

**Description:** 1.575 GHz GNSS Ceramic  
Chip Antenna

**Series:** Ceramic Chip Antenna

**PART NUMBER:** W3011A

### Features:

- Frequency 1559-1606.6MHz
- Gain 1.3 / 2.0 / 2.2dBi
- Size 3.2 x 1.6 x 1.1 mm
- PCB Keep out 4 x 6.25 mm
- Polarization Linear
- Radiation pattern Omni



### Applications:

- L1 GNSS Receivers
- Beidou, GPS, Galileo  
Glonass
- IoT, M2M
- Asset tracking
- Portable satellite receivers

All dimensions are in mm / inches

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Chip Antenna**Series:** Ceramic Chip Antenna**PART NUMBER:** W3011A**ELECTRICAL SPECIFICATIONS**

Antenna Type	Chip antenna
Frequency	1559-1563MHz 1574.4-1576.4MHz 1598.6-1606.6MHz
Nominal Impedance	50 $\Omega$
Return Loss (Max)	-7 / -10 / -10 dB
Radiation Pattern	Omni
Gain(Min)	1.3 / 2.0 / 2.2dBi
Efficiency(Min)	65 / 75 / 78 %
Polarization	Vertical
Power Withstanding	2W

**MECHANICAL SPECIFICATIONS**

Compact size	3.2 x 1.6 x 1.1mm
Weight	0.033g
Fixing system	SMT
MSL(MOISTURE SENSITIVITY LEVEL)	1

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature	-40 ~ +85° C
Storage Temperature	-40 ~ +85° C
RoHS Compliant	Yes

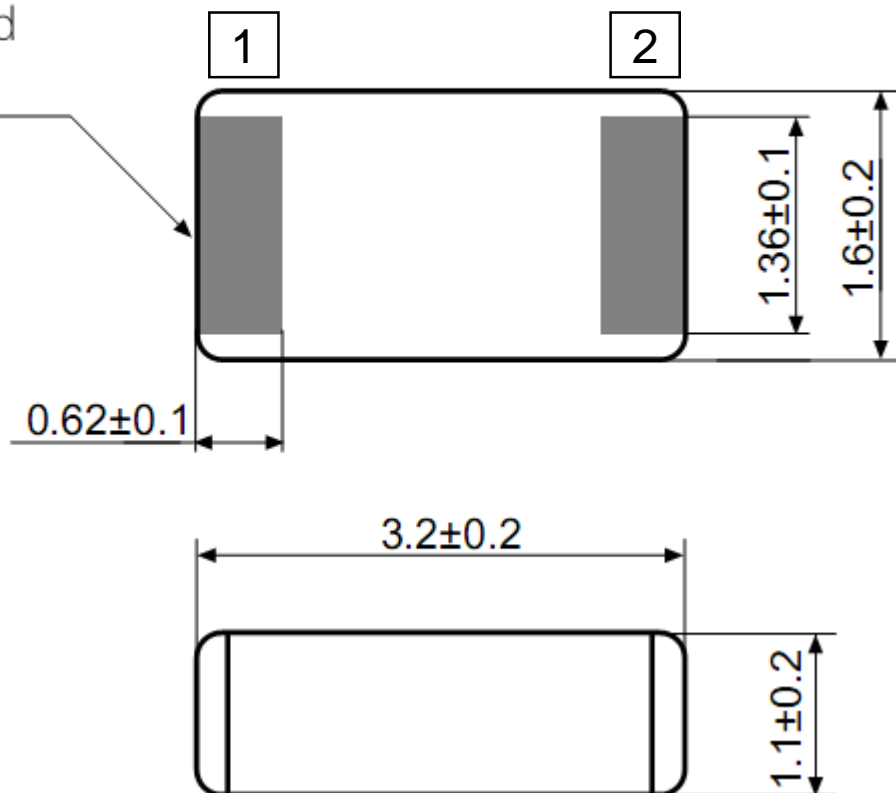
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## MECHANICAL DRAWING

Ag metallization  
contact pad  
area (2x)



### Antenna features

No.	Terminal name	Terminal Dimensions
1	Feed / GND	$0.62 \times 1.36$ mm
2	Feed / GND	$0.62 \times 1.36$ mm

Antenna is symmetrical.

Either of terminals 1 or 2 can be feed / GND

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### W3011 GPS Antenna PWB Layout

Ground cleared under antenna, clearance area 4.00 x 6.25 mm  
Matching and tuning component value and placement 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 80 x 37 mm.

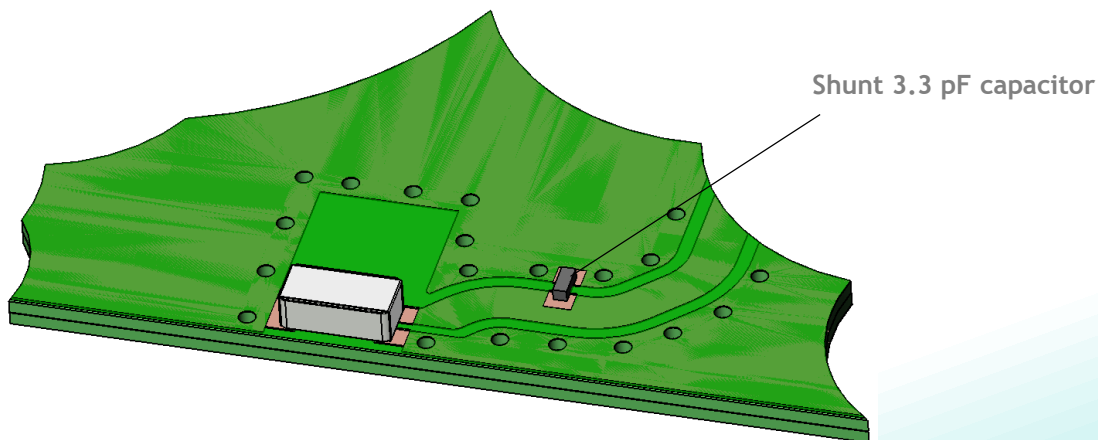
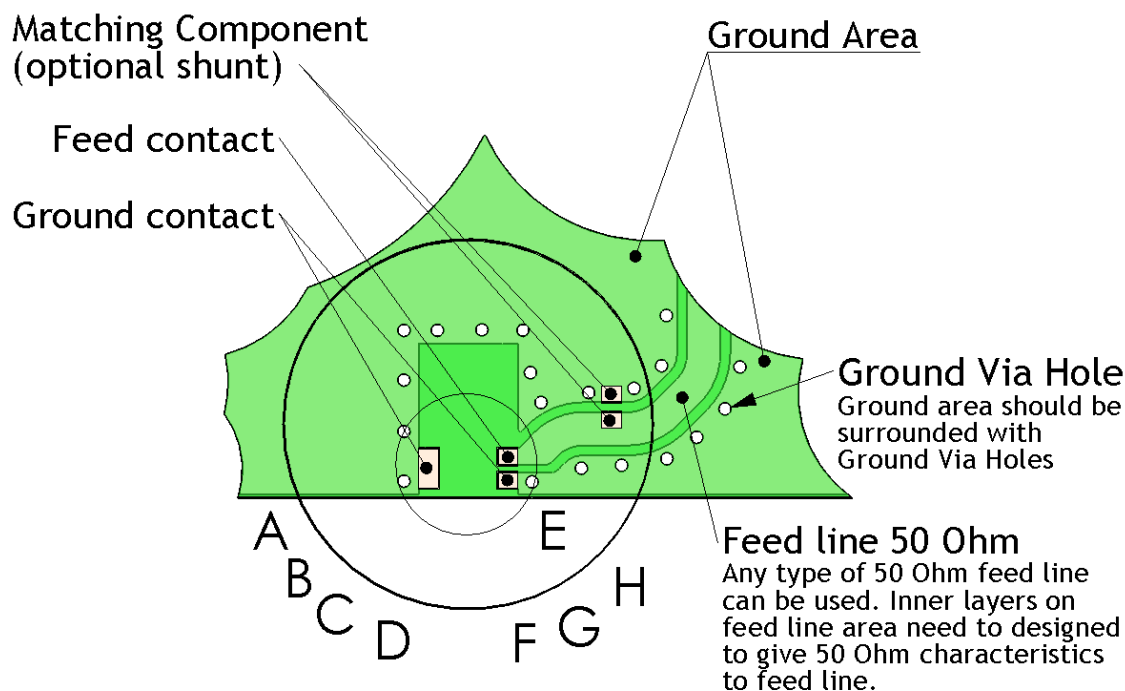
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## PWB layout for W3011A GPS Antenna

**Note:** All dimensions are in metric system.



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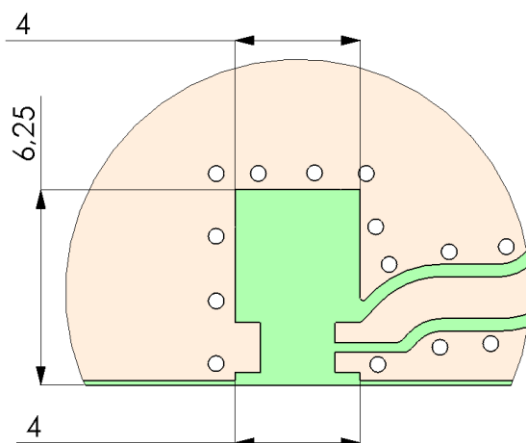
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Ground clearance area for W3011A GPS Antenna

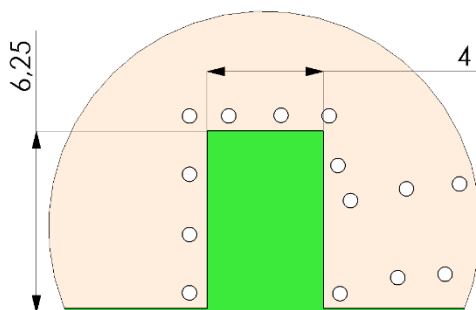
Ground clearance area (4,00 x 6,25 mm)



All metallization should be removed from all PWB layers on ground clearance area (4,00 x 6,25 mm).

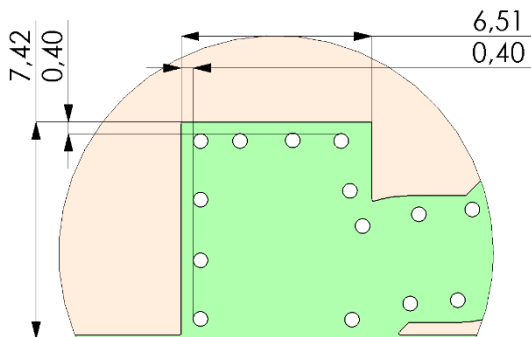
DETAIL A

Opening in bottom/inner ground layers



DETAIL B

Opening in other layers (no ground/ RF)



DETAIL C

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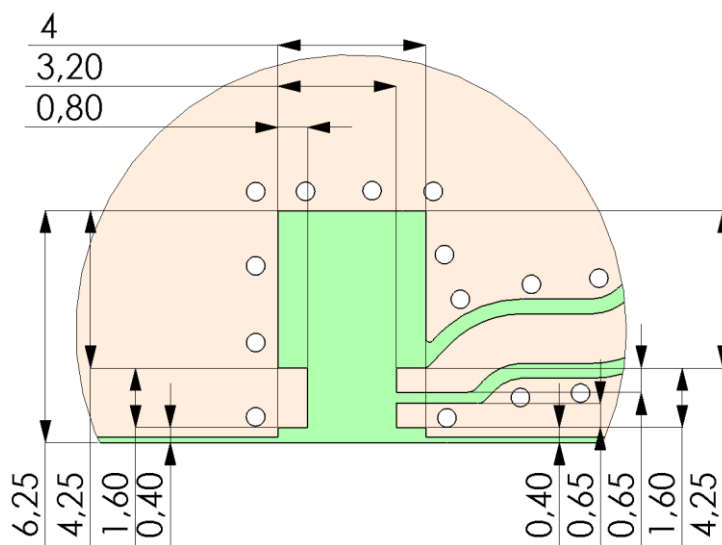
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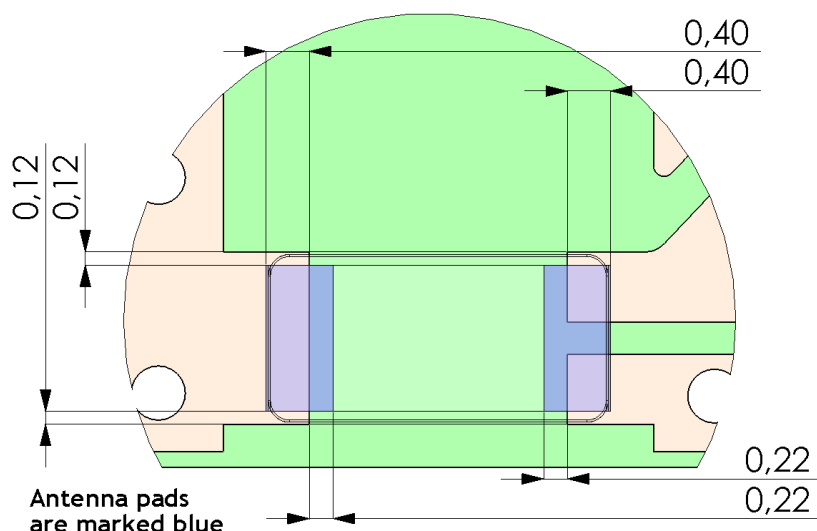
## PWB pad dimensions and antenna position for W3011A GPS Antenna

Pad dimensions in top copper



DETAIL D

Antenna position on PWB layout



DETAIL E

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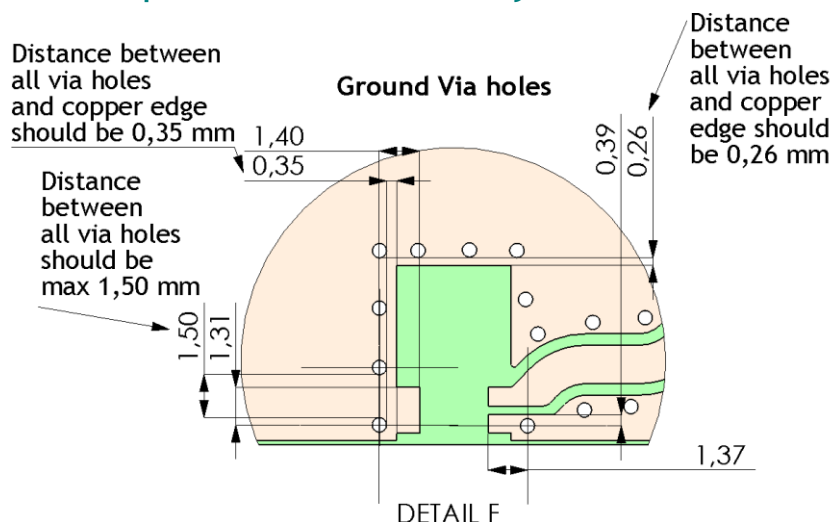
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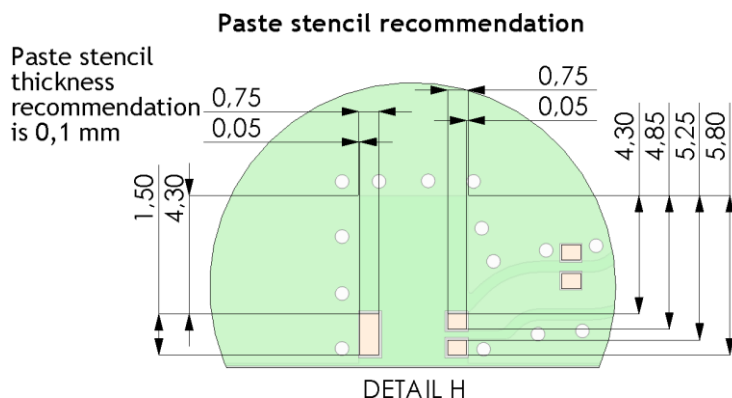
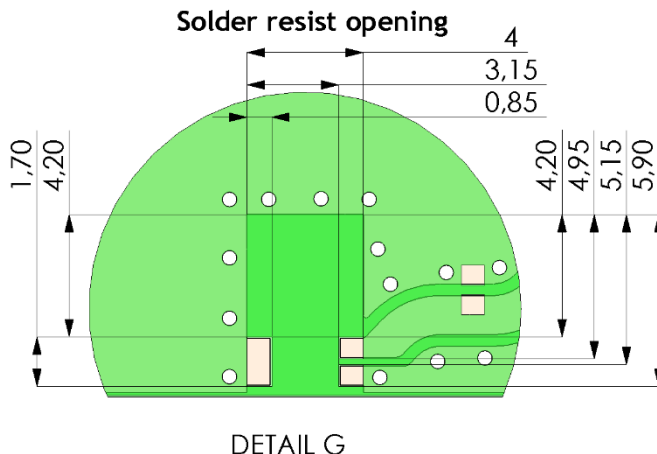
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Typical Ground via hole placement in PWB layout for W3011A GPS Antenna



Solder resist opening and paste stencil recommendations for W3011A GPS Antenna



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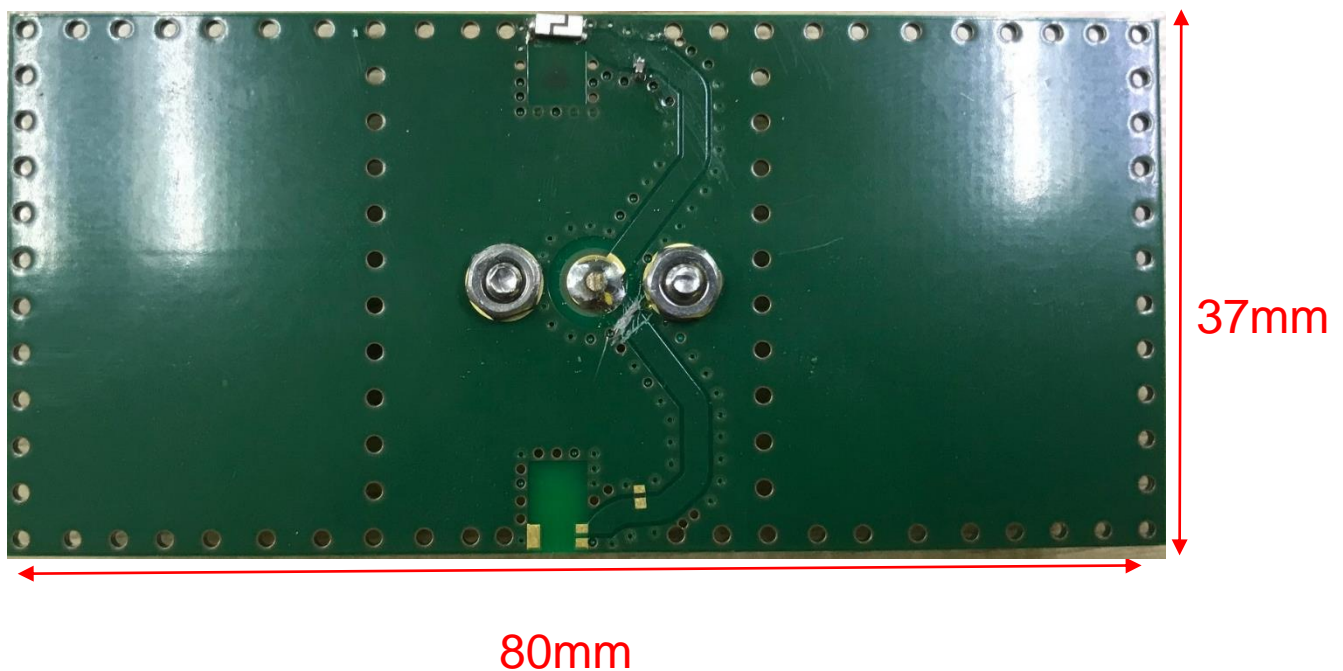
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## TEST SETUP

All RF parameters tested on 80x37mm sized test board.  
Antenna position on side center of PCB long edge.



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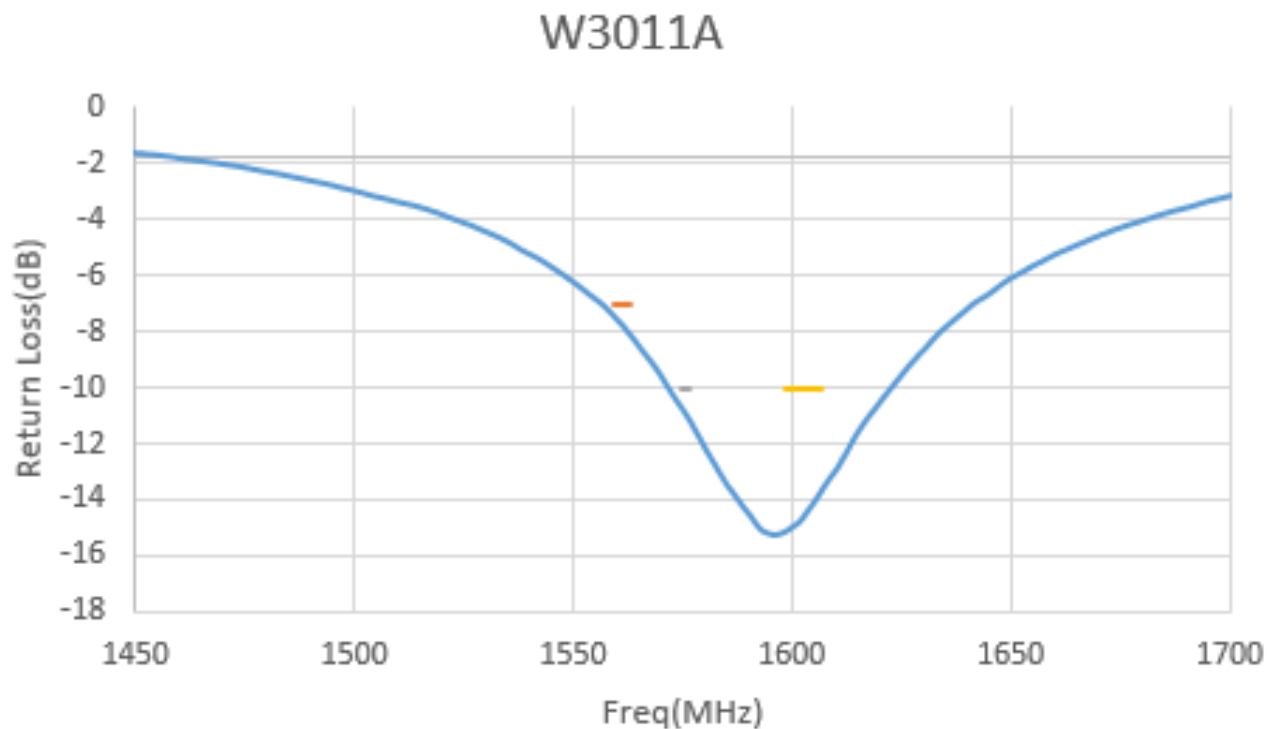
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## CHARTS

### Return Loss vs Frequency



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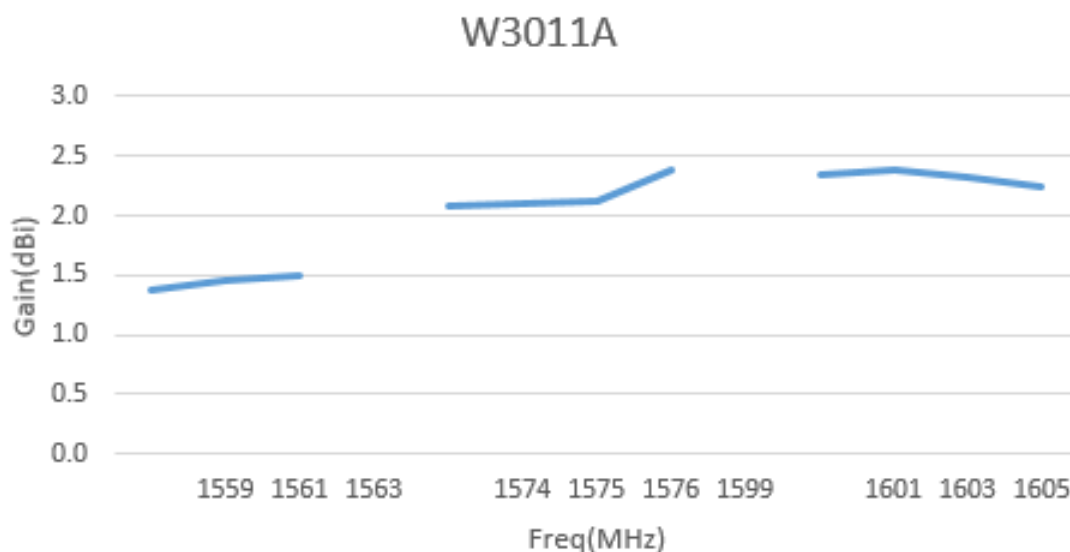
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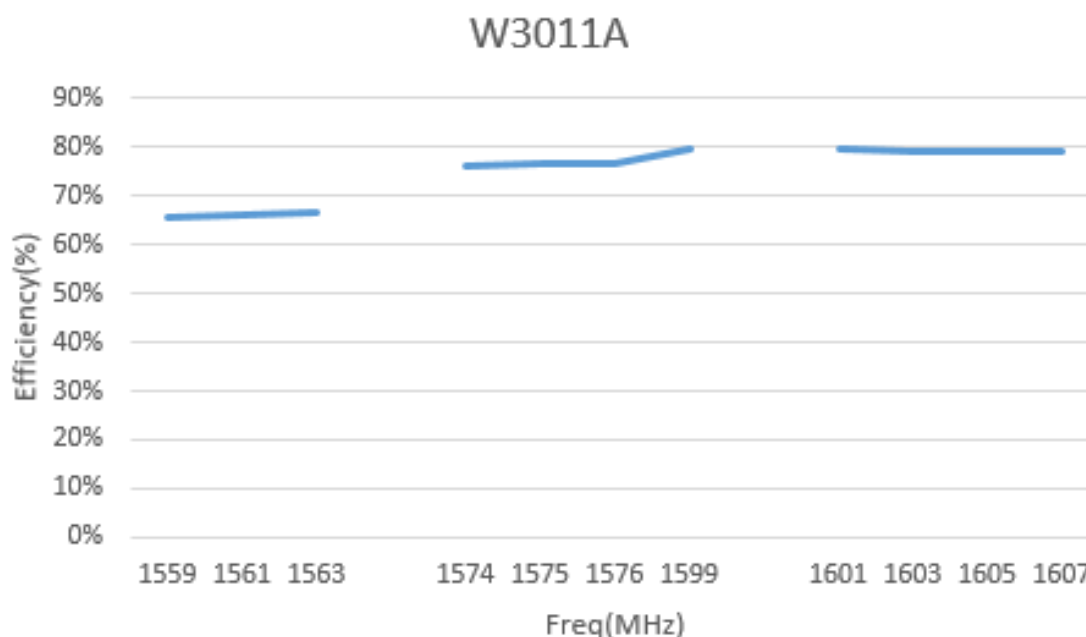
**PART NUMBER:** W3011A

## CHARTS

### Gain vs Frequency



### Radiation Efficiency vs Frequency



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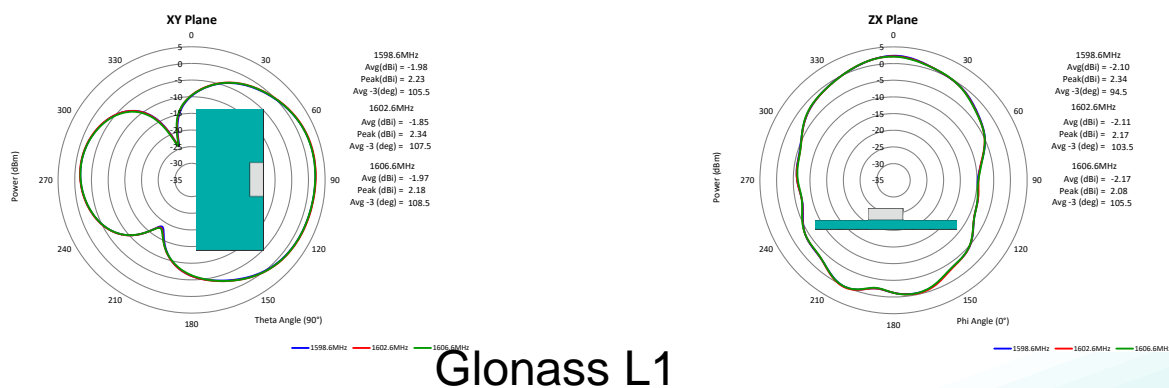
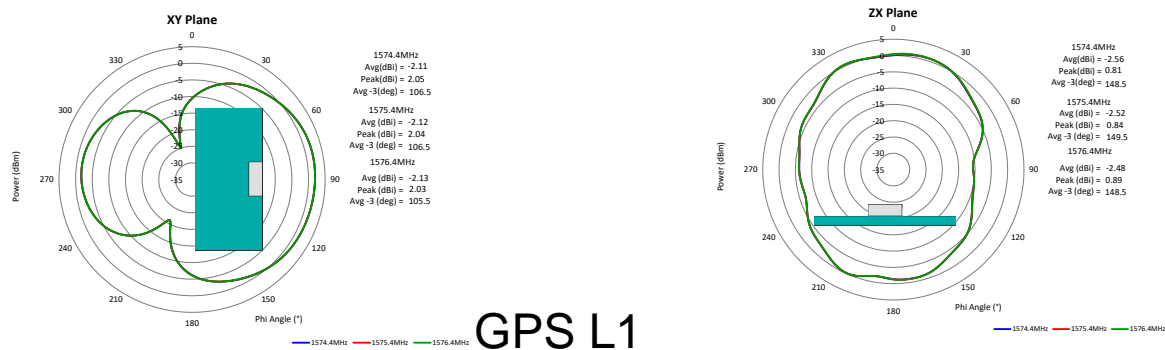
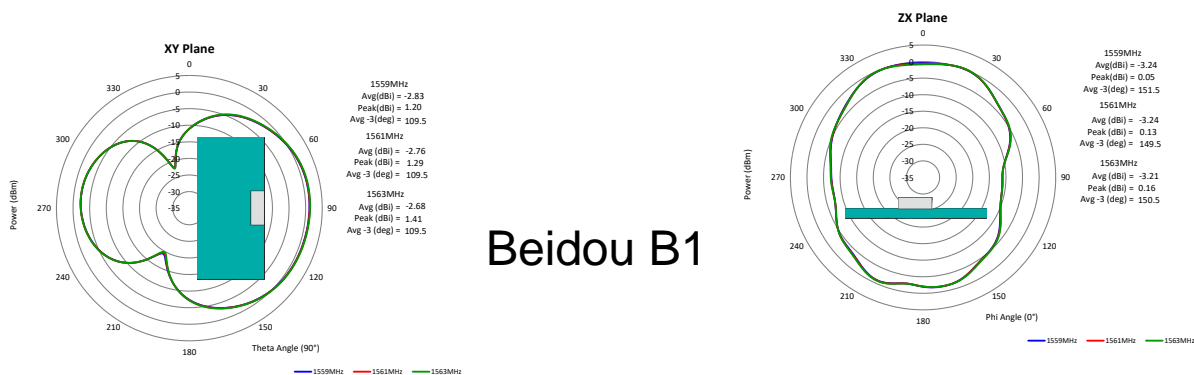
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## CHARTS



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## Recommendation for reflow soldering process

Printing stencil thickness 0,15 - 0,25 mm is recommended for the solder paste. The maximum soldering temperature should not exceed 260°C. The temperature profile recommendations for reflow soldering process is presented in the Figures 1 and 2. The reflow profile

presented in figure 1 describes minimum reflow temperatures. The reflow profile presented in figure 2 describes maximum reflow temperatures. located at the center of the coverage area.

	Method of heat transfer	Controlled hot air convection
1	Average temperature gradient in preheating	2.5 °C/s
2	Soak time	2-3 minutes
3	Max temperature gradient in reflow	3 °C/s
4	Time above 217 °C	Max 30 sec
5	Peak temperature in reflow	230 °C for 10 seconds
6	Temperature gradient in cooling	Max -5 °C/s

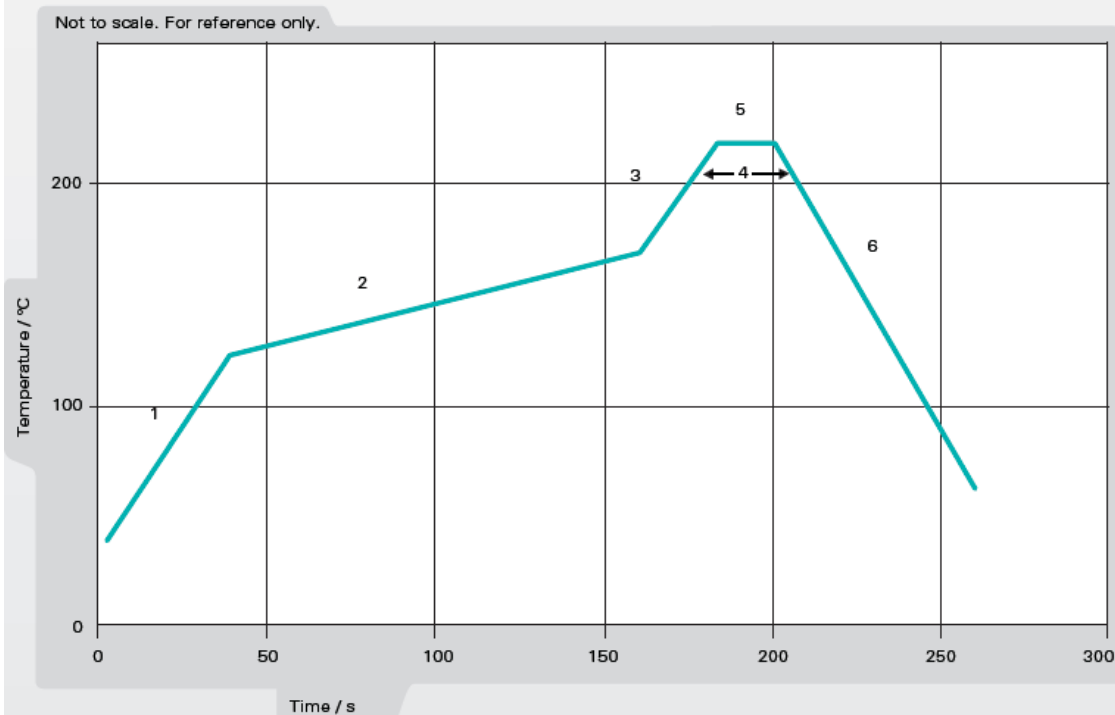


Figure 1. Minimum temperature profile recommendation for reflow soldering process

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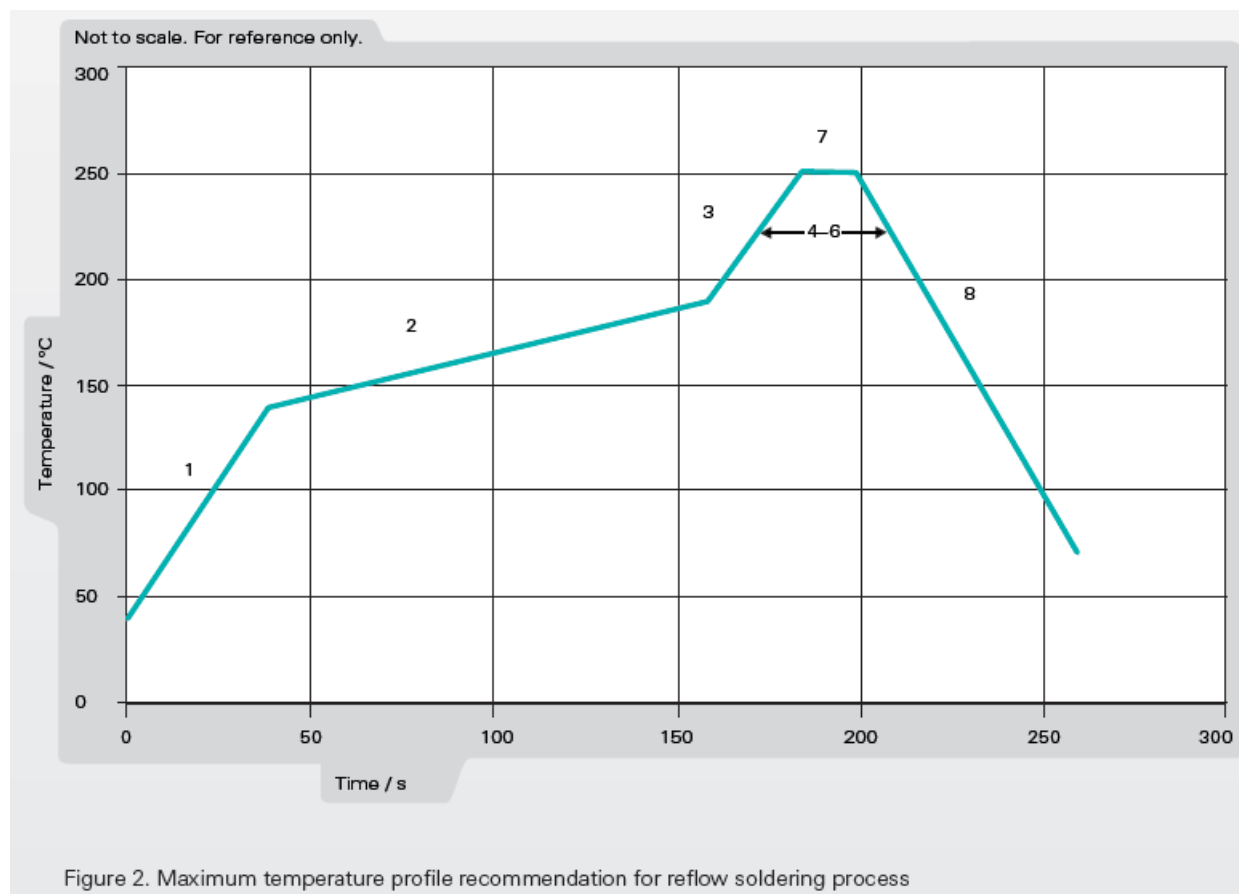
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**Recommendation for reflow soldering process**

	Method of heat transfer	Controlled hot air convection
1	Average temperature gradient in preheating	2.5 °C/s
2	Soak time	2-3 minutes
3	Max temperature gradient in reflow	3 °C/s
4	Time above 217 °C	Max 60 sec
5	Time above 230 °C	Max 50 sec
6	Time above 250 °C	Max 10 sec
7	Peak temperature in reflow	260 °C for 5 seconds
8	Temperature gradient in cooling	Max -5 °C/s



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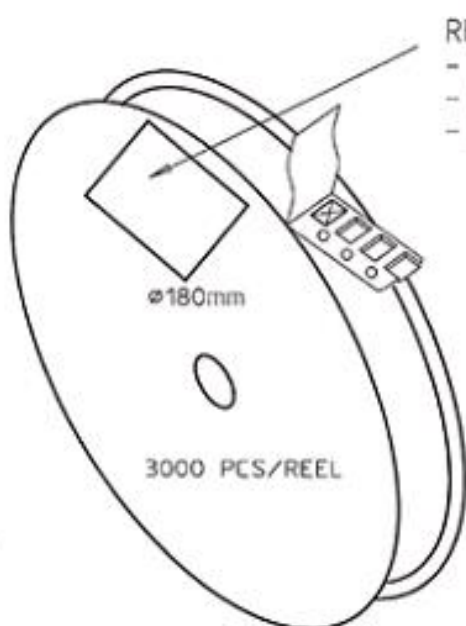
**PART NUMBER:** W3011A

## PACKAGING

Taping package

3000PCS/Reel

30000PCS/Carton box



### REEL LABEL INFORMATION:

- TRACEABILITY
- QUANTITY
- PRODUCT CODE

CARRIER TAPE H85-00125

width=8,00 depth=1,22

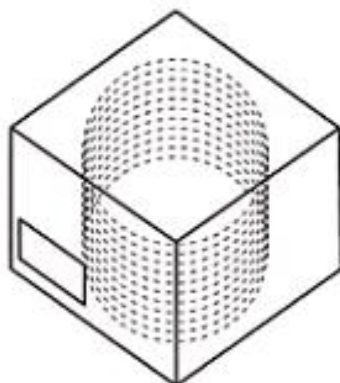
COVER TAPE H85-00126

width=5,60

### LENGTH OF TAPE:

- Leader section: 50 empty cavities before component section
- Trailer section: 25 empty cavities 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

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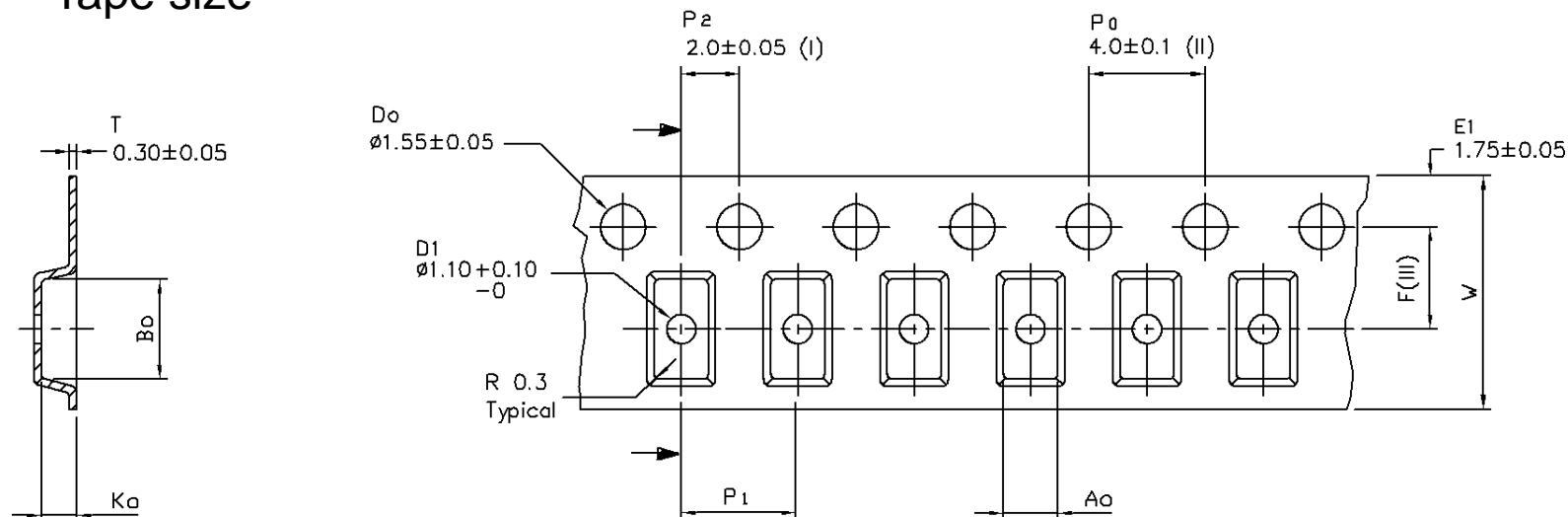
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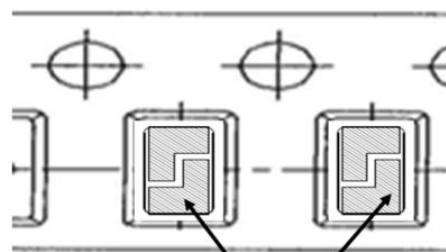
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**PACKAGING**

**Tape size**



Ao	1.85	+ / - 0.1
Bo	3.43	+ / - 0.1
Ko	1.22	+ / - 0.1
F	3.50	+ / - 0.05
P1	4.00	+ / - 0.1
W	8.00	+ / - 0.1



TOP SURFACE OF THE ANTENNA  
(ANTENNA SOLDERING PADS  
FACING SOWN TO THE BOTTOM  
OF THE CARRIER TAPE)

TOP VIEW OF THE CARRIER TAPE

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