

Features:

- 3G/4G LTE antenna
- Fully SMT compatible
- RoHS compliant
- 40 x 7 x 3 mm
- Tape&Reel packing
- Part numbers:
 - W3796
 - W3796NL

Applications:

- Devices requiring high performance compact internal 3G/4G antenna
- Suitable for 2xMiMo use when mounting two pcs W3769 onto radio board

Issue: 1710

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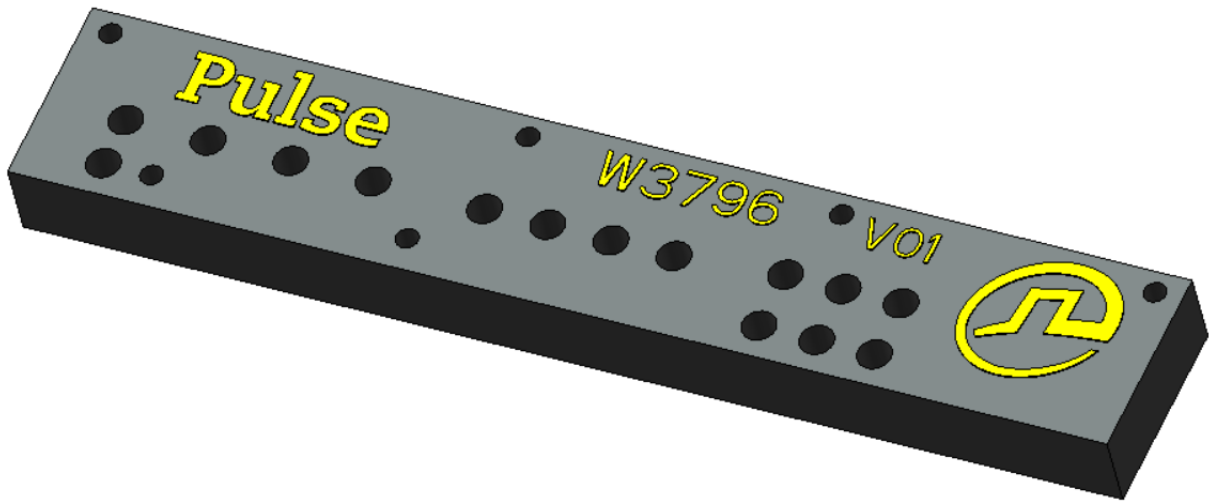
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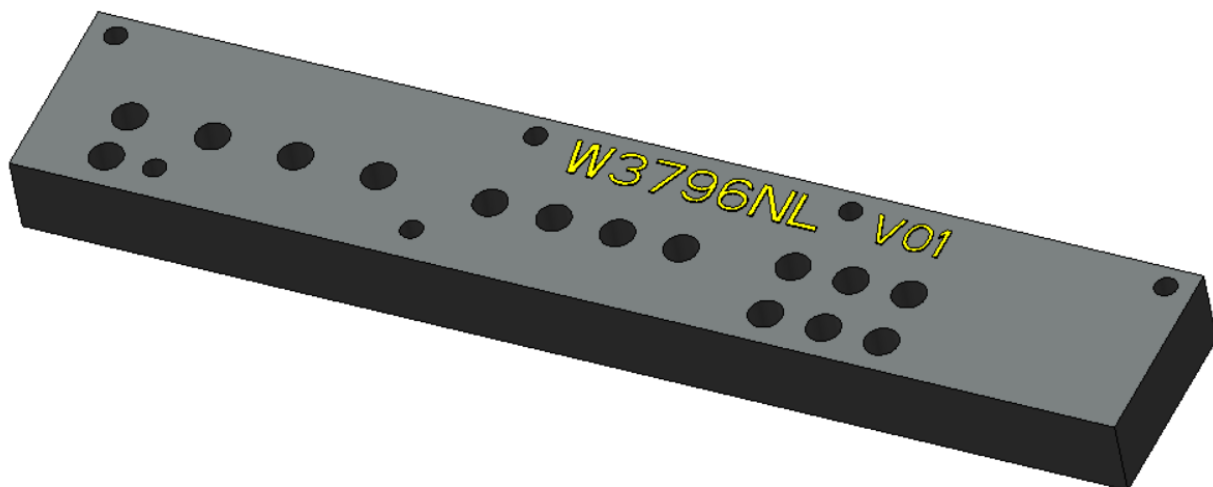
This document covers all product variants of the following product family:

1. W3796



2. W3796NL

P.S.: Same antenna & RF performance as W3796 but remove the Pulse logo (shown as below).



ELECTRICAL SPECIFICATIONS

| | |
|--------------------------------------|--|
| Antenna Type | PCB, SMD |
| Frequency | 698-960 / 1427.9-1660.5/ 1695-2200 / 2300-2700MHz |
| Nominal Impedance | 50 Ω |
| VSWR | 3 : 1 |
| Return loss | 6dB |
| Total Efficiency (698-960MHz) | 65% |
| Total Efficiency (1427.9-1660.5MHz) | 55% |
| Total Efficiency (1695-2200MHz) | 75% |
| Total Efficiency (2300-2700MHz) | 70% |
| Average Peak Gain (698-960MHz) | 1.5dBi |
| Average Peak Gain (1427.9-1660.5MHz) | 2dBi |
| Average Peak Gain (1695-2200MHz) | 5.5dBi |
| Average Peak Gain (2300-2700MHz) | 5dBi |
| Average Gain (698-960MHz) | -2.5dBi |
| Average Gain (1427.9-1660.5MHz) | -3dBi |
| Average Gain (1695-2200MHz) | -2dBi |
| Average Gain (2300-2700MHz) | -1.5dBi |
| Maximum power input | 5W |

(*) All RF parameters measured on Pulse reference test PCB

MECHANICAL SPECIFICATIONS



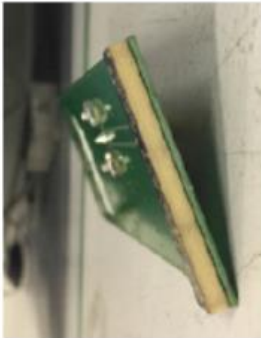
| | |
|----------------------------------|---------------------------|
| Color | Black |
| Size | 40mm(L) * 7mm(W) * 3mm(T) |
| Weight | 1.65 g |
| Fixing system | SMT |
| MSL (MOISTURE SENSITIVITY LEVEL) | 3 |

ENVIRONMENTAL SPECIFICATIONS

| | |
|-----------------------|---|
| Operating Temperature | -40 ~ +85° C |
| Storage Temperature | 24 hrs at 85 ° C and 24 hrs at -40 ° C per MIL STD 801G Method 501.5 (high) Method 502.5 (low) |
| Humidity | 24hrs at 30 ° C and 93%RH per MIL STD 810G Method 507.5 |
| RoHS Compliant | Yes |

OTHER SPECIFICATIONS

1. W3796 Push Force Test

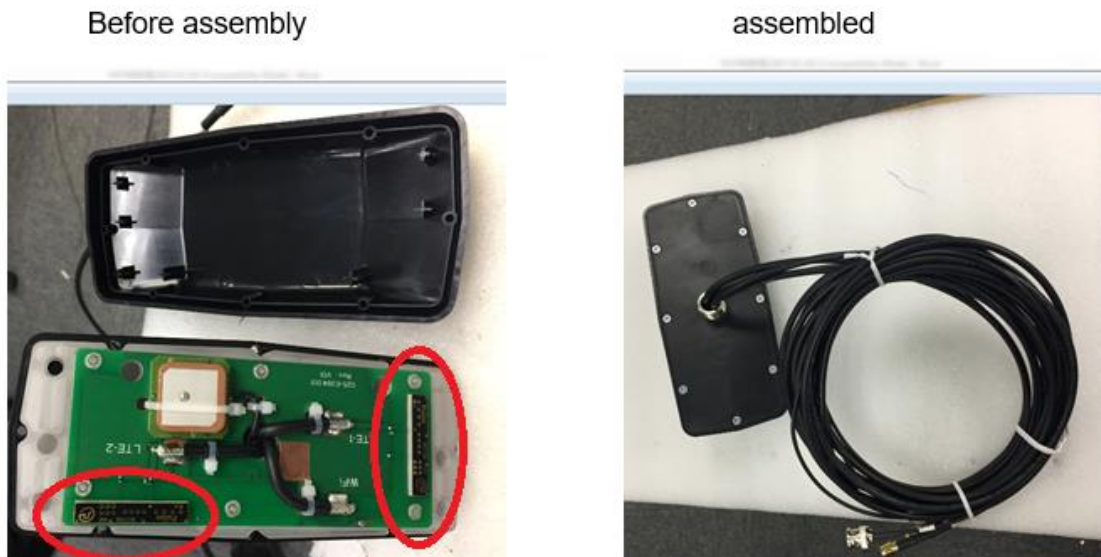
| Project Name: | | W3796-K | | | |
|---------------|--|--|---|--------------------|------------|
| Test Item: | | Push Force > 10N | | | |
| Sample # | Picture_Test Before | Test Setup | Picture_Test After | Test Value Antenna | Conclusion |
| 1 |  |  |  | 86.16 | Pass |
| 2 | | | | 64 | Pass |
| 3 | | | | 65.00 | Pass |
| 4 | | | | 75 | Pass |
| 5 | | | | 80.00 | Pass |
| Conclusion: | Antenna Push test passed. | | | | |

OTHER SPECIFICATIONS

2.. W3796 Drop Test

The following sample/application is just for reference to show how to conduct the drop test when the PCB antennas W3796 is SMT on a PCB of a device.

Fig.1: Appearance photos of the samples before test.

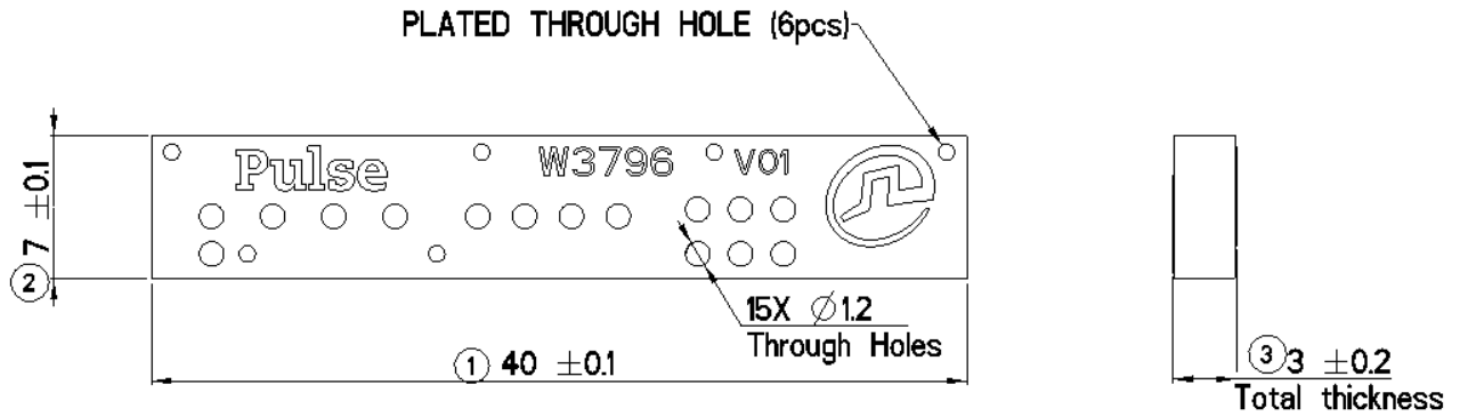


Test Method: The whole assembly at 1 meter drop. A minimum of one drop per orientation - flat top, bottom, side and corner (a total of 4 drops). It's recommended to get one drop on flat top, bottom, all four flat sides and four top corners, a total of 10 drops. (Note: MIL STD and JASO D001-1994 cites to drop products on a 2 inch plywood backed by concrete floor)

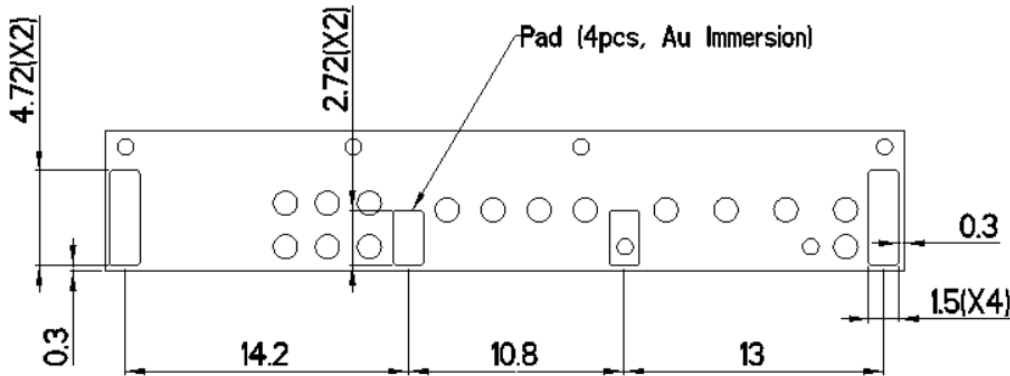
P.S.:

When doing the structure design, please keep enough safe space between the W3796 and the housing, and also fix the PCB firmly in the housing to avoid any impact during the drop test.

MECHANICAL DRAWING



Front View

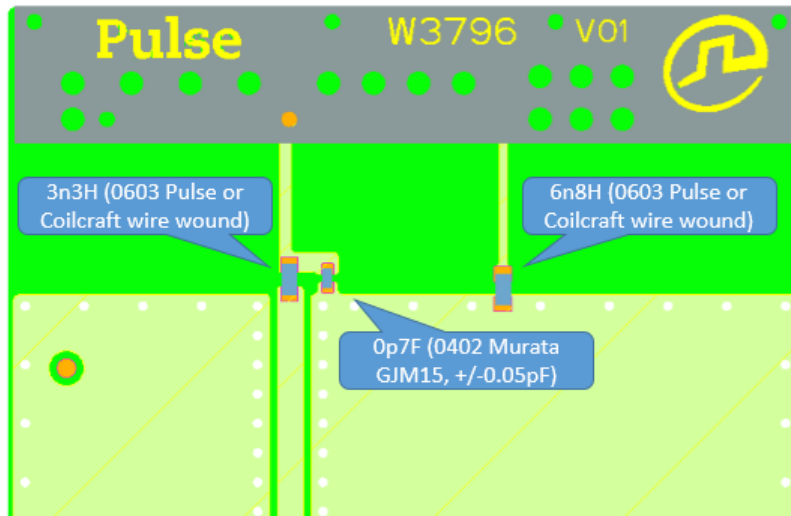
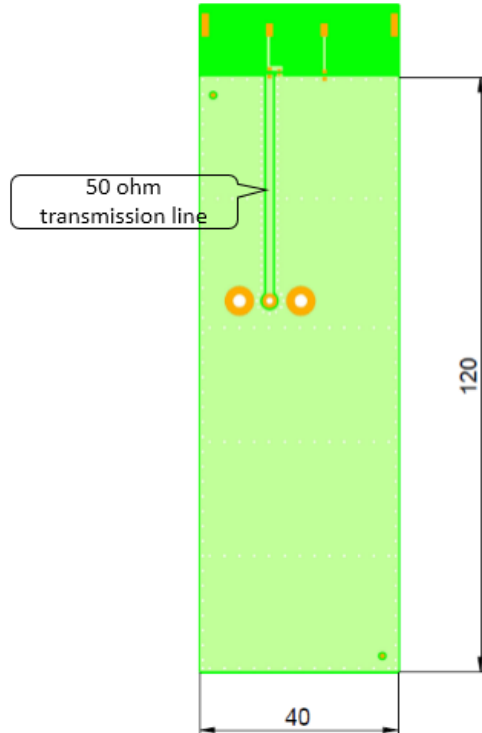


Back View

All dimensions are measured in mm.

TEST SETUP

Pulse reference test PCB for W3796 antenna



Ground clearance dimensions (mm) and matching component values

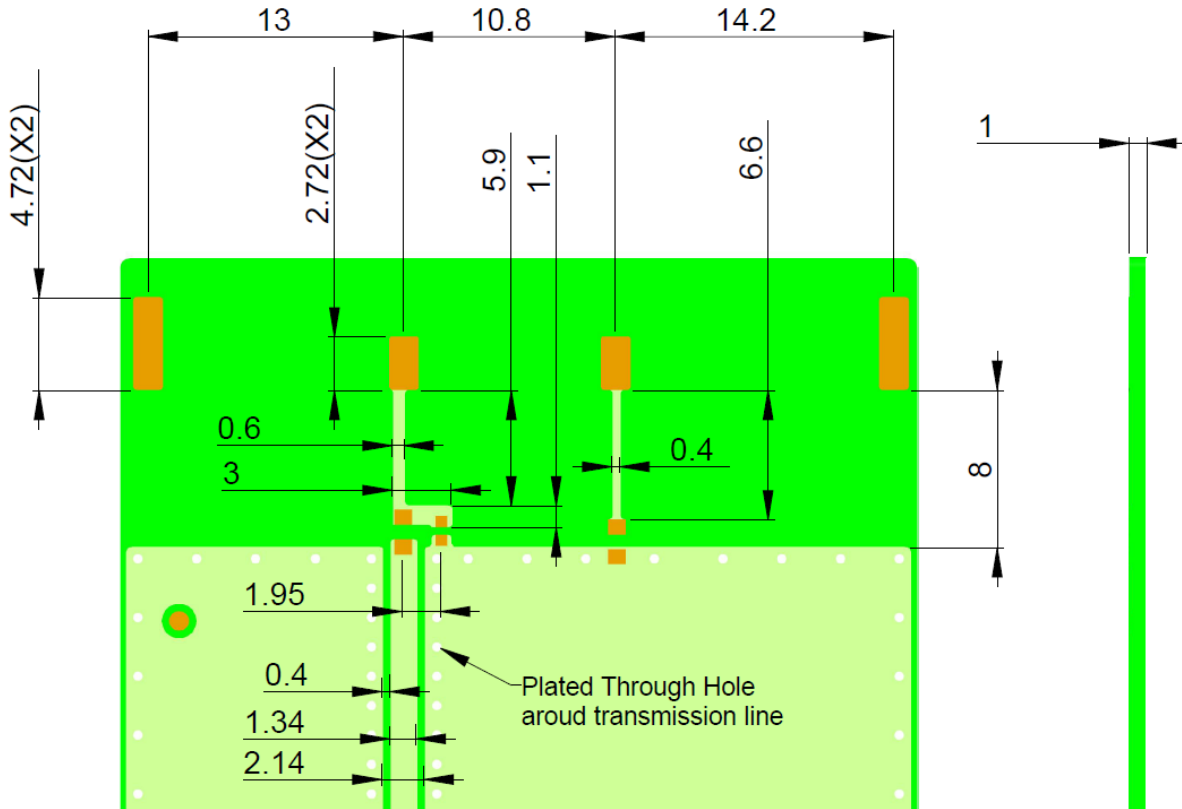
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CHARTS

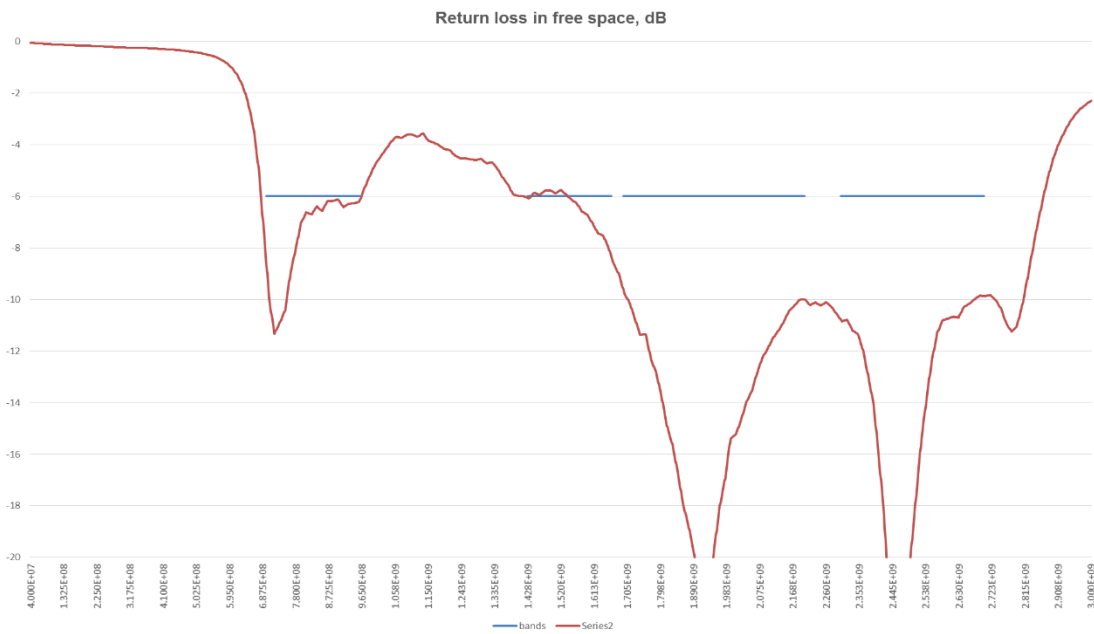


Recommended test board PCB layout for electrical characteristic measurement. Substrate material FR4.

All dimensions are in mm

CHARTS

Charts (free space measurements on Pulse reference test PCB)



Issue: 1710

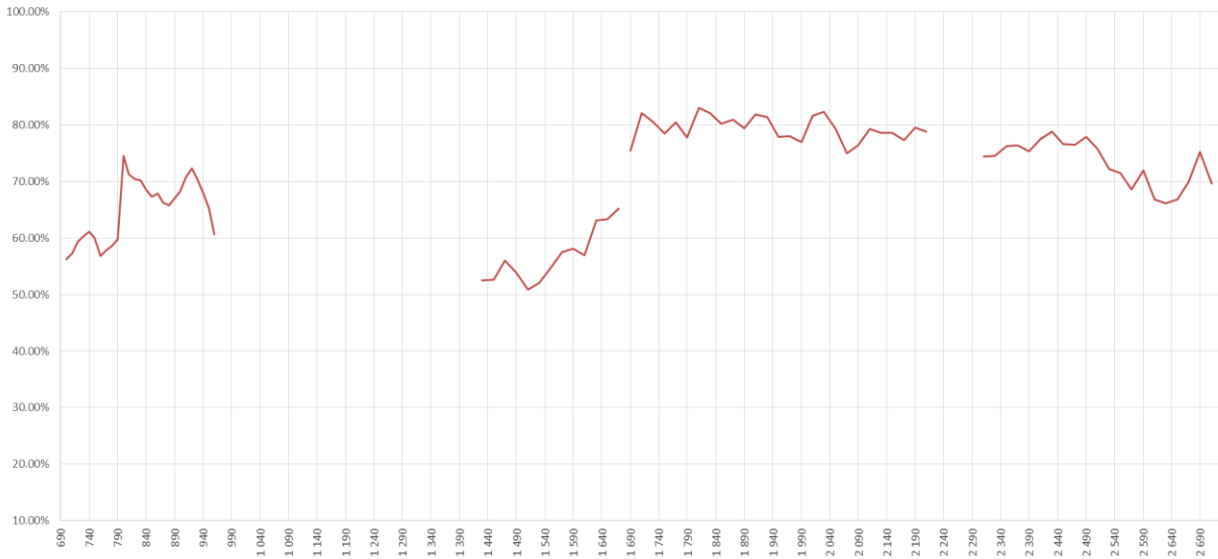
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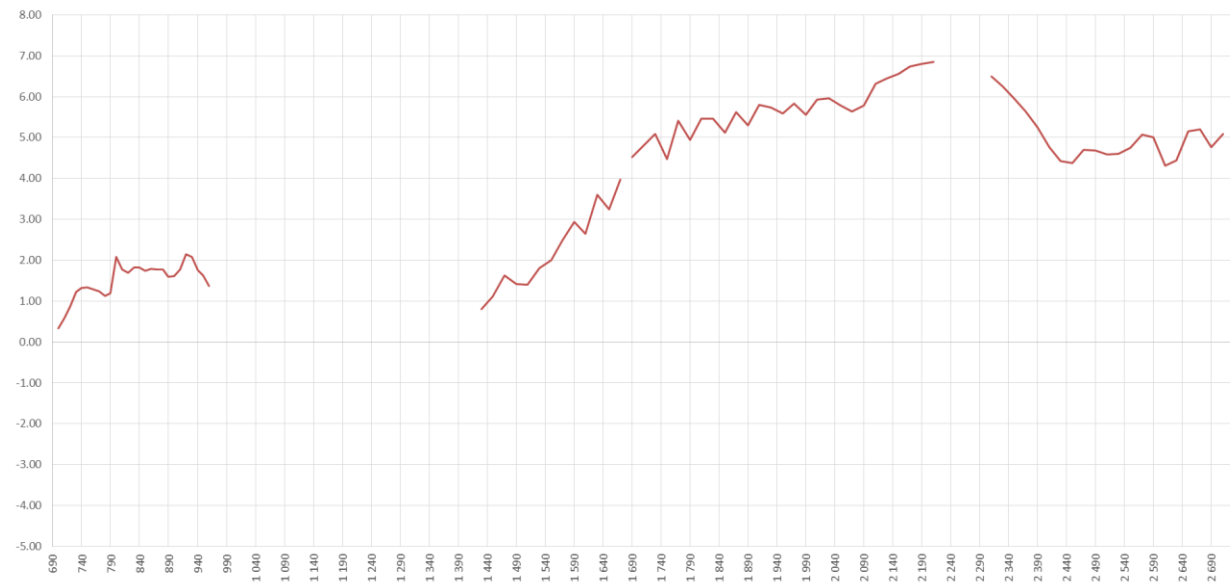
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CHARTS

Efficiency in free space, %



Peak gain, dBi



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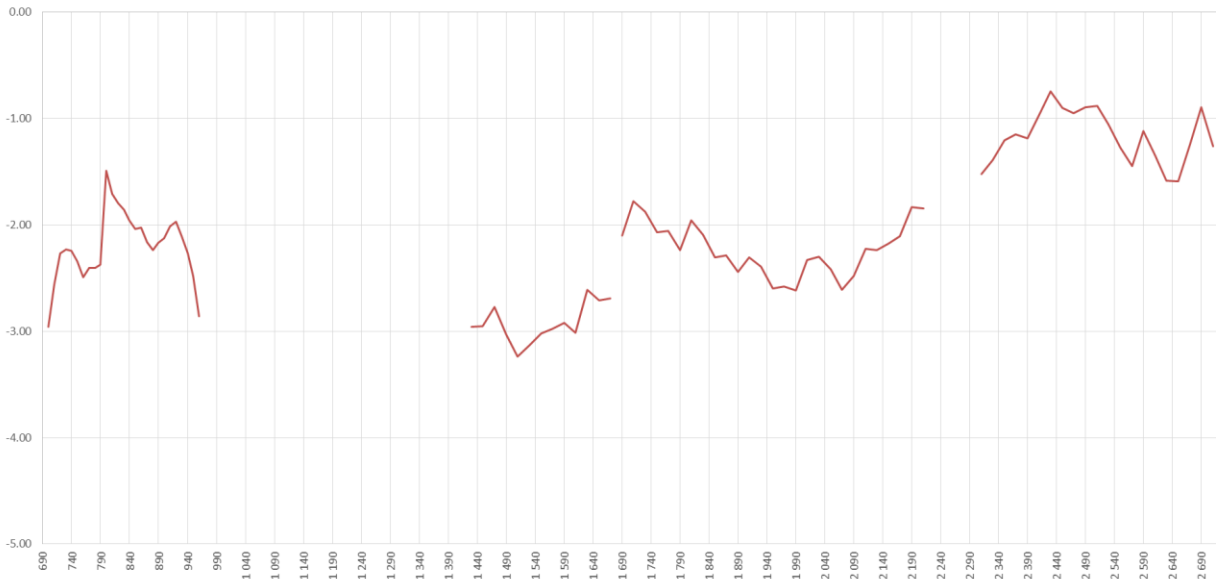
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CHARTS

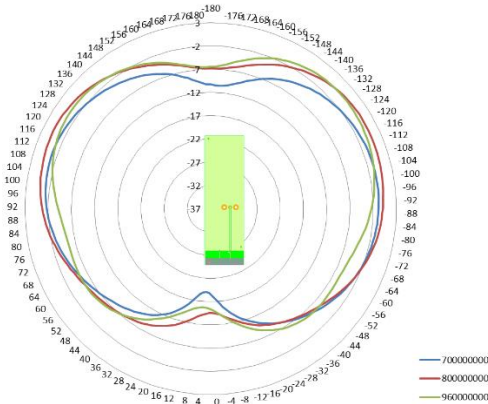
Average gain, dBi



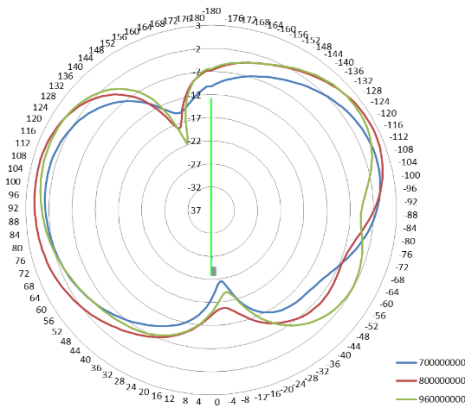
CHARTS

698-960MHz

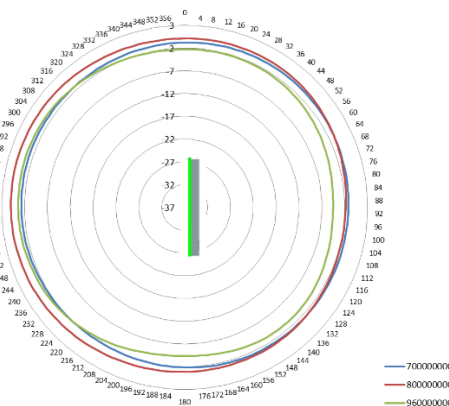
Vertical plot, front view



Vertical plot, side view



Horizontal plot



Issue: 1710

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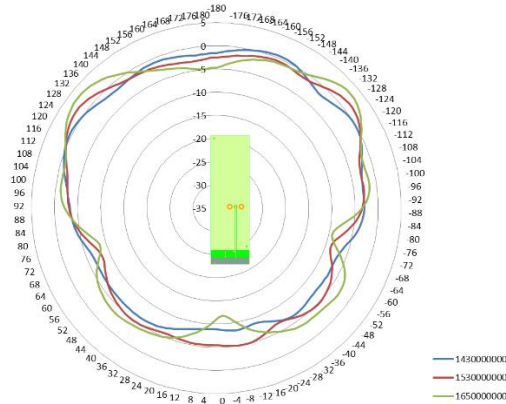
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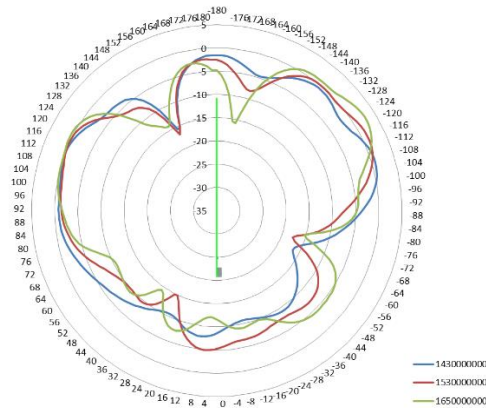
CHARTS

1427.9-1660.5MHz

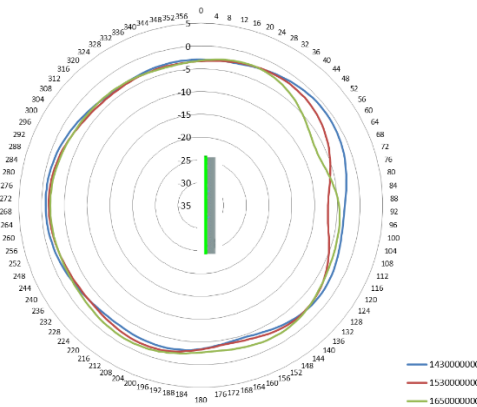
Vertical plot, front view



Vertical plot, side view



Horizontal plot



Issue: 1710

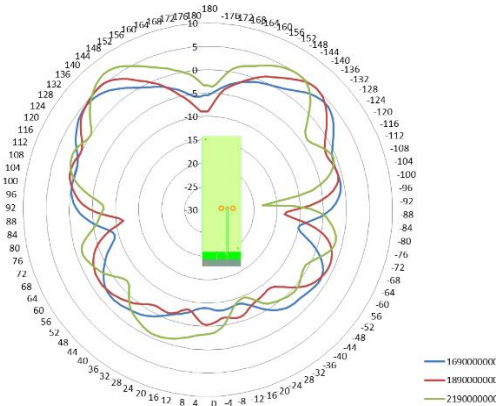
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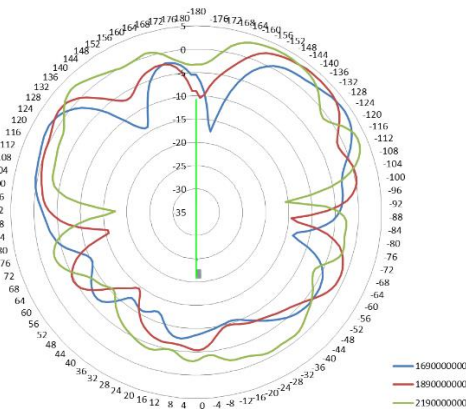
CHARTS

1695-2200MHz

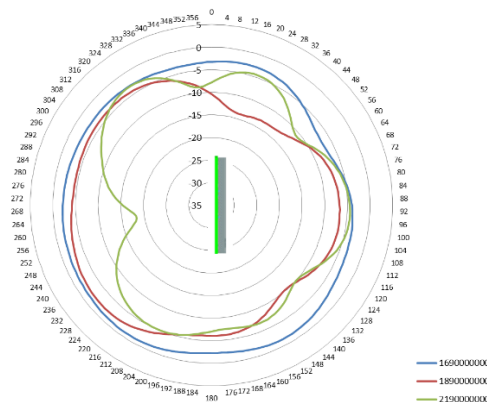
Vertical plot, front view



Vertical plot, side view



Horizontal plot



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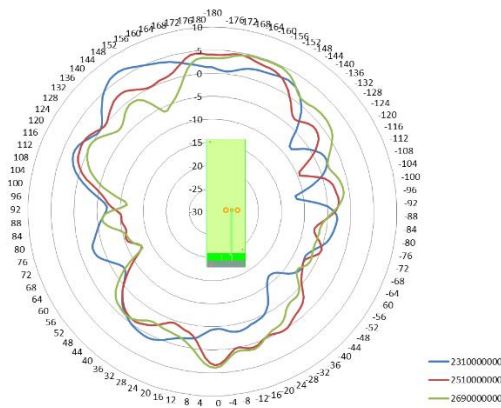
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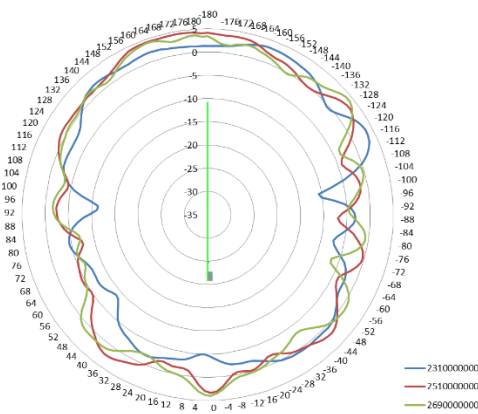
CHARTS

2300-2700MHz:

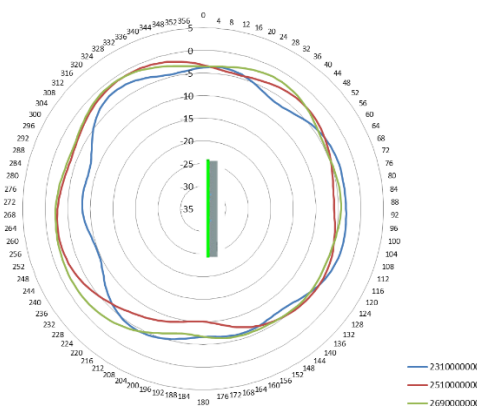
Vertical plot, front view



Vertical plot, side view



Horizontal plot



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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 |

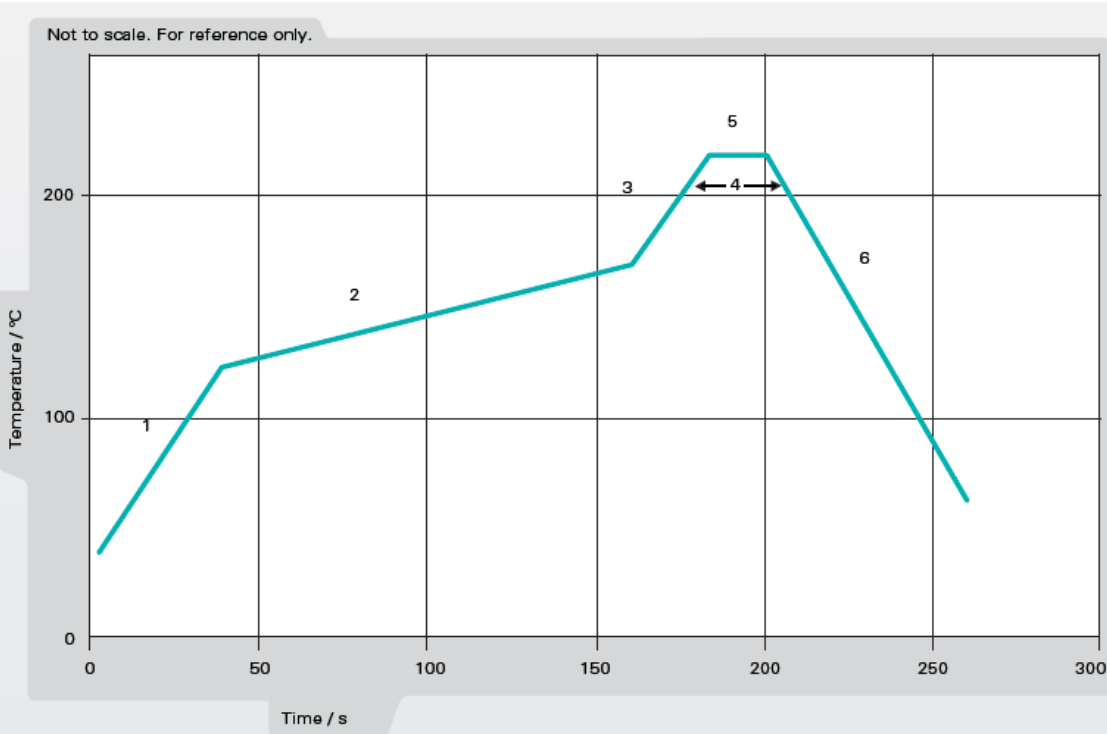
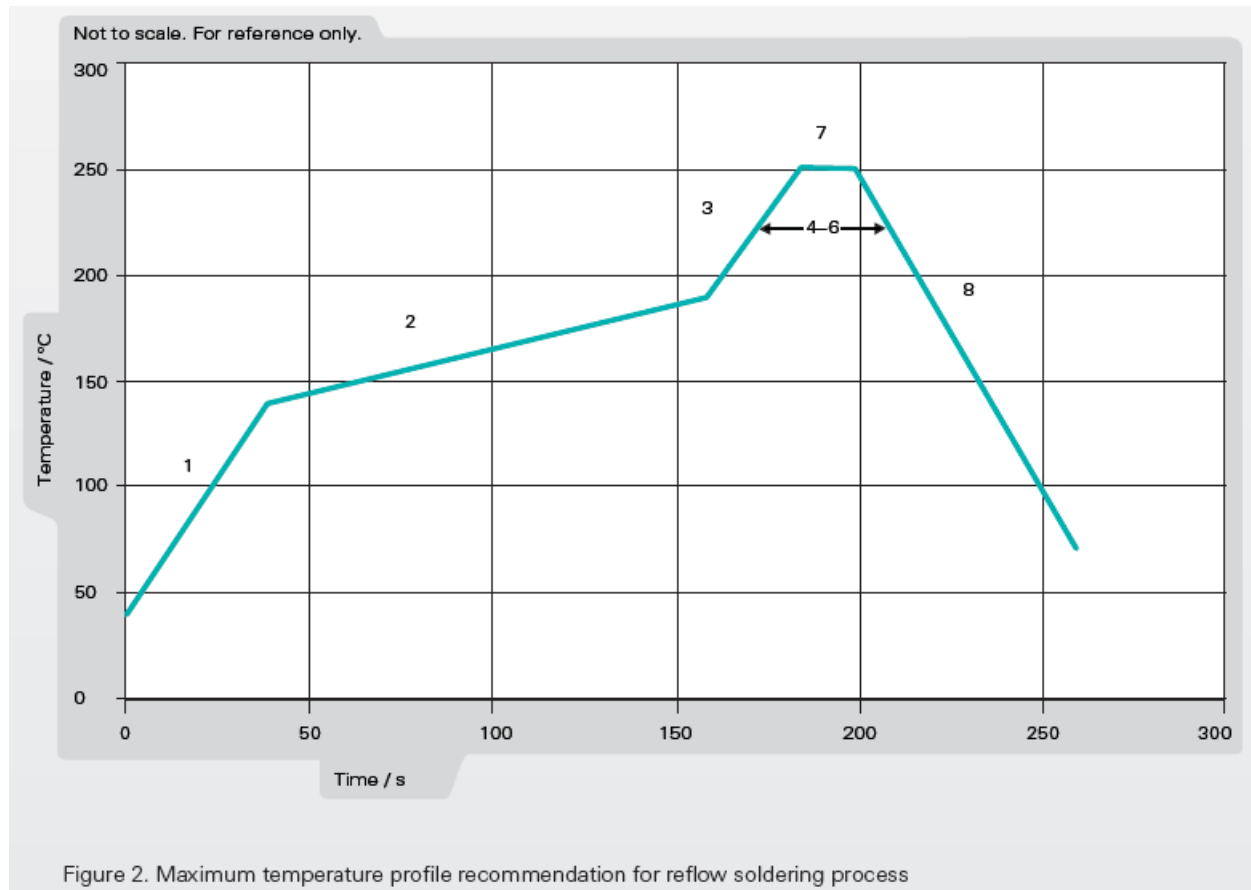


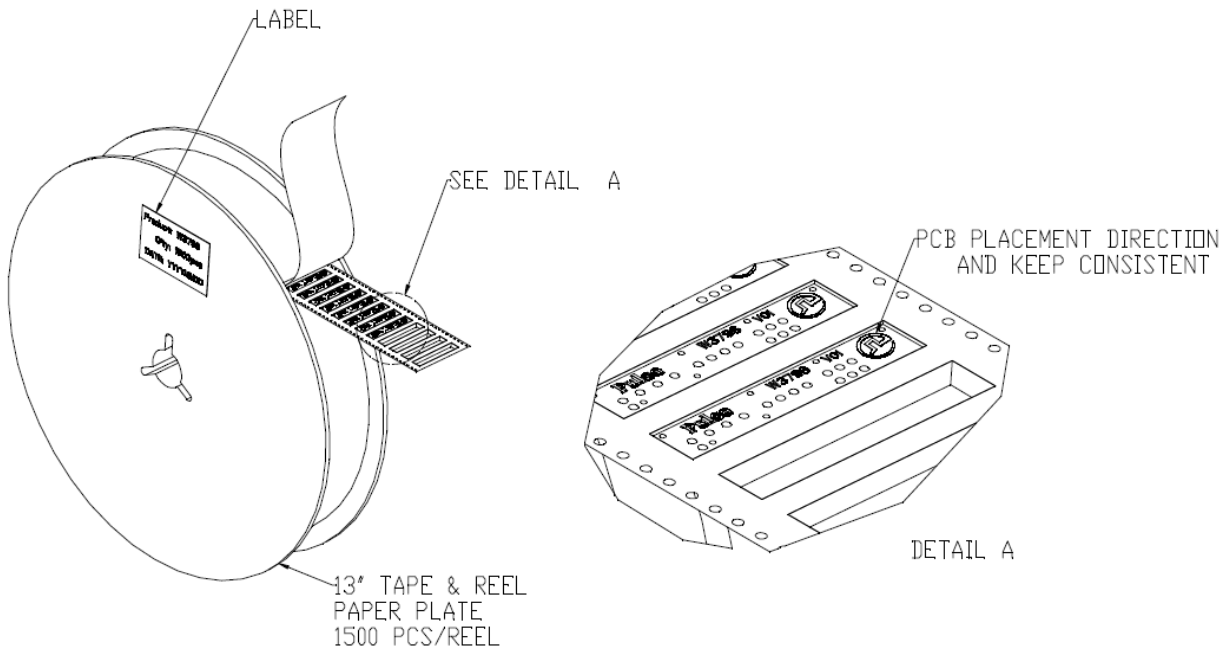
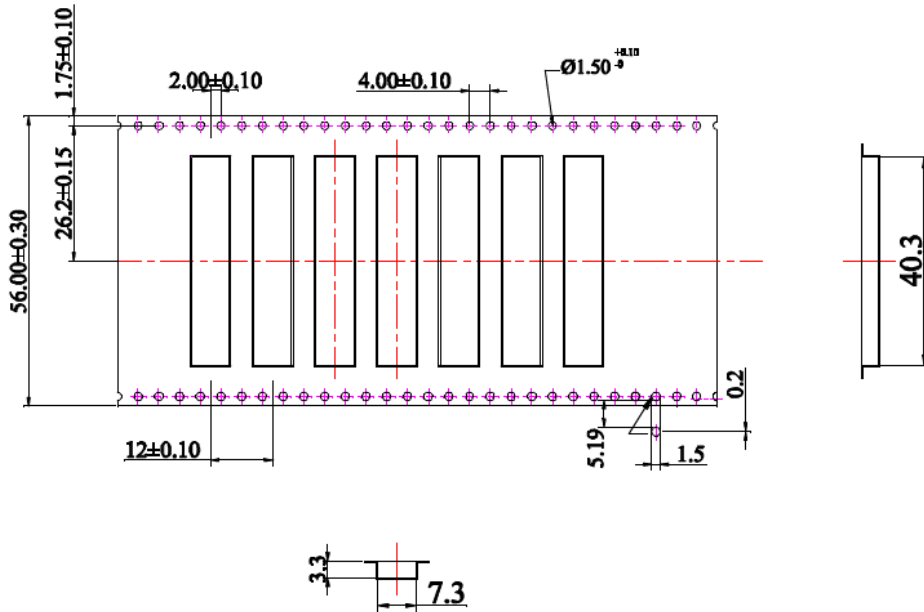
Figure 1. Minimum temperature profile recommendation for reflow soldering process

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 |



PACKAGING (TAPE & REEL)



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