PART NUMBER: GA-075

1 SCOPE

This specification covers the **FR4 Hexa-band Antenna** for **700~960**MHz, **1710~2170** MHz, **2500~27000** MHz application.

2 Name of the product

This product is named "**FR4 Hexa-band Antenna** ".

3 Electrical characteristics

3-1 Electrical characteristics of antenna

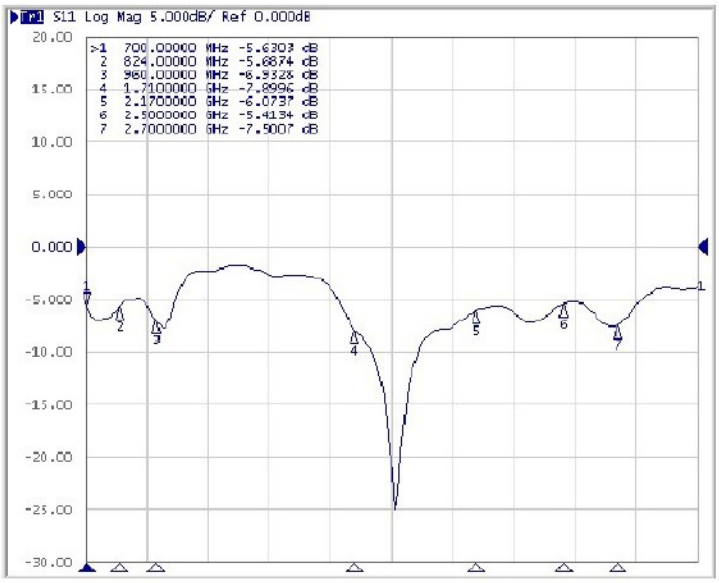
The antenna has the electrical characteristics given in Table 1 under the CHINMORE standard installation conditions shown in the figure of Evaluation Board.

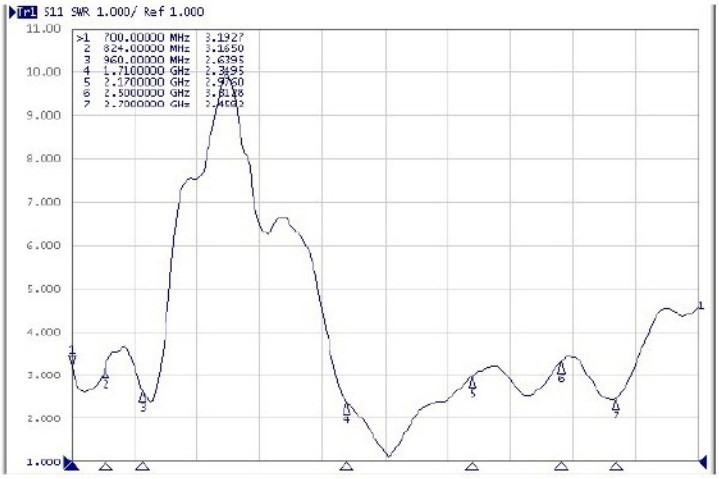
Table 1

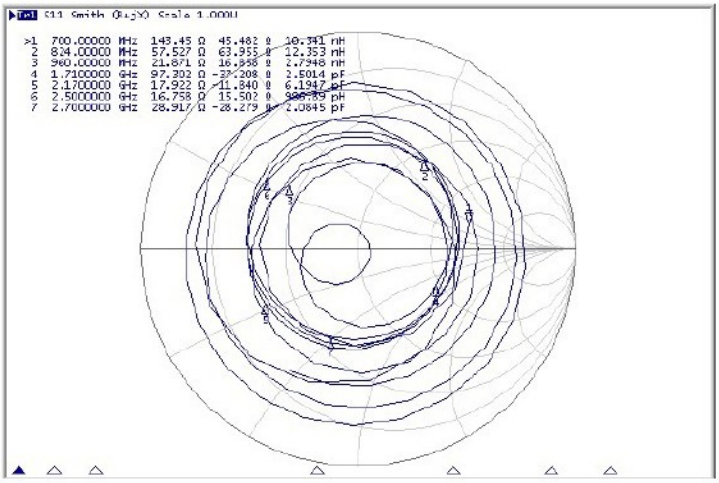
No	Parameter	Specification
1	Working Frequency	700~960 MHz , 1710~2170 MHz , 2500~2700MHz
2	Dimension	40×8×3.2 mm
3	VSWR	4 max (depends on the special environment)
4	Polarization	Linear
5	Impedance	50 Ω
6	Operating Temperature	-40~85℃
7	Termination	Ag (Environmentally-Friendly Pb Free)

* Evaluation board size 45X120 mm^2
* Actual Electrical value will depend on customer ground plane size

S11 Response curve





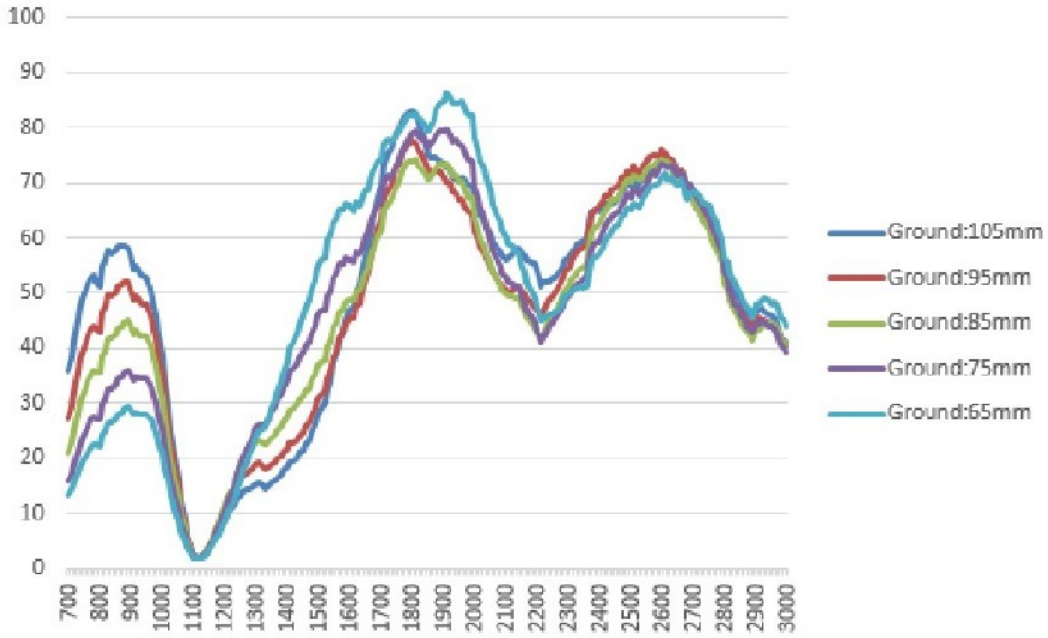


Gain and Efficiency

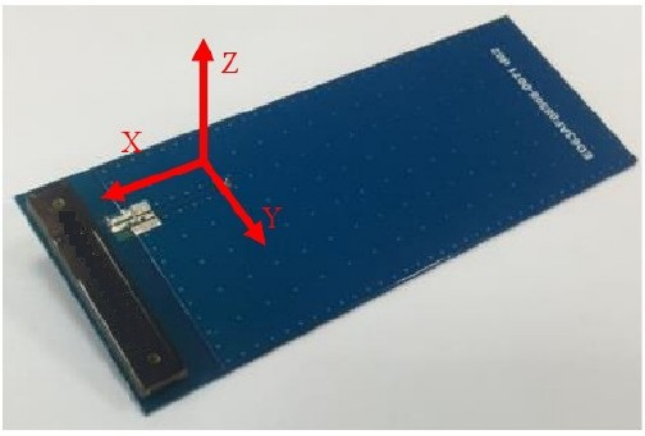
(Ground length: 105mm)

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

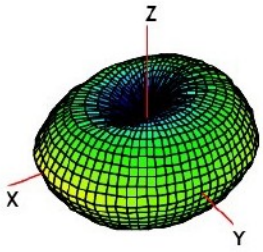
Reference efficiency data with different ground plane length :



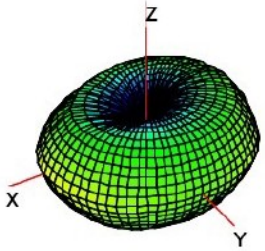
3D Radiation Pattern (measure on CHINMORE EVB)



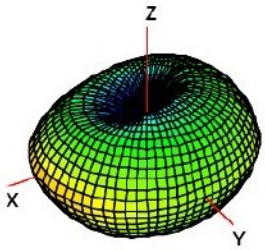
700MHz



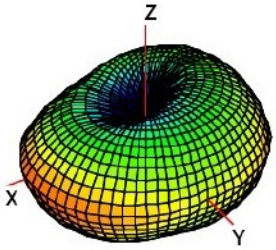
824MHz



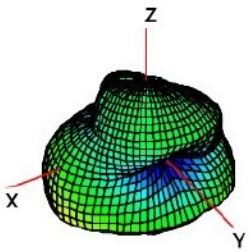
890MHz



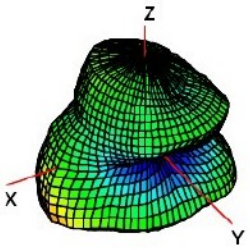
960MHz



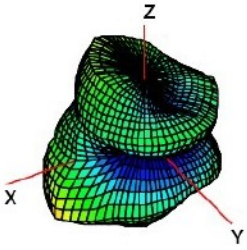
1710MHz



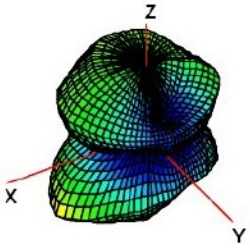
1850MHz



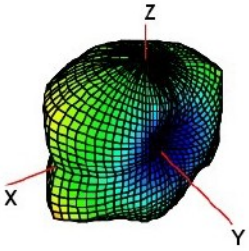
1990MHz



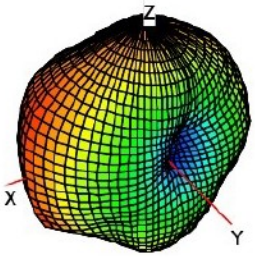
2170MHz



2500MHz



2700MHz



4 Environmental conditions

4-1 Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -40℃ to +85℃ and under the environmental conditions of +40℃ and 0-95 % r.h..

4-2 Storage temperature range

The storage temperature range of product is -40℃ to +85℃

5 Reliability tests

5-1 Low-temperature test

Expose the specimen to -40℃ for 16 hours and then to normal temperature/ humidity for 24 hours or more. After this test, examine its appearance and functions.

5-2 High-temperature test

Expose the specimen to +85℃ for 16 hours and then to normal temperature/ humidity for 24 hours or more. After this test, examine its appearance and functions.

5-3 High-temperature/high-humidity test

Subject the object to the environmental conditions of +85℃ and 90-95% r.h. for 96 hours, then expose to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

5-4 Thermal shock test

Subject the object to cyclic temperature change (-40℃, 30 minutes $\Longleftrightarrow$ +85℃, 30 minutes) for 5 cycles, the expose to normal temperature/humidity for 16 hours or more.

5-5 Vibration test

5-5-1 Sinusoidal vibration test

Subject the object to vibrations of 5 to 200 to 5Hz swept in 10 minutes, 4.5G at maximum (2mm amplitude), in X and Y directions for two hours each and in Z direction for four hours. After this test, examine its appearance functions.

5-5-2 Vibration test in packaged condition

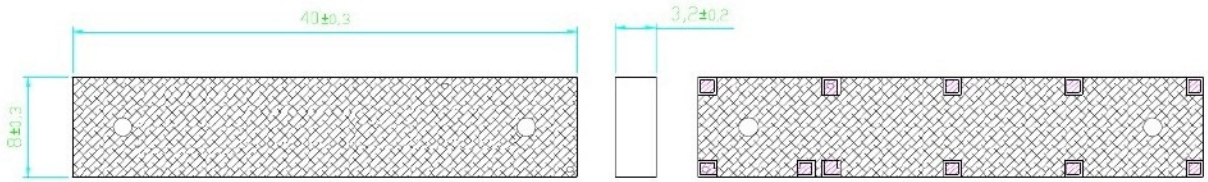
Subject the object, which is packaged as illustrated, to vibrations of 15 to 60 to 15Hz swept in 6 minutes, 4G at maximum (2mm amplitude at maximum), applied in X, Y and Z directions for two hours each, i.e. six hours in total. After this test, examine its appearance and functions.

5-6 Free fall test in packaged condition

Drop the object, which is packaged as illustrated, to a concrete surface from the height of 90 cm, on one comer, three edges and six faces once each, i.e. 10 times in total. After this, check the appearance and functions.

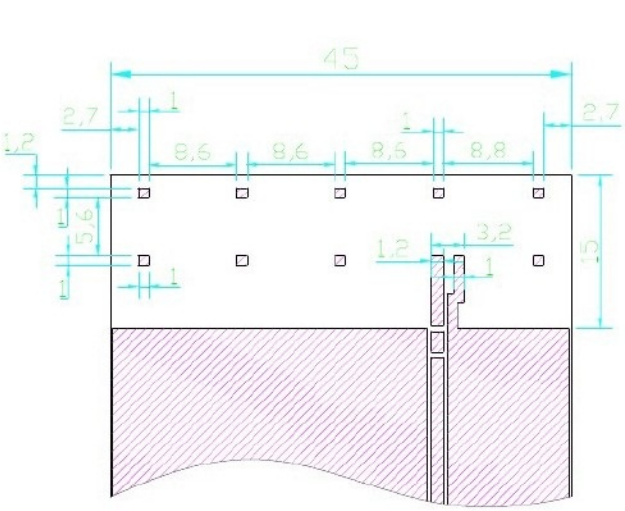
7. Drawings

Shape and Dimension



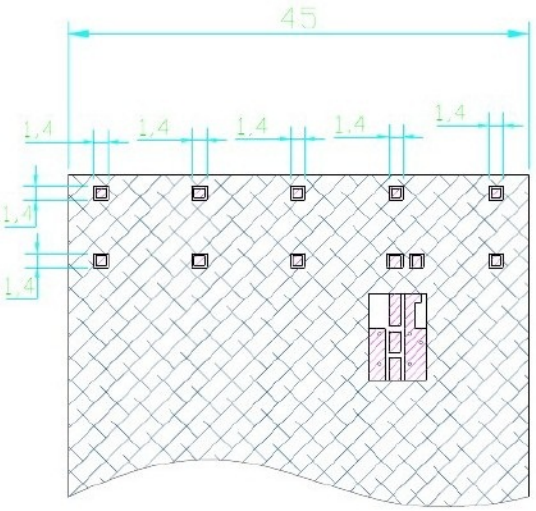
Unit :mm

Recommend foot print for Evaluation Board



Copper layer

Top layer



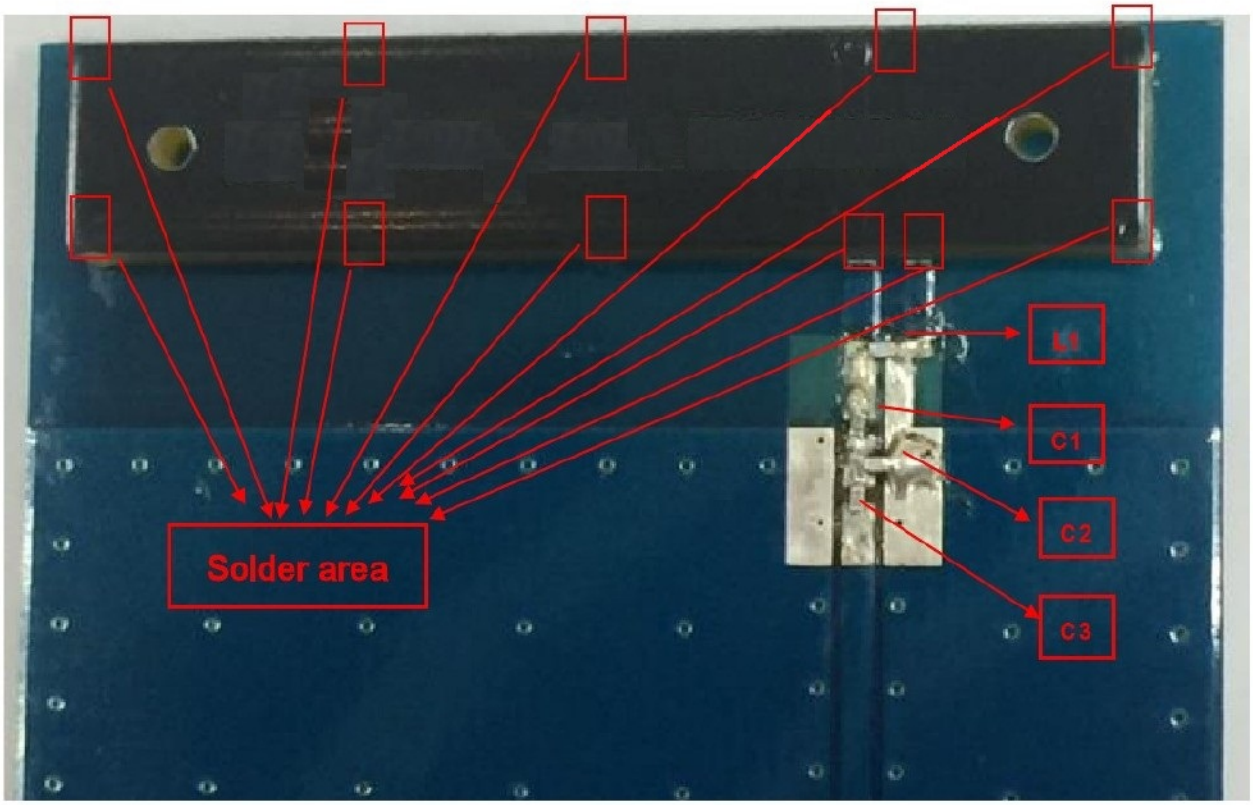
Solder area

Solder masker

Top layer

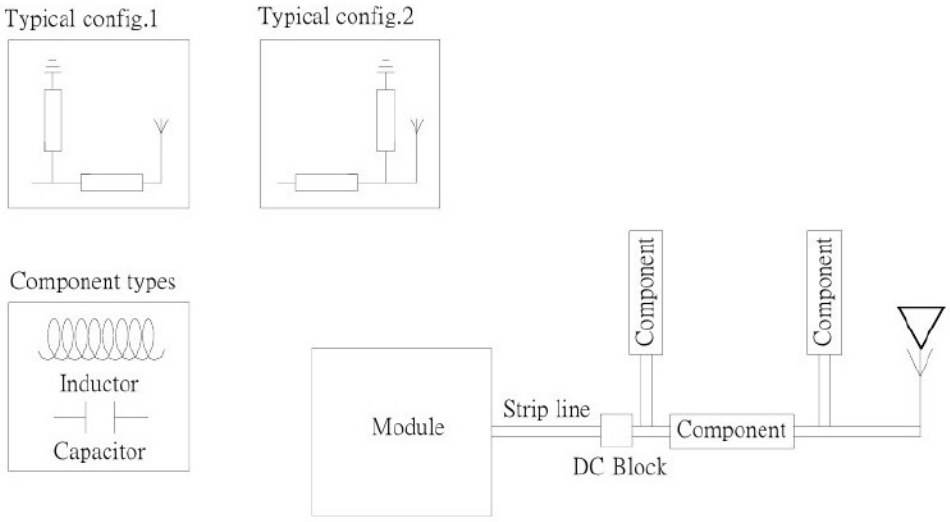
Tolerances unless otherwise specified ±0.1mm

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

Transmission line and matching



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

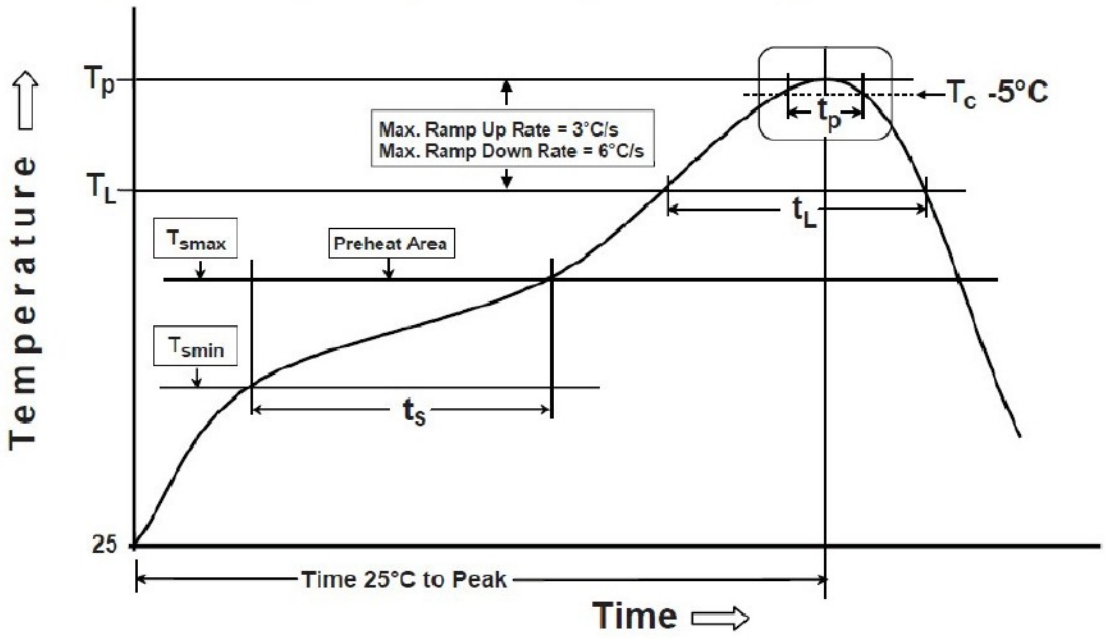
8. Recommended Reflow Soldering Profile

Chinmore 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℃ 200℃ 60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (Tsmax to TP)	3℃/second(max)
REFLOW	-Temperature(TL) -Total Time above TL (t L)	217℃ 30-100 seconds
PEAK	-Temperature(TP) -Time(tp)	260℃ 10-20 second
RAMP-DOWN	Rate	6℃ / second max.
Time from 25℃ to Peak Temperature		8 minutes max.
Composition of solder paste		96.5Sn/3Ag/0.5Cu
Solder Paste Model		SHENMAO PF606-P26

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 ℃.
Apply preheating at 120℃ for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron over temperature 270±10 ℃ or 3 seconds, it will make component surface peeling or damage.
Soldering iron can not leakage of electricity.