

# Mobile Communication

In-building solutions  
and Antenna line products

Catalogue 2021



Shaping the  
connected world

## ESB is a specialist for reliable, high quality and innovative communication technologies

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**ESB** is a global company Customer-focused with headquarters in Spain (Valencia) which manufactures and develops Mobile Communication solutions in different areas like macro, micro, indoor coverage, smallcells and camouflage antenna Solutions for Communication Service Providers around the world.

### Our vision

We trust in the efficient and sustainable telecom infrastructure as a primary driver in the international integration

### Mission

Communication technologies play an important role in the process of evolution. They connect people and enable the world to be connected. ESB pursues an effective and responsible connection of the worlds' technologies. Demand of these technologies is constantly rising, as well as global data consumption. With more than 40 years experience, we are capable of meeting the most complex requirements and challenges.

"It is our mission to shape a connected world, continue to build it and improve its efficiency using innovative and sustainable technologies"

Our near future depends on new technologies. Due to our strong roots and experience, we will fight daily to achieve this environmental friendly connected world.

Esb mobile communication portfolio offers high-end Wireless products for all frequency bands and global standards, we are constantly evolving our portfolio to meet the market demand and in close cooperation with our customers and sales network, from the proof of concept to massive production.

### Our Values

ESB develops and sales telecom products on a global market. Working globally with the automotive and telecom industry brings the responsibility of working towards social and economic development and sustainability, as well as conducting business responsibly.

We work actively in our basic values: Innovation, cooperation, long-term approach and reduction of environmental impact.

**Innovation:** every day we pursue innovation in all we do. we focus on research, development and innovation (R & D & I). These 3 factors are the basis of our growth and our main difference compared to our competitors.

**Cooperation.** Working on product development gives us the opportunity to collaborate with any kind of company. We work effusively to maintain respectful and positive relations with all of our partners as well as suppliers, clients and everyone else whom we work with.

**Long-Term approach.** Developing products implies committing to long-term approaches with our partners and major investors. Having a long-term mind-set with regard to sustainability and management secures customer and owner value over time.

**Environmental friendly.** ESB works on daily basis to reduce visual impact of the telecommunication sector in our world. Therefore, product development moves towards the integration of the antenna with the environment.

**Quality Policy.** Quality is the best argument when it comes to competing on the market and represents a guarantee for the continuity and the future of any company.

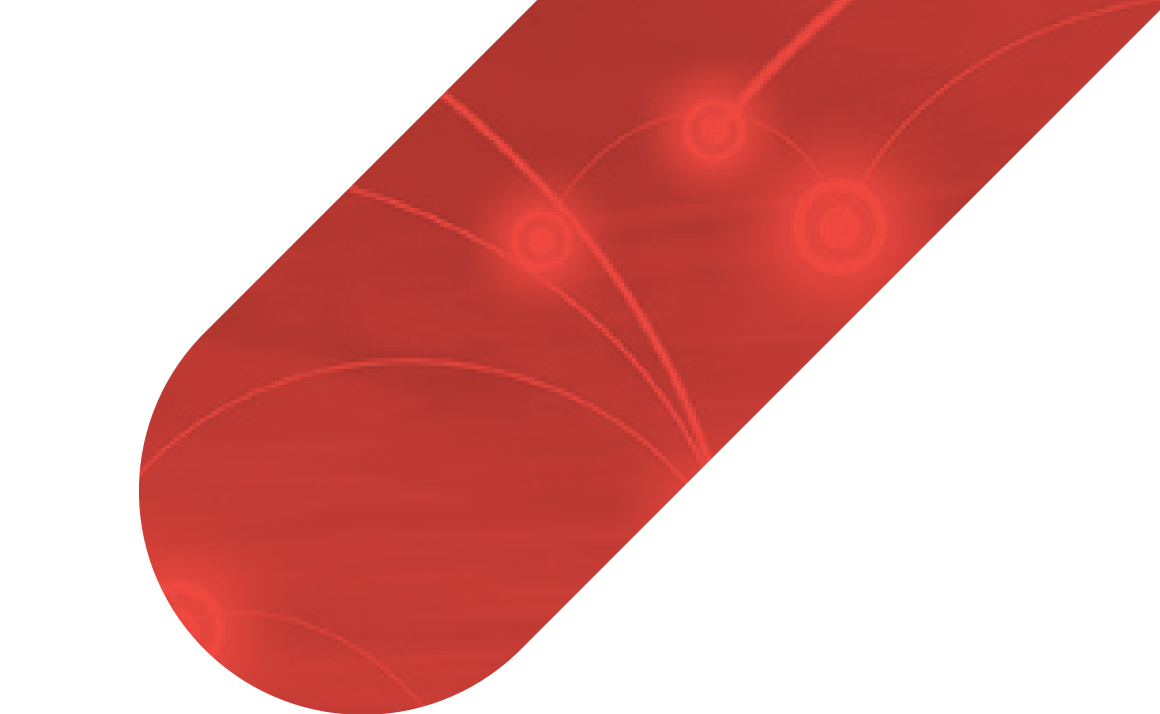


### **In-building solutions**

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### **Antenna line products**

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# **In-building solutions**



Indoor  
Antennas



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## Indoor Antennas

| Part Number | Antenna     |         | Connector |          | Frequency   |           | PIM         |                | Page |
|-------------|-------------|---------|-----------|----------|-------------|-----------|-------------|----------------|------|
|             | Type        | Applic. | N°        | Type     | Rango (MHz) | Gain (dB) | Value (dBc) | @Carrier Power |      |
| 78712019    | Omni        | SISO    | 1         | 4.3-10-F | 698-2700    | 2/5       | -150        | 2x43dBm        | 7    |
| 78711019    | Omni        | SISO    | 1         | N-F      | 698-2700    | 2/5       | -153        | 2x43dBm        | 7    |
| 78711019v01 | Omni        | SISO    | 1         | N-F      | 698-4000    | 2/5       | -153        | 2x43dBm        | 8    |
| 78712019v01 | Omni        | SISO    | 1         | 4.3-10-F | 698-4000    | 2/5       | -153        | 2x43dBm        | 8    |
| 78712031    | Omni        | SISO    | 1         | 4.3-10-F | 698-4000    | 2/4       | -153        | 2x43dBm        | 9    |
| 78712033    | Omni        | SISO    | 1         | 4.3-10-F | 698-4000    | 3/5       | -153        | 2x43dBm        | 10   |
| 78712035    | Slim Omni   | SISO    | 1         | 4.3-10-F | 698-4000    | 3/5       | -153        | 2x43dBm        | 11   |
| 78712041    | Omni        | SISO    | 1         | 4.3-10-F | 380-6000    | 2/3/6     | -153        | 2x43dBm        | 12   |
| 78712043    | Omni        | SISO    | 1         | 4.3-10-F | 698-4000    | 3/4       | -150        | 2x43dBm        | 13   |
| 78712045    | Omni        | SISO    | 1         | 4.3-10-F | 698-4000    | 3/4       | -150        | 2x43dBm        | 13   |
| 78712032    | Omni        | MIMO    | 2         | 4.3-10-F | 698-4000    | 3/6       | -150        | 2x43dBm        | 14   |
| 78711014    | Omni        | MIMO    | 2         | N-F      | 698-2700    | 2/4       | -150        | 2x43dBm        | 15   |
| 78712014    | Omni        | MIMO    | 2         | 4.3-10-F | 698-2700    | 2/4       | -150        | 2x43dBm        | 15   |
| 78711020    | Omni        | MIMO    | 2         | N-F      | 698-2700    | 3/5       | -150        | 2x43dBm        | 16   |
| 78712020    | Omni        | MIMO    | 2         | 4.3-10-F | 698-2700    | 3/5       | -150        | 2x43dBm        | 16   |
| 78711030    | Omni        | MIMO    | 2         | N-F      | 698-4000    | 3/5       | -153        | 2x43dBm        | 17   |
| 78712030    | Omni        | MIMO    | 2         | 4.3-10-F | 698-4000    | 3/5       | -153        | 2x43dBm        | 17   |
| 78712034    | Omni Flat   | MIMO    | 2         | 4.3-10-F | 698-4000    | 3/6       | -150        | 2x43dBm        | 18   |
| 78713160    | Omni        | MIMO    | 4         | 4.3-10-F | 698-4000    | 4/5       | -153        | 2x43dBm        | 19   |
| 78733160    | Omni        | MIMO    | 4         | N        | 698-4000    | 4/5       | -153        | 2x43dBm        | 19   |
| 78711313    | Directional | SISO    | 1         | N-F      | 698-2700    | 7/9       | -150        | 2x43dBm        | 20   |
| 78712313    | Directional | SISO    | 1         | 4.3-10-F | 698-2700    | 7/9       | -150        | 2x43dBm        | 20   |
| 78711323    | Directional | SISO    | 1         | N-F      | 698-4000    | 6/9       | -153        | 2x43dBm        | 21   |
| 78712323    | Directional | SISO    | 1         | 4.3-10-F | 698-4000    | 6/9       | -153        | 2x43dBm        | 21   |
| 78711311    | Directional | MIMO    | 2         | N-F      | 698-2700    | 6/9       | -153        | 2x43dBm        | 22   |
| 78712311    | Directional | MIMO    | 2         | 4.3-10-F | 698-2700    | 6/9       | -153        | 2x43dBm        | 22   |
| 78712330    | Directional | MIMO    | 2         | 4.3-10-F | 698-4000    | 6/9       | -153        | 2x43dBm        | 23   |
| 78713130    | Directional | MIMO    | 4         | 4.3-10   | 698-4000    | 6/9       | -153        | 2x43dBm        | 24   |
| 78733130    | Directional | MIMO    | 4         | N        | 698-4000    | 6/9       | -153        | 2x43dBm        | 24   |

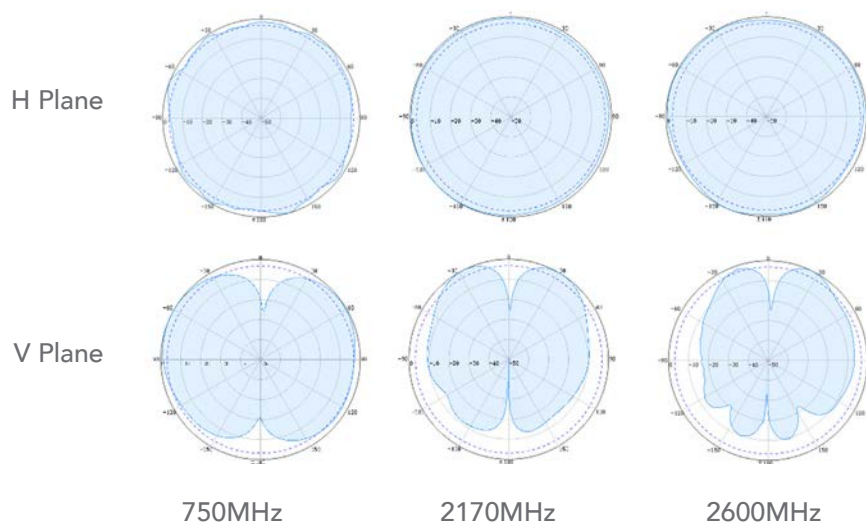


## 7871x019

### Indoor Omni Directional Antenna (Dome) V-Pol 1-port 2/5dBi 698-960 / 1710-2700

### Omni Indoor 698-960/1710-2700 2/5dBi (Dome)

| Type                       | 78712019            | 78711019     |
|----------------------------|---------------------|--------------|
| Frequency (MHz)            | 698-960             | 1710-2700    |
| Gain (dBi)                 | 2.0                 | 5.0          |
| VSWR                       | $\leq 1.8$          | $\leq 1.8$   |
| Polarization               | Vertical            |              |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$         |              |
| Horizontal Beamwidth (°)   | 360                 |              |
| Input Impedance (ohm)      | 50                  |              |
| Max. Input Power (W)       | 50                  |              |
| Lightning Protection       | DC Grounded         |              |
| Connector                  | 1 x 4.3-10 Female   | 1 x N Female |
| Dimension (mm)             | Ø186 x 86           |              |
| Weight (kgs)               | Approx. 0.25        |              |
| Reflector Material         | Aluminum            |              |
| Radome Material            | ABS (UV Stabilized) |              |
| Operating Temperature (°C) | -40 to +65          |              |



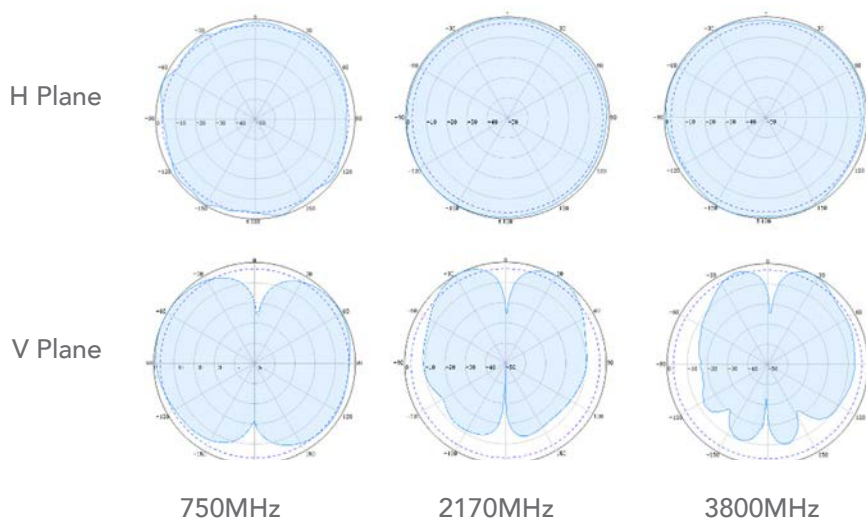


## 7871x019v01

**Indoor Omni Directional Antenna (Dome)**  
**V-Pol 1-port 2/5dBi**  
**698-960 / 1425-4000**

### Omni Indoor 698-960/1425-4000 2/5dBi (Dome)

| Type                       | 78712019v01         |         | 78711019v01  |           |
|----------------------------|---------------------|---------|--------------|-----------|
| Frequency (MHz)            | 698-805             | 806-960 | 1425-2700    | 3300-4000 |
| Gain (dBi)                 | 2.0                 | 2.0     | 5.0          | 5.5       |
| VSWR                       | ≤ 2.0               | ≤ 1.8   | ≤ 1.5        | ≤ 1.5     |
| Polarization               | Vertical            |         |              |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -153              |         |              |           |
| Horizontal Beamwidth (°)   | 360                 |         |              |           |
| Vertical Beamwidth (°)     | 85                  | 80      | 54           | 28        |
| Input Impedance (ohm)      | 50                  |         |              |           |
| Max. Input Power (W)       | 50                  |         |              |           |
| Lightning Protection       | DC Grounded         |         |              |           |
| Connector                  | 1 x 4.3-10 Female   |         | 1 x N Female |           |
| Dimension (mm)             | Ø186 x 86           |         |              |           |
| Weight (kgs)               | Approx. 0.25        |         |              |           |
| Reflector Material         | Aluminum            |         |              |           |
| Radome Material            | ABS (UV Stabilized) |         |              |           |
| Operating Temperature (°C) | -40 to +65          |         |              |           |



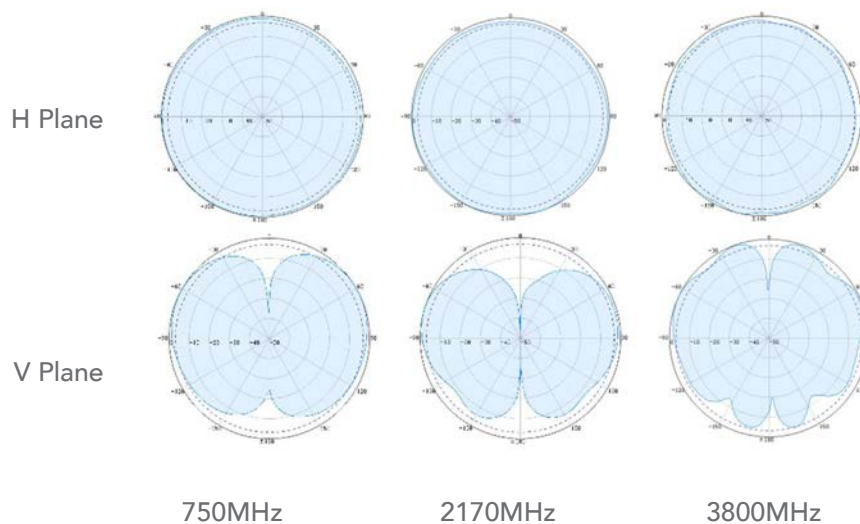


## 78712031

### Indoor Omni Directional Antenna V-Pol 1-port 2/4dBi 698-960 / 1425-4000

### Omni Indoor 698-960/1425-4000 2/4dBi

| Type                       | 78712031            |            |            |            |
|----------------------------|---------------------|------------|------------|------------|
| Frequency (MHz)            | 698-805             | 806-960    | 1425-2700  | 3300-4000  |
| Gain (dBi)                 | 1.5                 | 2.0        | 3.0        | 4.0        |
| VSWR                       | $\leq 2.0$          | $\leq 2.0$ | $\leq 1.5$ | $\leq 1.5$ |
| Polarization               | Vertical            |            |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -153$         |            |            |            |
| Horizontal Beamwidth (°)   | 360                 |            |            |            |
| Vertical Beamwidth (°)     | 95                  | 80         | 38         | 32         |
| Input Impedance (ohm)      | 50                  |            |            |            |
| Max. Input Power (W)       | 50                  |            |            |            |
| Lightning Protection       | DC Grounded         |            |            |            |
| Connector                  | 4.3-10 Female       |            |            |            |
| Dimension (mm)             | Ø204 x 125          |            |            |            |
| Weight (kgs)               | Approx. 0.40        |            |            |            |
| Reflector Material         | Aluminum            |            |            |            |
| Radome Material            | ABS (UV Stabilized) |            |            |            |
| Operating Temperature (°C) | -40 to +65          |            |            |            |





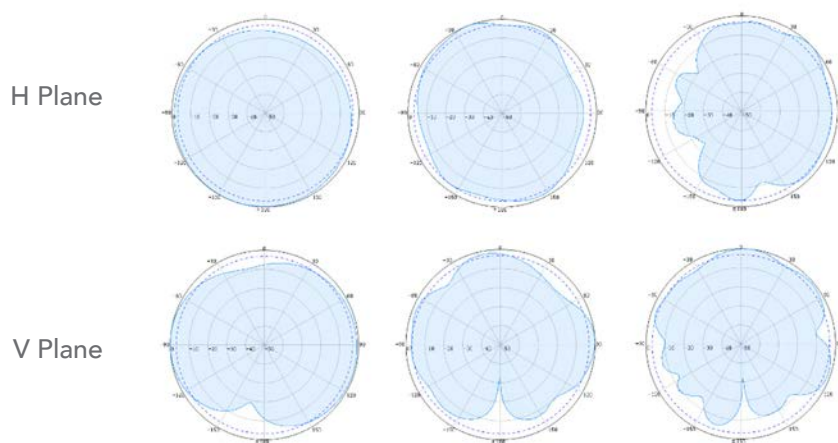
## 78712033

### Indoor Omni Directional Antenna V-Pol 1-port 3/5dBi 698-960 / 1425-4000

### Omni Indoor 698-960/1425-4000 3/5dBi (Rectangular Card)

| Type                       | 78712033            |            |            |            |            |
|----------------------------|---------------------|------------|------------|------------|------------|
| Frequency (MHz)            | 698-960             | 1425-1690  | 1690-2170  | 2170-2700  | 3300-4000  |
| Gain (dBi)                 | 3.0                 | 3.5        | 4.0        | 5.0        | 4.0        |
| VSWR                       | $\leq 2.0$          | $\leq 2.0$ | $\leq 1.8$ | $\leq 1.8$ | $\leq 1.8$ |
| Polarization               | Horizontal          |            |            |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -153$         |            |            |            |            |
| Horizontal Beamwidth (°)   | 360                 |            |            |            |            |
| Vertical Beamwidth (°)     | 118                 | 85         | 75         | 63         | 70         |
| Input Impedance (ohm)      | 50                  |            |            |            |            |
| Max. Input Power (W)       | 50                  |            |            |            |            |
| Lightning Protection       | DC Grounded         |            |            |            |            |
| Connector                  | 1 x 4.3-10 Female   |            |            |            |            |
| Dimension (mm)             | 180 x 110 x 7       |            |            |            |            |
| Weight (kgs)               | Approx. 0.2         |            |            |            |            |
| Reflector Material         | RF PCB              |            |            |            |            |
| Radome Material            | ABS (UV Stabilized) |            |            |            |            |
| Operating Temperature (°C) | -40 to +65          |            |            |            |            |

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750MHz

2170MHz

3800MHz



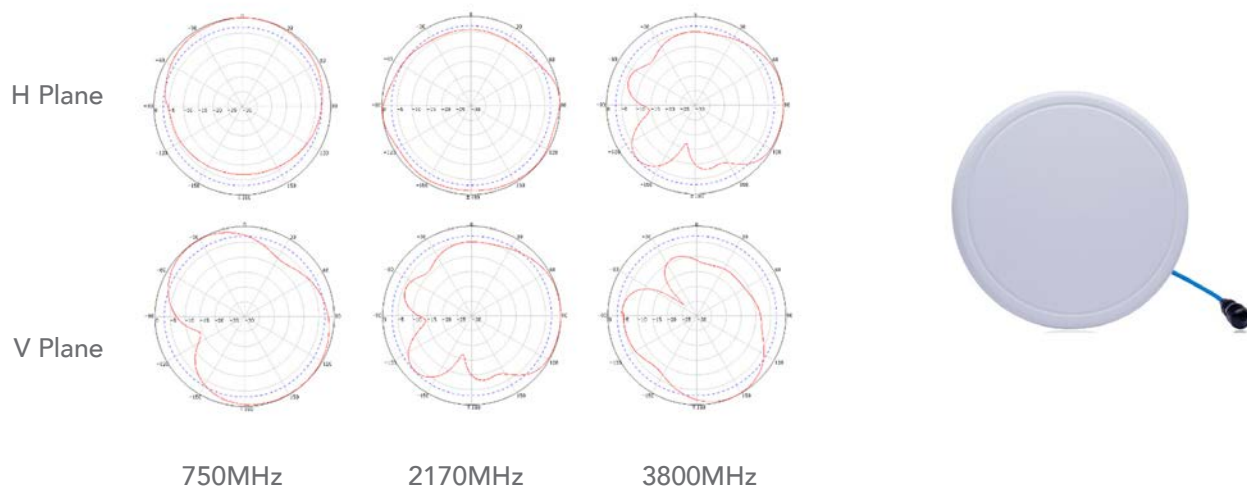


## 78712035

### Indoor Omni Directional Antenna (Flat) H-Pol 1-port 3/5dBi 698-960 / 1425-4000

### Omni Indoor 698-960/1425-4000 3/5dBi (Flat)

| Type                       | 78712035            |            |            |            |            |
|----------------------------|---------------------|------------|------------|------------|------------|
| Frequency (MHz)            | 698-960             | 1425-1690  | 1690-2170  | 2170-2700  | 3300-4000  |
| Gain (dBi)                 | 2.5                 | 3.5        | 4.0        | 5.0        | 4.0        |
| VSWR                       | $\leq 2.0$          | $\leq 2.0$ | $\leq 1.8$ | $\leq 1.8$ | $\leq 1.8$ |
| Polarization               | Horizontal          |            |            |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -153$         |            |            |            |            |
| Horizontal Beamwidth (°)   | 360                 |            |            |            |            |
| Vertical Beamwidth (°)     | 116                 | 90         | 78         | 70         | 65         |
| Input Impedance (ohm)      | 50                  |            |            |            |            |
| Max. Input Power (W)       | 50                  |            |            |            |            |
| Lightning Protection       | DC Grounded         |            |            |            |            |
| Connector                  | Ø190 x 7.3          |            |            |            |            |
| Dimension (mm)             | 180 x 110 x 7       |            |            |            |            |
| Weight (kgs)               | Approx. 0.2         |            |            |            |            |
| Reflector Material         | RF PCB              |            |            |            |            |
| Radome Material            | ABS (UV Stabilized) |            |            |            |            |
| Operating Temperature (°C) | -40 to +65          |            |            |            |            |





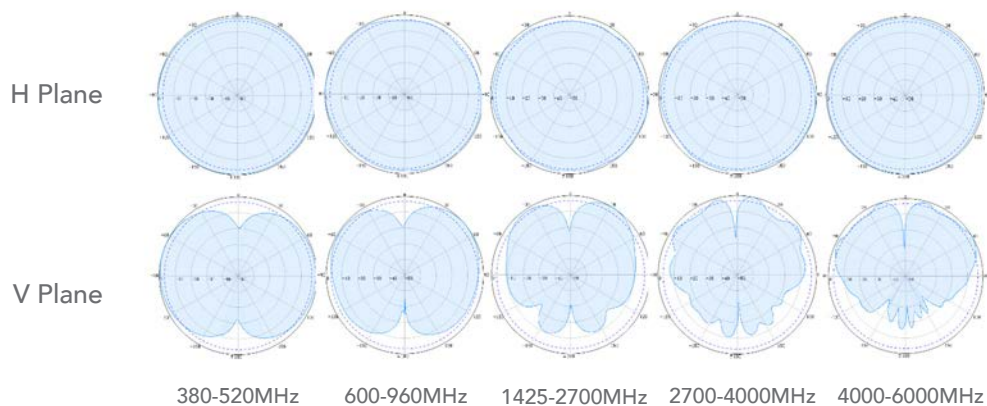
## 78712041

**Omni Antenna (Mini)**  
**V-Pol 1-port 3/4dBi**  
**698-960 / 1425-4000**

## Omni Indoor 380-520/600-960/1425-6000 2/3/6dBi (Dome)

| Type                       | 78712041            |         |           |           |           |
|----------------------------|---------------------|---------|-----------|-----------|-----------|
| Frequency (MHz)            | 380-520             | 600-960 | 1425-2700 | 2700-4000 | 4000-6000 |
| Gain (dBi)                 | 1.5                 | 2.5     | 4.5       | 5.0       | 5.5       |
| VSWR                       | ≤ 2.5               | ≤ 2.0   | ≤ 2.0     | ≤ 2.0     | ≤ 2.0     |
| Polarization               | Vertical            |         |           |           |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -153              |         |           |           |           |
| Horizontal Beamwidth (°)   | 360                 |         |           |           |           |
| Vertical Beamwidth (°)     | 100                 | 90      | 45        | 22        | 35        |
| Input Impedance (ohm)      | 50                  |         |           |           |           |
| Max. Input Power (W)       | 50                  |         |           |           |           |
| Lightning Protection       | DC Grounded         |         |           |           |           |
| Connector                  | 1 x 4.3-10 Female   |         |           |           |           |
| Dimension (mm)             | Ø285 x 135          |         |           |           |           |
| Weight (kgs)               | Approx. 0.85        |         |           |           |           |
| Reflector Material         | Aluminum            |         |           |           |           |
| Radome Material            | ABS (UV Stabilized) |         |           |           |           |
| Operating Temperature (°C) | -40 to +65          |         |           |           |           |

A)4WN51115907YR/4WO51115907YR





## 78712043 & 78712045

**Omni Antenna (Mini)**  
**V-Pol 1-port 3/4dBi**  
**698-960 / 1425-4000**

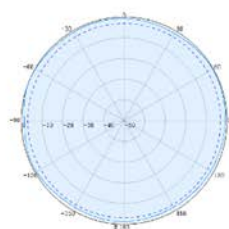
### V-Pol Omni 698-960 / 1425-4000 3/4dBi

| Type                       | Cubic Column                             | 78712043  |                         |  |
|----------------------------|------------------------------------------|-----------|-------------------------|--|
|                            | Cylindrical Column                       | 78712045  |                         |  |
| Frequency Range (MHz)      | 698-960                                  | 1425-2700 | 3300-4000               |  |
| Gain (dBi)                 | 3                                        | 4         | 4.5                     |  |
| VSWR                       | ≤ 1.8                                    |           |                         |  |
| 3rd Order PIM (dBc)        | ≤ -150 @ 2x43dBm                         |           |                         |  |
| Polarization               | Vertical                                 |           |                         |  |
| Horizontal Beamwidth (°)   | 360                                      |           |                         |  |
| Vertical Beamwidth (°)     | 80                                       | 52        | 38                      |  |
| Input Impedance (ohm)      | 50                                       |           |                         |  |
| Max. Input Power (W)       | 100                                      |           |                         |  |
| Lightning Protection       | DC Grounded                              |           |                         |  |
| Connector Type             | 1 x 4.3-10 Female                        |           |                         |  |
| Dimension (mm)             | 66 x 66 x 190                            |           | Ø63 x 190               |  |
| Weight (kgs)               | Cubic Column: 0.35                       |           | Cylindrical Column: 1.0 |  |
| Radome Material            | UV-ABS                                   |           |                         |  |
| Radiator Material          | Aluminum                                 |           |                         |  |
| Operating Temperature (°C) | -40 to +65                               |           |                         |  |
| Mounting                   | Mounting Clamp for Pole Ø38-Ø52 included |           |                         |  |

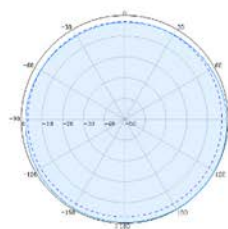
**78712043**  
Cubic Column



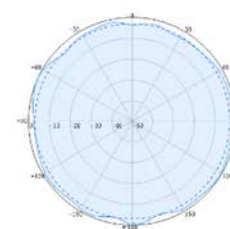
**78712045**  
Cylindrical Column



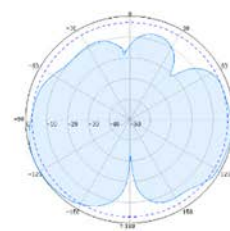
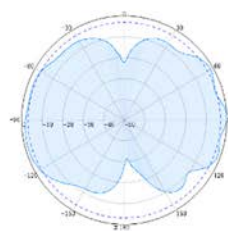
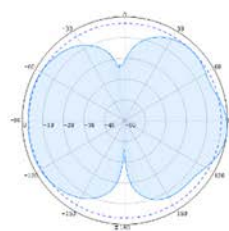
750MHz



2170MHz



3800MHz



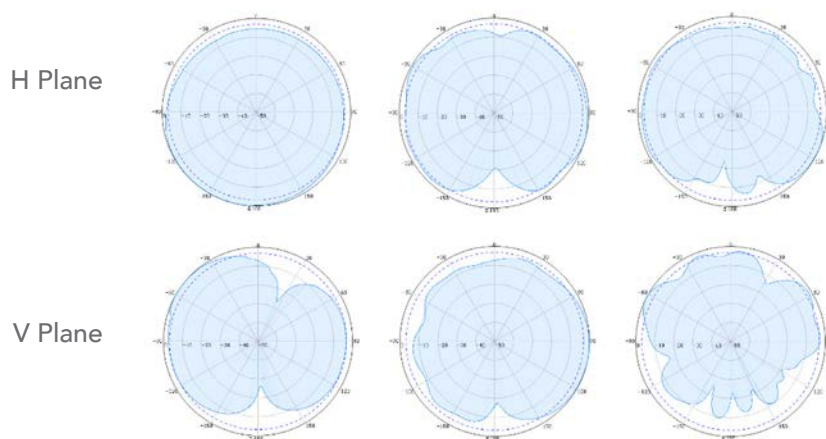


## 78712032

**Indoor Omni Directional Antenna (Rect. Card)**  
**H/H-Pol 2-port 3/6dBi**  
**617-960 / 1425-4000**

### Omni Indoor 617-960/1425-4000 3/6dBi (Rectangular Card)

| Type                       | 78712032            |            |            |            |
|----------------------------|---------------------|------------|------------|------------|
| Frequency (MHz)            | 617-960             | 1425-2170  | 2300-2700  | 3300-4000  |
| Gain (dBi)                 | 3.0                 | 4.0        | 6.0        | 5.5        |
| VSWR                       | $\leq 2.0$          | $\leq 2.0$ | $\leq 1.8$ | $\leq 1.8$ |
| Polarization               | H-H                 |            |            |            |
| Isolation (dB)             | 20                  | 23         | 23         | 23         |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$         |            |            |            |
| Horizontal Beamwidth (°)   | 360                 |            |            |            |
| Vertical Beamwidth (°)     | 113                 | 78         | 65         | 102        |
| Input Impedance (ohm)      | 50                  |            |            |            |
| Max. Input Power (W)       | 50                  |            |            |            |
| Lightning Protection       | DC Grounded         |            |            |            |
| Connector                  | 2 x 4.3-10 Female   |            |            |            |
| Dimension (mm)             | 250 X 150 X 12      |            |            |            |
| Weight (kgs)               | Approx. 0.4         |            |            |            |
| Reflector Material         | RF PCB              |            |            |            |
| Radome Material            | ABS (UV Stabilized) |            |            |            |
| Operating Temperature (°C) | -40 to +65          |            |            |            |



750MHz

2170MHz

3800MHz





## 7871x014

**Indoor Omni Directional Antenna**  
**V/H-Pol 2-port 2/4dBi**  
**698-960 (SISO) / 1710-2700 (MIMO)**

### Omni Indoor 698-960 (SISO) / 1710-2700 (MIMO) 2/4dBi

| Type                       | 78712014            |         |              | 78711014   |           |
|----------------------------|---------------------|---------|--------------|------------|-----------|
| Port Allocation            | Port 1              |         |              | Port 2     |           |
| Frequency (MHz)            | 698-805             | 806-960 | 1710-2700    | 1710-1880  | 1880-2700 |
| Gain (dBi)                 | 1.5                 | 2.0     | 3.5          | 3.5        | 4.0       |
| VSWR                       | ≤ 1.8               | ≤ 1.5   | 1.5          | ≤ 1.8      | ≤ 1.5     |
| Polarization               | Vertical            |         |              | Horizontal |           |
| Isolation (dB)             | ≥ 25                |         |              |            |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -150              |         |              |            |           |
| Horizontal Beamwidth (°)   | 360                 |         |              |            |           |
| Vertical Beamwidth (°)     | 98                  | 85      | 38           | 45         | 42        |
| Input Impedance (ohm)      | 50                  |         |              |            |           |
| Max. Input Power (W)       | 50                  |         |              |            |           |
| Lightning Protection       | DC Grounded         |         |              |            |           |
| Connector                  | 2 x 4.3-10 Female   |         | 2 x N Female |            |           |
| Dimension (mm)             | Ø182 x 123          |         |              |            |           |
| Weight (kgs)               | Approx. 0.37        |         |              |            |           |
| Reflector Material         | Aluminum and PCB    |         |              |            |           |
| Radome Material            | ABS (UV Stabilized) |         |              |            |           |
| Operating Temperature (°C) | -40 to +55          |         |              |            |           |





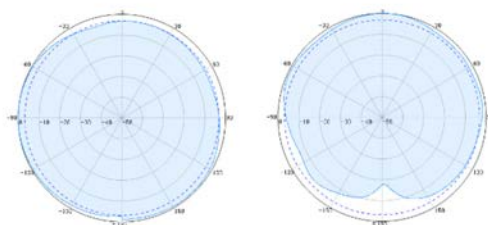
## 7871x020

**Indoor Omni Directional Antenna**  
**H/V-Pol 2-port 3/5dBi**  
**698-960 / 1710-2700**

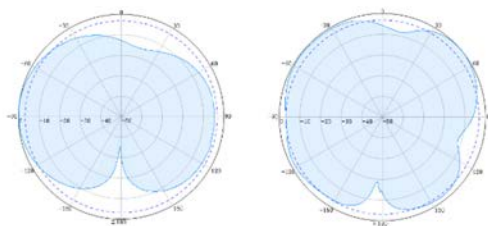
### Omni Indoor 698-960/1710-2700 3/5dBi

| Type                       | 78712020            | 78711020     |
|----------------------------|---------------------|--------------|
| Frequency (MHz)            | 698-960             | 1710-2700    |
| Gain (dBi)                 | 3.0                 | 4.5          |
| VSWR                       | $\leq 1.8$          | $\leq 1.7$   |
| Polarization               | H-V                 |              |
| Isolation (dB)             | $\geq 19$           | $\geq 23$    |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$         |              |
| Horizontal Beamwidth (°)   | 360                 |              |
| Vertical Beamwidth (°)     | 90                  | 46           |
| Input Impedance (ohm)      | 50                  |              |
| Max. Input Power (W)       | 50                  |              |
| Lightning Protection       | DC Grounded         |              |
| Connector                  | 2 x 4.3-10 Female   | 2 x N Female |
| Dimension (mm)             | Ø215 x 47           |              |
| Weight (kgs)               | Approx. 0.45        |              |
| Reflector Material         | Copper and PCB      |              |
| Radome Material            | ABS (UV Stabilized) |              |
| Operating Temperature (°C) | -40 to +65          |              |

H Plan



V Plan



750MHz

2170MHz





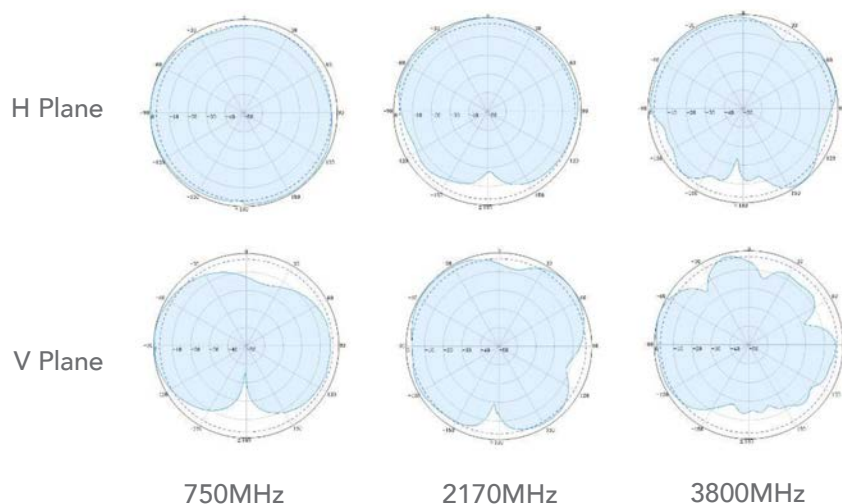


## 7871x030

### Indoor Omni Directional Antenna H/V-Pol 2-port 3/5dBi 698-960 / 1425-4000

#### Omni Indoor 698-960/1425-4000 3/5dBi

| Type                       | 78712030            |         | 78711030     |           |
|----------------------------|---------------------|---------|--------------|-----------|
| Frequency (MHz)            | 698-805             | 806-960 | 1425-2700    | 3300-4000 |
| Gain (dBi)                 | 2.5                 | 3.5     | 4.5          | 5.0       |
| VSWR                       | ≤ 2.0               | ≤ 1.8   | ≤ 1.8        | ≤ 1.8     |
| Polarization               | H-V                 |         |              |           |
| Isolation (dB)             | ≥ 19                |         | ≥ 23         |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -153              |         |              |           |
| Horizontal Beamwidth (°)   | 360                 |         |              |           |
| Vertical Beamwidth (°)     | 95                  | 90      | 46           | 38        |
| Input Impedance (ohm)      | 50                  |         |              |           |
| Max. Input Power (W)       | 50                  |         |              |           |
| Lightning Protection       | DC Grounded         |         |              |           |
| Connector                  | 2 x 4.3-10 Female   |         | 2 x N Female |           |
| Dimension (mm)             | Ø215 x 47           |         |              |           |
| Weight (kgs)               | Approx. 0.45        |         |              |           |
| Reflector Material         | Aluminum            |         |              |           |
| Radome Material            | ABS (UV Stabilized) |         |              |           |
| Operating Temperature (°C) | -40 to +65          |         |              |           |



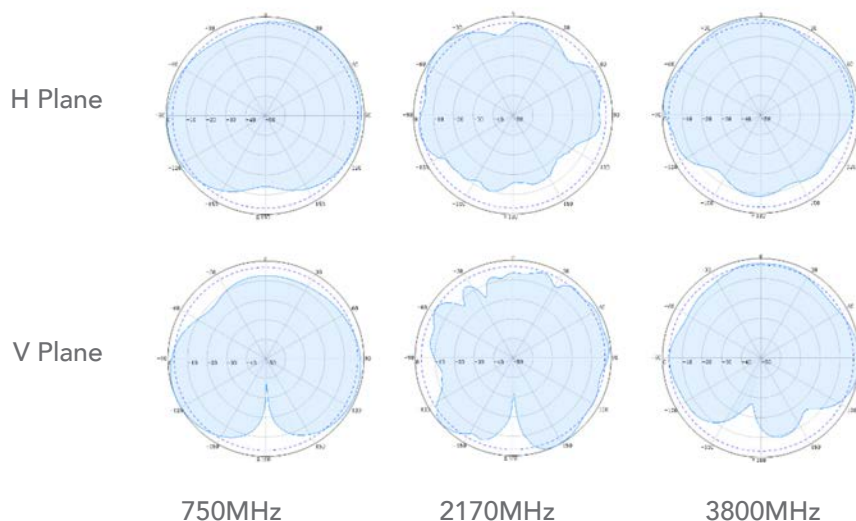


## 78712034

**Indoor Omni Directional Antenna (Flat)**  
**H/H-Pol 2-port 3/6dBi**  
**698-960 / 1425-4000**

### Omni Indoor 698-960/1425-4000 3/6dBi (Flat)

| Type                       | 78712034            |           |           |           |
|----------------------------|---------------------|-----------|-----------|-----------|
| Frequency (MHz)            | 698-960             | 1425-2170 | 2300-2700 | 3300-4000 |
| Gain (dBi)                 | 3.0                 | 4.0       | 6.0       | 5.5       |
| VSWR                       | ≤ 2.0               | ≤ 2.0     | ≤ 1.8     | ≤ 1.8     |
| Polarization               | H-H                 |           |           |           |
| Isolation (dB)             | 20                  | 23        | 23        | 23        |
| PIM3 (dBc, @2x43dBm)       | ≤ -150              |           |           |           |
| Horizontal Beamwidth (°)   | 360                 |           |           |           |
| Vertical Beamwidth (°)     | 110                 | 68        | 29        | 30        |
| Input Impedance (ohm)      | 50                  |           |           |           |
| Max. Input Power (W)       | 50                  |           |           |           |
| Lightning Protection       | DC Grounded         |           |           |           |
| Connector                  | 2 x 4.3-10 Female   |           |           |           |
| Dimension (mm)             | Ø280 x 19           |           |           |           |
| Weight (kgs)               | Approx. 0.55        |           |           |           |
| Reflector Material         | RF PCB              |           |           |           |
| Radome Material            | ABS (UV Stabilized) |           |           |           |
| Operating Temperature (°C) | -40 to +65          |           |           |           |



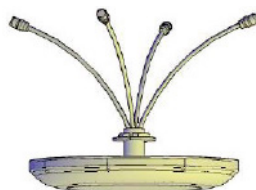


## 787x3160

### Indoor Omni Antenna HH-Pol 4-port 4/5dBi 698-960 / 1425-4000

#### Omni Indoor 698-960/1425-4000 4/5dBi

| Type                       | 78713160            |           | 78733160     |
|----------------------------|---------------------|-----------|--------------|
| Frequency (MHz)            | 698-960             | 1425-2700 | 3300-4000    |
| Gain (dBi)                 | 3.5                 | 4.0       | 4.5          |
| VSWR                       | ≤ 2.0               | ≤ 2.0     | ≤ 2.0        |
| Polarization               | H-H                 |           |              |
| PIM3 (dBc, @2x43dBm)       | ≤ -153              |           |              |
| Isolation (dB)             | ≥ 15                | ≥ 20      | ≥ 22         |
| Horizontal Beamwidth (°)   | 360                 |           |              |
| Vertical Beamwidth (°)     | 90                  | 46        | 38           |
| Input Impedance (ohm)      | 50                  |           |              |
| Max. Input Power (W)       | 50                  |           |              |
| Lightning Protection       | DC Grounded         |           |              |
| Connector                  | 4 x 4.3-10 Female   |           | 4 x N Female |
| Dimension (mm)             | Ø320 x 50           |           |              |
| Weight (kgs)               | Approx. 1.0         |           |              |
| Radome Material            | ABS (UV Stabilized) |           |              |
| Operating Temperature (°C) | -40 to +65          |           |              |



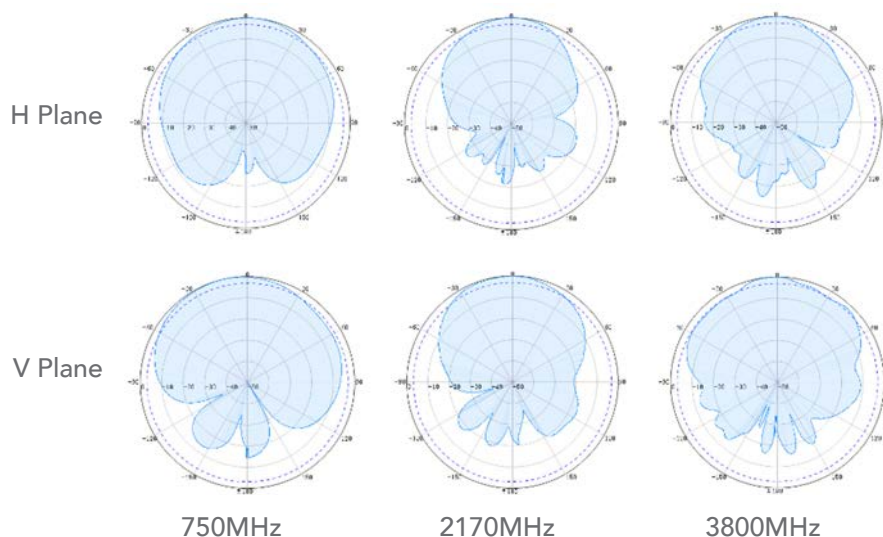


## 7871x313

### Indoor Directional Panel Antenna V-Pol 1-port 7/9dBi 698-960 / 1710-2700

### Panel Indoor 698-960/1710-2700 6/8dBi

| Type                       | 78712313            | 78711313   |
|----------------------------|---------------------|------------|
| Frequency (MHz)            | 698-960             | 1710-2700  |
| Gain (dBi)                 | 7.0                 | 9.0        |
| VSWR                       | $\leq 2.0$          | $\leq 1.8$ |
| Polarization               | Vertical            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$         |            |
| Horizontal Beamwidth (°)   | 90                  | 65         |
| Vertical Beamwidth (°)     | 90                  | 60         |
| Input Impedance (ohm)      | 50                  |            |
| Max. Input Power (W)       | 50                  |            |
| Lightning Protection       | DC Grounded         |            |
| Connector                  | 4.3-10 Female       | N Female   |
| Dimension (mm)             | 180 x 158 x 60      |            |
| Weight (kgs)               | Approx. 0.40        |            |
| Reflector Material         | Aluminum            |            |
| Radome Material            | ABS (UV Stabilized) |            |
| Operating Temperature (°C) | -40 to +65          |            |



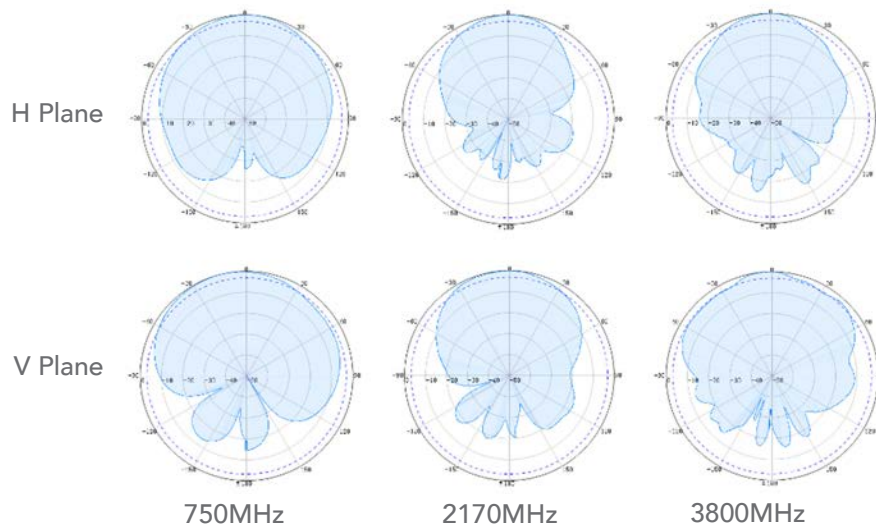


## 7871x323

### Indoor Directional Panel Antenna V-Pol 1-port 6/8dBi 698-960 / 1425-4000

#### Panel Indoor 698-960/1425-4000 6/8dBi

| Type                       | 78712323            |         | 78711323  |           |
|----------------------------|---------------------|---------|-----------|-----------|
| Frequency (MHz)            | 698-806             | 806-960 | 1425-2700 | 3300-3800 |
| Gain (dBi)                 | 5.5                 | 6.5     | 8.0       | 7.0       |
| VSWR                       | ≤ 2.0               | ≤ 2.0   | ≤ 1.8     | ≤ 1.8     |
| Polarization               | Vertical            |         |           |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -150              |         |           |           |
| Front-to-Back Ratio (dB)   | ≥ 9                 | ≥ 10    | ≥ 15      | ≥ 11      |
| Horizontal Beamwidth (°)   | 100                 | 85      | 65        | 50        |
| Vertical Beamwidth (°)     | 90                  | 82      | 60        | 45        |
| Input Impedance (ohm)      | 50                  |         |           |           |
| Max. Input Power (W)       | 50                  |         |           |           |
| Lightning Protection       | DC Grounded         |         |           |           |
| Connector                  | 4.3-10 Female       |         | N Female  |           |
| Dimension (mm)             | 180 x 158 x 60      |         |           |           |
| Weight (kgs)               | Approx. 0.40        |         |           |           |
| Reflector Material         | Aluminum            |         |           |           |
| Radome Material            | ABS (UV Stabilized) |         |           |           |
| Operating Temperature (°C) | -40 to +65          |         |           |           |



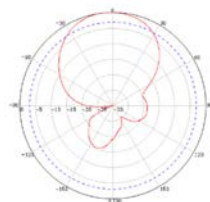
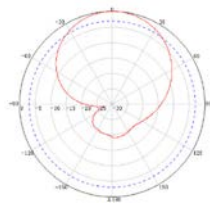


## 7871x311

### Indoor Panel Directional Antenna H/V-Pol 2-port 6/9dBi 698-960 / 1690-2700

#### Panel Indoor 698-960/1690-2700 7/9dBi

| Type                       | 78712311            |         | 78711311     |           |
|----------------------------|---------------------|---------|--------------|-----------|
| Frequency (MHz)            | 698-805             | 806-960 | 1690-2170    | 2170-2700 |
| Gain (dBi)                 | 6.5                 | 7.0     | 8.5          | 9.0       |
| VSWR                       | ≤ 1.8               |         | ≤ 1.7        |           |
| Polarization               | ±45°                |         |              |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -150              |         |              |           |
| Isolation (dB)             | ≥ 20                |         | ≥ 23         |           |
| Horizontal Beamwidth (°)   | 78                  | 73      | 65           | 60        |
| Vertical Beamwidth (°)     | 70                  | 62      | 58           | 55        |
| Input Impedance (ohm)      | 50                  |         |              |           |
| Max. Input Power (W)       | 50                  |         |              |           |
| Lightning Protection       | DC Grounded         |         |              |           |
| Connector                  | 2 x 4.3-10 Female   |         | 2 x N Female |           |
| Dimension (mm)             | 315 x 195 x 68      |         |              |           |
| Weight (kgs)               | Approx. 0.7         |         |              |           |
| Reflector Material         | Copper and PCB      |         |              |           |
| Radome Material            | ABS (UV Stabilized) |         |              |           |
| Operating Temperature (°C) | -40 to +65          |         |              |           |



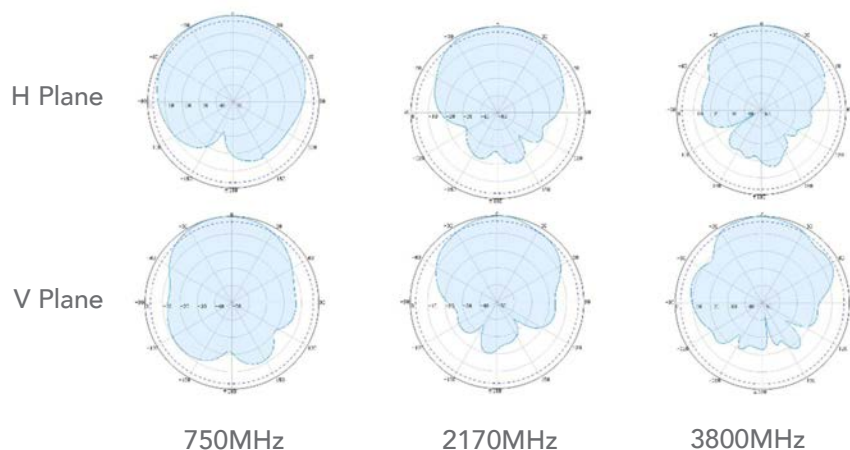


## 78712330

### Indoor Panel Directional Antenna H/H-Pol 2-port 6/9dBi 698-960 / 1425-4000

#### Panel Indoor 698-960/1425-4000 6/9dBi

| Type                       | 78712330            |            |            |
|----------------------------|---------------------|------------|------------|
| Frequency (MHz)            | 698-960             | 1425-2700  | 3300-4000  |
| Gain (dBi)                 | 5.5                 | 8.5        | 7.0        |
| VSWR                       | $\leq 2.0$          | $\leq 1.8$ | $\leq 2.0$ |
| Polarization               | H-V                 |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -153$         |            |            |
| Isolation (dB)             | $\geq 12$           | $\geq 20$  | $\geq 24$  |
| Front-to-Back Ratio (dB)   | $\geq 7$            | $\geq 13$  | $\geq 10$  |
| Horizontal Beamwidth (°)   | 90                  | 65         | 45         |
| Vertical Beamwidth (°)     | 78                  | 60         | 38         |
| Input Impedance (ohm)      | 50                  |            |            |
| Max. Input Power (W)       | 50                  |            |            |
| Lightning Protection       | DC Grounded         |            |            |
| Connector                  | 2 x 4.3-10 Female   |            |            |
| Dimension (mm)             | 315 x 195 x 68      |            |            |
| Weight (kgs)               | Approx. 0.65        |            |            |
| Reflector Material         | Aluminum and PCB    |            |            |
| Radome Material            | ABS (UV Stabilized) |            |            |
| Operating Temperature (°C) | -40 to +65          |            |            |



**787x3130**

**Indoor Panel Directional Antenna**  
**VH-Pol 4-port 6/9dBi**  
**698-960 / 1425-4000**

**Panel Indoor 698-960/1425-4000 6/9dBi**

| Type                       | 78713130            |           | 78733130     |
|----------------------------|---------------------|-----------|--------------|
| Frequency (MHz)            | 698-960             | 1425-2700 | 3300-4000    |
| Gain (dBi)                 | 5.5                 | 8.5       | 7.9          |
| VSWR                       | ≤ 2.0               | ≤ 2.0     | ≤ 2.0        |
| Polarization               | V-H                 |           |              |
| PIM3 (dBc, @2x43dBm)       | ≤ -153              |           |              |
| Isolation (dB)             | ≥ 12                | ≥ 20      | ≥ 24         |
| Front-to-Back Ratio (dB)   | ≥ 7                 | ≥ 13      | ≥ 10         |
| Horizontal Beamwidth (°)   | 130-85              | 95-58     | 65-33        |
| Vertical Beamwidth (°)     | 108-78              | 83-45     | 90-25        |
| Input Impedance (ohm)      | 50                  |           |              |
| Max. Input Power (W)       | 50                  |           |              |
| Lightning Protection       | DC Grounded         |           |              |
| Connector                  | 4 x 4.3-10 Female   |           | 4 x N Female |
| Dimension (mm)             | 385 x 315 x 68      |           |              |
| Weight (kgs)               | Approx. 1.5         |           |              |
| Reflector Material         | Aluminum and PCB    |           |              |
| Radome Material            | ABS (UV Stabilized) |           |              |
| Operating Temperature (°C) | -40 to +65          |           |              |







Low PIM  
Splitters



# Index

## Low PIM Splitters

| Part Number | Description    | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|----------------|-----------------------|-----------|-----------------|----------------|------|
| 78761022    | 2-way Splitter | 698-2700              | -155      | 300             | N-F            | 27   |
| 78761032    | 3-way Splitter | 698-2700              | -155      | 300             | N-F            | 27   |
| 78761042    | 4-way Splitter | 698-2700              | -155      | 300             | N-F            | 27   |
| 78762023    | 2-way Splitter | 698-4000              | -160      | 500             | 4.3-10-F       | 28   |
| 78762033    | 3-way Splitter | 698-4000              | -160      | 500             | 4.3-10-F       | 28   |
| 78762043    | 4-way Splitter | 698-4000              | -160      | 500             | 4.3-10-F       | 28   |



## 787610X2

**Power Splitter 2- / 3- / 4-way N 300W**  
**PIM -155dB**  
**698-2700**

### Power Splitter 300W 698-2700(Round Tube)

| Type                       | 78761022                        | 78761032      | 78761042        |
|----------------------------|---------------------------------|---------------|-----------------|
| Frequency (MHz)            | 698-2700                        |               |                 |
| Splitting Output           | 2-way                           | 3-way         | 4-way           |
| Distribution Loss (dB)     | 3.0                             | 4.8           | 6.0             |
| Insertion Loss (dB)        | < 0.3                           | < 0.4         | < 0.5           |
| Return Loss (dB)           | ≥ 19                            |               |                 |
| PIM3 (dBc, @2x43dBm)       | ≤ -155                          |               |                 |
| Input Impedance (ohm)      | 50                              |               |                 |
| Max. Input Power (W)       | 300                             |               |                 |
| Max. Peak Power (W)        | 800                             |               |                 |
| Connector                  | N Female (Screwed-in)           |               |                 |
| Weight (kgs)*              | 0.18                            | 0.23          | 0.28            |
| Dimension (mm)**           | 224 x 25 x 25                   | 258 x 25 x 25 | 288.2 x 25 x 25 |
| Ingress Protection Class   | IP65 (for outdoor and indoor)   |               |                 |
| Operating RH (%)           | ≤ 95                            |               |                 |
| Operating Temperature (°C) | -25 to +65                      |               |                 |
| Mounting                   | Built-in Bracket for wall mount |               |                 |
| Colour                     | Light Grey                      |               |                 |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors

## 787620X3

**Power Splitter 2- / 3- / 4-way 4.3-10 500W**  
**PIM -160dBc**  
**698-4000**

### Power Splitter 500W 698-4000 (Round Tube)

| Type                       | 78762023                        | 78762033        | 78762043        |
|----------------------------|---------------------------------|-----------------|-----------------|
| Frequency (MHz)            | 698-4000                        |                 |                 |
| Splitting Output           | 2-way                           | 3-way           | 4-way           |
| Distribution Loss (dB)     | 3.0                             | 4.8             | 6.0             |
| Insertion Loss (dB)        | < 0.4                           | < 0.5           | < 0.6           |
| Return Loss (dB)           | ≥ 19                            |                 |                 |
| PIM3 (dBc, @2x43dBm)       | ≤ -160                          |                 |                 |
| Input Impedance (ohm)      | 50                              |                 |                 |
| Max. Input Power (W)       | 500                             |                 |                 |
| Connector                  | 4.3-10 Female (Screwed-in)      |                 |                 |
| Weight (kgs)               | 0.22                            | 0.3             | 0.35            |
| Dimension (mm)             | 199.1 x 25 x 25                 | 233.6 x 25 x 25 | 236.1 x 25 x 25 |
| Ingress Protection Class   | IP65 (for outdoor and indoor)   |                 |                 |
| Operating RH (%)           | ≤ 95                            |                 |                 |
| Operating Temperature (°C) | -25 to +65                      |                 |                 |
| Mounting                   | Built-in Bracket for wall mount |                 |                 |
| Colour                     | Light Grey                      |                 |                 |



78762043

\* including mounting bracket and connectors

\*\* excluding mounting bracket and connectors



Low PIM  
Directional Couplers



# Index

## Low PIM Directional Couplers

| Part Number | Description   | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|---------------|-----------------------|-----------|-----------------|----------------|------|
| 78761106    | 6 dB Coupler  | 698-2700              | -155      | 300             | N              | 31   |
| 78761108    | 8 dB Coupler  | 698-2700              | -155      | 300             | N              | 31   |
| 78761110    | 10 dB Coupler | 698-2700              | -155      | 300             | N              | 31   |
| 78761115    | 15 dB Coupler | 698-2700              | -155      | 300             | N              | 31   |
| 78761120    | 20 dB Coupler | 698-2700              | -155      | 300             | N              | 31   |
| 78762106    | 6 dB Coupler  | 698-4000              | -160      | 500             | 4.3-10         | 32   |
| 78762108    | 8 dB Coupler  | 698-4000              | -160      | 500             | 4.3-10         | 32   |
| 78762110    | 10 dB Coupler | 698-4000              | -160      | 500             | 4.3-10         | 32   |
| 78762115    | 15 dB Coupler | 698-4000              | -160      | 500             | 4.3-10         | 32   |
| 78762120    | 20 dB Coupler | 698-4000              | -160      | 500             | 4.3-10         | 32   |
| 78762130    | 30 dB Coupler | 698-4000              | -160      | 500             | 4.3-10         | 32   |



## 787611XX

### Directional Coupler N PIM -155dBc 698-2700

### Directional Coupler 690-2700

| Type                | 78761106 | 78761108 | 78761110 | 78761115 | 78761120 |
|---------------------|----------|----------|----------|----------|----------|
| Coupling Value (dB) | 6        | 8        | 10       | 15       | 20       |
| Coupling Bias (dB)  | ±0.8     | ±0.8     | ±1.0     | ±1.0     | ±1.0     |
| Insertion Loss (dB) | ≤1.76    | ≤1.17    | ≤0.96    | ≤0.44    | ≤0.34    |
| Isolation (dB)      | ≥24      | ≥26      | ≥28      | ≥33      | ≥38      |

| Electrical Specifications |          |
|---------------------------|----------|
| Frequency Range (MHz)     | 698-2700 |
| Impedance (Ω)             | 50       |
| Return Loss (dB)          | > 19     |
| IM3 (dBc, @2x43dBm)       | ≤ -155   |
| Max. Power Rating (W)     | 300      |
| Peak Power (W)            | 800      |

| Mechanical and Environmental Specifications |                         |
|---------------------------------------------|-------------------------|
| Dimension (mm)**                            | 126 x 45 x 25           |
| Weight (kgs)*                               | 0.53                    |
| Colour                                      | Light Grey              |
| Mounting                                    | Wall Mount with Bracket |
| Operating Temp (°C)                         | -25 to +65              |
| Ingress Protection Class                    | IP65                    |
| Packing Dimension (mm)                      | 180 x 100 x 55          |
| SKU (unit per box)                          | 40 pcs per inner carton |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors

787621XX

Directional Coupler 4.3-10  
PIM -160dBc  
698-4000

Directional Coupler 690-2700

| Type                | 78762106 | 78762108 | 78762110 | 78762115 | 78762120 | 78762130 |
|---------------------|----------|----------|----------|----------|----------|----------|
| Coupling Value (dB) | 6        | 8        | 10       | 15       | 20       | 30       |
| Coupling Bias (dB)  | ±1.0     | ±1.2     | ±1.2     | ±1.3     | ±1.5     | ±1.5     |
| Insertion Loss (dB) | ≤1.8     | ≤1.2     | ≤0.8     | ≤0.4     | ≤0.3     | ≤0.3     |
| Isolation (dB)      | ≥24      | ≥26      | ≥28      | ≥33      | ≥38      | ≥45      |

| Electrical Specifications |                                                    |
|---------------------------|----------------------------------------------------|
| Frequency Range (MHz)     | 698-4000                                           |
| Impedance (Ω)             | 50                                                 |
| Return Loss (dB)          | > 21 (Freq ≤ 2700MHz);<br>> 19 (Freq 2700-4000MHz) |
| Directivity (dB)          | > 20 (Freq ≤ 2700MHz);<br>> 18 (Freq 2700-4000MHz) |
| IM3 (dBc, @2x43dBm)       | ≤ -160                                             |
| Connector Type            | 4.3-10                                             |
| Max. Power Rating (W)     | 500                                                |
| Peak Power (W)            | 1,500                                              |

| Mechanical and Environmental Specifications |                         |
|---------------------------------------------|-------------------------|
| Dimension (mm)**                            | 137 x 47.3 x 26         |
| Weight (kgs)*                               | 0.45                    |
| Colour                                      | Light Grey              |
| Mounting                                    | Wall Mount              |
| Operating Temp (°C)                         | -35 to +85              |
| Ingress Protection Class                    | IP65                    |
| Packing Dimension (mm)                      | 250 x 95 x 45           |
| SKU (unit per box)                          | 30 pcs per inner carton |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors





Standard  
Attenuators



# Index

## Standard Attenuators

| Part Number | Description      | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|------------------|-----------------------|-----------|-----------------|----------------|------|
| 78710395    | 3 dB Attenuator  | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78710695    | 6 dB Attenuator  | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78711095    | 10 dB Attenuator | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78711595    | 15 dB Attenuator | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78712095    | 20 dB Attenuator | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78713095    | 30 dB Attenuator | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78714095    | 40 dB Attenuator | DC-4000               | -120      | 2               | 4.3-10 F/M     | 36   |
| 78710315    | 3 dB Attenuator  | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78710615    | 6 dB Attenuator  | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78711015    | 10 dB Attenuator | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78711515    | 15 dB Attenuator | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78712015    | 20 dB Attenuator | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78713015    | 30 dB Attenuator | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78714015    | 40 dB Attenuator | DC-4000               | -120      | 5               | 4.3-10 F/M     | 37   |
| 78710310    | 3 dB Attenuator  | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78710610    | 6 dB Attenuator  | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78711010    | 10 dB Attenuator | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78711510    | 15 dB Attenuator | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78712010    | 20 dB Attenuator | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78713010    | 30 dB Attenuator | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78714010    | 40 dB Attenuator | DC-4000               | -120      | 10              | 4.3-10 F/M     | 38   |
| 78710385    | 3 dB Attenuator  | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78710685    | 6 dB Attenuator  | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78711085    | 10 dB Attenuator | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78711585    | 15 dB Attenuator | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78712085    | 20 dB Attenuator | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78713085    | 30 dB Attenuator | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |
| 78714085    | 40 dB Attenuator | DC-4000               | -120      | 15              | 4.3-10 F/M     | 39   |



| Part Number | Description      | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|------------------|-----------------------|-----------|-----------------|----------------|------|
| 78710325    | 3 dB Attenuator  | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78710625    | 6 dB Attenuator  | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78711025    | 10 dB Attenuator | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78711525    | 15 dB Attenuator | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78712025    | 20 dB Attenuator | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78713025    | 30 dB Attenuator | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78714025    | 40 dB Attenuator | DC-4000               | -120      | 25              | 4.3-10 F/M     | 40   |
| 78710345    | 3 dB Attenuator  | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78710645    | 6 dB Attenuator  | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78711045    | 10 dB Attenuator | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78711545    | 15 dB Attenuator | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78712545    | 20 dB Attenuator | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78713045    | 30 dB Attenuator | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78714045    | 40 dB Attenuator | DC-4000               | -105      | 50              | 4.3-10 F/M     | 41   |
| 78710355    | 3 dB Attenuator  | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78710655    | 6 dB Attenuator  | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78711055    | 10 dB Attenuator | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78711555    | 15 dB Attenuator | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78712055    | 20 dB Attenuator | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78713055    | 30 dB Attenuator | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |
| 78714055    | 40 dB Attenuator | DC-4000               | -105      | 100             | 4.3-10 F/M     | 42   |



## 7871xx95

### Attenuator 2W 4.3-10 DC-4000

#### Attenuator DC-4000 2W

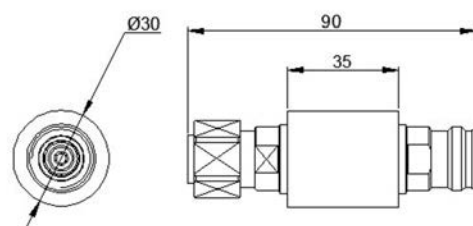
| Type                       | 78710395 | 78710695 | 78711095 | 78711595 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712095 | 78713095 | 78714095 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x33dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 2          |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |             |
|---------------------------------------------|-------------|
| Dimension (mm)**                            | Ø30 x 35    |
| Weight (kgs)*                               | 0.22        |
| Ingress Protection                          | IP55        |
| Operating Temperature (°C)                  | -55 to +125 |
| Operating RH (%)                            | ≤ 95        |

| Packing Information     |                                 |
|-------------------------|---------------------------------|
| Packing Size (mm)       | 70 x 30 x 30                    |
| SKU (unit/inner carton) | 100 pieces per inner carton/box |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors



## 7871xx15

### Attenuator 5W 4.3-10 DC-4000

### Attenuator DC-4000 5W

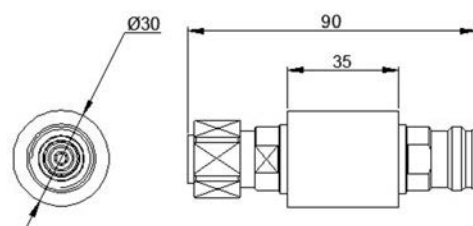
| Type                       | 78710315 | 78710615 | 78711015 | 78711515 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712015 | 78713015 | 78714015 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x33dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 5          |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |             |
|---------------------------------------------|-------------|
| Dimension (mm)**                            | Ø30 x 35    |
| Weight (kgs)*                               | 0.22        |
| Ingress Protection                          | IP55        |
| Operating Temperature (°C)                  | -55 to +125 |
| Operating RH (%)                            | ≤ 95        |

| Packing Information     |                                 |
|-------------------------|---------------------------------|
| Packing Size (mm)       | 70 x 30 x 30                    |
| SKU (unit/inner carton) | 100 pieces per inner carton/box |



\* including mounting bracket and connectors

\*\* excluding mounting bracket and connectors



## 7871xx10

### Attenuator 10W 4.3-10 DC-4000

#### Attenuator DC-4000 10W

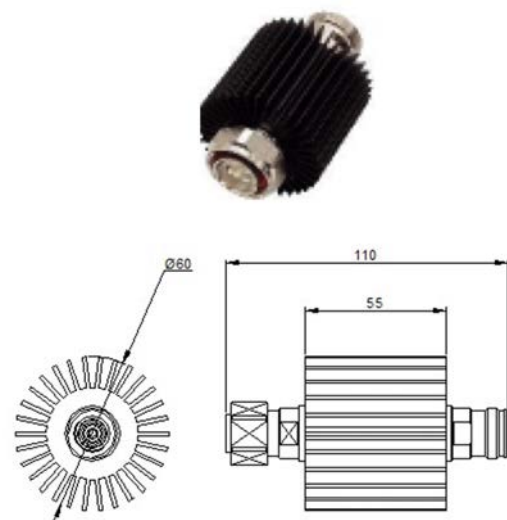
| Type                       | 78710310 | 78710610 | 78711010 | 78711510 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712010 | 78713010 | 78714010 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.8     | ±0.8     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x33dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 10         |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |                  |
|---------------------------------------------|------------------|
| Dimension (mm)**                            | Ø55 x 69         |
| Weight (kgs)*                               | 4.3-10 F/M: 0.30 |
| Ingress Protection                          | IP55             |
| Operating Temperature (°C)                  | -55 to +125      |
| Operating RH (%)                            | ≤ 95             |

| Packing Information     |                                |
|-------------------------|--------------------------------|
| Packing Size (mm)       | 160 x 70 x 70                  |
| SKU (unit/inner carton) | 50 pieces per inner carton/box |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors



## 7871xx85

### Attenuator 15W 4.3-10 DC-4000

#### Attenuator DC-4000 15W

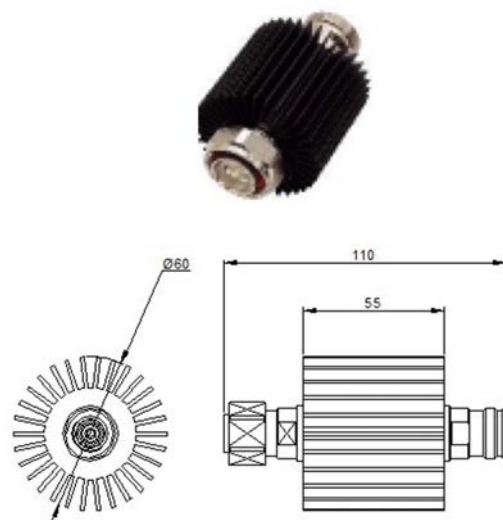
| Type                       | 78710385 | 78710685 | 78711085 | 78711585 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712085 | 78713085 | 78714085 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.8     | ±0.8     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x33dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 15         |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |                  |
|---------------------------------------------|------------------|
| Dimension (mm)**                            | Ø60 x 55         |
| Weight (kgs)*                               | 4.3-10 F/M: 0.30 |
| Ingress Protection                          | IP55             |
| Operating Temperature (°C)                  | -55 to +125      |
| Operating RH (%)                            | ≤ 95             |

| Packing Information     |                                |
|-------------------------|--------------------------------|
| Packing Size (mm)       | 160 x 70 x 70                  |
| SKU (unit/inner carton) | 50 pieces per inner carton/box |



\* including mounting bracket and connectors

\*\* excluding mounting bracket and connectors



## 7871xx25

### Attenuator 25W 4.3-10 DC-4000

#### Attenuator DC-4000 25W

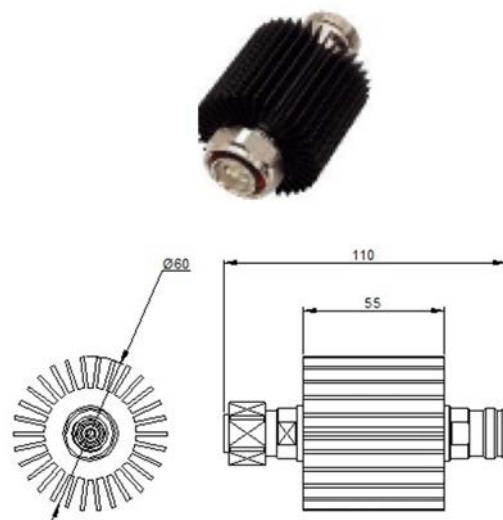
| Type                       | 78710325 | 78710625 | 78711025 | 78711525 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712025 | 78713025 | 78714025 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.8     | ±0.8     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x33dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 25         |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |                  |
|---------------------------------------------|------------------|
| Dimension (mm)**                            | Ø60 x 55         |
| Weight (kgs)*                               | 4.3-10 F/M: 0.30 |
| Ingress Protection                          | IP55             |
| Operating Temperature (°C)                  | -55 to +125      |
| Operating RH (%)                            | ≤ 95             |

| Packing Information     |                                |
|-------------------------|--------------------------------|
| Packing Size (mm)       | 160 x 70 x 70                  |
| SKU (unit/inner carton) | 50 pieces per inner carton/box |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors





## 7871x45

### Attenuator 50W 4.3-10 DC-4000

#### Attenuator DC-4000 50W

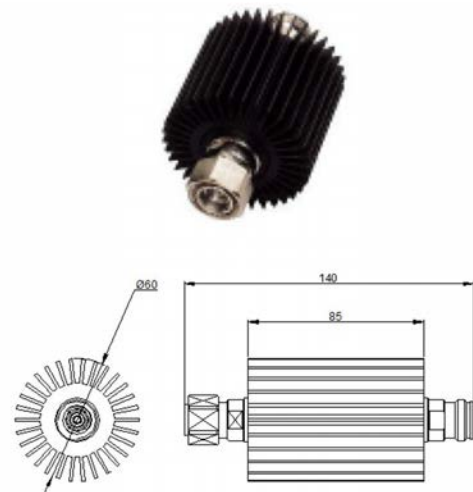
| Type                       | 78710345 | 78710645 | 78711045 | 78711545 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712045 | 78713045 | 78714045 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.8     | ±0.8     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x43dBm)      | ≤ -120     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 50         |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |                  |
|---------------------------------------------|------------------|
| Dimension (mm)**                            | Ø60 x 85         |
| Weight (kgs)*                               | 4.3-10 F/M: 0.45 |
| Ingress Protection                          | IP55             |
| Operating Temperature (°C)                  | -55 to +125      |
| Operating RH (%)                            | ≤ 95             |

| Packing Information     |                                |
|-------------------------|--------------------------------|
| Packing Size (mm)       | 160 x 70 x 70                  |
| SKU (unit/inner carton) | 50 pieces per inner carton/box |



\* including mounting bracket and connectors

\*\* excluding mounting bracket and connectors



## 7871xx55

### Attenuator 100W 4.3-10 DC-4000

### Attenuator DC-4000 100W

| Type                       | 78710355 | 78710655 | 78711055 | 78711555 |
|----------------------------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.7     | ±0.7     | ±0.7     |

| Type                       | 78712055 | 78713055 | 78714055 |
|----------------------------|----------|----------|----------|
| Attenuation (dB)           | 20       | 30       | 40       |
| Attenuation Tolerance (dB) | ±0.7     | ±0.8     | ±0.8     |

| Electrical Specifications |            |
|---------------------------|------------|
| Frequency (MHz)           | DC - 4000  |
| PIM3 (dBc, @2x43dBm)      | ≤ -105     |
| Impedance (Ω)             | 50         |
| Return Loss (dB)          | ≥ 21       |
| Max Input Power (W)       | 100        |
| Connector                 | 4.3-10 F/M |

| Mechanical and Environmental Specifications |                  |
|---------------------------------------------|------------------|
| Dimension (mm)**                            | Ø60 x 150        |
| Weight (kgs)*                               | 4.3-10 F/M: 0.95 |
| Ingress Protection                          | IP55             |
| Operating Temperature (°C)                  | -55 to +125      |
| Operating RH (%)                            | ≤ 95             |

| Packing Information     |                                |
|-------------------------|--------------------------------|
| Packing Size (mm)       | 225 x 70 x 70                  |
| SKU (unit/inner carton) | 50 pieces per inner carton/box |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors





Low PIM  
Attenuators



# Index

## Low PIM Attenuators

| Part Number | Description      | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|------------------|-----------------------|-----------|-----------------|----------------|------|
| 78710344    | 3 dB Attenuator  | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78710644    | 6 dB Attenuator  | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78711044    | 10 dB Attenuator | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78711544    | 15 dB Attenuator | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78712044    | 20 dB Attenuator | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78713044    | 30 dB Attenuator | 698 - 4000            | -160      | 50              | 4.3-10 F/M     | 46   |
| 78710354    | 3 dB Attenuator  | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78710654    | 6 dB Attenuator  | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78711054    | 10 dB Attenuator | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78711554    | 15 dB Attenuator | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78712054    | 20 dB Attenuator | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78713054    | 30 dB Attenuator | 698 - 4000            | -160      | 100             | 4.3-10 F/M     | 47   |
| 78710364    | 3 dB Attenuator  | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |
| 78710664    | 6 dB Attenuator  | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |
| 78711064    | 10 dB Attenuator | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |
| 78711564    | 15 dB Attenuator | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |
| 78712064    | 20 dB Attenuator | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |
| 78713064    | 30 dB Attenuator | 698 - 4000            | -160      | 200             | 4.3-10 F/M     | 48   |



## 7871xx44

### Low PIM Attenuator 50W 4.3-10 698-4000

### Attenuator 698-4000 50W

| Type                       | 78710344 | 78710644 | 78711044 | 78711544 | 78712044 | 78713044 |
|----------------------------|----------|----------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       | 20       | 30       |
| Attenuation Tolerance (dB) | ±0.6     | ±1.0     | ±1.0     | ±1.0     | ±1.3     | ±1.3     |

#### Electrical Specifications

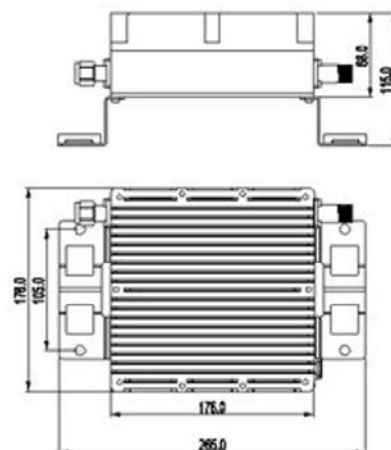
|                      |            |
|----------------------|------------|
| Frequency (MHz)      | 698 - 4000 |
| PIM3 (dBc, @2x43dBm) | ≤ -160     |
| Impedance (Ω)        | 50         |
| Return Loss (dB)     | ≥ 19       |
| Max Input Power (W)  | 50         |
| Connector            | 4.3-10 F/M |

#### Mechanical and Environmental Specifications

|                            |                |
|----------------------------|----------------|
| Dimension (mm)**           | 176 x 176 x 68 |
| Weight (kgs)*              | 3.7            |
| Ingress Protection         | IP65           |
| Operating Temperature (°C) | -40 to +65     |
| Operating RH (%)           | ≤ 95           |

#### Packing Information

|                         |                                   |
|-------------------------|-----------------------------------|
| Packing Size (mm)       | 415 x 290 x 265                   |
| SKU (unit/inner carton) | 4 pieces per inner carton/<br>box |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors



## 7871xx54

### Low PIM Attenuator 50W 4.3-10 698-4000

## Attenuator 698-4000 100W

| Type                       | 78710354 | 78710654 | 78711054 | 78711554 | 78712054 | 78713054 |
|----------------------------|----------|----------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       | 20       | 30       |
| Attenuation Tolerance (dB) | ±0.6     | ±1.0     | ±1.0     | ±1.0     | ±1.3     | ±1.3     |

#### Electrical Specifications

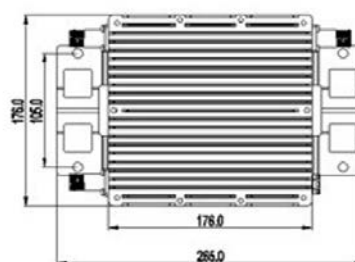
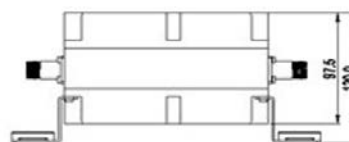
|                      |            |
|----------------------|------------|
| Frequency (MHz)      | 698 - 4000 |
| PIM3 (dBc, @2x43dBm) | ≤ -160     |
| Impedance (Ω)        | 50         |
| Return Loss (dB)     | ≥ 19       |
| Max Input Power (W)  | 100        |
| Connector            | 4.3-10 F/M |

#### Mechanical and Environmental Specifications

|                            |                  |
|----------------------------|------------------|
| Dimension (mm)**           | 176 x 176 x 97.5 |
| Weight (kgs)*              | 4.3-10 F/M: 4.7  |
| Ingress Protection         | IP65             |
| Operating Temperature (°C) | -40 to +65       |
| Operating RH (%)           | ≤ 95             |

#### Packing Information

|                         |                                   |
|-------------------------|-----------------------------------|
| Packing Size (mm)       | 415 x 290 x 265                   |
| SKU (unit/inner carton) | 4 pieces per inner carton/<br>box |



\* including mounting bracket and connectors

\*\* excluding mounting bracket and connectors



## 7871xx64

### Low PIM Attenuator 50W 4.3-10 698-4000

## Attenuator 698-4000 200W

| Type                       | 78710364 | 78710664 | 78711064 | 78711564 | 78712064 | 78713064 |
|----------------------------|----------|----------|----------|----------|----------|----------|
| Attenuation (dB)           | 3        | 6        | 10       | 15       | 20       | 30       |
| Attenuation Tolerance (dB) | ±0.6     | ±1.0     | ±1.0     | ±1.0     | ±1.3     | ±1.3     |

#### Electrical Specifications

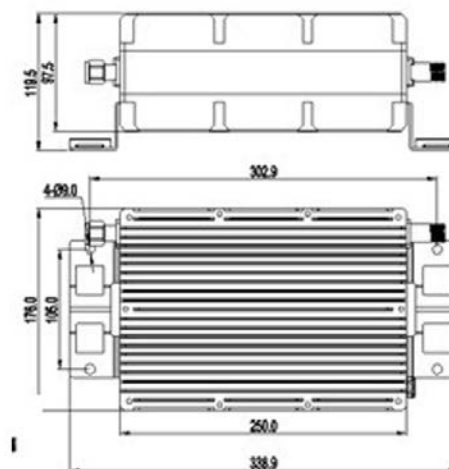
|                      |            |
|----------------------|------------|
| Frequency (MHz)      | 698 - 4000 |
| PIM3 (dBc, @2x43dBm) | ≤ -160     |
| Impedance (Ω)        | 50         |
| Return Loss (dB)     | ≥ 19       |
| Max Input Power (W)  | 200        |
| Connector            | 4.3-10 F/M |

#### Mechanical and Environmental Specifications

|                            |                  |
|----------------------------|------------------|
| Dimension (mm)**           | 250 x 176 x 97.5 |
| Weight (kgs)*              | 4.3-10 F/M: 7.7  |
| Ingress Protection         | IP65             |
| Operating Temperature (°C) | -40 to +65       |
| Operating RH (%)           | ≤ 95             |

#### Packing Information

|                         |                                   |
|-------------------------|-----------------------------------|
| Packing Size (mm)       | 415 x 365 x 285                   |
| SKU (unit/inner carton) | 4 pieces per inner carton/<br>box |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors





Koodo

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Low PIM  
Loads



# Index

## Low PIM Loads

| Part Number | Description      | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|------------------|-----------------------|-----------|-----------------|----------------|------|
| 75110504    | Termination Load | DC-4000               | -160      | 50W             | 4.3-10-F       | 52   |
| 75120504    | Termination Load | DC-4000               | -160      | 50W             | 4.3-10-M       | 52   |
| 75111004    | Termination Load | DC-4000               | -160      | 100W            | 4.3-10-F       | 53   |
| 75121004    | Termination Load | DC-4000               | -160      | 100W            | 4.3-10-M       | 53   |
| 75112004    | Termination Load | DC-4000               | -160      | 200W            | 4.3-10-F       | 54   |
| 75122004    | Termination Load | DC-4000               | -160      | 200W            | 4.3-10-M       | 54   |

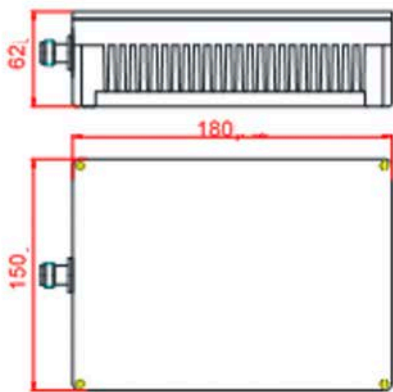


751X0504

Termination Load 50 ohm  
Low PIM: -160dBc 50W  
DC-4000 4.3-10: -Male / Female

Termination Load 50ohm DC-4000 50W

| Type               | 75110504<br>(4.3-10-Female)           | 75120504<br>(4.3-10-Male) |
|--------------------|---------------------------------------|---------------------------|
| Power Rating (W)   | 50                                    |                           |
| Frequency (MHz)    | DC - 4000                             |                           |
| PIM3 (dBc)         | See Above Type Number Selection Table |                           |
| Impedance (Ω)      | 50                                    |                           |
| VSWR               | ≤ 1.20                                |                           |
| Dimension (mm)**   | 180 x 150 x 62                        |                           |
| Weight (kgs)*      | Female: 2.545 approx.                 |                           |
|                    | Male: 2.530 approx.                   |                           |
| Ingress Protection | IP65                                  |                           |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors

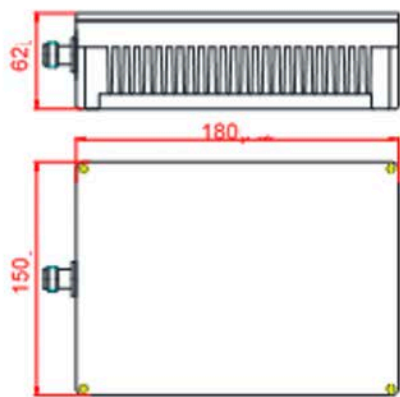


751X1004

Termination Load 50 ohm  
Low PIM: -160dBc 100W  
DC-4000 4.3-10: -Male / Female

Termination Load 50ohm DC-4000 100W

| Type                                         | 75111004<br>(4.3-10-Female) | 75121004<br>(4.3-10-Male) |
|----------------------------------------------|-----------------------------|---------------------------|
| Power Rating (W)                             | 100                         |                           |
| Frequency (MHz)                              | DC - 4000                   |                           |
| PIM3 (dBc)                                   | -160                        |                           |
| Impedance ( $\Omega$ )                       | 50                          |                           |
| VSWR                                         | $\leq 1.20$                 |                           |
| Dimension (mm)**                             | 180 x 150 x 62              |                           |
| Weight (kgs)*                                | Female: 2.545 approx.       |                           |
|                                              | Male: 2.530 approx.         |                           |
| Ingress Protection                           | IP65                        |                           |
| Operating temperature ( $^{\circ}\text{C}$ ) | -40 to +80                  |                           |



\* including mounting bracket and connectors  
\*\* excluding mounting bracket and connectors

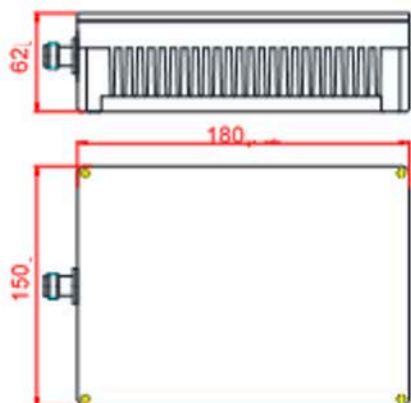


## 751X2004

**Termination Load 50 ohm**  
**Low PIM: -160dBc 200W**  
**DC-4000 4.3-10: -Male / Female**

### Termination Load 50ohm DC-4000 200W

| Type                                         | 75112004<br>(4.3-10-Female) | 75122004<br>(4.3-10-Male) |
|----------------------------------------------|-----------------------------|---------------------------|
| Power Rating (W)                             | 200                         |                           |
| Frequency (MHz)                              | DC - 4000                   |                           |
| PIM3 (dBc)                                   | -160                        |                           |
| Impedance ( $\Omega$ )                       | 50                          |                           |
| VSWR                                         | $\leq 1.20$                 |                           |
| Dimension (mm)**                             | 180 x 150 x 62              |                           |
| Weight (kgs)*                                | Female: 2.595 approx.       |                           |
|                                              | Male: 2.580 approx.         |                           |
| Ingress Protection                           | IP65                        |                           |
| Operating temperature ( $^{\circ}\text{C}$ ) | -40 to +80                  |                           |

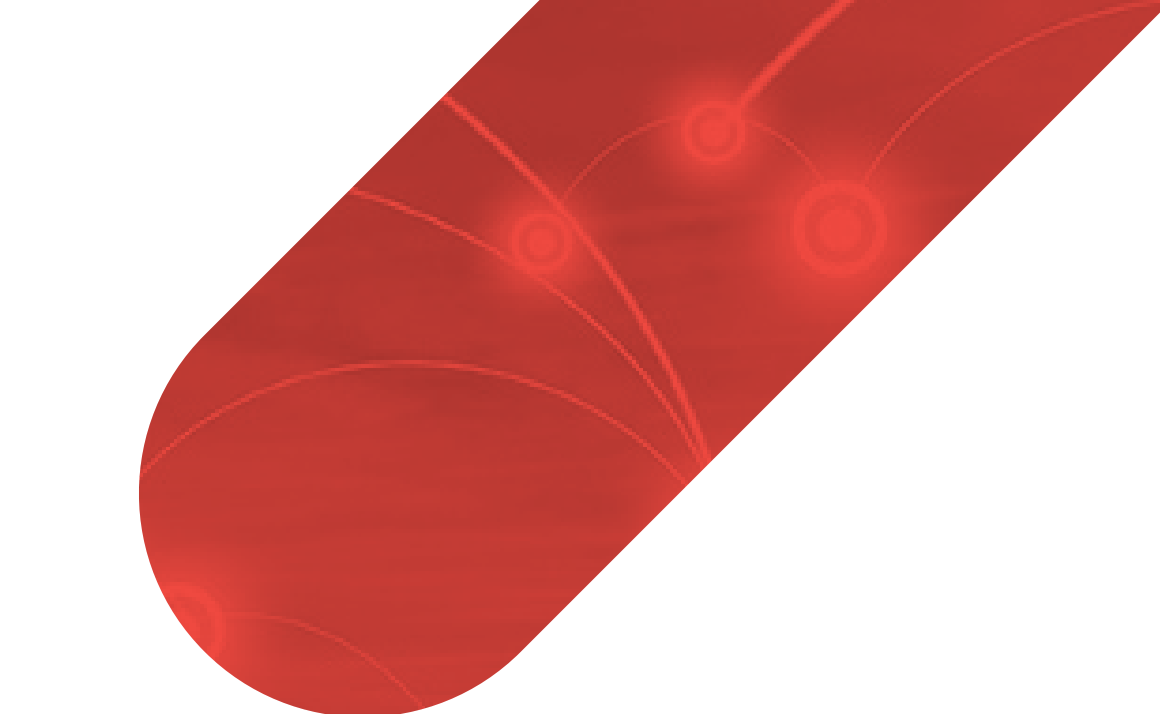


\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors









# **Antenna line products**





Hybrid  
Combiners



# Index

## Hybrid Combiners

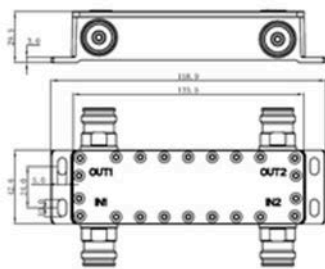
| Part Number | Description         | Frequency Range (MHz) | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|---------------------|-----------------------|-----------|-----------------|----------------|------|
| 78211527    | Hybrid combiner 2:2 | 698-4000              | -160      | 500             | 4.3-10-F       | 59   |
| 78211533    | Hybrid combiner 3:3 | 698-4000              | -160      | 500             | 4.3-10-F       | 60   |
| 78211536    | Hybrid combiner 4:4 | 698-4000              | -160      | 500             | 4.3-10-F       | 61   |

## 78211527

**Hybrid Combiner 2-in/2-out**  
**PIM -160dBc**  
**698-4000Mhz**

### 2:2 Hybrid Combiner 698-4000Mhz

| Type                                | 78211527                      |
|-------------------------------------|-------------------------------|
| Frequency (MHz)                     | 698-4000                      |
| Insertion Loss (dB)                 | 3.1 ±0.6                      |
| VSWR                                | ≤ 1.25                        |
| Isolation (dB)                      | ≥ 25                          |
| PIM3 (dBc, @2x43dBm)                | ≤ -160                        |
| Input Impedance (ohm)               | 50                            |
| Max. Input Power (W)                | 500                           |
| Peak Power (W)                      | 1,500                         |
| Connector                           | 4.3-10 Female                 |
| Weight (kgs)*                       | 0.50                          |
| AISG/DC Bypass Path<br>(2500mA Max) | IN1 ↔ OUT1<br>IN2 ↔ OUT2      |
| Dimension (mm)**                    | 215 x 140 x 95                |
| Ingress Protection Class            | IP65 (for outdoor and indoor) |
| Operating RH (%)                    | ≤ 95                          |
| Operating Temperature (°C)          | -40 to +65                    |
| Mounting                            | Wall Mount                    |
| Colour                              | Light Grey                    |



\* including mounting bracket and connectors  
 \*\* excluding mounting bracket and connectors

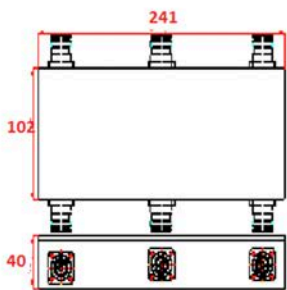


78211533

Hybrid Combiner 3-in/3-out  
PIM -150dBc  
698-3800

3:3 Hybrid Combiner 698-3800

| Type                       | 78211533                                                   |
|----------------------------|------------------------------------------------------------|
| Frequency (MHz)            | 698-3800                                                   |
| Insertion Loss (dB)        | 4.77 ±1                                                    |
| VSWR                       | ≤ 1.3                                                      |
| Isolation (dB)             | ≥ 20                                                       |
| PIM3 (dBc, @2x43dBm)       | ≤ -160                                                     |
| Input Impedance (ohm)      | 50                                                         |
| Max. Input Power (W)       | 500                                                        |
| Peak Power (W)             | 1,500                                                      |
|                            | IN1↔OUT3<br>IN2↔OUT2<br>IN3↔OUT1                           |
| Connector                  | 4.3-10 Female                                              |
| Dimension (mm)*            | 241 x 102 x 40 (excluding mounting bracket and connectors) |
| Ingress Protection Class   | IP65 (for outdoor and indoor)                              |
| Operating RH (%)           | ≤ 95                                                       |
| Operating Temperature (°C) | -40 to +80                                                 |
| Mounting                   | Wall Mount                                                 |
| Colour                     | Light Grey                                                 |



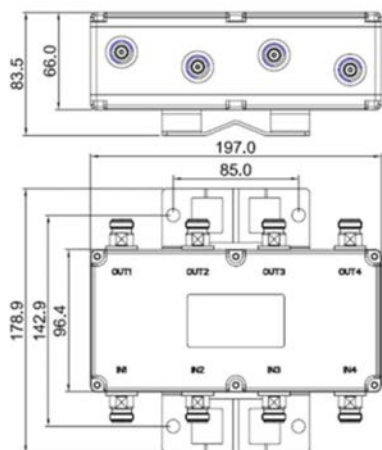
\* excluding mounting bracket and connectors

## 78211536

**Hybrid Combiner 4-in/4-out**  
**PIM -160dBc**  
**698-4000Mhz**

### 4:4 Hybrid Combiner 698-4000Mhz

| Type                       | 78211536                                      |                        |
|----------------------------|-----------------------------------------------|------------------------|
| Frequency (MHz)            | 698-4000                                      |                        |
| Insertion Loss (dB)        | 698-2700: $6 \pm 1.2$                         | 2700-4000: $6 \pm 1.4$ |
| Return Loss (dB)           | 698-2700: $\geq 19$                           | 2700-4000: $\geq 18$   |
| Isolation (dB)             | $\geq 23$                                     |                        |
| PIM3 (dBc, @2x43dBm)       | $\leq -160$                                   |                        |
| Input Impedance (ohm)      | 50                                            |                        |
| Max. Input Power (W)       | 500                                           |                        |
| Peak Power (W)             | 1,500                                         |                        |
| Connector                  | 4.3-10 Female                                 |                        |
| Weight (kgs)               | 2.2                                           |                        |
| Dimension (mm)*            | 197 x 96.4 x 66                               |                        |
| Ingress Protection Class   | IP65 (for outdoor and indoor)                 |                        |
| Operating RH (%)           | $\leq 95$                                     |                        |
| Operating Temperature (°C) | -40 to +65                                    |                        |
| Mounting                   | Built-in Bracket for wall mount or pole mount |                        |
| Colour                     | Light Grey                                    |                        |



\* excluding mounting bracket and connectors









Multi-band  
Combiners



# Index

## Multi-band Combiners

| Part Number | Description                                                                          | Page |
|-------------|--------------------------------------------------------------------------------------|------|
| 78321001    | DBC 698-2700/3300-4000MHz 4.3-10 SU                                                  | 65   |
| 78322001    | DBC 698-2700/3300-4000MHz 4.3-10 DU                                                  | 65   |
| 78321002    | DBC 690-960/1427-3800Mhz 4.3-10 SU                                                   | 67   |
| 78322002    | DBC 690-960/1427-3800Mhz 4.3-10 DU                                                   | 67   |
| 78331001    | TBC 690-862/880-960/1427-3800MHz 4.3-10 SU                                           | 69   |
| 78332001    | TBC 690-862/880-960/1427-3800MHz 4.3-10 DU                                           | 69   |
| 78331002    | TBC 690-960/1710-2700/3300-3800MHz 4.3-10 SU                                         | 71   |
| 78332002    | TBC 600-960/1710-2700/3300-3800MHz 4.3-10 DU                                         | 71   |
| 78331003    | TBC 703-788/791-960/1427-3800MHz 4.3-10 SU                                           | 73   |
| 78332003    | TBC 703-788/791-960/1427-3800MHz 4.3-10 DU                                           | 73   |
| 78341001    | QBC 1695-1880 / 1920-2200 / 2300-2700 / 3300-3800MHz 4.3-10 SU                       | 75   |
| 78342001    | QBC 1695-1880 / 1920-2200 / 2300-2700 / 3300-3800MHz 4.3-10 DU                       | 75   |
| 78351001    | PBC 690-862 / 880-960 / 1710-1880 / 1920-2170 / 2490-2690MHz 4.3-10 SU               | 77   |
| 78352001    | PBC 690-862 / 880-960 / 1710-1880 / 1920-2170 / 2490-2690MHz 4.3-10 DU               | 77   |
| 78361001    | HBC 600-960 / 1695-1880 / 1920-2200 / 2300-2400 / 2500-2690 / 3300-3800MHz 4.3-10 SU | 79   |
| 78362001    | HBC 600-960 / 1695-1880 / 1920-2200 / 2300-2400 / 2500-2690 / 3300-3800MHz 4.3-10 DU | 79   |





## 7832x001

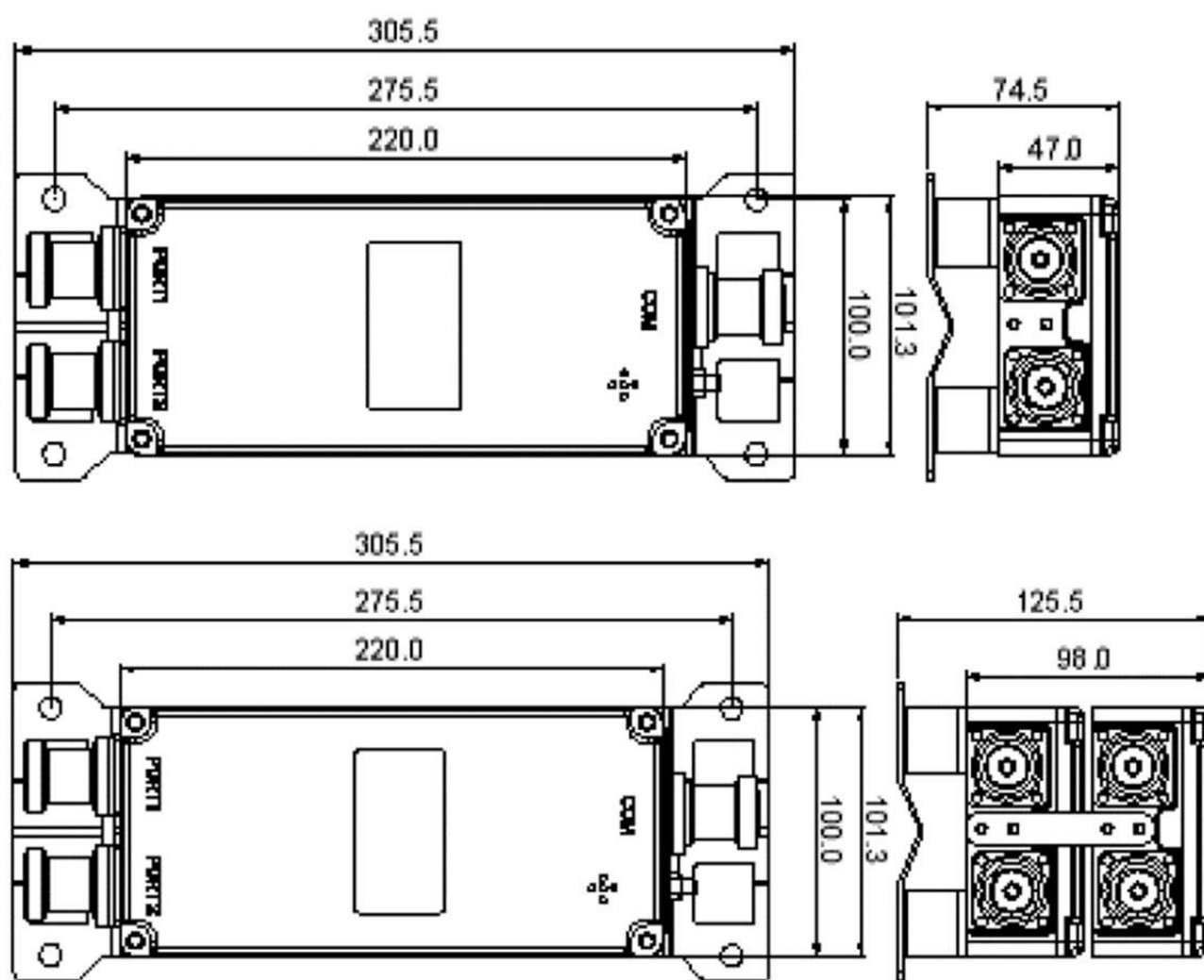
### Dual Band Combiner 690-2700 / 3300-4000

#### Dual Band Combiner 690-2700 / 3300-4000

| Type                                | 78321001<br>Single Unit                         | 78322001<br>Double Unit    |
|-------------------------------------|-------------------------------------------------|----------------------------|
| Frequency (MHz)<br>Band 1<br>Band 2 | 690-2700<br>3300-4000                           |                            |
| Insertion Loss (dB)                 | ≤ 0.5                                           |                            |
| Isolation (dB)                      | ≥ 95                                            |                            |
| PIM3 (dBc, @2x43dBm)                | ≤ -155                                          |                            |
| Return Loss (dB)                    | ≥ 19                                            |                            |
| Input Impedance (ohm)               | 50                                              |                            |
| Max. Input Power (W)                | 200 per Port                                    |                            |
| ASIG/DC By-pass                     | Bypass at Band 1 (690-2700)                     | Stop at Band 2 (3300-4000) |
| Connectors                          | 4.3-10 Female                                   |                            |
| Dimension (mm)*                     | 220 x 100 x 47                                  | 222.5 x 204 x 160          |
| Weight (kgs)                        | 4.2                                             | 220 x 100 x 98             |
| Ingress Protection Class            | IP67                                            |                            |
| Operational RH (%)                  | ≤ 95                                            |                            |
| Operating Temperature (°C)          | -30 to +60                                      |                            |
| Storage Temperature (°C)            | -40 to +85                                      |                            |
| Lightning Protection                | 10kA@8/20μS                                     |                            |
| Mounting                            | Wall Mount or Pole Mount (Pole Size: Ø35-125mm) |                            |



## Dimensions





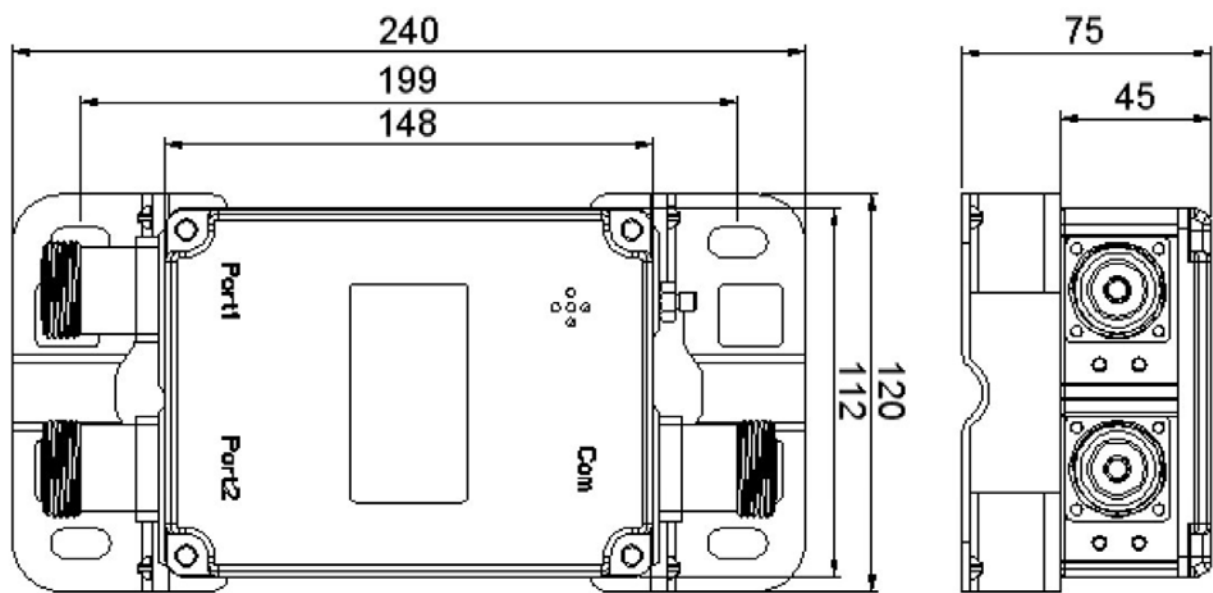
## 7832x002

### Dual Band Combiner 490-960 / 1427-3800

#### Dual Band Combiner 490-960 / 1427-3800

| Type                                | 78321002<br>Single Unit                         | 78322002<br>Double Unit |
|-------------------------------------|-------------------------------------------------|-------------------------|
| Frequency (MHz)<br>Band 1<br>Band 2 | 490-960<br>1427-3800                            |                         |
| Insertion Loss (dB)                 | Port 1: $\leq 0.3$<br>Port 2: $\leq 0.4$        |                         |
| Isolation (dB)                      | $\geq 45$                                       |                         |
| PIM3 (dBc, @2x43dBm)                | $\leq -155$                                     |                         |
| Return Loss (dB)                    | $\geq 20$                                       |                         |
| Input Impedance (ohm)               | 50                                              |                         |
| Max. Input Power (W)                | 250 per Port                                    |                         |
| ASIG/DC By-pass                     | Bypass at Port 1                                | Stop at Port 2          |
| Connectors                          | 4.3-10 Female                                   |                         |
| Dimension (mm)*                     | 148 x 112 x 45                                  | 148 x 112 x 94          |
| Weight (kgs)                        | 1.6                                             | 3.2                     |
| Ingress Protection Class            | IP67                                            |                         |
| Operational RH (%)                  | $\leq 95$                                       |                         |
| Operating Temperature (°C)          | -40 to +60                                      |                         |
| Storage Temperature (°C)            | -50 to +85                                      |                         |
| Barometric Pressure (kPa)           | 10kA@8/20 $\mu$ S                               |                         |
| Mounting                            | Wall Mount or Pole Mount (Pole Size: Ø35-125mm) |                         |

## Dimensions





## 7833x001

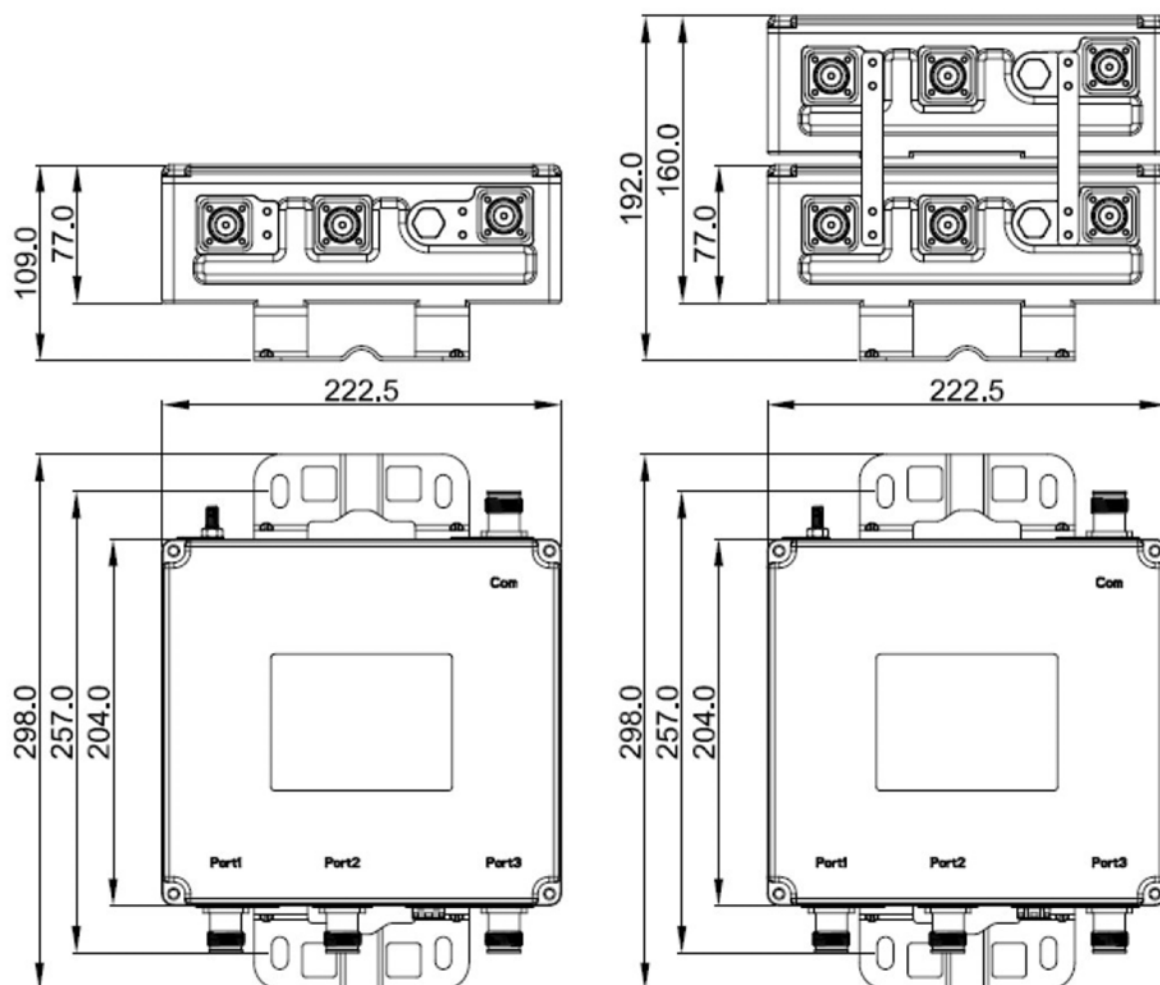
### Triple Band Combiner 690-862 / 880-960 / 1427-3800

### Triple Band Combiner 690-862 / 880-960 / 1427-3800

| Type                                          | 78331001<br>Single Unit                                                                                                                                     | 78332001<br>Double Unit |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Frequency (MHz)<br>Band 1<br>Band 2<br>Band 3 | 690-862<br>880-960<br>1427-3800                                                                                                                             |                         |
| Insertion Loss (dB)                           | Port 1: $\leq 0.35$ (690-852) / $\leq 0.6$ (852-862)<br>Port 2: $\leq 0.6$ (880-890) / $\leq 0.35$ (890-960)<br>Port 3: $\leq 0.35$ (1427-3800)             |                         |
| Isolation (dB)                                | Port 1 & Port 2: $> 50$ ; Port 1 & Port 3: $> 90$<br>Port 2 & Port 1: $> 60$ ; Port 2 & Port 3: $> 90$<br>Port 3 & Port 1: $> 65$ ; Port 3 & Port 2: $> 60$ |                         |
| PIM3 (dBc, @2x43dBm)                          | $\leq -155$                                                                                                                                                 |                         |
| VSWR                                          | $\geq 19$                                                                                                                                                   |                         |
| Input Impedance (ohm)                         | 50                                                                                                                                                          |                         |
| Max. Input Power (W)                          | 200 per Port                                                                                                                                                |                         |
| ASIG/DC By-pass                               | Bypass at All Ports                                                                                                                                         |                         |
| Connectors                                    | 4.3-10 Female                                                                                                                                               |                         |
| Dimension (mm)*                               | 222.5 x 204 x 77                                                                                                                                            | 222.5 x 204 x 160       |
| Weight (kgs)                                  | 4.2                                                                                                                                                         | 8.5                     |
| Ingress Protection Class                      | IP66                                                                                                                                                        |                         |
| Operational RH (%)                            | $\leq 95$                                                                                                                                                   |                         |
| Operating Temperature (°C)                    | -40 to +60                                                                                                                                                  |                         |
| Storage Temperature (°C)                      | -50 to +85                                                                                                                                                  |                         |
| Barometric Pressure (kPa)                     | 10kA@8/20 $\mu$ S                                                                                                                                           |                         |
| Mounting                                      | Wall Mount or Pole Mount (Pole Size: Ø35-125mm)                                                                                                             |                         |

\* excluding connectors and clamp

## Dimensions





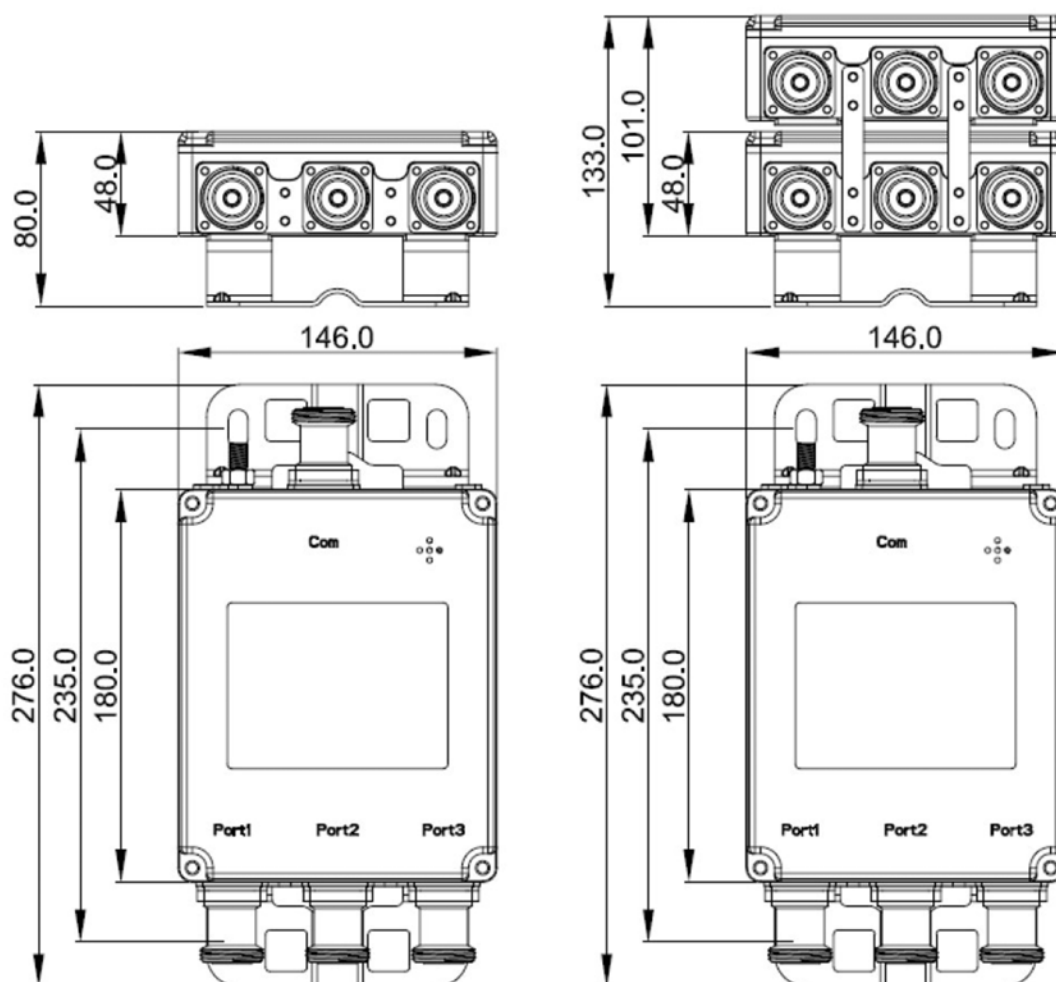
## 7833x002

### Triple Band Combiner 600-960 / 1710-2700 / 3300-3800

### Triple Band Combiner 600-960 / 1710-2700 / 3300-3800

| Type                       | 78331002<br>Single Unit                         | 78332002<br>Double Unit |
|----------------------------|-------------------------------------------------|-------------------------|
| Frequency (MHz)            |                                                 |                         |
| Band 1                     | 600-960                                         |                         |
| Band 2                     | 1710-2700                                       |                         |
| Band 3                     | 3300-3800                                       |                         |
| Insertion Loss (dB)        | ≤ 0.5                                           |                         |
| Isolation (dB)             | > 70                                            |                         |
| PIM3 (dBc, @2x43dBm)       | ≤ -155                                          |                         |
| VSWR                       | ≥ 20                                            |                         |
| Input Impedance (ohm)      | 50                                              |                         |
| Max. Input Power (W)       | 250 per Port                                    |                         |
| ASIG/DC By-pass            | Bypass at All Ports                             |                         |
| Connectors                 | 4.3-10 Female                                   |                         |
| Dimension (mm)*            | 180 x 146 x 48                                  | 180 x 146 x 101         |
| Weight (kgs)               | 1.7                                             | 3.4                     |
| Ingress Protection Class   | IP67                                            |                         |
| Operational RH (%)         | ≤ 95                                            |                         |
| Operating Temperature (°C) | -40 to +65                                      |                         |
| Storage Temperature (°C)   | -50 to +85                                      |                         |
| Barometric Pressure (kPa)  | 10kA@8/20μS                                     |                         |
| Mounting                   | Wall Mount or Pole Mount (Pole Size: Ø35-125mm) |                         |

## Dimensions







## 7833x003

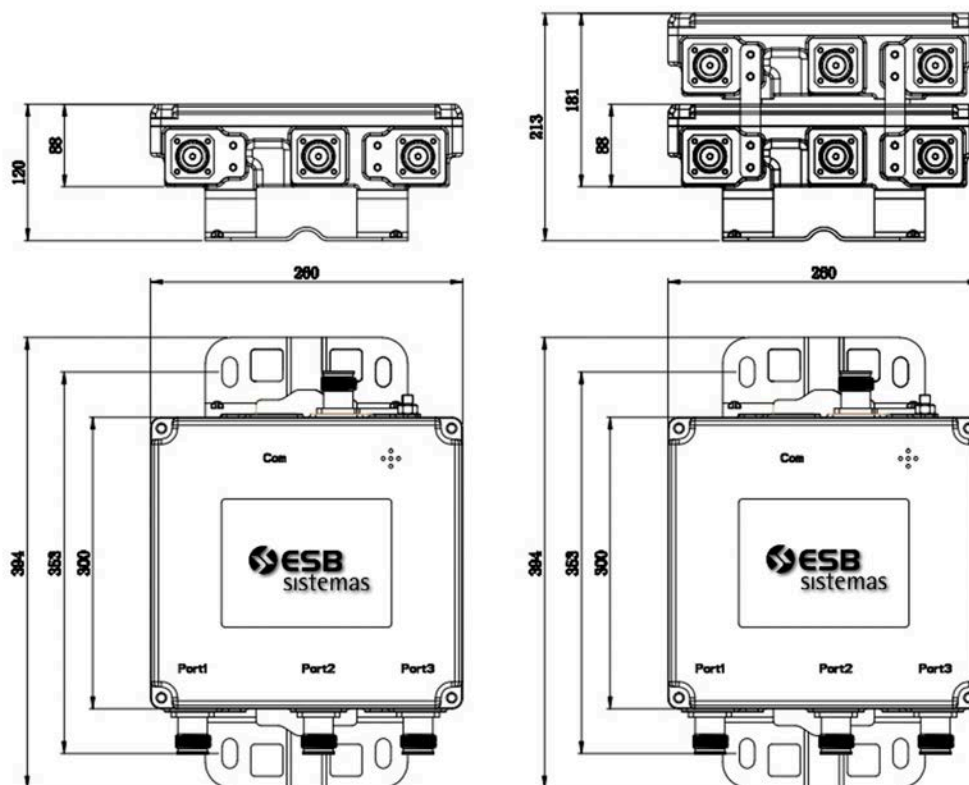
### Triple Band Combiner 703-788 / 791-960 / 1427-3800

#### Triple Band Combiner 703-788 / 791-960 / 1427-3800

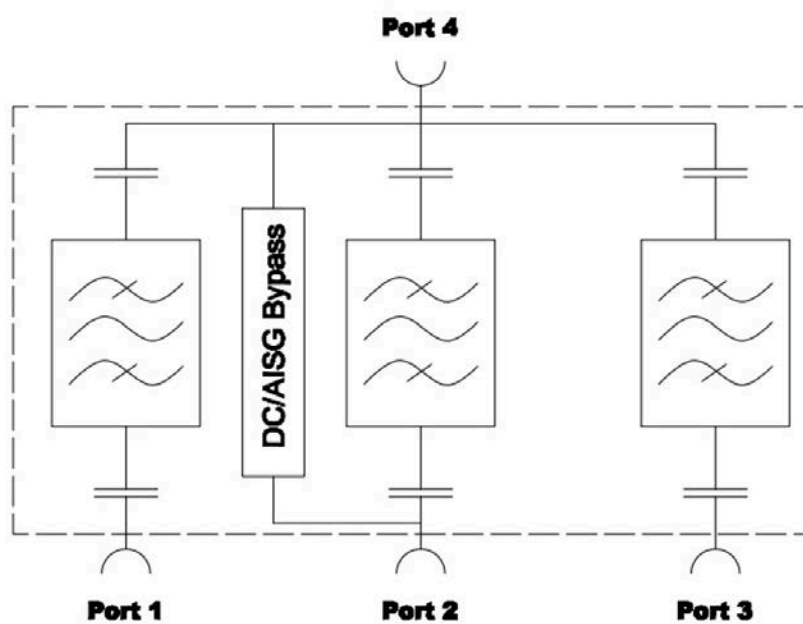
| Type                                          | 78331003<br>Single Unit                                                                                                                                                                    | 78332003<br>Double Unit |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Frequency (MHz)<br>Port 1<br>Port 2<br>Port 3 | 703-788<br>791-960<br>1427-3800                                                                                                                                                            |                         |
| Insertion Loss (dB)                           | Port 1: $\leq 0.7$ (703-785) / $\leq 1.0$ (785-787) / $\leq 1.5$ (787-788)<br>Port 2: $\leq 1.5$ (791-792) / $\leq 1.0$ (792-800) / $\leq 0.7$ (800-960)<br>Port 3: $\leq 0.3$ (1427-3800) |                         |
| Isolation (dB)                                | $\geq 40$                                                                                                                                                                                  |                         |
| PIM3 (dBc, @2x43dBm)                          | $\leq -160$                                                                                                                                                                                |                         |
| VSWR                                          | $\leq 1.25$                                                                                                                                                                                |                         |
| Input Impedance (ohm)                         | 50                                                                                                                                                                                         |                         |
| Max. Input Power (W)                          | Port 1: 200<br>Port 2: 200<br>Port 3: 200 (1427-2700) / 100 (2700-3800)                                                                                                                    |                         |
| ASIG/DC By-pass                               | Bypass at Port 2 (Max. 2500mA)                                                                                                                                                             |                         |
| Connectors                                    | 4.3-10 Female                                                                                                                                                                              |                         |
| Dimension (mm)*                               | 260 x 300 x 88                                                                                                                                                                             | 260 x 300 x 181         |
| Weight (kgs)                                  | 6.2                                                                                                                                                                                        | 12                      |
| Ingress Protection Class                      | IP66                                                                                                                                                                                       |                         |
| Operational RH (%)                            | $\leq 95$                                                                                                                                                                                  |                         |
| Operating Temperature (°C)                    | -40 to +60                                                                                                                                                                                 |                         |
| Storage Temperature (°C)                      | -40 to +85                                                                                                                                                                                 |                         |
| Barometric Pressure (kPa)                     | 55 to 106                                                                                                                                                                                  |                         |
| Mounting                                      | Wall Mount                                                                                                                                                                                 |                         |

\* excluding connectors and clamp

## Dimensions



## Block Diagram





## 7834x001

### Quad Band Combiner

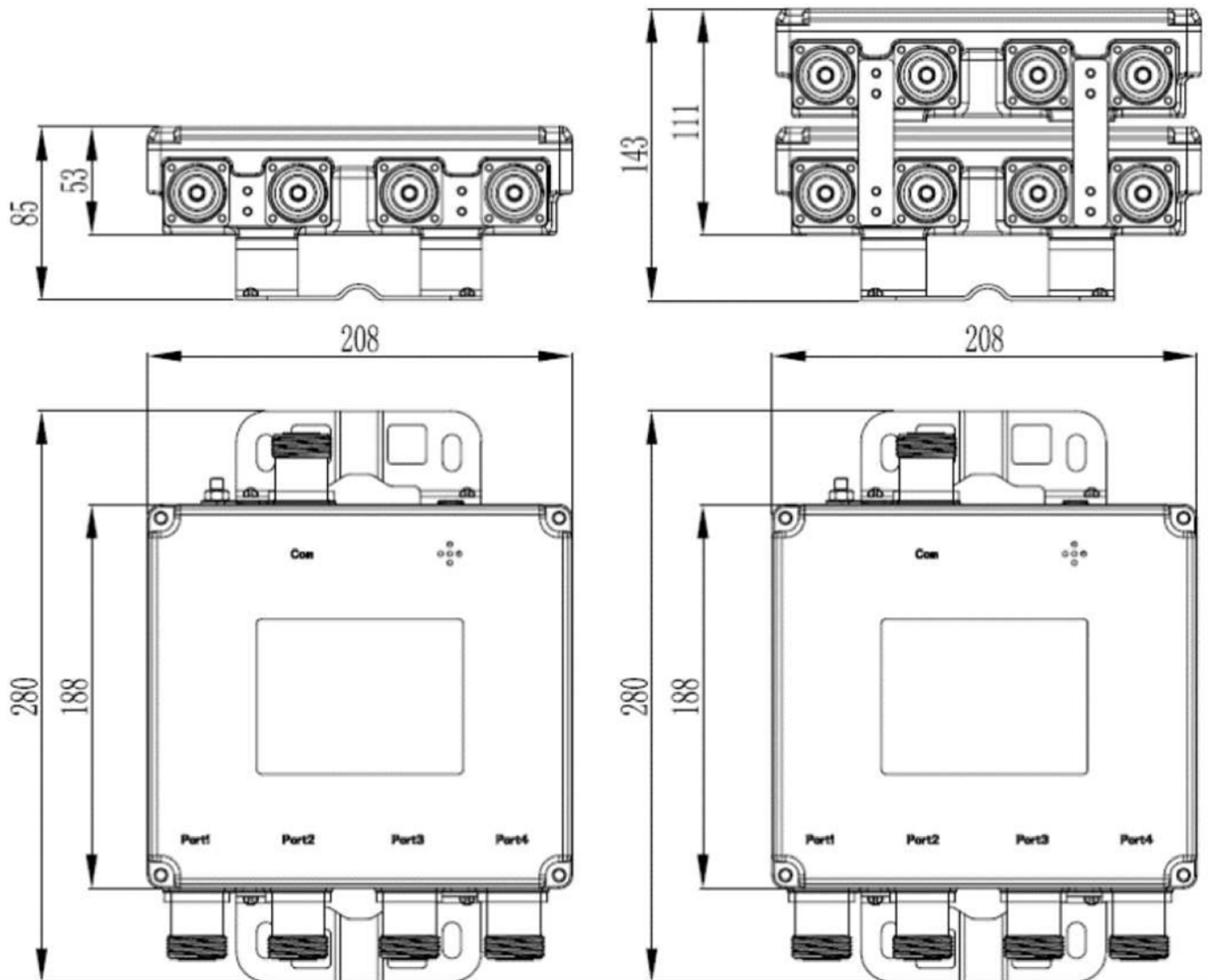
1695-1880 / 1920-2200 / 2300-2700 / 3300-3800

### Quad Band Combiner 1695-1880 / 1920-2200 / 2300-2700 / 3300-3800

| Type                       | 78341001<br>Single Unit                         | 78342001<br>Double Unit |
|----------------------------|-------------------------------------------------|-------------------------|
| Frequency (MHz)            |                                                 |                         |
| Band 1                     | 1695-1880                                       |                         |
| Band 2                     | 1920-2200                                       |                         |
| Band 3                     | 2300-2700                                       |                         |
| Band 4                     | 3300-3800                                       |                         |
| Insertion Loss (dB)        | ≤ 0.3                                           |                         |
| Isolation (dB)             | > 50                                            |                         |
| PIM3 (dBc, @2x43dBm)       | ≤ -155                                          |                         |
| Return Loss (dB)           | ≥ 20                                            |                         |
| Input Impedance (ohm)      | 50                                              |                         |
| Max. Input Power (W)       | 250 per Port                                    |                         |
| ASIG/DC By-pass            | Bypass at All Ports                             |                         |
| Connectors                 | 4.3-10 Female                                   |                         |
| Dimension (mm)*            | 208 x 188 x 53                                  | 208 x 188 x 111         |
| Weight (kgs)               | 2.7                                             | 5.5                     |
| Ingress Protection Class   | IP67                                            |                         |
| Operational RH (%)         | ≤ 95                                            |                         |
| Operating Temperature (°C) | -40 to +65                                      |                         |
| Storage Temperature (°C)   | -50 to +85                                      |                         |
| Barometric Pressure (kPa)  | 10kA@8/20μS                                     |                         |
| Mounting                   | Wall Mount or Pole Mount (Pole Size: Ø35-125mm) |                         |

\* excluding connectors and clamp

## Dimensions





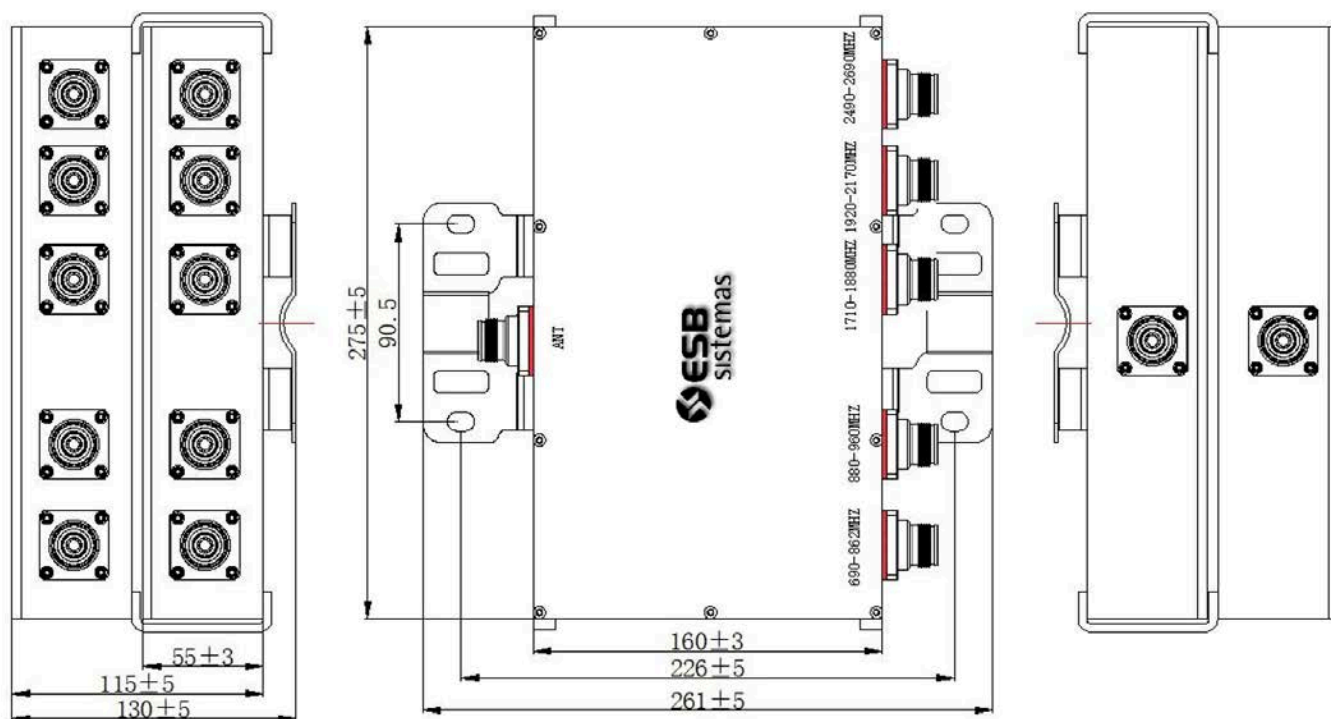
## 7835x001

**Penta-Band Combiner**  
**690-862 / 880-960 / 1710-1880 /**  
**1920-2170 / 2490-2690**

### Penta-Band Combiner

| Type                       | 78341001<br>Single Unit | 78342001<br>Double Unit |
|----------------------------|-------------------------|-------------------------|
| Frequency (MHz)            |                         |                         |
| Band 1                     | 690-862                 |                         |
| Band 2                     | 880-960                 |                         |
| Band 3                     | 1710-1880               |                         |
| Band 4                     | 1920-2170               |                         |
| Band 5                     | 2490-2690               |                         |
| Insertion Loss (dB)        | ≤ 0.5                   |                         |
| Isolation (dB)             | ≥ 50                    |                         |
| PIM3 (dBc, @2x43dBm)       | ≤ -155                  |                         |
| Input Impedance (ohm)      | 50                      |                         |
| Power Average (W)          | 150                     |                         |
| Return Loss                | ≥ 18dB                  |                         |
| Max. Input Power (W)       | 200W                    |                         |
| Peak Power (W)             | 1000W                   |                         |
| ASIG/DC By-pass            | All ports               |                         |
| Colour                     | Cool grey               |                         |
| Connectors                 | 4.3-10F                 |                         |
| Dimension (mm)*            | 275 x 160 x 55          | 275 x 160 x 115         |
| Weight (kgs)               | 5kg                     | 10kg                    |
| Ingress Protection Class   | IP65                    |                         |
| Operational RH (%)         | ≤ 95                    |                         |
| Operating Temperature (°C) | -20 to +65              |                         |

## Dimensions





## 7836x001

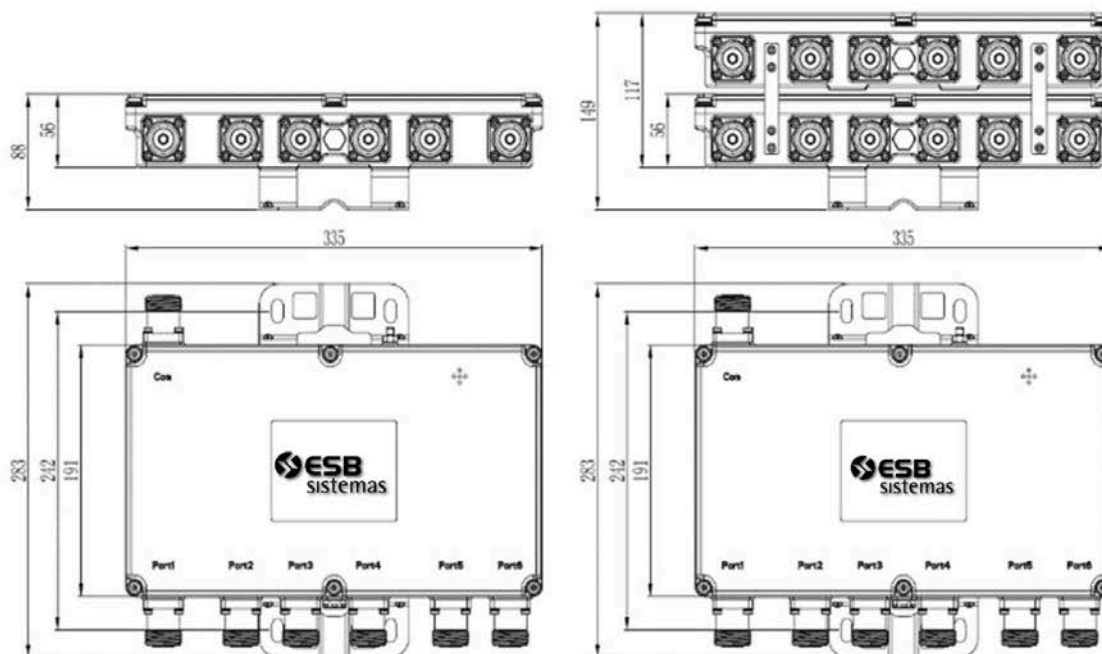
### Hexa-Band Combiner

600-960 / 1695-1880 / 1920-2200 /  
2300-2400 / 2500-2690 / 3300-3800

### Hexa-Band Combiner

| Type                       | 78361001<br>Single Unit | 78362001<br>Double Unit |
|----------------------------|-------------------------|-------------------------|
| Frequency (MHz)            |                         |                         |
| Band 1                     | 600-960                 |                         |
| Band 2                     | 1695-1880               |                         |
| Band 3                     | 1920-2200               |                         |
| Band 4                     | 2300-2400               |                         |
| Band 5                     | 2500-2690               |                         |
| Band 6                     | 3300-3800               |                         |
| Insertion Loss (dB)        | ≤ 0.5                   |                         |
| Isolation (dB)             | ≥ 50                    |                         |
| PIM3 (dBc, @2x43dBm)       | ≤ -155                  |                         |
| Return Loss (dB)           | ≥ 19                    |                         |
| Input Impedance (ohm)      | 50                      |                         |
| Max. Input Power (W)       | 300                     |                         |
| Peak Power (W)             | 2,000                   |                         |
| ASIG/DC By-pass            | NA                      |                         |
| Connectors                 | 4.3-10F                 |                         |
| Dimension (mm)             | 335 x 19 x 56           | 335 x 19 x 117          |
| Weight (kgs)               | 4.7                     | 9.4                     |
| Ingress Protection Class   | IP66                    |                         |
| Operational RH (%)         | ≤ 95                    |                         |
| Operating Temperature (°C) | -10 to +65              |                         |

## Dimensions







Same band  
Combiners



# Index

## Same Band Combiners

| Part Number | Description               | Technology | IM3 (dBc) | Input Power (W) | Connector Type | Page |
|-------------|---------------------------|------------|-----------|-----------------|----------------|------|
| 78211236    | Same band combiner OR-TME | 800        | -160      | 100             | 4.3-10-F       | 83   |
| 78211936    | Same band combiner OR-VDF | 1800       | -160      | 100             | 4.3-10-F       | 84   |
| 78212370v02 | Same band combiner TME-YO | 1800       | -160      | 100             | 4.3-10-F       | 85   |
| 78211925v02 | Same band combiner OR-VDF | 2100       | -153      | 160             | 4.3-10-F       | 86   |
| 78211926v01 | Same band combiner OR-TME | 2100       | -160      | 100             | 4.3-10-F       | 87   |

## 78211236

### 800Mhz Tuned Same Band Combiner

791 - 801 / 832 - 842 MHz  
LTE800  
ORANGE (10Mhz)

811 -821 / 852 - 862 MHz  
LTE800  
TELEFONICA (10Mhz)

Low loss combiner OR/TME  
Designed for antenna sharing  
DTMA supply  
DC/AISG by-pass between all ports  
Excellent PIM3 performance  
(-160dBc)  
Double Unit



### 78211236

|                         |                                                                                                                                                          |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frecuency               | P1:Tx1 791-801Mhz – Rx1: 832-842Mhz<br>P2:Tx3 811-821Mhz – Rx3: 852-862Mhz<br>P4:Tx2 791-801Mhz – Rx2: 832-842Mhz<br>P5:Tx4 811-821Mhz – Rx4: 852-862Mhz |
| Insertion Loss          | < 0.5dB ±0.15dB                                                                                                                                          |
| VSWR                    | ≤ 1.25                                                                                                                                                   |
| Isolation               | >30dB                                                                                                                                                    |
| Intermodulation Product | < -160dBc (3rd order with 2x 20W)                                                                                                                        |
| DC/AISG                 | By-pass between all ports                                                                                                                                |
| Power Handling          | 100W                                                                                                                                                     |
| Impedance               | 50Ω                                                                                                                                                      |
| Application             | Outdoor; IP66                                                                                                                                            |
| Temperature Range       | -20°C ... +60°C                                                                                                                                          |
| Mounting                | Wall/Pole mounting                                                                                                                                       |
| Dimensions              | 259x186x146mm (without connectors)                                                                                                                       |
| Weight                  | 7.1 Kg                                                                                                                                                   |
| Connector               | 4.3-10 F (Female)                                                                                                                                        |



## 78211936

### 900Mhz Tuned Same Band Combiner

880 - 890 / 925 - 935 MHz  
GSM/UMTS 900  
ORANGE

905 - 915 / 950 - 960 MHz  
GSM/UMTS 900  
VODAFONE

Low loss combiner 900 OR/VF  
Designed for antenna sharing  
Excellent PIM3 performance (-160dBc)  
Double Unit



### 78211936

|                         |                                                                                                                                                                                                                                                         |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency               | <p>Port1: Tx1: 925.1 ~ 935.1 MHz, Rx1 = 880.1 ~ 890.1 MHz</p> <p>Port2: Tx3: 949.9 ~ 959.9 MHz, Rx3 = 904.9 ~ 914.9 MHz</p> <p>Port4: Tx2: 925.1 ~ 935.1 MHz, Rx2 = 880.1 ~ 890.1 MHz</p> <p>Port5: Tx4: 949.9 ~ 959.9 MHz, Rx4 = 904.9 ~ 914.9 MHz</p> |
| Insertion Loss          | < 0.6dB                                                                                                                                                                                                                                                 |
| VSWR                    | ≤ 1.25                                                                                                                                                                                                                                                  |
| Isolation               | >30dB                                                                                                                                                                                                                                                   |
| Intermodulation Product | < -160dBc (3rd order with 2x 20W)                                                                                                                                                                                                                       |
| DC/AISG                 | <p>Port 1 ↔ Port 3 / Port 4 ↔ Port 6: Stop</p> <p>Port 2 ↔ Port 3 / Port 5 ↔ Port 6: DC by-pass (max. 2500 mA)</p>                                                                                                                                      |
| Power Handling          | 100W                                                                                                                                                                                                                                                    |
| Impedance               | 50Ω                                                                                                                                                                                                                                                     |
| Application             | Outdoor; IP66                                                                                                                                                                                                                                           |
| Temperature Range       | -20°C ... +60°C                                                                                                                                                                                                                                         |
| Mounting                | Wall/Pole mounting                                                                                                                                                                                                                                      |
| Dimensions              | 245 x 190 x 120 mm (without connectors)                                                                                                                                                                                                                 |
| Weight                  | 6 Kg                                                                                                                                                                                                                                                    |
| Connector               | 4.3-10 F (Female)                                                                                                                                                                                                                                       |



## 78212370v02

### 1800Mhz Tuned Same Band Combiner

1710 - 1730 / 1805 - 1825 MHz  
LTE/GSM 1800  
TELEFONICA

1750 -1765 / 1845 - 1860 MHz  
LTE/GSM 1800  
YOIGO

Low loss combiner 1800 TME/YO  
Designed for antenna sharing  
DTMA supply  
DC/AISG by-pass between all ports  
Excellent PIM3 performance (-160dBc)  
Double Unit



### 78212370v02

|                         |                                                                                                                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency               | <p>Port1: Tx1: 1805.1 ~ 1825.1 MHz, Rx1 = 1710.1 ~ 1730.1 MHz</p> <p>Port2: Tx3: 1845.1 ~ 1859.9 MHz, Rx3 = 1750.1 ~ 1764.9 MHz</p> <p>Port4: Tx2: 1805.1 ~ 1825.1 MHz, Rx2 = 1710.1 ~ 1730.1 MHz</p> <p>Port5: Tx4: 1845.1 ~ 1859.9 MHz, Rx4 = 1750.1 ~ 1764.9 MHz</p> |
| Insertion Loss          | < 0.6dB                                                                                                                                                                                                                                                                 |
| VSWR                    | ≤ 1.25                                                                                                                                                                                                                                                                  |
| Isolation               | >30dB                                                                                                                                                                                                                                                                   |
| Intermodulation Product | < -160dBc (3rd order with 2x 20W)                                                                                                                                                                                                                                       |
| DC/AISG                 | All ports                                                                                                                                                                                                                                                               |
| Power Handling          | 100W                                                                                                                                                                                                                                                                    |
| Impedance               | 50Ω                                                                                                                                                                                                                                                                     |
| Application             | Outdoor; IP66                                                                                                                                                                                                                                                           |
| Temperature Range       | -20°C ... +60°C                                                                                                                                                                                                                                                         |
| Mounting                | Wall/Pole mounting                                                                                                                                                                                                                                                      |
| Dimensions              | 230 x200 x 87 mm (without connectors)                                                                                                                                                                                                                                   |
| Weight                  | 6 Kg                                                                                                                                                                                                                                                                    |
| Connector               | 4.3-10 F (Female)                                                                                                                                                                                                                                                       |



## 78211925v02

### 2100Mhz Tuned Same Band Combiner

1935 - 1945 / 2125 - 2135 MHz  
UMTS 2100  
ORANGE (10Mhz)

1950 - 1965 / 2140 - 2155 MHz  
UMTS 2100  
VODAFONE (15Mhz)

Designed to share 2100Mhz bands  
DC/AISG by pass set manually  
Excellent PIM3 performance (-160dBc)  
Double Unit  
5Mhz guard band



### 78211925v02

|                             |                                                                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency                   | P1:Tx1 2125-2135Mhz – Rx1: 1935-1945Mhz<br>P2:Tx3 2140-2155Mhz – Rx3: 1950-1965Mhz<br>P4:Tx2 2125-2135Mhz – Rx2: 1935-1945Mhz<br>P5:Tx4 2140-2155Mhz – Rx4: 1950-1965Mhz |
| Insertion Loss              | ≤ 1.0dB                                                                                                                                                                  |
| VSWR                        | ≤ 1.25                                                                                                                                                                   |
| Isolation                   | >30dB                                                                                                                                                                    |
| Intermodulation Product     | < -153dBc (3rd order with 2x 20W)                                                                                                                                        |
| DC/AISG                     | PIN in: DC by-pass<br>PIN out: DC stop                                                                                                                                   |
| Power Handling              | 160W                                                                                                                                                                     |
| Impedance                   | 50Ω                                                                                                                                                                      |
| Group delay                 | ≤ 150 ns                                                                                                                                                                 |
| Application                 | Outdoor; IP66                                                                                                                                                            |
| Operating Temperature Range | -33°C ... +55°C                                                                                                                                                          |
| Storage Temperature Range   | -40°C ... +85°C                                                                                                                                                          |
| Humidity Range              | 5% ... 100%                                                                                                                                                              |
| Lightning Protection        | 20KA, 8/20us                                                                                                                                                             |
| Mounting                    | Wall or Wall/Pole mounting                                                                                                                                               |
| Dimensions                  | 265x260x100mm (without connectors, without mounting brackets))                                                                                                           |
| Peso                        | 8.8Kg                                                                                                                                                                    |
| Connector                   | 4.3-10 F (Female)                                                                                                                                                        |



## 78211926v01

### 2100Mhz Tuned Same Band Combiner

1935 - 1945 / 2125 - 2135 MHz  
UMTS 2100  
ORANGE (10MHz)

1950 - 1965 / 2140 - 2155-2170 MHz  
UMTS 2100  
TELEFÓNICA

Designed to share 2100Mhz bands  
DC/AISG by Pass for DTMA supply  
Excellent PIM performance  
Double Unit



### 78211926v01

|                             |                                                                                                                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pass Band                   | <p>P1:Tx1 2125-2140Mhz – Rx1: 1935-1950Mhz</p> <p>P2:Tx3 2155-2170Mhz – Rx3: 1965-1980Mhz</p> <p>P4:Tx2 2125-2140Mhz – Rx2: 1935-1950Mhz</p> <p>P5:Tx4 2155-2170Mhz – Rx4: 1965-1980Mhz</p> |
| Insertion Loss              | < 1.2dB                                                                                                                                                                                     |
| VSWR                        | ≤ 1.25                                                                                                                                                                                      |
| Isolation                   | >28dB                                                                                                                                                                                       |
| Intermodulation Product     | < -160dBc (3rd order with 2x 20W)                                                                                                                                                           |
| DC/AISG                     | P2->P3 y P5->P6 (max 2500mA)                                                                                                                                                                |
| Max Input Power             | 100W                                                                                                                                                                                        |
| Impedance                   | 50Ω                                                                                                                                                                                         |
| Application                 | Outdoor; IP66                                                                                                                                                                               |
| Operating Temperature Range | -20°C ... +60°C                                                                                                                                                                             |
| Storage Temperature Range   | -40°C ... +85°C                                                                                                                                                                             |
| Humidity Range              | 5% ... 95%                                                                                                                                                                                  |
| Mounting                    | Wall/Pole mounting                                                                                                                                                                          |
| Dimensions                  | 283.8 x140.5 x 87 mm (without connectors)                                                                                                                                                   |
| Peso                        | 5.1 Kg                                                                                                                                                                                      |
| Connector                   | 4.3-10 F (Female)                                                                                                                                                                           |



Small Cell  
Antennas





# Index

## Small Cell Antennas

| Part Number | Description                           | Connector | Inputs | Gain (dBi) | Page |
|-------------|---------------------------------------|-----------|--------|------------|------|
| 72432008    | Log Periodic 698-960/1710-4000        | N-F       | 1      | 8/9dBi     | 88   |
| 72412008    | Log Periodic 698-960/1710-4001        | 4.3-10-F  | 1      | 8/9dBi     | 88   |
| 80112751    | X-Pol Directional 1710-2690/3300-4000 | 4.3-10-F  | 2      | 8dBi       | 89   |
| 80112752    | X-Pol Directional 1710-2690/3300-4000 | 4.3-10-F  | 2      | 11dBi      | 90   |
| 80112754    | XX-Pol Directional 698-4000           | 4.3-10-F  | 4      | 8/9dBi     | 91   |
| 80020449    | Bi-directional 698-4000               | 4.3-10-F  | 1      | 3/5dBi     | 92   |
| 80011846    | Omni 698-4000                         | 4.3-10-F  | 1      | 3dBi       | 93   |
| 80011847    | Omni 698-4000                         | 4.3-10-F  | 1      | 3dBi       | 94   |



## 724x2008-V00

**Log Periodic Antenna**  
**V-Pol 1-port 8/9dBi**  
**698-960 / 1710-4000**

### Log Periodic 698-960/1710-4000 8/9dBi

| Type                       | 72412008<br>(4.3-10 Female)                        |              | 72432008<br>(N Female) |
|----------------------------|----------------------------------------------------|--------------|------------------------|
| Frequency (MHz)            | 698-960                                            | 1710-2700    | 3300-4000              |
| Gain (dBi)                 | 8                                                  | 9            | 9.5                    |
| VSWR                       | ≤ 2.0                                              | ≤ 1.5        | ≤ 1.8                  |
| Polarization               | Vertical                                           |              |                        |
| PIM3 (dBc, @2x43dBm)       | ≤ -150                                             |              |                        |
| Front-to-Back Ratio (dB)   | ≥ 15                                               |              |                        |
| Horizontal Beamwidth (°)   | 95                                                 | 78           | 59                     |
| Vertical Beamwidth (°)     | 68                                                 | 56           | 48                     |
| Input Impedance (ohm)      | 50                                                 |              |                        |
| Max. Input Power (W)       | 50                                                 |              |                        |
| Lightning Protection       | DC Grounded                                        |              |                        |
| Connector                  | 1 x 4.3-10 Female                                  | 1 x N Female |                        |
| Dimension (mm)             | 249 x 210 x 65                                     |              |                        |
| Weight (kgs)               | Approx. 0.87                                       |              |                        |
| Reflector Material         | Aluminum                                           |              |                        |
| Radome Material            | ABS (UV Stabilized)                                |              |                        |
| Operating Temperature (°C) | -40 to +65                                         |              |                        |
| Mounting                   | Pole-mount Clamp for Pole Size Ø38 to Ø52 Included |              |                        |





## 80112751

**Directional Antenna**  
**X-Pol 2-port 8dBi 65°**  
**1710-2690 / 3300-4000 Fixed Electrical D/T (0T)**

### XPol Directional 1710-2690/ 3300-4000 8dBi 0°T (Preliminary)

| Type                       | 80112751                                                              |            |
|----------------------------|-----------------------------------------------------------------------|------------|
| Frequency Range (MHz)      | 1710-2690                                                             | 3300-4000  |
| Gain (dBi)                 | 8                                                                     | 8          |
| VSWR                       | $\leq 1.5$                                                            |            |
| 3rd Order PIM (dBc)        | $\leq -150$ @ 2x43dBm                                                 |            |
| Polarization               | $\pm 45^\circ$                                                        |            |
| Electrical Tilt (°)        | 0                                                                     |            |
| Horizontal Beamwidth (°)   | $65 \pm 5$                                                            | $65 \pm 5$ |
| Vertical Beamwidth (°)     | $60 \pm 5$                                                            | $60 \pm 5$ |
| Input Impedance (ohm)      | 50                                                                    |            |
| Max. Input Power (W)       | 100                                                                   |            |
| Front-to-Back Ratio (dB)   | $\geq 23$                                                             |            |
| Isolation (dB)             | $\geq 25$                                                             |            |
| Lightning Protection       | DC Grounded                                                           |            |
| Connector Type             | 2 x 4.3-10 Female                                                     |            |
| Dimension (mm)             | 220 x 160 x 80                                                        |            |
| Weight (kgs)               | 1.0                                                                   |            |
| Radome Material            | UV-PVC                                                                |            |
| Reflector Material         | Aluminum                                                              |            |
| Rated Wind Velocity (km/h) | 210                                                                   |            |
| Operating Temperature (°C) | -40 to +70                                                            |            |
| Mounting                   | Mechanical Adjustable Downtilt Clamp for Pole Diameter 38-52 included |            |





## 80112752

**Directional Antenna**  
**X-Pol 2-port 11dBi 65°**  
**1710-2690 / 3300-4000 Fixed Electrical D/T (0T)**

### **XPOL Directional 1710-2690/ 3300-4000 11dBi 0°T** *(Preliminary)*

| Type                       | 80112752                                                              |            |
|----------------------------|-----------------------------------------------------------------------|------------|
| Frequency Range (MHz)      | 1710-2690                                                             | 3300-4000  |
| Gain (dBi)                 | 11                                                                    | 11         |
| VSWR                       | $\leq 1.5$                                                            |            |
| 3rd Order PIM (dBc)        | $\leq -150$ @ 2x43dBm                                                 |            |
| Polarization               | $\pm 45^\circ$                                                        |            |
| Electrical Tilt (°)        | 0                                                                     |            |
| Horizontal Beamwidth (°)   | 65 $\pm$ 5                                                            | 65 $\pm$ 5 |
| Vertical Beamwidth (°)     | 30 $\pm$ 5                                                            | 30 $\pm$ 5 |
| Input Impedance (ohm)      | 50                                                                    |            |
| Max. Input Power (W)       | 100                                                                   |            |
| Front-to-Back Ratio (dB)   | $\geq 23$                                                             |            |
| Isolation (dB)             | $\geq 25$                                                             |            |
| Lightning Protection       | DC Grounded                                                           |            |
| Connector Type             | 2 x 4.3-10 Female                                                     |            |
| Dimension (mm)             | 250 x 160 x 80                                                        |            |
| Weight (kgs)               | 1.2                                                                   |            |
| Radome Material            | UV-PVC                                                                |            |
| Reflector Material         | Aluminum                                                              |            |
| Rated Wind Velocity (km/h) | 210                                                                   |            |
| Operating Temperature (°C) | -40 to +70                                                            |            |
| Mounting                   | Mechanical Adjustable Downtilt Clamp for Pole Diameter 38-52 included |            |





## 80112754

**Directional Antenna**  
**XX-Pol 4-port 8/9dBi 75°/65° 0T/0T**  
**698-960 / 1710-2690 / 3300-4000**

### XXPol Directional 698-960/1710-2690/3300-4000 8/9dBi 0°T/0°T (Preliminary)

| Type                       | 80112754                                                              |            |           |
|----------------------------|-----------------------------------------------------------------------|------------|-----------|
| Port                       | Port 1 & 2                                                            | Port 3 & 4 |           |
| Frequency Range (MHz)      | 698-960                                                               | 1710-2690  | 3300-4000 |
| Gain (dBi)                 | 8 ±0.5                                                                | 9 ±0.5     | 9 ±0.5    |
| VSWR                       | ≤ 1.5                                                                 |            |           |
| 3rd Order PIM (dBc)        | ≤ -150 @ 2x43dBm                                                      |            |           |
| Polarization               | ±45°                                                                  |            |           |
| Electrical Tilt (°)        | 0                                                                     |            |           |
| Horizontal Beamwidth (°)   | 75                                                                    | 65         | 65        |
| Vertical Beamwidth (°)     | 63                                                                    | 60         | 60        |
| Input Impedance (ohm)      | 50                                                                    |            |           |
| Max. Input Power (W)       | 100                                                                   |            |           |
| Front-to-Back Ratio (dB)   | ≥ 23                                                                  |            |           |
| Isolation (dB)             | ≥ 25                                                                  |            |           |
| Lightning Protection       | DC Grounded                                                           |            |           |
| Connector Type             | 4 x 4.3-10 Female                                                     |            |           |
| Dimension (mm)             | 330 x 280 x 130                                                       |            |           |
| Weight (kgs)               | 2.5                                                                   |            |           |
| Radome Material            | UV-PVC                                                                |            |           |
| Reflector Material         | Aluminum                                                              |            |           |
| Rated Wind Velocity (km/h) | 210                                                                   |            |           |
| Operating Temperature (°C) | -40 to +65                                                            |            |           |
| Mounting                   | Mechanical Adjustable Downtilt Clamp for Pole Diameter 38-52 included |            |           |



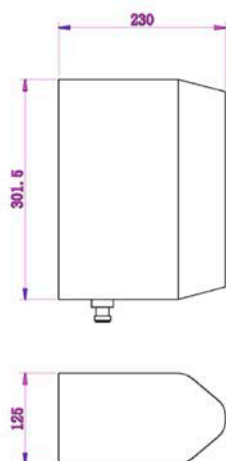


## 80020449

### Outdoor Panel Directional Antenna V-Pol 1-port 4/5dBi Bi-directional 694-960 / 1710-4000

#### V-Pol Bi-Directional 694-960/1710-4000 3/5dBi

| Type                       | 80020449                                         |         |           |           |
|----------------------------|--------------------------------------------------|---------|-----------|-----------|
| Frequency (MHz)            | 694-806                                          | 806-960 | 1710-2690 | 3300-4000 |
| Gain (dBi)                 | 3.0                                              | 3.5     | 4.5       | 4.0       |
| VSWR                       | ≤ 2.0                                            | ≤ 2.0   | ≤ 1.8     | ≤ 2.0     |
| Polarization               | Vertical                                         |         |           |           |
| PIM3 (dBc, @2x43dBm)       | ≤ -150                                           |         |           |           |
| Horizontal Beamwidth (°)   | 85                                               | 78      | 58        | 62        |
| Vertical Beamwidth (°)     | 62                                               | 58      | 50        | 55        |
| Input Impedance (ohm)      | 50                                               |         |           |           |
| Max. Input Power (W)       | 100                                              |         |           |           |
| Lightning Protection       | DC Grounded                                      |         |           |           |
| Connector (at the bottom)  | 1 x 4.3-10 Female                                |         |           |           |
| Dimension (mm)             | 250 x 210 x 125                                  |         |           |           |
| Weight (kgs)               | Approx. 1.1                                      |         |           |           |
| Radome Material            | Fiber Glass                                      |         |           |           |
| Operating Temperature (°C) | -40 to +65                                       |         |           |           |
| Mounting                   | Mounting Clamp for Pole Size Ø38 to Ø52 Included |         |           |           |



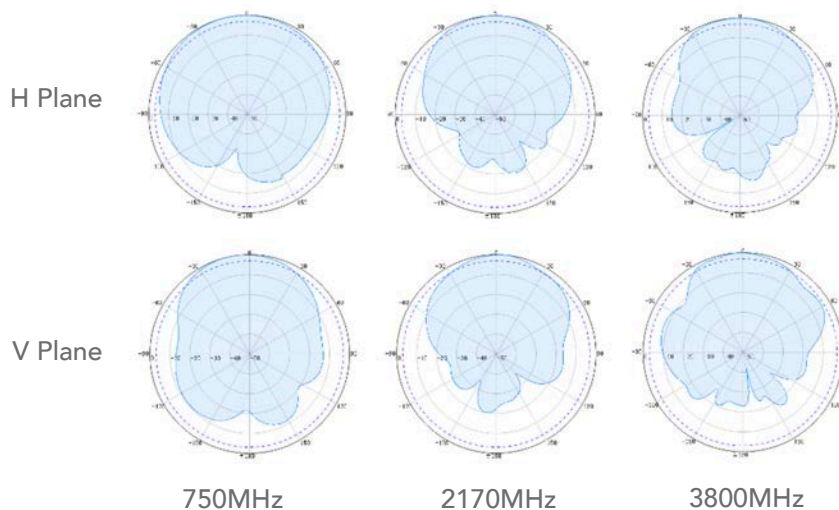


## 80011846

### Outdoor Mini Omni Directional Antenna V-Pol 1-port 3dBi 698-960 / 1710-4000

### Outdoor Mini Omni 698-960/1710-4000 3dBi

| Type                       | 80011846               |            |            |            |            |
|----------------------------|------------------------|------------|------------|------------|------------|
| Frequency (MHz)            | 698-806                | 806-960    | 1710-2170  | 2170-2700  | 3300-4000  |
| Gain (dBi)                 | $\geq 2.9$             | $\geq 3.0$ | $\geq 2.6$ | $\geq 3.2$ | $\geq 2.7$ |
| VSWR                       | $\leq 2.5$             | $\leq 2.5$ | $\leq 3.0$ | $\leq 2.5$ | $\leq 1.5$ |
| Polarization               | Vertical               |            |            |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$            |            |            |            |            |
| Horizontal Beamwidth (°)   | 360                    |            |            |            |            |
| Vertical Beamwidth (°)     | 85                     | 70         | 50         | 35         | 33         |
| Input Impedance (ohm)      | 50                     |            |            |            |            |
| Max. Input Power (W)       | 100                    |            |            |            |            |
| Lightning Protection       | DC Grounded            |            |            |            |            |
| Connector                  | 1 x 4.3-10 Female      |            |            |            |            |
| Dimension (mm)             | Ø30 x 200              |            |            |            |            |
| Weight (kgs)               | Approx. 0.25           |            |            |            |            |
| Reflector Material         | Aluminum               |            |            |            |            |
| Radome Material            | Fiber Glass            |            |            |            |            |
| Operating Temperature (°C) | -40 to +65             |            |            |            |            |
| Mounting                   | Fixed mounting bracket |            |            |            |            |



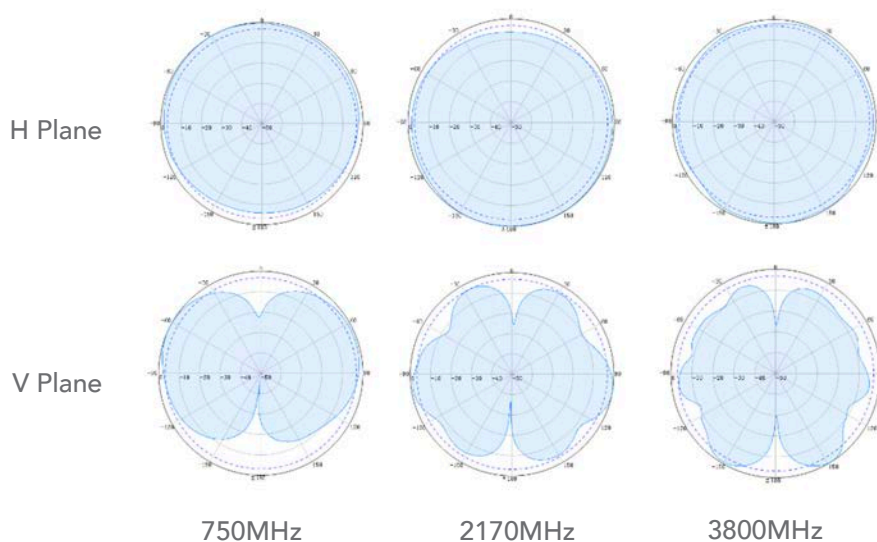


## 80011847

### Outdoor Mini Omni Directional Antenna V-Pol 1-port 3dBi 698-960 / 1710-4000

### Outdoor Mini Omni 698-960/1710-4000 3dBi

| Type                       | 80011847                    |            |            |            |            |
|----------------------------|-----------------------------|------------|------------|------------|------------|
| Frequency (MHz)            | 698-806                     | 806-960    | 1710-2170  | 2170-2700  | 3300-4000  |
| Gain (dBi)                 | $\geq 2.9$                  | $\geq 3.0$ | $\geq 2.6$ | $\geq 3.2$ | $\geq 2.7$ |
| VSWR                       | $\leq 2.5$                  | $\leq 2.5$ | $\leq 3.0$ | $\leq 2.5$ | $\leq 1.5$ |
| Polarization               | Vertical                    |            |            |            |            |
| PIM3 (dBc, @2x43dBm)       | $\leq -150$                 |            |            |            |            |
| Horizontal Beamwidth (°)   | 360                         |            |            |            |            |
| Vertical Beamwidth (°)     | 85                          | 70         | 50         | 35         | 33         |
| Input Impedance (ohm)      | 50                          |            |            |            |            |
| Max. Input Power (W)       | 100                         |            |            |            |            |
| Lightning Protection       | DC Grounded                 |            |            |            |            |
| Connector                  | 1 x 4.3-10 Female           |            |            |            |            |
| Dimension (mm)             | Ø30 x 200                   |            |            |            |            |
| Weight (kgs)               | Approx. 0.25                |            |            |            |            |
| Reflector Material         | Aluminum                    |            |            |            |            |
| Radome Material            | Fiber Glass                 |            |            |            |            |
| Operating Temperature (°C) | -40 to +65                  |            |            |            |            |
| *Optional Mounting bracket | 73410007 (order separately) |            |            |            |            |









# Special Antennas



# Index

## Special Antennas

| Part Number | Antenna    |         | Connector |          | Frequency   |           | PIM         |                | Page |
|-------------|------------|---------|-----------|----------|-------------|-----------|-------------|----------------|------|
|             | Type       | Applic. | N°        | Type     | Rango (MHz) | Gain (dB) | Value (dBc) | @Carrier Power |      |
| 80011747    | Omni       | 2port   | 2         | 4.3-10-F | 698-960     | 7.5       | -150        | 2x43dBm        | 100  |
| 80112014    | Quasi-Omni | 4port   | 4         | 4.3-10-F | 698-2690    | 8/12      | -150        | 2x43dBm        | 101  |
| 74212011    | Log-per    | 1port   | 1         | 4.3-10-F | 698-4000    | 11        | -150        | 2x43dBm        | 102  |
| 74252011    | Log-per    | 1port   | 1         | 7/16-F   | 698-4000    | 11        | -150        | 2x43dBm        | 102  |
| 74212010    | Log-Per    | 1port   | 1         | 4.3-10-F | 698-4000    | 12/14     | -150        | 2x43dBm        | 103  |
| 74252010    | Log-per    | 1port   | 1         | 7/16-F   | 698-4000    | 12/14     | -150        | 2x43dBm        | 103  |
| 74212012    | Log-Per    | 1port   | 2         | 4.3-10-F | 698-4000    | 10/11     | -150        | 2x43dBm        | 104  |
| 74252012    | Log-per    | 1port   | 2         | 7/16-F   | 698-4000    | 10/11     | -150        | 2x43dBm        | 104  |



## 80011747/2

**Omni Antenna**  
**VV-Pol 2-port 7.5dBi**  
**698-960Mhz**

### VV-Pol Omni 698-960Mhz 7.5dBi Outdoor

| Type                        | 80011747/2                                |
|-----------------------------|-------------------------------------------|
| Frequency Range (MHz)       | 698-960                                   |
| Gain (dBi)                  | 7.5                                       |
| VSWR                        | ≤ 1.7                                     |
| 3rd Order PIM (dBc)         | ≤ -150 @ 2x43dBm                          |
| Polarization                | Vertical / Vertical                       |
| Horizontal Beamwidth (°)    | 360                                       |
| Vertical Beamwidth (°)      | 15                                        |
| Pre-set Electrical Tilt (°) | 2                                         |
| Input Impedance (ohm)       | 50                                        |
| Max. Input Power (W)        | 250 per port                              |
| Lightning Protection        | DC Grounded                               |
| Connector Type              | 2 x 4.3-10 Female                         |
| Dimension (mm)              | Ø76 x 3,200                               |
| Weight (kgs)                | 10.5                                      |
| Radome Material             | Fiber Glass                               |
| Radiator Material           | Copper                                    |
| Operating Temperature (°C)  | -40 to +65                                |
| Max. Wind Velocity (km/h)   | 210                                       |
| Mounting                    | Mounting Clamp for Pole Ø60-Ø110 included |



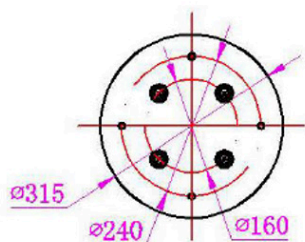
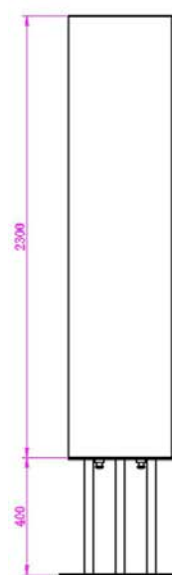


## 80112014

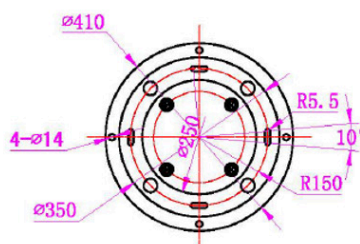
**Quasi-Omni Antenna**  
**XX-Pol 4-port 8/12dBi**  
**698-960 / 1710-2690**

### X-Pol Quasi-Omni 698-960 / 1710-2690 8/12dBi

| Type                                       | 80112014                                |                   |
|--------------------------------------------|-----------------------------------------|-------------------|
| Frequency Range (MHz)                      | 698-960                                 | 1710-2690         |
| Gain (dBi)                                 | 8                                       | 12                |
| VSWR                                       | $\leq 1.7$                              |                   |
| 3rd Order PIM (dBc)                        | $\leq -150$ @ 2x43dBm                   |                   |
| Polarization                               | $\pm 45^\circ$                          |                   |
| Isolation (dB)                             | $\geq 18$                               | $\geq 18$         |
| Horizontal Beamwidth ( $^\circ$ )          | 360                                     |                   |
| Vertical Beamwidth ( $^\circ$ )            | 12                                      | 7                 |
| Input Impedance (ohm)                      | 50                                      |                   |
| Max. Input Power (W)                       | 250                                     |                   |
| Lightning Protection                       | DC Grounded                             |                   |
| Connector Type                             | 2 x 4.3-10 Female                       | 2 x 4.3-10 Female |
| Dimension (mm)                             | $\varnothing 315 \times 2,300$          |                   |
| Weight (kgs)                               | 15                                      |                   |
| Radome Material                            | Fiber Glass                             |                   |
| Reflector Material                         | Aluminum                                |                   |
| Operating Temperature ( $^\circ\text{C}$ ) | -40 to +65                              |                   |
| Max. Wind Velocity (km/h)                  | 200                                     |                   |
| Mounting                                   | Floor Mount with Steel Stand (Supplied) |                   |



Bottom View - Antenna



Bottom View - Stand

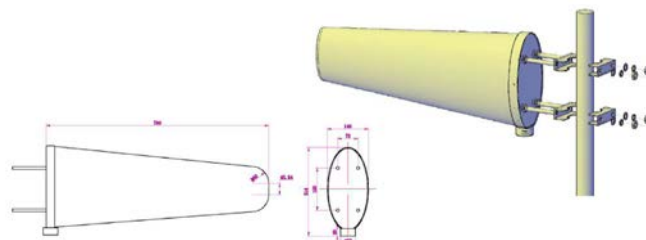


## 742x2011

### Log Periodic Antenna V-Pol 1-port 12/14dBi 690-960 / 1425-4000

### Log Periodic Antenna 690-4000 11dBi

| Type                                 | 74212011                                        |          |                      | 74252011        |                  |           |
|--------------------------------------|-------------------------------------------------|----------|----------------------|-----------------|------------------|-----------|
| Frequency Range (M Hz)               | 690-960                                         | 960-1695 | 1695-2200            | 2200-2490       | 2490-2690        | 3300-3800 |
| Gain (dBi, typ.)                     | 10.3                                            | 11.0     | 11.0                 | 11.0            | 11.0             | 10.5      |
| VSWR                                 | ≤ 1.5                                           | ≤ 1.5    | ≤ 1.5                | ≤ 1.5           | ≤ 1.5            | ≤ 1.5     |
| Polarization                         | Vertical                                        |          |                      |                 |                  |           |
| PIM3 (dBc), @2x43dBm                 | ≤ -150                                          |          |                      |                 |                  |           |
| Horizontal Beamwidth (°)             | 67                                              | 57       | 53                   | 47              | 41               | 63        |
| Vertical Beamwidth (°)               | 54                                              | 50       | 48                   | 45              | 44               | 55        |
| Front-to-Back Ratio (dB)             | ≥ 20                                            | ≥ 20     | ≥ 25                 | ≥ 25            | ≥ 25             | ≥ 25      |
| Input Impedance (Ω)                  | 50                                              |          |                      |                 |                  |           |
| Max. Input Power (W)                 | 250                                             | 250      | 200                  | 200             | 200              | 200       |
| Lightning Protection                 | DC Grounded                                     |          |                      |                 |                  |           |
| Connector Type                       | 1 x 4.3-10 Female                               |          |                      | 1 x 7/16 Female |                  |           |
| Dimension (mm)                       | 300 x 155 x 785                                 |          |                      |                 |                  |           |
| Weight (kgs)                         | 5.5                                             |          |                      |                 |                  |           |
| Reflector Material                   | Aluminum                                        |          |                      |                 |                  |           |
| Radome Material                      | Fiber Glass                                     |          |                      |                 |                  |           |
| Rated Wind Velocity (km/h)           | 200                                             |          |                      |                 |                  |           |
| Operating Temperature (°C)           | -40 to +65                                      |          |                      |                 |                  |           |
| Mounting                             | Pole Mount for Ø38 to Ø52 included              |          |                      |                 |                  |           |
| Wind Load (N) (@150km/h Wind Speed)  | Frontal: 25.5   Lateral: 143.1   Rearside: 41.8 |          |                      |                 |                  |           |
| Complaint to Environmental Standards | Dry Heat                                        |          | GB/T 2423.2          |                 | (IEC 60068-2-2)  |           |
|                                      | Cold                                            |          | GB/T 2423.1          |                 | (IEC 60068-2-1)  |           |
|                                      | Damp Heat                                       |          | GB/T 2423.3          |                 | (IEC 60068-2-78) |           |
|                                      | Change of Temperature                           |          | GB/T 2423.22         |                 | (IEC 60068-2-14) |           |
|                                      | Salt Mist                                       |          | GB/T 2423.17         |                 | (IEC 60068-2-11) |           |
|                                      |                                                 |          | GB/T 10125           |                 | (ISO 9227)       |           |
|                                      | Ingress Protection                              |          | GB/T 4208            |                 | (IEC 60529)      |           |
|                                      | Vibration                                       |          | GB/T 2423.10         |                 | (IEC 60068-2-64) |           |
|                                      | Drop Test                                       |          | GB/T 2423.8 & 4857.5 |                 | (ISO 2248)       |           |



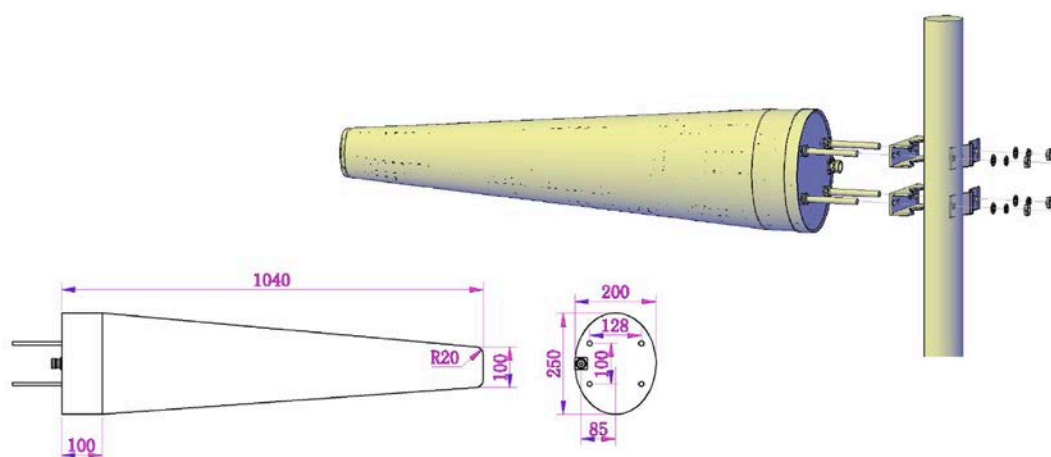


## 742x2010

**Log Periodic Antenna**  
**V-Pol 1-port 12/14dBi**  
**690-960 / 1425-4000**

### Log Periodic Antenna 690-960 / 1425-4000 12/14dBi

| Type                       | 74212010                            |         |                 | 74252010  |           |
|----------------------------|-------------------------------------|---------|-----------------|-----------|-----------|
| Frequency Range (MHz)      | 690-806                             | 806-960 | 1425-2170       | 2170-2700 | 3300-4000 |
| Gain (dBi, typ.)           | 11.5                                | 12.5    | 13.5            | 13.5      | 13.5      |
| VSWR                       | ≤ 1.5                               | ≤ 1.5   | ≤ 1.5           | ≤ 1.5     | ≤ 1.5     |
| Polarization               | Vertical                            |         |                 |           |           |
| PIM3 (dBc), @2x43dBm       | ≤ -150                              |         |                 |           |           |
| Horizontal Beamwidth (°)   | 56                                  | 54      | 45              | 41        | 40        |
| Vertical Beamwidth (°)     | 47                                  | 45      | 37              | 35        | 32        |
| Front-to-Back Ratio (dB)   | ≥ 25                                | ≥ 25    | ≥ 25            | ≥ 25      | ≥ 23      |
| Input Impedance (Ω)        | 50                                  |         |                 |           |           |
| Max. Input Power (W)       | 250                                 |         |                 |           |           |
| Lightning Protection       | DC Grounded                         |         |                 |           |           |
| Connector Type             | 1 x 4.3-10 Female                   |         | 1 x 7/16 Female |           |           |
| Dimension (mm)             | 250 x 200 x 1040                    |         |                 |           |           |
| Weight (kgs)               | 3.5                                 |         |                 |           |           |
| Reflector Material         | Copper                              |         |                 |           |           |
| Radome Material            | Fiber Glass                         |         |                 |           |           |
| Rated Wind Velocity (km/h) | 200                                 |         |                 |           |           |
| Operating Temperature (°C) | -40 to +65                          |         |                 |           |           |
| Mounting                   | Pole Mount for Ø60 to Ø100 included |         |                 |           |           |



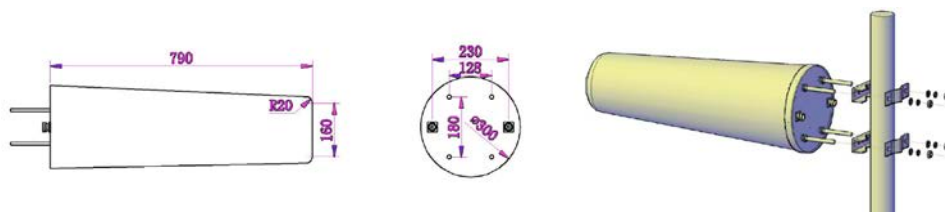


## 742x2012

### Log Periodic Antenna V-Pol 2-port 11dBi 690-4000

### Log Periodic Antenna 690-4000 10/11dBi

| Type                                 | 74212012                                        |                      |                 | 74252012         |           |
|--------------------------------------|-------------------------------------------------|----------------------|-----------------|------------------|-----------|
| Frequency Range (MHz)                | 690-960                                         | 960-1695             | 1695-2170       | 2170-2690        | 3300-3800 |
| Gain (dBi, typ.)                     | 9.5                                             | 10.5                 | 11.0            | 11.0             | 10.5      |
| VSWR                                 | ≤ 1.8                                           | ≤ 1.6                | ≤ 1.6           | ≤ 1.6            | ≤ 1.6     |
| Polarization                         | Vertical / Horizontal                           |                      |                 |                  |           |
| PIM3 (dBc), @2x43dBm                 | ≤ -150                                          |                      |                 |                  |           |
| Horizontal Beamwidth (°)             | 68                                              | 65                   | 61              | 58               | 65        |
| Vertical Beamwidth (°)               | 53                                              | 50                   | 48              | 45               | 53        |
| Isolation (dB)                       | ≥ 20                                            | ≥ 20                 | ≥ 28            | ≥ 28             | ≥ 28      |
| Front-to-Back Ratio (dB)             | ≥ 20                                            | ≥ 20                 | ≥ 25            | ≥ 25             | ≥ 25      |
| Input Impedance (Ω)                  | 50                                              |                      |                 |                  |           |
| Max. Input Power (W)                 | 200                                             |                      |                 |                  |           |
| Lightning Protection                 | DC Grounded                                     |                      |                 |                  |           |
| Connector Type                       | 2 x 4.3-10 Female                               |                      | 2 x 7/16 Female |                  |           |
| Dimension (mm)                       | 300 x 300 x 785                                 |                      |                 |                  |           |
| Weight (kgs)                         | 6.5                                             |                      |                 |                  |           |
| Reflector Material                   | Aluminum                                        |                      |                 |                  |           |
| Radome Material                      | Fiber Glass                                     |                      |                 |                  |           |
| Rated Wind Velocity (km/h)           | 200                                             |                      |                 |                  |           |
| Operating Temperature (°C)           | -40 to +65                                      |                      |                 |                  |           |
| Mounting                             | Pole Mount for Ø38 to Ø52 included              |                      |                 |                  |           |
| Wind Load (N) (@150km/h Wind Speed)  | Frontal: 25.5   Lateral: 143.1   Rearside: 41.8 |                      |                 |                  |           |
| Complaint to Environmental Standards | Dry Heat                                        | GB/T 2423.2          |                 | (IEC 60068-2-2)  |           |
|                                      | Cold                                            | GB/T 2423.1          |                 | (IEC 60068-2-1)  |           |
|                                      | Damp Heat                                       | GB/T 2423.3          |                 | (IEC 60068-2-78) |           |
|                                      | Change of Temp.                                 | GB/T 2423.22         |                 | (IEC 60068-2-14) |           |
|                                      | Salt Mist                                       | GB/T 2423.17         |                 | (IEC 60068-2-11) |           |
|                                      |                                                 | GB/T 10125           |                 | (ISO 9227)       |           |
|                                      | Ingress Protection                              | GB/T 4208            |                 | (IEC 60529)      |           |
|                                      | Vibration                                       | GB/T 2423.10         |                 | (IEC 60068-2-64) |           |
|                                      | Drop Test                                       | GB/T 2423.8 & 4857.5 |                 | (ISO 2248)       |           |





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