

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

**Series:** Ceramic Chip Antenna

**PART NUMBER:** W3011



### Features:

- Frequency 1559-1606.6MHz
- Gain 1 / 1.8 / 1.4dBi
- Size 3.2 x 1.6 x 1.1 mm
- PCB Keep out 4 x 4.25 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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**Description:** 1.575 GHz GNSS Ceramic  
Chip Antenna**Series:** Ceramic Chip Antenna**PART NUMBER:** W3011**ELECTRICAL SPECIFICATIONS**

Antenna Type	Chip antenna
Frequency	1559-1563MHz 1574.4-1576.4MHz 1598.6-1606.6MHz
Nominal Impedance	50 $\Omega$
Return Loss (Max)	-6 / -10 / -7 dB
Radiation Pattern	Omni
Gain(Min)	1 / 1.8 / 1.4dBi
Efficiency(Min)	50 / 68 / 60 %
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

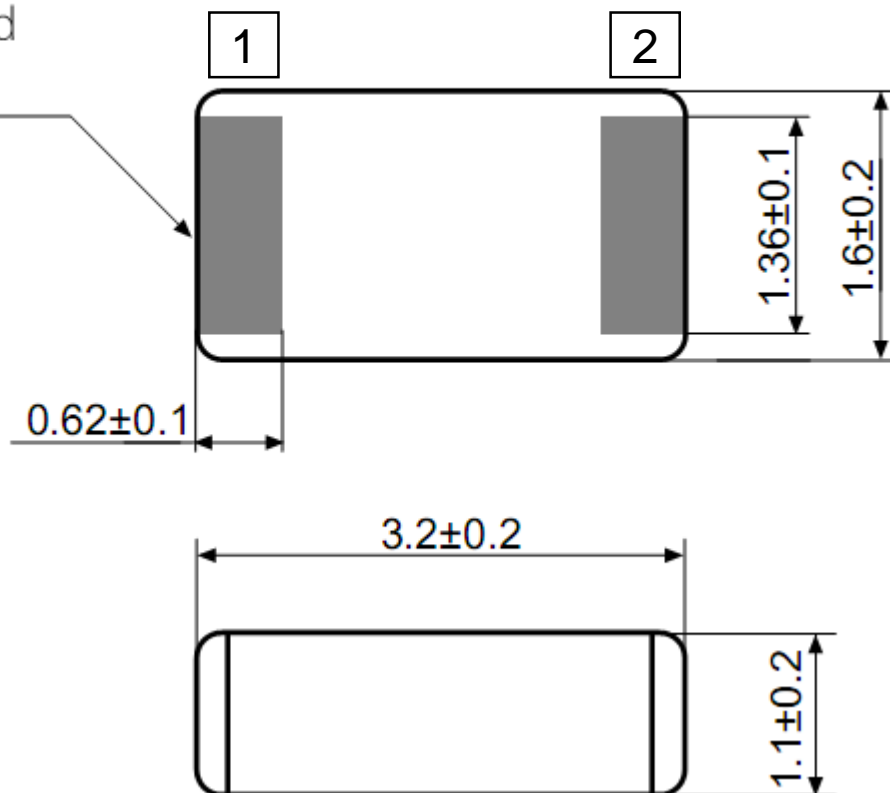
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## MECHANICAL DRAWING

Ag metallization  
contact pad  
area (2x)



### Antenna features

No.	Terminal name	Terminal Dimensions
1	Feed / GND	0.62 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

**Series:** Ceramic Chip Antenna**Description:** 1.575 GHz GNSS Ceramic  
Chip Antenna**PART NUMBER:** W3011**W3011 GPS Antenna PWB Layout**

Ground cleared under antenna, clearance area 4.00 x 4.25 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.

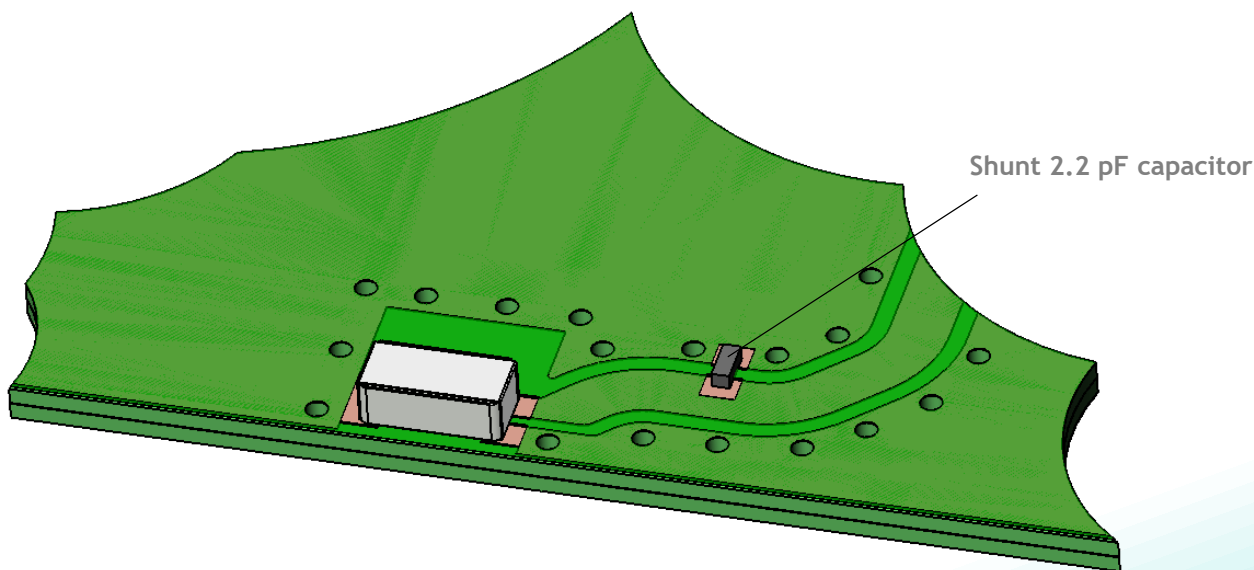
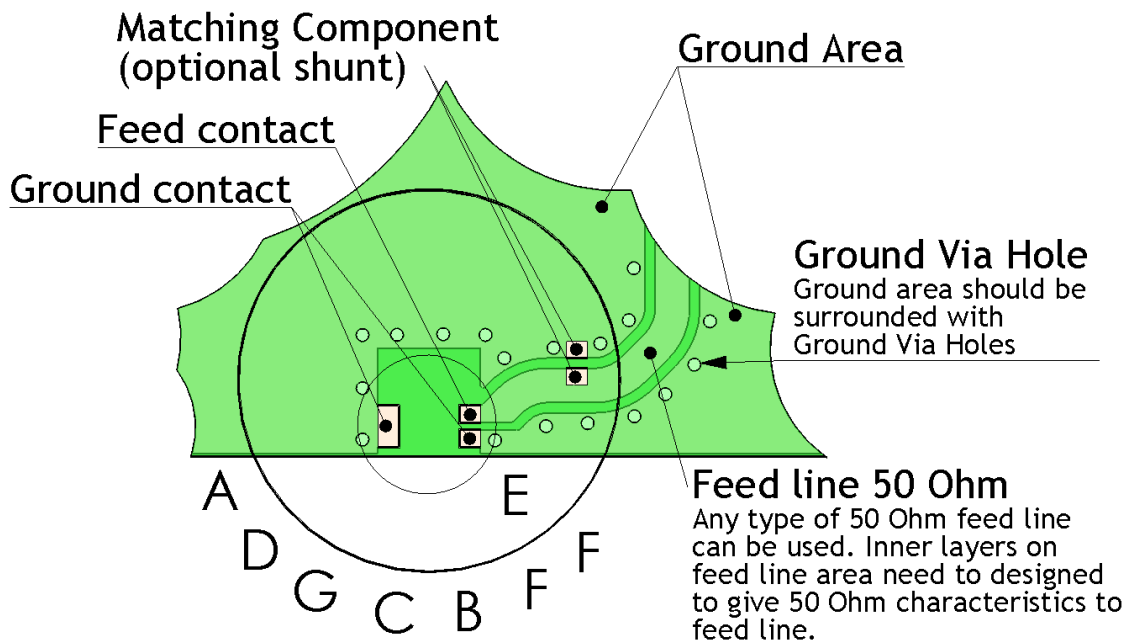
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## PWB layout for W3011 GPS Antenna

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



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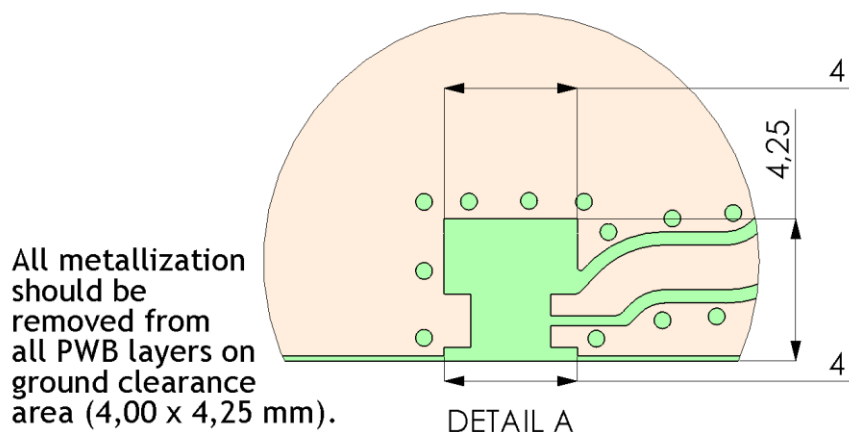
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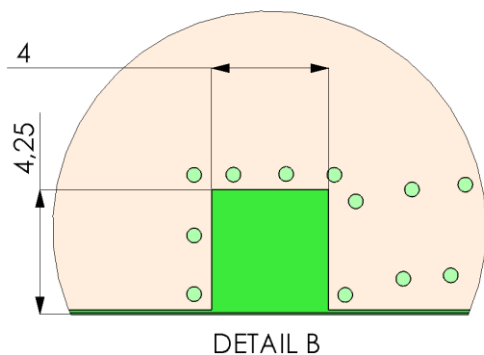
**PART NUMBER:** W3011

Ground clearance area for W3011 GPS Antenna

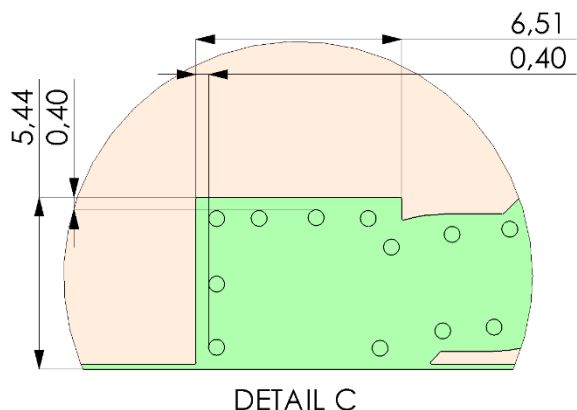
Ground clearance area (4,00 x 4,25 mm)



Opening in bottom/inner ground layers



Opening in other layers (no ground/ RF)



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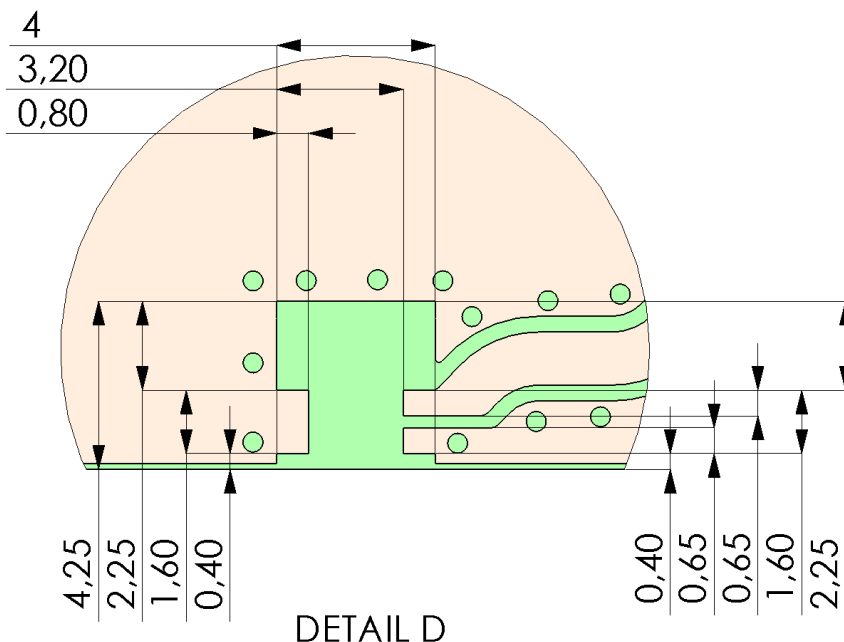
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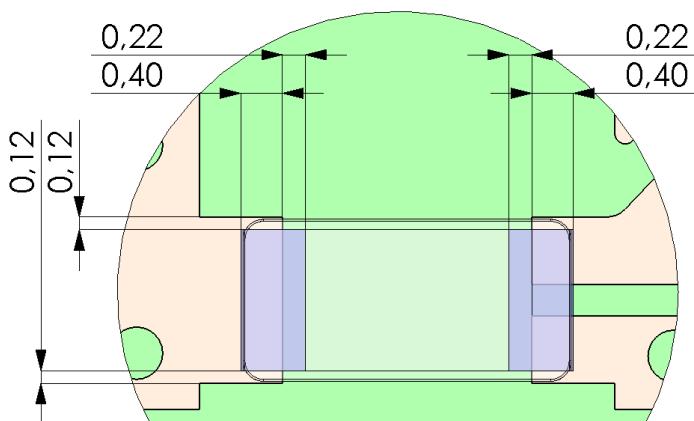
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## PWB pad dimensions and antenna position for W3011 GPS Antenna

**Pad dimensions in top copper**



**Antenna position on PWB layout**



Antenna pads are marked blue

DETAIL E

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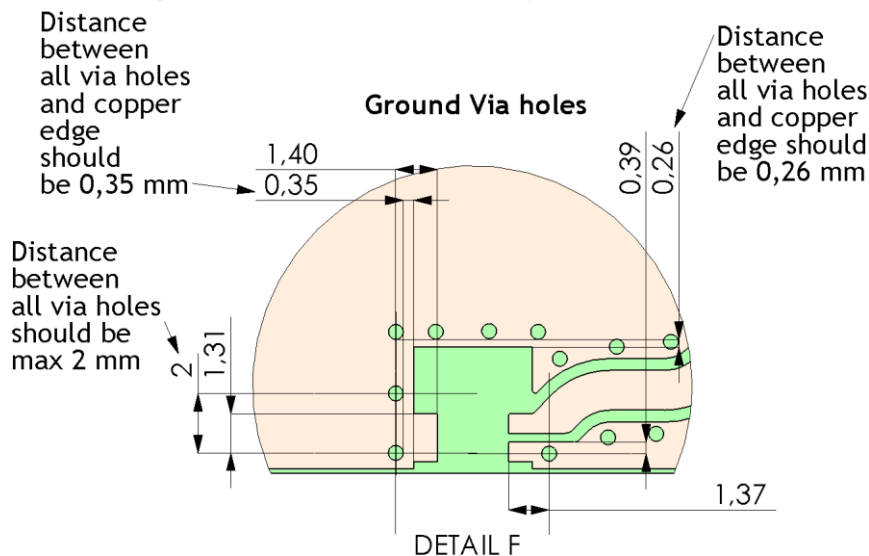
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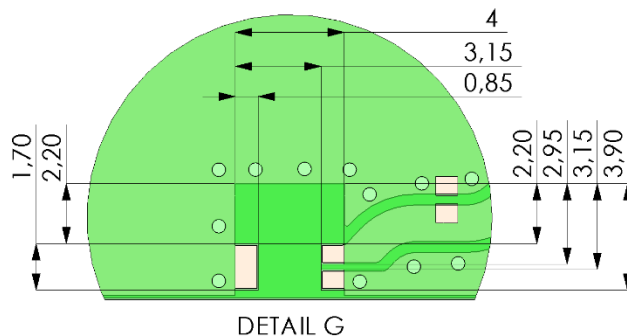
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Typical Ground via hole placement in PWB layout for W3011 GPS Antenna

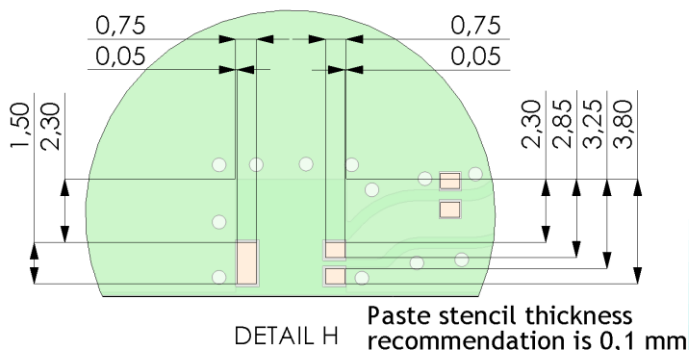


Solder resist opening and paste stencil recommendations for W3011 GPS Antenna

Solder resist opening



Paste stencil recommendation



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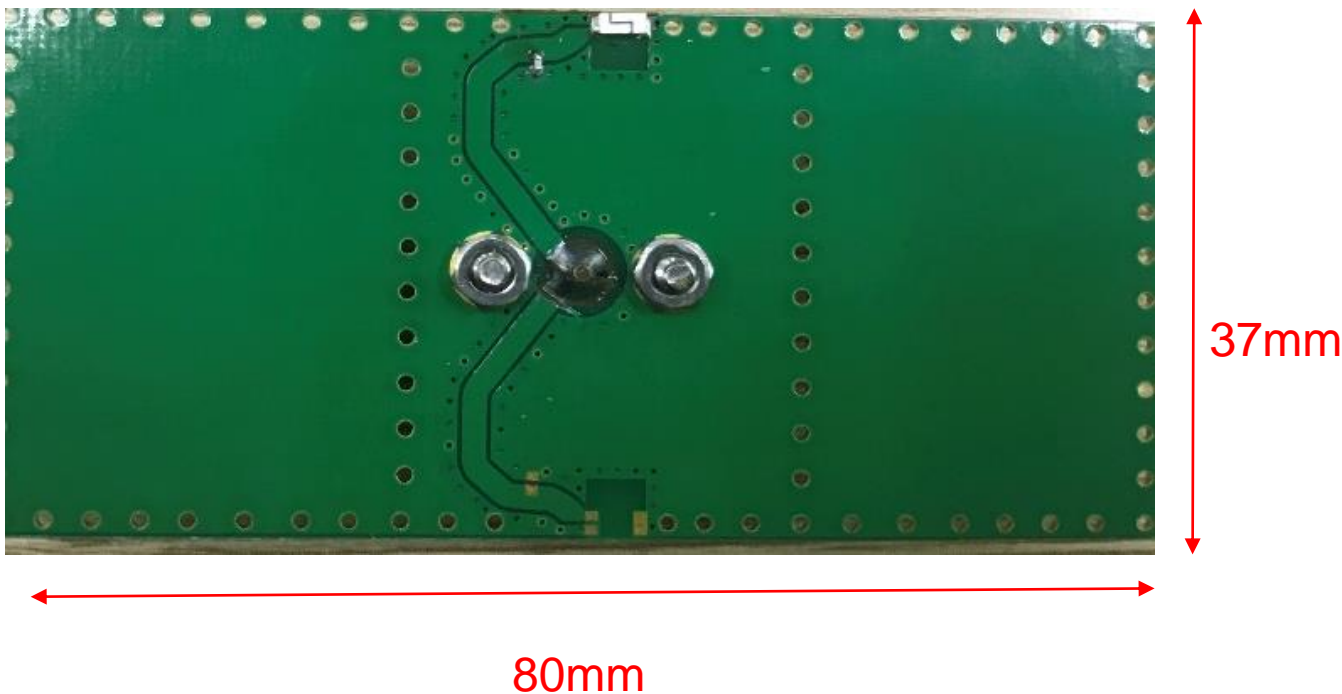
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## TEST SETUP

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



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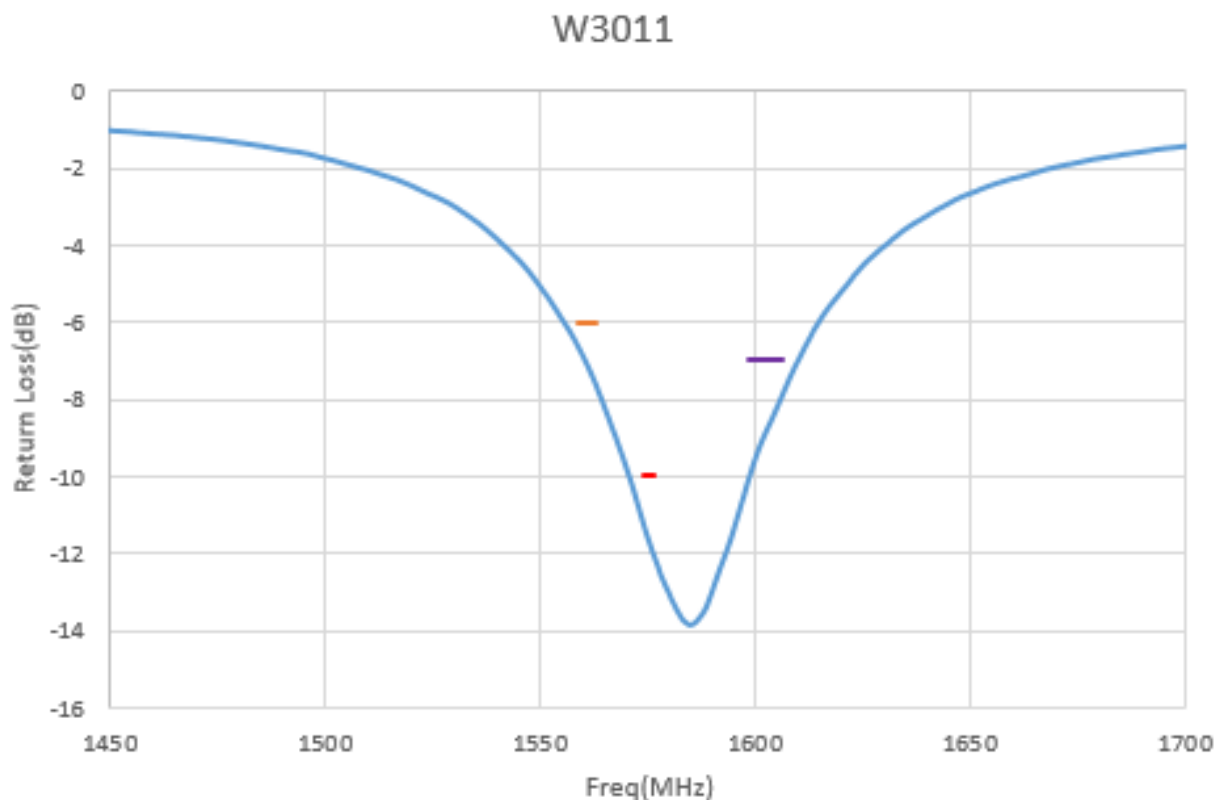
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## CHARTS

### Return Loss vs Frequency



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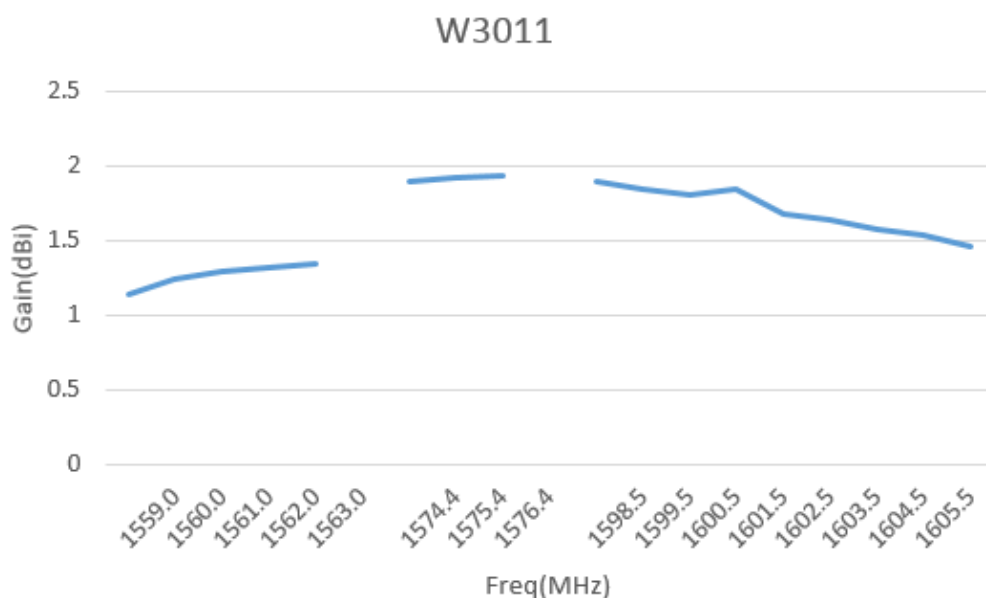
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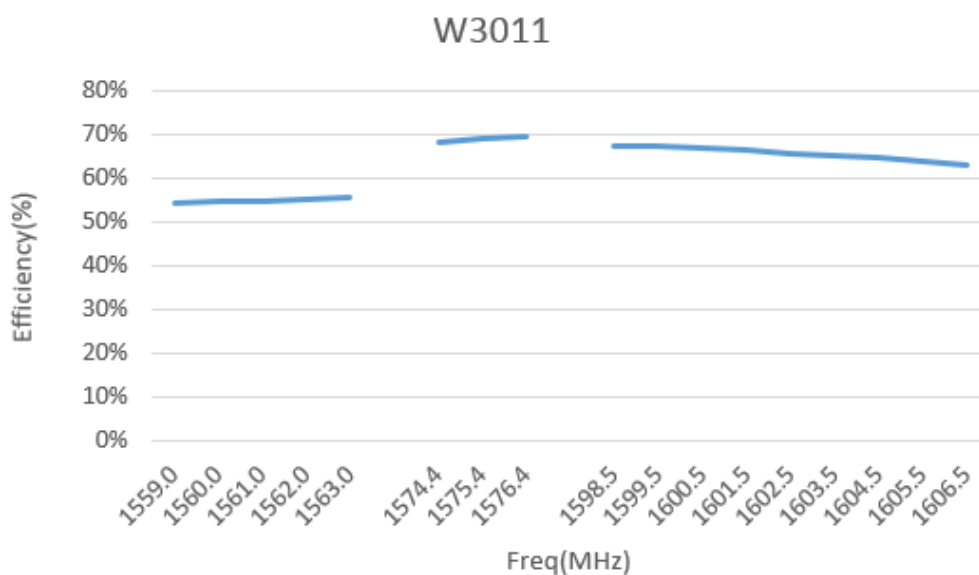
**PART NUMBER:** W3011

## CHARTS

### Gain vs Frequency



### Radiation Efficiency vs Frequency



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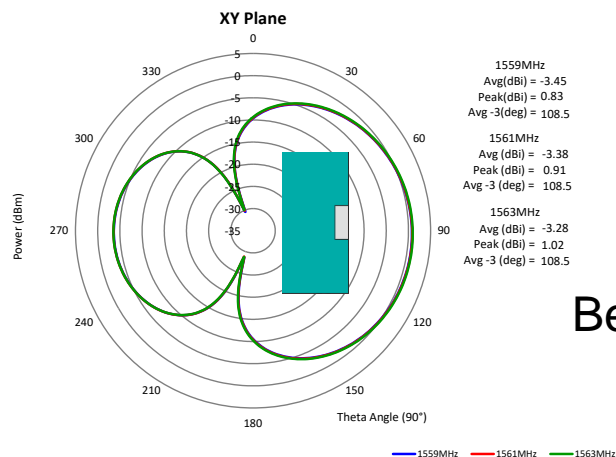
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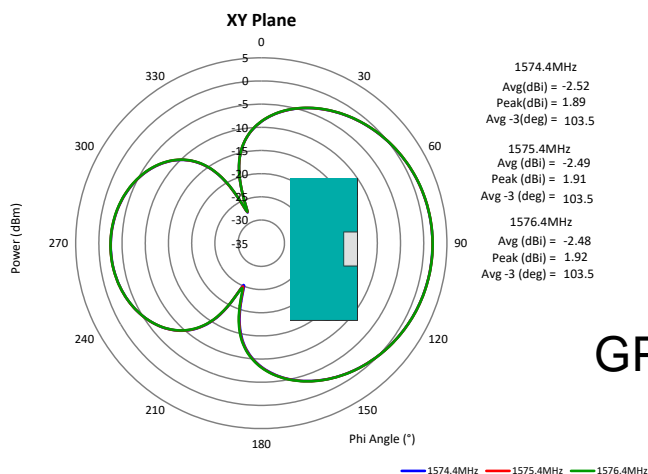
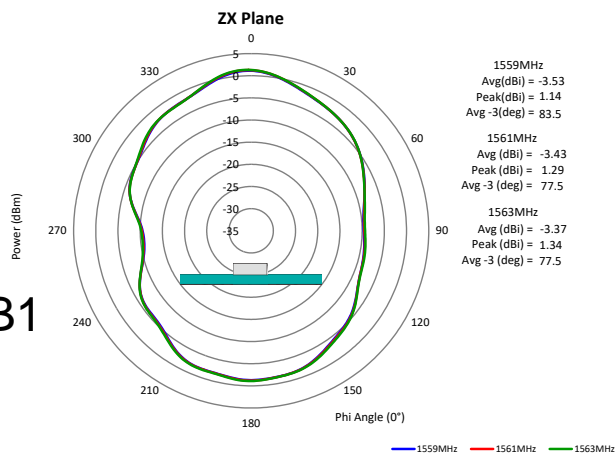
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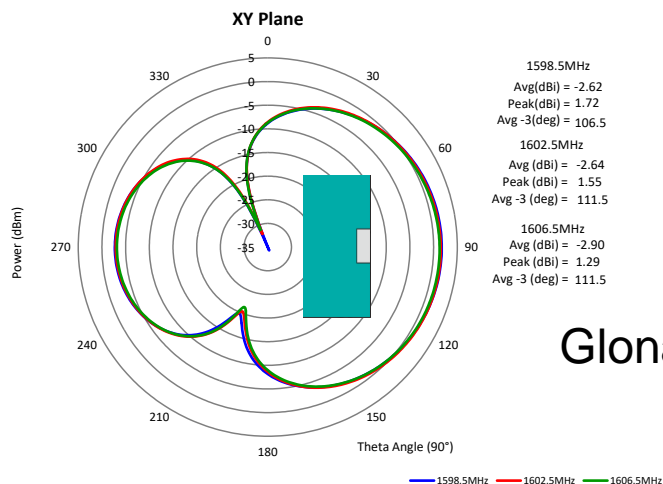
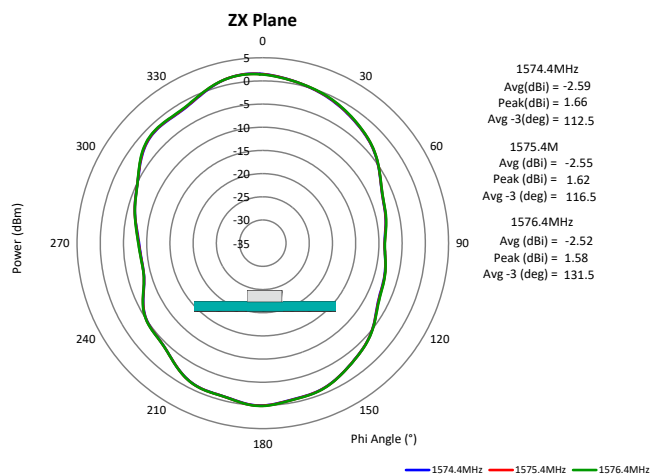
## CHARTS



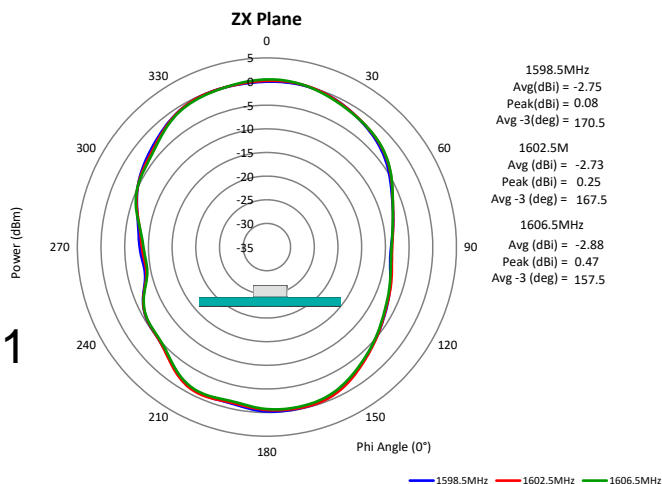
Beidou B1



GPS L1



Glonass L1



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# Description: 1.575 GHz GNSS Ceramic Chip Antenna

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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

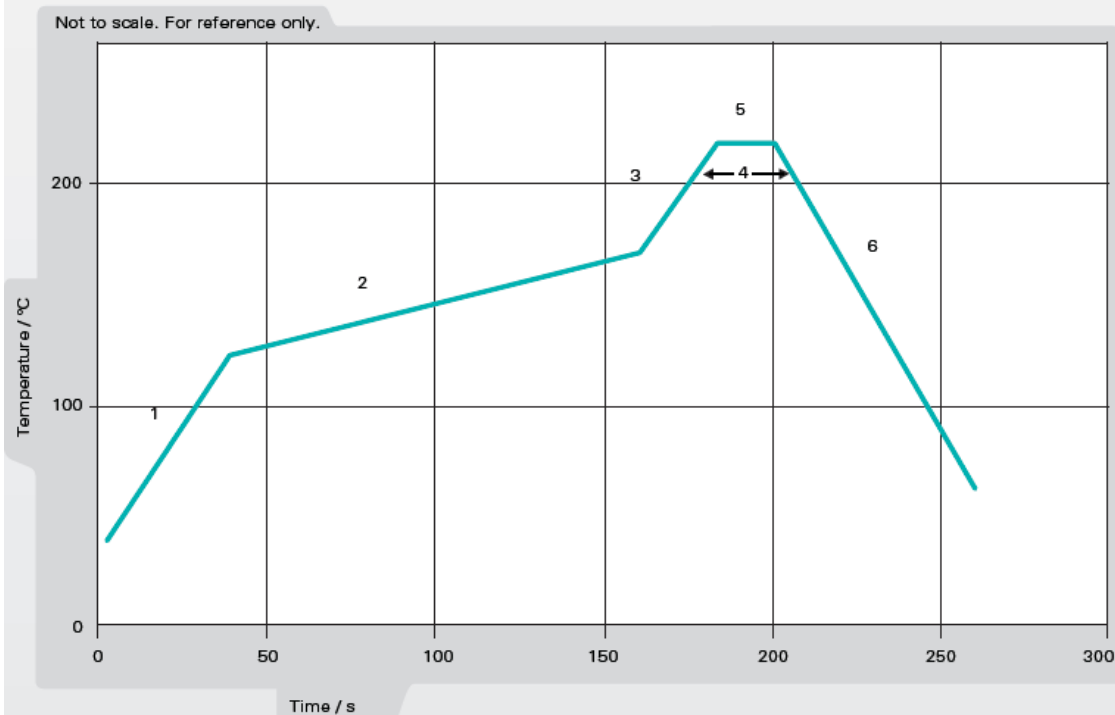


Figure 1. Minimum temperature profile recommendation for reflow soldering process

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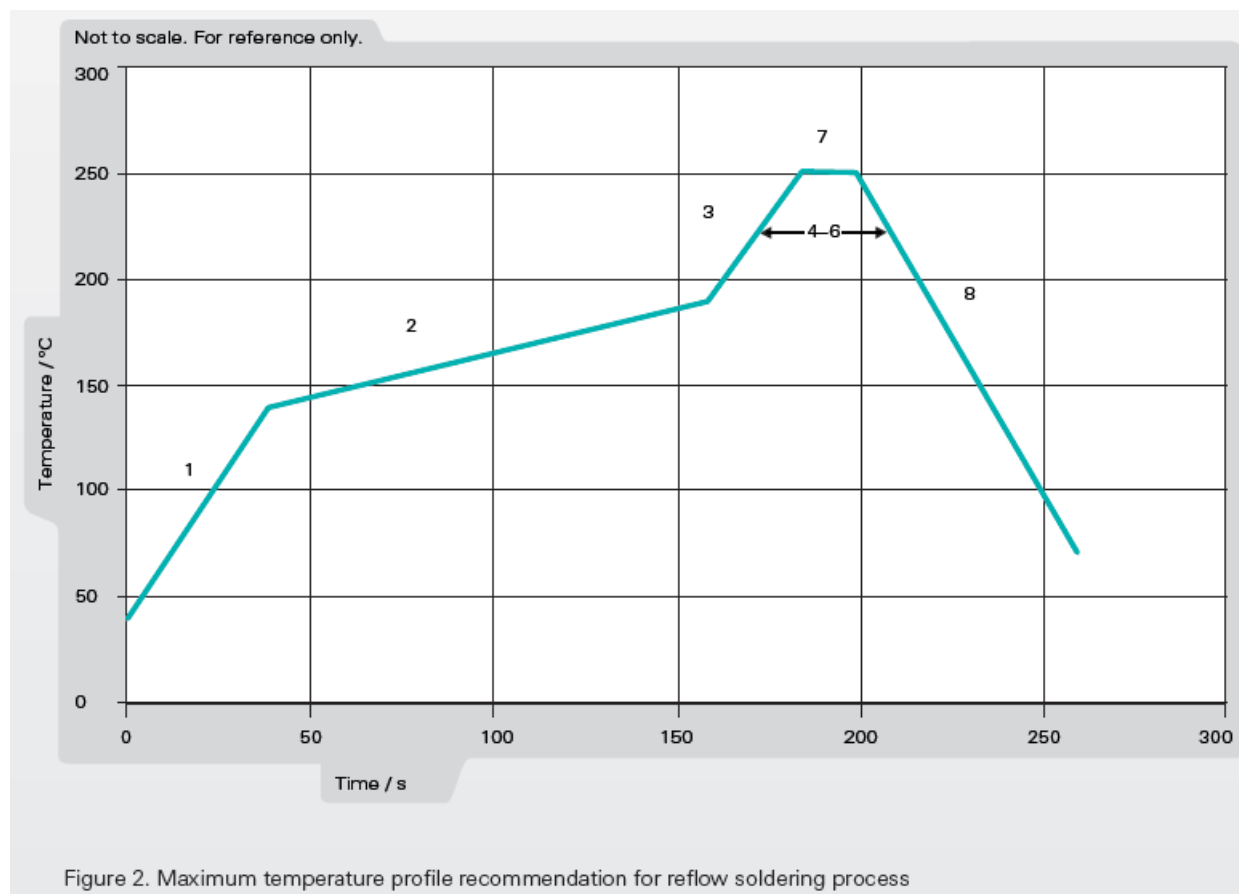
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**Recommendation for reflow soldering process**

	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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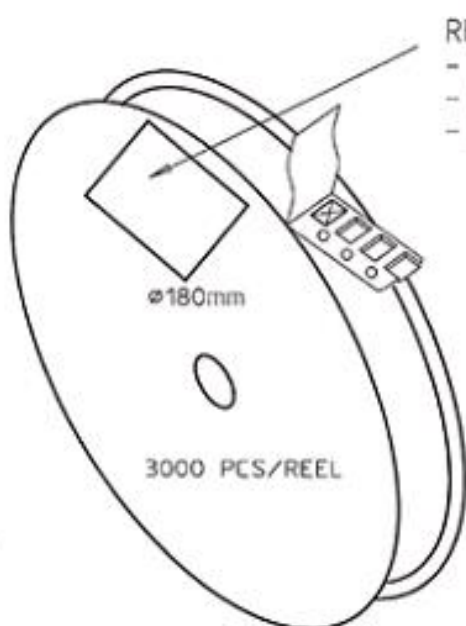
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## PACKAGING

Taping package

3000PCS/Reel

30000PCS/Carton box



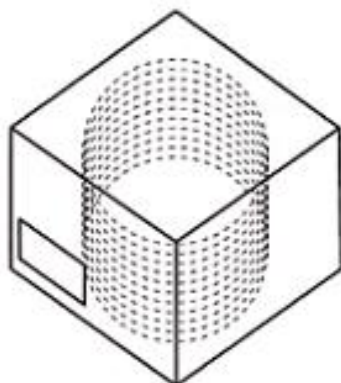
REEL LABEL INFORMATION:  
- TRACEABILITY  
- QUANTITY  
- PRODUCT CODE

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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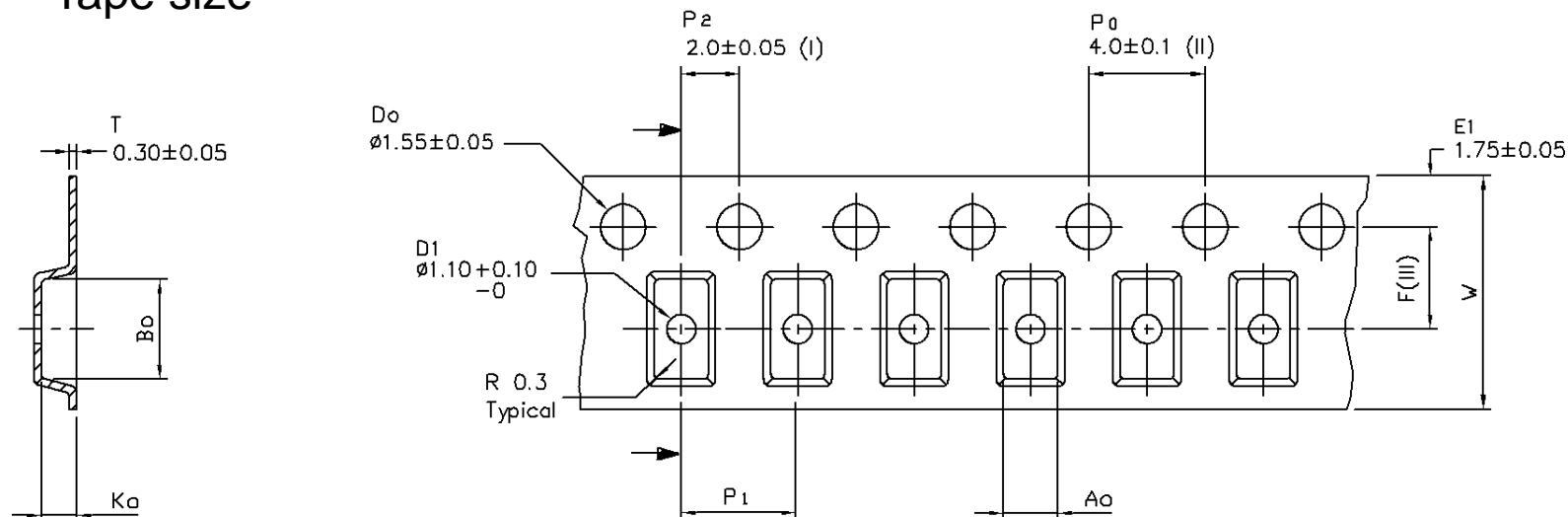
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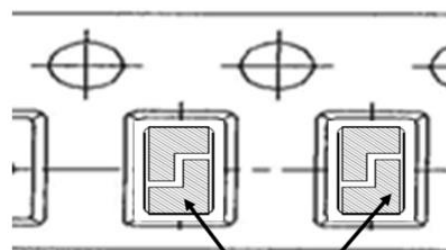
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**PACKAGING**

**Tape size**



$A_0$	1.85	$+/- 0.1$
$B_0$	3.43	$+/- 0.1$
$K_0$	1.22	$+/- 0.1$
$F$	3.50	$+/- 0.05$
$P_1$	4.00	$+/- 0.1$
$W$	8.00	$+/- 0.1$



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

TOP VIEW OF THE CARRIER TAPE

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