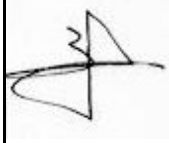
ANTENNA SPECIFICATION

	Prepared By		Checked By	Approved By
Electronic				
	9/21	/	9/21	
Mechanics				
	9/21	/	9/21	9/21

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1. Revision List

REVISION LIST					
NO	DATE	Before change	After change	Reason	REV
1	2005-09-07	-	-	- new approval	IR
2	2005-09-21	LSP-400R (DRAK GRAY) V.S.W.R 90DEG 2.0:1 -	WLL-800MHz(Dark Gray) V.S.W.R 90DEG 2.1:1 Del: Network Analyzer model name (section 4.1, 4.3)	- new approval	A
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2. Technical Items

2.1 Electrical Spec.

Frequency Range	824 ~ 894 MHz
GAIN	2 dBi ±1dB
VSWR	Less than 2.5:1
Impedance	50 ohms
polarization	vertical
Radiation pattern	Omni-directional
Maximum power	3 Watt

2.2 Mechanical Spec.

connector	TNC MALE
Overall length	See drawing
Operating temperature	-20 ℃ ~ +70 ℃
weight	about 38.0g

2.3 Packing Spec

PRODUCT NO	Antenna Q'TY	MATERIAL	비 고
GIFT BOX	100EA	SW 2 TYPE(B CORRUGATED)	
CARTON BOX	400EA	DW 2 TYPE(AB CORRUGATED)	

3.Test environment

3.1 Test equipment

The test equipments for antenna are as follows

? Spectrum Analyzer measure for receipt signal intensity.

? possible to mediate stand antenna same to standard dipole in a cellular band width

? Network Analyzer (HP8752C) to measure the V.S.W.R and impedance of antenna

? Spectrum Analyzer to measure the receiving signal intensity

? Anechoic Chamber installed the cables, connectors and equipments for measurement

? Dogmatic Caliper to measure the dimensions

? Torque Driver to measure the torque force of the helix

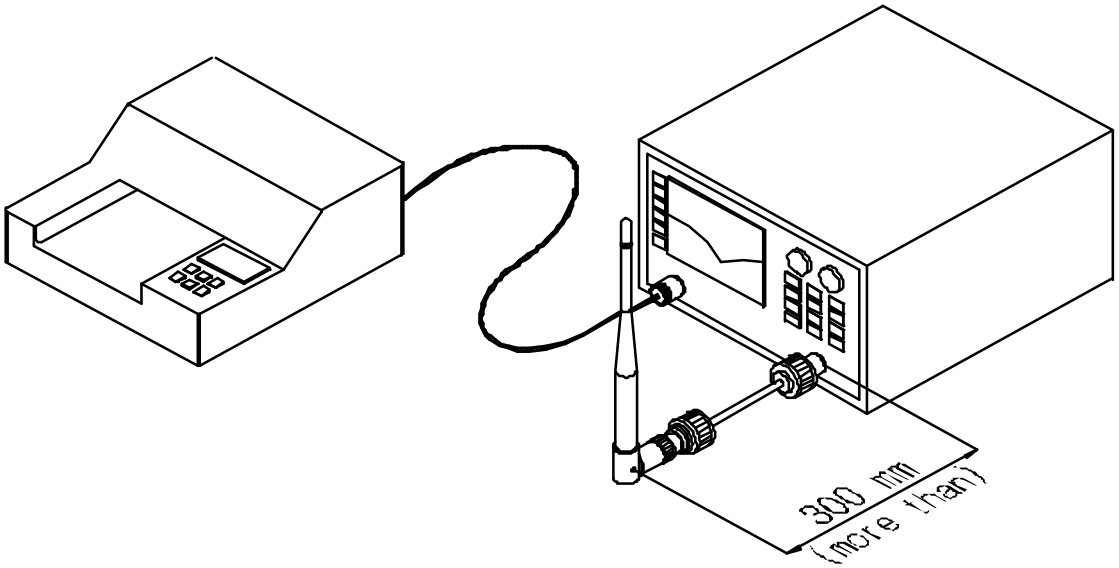
? Push/Pull gauge to measure the pulling force

? Climatic Chamber for environmental test

4. Electrical Demand

4.1 V.S.W.R

The S.W.R characteristics must satisfy the electrical demands with V.S.W.R 2.5:1 in 0 DEG, 2.1:1 in 90 DEG.



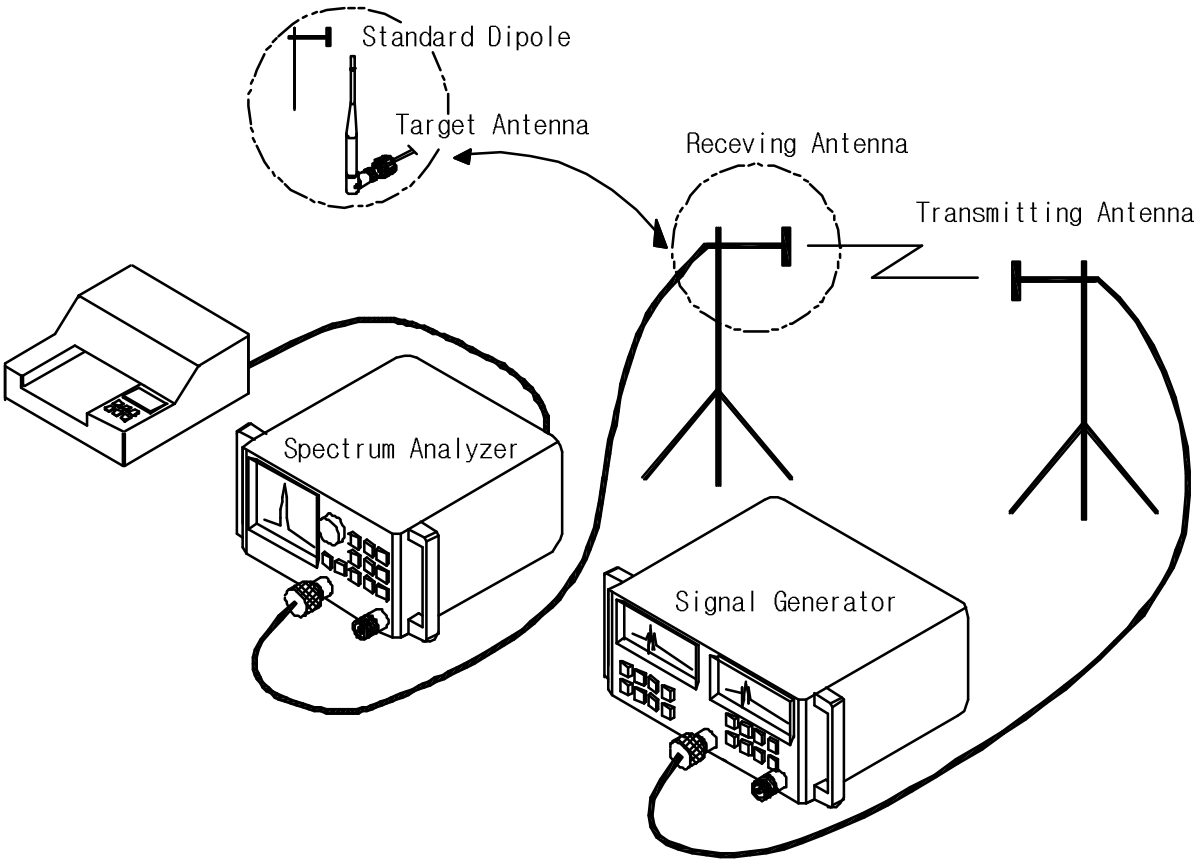
4.2 Radiation Pattern

The radiation pattern must have the omni-directional characteristic in Azimuth Plane

4.3 GAIN

The gain is expressed as dBi.

the maximum Gain of antenna must satisfy the electrical demands in 2 dBi ±1 dB

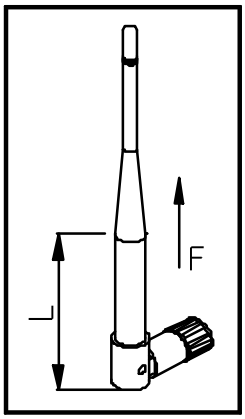


5. Mechanical Demands

5.1 breakdown test

The antenna is assembled to the test equipment. We apply to force from the bottom part to the upper point. In a vertical direction(F) and horizontal direction(P). After the test, no visual deterioration shall occur. After the test, the antenna shall satisfy the electrical demands.

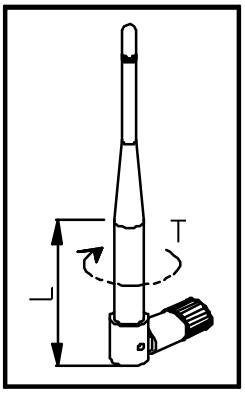
F (Kg/f)	7
P (Kg/f)	-
L (mm)	2/3
Remarks	-



5.2 torque test

The antenna is assembled to the test equipment. Torque is applied to the antenna in clockwise direction. The torque shall be applied L(mm) above the bottom of the HELIX. After the test, no visual deterioration shall occur. After the test, the antenna shall satisfy the electrical demands

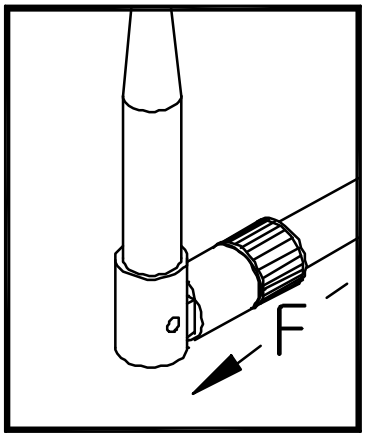
T (Kg/f)	3
L (mm)	2/3
Remarks	-



5.3 Traction test

The antenna is assembled to the test equipment. Force is applied, during 30 sec, to the antenna parallel to the antenna axis. After the test, no visual deterioration shall occur. After the test, the antenna shall satisfy the electrical demands

F (kg/f)	7
시 간(S)	30
Remarks	-

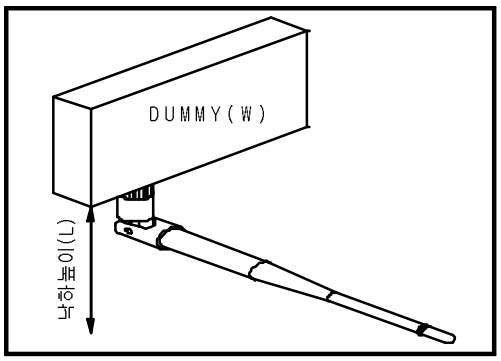


5.4 drop test

The antenna is assembled to dummy (or the handset with W(g)). The handset is dropped with the antenna downward onto a concrete surface at H(cm) height.

After the test, the original shape shall be possible to restore. The antenna shall satisfy the electrical demands

W (g)	SET WEIGTH
L(Cm)	150
Remarks	-

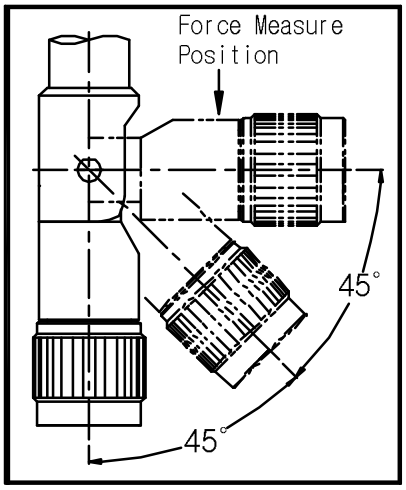


5.5 Bending test

Bending force of antenna must have F (Kgf) more than designated force.

After an Environmental test or repeating test(100 times), vibrational rate of BENDING force must have less than 50%.

W (kgf)	1
Remarks	-



5.6 Appearance test

Test items	Standard	Measurement Method	Test method	Record
BLACK SPOT WHITE SPOT NONMATERIAL	Less than 0.15mm through, (less than in the same face)	Nonmaterial gage (or standard sample)	G-11 AQL-0.65	Reliability Test report

6.Environmental Demands

6.1 Operation Temperature Test

-Test A: Place the antennas for testing in chamber. The chamber condition should be as follows: 1hours at -20℃

-Final measurements : The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.

-Test B: Place the antennas for testing in chamber. The chamber condition should be as follows: 1hours at 70℃

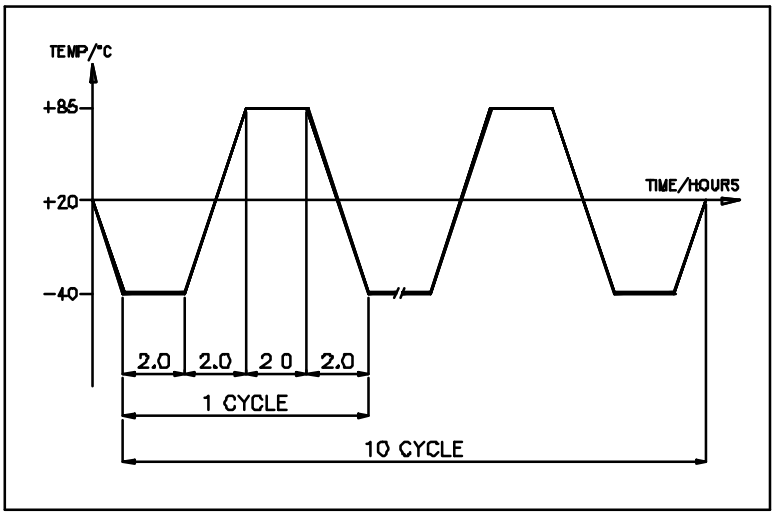
-Final measurements : The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.

6.2 Temperature Change Test

The object of temperature test is to evaluate the reliability of antenna component at temperature change.

-Test: Temperature cycle is as follows. 2 hours at -40℃, 2 hours at +85℃.
Temperature increase/decrease time (Temperature change time) is 2 hours.
10 cycles.

-Final measurements: The antenna shall be visually inspected and electrically and mechanically checked as required by products standard.



6.3 High Humidity Test

-Test: Place the antennas for testing in chamber. The chamber condition should be as follows: 24hours at +55℃, Relative humidity is 95%.

-Final measurements : The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.

6.4 Corrosion test

The antenna shall be exposed for 96 hours at +35℃ to a 5% Sodium Chloride fog.

After the test, no visual deterioration shall occur. After the test, the antenna shall satisfy the electrical demands. The test is satisfied with IEC 68-2-11.

6.5 thermal shock test

The antenna is placed in the temperature chamber with +80℃ for 30 minutes and -40℃ for 30 minutes measured in ten times.

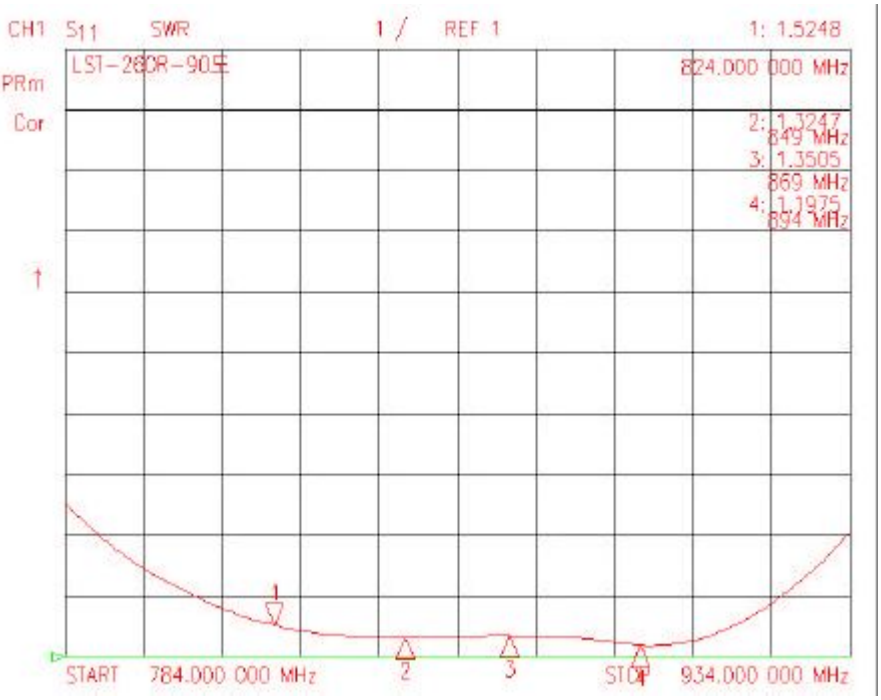
After the test, no visual deterioration shall occur. After the test, the antenna shall satisfy the electrical demands.

7. The others documents

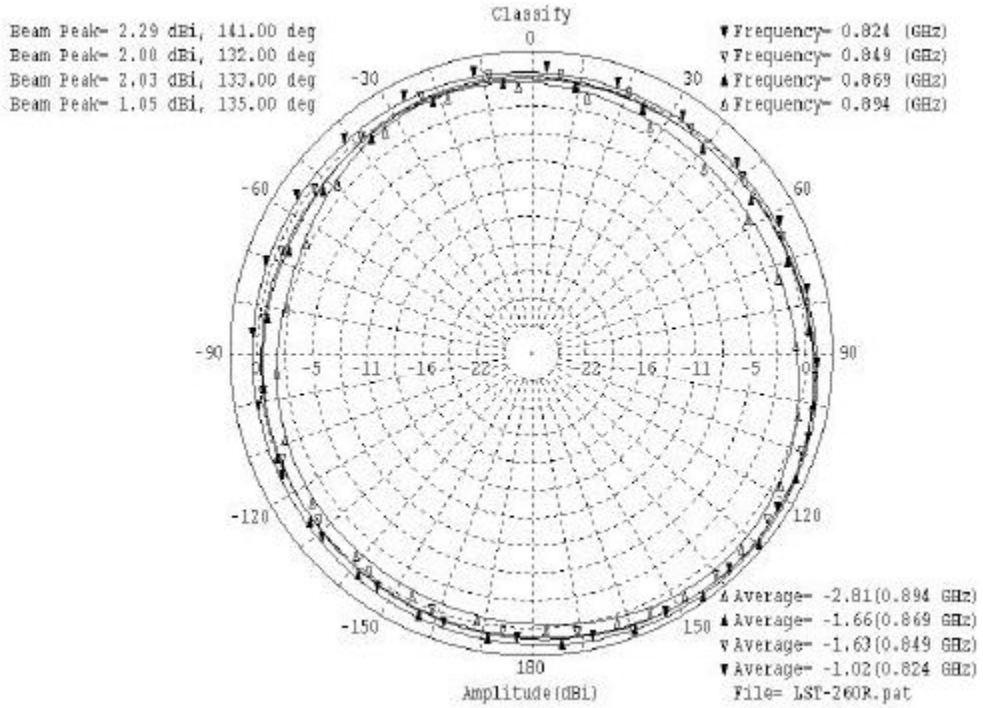
7.1 Electrical data

- V.S.W.R of set up Antenna Straighted(0Deg)

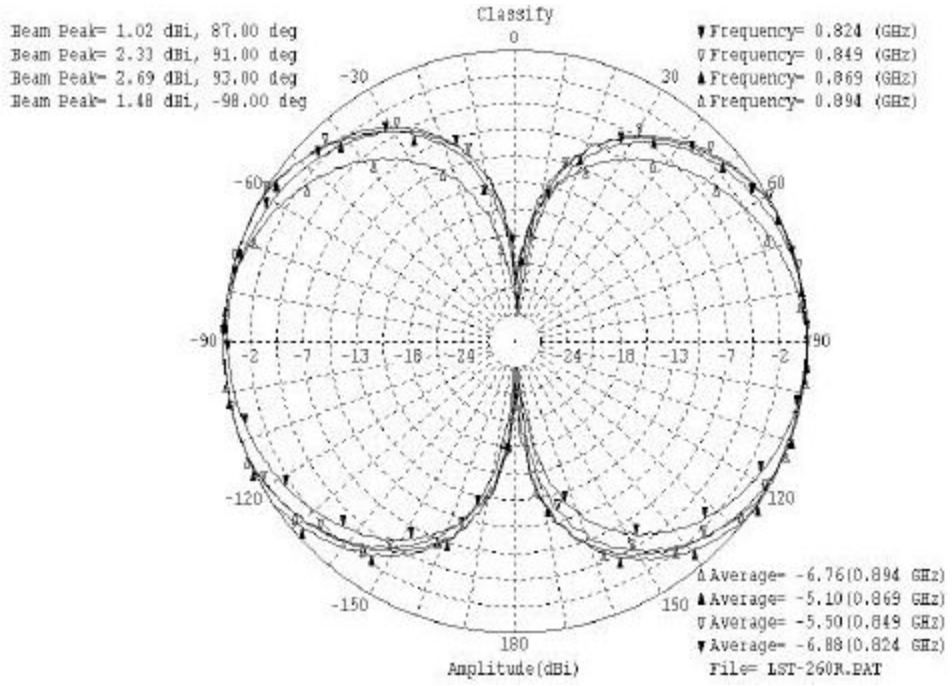
- V.S.W.R of set up Antenna Foldeded(90Deg)



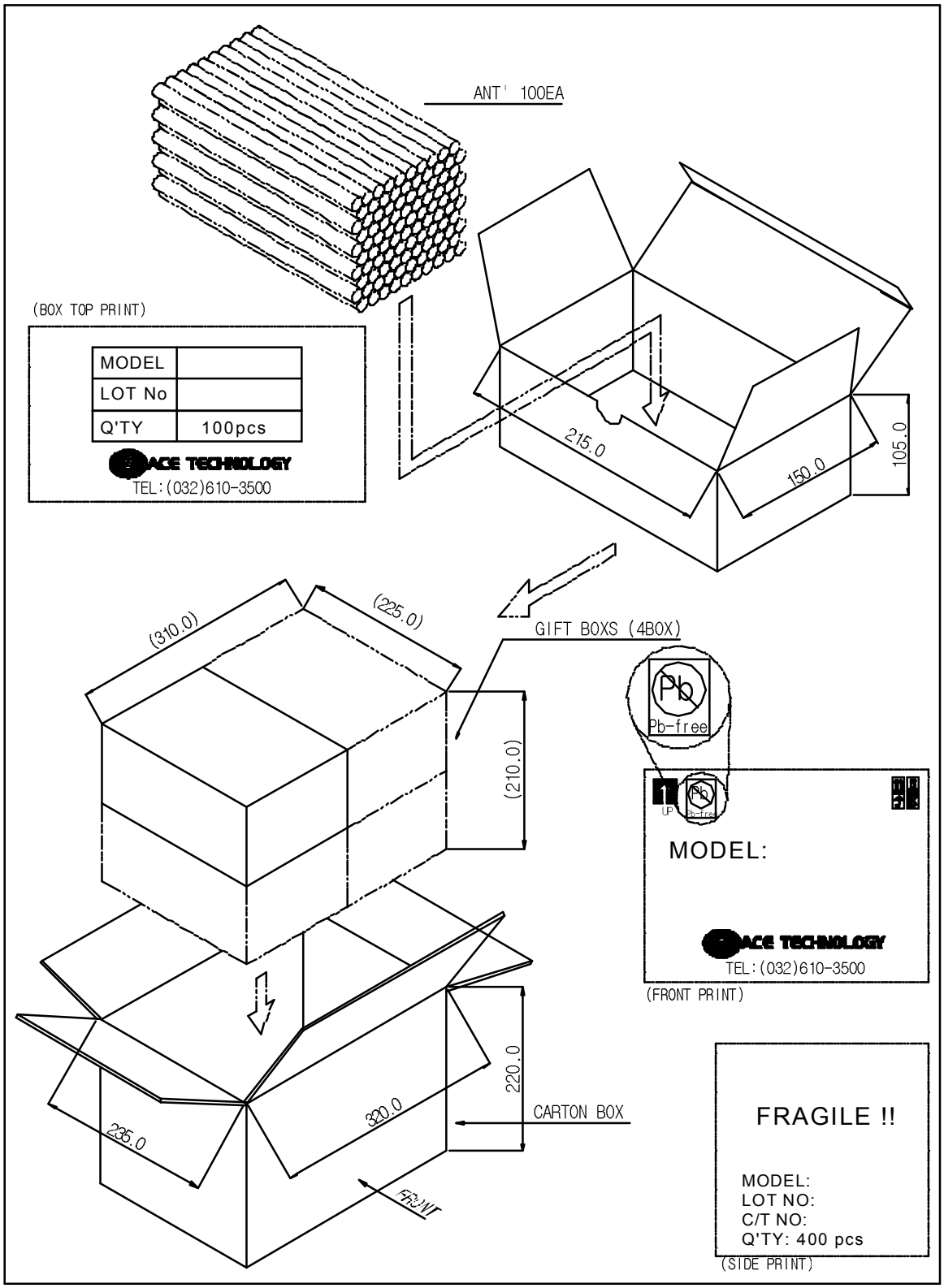
- Radiation Pattern of set up Antenna foldeded



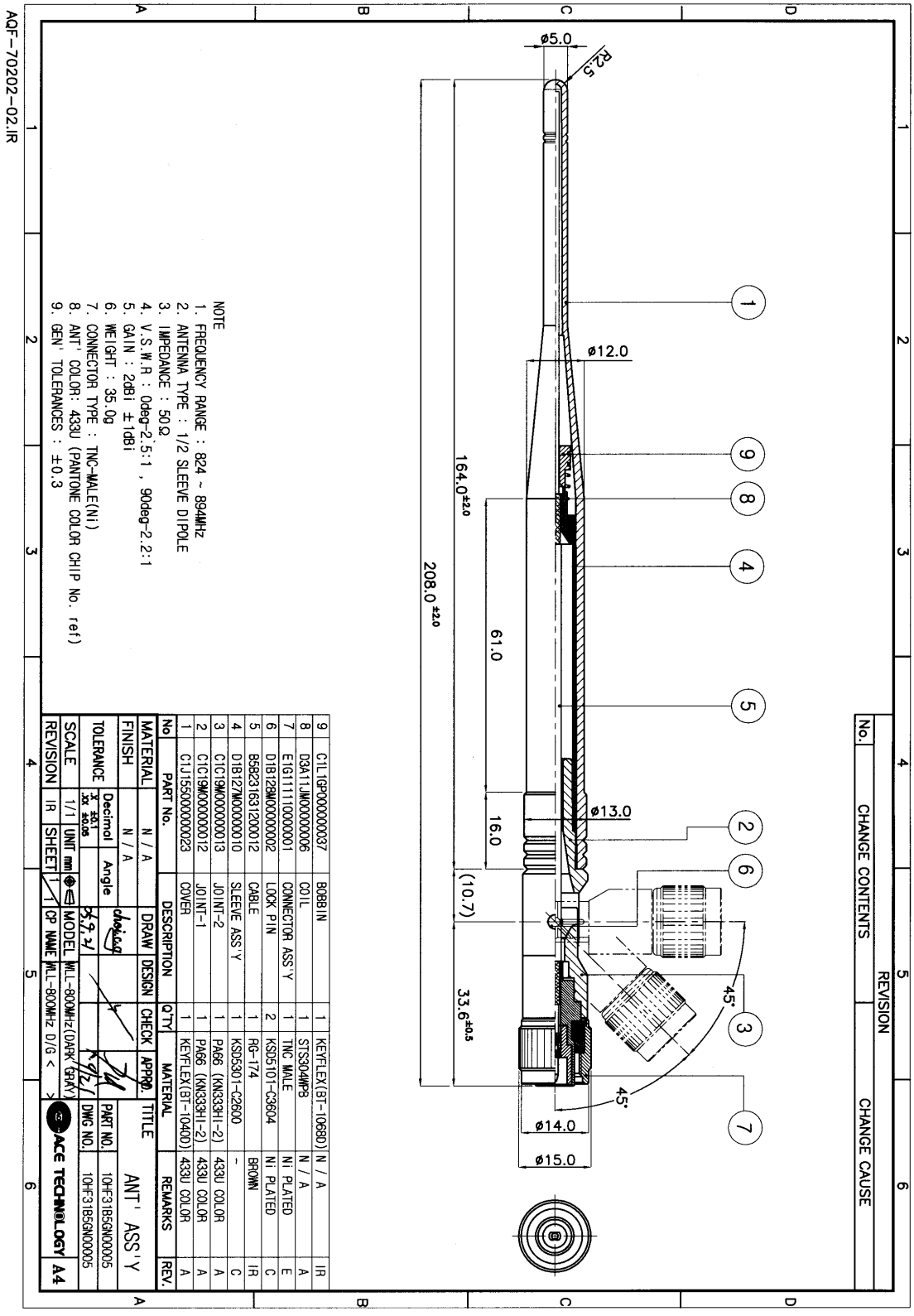
- Radiation Pattern of set up Antenna foldeded



7.2 Packing Specification (Drawing)



7.3 Antenna Drawing



7.4 Reliability test data

7.4.1 Reliability test report(1/2)

에이스테크놀로지

Reliability Test Report (1/2)	Prepared by	Checked By	Reviewed By	Approved By
	9/9	/	/	9/9

Model	LSP-400R	Date	05.09.1~9.9	Measured by	S.W.JUNG
Sample(n)	40			Product dept	ACE / Q.A

1. Test reason : new approval objection

2. Test Result

NO.	Test item	spec	results	Sample(n)
1	Demision	Drawing spec	OK	3
2	V.S.W.R	824 ~ 894MHz, less than 2.5	OK	30
3	Visual inspection	visual deterioration shall occur (black spot,alien, gap)	OK	30
4	torque test	3kgf (After the test, no visual deterioration shall occur and the part of the cover and the frame shall remain mechanically bonded)	OK	3
5	traction test	7kgf (After the test, no visual deterioration shall occur) Joint + connector= bonding strength	OK	3
6	Drop test	SET(1200g) 1.5m, 1time After the test, the original shape shall be possible to restore	OK	3
7	Bending test	Bending force: more than 1kgf vibrational rate of BENDING force must have less than 50%.	OK	3
8	Environmental Demands	-Operation Temperature Test -Temperature Change Test -High Humidity Test -thermal shock test -Corrosion test	OK	3

3. Conclusion : GOOD

AQF-80500-03.IR

7.4.1 Reliability test report(2/2)

에이스테크놀로지

Reliability Test Report (2/2)	담 당	검 토	확 인	승 인
	9/97		/	9/9

< other documents 1 > Test DATA

1. . Mechanical Demands

NO.	Test item	#1	#2	#3	Results
1	torque test	OK	OK	OK	GOOD
2	traction test	OK	OK	OK	GOOD
3	Drop test	OK	OK	OK	GOOD

2. BENDING Test (unit : Kgf)

NO	1	2	3	AVE	Results
Before	1.7	1.8	1.5	1.67	GOOD
After	1.2	1.2	1.0	1.13	GOOD
Strain rate	29.4	33.3	33.3	32.3	GOOD

3. V.S.W.R / V.S.W.R(Environmental) : other documents 2
4. Demision check data : other documents 3

7.4.2 DIMENSION CHECK DATA

ACE TECHNOLOGY

LSP-400R Antenna ass'y Dimension check data

DIMENSION												Remark
Unit : mm												
	1	2	3	4	5	6	7	8	9	10	11	
	208.0±2.0	164.0±2.0	61.0±0.3	16.0±0.3	33.6±0.5	Φ14.0±0.3	Φ15.0±0.3	10.7±0.3	Φ13.0±0.3	Φ12.0±0.3	Φ5.0±0.3	
1	206.65	162.63	60.82	15.87	33.40	13.95	14.95	10.75	12.78	11.79	5.02	
2	206.61	162.62	60.90	15.86	33.42	13.96	14.96	10.75	12.77	11.80	5.01	
3	206.60	162.63	60.90	15.88	33.42	13.96	14.95	10.74	12.77	11.81	5.01	

Date:2005.09.09

7.4.3 VSWR CHECK DATA(1/2)

ACE TECHNOLOGY

LSP-400R Antenna ass'y V.S.W.R check data

Date:2005.09.09

	Visual inspection	Electrical (VSWR)		Remark
		0 DEG	90 DEG	
		824~894MHz	824~894MHz	
		LESS THAN 2.5	LESS THAN 2.1	
1	OK	1.74	1.52	
2	OK	1.69	1.49	
3	OK	1.80	1.60	
4	OK	1.82	1.53	
5	OK	1.69	1.55	
6	OK	1.74	1.51	
7	OK	1.77	1.42	
8	OK	1.80	1.60	
9	OK	1.62	1.62	
10	OK	1.65	1.49	
11	OK	1.82	1.51	
12	OK	1.71	1.50	
13	OK	1.70	1.42	
14	OK	1.69	1.49	
15	OK	1.82	1.61	
16	OK	1.80	1.41	
17	OK	1.65	1.48	
18	OK	1.66	1.58	
19	OK	1.69	1.55	
20	OK	1.71	1.60	
21	OK	1.80	1.42	
22	OK	1.74	1.49	
23	OK	1.69	1.58	
24	OK	1.65	1.52	
25	OK	1.74	1.56	
26	OK	1.79	1.51	
27	OK	1.72	1.47	
28	OK	1.63	1.46	
29	OK	1.80	1.61	
30	OK	1.66	1.55	
USL	-	2.5	2.0	
LSL	-			
Xbar	-	1.726	1.522	
Max	-	1.82	1.62	
Min	-	1.62	1.41	
R	-	0.20	0.21	
StDev	-	0.063	0.062	
Cpu	-	4.10	2.58	
Cpk	-	**4.10**	**2.58**	

Quality Assurance Dept.

7.4.3 VSWR CHECK DATA(2/2)(After Environmental test)

ACE TECHNOLOGY

LSP-400R Antenna ass'y V.S.W.R check data (Environmental)

Date:2005.09.09

	Visual inspection	Electrical (VSWR)				TEST ITEM
		Before		After		
		0 DEG	90 DEG	0 DEG	90 DEG	
		824~894MHz	824~894MHz	824~894MHz	824~894MHz	
		LESS THAN 2.5	LESS THAN 2.1	LESS THAN 2.5	LESS THAN 2.1	
1	OK	1.74	1.52	1.70	1.50	High Temperature Test
2	OK	1.69	1.49	1.66	1.51	
3	OK	1.80	1.60	1.72	1.58	
4	OK	1.82	1.53	1.77	1.51	Low Temperature Test
5	OK	1.69	1.55	1.60	1.50	
6	OK	1.74	1.51	1.71	1.46	
7	OK	1.77	1.42	1.70	1.49	High Humidity Test
8	OK	1.80	1.60	1.72	1.51	
9	OK	1.62	1.62	1.69	1.58	
10	OK	1.65	1.49	1.61	1.44	Corrosion Test
11	OK	1.82	1.51	1.80	1.43	
12	OK	1.71	1.50	1.79	1.41	
13	OK	1.70	1.42	1.63	1.49	Operation Temperature Test
14	OK	1.69	1.49	1.60	1.51	
15	OK	1.82	1.61	1.74	1.58	
16	OK	1.80	1.41	1.82	1.46	Thermal Shock Test
17	OK	1.65	1.48	1.62	1.49	
18	OK	1.66	1.58	1.64	1.55	

Quality Assurance Dept.