

# 4G/LTE Ceramic Chip Antenna



ACAR4008-S698



40.0 x 8.0 x 3.2 mm  
RoHS/RoHS II Compliant  
MSL = N/A

## 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

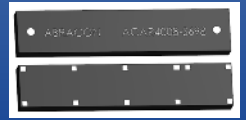
## Electrical Characteristics

Item	Spec
Working Frequency	700~960 MHz , 1710~2170 MHz , 2500~2700MHz
VSWR	< 4.0 (depends on the special environment)*
Polarization	Linear
Impedance	50 Ω
Operating Temperature	-40~85 °C
Termination	Ag (Environmentally-Friendly Pb Free)

\* Evaluation board size 45.0 x 105.0 mm<sup>2</sup>

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

# 4G/LTE Ceramic Chip Antenna

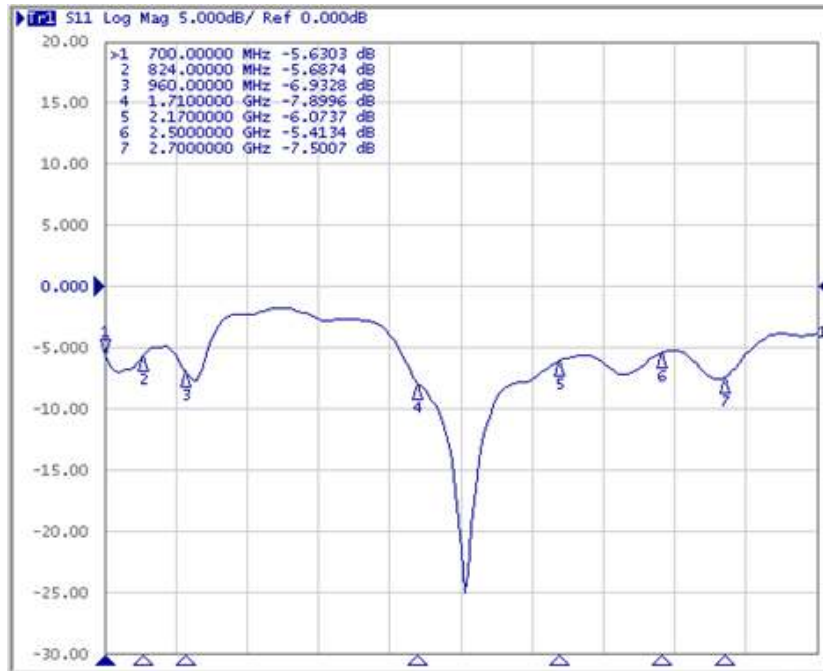


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## S11 Response Curve



## VSWR Response



# 4G/LTE Ceramic Chip Antenna

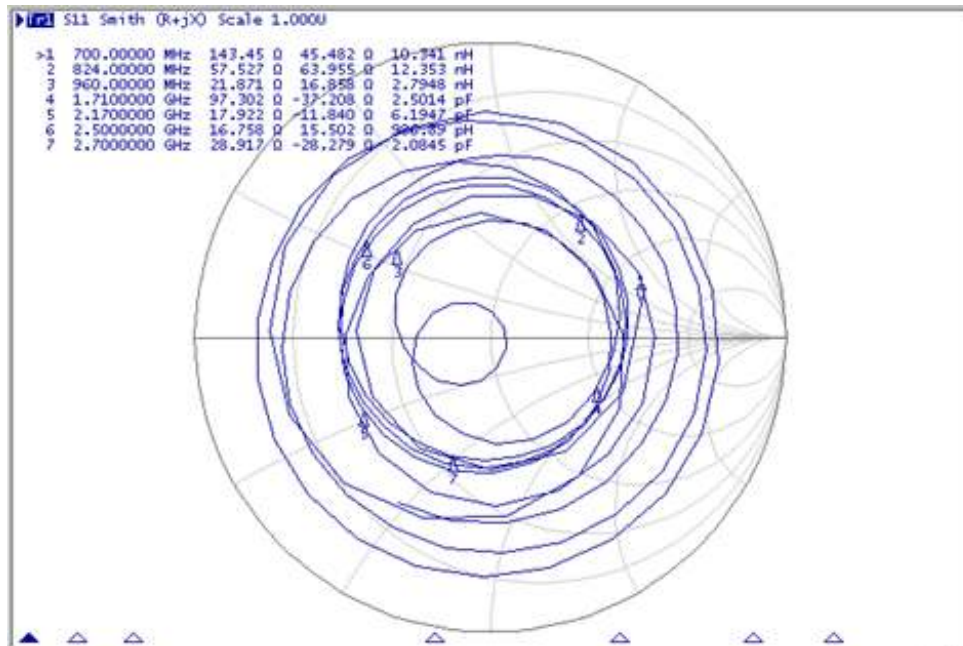


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## Smith Chart Response

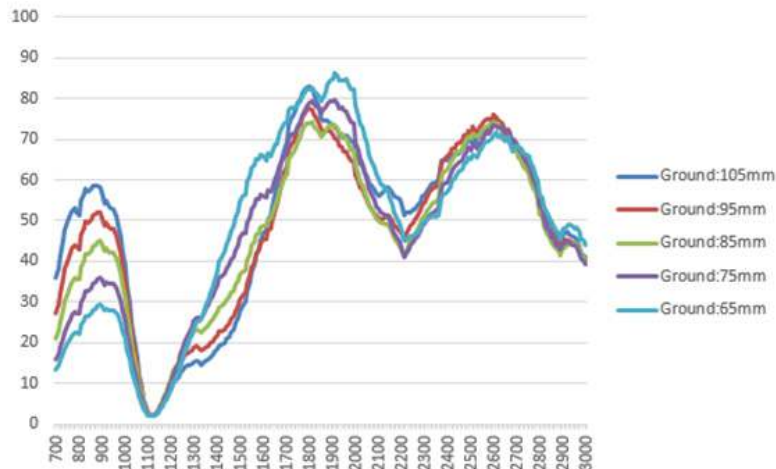


## Gain and Efficiency

(Ground length: 105mm)

Antenna Parameter Summary										
Band	700	824	890	960	1710	1850	1990	2170	2500	2700
Peak Gain(dBi)	-1.55	0.1	0.33	-0.16	4.10	3.79	2.75	2.27	2.74	1.75
Efficiency(%)	35.78	56.34	58.14	50.82	73.61	75.01	69.64	55.96	69.45	68.84

Reference efficiency data with different ground plane length:



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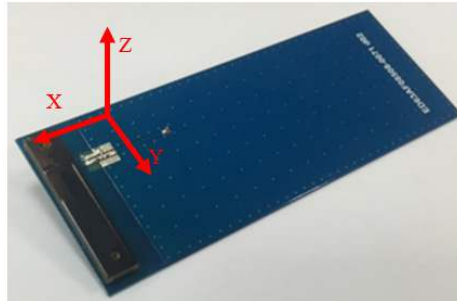


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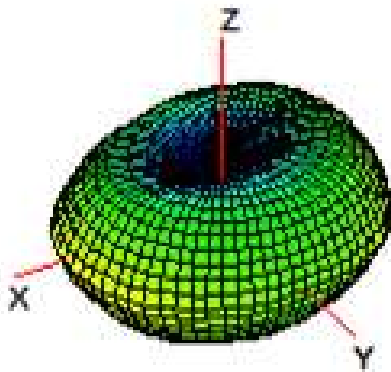


40.0 x 8.0 x 3.2 mm  
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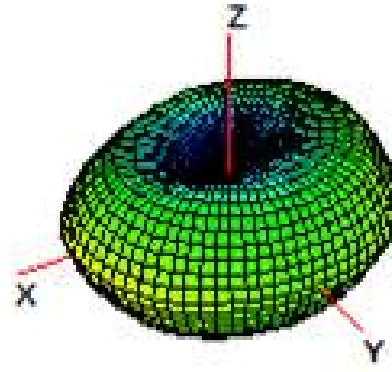
## 3D Radiation Pattern



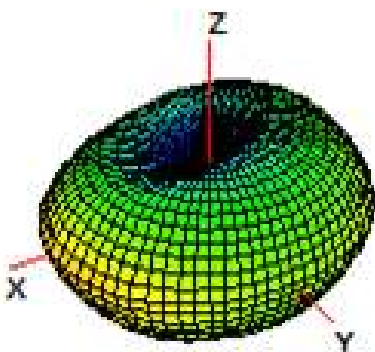
700MHz



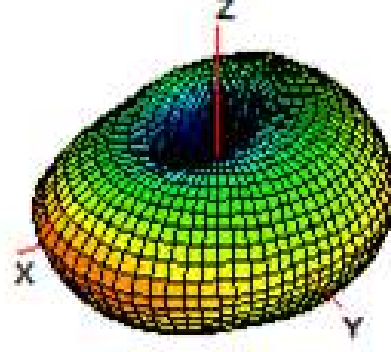
824MHz



890MHz



960MHz



# 4G/LTE Ceramic Chip Antenna



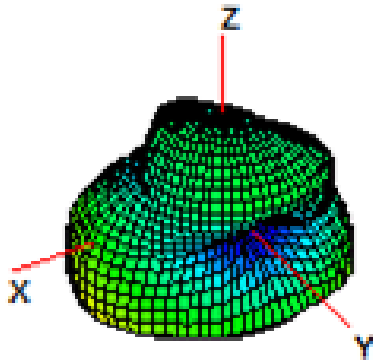
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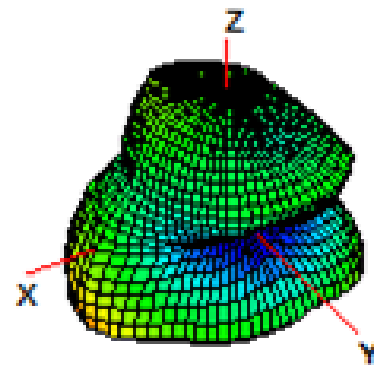
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## 3D Radiation Pattern

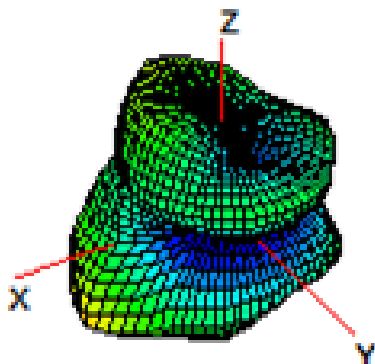
1710MHz



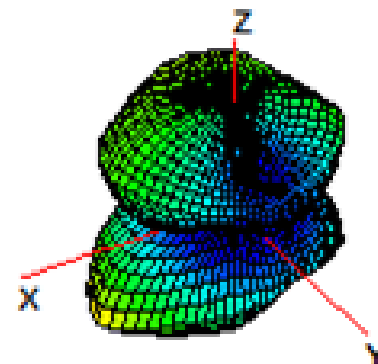
1850MHz



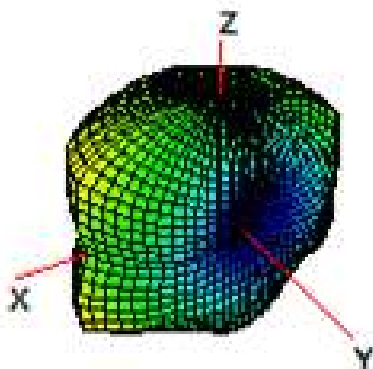
1990MHz



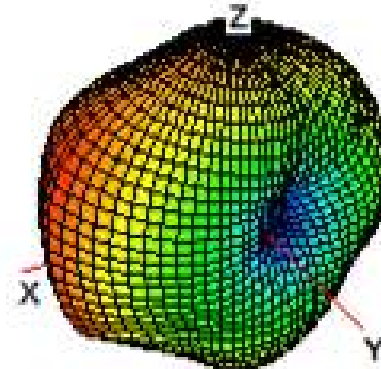
2170MHz



2500MHz



2700MHz



# 4G/LTE Ceramic Chip Antenna



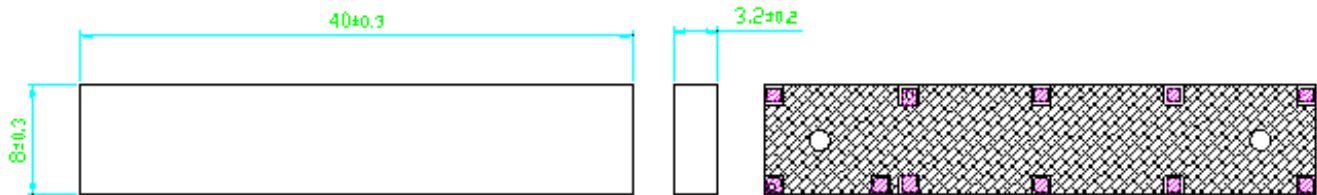
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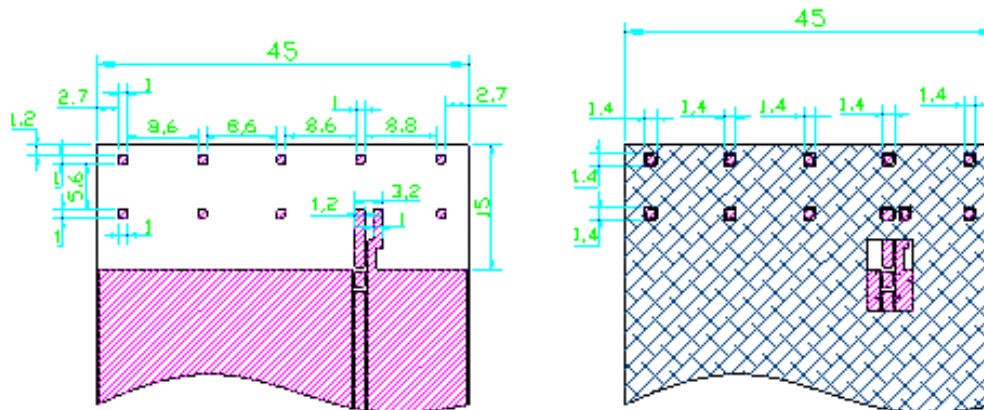
## Drawings

### Shape and Dimensions



Unit: mm

### Recommended Foot Print for Evaluation Board



Copper layer

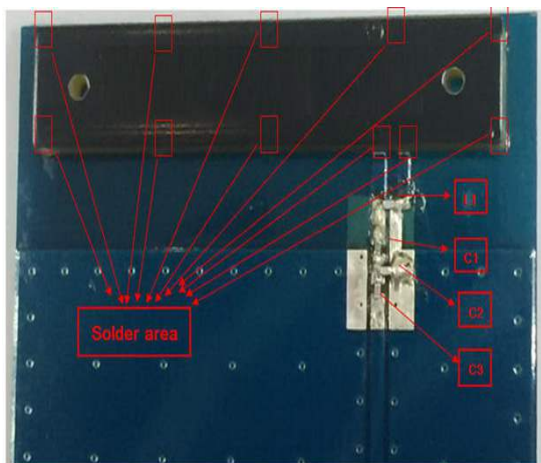
Top layer

Solder area

Solder mask

Top layer

Tolerances unless otherwise specified  $\pm 0.1$  mm  
 $t, w$  = Unique dimensioning according to your PCB.



Circuit Symbol	Size	Description
L1	0402	6.8nH Inductor
C1	0402	6.8pF Capacitor
C2	0402	1.2pF Capacitor
C3	0402	6.8pF Capacitor

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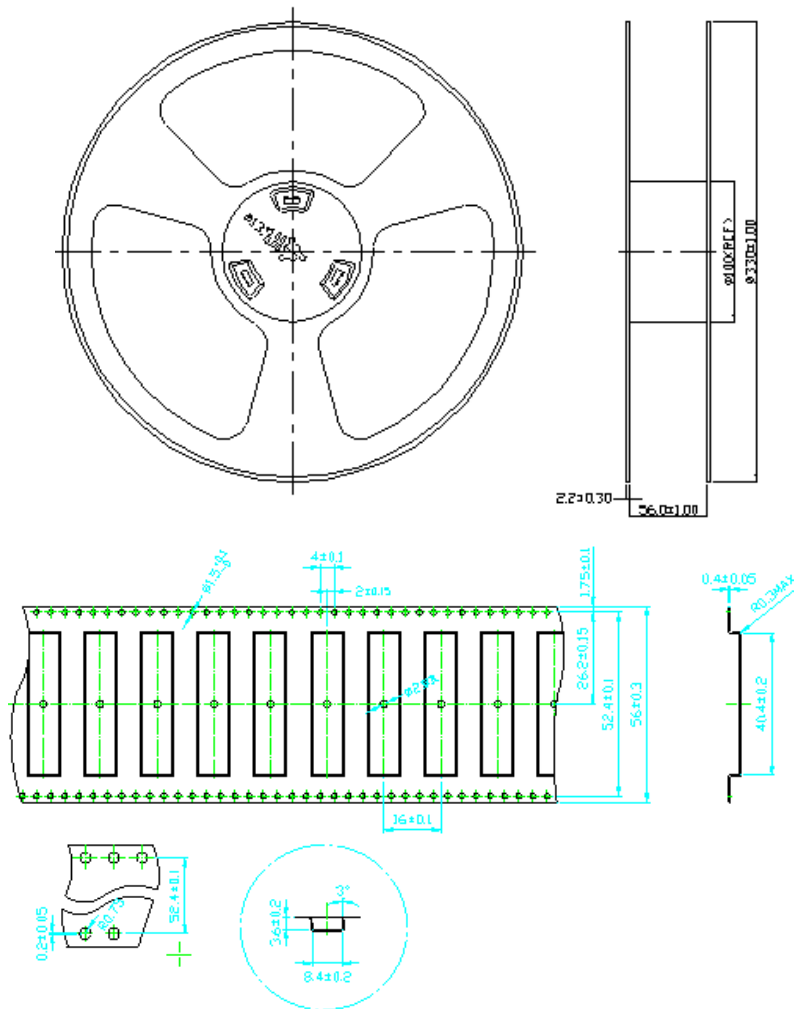
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## Environmental Conditions

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

## Packaging

1. Blister tape to IEC 286-3, polyester
2. 1000 pcs/reel
3. 370\*360\*275 mm (3000 pcs/Carton)
4. GW – 7.1 Kg



Unit: mm

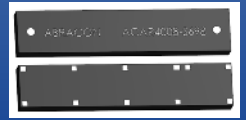


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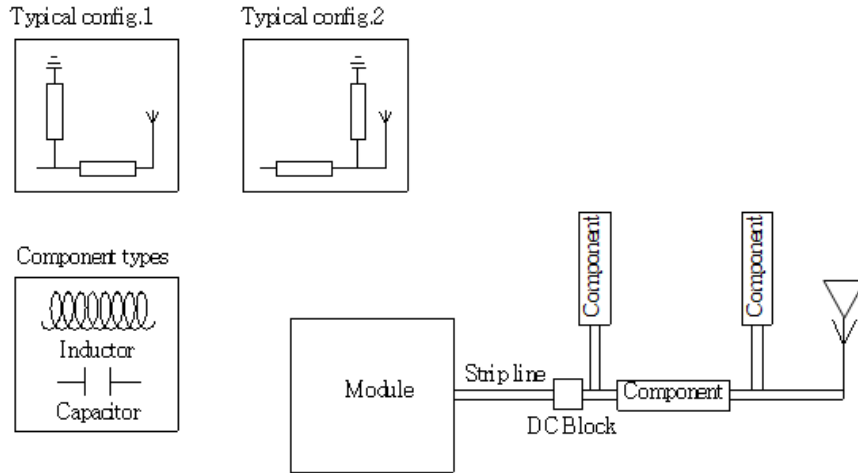


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## Transmission Line and Matching



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	Pb-Free Assembly (SnAgCu)
PREHEAT	-Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(ts) form (Tsmin to Tsmax)	150°C 200°C 60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (Tsmax to TP)	3°C/second(max)
REFLOW	-Temperature(TL) -Total Time above TL (t L)	217°C 30-100 seconds
PEAK	-Temperature(TP) -Time(tp)	260°C 10-20 second
RAMP-DOWN	Rate	6°C/ second max.
Time from 25°C to Peak Temperature		8 minutes max.
Composition of solder paste		96.5Sn/3Ag/0.5Cu
Solder Paste Model		SHENMAO PF606-P26



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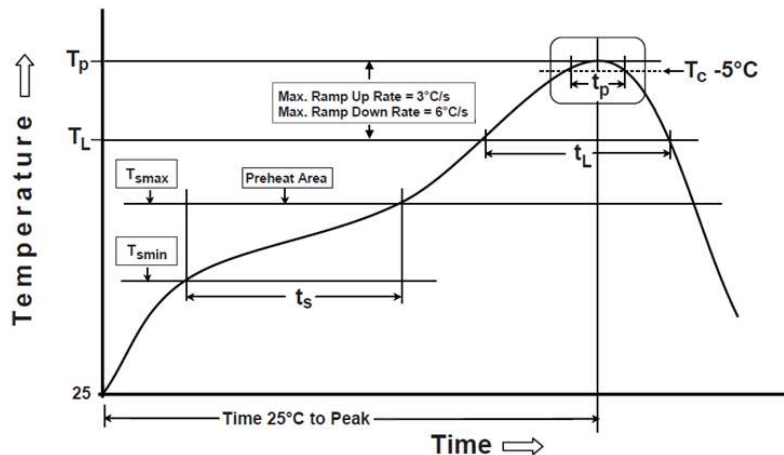


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## Recommended Reflow Soldering Profile

Note: All the temperature measure point is on top surface of the component, if temperature over recommend, it will make component surface peeling or damage.

The graphic shows temperature profile for component assembly process in reflow ovens



## Soldering With Iron:

**Soldering condition :** Soldering iron temperature 270±10 °C

Apply preheating at 120 °C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron over temperature 270±10 °C or 3 seconds, it will make component surface peeling or damage.

Soldering iron can not leakage of electricity.

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