

# **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

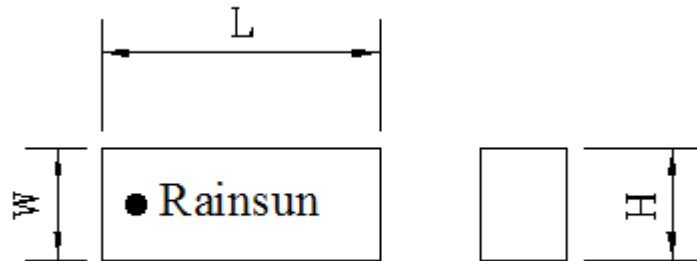
- 2.4 GHz & 5~6GHz Wireless communication
- 802.11a/b/g/n WLAN device, WLAN Router
- Netbook, Tablet PC, PDA

## 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

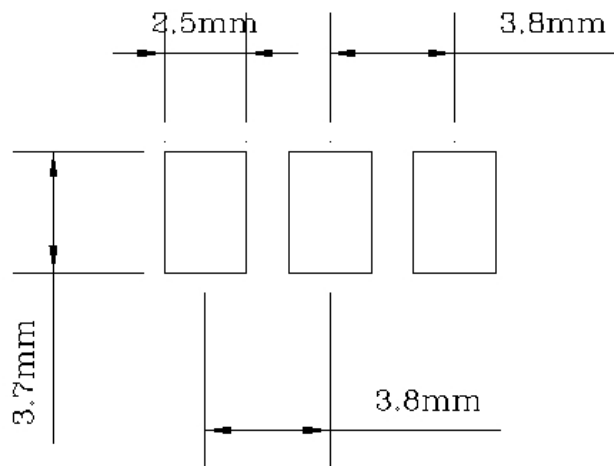
# Dimension

## Top view

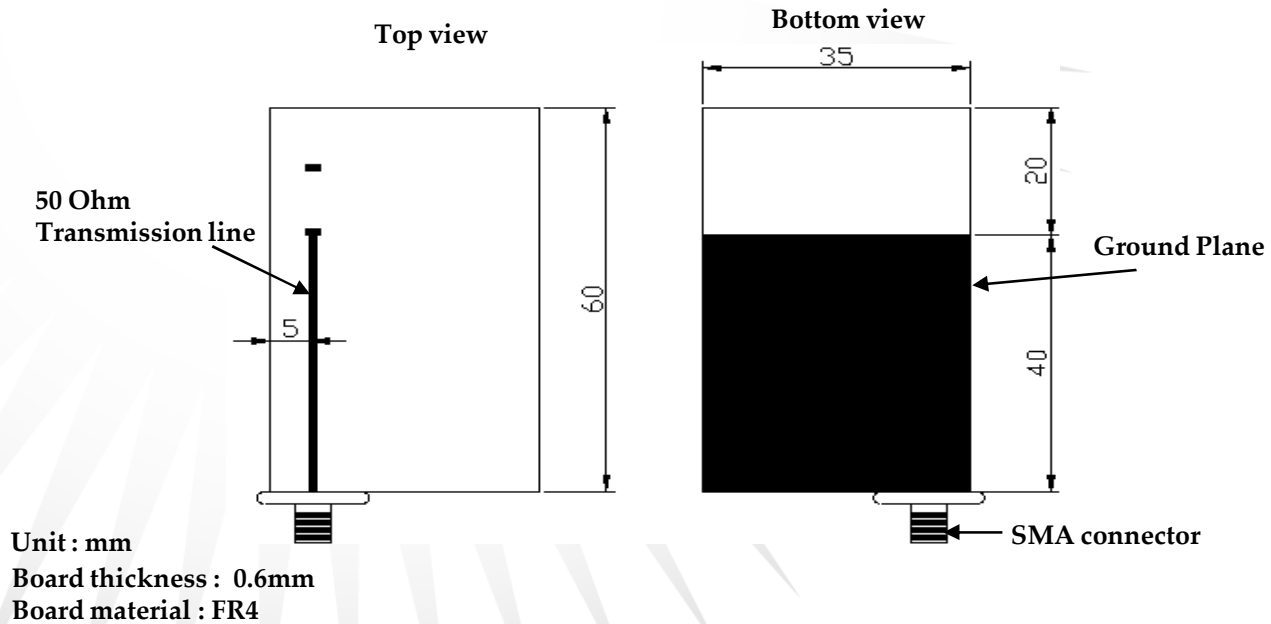


L (Length)	10.1 ±0.1mm
W (Width)	4.1 ±0.1mm
H (Height)	3.1 ±0.1mm

## PCB Foot printer

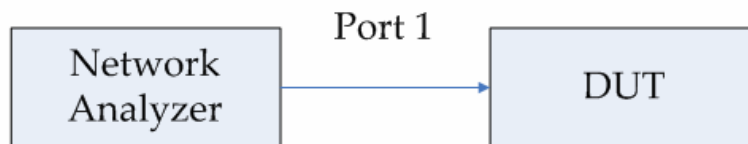


## Recommended Test Board Pattern



**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.

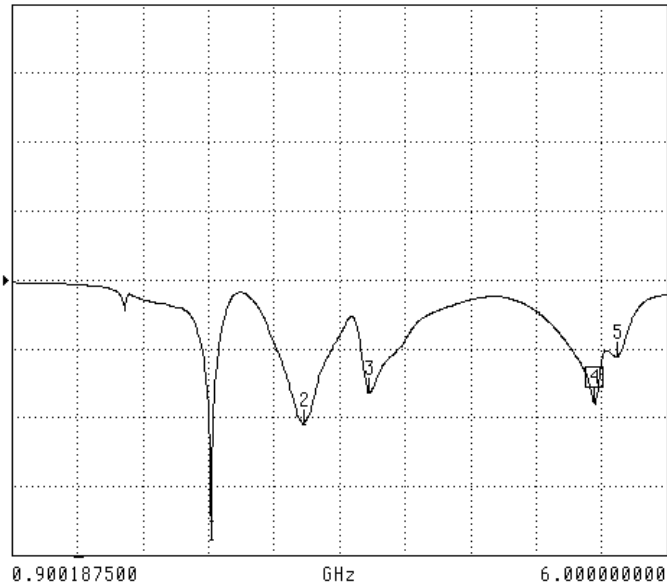
The test board dimension and it's layout is the same as Fig-1.

# 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

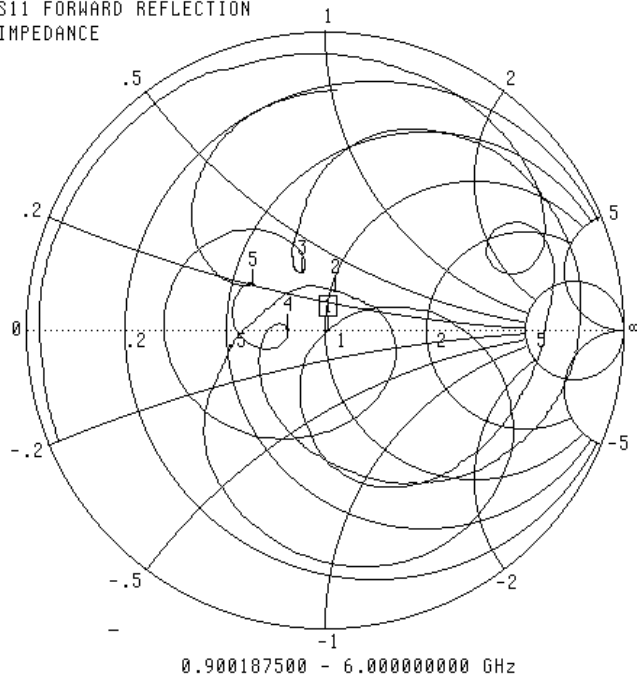
MARKER TO MAX  
 MARKER TO MIN

- 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 j mΩ

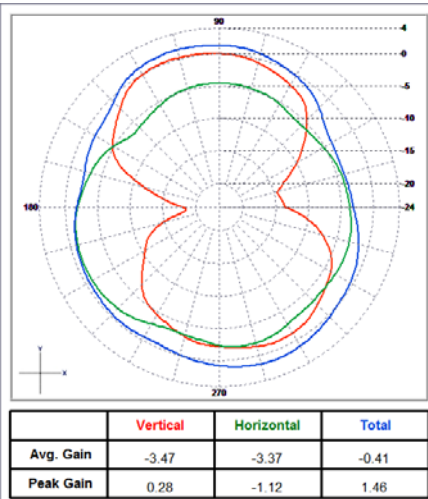
MARKER TO MAX  
 MARKER TO MIN

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

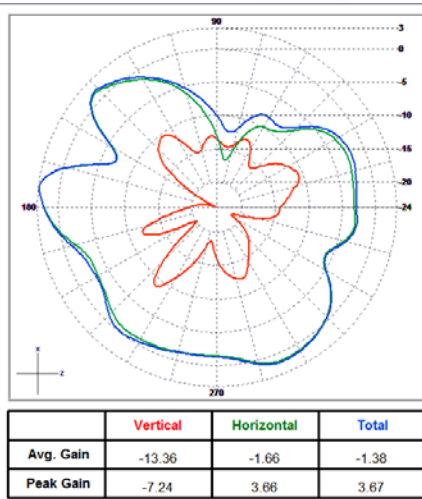
MARKER READOUT  
 FUNCTIONS

## 2.4GHz Radiation Pattern

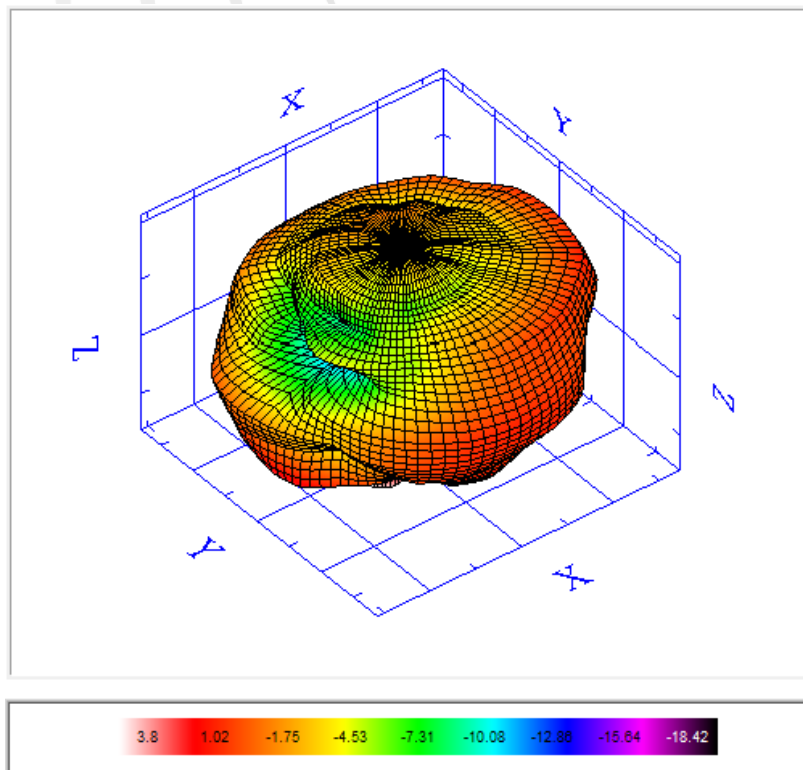
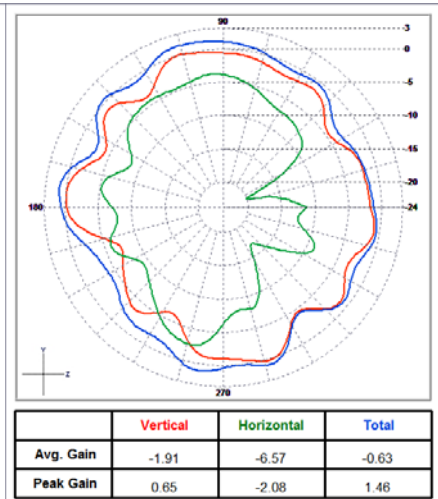
X-Y



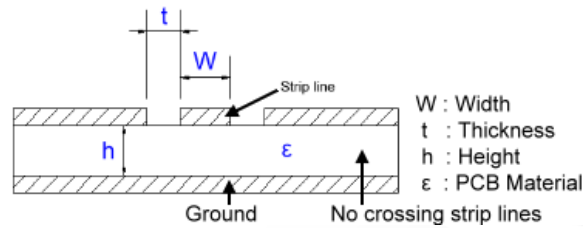
X-Z



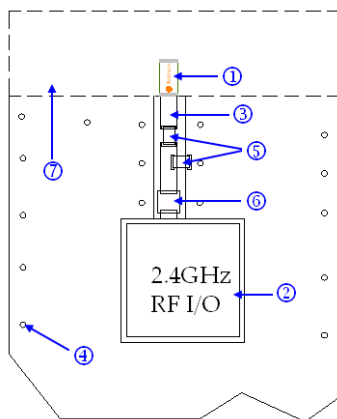
Y-Z



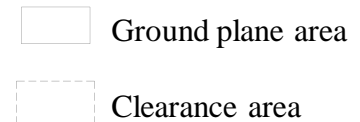
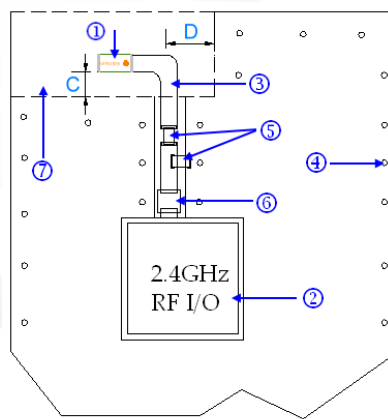
## 4. Application design guide



### 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.

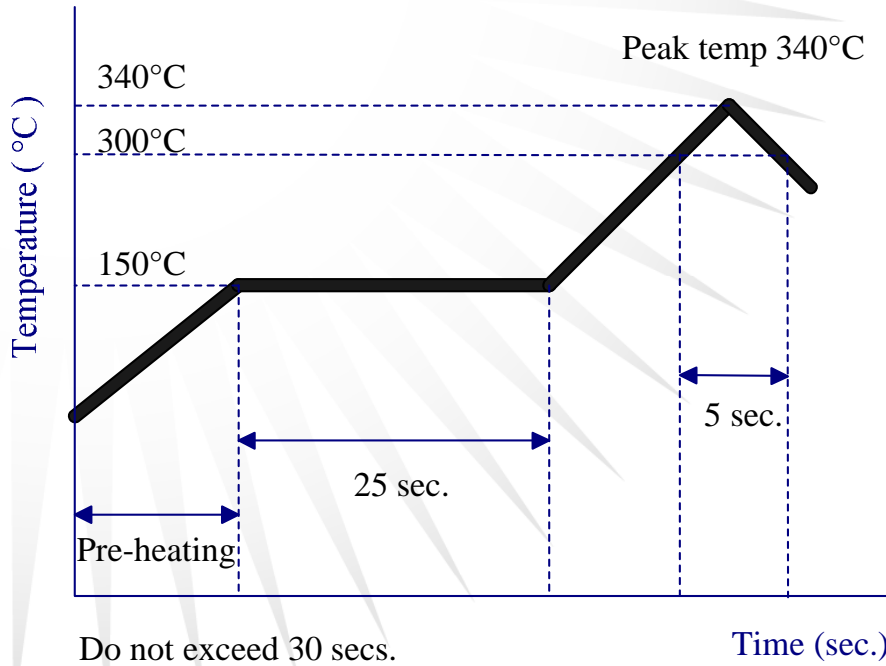
#### 6. DC Block

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

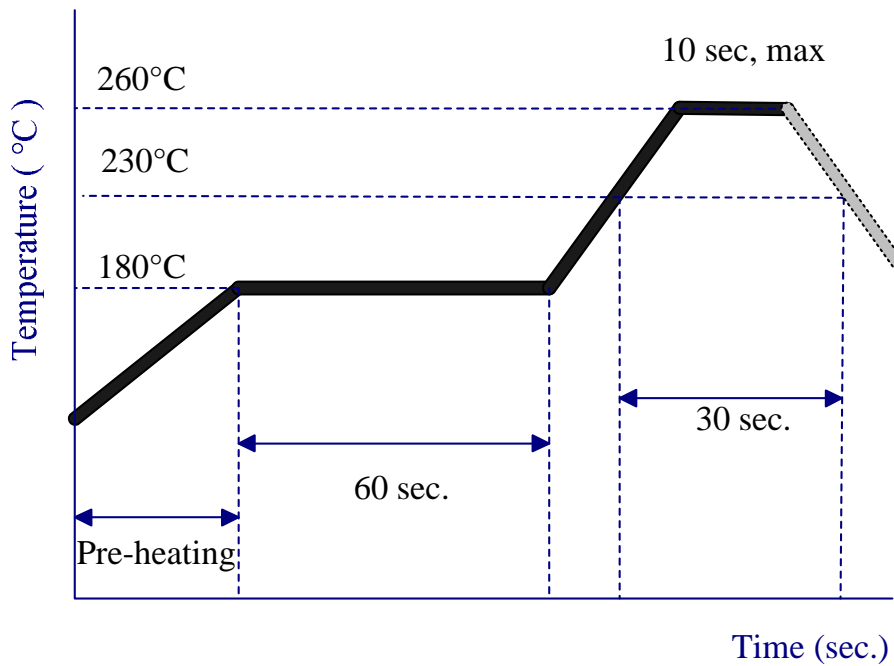
#### 7. Clearance

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



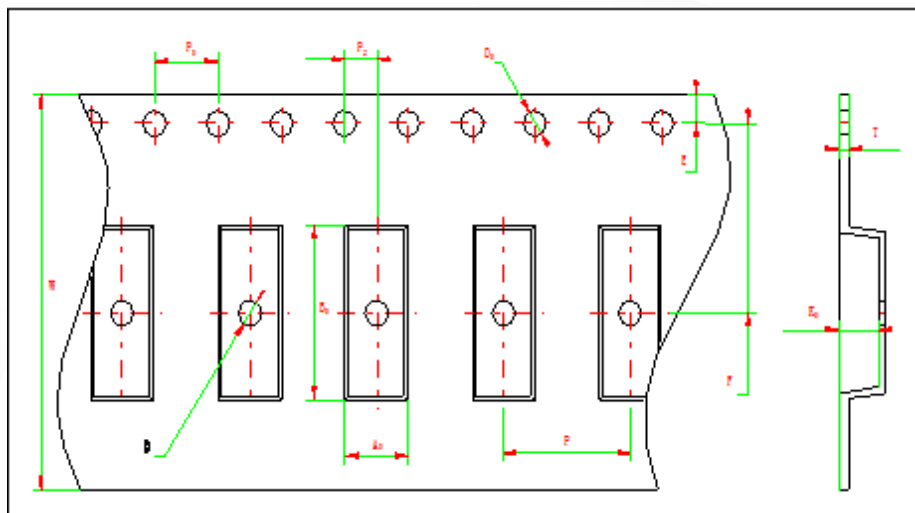
### Reflow Soldering





# Packing

## Blister Tape Specifications



Symbol	Dimension (mm)
w	$24^{\pm 0.3}$
P	$8^{\pm 0.1}$
E	$1.75^{\pm 0.1}$
F	$11.5^{\pm 0.05}$
$\Phi D_0$	$1.5^{+0.1}_{-0}$
$\Phi D_1$	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	$0.3^{\pm 0.05}$