

# APPLICATION NOTE FOR GLA.01 ANTENNA INTEGRATION



VERSION 1

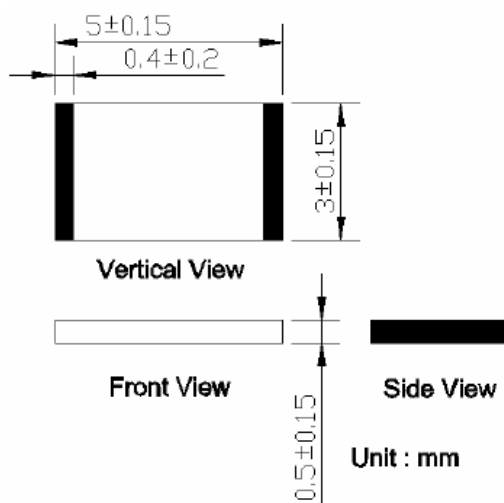
VERSION	DATE	PAGE	DESCRIPTION	CENTRE	APPROVED
1	03/02/2010	All	Integration Note	Taiwan	Ronan Quinlan

## Application Note

### I. BASICS

#### Characteristics

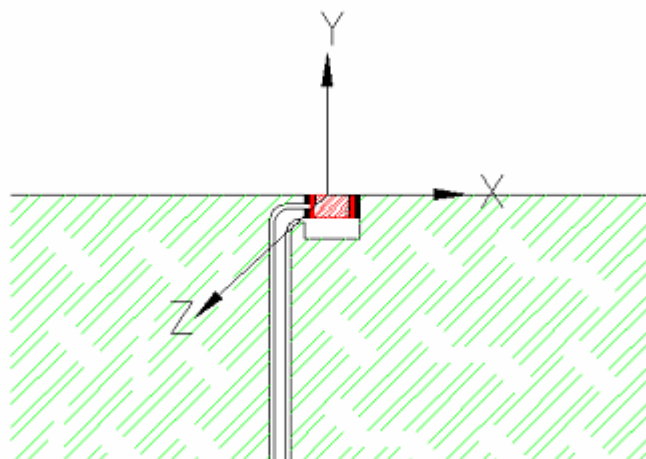
- Slim and Small (5.0\*3.0\*0.5mm)
- Wider Frequency
- High efficiency (80%)
- Omni-Directional
- Fully conform to (SMT) Process
- RoHS Appliance



### II. APPLICATIONS

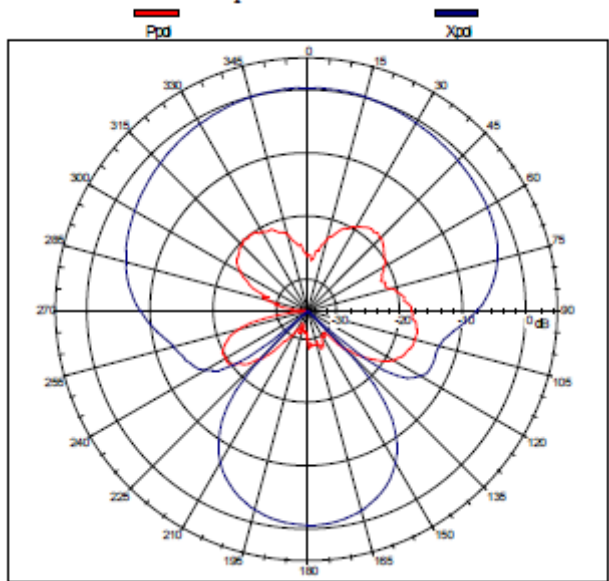
- Solution for small device that requires a very high receiving frequency such as
  - PND
  - Smart Phone, mobile phone
  - Tracking Device

### III. RADIATION PATTERNS



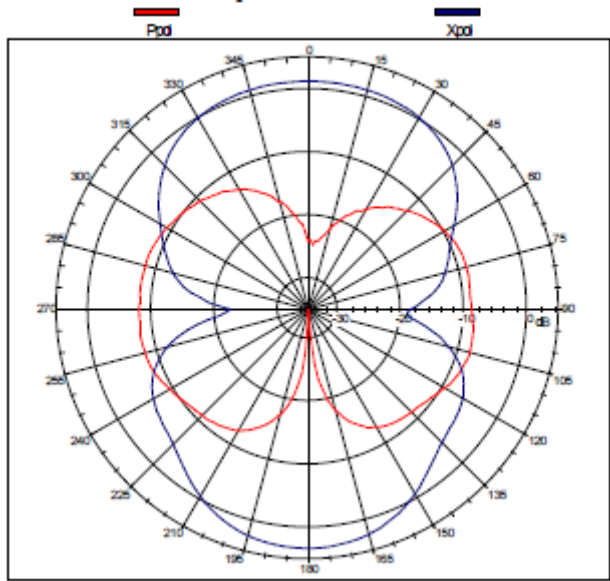
Application Note

Far-field amplitude of 050301-XY-2.nsi



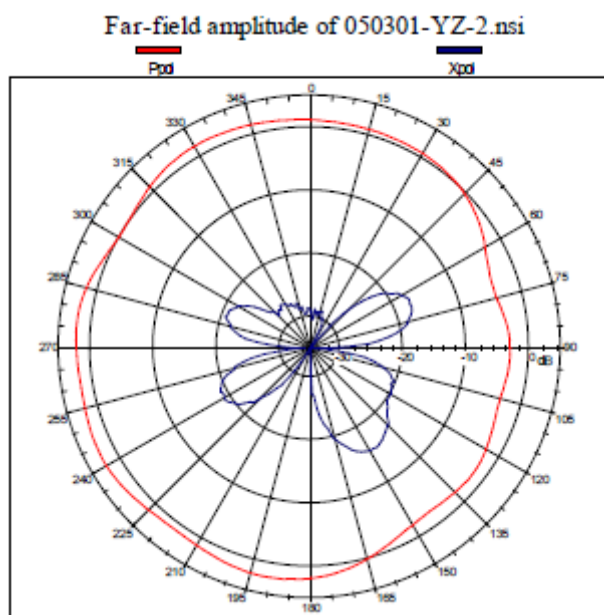
XY Plane

Far-field amplitude of 050301-XZ-2.nsi



XZ Plane

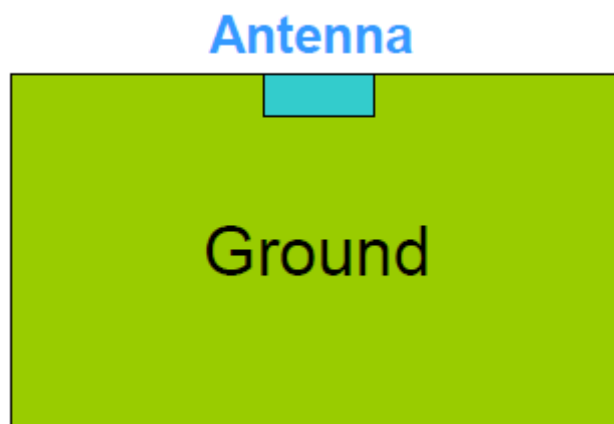
### Application Note



YZ Plane

## IV. ANTENNA POSITION

### IV.1 PND

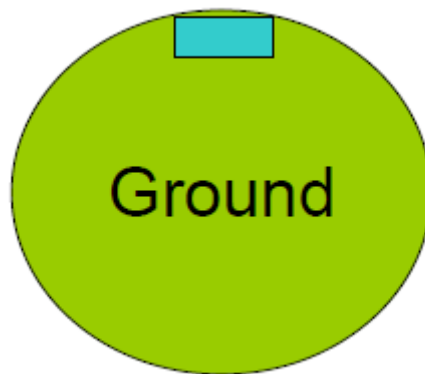


Application Note

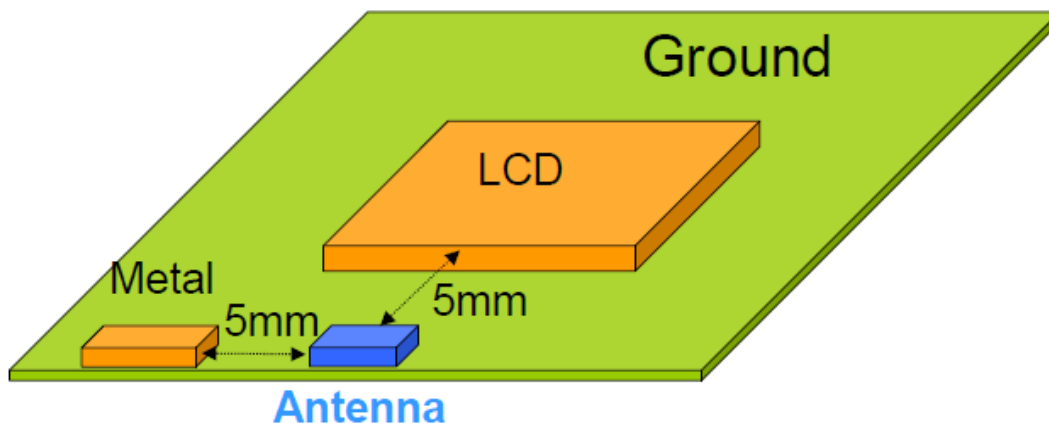
IV.II Smart Phone



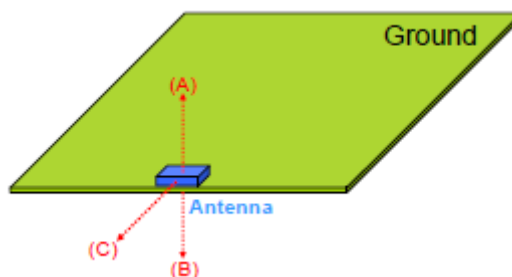
IV.III Multi-Function Watch



### Application Note



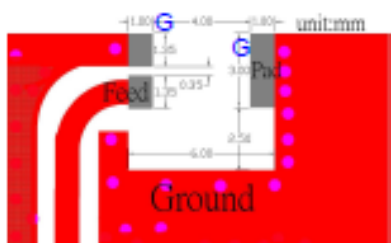
- Antenna should be put just right at the edge of PCB, It will be much better to put antenna at the centre of PCB
- Keep ground area around antenna as symmetrical as possible
- It needs at least 5 mm clearance between LCD panel/shielding and antenna
- It is better to have at least 50mm x 10mm PCB size



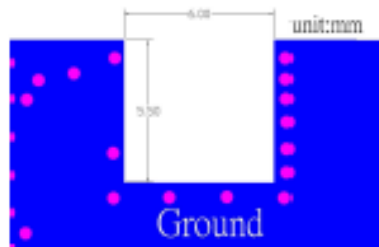
- Antenna has no orientation; it will show just the same performance when turned from left to right or top to bottom
- NO metal components are allowed in the (A), (B) and (C) direction as illustrated above

Application Note

V. LAYOUT GUIDE

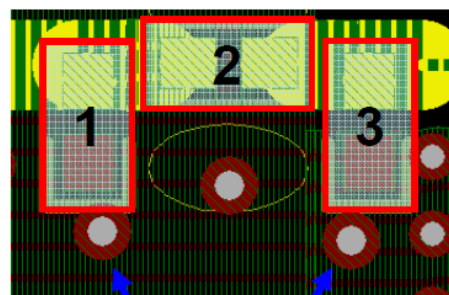
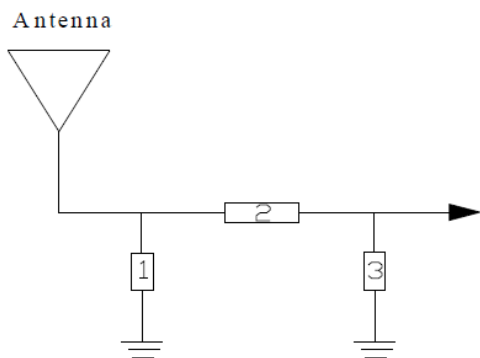


Top Layer



Bottom Layer

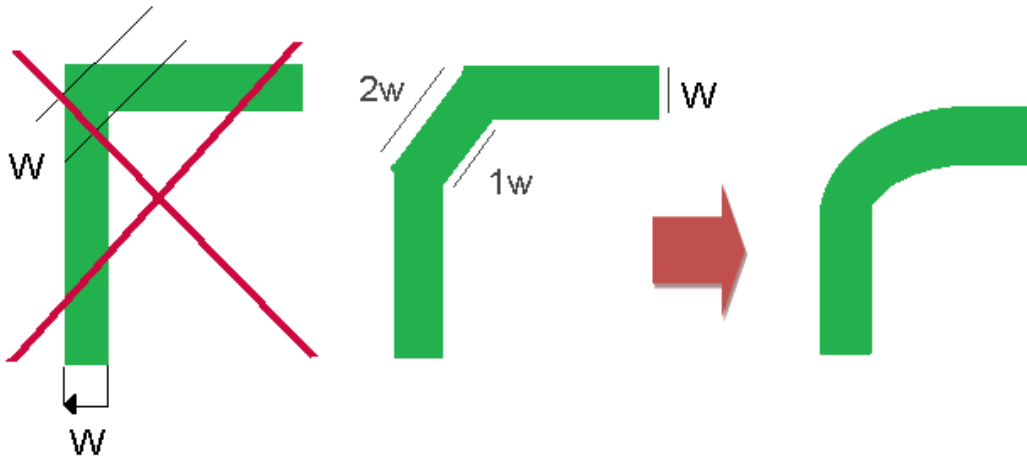
- Both top and bottom layers need a clearance area
- It needs at least 2.5mm clearance under antenna
- Via should be as close to the clearance area as possible, It performs better, has a grounding effect
- Both Position G need to connect to ground directly
- Put a  $\pi$  matching circuit after feeding line and as close as possible. Component 1 and 3 need to connect to ground directly.



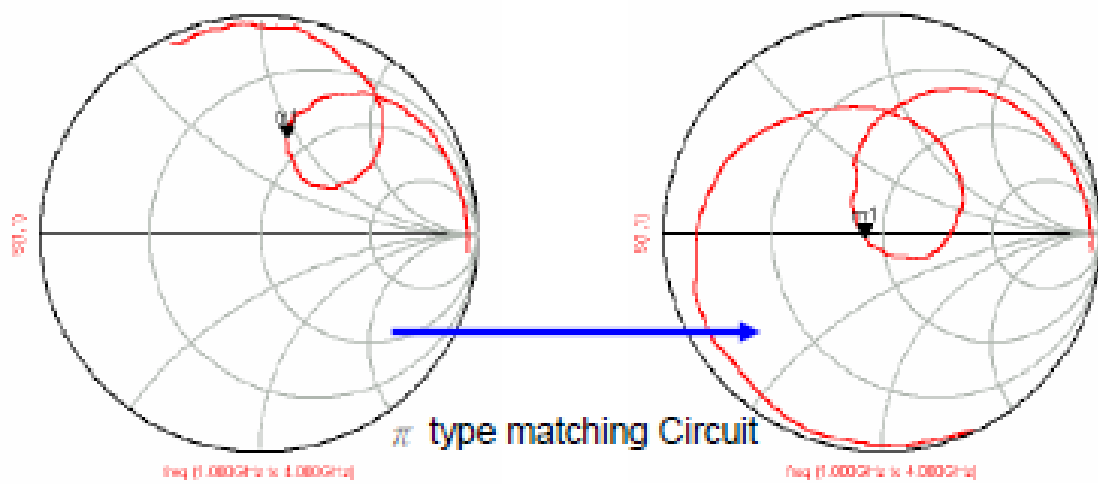
Grounding directly

Application Note

- Impedance of feeding line should be 50  $\Omega$
- If feeding line needs to make a turn, it needs to avoid turning at a 90 degree angle, It should turn at 45 degree angle or turn at arc as below



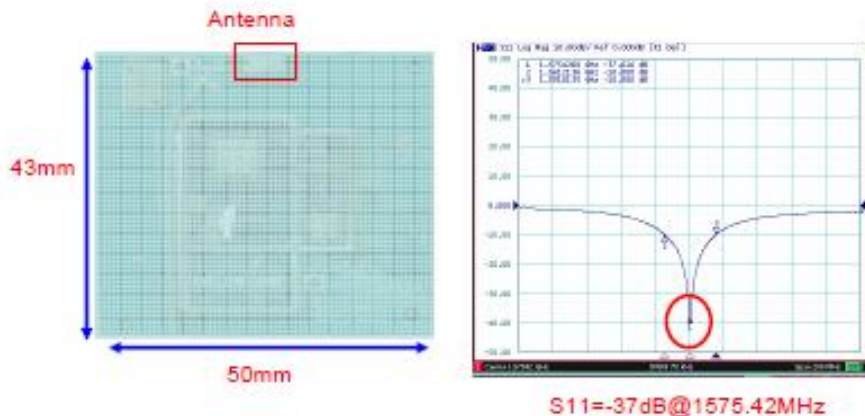
VI. MATCHING



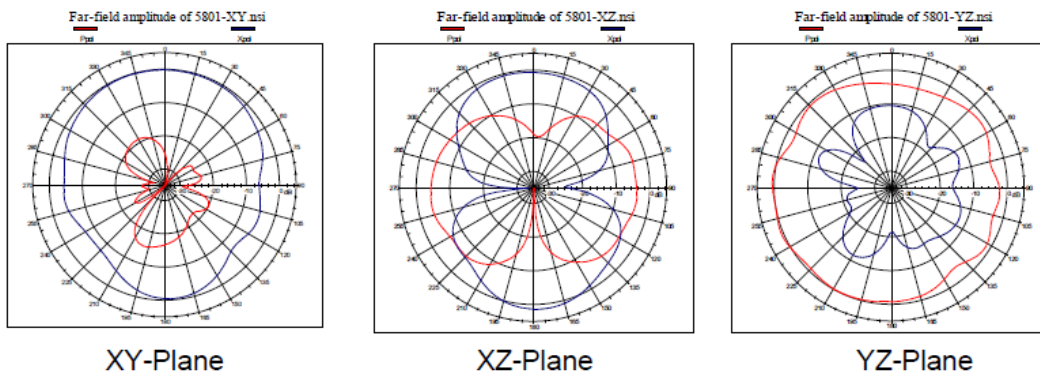
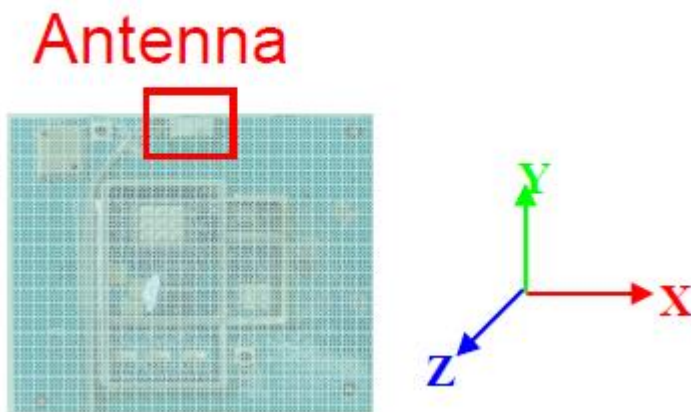
## Application Note

### VII. REAL CASE

#### VII.I Return Loss



#### VII.II Radiation Pattern



Application Note

Plane	XY	XZ	YZ
Peak Gain	-0.06	0.92	0.59
Average Gain	-3.22	-2.36	-1.83

(Unit:dBi)