

# 2G/3G/GSM Ceramic Chip Antenna



ACAR3005-S824



30.0 x 5.0 x 5.0 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## Features

- 824~960 MHz, 1710~2170 MHz band support
- Covering GSM850, GSM900, DCS, PCS, & UMTS
- 2G/3G/GSM support
- Omnidirectional pattern
- Linear polarization

## Applications

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

## Electrical Characteristics

Item	Spec	
Working Frequency	824~960 MHz, 1710~2170 MHz	
Dimension	30.0 × 5.0 × 5.0 mm	
VSWR	3 max (depends on the special environment)	
Polarization	Linear	
Impedance	50 Ω	
Operating Temperature	-40~85°C	
Termination	Ag (Environmentally-Friendly Pb Free)	
Efficiency(%)	824~960 MHz	55
	1710~2170 MHz	60

\* Evaluation board size 40.0 x 120.0 mm<sup>2</sup>

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

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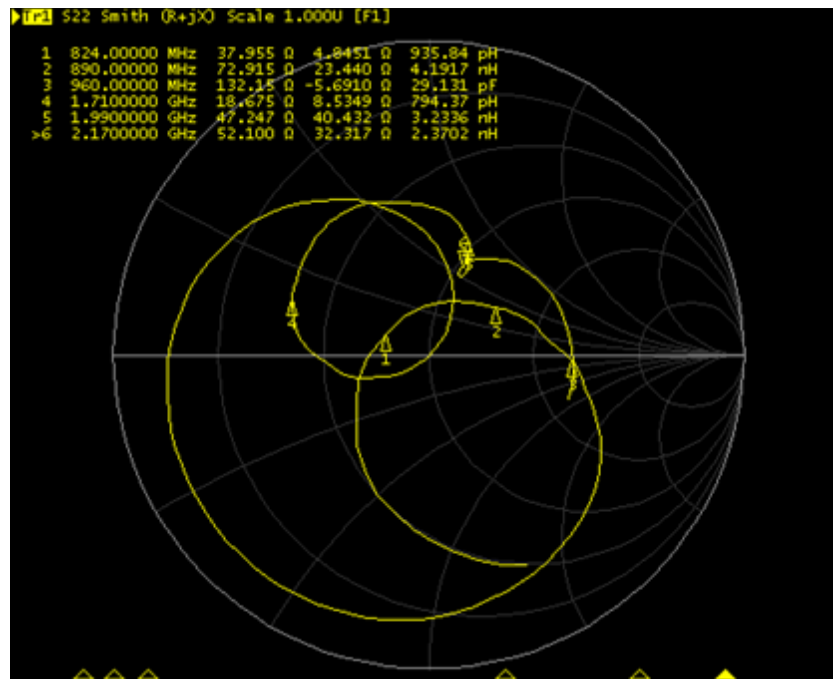
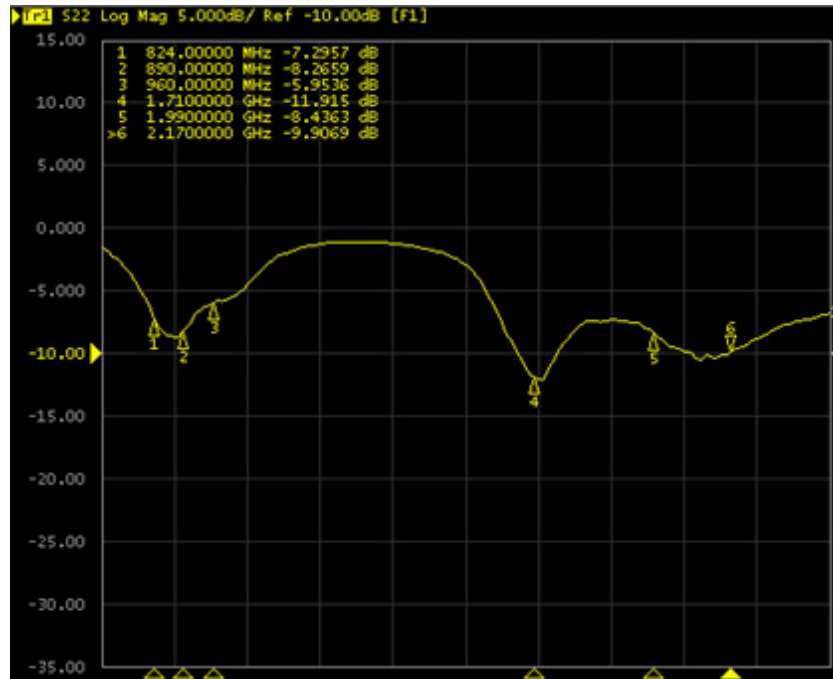


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## Return Loss Characteristics



# 2G/3G/GSM Ceramic Chip Antenna



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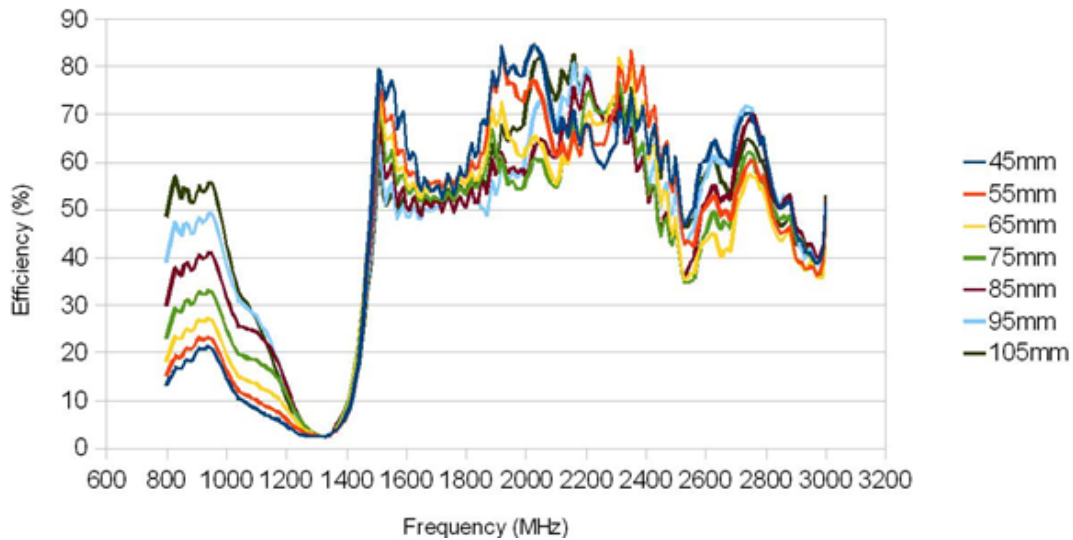


30.0 x 5.0 x 5.0 mm  
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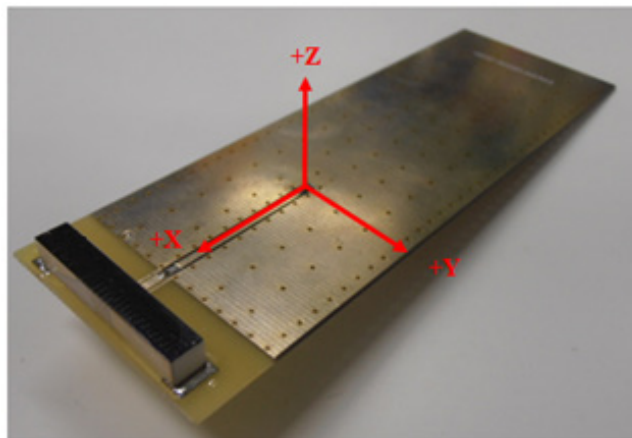
## Gain and Efficiency

(Ground length: 107mm)

Peak Gain Parameter Summary										
Band	GSM (MHz)				DCS (MHz)		PCS (MHz)		WCDMA (MHz)	
	824	890	880	960	1710	1880	1850	1990	2110	2170
Peak Gain(dBi)	0.77	0.10	0.55	-0.18	2.08	1.78	2.12	2.70	3.03	3.12
Efficiency(%)	59.4	53.15	54.12	54.57	54.42	53.18	53.90	58.94	66.10	63.80



## 3D Radiation Pattern



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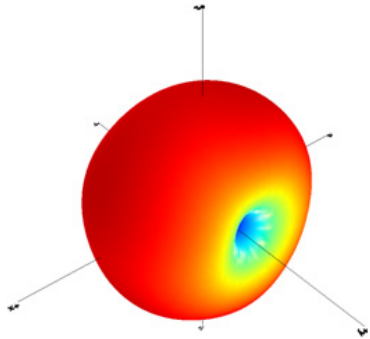


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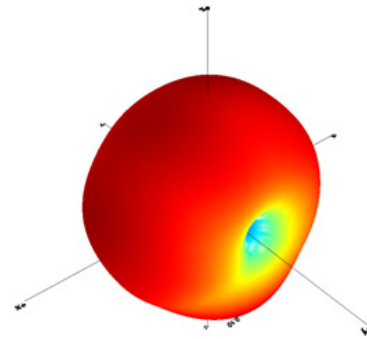


30.0 x 5.0 x 5.0 mm  
RoHS/RoHS II Compliant  
MSL = N/A

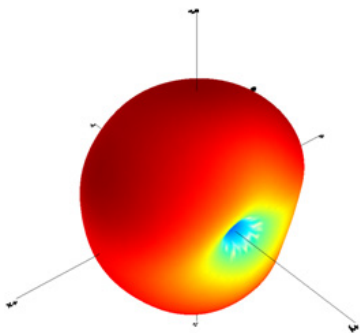
## 3D Radiation Pattern



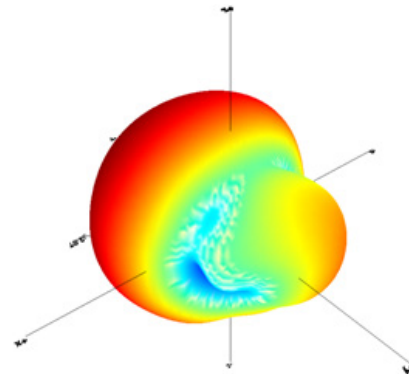
824MHz



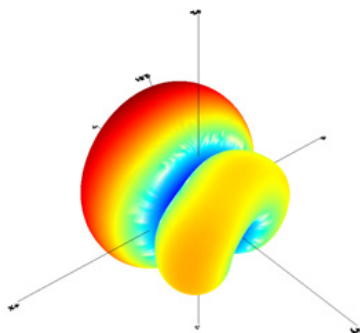
890MHz



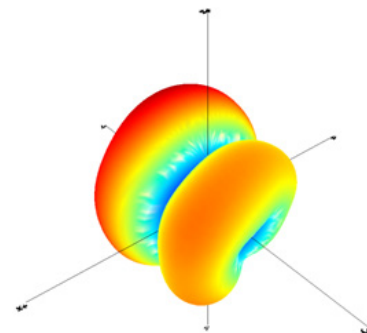
960MHz



1710MHz



1990MHz



2170MHz

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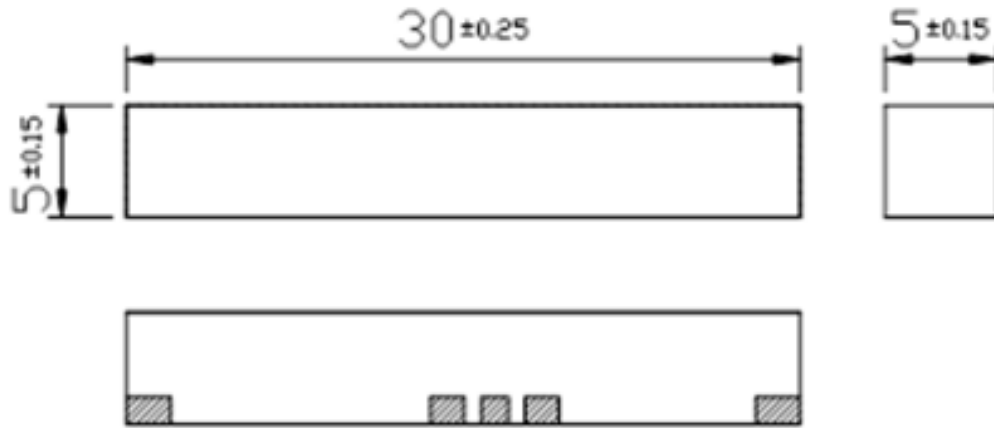
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30.0 x 5.0 x 5.0 mm  
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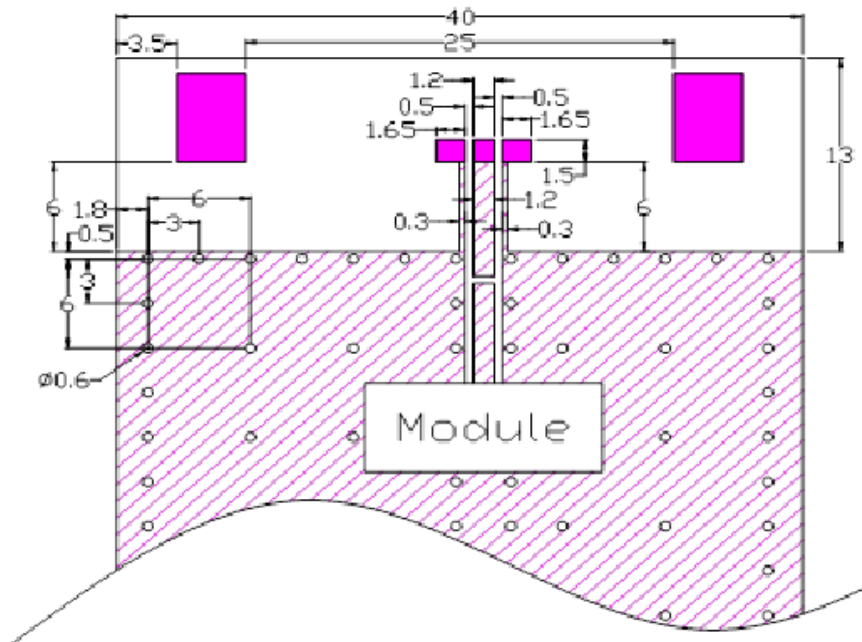
## Drawings

### Shape and Dimensions



Unit: mm

### Recommended Foot Print for Evaluation Board



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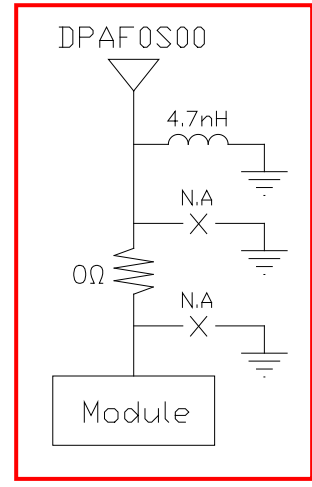
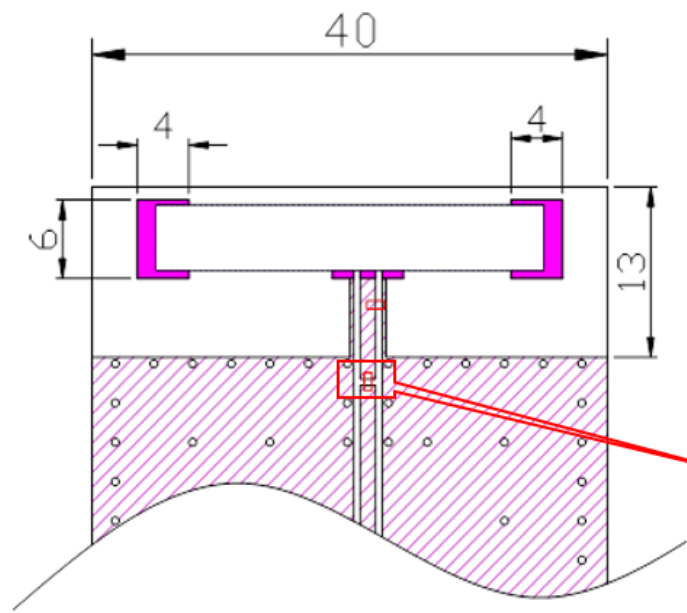
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30.0 x 5.0 x 5.0 mm  
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## Antenna Environment on Demo Board

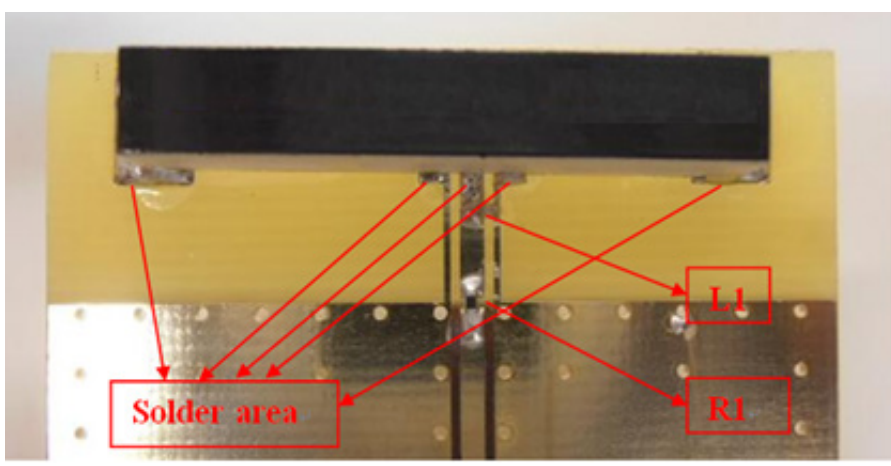
### Matching Circuit



Pi type matching

A pi type matching circuit is needed between antenna and module.

Unit: mm



Circuit Symbol	Size	Description
L1	0402	4.7nH Inductor
R1	0402	0 Ω

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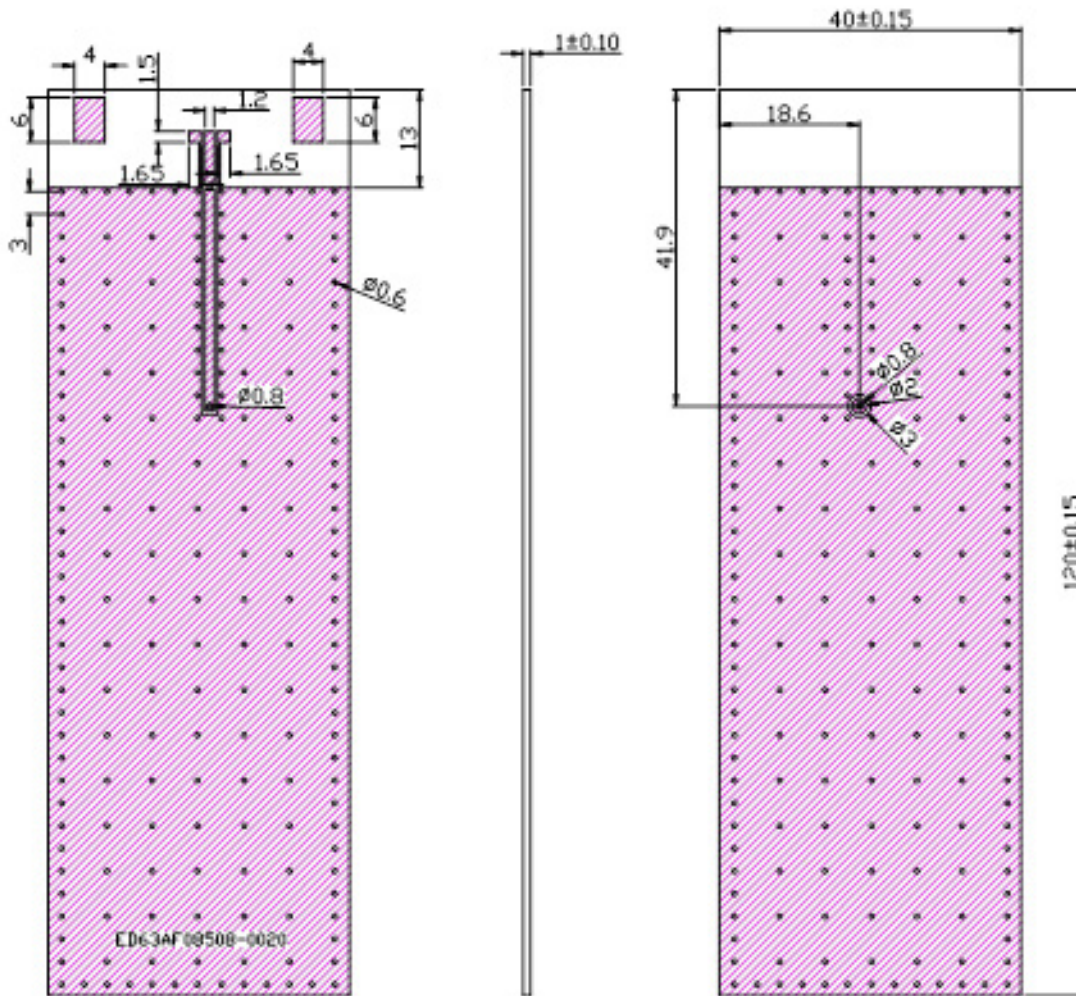


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30.0 x 5.0 x 5.0 mm  
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## Test Board Dimensions



Unit: mm

## Environmental Conditions

Parameters	Description
Operating Temperature Range	-40°C ~ + 85°C
Relative Humidity	0 ~ 95% RH @ +40°C
Storage Temperature Range	-40°C ~ + 85°C

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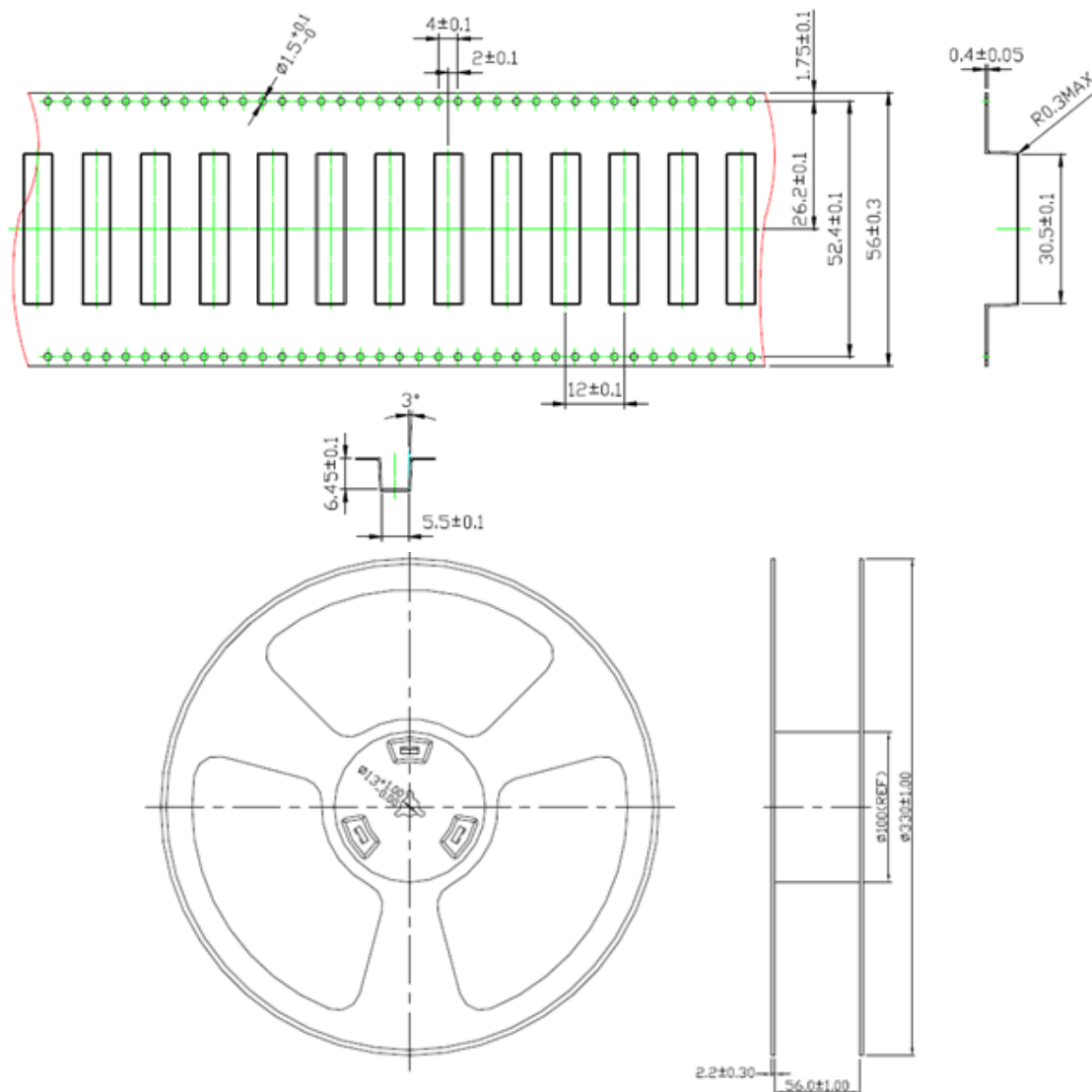
30.0 x 5.0 x 5.0 mm  
RoHS/RoHS II Compliant  
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## Precautions

- Antenna pattern use an Ag electrode.
- Please don't use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.
- Please don't direct solder onto the gold electrode of Antenna pattern.

## Packaging

1. 450pcs/reel
2. 350.0 x 340.0 x 67.0 mm (450pcs/Cartron-Inside)
3. 370.0 x 360.0 x 275.0 mm (1,350pcs/Cartron-Outside)
4. GW - 6.19KG



Unit: mm



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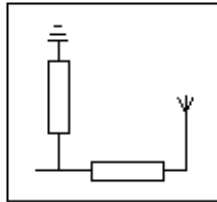
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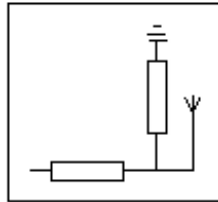
30.0 x 5.0 x 5.0 mm  
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## Transmission Line and Matching

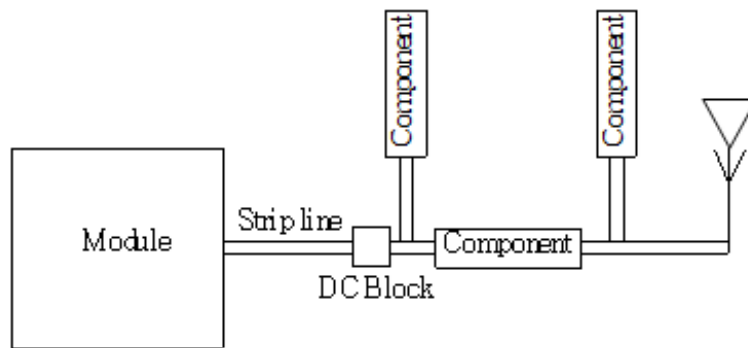
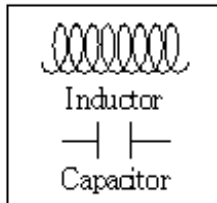
Typical config.1



Typical config.2



Component types



The matching network has to be individually designed using one, two, or three components.

## Recommended Reflow Soldering Profile

Abrakon products can be assembled following 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)
PREHEAT	Avg. Ramp-up Rate (T <sub>max</sub> to TP)	3°C/second (max)	3°C/second (max)
RAMP-UP	-Temperature Min(T <sub>Smin</sub> ) -Temperature Max(T <sub>Smin</sub> ) -Time(t <sub>Smin</sub> to t <sub>Smax</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 second	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.

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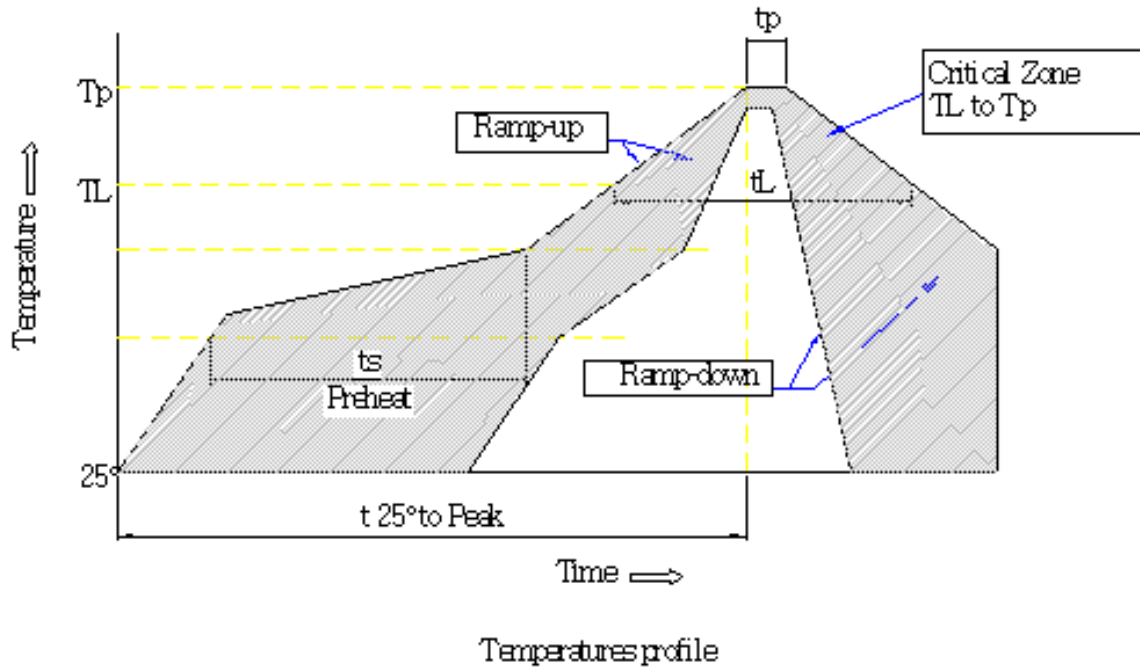


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Next graphic shows temperature profile (gray zone) for the antenna assembly process in reflow ovens



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