*Application note***900 MHz ANTENNA**

*10 x 3.2 x 4.0 mm Ceramic Chip Antenna  
(Ground Cleared Under Antenna 10.80 x 8.25 mm)*

*Pulse Part Number: W3012*

**Status**

<b>Author</b>	TeJa	<b>Version</b>	1.0.8
<b>Checked by</b>	Kiko	<b>Date</b>	2007.06.13
<b>Approved by</b>	SKy	<b>Date</b>	2007.06.13

# Table of Content

<b>W3012 ANTENNA GENERAL FEATURES AND APPLICATIONS.....</b>	<b>3</b>
FEATURES.....	3
APPLICATIONS.....	3
ELECTRICAL SPECIFICATIONS @ +25 °C .....	3
<b>W3012 ANTENNA TERMINAL CONFIGURATION AND DIMENSIONS.....</b>	<b>4</b>
<b>W3012 ANTENNA PWB LAYOUT SPECIFICATIONS.....</b>	<b>5</b>
PWB LAYOUT FOR W3012 ANTENNA .....	5
GROUND CLEARANCE AREA FOR W3012 ANTENNA .....	5
PWB PAD DIMENSIONS AND ANTENNA POSITION FOR W3012 ANTENNA.....	7
TYPICAL GROUND VIA HOLE PLACEMENT IN PWB LAYOUT FOR W3012 ANTENNA.....	8
SOLDER RESIST OPENING AND PASTE STENCIL RECOMMENDATION FOR W3012 ANTENNA.....	8
RECOMMENDED ANTENNA POSITION ON PWB FOR W3012 ANTENNA.....	9
<b>W3012 ANTENNA TEST SET UP AND MEASUREMENT PERFORMANCE.....</b>	<b>10</b>
TYPICAL ELECTRICAL CHARACTERISTICS (T=25°C) .....	10
TYPICAL FREE SPACE RADIATION PATTERNS .....	11
<b>W3012 ANTENNA PACKING .....</b>	<b>12</b>
GENERAL.....	12
CARRIER TAPE.....	12
BLOCK ORIENTATION .....	13
PACKING FORM .....	14
<b>W3012 ANTENNA MECHANICAL OUTLINE.....</b>	<b>15</b>
<b>CONTACT INFORMATION .....</b>	<b>16</b>

## W3012 Antenna General Features and Applications

Ground cleared under antenna, clearance area **10.80 x 8.25 mm**

### Features

- Omni directional radiation
- Low profile
- Compact size W x L x H (10 x 3.2 x 4 mm)
- Low weight (600 mg)
- Lead free materials
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS compliant product



### Applications

- 900 MHz ISM-Band

### Electrical specifications @ +25 °C

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

#### ISM 900 MHz

Typical performance

(Test board size 100 x 37 mm, PWB ground clearance area **10.80 x 8.25 mm**, position 1 on PWB, see Page 9)

Frequency Range [MHz]	Linear Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [°C]
902 – 928	2 (peak) 0.5 (band edges)	70 / -1,55 (peak) 50 / -3 (band edges)	-6	50	-40 to +85

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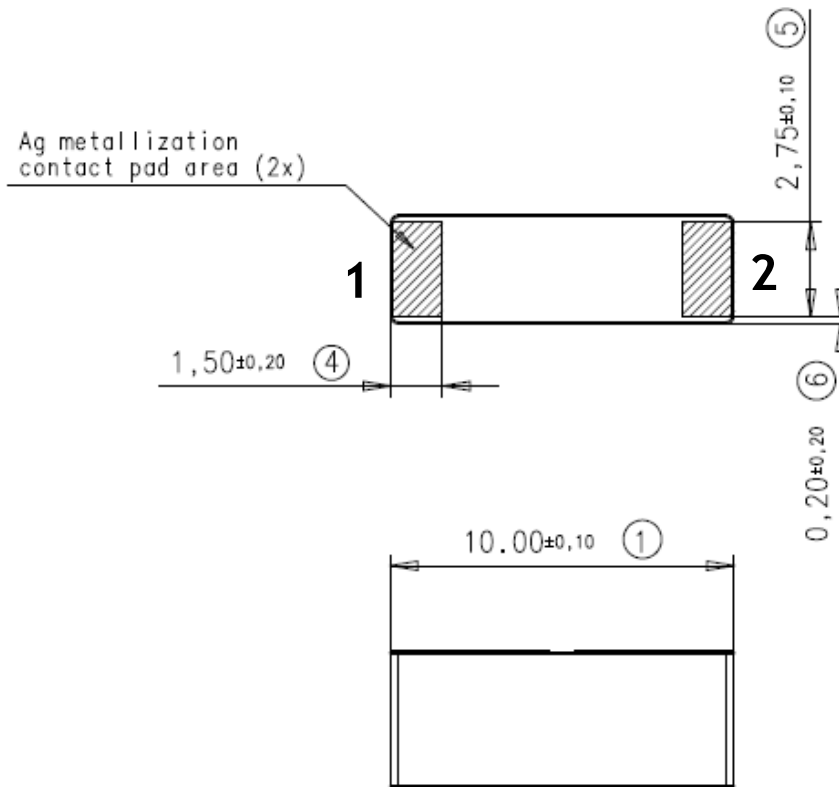
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## W3012 antenna terminal configuration and dimensions

Ground cleared under antenna, clearance area **10.80 x 8.25 mm**



No.	Terminal Name	Terminal Dimensions
1	Feed / GND	1.5 x 2.75 mm
2	Feed / GND	1.5 x 2.75 mm

Antenna is symmetrical. Either of terminals 1 or 2 can be Feed / GND

## W3012 Antenna PWB Layout Specifications

Ground cleared under antenna, clearance area **10.80 x 8.25 mm**

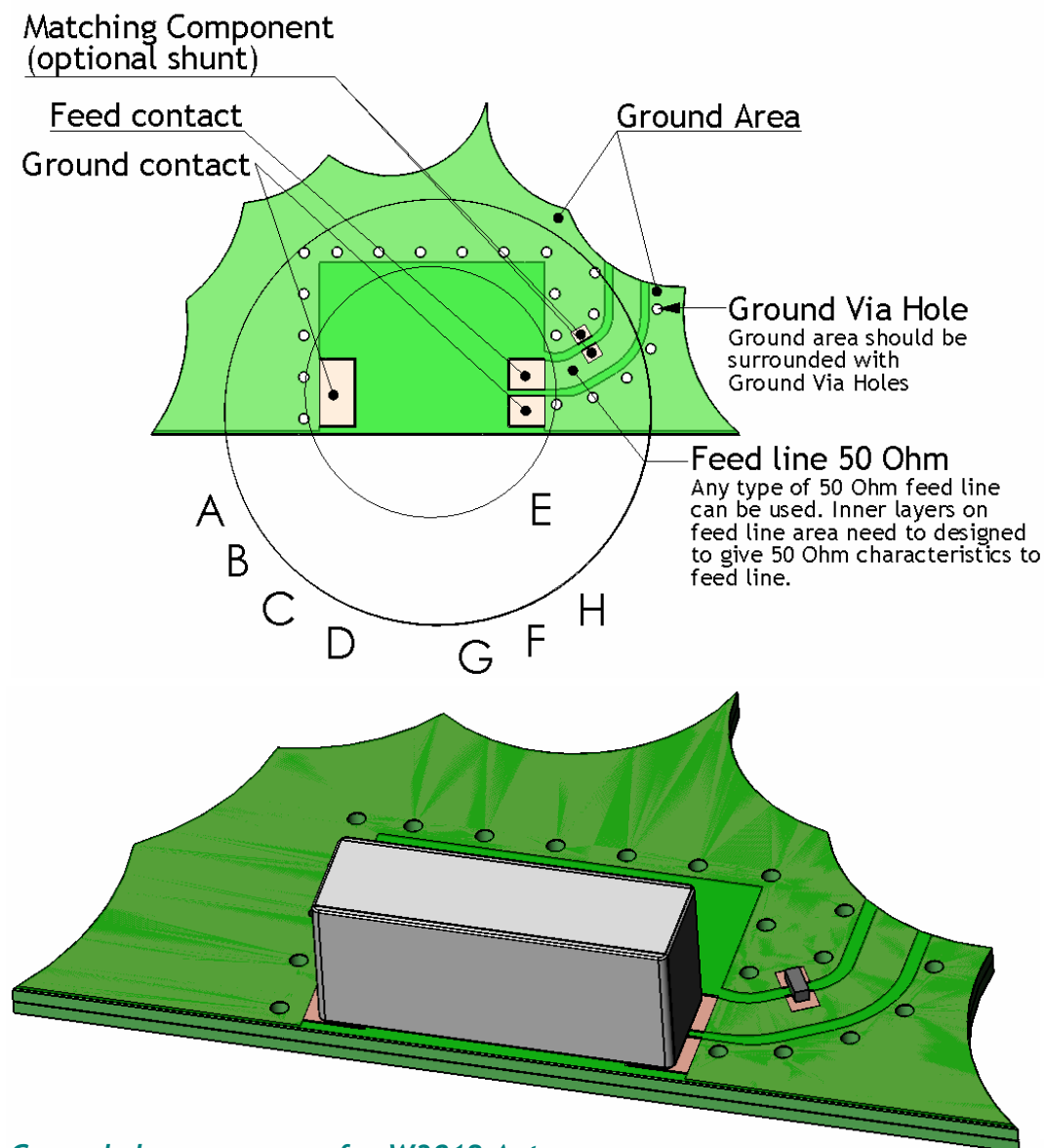
Matching and tuning component values depend on application and surrounding mechanics / materials.

Feed line should be designed to match 50  $\Omega$  characteristic impedance, depending on PWB material and thickness.

Recommended test board layout for electrical characteristic measurement, test board outline size 100 x 37 mm.

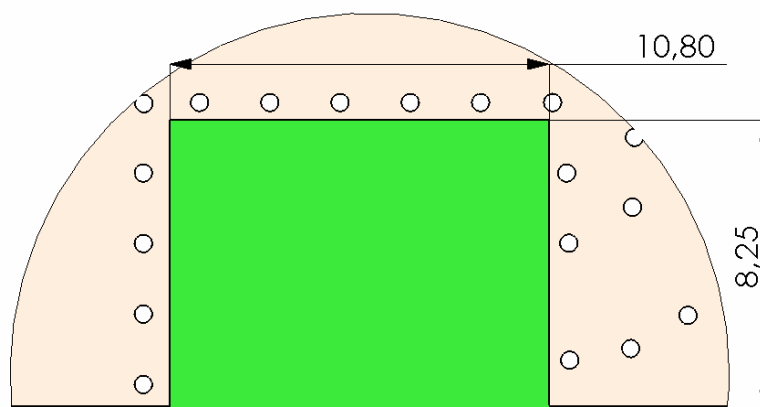
### PWB layout for W3012 Antenna

Note: All dimensions are in metric system.



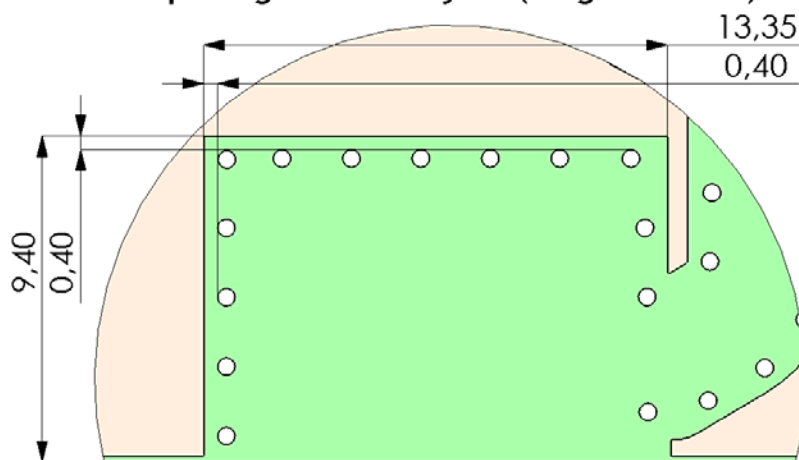


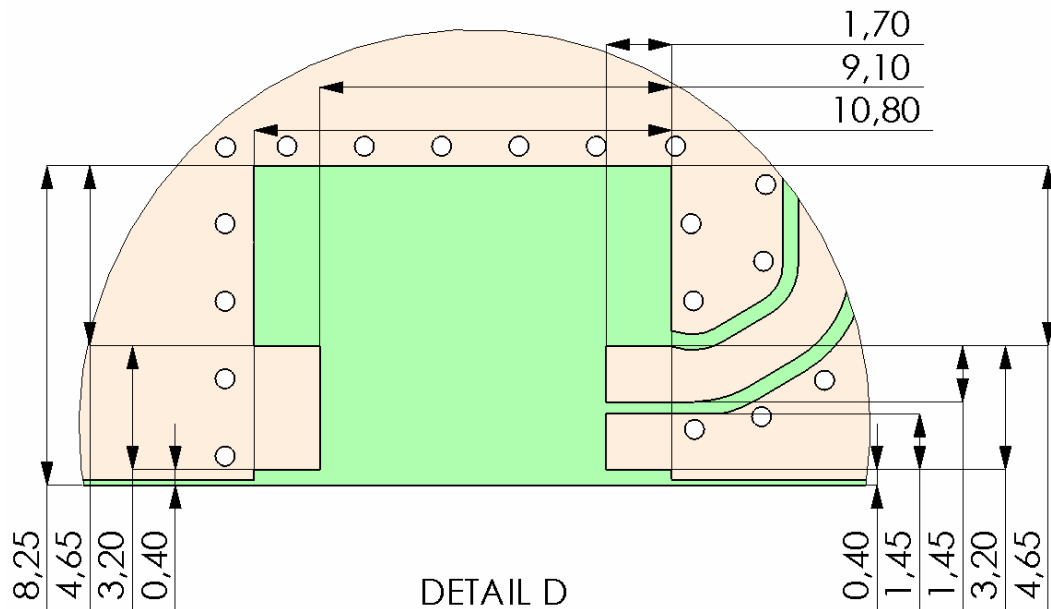
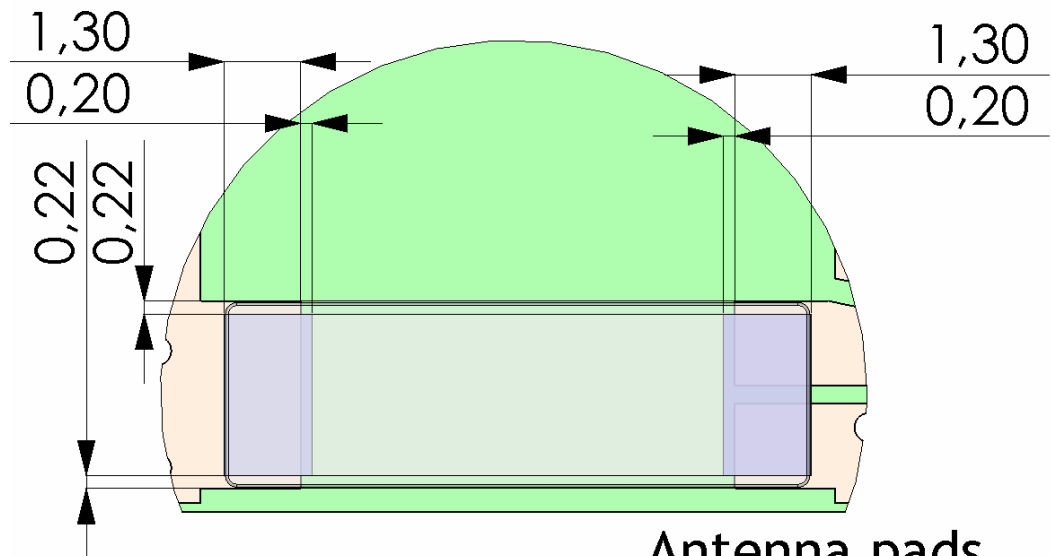
### Opening in bottom/inner ground layers



DETAIL B

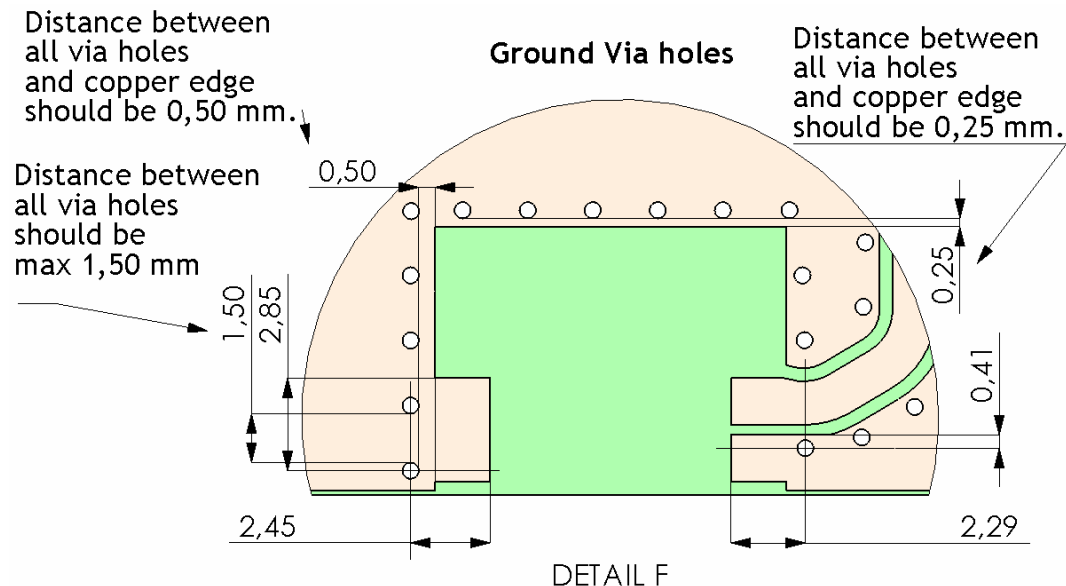
### Opening in other layers (no ground/ RF)



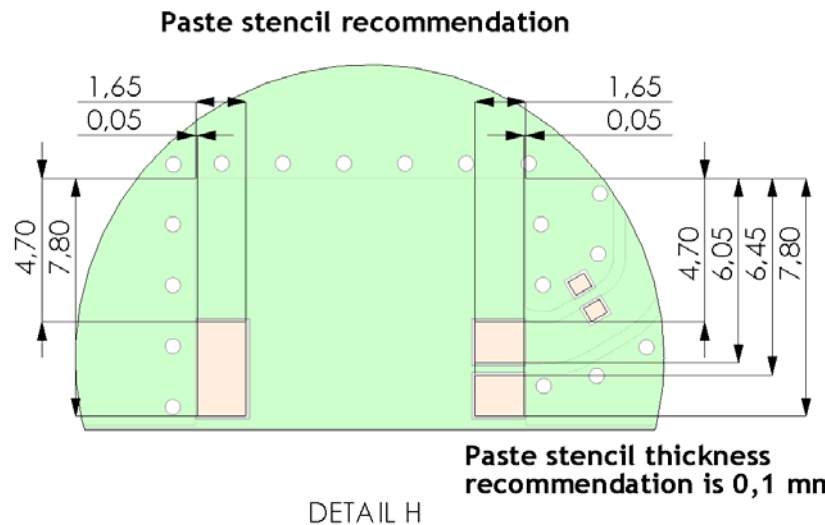
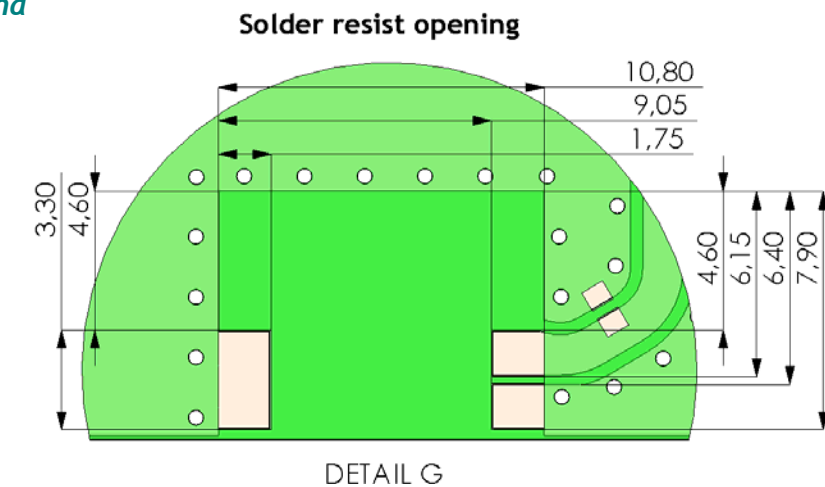
**PWB pad dimensions and antenna position for W3012 Antenna****Pad dimensions in top copper****Antenna position on PWB layout**

Antenna pads  
DETAIL E are marked blue

### Typical ground via hole placement in PWB layout for W3012 Antenna



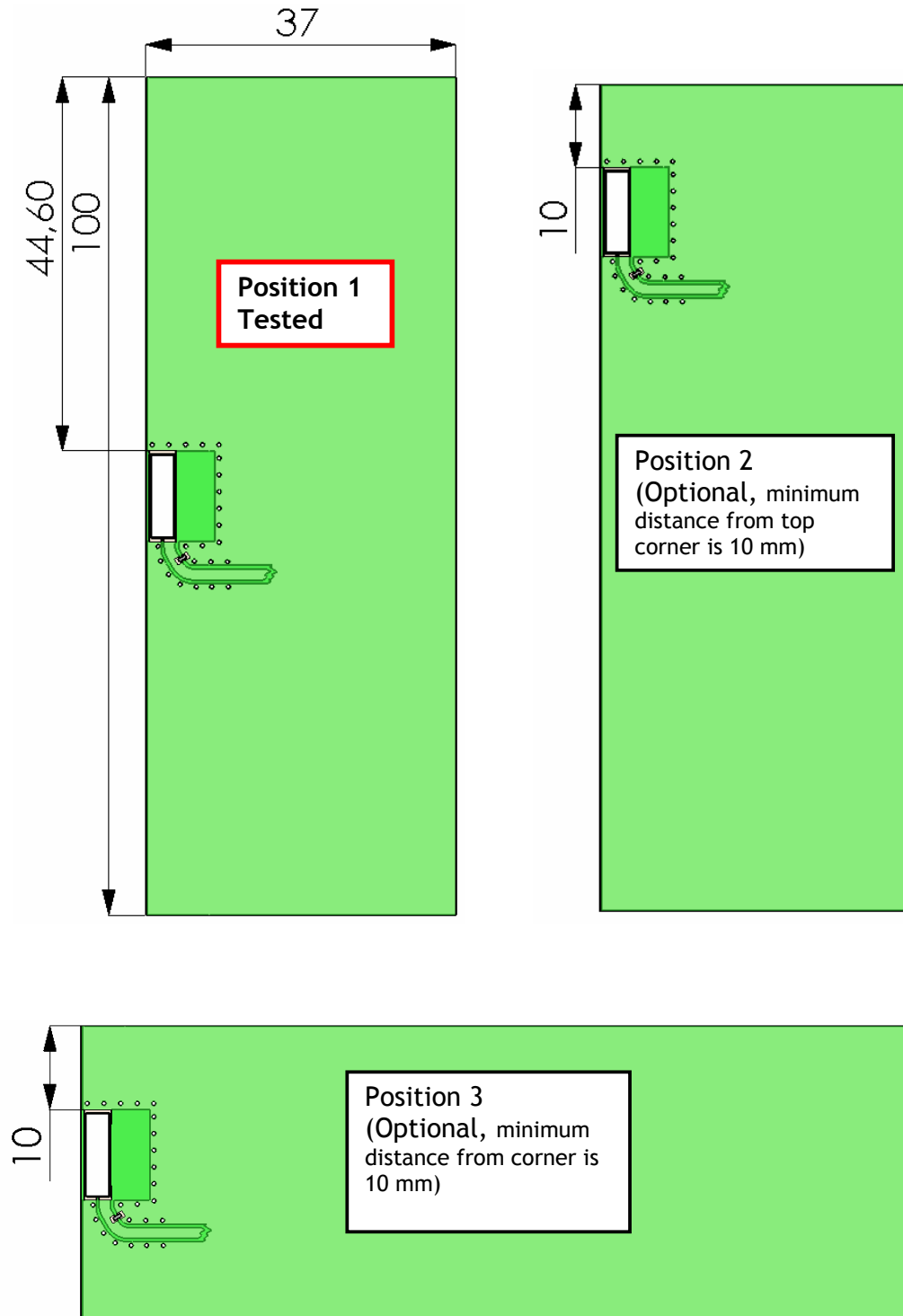
### Solder resist opening and Paste stencil recommendation for W3012 Antenna





### Recommended antenna position on PWB for W3012 Antenna

Our test PWB size is 37 x 100 mm, other sized boards can be used depending on customer device size (minimum 35 x 35 mm)



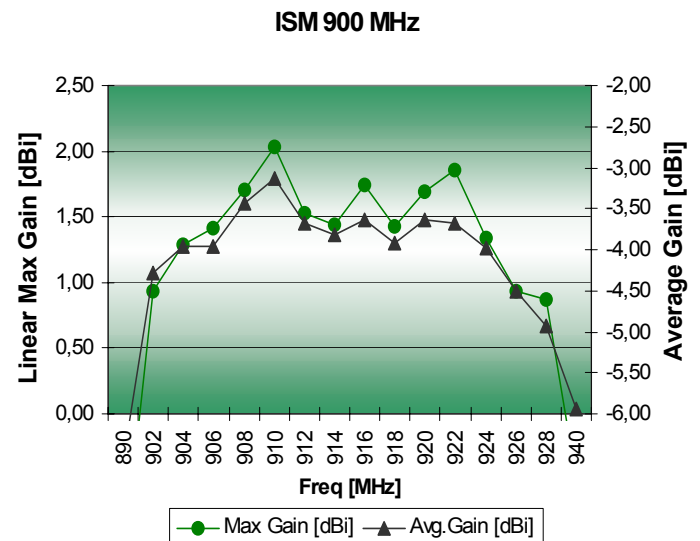
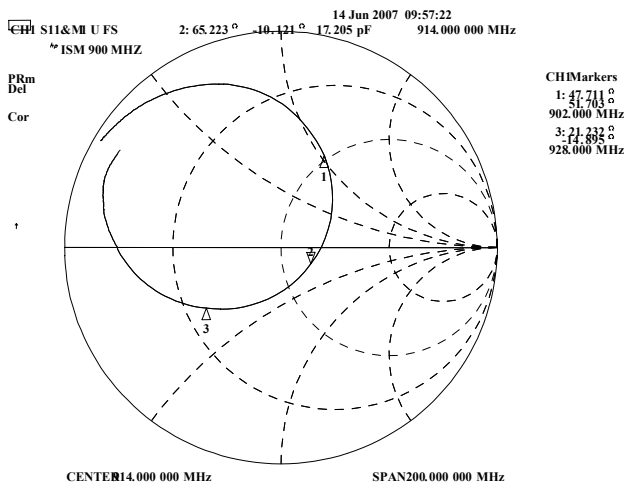
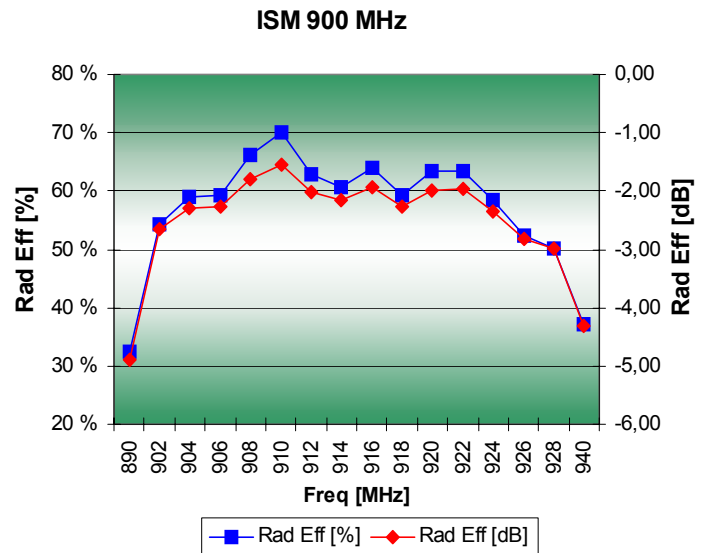
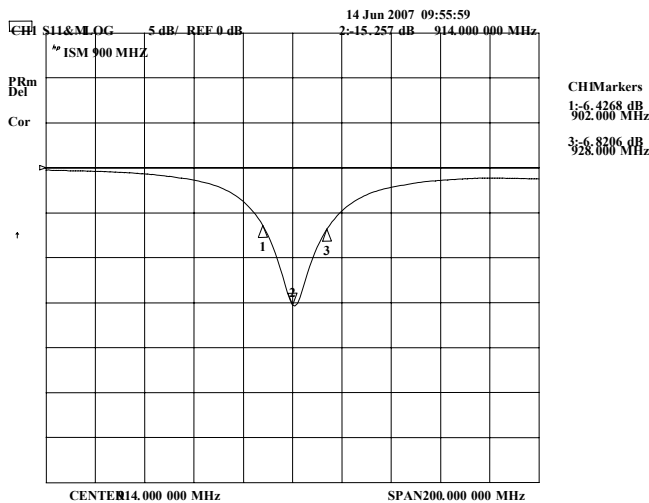
## W3012 Antenna Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area **10.80 x 8.25 mm**

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

Measured on the 100 x 37 mm test board with matching circuit (6,8 pF shunt matching capacitor on feed). Measured in antenna position 1 on PWB layout, see page 9.

Typical Return Loss S11/ impedance, free space efficiency and gain



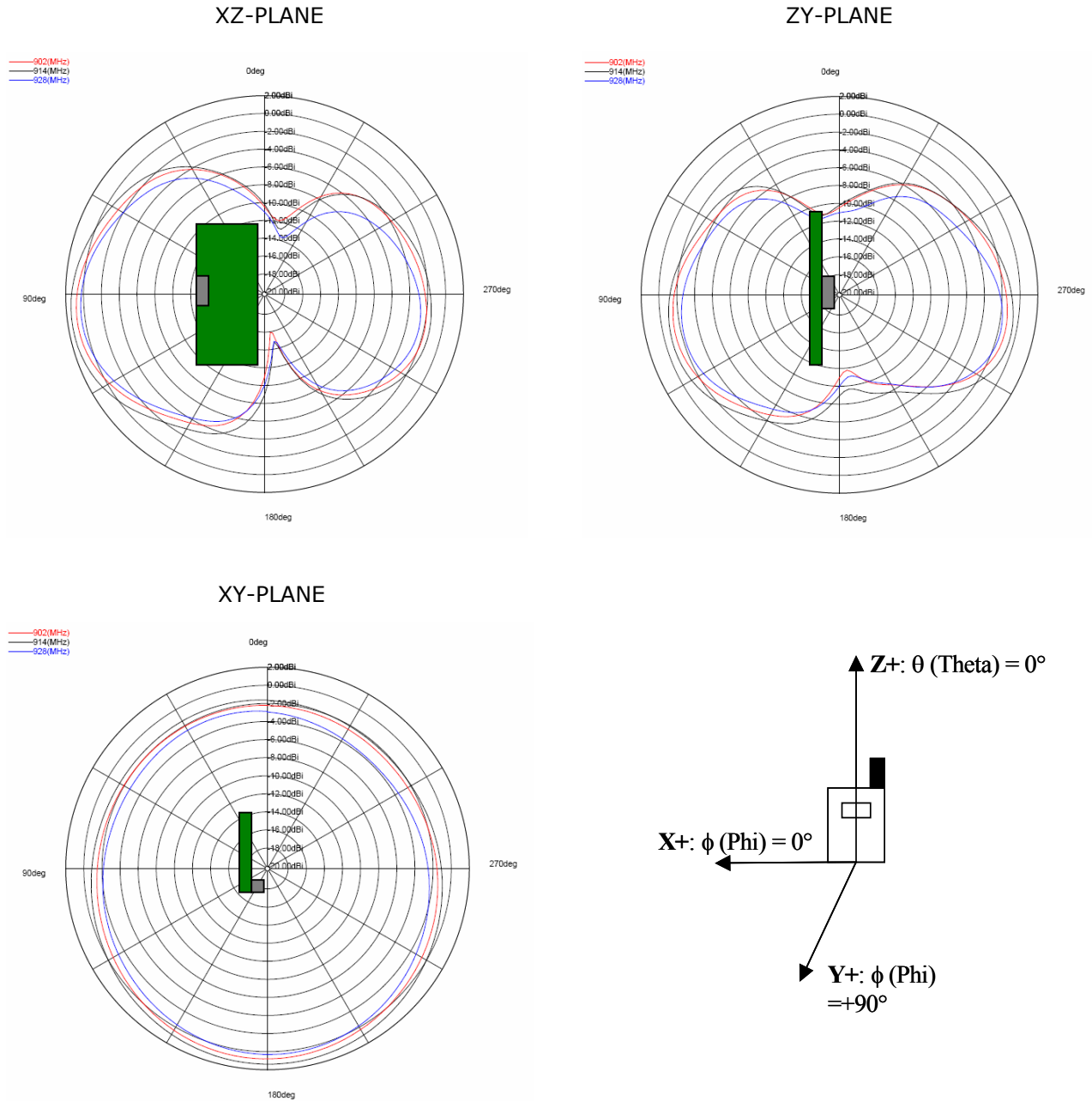
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## Typical Free Space Radiation Patterns

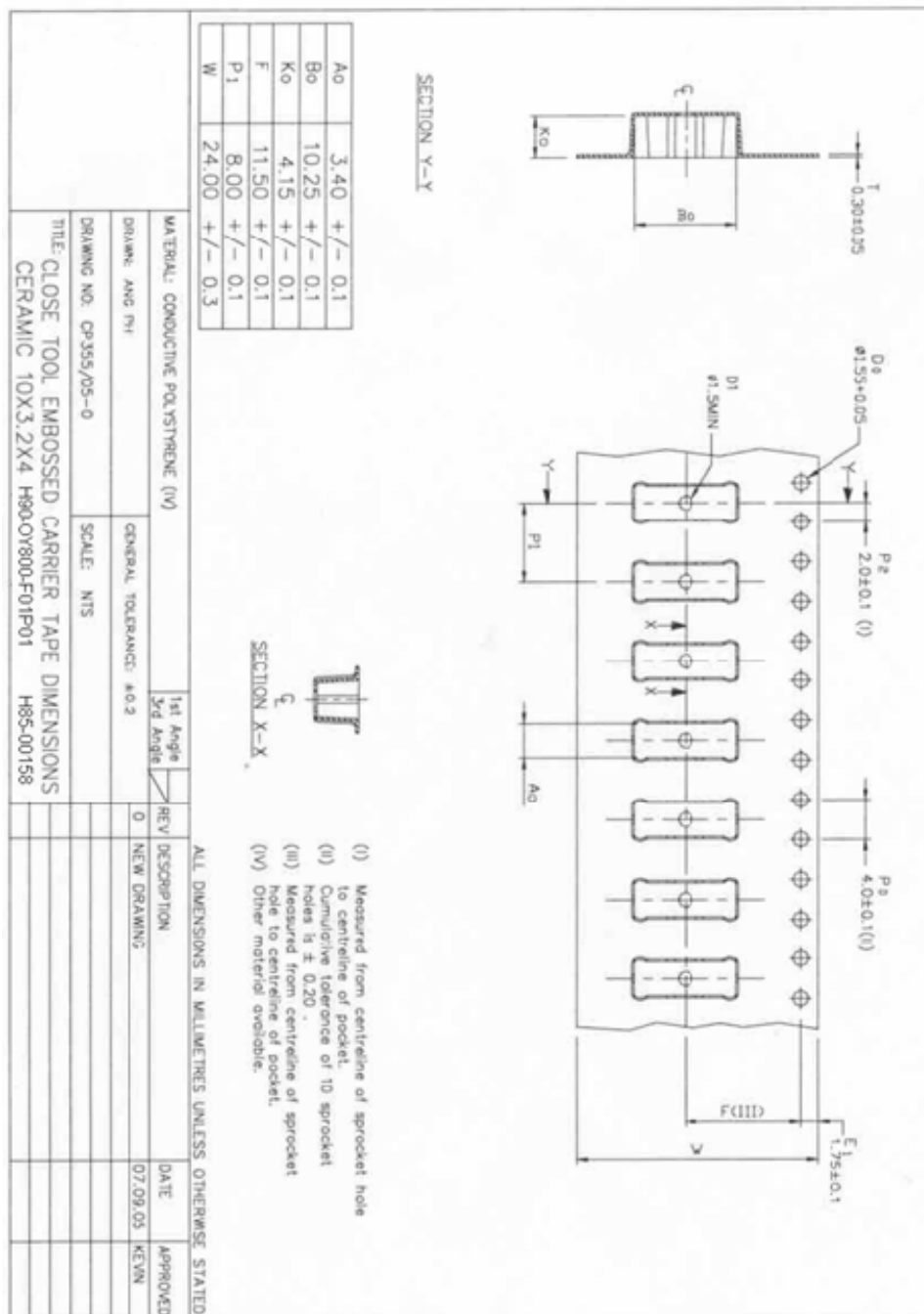


## W3012 Antenna Packing

### General

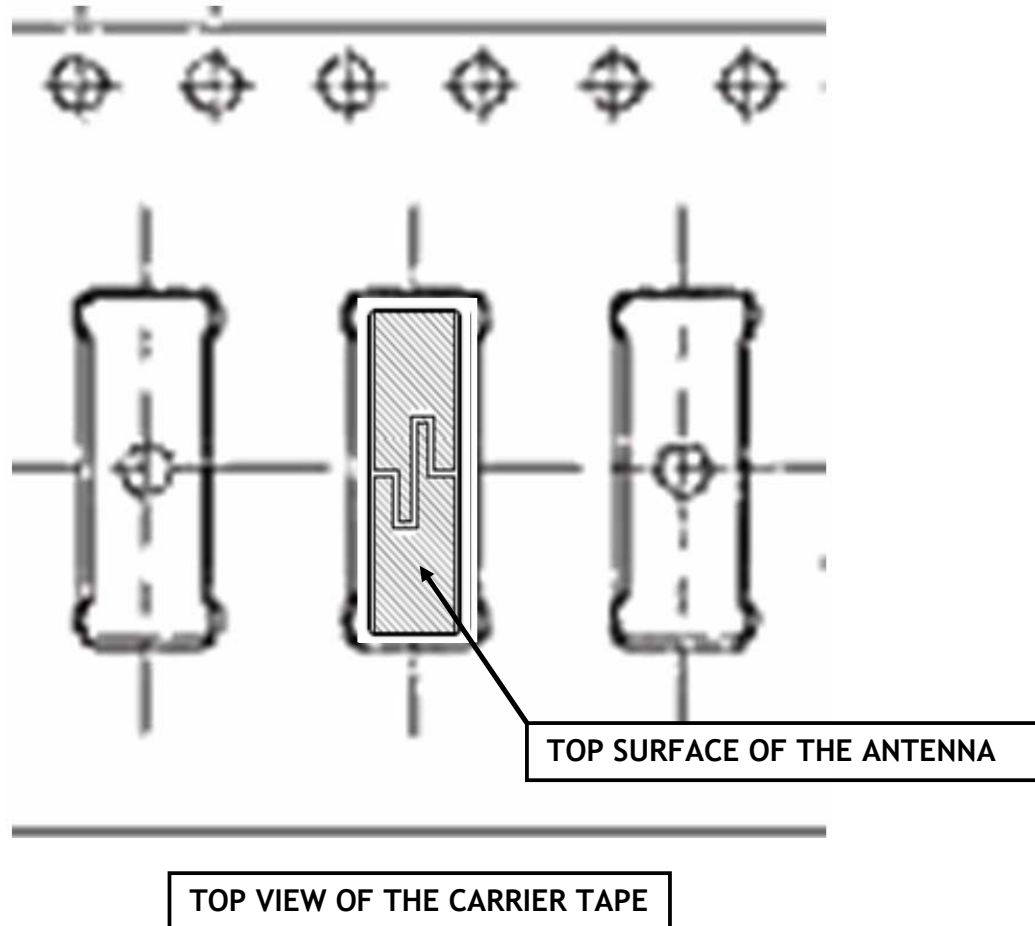
Tape and reel packing is used. Carrier tape, reel and box dimensions are presented in following pictures.

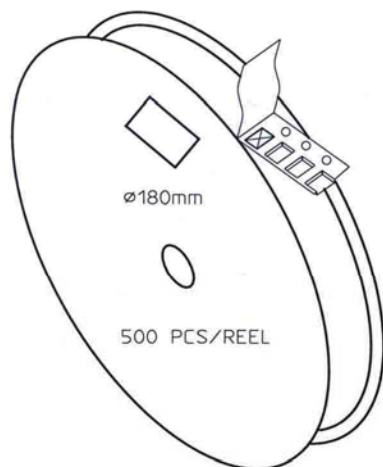
### Carrier tape



### Block orientation

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



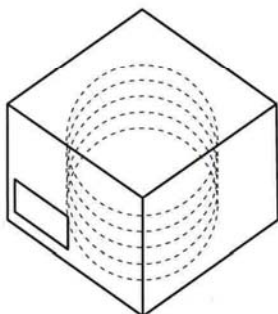
**Packing form**

CARRIER TAPE H85-00158  
width=24,00 depth=4.15  
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.


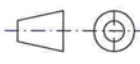
Empty part cavities at leader and trailer section of the tape must be sealed with top cover tape.



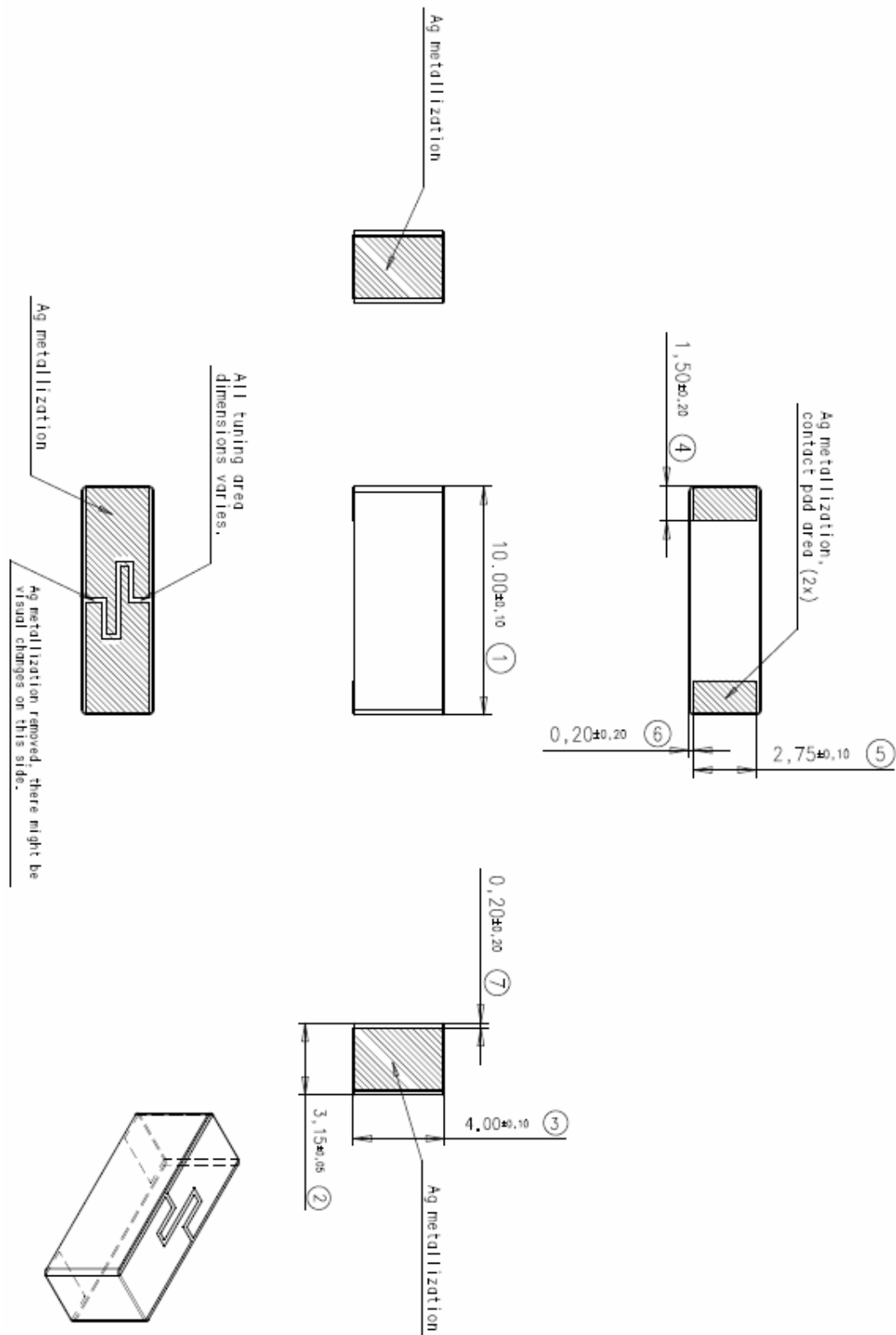
BOX H85-00128 1 pcs  
(182x182x125)  
- LABEL 1 pcs/BOX  
REEL H85-00160 4 pcs  
(D180, W28)  
- REEL LABEL 1 pcs/REEL

## MATERIAL

## HANDLINGS

		RATIO	DRWN	160107 PeHa	H	
			DGNER		G	
			CHKD		F	
			APPRD		E	
			APPRD BY		D	
PRODUCT		H90-OY800-F01P01			C	
DENOMINATION		PACKING FORM			B	
					A	
		VERSION		MOD/DATE/NAME		

## W3012 Antenna Mechanical Outline



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