*Application note*

Ceramic Dual Band Monopole Antenna

EGSM900 and PCN1800

*10 mm x 3.2 mm x 2 mm Ceramic Chip Antenna**Ground Cleared Under Antenna:**Version 1: 25 mm x 10 mm**Version 2: 40 mm x 10 mm**Pulse Part Number: W3070*

Status

| | | | |
|-------------|------|---------|------------|
| Author | MiJu | Version | 4.0.0 |
| Checked by | | Date | 02.07.2009 |
| Approved by | | Date | |

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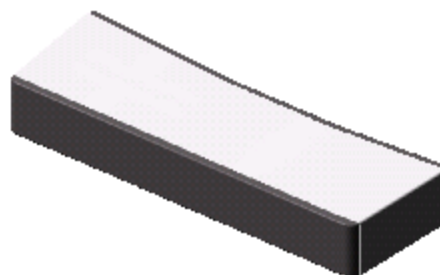
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Ceramic Chip Antenna

Ground Cleared Under Antenna

Features

- Low profile
- Compact size W x L x H (10 x 3.2 x 2 mm)
- Low weight (240 mg)
- Lead free materials
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS Compliant Product



Applications

- EGSM900 and PCN1800 radios

Electrical specifications @ +25 °C

Note: Electrical characteristics depend on test board (GP) size and antenna positioning on GP and Ground Clearance area size.

W3070 Ceramic Dual Band Monopole Antenna (Version 1: Ground Cleared Under Antenna 25 mm x 10mm)

Typical performance (test board size 95 mm x 40 mm, PWB ground clearance area 25 mm x 10 mm)

18nH and 10nH series-inductors used for frequency tuning and 6.8nH shunt-inductor used for impedance matching.

| Frequency Range [MHz] | 3D Max Gain [dBi] | 3D Efficiency [%] / [dB] | Return loss min. [dB] | Impedance [Ω] | Operating Temperature [°C] |
|-----------------------|-------------------------------------|---|--------------------------|---------------|----------------------------|
| 880 - 960 | +1.5 (peak) -0.4 (band edges) | 70 / -1.55 (peak) 47 ; 40 / -3.3 ; -4 (band edges) | -4.7 ; -3.8 (band edges) | 50 | -40 to +85 |
| 1710 – 1880 | +1 (peak) -1 ; +0.5 (band edges) | 50 / -3 (peak) 30 ; 40 / -5.2 ; -4 (band edges) | -4 ; -4.6 (band edges) | 50 | -40 to +85 |

W3070 Ceramic Dual Band Monopole Antenna (Version 2: Ground Cleared Under Antenna 40 mm x 10mm)

Typical performance (test board size 95 mm x 40 mm, PWB ground clearance area 40 mm x 10 mm)

18nH and 10nH series-inductors used for frequency tuning.

| Frequency Range [MHz] | 3D Max Gain [dBi] | 3D Efficiency [%] / [dB] | Return loss min. [dB] | Impedance [Ω] | Operating Temperature [°C] |
|-----------------------|---------------------------------------|--|--------------------------|---------------|----------------------------|
| 880 - 960 | +1.2 (peak) -0.4 (band edges) | 65 / -1.9 (peak) 47 / -3.3 (band edges) | -5.1 ; -5.3 (band edges) | 50 | -40 to +85 |
| 1710 – 1880 | +2.5 (peak) +1.5 ; +2 (band edges) | 60 / -2.2 (peak) 50 ; 55 / -3 ; -2.6 (band edges) | -5.8 ; -5.7 (band edges) | 50 | -40 to +85 |

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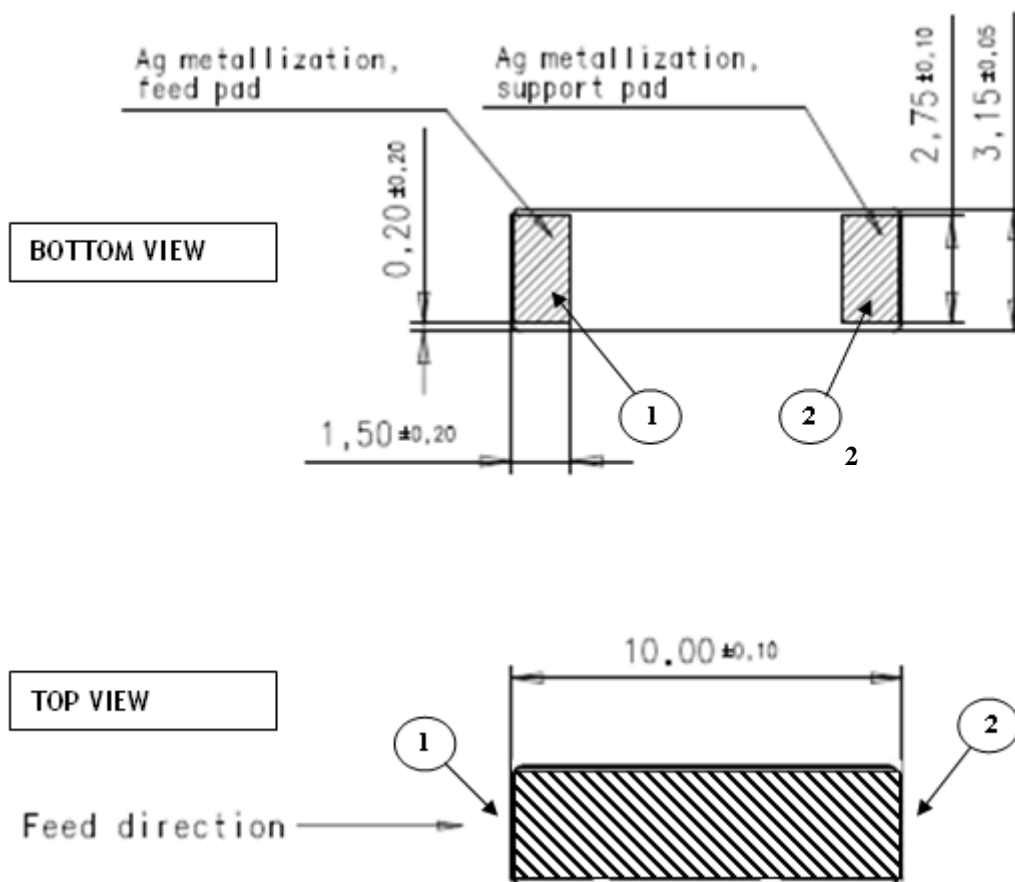
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Ceramic Chip Antenna

Terminal Configuration and Antenna Dimensions



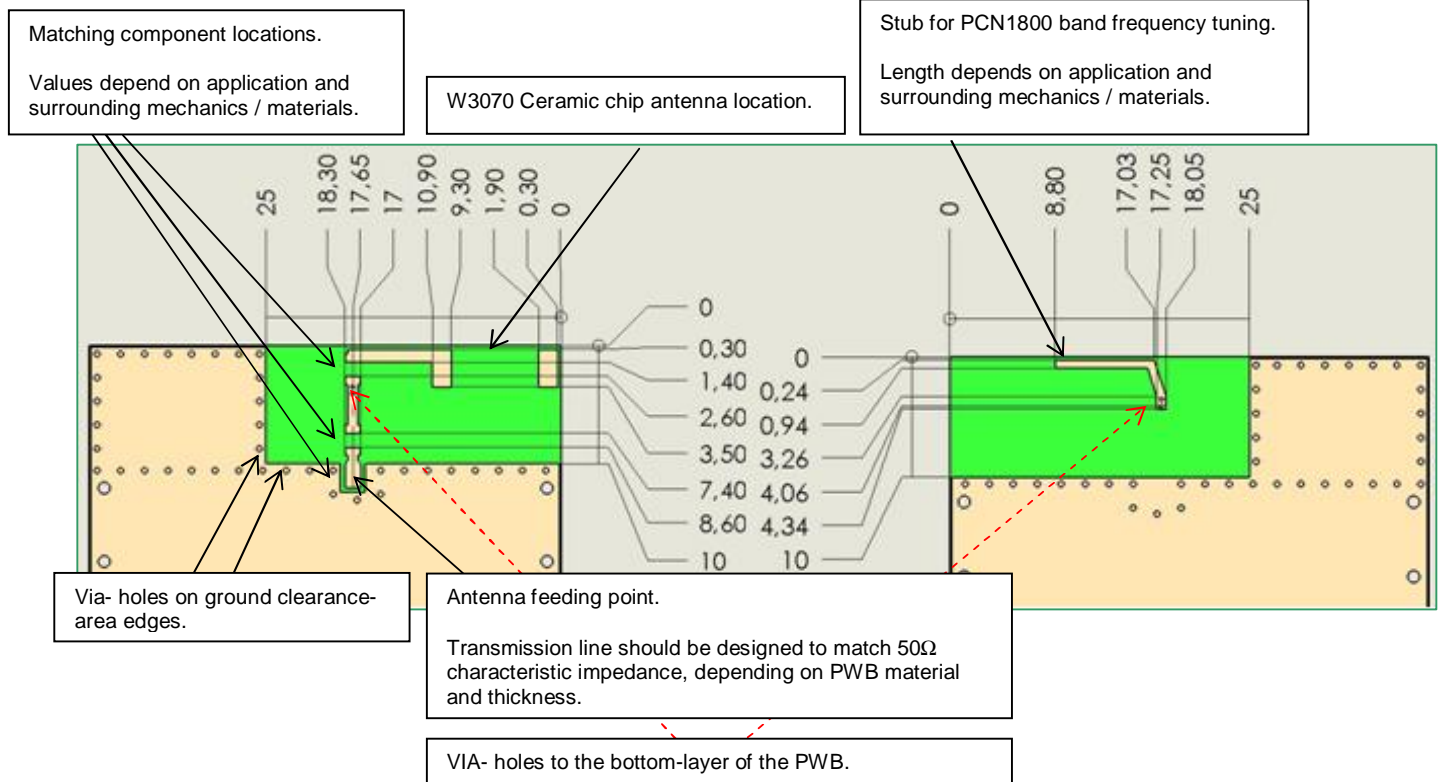
| No. | Terminal Name | Terminal Dimensions |
|--|---------------|---------------------|
| 1 | Feed | 1.5 x 2.75 mm |
| 2 | Support pad | 1.5 x 2.75 mm |
| Antenna is symmetrical and orientation on footprint can be rotated 180 degrees without change in performance | | |

Ceramic Chip Antenna

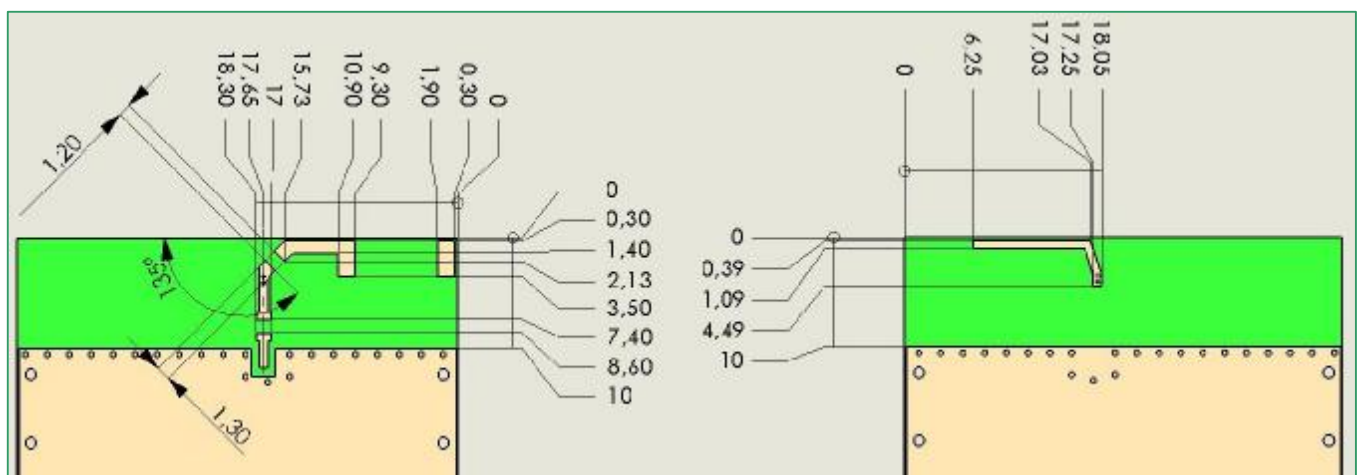
Test Setup for Electrical Measurements

Recommended test board- layout for electrical characteristic measurement. Test board outline size 95 x 40mm.

Ground cleared under antenna, clearance area **25 mm x 10 mm**



Ground cleared under antenna, clearance area **40 mm x 10 mm**



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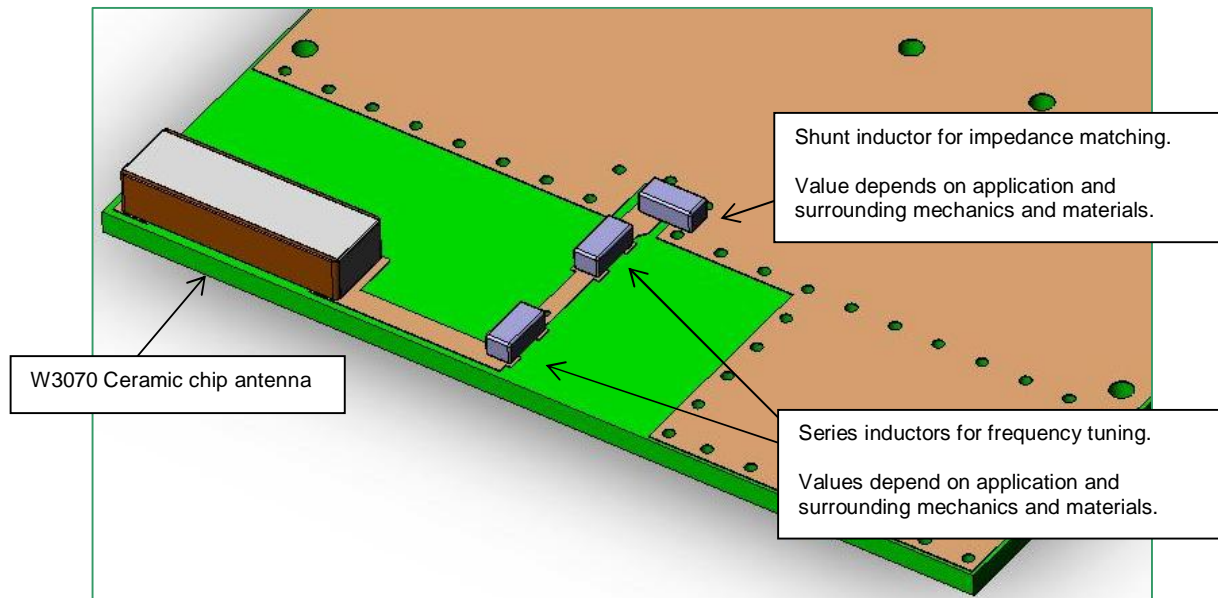


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Recommended test board- layout for electrical characteristic measurement. Test board outline size 95 x 40mm.

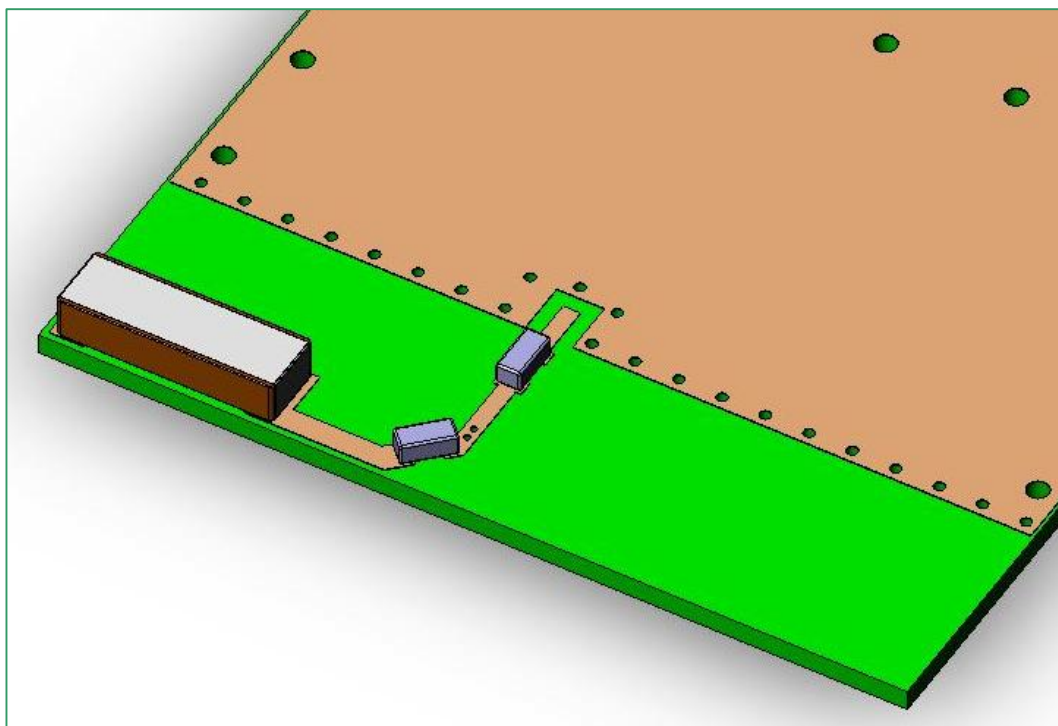
3D- view of Test Setup

Ground cleared under antenna, clearance area **25 mm x 10 mm**



3D- view of Test Setup

Ground cleared under antenna, clearance area **40 mm x 10 mm**



Ceramic Chip Antenna

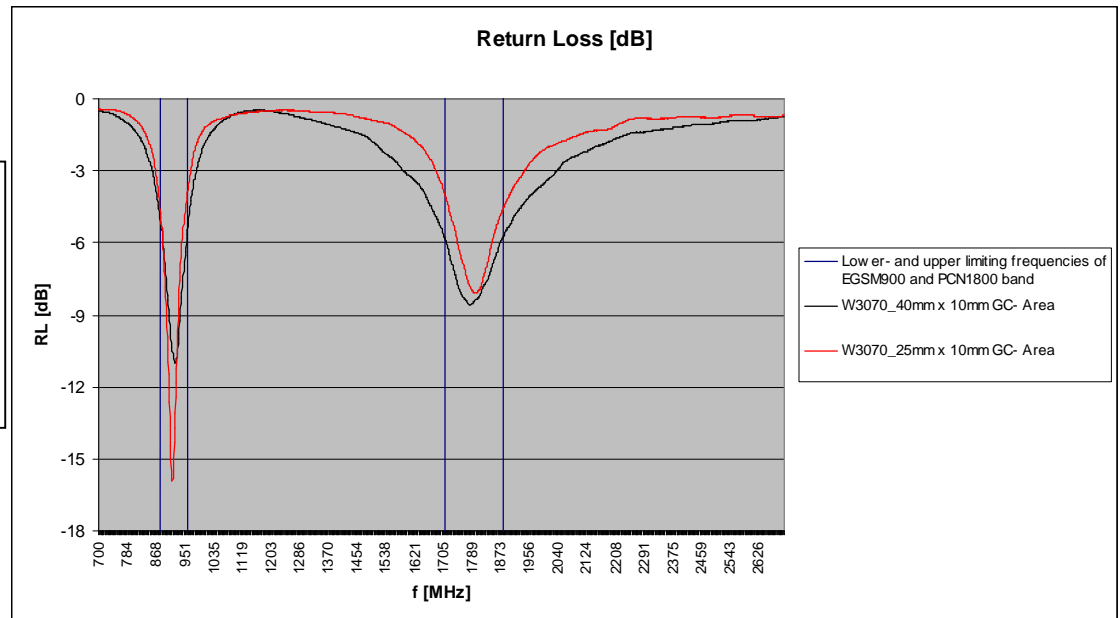
Ground cleared under antenna. Clearance areas **25 mm x 10 mm** and **40mm x 10mm**.

Typical Electrical Characteristics (T=25 °C)

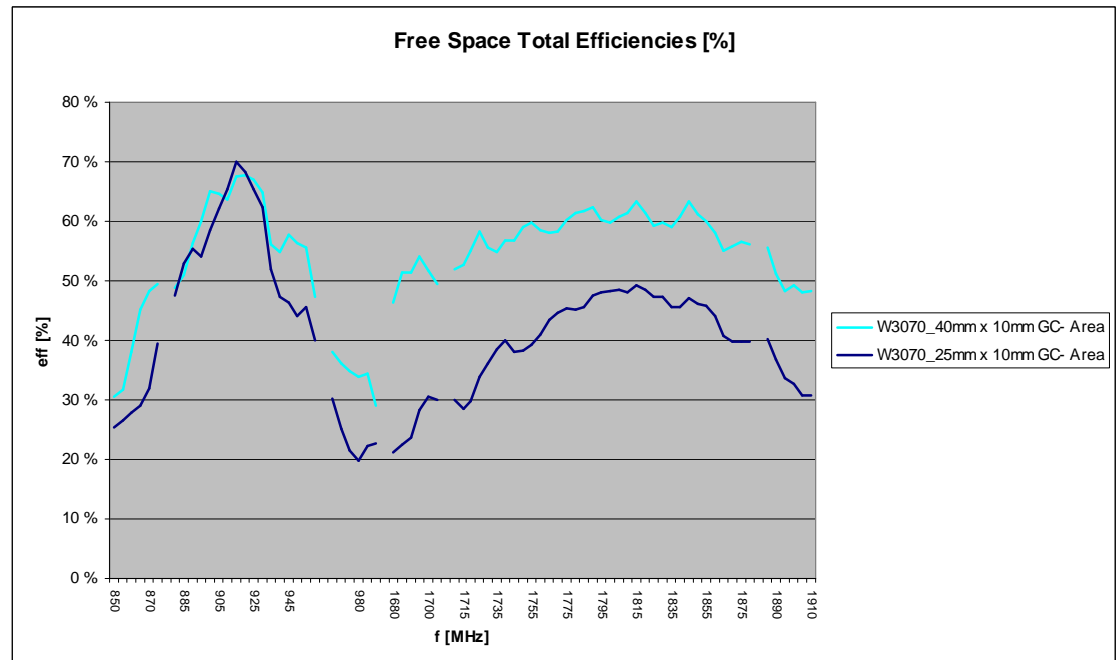
Measured on the 95 x 40mm test board with matching circuit.

Typical Return Loss S11

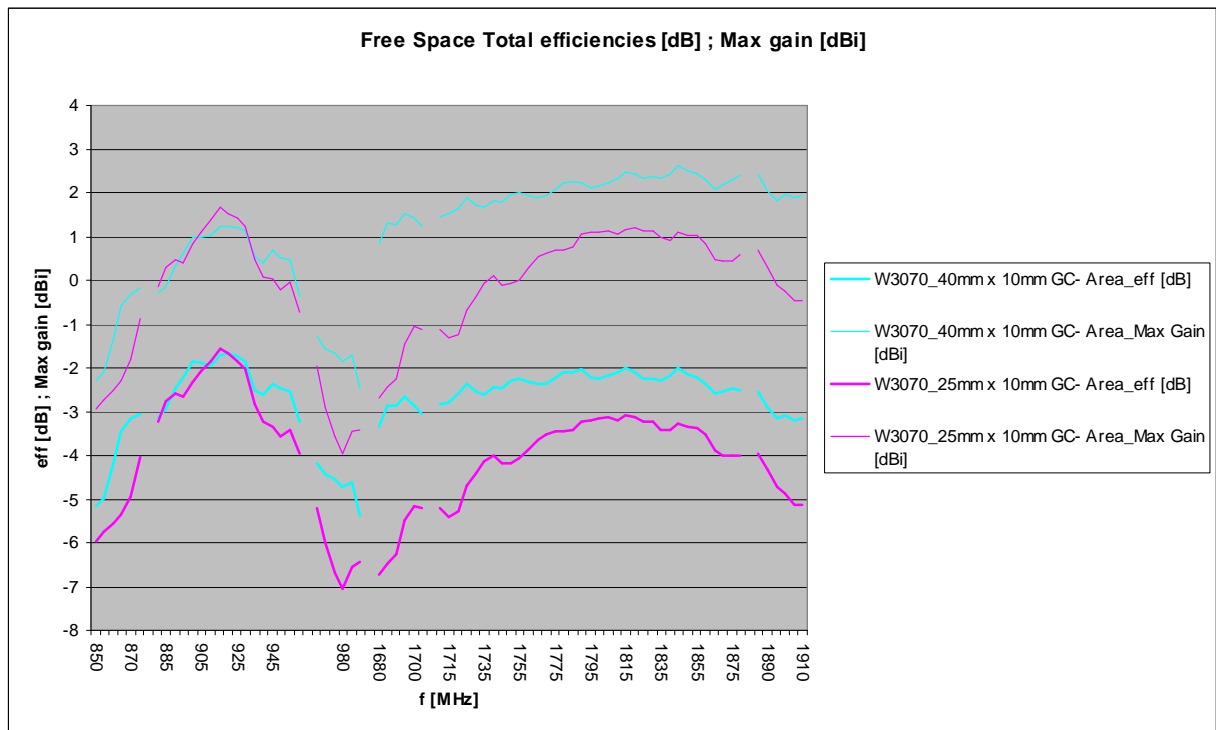
| Typical return loss-values at band edges: | |
|---|----------------|
| 880MHz | 960MHz |
| -5.1dB | -5.3dB |
| -4.7dB | -3.8dB |
| 1710MHz | 1880MHz |
| -5.8dB | -5.7dB |
| -4dB | -4.6dB |



Typical free Space Total Efficiencies [%]



Typical free Space Total Efficiencies [dB] and Maximum Gain [dBi]



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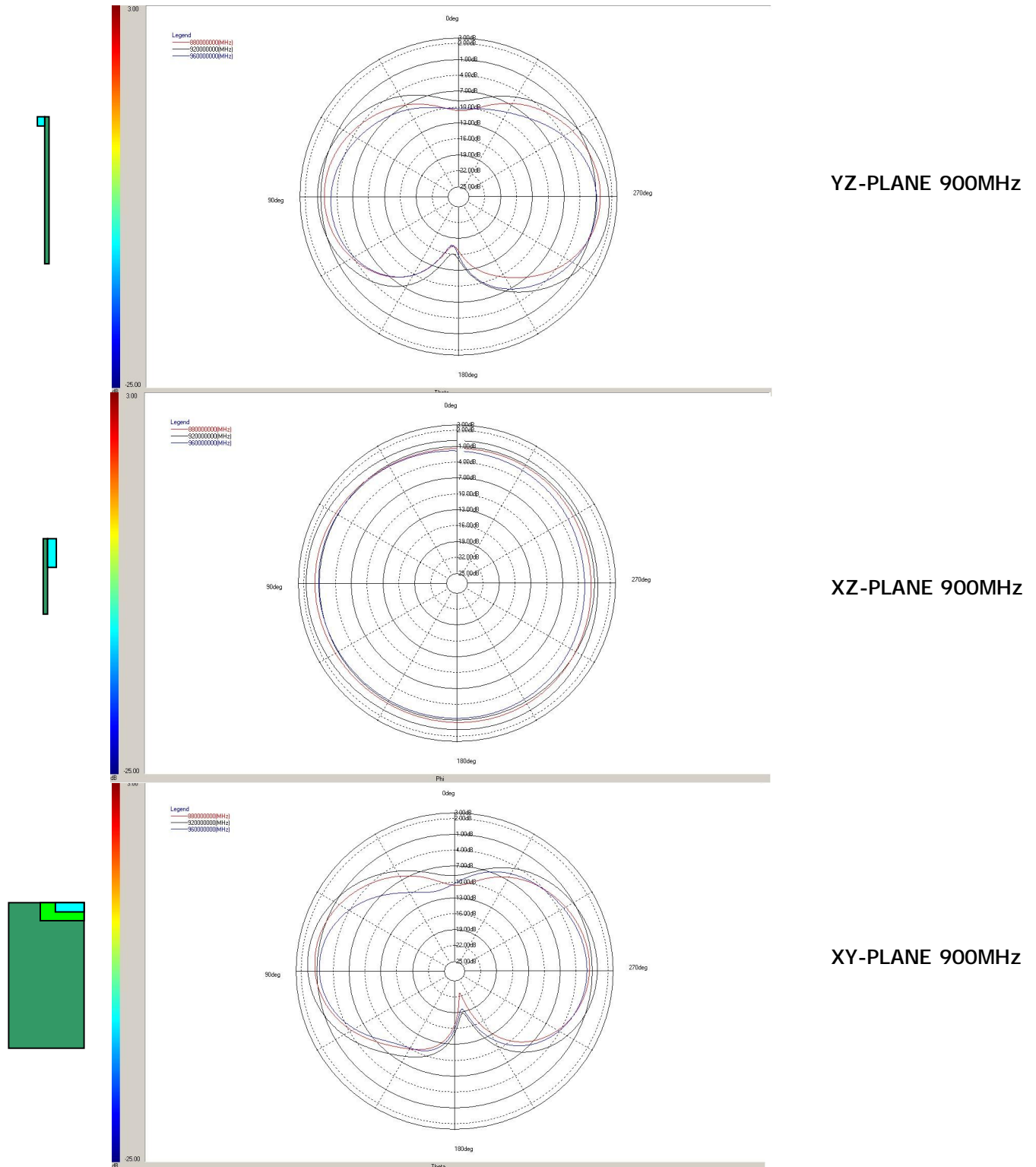


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Ceramic Chip Antenna

Ground cleared under antenna. Clearance area **25 mm x 10mm**.

Typical Free Space Radiation Patterns for EGSM900 Band



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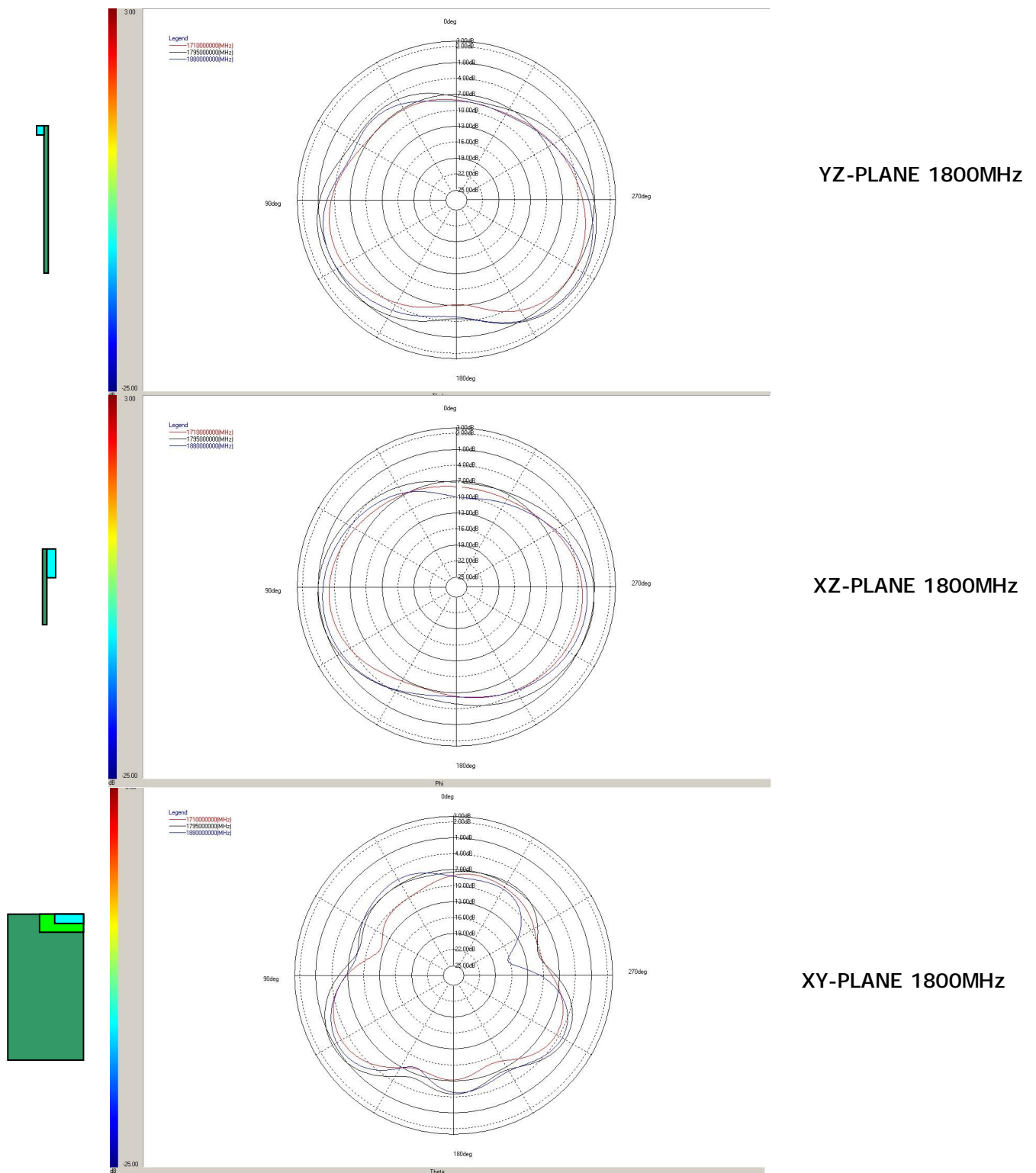
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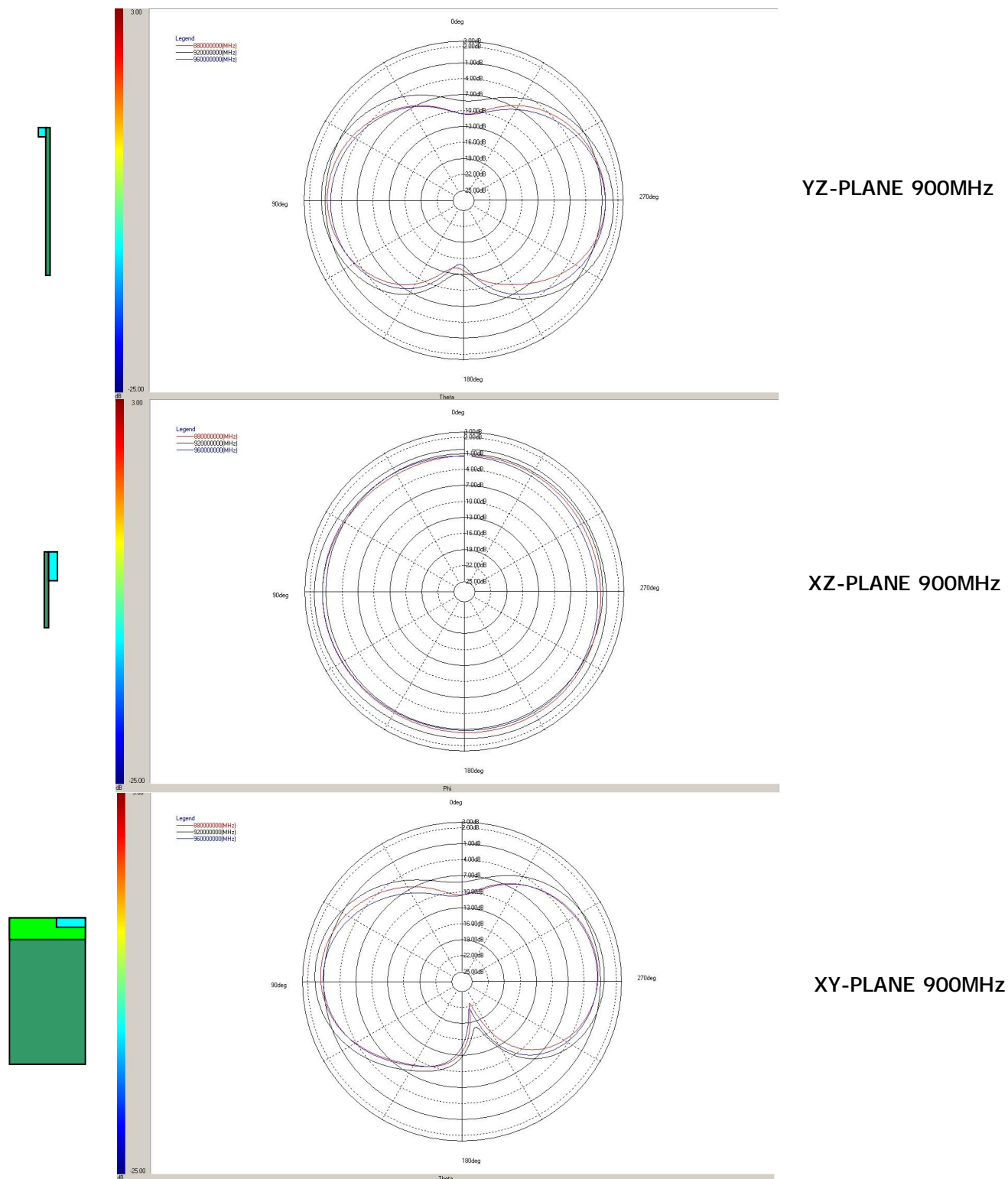
Typical Free Space Radiation Patterns for PCN1800 Band



Ceramic Chip Antenna

Ground cleared under antenna. Clearance area **40 mm x 10mm**.

Typical Free Space Radiation Patterns for EGSM900 Band



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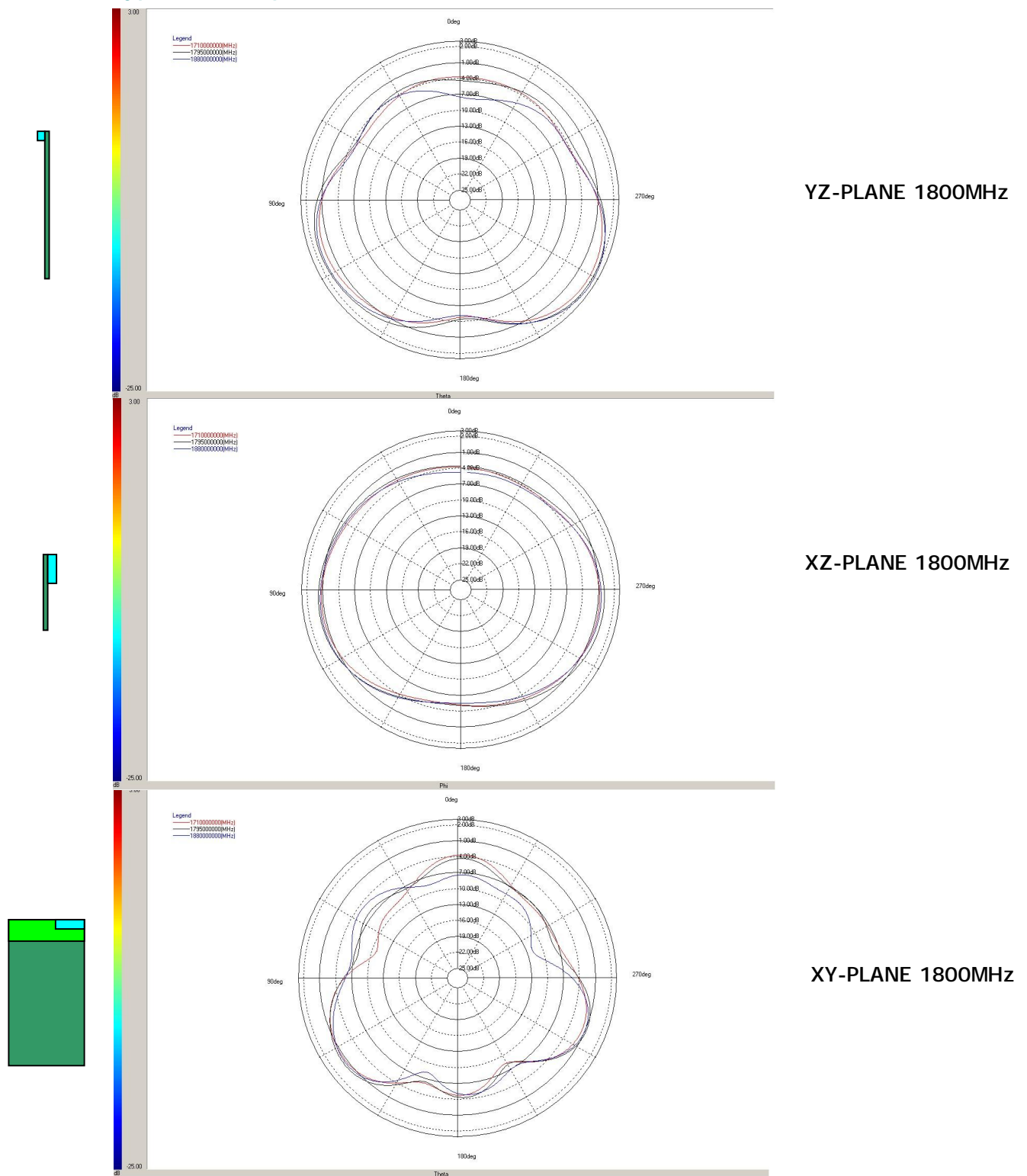
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Typical Free Space Radiation Patterns for PCN1800 Band



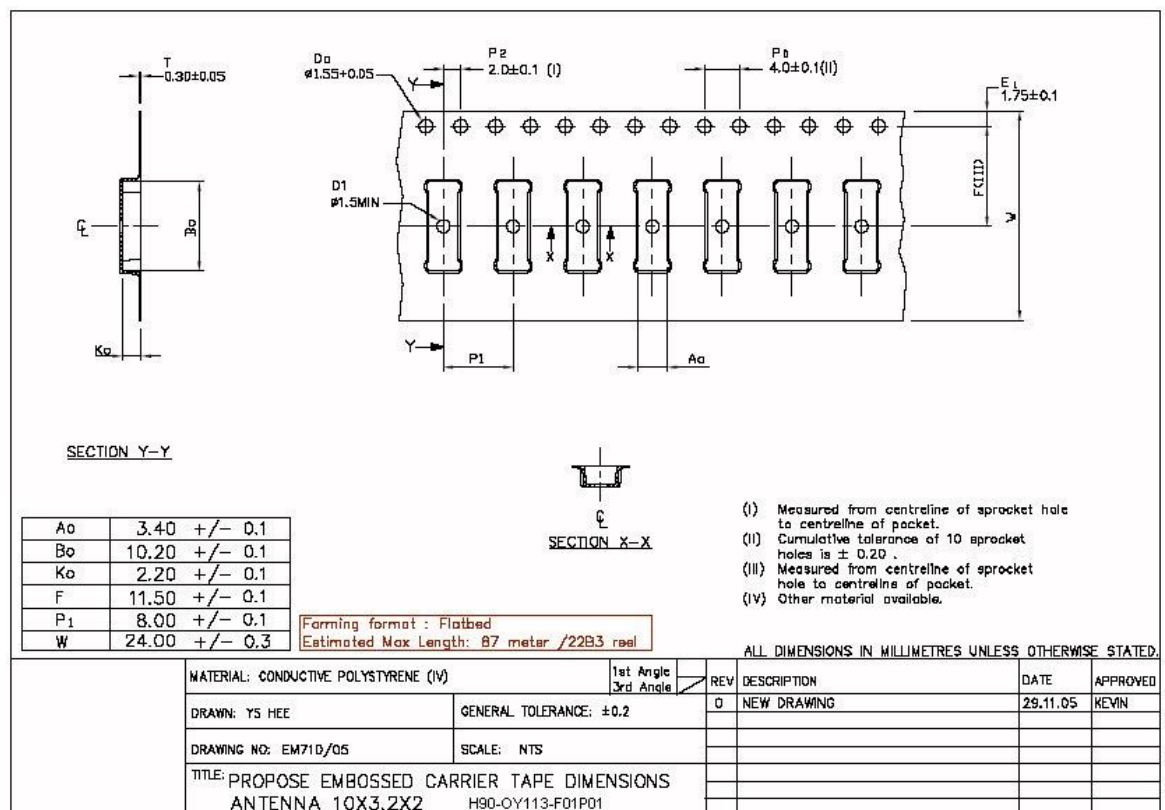
Ceramic Chip Antenna

Packing

General

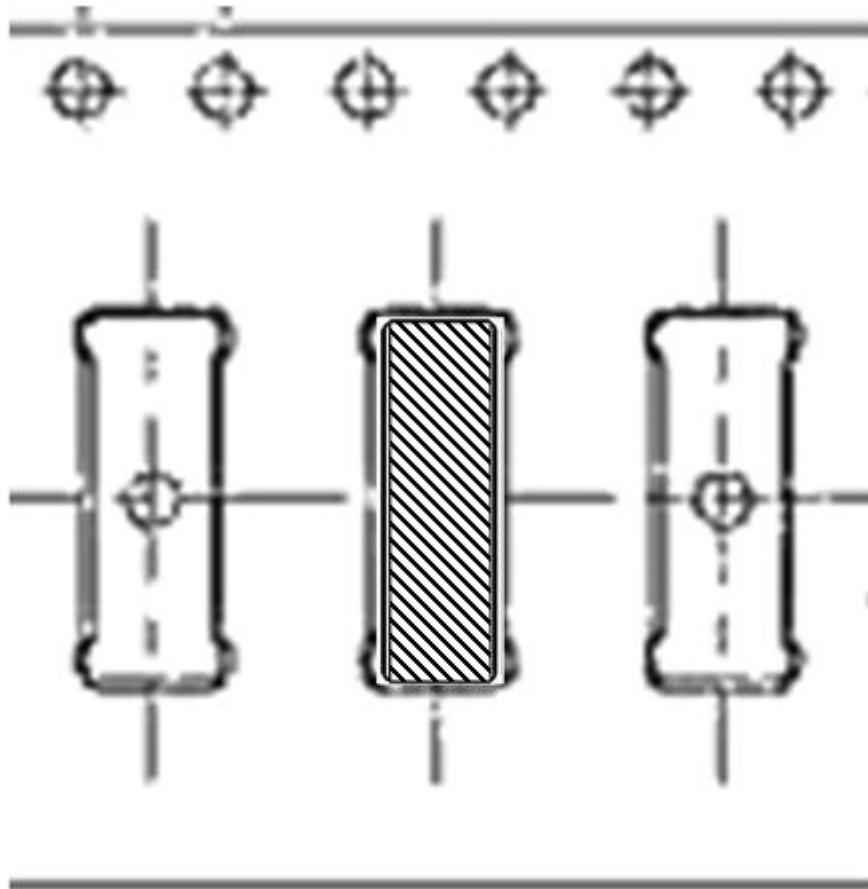
Tape and reel packing is used. Carrier tape, reel and box dimensions are presented in following pictures.

Carrier tape

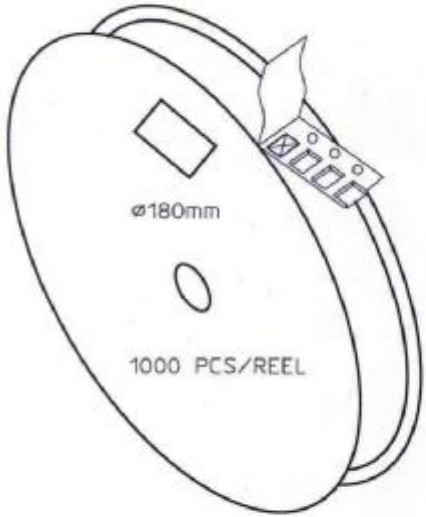
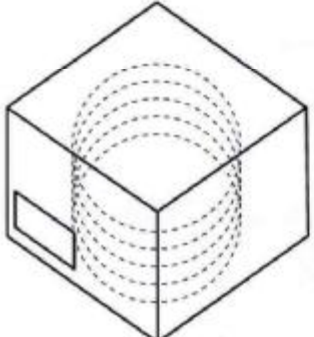

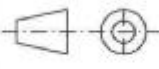


Block orientation

Antenna soldering pads facing down to the bottom of the carrier tape.

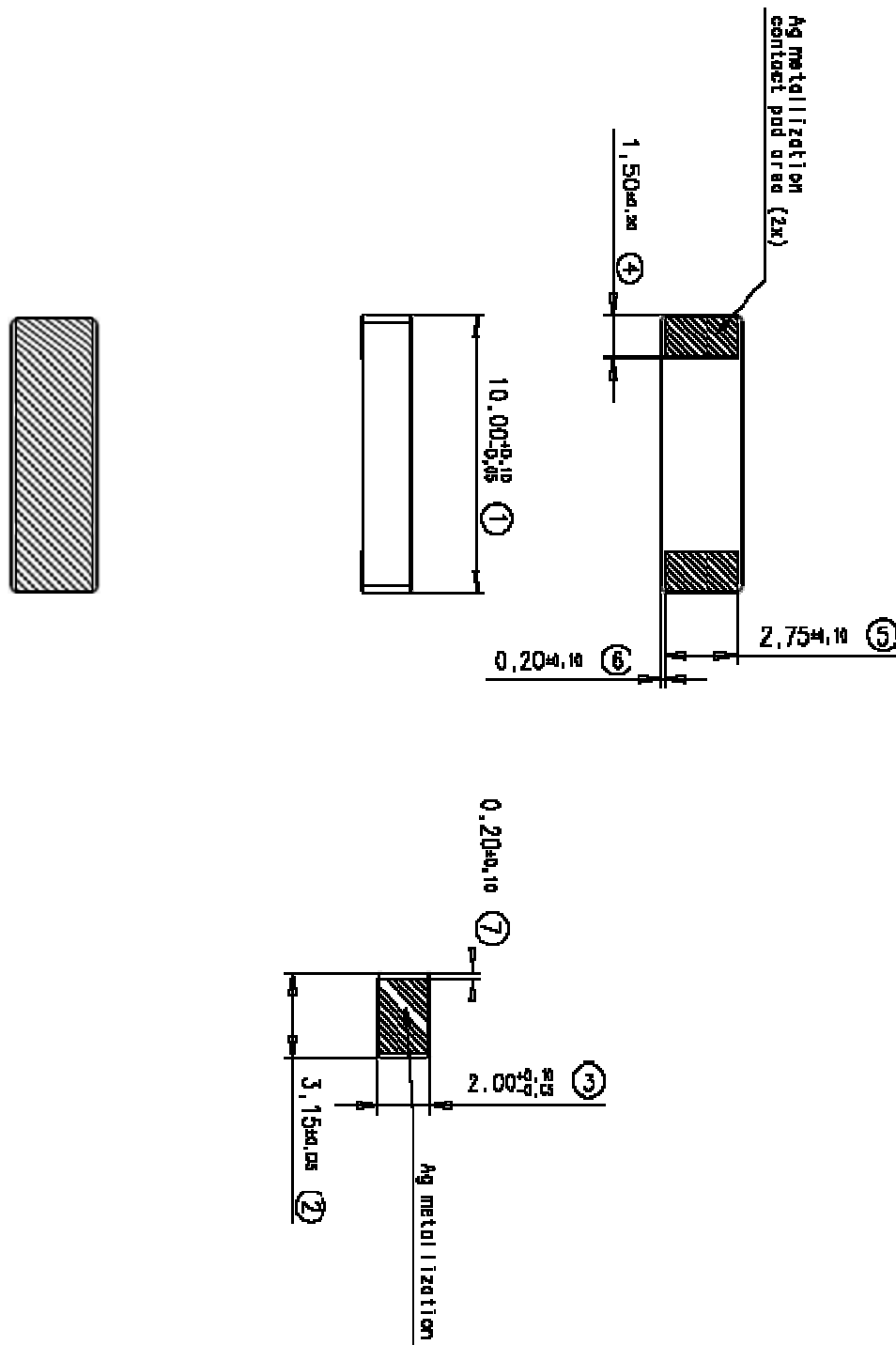


Packing form

| | | | |
|---|---|--|--------------------|
|  | | <p>CARRIER TAPE H85-00168 width=24,00 depth=2.20 COVER TAPE H85-00159 width=21.20</p> <p>LENGTH OF TAPE:</p> <ul style="list-style-type: none"> - Leader section: min 350 mm before component section - Trailer section: min 40 mm after component section. <p>Empty part cavities at leader and trailer section of the tape must be sealed with top cover tape.</p> | |
|  | | <p>BOX H85-00128 (182x182x125) 1 pcs</p> <p>- LABEL 1 pcs/BOX</p> <p>REEL H85-00160 (D180, W28) 4 pcs</p> <p>- REEL LABEL 1 pcs/REEL</p> | |
| MATERIAL | | | |
| HANDLINGS | | | |
|  |  | RATIO | DRWN 160107 PeHa H |
| | | | DGNER |
| | | | CHKD |
| | | | APPRD |
| | | | APPRD BY |
| PRODUCT H90-OY113-F01P01 | | | C |
| DENOMINATION PACKING FORM | | | B |
| | | | A |
| | | VERSION | MOD/DATE/NAME |

Ceramic Chip Antenna

Mechanical Outline



For More Information, please contact:

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