

PF1004

Chip Antenna for Wireless Application

PF1004 Chip Antenna

◆ Features

- Size : 10.1mm(L)X4.2mm(W)X3.1mm(H)
 - Light weight and low profile
 - Linear Polarization
- Lead (Pb) Free

◆ Applications

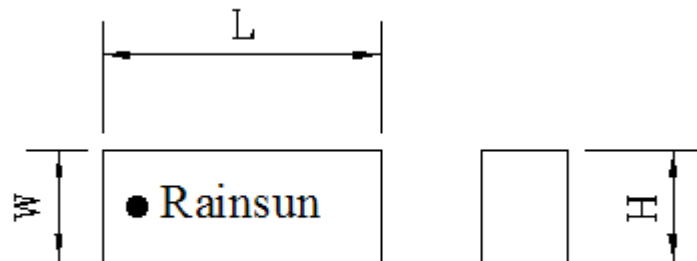
- 2.4 GHz & 5~6GHz Wireless communication
- 802.11a/b/g/n WLAN device, WLAN Router
- Netbook, Tablet PC, PDA

Specifications

| | |
|-----------------------|----------------|
| Frequency range | 2.45G & 5~6GHz |
| Peak gain | 3 dBi |
| Operation temperature | -40 ~ +85 °C |
| Storage temperature | -40 ~ +100 °C |
| VSWR | 2 (Max) |
| Input Impedance | 50 Ohm |
| Power handling | 5W (Max) |
| Polarization | Linear |
| Soldering pad | Natural tin |

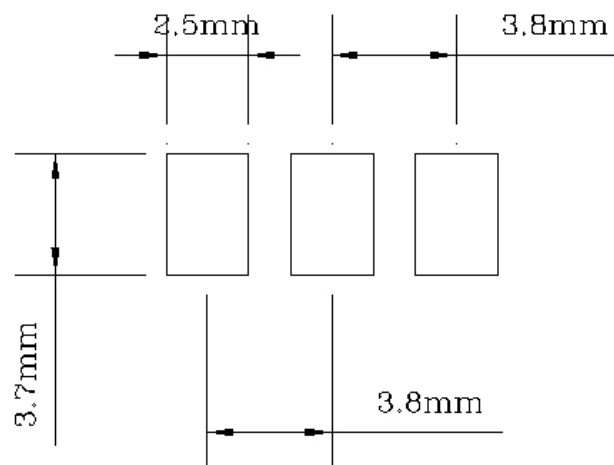
Dimension

Top view



| | |
|------------|-------------------------|
| L (Length) | $10.1 \pm 0.1\text{mm}$ |
| W (Width) | $4.1 \pm 0.1\text{mm}$ |
| H (Height) | $3.1 \pm 0.1\text{mm}$ |

PCB Foot printer



Recommended Test Board Pattern

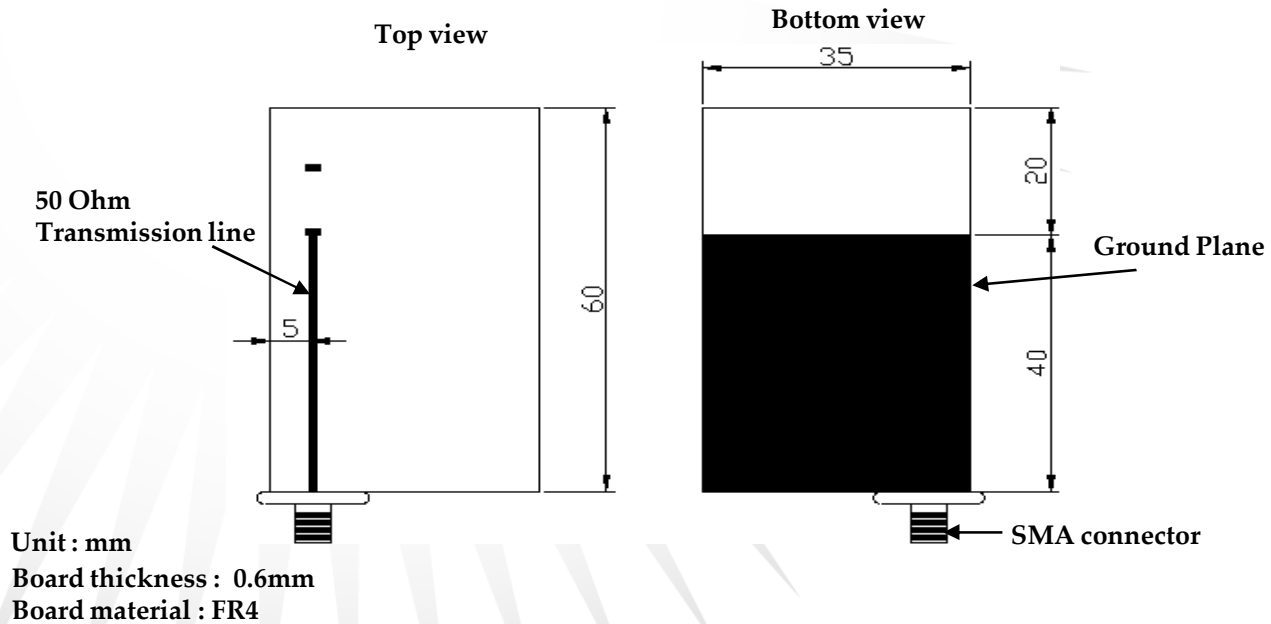
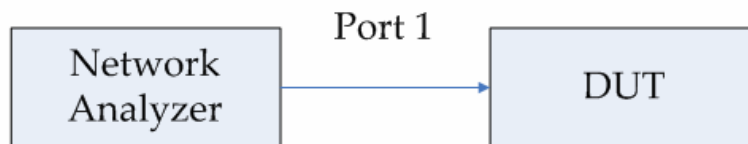


Fig-1

Testing Setup



Measurement



Testing Instrument:

Anritsu 37369C VNA (Vector Network Analyzer)

VNA calibrate with 1 path reflection only calibration sequence on test board feed point.

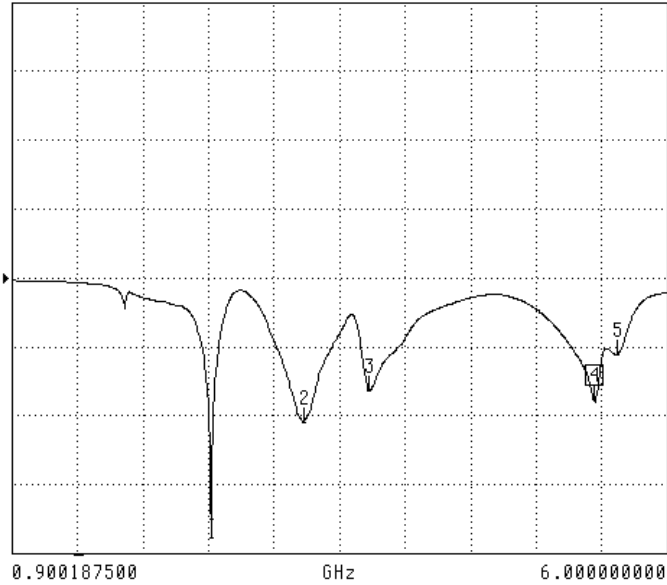
The test board dimension and its layout is the same as Fig-1.

Typical Electrical Characteristics

Return loss

S11 FORWARD REFLECTION

LOG MAGNITUDE REF=0.000 dB 10.000 dB/DIV



CH 1 - S11
 REFERENCE PLANE
 0.0000 mm

MARKER 4
 5.432125000 GHz
 -17.781 dB

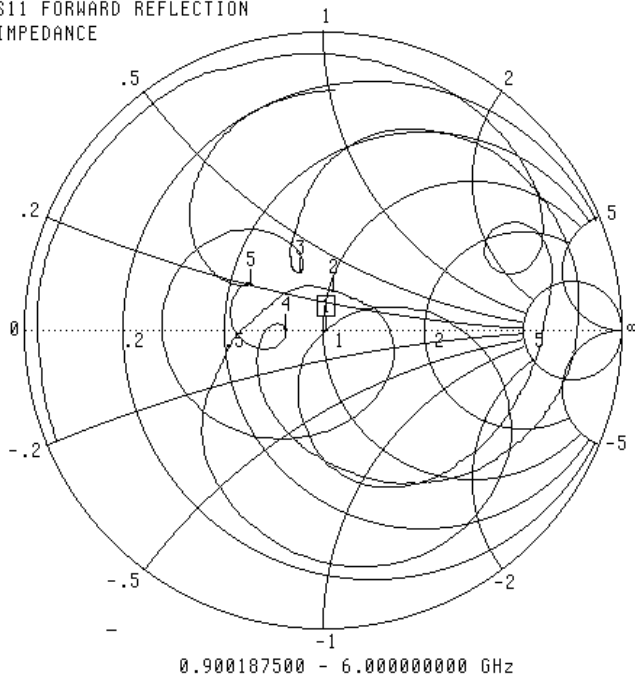
MARKER TO MAX
 MARKER TO MIN

- 1 2.452625000 GHz
-37.749 dB
- 2 3.179062500 GHz
-21.002 dB
- 3 3.684250000 GHz
-16.357 dB
- 5 5.609125000 GHz
-11.181 dB

MARKER READOUT
 FUNCTIONS

Smith Chart

S11 FORWARD REFLECTION
 IMPEDANCE



CH 1 - S11
 REFERENCE PLANE
 0.0000 mm

MARKER 1
 2.452625000 GHz
 51.607 Ω
 -465.298 jΩ

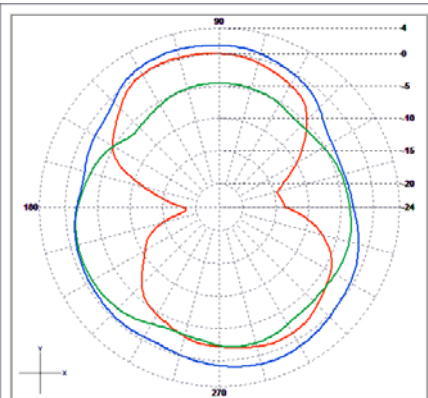
MARKER TO MAX
 MARKER TO MIN

- 2 3.190125000 GHz
52.250 Ω
13.648 jΩ
- 3 3.699000000 GHz
40.373 Ω
16.051 jΩ
- 4 5.424750000 GHz
39.131 Ω
168.208 jΩ
- 5 5.594375000 GHz
29.522 Ω
9.744 jΩ

MARKER READOUT
 FUNCTIONS

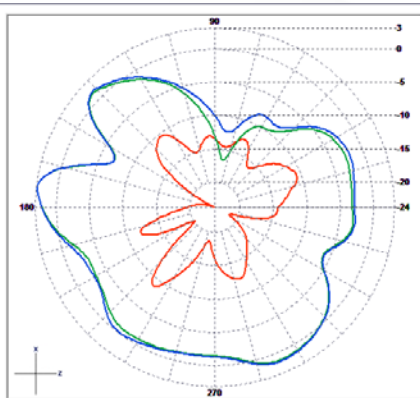
2.4GHz Radiation Pattern

X-Y



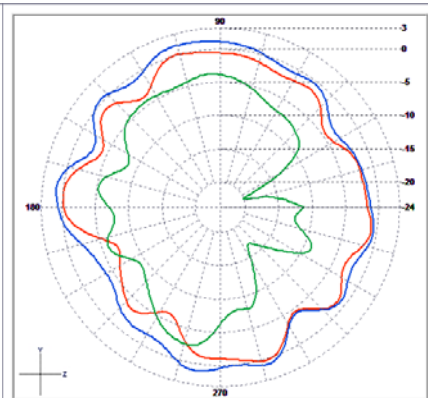
| | Vertical | Horizontal | Total |
|-----------|----------|------------|-------|
| Avg. Gain | -3.47 | -3.37 | -0.41 |
| Peak Gain | 0.28 | -1.12 | 1.46 |

X-Z

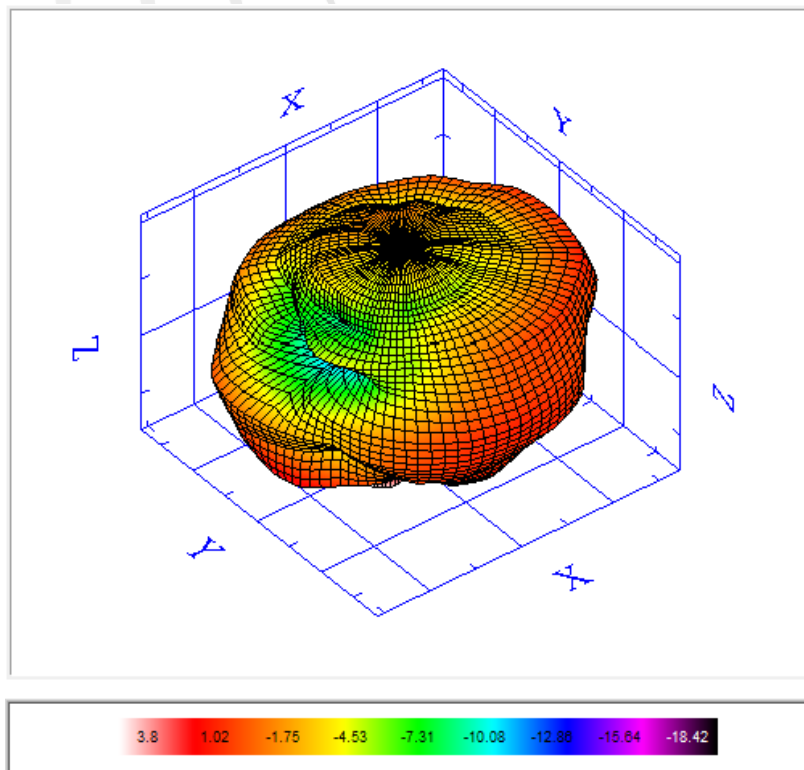


| | Vertical | Horizontal | Total |
|-----------|----------|------------|-------|
| Avg. Gain | -13.36 | -1.66 | -1.38 |
| Peak Gain | -7.24 | 3.66 | 3.67 |

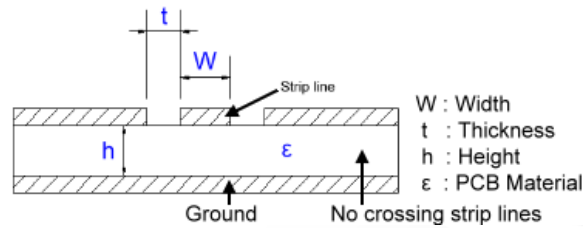
Y-Z



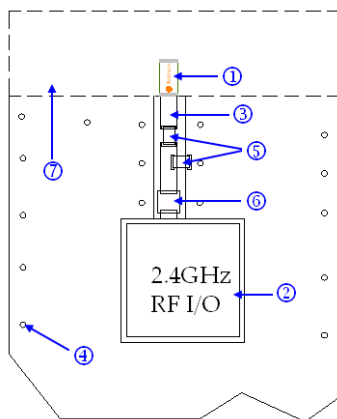
| | Vertical | Horizontal | Total |
|-----------|----------|------------|-------|
| Avg. Gain | -1.91 | -6.57 | -0.63 |
| Peak Gain | 0.65 | -2.08 | 1.46 |



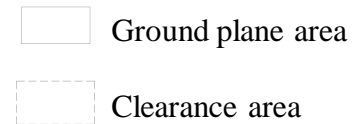
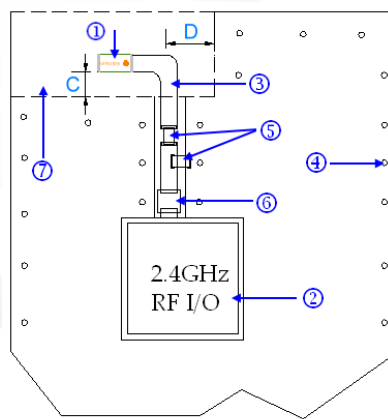
4. Application design guide



Best Choice



Acceptable



1. Placement of the antenna

The antenna shall be placed on a area without underlying ground plane at the edge of the PCB oriented as above. Ground plane area surrounding the antenna should be with minimum clearance 3mm.

2. Placement of 2.4 GHz module

To avoid losses in the strip line, the module shall be placed as close to the antenna as possible.

3. Strip line

The strip line impedance must be dimensioned according to your specific PCB (see fig.2) to 50 Ohm. No crossing strip lines are allowed between the strip line and its ground plane.

4. Via Connections on PCB

To avoid spurious effects via connections must be made to analogue ground. Via connection depends on PCB layout design. Figure 2 for reference only.

5. Component matching

Component values are depending on antenna placement, PCB dimensions and location of other components. PCB dimension and antenna location will effect the antenna frequency.

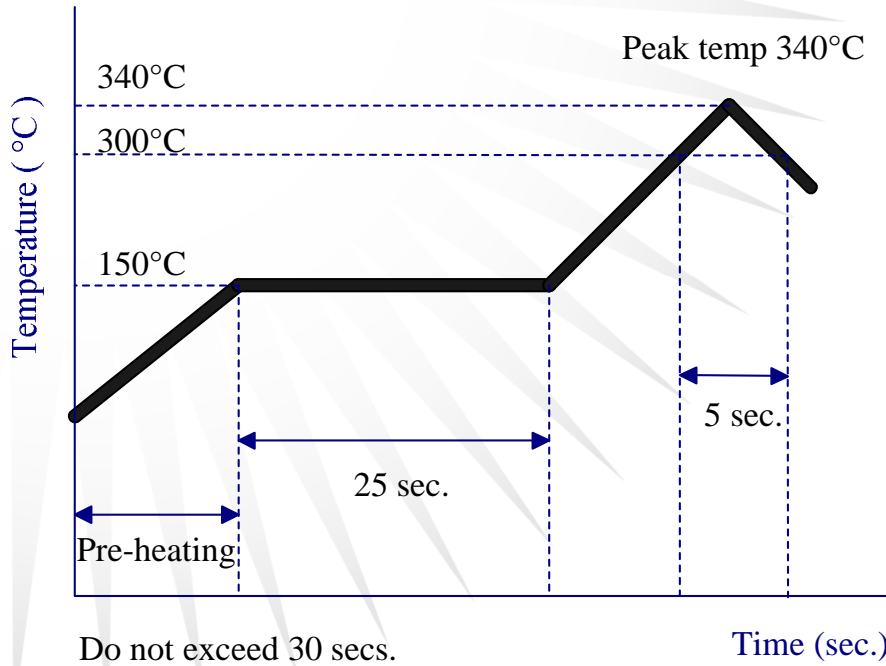
6. DC Block

It might be needed depending on RF Module or chip hardware design.

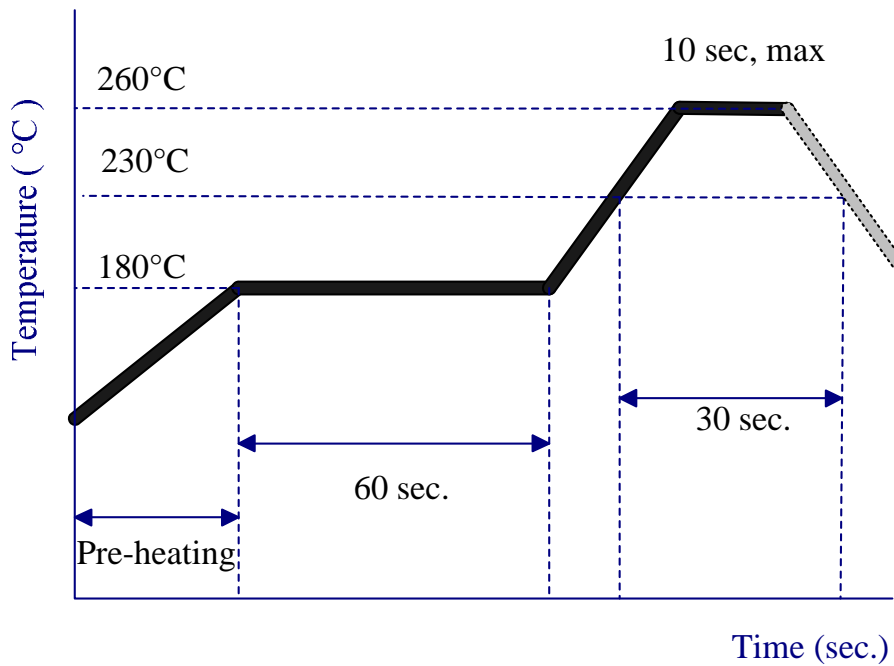
7. Clearance

No components allowed within the clearence area with a minimum distance to other components. The minimum distance is 3mm.

Typical Soldering Profile for Lead-free Process

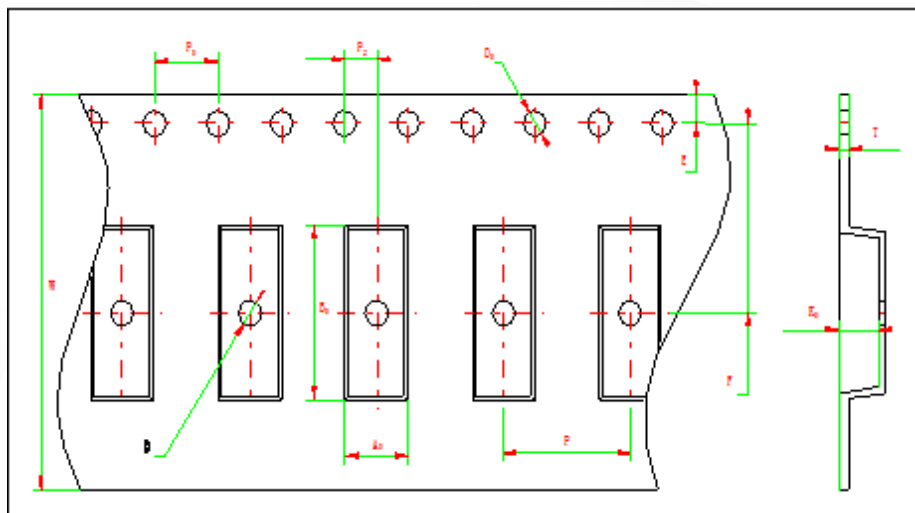


Reflow Soldering



Packing

Blister Tape Specifications



| Symbol | Dimension (mm) |
|------------|-------------------|
| w | $24^{\pm 0.3}$ |
| P | $8^{\pm 0.1}$ |
| E | $1.75^{\pm 0.1}$ |
| F | $11.5^{\pm 0.05}$ |
| ΦD_0 | $1.5^{+0.1}_{-0}$ |
| ΦD_1 | 1.5MIN |
| P_0 | $4^{\pm 0.1}$ |
| $10P_0$ | $40^{\pm 0.2}$ |
| P_2 | $2^{\pm 0.05}$ |
| A_0 | $4.3^{\pm 0.1}$ |
| B_0 | $10.6^{\pm 0.1}$ |
| K_0 | $3.5^{\pm 0.1}$ |
| t | $0.3^{\pm 0.05}$ |