

SPECIFICATION

Part No. : PA.22A

Product Name : **GSM Dielectric PIFA Antenna**

Description : Tri-band - 880~960 MHz, 1710~1990 MHz, 0dB Gain

Size: 29.8mm*6mm*5mm

RoHS



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1.0 Scope

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

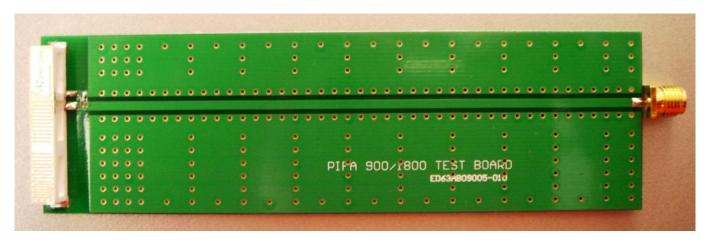
Note: The antenna also shows a response at 850MHz which means the antenna can also be defined on quad-band, depending on the target specification for the device itself.

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*6.0*5.0 mm
3	Impedance	50 Ω
4	VSWR	2.5 max (depends on environment)
5	Polarization	Linear
6	Operating Temperature	-40~105°C
		Ag (Environmentally Friendly Lead-
7	Termination	Free)

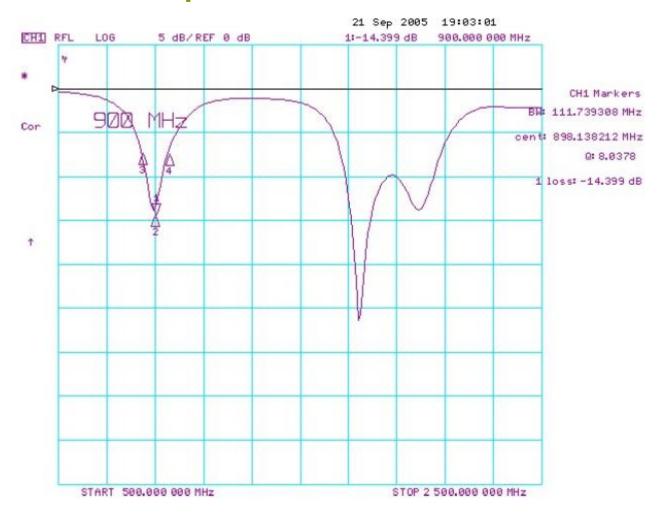
*Data is measured on Taoglas Evaluation Board (reference ground plane) pictured below



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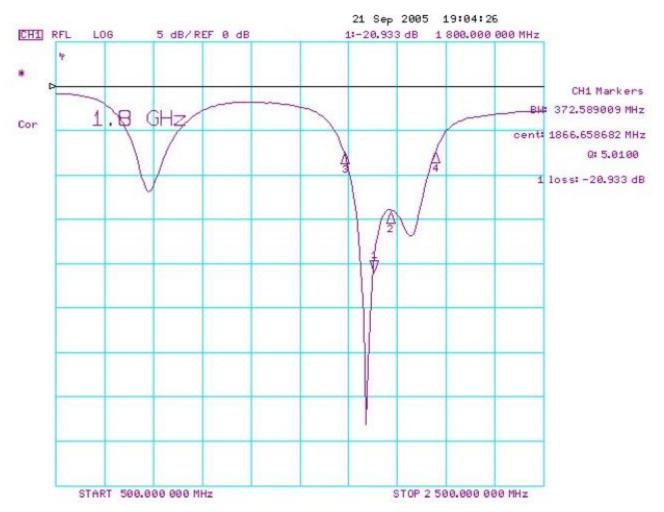


2.1 S11 Response Curve



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

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2.2 Gain and Efficiency

GSM900

F	requency	Peak Gain	Efficiency
	(MHz)	(dBi)	(%)
	880.2	-3.65	21.09
TX	890.2	-2.73	26.25
17	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

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GSM1800

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

GSM1900

F	requency	Peak Gain	Efficiency
	(MHz)	(dBi)	(%)
тх	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

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GSM900 GSM1800

F	requency (GHz)	Plane	Average Gain (dBi)
	880.2	XY plane	-7.133
		YZ plane	-9.766
		XZ plane	-6.101
		XY plane	-5.968
	890.2	YZ plane	-8.845
TX		XZ plane	-5.126
1.	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
	925.2	XY plane	-3.599
		YZ plane	-7.202
		XZ plane	-3.732
	935.2	XY plane	-3.802
		YZ plane	-7.648
RX		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

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

GSM1900

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

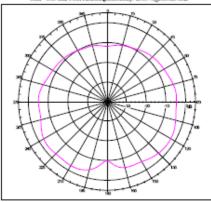
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GSM900

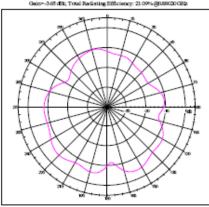
Frequency:880.2 MHz

Far-field Fower Distribution on N-Z Flanc (E-Flanc of L3 Pol Sense) Gains-3-65 dBi; Total Radiating Efficiency: 21.09% (§0.0000 GHz.

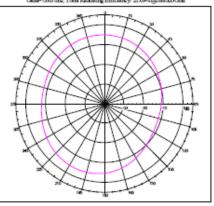


Fas-field Power Distribution on Y-Z-Plane(H-Plane of L3 Pol Sense)

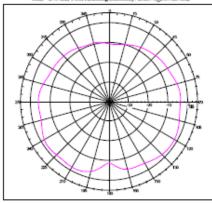
Gain-368 dB; Total Radiating Efficiency: 21.09%@089020GB;

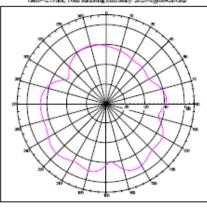


Far-field Power Distribution on X-Y Plane n=3-65 dB; Total Radiating Efficiency: 21.09%(@080020 GBb;

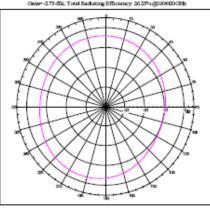


Frequency:890.2 MHz
For-field Power Extribution on No.2. Hereal (Filters of 1.3 Ped Stance)
Onto-273 disk, Total Randoning Efficiency: 202294 (\$0.00000000000)



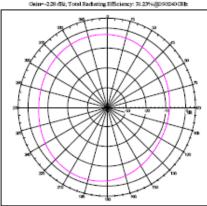


Far-field Power Distribution on X-Y Plane n=-273 dBi; Total Radiating Efficiency: 26.274@089029.08b

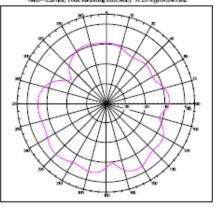


Frequency:902.4MHz

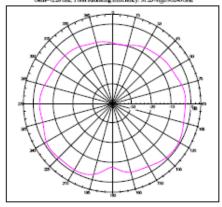
Far-field Power Distribution on X-Y Plane Outre-228 dN; Total Radiating Efficiency: N 23%(@090260 GN);



Far-field Power Distribution on Y-Z Plane (H-Plane of L3 Pol Sense)
Gain=-228 dB; Total Radiating Efficiency: 31.23% (80.90240 GB):



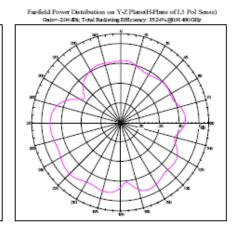
Far-field Power Distribution on N.Z. Flanc (E-Flanc of L.3 Pol Sense) Ontre-4.28 dBi; Total Radiating Efficiency: N. 274 (§199000 GBb)

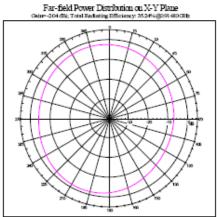


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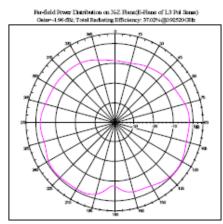


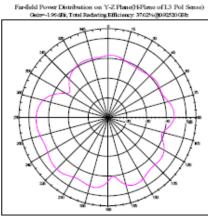
Frequency:914.8MHz





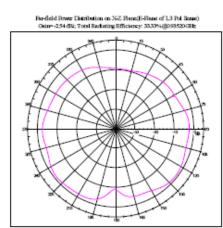
Frequency:925.2MHz

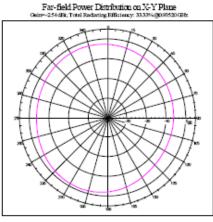


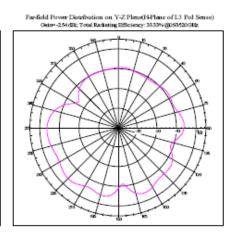




Frequency:935.2MHz





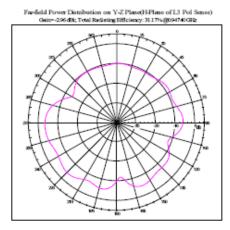


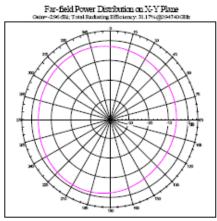
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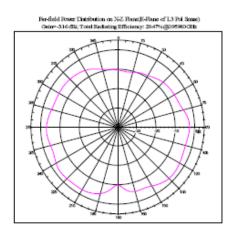
Frequency:947.4MHz

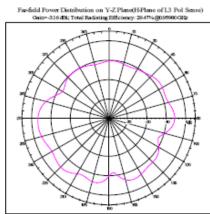
Fir-field flow: Distribution on Not. Hame(B-Hame of L3 Pol Sense)
Oster-256-dist, Total Radiating Hillsciency: 30.17% (806-07-0-ORE)

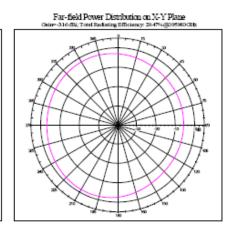




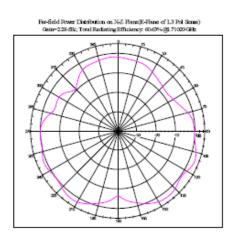
Frequency:959.8MHz

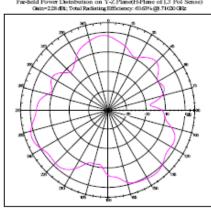


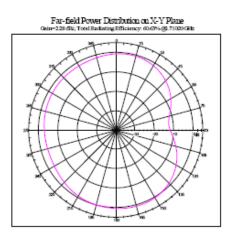




GSM1800 Frequency :1710.2 MHz



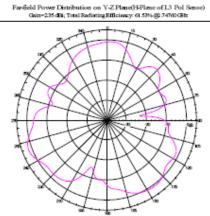


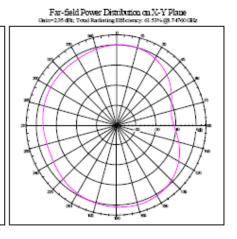


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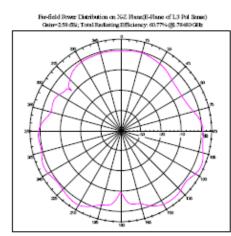


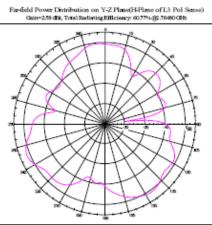
Frequency:1747.6 MHz

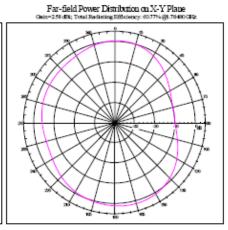




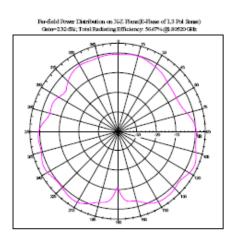
Frequency: 1784.8 MHz

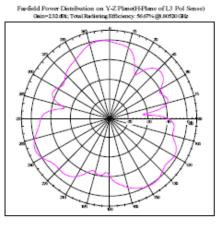


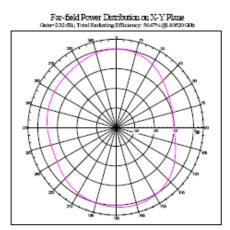




Frequency:1805.2 MHz







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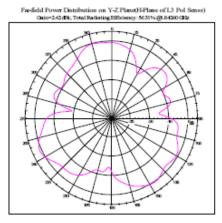


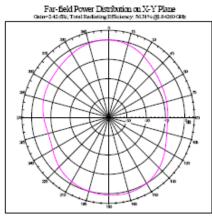
Frequency:1842.6 MHz

Par-field Power Distriction on Not. Plane (E-Brace of L3 Ped Strace)

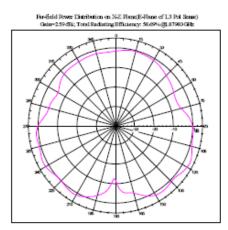
Gaint-2-42-50; Total Radioting Billistency 5531% (St. 8400 GHz)

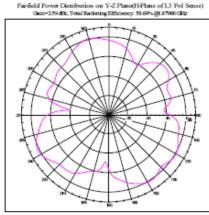
The strategy of the str

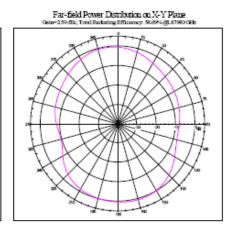




Frequency:1879.8 MHz

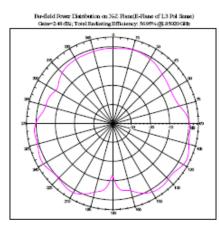


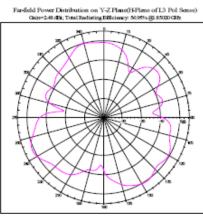


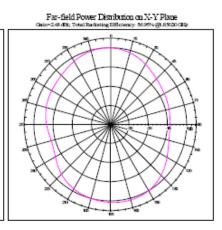


GSM1900

Frequency:1850.2 MHz



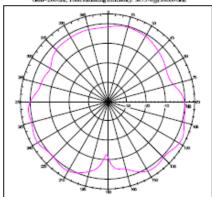


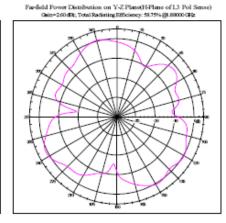


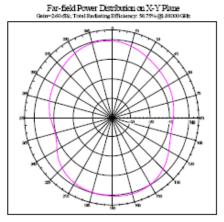
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Frequency:1880.0 MHz Fir-field Rowe Distribution on No.2 Heard B-Plane of L3 Pel Series Geor-260-581; Total Radiating Hilliciancy: 98.799-681.88000 GHz

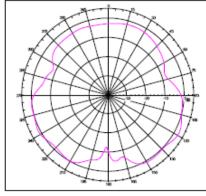


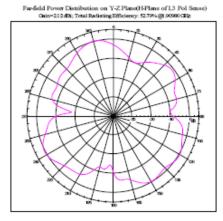


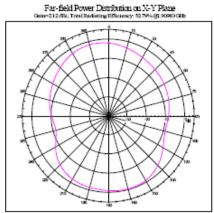


Frequency:1909.8 MHz

Far-field Power Distribution on N-Z Plane (E-Plane of L3 Pol Sense) Gain=212:fibi; Total Radiating Efficiency: 52:79% (E-9090) Gib:

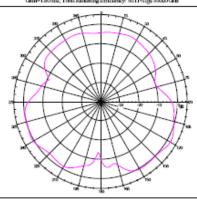


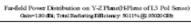


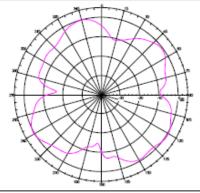


Frequency: 1930.2 MHz

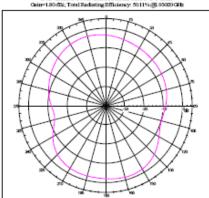
Far-field Power Distribution on N-Z Flanc (E-Flanc of L3 Pol Sense) Gain=1.80 dBi; Total Radiating Efficiency: 50.11% (B. 98020 GHz







Far-field Power Distribution on X-Y Plane



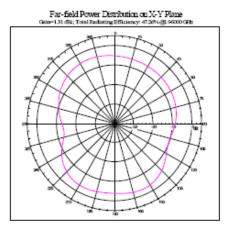
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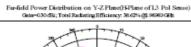
Frequency: 1960.0 MHz

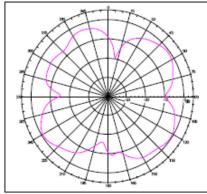
Par-field Power Distribution on N-Z Plane(E-Plane of L3 Pol Sense) Gain=1.31 GB; Total Radiating Efficiency. 47.26% (S. 96000 GB;

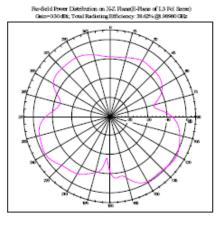
Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense) Cain-131 dB; Total Radiating Efficiency: 47 28%-(82 90000 GBb;

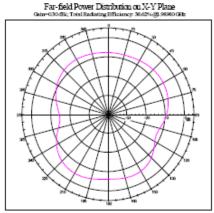


Frequency: 1989.8 MHz







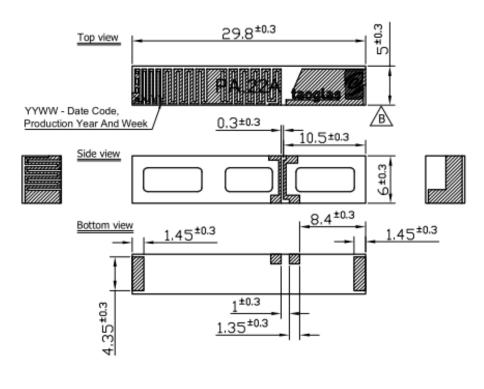


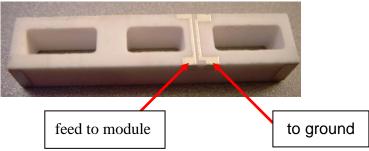
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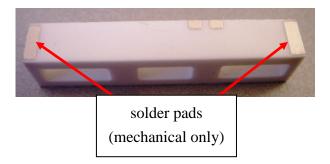


3.0 Mechanical Dimensions

3.1 PA.22 Antenna



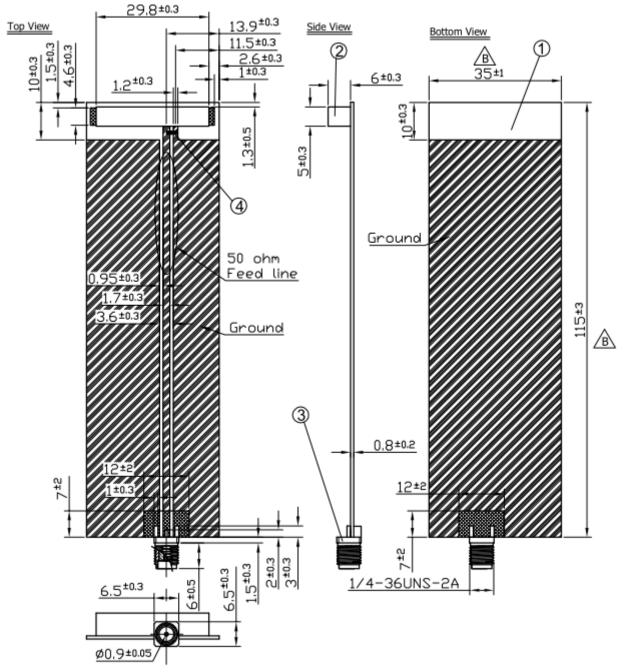




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3.2Evaluation board dimensions

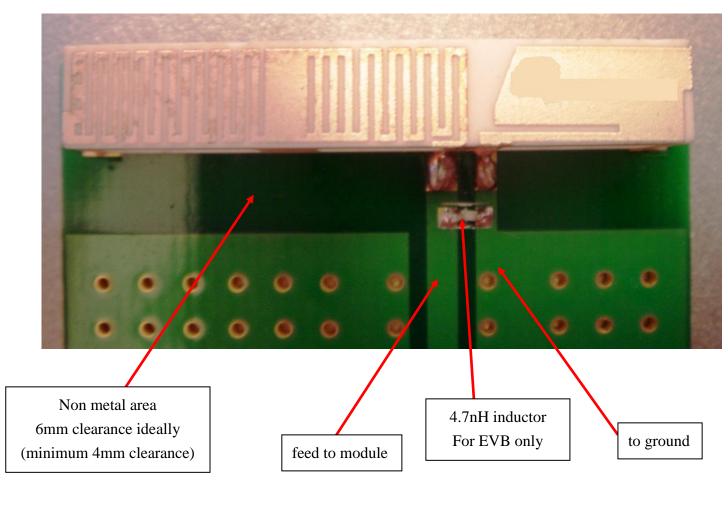


- 1. Unique dimensioning according to your PCB inductor and capacitor values according to you specific device
- Copper area
 Soldered area
- 4.Clearance area

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3.3 Recommended layout (as per Taoglas evalution board)

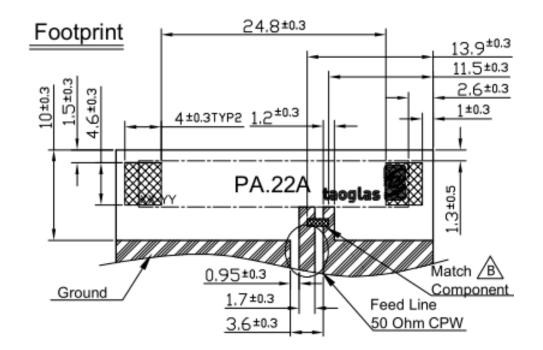




View from underneath board – note solder pads either side – laid out on non metal area Layout dimensions - Allow 6mm clearance all around if possible (minimum 4mm)

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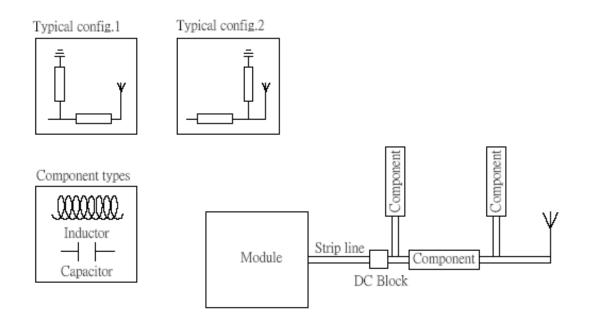




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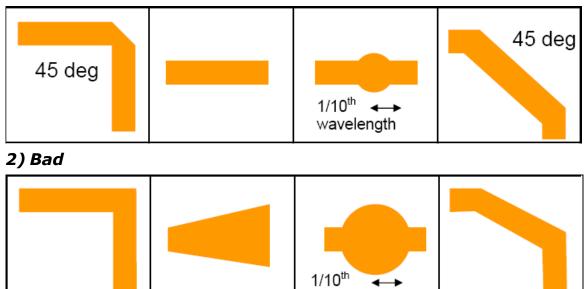
3.4 Recommended Transmission Line and Matching Network



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



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wavelength

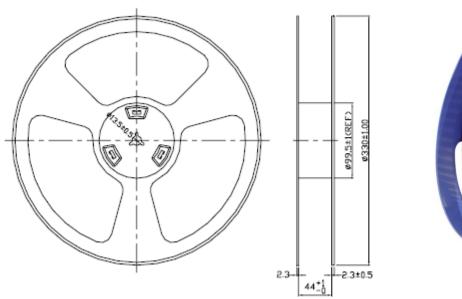


4.0 Delivery Mode

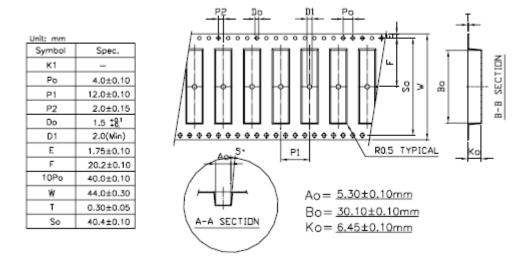
Blister tape to IEC 286-3, polyester

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)







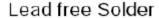
Note: Design application note also available

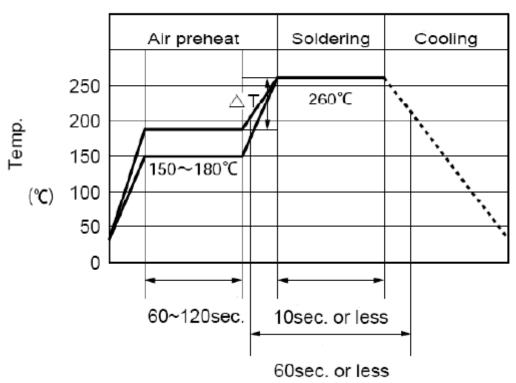
Note: Environmental test report also available

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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/Iiter -Cleaning time: 5minutes max.

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