External Monopole Antenna

APPROVAL SHEET

CUSTOMER : 삼성전자 디지털프린팅사업부

ITEM : External WLAN Antenna

DESCRIPTION : Monopole Ant.

CUSTOMER P/NO :

DATA : 2004 . 12 . 02

CUSTOMER'S APPROVED

A P P R O V E D			
삼성전자 디지털 프린팅 사업부	EN'GR	CHKD	APPD
	Approval Date		
	Approval No.		
	DESC		

REV NO ;

	CUIT.	MECH.	SAFETY	EMI
CHKD				
APPD				

KOSANTenna™ KOSAN I & T Co., Ltd

KOSAN		Subject	External Monopole Antenna Approval Sheet

Document No.	KAT-0404-EX078P	Rev.	IR
Model Name	KWBE-2454TD90	Date	May 6, 2004
Application System	WLAN	Customer	삼성전자 디지털프린팅 사업부
Notice	All the specifications and data in this sheet may vary for each different product board of you.		

KOSAN I & T Co., Ltd.
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		Investigation	Verification	Approval
KOSAN	SEOK KEE SONG			
	Approval No.			
	Approval Date			

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1. Electrical & Mechanical Specifications

Electrical Specifications		
Frequency Range	2400~2483.5 MHz	5150~5875 MHz
V.S.W.R	1.9 : 1 (Max)	1.9 : 1 (Max)
Gain(Max)	4±0.5 dBi	4±0.5 dBi
Nominal Impedance	50 ohm	
Radiation Pattern	Omni - Directional	
Polarization	Linear	
Power Handling	3 watts (max)	

Mechanical Specifications	
Dimensions	128 mm × 11 Ø
Weight	15g
Radiator	Copper
Operating Temp	-20 ~ 90 ℃
Operating Humidity	0 ~ 95 %
Option	N/A

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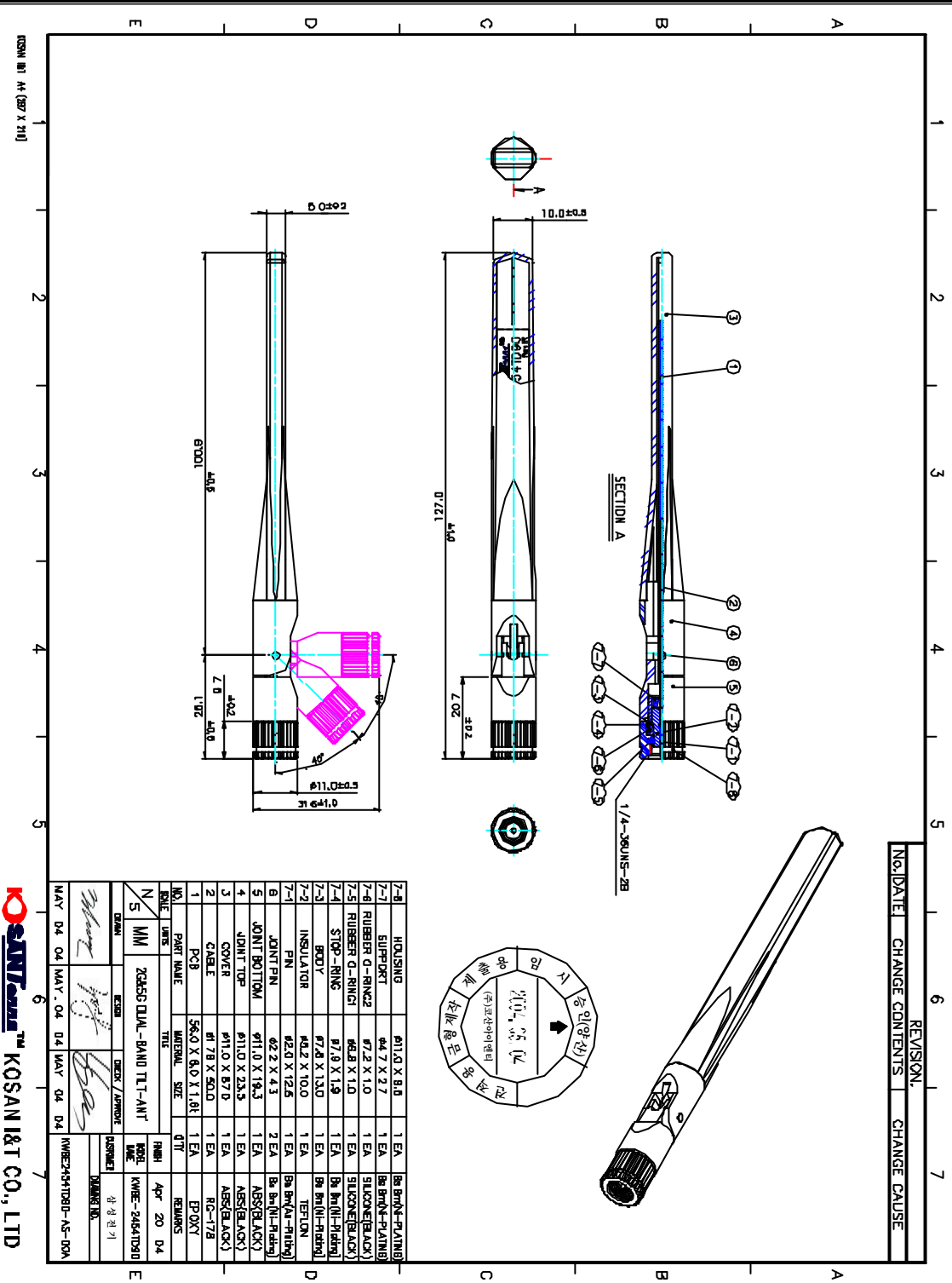
2. Mechanical Drawing



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3. Measurement Setup

3-1. Test Equipments

Network Analyzer	HP8753ES
Calibration Kit	HP85033D
High Resistance Meter	HP4277A
Withstanding Voltage Tester	TOS-8750
Adaptor	SMA Type Female ↔ SMA male
Measurement Cable	8120-4779 (Hewlett Packard)

3-2. Test Equipments Setting

2.1 Display	Dual channel : On
	Split display : On
2.2 Menu	Number of points : 201
	Power : 0 dBm
2.3 Measure	Channel 1 : S11

3-3. Calibration

Calibration-

Cal. Kit : 50 Ω
Calibration menu → Full-2 Port
Reflection
Forward : Open → Short → Load
Reverse : Open → Short → Load
Done
Transmission
Do Both → FWD + REV
Done
Isolation
Omit Isolation
Done

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4. Test Procedures

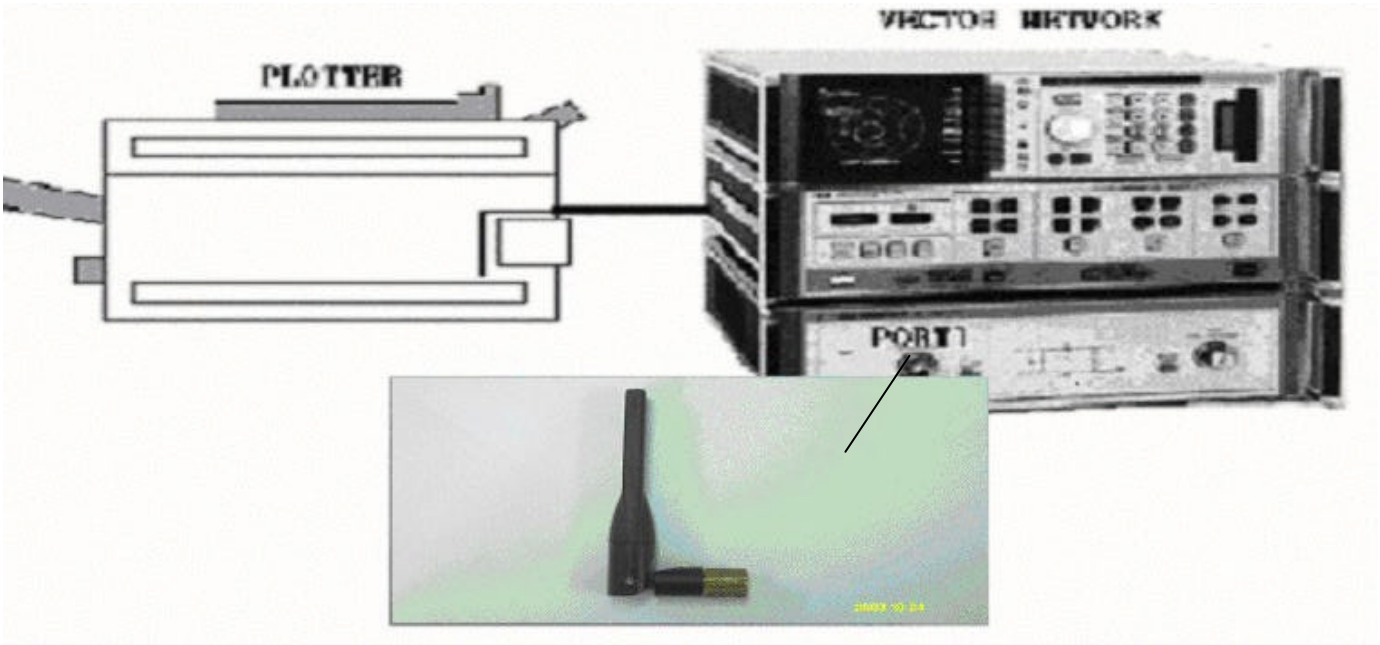
4-1. V.S.W.R.

Step 1. Connect ANT Port With Cable included Adaptor to Port1 of Network Analyzer.

Step 2. Point out Markers on Network Analyzer Display at2400MHz , 2483.5MHz, and 5150MHz, 5475 MHz, 5875MHz

Step 3. Inspect V.S.W.R < 1.9

Step 4. Measurement



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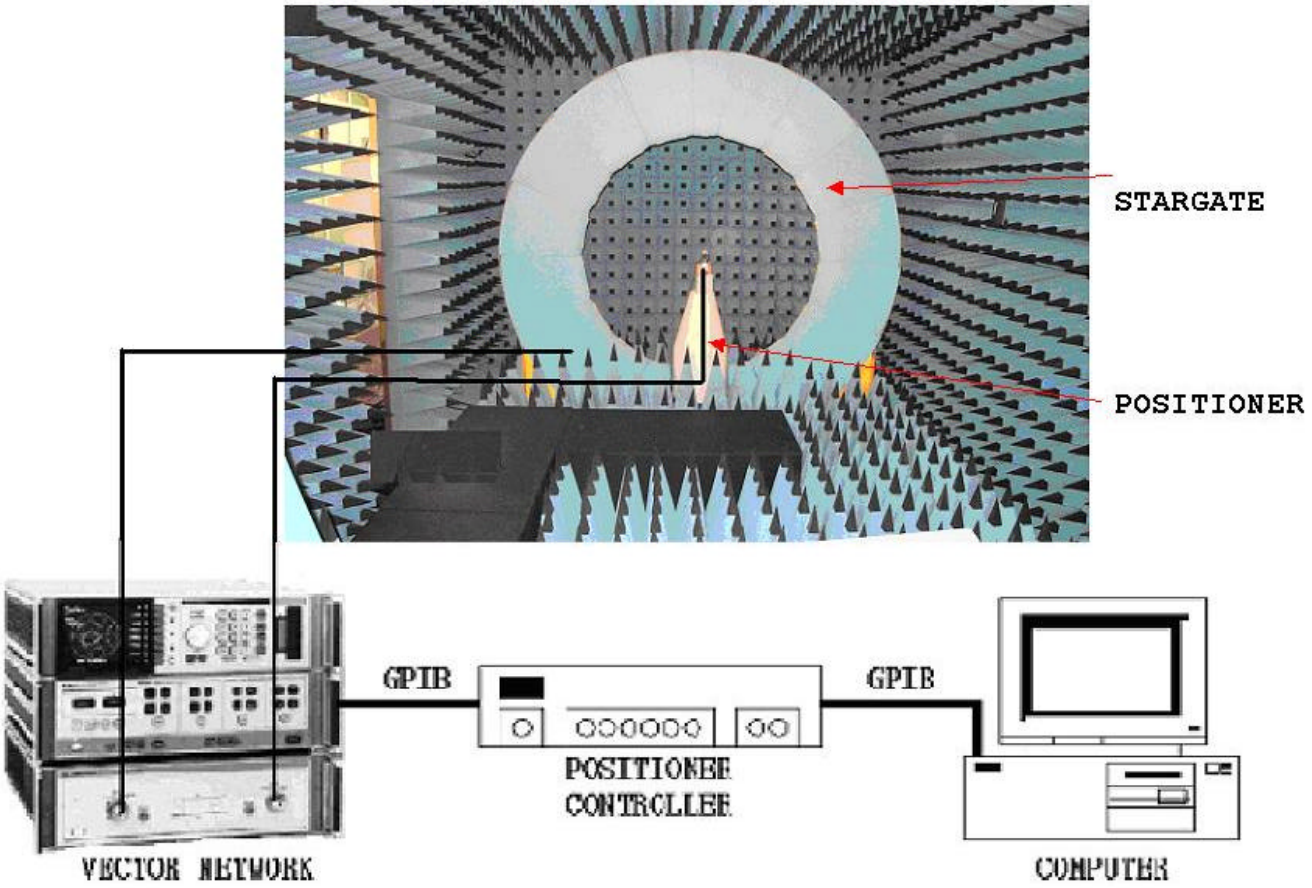
4-2. Gain and Pattern (Near Field Chamber)

Step 1. Calibrate Chamber System for Gain Measurement Using Stargate 32 Sensor. At the Same Time Set Up Software Program for Chamber System Control.

Step 2. Change Over from a Stargate 32 Sensor to Measuring Antenna on Target Positioner.

Step 3. Start a Software Program for Chamber System Control & Measuring

Step 4. Measurement Data



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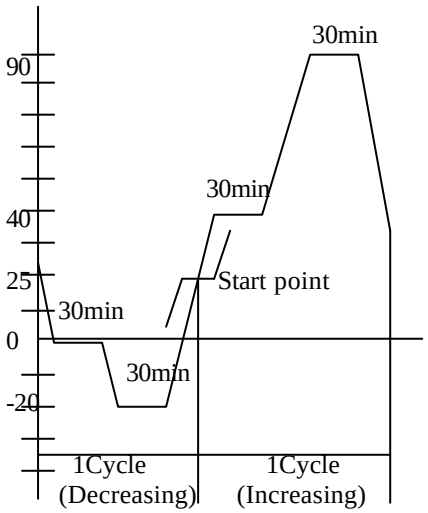
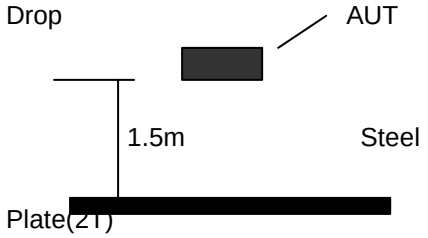
5. Reliability Test

Item	Specification	Conditions
Vibration Resistance	No Momentary Disconnections or Noise for 300s to 600s No Damage, Crack or Parts Looseness	Frequency of 100Hz to 20KHz , Amplitude of 1mm for versus deaction of Antenna , 1 Cycle Time of 60s
Humidity Resistance	Changeable range of RF Impedance in 50Ω±5Ω No Electrical Short	Temperature of 40℃, Humidity of 95% let stand for 96 hours
Temperature Test **Temperature(° C)**  	Changeable range of RF Impedance in 50Ω±5Ω No change of material characteristic No disconnection	Decreasing form +25℃ to -0℃; 5min / Keeping on -0℃ for 30min / Decreasing form -0℃ to -20℃; 5min / Keeping on -20℃ for 30min / Increasing form -20℃ to +25℃; 30min / Cycle time = 5 Increasing form +25℃ to +40℃; 5min / Keeping on +40℃ for 30min / Increasing form +40℃ to +90℃; 5min / Keeping on +90℃ for 30min / Decreasing form +90℃ to +25℃; 60min / Cycle time = 5
Withstand Voltage	No line or insulator breakdown No disconnection No damage	200V AC for 1 min
Drop  	No disconnection No crack or damage	Drop antenna' set at 1.5m height From steel plate(2T) of ground

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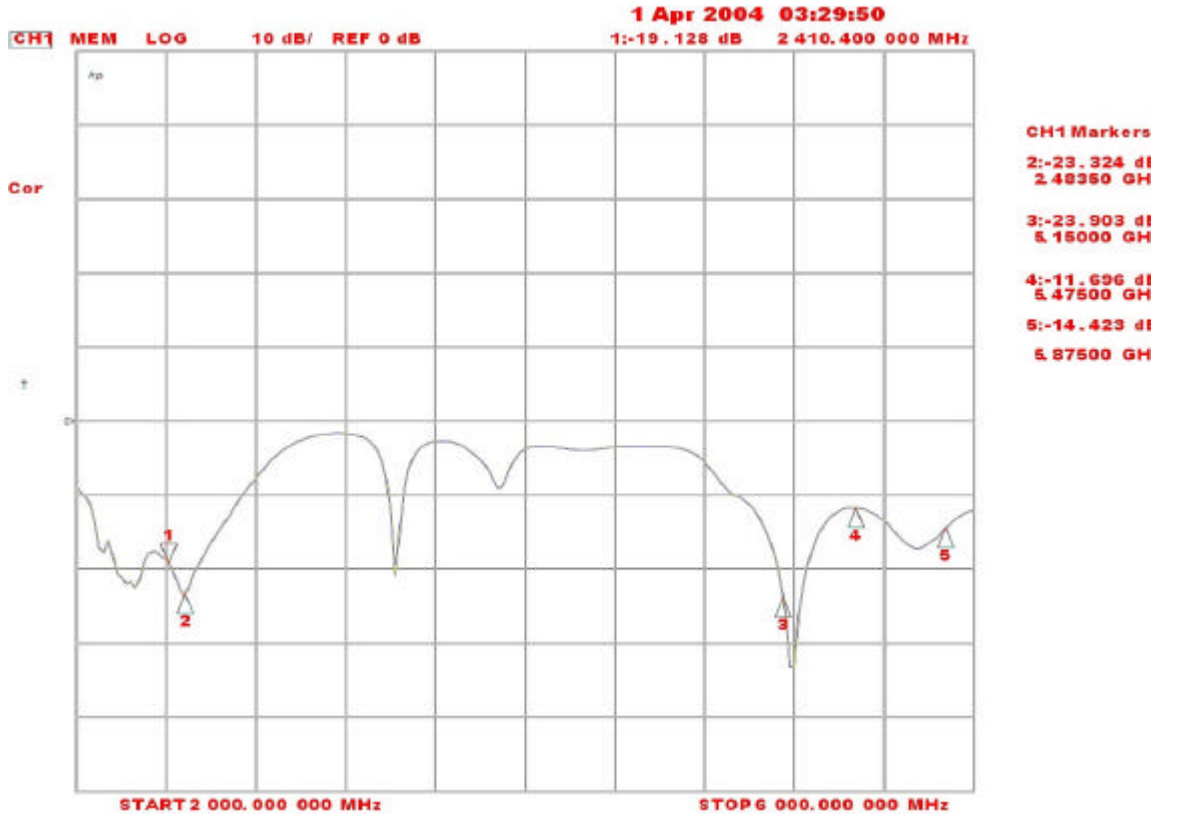
6. Measurement Data

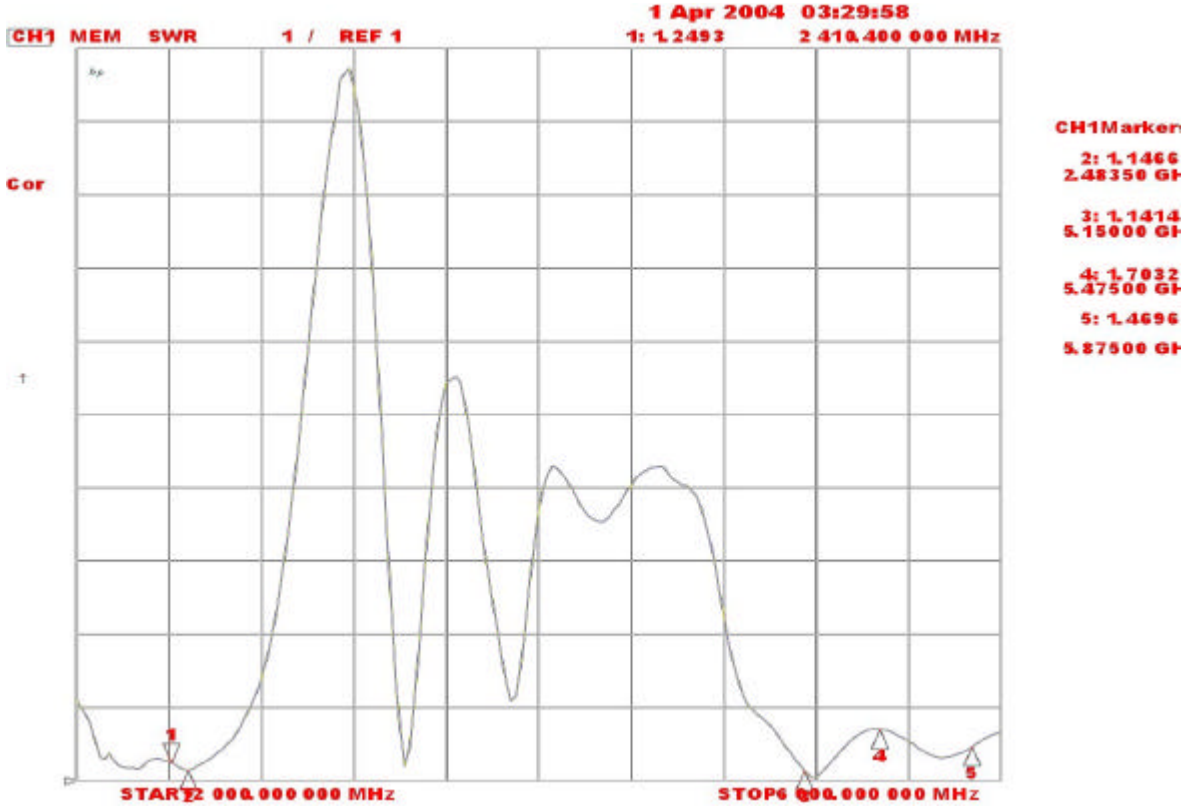
Model Name	**KWBE-2454TD90**		
Written by	**SEOK KEE SONG**	**Authorized by**	**PAN SIK CHOI**
Instrument	**Network Analyzer: 8753ES (HP)**		
Subject	External Monopole Antenna		
Frequency	**2400~2483.5 MHz**	**5150~5875 MHz**	

Items	**Spec.**		**Test Result (#1)**
Frequency	**2400~2483.5 MHz**	**5150~5875 MHz**	**O.K**
V.S.W.R	**< 1.9**	**< 1.9**	**O.K**
Gain	**4 ± 0.5 dBi (Max)**	**4 ± 0.5 dBi (Max)**	**O.K**
Polarization	**Linear**	**Linear**	**Linear**

S_{11}

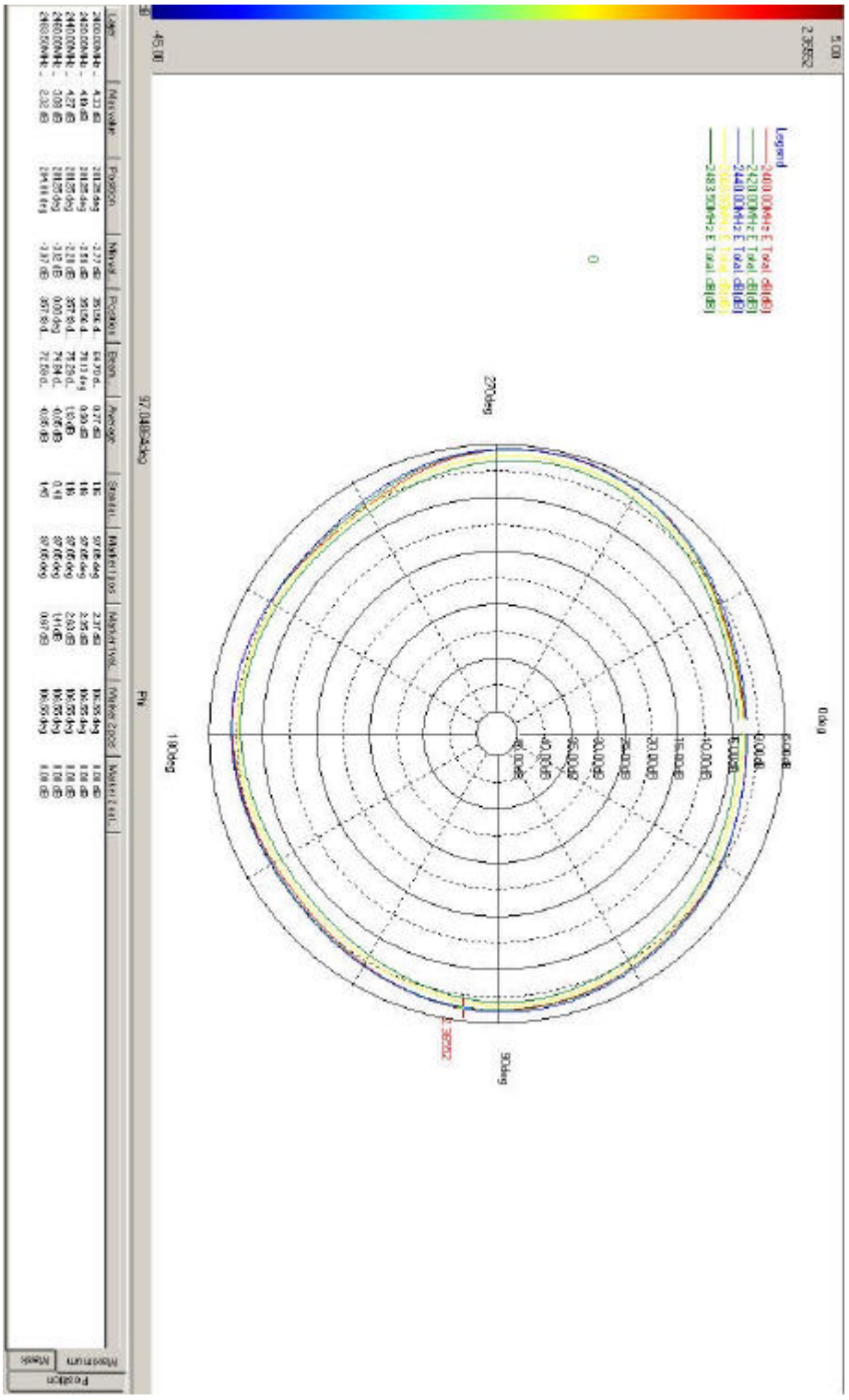

1 Apr 2004 03:29:50
CH1 MEM LOG 10 dB/ REF 0 dB
1:-19.128 dB 2 410.400 000 MHz
Cor
CH1 Markers
2:-23.324 dB
2.48350 GHz
3:-23.903 dB
5.15000 GHz
4:-11.696 dB
5.47500 GHz
5:-14.423 dB
5.87500 GHz
START 2 000.000 000 MHz
STOP 6 000.000 000 MHz

VSWR


1 Apr 2004 03:29:58
CH1 MEM SWR 1 / REF 1
1: 1.2493 2 410.400 000 MHz
Cor
CH1Marker
2: 1.1466
2.48350 GHz
3: 1.1414
5.15000 GHz
4: 1.7032
5.47500 GHz
5: 1.4696
5.87500 GHz
START 2 000.000 000 MHz
STOP 6 000.000 000 MHz

Radiation Pattern(AZIMUTH)

- 2GHz 대역 -



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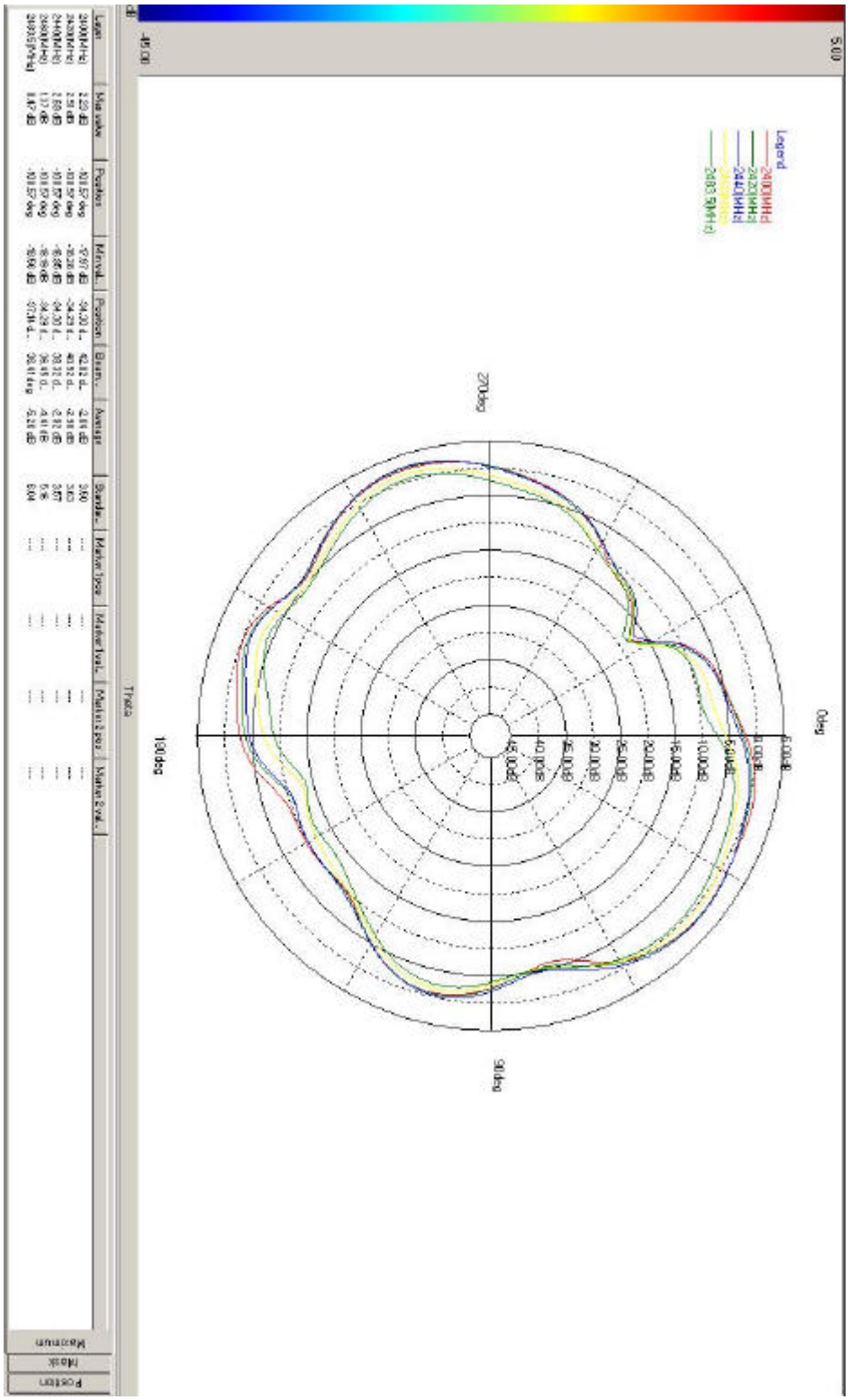
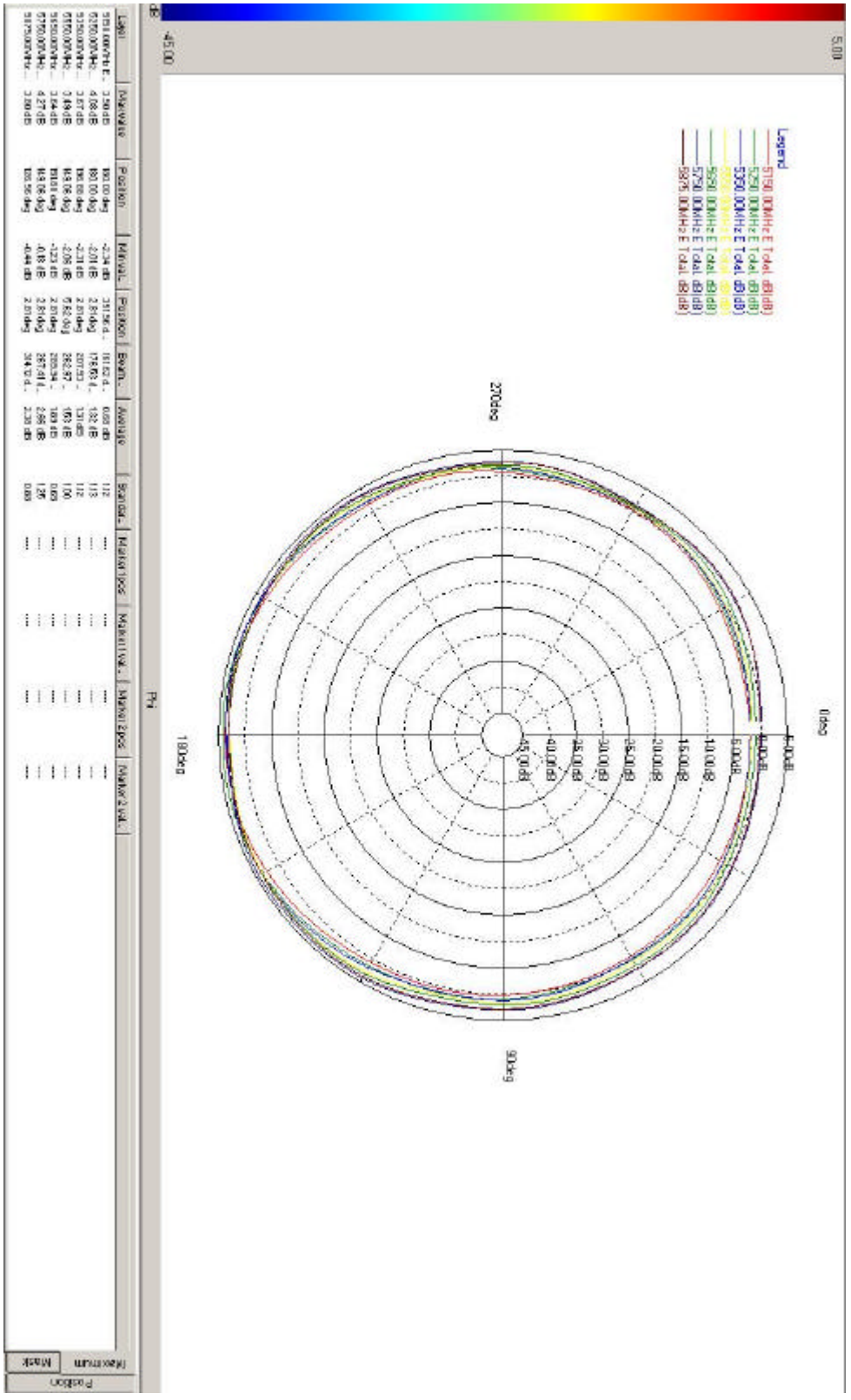
Radiation Pattern(ELEVATION)

- 2GHz대역 -



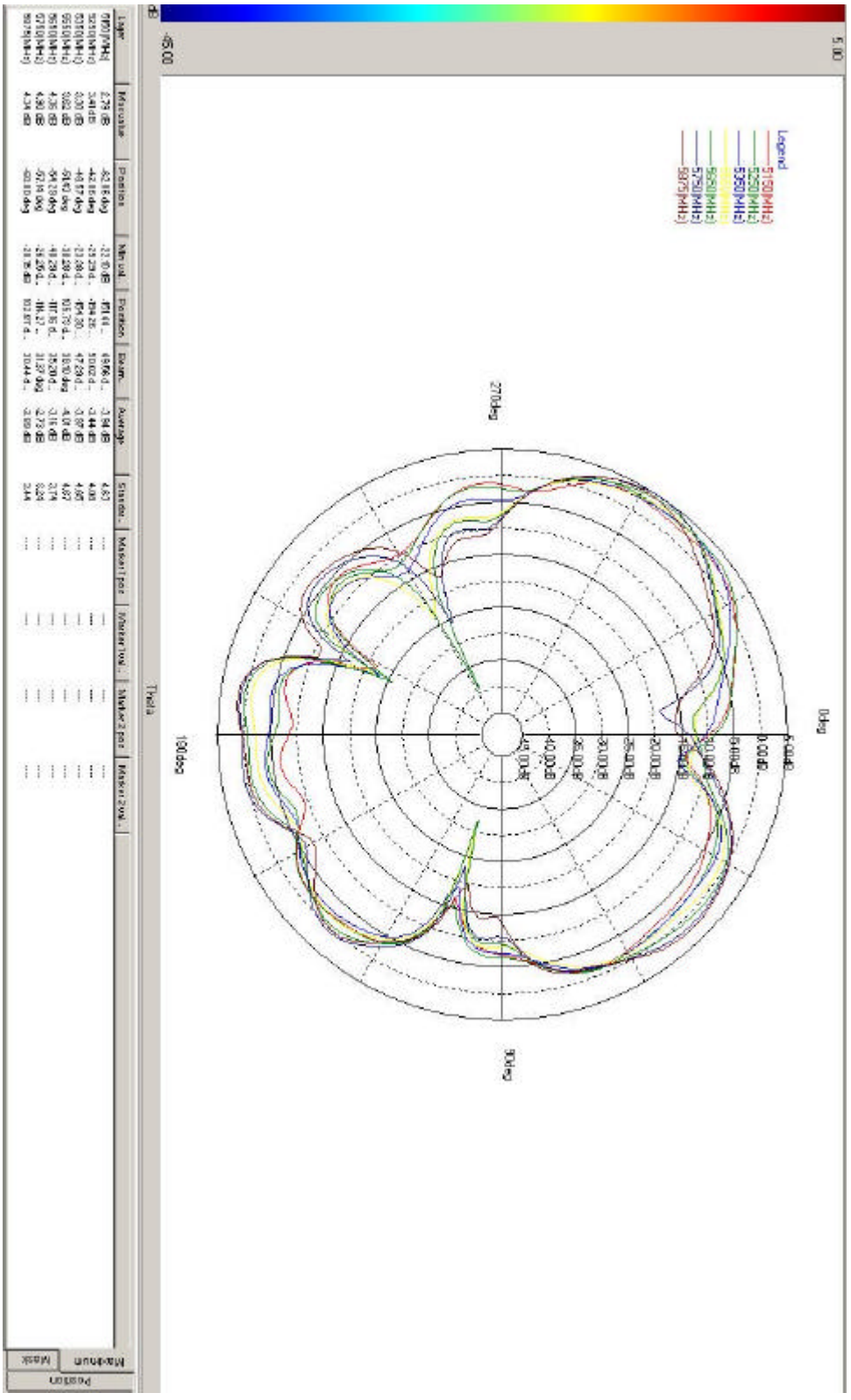
Radiation Pattern(AZIMUTH)

- 5GHz 대역 -



Radiation Pattern(ELEVATION)

- 5GHz대역-



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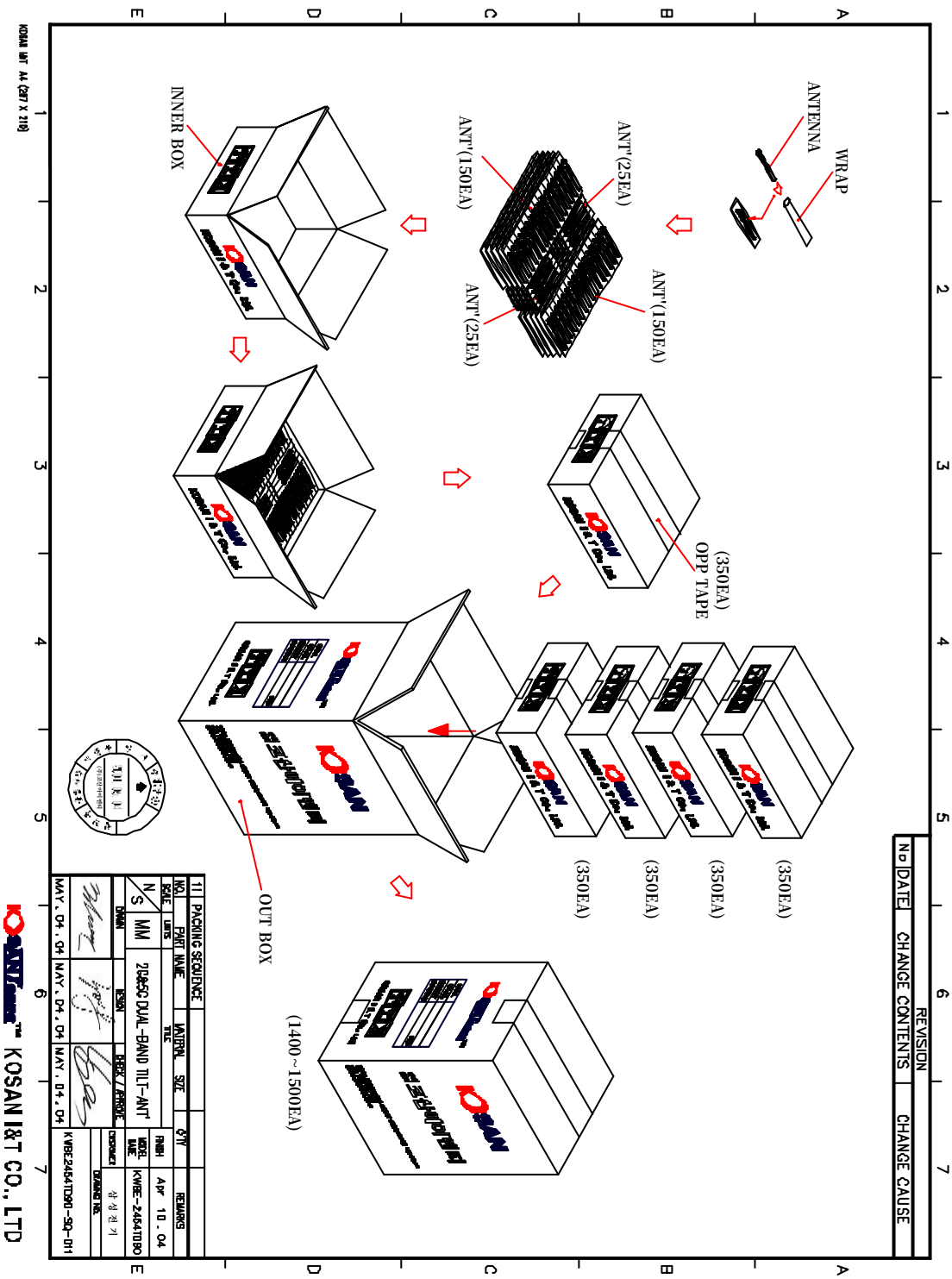
7. Packing



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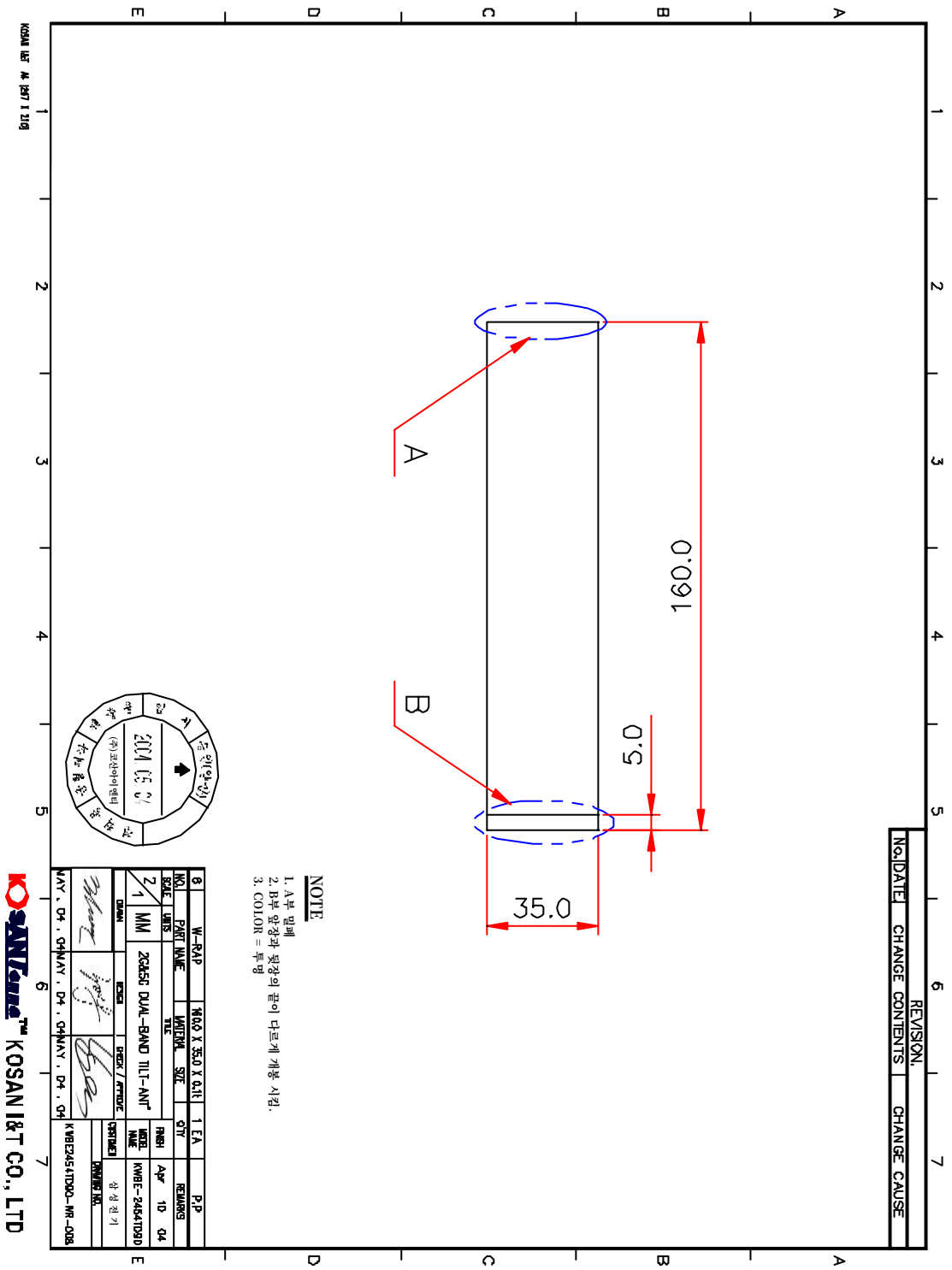
WRAP



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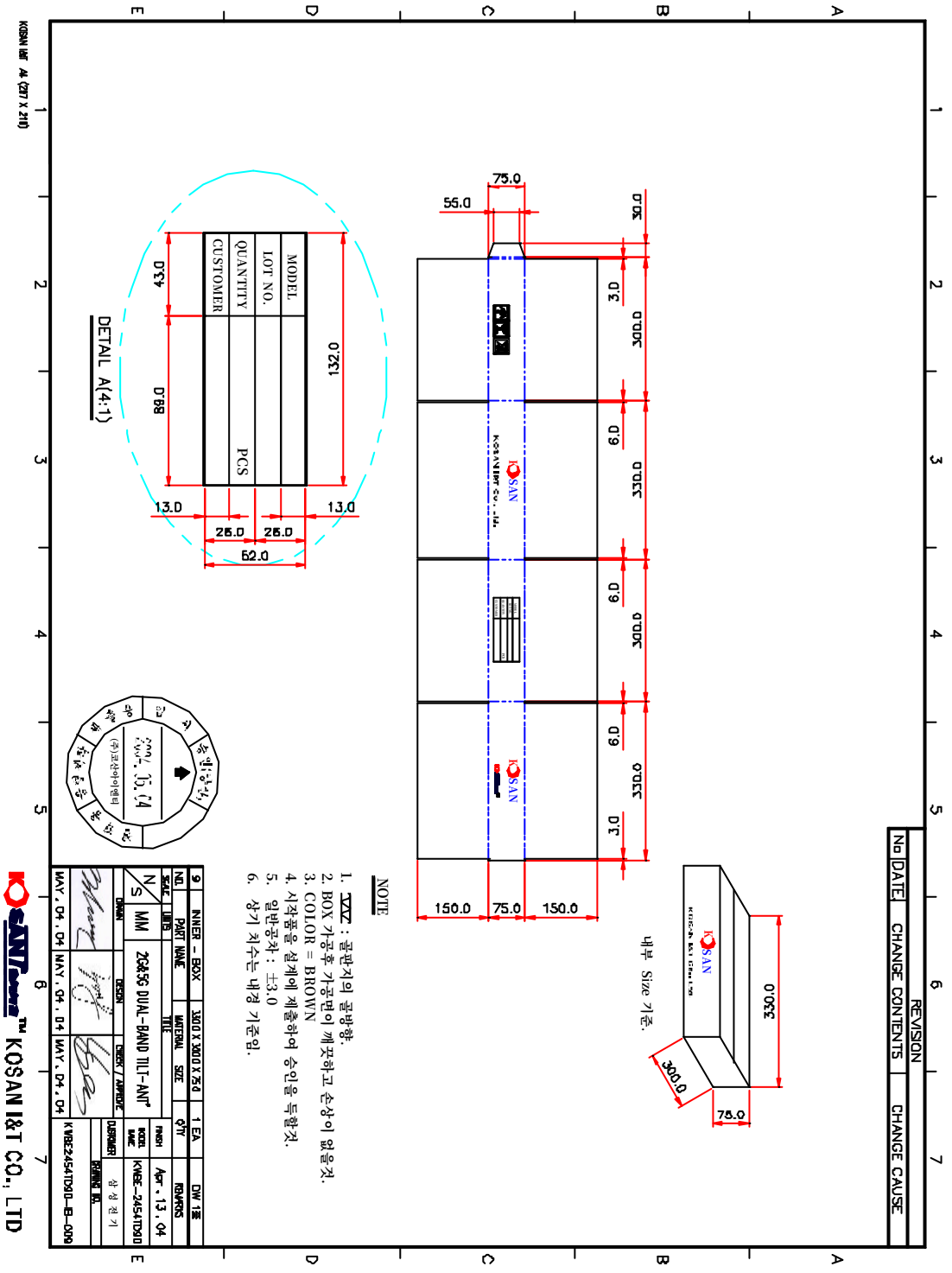
INNER BOX



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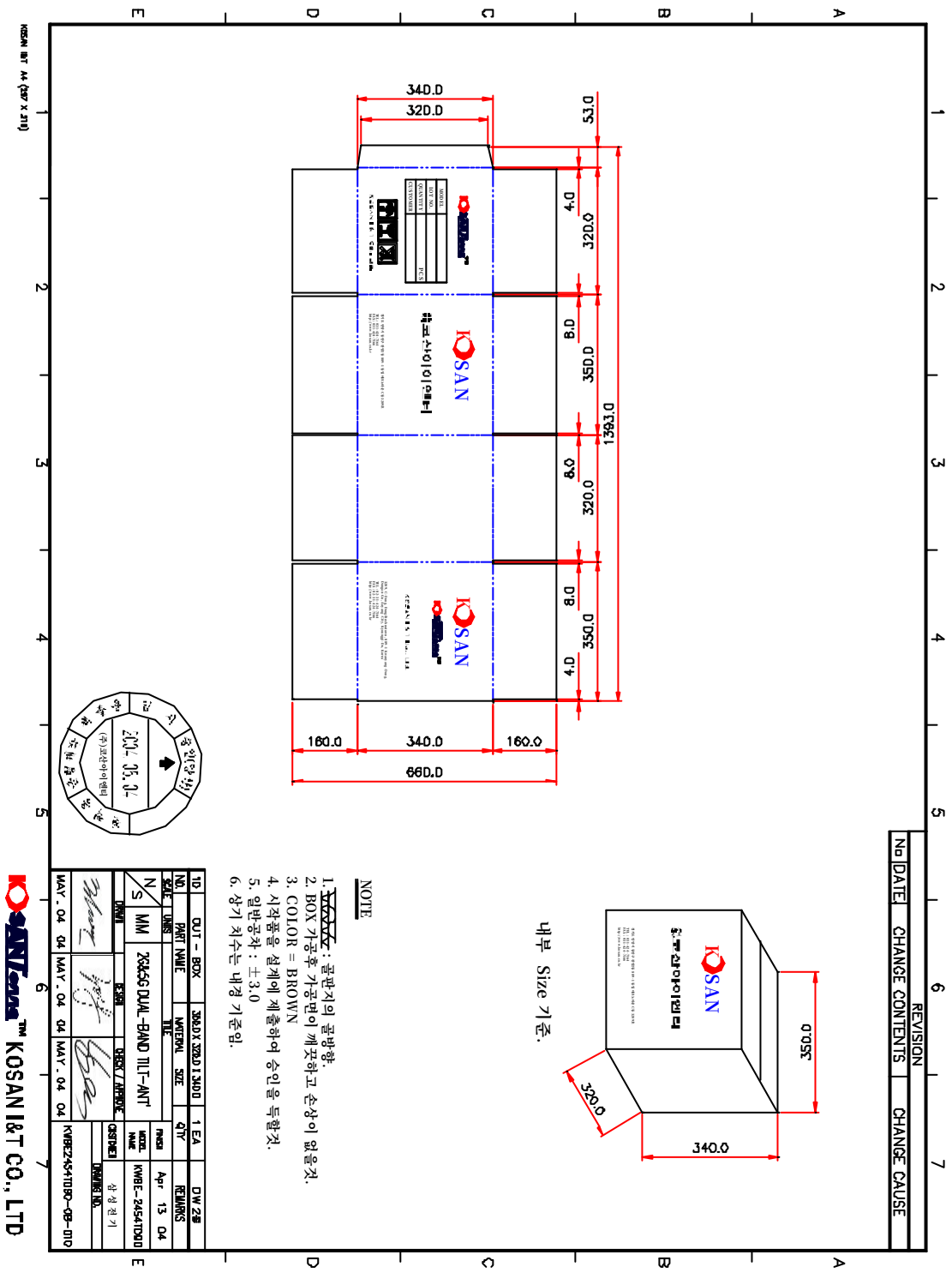
OUT BOX



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8. QC Process Chart

QC Process Chart

작 성	검 토	승 인

제품/모델: Tilt Antenna/KWBE-2454TD90 | 도 번: | 문서번호: | 제 정 일: 2004. 4. 12

번호	공정	공정명	주관부서	작업 내용	사용설비/계측기	관리항목(방법)	품질기준: 검사항목	품질기준: 검사기준	품질기준: 주기	품질기준: 관련표준	비고
1	▽	자 재	자재	· Vendor 확인 · 검사의뢰	· Part List · 도면	· Lot 구분(FIFO)					
2	◇	수입검사	QA	· 부품 외관/특성 검사의뢰	· 계측기 · 육안		· 외관 · 치수/특성 · 신뢰성	· 양호할 것 · Spec.과 일치할 것 · 이상 없을 것	Lot	· 수입검사 기준서	· Data
3	□	자 재	자재	· Item별 불출	· Part List	· Lot 구분(FIFO)				· Part List	
4	○	납 땜	생산	· Cable(탈피면 긴쪽)과 Pin을 연결하여 납땜 - ① (Cable길이 50.0mm)	· 인두기	· 납땜상태	· 냉납 · 미납 · 과납	· 없을 것 · 없을 것 · 없을 것	전수	· 작업 기준서	
5	○	납 땜	생산	· 상기 ①을 Connector에 연결하여 납땜 - ②	· 인두기	· 납땜상태	· 냉납 · 미납 · 과납	· 없을 것 · 없을 것 · 없을 것	전수	· 작업 기준서	
6	○	조 립	생산	· 상기 ②의 Cable을 Joint 하부(사출물)에 넣고 조립 - ③	· Hand Press	· 조립상태			전수	· 작업 기준서	
7	◇	외관검사 (자주검사)	생산	· Ass'y (납땜, 조립)상태를 육안으로 확인		· 납땜상태 · 조립상태			전수		
8	○	납 땜	생산	· 상기 ③의 Cable을 PCB에 연결하여 납땜 - ④	· 인두기	· 납땜상태	· 냉납 · 미납 · 과납	· 없을 것 · 없을 것 · 없을 것	전수	· 작업 기준서	
9	○	조립	생산	· 상기 ④의 Joint 하부(사출물)와 Joint 상부(사출물)를 결합 · 결합후 Pin(2EA) 을 넣고 프레스를 이용하여 체결	· Hand Press	· 조립상태			전수	· 작업 기준서	
10	◇	외관검사 (자주검사)	생산	· Ass'y (납땜포함)상태를 육안으로 확인		· 외관 · 납땜상태	· 이물질	· 없을 것	전수		
11	◇	시험	생산	· 제품의 특성을 시험	· N/A		· 정재파비	· Spec.과 일치할 것	전수	· 작업 기준서	
12	○	조립	생산	· Cover 안쪽 접합부에 Bond를 360° 완전도포하고 Joint 상단 접합부 삽	· Bond				전수	· 작업 기준서	
13	○	포장	생산	· 비닐봉지에 제품을 넣어 밀봉	· 밀봉기	· 포장상태(수량)			전수	· 작업 기준서	
14	◇	출하검사	QA	· 제품 특성 및 외관 상태를 확인	· Network Analyzer	· 외관 검사 · 특성 검사	· 외관 · 특성 · 포장	· 양호할 것 · Spec. 만족할 것 · 양호할 것	Sam.	· 출하검사 기준서	· Data
15	△	출하	자재	· 제품 창고에 입고	· Hand car	· Lot 구분 · 적재상태	· 포장				

번호	개정일	개 정 내 용	개정자	확인	번호	개정일	개 정 내 용	개정자	확인