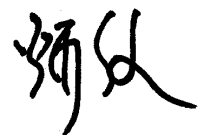



MSL Level 1
ROHS-Y

Approval Sheet

Products	Dielectric Chip Antenna		
Customer	Telian		
Model	K-2000		
Customer CODE			
Supplier	PARTRON		
Supplier CODE	ACS2450GBAK20		
Telian	By designed	By checked	By approved
PARTRON	By designed	By checked	By approved
			
	Research 5 Team	Quality Assurance	Laboratory
	Chanik.Jeon	Nam-Sik.Min	Byoung-Jun.Yim
	01/04	01/04	01/04

2008. 01. 04


22-6 Seokwoo-dong, Hwaseong-si, Gyeonggi-do, Korea 455-300
 Tel : 82-31-201-7870~6
 Fax : 82-31-201-7800
www.partron.co.kr


MSL Level 1
ROHS-Y

SPECIFICATION

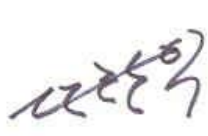
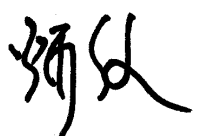
MODEL : ACS2450GBAK20

3D Structure



Top View

Bottom View

By designed	By checked	By approved
		
Research 5 Team	Quality Assurance	Laboratory
Chanik.Jeon	Nam-Sik.Min	Byoung-Jun.Yim
01/04	01/04	01/04

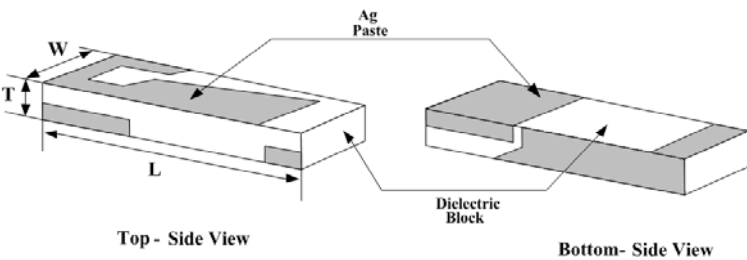
2008. 01. 04

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2. Summary of Parts

- This product is the internal dielectric chip antenna of radio communication, forms the pattern with Ag paste on the brick of dielectric block and materializes the characteristics

Type	Only Bulk Ceramic	
Material	Dielectric Block	Mg ₂ SiO ₄ (Magnesium Silicate)
	Electrode Paste	Ag
Size[mm]	W = 2.0±0.1	
	L = 7.0±0.1	
	T = 1.2±0.1	
Flatness Level	0.04	
MSL Level	MSL Level 1	
ESD Level	More than 15 KV (HBM CLASS 3B)	
Version	Revision 1.0	

3. Critical to Quality ()

- The following list is specified as the emphasis management list and managed.

CTQ ITEM	Specification Reason
Shape weight, size	Shape weight and size determines the electric block size after plastic and the dielectric block size effects the level of detail for the printing.
Plastic Size	The size after plastic effects the level of detail for the printing.
Printing Size	The level of detail for printing size is an essential list of the BT antenna.

CTF ITEM 	Specification Reason
Single Element measurement SWR	An important Parameter classifying the electrical characteristics.

- require attention for the following list.

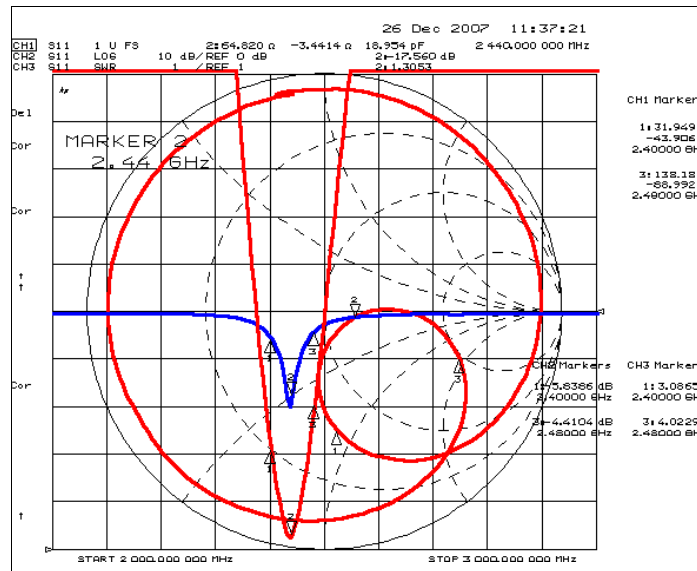
ITEM	Content
Keeping	Sealing tightly when keeping for a long time.
Action	Maybe characteristics changes when changing any design.

4. Electrical Characteristics

4.1 Set Condition

ITEM				SPEC
Frequency Range [MHz]				2400 ~ 2485
SWR [Max]				4.5 : 1 (Typ 4.0 : 1)
Input Impedance [Ω]				50 Ohm
Polarization				Linear
Gain[dBi]	Total Gain (Peak / Avg) [dBi]			-1.2 / -9.1
	Azimuth	Theta	Peak	-2.79
			Average	-8.43
		Phi	Peak	-8.66
			Average	-14.23
	Elevation 1	Theta	Peak	-4.08
			Average	-8.29
		Phi	Peak	-2.19
			Average	-8.33
	Elevation 2	Theta	Peak	-8.05
			Average	-14.35
		Phi	Peak	-1.22
			Average	-6.61

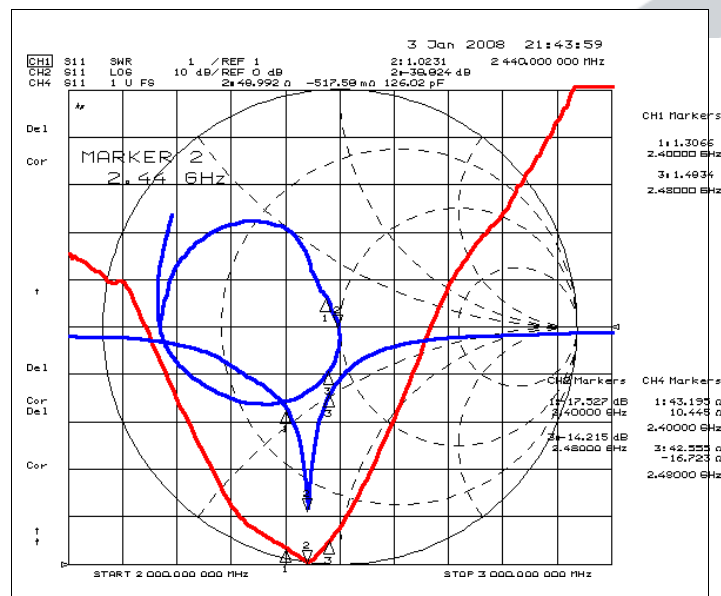
4.2 S11 Graph of Set Condition



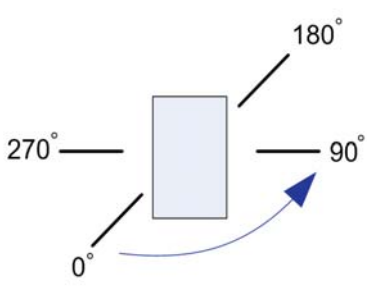
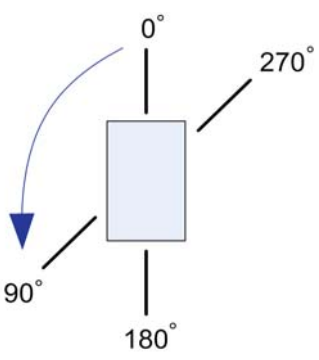
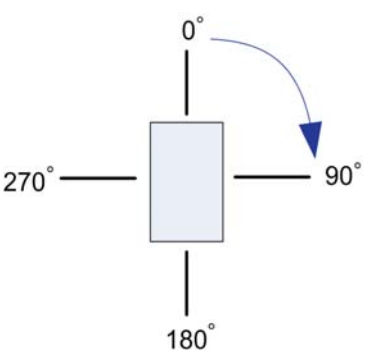
4.3 Test Fixture Condition

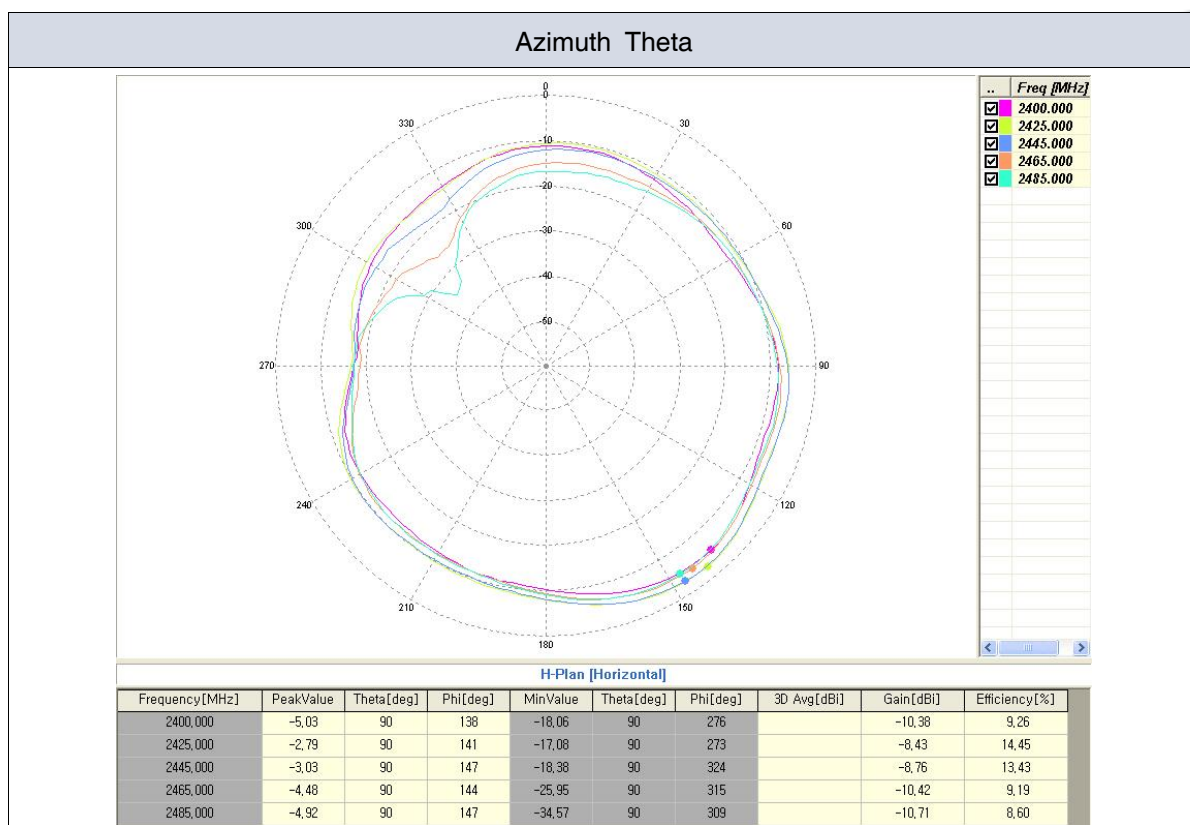
ITEM	SPEC
Frequency Range [MHz]	2400 ~ 2480
Lower frequency(2400MHz) SWR [Min~Max]	1.0 ~ 2.0 : 1 (Typ 1.5 : 1)
Upper frequency(2480MHz) SWR [Min~Max]	1.0 ~ 2.0 : 1 (Typ 1.5 : 1)

4.4 S11 Graph of Test Fixture Condition

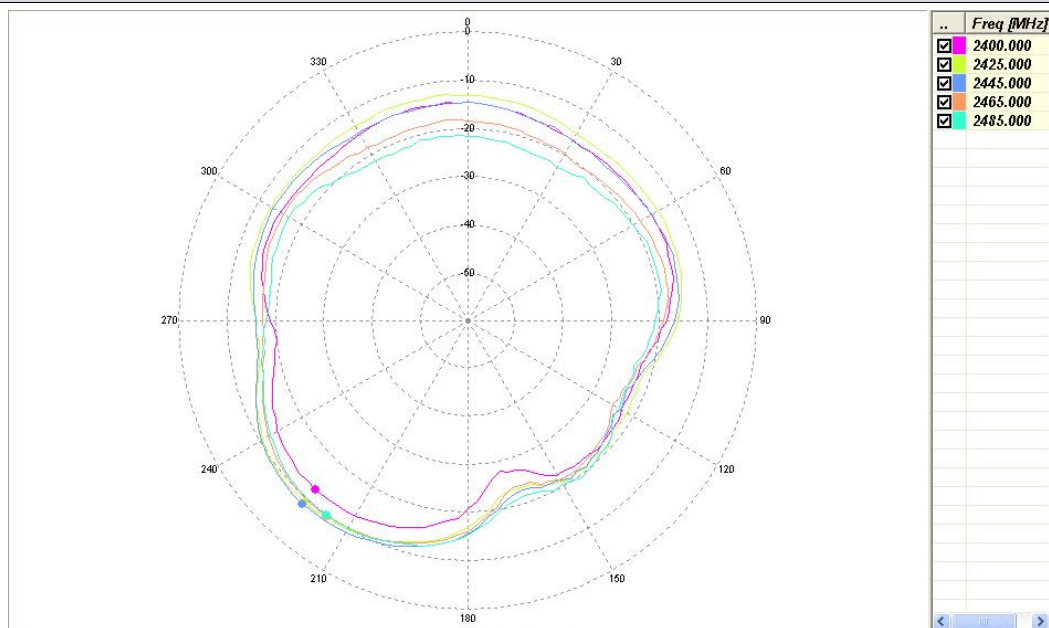


4.5 Radiation Pattern

Azimuth Plane	Elevation1 Plane	Elevation2 Plane
		
Theta	Vertical field of measured plane	
Phi	Horizontal field of measured plane	



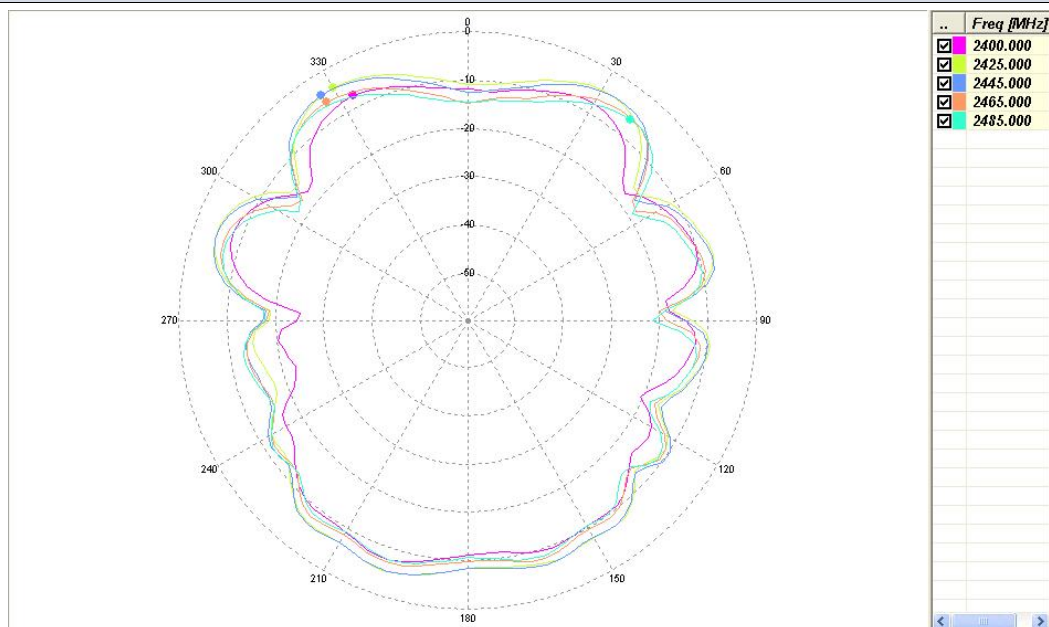
Azimuth Phi



H-Plan [Vertical]

Frequency[MHz]	PeakValue	Theta[deg]	Phi[deg]	MinValue	Theta[deg]	Phi[deg]	3D Avg[dBi]	Gain[dBi]	Efficiency[%]
2400,000	-12,71	90	222	-28,01	90	168		-16,42	2,39
2425,000	-9,12	90	222	-23,62	90	165		-13,90	4,18
2445,000	-8,66	90	222	-24,04	90	114		-14,23	3,89
2465,000	-9,75	90	216	-25,26	90	120		-16,00	2,62
2485,000	-9,91	90	216	-24,40	90	105		-16,54	2,33

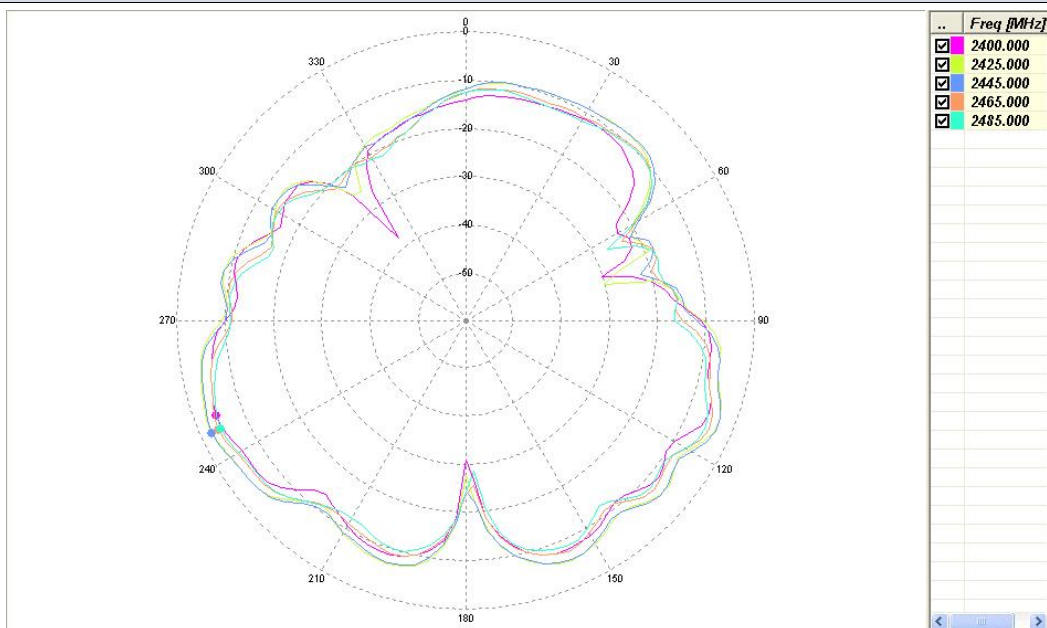
Elevation1 Theta



E1-Plan [Vertical]

Frequency[MHz]	PeakValue	Theta[deg]	Phi[deg]	MinValue	Theta[deg]	Phi[deg]	3D Avg[dBi]	Gain[dBi]	Efficiency[%]
2400,000	-7,53	333	0	-25,02	273	0		-11,21	7,67
2425,000	-4,11	330	0	-18,78	273	0		-8,27	15,00
2445,000	-4,08	327	0	-19,09	87	0		-8,29	14,95
2465,000	-5,86	327	0	-20,28	87	0		-9,94	10,25
2485,000	-6,15	39	0	-21,73	90	0		-10,51	9,01

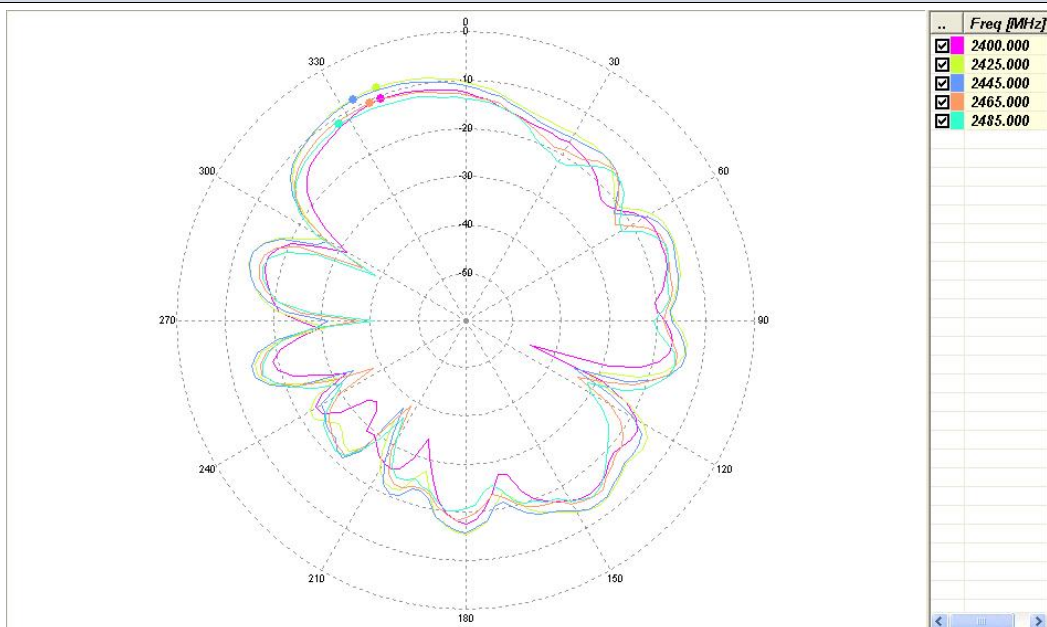
Elevation1 Phi



E1-Plan [Horizontal]

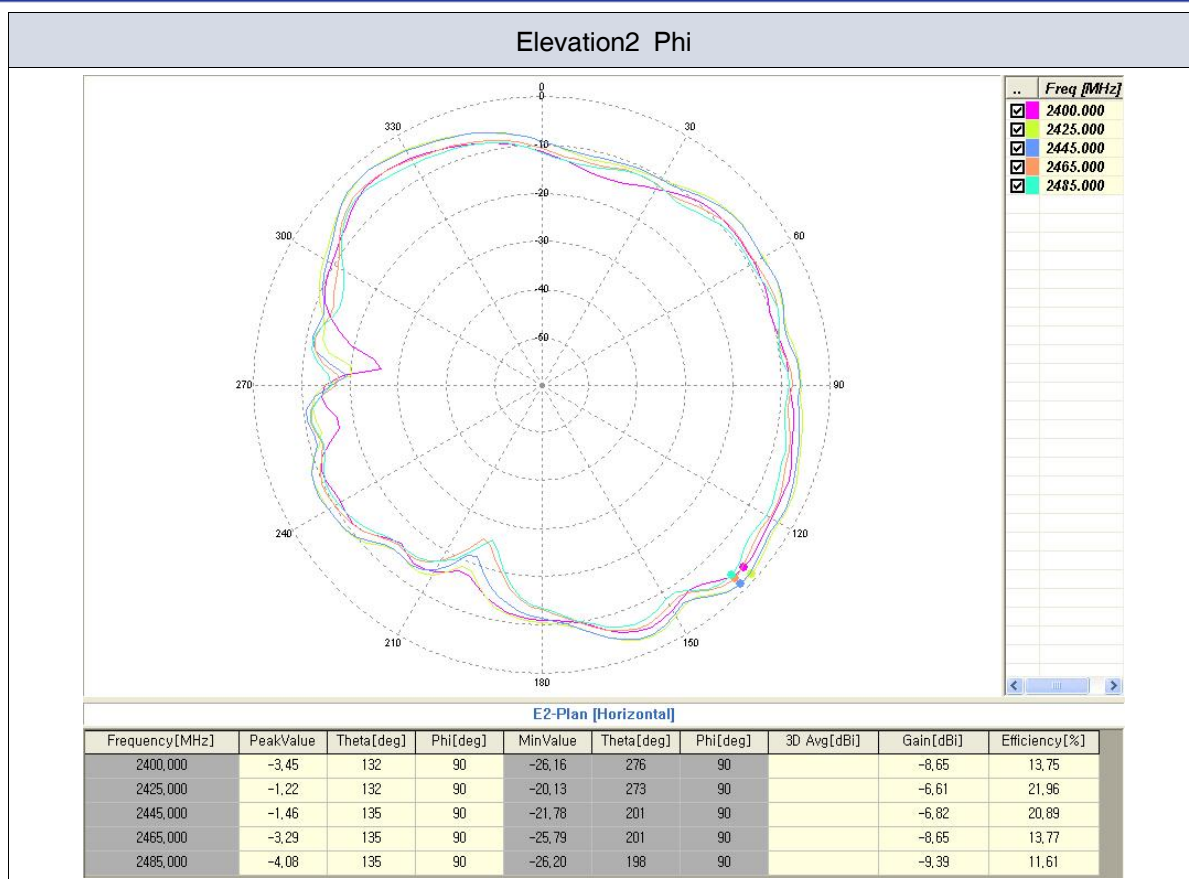
Frequency[MHz]	PeakValue	Theta[deg]	Phi[deg]	MinValue	Theta[deg]	Phi[deg]	3D Avg[dBi]	Gain[dBi]	Efficiency[%]
2400,000	-4,44	249	0	-37,66	321	0		-10,54	8,94
2425,000	-2,24	246	0	-30,34	75	0		-8,27	14,99
2445,000	-2,19	246	0	-24,49	180	0		-8,33	14,81
2465,000	-3,79	246	0	-25,74	177	0		-10,04	10,03
2485,000	-4,27	246	0	-28,69	177	0		-10,63	8,75

Elevation2 Theta



E2-Plan [Vertical]

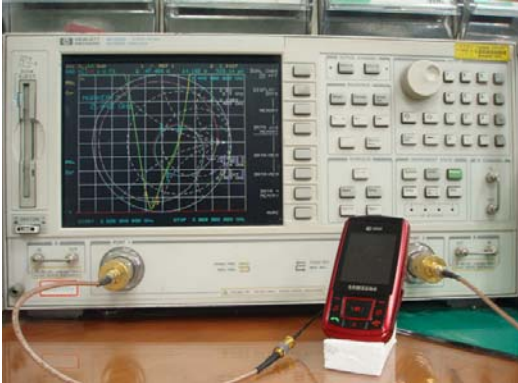
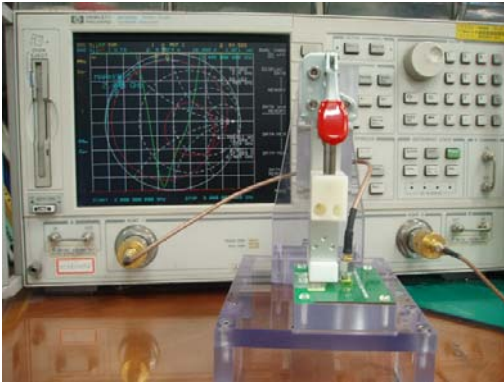
Frequency[MHz]	PeakValue	Theta[deg]	Phi[deg]	MinValue	Theta[deg]	Phi[deg]	3D Avg[dBi]	Gain[dBi]	Efficiency[%]
2400,000	-10,58	339	90	-45,53	111	90		-17,15	2,04
2425,000	-8,05	339	90	-34,40	216	90		-14,35	3,78
2445,000	-8,49	333	90	-37,62	216	90		-14,64	3,55
2465,000	-10,57	336	90	-38,86	213	90		-16,53	2,34
2485,000	-11,37	327	90	-40,90	270	90		-17,29	1,98



5. Measurement Process

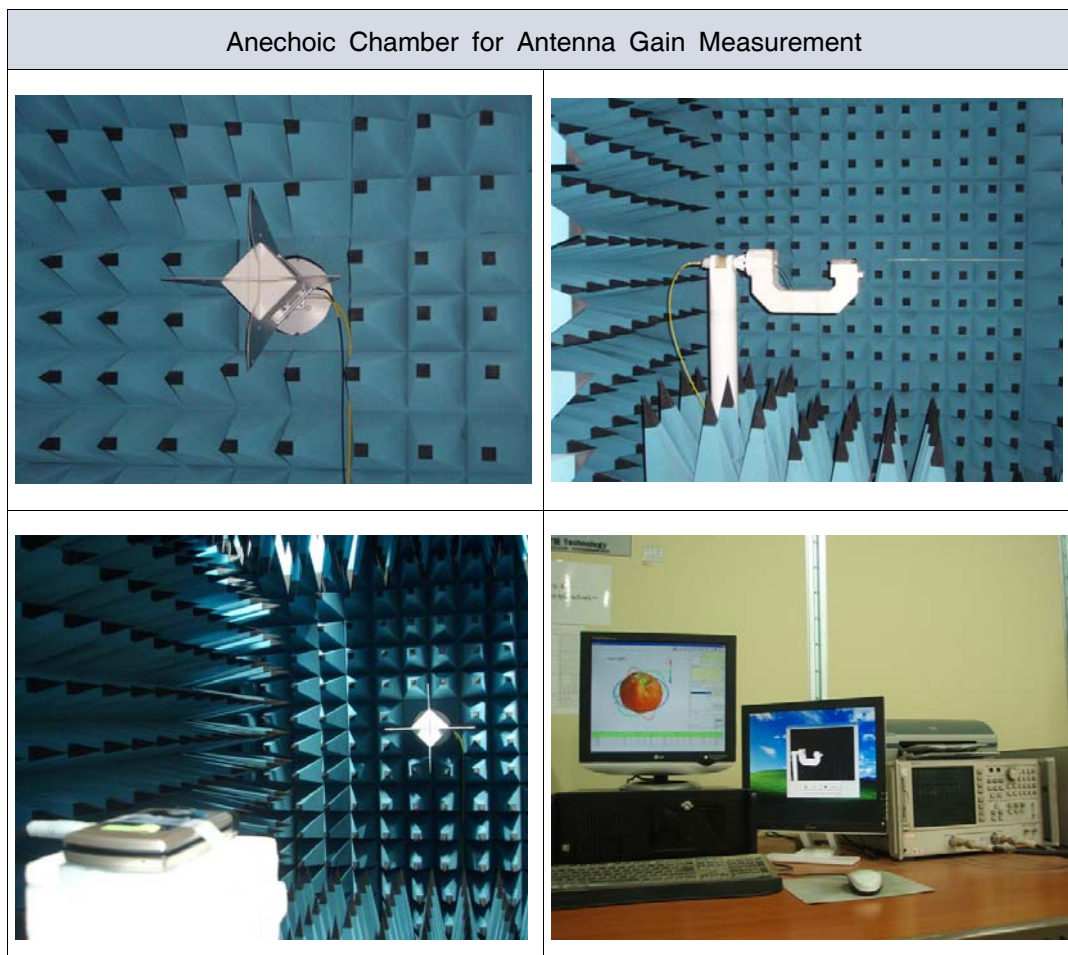
5.1 SWR/Return loss

Use Network Analyzer when measuring SWR/Return loss and selecting standard SPL,
Use automatic inspection equipment when selecting superior and inferior goods.

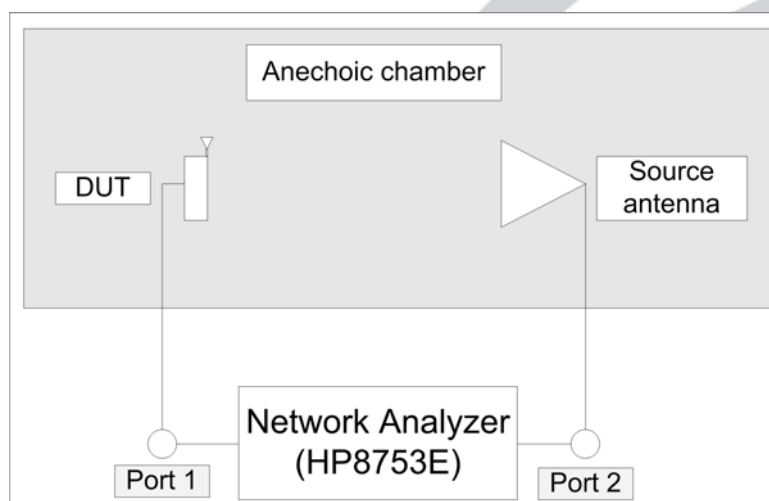
	Set Condition	Test Fixture Condition
Network Analyzer	Agilent HP8753D	Agilent HP8753D or Advantest R3765CH
Cable	RF cable(300mm)	RF cable(300mm)
Test condition		

5.2 Gain

Antenna gain is measured in the Anechoic Chamber of this company, using set above of 4.1 list.

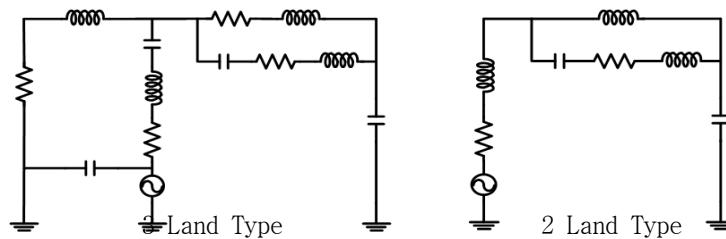


5.3 Gain test block diagram



6. Internal Block Diagram

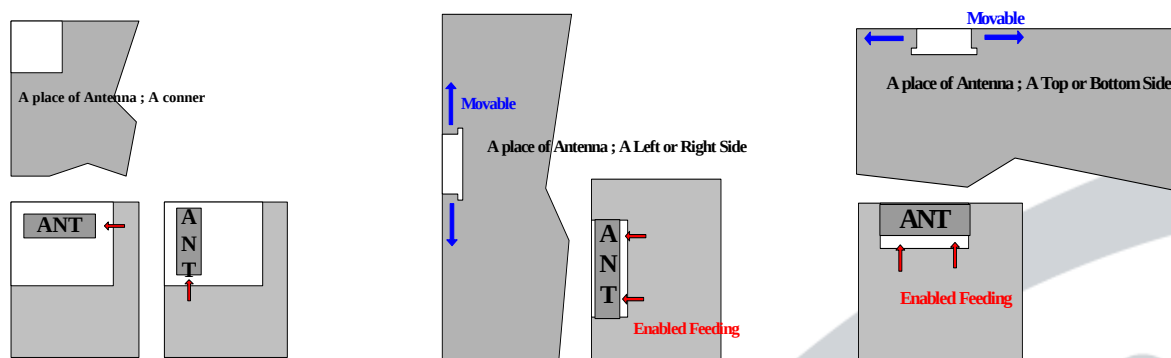
This product is made of the dielectric block and RF part materialized the characteristics by structural change of Ag pattern on the brick of dielectric block and conditioning value of the structural equivalent circuit.



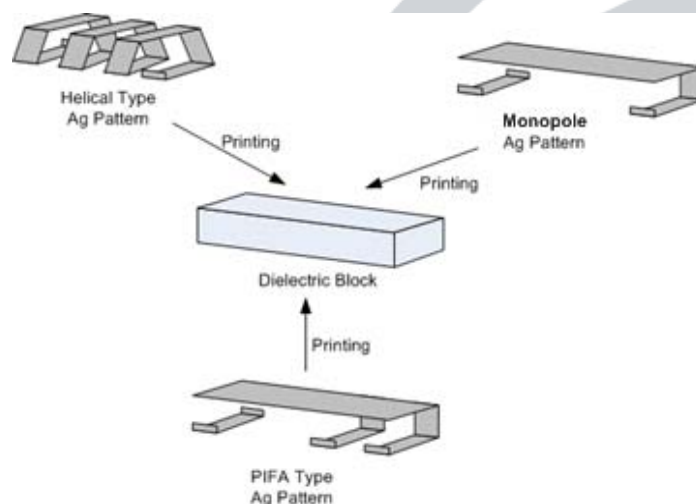
7. Basis Action / Application Note

This product is the internal dielectric chip antenna of radio communication, converts the electric signal advanced along by transmission line into free space wave.

This product will be mounted wherever you want and the design is revised by mount condition. But require attention to select the mount position, because this product is the radiation part and changed characteristics by boundary condition,

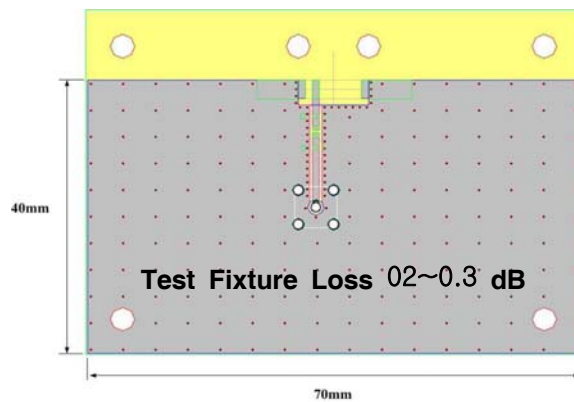


As the following, this product is easy to revise the various types for the boundary condition.



8. Measurement Jig SPEC

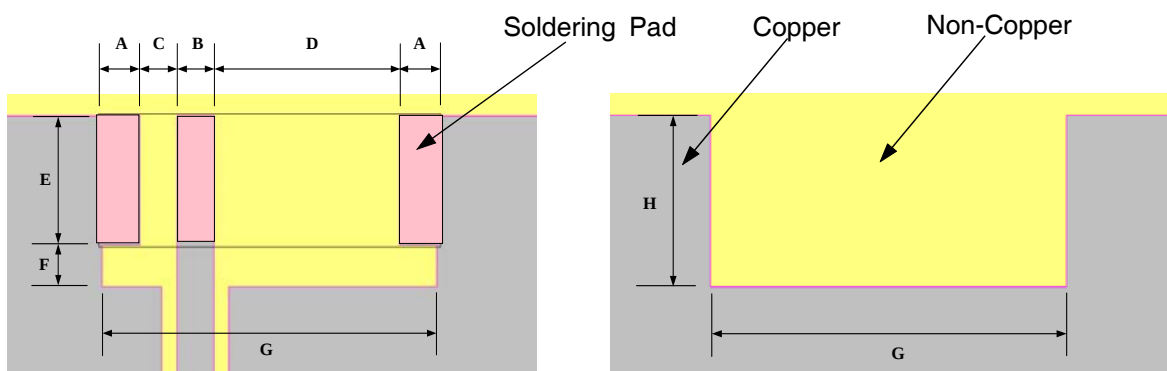
8.1 Test Fixture And GROUND Condition



※ Ev B'd and Test Fixture Jig is the same

(Contact way of Ev B'd is soldering, Test Fixture is copper contact way)

8.2 PCB Layout & Soldering Pad Dimension



Top Layout

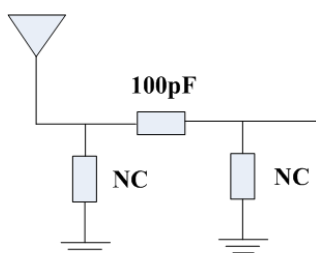
Bottom Pattern

Parameter	A	B	C	D	E	F	G	H
Value[mm]	1.1	1.0	0.5	3.5	2.2	1.0	7.2	3.2

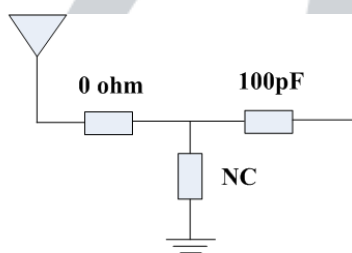
Unit ; mm

Unless specified tolerances are ± 0.1

8.3 Matching Circuit And Reference Value



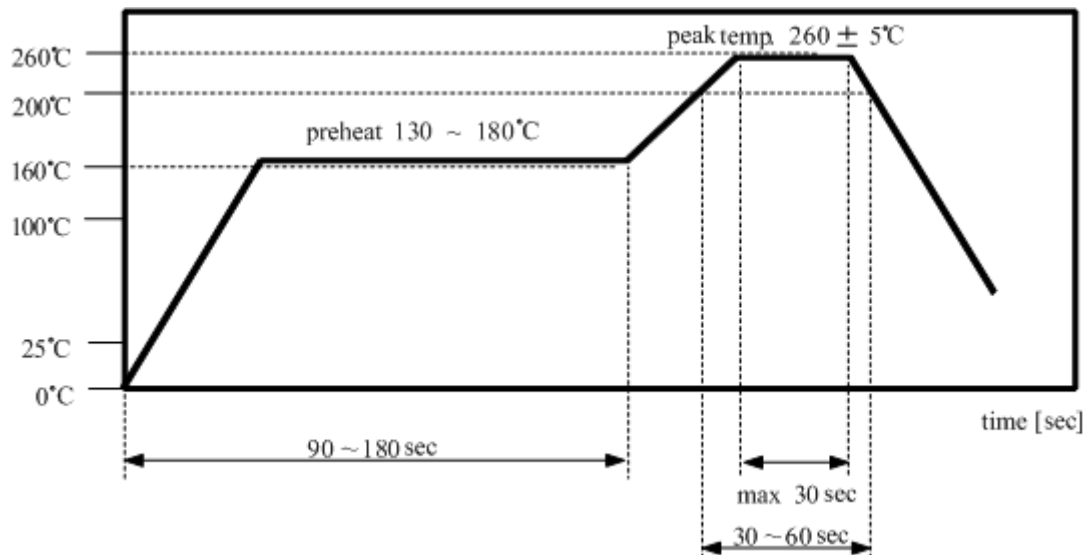
π Matching



T Matching

9. REFLOW PROFILE

9.1 Reflow Soldering



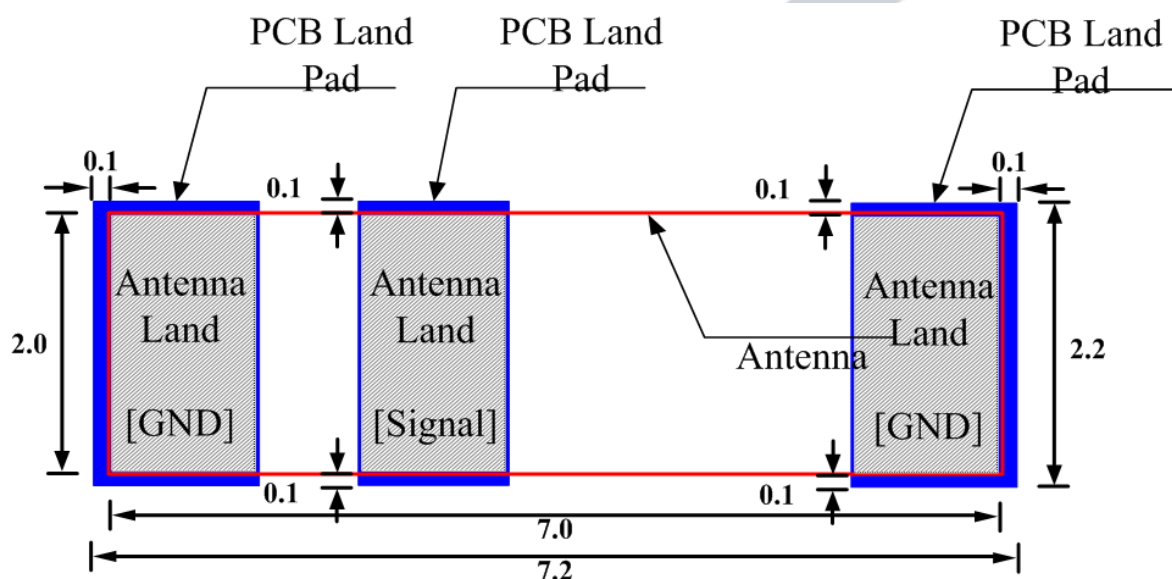
9.2 Manual Soldering

Pre-heating Temperature : 120°C , 60 ~ 300 sec.

Soldering Temperature : 340°C±5°C , 5sec max per each terminal

9.3 PCB Pattern Design

As the following, the PCB land pattern lays out 0.1mm outside land pattern of antenna more than indicated antenna land dimension



10. Primary Inspection List

Item	Electrical Characteristic[MHz] 		Size [mm]		
Standard	VSWR 2.0 MAX		W=2.0±0.1	L=7.0±0.1	T=1.2±0.1
	2400MHz	2480MHz			
1	1.34	1.44	2.02	7.01	1.23
2	1.35	1.41	2.03	7.02	1.23
3	1.30	1.49	2.03	7.03	1.23
4	1.38	1.36	2.03	7.01	1.22
5	1.30	1.49	2.02	7.01	1.23
6	1.39	1.38	2.04	7.01	1.24
7	1.32	1.40	2.02	7.02	1.24
8	1.41	1.38	2.03	7.02	1.22
9	1.40	1.42	2.02	7.02	1.24
10	1.34	1.45	2.03	7.02	1.24
11	1.39	1.39	2.03	7.03	1.23
12	1.36	1.40	2.02	7.03	1.24
13	1.34	1.42	2.04	7.02	1.22
14	1.37	1.37	2.02	7.01	1.23
15	1.35	1.41	2.03	7.01	1.23
16	1.36	1.41	2.03	7.02	1.24
17	1.26	1.56	2.02	7.03	1.22
18	1.38	1.39	2.04	7.03	1.24
19	1.42	1.40	2.02	7.01	1.23
20	1.36	1.39	2.02	7.02	1.24
Min	1.26	1.36	2.02	7.01	1.22
Max	1.42	1.56	2.04	7.03	1.23
X	1.36	1.42	2.02	7.01	1.23
σ	0.03	0.05	0.01	0.01	0.01
Cpk	2.93	2.85	3.28	3.38	2.91
Decision	OK	OK	OK	OK	OK