

PRODUCT SPECIFICATION

Product Name	INTERNAL ANTENNA [2Shot Molding Antenna]		
MFG. Location	China		
Model	Samsung SM-G130HN Main Antenna		
Tool	MP Tool Core material : STAVAX		
SEC Code			
Provider	Tyco Electronics Corporation		
Weight Data	1.25g		
Part Number	2108825-1		
Samsung Electronics	Originated	Confirmed	Approved
Tyco Electronics	Originated	Confirmed	Approved
			
	Engineering	Engineering	Project Manager
	J.G.Park	D.Y.Kim	S.C. Lee
	APR 25th, 2014	APR 25th, 2014	APR 25th, 2014

Tyco Electronics Corporation

4th Fl., Seocho Bldg., 1365-10, Seocho-Dong, Seocho-Ku, Seoul, Korea

Ph: +82-2-3415-4547

Fax: +82-2-3486-3808



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1. CTQ Items (CTF: Critical to Factor/Function)

1.1 Electrical characteristics (VSWR) (Cpk value > 1.33)

Main antenna

CTF Item	Spec.(VSWR)	Sample q'ty	Cpk	Remark
596 MHz	2.5 < VSWR < 3.5	50pcs	1.96	Refer to page 21~28
872 MHz	2.6 < VSWR < 3.6	50pcs	2.02	Refer to page 21~28
1259 MHz	1.6 < VSWR < 2.6	50pcs	2.06	Refer to page 21~28
1458 MHz	1.5 < VSWR < 2.5	50pcs	1.59	Refer to page 21~28

REAR+Main antenna

CTF Item	Spec.(VSWR)	Sample q'ty	Cpk	Remark
628 MHz	3.5 < VSWR < 4.5	40pcs	1.40	Refer to page 29~36
946 MHz	3.5 < VSWR < 4.5	40pcs	1.44	Refer to page 29~36
1345 MHz	3.7 < VSWR < 4.7	40pcs	1.33	Refer to page 29~36
1779 MHz	3.5 < VSWR < 4.5	40pcs	1.80	Refer to page 29~36

1.2 Mechanical characteristics (Cpk value > 1.0)

Main antenna

CTF Item	Spec.	Sample q'ty	Cpk	Remark
Size				
Pattern				

2. Critical issues during development stage

No need

3. Sample manufacturing data and yield data

Molding condition(Supplier : Mobitec)		Plating(Supplier : TE Qingdao)	
PC molding temperature	245℃	Chemical supplier	TE's designated one
Actual measured mold Temperature (Upper / Lower mold)	Upper : 70~80℃ Lower : Normal cooling	Etching (Dilution/Temperature/ Time)	75℃/30min
Resin drying (Temperatuer/time)	95~105℃/6hr	Cu plating (Dilution/Temperature/ Time)	58℃/160min

◆ Sample making yield data(수율데이터)

#1 차 금형

	Molding	Plating	Painting	Assembly/ RF inspection	RTY
NG Q'ty / Input Q'ty (pcs)	971 / 1000	953 / 971	931 / 953	931 / 931	1000
Yield(%)	96.6	98.2	98.0	100.0	93.1
Worst3 NG (NG mode, NG Q'ty)	1. Short shot (29pcs)	1. void plating (18pcs)	1. Bubble (22pcs)		Result : OK

4. Revision Sheet				
No.	Date	Rev	Description of Changes	Remarks

5. Part Number List

No.	PART No.	Description	Remarks
1	2108825-1	Internal Antenna – SM-G130H Main	

- Part list

Part Name	Material & Spec	Material supplier	Color	Manufacturing site	Manufacturing method	Remark
Carrier	1st shot : PC (EH-1051)	Cheil	White	MBT, Korea	Injection	
	2nd shot : ABS (AX06437)	Sabic	Gray			
Plating	Electroless plating 1) Cu : 10~14 μ m 2) Ni : 3~5 μ m		Gray	TE Qingdao, china	Plating	

6. Product Description

Description

This specification covers the requirements for product performance, test methods and quality assurance provisions of the INTERNAL ANTENNA for the Samsung **SM-G130H** mobile phone hand set. Currently, the product is manufactured using 1-shot molding in conjunction with laser activation of the antenna surface and selective plating techniques. The 2-Shot MID technology will be used to manufacture this part in mass production.

Part Number

Tyco Electronics Part Number : **2108825-1**

Materials

A. Crystalline Polymer

1st shot: Cheil EH-1051

2nd shot: Sabic AX06437

B. Plating: 10.0-14.0µm of Electroless Copper over plated with 3.0-5.0µm of Low Temperature Nickel.

Applicable Documents

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

A. AMP Specification 109-5000 - Test Specification, General Requirements for Test Methods

B. Product Drawing number C- **2108825**

7. Electrical Properties

7.1 Frequency Band

Service/ Frequency	GSM850	EGSM	DCS	PCS	WCDMA1
Tx (MHz)	824 – 849	880 – 915	1710 – 1785	1850 - 1915	1920 - 1980
Rx (MHz)	869 - 894	925 - 960	1805 - 1880	1925 - 1990	2110 - 2170

7.2 Impedance

7.2.1 Nominal Impedance

R_x = 50 Ohm

7.2.2 Measuring Method

Using a Network Analyzer, connect the antenna to the reflection point of the analyzer and measure the impedance within the designated frequency band.

7.3 Matching Circuit

Main antenna : Antenna / Shunt : N.C / Series 100pF / Shunt NC /
Series 100pF / RF switch

7.4 V.S.W.R

7.4.1 Free Space Environment

Service/ Mode	GSM850		EGSM		DCS		PCS		WCDMA1	
	Tx	Rx	Tx	Tx	Rx	Rx	Tx	Rx	Tx	Rx
V.S.W.R	7	4	4	3	3	3	3	3	3	3

7.4.2 Main Antenna Test Jig



Service/ Frequency	596 MHz	872 MHz	1259 MHz	1458 MHz
V.S.W.R [MAX]	3.5	3.6	2.6	2.5
Average	3.04	3.14	2.10	2.00
V.S.W.R [MIN]	2.5	2.6	1.6	1.5

7.4.2 REAR + Main Antenna Test Jig

Service/ Frequency	628MHz	946 MHz	1345 MHz	1779 MHz
V.S.W.R [MAX]	4.5	4.5	4.7	4.5
Average	4.00	4.00	4.19	4.01
V.S.W.R [MIN]	3.5	3.5	3.7	3.5

7.5 Directivity

Omni-directional (Horizontal)

7.6 Gain

7.6.1 Maximum Gain

Service/ Mode	GSM 850	EGSM	DCS1800	PCS	WCDMA1
Gain (dBi)	-2.4	-1.18	+0.61	+1.90	+1.23

7.6.2 Average Gain

Service/ Mode	GSM 850	EGSM	DCS1800	PCS	WCDMA1
Gain (dBi)	-6.11	-4.54	-2.94	-2.51	-3.72

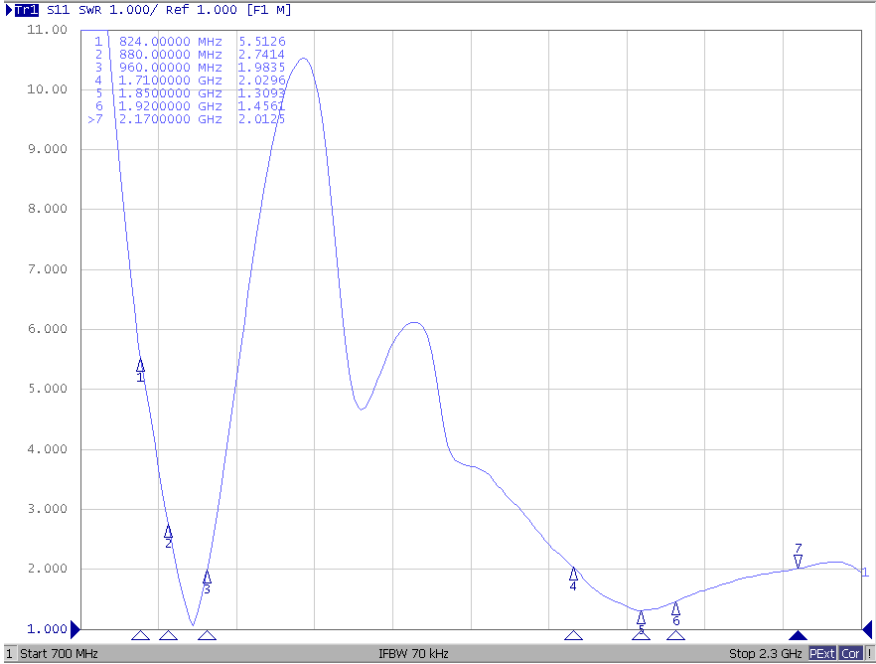
7.7 Maximum Power

P = 5W under

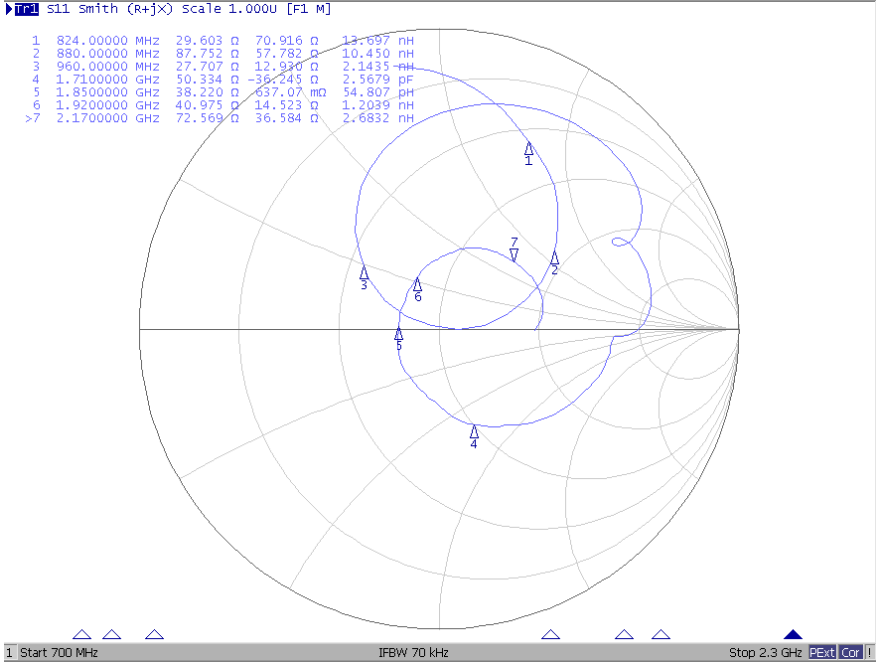
7.8Electrical Performance

7.8.1 Main antenna

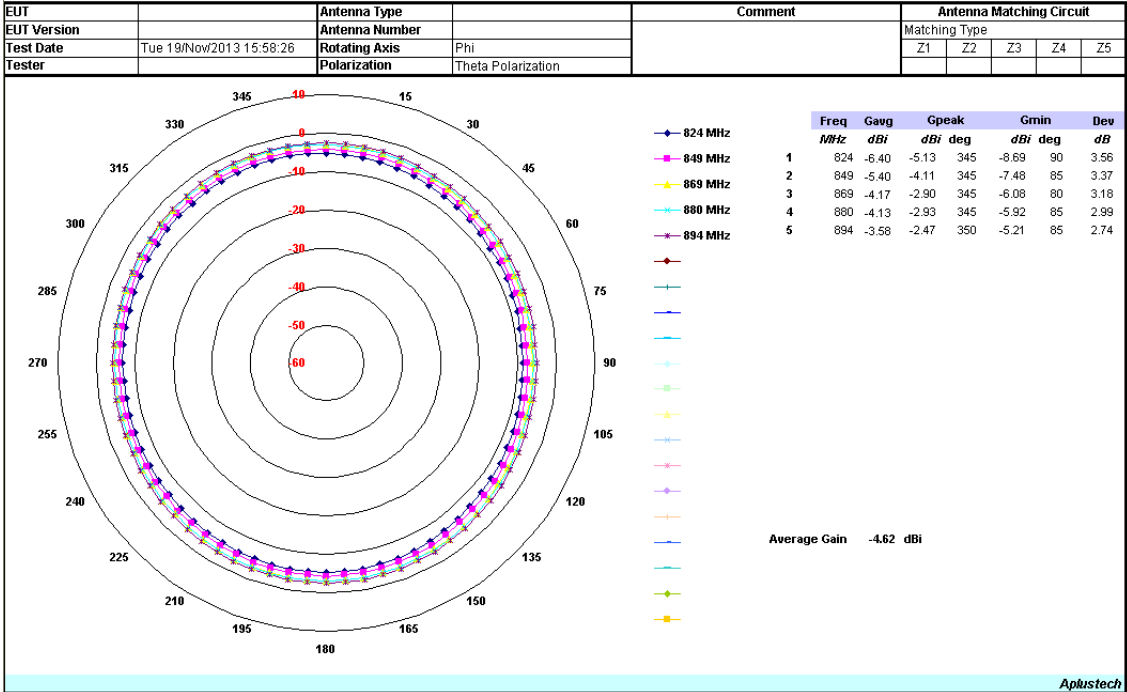
7.8.1.1 VSWR



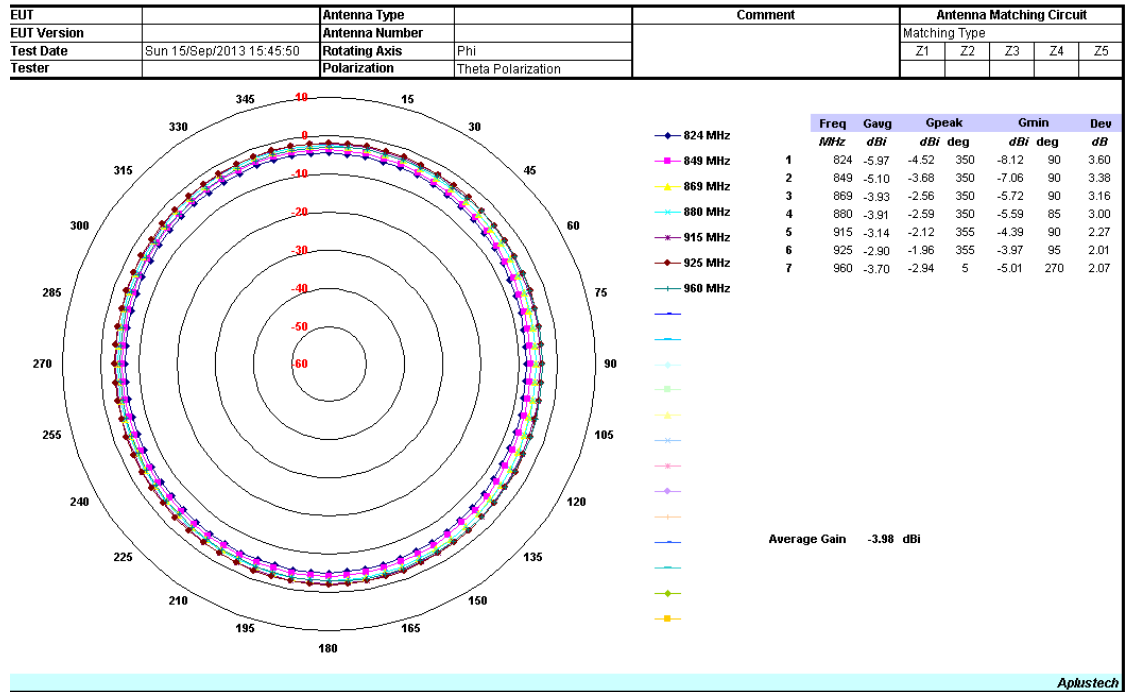
7.8.1.2 SMITH CHART



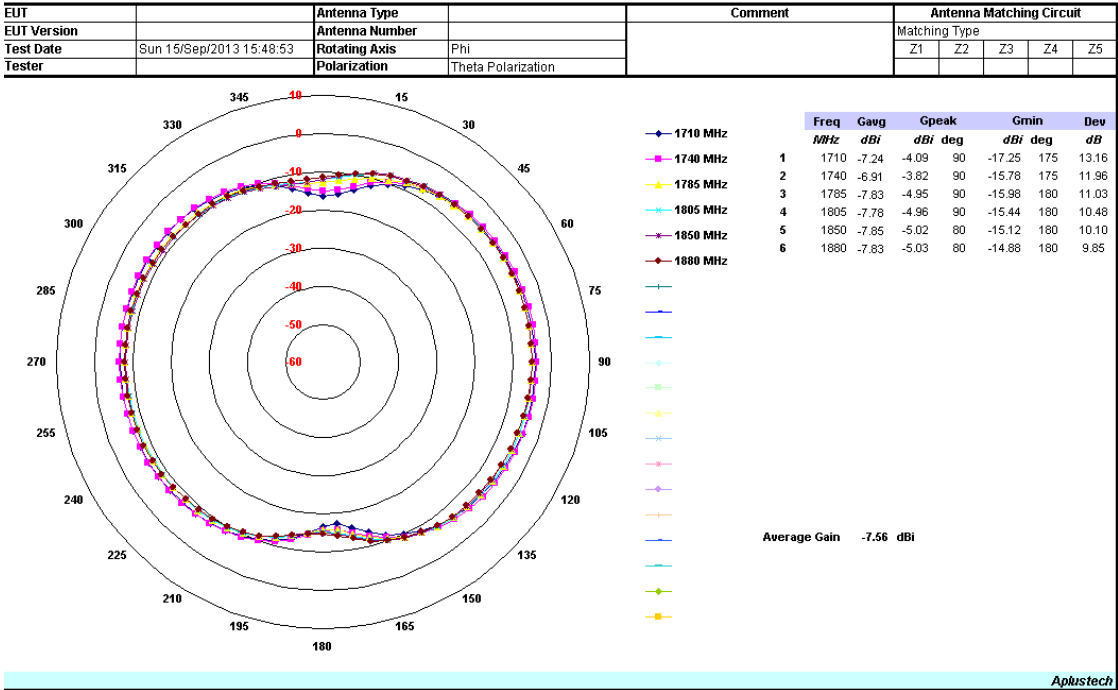
7.8.1.3 GSM 850 Band Radiation Pattern-H plane



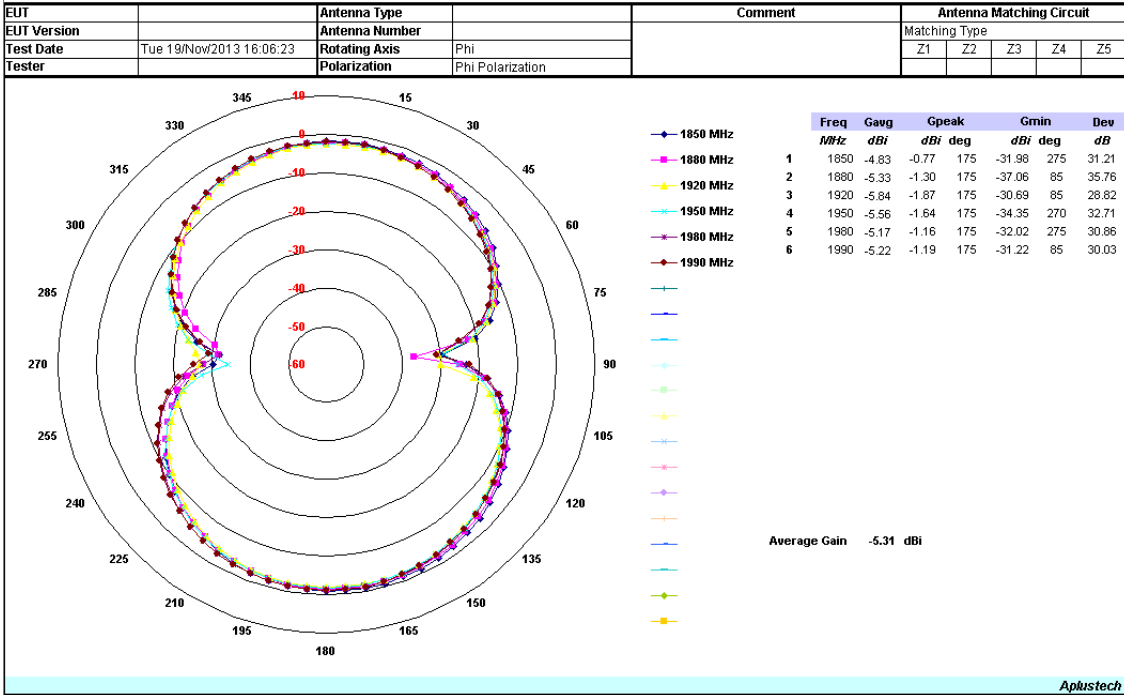
7.8.1.4 GSM 900 Band Radiation Pattern-H plane



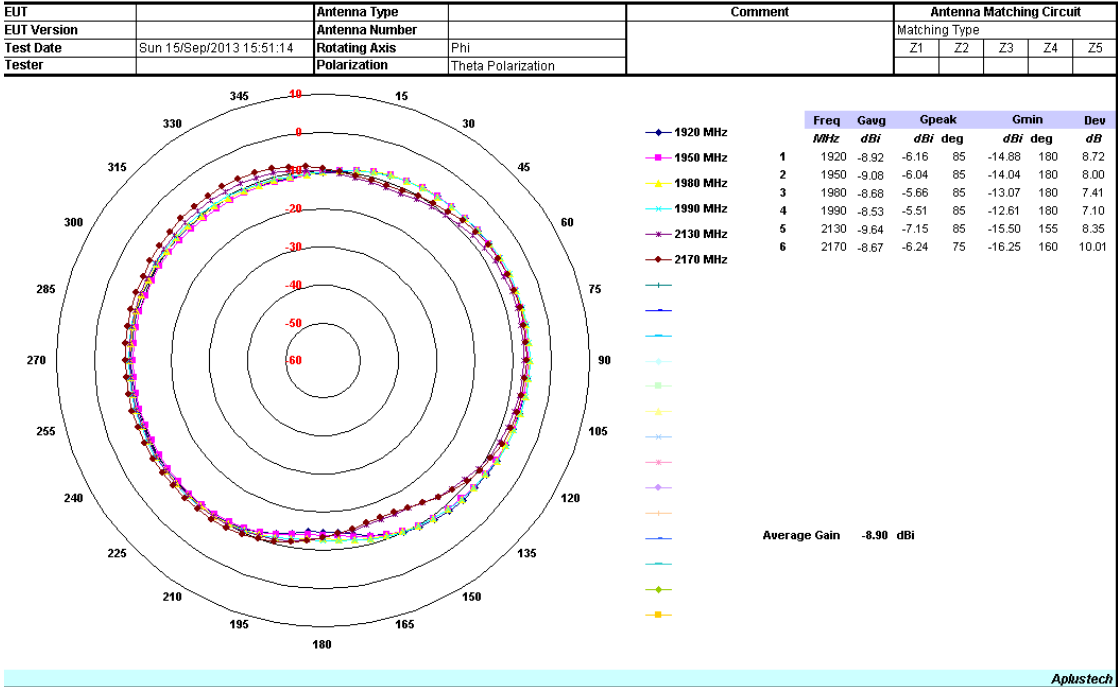
7.8.1.5 DCS 1800 Band Radiation Pattern –H plane



7.8.1.6 DCS1900(PCS)Band Radiation Pattern –H plane



7.8.1.7 WCDMA1 Band Radiation Pattern –H plane

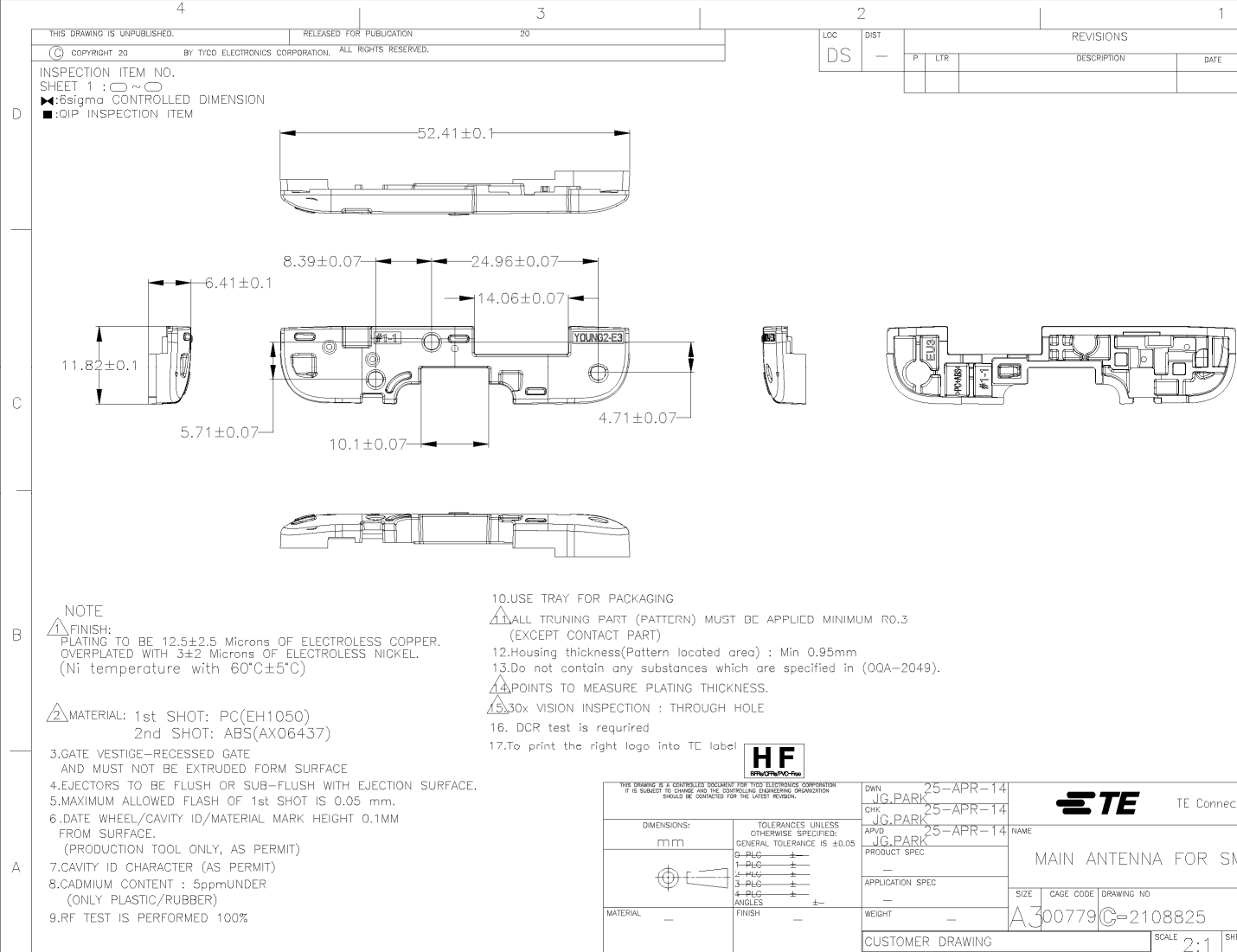


7.8.3 Efficiency & Peak Gain

7.8.3.1 Main antenna

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Frequency [MHz]	824	849	869	880	915	925	960	1710	1740	1785	1805	1850	1880	1920	1950	1980	1990	2130	2170
Efficiency [dB]	-7.67	-6.49	-5.18	-5.11	-4.20	-3.94	-4.92	-3.76	-3.01	-2.82	-2.53	-2.67	-2.86	-3.48	-3.41	-3.10	-2.99	-4.88	-4.46
Efficiency [%]	17.10	22.44	30.32	30.80	38.04	40.33	32.24	42.03	49.96	52.28	55.82	54.07	51.81	44.88	45.62	49.03	50.21	32.48	35.80
TRG [dB]	-7.67	-6.49	-5.18	-5.11	-4.20	-3.94	-4.92	-3.76	-3.01	-2.82	-2.53	-2.67	-2.86	-3.48	-3.41	-3.10	-2.99	-4.88	-4.46
TRG _g [dB]	-7.81	-6.64	-5.35	-5.30	-4.45	-4.24	-5.31	-8.40	-7.80	-7.83	-7.34	-6.91	-6.78	-7.20	-6.89	-6.21	-6.00	-6.83	-6.24
Gain _{g Peak} [dB]	-4.63	-3.76	-2.56	-2.40	-1.36	-1.20	-2.51	-2.92	-1.71	-0.80	-0.02	0.34	0.11	-0.45	-0.34	-0.12	-0.13	-1.08	0.00
Gain _{g Min} [dB]	-16.95	-17.23	-18.54	-20.97	-31.92	-36.87	-30.46	-29.38	-31.24	-26.57	-23.91	-19.17	-17.52	-23.04	-25.06	-27.98	-29.45	-21.73	-21.84
TRG _g [dB]	-22.76	-21.10	-19.31	-18.78	-16.63	-15.75	-15.49	-5.60	-4.77	-4.46	-4.27	-4.73	-5.11	-5.88	-6.00	-6.01	-6.01	-9.30	-9.19
Gain _{g Peak} [dB]	-17.19	-14.92	-12.58	-11.82	-9.27	-8.32	-8.01	-0.51	0.12	0.16	0.33	-0.40	-0.67	-0.32	-0.21	-0.07	0.00	-1.75	-1.51
Gain _{g Min} [dB]	-43.99	-44.46	-42.13	-43.89	-29.03	-27.94	-33.70	-38.66	-36.80	-30.78	-27.84	-25.24	-22.27	-24.75	-24.46	-24.92	-24.48	-28.78	-27.88
UHRG [dB]	-10.38	-9.07	-7.65	-7.52	-6.49	-6.25	-7.25	-7.37	-6.41	-6.15	-5.88	-5.81	-5.66	-5.90	-5.72	-5.32	-5.17	-6.41	-5.97
UHRG/TRG [%]	53.57	55.20	56.65	57.41	58.95	58.78	58.36	43.56	45.78	46.47	46.24	48.58	52.40	57.25	58.76	59.97	60.62	70.35	70.68
H-Plane	-5.99	-5.10	-3.92	-3.89	-3.16	-2.94	-3.82	-7.32	-6.99	-7.88	-7.82	-7.90	-7.89	-9.02	-9.25	-8.89	-8.76	-10.10	-9.38
E1-Plane, AVG [dB]	-8.07	-6.98	-5.74	-5.71	-4.96	-4.79	-6.00	-16.82	-15.66	-14.52	-13.63	-12.27	-11.36	-10.30	-9.34	-8.26	-7.97	-7.88	-7.55
E2-Plane, AVG [dB]	-9.92	-8.61	-7.21	-7.10	-6.05	-5.76	-6.59	-4.43	-3.87	-4.12	-3.84	-3.90	-4.01	-4.90	-4.94	-4.49	-4.33	-5.74	-4.83
Peak Gain [dB]	-4.60	-3.73	-2.56	-2.40	-1.35	-1.18	-2.44	-0.46	0.13	0.17	0.39	0.54	0.61	0.30	0.58	1.06	1.23	-0.10	0.26
Directivity [dB]	3.07	2.76	2.62	2.71	2.84	2.76	2.48	3.31	3.14	2.99	2.92	3.21	3.46	3.78	3.99	4.16	4.22	4.79	4.72
Minimum Gain [dB]	-16.13	-16.04	-17.06	-18.80	-21.04	-20.04	-19.93	-14.62	-15.56	-16.52	-14.59	-12.08	-14.36	-19.42	-20.25	-20.50	-20.99	-20.54	-19.49

8. Product Drawing



9. Standard Test Data

9.1 MID 4+4 SHOT RF Data with JIG mold #1 (Main antenna Only)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	596 MHz	872 MHz	1259 MHz	1458 MHz
VSWR MAX	3.5	3.6	2.6	2.5
VSWR MIN	2.5	2.6	1.6	1.5
#1-1	3.02	3.10	2.00	2.06
	3.32	3.19	1.92	2.14
	3.10	3.11	2.00	1.93
	2.98	3.21	2.05	2.10
	3.22	3.20	2.09	2.14
#1-2	3.08	3.15	2.12	2.00
	3.03	3.05	2.09	1.81
	2.92	3.21	2.19	2.14
	3.21	3.30	2.11	1.96
	3.12	3.18	1.94	1.87
#1-3	3.05	3.00	1.93	1.91
	2.98	2.95	2.00	2.00
	3.03	3.30	2.17	1.93
	3.22	3.14	2.05	1.94
	3.03	3.08	2.12	2.21
#1-4	3.18	3.18	1.90	1.95
	3.10	3.30	2.08	1.92
	3.00	3.01	2.05	2.02
	3.15	3.07	1.91	2.00
	3.05	3.19	2.04	2.00
#1-5	2.91	3.22	2.06	1.85
	3.10	3.24	2.14	2.00
	3.14	3.09	1.99	2.31
	3.12	3.19	1.87	1.90
	3.03	3.22	2.04	1.95

#1-6	3.27	3.18	2.10	2.01
	3.25	3.17	2.13	2.00
	3.22	3.27	1.99	2.02
	3.15	3.18	1.99	1.85
	3.25	3.21	2.13	1.94
#1-7	3.12	3.11	2.22	1.90
	3.10	3.14	2.02	1.95
	3.05	3.13	2.22	2.14
	3.18	3.25	2.17	2.02
	2.98	3.18	2.02	2.02
#1-8	3.19	3.20	2.03	1.89
	3.18	3.24	2.02	1.81
	3.19	3.20	2.03	1.90
	3.03	3.18	2.00	1.90
	3.10	3.19	2.13	1.94
	3.15	3.30	2.04	1.89
	3.19	3.06	1.90	1.81
	3.02	3.11	2.05	2.14
	2.98	3.24	2.16	1.91
	3.16	3.03	2.11	1.95
	3.20	3.26	2.09	1.84
	3.02	3.21	2.14	2.01
	3.10	3.11	2.13	1.92
	3.10	3.01	1.90	2.11
	3.10	3.16	1.83	2.10
X	3.11	3.16	2.05	1.98
σ	0.09	0.08	0.09	0.11
Cpk	1.75	1.95	1.88	1.54

9.2 MID 4+4 SHOT RF Data with JIG mold #2 (Main antenna Only)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	596 MHz	872 MHz	1259 MHz	1458 MHz
VSWR MAX	3.5	3.6	2.6	2.5
VSWR MIN	2.5	2.6	1.6	1.5
#2-1	3.02	3.00	2.06	2.05
	3.22	3.09	2.07	2.13
	3.00	3.01	2.06	1.92
	2.88	3.11	2.11	2.09
	3.12	3.12	2.15	2.13
#2-2	3.11	3.16	2.18	1.99
	2.93	2.95	2.15	2.10
	3.11	3.11	2.25	2.13
	3.11	3.03	2.17	1.95
	3.02	3.16	2.12	1.86
#2-3	2.95	2.90	1.99	1.90
	2.88	2.85	2.06	1.99
	2.93	3.20	2.23	1.92
	3.12	3.04	2.11	1.93
	2.93	2.98	2.18	2.20
#2-4	3.08	3.08	1.96	1.94
	3.00	3.20	2.14	1.91
	2.90	2.91	2.11	2.01
	3.05	2.97	1.97	1.99
	2.95	3.09	2.10	1.99
#2-5	2.81	3.12	2.12	2.09
	3.11	3.14	2.20	1.99
	3.04	2.99	2.12	2.30
	3.02	3.09	1.93	2.09
	2.93	3.12	2.10	1.94

#2-6	3.17	3.08	2.16	2.00
	3.15	3.07	2.19	1.99
	3.12	3.17	2.05	2.01
	3.05	3.08	2.05	2.05
	3.15	3.11	2.19	1.93
#2-7	3.02	3.16	2.28	2.05
	3.00	3.04	2.08	1.94
	3.11	3.03	2.28	2.13
	3.08	3.15	1.97	2.01
	2.88	3.08	1.97	2.01
#2-8	3.09	3.10	2.09	2.13
	3.08	3.09	2.12	2.13
	3.09	3.10	2.09	2.00
	2.93	3.08	2.06	1.89
	3.00	3.09	2.19	1.93
	3.05	3.03	1.97	2.00
	3.09	2.96	1.96	1.80
	2.92	3.01	2.11	2.13
	2.88	3.14	2.22	2.10
	3.06	2.93	2.17	1.94
	3.10	3.16	2.15	2.13
	2.92	3.16	2.20	2.00
	3.10	3.01	2.19	1.91
	3.00	2.91	2.12	2.10
	3.10	3.06	2.07	2.09
X	3.03	3.06	2.11	2.02
σ	0.09	0.08	0.09	0.10
Cpk	1.78	1.97	1.89	1.71

9.3 MID 4+4 SHOT RF Data with JIG mold #3 (Main antenna Only)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	596 MHz	872 MHz	1259 MHz	1458 MHz
VSWR MAX	3.5	3.6	2.6	2.5
VSWR MIN	2.5	2.6	1.6	1.5
#3-1	3.22	3.02	2.06	2.15
	3.42	3.11	2.07	2.23
	3.20	3.03	2.06	2.02
	3.08	3.13	2.11	2.19
	3.32	3.14	2.15	2.23
#3-2	3.31	3.18	2.18	2.09
	3.13	2.97	2.15	2.20
	3.31	3.13	2.25	2.23
	3.31	3.05	2.17	2.05
	3.22	3.18	2.12	1.96
#3-3	3.15	2.92	1.99	2.00
	3.08	2.87	2.06	2.09
	3.13	3.22	2.23	2.02
	3.32	3.06	2.11	2.03
	3.13	3.00	2.18	2.30
#3-4	3.28	3.10	1.96	2.04
	3.20	3.22	2.14	2.01
	3.10	2.93	2.11	2.11
	3.25	2.99	1.97	2.09
	3.15	3.11	2.10	2.09
#3-5	3.01	3.14	2.12	2.19
	3.31	3.16	2.20	2.09
	3.24	3.01	2.12	2.40
	3.22	3.11	1.93	2.19
	3.13	3.14	2.10	2.04

#3-6	3.37	3.10	2.16	2.10
	3.35	3.09	2.19	2.09
	3.32	3.19	2.05	2.11
	3.25	3.10	2.05	2.15
	3.35	3.13	2.19	2.03
#3-7	3.22	3.18	2.28	2.15
	3.20	3.06	2.08	2.04
	3.31	3.05	2.28	2.23
	3.28	3.17	1.97	2.11
	3.08	3.10	1.97	2.11
#3-8	3.29	3.12	2.09	2.23
	3.28	3.11	2.12	2.23
	3.29	3.12	2.09	2.10
	3.13	3.10	2.06	1.99
	3.20	3.11	2.19	2.03
	3.25	3.05	1.97	2.10
	3.29	2.98	1.96	1.90
	3.12	3.03	2.11	2.23
	3.08	3.16	2.22	2.20
	3.26	2.95	2.17	2.04
	3.30	3.18	2.15	2.23
	3.12	3.18	2.20	2.10
	3.30	3.03	2.19	2.01
	3.20	2.93	2.12	2.20
	3.30	3.08	2.07	2.19
X	3.23	3.08	2.11	2.12
σ	0.09	0.08	0.09	0.10
Cpk	1.78	1.97	1.91	1.71

9.4 MID 4+4 SHOT RF Data with JIG mold #4 (Main antenna Only)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	596 MHz	872 MHz	1259 MHz	1458 MHz
VSWR MAX	3.5	3.6	2.6	2.5
VSWR MIN	2.5	2.6	1.6	1.5
#4-1	3.03	3.12	2.14	2.02
	3.10	3.21	2.13	1.90
	3.14	3.13	2.06	1.89
	3.08	3.23	2.05	2.06
	3.06	3.24	2.09	2.10
#4-2	2.94	3.28	2.12	1.96
	3.00	3.07	2.01	1.88
	3.01	3.23	2.22	2.00
	2.98	3.15	2.14	1.84
	2.91	3.07	2.13	2.00
#4-3	2.94	3.02	2.06	1.87
	3.08	3.15	2.20	2.17
	3.08	3.04	2.19	2.10
	3.09	3.16	2.11	1.80
	2.93	3.10	2.06	1.90
#4-4	3.00	3.03	2.14	1.91
	2.98	3.03	2.08	2.16
	3.00	3.13	2.05	1.98
	3.10	3.25	1.91	2.14
	3.15	3.18	2.23	1.96
#4-5	3.01	3.00	2.06	2.06
	3.31	3.10	2.14	1.96
	2.94	3.20	2.06	1.94
	3.14	3.18	1.87	2.10
	3.00	3.04	2.04	1.91

#4-6	3.16	3.20	2.10	1.97
	3.01	3.19	2.13	1.96
	2.97	3.04	2.22	2.11
	2.94	3.20	1.99	2.02
	2.94	3.10	2.13	1.90
#4-7	3.09	3.28	2.22	2.02
	2.93	3.16	2.02	1.91
	3.00	3.15	2.22	2.04
	3.11	3.15	2.06	1.98
	3.08	3.20	2.23	2.04
#4-8	3.07	3.20	2.04	2.12
	3.06	3.11	2.03	2.10
	3.05	3.24	2.13	2.04
	2.94	3.34	1.99	1.78
	3.15	3.21	1.99	2.10
	3.00	3.15	2.13	2.10
	2.91	3.08	2.22	2.21
	3.12	3.13	2.05	1.81
	3.08	3.03	2.16	2.00
	3.04	3.05	2.11	1.87
	3.10	3.15	2.09	2.09
	3.12	3.28	2.14	1.97
	2.94	3.10	2.13	2.09
	2.91	3.03	2.06	1.90
	3.08	3.07	2.13	2.06
X	3.04	3.14	2.10	2.00
σ	0.08	0.08	0.08	0.10
Cpk	1.96	2.02	2.06	1.59

9.5 MID 4+4 SHOT RF Data with JIG mold #1 (Rear Case + Main antenna)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	628MHz	946 MHz	1345 MHz	1779 MHz
VSWR MAX	4.5	4.5	4.7	4.5
VSWR MIN	3.5	3.5	3.7	3.5
#1-1	4.02	4.00	4.15	4.00
	3.86	4.07	4.24	3.96
	3.96	4.15	4.38	3.87
	4.07	3.91	4.15	4.03
	4.09	4.07	4.15	3.95
#1-2	4.24	4.01	4.41	3.89
	4.17	4.14	4.17	3.80
	3.91	4.09	4.09	3.88
	3.94	3.90	4.26	3.98
	4.03	4.05	4.29	3.81
#1-3	3.89	3.89	4.26	3.89
	4.07	4.01	4.07	3.94
	4.08	4.04	4.53	4.11
	3.88	4.12	4.53	4.05
	4.11	4.05	4.37	4.01
#1-4	4.06	4.11	4.53	4.00
	4.01	4.12	4.37	3.79
	3.89	4.04	4.31	3.94
	4.07	4.04	4.15	4.01
	3.90	4.04	4.27	3.89
#1-5	4.25	4.11	4.17	3.95
	3.98	4.04	4.38	3.80
	3.89	4.04	4.32	4.01
	4.11	3.89	4.38	4.00
	4.05	3.99	4.37	3.95

#1-6	4.01	4.10	4.25	3.87
	4.09	4.12	4.36	3.77
	4.08	4.27	4.27	3.89
	4.08	4.20	4.21	4.00
	4.14	3.94	4.36	3.69
#1-7	4.08	3.90	4.15	3.92
	3.88	4.05	4.31	3.89
	4.11	3.89	4.15	3.70
	4.06	3.99	4.42	4.16
	4.01	4.10	4.40	4.16
#1-8	3.98	3.89	4.32	4.01
	4.11	3.99	4.09	4.01
	4.06	4.10	4.09	4.05
	3.87	4.01	4.25	4.00
	4.02	3.92	4.31	3.89
X	4.03	4.03	4.28	3.94
σ	0.10	0.09	0.12	0.11
Cpk	1.69	1.81	1.34	1.53

9.6 MID 4+4 SHOT RF Data with JIG mold #2 (Rear Case + Main antenna)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	628MHz	946 MHz	1345 MHz	1779 MHz
VSWR MAX	4.5	4.5	4.7	4.5
VSWR MIN	3.5	3.5	3.7	3.5
#2-1	4.00	3.98	4.08	4.02
	3.84	4.05	4.17	3.98
	3.94	4.13	4.31	3.89
	4.05	3.89	4.08	4.05
	4.07	4.05	4.08	3.97
#2-2	4.22	3.99	4.34	3.91
	4.15	4.12	4.10	3.82
	3.89	4.07	4.02	3.90
	3.92	3.88	4.19	4.00
	4.01	4.03	4.22	3.83
#2-3	3.87	3.87	4.19	3.91
	4.05	3.99	4.00	3.96
	4.06	4.02	4.46	4.13
	3.86	4.10	4.46	4.07
	4.09	4.03	4.30	4.03
#2-4	4.04	4.09	4.46	4.02
	3.99	4.10	4.30	3.81
	3.87	4.02	4.24	3.96
	4.05	4.02	4.08	4.03
	3.88	4.02	4.20	3.91
#2-5	4.23	4.09	4.10	3.97
	3.96	4.02	4.31	3.82
	3.87	4.02	4.25	4.03
	4.09	3.87	4.31	4.02
	4.03	3.97	4.30	3.97

#2-6	3.99	4.08	4.18	3.89
	4.07	4.10	4.29	3.79
	4.06	4.25	4.20	3.91
	4.06	4.18	4.14	4.02
	4.12	3.92	4.29	3.71
#2-7	4.06	3.88	4.08	3.94
	3.86	4.03	4.24	3.91
	4.09	3.87	4.08	3.72
	4.04	3.97	4.35	4.18
	3.99	4.08	4.33	4.18
#2-8	3.96	3.87	4.25	4.03
	4.09	3.97	4.02	4.03
	4.04	4.08	4.02	4.07
	3.85	3.99	4.18	4.02
	4.00	3.90	4.24	3.91
X	4.01	4.01	4.21	3.96
σ	0.10	0.09	0.12	0.11
Cpk	1.67	1.81	1.34	1.53

9.7 MID 4+4 SHOT RF Data with JIG mold #3 (Rear Case + Main antenna)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	628MHz	946 MHz	1345 MHz	1779 MHz
VSWR MAX	4.5	4.5	4.7	4.5
VSWR MIN	3.5	3.5	3.7	3.5
#3-1	4.00	3.96	3.93	4.01
	3.84	4.03	4.02	3.97
	3.94	4.11	4.16	3.88
	4.05	3.87	3.93	4.04
	4.07	4.03	3.93	3.96
#3-2	4.22	3.97	4.19	3.90
	4.15	4.10	3.95	3.81
	3.89	4.05	3.87	3.89
	3.92	3.86	4.04	3.99
	4.01	4.01	4.07	3.82
#3-3	3.87	3.85	4.04	3.90
	4.05	3.97	3.85	3.95
	4.06	4.00	4.31	4.12
	3.86	4.08	4.31	4.06
	4.09	4.01	4.15	4.02
#3-4	4.04	4.07	4.31	4.01
	3.99	4.08	4.15	3.80
	3.87	4.00	4.09	3.95
	4.05	4.00	3.93	4.02
	3.88	4.00	4.05	3.90
#3-5	4.23	4.07	3.95	3.96
	3.96	4.00	4.16	3.81
	3.87	4.00	4.10	4.02
	4.09	3.85	4.16	4.01
	4.03	3.95	4.15	3.96

#3-6	3.99	4.06	4.03	3.88
	4.07	4.08	4.14	3.78
	4.06	4.23	4.05	3.90
	4.06	4.16	3.99	4.01
	4.12	3.90	4.14	3.70
#3-7	4.06	3.86	3.93	3.93
	3.86	4.01	4.09	3.90
	4.09	3.85	3.93	3.71
	4.04	3.95	4.20	4.17
	3.99	4.06	4.18	4.17
#3-8	3.96	3.85	4.10	4.02
	4.09	3.95	3.87	4.02
	4.04	4.06	3.87	4.06
	3.85	3.97	4.03	4.01
	4.00	3.88	4.09	3.90
X	4.01	3.99	4.06	3.95
σ	0.10	0.09	0.12	0.11
Cpk	1.67	1.81	1.34	1.53

9.8 MID 4+4 SHOT RF Data with JIG mold #4 (Rear Case + Main antenna)

TEST BAND & TEST ITEM	VSWR PROPERTY 			
	628MHz	946 MHz	1345 MHz	1779 MHz
VSWR MAX	4.5	4.5	4.7	4.5
VSWR MIN	3.5	3.5	3.7	3.5
#4-1	3.96	4.02	4.10	4.03
	4.02	3.89	4.30	4.03
	3.96	3.97	4.28	4.11
	3.94	4.00	4.39	4.10
	3.99	3.89	4.30	4.02
#4-2	4.20	4.13	4.24	4.19
	4.05	3.89	4.39	3.87
	3.79	4.21	4.01	3.89
	4.20	4.00	4.14	3.97
	3.91	4.02	4.17	4.08
#4-3	3.77	3.88	4.14	3.96
	3.95	4.12	3.95	4.12
	4.02	4.19	4.31	3.97
	3.90	3.94	4.41	4.12
	4.21	4.17	4.25	4.08
#4-4	3.94	3.93	4.31	3.94
	4.12	4.06	4.25	3.91
	4.20	3.86	4.19	4.01
	3.95	4.08	4.03	3.92
	3.78	3.98	4.15	3.96
#4-5	4.13	3.93	4.05	4.02
	3.86	4.24	4.10	4.02
	3.77	3.86	4.33	4.19
	3.99	3.71	4.33	4.00
	3.93	4.00	4.40	3.81

#4-6	4.10	3.92	4.13	3.94
	3.97	4.16	4.24	4.13
	4.13	4.02	4.15	3.96
	3.96	3.95	4.09	4.07
	3.96	4.04	4.24	3.76
#4-7	4.02	4.21	4.03	3.99
	3.96	3.88	4.19	4.13
	4.12	3.98	4.10	4.00
	3.99	4.00	4.30	3.95
	4.00	3.92	4.28	4.23
#4-8	4.12	3.71	4.20	4.08
	3.99	3.81	3.97	3.97
	3.94	3.92	3.97	3.97
	4.12	4.26	4.13	4.02
	3.90	4.23	4.19	3.97
X	4.00	4.00	4.19	4.01
σ	0.12	0.14	0.13	0.10
Cpk	1.40	1.44	1.33	1.80

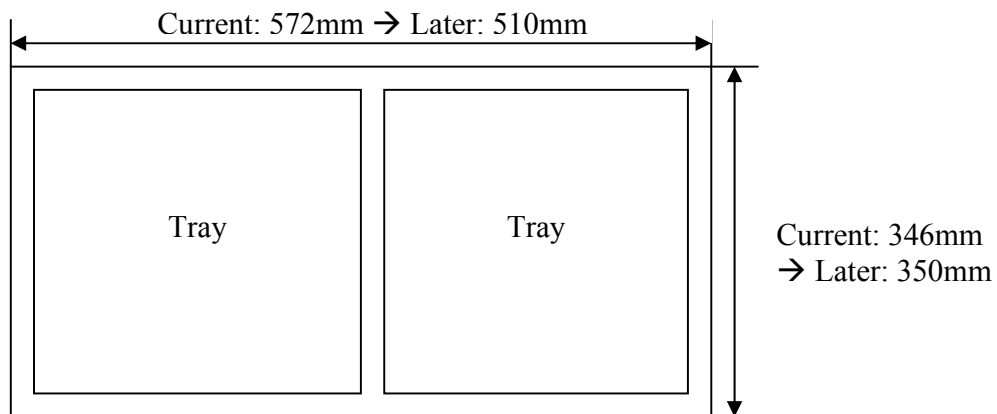
9.7 Mechanical Data(MID Antenna)

Test Sample	Measuring No.						
	Antenna Size					Pattern	
A1							
A2							
A3							
A4							
A5							
B1							
B2							
B3							
B4							
B5							
C1							
C2							
C3							
C4							
C5							
D1							
D2							
D3							
D4							
D5							
E1							
E2							
E3							
E4							
E5							
F1							
F2							
F3							
F4							
F5							
X							
σ							
Cpk							
Decision							

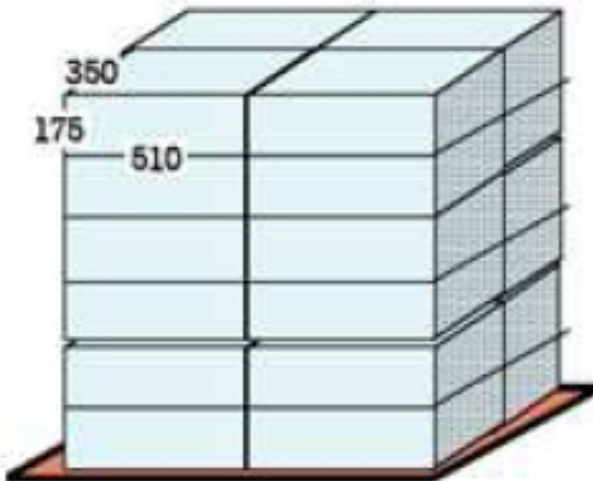
10. Packaging (Estimated)

Parts to be packaged in vacuum formed trays and packed into boxes per below concept:

10.1 Box inside

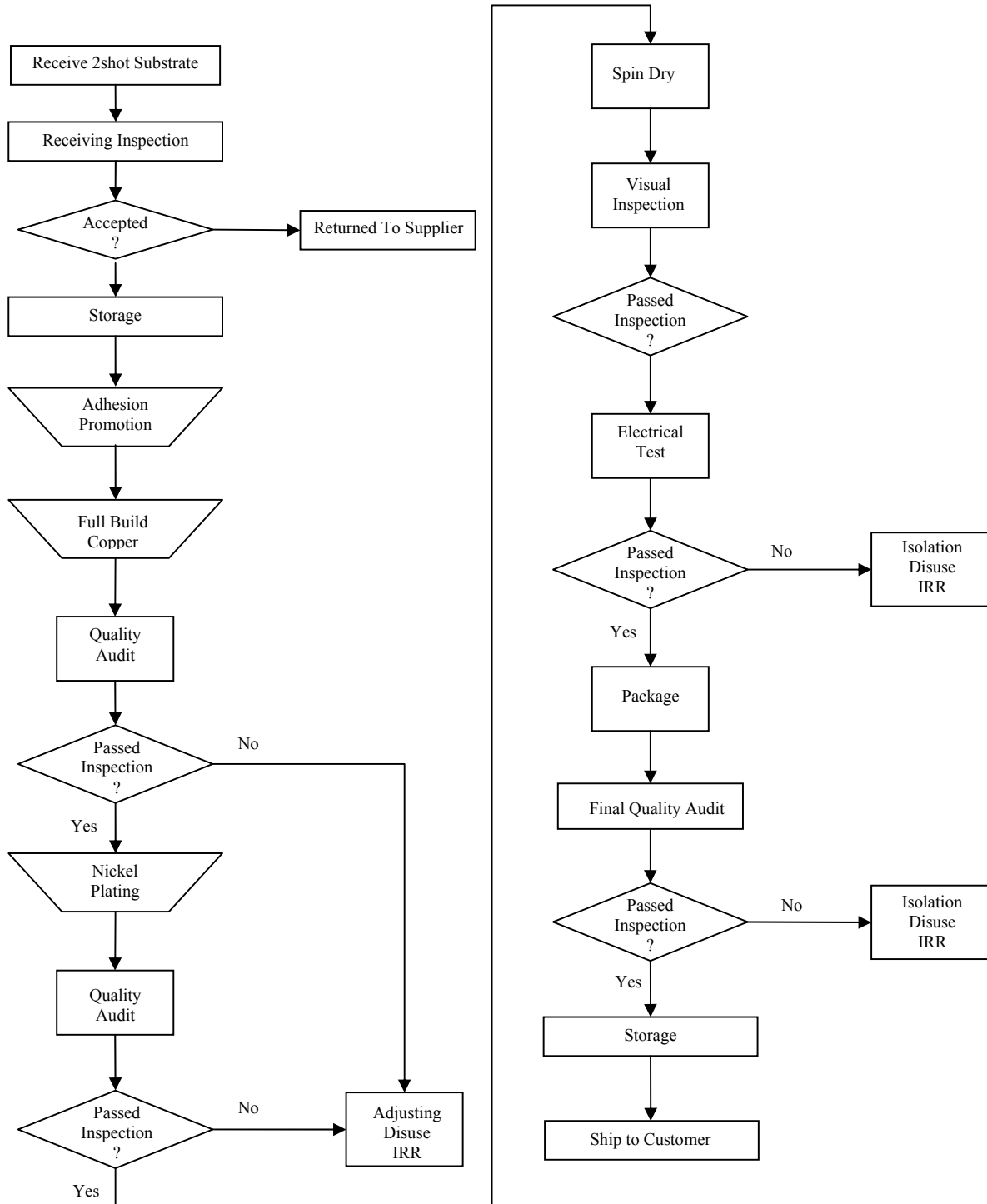


10.2 Box stacking method



11. Manufacturing Process / Quality Assurance

11.1 Process Flow



11.2 Process Control Plan

AMP-Q QC019 REV:B

QC FLOW CHART

QFC-4-Q266A

Part :							Control Place/Time	Brachylogy	
MID ANTENNA FOR SM-G350							A. Receiving Inspection Place	RI-Receiving Inspection	
P/N:							B. Manufacture Process Place	FAA First Article Approval Request	
2108670-1	0	2013.11.20	Original	Xie Dongping	Wang Xu	Li Fugang	C. Plating Analysis Place	PI-Process Inspection	
	Rev	Date	Modify Reason/Content	Prepared By	Checked By	Approved By	D. QC Inspection Place E. Warehouse	1X/2H-1Time/2Hours 1X/L-1Time/LOT	

Proc ess	No.	Process	Equipment, Jig etc		Specification				Control Method						Actions	Control Place
			Equipment, Jig etc	No	Key Parameter of Process	Attribute		Key Parameter of Parts	Measurement Technique	Sample		Records	Cpk	Current Controls		
						Tag	Type			Sample Size	Frequency					
▲ ◆ ▼ ◇ ◇ ◇ ◇ ◇ ◇ ◇ ◇ ◇	1	Receiving Parts	Transport, Rack	/	P/N, Quantity, Package etc	/	Appearance	P/N, Quantity, Package etc	Visual	WI.102-77216	Each Shipment	SAP	/	WI 102-77239	Return, CCR	E
	2	Receiving Inspection	MSP×20	/	Dimension, Appearance etc	/	Appearance Dimension	/	/	WI.102-77216	Each Shipment	AMP-Q QC004	/	WI 102-77217	Return, CCR	A
	3	Storage	Transport, Rack	/	P/N, Quantity, Package etc	/	Appearance	P/N, Quantity, Package etc	Visual	/	Each Shipment	SAP	/	WI 102-77239	Verify	E
	4	Etching	Etching Bath	1	Chemical concentration	/	Data	/	Chemical analysis	/	Auto	AMP-Q PT278	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Re-analyze Addition/New Bath	C
					Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B
	5	Rinse	Rinse Bath	2	Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B
	6	Neutralizer	Neutralizer bath	3	Chemical concentration	/	Data	/	Chemical analysis	/	Auto	AMP-Q PT278	/		Re-analyze Addition/New Bath	C
					Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B
	7	Rinse	Rinse Bath	4	Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B
	8	Full build copper	Full build copper bath	5	Chemical concentration	/	Data	/	Chemical analysis	/	Auto	AMP-Q PT278	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Re-analyze Addition/New Bath	C
					Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B
	9	Rinse	Rinse Bath	6	Temperature	/	Data	/	Visual	/	1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/	Auto	/	/		Verify	B

◆	10	FAA	X-ray;MSP;3M-Tape	/	-Analysis file Cu-MID-0.2mm.ana -3M Tape -MSP×20	Items of IP-6-Q148	Appearance Thickness	Cu Spec:15.0±2um	For IP-6-Q148	Cu Thickness N=3		FAA	IP-6-Q148	CPK ≥1.33	WI 118-77203 QCQ-3-430	①IRR ②Adjusting ③Disuse	D						
										Peeling Test N=3													
										Appearance N=3													
Proc ess	No.	Process	Equipment、Jig etc		Specification				Control Method							Actions	Control Place						
			Equipment、Jig etc	No	Key Parameter of Process	Attribute		Key Parameter of Parts	Measuremen Technique	Sample			Records	Cpk	Current Controls								
						Tag	Tag			Sample Size		取样频次											
◆	11	PI	X-ray;MSP;3M-Tape	/	-Analysis file Cu-MID-0.2mm.ana -3M Tape -MSP×20	Items of IP-6-Q148	Appearance Thickness	Cu SPEC:15.0±2um	For IP-6-Q148	Cu Thickness N=3		1X/L	IP-6-Q148	/	WI 118-77203 QCQ-3-430	①IRR ②Adjusting ③Disuse	D						
◇	12	Pd Initiator	Initiator bath	7	Chemical concentration	/	Data	/	Chemical analysis	/								Auto	AMP-Q PT278	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Re-analyze Addition/New Bath	C
					Temperature	/	Data	/	Visual	/								1X/2H	AMP-Q PT159	/		Verify	B
					Time	/	Data	/	Visual	/		Auto	/	/	Verify	B							
◇	13	Ni Plating	Nickel plating bath	8	Chemical concentration	/	Data	/	Chemical analysis	/		Auto	AMP-Q PT278	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Re-analyze Addition/New Bath	C						
					Temperature	/	Data	/	Visual	/		1X/2H	AMP-Q PT159	/		Verify	B						
					Time	/	Data	/	Visual	/		Auto	/	/		Verify	B						
◇	14	Sealing	Sealing bath	9	Chemical concentration	/	Data	/	Chemical analysis	/		Auto	AMP-Q PT278	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Re-analyze Addition/New Bath	C						
					Temperature	/	Data	/	Visual	/		1X/2H	AMP-Q PT159	/		Verify	B						
					Time	/	Data	/	Visual	/		Auto	/	/		Verify	B						
◇	15	Rinse	Rinse Bath	10	Temperature	/	Data	/	Visual	/		1X/2H	AMP-Q PT159		WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Verify	B						
					Time	/	Data	/	Visual	/		Auto	/			Verify	B						
					Temperature	/	Data	/	Visual	/		/	/	/		Verify	B						
◇	16	Drying	Dryer	/	Temperature	/	Data	/	Visual	/		/	/	/	WI 131-3.7.8.7 WI 131-9.2.2.2 WI 131-3.8.0.6	Verify	B						
					Time	/	Data	/	Visual	/		/	/	/		Verify	B						
◆	17	FAA	X-ray;MSP;3M-Tape	/	-Analysis file Cu-MID-0.2mm.ana -3M Tape -MSP×20	Items of IP-6-Q148	Appearance Thickness	Ni Spec:3.0±1.5um	For IP-6-Q148	Ni Thickness N=3		FAA	IP-6-Q148	CPK ≥1.33	WI 118-77203 QCQ-3-430	①IRR ②Adjusting ③Disuse	D						
										Peeling Test N=3													
										Appearance N=3													
◆	18	PI	X-ray;MSP;3M-Tape	/	-Analysis file Cu-MID-0.2mm.ana -3M Tape -MSP×20	Items of IP-6-Q148	Appearance Thickness	Ni Spec:3.0±1.5um	For IP-6-Q148	Ni Thickness N=3		1X/L	IP-6-Q148	/	WI 118-77203	①IRR ②Adjusting ③Disuse	D						
									Peeling Test N=3														
									Appearance N=3														
◆	19	Visual Inspection	R×5	/	/	Items of QCQ-3-430	Appearance	Visual Inspection Criterion	Visual	100%		Every Lot	AMP-Q PT157	/	WI 118-77203 QCQ-3-430	IRR、Isolation、 Disuse	B						

◆	20	Electrical Test	Agilent RF Network Analyzers	/	/	/	Data	RF Performance	Specific RF Setup	100%	Each shipment	AMP-Q PT156	/	WI 131-0136J	IRR、Isolation、Disuse	B
◆	21	Visual Inspection	R×5	/	/	Items of QCQ-3-430	Appearance	Visual Inspection Criterion	Visual	100%	Each shipment	AMP-Q PT157	/	WI 118-77203 QCQ-3-430	IRR、Isolation、Disuse	B
◇	22	Packing	By hand	/	Apperance、P/N、Quantity、Package etc	/	Appearance	P/N、Quantity、Package etc	Visual	Every Lot	Each shipment	/	/	S8500 Package criteria	IRR、Verify	B
◆	23	Final quality audit	V	/	All conformance	/	Appearance	P/N、Quantity、Package etc	Visual	Every Lot	Each shipment	AMP-Q QC003	/	WI 118-77203 WI 102-77216	IRR、Rework	E
▼	24	Storage	Transport、Rack	/	Temperature Humidity	/	Appearance	P/N、Quantity、Package etc	Visual	Every Lot	Each shipment	SAP	/	WI 102-77239	IRR、Verify	E

▲:Substrate ◆:Inspection ◇: Operation and Self-Inspection ▼:Storage

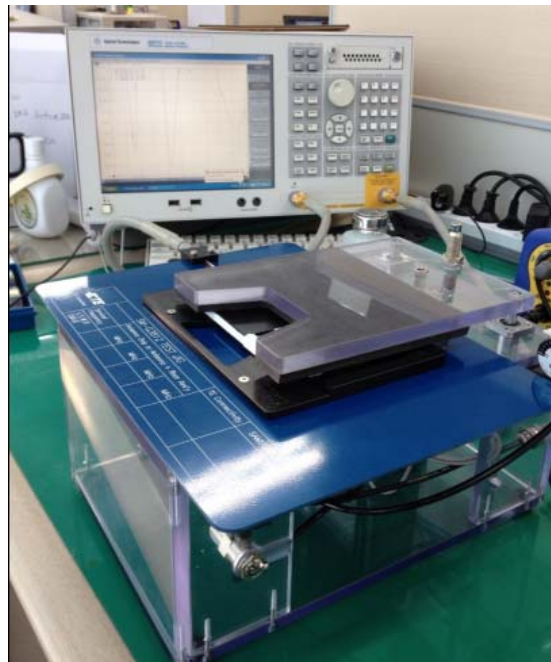
Remark : Plating line—MID

12. Picture of Testing with SET and Test JIG

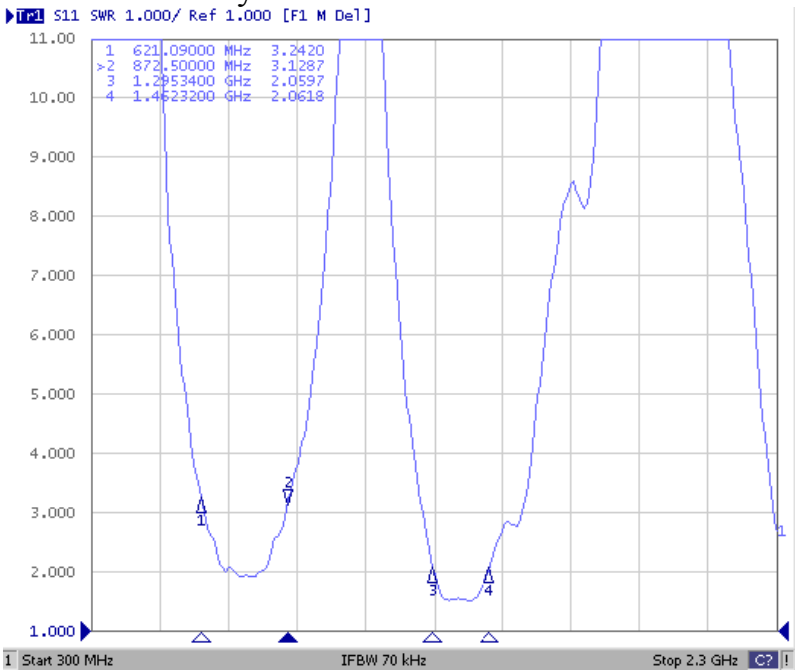
12. 1 Set condition



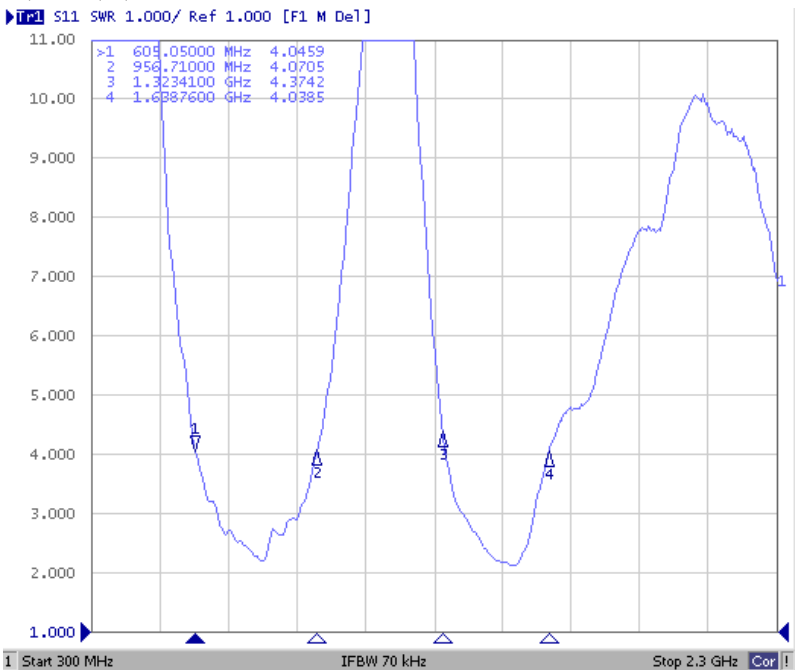
12. 2 Test Jig condition



12.3 TEST JIG VSWR
MAIN ANTENNA Only



Rear + ANTENNA

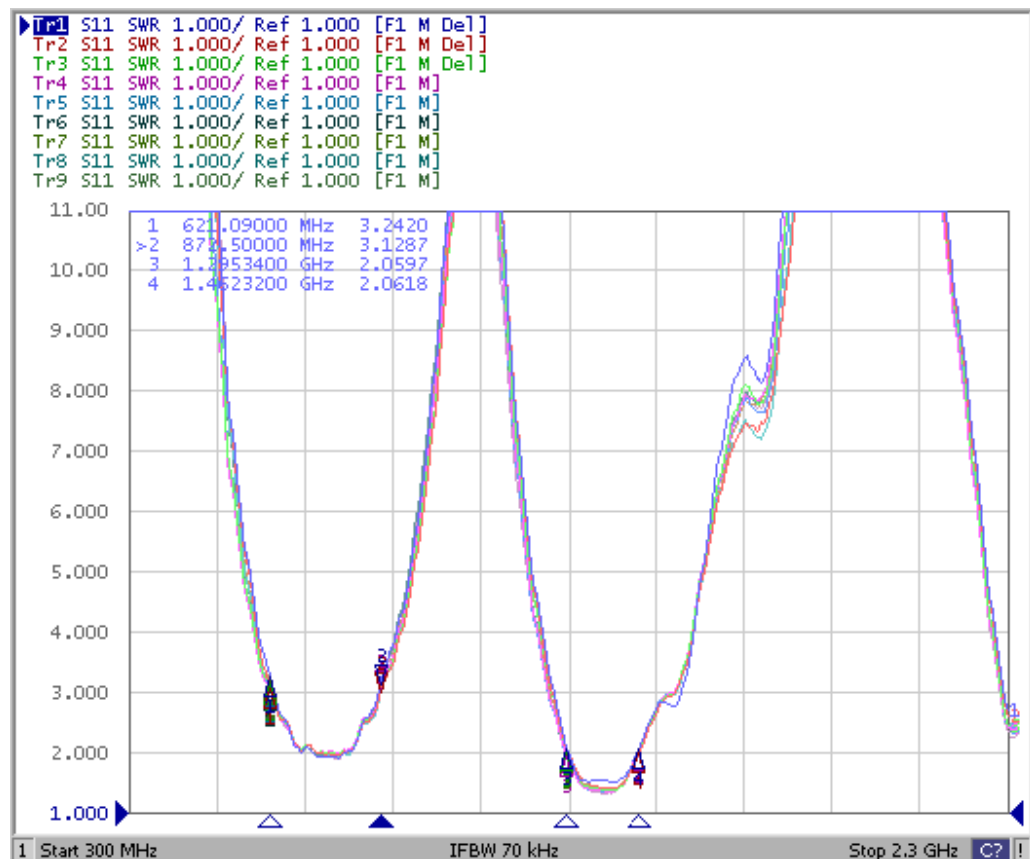


13. VSWR Comparison

13.1.1. VSWR Comparison between #1-1 Cav. & #1-8 Cav.

(Main Antenna only)

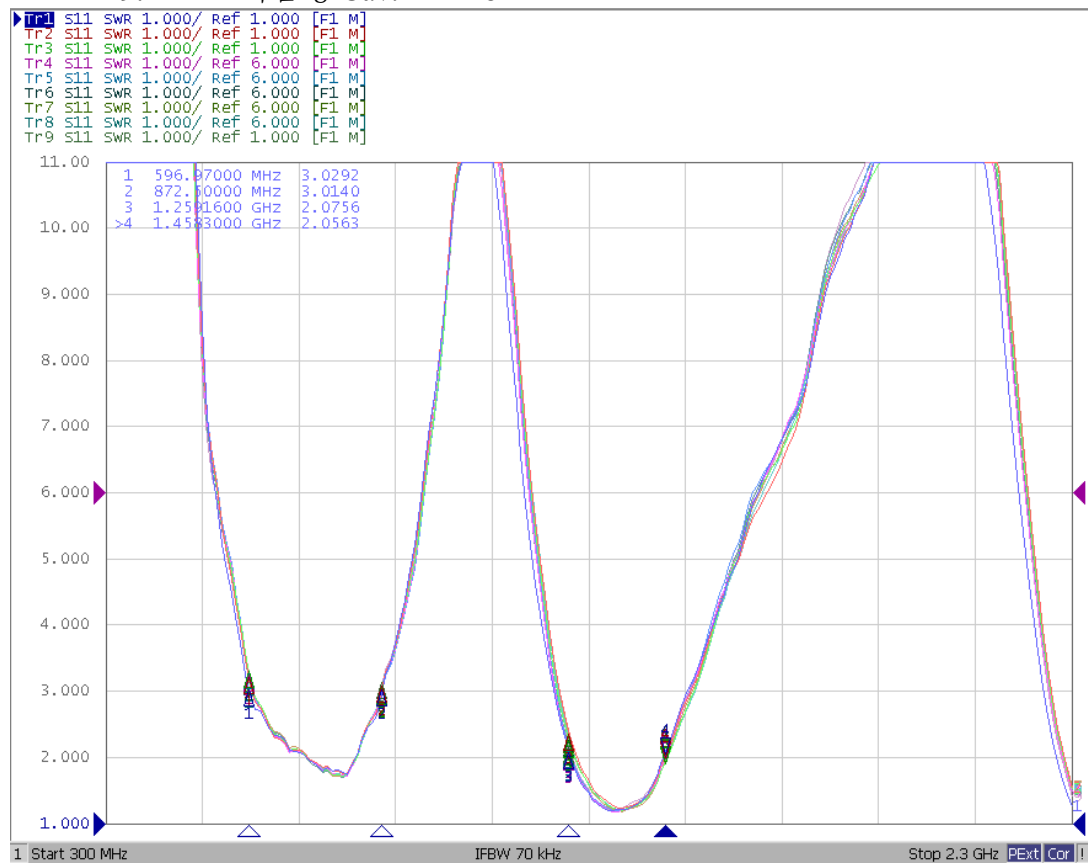
- Tr1 1+1 금형 안테나
- Tr2~Tr9: 4+4 #1차금형 Cav.1-1~1-8



13.1.2. VSWR Comparison between #2-1 Cav. & #2-8 Cav. (Main Antenna only)

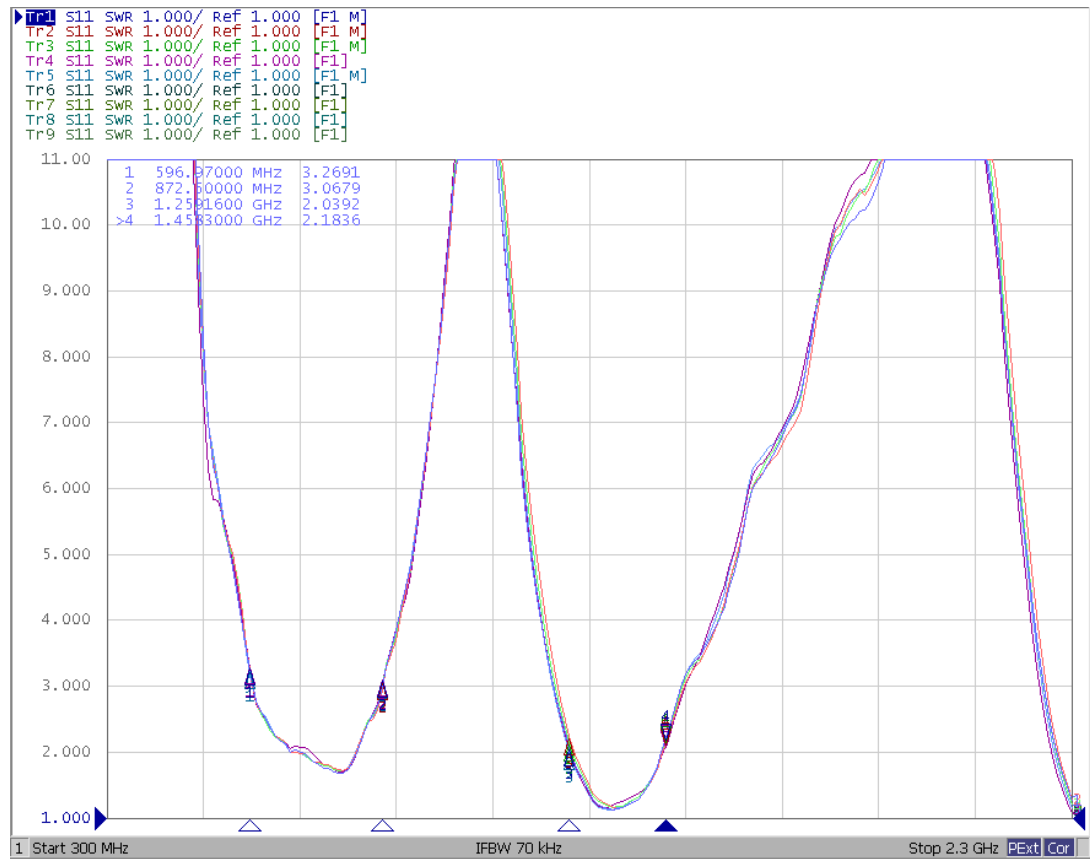
- Tr1 4+4 #1차금형 안테나

- Tr2~Tr9: 4+4 #2차금형 Cav.2-1~2-8



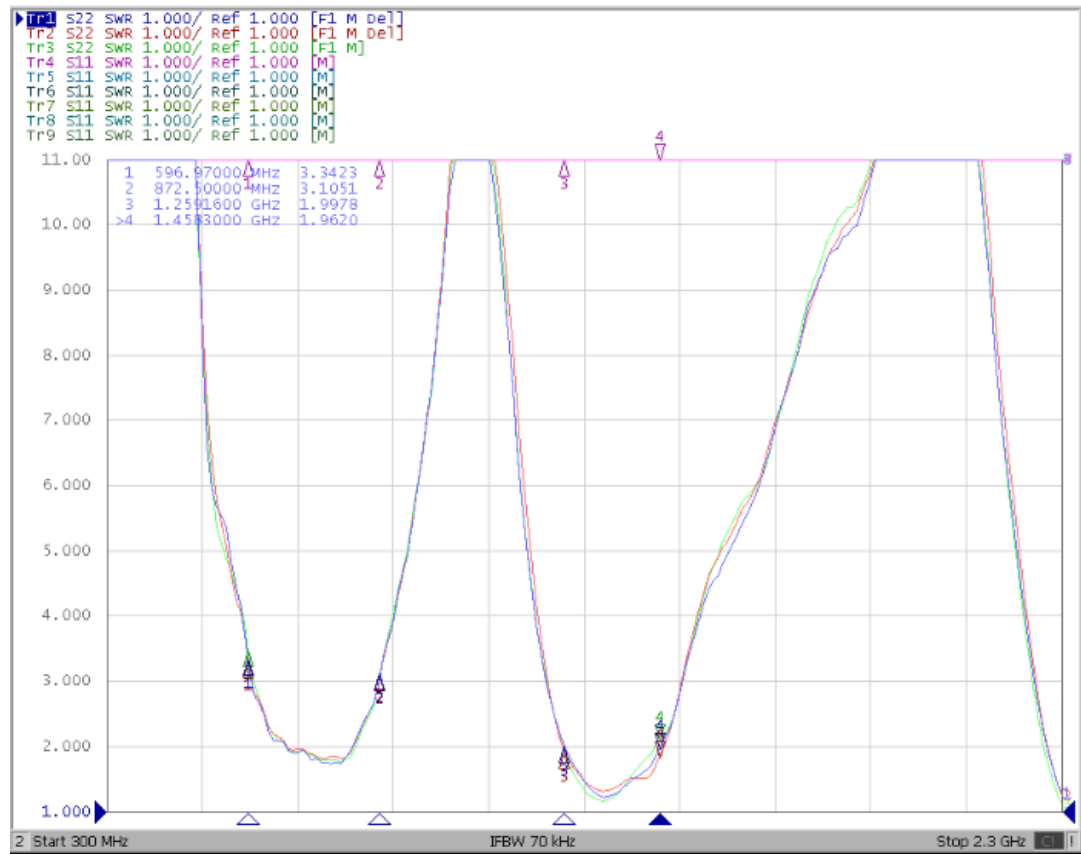
13.1.3. VSWR Comparison between #3-1 Cav. & #3-8 Cav. (Main Antenna only)

- Tr1 4+4 #1차급형 안테나
- Tr2~Tr9: 4+4 #3차급형 Cav.3-1~3-8



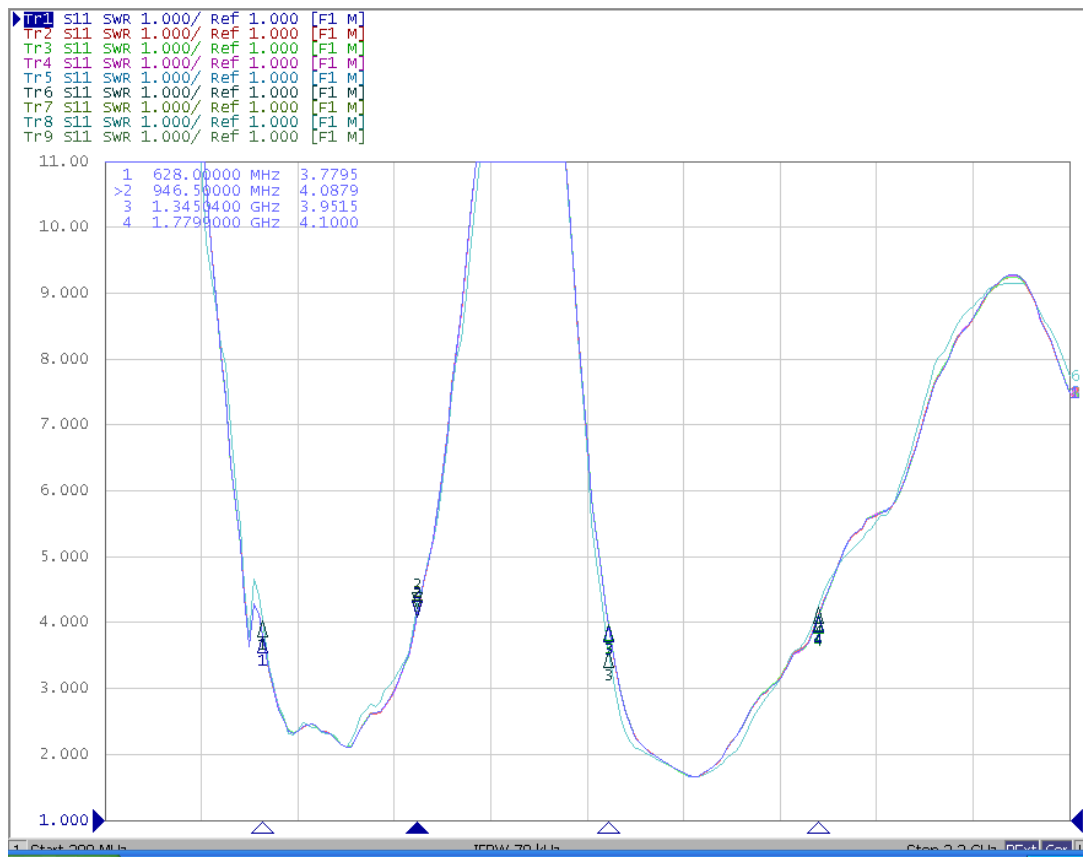
13.1.4. VSWR Comparison between #4-1 Cav. & #4-8 Cav. (Main Antenna only)

- Tr1 4+4 #1차급형 안테나
- Tr2~Tr9: 4+4 #4차급형 Cav.4-1~4-8



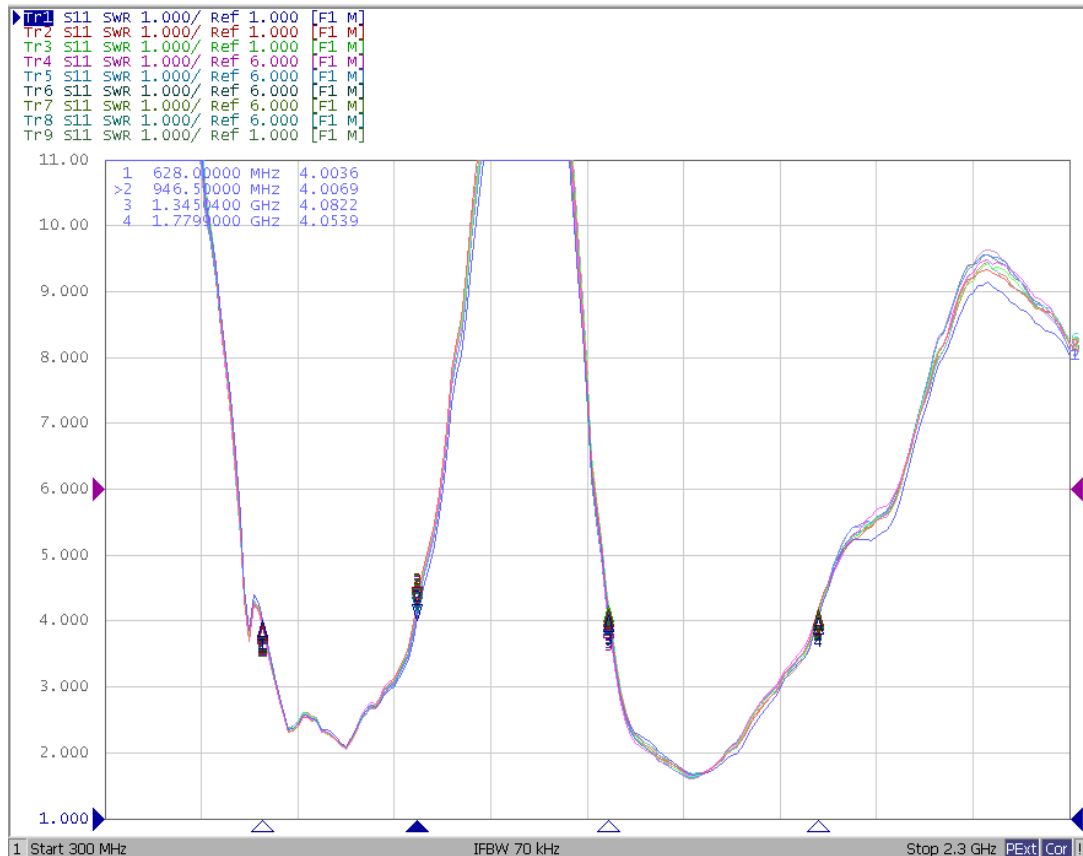
13.1.5. VSWR Comparison between #1-1 Cav. & #1-8 Cav. (Main Antenna + Rear Ass'y)

- Tr1 1+1 금형 안테나
- Tr2~Tr9: 4+4 #1차금형 Cav.1-1~1-8



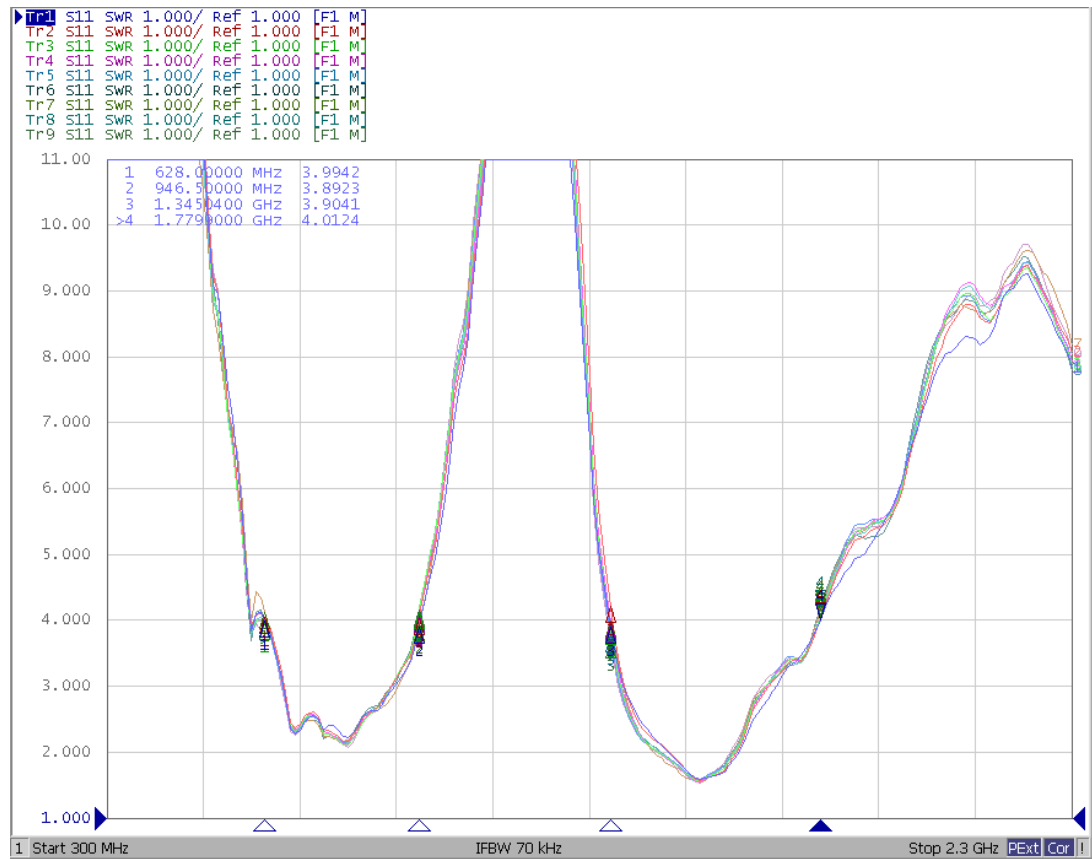
13.1.6. VSWR Comparison between #2-1 Cav. & #2-8 Cav. (Main Antenna + Rear Ass'y)

- Tr1 4+4 #1차급형 안테나
- Tr2~Tr9: 4+4 #2차급형 Cav.2-1~2-8



13.1.7. VSWR Comparison between #3-1 Cav. & #3-8 Cav. (Main Antenna + Rear Ass'y)

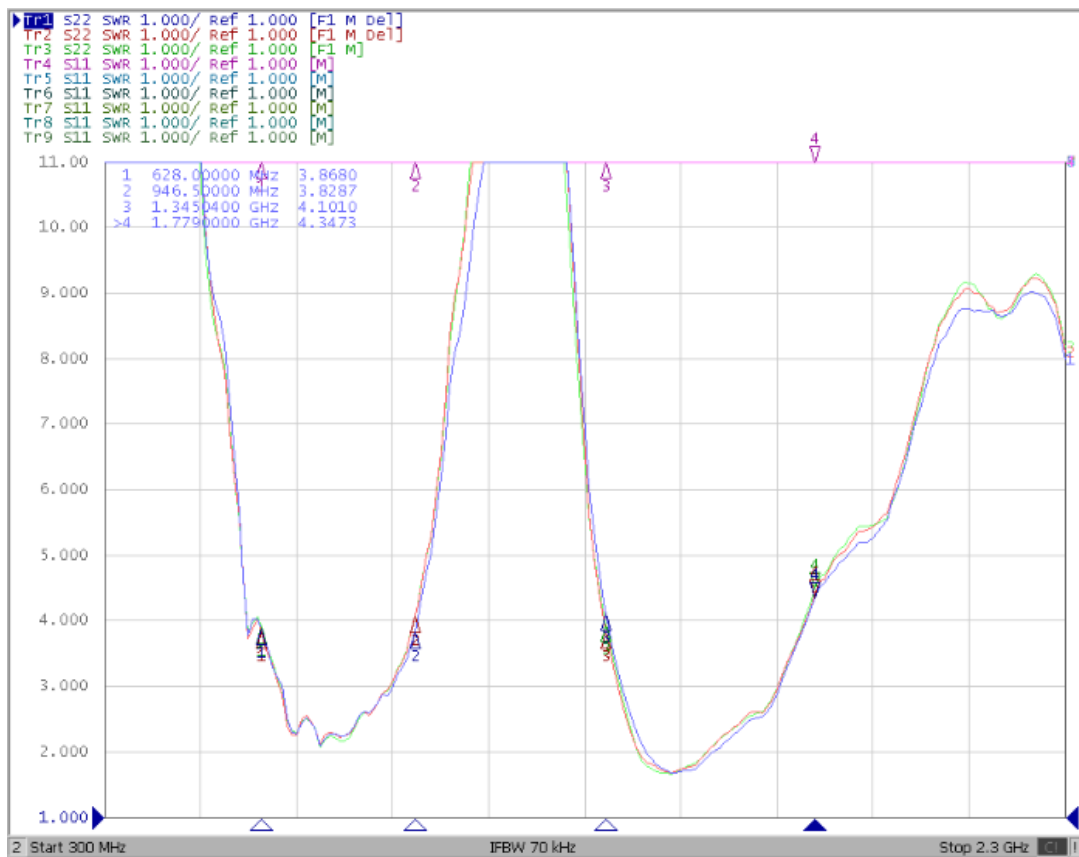
- Tr1 4+4 #1차금형 안테나
- Tr2~Tr9: 4+4 #3차금형 Cav.3-1~3-8



13.1.8. VSWR Comparison between #4-1 Cav. & #4-8 Cav.

(Main Antenna + Rear Ass'y)

- Tr1 4+4 #1차급형 안테나
- Tr2~Tr9: 4+4 #4차급형 Cav.4-1~4-8



14. 안테나 Edge 시료 VSWR 3점 정합성 측정 DATA

안테나 Edge 시료 VSWR 3점 정합성 측정 DATA

Cavity #1-1	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.05	3.21	2.15	1.87	3.02	3.05	4.26	3.92	29.02	19.16
		2	3.11	3.19	2.09	1.94	3.06	2.94	4.32	3.84	28.78	19.17
	Average		3.08	3.20	2.12	1.91	3.04	3.00	4.29	3.88	29.03	19.69

Cavity #1-2	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.05	3.21	2.15	1.87	3.02	3.05	4.26	3.92	29.02	19.16
		2	3.11	3.19	2.09	1.94	3.06	2.94	4.32	3.84	28.78	19.17
	Average		3.08	3.20	2.12	1.91	3.04	3.00	4.29	3.88	28.90	19.17

Cavity #1-3	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.03	3.23	2.12	1.82	3.05	3.04	4.29	3.97	29.10	19.12
		2	3.07	3.23	2.11	1.97	3.02	2.98	4.31	3.85	28.85	19.19
	Average		3.05	3.23	2.12	1.90	3.04	3.01	4.30	3.91	28.98	19.16

Cavity #1-4	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.07	3.23	2.19	1.85	3.00	3.07	4.21	3.98	29.14	19.13
		2	3.10	3.24	2.11	1.90	3.05	2.98	4.30	3.82	28.74	19.12
	Average		3.09	3.24	2.15	1.88	3.03	3.03	4.26	3.90	28.94	19.13

Cavity #1-5	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.08	3.19	2.17	1.85	3.05	3.08	4.23	3.90	29.10	19.22
		2	3.10	3.16	2.06	1.91	3.04	2.96	4.27	3.83	28.86	19.26
Average			3.09	3.18	2.12	1.88	3.05	3.02	4.25	3.87	28.98	19.24

Cavity #1-6	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.04	3.25	2.12	1.84	3.06	3.02	4.28	3.94	29.11	19.13
		2	3.07	3.21	2.08	1.97	3.04	2.96	4.30	3.82	28.90	19.21
Average		3.06	3.23	2.10	1.91	3.05	2.99	4.29	3.88	29.01	19.17	

Cavity #1-7	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.08	3.19	2.13	1.81	2.99	3.03	4.24	3.88	29.07	19.14
		2	3.12	3.15	2.13	1.92	3.07	2.96	4.35	3.86	28.72	19.13
Average		3.10	3.17	2.13	1.87	3.03	3.00	4.30	3.87	28.90	19.14	

Cavity #1-8	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.08	3.19	2.22	1.91	2.97	3.11	4.30	3.86	29.11	19.11
		2	3.13	3.21	2.04	1.92	3.13	2.90	4.34	3.89	28.86	19.08
Average			3.11	3.20	2.13	1.92	3.05	3.01	4.32	3.88	28.99	19.10

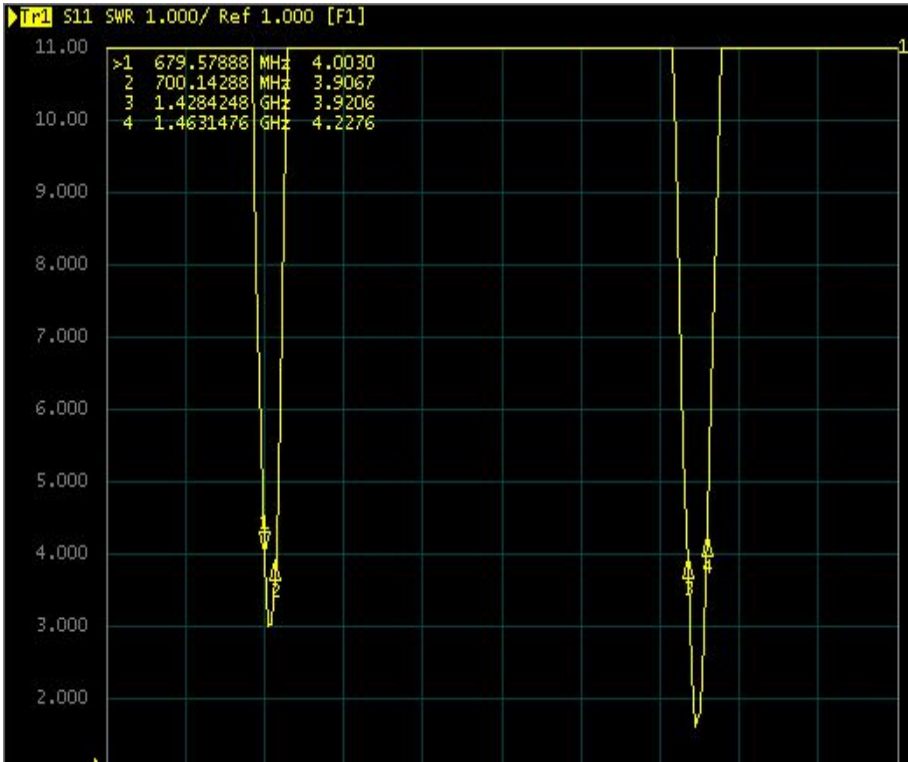
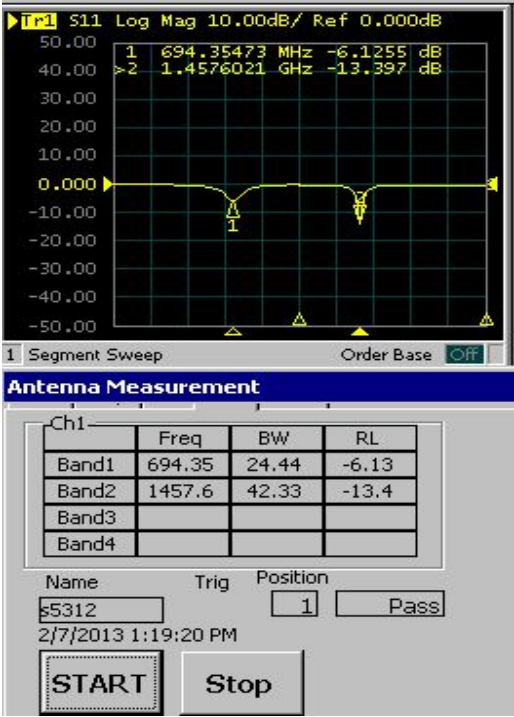
상한 샘플	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	2.75	3.64	1.86	2.09	2.72	3.35	3.95	4.26	29.35	19.42
		2	2.80	3.49	1.76	2.24	2.81	3.22	4.06	4.01	29.05	19.44
Average			2.78	3.57	1.81	2.17	2.77	3.29	4.01	4.14	29.20	19.43

하한 샘플	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.29	3.08	2.38	1.53	3.33	2.56	4.48	3.68	28.78	18.94
		2	3.35	2.81	2.34	1.84	3.36	2.76	4.56	3.51	28.52	18.88
Average		3.32	2.95	2.36	1.69	3.35	2.66	4.52	3.60	28.65	18.91	

불량 MASTER 표준시료	구분		단품특성				조립특성 (SPK/사출)				Set특성	
											Gain(dBm)	
	측정 주파수(MHz)		621	872	1295	1462	605	957	1323	1638	EGSM	WCDMA1
	측정값	1	3.64	2.61	2.91	1.46	3.31	2.44	4.81	3.66	28.30	18.52
		2	3.83	2.72	2.79	1.37	3.68	2.41	5.10	3.22	28.17	18.46
Average			3.74	2.67	2.85	1.42	3.50	2.43	4.96	3.44	28.24	18.49

15. TE Qingdao RF Jig

14.1.Log Mag. and VSWR(3:1) data for reference sample



15.2 Spec. with tolerance

63812							
BAND1	REF		SPEC	BAND2	REF		SPEC
	F _c	694.35MHz	+/-7MHz		F _c	1457.6MHz	+/-15MHz
	BW	24.44MHz	+/-3MHz		BW	42.33MHz	+/-3MHz
	RL	-6.13dB	+/-0.05		RL	-13.4dB	+/-0.05

상기 세가지 Spec (Fc, BW, RL) 중 한가지라도 fail 항목이면 fail 로 분류

1. 표준 지그 Ref Sample : 승인용 샘플과 동일한 표준시료
2. 표준 지그 Low shift Limit Sample:표준지그에서 VSWR 0.5 미만의 Low shift limit 샘플
3. 표준 지그 high shift Limit Sample:표준지그에서 VSWR 0.5 미만의 high shift limit 샘플

15.3 Limit Sample TE Qingdao Jig 확인 test

<표준 지그 Low shift Limit Sample >



<표준 지그 high shift Limit Sample >

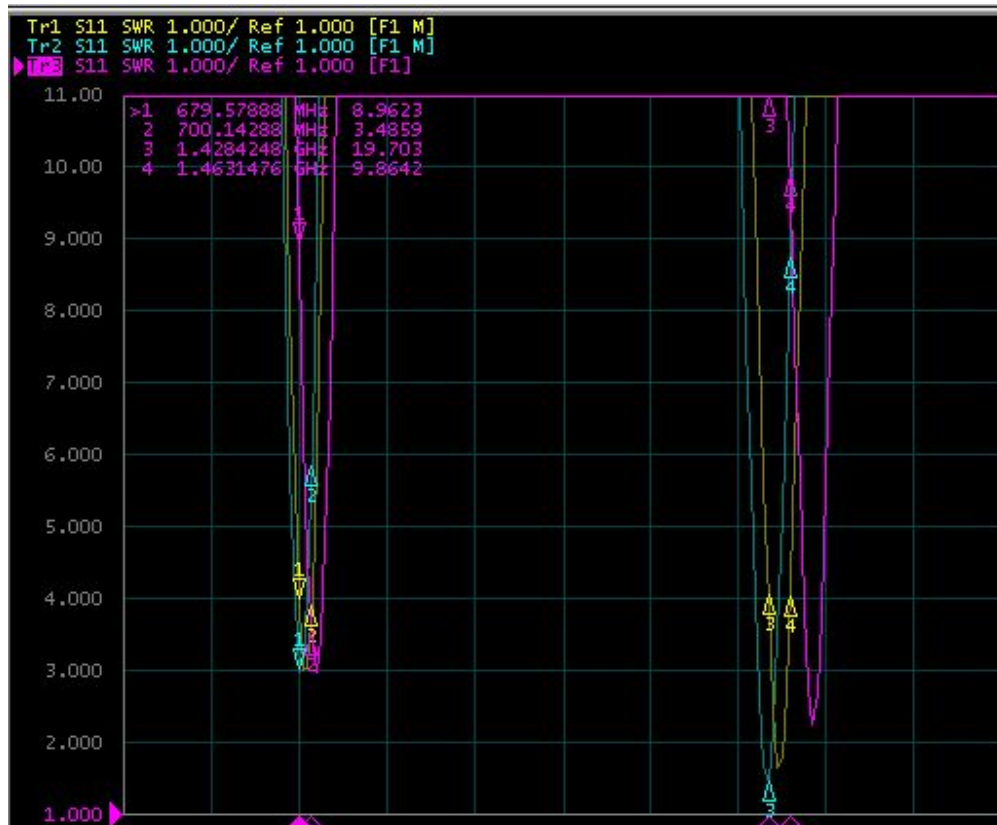


15.4 표준지그 Reference sample, high/low Limit sample VSWR 비교

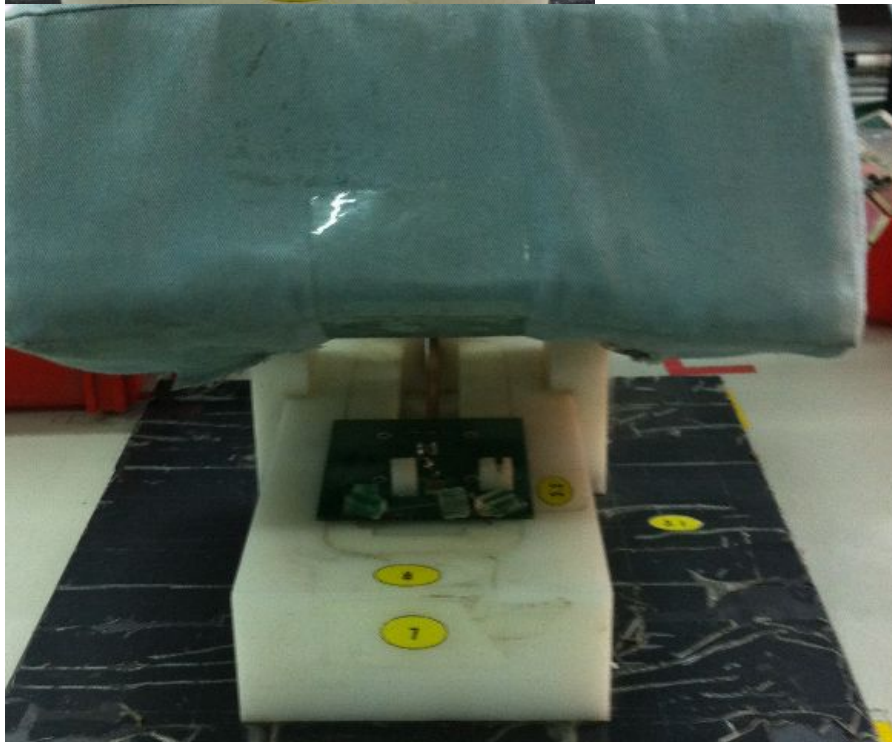
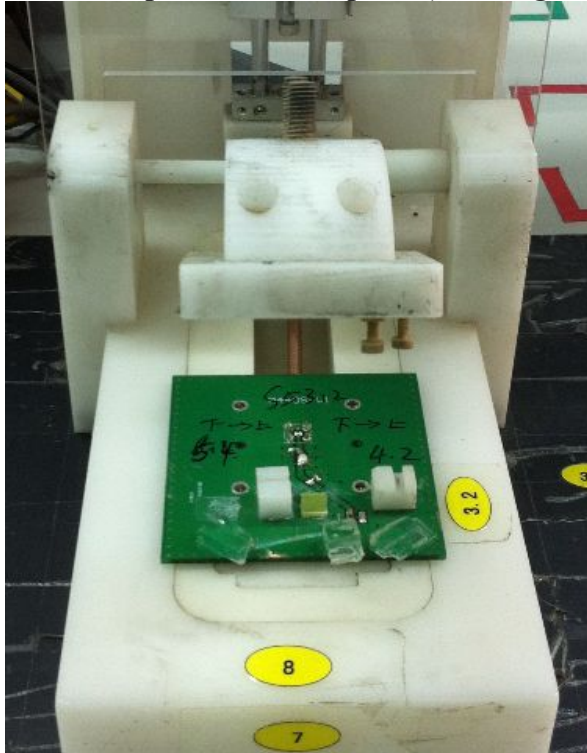
Tr1 : Ref Sample VSWR on TE Qingdao RF JIG

Tr2 : 표준지그 Low shift Limit Sample VSWR on TE Qingdao RF JIG

Tr3 : 표준지그 High shift Limit Sample VSWR on TE Qingdao RF JIG



15.5 RF inspection fixture photo(TE Qingdao)



작업표준서

재	작 성	검 토	승 인
1	2007.08	11	11

16. Molding parameters

호기	관리번호	극점번호	거래처	모델	포장	포변	CAVITY	C/T	일 생산 SHOT (24hr 기준)	일일생산수량 EA (24hr 기준)
호기	01P-1-10S-103	-	단이로	GT-0850	ANTENNA	2100870-1	1+1	25.13	3,453	13,752
원재료	구분	원자재명	GRADE NO.	색상	SHOT종량		EA당종량 (g)	전조온도	전조시간	OATE
					제품(NET)(g)	8PRUE(g)	총종량(g)			
1 차	PC	EH-1050	BLACK	5.92	18.65	24.57	6.14	100 ℃	4 H/R	PIN POINT
2 차	ABS	AV08437	HT	0.23	14.62	14.90	6.73	80 ℃	4 H/R	PIN POINT
온도	구분	NH	1H	2H	3H	크림온도	상속	하속	결	검
1차실린더	305/305±5%	300±5℃	295±5℃	295±5℃	295±5℃	1차부	75±5℃	70±5℃	개	고속
2차실린더	270/285±5%	295±5℃	245±5℃	225±5℃	225±5℃	2차부	75±5℃	70±5℃	속	저속
사출조건	구분	사출압력	사출속도	배압	사출시간(초)	중간시간(초)	냉각시간(초)	CYCLE TIME (초)	비	고
1차실린더	57±5%	58/53±mm/s	10±5%	3.0	9.13	13	25.13	1	1	1
2차실린더	38±5%	48±mm/s	15±5%	2.0	9.13	13	25.13	2	2	2
개	구분	보압	8M	회전수	개방위치	크림력(TON)	크림보로	스크류φ	28φ	32φ
1차실린더	57/53±5%	52mm	1309PM	57mm	140TON	0.8mm	28φ	4	4	4
2차실린더	38±5%	30mm	1209PM	35mm	140TON	0.8mm	32φ	5	5	5
포장규격				일시용량		포장방법		작업순서 및 방법		
1	포장 (15롤_신)	250mm x 300mm	34.4장	1	지름을 이용하여 400개씩 지퍼백에 포장한다.	1	1116 1-10L를 이용 크림을 채워 한다. (외사사출금지)	1	1116 1-10L를 이용 크림을 채워 한다. (외사사출금지)	1
2	포장할 수량	400EA	-	2	작업표준서에 준하여 샘플조건을 설정한다.	2	작업표준서에 준하여 샘플조건을 설정한다.	2	작업표준서에 준하여 샘플조건을 설정한다.	2
3	PAO(규격)	8호(475*320)	8장	3	3호BOX 맨 밑에 3호PAO를 넣고 에어백을 얻은 후 18을지름 넣는다.	3	3호BOX 맨 밑에 3호PAO를 넣고 에어백을 얻은 후 18을지름 넣는다.	3	3호BOX 맨 밑에 3호PAO를 넣고 에어백을 얻은 후 18을지름 넣는다.	3
4	BOX원료(규격)	8호(485*330*330)	2.1장	4	유리판과 샘플링을 할정지침에 준하며, 사출물 즉제발생시	4	유리판과 샘플링을 할정지침에 준하며, 사출물 즉제발생시	4	유리판과 샘플링을 할정지침에 준하며, 사출물 즉제발생시	4
5	BOX수량	6,400EA	-	5	M808조치사항에 따라 조치하며, 폐기물은 지정된 장소에 폐기.	5	M808조치사항에 따라 조치하며, 폐기물은 지정된 장소에 폐기.	5	M808조치사항에 따라 조치하며, 폐기물은 지정된 장소에 폐기.	5
6	원재료의사출량(kg)	1차	85kg	2차	52kg	3	리이드로 절단한다.	6	작업표준서에 준하여 샘플조건을 설정한다.	6

17. Outgoing inspection report

Supplier	prepared	checked	approved	INSPECTION REPORT											
Tyco	郭娜娜	刘福强	王旭												
Delivery date		2013-11-20		Customer P/N											
Supplier		Tyco Electronics		Part Name.		ANTENNA for SM-G350									
inspection level		VL=IV		Part No.		2108670-1									
Inspection date		2013-11-20		Inspector		郭娜娜									
Inspection Item	Sampling Q'ty	Requirement	Inspection result												
			Lot no:	13325-1											
Appearance	40pcs	To meet VQD(Visual Quality Document)	All are acceptable.												
Plating thickness	3pcs/lot	Cu: 12±2um		11.972	11.988	11.971									
		Ni: 4±1um		3.991	3.972	3.888									
Peeling-off	3pcs/lot	Adhesion test standard		OK	OK	OK									
RF Test	40pcs	Set-up RF parameters	All are acceptable according to set up standard.												
RoHS	3pcs	customer requirement	Acceptable level												