



Application note

1.9 GHz Diversity RX ANTENNA

3.2 x 1.6 x 1.1 mm Ceramic Chip Antenna

(Ground Cleared Under Antenna 4.00 x 4.25 mm / 6.25 mm)

Pulse Part Number: W3038, W3038A

Status

Author	JaP	Version	1.0.0
Checked by	SKy	Date	2007.08.23
Approved by	KiKo	Date	2007.08.23

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1.9 GHz Diversity Rx Antennas General Features and Applications (W3038 / W3038A)

Ground cleared under antenna, clearance area **4.00 x 4.25 mm / 6.25 mm**

Features

- Omni directional radiation
- Low profile
- Compact size W x L x H (3.2 x 1.6 x 1.1 mm)
- Low weight (33 mg)
- Lead free materials
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS Compliant Product

Applications

- PCS Rx
- 1.9 GHz Diversity RX



Electrical specifications @ +25 °C

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

1.9 GHz Diversity Rx W3038

Typical performance (Test board size 80 x 37 mm, PWB ground clearance area **4.00 x 4.25 mm**, Position 1 on PWB , see page 10)

Frequency Range [MHz]	Linear Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [°C]
1881- 1930	1 (peak) 0.5 (band edges)	70 / -1.55 (peak) 50 / -3 (band edges)	-6	50	-40 to +85

1.9 GHz Diversity Rx W3038A

Typical performance (Test board size 80 x 37 mm, PWB ground clearance area **4.00 x 6.25 mm**, Position 1 on PWB, see page 19)

Frequency Range [MHz]	Linear Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [°C]
1881- 1930	2 (peak) 1.5 (band edges)	80 / -1 (peak) 70 / -1.55 (band edges)	-9	50	-40 to +85

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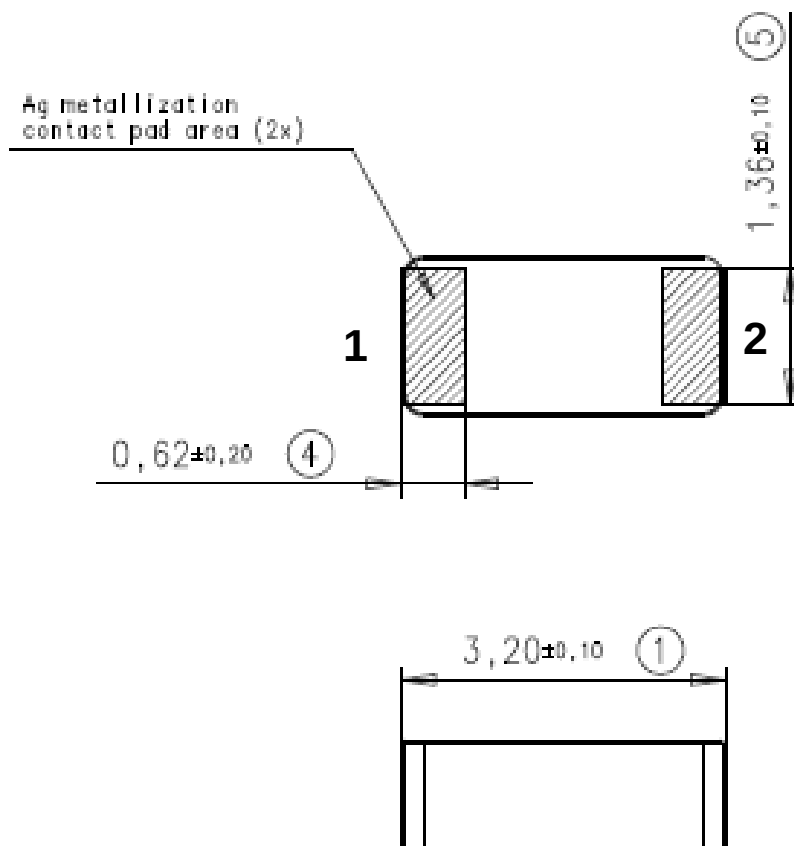
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1.9 GHz Diversity Rx Antennas Terminal Configuration and Dimensions (W3038 / W3038A)

Ground cleared under antenna, clearance area 4.00 x 4.25 mm / 6.25 mm.



No.	Terminal Name	Terminal Dimensions
1	Feed / GND	0.62 x 1.36 mm
2	Feed / GND	0.62 x 1.36 mm
Antenna is symmetrical. Either of terminals 1 or 2 can be Feed / GND		

W3038 1.9 GHz Diversity Rx Antenna

Test board and typical performance data

PWB ground clearance area 4.00 x 4.25 mm



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W3038 1.9 GHz Diversity Rx Antenna PWB Layout Specifications

Ground cleared under antenna, clearance area **4.00 x 4.25 mm**

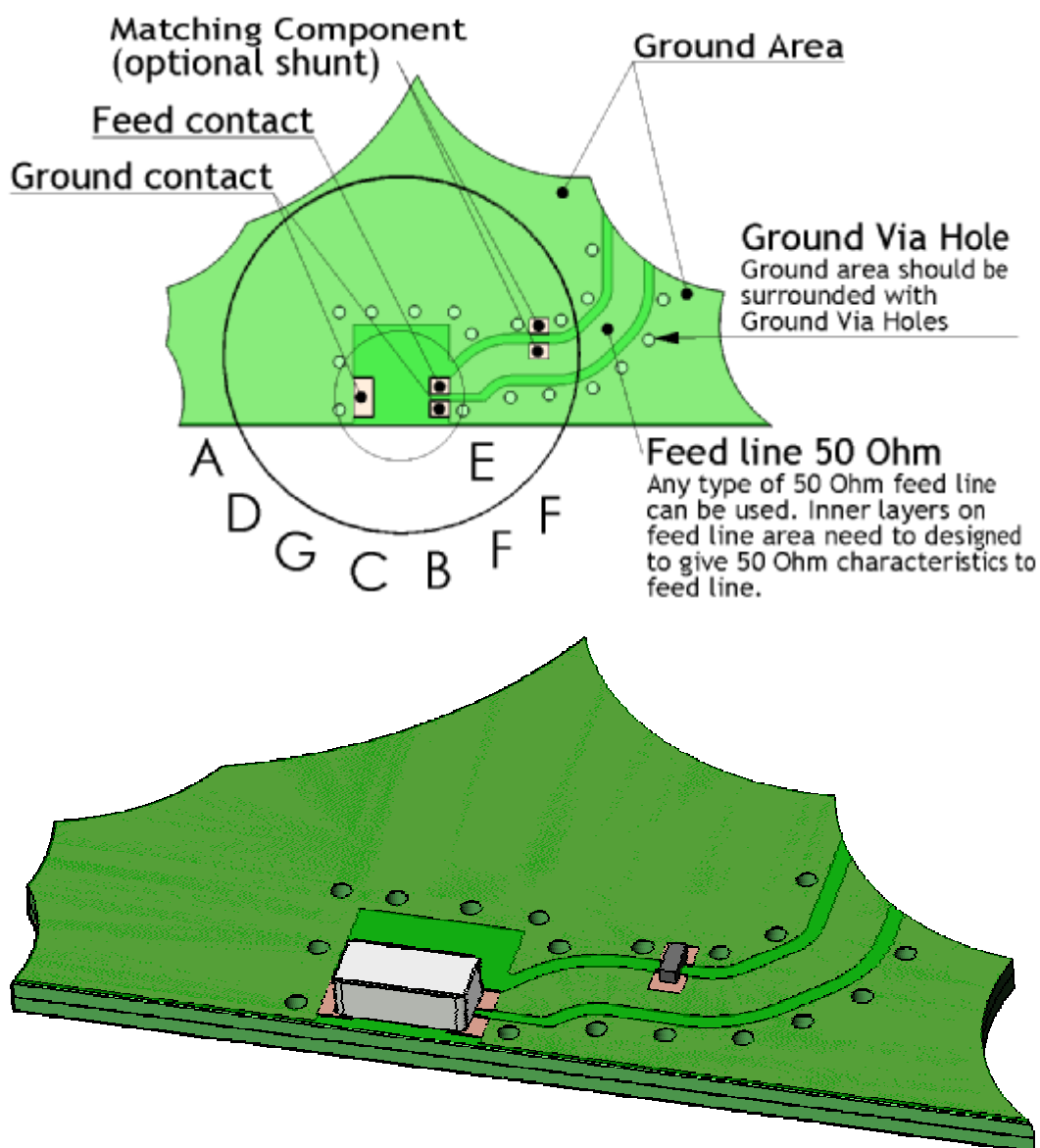
Matching and tuning component values depend on application and surrounding mechanics / materials.

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

Recommended test board layout for electrical characteristic measurement, test board outline size 80 x 37 mm.

PWB layout for W3038 1.9 GHz Diversity Rx Antenna

Note: All dimensions are in metric system.



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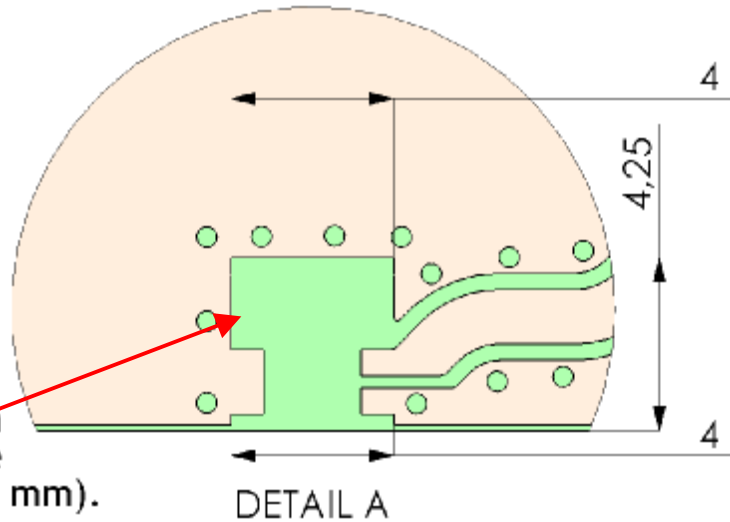
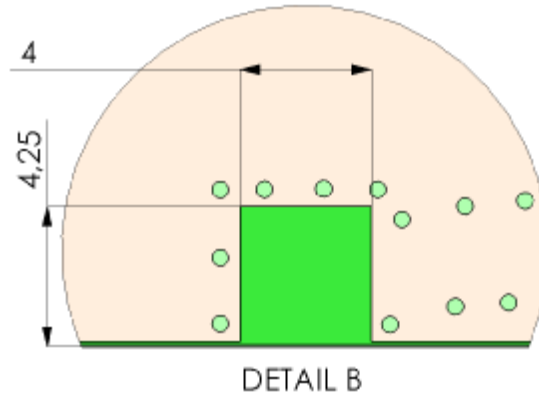
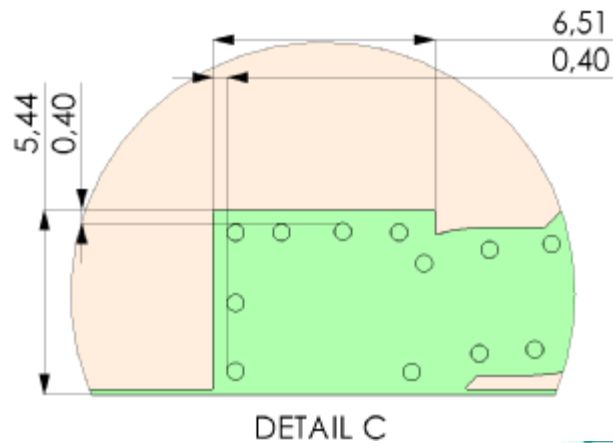
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Ground clearance area for W3038 1.9 GHz Diversity Rx Antenna**Ground clearance area (4,00 x 4,25 mm)**

All metallization should be removed from all PWB layers on ground clearance area (4,00 x 4,25 mm).

**Opening in bottom/inner ground layers****Opening in other layers (no ground/ RF)****Pulse Finland Oy**

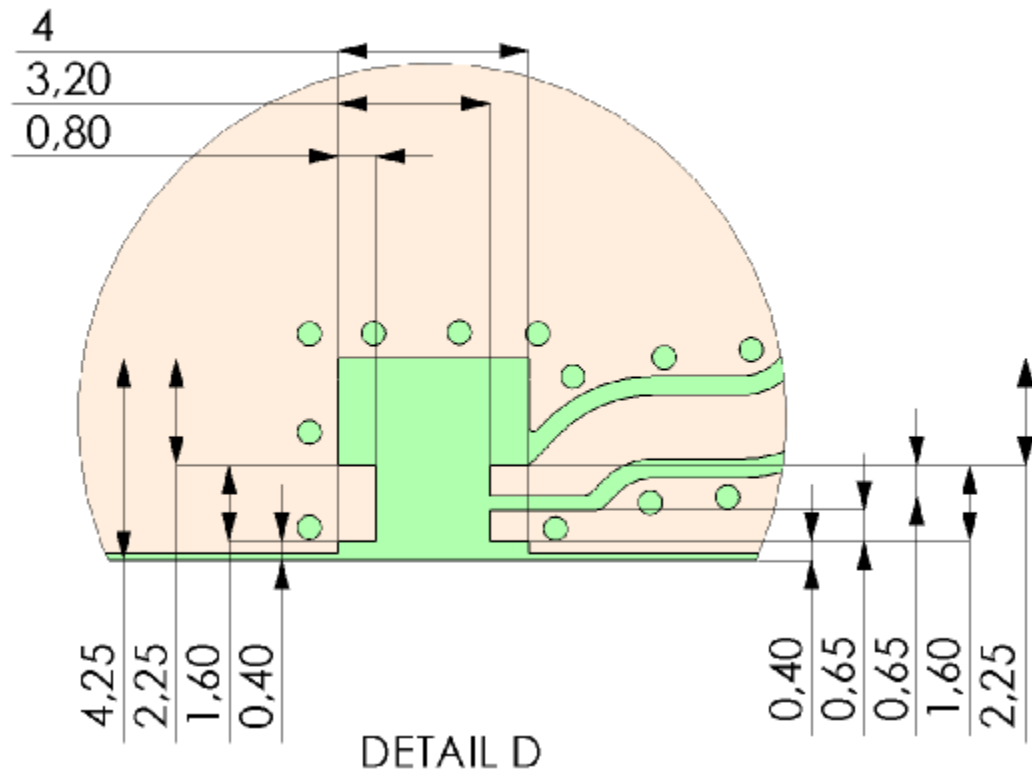
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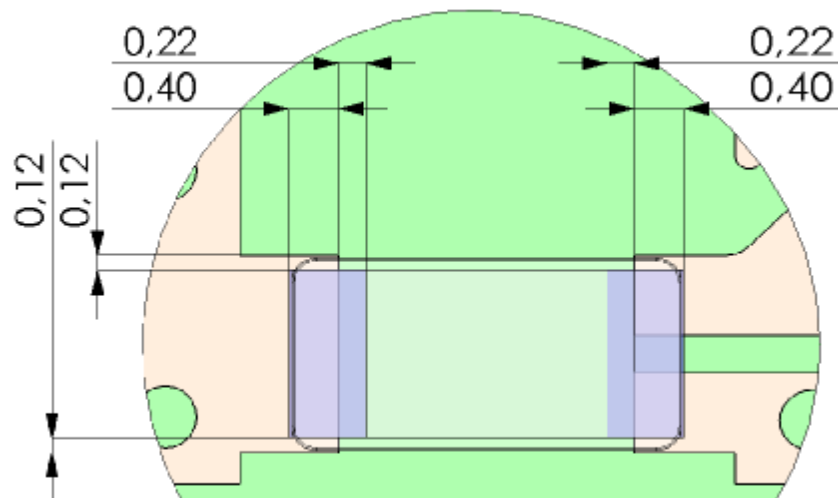


PWB pad dimensions and antenna position for W3038 1.9 GHz Diversity Rx Antenna

Pad dimensions in top copper



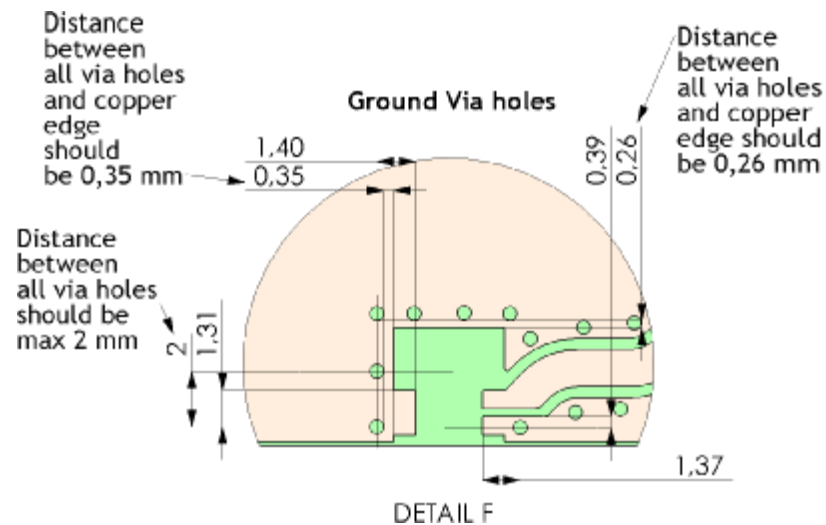
Antenna position on PWB layout



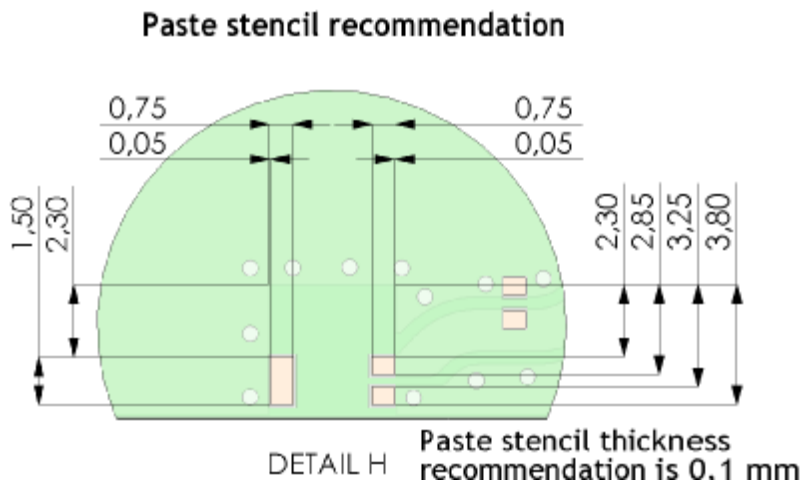
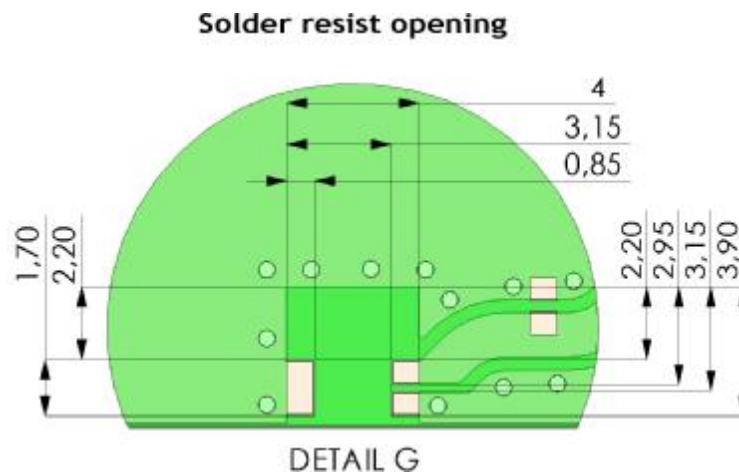
Antenna pads are
marked blue

DETAIL E

Typical Ground via hole placement in PWB layout for W3038 1.9 GHz Diversity Rx Antenna

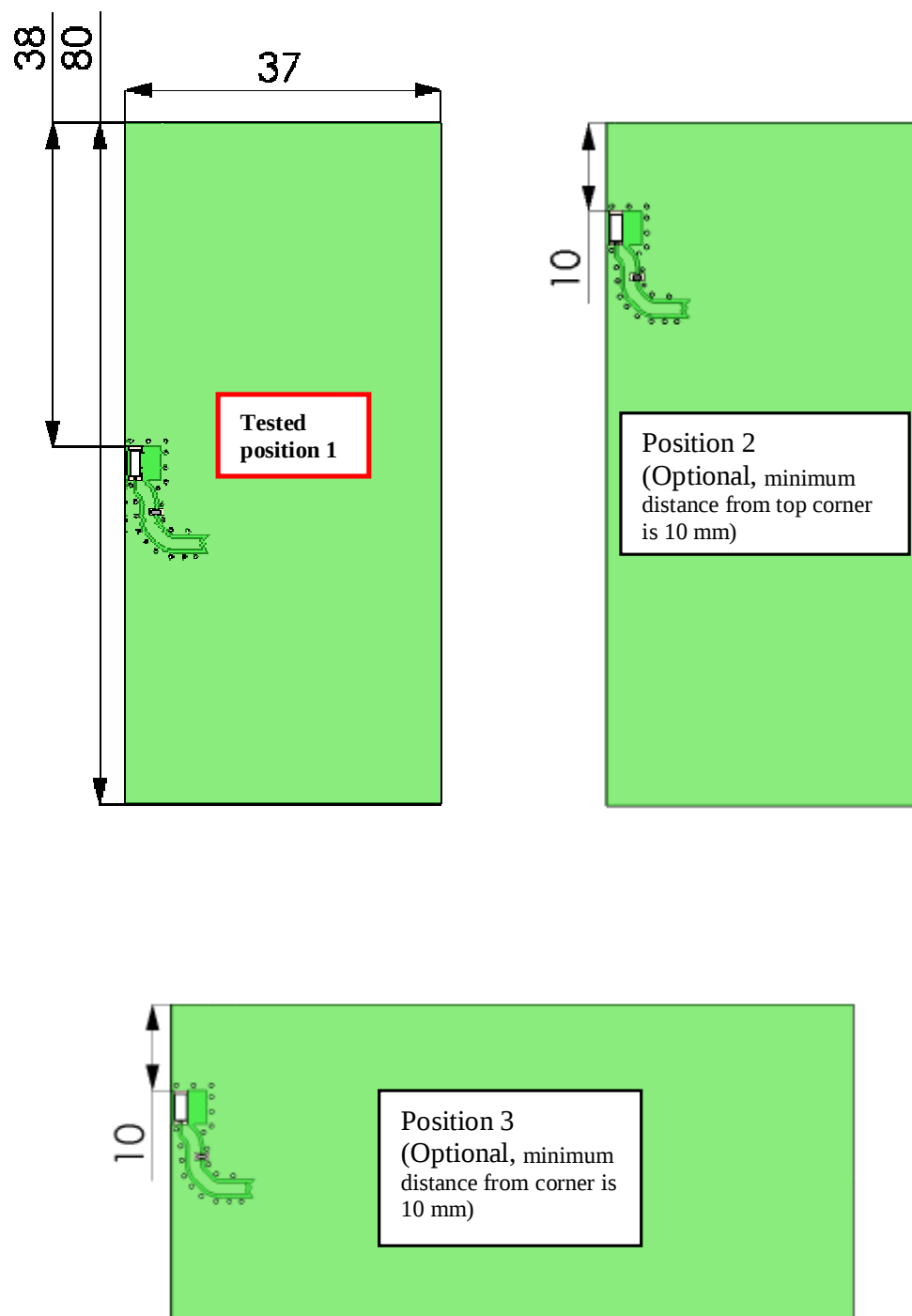


Solder resist opening and paste stencil recommendations for W3038 1.9 GHz Diversity Rx Antenna



Recommended Antenna Position on PWB for W3038 1.9 GHz Diversity Rx Antenna

Our test PWB size is 37 x 80 mm, other sized boards can be used depending on customer device size (minimum 35 x 35 mm)



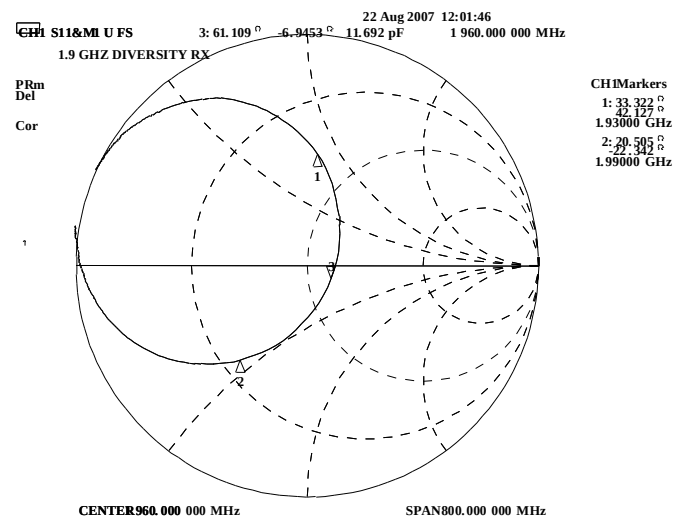
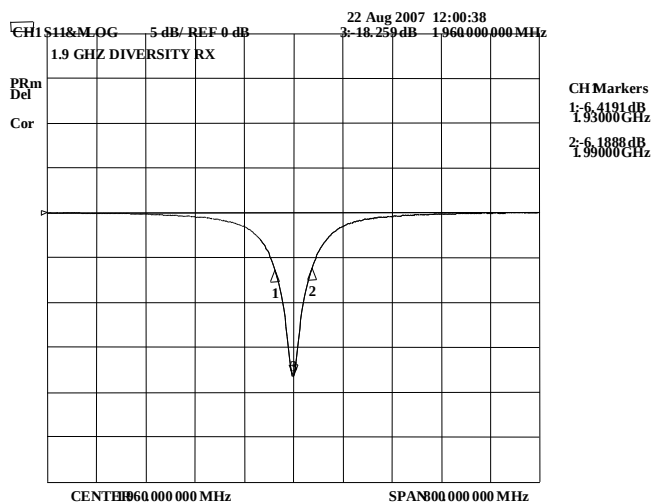
W3038 1.9 GHz Diversity RX Antenna Test Set Up and Measured Performance

Ground cleared under antenna, clearance area 4.00 x 4.25 mm

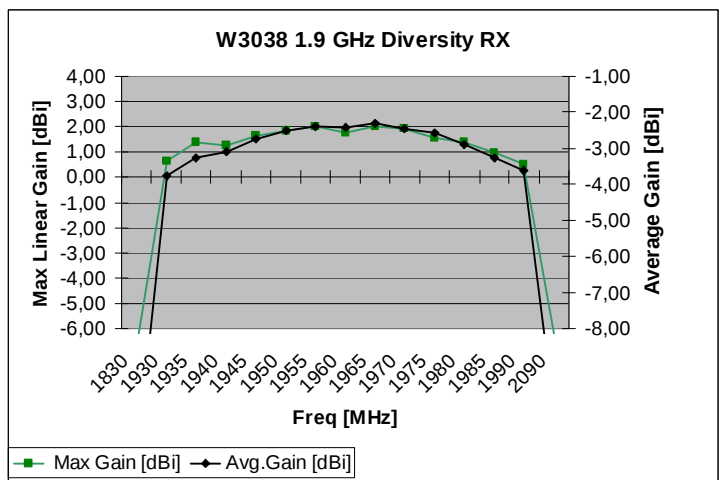
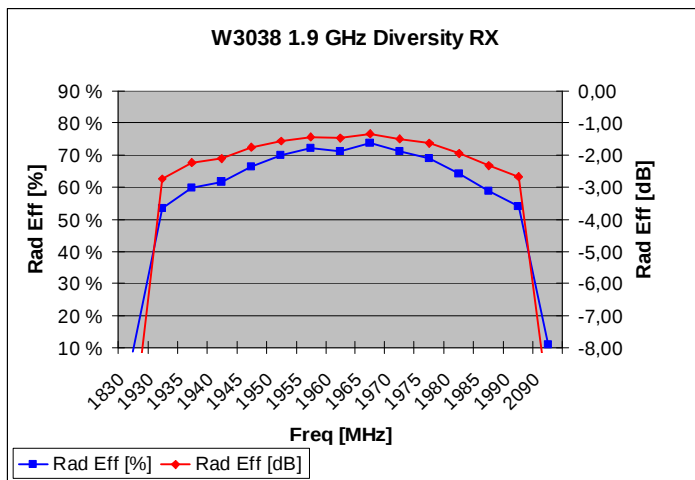
Typical Electrical Characteristics (T=25 °C)

Measured on the 80x37mm test board without matching circuit and in antenna position 1 on PWB layout, see page 10.

Typical Return Loss S11/ impedance



Typical free space efficiency and maximum gain



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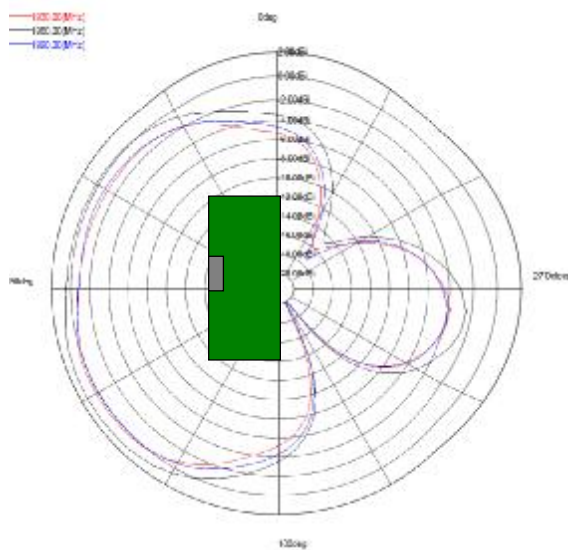
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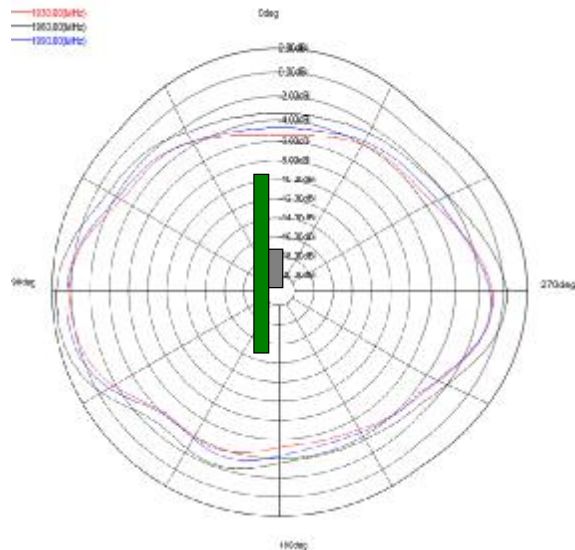


Typical Free Space Radiation Patterns

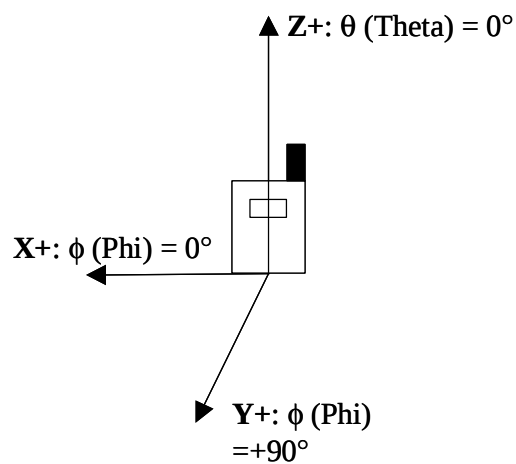
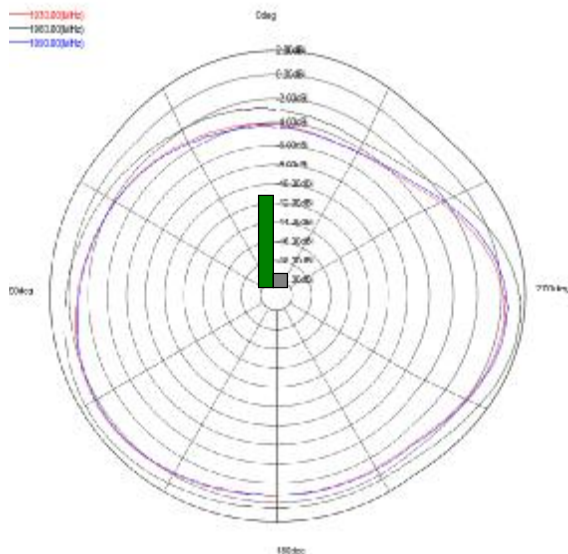
XZ-PLANE



ZY-PLANE



XY-PLANE



W3038A 1.9 GHz Diversity Rx Antenna

PWB ground clearance area 4.00 x 6.25 mm



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W3038A 1.9 GHz Diversity RX Antenna PWB Layout Specifications

Ground cleared under antenna, clearance area **4.00 x 6.25 mm**

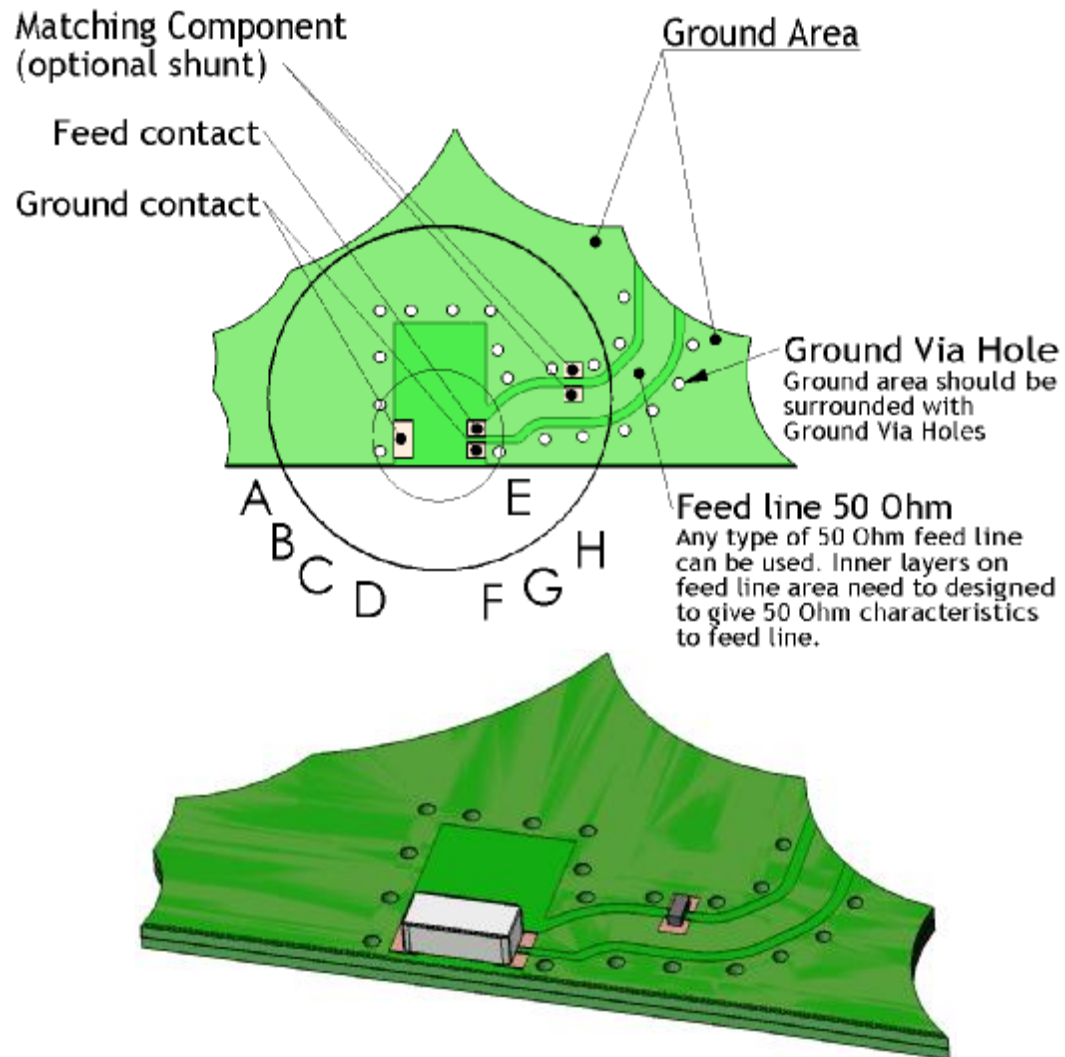
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Feed line should be designed to match 50 Ω characteristic impedance, depending on PWB material and thickness.

Recommended test board layout for electrical characteristic measurement, test board outline size 80 x 37 mm.

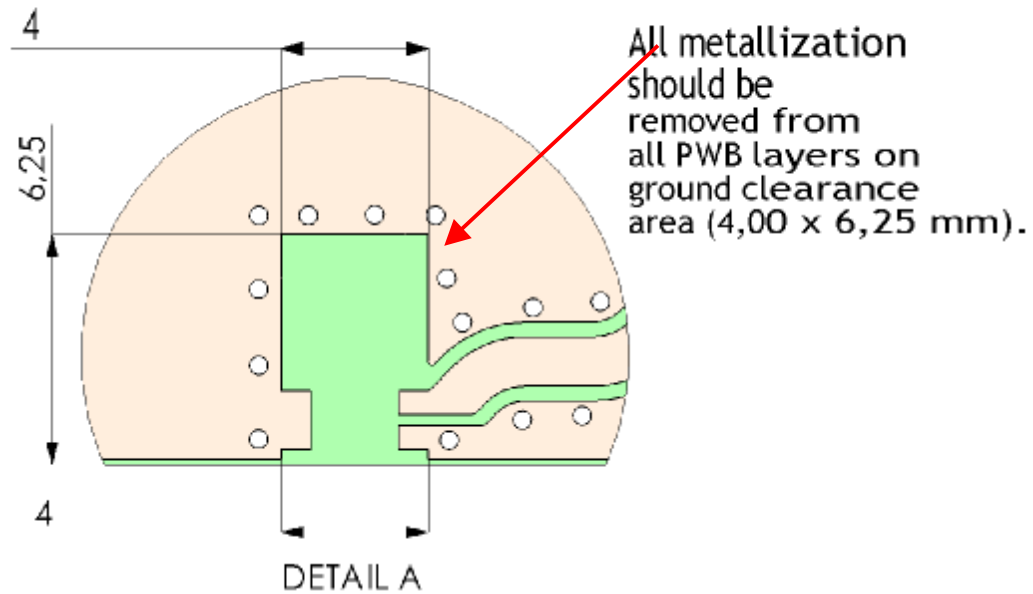
PWB layout for W3038A 1.9 GHz Diversity Rx Antenna

Note: All dimensions are in metric system.

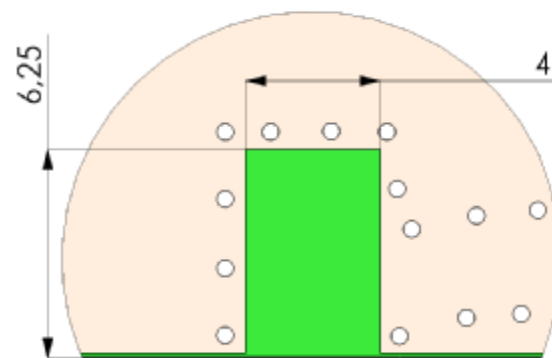


Ground clearance area for W3038A 1.9 GHz Diversity Rx Antenna

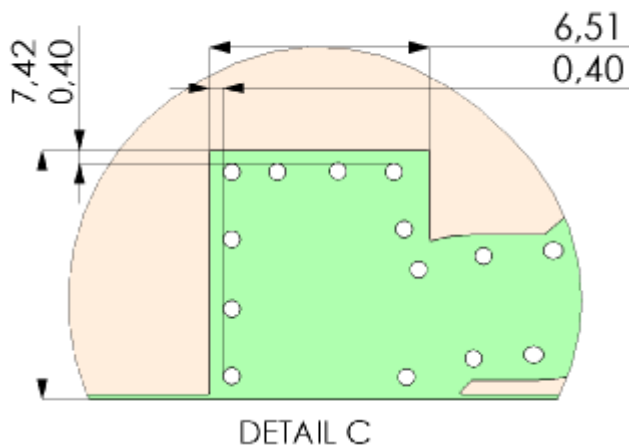
Ground clearance area (4,00 x 6,25 mm)



Opening in bottom/inner ground layers

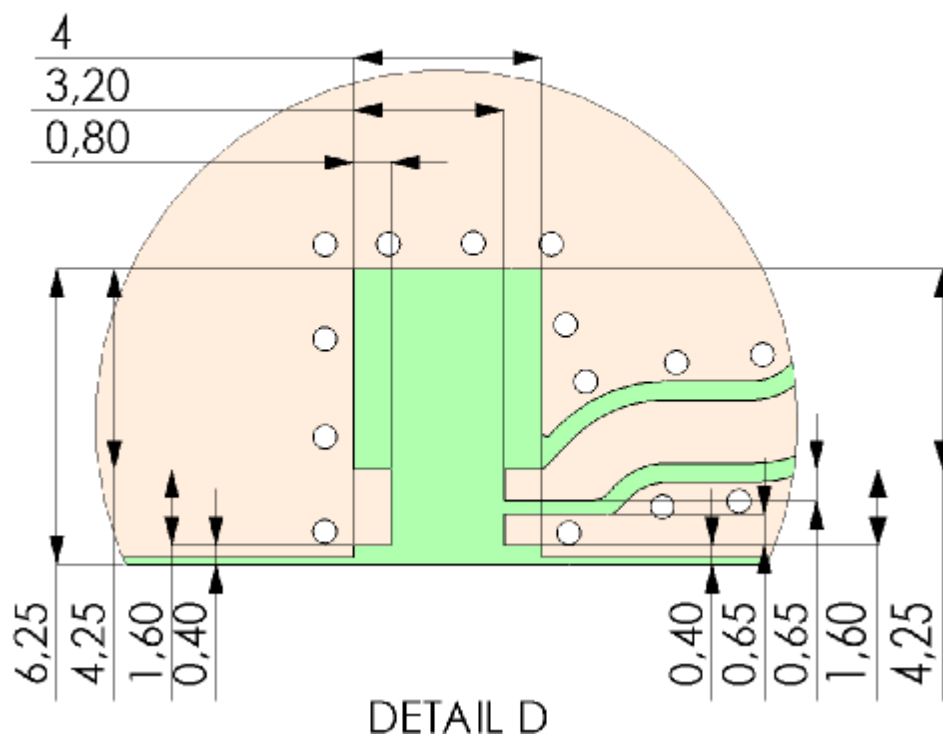


Opening in other layers (no ground/ RF)

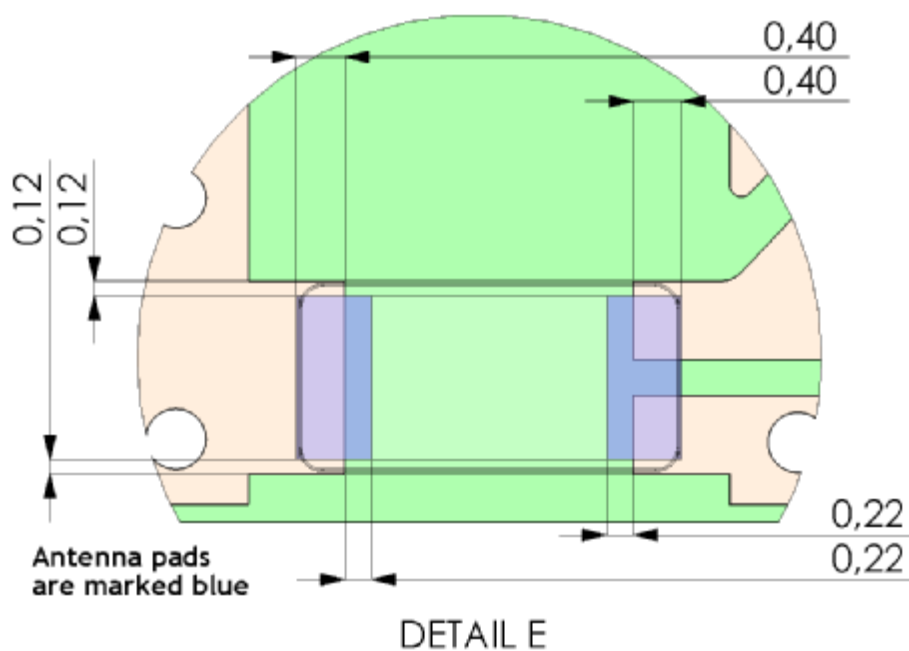


PWB pad dimensions and antenna position for W3038A 1.9 GHz Diversity Rx Antenna

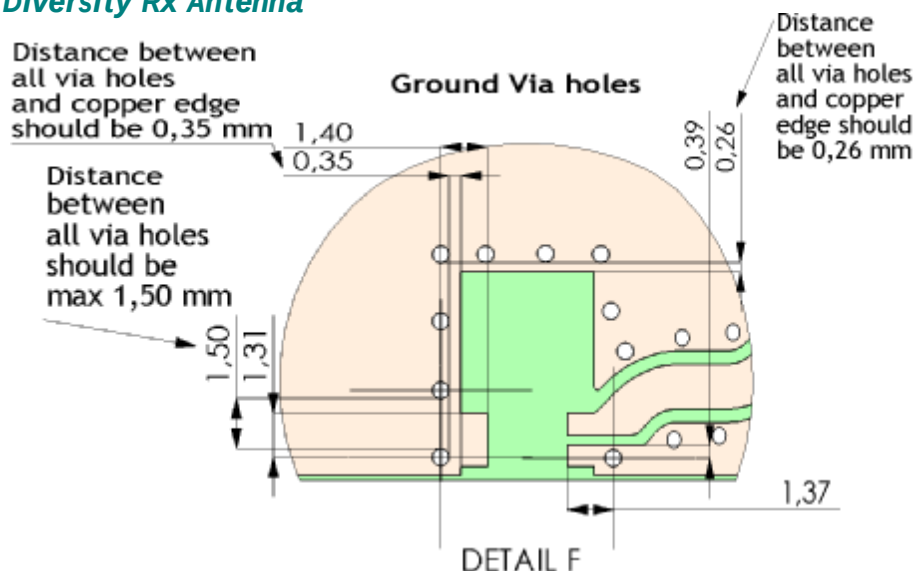
Pad dimensions in top copper



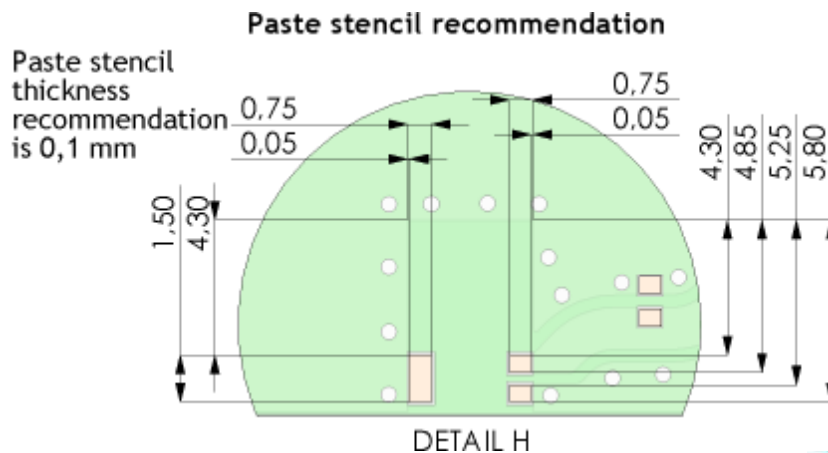
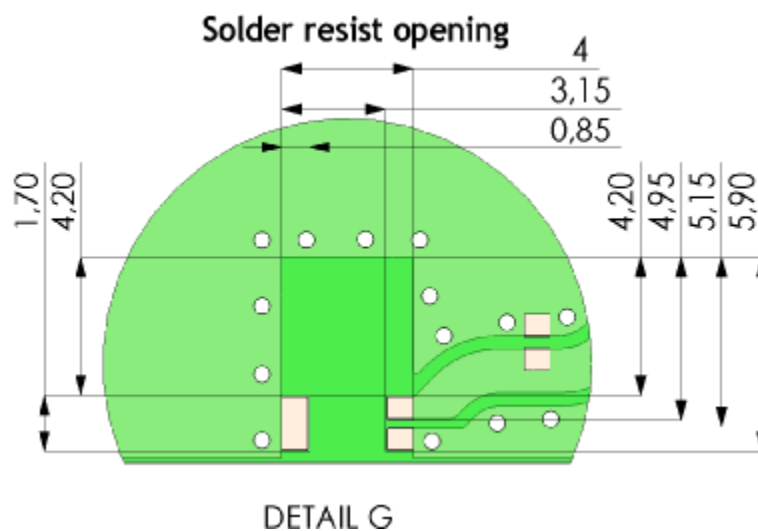
Antenna position on PWB layout



Typical Ground via hole placement in PWB layout for W3038A 1.9 GHz Diversity Rx Antenna

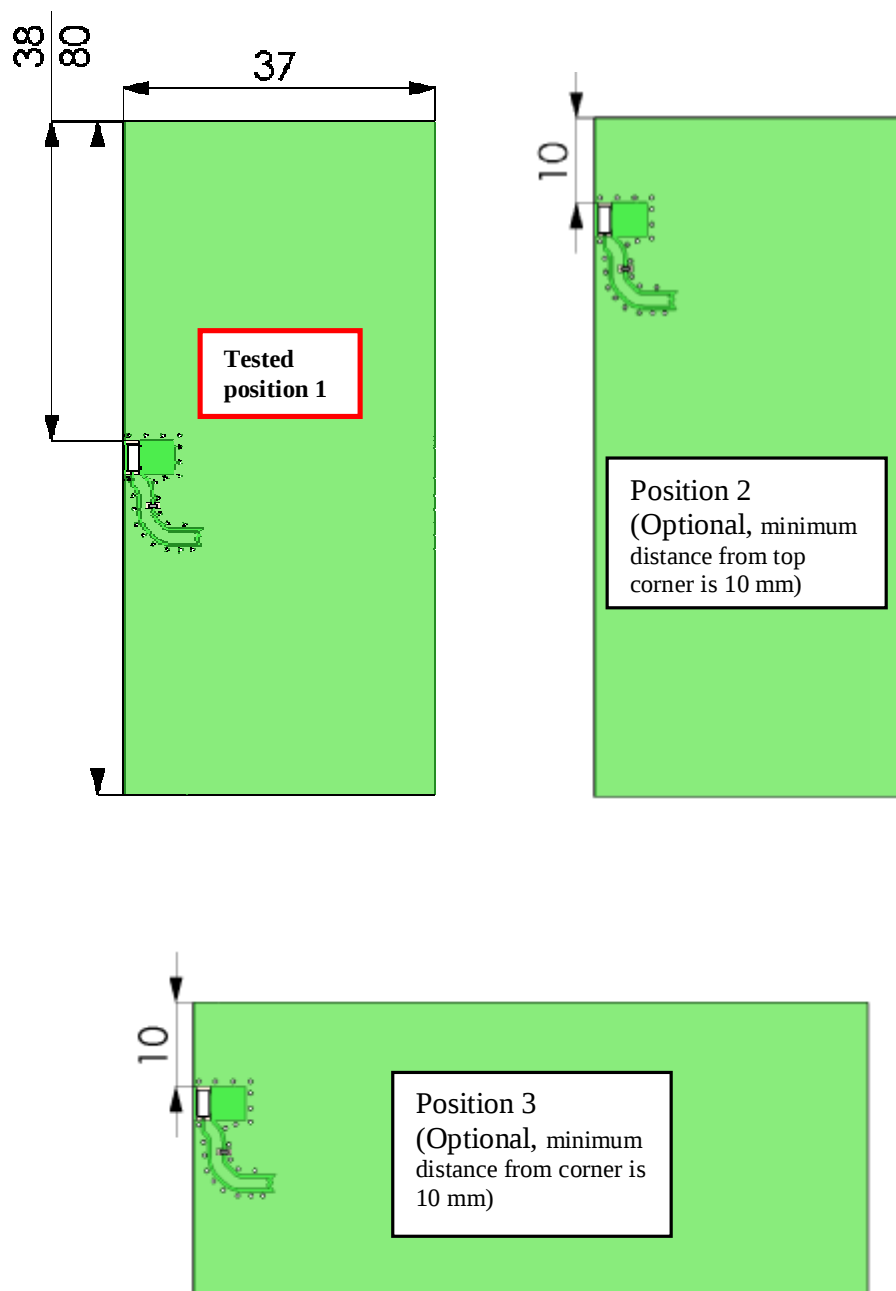


Solder resist opening and paste stencil recommendations for W3038A 1.9 GHz Diversity Rx Antenna



Recommended antenna position on PWB for W3038A 1.9 GHz Diversity Rx Antenna

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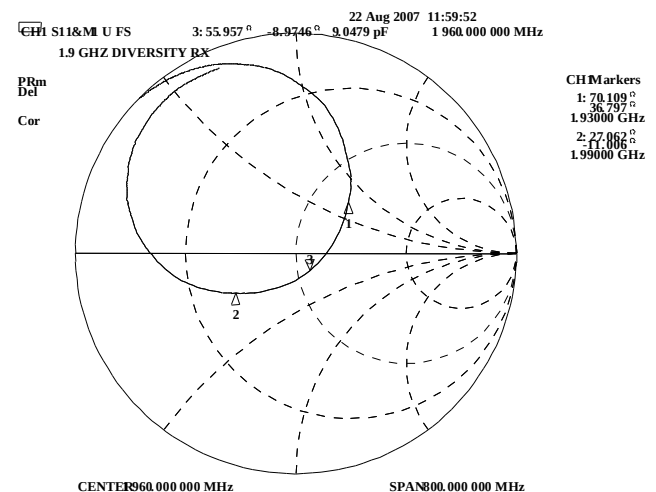
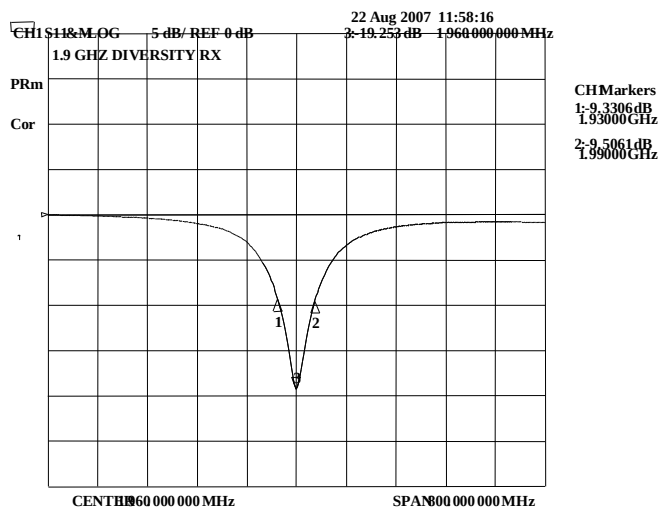
W3038A 1.9 GHz Diversity Rx Antenna Test Set Up and Measured Performance

Ground cleared under antenna, clearance area 4.00 x 6.25 mm

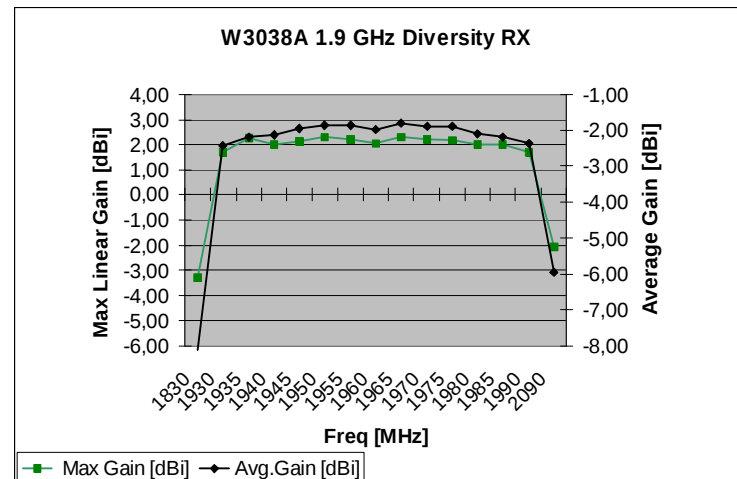
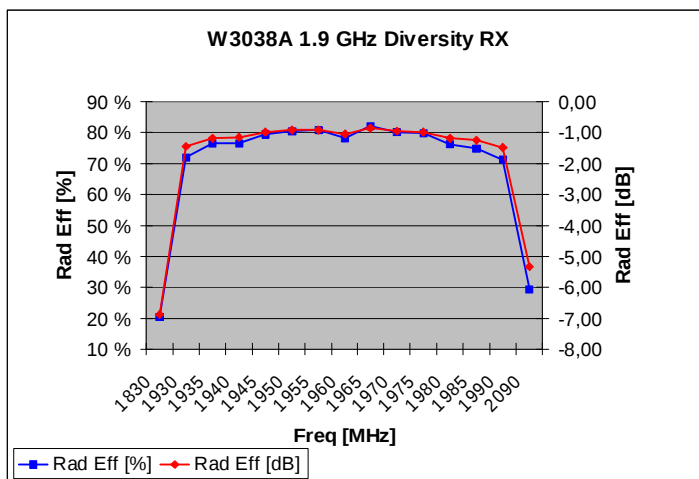
Typical Electrical Characteristics (T=25 °C)

Measured on the 80 x 37mm test board with matching circuit (1.2 pF shunt capacitor) and in antenna position 1 on PWB layout, see page 18.

Typical Return Loss S11/ impedance



Typical free space efficiency and maximum gain



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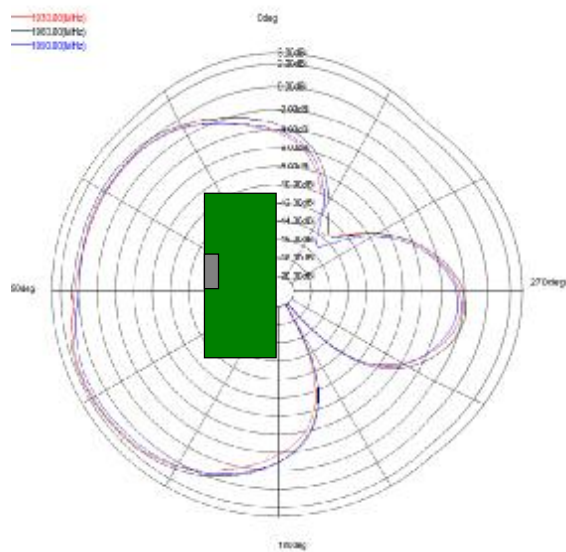
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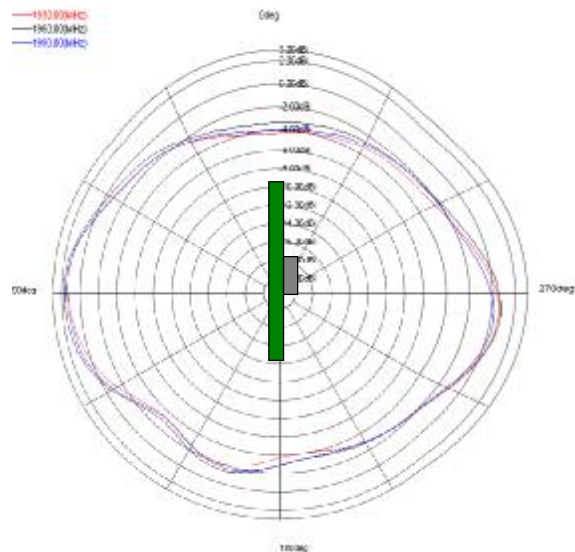


Typical Free Space Radiation Patterns

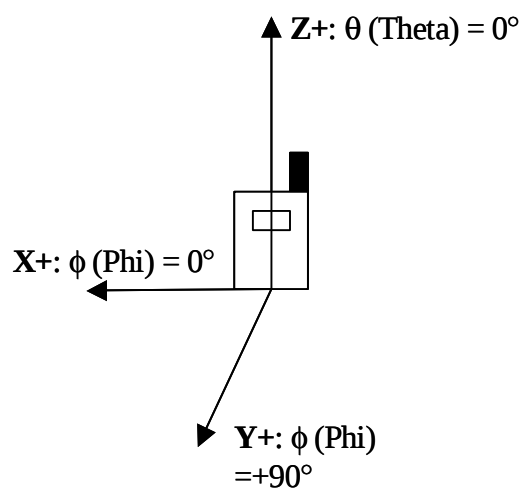
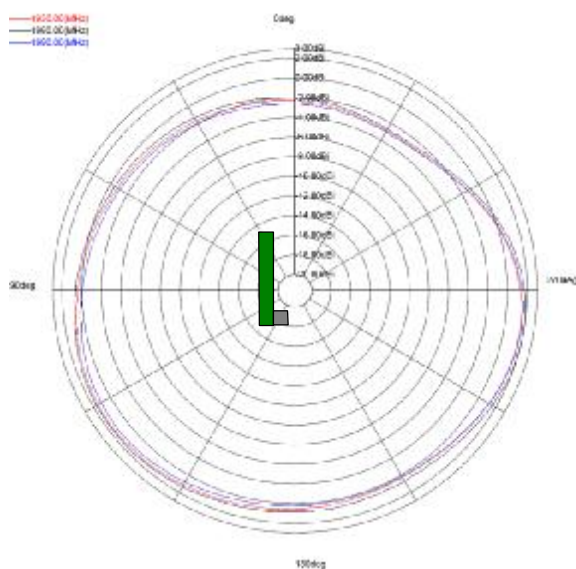
XZ-PLANE



ZY-PLANE



XY-PLANE

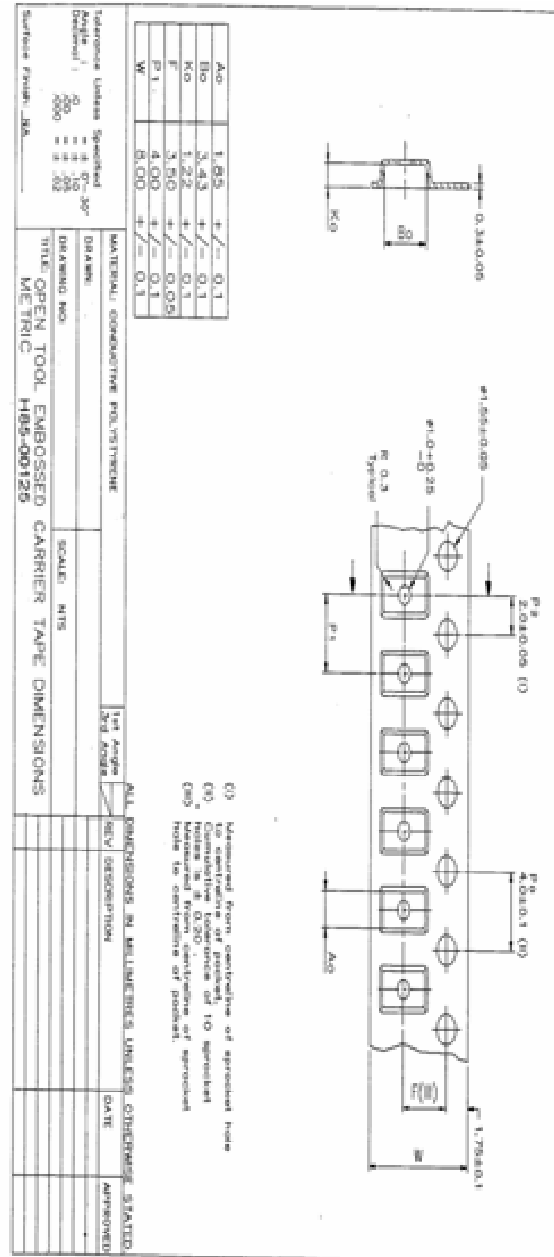


Diversity Rx Antenna Packing (W3038 / W3038A)

General

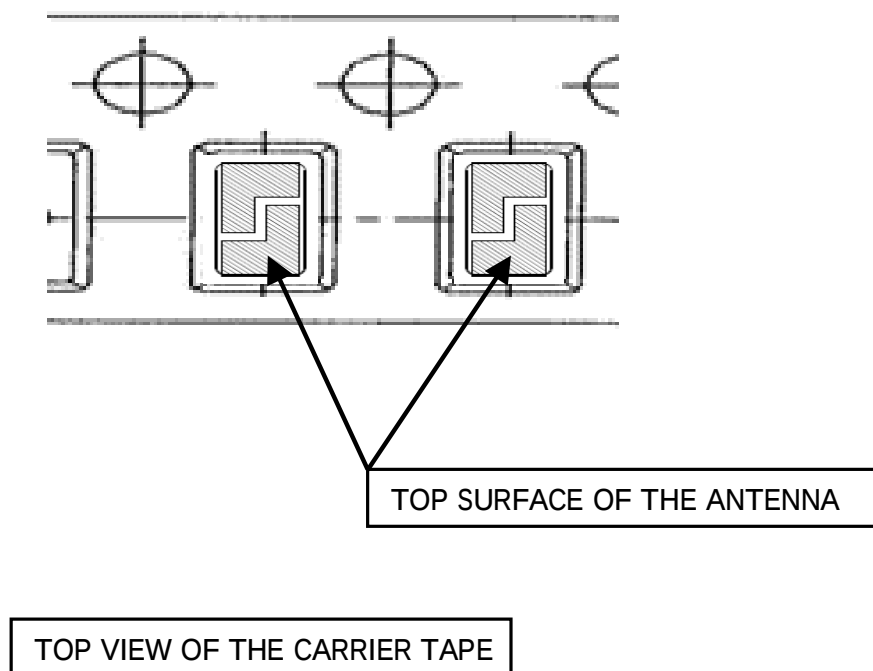
Tape and reel packing is used. Carrier tape, reel and box dimensions are presented in following pictures.

Carrier tape

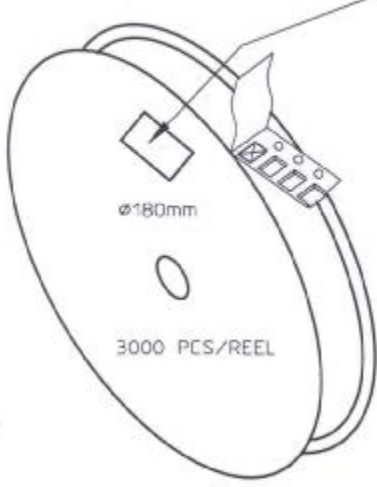
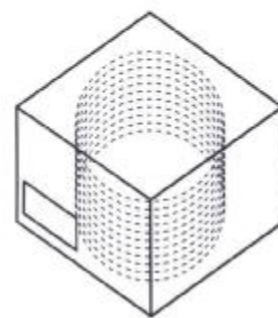


Block orientation

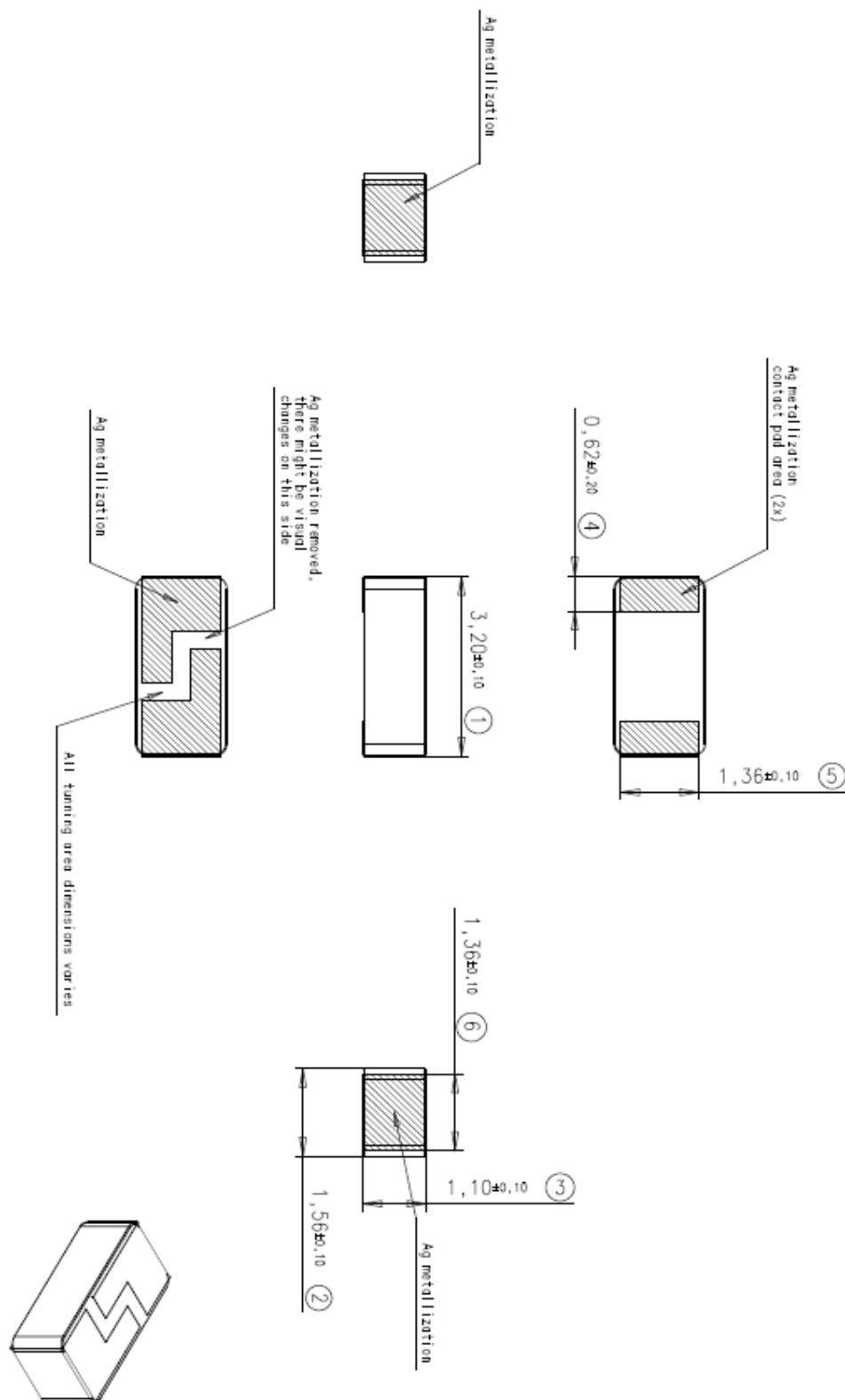
Antenna soldering pads facing down to the bottom of the carrier tape.



Packing form

		REEL LABEL INFORMATION: - TRACEABILITY - QUANTITY - PRODUCT CODE			
		CARRIER TAPE H85-00125 width=8,00 depth=1,22 COVER TAPE H85-00126 width=5,60 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 (182x182x132)		1 pcs			
- LABEL		1 pcs/BOX			
REEL H85-00127 (D180, W12)		10 pcs			
- REEL LABEL		1 pcs/REEL			
MATERIAL					
HANDLINGS					
		RATIO	DRWN	090507 PzHa	H
			DGNER		G
			CHKD		F
			APPRD		E
			APPRD BY		D
PRODUCT		H90-OY805			
DENOMINATION		PACKING FORM			
		VERSION		MOD/DATE/NAME	

Diversity Rx Antenna Mechanical Outline (W3038 / W3038A)



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