Product Specification

(TI-WMDH-31 2.4G/5G)

PCB Cable Antenna

.

Company Address

Head office : 1010-ho Shinil IT UTO 13 LS-ro, Gunpo-si, Gyeonggi-do, 15843, Korea
TEL : 82-31-689-4366 FAX : 82-31-689-4368

Antenna Approval sheet

	PCB CABLE Antenna
Product Name	2.4GHz / 5GHz
Part No.	TI-WMDH-31 V1.1 45mm
Customer code	
Customer	F1 media
Provider	TELLESTAR

	Classification	DIRECTOR	EXAMINATION	APPROVAL
TELLESTAR	RF			
APPROVAL	MECHANICAL			
	Classification	DIRECTOR	EXAMINATION	APPROVAL
F1 midia	RF			
APPROVAL	MECHANICAL			

LEAD-FREE

Table of Contents

1 .Approval Sheet Check List 4
2. Revision List 5
3. Specification 6
3-1 General Standard 6
3-2 Electrical Standard 6
3-3 Mechanical Standard 6
4 Test Procedure & Measurement 7
4-1 External Test 7
4-2 Electrical Feature Inspection 7
4-2-1 Materials 7
Inspection 7
4-3 .Radiation Pattern Test 9
4-3-1 Chamber Materials (KTM Korea) 9
4-3-2 Inspection 9
5 .Packing, Shipping, Handling 11
5-1.Exterior Option 11
5-2 .Packing 11
6 Antenna drawing 12
7 Reliability Test 13
8 Electrical data 14
8-1 V.S.W.R 14
8.2 Radiation Pattern 16

1 .Approval Sheet Check List

Change of Record		Date	Item/Contents	Foundation
Approval Issue	Product Issue			
1.1		23.10.14	Approval	

2. Revision List

No	Date	Before change	After change	Reason	Rev
1	23.10.143			DATA	1.1
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

3. Specification

3-1 General Standard

General Specification	
Model name	TI-WMDH-31
Antenna type	PCB CABLE Antenna

3-2 Electrical Standard

Electrical Specification		
Frequency range	2400~2485 MHz	5150~5875 MHz
V.S.W.R (less than)	3.5:1	4.0:1
Gain(dBi) MAX	3.8dBi	3.9dBi
Radiation pattern	Omni-Directional	
Polarization	Vertical	
Max Power(W)	2W Max.	
Impedance	50ohms	

3-3 Mechanical Standard

Mechanical Specification	
Drawing	Drawing reference P12
Material	CU
CONNECTOR	IPEX MHF1 & COPY
Temperature range	-40℃ ~ 80℃
CABLE	1.13mm GRAY 45mm
TAPE	42X7X0.6mm

4 Test Procedure & Measurement

4-1 External Test

To check the unity Antenna's exterior, size, connector and etc. with the exterior indicated

4-2 Electrical Feature Inspection

4-2-1 Materials

Equipment	Model	Quantity	Standard
Network Analyzer	E5071C equipment with the equivalent	1EA	·Freq. Range : 9KHz ~ 8.5GHz · Accuracy : <5ppm ·Dynamic Range : 105dB · Trace at ±200dB · Resolution : 1Hz · Impedance : 50Ω
Adaptor		1EA	· N(F)-SMA(M)
Calibration Kit	HP85033D	1Set	· DC ~ 8.5GHz (SMA-Type)

Inspection

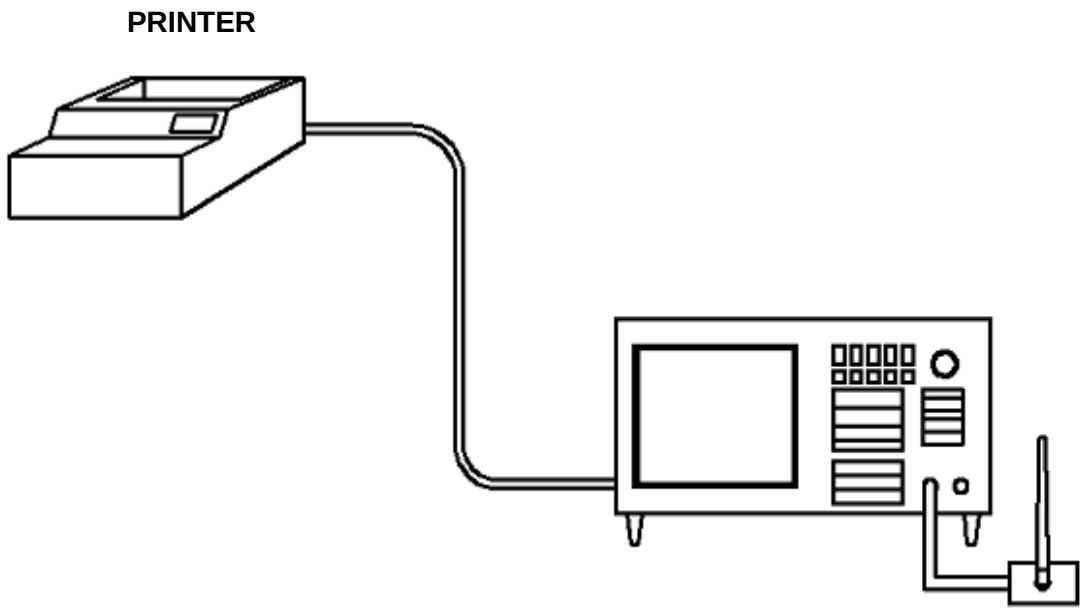


Figure 1. (Network Analyzer)Electrical Characteristic Measurement

4-2-2 Inspection

1. Equipment Setting and Calibration

Equipment Setting

ⓐBandwidth: 2400~2485MHz & 5150~5875MHz

ⓑ Source Power: 0dBm,

Calibration

Using N-Type Cal Kit Applying O.S.L. Method, Calibrate Port number 1.

S_{11}Calibration: Open Port #1, Calibrate after connecting the Load short.

Calibration Check

ⓐConnect Load to Port #1 to check $S_{11's}$ V.S.W.R is less than 1.02:1

ⓑConnect Load to Port #1 to check $S_{21}$is less than -80.0dB.

If not satisfied with the Result, Repeat Procedure Calibration.

2. Inspection Method and Contents

Item	Inspection Method	Standard
V.S.W.R	Connect ANT to the Positioner and Measure the S_{11} within Operating Band, as Shown above on Figure 1.	2.0:1 Max.
Impedance	Connect ANT to the Positioner and Measure the S_{11} VALUE that's on Smith Chart within the Operating Band, as shown above on Figure w.	50Ω

4-3 .Radiation Pattern Test

4-3-1 Chamber Materials (KTM Korea)

Name of the Equipment	Model	Quantity	Standard
Far Field Chamber	KTM	1EA	·Freq. Range: 400MHz~6GHz · Measurement Speed : Radiation Pattern Cuts: Real Time Full sphere far-field : <600 sec · Measurement Accuracy : Dynamic Range: 70 dB Cross-polar isolation < -45 dB · Gain Accuracy : MTG 1 - 6GHz < ±0.75dB
Adaptor		1EA	· SMA(M)-SMA(F)
Computer		1EA	·Data for Measurement

4-3-2 Inspection

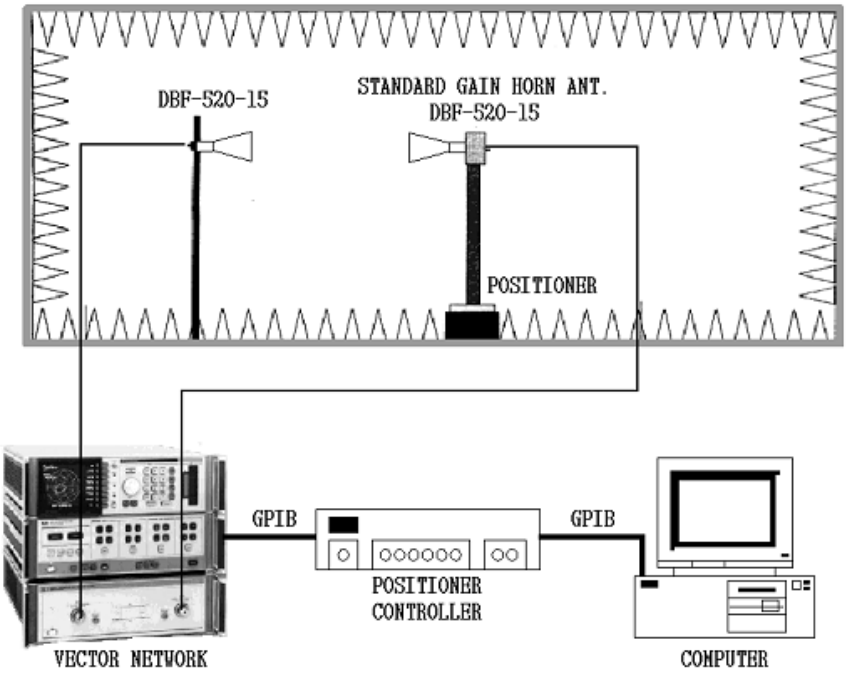
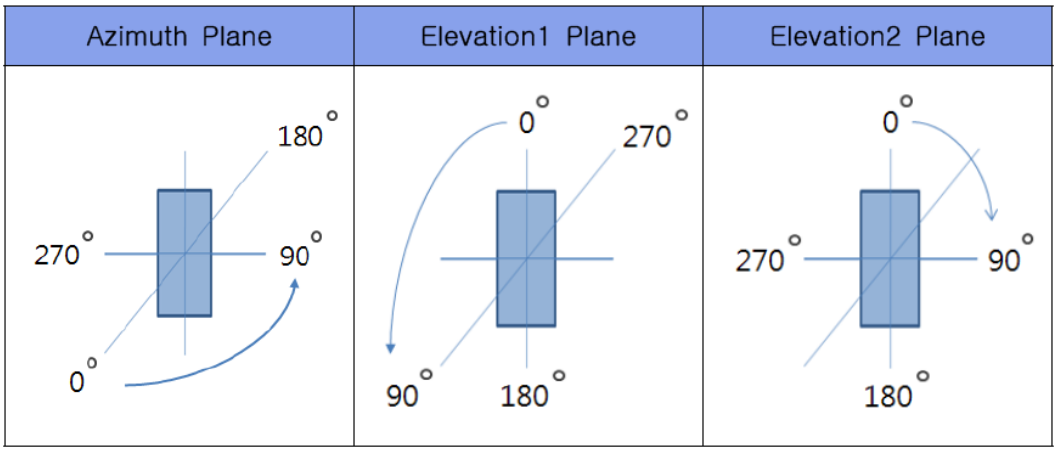


Figure2. Radiation Patten Test Construction



A. Equipment Setting and Measurement

Network Analyzer Setting

ⓐ Calibrate Chamber System for Gain Measurement using KTM. At the Same Time set up Software Program fir Chamber System Control.

- **Test Frequency Setting : 2.4 & 5G Band**

ⓑ Change Over from a TX to the RX on Target Positioner.

ⓒ Start a Software Program for Chamber System Control & Measuring.

ⓓ Measurement Data.

B. Inspection Method and Contents

Item	Inspection Method	Standard
Radiation Pattern	Connect ANT' to the Positioner and measure the Radiation Pattern within the Far Field Chamber, as shown above, on Figure 2.	Normal: dBi

5 .Packing, Shipping, Handling

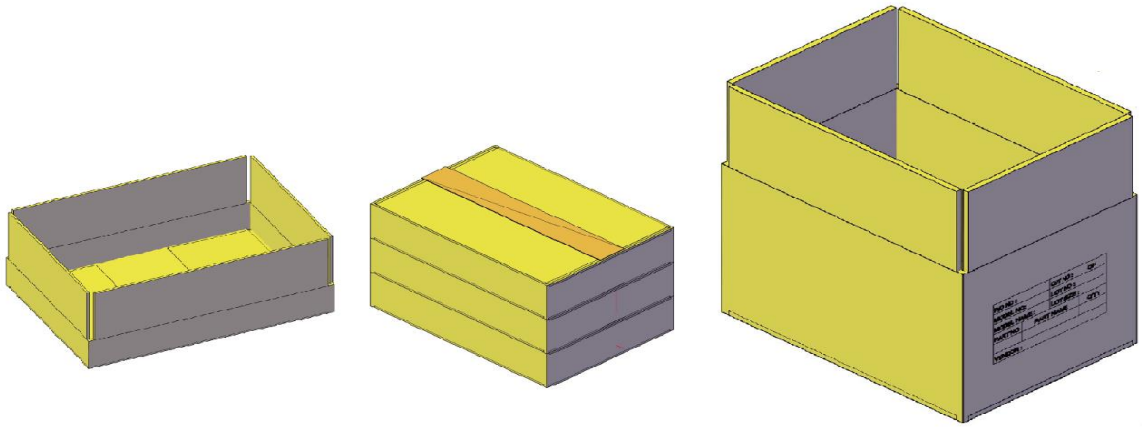
5-1.Exterior Option

1) **Both ordering enterprise and producer's names should be indicated.**

2) **Name, Serial number and quantity of the Model should be indicated.**

5-2 .Packing

manufacturer

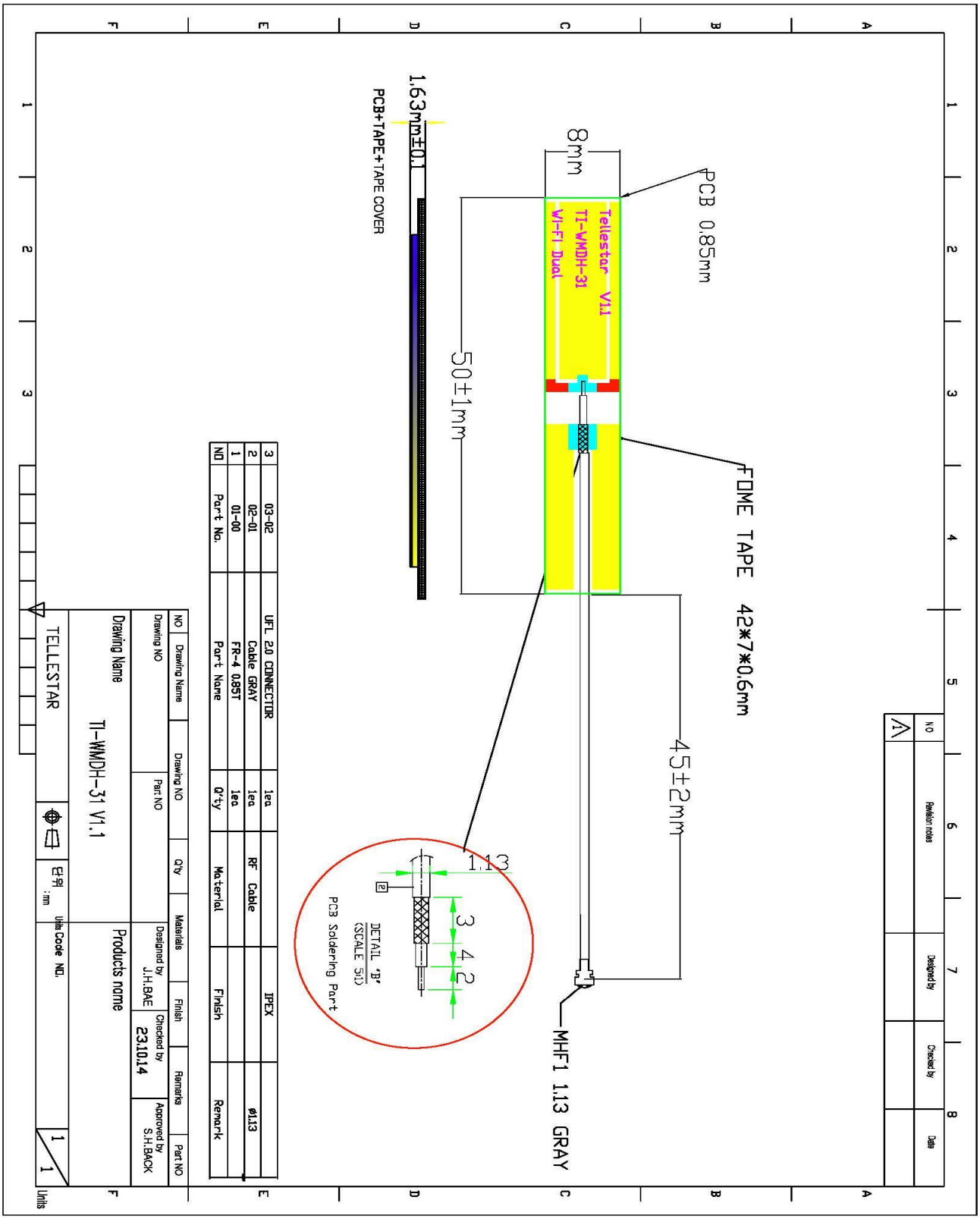


C-corrugated BC- corrugated

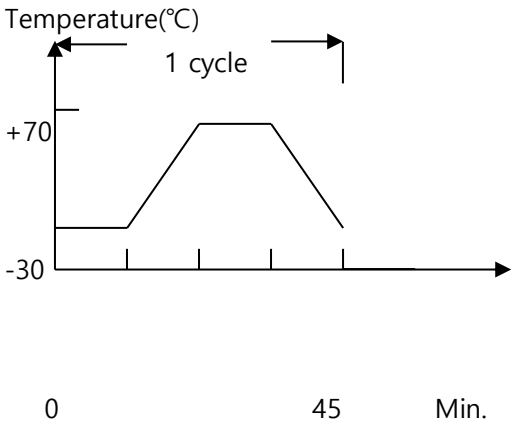
	PART NAME	Q.TY
1	VINYL	100EA
2	INNER BOX 330*250*80mm	2000EA
3	OUTBOX 365*260*250mm	6000EA

AS: defective products 1:1 exchange

6 Antenna drawing

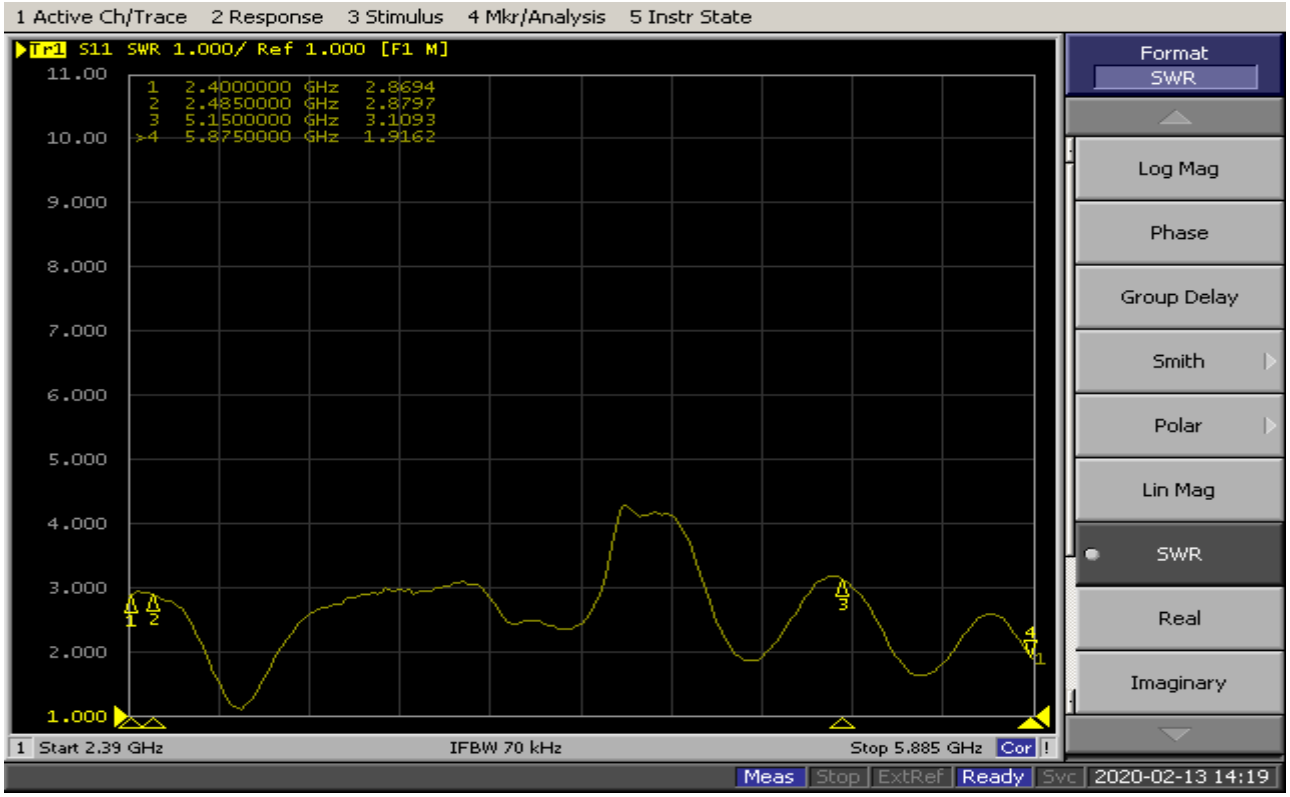


7 Reliability Test

NO	Items	Specifications	
7-1	LOW TEMP EXPOSURE TEST	TEMPERATURE : -40℃ TIME : 48 HOURS	AFTER 2HOURS EXPOSURE IN ORDINARY FROM TEST , ANTENNAS SHALL BE APPROVED AS SPECIFIED IN ITEM 5 AND 6
7-2	HIGHTEMP EXPOSURE TEST	TEMPERATURE : 80℃ TIME : 48 HOURS	
7-3	HUMIDITY EXPOSURE TEST	TEMPERATURE : 60℃±2℃ HUMIDITY : 85%RH TIME : 48 HOURS	
7-4	THERMAL SHOCK	 Test cycle : 5cycles	
7-5	DROP TEST	SET THE MOTOR ON THE HEAVY BLOCK ABOUT 100g WEIGHT (INCLUDE THE NOTOR) AND DROP THE MOTOR ON THE CONCRETE FLOOR. HEIGHT : 1.5m DIRCCTION : ±X , ±Y , ±Z TIMES : THREE DROPS PER PLANE FOR A TOTAL OF 10 DROPS.	

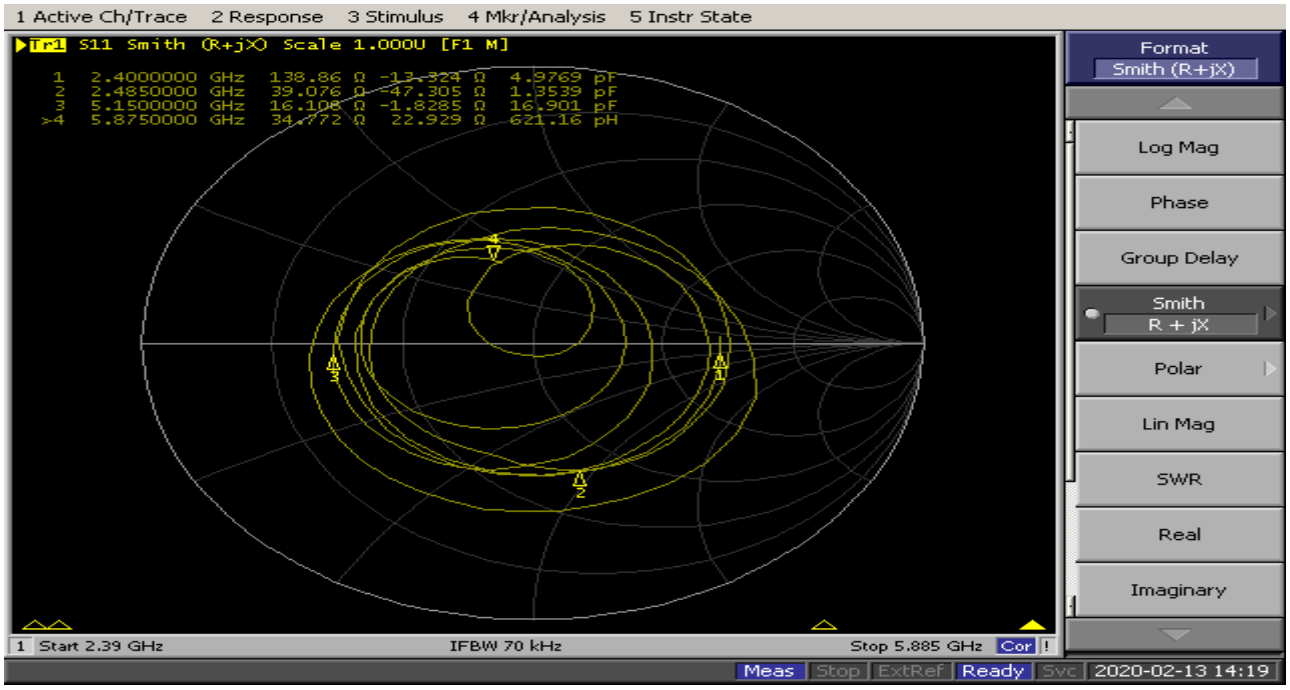
8 Electrical data

8-1 V.S.W.R



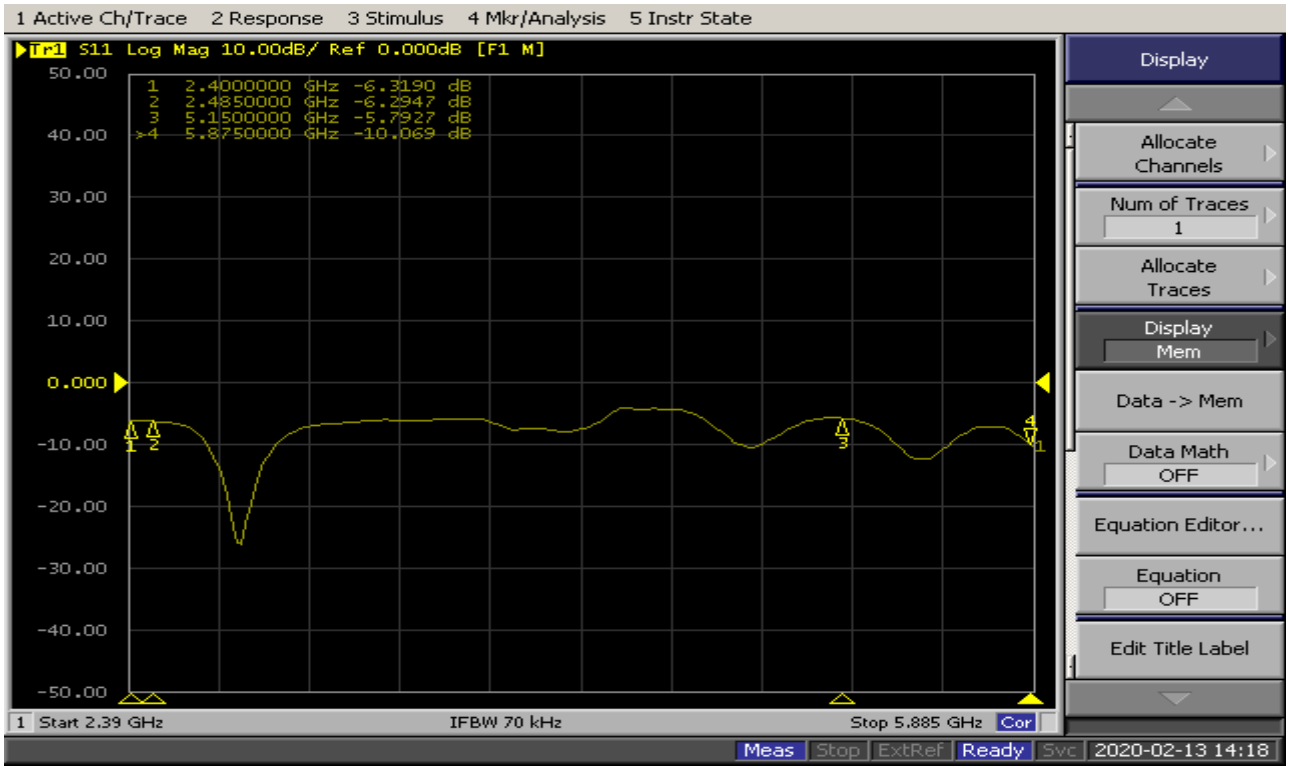
V.S.W.R

8.1.2 Smith Chart



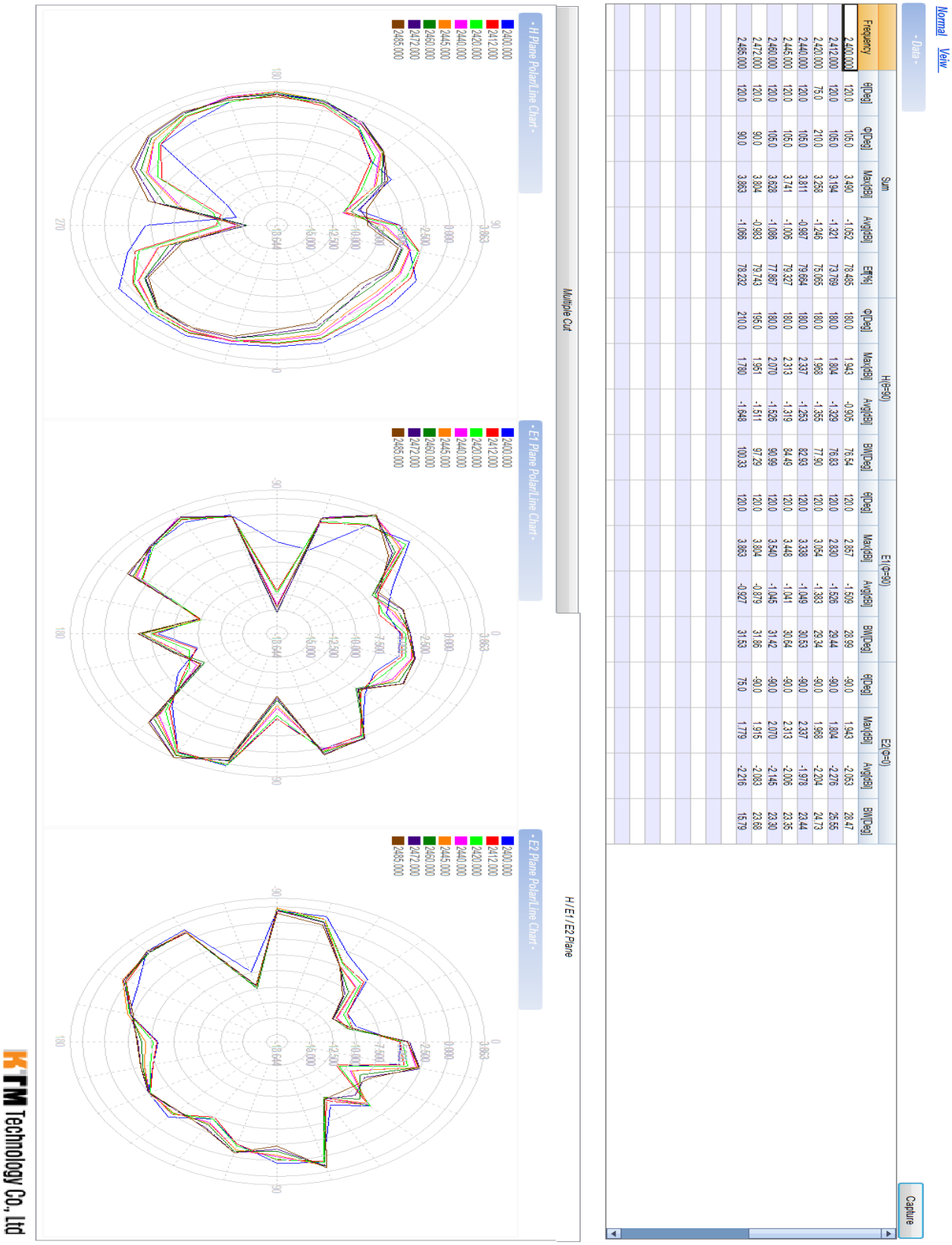
Smith Chart

8.1.3 RETRUN LOSS

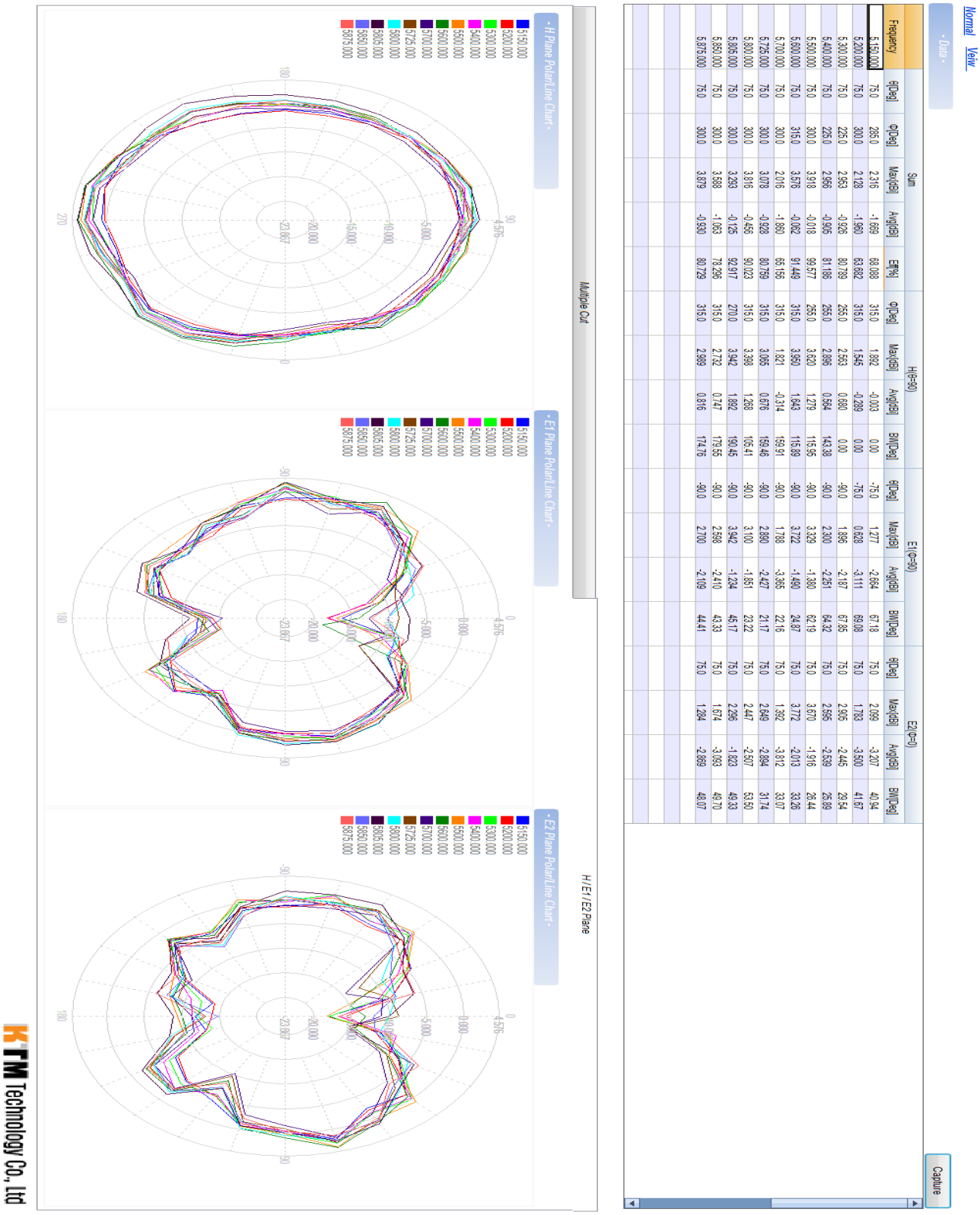


Return Loss

8.2 Radiation Pattern 2.4G



Radiation Pattern 5G



KTM Technology Co., Ltd

<3D Multiple Frequency Data >