SPECIFICATION

Part No. : **PA.22A**

Product Name : **GSM Dielectric PIFA Antenna (DPA™)**

Description : Tri-band - 880~960 MHz, 1710~1990 MHz, 0dB Gain
Size: 29.8mm*6mm*5mm

REVISION STATUS

Version	Date	Page	Revision Description	Prepared	Approved
01	Nov 4th 2005	All	New format	TW Product Centre	Ronan Quinlan
02	Jan 16th 2008	2	Max Power	TW Product Centre	Dermot O'Shea
03	Dec 15th 2008	All	New Format	TW Product Centre	Aine Doyle

1.0 Scope

This specification is for a Tri-band GSM miniature PIFA (Dielectric Planar inverted-F Type Antenna) (DPA™) Antenna for internal SMT mounting.

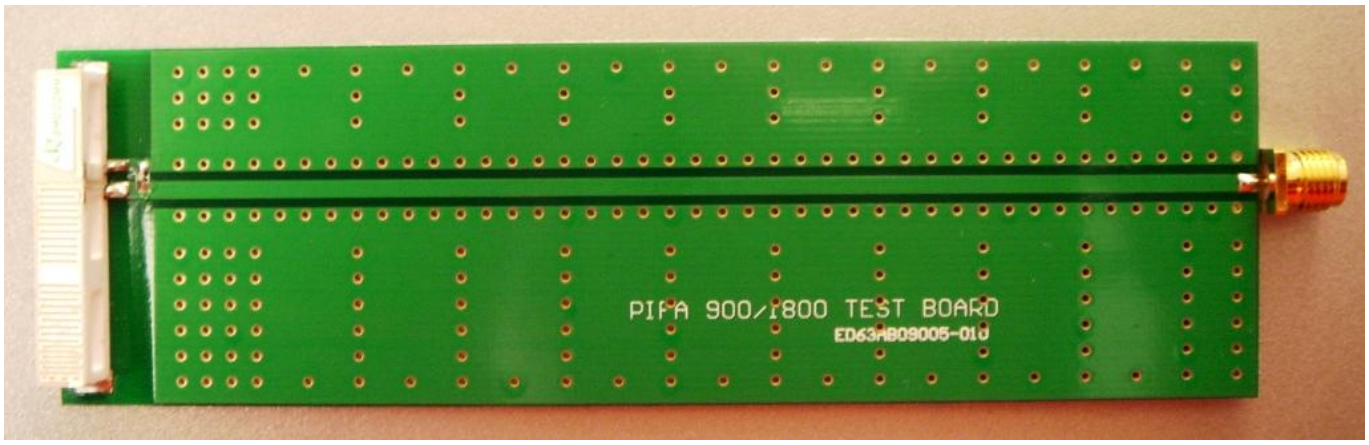
Note: The antenna also shows a response at 850MHz which means the antenna can also be defined on quad-band, depending on the target specification for the device itself.

2.0 Electrical Specifications

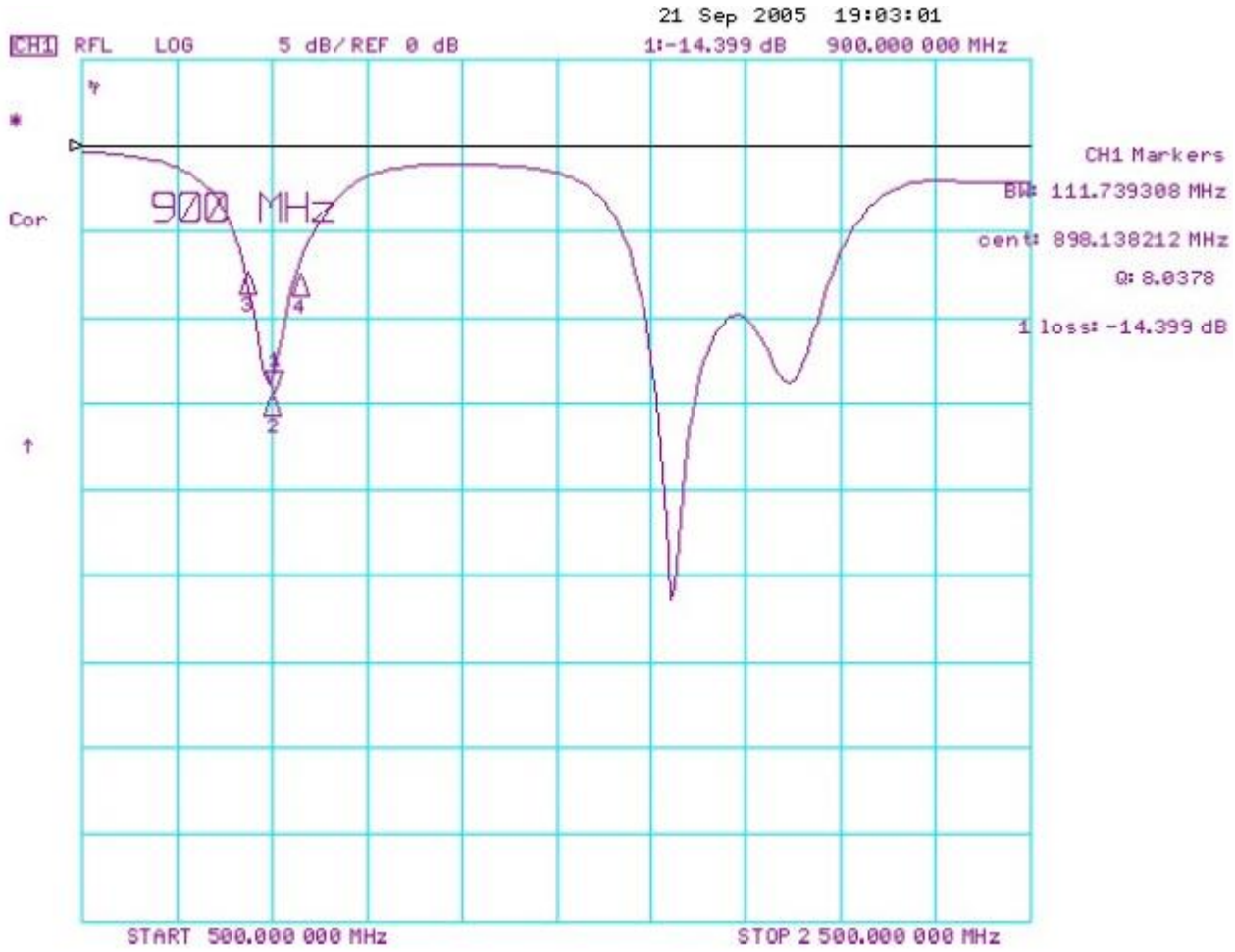
The antenna has the electrical characteristics given in Table 1 under the Taoglas standard installation conditions as shown in the Evaluation Board (Figure

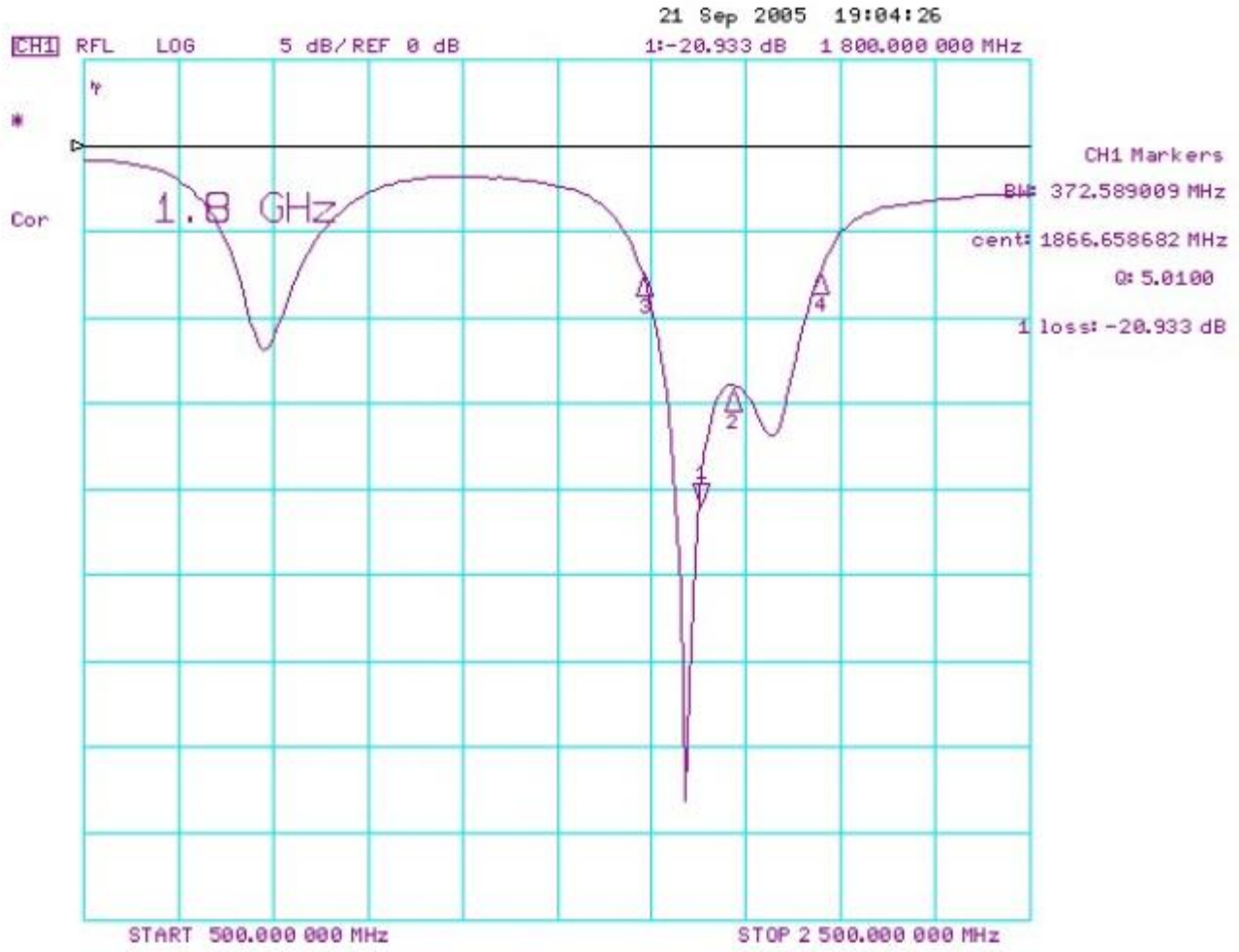
No.	Parameter	Specification
1	Frequency	880~960 MHz , 1710~1990 MHz
2	Dimensions	29.8 x 6.0 x 5.0 mm
3	Impedance	50 Ω
4	VSWR	2.5 max (depends on environment)
5	Polarization	Linear
6	Operating Temperature	-40~105°C
7	Termination	Ag (Environmentally Friendly Lead- Free)
8	Max power	2w for average / 5w peak for short

*Data is measured on Taoglas Evaluation Board (reference ground plane) pictured below



2.1 S11 Response Curve





Radiation patterns also available (measured in free space and on evaluation board)

2.2 Gain and Efficiency

GSM900

Frequency (MHz)		Peak Gain (dBi)	Efficiency (%)
TX	880.2	-3.65	21.09
	890.2	-2.73	26.25
	902.4	-2.28	31.23
	914.8	-2.04	35.24
RX	925.2	-1.96	37.02
	935.2	-2.54	33.33
	947.4	-2.96	31.17
	959.8	-3.16	29.47

GSM1800

Frequency (MHz)		Peak Gain (dBi)	Efficiency (%)
TX	1710.2	2.28	60.63
	1747.6	2.35	61.53
	1784.8	2.58	60.77
RX	1805.2	2.32	56.67
	1842.6	2.43	56.31
	1879.8	2.59	58.69

GSM1900

Frequency (MHz)		Peak Gain (dBi)	Efficiency (%)
TX	1850.2	2.48	56.95
	1880.0	2.60	58.75
	1909.8	2.12	52.79
RX	1930.2	2.01	52.02
	1960.0	1.31	47.26
	1989.8	0.30	38.62

GSM900

Frequency (GHz)		Plane	Average Gain (dBi)
TX	880.2	XY plane	-7.133
		YZ plane	-9.766
		XZ plane	-6.101
	890.2	XY plane	-5.968
		YZ plane	-8.845
		XZ plane	-5.126
	902.4	XY plane	-4.898
		YZ plane	-8.892
		XZ plane	-4.350
	914.8	XY plane	-4.077
		YZ plane	-7.477
		XZ plane	-3.865
RX	925.2	XY plane	-3.599
		YZ plane	-7.202
		XZ plane	-3.732
	935.2	XY plane	-3.802
		YZ plane	-7.648
		XZ plane	-4.290
	947.4	XY plane	-3.788
		YZ plane	-7.843
		XZ plane	-4.579
	959.8	XY plane	-3.801
		YZ plane	-7.913
		XZ plane	-5.187

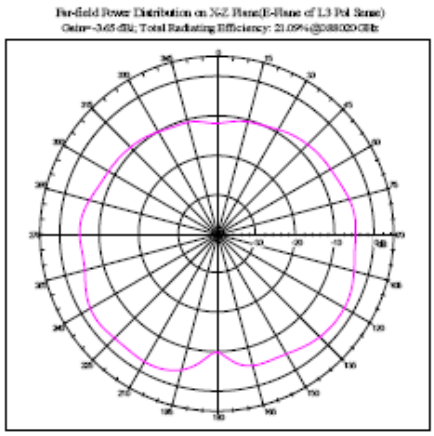
GSM1800

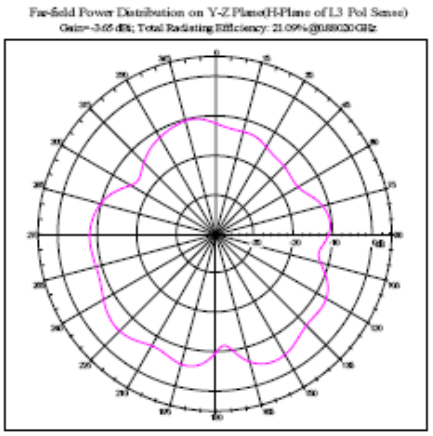
Frequency (GHz)		Plane	Average Gain (dBi)
TX	1710.2	XY plane	-2.648
		YZ plane	-4.661
		XZ plane	-1.687
	1747.6	XY plane	-2.529
		YZ plane	-4.696
		XZ plane	-1.207
	1784.8	XY plane	-2.685
		YZ plane	-4.687
		XZ plane	-0.888
RX	1805.2	XY plane	-3.193
		YZ plane	-4.911
		XZ plane	-1.105
	1842.6	XY plane	-3.468
		YZ plane	-4.753
		XZ plane	-1.145
	1879.8	XY plane	-3.745
		YZ plane	-4.131
		XZ plane	-1.430

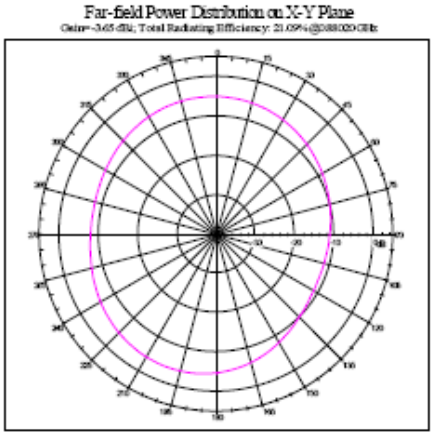
GSM1900

Frequency (GHz)		Plane	Average Gain (dBi)
TX	1850.2	XY plane	-3.511
		YZ plane	-4.649
		XZ plane	-1.147
	1880.0	XY plane	-3.746
		YZ plane	-4.124
		XZ plane	-1.435
	1909.8	XY plane	-4.683
		YZ plane	-4.228
		XZ plane	-2.525
RX	1930.2	XY plane	-5.539
		YZ plane	-4.270
		XZ plane	-3.257
	1960.0	XY plane	-6.444
		YZ plane	-4.441
		XZ plane	-4.126
	1989.8	XY plane	-8.068
		YZ plane	-5.359
		XZ plane	-5.477

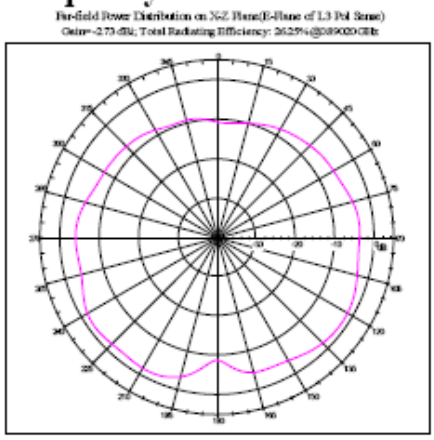
GSM900
Frequency :880.2 MHz

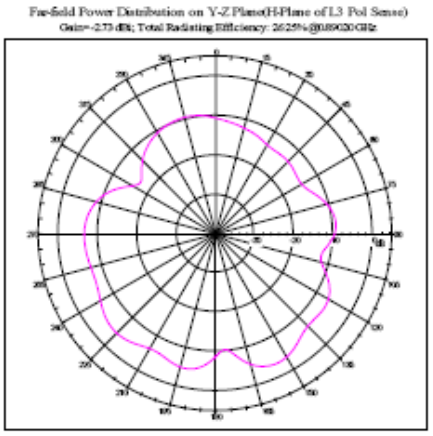


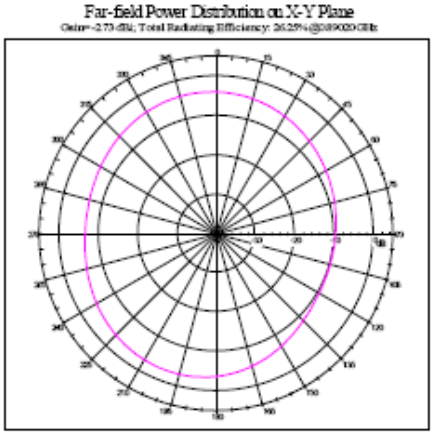




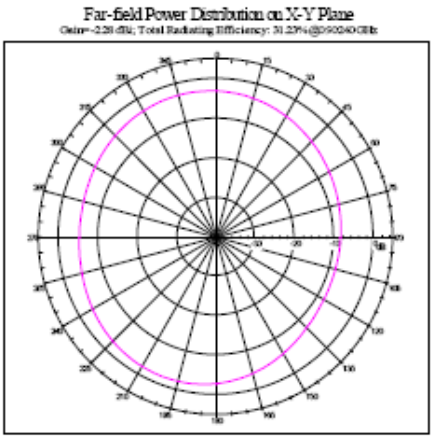
Frequency :890.2 MHz

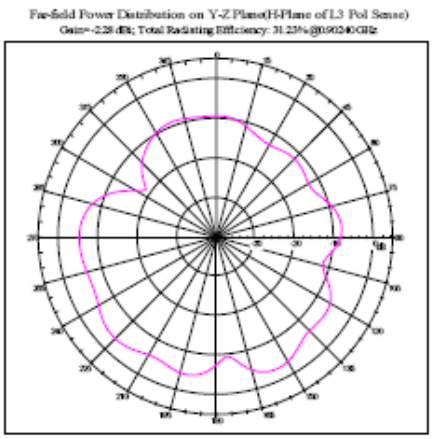


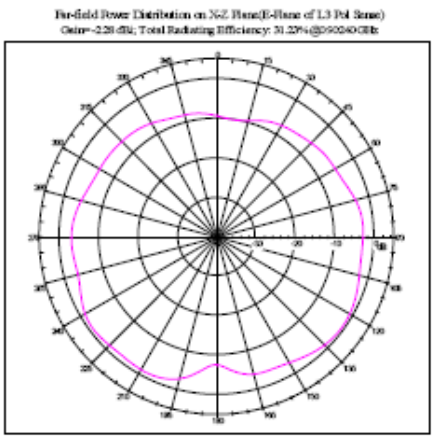




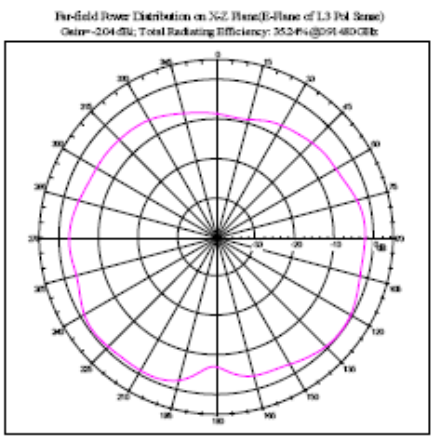
Frequency :902.4MHz

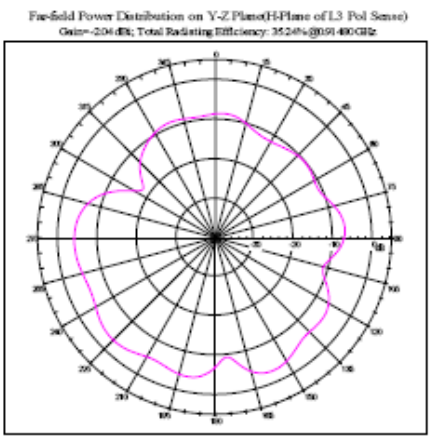


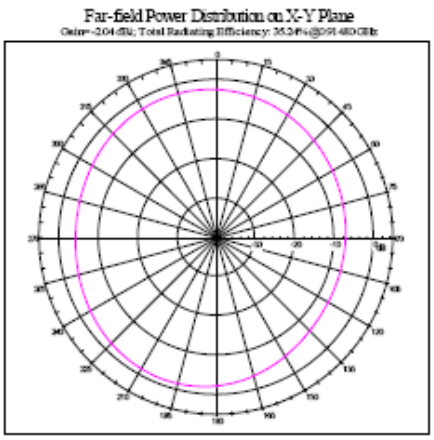




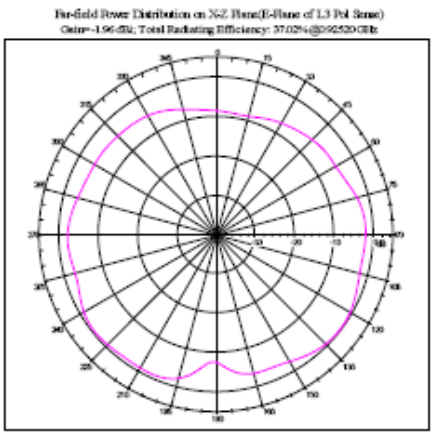
Frequency :914.8MHz

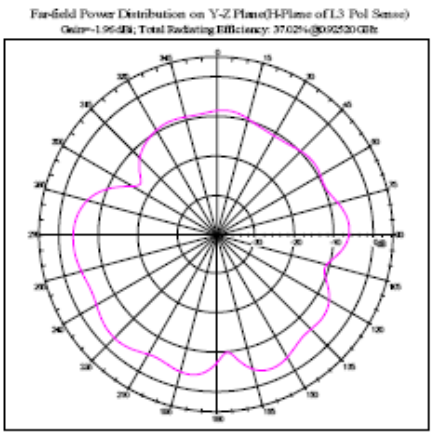


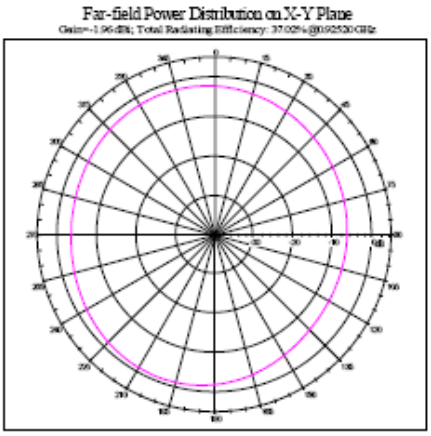




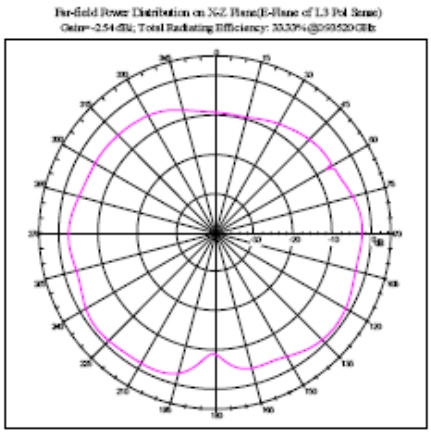
Frequency :925.2MHz

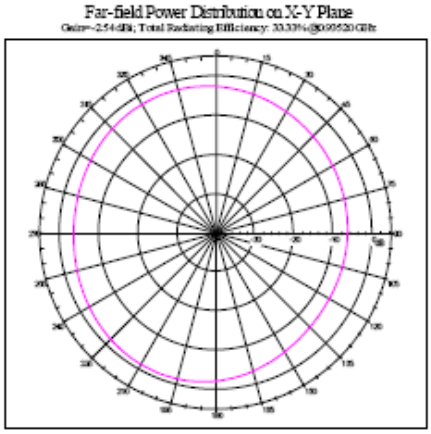


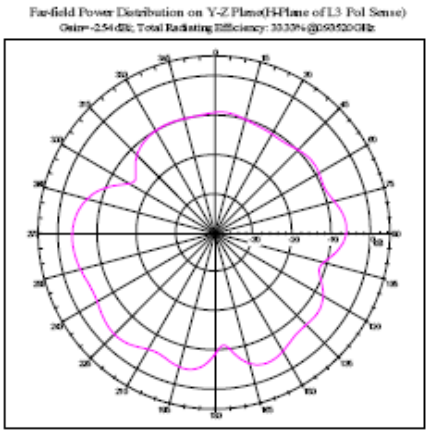




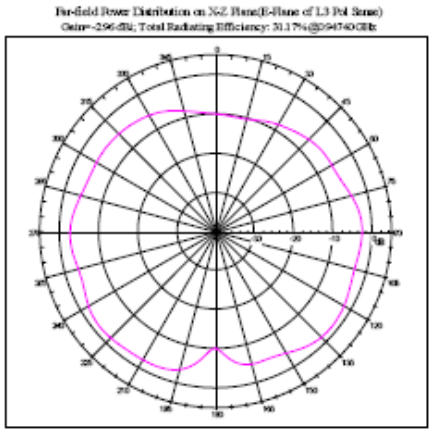
Frequency :935.2MHz

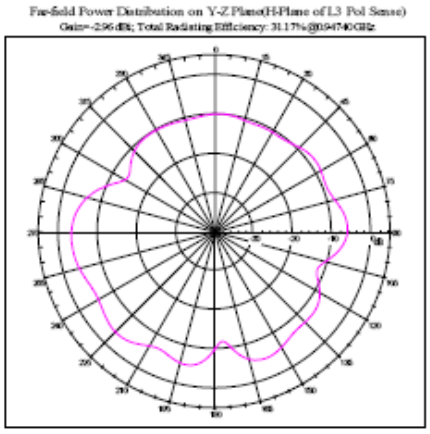


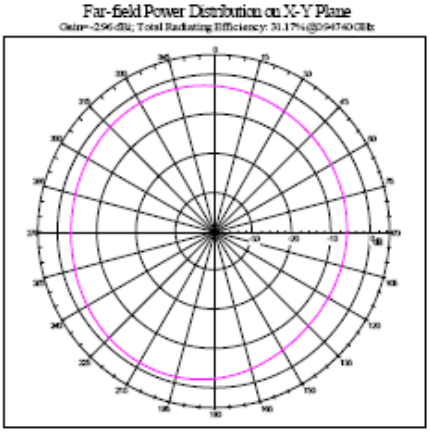




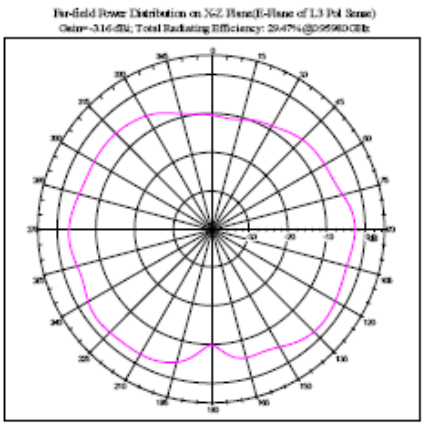
Frequency :947.4MHz

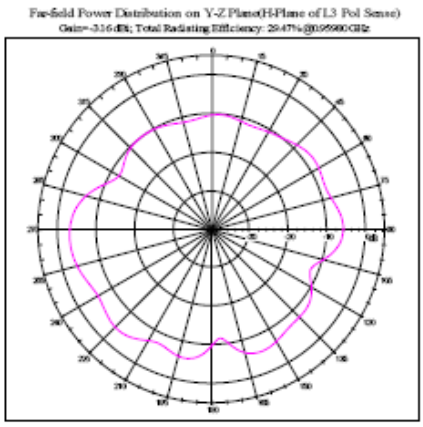


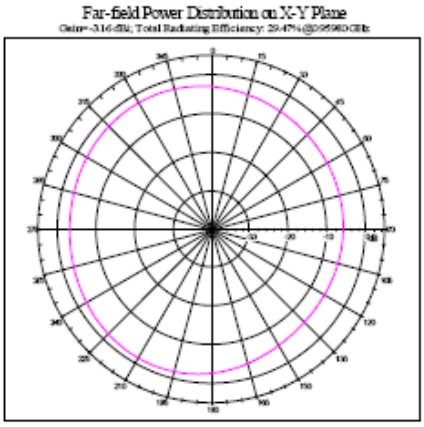




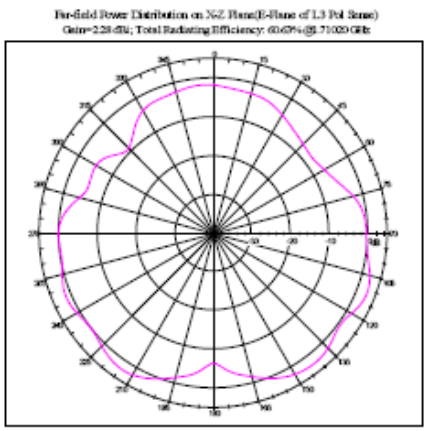
Frequency :959.8MHz

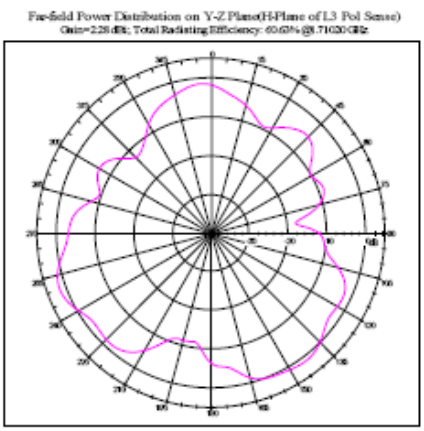


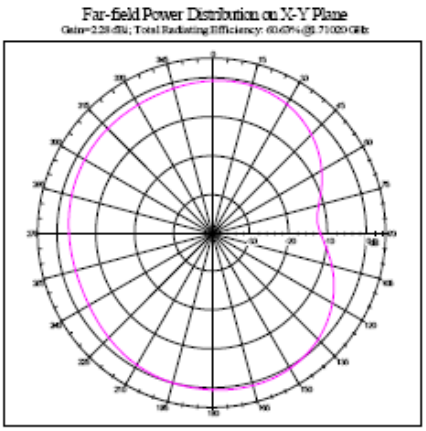




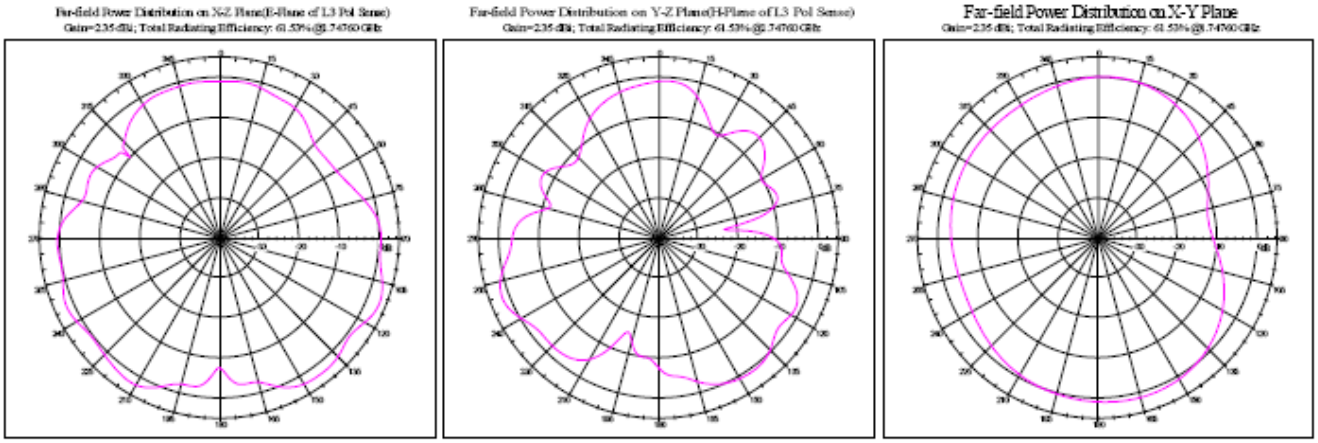
GSM1800
Frequency :1710.2 MHz



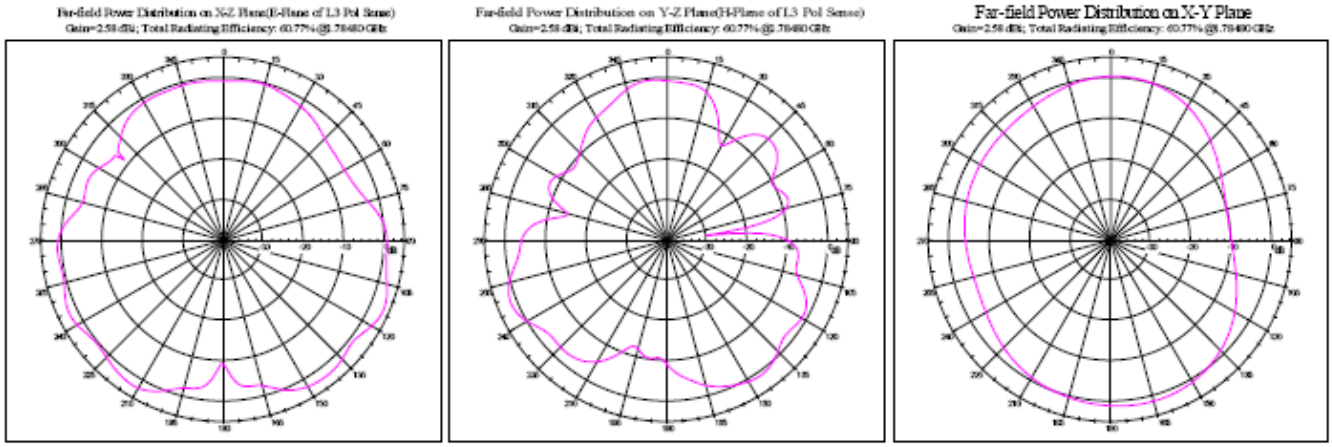




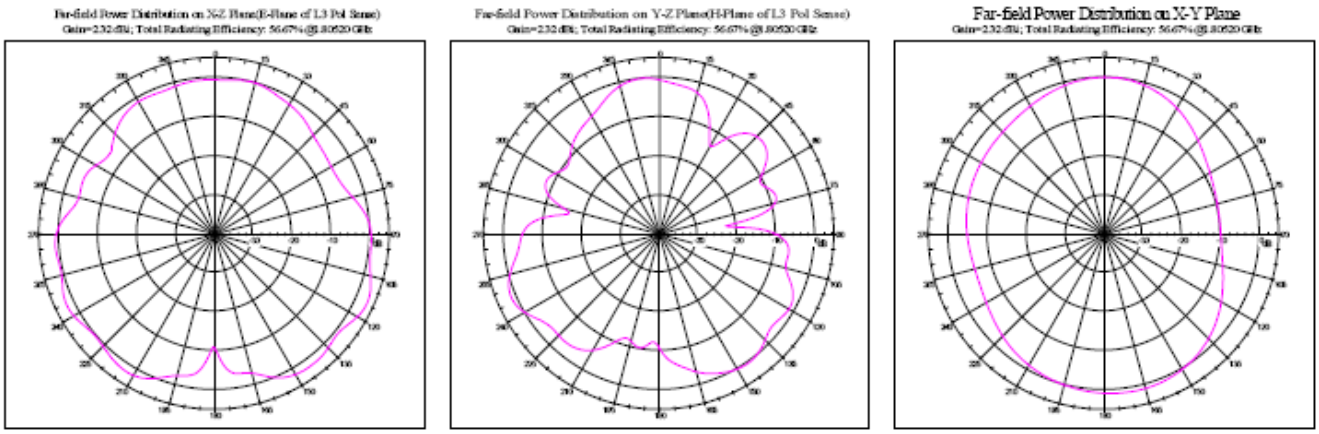
Frequency :1747.6 MHz



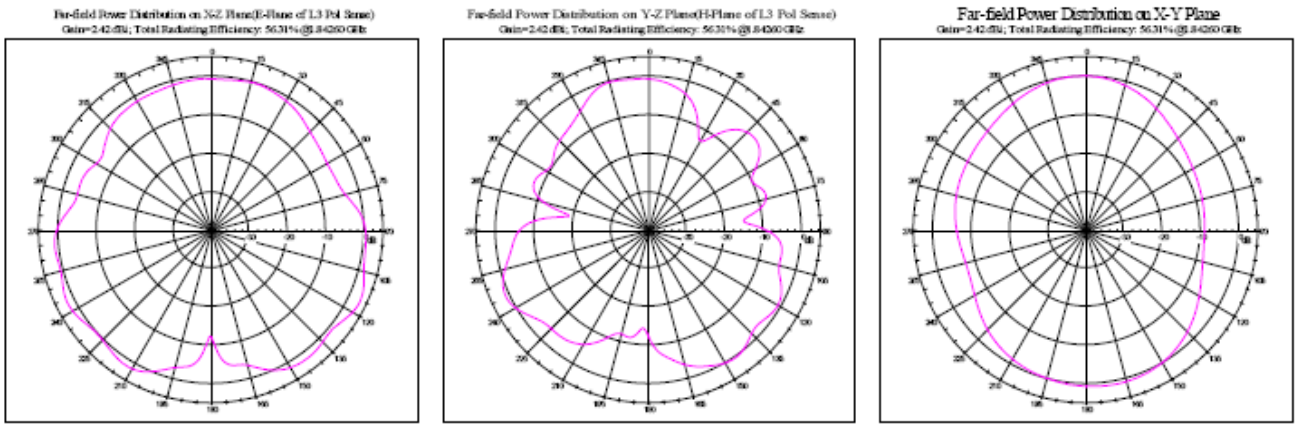
Frequency :1784.8 MHz



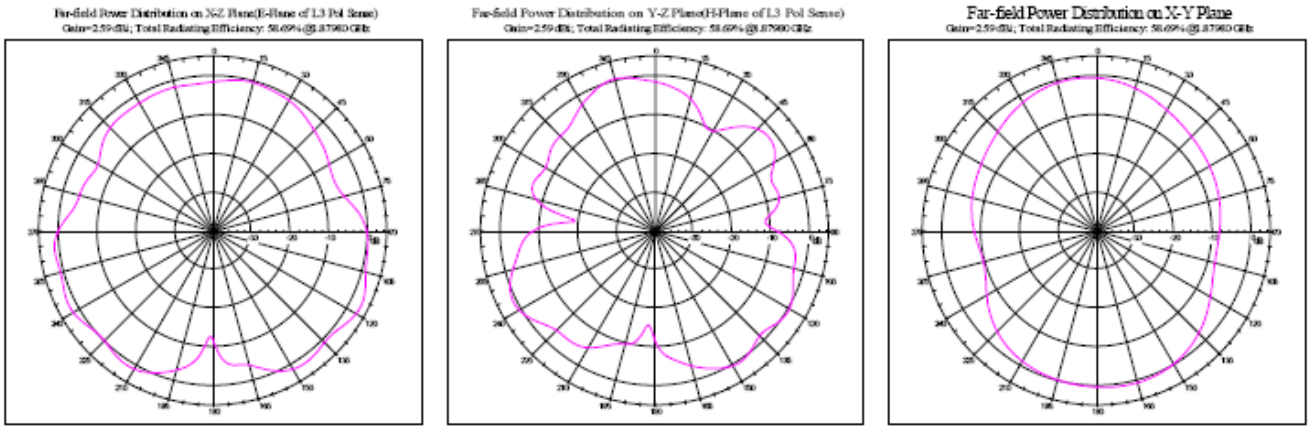
Frequency :1805.2 MHz



Frequency :1842.6 MHz

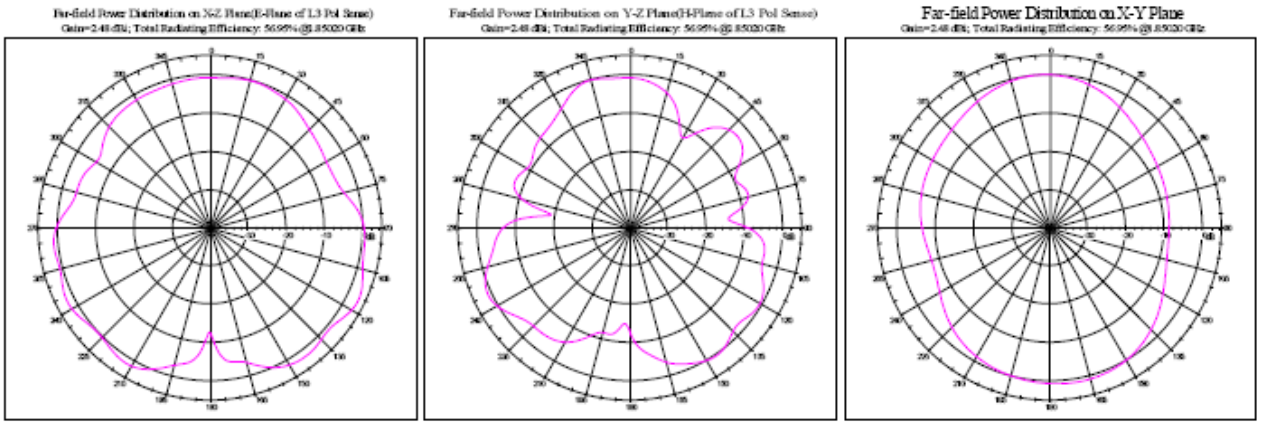


Frequency :1879.8 MHz

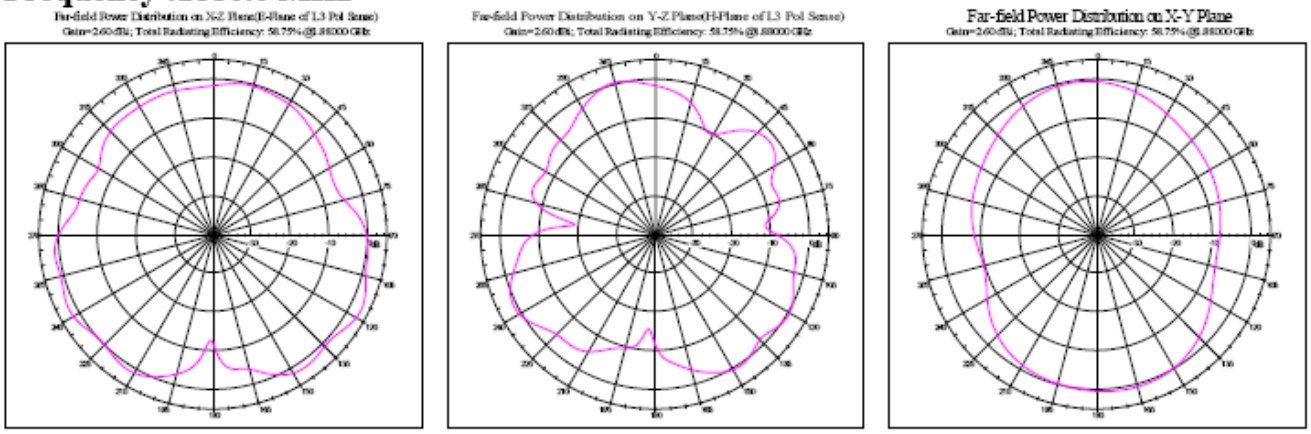


GSM1900

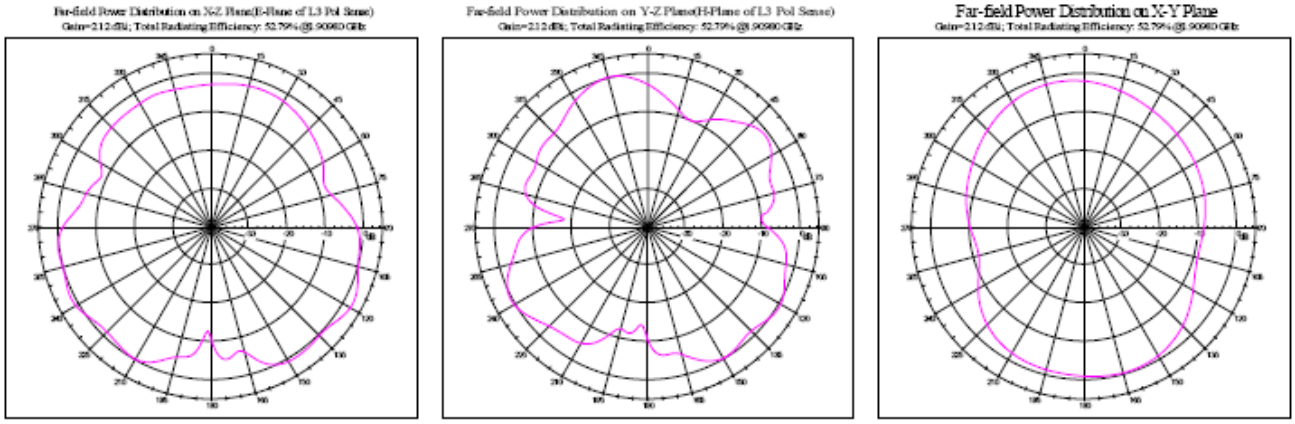
Frequency :1850.2 MHz



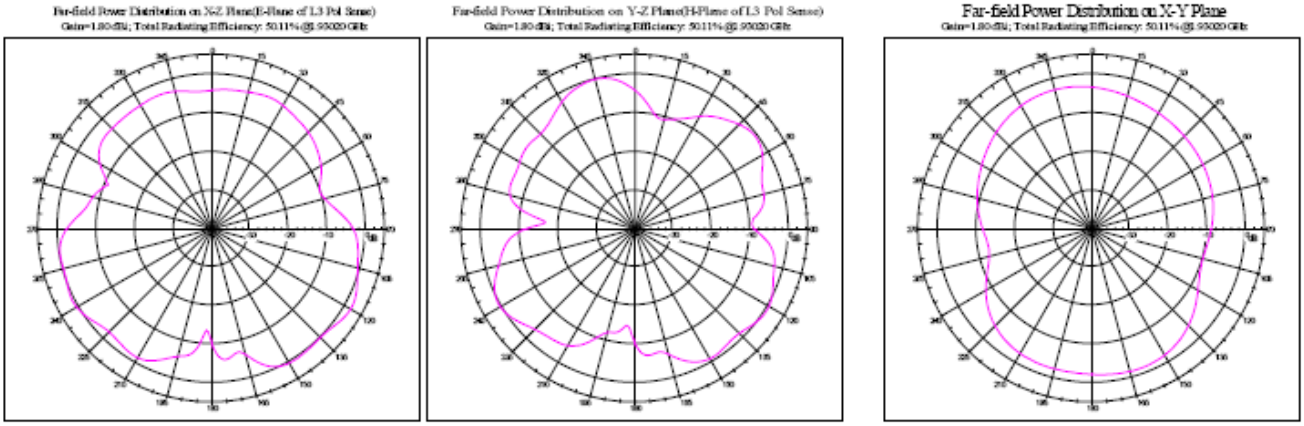
Frequency :1880.0 MHz



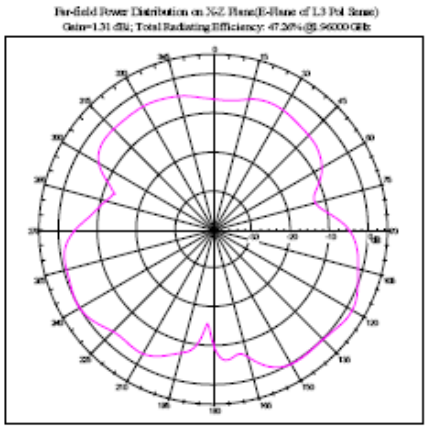
Frequency :1909.8 MHz

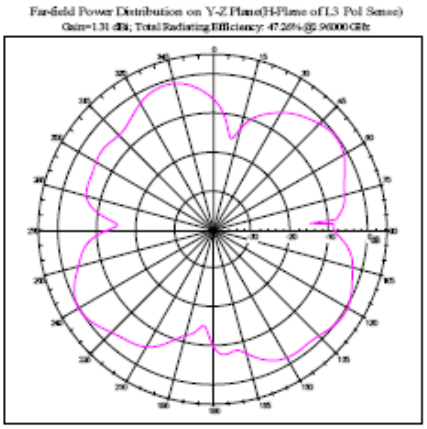


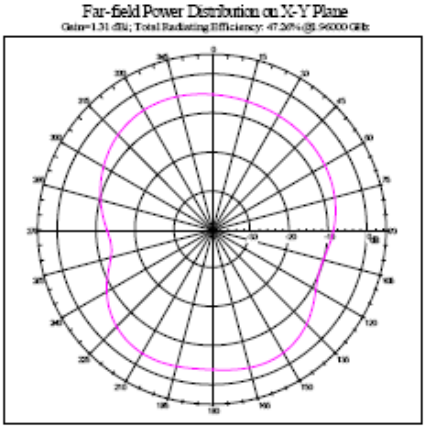
Frequency : 1930.2 MHz



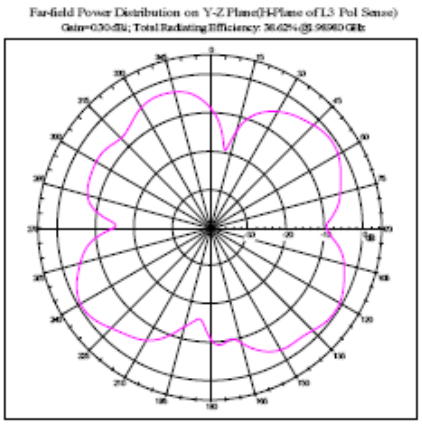
Frequency : 1960.0 MHz

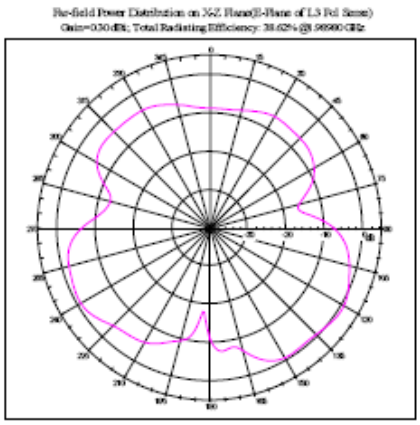


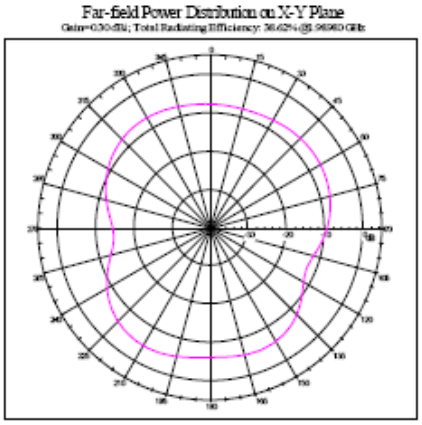




Frequency : 1989.8 MHz

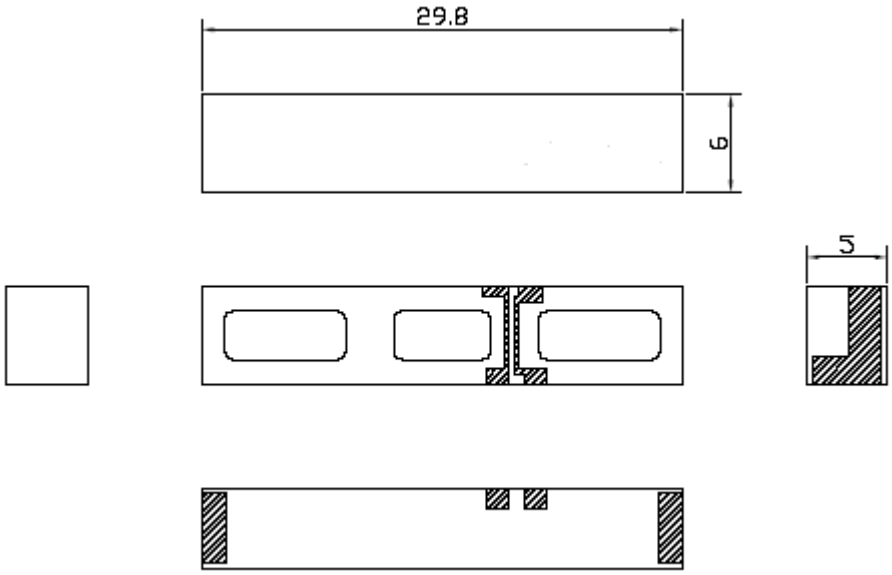


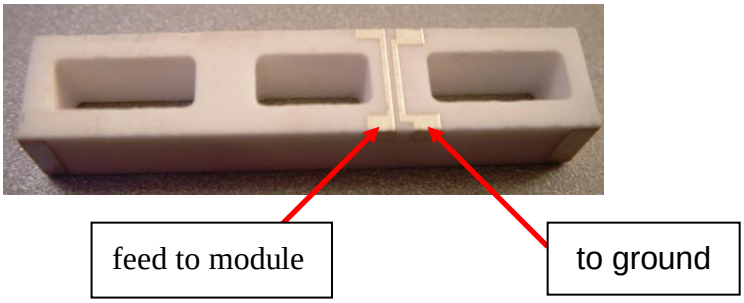


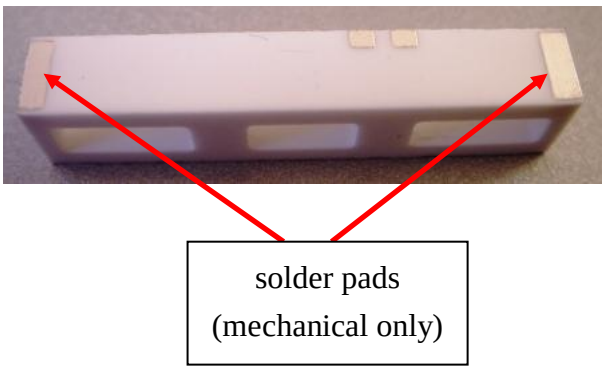


3.0 Mechanical Dimensions

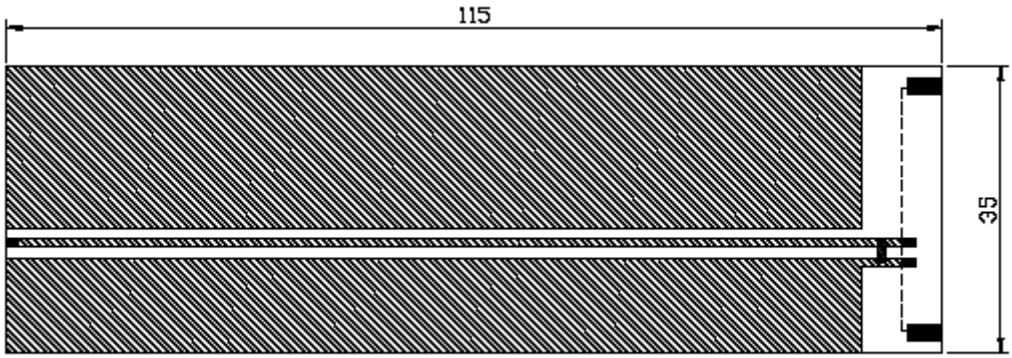
3.1 PA.22 Antenna



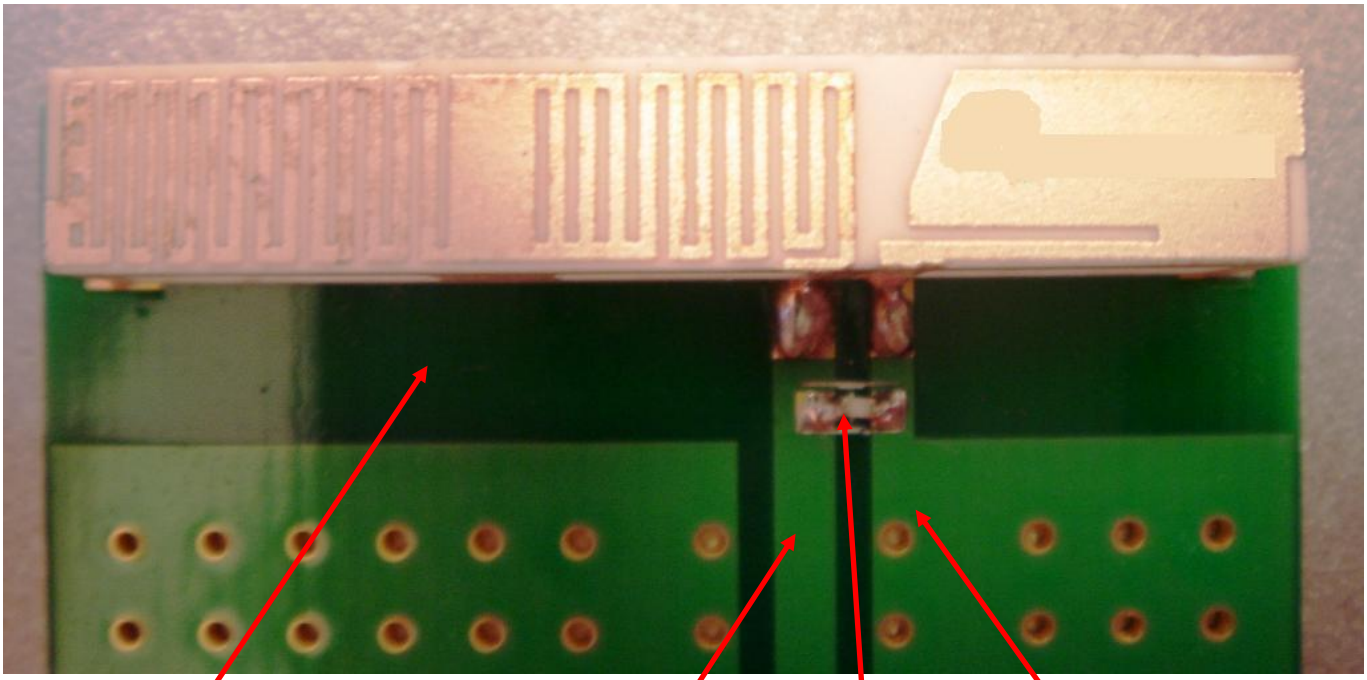




3.2 Evaluation board dimensions

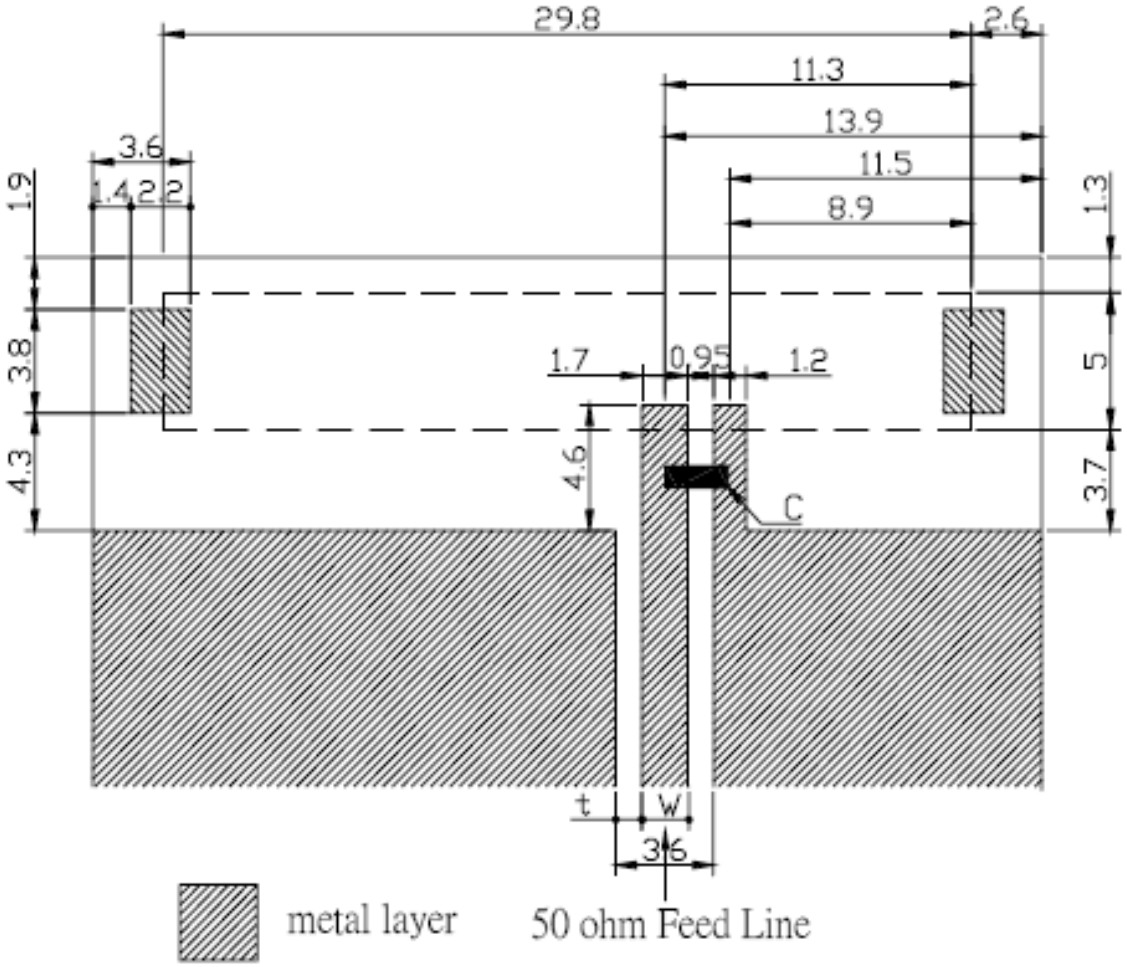


3.3 Recommended layout (as per Taoglas evalution board)



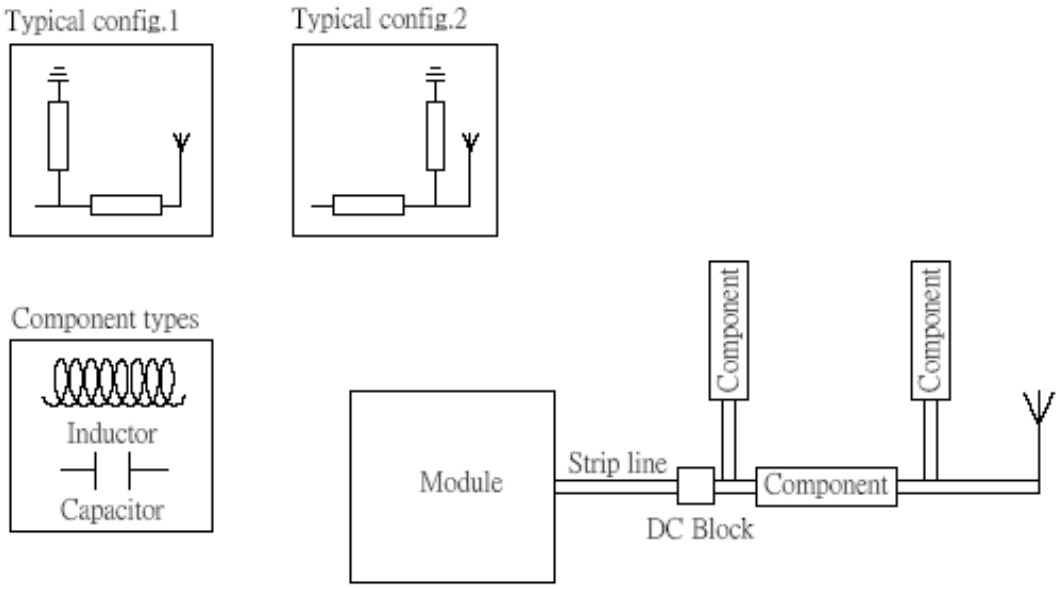
View from underneath board – note solder pads either side – laid out on non metal area

Layout dimensions - Allow 6mm clearance all around if possible (minimum 4mm)



t,w=Unique dimensioning according to your PCB.
C=inductor and capacitor values according to your specific device.

3.4 Recommended Transmission Line and Matching Network

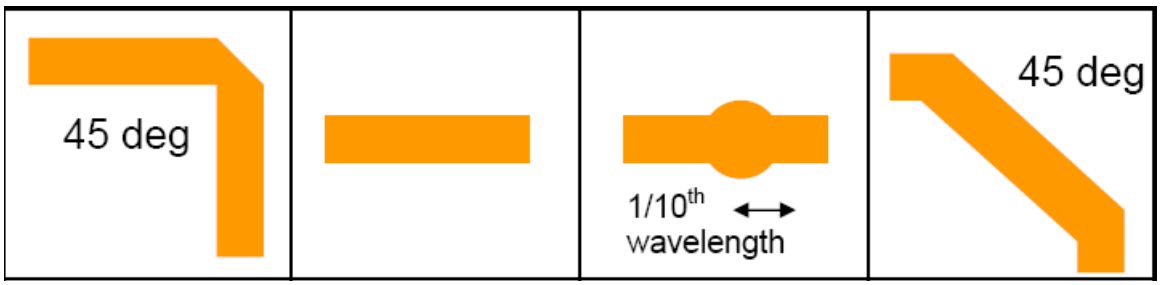


The matching network has to be individually designed using one,two or three components.

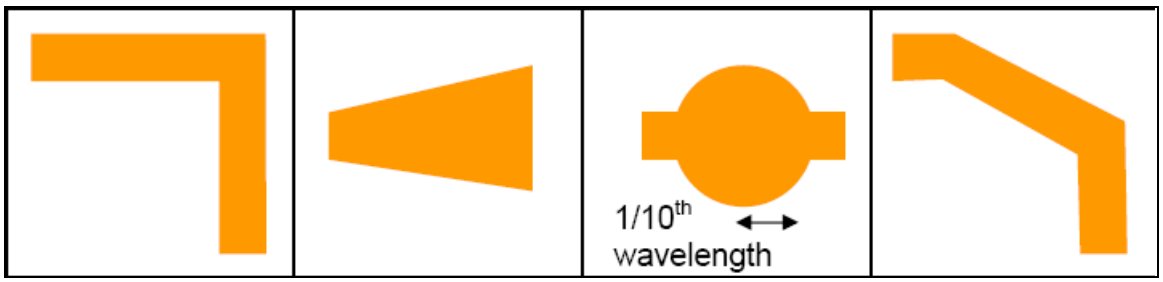
Note: The PA.22 can be made "quad band" with appropriate matching circuit

Guidelines for routing RF when designing a PCB;

1) Good



2) Bad



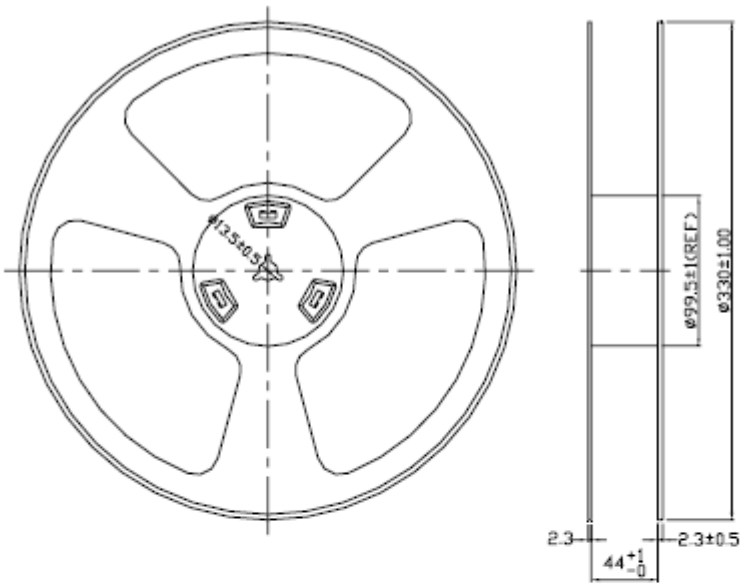
4.0 Delivery Mode

Blister tape to IEC 286-3, polyester

Pieces per tape: 450

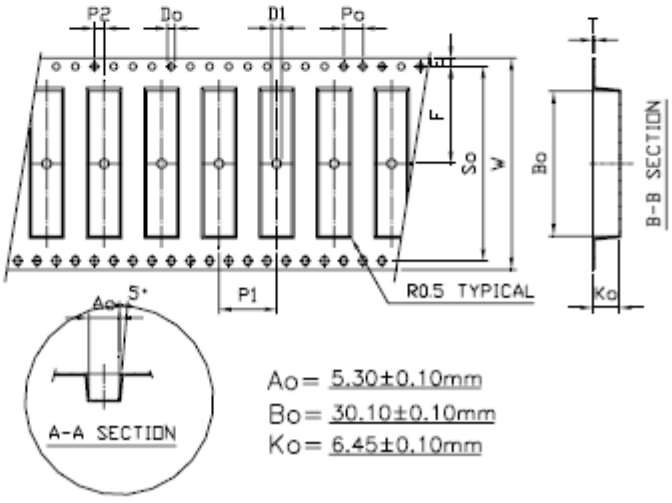
4 Reels (1800) in each Carton – Carton size 37cm*36cm*27.5cm

Carton Weight – Net Weight 5.9kg – Gross Weight 7.5kg (approx)



Unit: mm

Symbol	Spec.
K1	–
Po	4.0±0.10
P1	12.0±0.10
P2	2.0±0.15
Do	1.5 +0.1 -0
D1	2.0(Min)
E	1.75±0.10
F	20.2±0.10
10Po	40.0±0.10
W	44.0±0.30
T	0.30±0.05
So	40.4±0.10

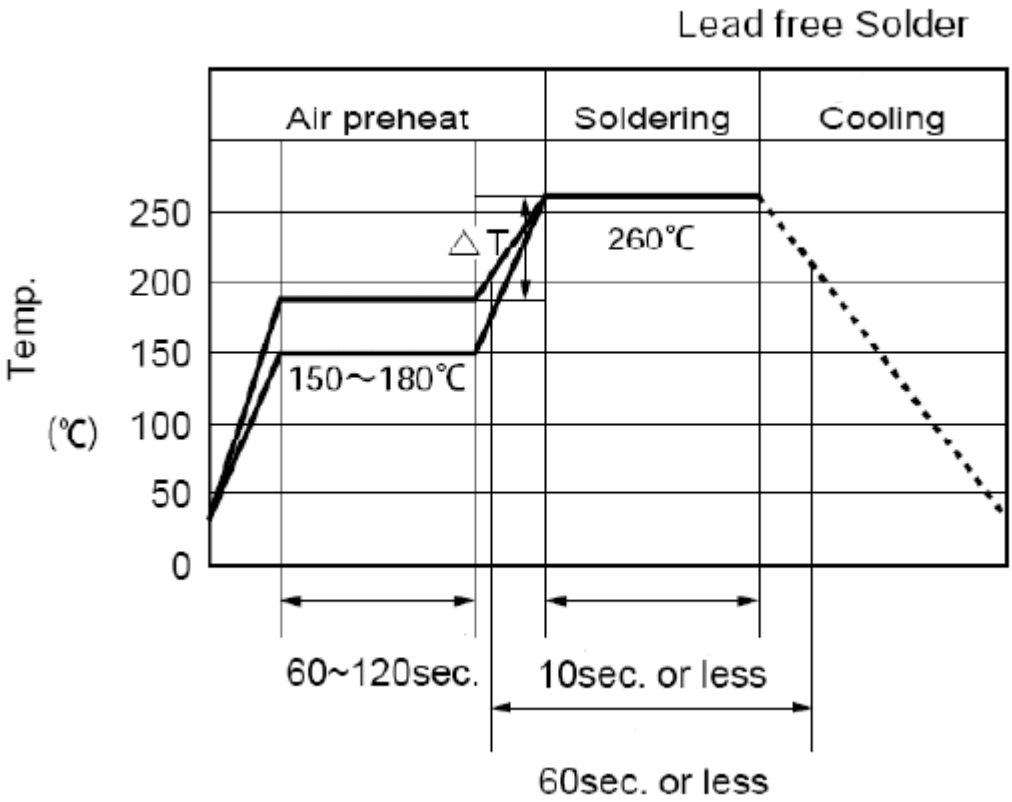


Ao= 5.30±0.10mm
Bo= 30.10±0.10mm
Ko= 6.45±0.10mm

Note: Design application note also available

Note: Environmental test report also available

5.0 Recommended Reflow Temperature Profile



(1) Time shown in the above figures is measured from the point when chip surface reaches temperature.
(2) Temperature difference in high temperature part should be within 110°C.
(3) After soldering, do not force cool, allow the parts to cool gradually.
*General attention to soldering:
● High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
● for soldering, please refer to the soldering curves above. However, please keep exposure to temperatures exceeding 200°C to under 50 seconds.
● please use a mild flux (containing less than 0.2wt% Cl). Also, if the flux is water soluble, be sure to wash thoroughly to remove any residue from the underside of components that could affect resistance.
Cleaning:
When using ultrasonic cleaning, the board may resonate if the output power is too high. Since this vibration can cause cracking or a decrease in the adherence of the termination, we recommend that you use the conditions below.
Frequency: 40 kHz max. - Output power: 20W/liter -Cleaning time: 5minutes max.