

*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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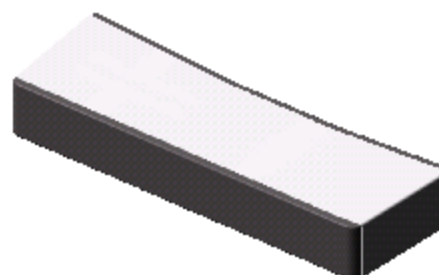


# Ceramic Chip Antenna

*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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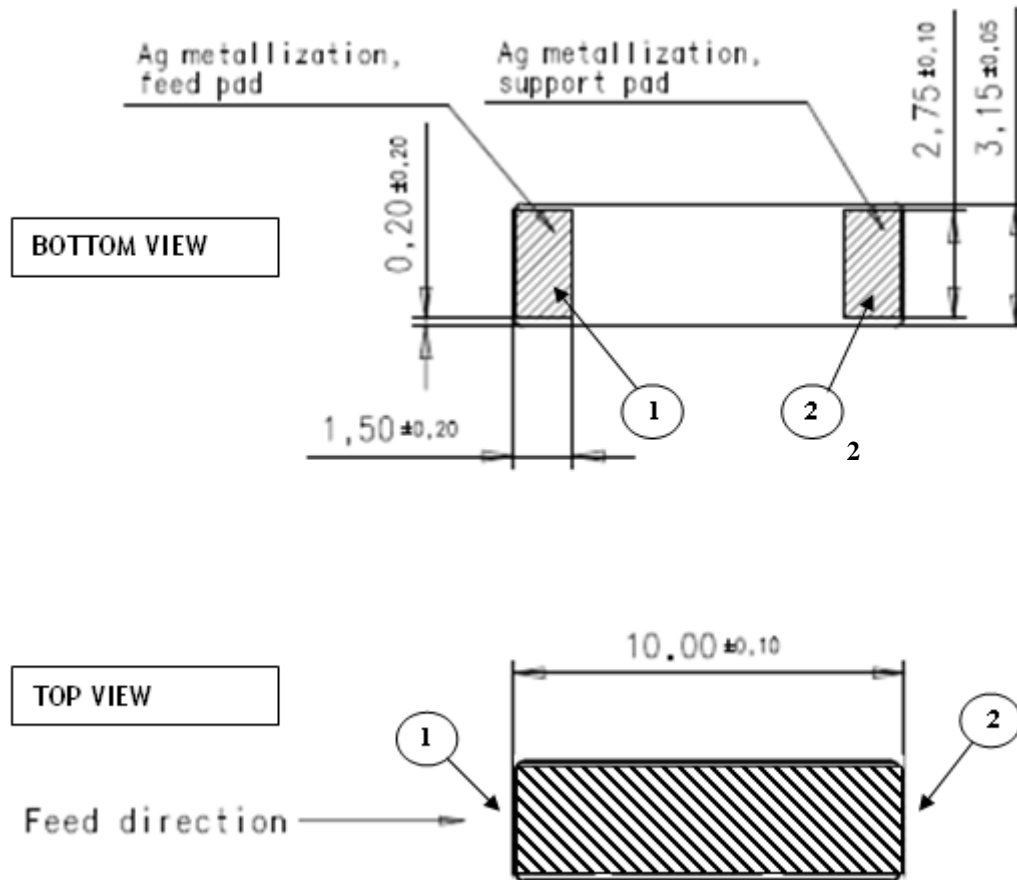
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# Ceramic Chip Antenna

## 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

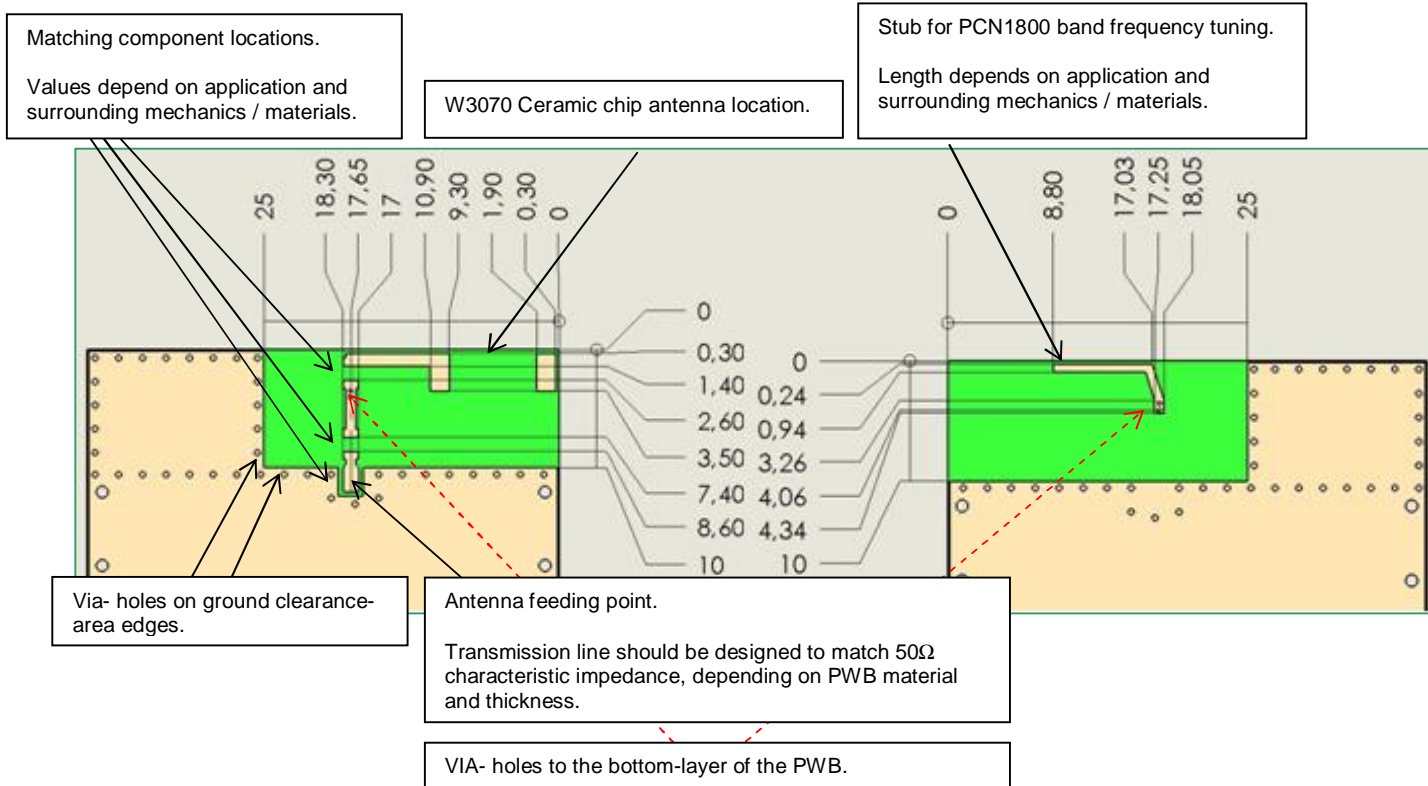
Antenna is symmetrical and orientation on footprint can be rotated 180 degrees without change in performance

# Ceramic Chip Antenna

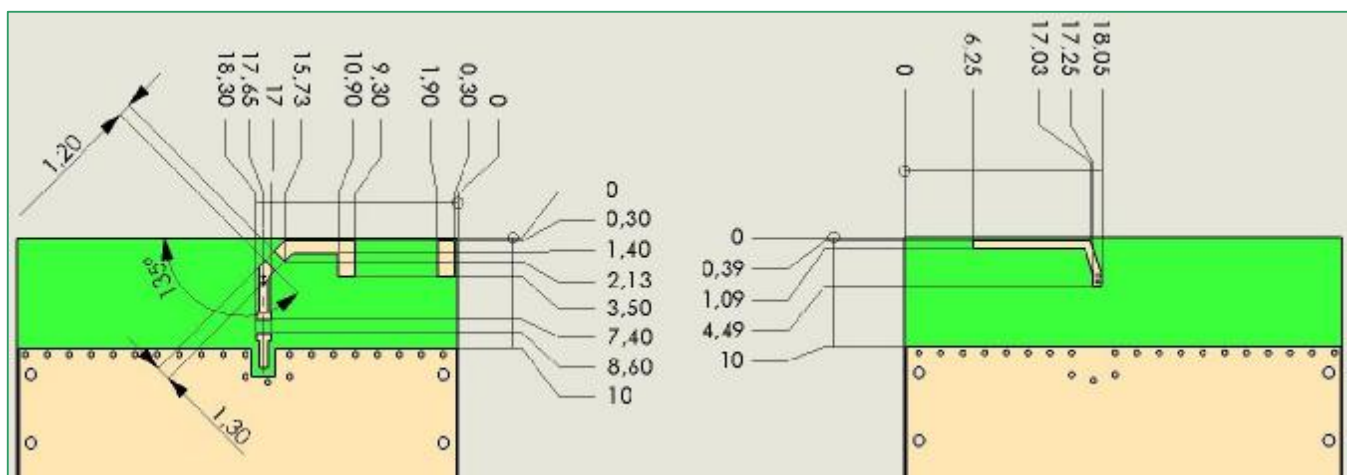
## Test Setup for Electrical Measurements

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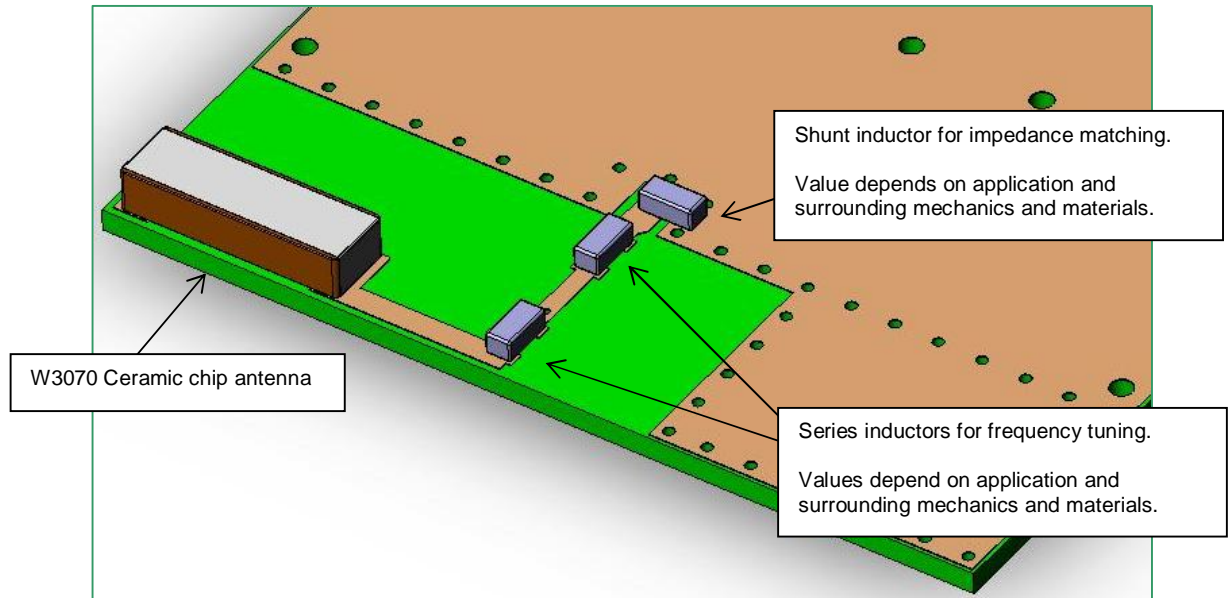
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*Recommended test board- layout for electrical characteristic measurement. Test board outline size 95 x 40mm.*

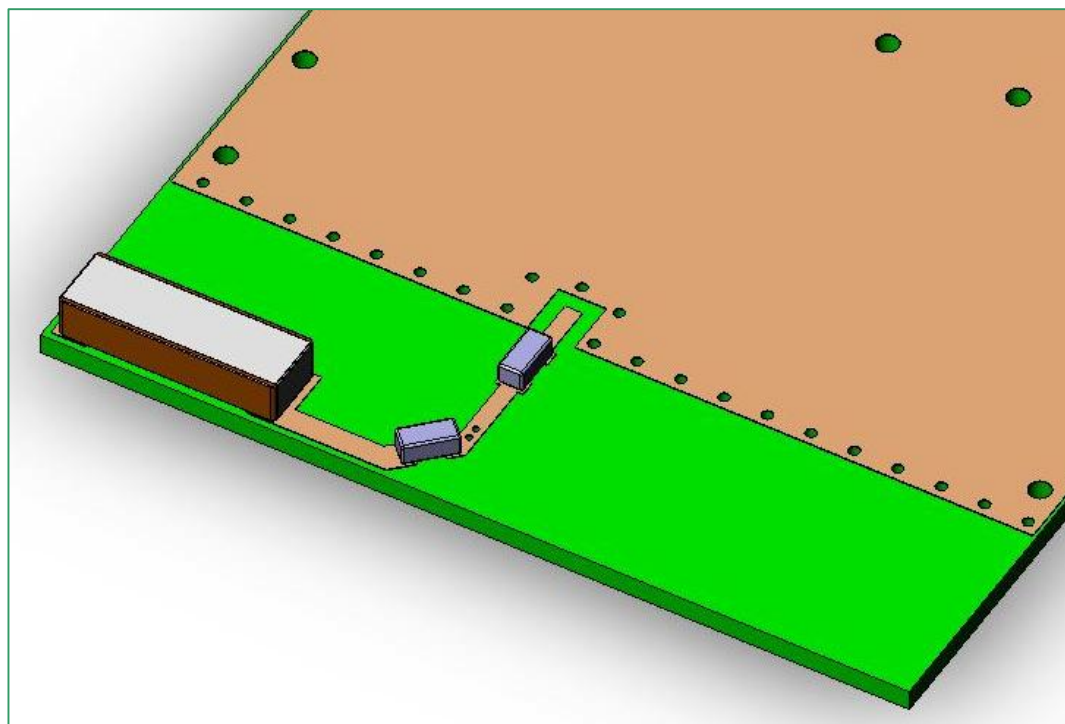
### 3D- view of Test Setup

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**



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# Ceramic Chip Antenna

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

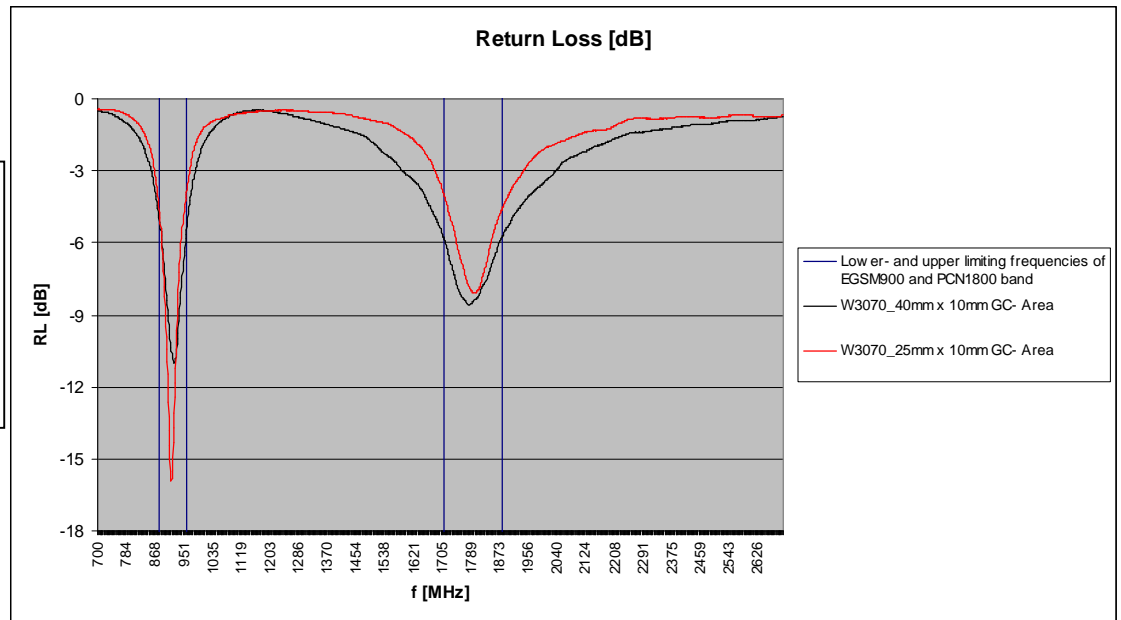
## Typical Electrical Characteristics (T=25 °C)

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

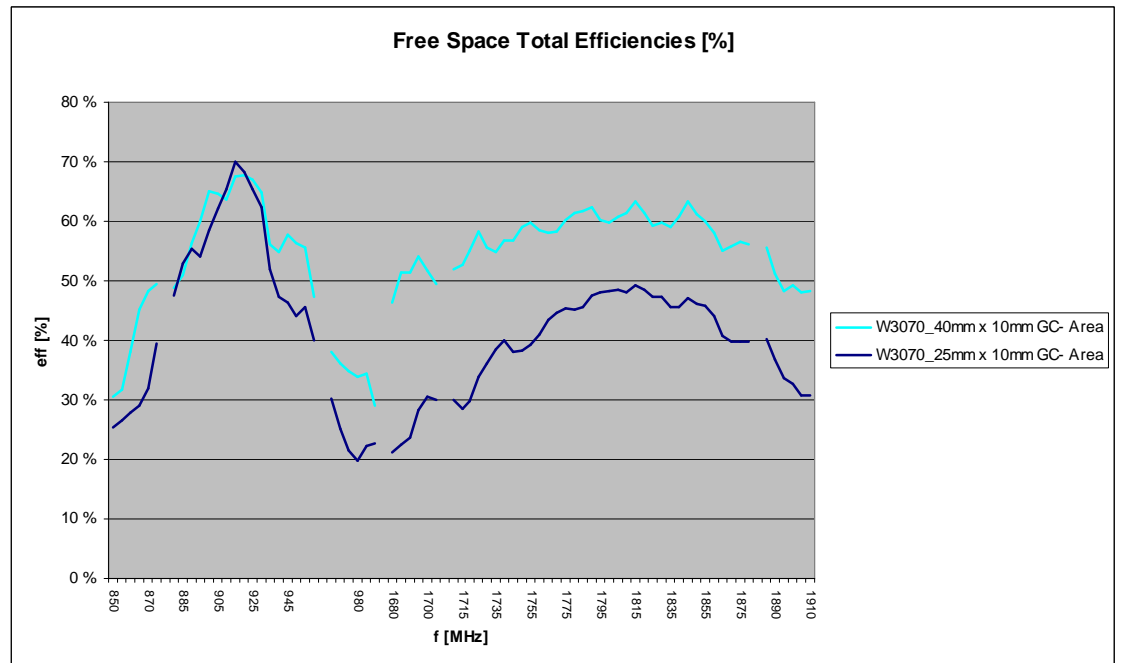
### Typical Return Loss S11

**Typical return loss-values at band edges:**

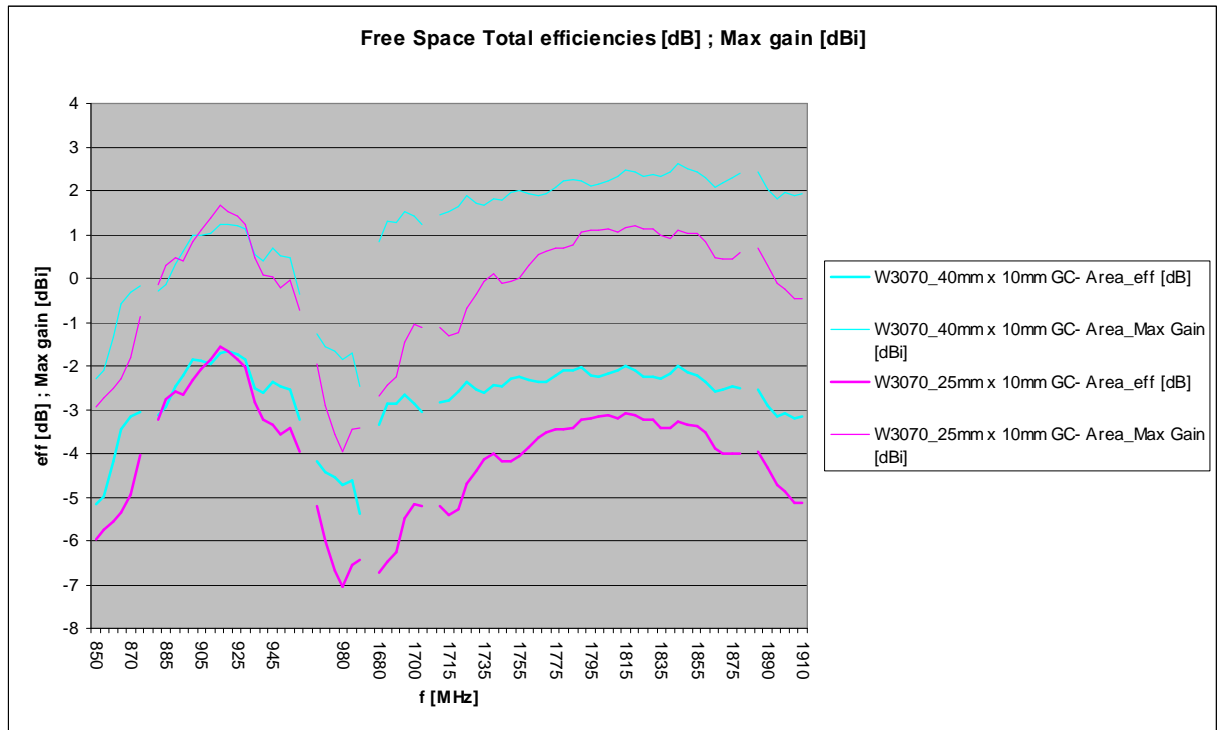
<b>880MHz</b>	<b>960MHz</b>
-5.1dB	-5.3dB
-4.7dB	-3.8dB
<b>1710MHz</b>	<b>1880MHz</b>
-5.8dB	-5.7dB
-4dB	-4.6dB



### Typical free Space Total Efficiencies [%]



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



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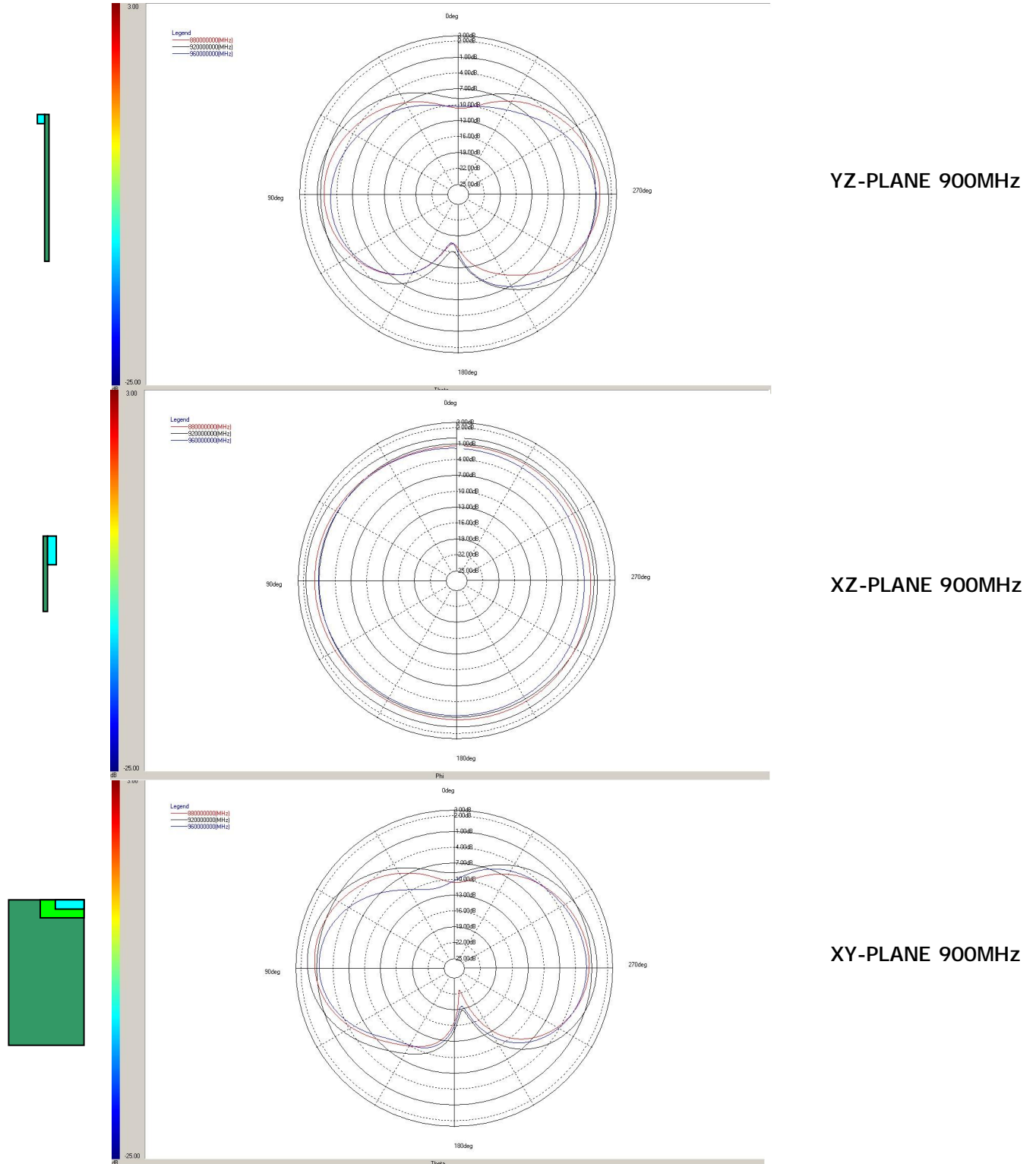




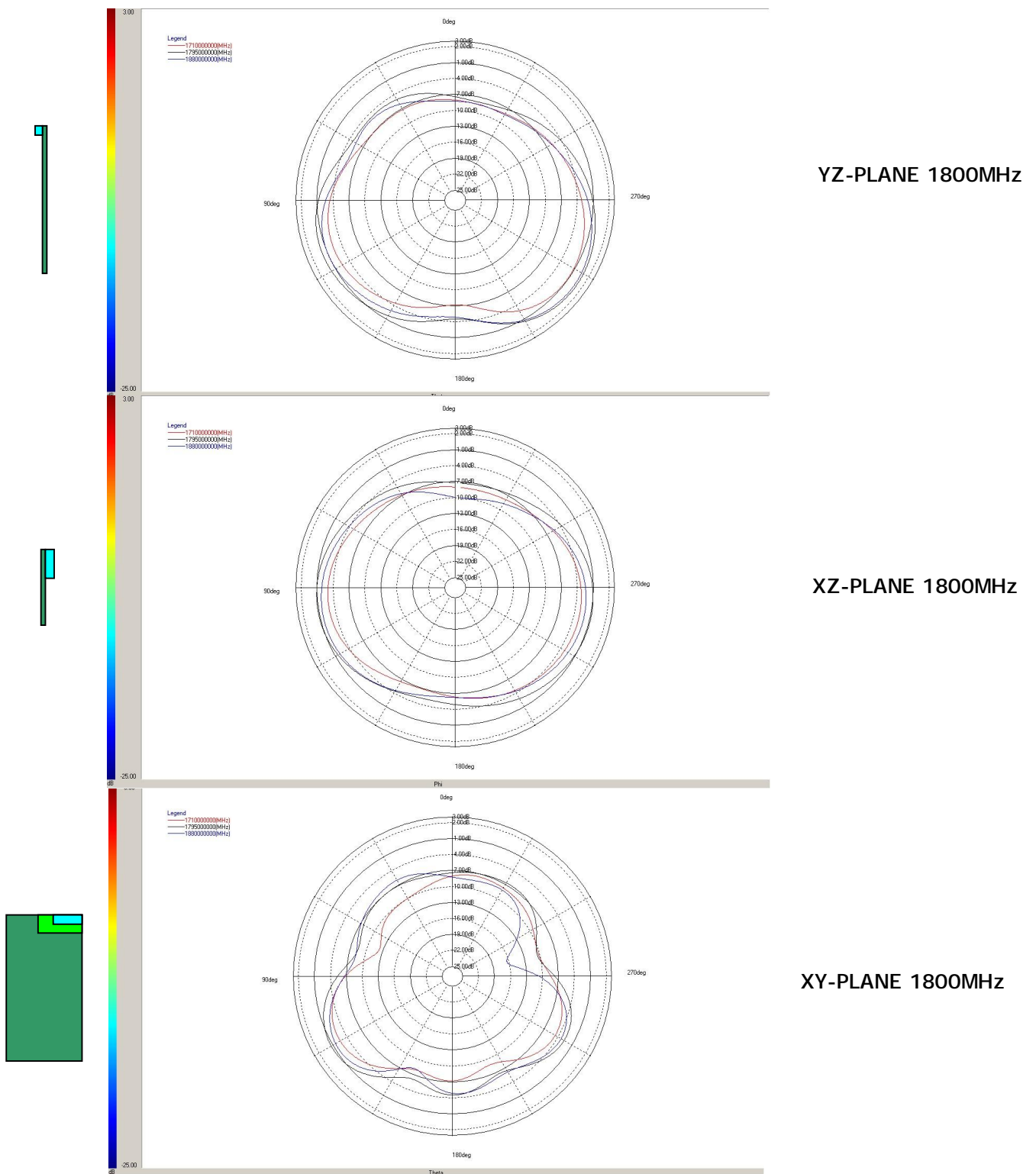
# Ceramic Chip Antenna

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

## Typical Free Space Radiation Patterns for EGSM900 Band



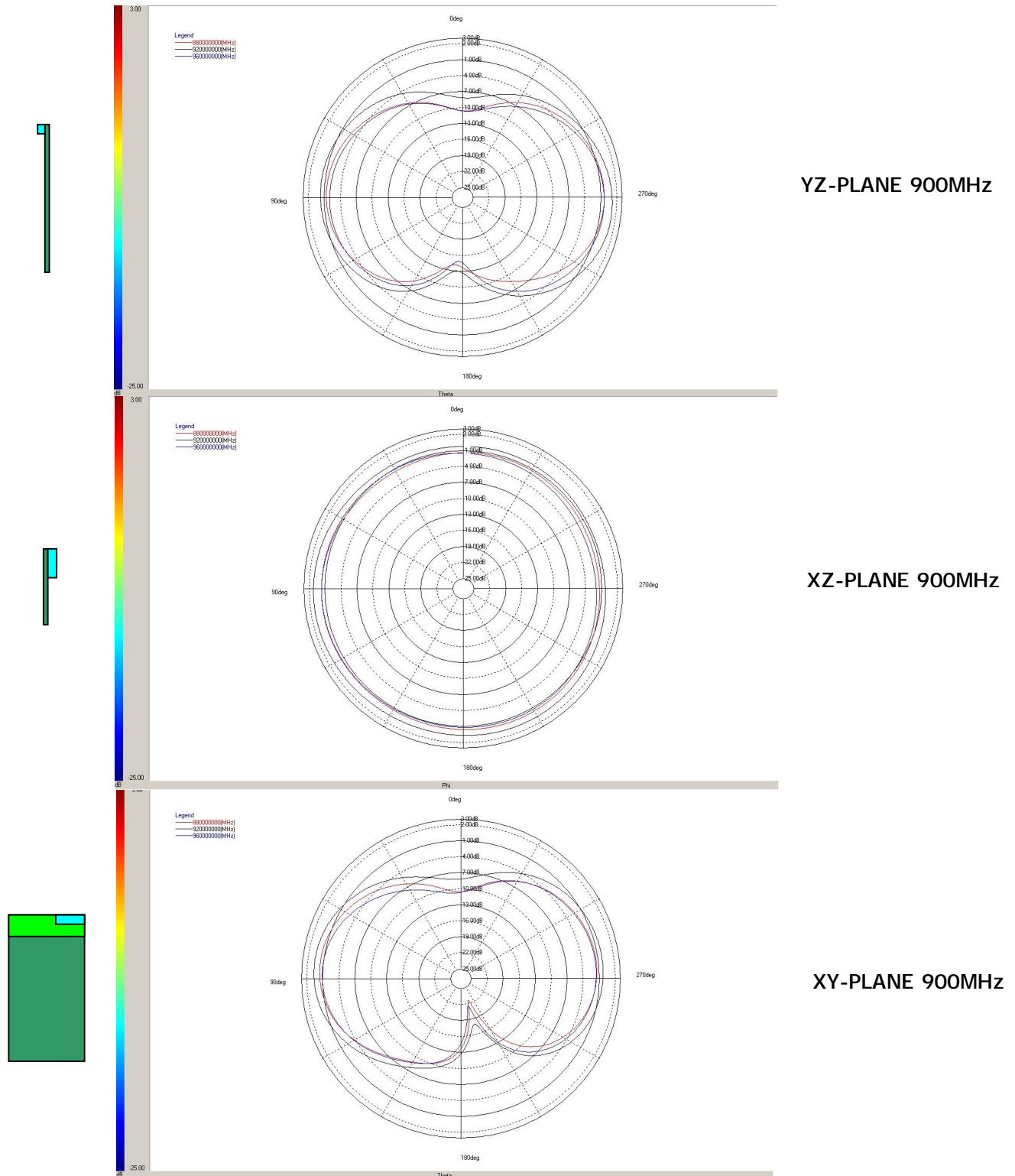
### Typical Free Space Radiation Patterns for PCN1800 Band



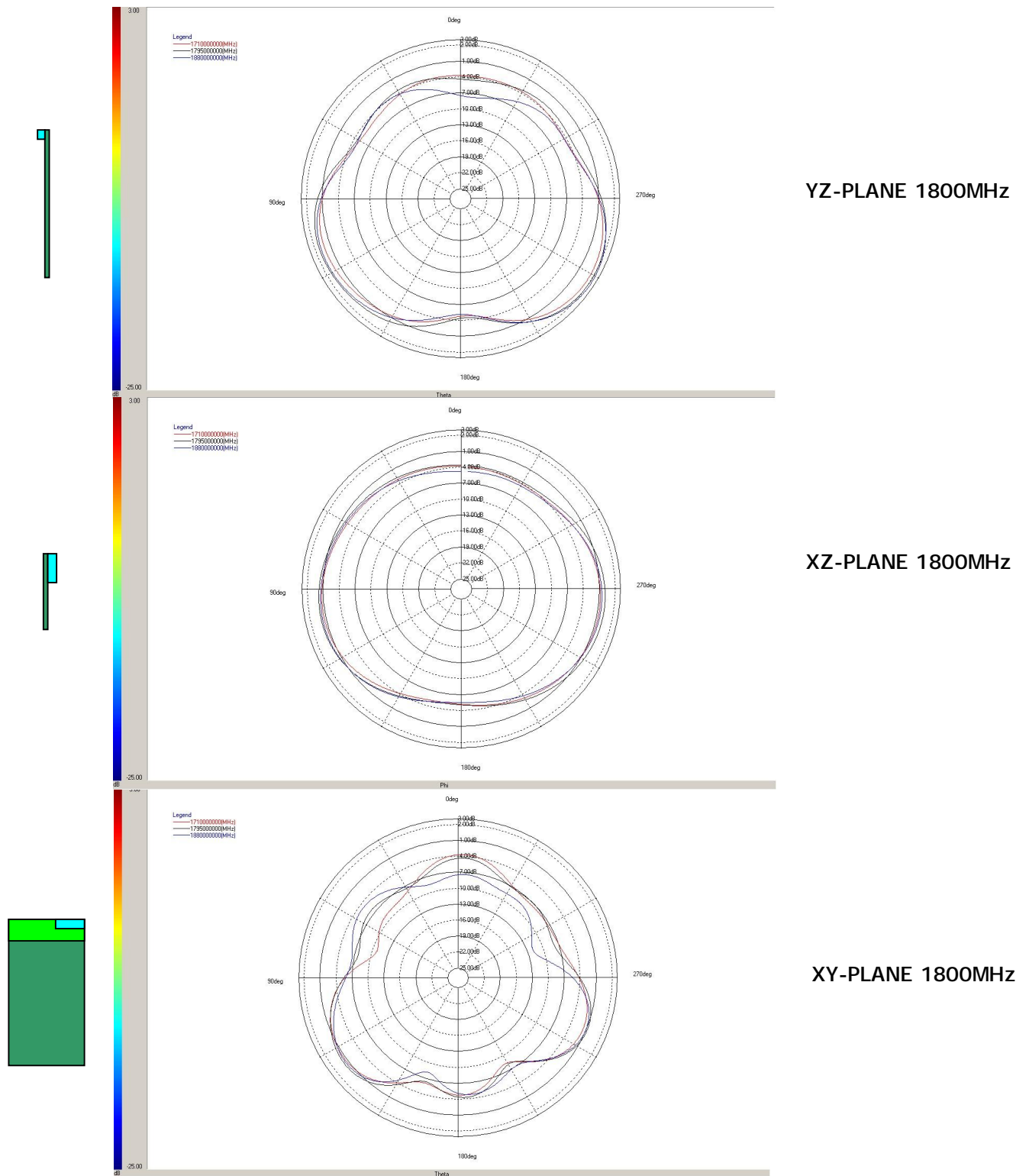
# Ceramic Chip Antenna

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

## Typical Free Space Radiation Patterns for EGSM900 Band



### Typical Free Space Radiation Patterns for PCN1800 Band



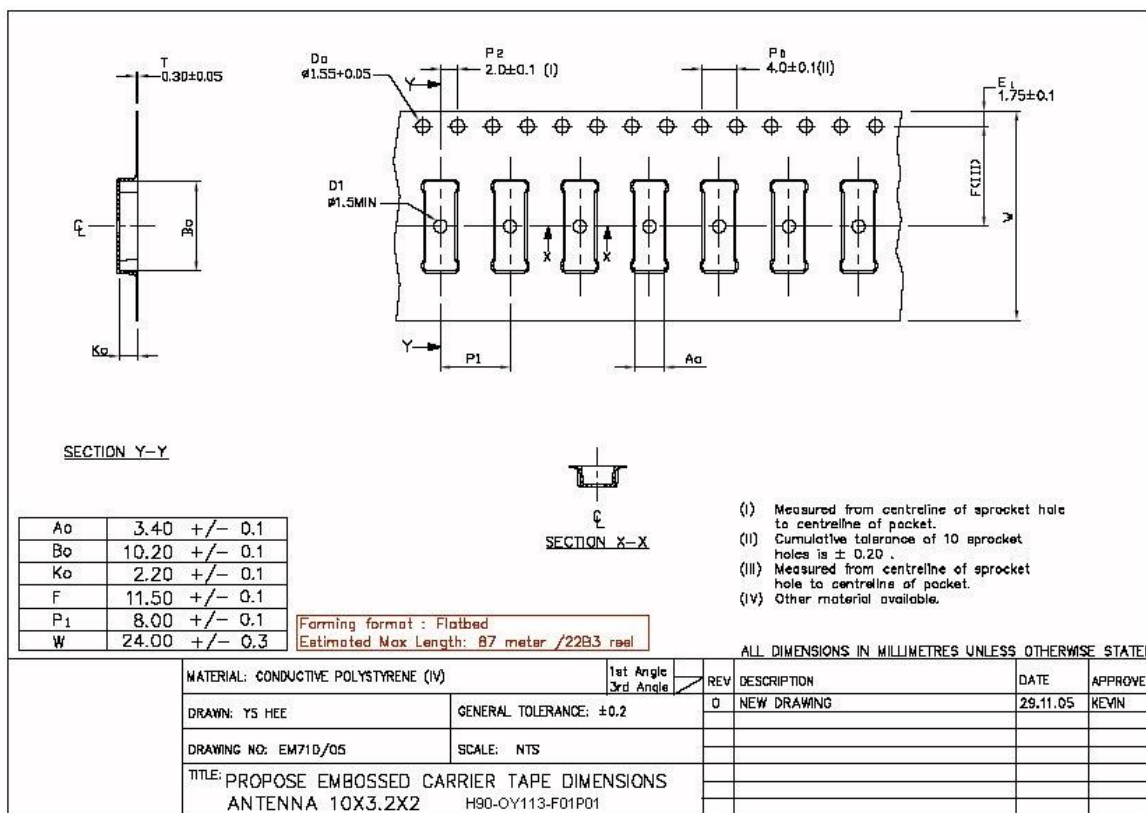
# Ceramic Chip Antenna

## Packing

### General

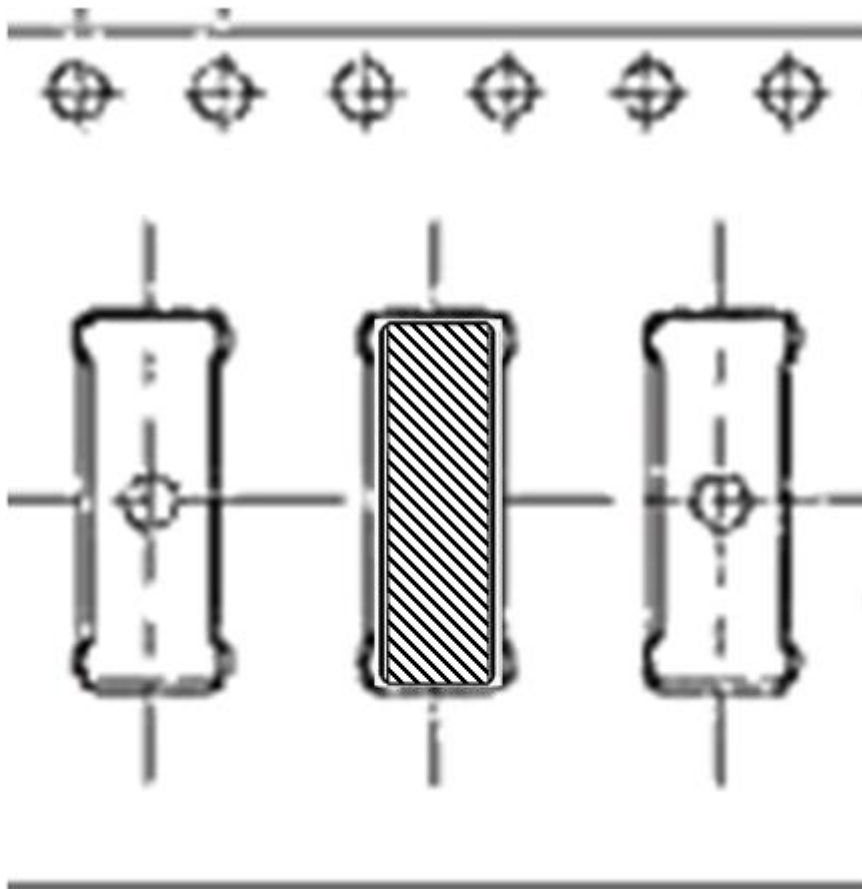
Tape and reel packing is used. Carrier tape, reel and box dimensions are presented in following pictures.

### Carrier tape



### **Block orientation**

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

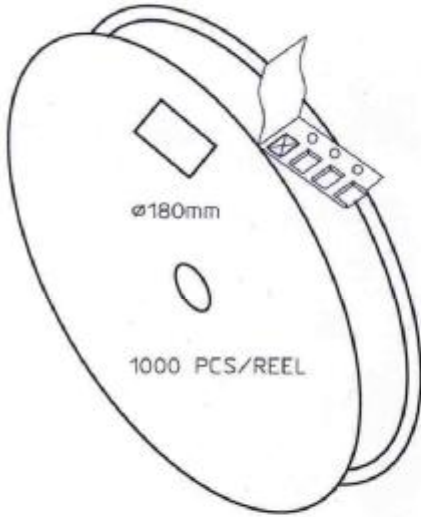
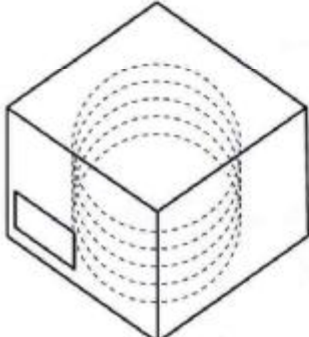


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### Packing form


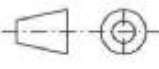
CARRIER TAPE H85-00168  
width=24,00 depth=2.20  
COVER TAPE H85-00159  
width=21.20

LENGTH OF TAPE:

- Leader section: min 350 mm before component section
- Trailer section: min 40 mm after component section.

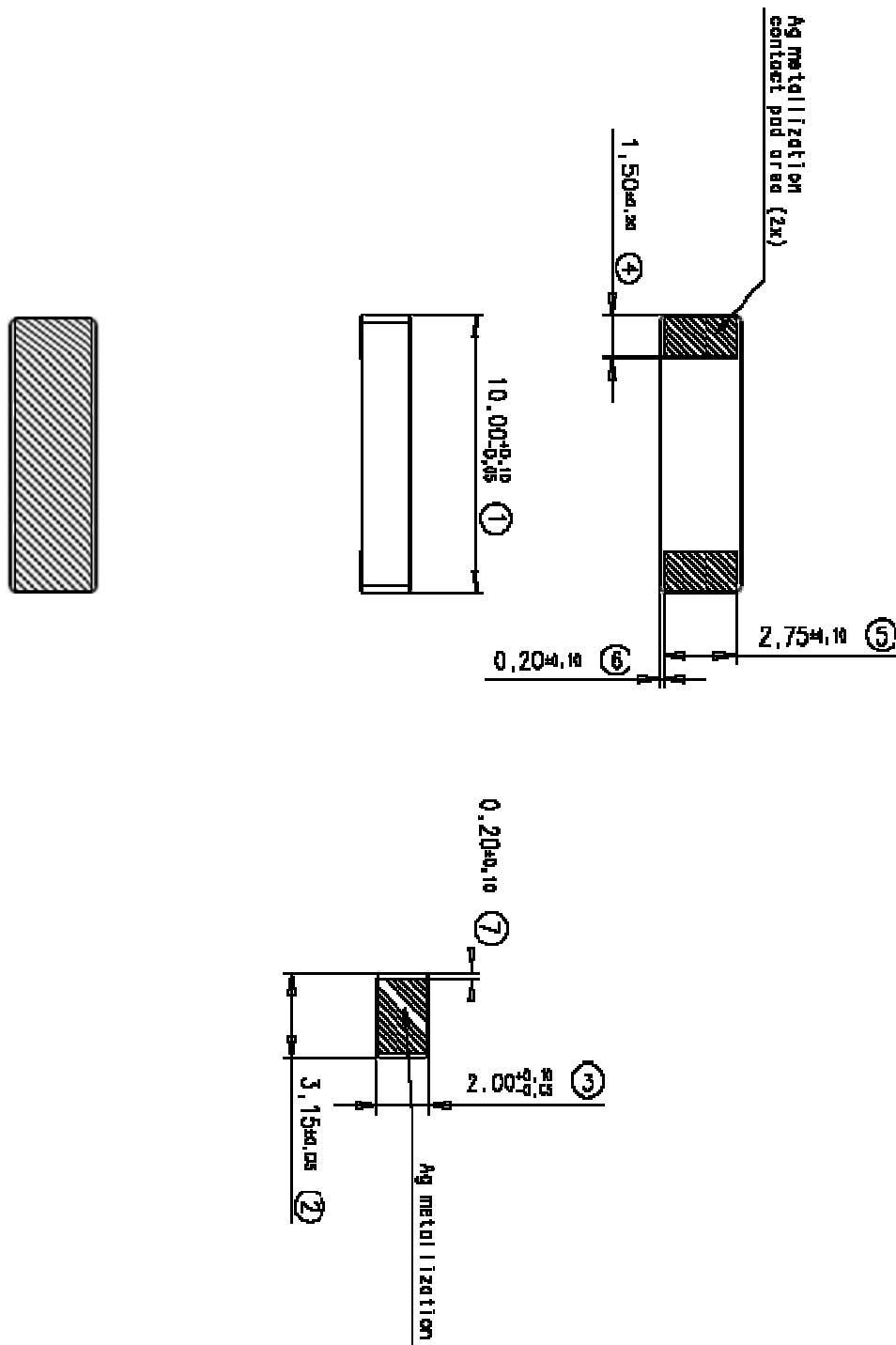
Empty part cavities at leader and trailer section of the tape must be sealed with top cover tape.

BOX H85-00128 (182x182x125)	1 pcs
- LABEL	1 pcs/BOX
REEL H85-00160 (D180, W28)	4 pcs
- REEL LABEL	1 pcs/REEL

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





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