

# 4G/LTE Ceramic Chip Antenna



ACAR3705-S698



37.0 x 5.0 x 5.0 mm  
RoHS/RoHS II Compliant  
MSL = 1

## Features

- 4G/LTE full band coverage (700~960 MHz, 1710~2170 MHz, 2500~2700MHz)
- 2G/3G/GSM support
- Compact size
- Linear polarization

## Applications

- IoT
- M2M
- 4G/LTE/3G/2G/GSM applications
- Telecommunications
- Networking
- Wireless modules
- Mobile devices
- Consumer electronics
- Broadband cellular connectivity
- Video and surveillance

## Electrical Characteristics

Item	Spec*	Comments
Working Frequency Range	700~960 MHz / 1710~2170 MHz / & 2500~2700 MHz	Covers 4G LTE
VSWR	4.5 : 1 max	Depends on the environment
Peak Gain (2400~2500MHz)	-3.77dB min / -1.13dB max	Frequency dependent measured from 824MHz to 2700MHz
Efficiency	700~960 MHz	55%
	1710~ 2170MHz	70%
	2500~2700MHz	50%
Polarization	Linear	
Impedance	50 Ω	
Terminations	Ag	Environmentally Friendly Pb Free
Operating Temperature	-40°C ~ 85°C	
Storage Temperature	-40°C ~ 85°C	

\* Data collected per Table on standard evaluation board size 45 x 120 mm, and under the environmental conditions of +40°C and 0-95% relative humidity.

\*\* Actual Electrical value will depend on customer ground plane size

# 4G/LTE Ceramic Chip Antenna

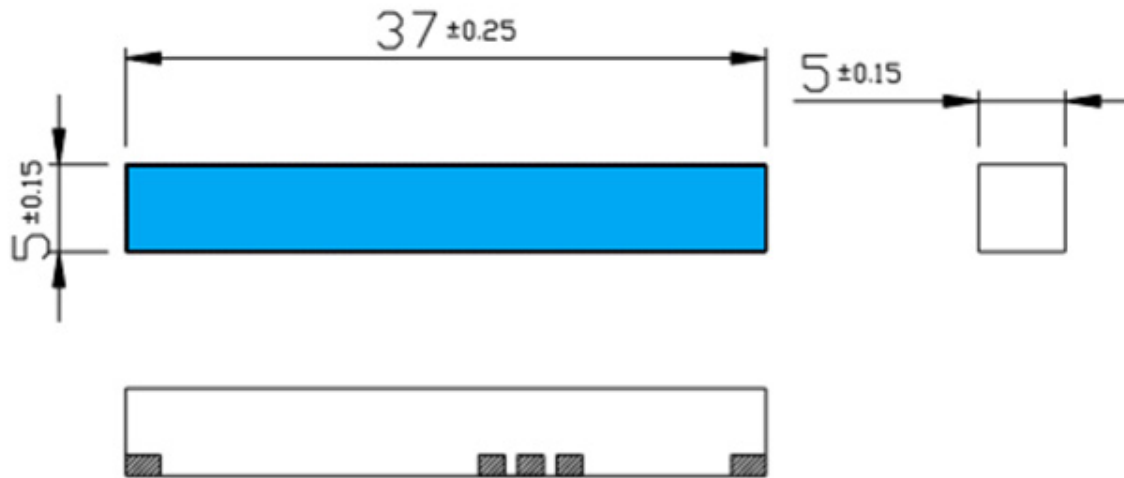


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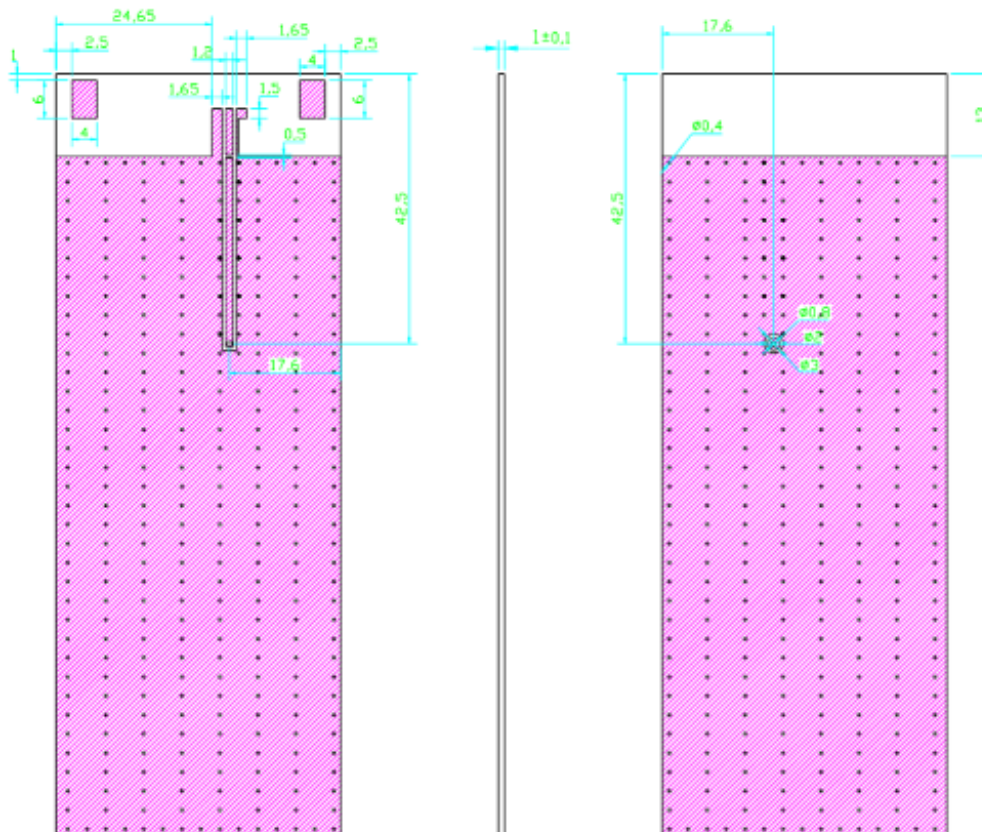
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## Dimensions



Unit:mm

## Evaluation Board and Dimensions



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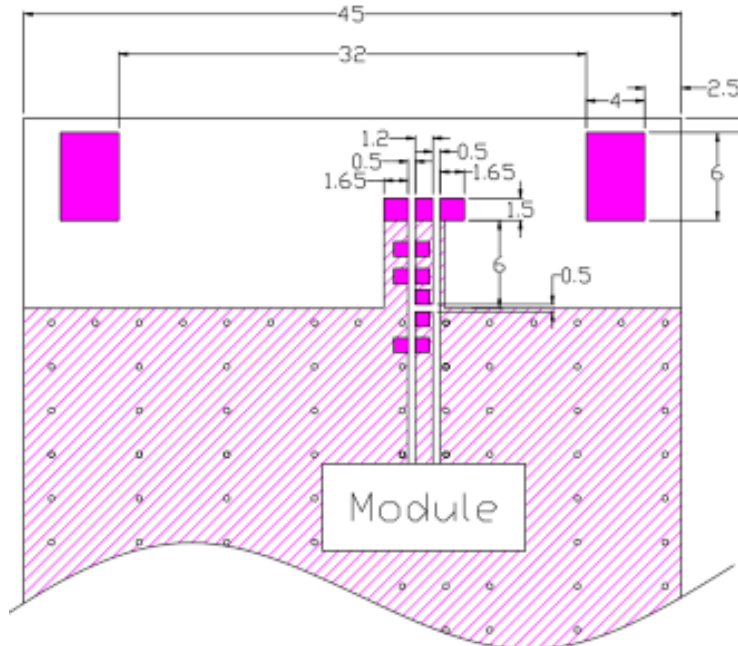


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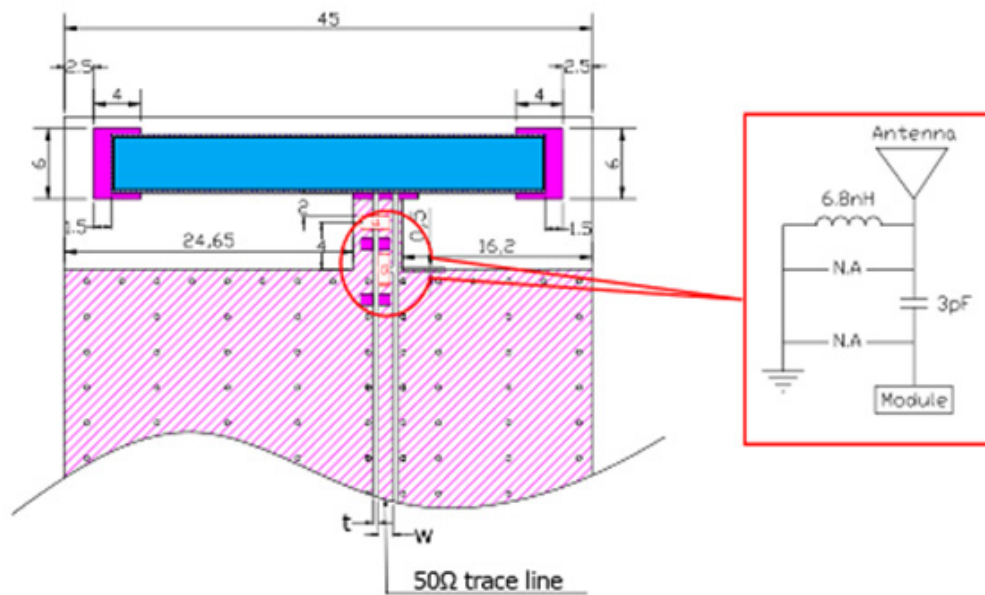


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## Recommended Layout Dimensions



## Recommended Layout from Evaluation Board



T and w = Unique dimensioning according to your PCB design.

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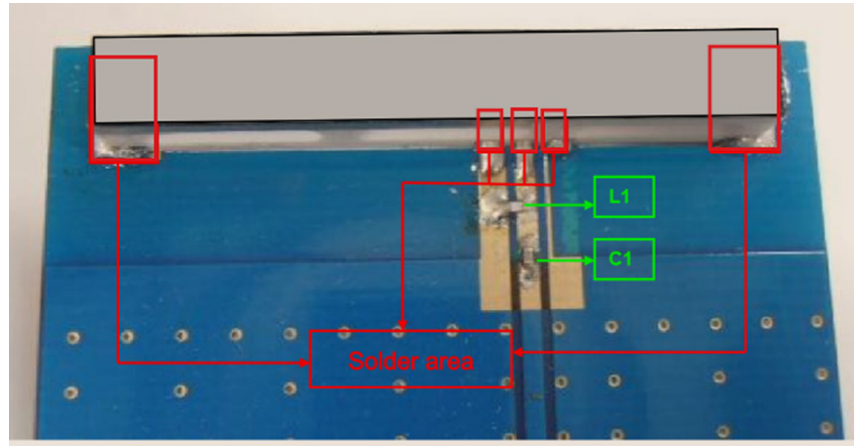


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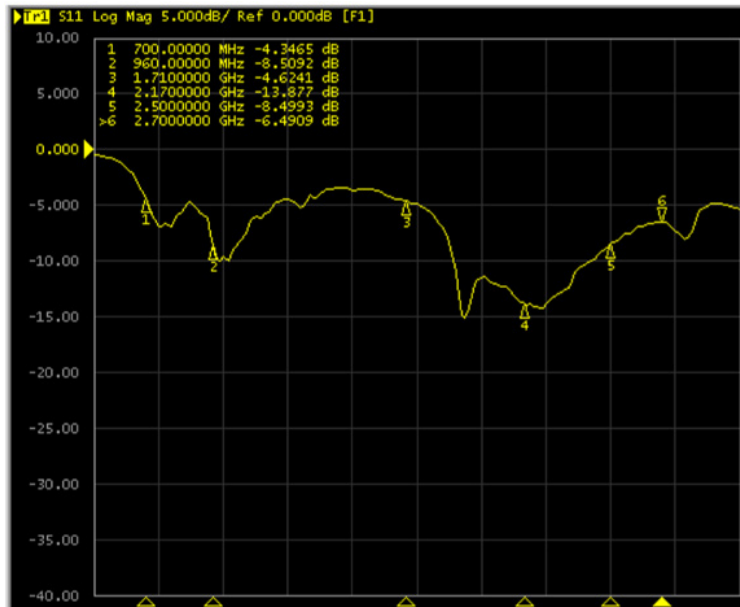
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Evaluation Board showing position of match components and solder pads



Circuit Symbol	Size	Description
L1	0402	6.8nH
C1	0402	3pF Capacitor

## Antenna Response – Return Loss S11



Return Loss	700MHz	960MHz	1710MHz	2170MHz	2500MHz	2700MHz
S11	-4.34dB	-8.50dB	-4.62dB	-13.87dB	-8.49dB	-6.49dB

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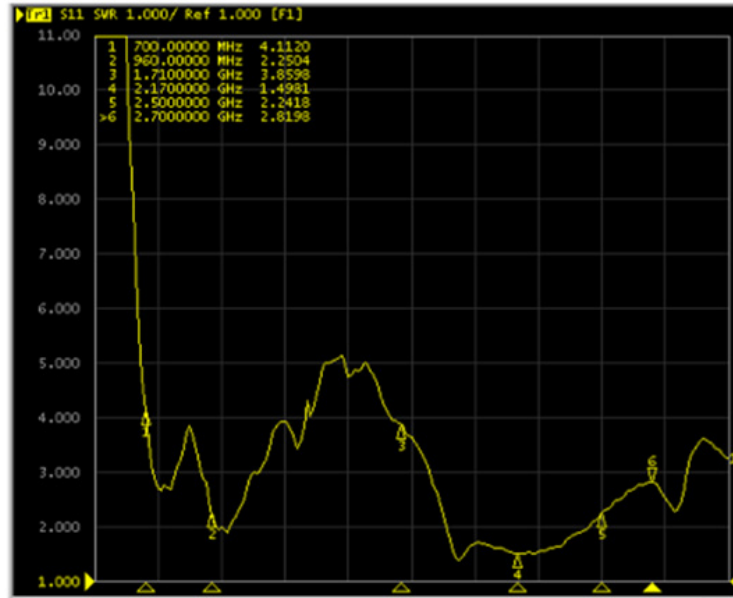


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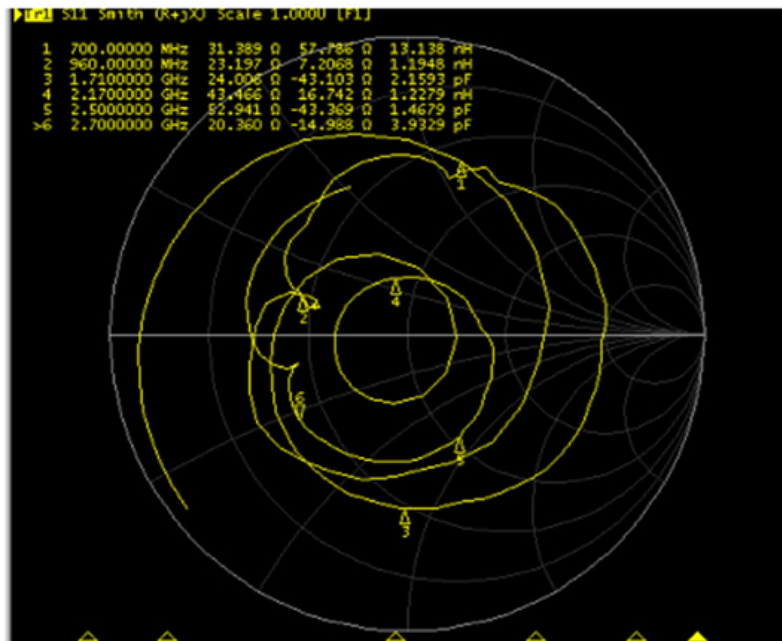


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## Antenna SWR



## Antenna Smith Chart



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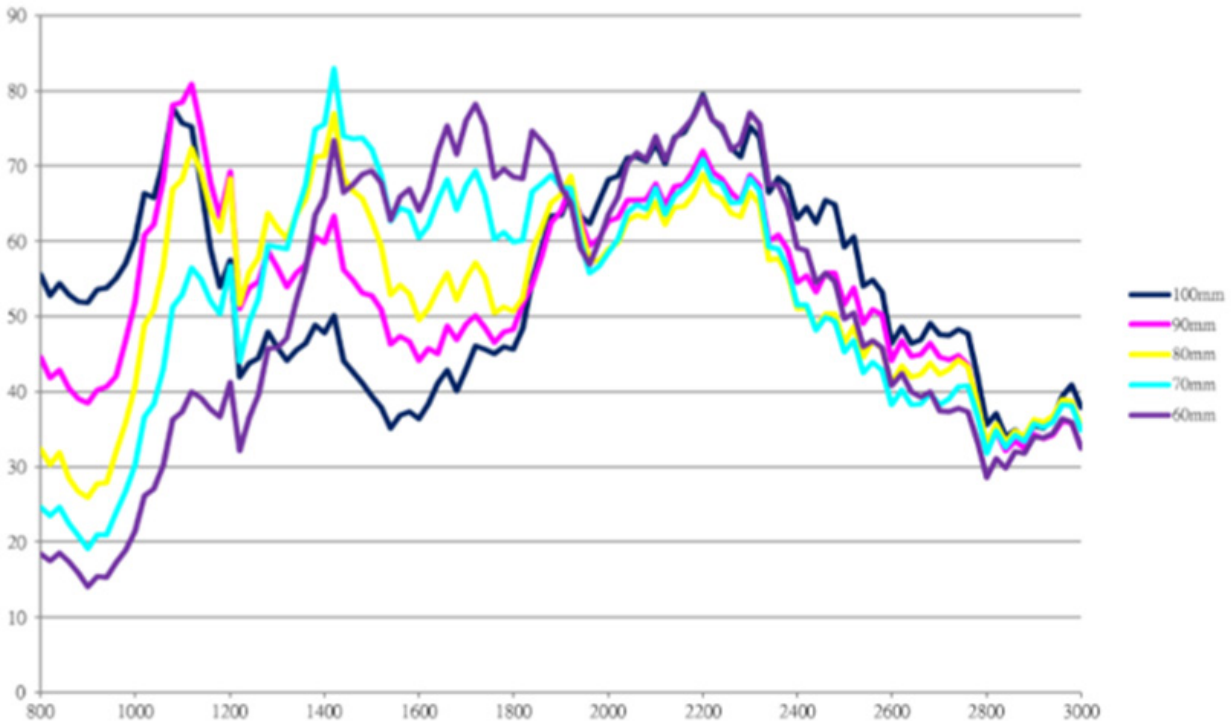
## Antenna Performance

GSM Antenna Performance Summary*								
Band (MHz)	824	960	1710	1850	1990	2170	2500	2700
Efficiency (%)	54.50	51.26	45.07	57.30	67.94	77.00	56.66	41.99
Average Gain (dBi)	-2.47	-2.49	-3.46	-2.42	-1.67	-1.13	-2.46	-3.77

\* (Ground Length 107 mm)

## Antenna Efficiency Versus Ground Plane Length

Reference Efficiency vs Ground Plane Length



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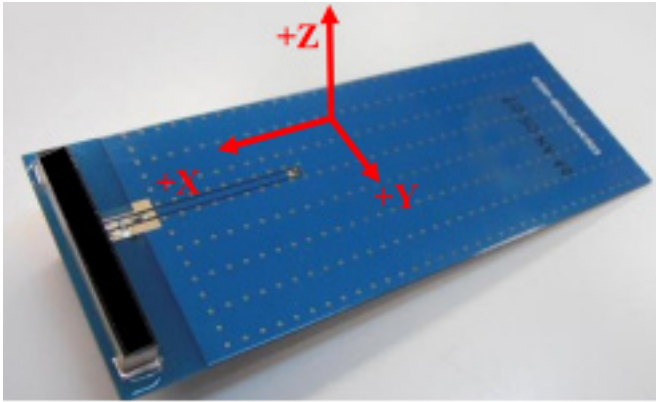
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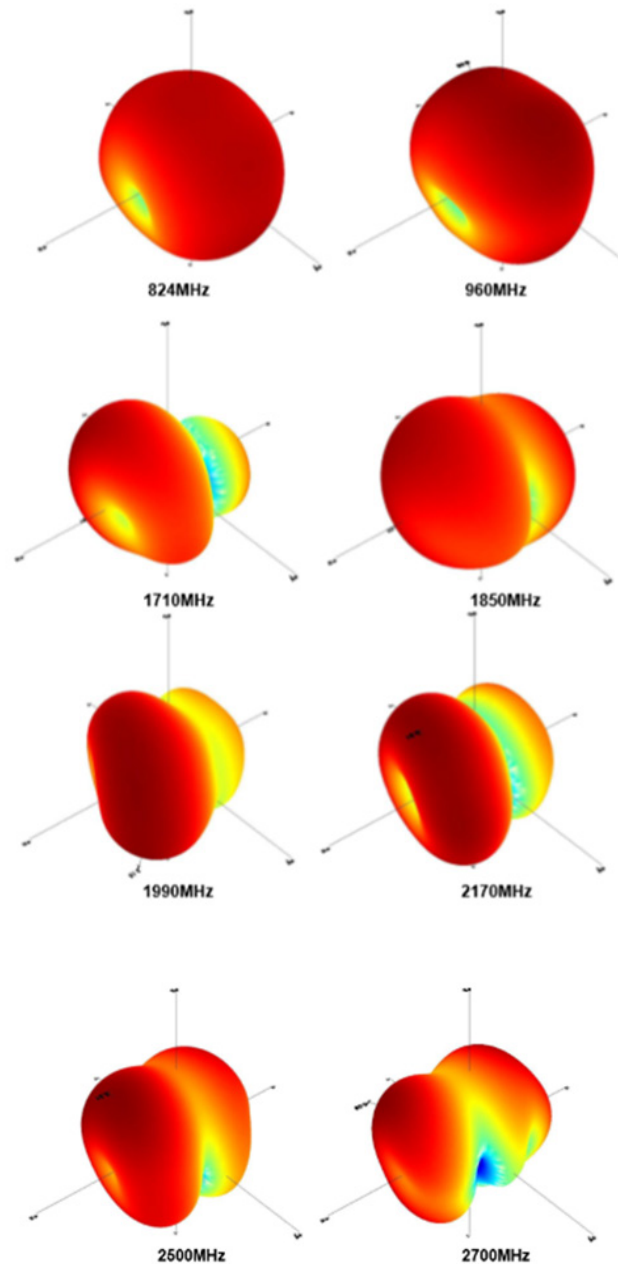
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## Antenna 3D Radiation Patterns – Evaluation Board

Coordinates



Radiation patterns (3D)



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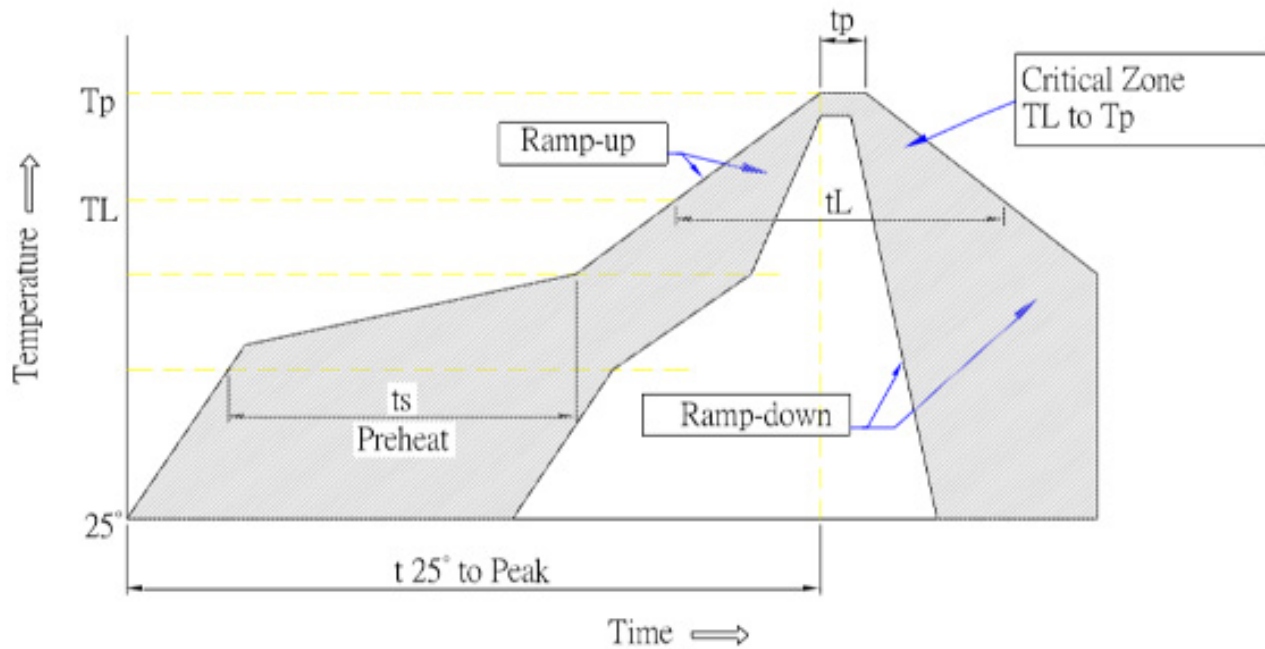
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## Reflow Soldering Standard Condition

Abrakon's ACAR3705-S698 Planer Inverted-F antenna can be assembled following either Sn-Pb or Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follow:

Phase	Profile Features	Sn-Pb Assembly	Pb-Free Assembly (SnAgCu)
Ramp-Up	Avg Ramp-Up Rate (T <sub>max</sub> to TP)	3°C /second(max)	3°C /second(max)
Preheat	-Temperature Min (T <sub>min</sub> ) -Temperature Max (T <sub>max</sub> ) -Time (T <sub>min</sub> to T <sub>max</sub> )	100°C 150°C 60-120 seconds	100°C 150°C 60-120 seconds
Reflow	-Temperature (TL) -Total Time above TL (t L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak	-Temperature (TP) -Time(tp)	235°C 10-30 seconds	260°C 20 - 40 second
Ramp-Down	Rate	6°C / second max.	6°C / second max.
Time from 25°C to Peak Temperature		6 minutes max	8 minutes max.

Reflow Profile



Temperatures profile



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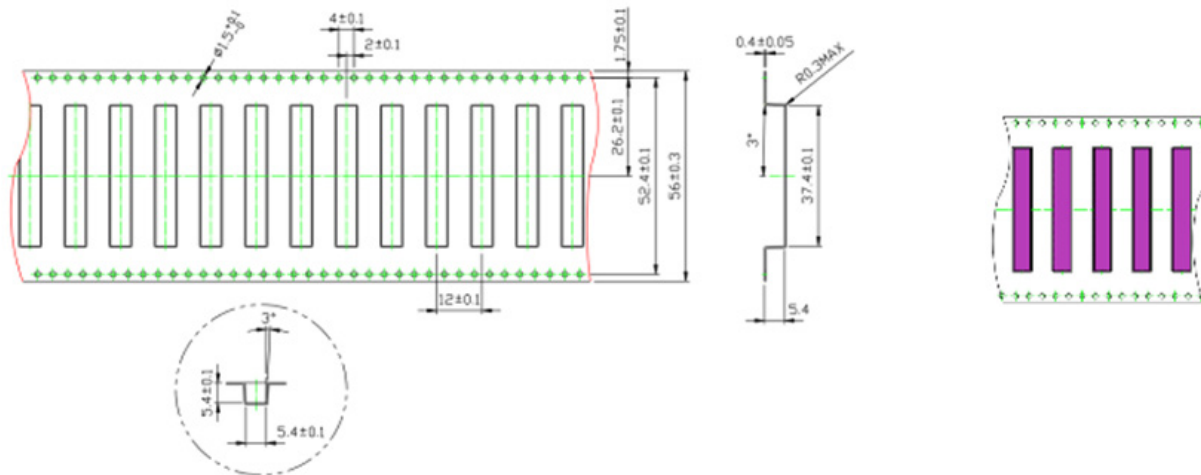
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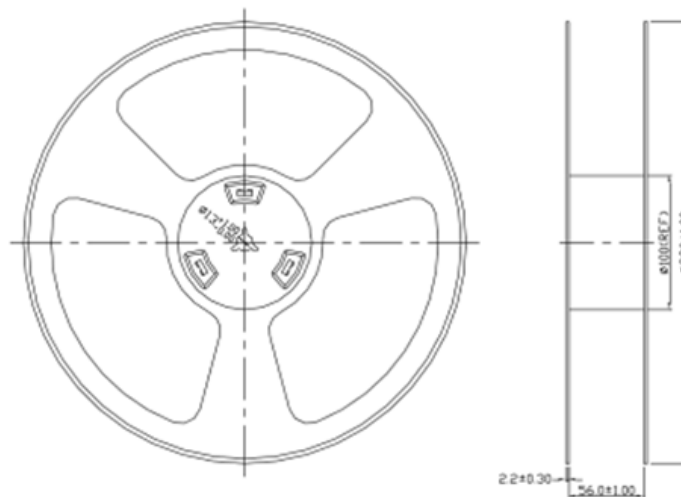
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## Packaging

Tape Dimensions (mm)



Reel Dimensions (mm)



1. Blister tape to IEC 286-3, polyester.
2. Pieces per tape /reel: 450pcs
3. MOQ: 1350pcs (3 x reels)

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