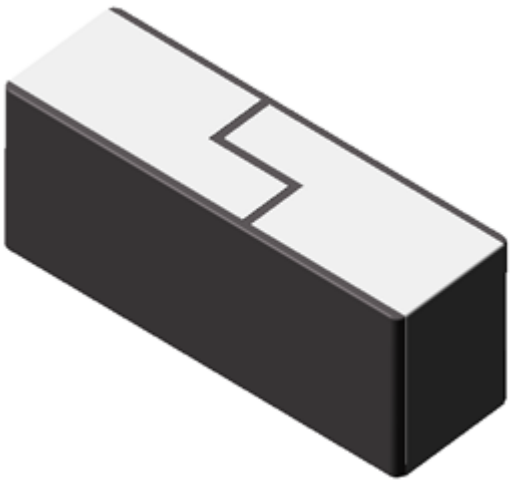
Pulse | LARSEN Antennas
A YAGEO Company

TECHNICAL DATA SHEET

Description: 868MHz Ceramic Chip Antenna

Series: Ceramic Chip Antenna

PART NUMBER: W3013



Features:

- Frequency 866-870 MHz
- Gain 1.5dBi
- Size 10 x 3.2 x 4 mm
- PCB Keep out 10.8 x 8.25 mm
- Polarization Linear
- Radiation pattern Omni

Applications:

- ISM 868MHz Band

All dimensions are in mm / inches

Issue: 2036

RoHS COMPLIANT

For more information:

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Pulse (Suzhou) Wireless Products Co, Inc.
99 Huo Ju Road(#29 Bldg,4th Phase
Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998

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ELECTRICAL SPECIFICATIONS

Antenna Type	Chip antenna
Frequency	868-870MHz
Nominal Impedance	50 Ω
Return Loss (Max)	-10dB
Radiation Pattern	Omni
Gain(Min)	1.5 dBi
Efficiency(Min)	68 %
Polarization	Vertical
Power Withstanding	3W

MECHANICAL SPECIFICATIONS

Compact size	10 x 3.2 x 4mm
Weight	0.6g
Fixing system	SMT
MSL(MOISTURE SENSITIVITY LEVEL)	1

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-40 ~ +85° C
Storage Temperature	-10 ~ +30° C
RoHS Compliant	Yes

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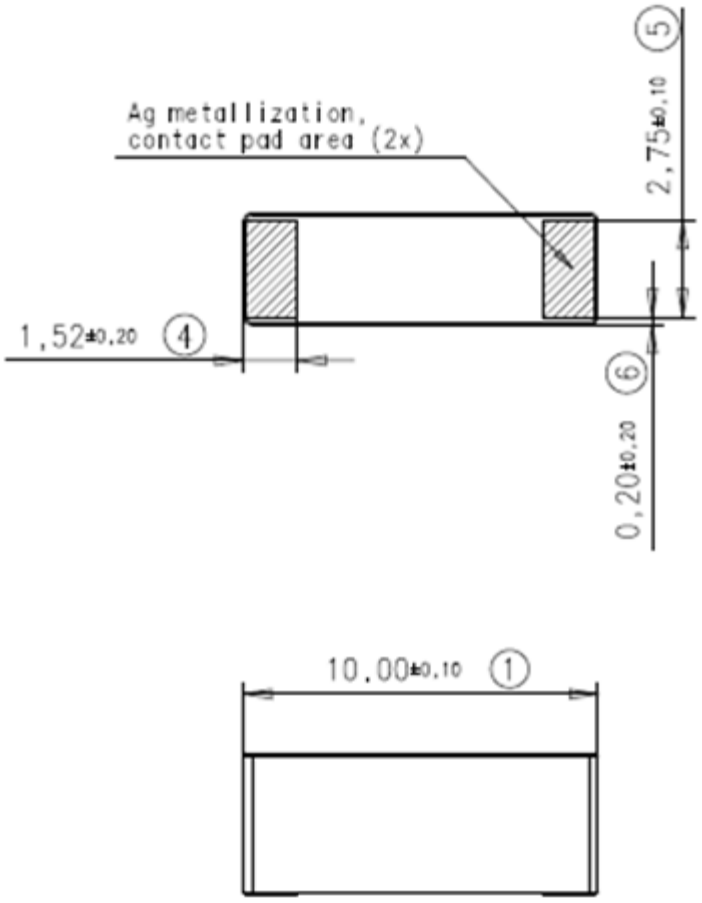
MECHANICAL DRAWING



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		

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W3011 GPS Antenna PWB Layout

W3013 Antenna PWB Layout Specifications

Ground cleared under antenna, clearance area 10.80 x 8.25 mm

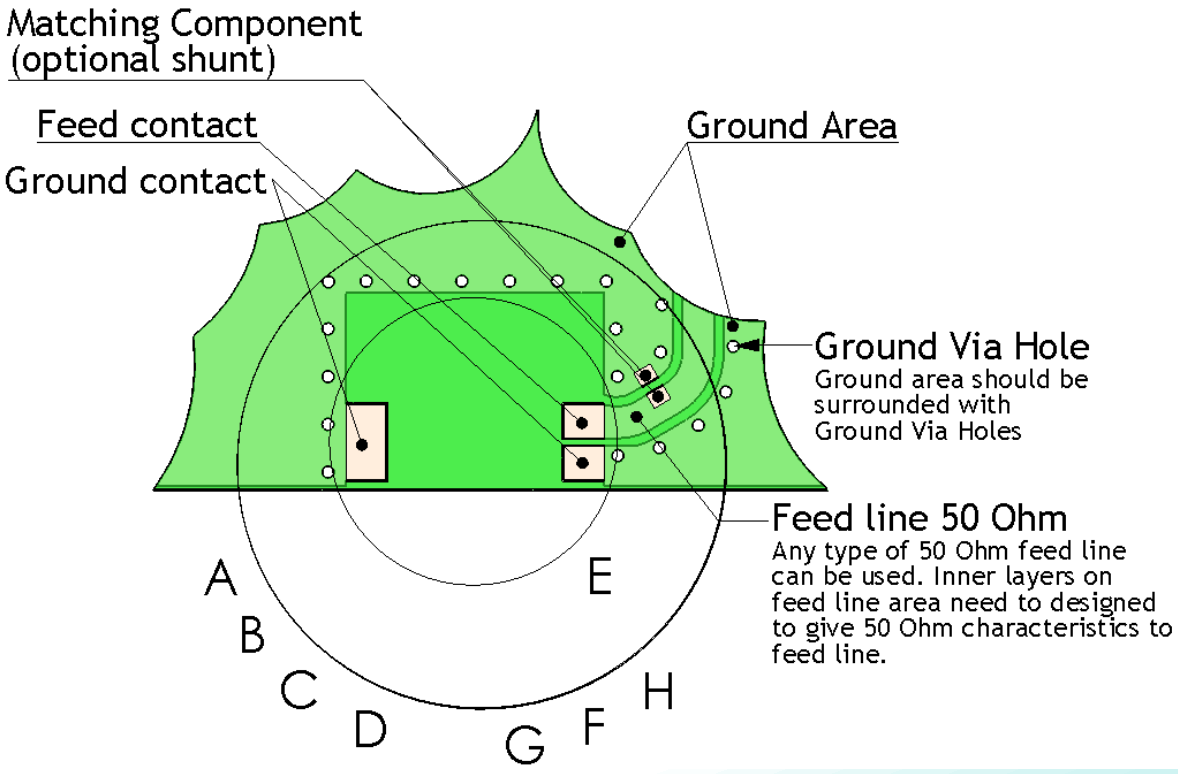
Matching and tuning component values depend on application and surrounding mechanics / materials.

Feed line should be designed to match 50 Ω 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 W3013 Antenna

Note: All dimensions are in metric system.



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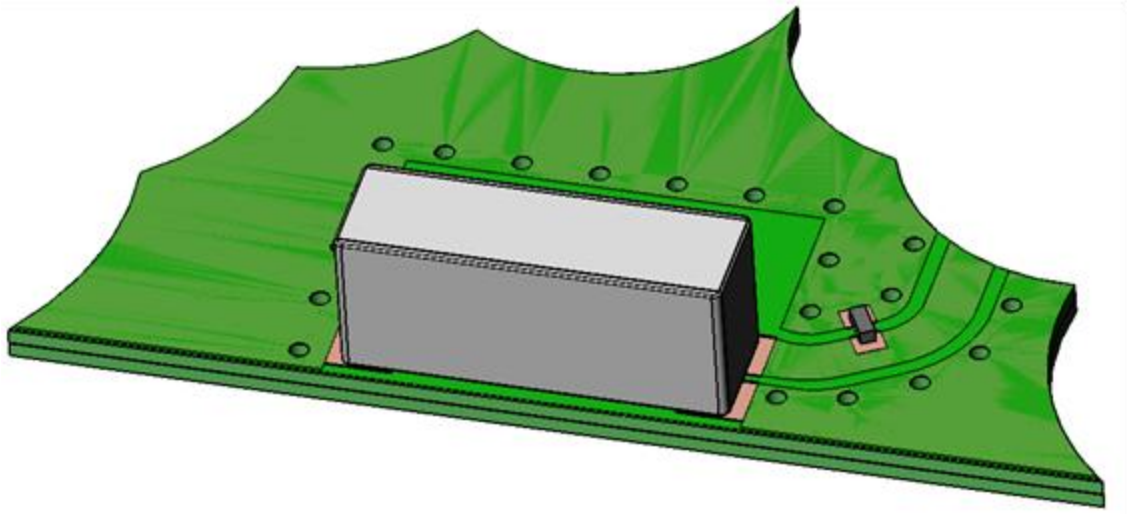
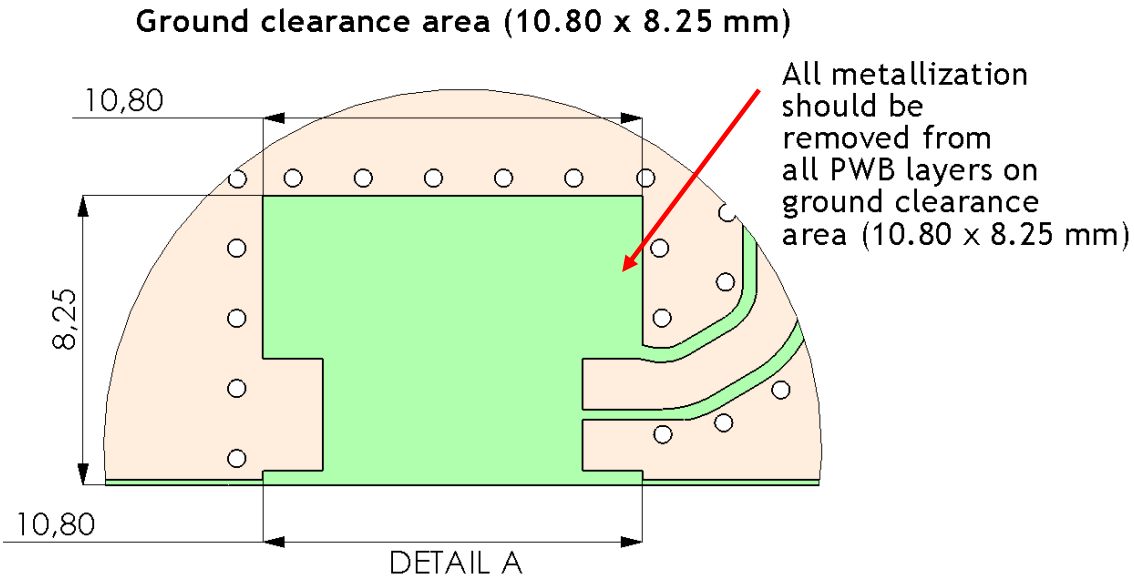


Ground clearance area for W3013 Antenna



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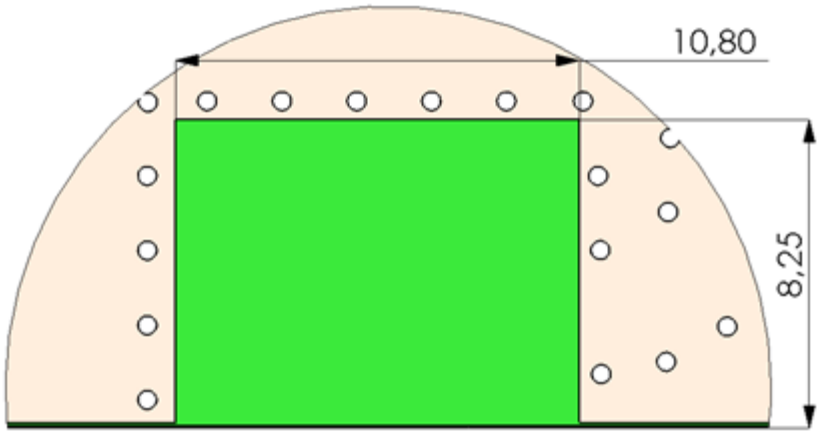
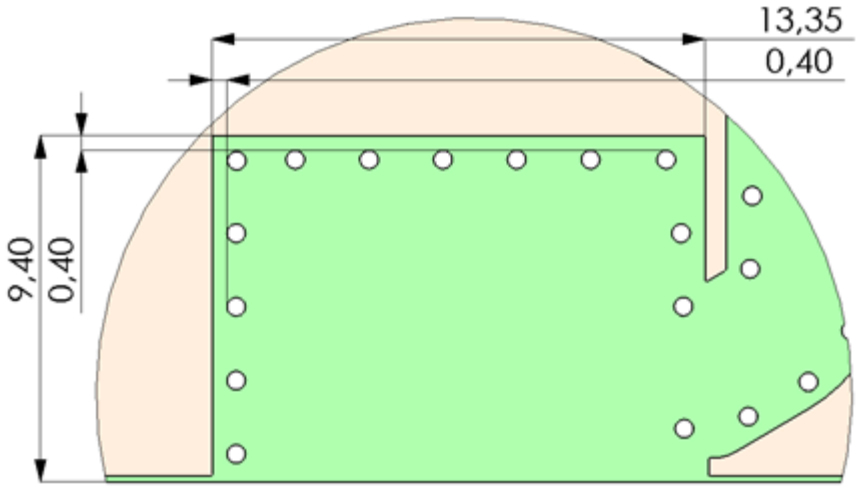
Opening in bottom/inner ground layers



DETAIL B

Opening in other layers (no ground/ RF)



DETAIL C

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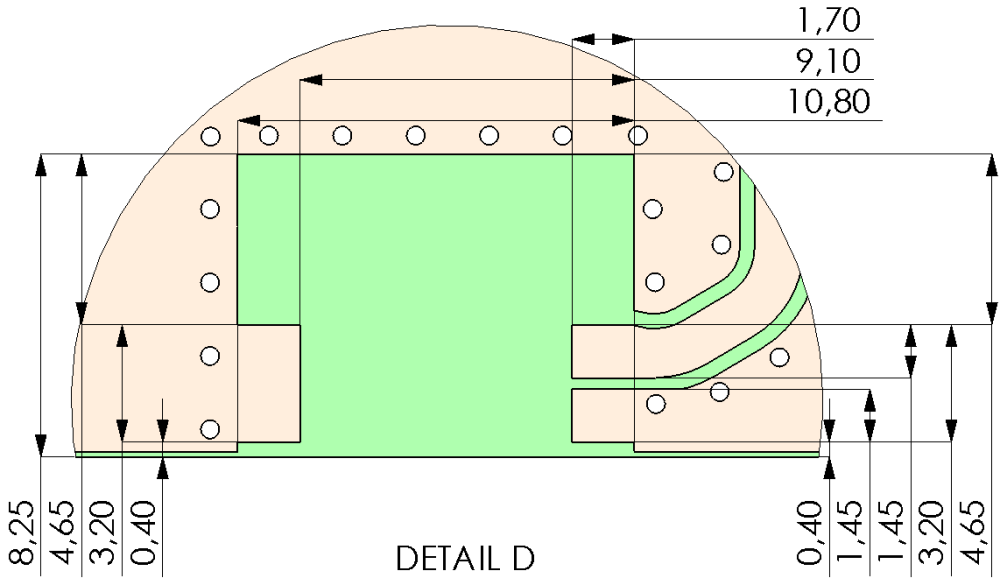
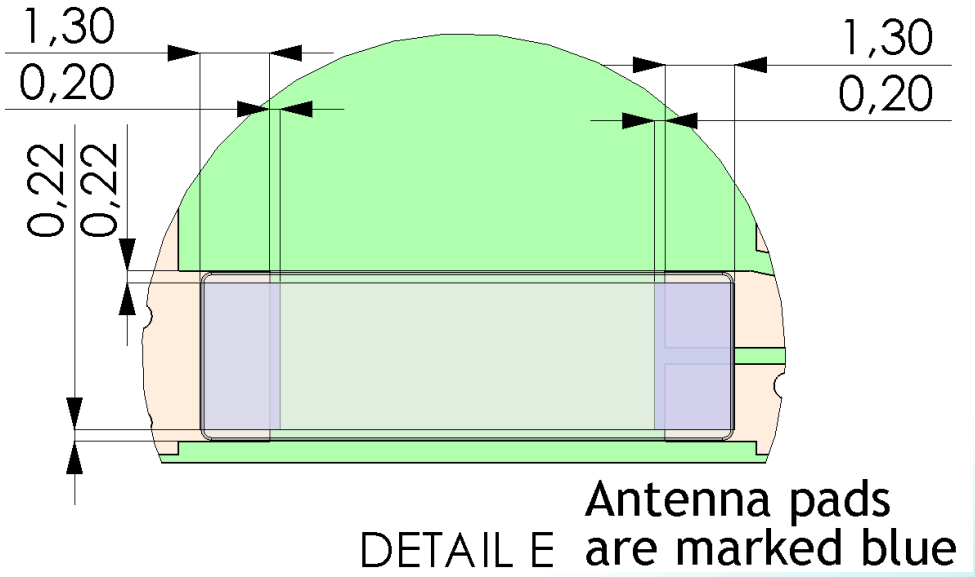
PART NUMBER: W3013

PWB pad dimensions and antenna position for W3013 Antenna

Pad dimensions in top copper



Antenna position on PWB layout



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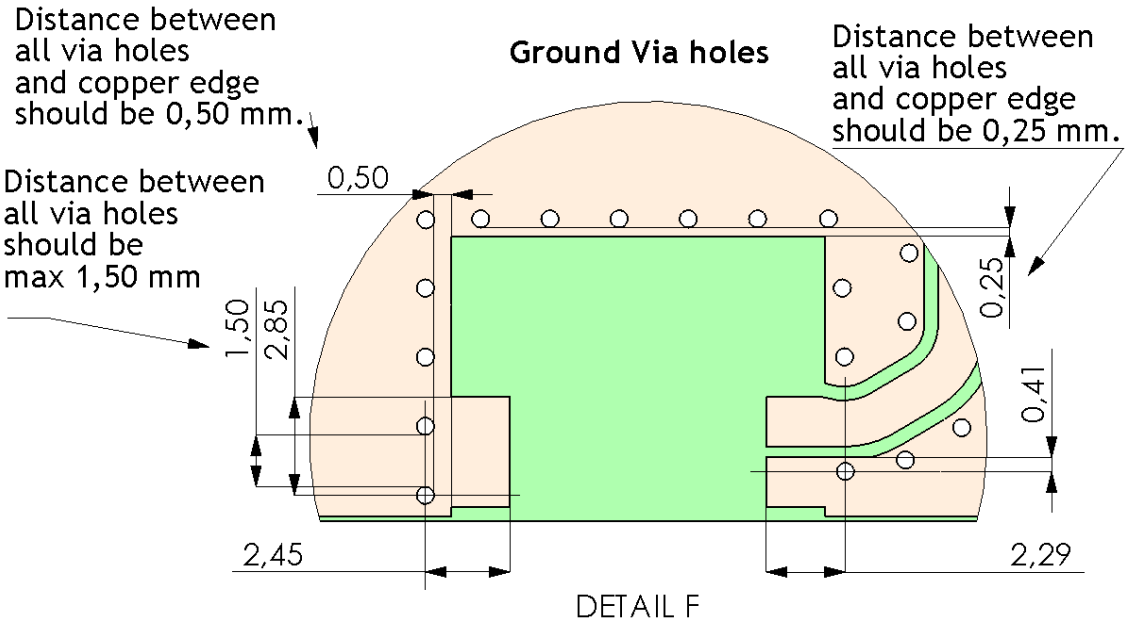
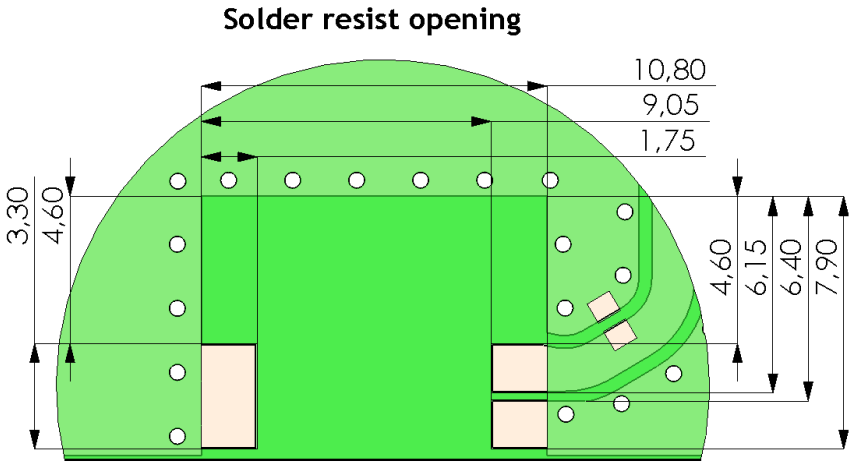
Typical ground via hole placement in PWB layout for W3013 Antenna



DETAIL F

Solder resist opening and Paste stencil recommendation for W3031 Antenna



DETAIL G

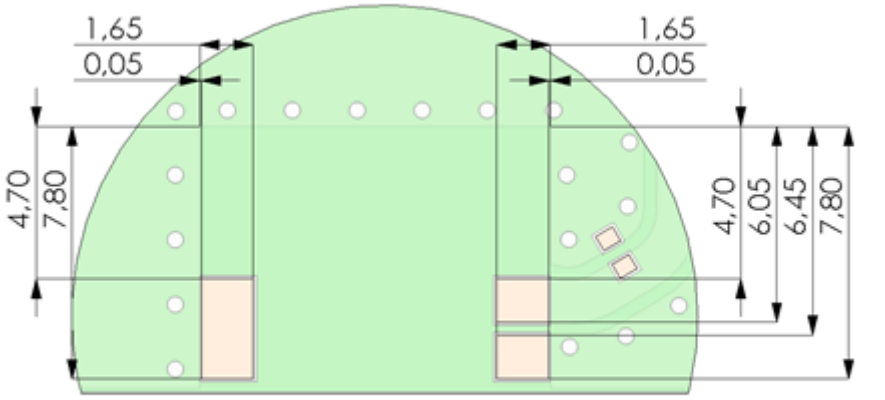
RoHS COMPLIANT

Description: 868MHz Ceramic Chip Antenna

Series: Ceramic Chip Antenna

PART NUMBER: W3013

Paste stencil recommendation



Paste stencil thickness recommendation is 0,1 mm

DETAIL H

RoHS COMPLIANT

Description: 868MHz Ceramic Chip Antenna

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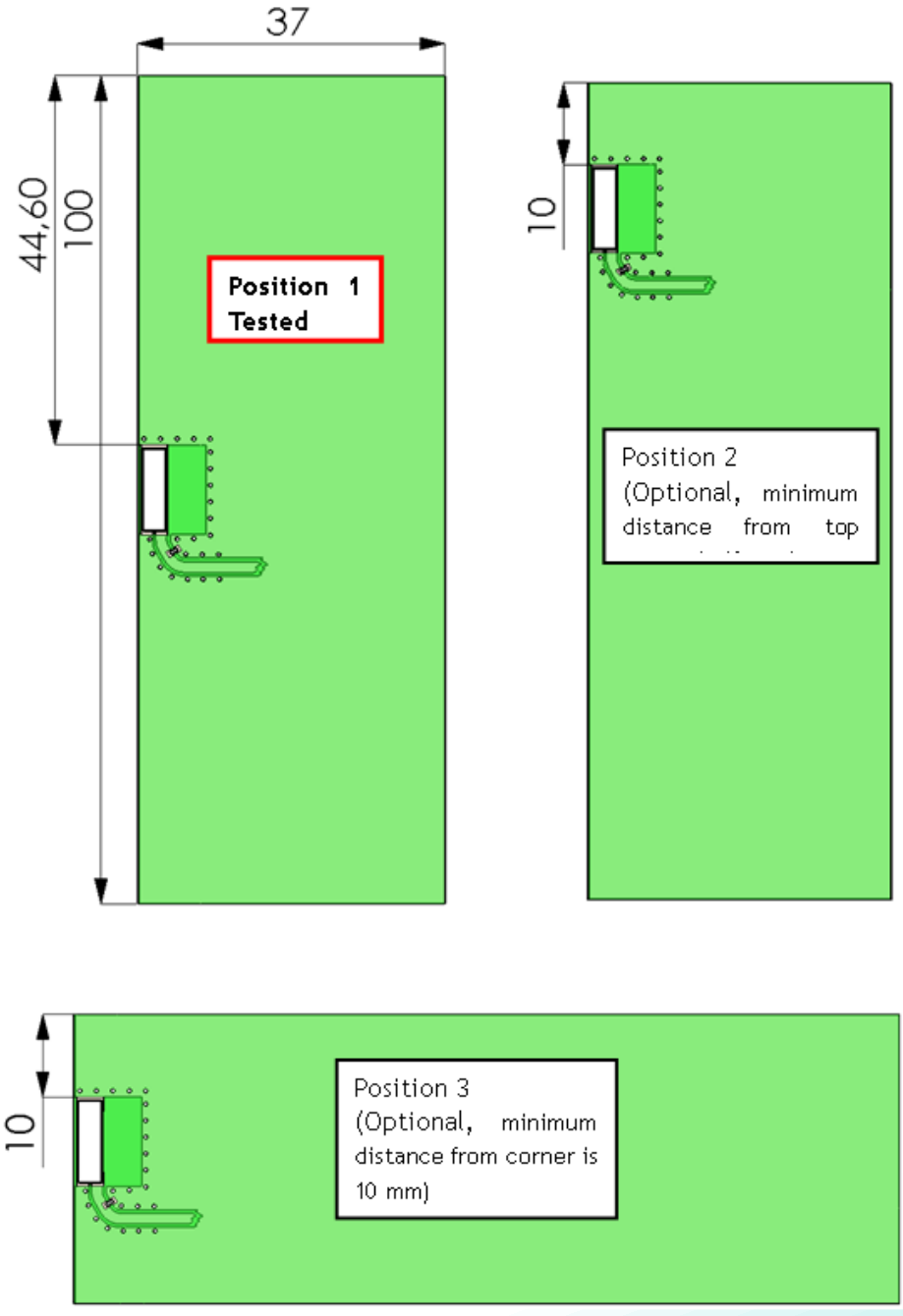
Recommended antenna position on PWB for W3013 Antenna

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)



RoHS COMPLIANT

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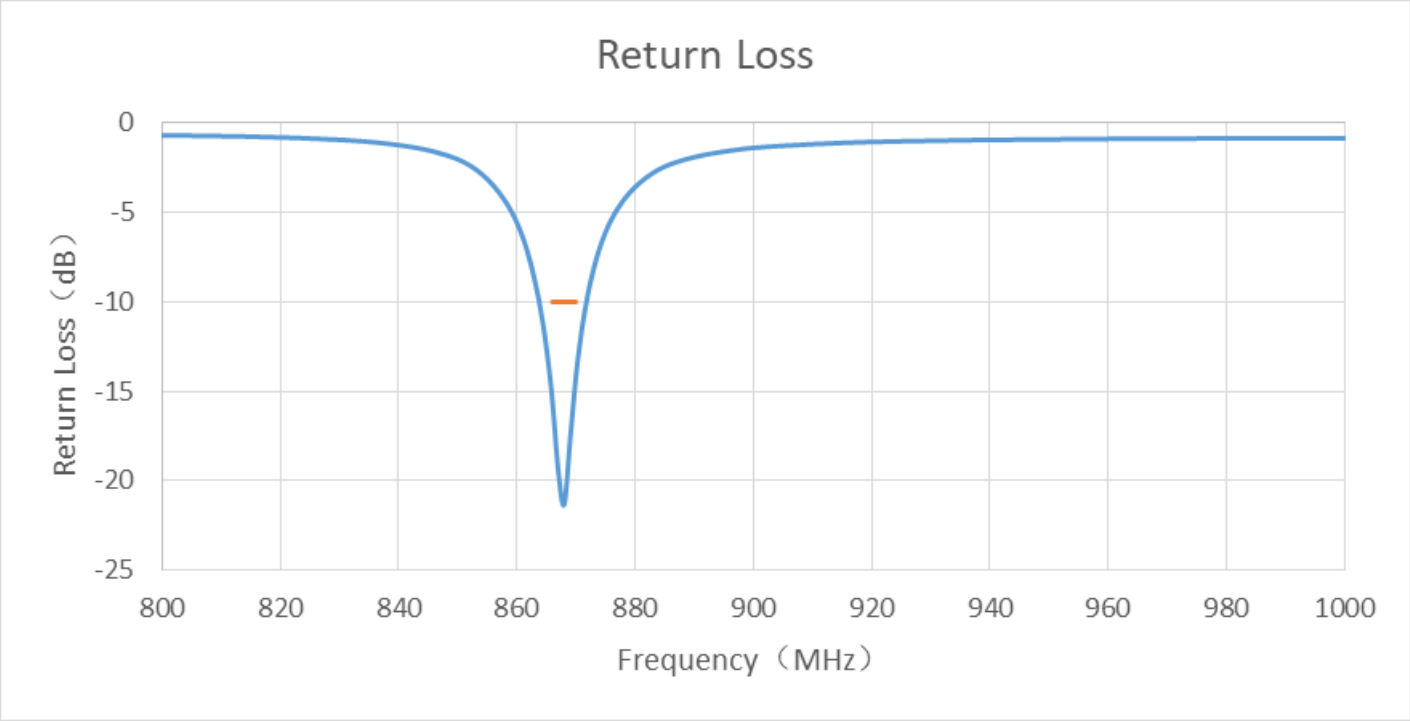
GHARTS

Typical Electrical Characteristics (T=25 °C)

Measured on the 100 x 37mm test board with 3 pF matching capasitor.

Typical Return Loss S11/ impedance



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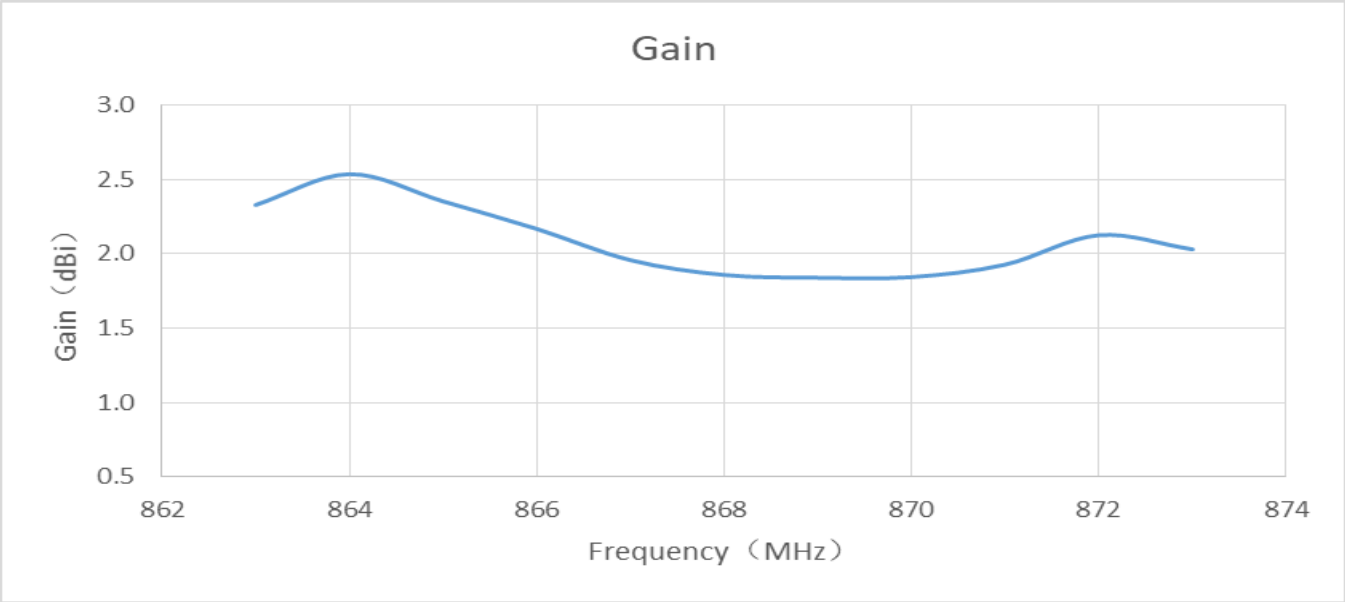
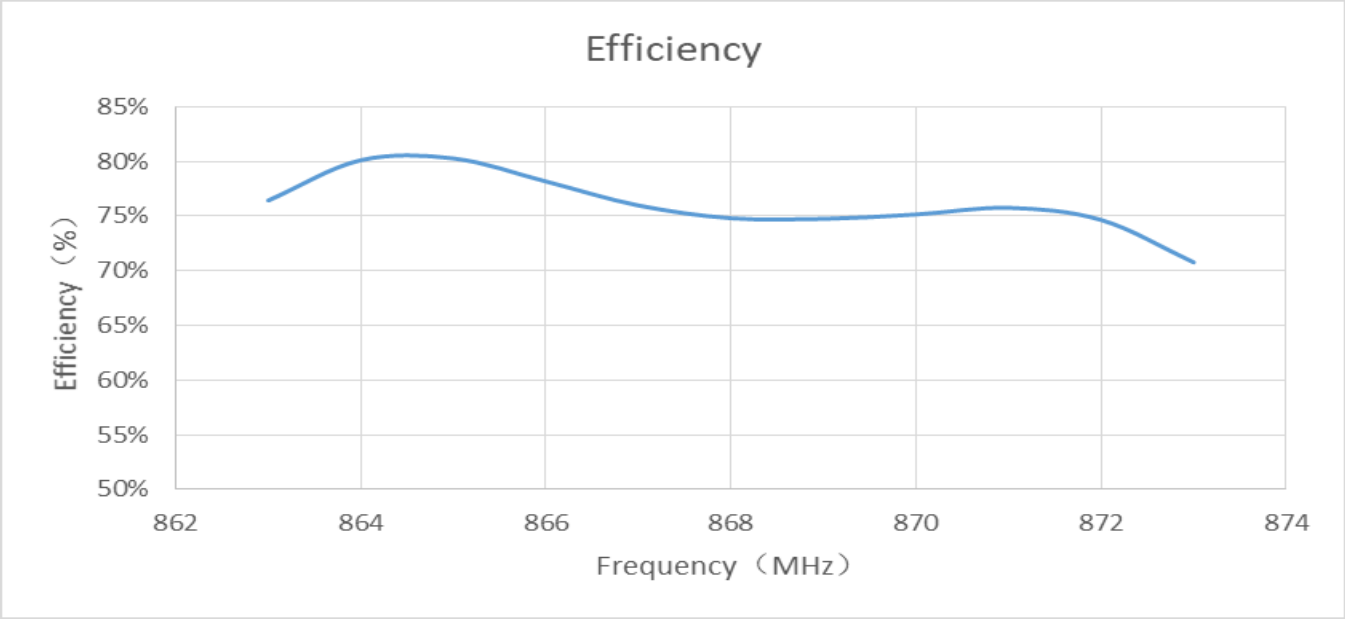
PART NUMBER: W3013

CHARTS

Gain



Radiation Efficiency



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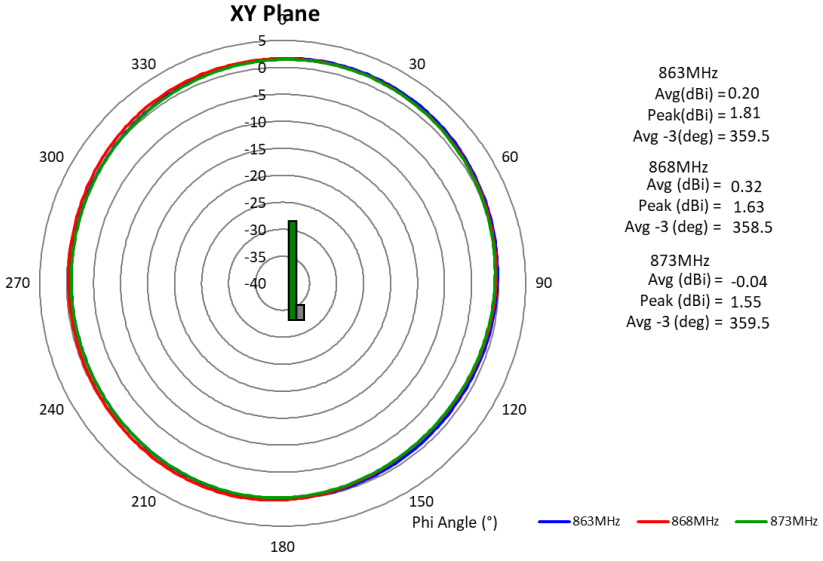
CHARTS

XY Plane

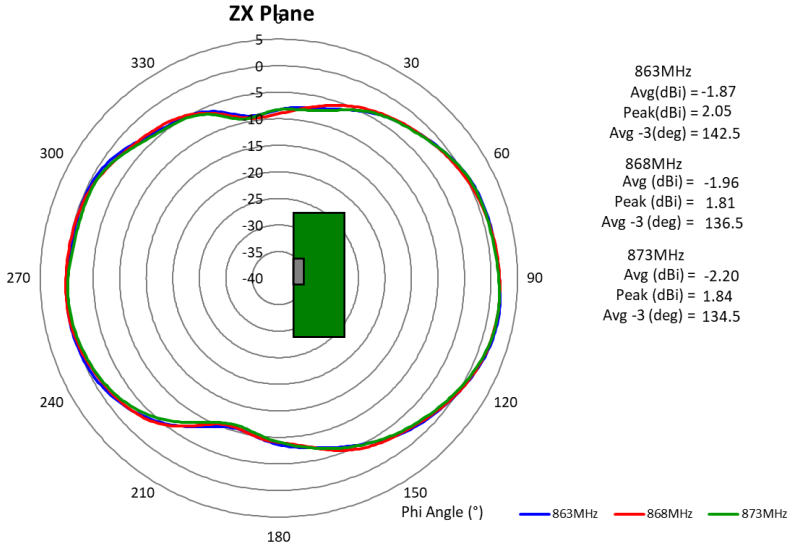


863MHz
Avg(dBi) = 0.20
Peak(dBi) = 1.81
Avg -3(deg) = 359.5

868MHz
Avg (dBi) = 0.32
Peak (dBi) = 1.63
Avg -3 (deg) = 358.5

873MHz
Avg (dBi) = -0.04
Peak (dBi) = 1.55
Avg -3 (deg) = 359.5

ZX Plane

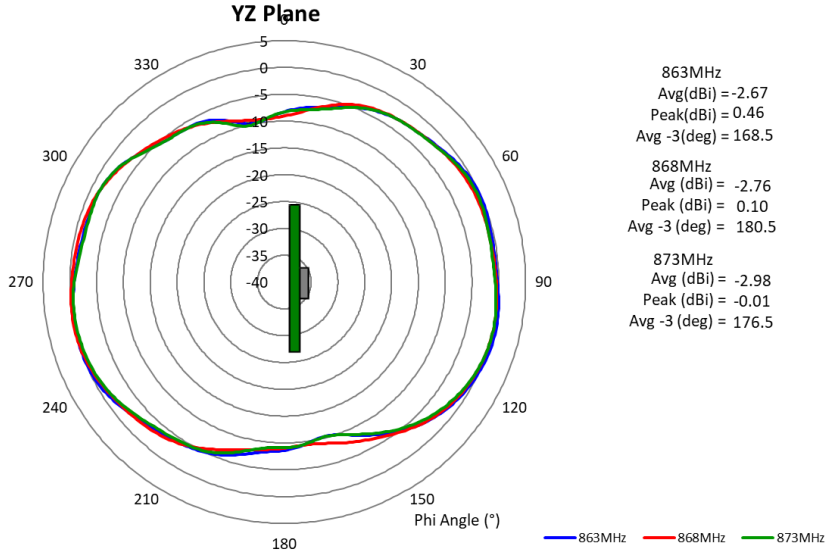


863MHz
Avg(dBi) = -1.87
Peak(dBi) = 2.05
Avg -3(deg) = 142.5

868MHz
Avg (dBi) = -1.96
Peak (dBi) = 1.81
Avg -3 (deg) = 136.5

873MHz
Avg (dBi) = -2.20
Peak (dBi) = 1.84
Avg -3 (deg) = 134.5

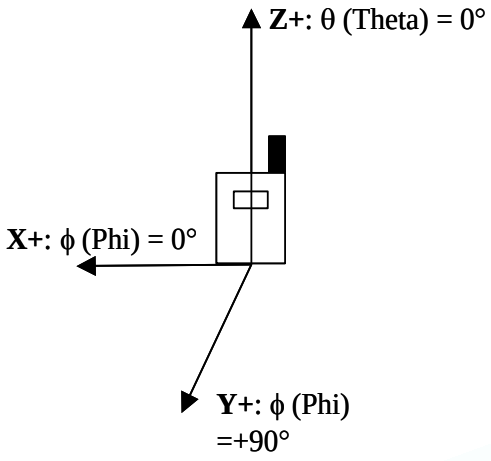
YZ Plane



863MHz
Avg(dBi) = -2.67
Peak(dBi) = 0.46
Avg -3(deg) = 168.5

868MHz
Avg (dBi) = -2.76
Peak (dBi) = 0.10
Avg -3 (deg) = 180.5

873MHz
Avg (dBi) = -2.98
Peak (dBi) = -0.01
Avg -3 (deg) = 176.5



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Recommendations for ceramic chip antenna storage

Storage time

Products should be used within 6 months from the day of manufacturers packaging even when they are stored under below mentioned conditions. Longer storage period may decrease the component solderability.

Storage environmental conditions

To maintain solderability of Pulse ceramic products care must be taken to control the storage and use conditions:

- Do not store or use products in a corrosive atmosphere, especially where chloride, sulphur or sulfide, alkali or acid salts exist in the air. Corrosive gases may cause oxidation of electrodes and reduce solderability
- Keep temperature and humidity stabile and do not exceed the below mentioned minimum and maximum conditions: Temperature: -10 to +30 Deg C Humidity: below 60% RH
- Do not store the products under direct sun light.

It is recommended to keep the products in manufacturers packing (tape&reel) until the time of assembly and soldering process. Air tight vacuum package is recommended in the conditions where it is know to be some corrosive gases.

Handling

Do not touch the components with bare hands. Protective gloves must be used to prevent contamination of terminals which may cause reduced solderability. Do not touch or damage the silver plated surface by any sharp objects. Soft materials (plastic, wood etc.) must be used if tweezers or other tools are used to pick the components. Avoid any excess mechanical shock or vibration during storage and handling.

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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

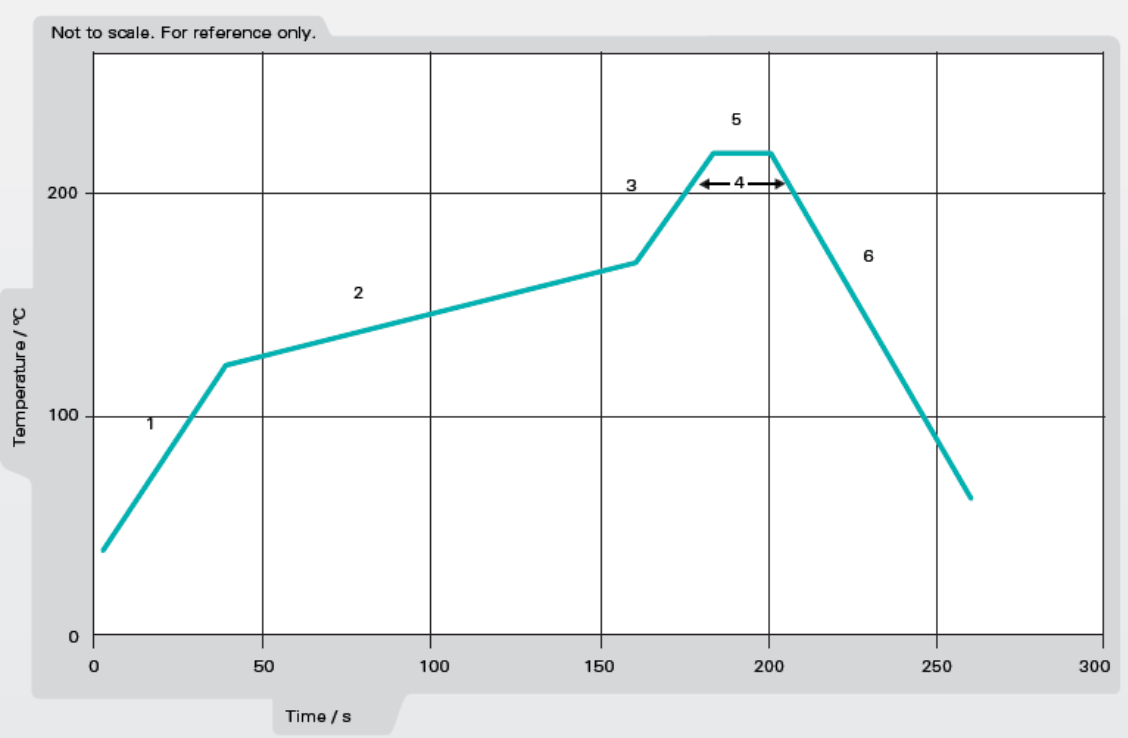

Figure 1. Minimum temperature profile recommendation for reflow soldering process

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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

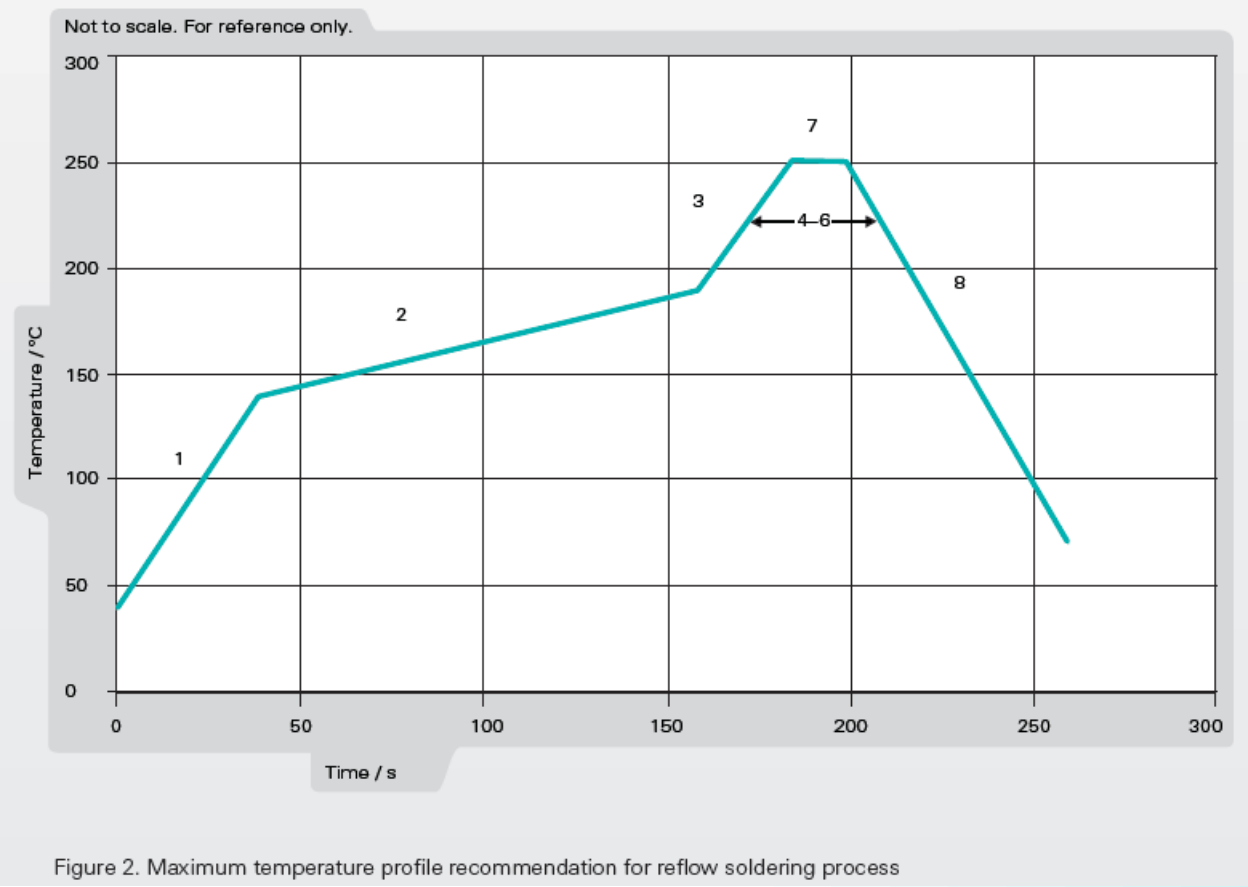

Figure 2. Maximum temperature profile recommendation for reflow soldering process

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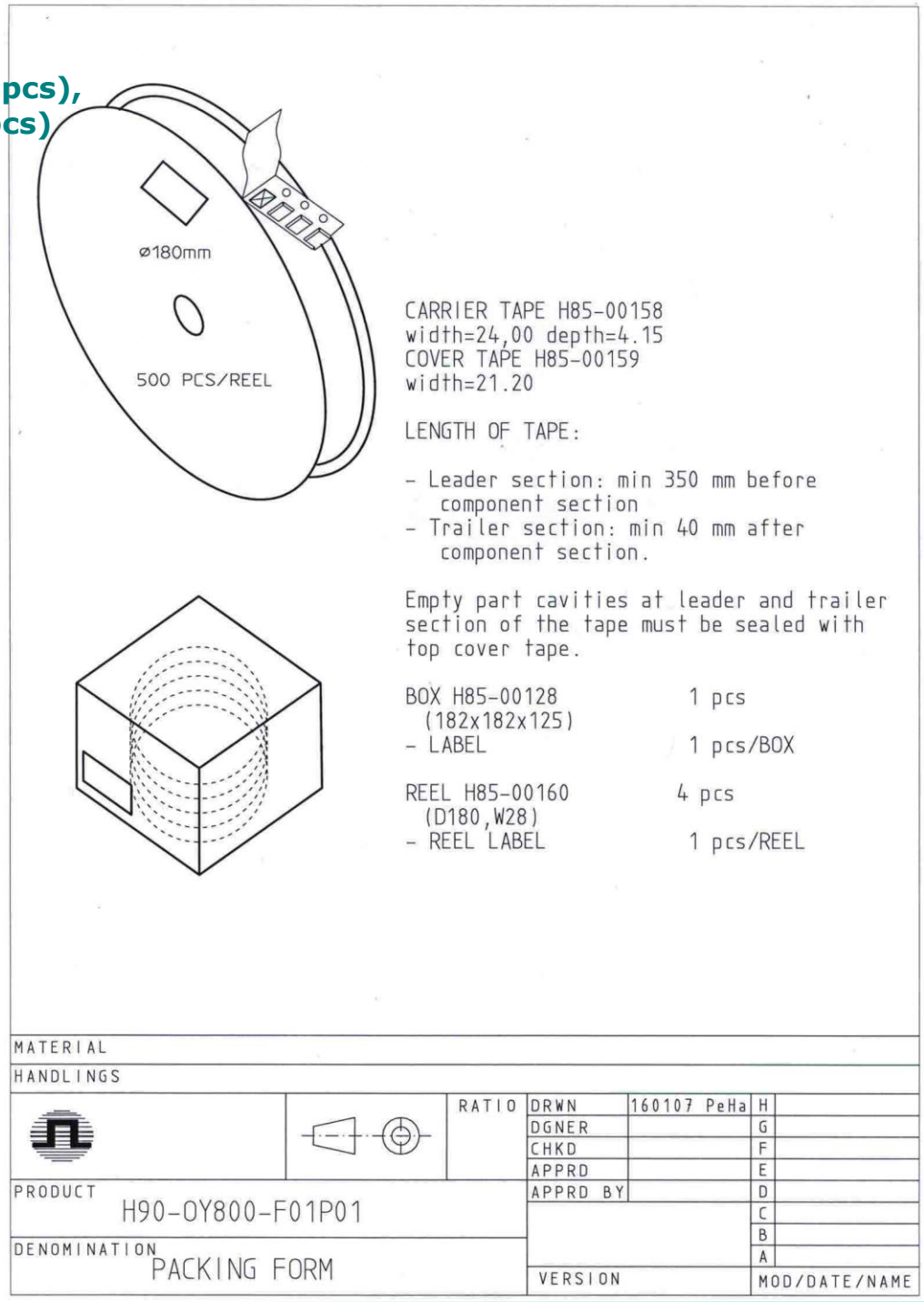
PACKAGING

Packing form

500pcs in one Reel,
3 reel in one inbox (1500 pcs),
2 inbox in out box (3000pcs)



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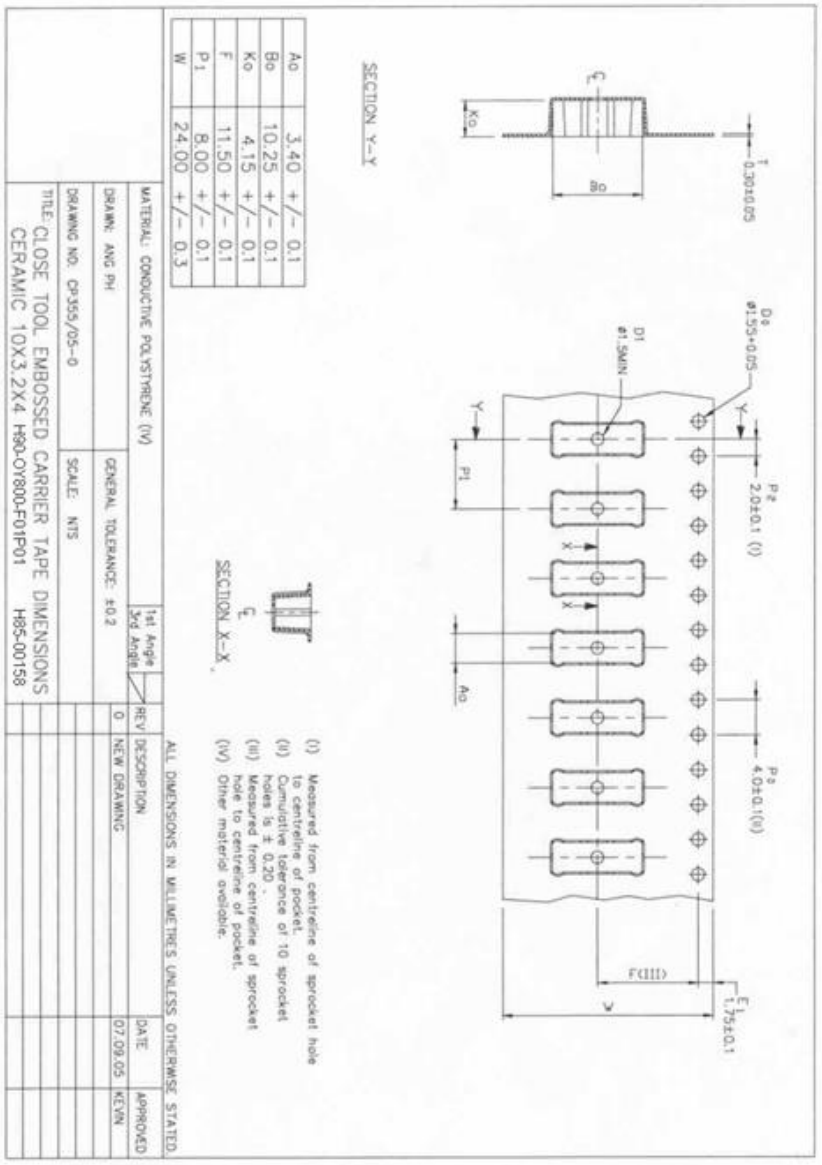
PACKAGING

General

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

Carrier tape



RoHS COMPLIANT