



Product Approval specification

SLC-150S42GA

LTE BAND42 Antenna

WiFi DUAL Antenna

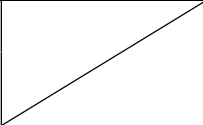
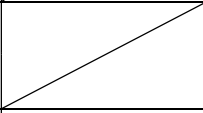
Head Office R&D Center :

1010-ho Shinil IT UTO 13 LS-ro , Gunpo-si, Gyeonggi-do, 435-831, Korea

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

Antenna Approval sheet

ITEM NAME	LTE Antenna & WiFi Antenna
MODEL/ BAND	SLC-150T42GA 3.5GHz & WiFi Dual
CODE NAME	TP-L42SS4-188MD Cat15 LTE TP-WDS4-189M , D WiFi Dual
CUSTOMER CODE	5A04-0112 LTE , 5A04-0113 WiFi M , 5A04-0114 WiFi D
CUSTOMER	SEOWON-INTECH
PROVIDER	TELLESTAR

TELLESTAR	Classification	DIRECTOR	EXAMINATION	APPROVAL
	RF			
APPROVAL	MECHANICAL			
CUSTOMER	Classification	DIRECTOR	EXAMINATION	APPROVAL
	RF			
APPROVAL	MECHANICAL			



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	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

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1 Revision List

NO	Date	Before change	After change	Reason	Rev.
1	2022.02.07			New	1.0

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2.1 Specification

2.1.1 Electrical Specifications – SET Measurement conditions (LTE)

Frequency Range		3400~3800MHz MAIN U0	3400~3800MHz MAIN U1	3400~3800MHz DIV U0	3400~3800MHz DIV U1
V.S.W.R Max		4.0:1	4.0:1	4.5:1	4.5:1
Gain	Peak Max	4.5	4.8	4.7	3.3
Impedance		50Ω			
Polarization		Linear			
Radiation pattern		Omni-Directional			

2.1.2 Electrical Specifications – single product conditions

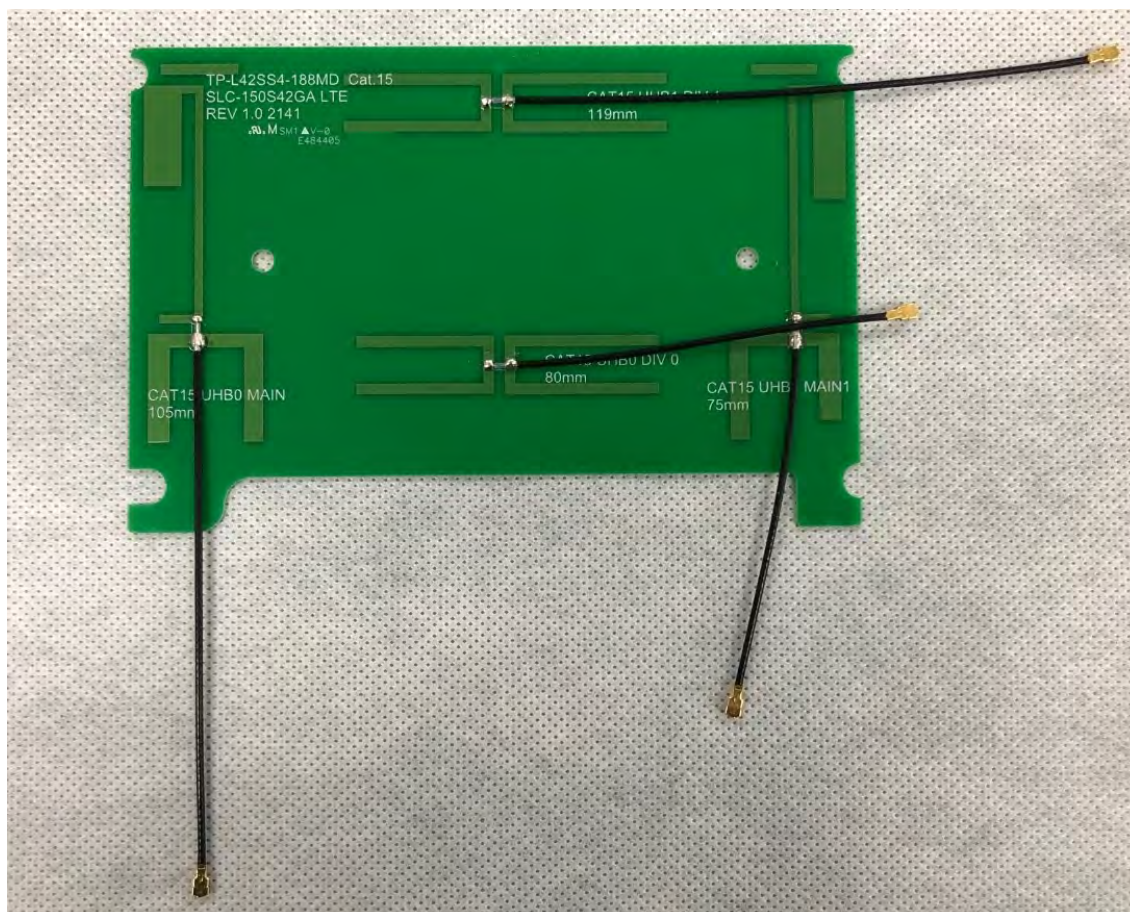
Frequency Range		3400~3800MHz MAIN U0	3400~3800MHz MAIN U1	3400~3800MHz DIV U0	3400~3800MHz DIV U1
V.S.W.R Max		4.5:1	4.5:1	4.5:1	4.5:1
Impedance		50Ω			
Polarization		Linear			
Radiation pattern		Omni-Directional			

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2.1.3 Mechanical specification

Overall length	Refer to drawing (ref.25)
Operating Temperature	-40°C ~ +85°C
Material, Color	FR-4 0.85T GREEN
Connector	IPEX I AU
Cable	1.37mm Black *4EA
Weight	19.8±1g

PHOTO



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2.2 Specification

2.2.1 Electrical Specifications – SET Measurement conditions (WiFi dual)

Frequency Range		2400~2485MHz MAIN	5150~5875MHz MAIN	2400~2485MHz DIV	5150~5875MHz DIV
V.S.W.R		7.0:1	3.5:1	6.5:1	3.5:1
Gain	Peak Max	1.89dBi	5.53Bi	1.77dBi	5.90dBi
Impedance		50Ω			
Polarization		Linear			
Radiation pattern		Omni-Directional			

2.2.2 Electrical Specifications – single product conditions

Frequency Range		2400~2485MHz MAIN	5150~5875MHz MAIN	2400~2485MHz DIV	5150~5875MHz DIV
V.S.W.R		7.0:1	4.0:1	7.0:1	4.0:1
Impedance		50Ω			
Polarization		Linear			
Radiation pattern		Omni-Directional			

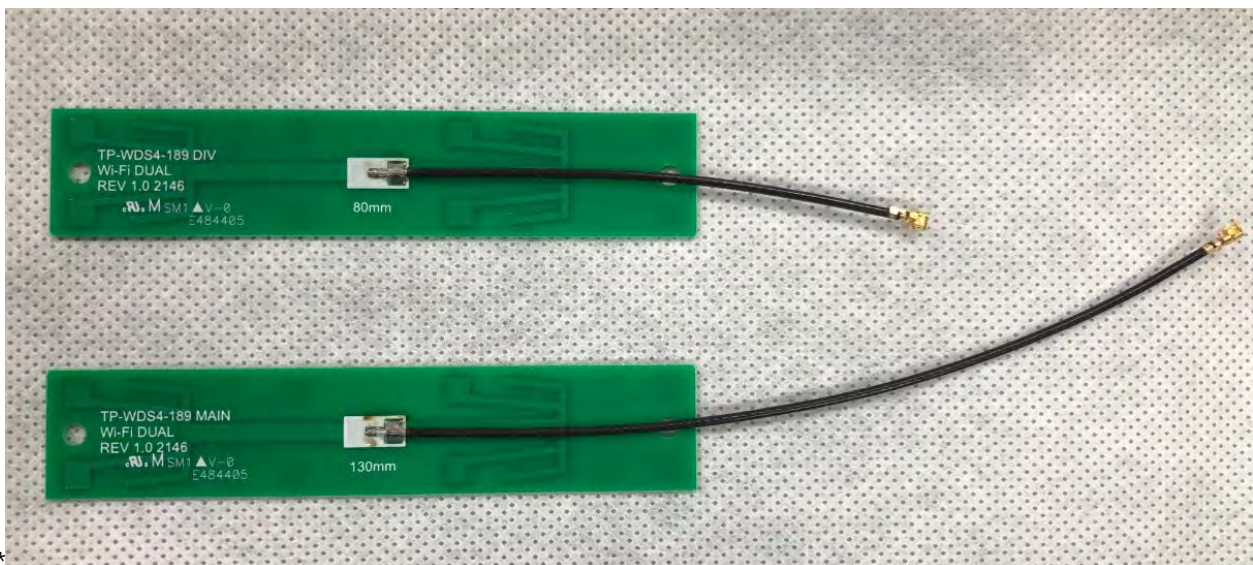
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2.2.3 Mechanical specification

Overall length	Refer to drawing (ref.25)
Operating Temperature	-40°C ~ +85°C
Material, Color	FR-4 0.85T Green Masking
Connector	IPEX I , AU
Cable	1.37mm Black
Weight	MAIN 3.38±0.5g DIV 3.16±0.5g

PHOTO

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3 Test conditions

3.1 Test Environmental Conditions

Electrical, mechanical and environmental tests are pretreated based on standard conditions and then tested.

Standard condition means 15-20°C, relative humidity of 25 to 80%, barometric pressure of 86 to 106 Kpa. Pre-treatment is intended to remove or partially neutralize the effects of pre-test history. This means the first process of the test method, to measure the characteristics of the test specimen and to ensure that it is in a safe state before testing.

(Standard condition standard: 20°C, atmospheric pressure)

- For the mechanical test, the pretreatment process shall be one hour.
- The mechanical test after the environmental test takes two hours of pretreatment.
- However, if there is a pre-test history after the pretreatment process, the pretreatment process is extended.

3.2 Test equipment

The following equipment is required for the test of the internal antenna.

Equipment	What to use	note
Network Analyzer	Measurement of VSWR and impedance of antenna	
Standard (horn) antenna	0.4~6GHz Setting the reference for the range	
anechoic chamber	Antenna gain measurement	cable, connector
Vernier calipers and microscope	Dimension measurement	
drop tester	Drop test	What to do with the test zig
Plating thickness measuring tester	Plating thickness measurement	
Salt water spray tester	Salt Water Spray Test	
constant temperature and humidity tester	High Temperature and High Humidity Test	

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4 Electrical requirements

4.1 V.S.W.R – Set measurement conditions

The antenna shall meet the VSWR requirements specified in the electrical specifications.

LTE

Frequency Range	3400~3800MHz MAIN U0	3400~3800MHz MAIN U1	3400~3800MHz DIV U0	3400~3800MHz DIV U1
V.S.W.R	4.0:1	4.0:1	4.5:1	4.5:1

WiFi Dual

Frequency Range	2400~2485MHz MAIN	5150~5875MHz MAIN	2400~2485MHz DIV	5150~5875MHz DIV
V.S.W.R	7.0:1	3.5:1	6.5:1	3.5:1

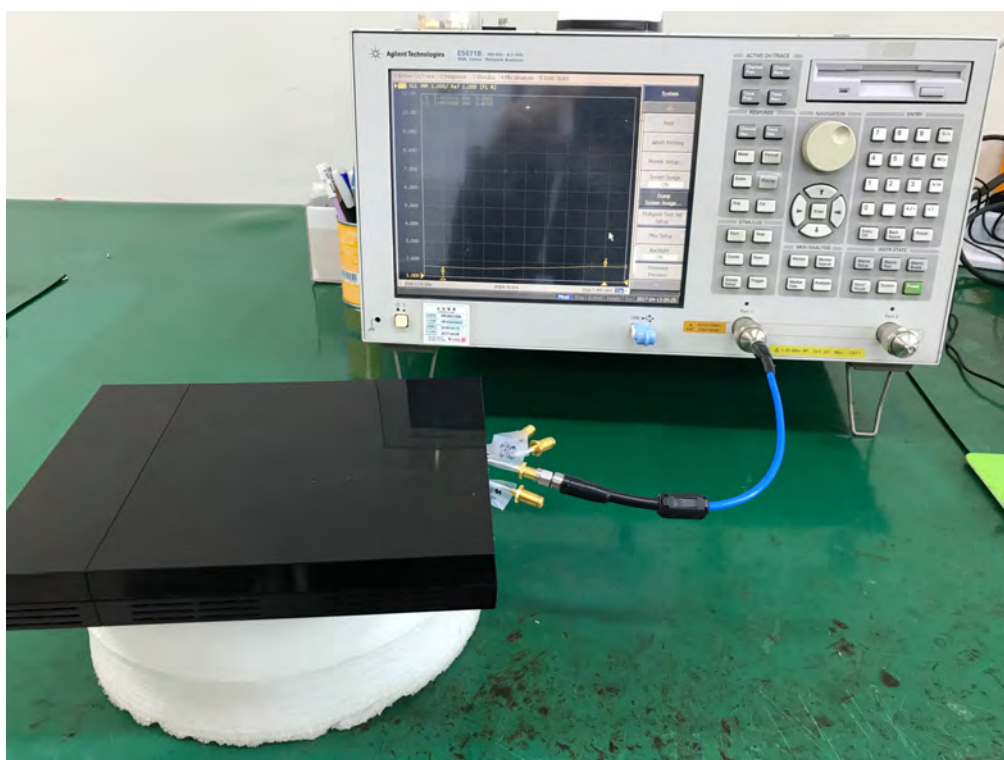


Figure 1: Testing with network analyzer

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4.2 V.S.W.R – Single product measurement conditions

The antenna shall meet the VSWR requirements specified in the electrical specifications.

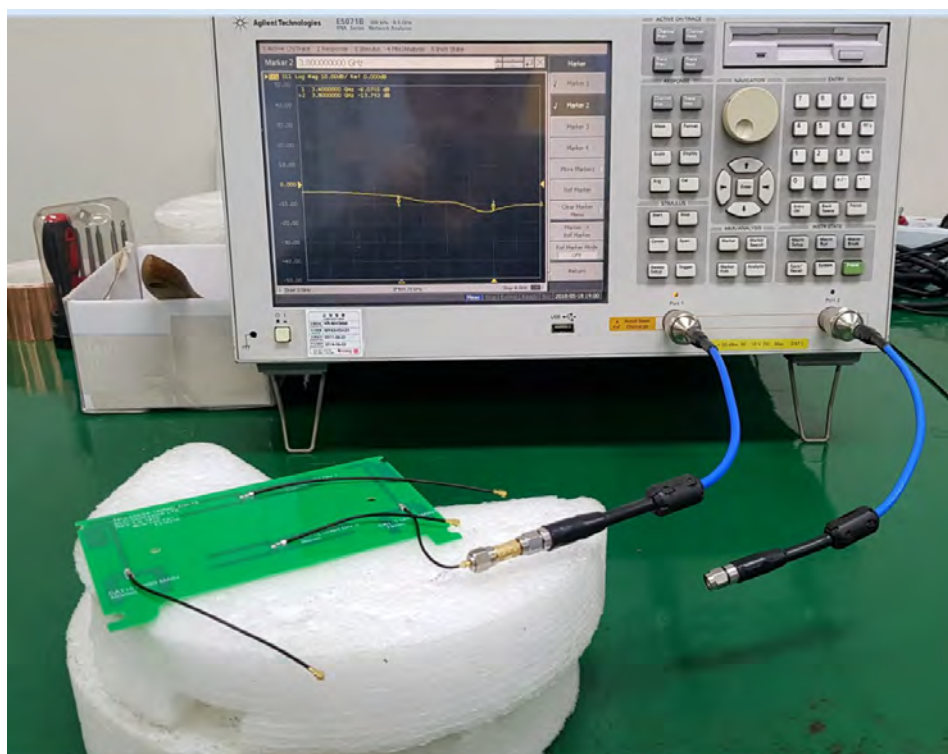
LTE

Frequency Range	3400~3800MHz MAIN U0	3400~3800MHz MAIN U1	3400~3800MHz DIV U0	3400~3800MHz DIV U1
V.S.W.R	4.5:1	4.5:1	4.5:1	4.5:1

WiFi Dual

Frequency Range	2400~2485MHz MAIN	5150~5875MHz MAIN	2400~2485MHz DIV	5150~5875MHz DIV
V.S.W.R	7.0:1	4.0:1	7.0:1	4.0:1

LTE



WiFi

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Figure 2: Testing with network analyzer

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4.3 Radiation pattern

The radiation pattern of this antenna shall have an omnidirectional pattern in the vertical plane.

4.4 Antenna Gain – SET measurement conditions : LTE & WiFi Dual

It shall be assembled in set (device) to test the gain and efficiency of the antenna and tested on fully assembled and operated AP machines. Antenna shall be tested by H, E1, E2 plan in an anechoic chamber free space. Antenna directivity shall be measured in the center of transmit and receive bands.

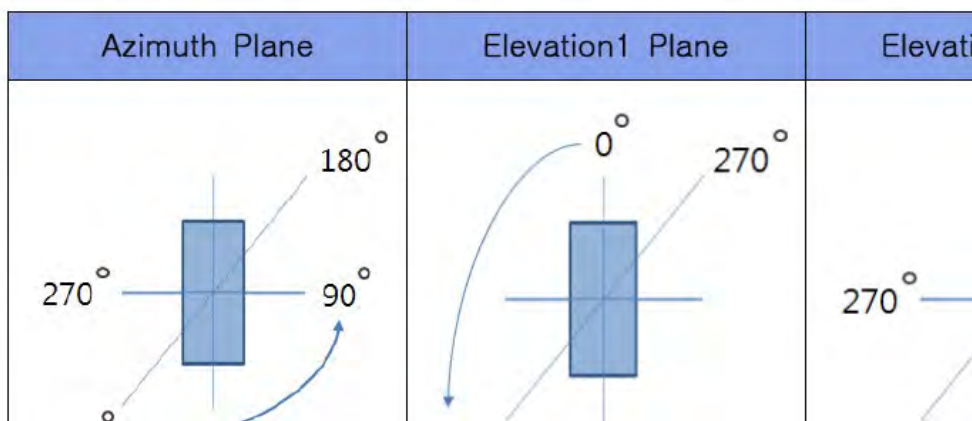


Figure 3: Geometry for for radiation patterns

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5.1 Electrical data

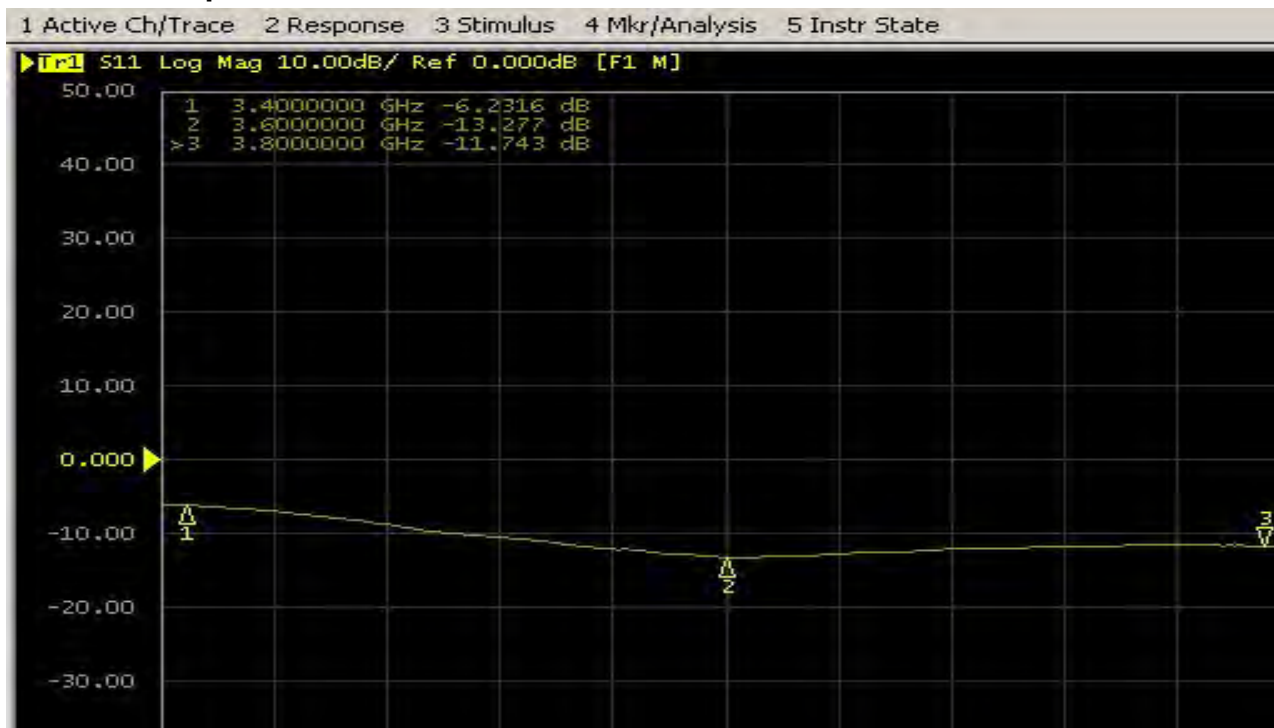
5.1 Test Standard (LTE)

		MAIN U0	MAIN U1
Frequency Range		3400~3800MHz	3400~3800MHz
V.S.W.R		2.9:1	2.33:1
(Gain) Max	PEAK	4.65	4.88
	3D	-1.55	-1.67

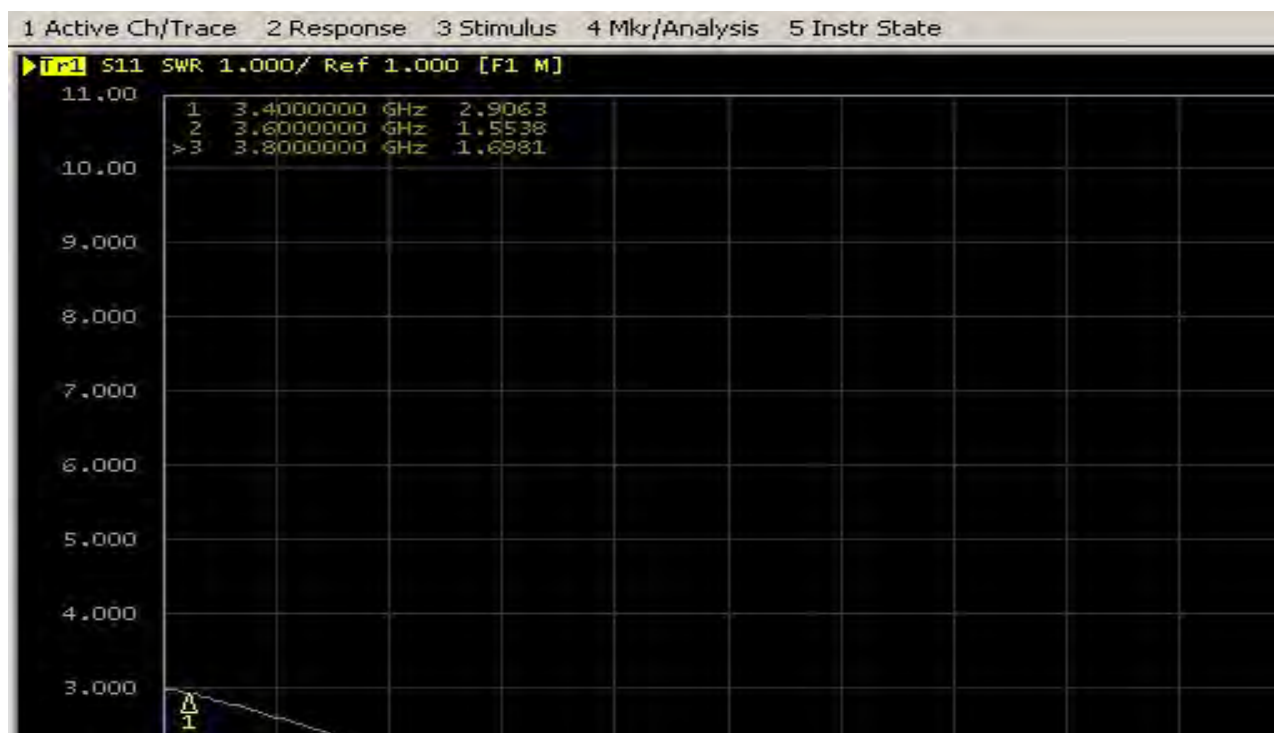
		DIV U0	DIV U1
Frequency Range		3400~3800MHz	3400~3800MHz
V.S.W.R		1.9:1	3.4:1
(Gain) Max	PEAK	4.71	3.36
	3D	-1.43	-1.91

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5.1.1 Input Return Loss : Main U0

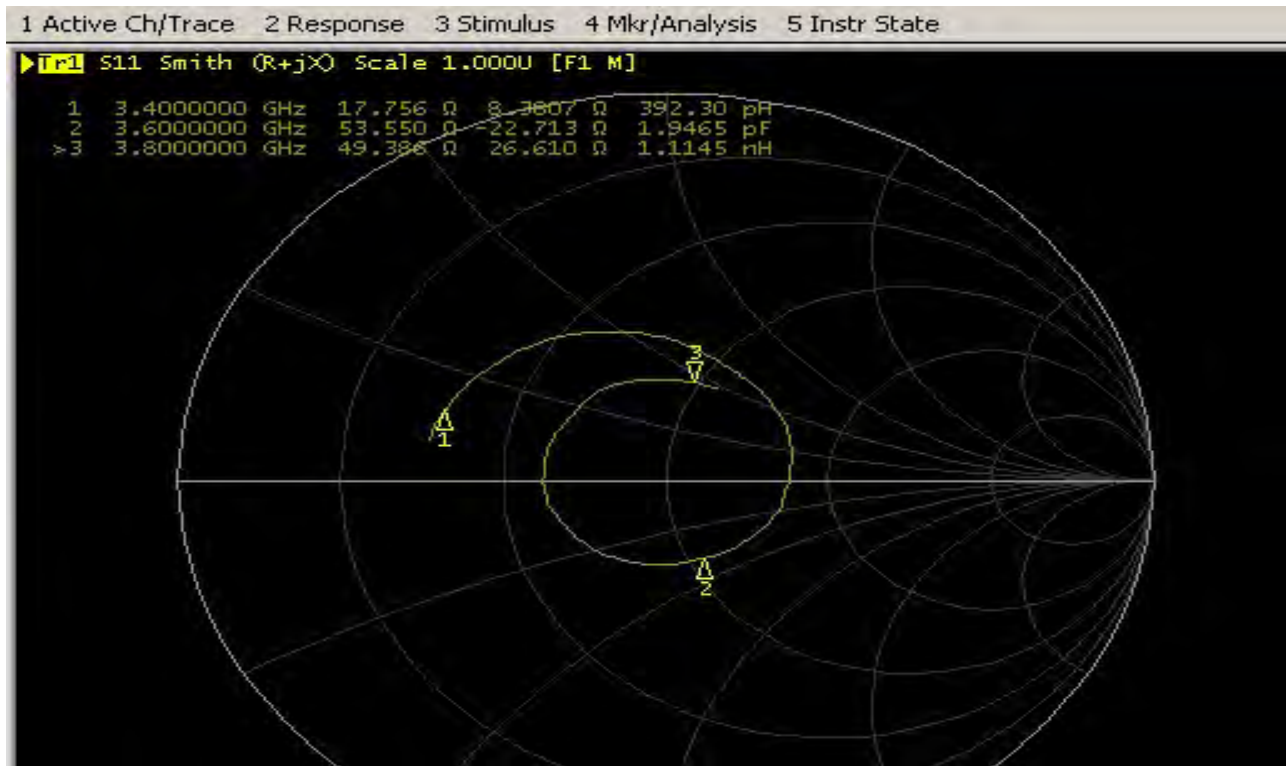


Return Loss



V.S.W.R

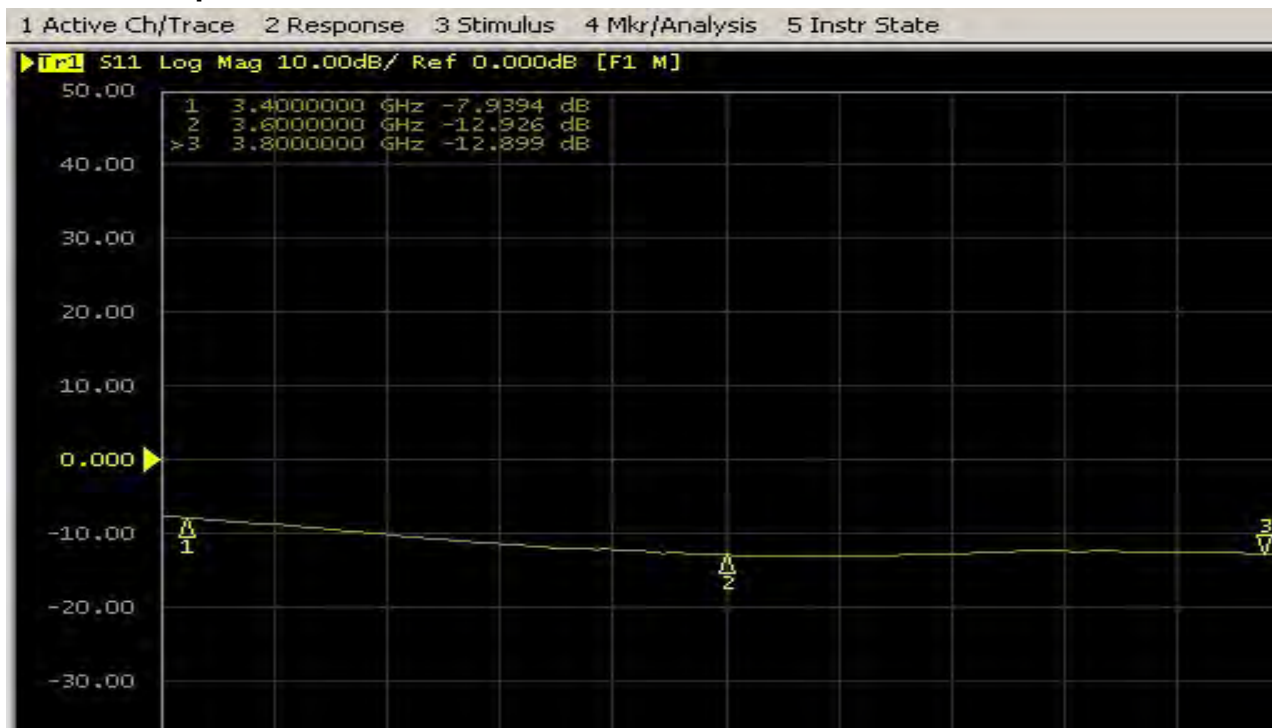
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SMITH CHART

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5.1.2 Input Return Loss : MAIN U1



Return Loss



V.S.W.R

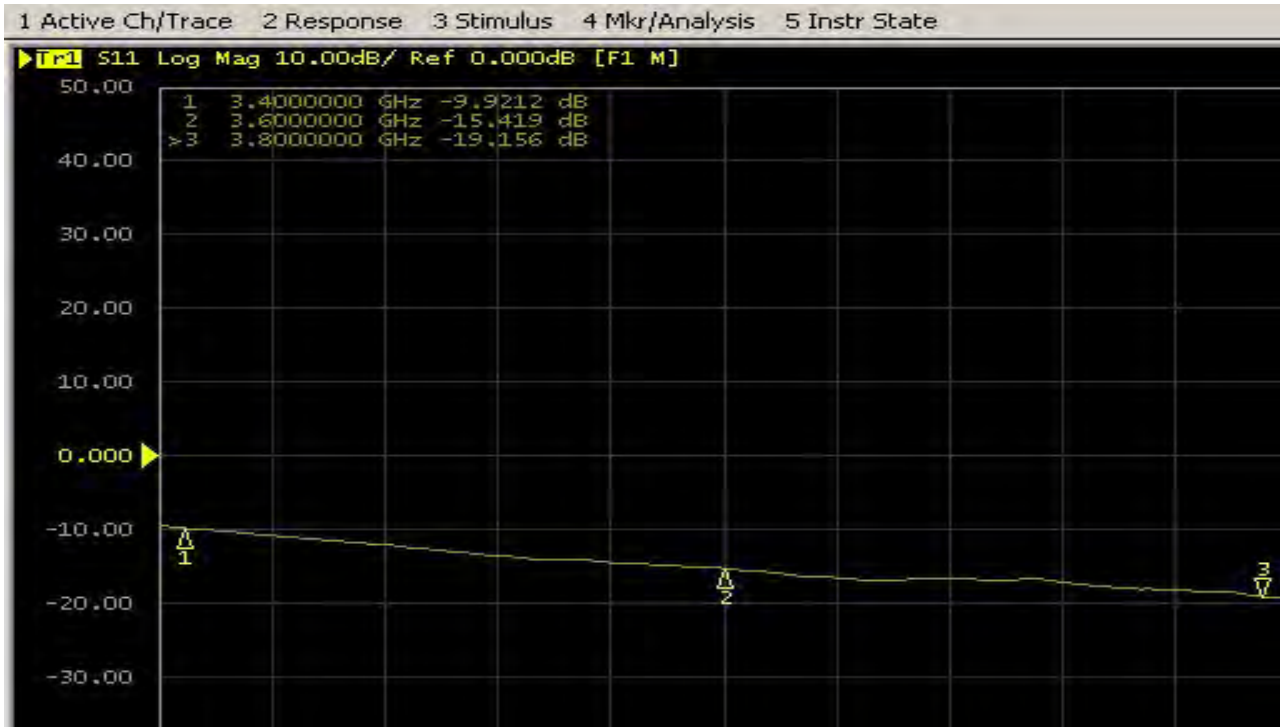
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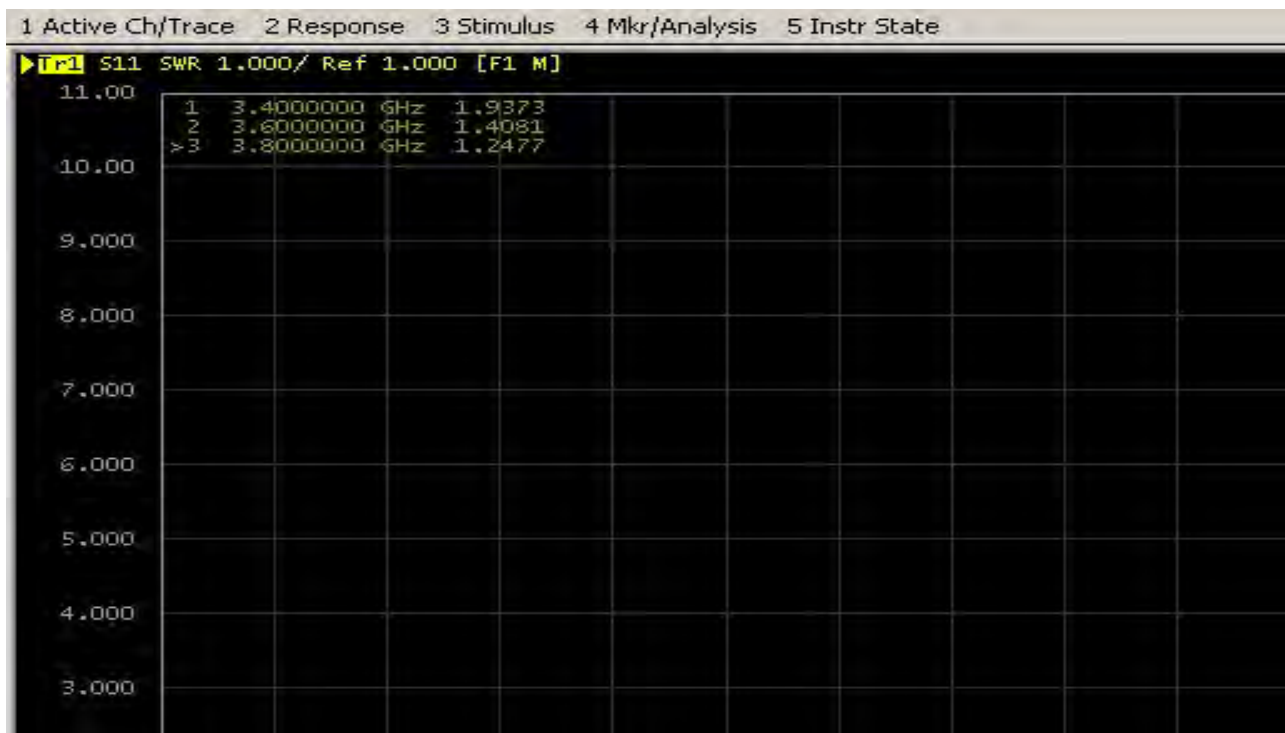
SMITH CHART

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5.1.3 Input Return Loss : DIV U0

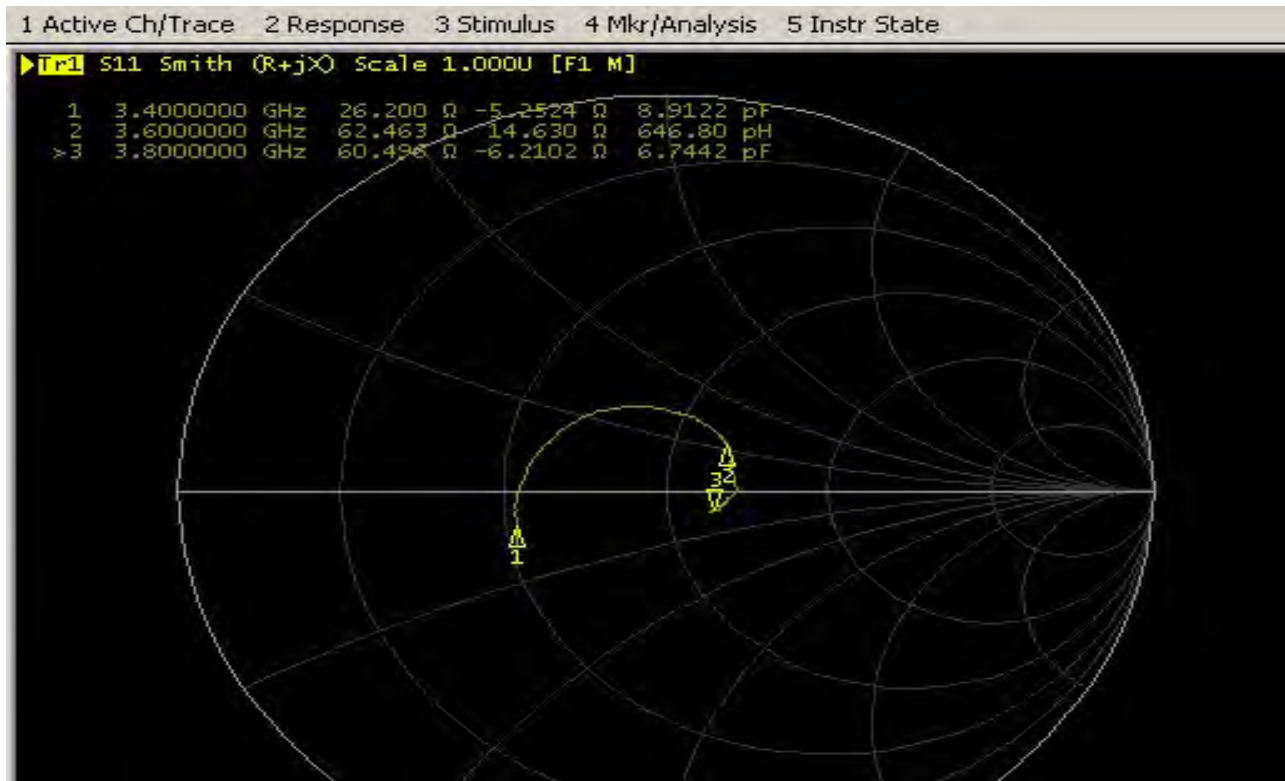


Return Loss



V.S.W.R

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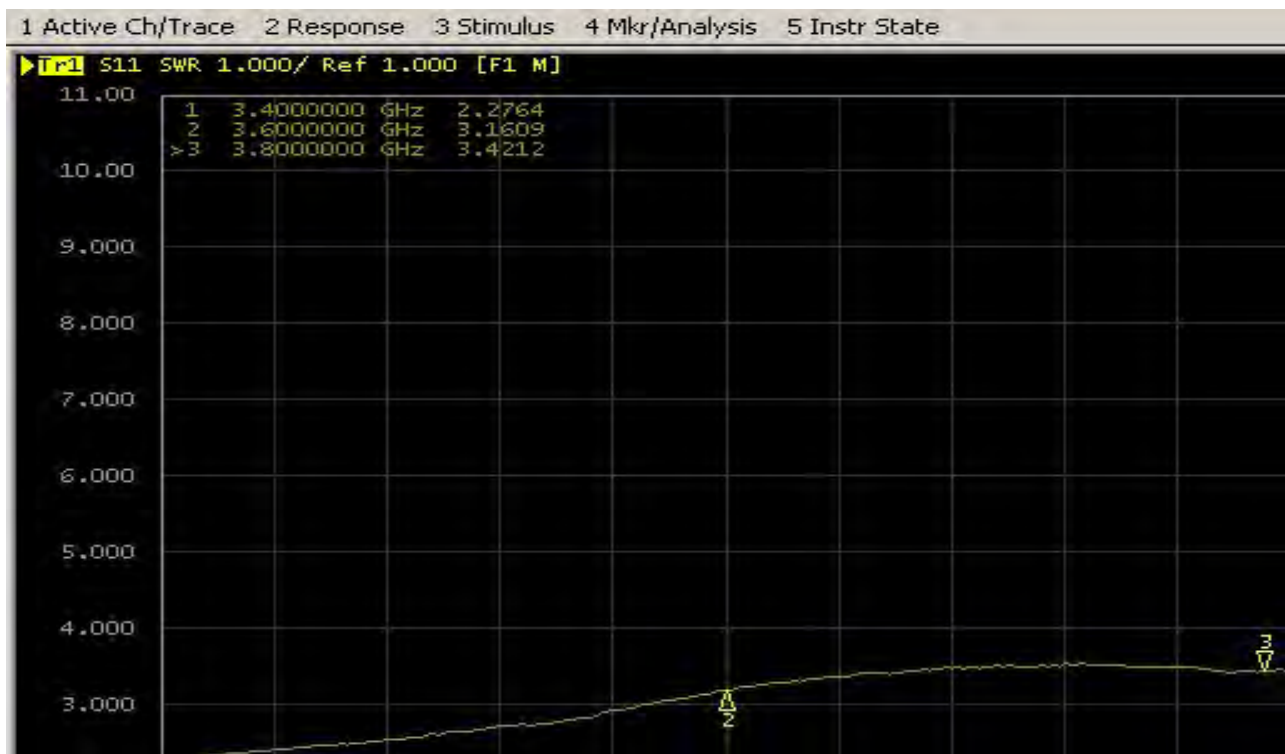
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5.1.4 Input Return Loss : Div U1

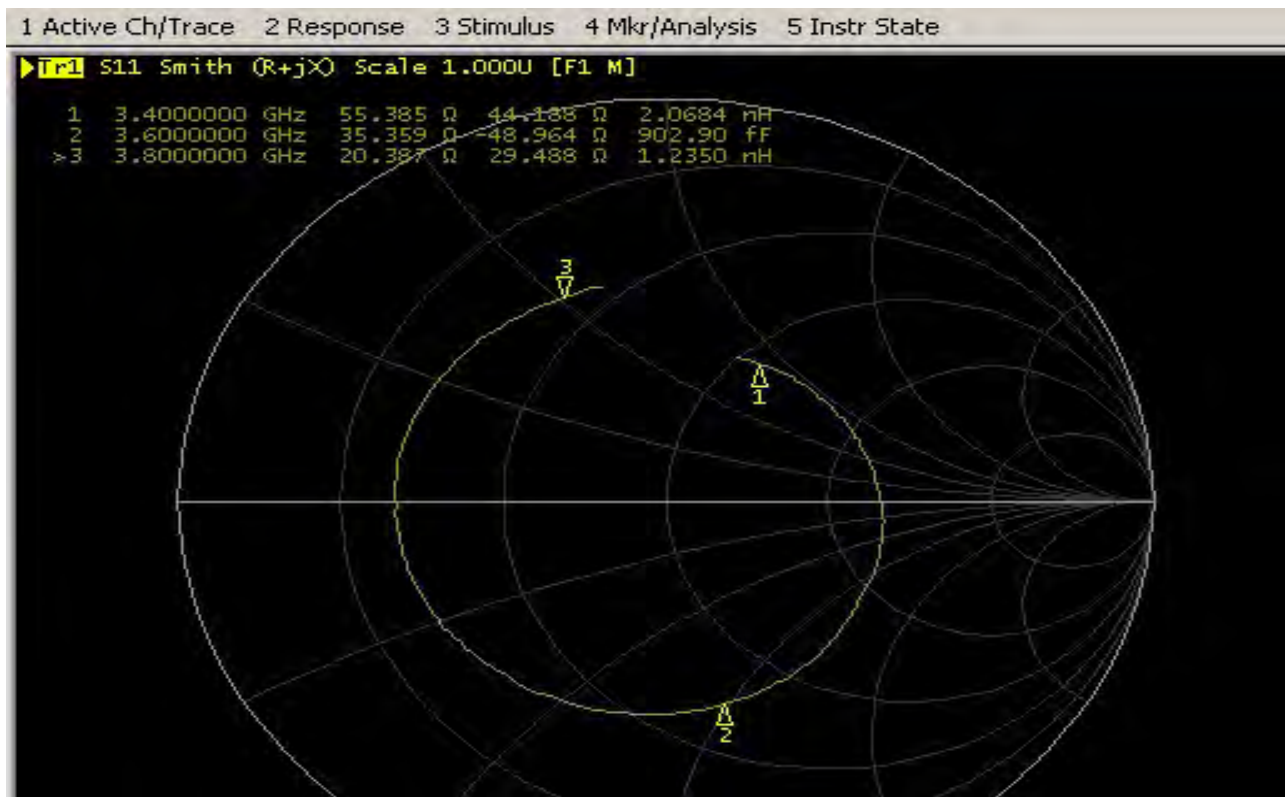


Return Loss



V.S.W.R

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Specification No.

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Customer.

SEOWONINTECH

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Normal View

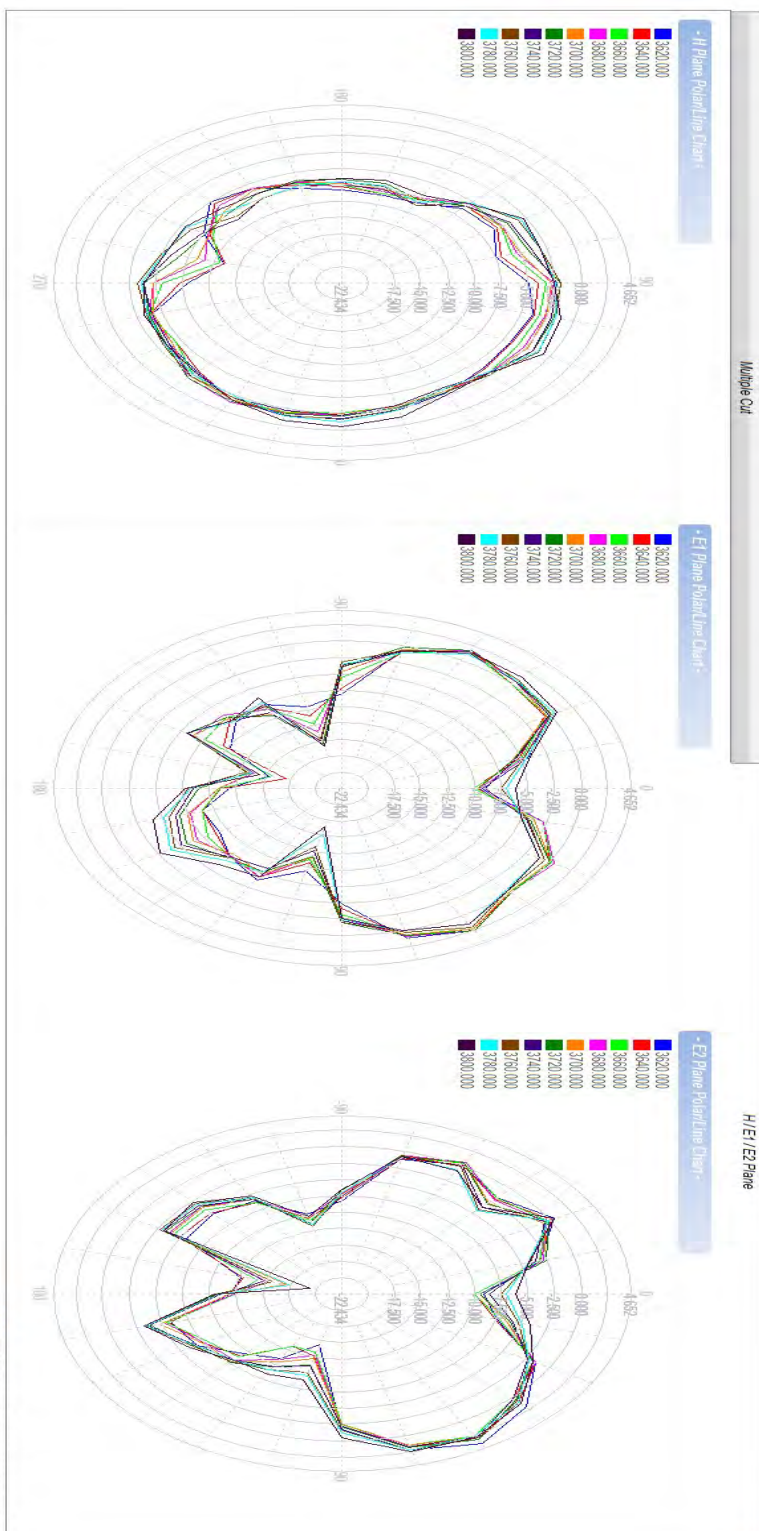
- Data -

Frequency	φ(Pol)	φ(Pol)	Sum	Angle	Eff	φ(Pol)	φ(Pol)	Angle	Eff	φ(Pol)	φ(Pol)	Angle	Eff	φ(Pol)	φ(Pol)	Angle	Eff
3.620,000	60.0	45.0	4.652	-1.594	69.285	345.0	-1.384	-4.618	161.38	60.0	2.800	-2.791	61.94	60.0	3.971	-2.840	38.75
3.640,000	60.0	45.0	4.420	-1.945	66.992	345.0	-1.765	-4.626	158.65	60.0	2.904	-2.894	63.93	60.0	3.447	-2.883	40.92
3.660,000	60.0	45.0	3.630	-1.957	63.730	330.0	-1.709	-4.422	166.77	60.0	2.340	-2.892	64.92	60.0	2.557	-3.064	42.83
3.680,000	60.0	60.0	3.692	-1.774	66.489	330.0	-1.382	-4.054	170.14	60.0	2.607	-2.886	64.94	60.0	2.804	-2.852	41.55
3.700,000	60.0	60.0	3.438	-1.977	63.435	330.0	-1.739	-4.199	170.03	60.0	2.338	-2.880	63.55	60.0	2.704	-2.890	38.33
3.720,000	60.0	315.0	3.542	-1.702	67.574	330.0	-1.609	-3.797	201.10	60.0	2.515	-2.899	64.32	60.0	3.132	-2.652	38.16
3.740,000	60.0	75.0	3.120	-2.138	67.128	60.0	-1.812	-4.054	207.47	60.0	1.938	-2.903	64.74	60.0	2.883	-2.910	38.88
3.760,000	60.0	0.0	3.043	-2.033	62.222	60.0	-1.239	-3.579	211.16	60.0	2.055	-2.845	65.24	60.0	3.343	-2.655	42.80
3.780,000	60.0	345.0	2.887	-2.324	65.959	0.0	-1.236	-3.613	208.90	60.0	1.452	-2.892	66.61	60.0	2.889	-2.753	47.53
3.800,000	60.0	0.0	2.850	-2.084	61.883	0.0	-0.458	-3.200	168.11	-60.0	1.888	-2.801	63.71	60.0	2.860	-2.424	50.52

Capture

Multiple Cut

H/E/E2 Plane



KTM Technology Co., Ltd

<3D Multiple Frequency Data >



Description

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TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

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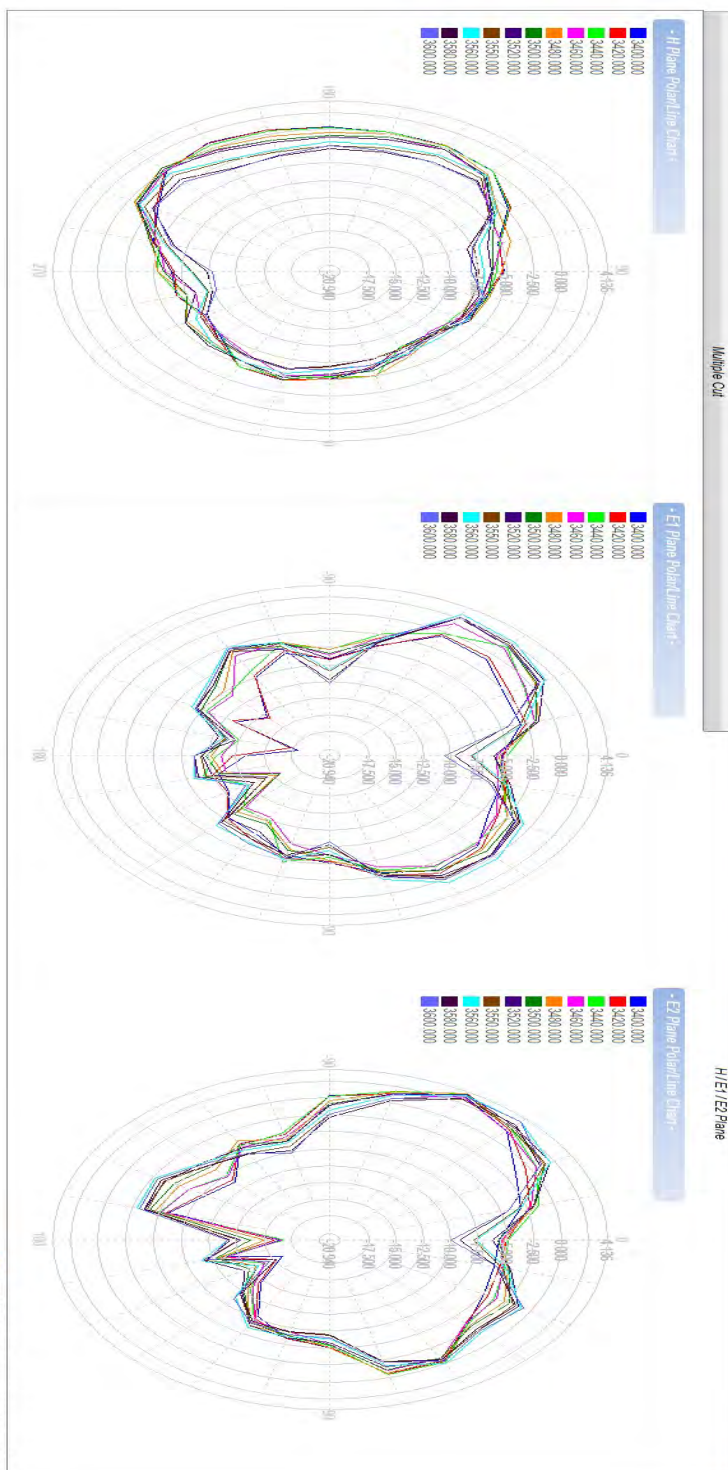
Rev.

1.0

Date

FEP 07, 2022

5.1.6 Gain - Set MAIN U1



KTM Technology Co., Ltd

		Sum				H-E=30°				E1-E=30°				E2-E=30°			
Frequency	qE[deg]	qE[deg]	Max[deg]	Angle[deg]	ET[deg]	qE[deg]	Max[deg]	Angle[deg]	B[deg]	qE[deg]	Max[deg]	Angle[deg]	B[deg]	qE[deg]	Max[deg]	Angle[deg]	B[deg]
3400.000	60.0	195.0	3.473	-2.944	50.775	210.0	0.913	-2.821	114.31	-80.0	-0.524	-4.823	60.23	-80.0	3.452	-2.790	49.02
3420.000	60.0	180.0	3.815	-2.888	53.856	210.0	0.958	-2.846	117.11	-80.0	-0.436	-4.437	61.94	-80.0	3.815	-2.823	45.04
3440.000	60.0	195.0	4.136	-2.875	57.662	210.0	0.954	-2.755	127.59	-45.0	1.521	-3.923	49.82	-80.0	4.051	-2.708	47.02
3460.000	60.0	195.0	3.481	-2.785	62.406	228.0	0.087	-3.467	120.24	-80.0	1.474	-3.995	52.28	-80.0	3.287	-2.693	53.95
3480.000	60.0	195.0	4.028	-2.189	60.406	228.0	0.668	-2.837	121.29	-80.0	2.365	-3.269	47.11	-80.0	3.892	-2.163	52.47
3500.000	60.0	195.0	3.980	-2.235	59.767	228.0	0.481	-3.188	120.38	-80.0	2.404	-3.182	46.45	-80.0	3.816	-2.220	52.37
3520.000	60.0	255.0	3.961	-1.955	63.173	228.0	0.379	-3.396	120.50	-80.0	2.661	-2.739	46.37	-80.0	3.940	-2.024	53.17
3540.000	60.0	255.0	3.839	-2.822	55.947	228.0	-0.917	-4.516	128.22	-80.0	2.401	-3.079	43.24	-80.0	2.997	-2.803	62.61
3560.000	60.0	255.0	3.899	-1.890	64.713	228.0	-0.528	-4.010	128.61	-80.0	3.057	-2.452	42.45	-80.0	3.887	-1.851	61.05
3580.000	60.0	195.0	3.186	-2.615	54.752	228.0	-1.888	-5.025	132.70	-80.0	2.420	-3.216	41.55	-80.0	3.047	-2.891	49.17
3600.000	60.0	195.0	3.880	-2.315	58.885	138.0	-2.297	-4.998	137.42	-80.0	2.653	-3.038	41.89	-80.0	3.510	-2.312	47.75

Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

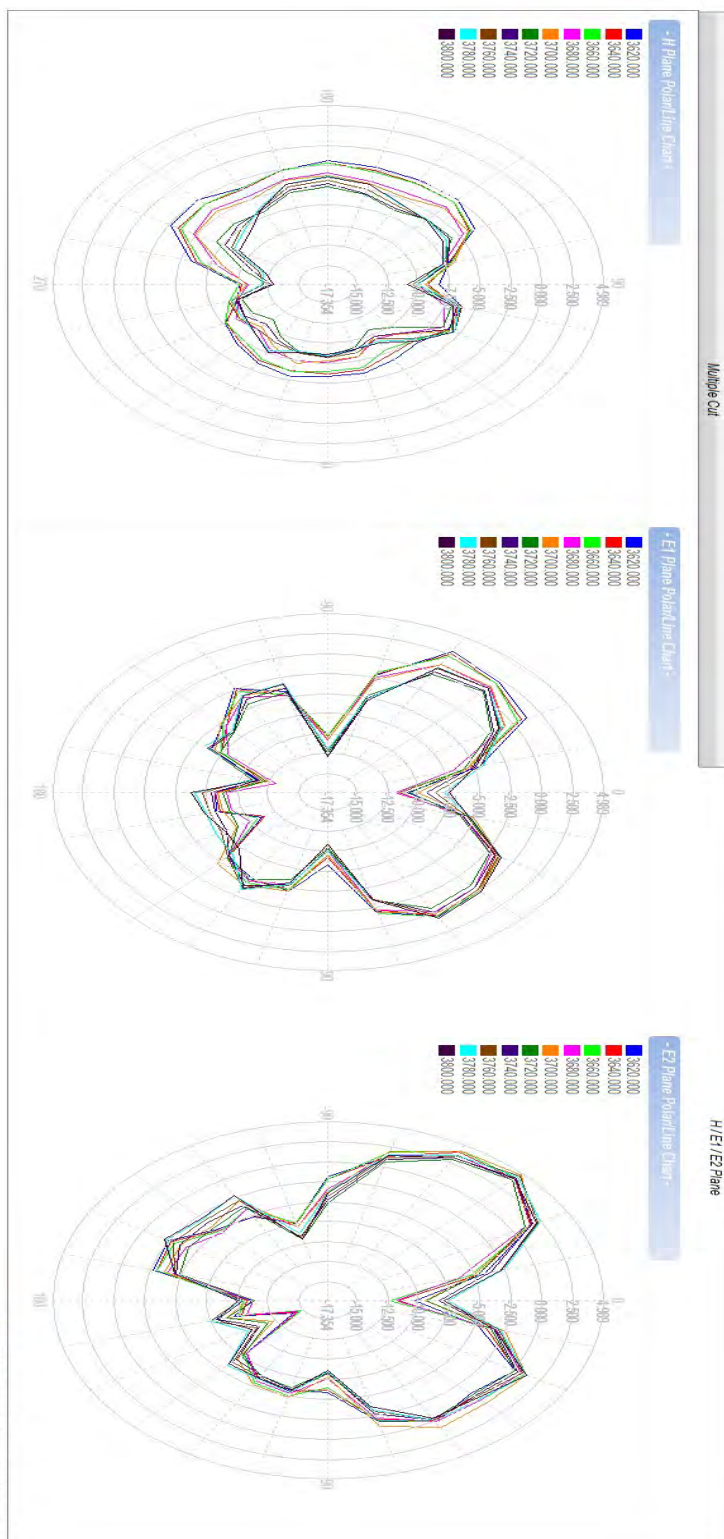
SEOWONINTECH

Rev.

1.0

Date

FEP 07, 2022



Normal View										Capture
- Data -										
Sum										
Frequency	q[deg]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	
3800.000	60.0	195.0	4.366	-1.068	65.974	180.0	-1.951	136.59	-60.0	
3840.000	60.0	195.0	4.329	-1.955	64.048	180.0	-2.180	5.065	134.66	
3880.000	60.0	195.0	4.652	-1.699	60.971	180.0	-2.225	-5.144	134.42	
3880.000	45.0	195.0	4.125	-2.223	59.943	180.0	-3.450	-6.265	138.99	
3700.000	45.0	195.0	4.999	-1.672	68.043	180.0	-3.615	-5.208	141.50	
3720.000	45.0	195.0	4.148	-2.791	62.934	180.0	-3.501	-7.793	143.47	
3740.000	45.0	195.0	4.554	-2.460	56.748	180.0	-4.797	-7.537	138.32	
3760.000	45.0	210.0	4.779	-2.138	61.107	180.0	-4.705	-7.313	115.97	
3780.000	45.0	210.0	4.937	-1.980	63.384	180.0	-3.614	-7.793	101.73	
3800.000	45.0	210.0	4.571	-2.158	60.947	180.0	-3.957	-7.305	100.04	
E1(φ=30)										
Frequency	q[deg]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	
3800.000	60.0	195.0	4.366	-1.068	65.974	180.0	-1.951	136.59	-60.0	
3840.000	60.0	195.0	4.329	-1.955	64.048	180.0	-2.180	2.953	-2.955	
3880.000	60.0	195.0	4.652	-1.699	60.971	180.0	-2.225	2.931	-2.949	
3880.000	45.0	195.0	4.125	-2.223	59.943	180.0	-3.450	-3.883	44.75	
3700.000	45.0	195.0	4.999	-1.672	68.043	180.0	-3.615	-3.262	42.31	
3720.000	45.0	195.0	4.148	-2.791	62.934	180.0	-3.501	-4.326	40.45	
3740.000	45.0	195.0	4.554	-2.460	56.748	180.0	-4.797	-3.900	39.41	
3760.000	45.0	210.0	4.779	-2.138	61.107	180.0	-4.705	-3.500	40.11	
3780.000	45.0	210.0	4.937	-1.980	63.384	180.0	-3.614	-3.334	40.37	
3800.000	45.0	210.0	4.571	-2.158	60.947	180.0	-3.957	-3.659	45.0	
E2(φ=0)										
Frequency	q[deg]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	q[deg]	Max[deg]	Angle[deg]	Eff[%]	
3800.000	60.0	195.0	4.366	-1.068	65.974	180.0	-1.951	4.133	-1.704	
3840.000	60.0	195.0	4.329	-1.955	64.048	180.0	-2.180	4.098	-1.773	
3880.000	60.0	195.0	4.652	-1.699	60.971	180.0	-2.225	4.562	-1.492	
3880.000	45.0	195.0	4.125	-2.223	59.943	180.0	-3.450	3.997	-1.924	
3700.000	45.0	195.0	4.999	-1.672	68.043	180.0	-3.615	4.845	-1.251	
3720.000	45.0	195.0	4.148	-2.791	62.934	180.0	-3.501	3.952	-2.292	
3740.000	45.0	195.0	4.554	-2.460	56.748	180.0	-4.797	4.917	-1.921	
3760.000	45.0	210.0	4.779	-2.138	61.107	180.0	-4.705	4.599	-1.605	
3780.000	45.0	210.0	4.937	-1.980	63.384	180.0	-3.614	4.488	-1.435	
3800.000	45.0	210.0	4.571	-2.158	60.947	180.0	-3.957	4.111	-1.618	

<3D Multiple Frequency Data >



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

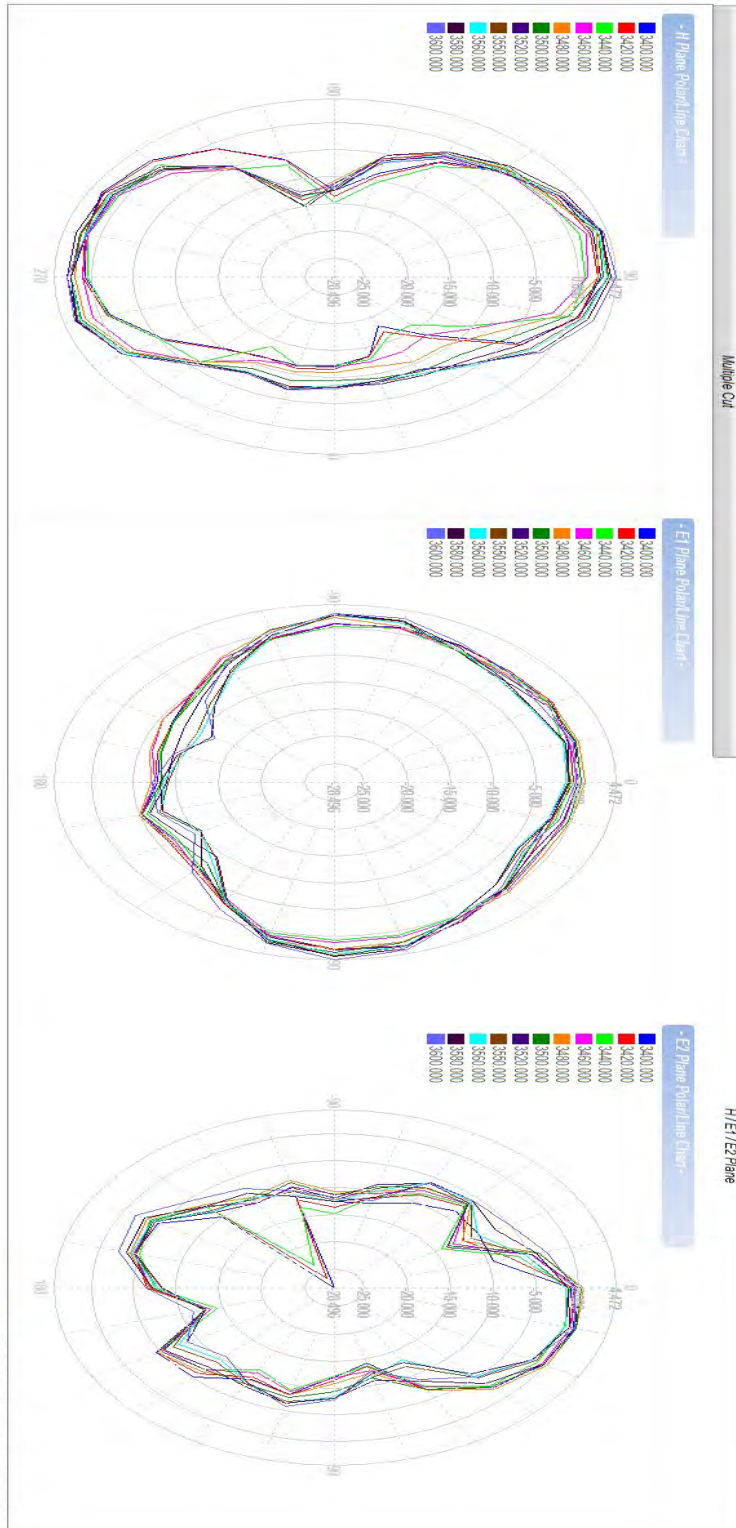
Rev.

1.0

Date

FEP 07, 2022

5.1.7 Gain – Set DIV U0



- Data -												Capture					
	Sum				H(φ=0)				E(φ=0)				E(φ=90)				
Frequency	φ(deg)	φ(deg)	Max(deg)	Angle(deg)	EFM	φ(deg)	Max(deg)	Angle(deg)	BIU(deg)	φ(deg)	Max(deg)	Angle(deg)	BIU(deg)	φ(deg)	Max(deg)	Angle(deg)	BIU(deg)
3400.000	75.0	90.0	3.056	-2.083	61.902	240.0	3.020	-1.371	60.83	75.0	3.056	-0.812	58.90	15.0	0.511	-5.568	48.91
3420.000	75.0	90.0	2.954	-2.087	61.946	240.0	2.831	-1.491	65.81	75.0	2.954	-0.878	63.53	15.0	0.343	-5.533	51.21
3440.000	75.0	240.0	1.651	-2.023	62.209	285.0	1.588	-2.259	66.88	75.0	1.112	-1.399	130.60	15.0	-0.527	-5.993	54.92
3460.000	90.0	105.0	2.194	-2.490	56.389	105.0	2.194	-2.265	55.73	75.0	1.317	-0.997	0.00	15.0	0.169	-5.348	55.30
3480.000	90.0	105.0	3.322	-1.940	65.463	105.0	3.322	-1.353	47.42	90.0	2.492	-0.326	82.04	15.0	0.854	-4.707	55.45
3500.000	90.0	105.0	3.612	-1.922	64.237	105.0	3.612	-0.552	47.98	90.0	3.054	-0.438	59.02	15.0	0.902	-4.873	51.66
3520.000	90.0	105.0	4.074	-1.954	65.291	105.0	4.074	-0.354	55.21	90.0	3.624	-0.503	49.25	15.0	0.604	-5.192	48.32
3540.000	90.0	105.0	3.764	-2.289	59.437	105.0	3.764	-0.575	57.22	90.0	3.575	-1.011	47.04	15.0	-0.321	-5.246	46.46
3560.000	90.0	105.0	3.585	-2.382	58.052	105.0	3.585	-0.591	58.49	90.0	3.547	-1.102	46.76	15.0	-0.465	-5.975	44.78
3580.000	90.0	90.0	3.946	-2.188	61.121	90.0	3.946	-0.804	57.30	90.0	3.846	-0.815	46.47	15.0	-0.007	-5.625	44.37
3600.000	90.0	90.0	4.472	-1.554	68.336	90.0	4.472	-0.355	54.10	90.0	4.472	-0.155	46.79	15.0	0.612	-4.884	45.55
													</				



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

Rev.

1.0

Date

FEP 07, 2022

Normal View

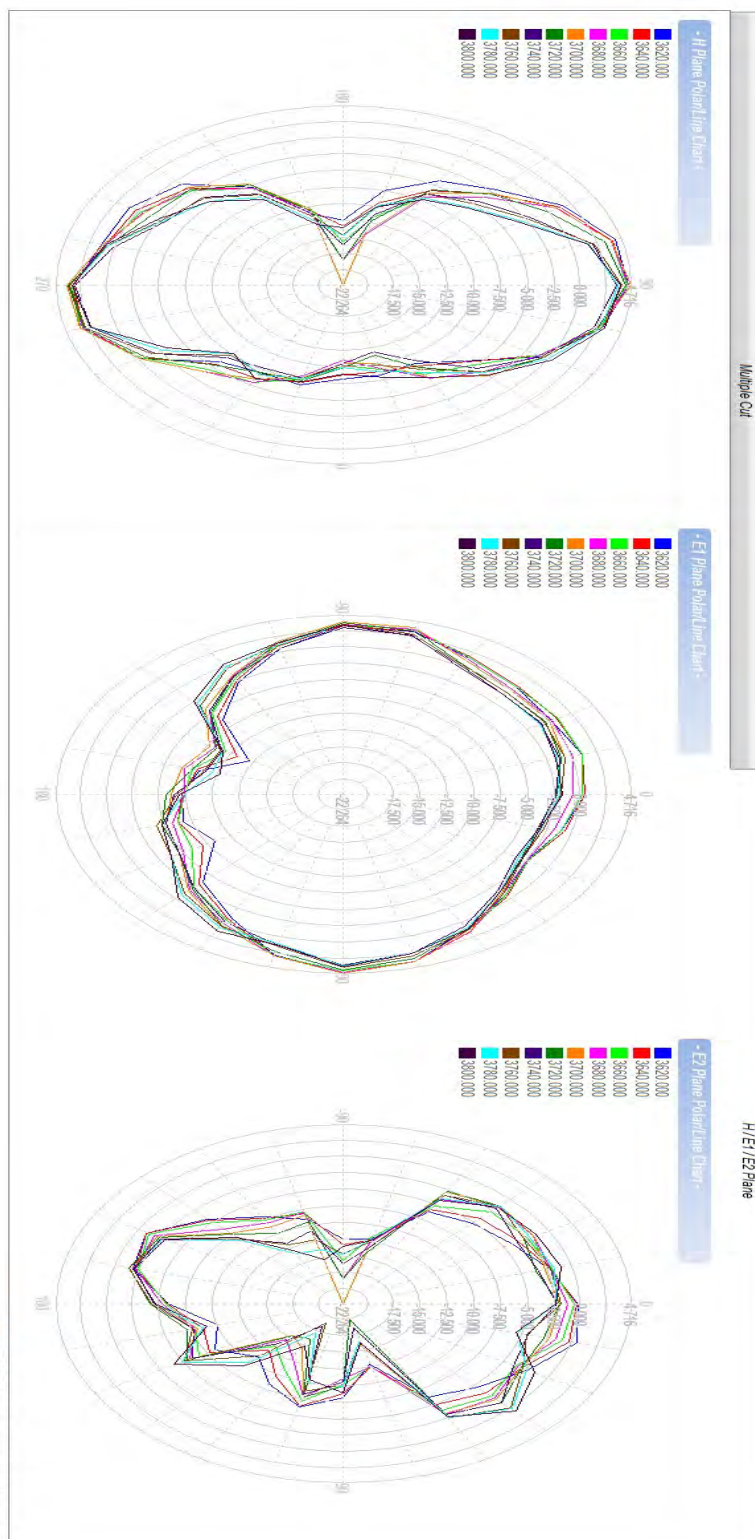
-Data-

Frequency	ETP(dB)	QTP(dB)	Max(dB)	Avg(dB)	ETM(dB)	QTM(dB)	Max(dB)	Avg(dB)	BTM(dB)	QTM(dB)	Max(dB)	Avg(dB)	BTM(dB)	QTM(dB)	Max(dB)	Avg(dB)	BTM(dB)
3.620,000	90.0	90.0	4.590	-1.599	69.199	90.0	4.590	-0.541	51.05	90.0	4.590	0.128	47.63	15.0	0.446	-4.633	-48.74
3.640,000	90.0	90.0	4.418	-1.640	68.942	90.0	4.418	-0.601	49.05	90.0	4.418	0.260	51.19	15.0	-0.265	-4.615	-70.99
3.660,000	90.0	90.0	4.354	-1.621	68.942	90.0	4.354	-0.666	48.28	90.0	4.354	0.320	52.86	0.0	-0.468	-4.555	-79.10
3.680,000	90.0	90.0	4.505	-1.582	69.477	90.0	4.505	-0.629	46.62	90.0	4.505	0.291	53.80	0.0	-1.220	-4.561	-122.14
3.700,000	90.0	90.0	4.716	-1.456	71.852	90.0	4.716	-0.655	46.83	90.0	4.716	0.303	52.73	-4.60	-1.369	-4.621	-123.55
3.720,000	90.0	90.0	4.175	-1.735	67.059	90.0	4.175	-1.116	45.29	90.0	4.175	-0.083	54.64	-4.60	-1.301	-4.697	-123.18
3.740,000	90.0	90.0	3.489	-2.463	57.500	90.0	3.489	-1.531	44.23	90.0	3.489	-0.535	55.24	-4.60	-1.202	-5.188	-43.96
3.760,000	90.0	90.0	3.653	-1.921	64.232	90.0	3.653	-1.546	44.62	90.0	3.653	-0.104	60.22	-4.60	-0.024	-4.628	-32.43
3.780,000	90.0	90.0	3.633	-2.112	61.488	90.0	3.633	-1.792	45.23	90.0	3.633	-0.324	64.83	-4.60	0.105	-4.713	-32.75
3.800,000	90.0	90.0	3.782	-1.919	64.231	90.0	3.782	-1.663	45.00	90.0	3.782	-0.177	67.57	-4.60	0.575	-4.424	-32.29

Capture

Multiple Cut

H/E1/E2 Plane



KTM Technology Co., Ltd

<3D Multiple Frequency Data >

Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

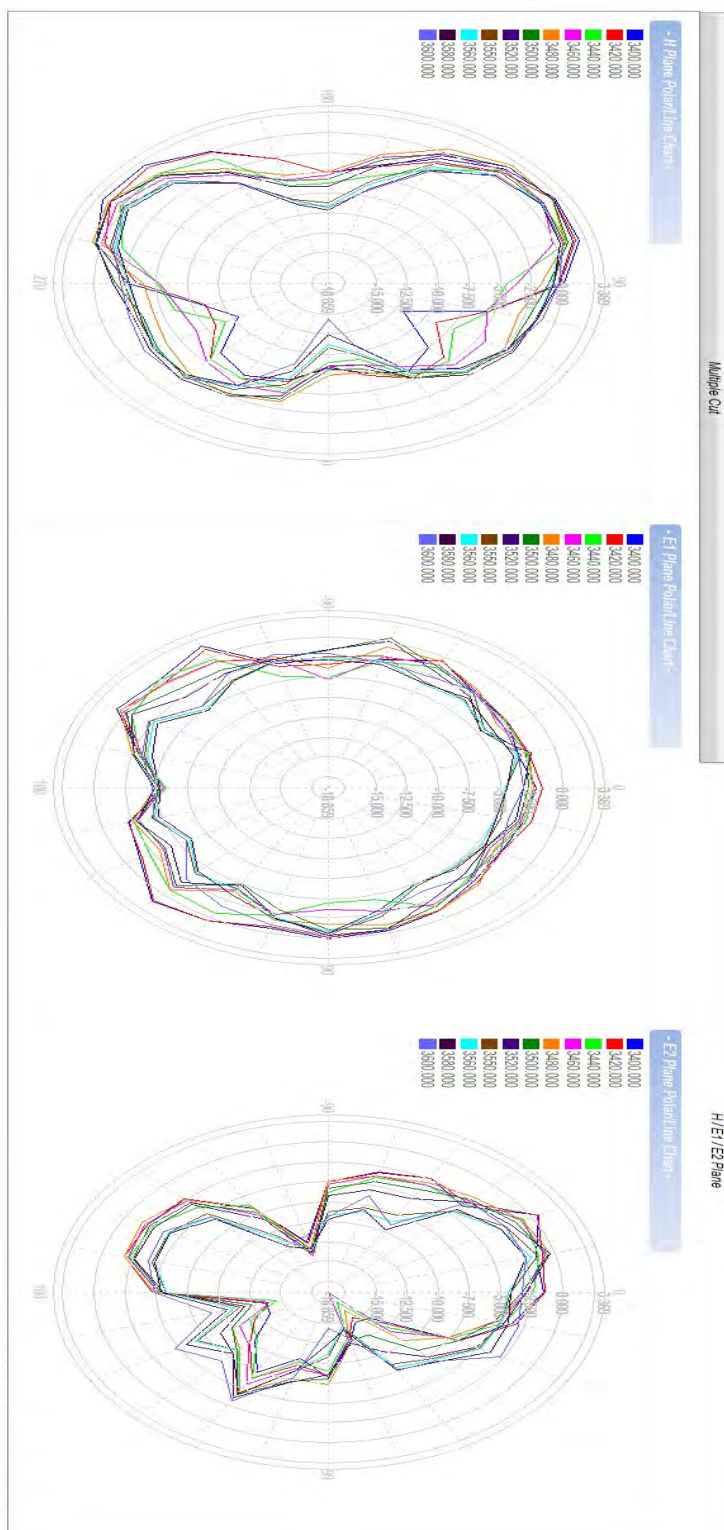
Rev.

1.0

Date

FEP 07, 2022

5.1.8 Gain - Set DIV U1

[illegible]



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

Rev.

1.0

Date

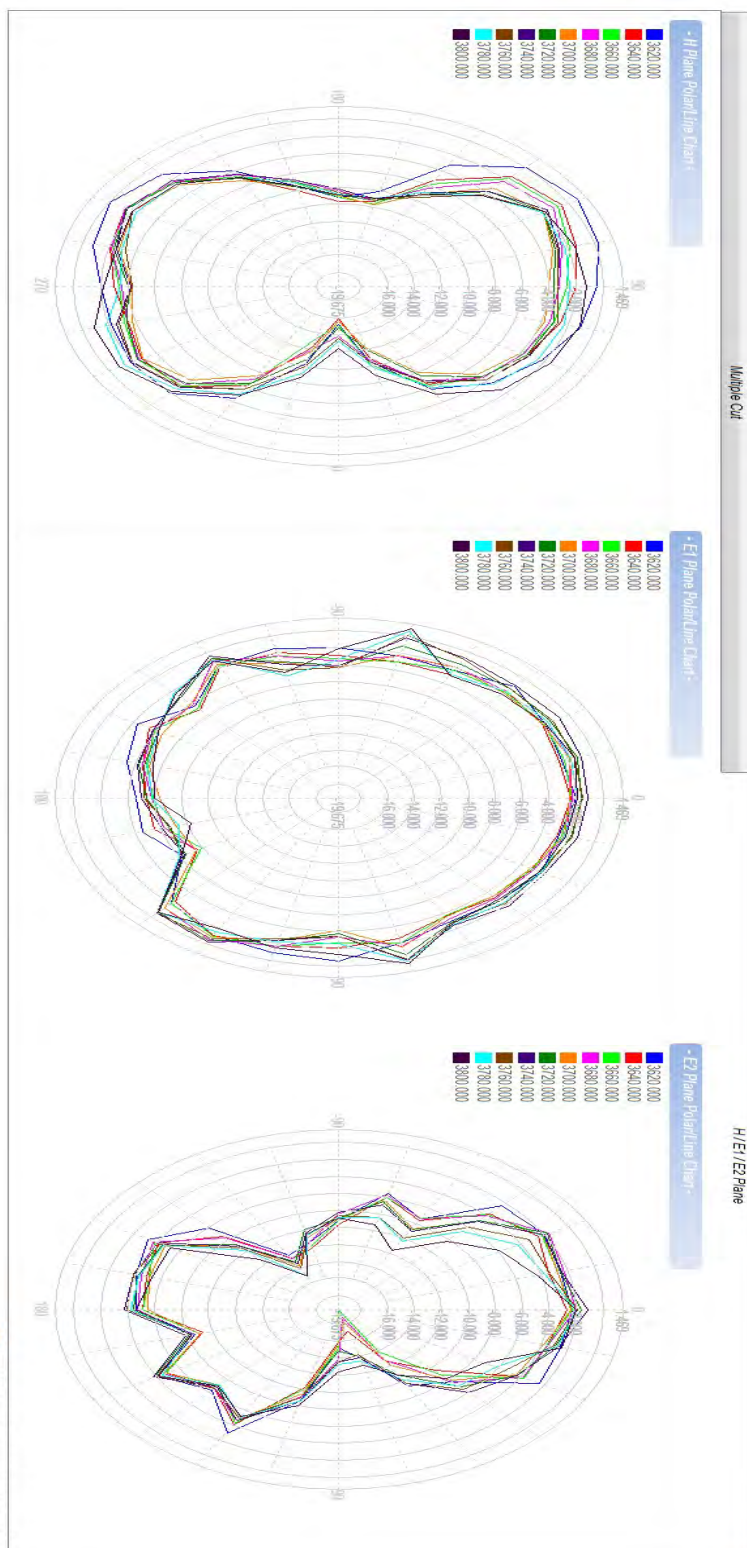
FEP 07, 2022

Normal View

-Data-

Frequency	EPlane	HPlane	Sum			H1E=90			E1E=90			E2E=0		
			Gain[dB]	Angle[dB]	Eff[%]	Gain[dB]	Angle[dB]	Eff[%]	Gain[dB]	Angle[dB]	Eff[%]	Gain[dB]	Angle[dB]	Eff[%]
3620.000	90.0	120.0	0.94	-2.804	52.427	120.0	0.94	-2.333	82.56	90.0	-0.465	-2.326	0.00	-30.0
3640.000	120.0	255.0	-0.085	-3.705	42.609	120.0	-0.416	-3.620	80.32	120.0	-1.078	-2.945	0.00	-30.0
3660.000	120.0	255.0	-0.314	-3.753	41.758	120.0	-0.890	-4.017	84.19	120.0	-0.883	-2.945	0.00	-30.0
3680.000	120.0	165.0	0.016	-3.572	43.532	120.0	-1.142	-4.173	91.06	120.0	-0.403	-2.661	0.00	-30.0
3700.000	120.0	255.0	-0.472	-3.990	39.935	240.0	-1.884	-4.627	105.05	120.0	-0.676	-2.979	4.772	-30.0
3720.000	45.0	60.0	0.177	-3.454	45.149	240.0	-1.508	-4.527	106.73	120.0	-0.248	-2.389	46.99	0.0
3740.000	60.0	60.0	0.613	-3.180	48.079	240.0	-1.370	-4.151	112.48	75.0	0.030	-1.930	173.88	0.0
3760.000	75.0	255.0	0.708	-3.564	44.018	300.0	-1.886	-4.378	115.54	-75.0	0.080	-2.184	173.11	0.0
3780.000	75.0	255.0	1.235	-3.700	42.635	300.0	-1.237	-3.582	110.56	-75.0	0.613	-2.340	24.27	0.0
3800.000	75.0	255.0	1.489	-3.726	42.307	300.0	-0.683	-3.372	105.03	-75.0	0.914	-2.244	26.10	0.0

Capture



H/E1/E2 Plane

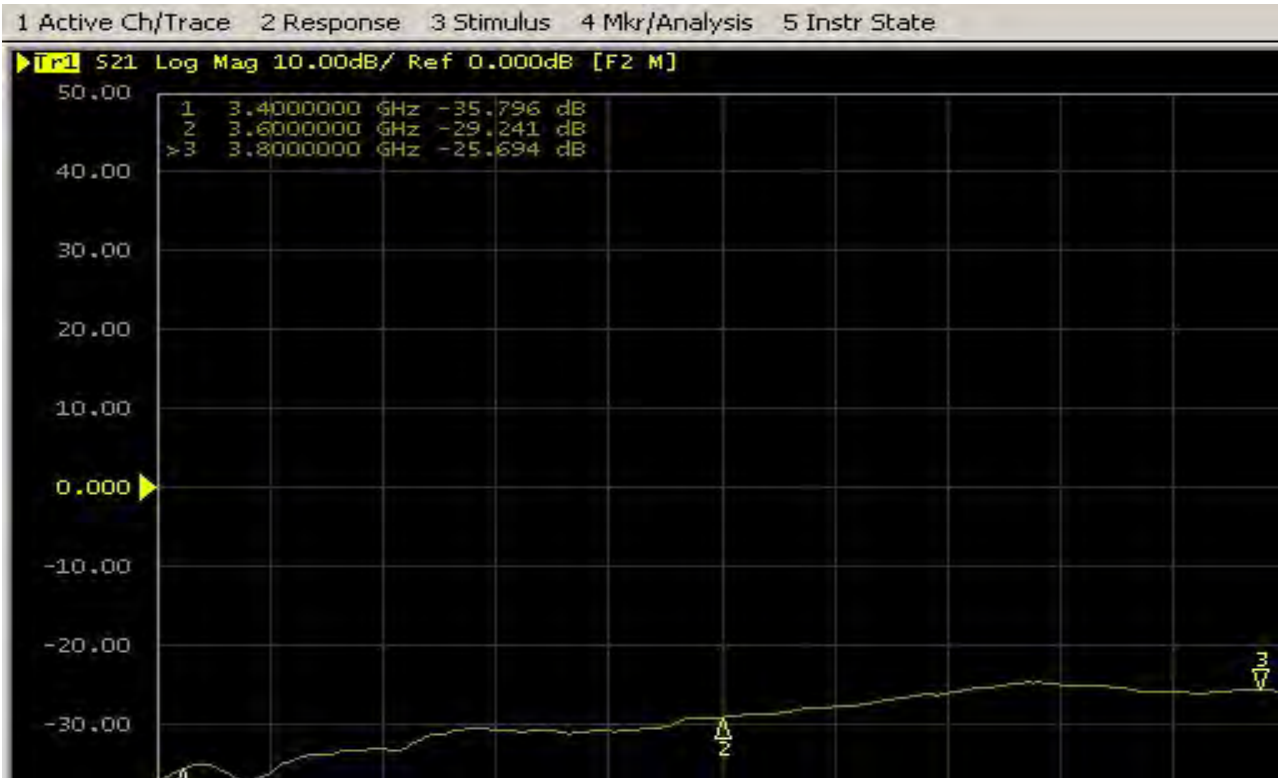
Multiple Cut

<3D Multiple Frequency Data >

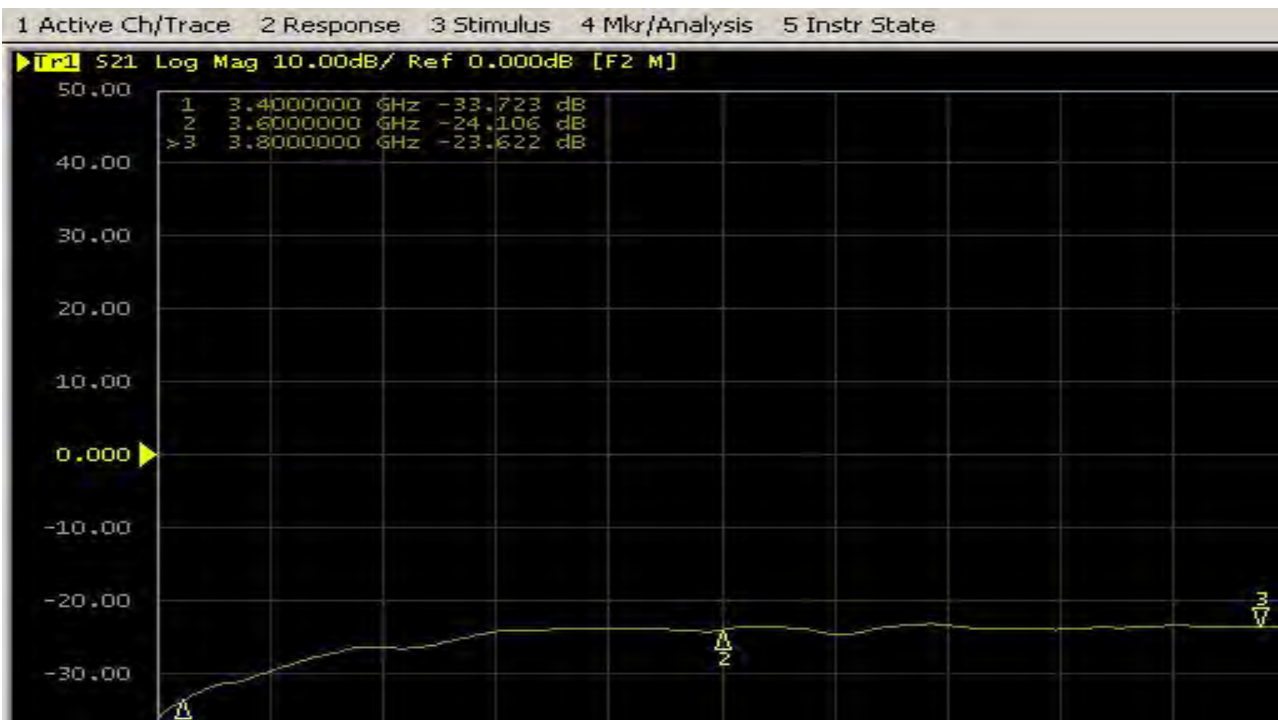
	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.1.9 Set Isolation

MAIN U0-MAIN U1

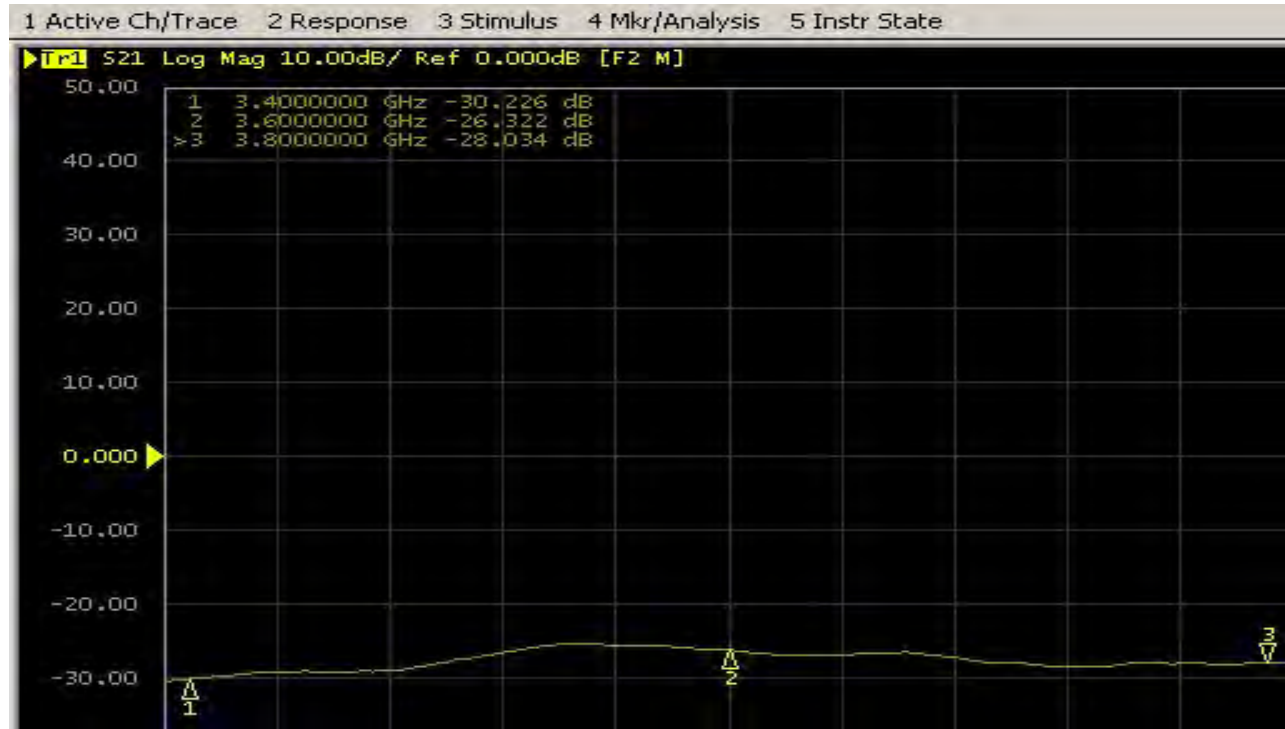


DIV U0-DIV U1

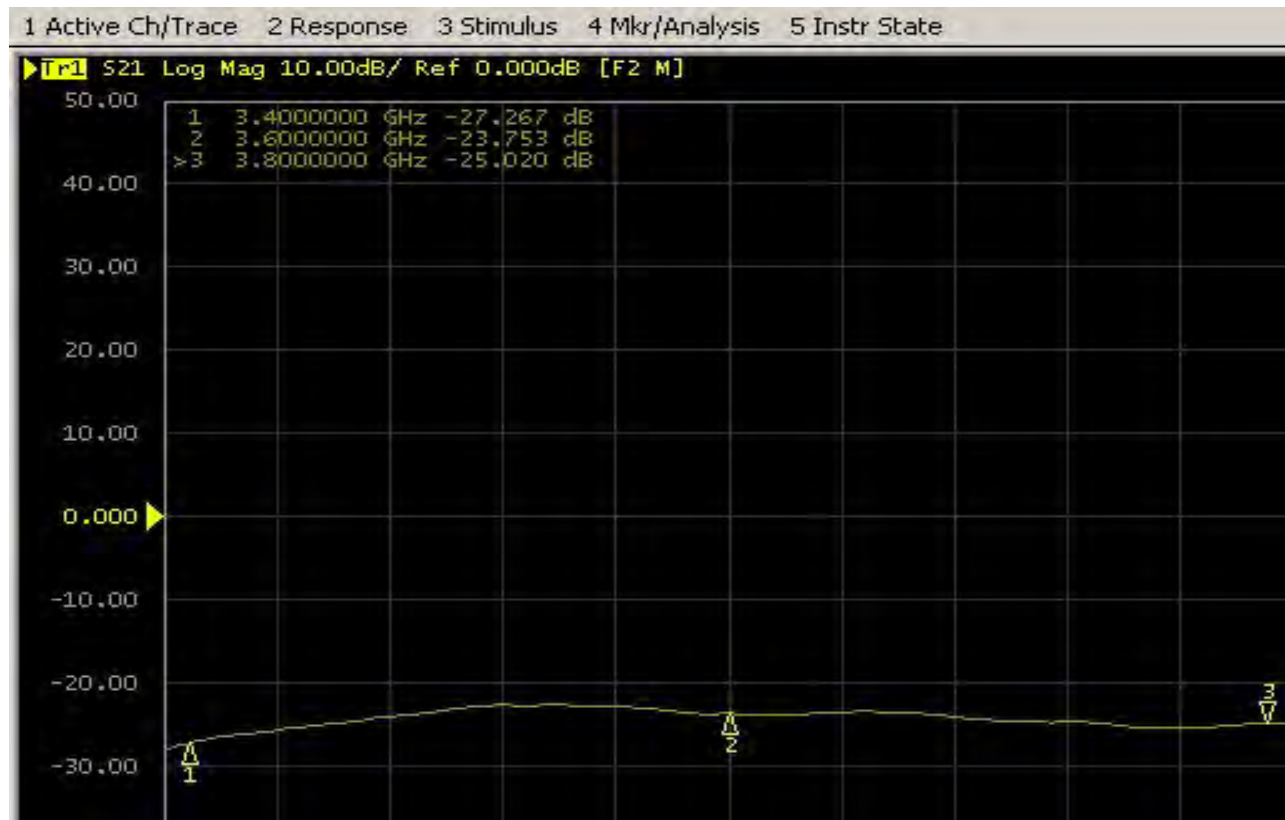


	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

MAIN U0-DIV U0



MAIN U0-DIV U1



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

MAIN U1-DIV U0



MAIN U1-DIV U1



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.2 Electrical data

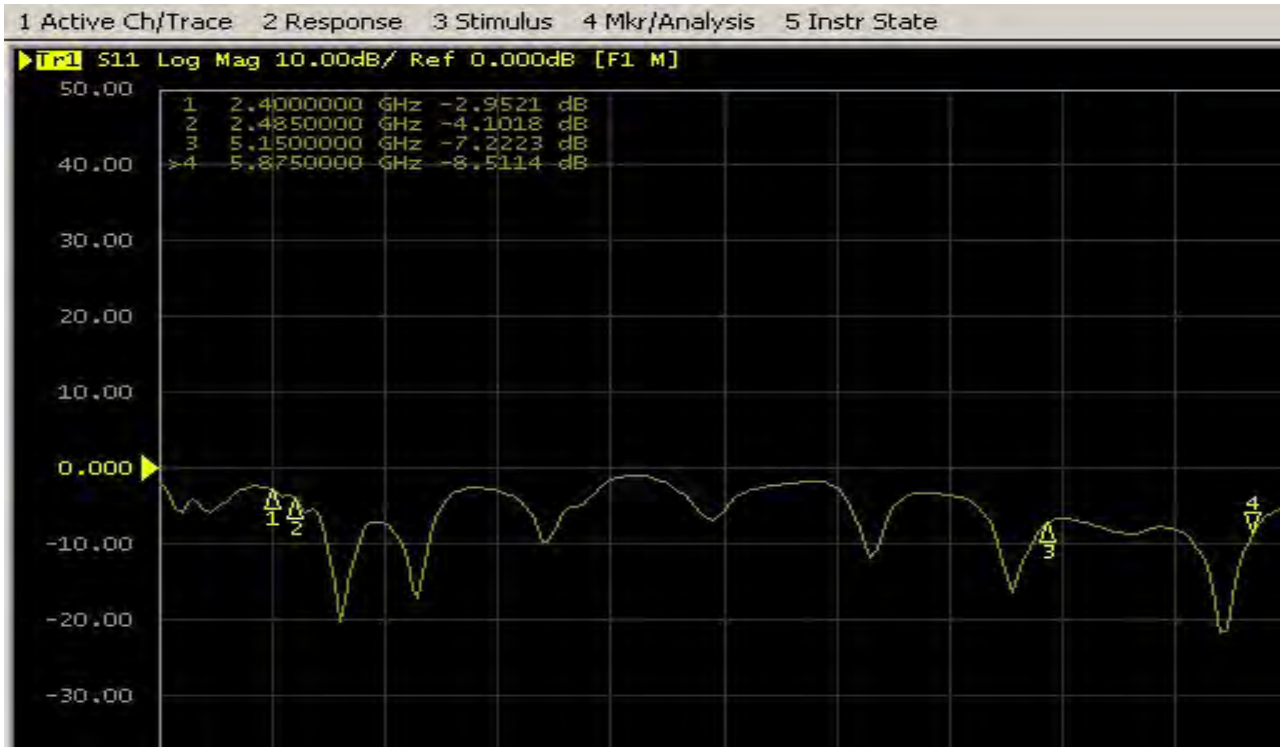
5.2 Test Standard (WiFi)

		MAIN			
Frequency Range		2400MHz	2485MHz	5150MHz	5875MHz
V.S.W.R		5.94	4.35	2.54	2.2
(Gain) Max	PEAK	-0.75	0.894	3.10	3.42
	3D	-6.85	-5.15	-4.28	-3.55

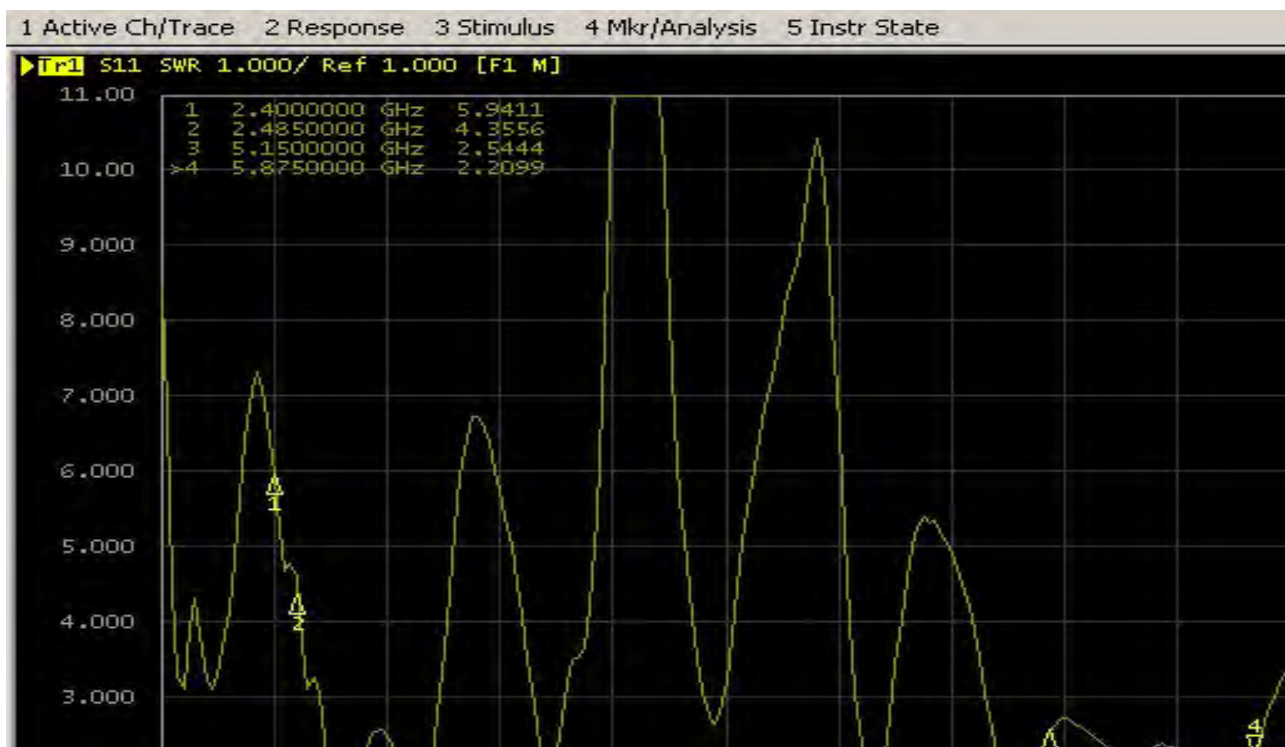
		DIV			
Frequency Range		2400MHz	2485MHz	5150MHz	5875MHz
V.S.W.R		4.58	3.96	2.12	2.57
(Gain) Max	PEAK	0.45	-0.48	3.13	4.52
	3D	-5.33	-6.65	-3.8	-3.77

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.2.1 Input Return Loss : Main

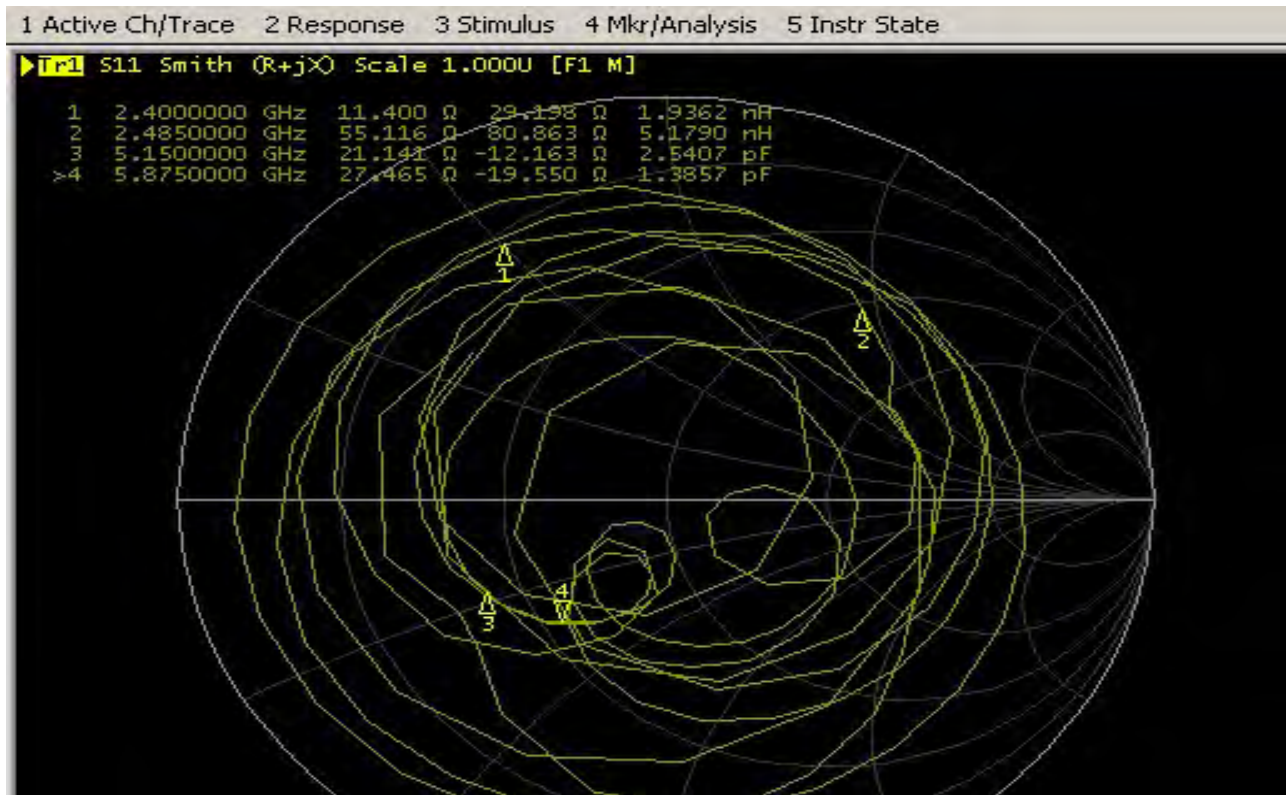


Return Loss



V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



SMITH CHART



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

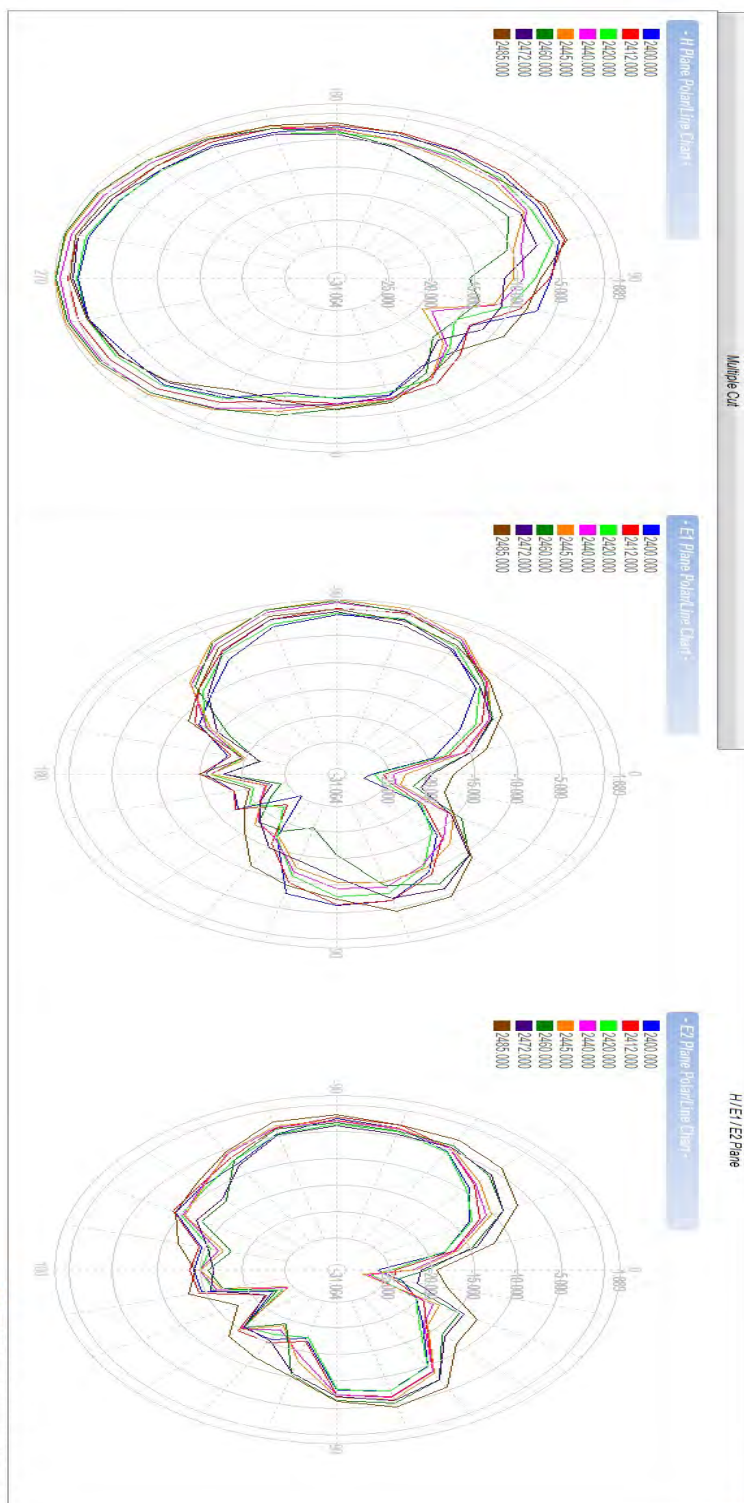
Rev.

1.0

Date

FEP 07, 2022

5.2.2 Gain – Set Main 2.4G



Frequency		Sum		H-φ=0		E1(φ=0)		E2(φ=0)	
φ(deg)	Mag(dB)	φ(deg)	Mag(dB)	φ(deg)	Mag(dB)	φ(deg)	Mag(dB)	φ(deg)	Mag(dB)
2400.000	75.0	255.0	-0.792	-0.888	20.614	270.0	-0.653	-3.746	195.64
2412.000	75.0	270.0	-0.378	-5.822	26.188	270.0	-0.299	-2.841	165.34
2424.000	90.0	270.0	-0.623	-6.882	20.597	270.0	-0.623	-3.944	146.34
2436.000	90.0	270.0	1.357	-5.514	28.093	270.0	1.357	-2.647	128.00
2448.000	90.0	270.0	1.889	-3.135	30.693	270.0	1.889	-2.246	123.40
2460.000	90.0	255.0	1.889	-5.315	29.409	255.0	1.889	-2.546	115.91
2472.000	75.0	255.0	0.276	-6.595	22.255	255.0	0.667	-4.185	117.17
2484.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2496.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2508.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2520.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2532.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2544.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2556.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2568.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2580.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2592.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2604.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2616.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2628.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2640.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2652.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2664.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2676.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2688.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55
2700.000	75.0	255.0	0.894	-3.155	30.514	255.0	0.595	-3.078	135.55

<3D Multiple Frequency Data >



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

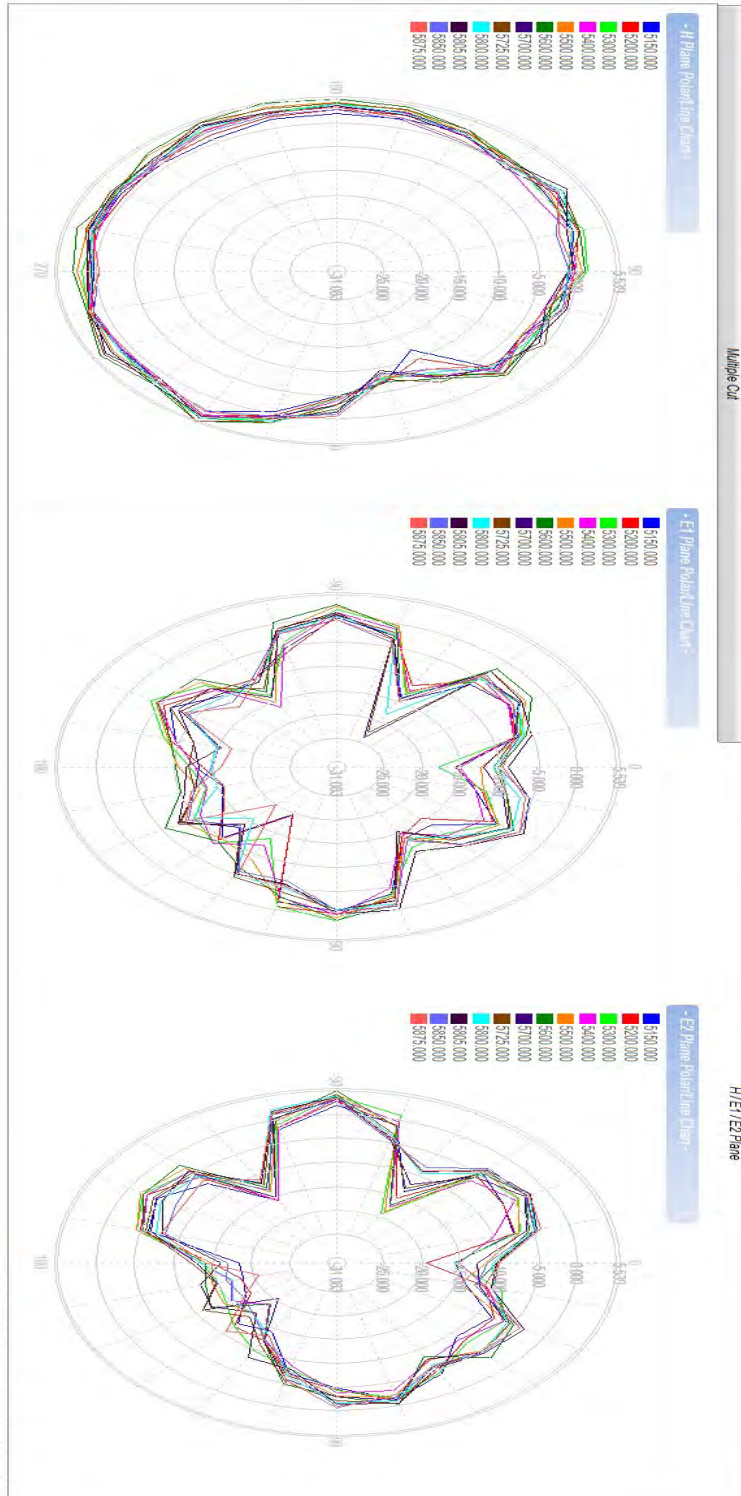
Rev.

1.0

Date

FEP 07, 2022

Main 5G



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- Data -		Capture															
		Sum				H-Plane				E1(φ=30)				E2(φ=9)			
Frequency	φ[deg]	φ[deg]	Mag[dB]	Angle[d]	ET[%]	φ[deg]	Mag[dB]	Angle[d]	φ[deg]	Mag[dB]	Angle[d]	φ[deg]	Mag[dB]	Angle[d]	φ[deg]	Mag[dB]	Angle[d]
5.150,000	90.0	300.0	3.103	-4.265	37.280	300.0	3.103	0.520	0.00	-90.0	0.488	-6.097	22.73	-90.0	1.974	-5.506	24.88
5.200,000	90.0	300.0	4.063	-3.838	41.324	300.0	4.063	0.971	61.26	-90.0	0.755	-5.690	22.33	-90.0	2.830	-5.021	21.11
5.300,000	90.0	300.0	4.442	-3.222	47.821	300.0	4.442	1.624	76.61	-90.0	2.018	-4.662	22.90	-90.0	4.063	-4.116	22.83
5.400,000	90.0	300.0	3.670	-3.919	40.557	300.0	3.670	0.924	0.00	-90.0	1.313	-5.566	23.31	-90.0	3.387	-4.955	20.45
5.500,000	90.0	300.0	4.579	-3.088	49.340	300.0	4.579	1.846	0.00	-90.0	2.885	-4.281	24.85	-90.0	4.414	-4.027	17.31
5.600,000	90.0	195.0	5.539	-2.499	57.425	195.0	5.539	2.573	88.03	-90.0	3.183	-3.510	26.86	-90.0	5.146	-3.363	15.97
5.700,000	90.0	300.0	4.656	-3.444	46.253	300.0	4.656	1.417	18.88	-90.0	0.889	-5.481	28.37	-90.0	3.404	-4.531	20.24
5.725,000	90.0	300.0	5.390	-2.715	53.524	300.0	5.390	2.046	18.78	-90.0	1.197	-5.102	28.61	-90.0	4.141	-3.759	20.06
5.800,000	90.0	300.0	4.450	-3.135	48.568	300.0	4.450	1.424	59.73	-90.0	0.804	-5.416	31.41	-90.0	3.890	-3.857	22.88
5.850,000	90.0	300.0	4.199	-2.852	61.655	300.0	4.199	1.638	0.00	-90.0	1.340	-4.638	26.61	-90.0	3.698	-3.675	22.15
5.850,000	90.0	180.0	2.949	-3.088	42.673	180.0	2.949	0.785	167.39	-90.0	-0.199	-5.443	29.55	-90.0	2.949	-4.825	22.80
5.875,000	90.0	180.0	3.420	-3.566	44.101	180.0	3.420	0.961	152.47	-90.0	-0.164	-5.414	31.37	-90.0	3.420	-4.100	22.64
							</										

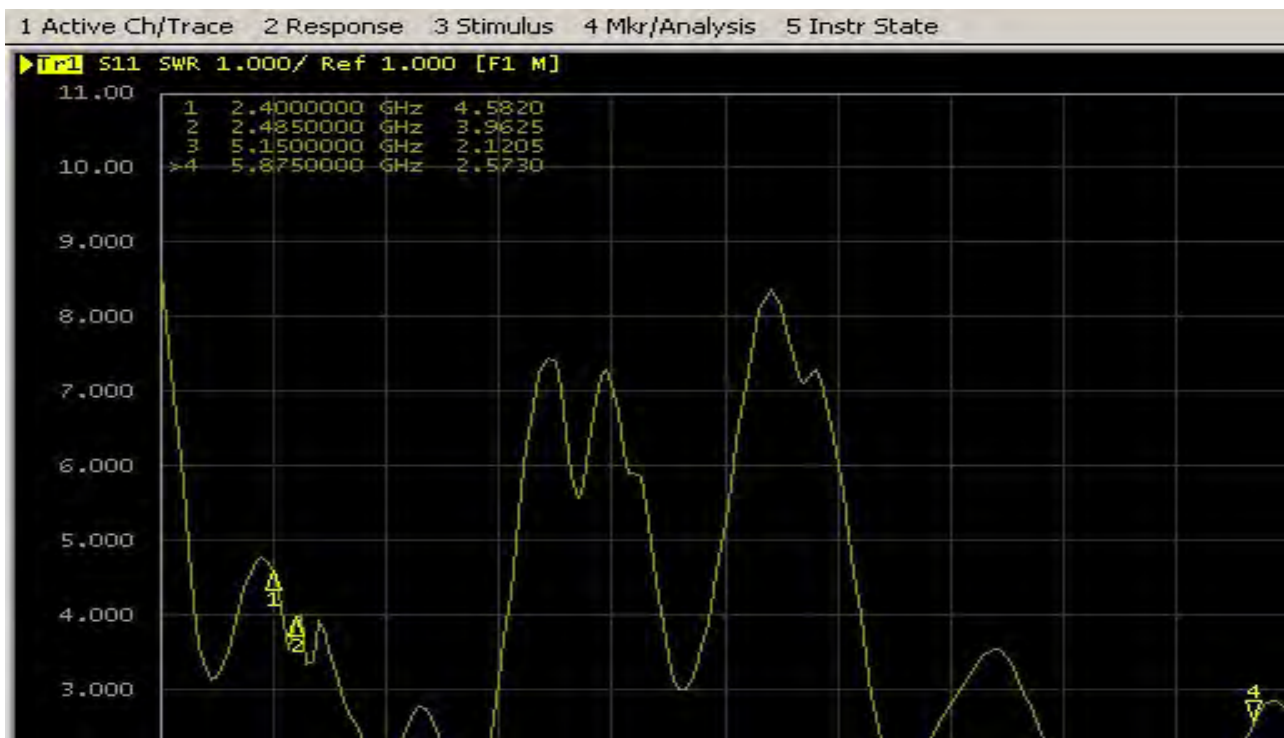
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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

5.2.3 Input Return Loss : DIV

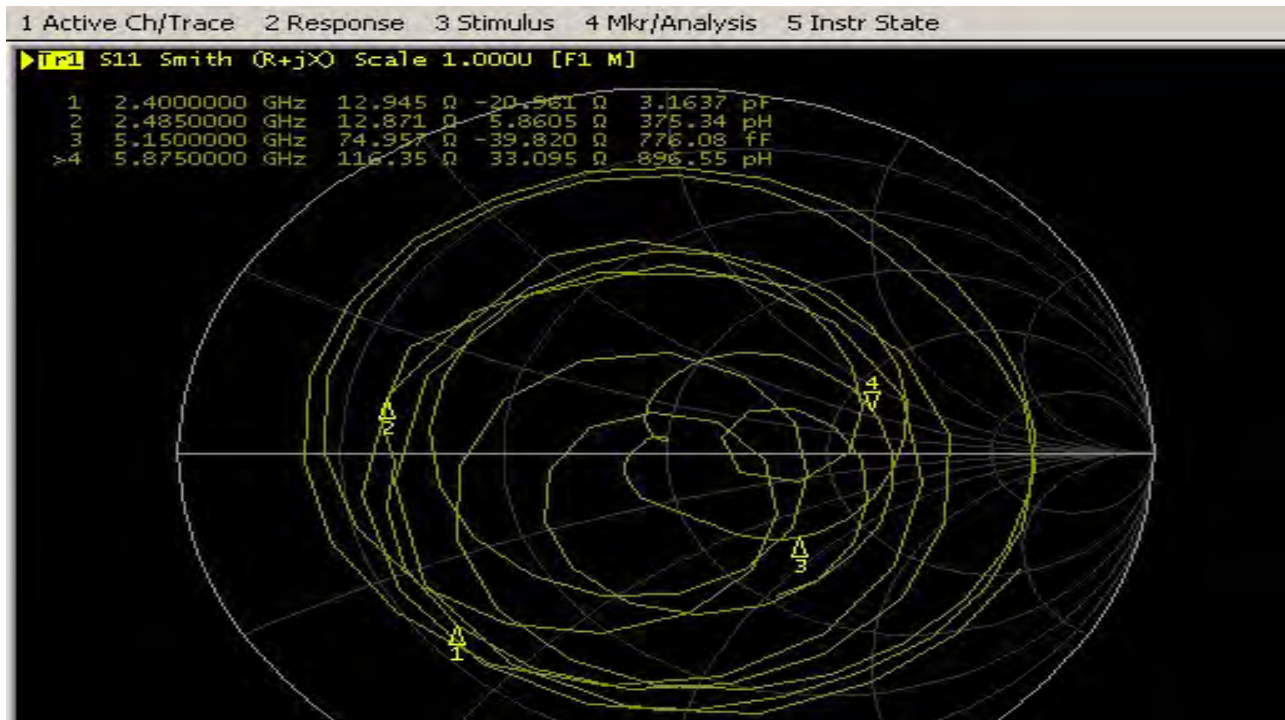


Return Loss



V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



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Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

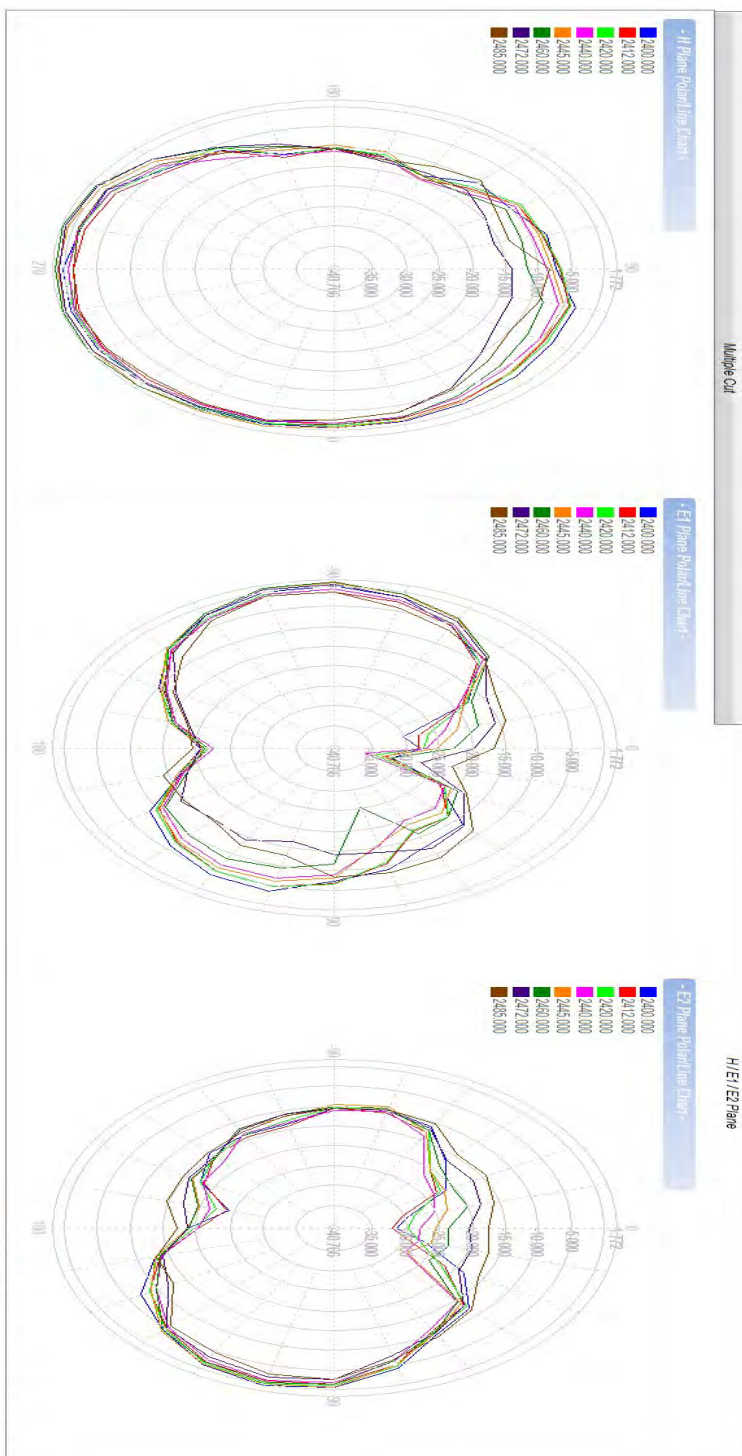
Rev.

1.0

Date

FEP 07, 2022

5.2.4 Gain – Set Div 2.4G



Sum		H/E-50		E1(E-50)		E2(E-5)	
Frequency	Angle	Angle	Angle	Angle	Angle	Angle	Angle
2400.000	105.0	330.0	0.453	-5.335	29.277	285.0	0.281
2412.000	105.0	330.0	-0.466	-5.282	29.599	300.0	-0.872
2420.000	105.0	330.0	0.061	-5.752	28.596	285.0	0.044
2430.000	90.0	285.0	-0.222	-5.326	29.303	285.0	-0.222
2440.000	90.0	285.0	1.229	-4.989	31.709	285.0	1.229
2450.000	90.0	300.0	1.772	-5.107	30.853	300.0	1.772
2460.000	90.0	300.0	1.284	-5.812	29.233	300.0	1.284
2472.000	90.0	285.0	-0.448	-6.354	21.808	285.0	-0.448
2485.000	90.0	285.0				285.0	

<3D Multiple Frequency Data >

Div 5G



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

Rev.

1.0

Date

FEP 07, 2022

Normal View

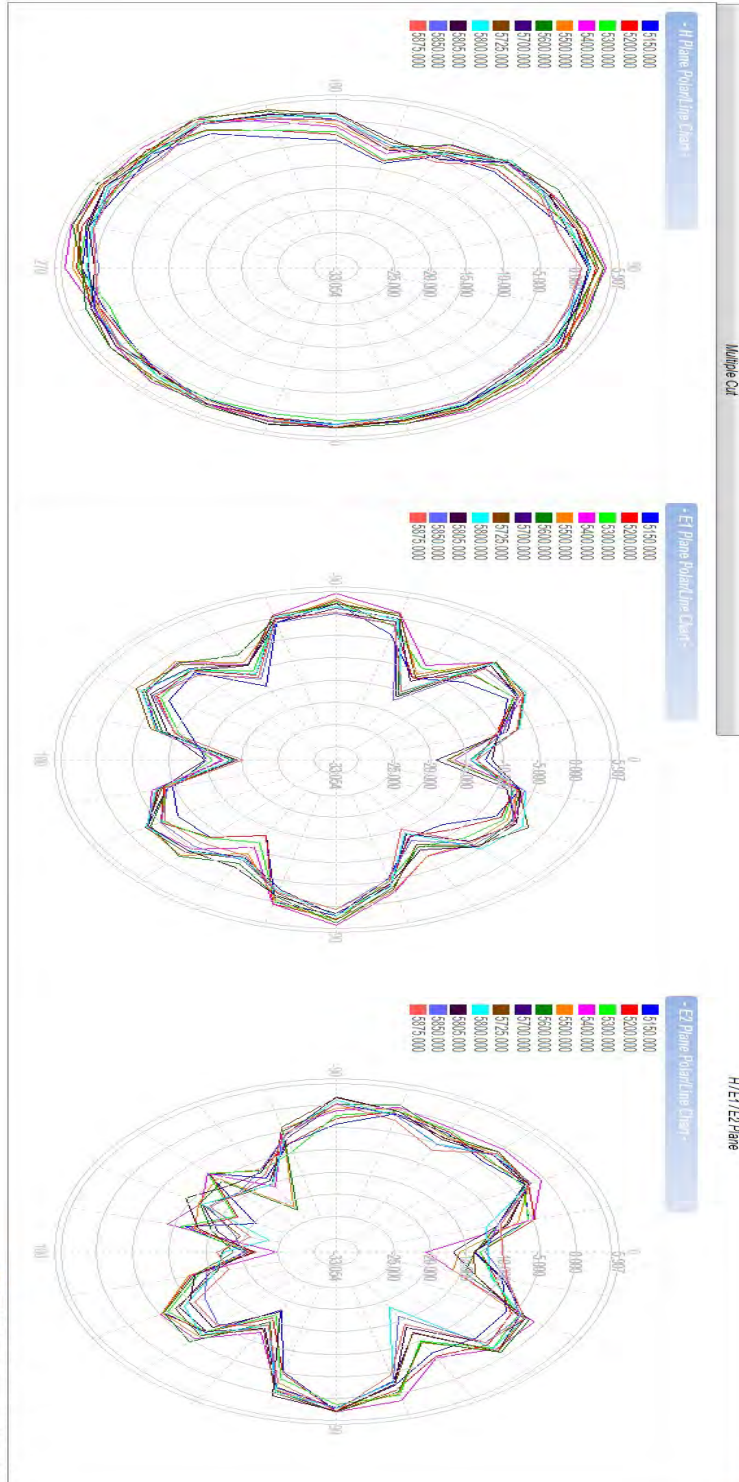
- Data -

Frequency	Sum	HP-30	EP-30	EP-30	EP-30
Frequency	Sum	HP-30	EP-30	EP-30	EP-30
5150.000	90.0	225.0	3.131	3.131	3.131
5200.000	90.0	225.0	3.131	3.131	3.131
5300.000	90.0	225.0	3.131	3.131	3.131
5400.000	90.0	225.0	3.131	3.131	3.131
5500.000	90.0	225.0	3.131	3.131	3.131
5600.000	90.0	225.0	3.131	3.131	3.131
5700.000	90.0	225.0	3.131	3.131	3.131
5800.000	90.0	225.0	3.131	3.131	3.131
5900.000	90.0	225.0	3.131	3.131	3.131
6000.000	90.0	225.0	3.131	3.131	3.131
6100.000	90.0	225.0	3.131	3.131	3.131
6200.000	90.0	225.0	3.131	3.131	3.131
6300.000	90.0	225.0	3.131	3.131	3.131
6400.000	90.0	225.0	3.131	3.131	3.131
6500.000	90.0	225.0	3.131	3.131	3.131
6600.000	90.0	225.0	3.131	3.131	3.131
6700.000	90.0	225.0	3.131	3.131	3.131
6800.000	90.0	225.0	3.131	3.131	3.131
6900.000	90.0	225.0	3.131	3.131	3.131
7000.000	90.0	225.0	3.131	3.131	3.131
7100.000	90.0	225.0	3.131	3.131	3.131
7200.000	90.0	225.0	3.131	3.131	3.131
7300.000	90.0	225.0	3.131	3.131	3.131
7400.000	90.0	225.0	3.131	3.131	3.131
7500.000	90.0	225.0	3.131	3.131	3.131
7600.000	90.0	225.0	3.131	3.131	3.131
7700.000	90.0	225.0	3.131	3.131	3.131
7800.000	90.0	225.0	3.131	3.131	3.131
7900.000	90.0	225.0	3.131	3.131	3.131
8000.000	90.0	225.0	3.131	3.131	3.131
8100.000	90.0	225.0	3.131	3.131	3.131
8200.000	90.0	225.0	3.131	3.131	3.131
8300.000	90.0	225.0	3.131	3.131	3.131
8400.000	90.0	225.0	3.131	3.131	3.131
8500.000	90.0	225.0	3.131	3.131	3.131
8600.000	90.0	225.0	3.131	3.131	3.131
8700.000	90.0	225.0	3.131	3.131	3.131
8800.000	90.0	225.0	3.131	3.131	3.131
8900.000	90.0	225.0	3.131	3.131	3.131
9000.000	90.0	225.0	3.131	3.131	3.131

Capture

Multiple Cut

H/E1/E2 Plane

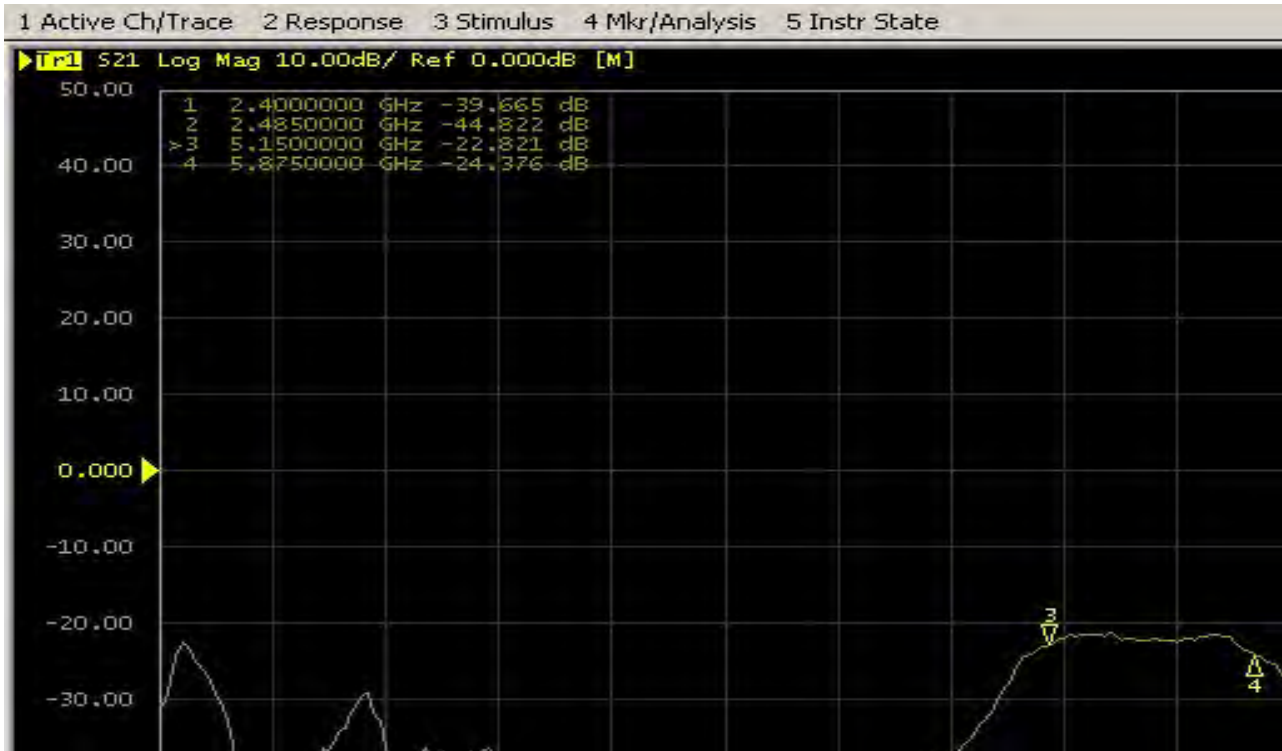


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<3D Multiple Frequency Data >

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

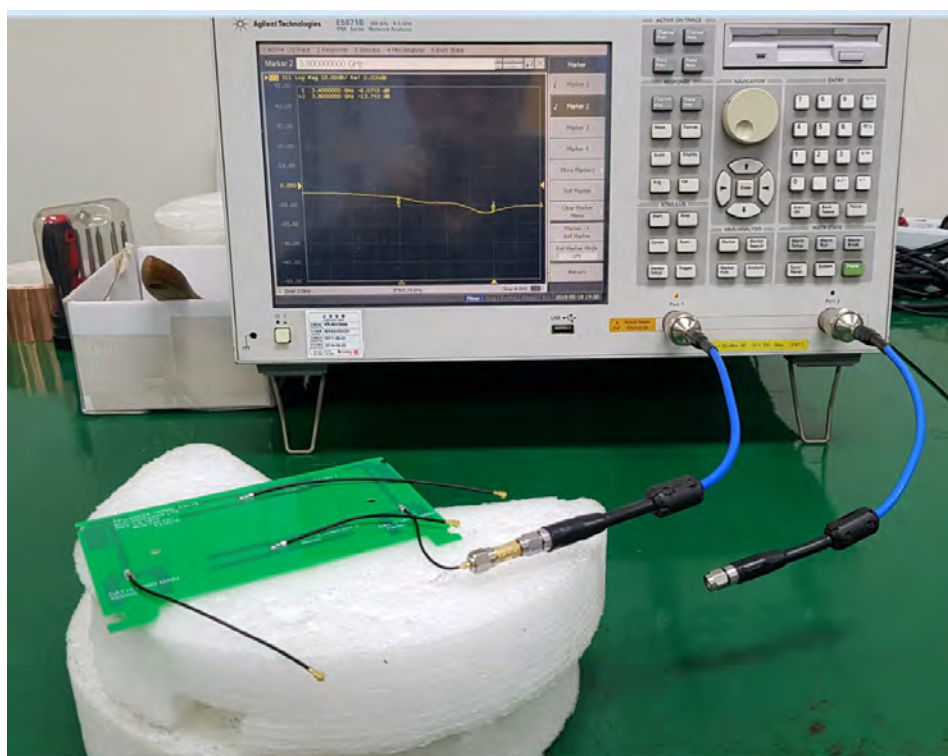
5.2.5 Set Isolation – Main-div



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

5.3 Electrical characteristics data – Single product measurement conditions (LTE)

Frequency Range	3400~3800MHz MAIN U0	3400~3800MHz MAIN U1	3400~3800MHz DIV U0	3400~3800MHz DIV U1
(V.S.W.R)	3.49:1	3.8:1	3.09:1	3.01:1

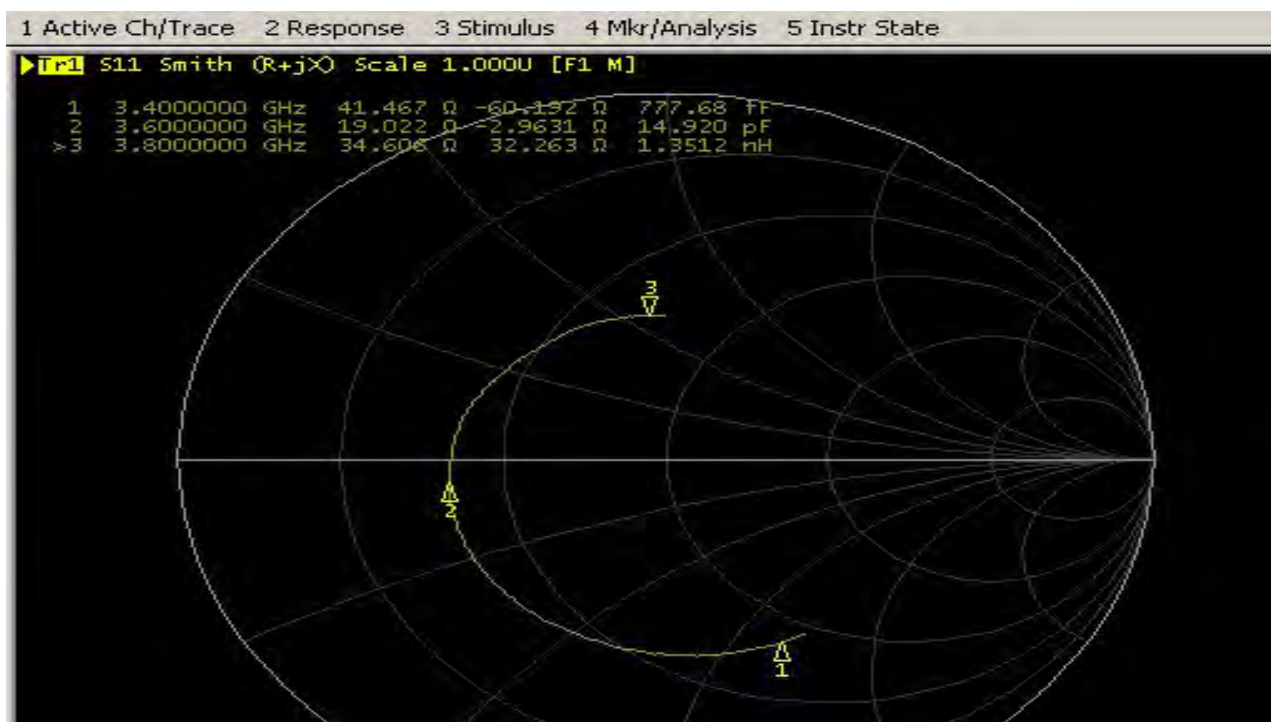


	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

5.3.1 Input Return Loss : Main U0



Return Loss



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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



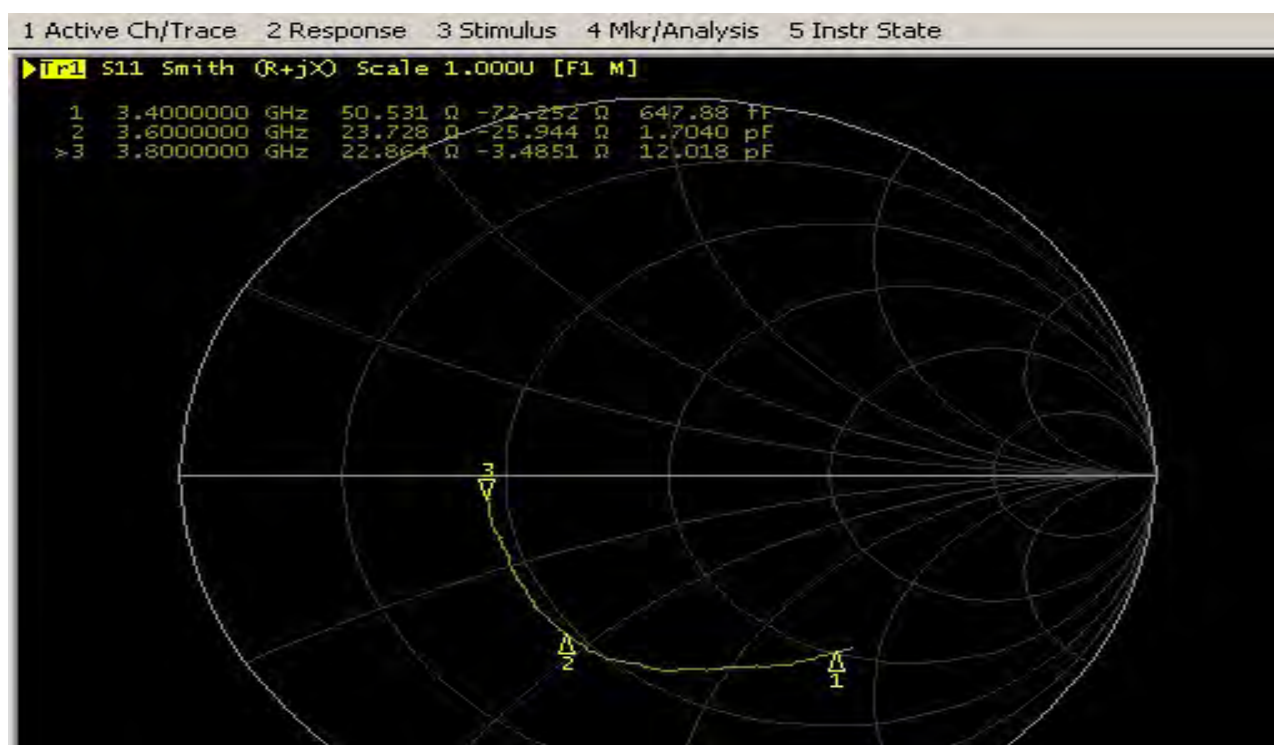
V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.3.2 Input Return Loss : MAIN U1



Return Loss



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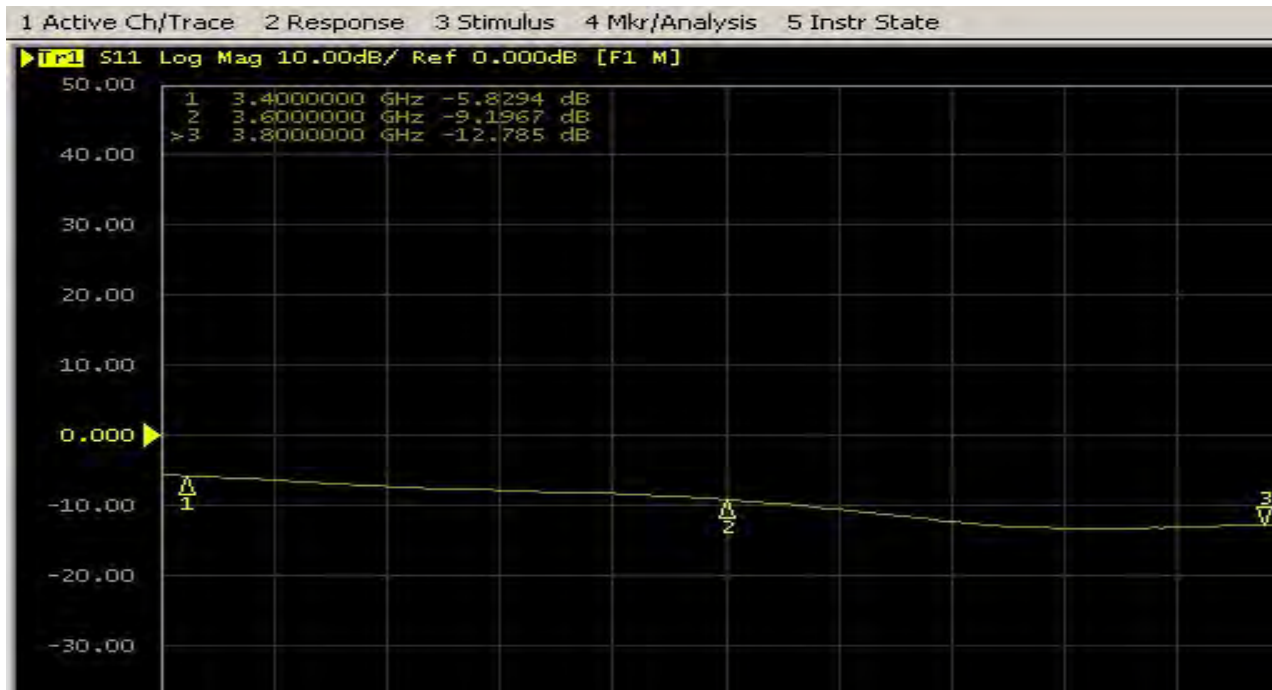
	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



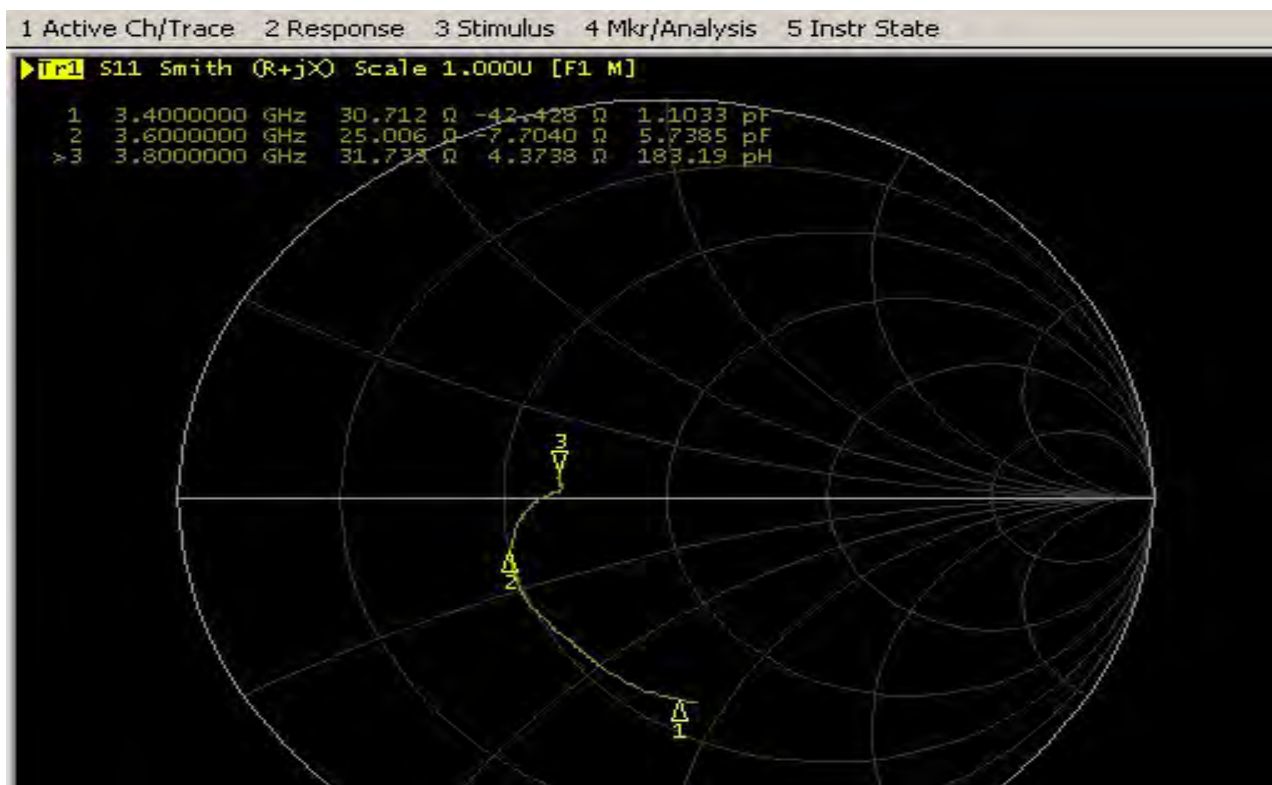
V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

5.3.3 Input Return Loss : DIV U0

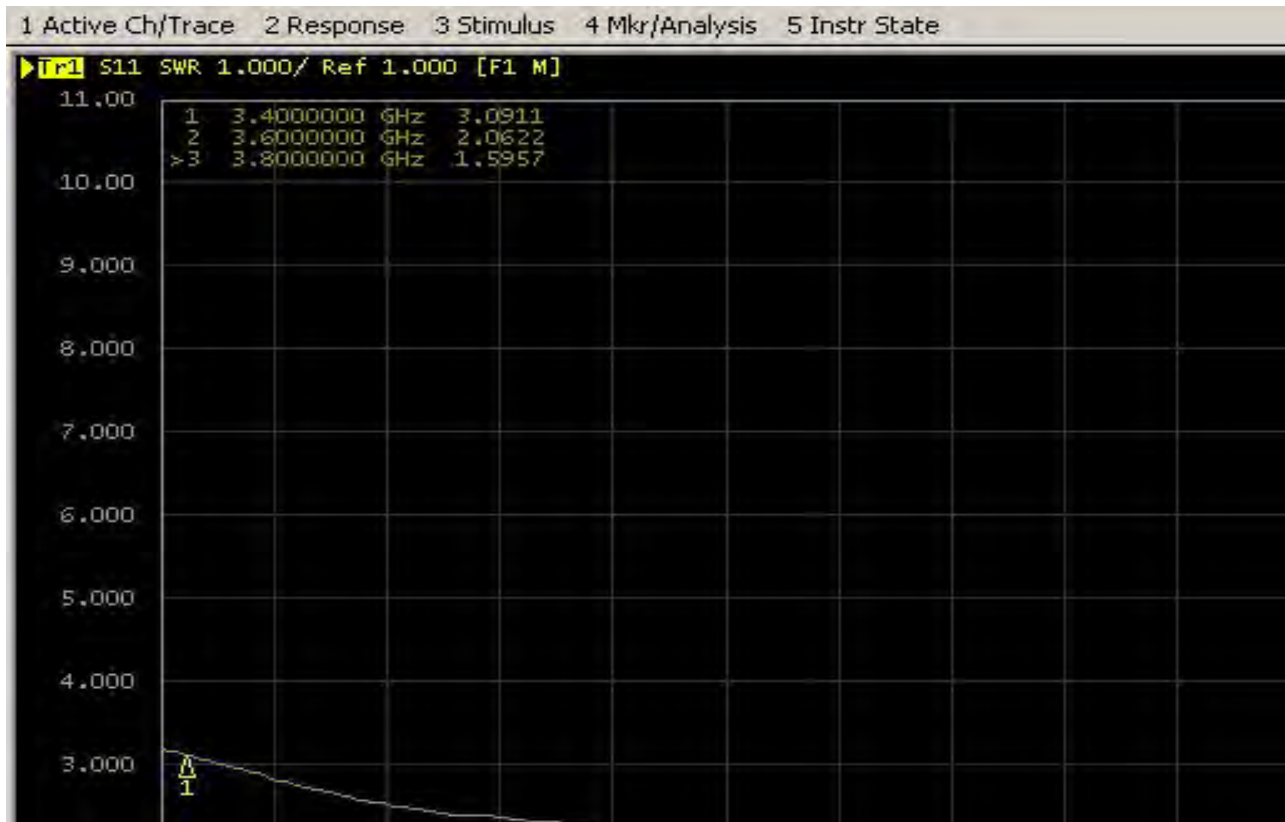


Return Loss



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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



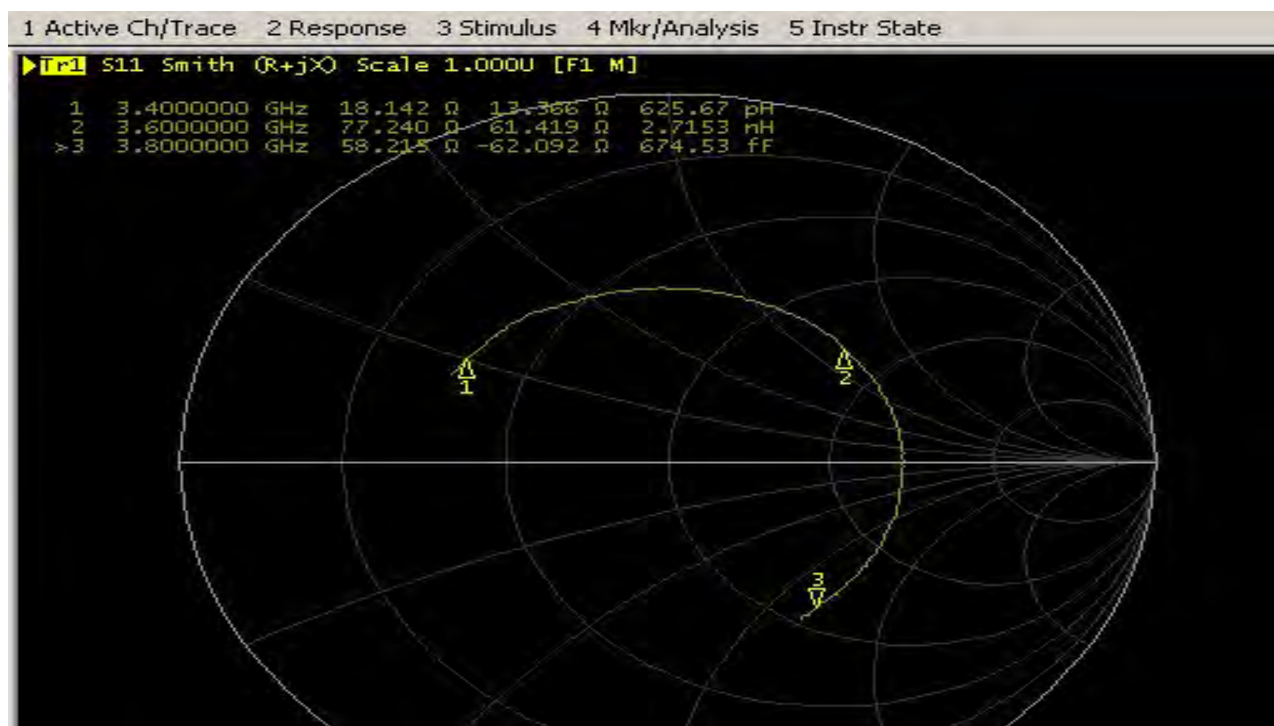
V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.3.4 Input Return Loss : DIV U1

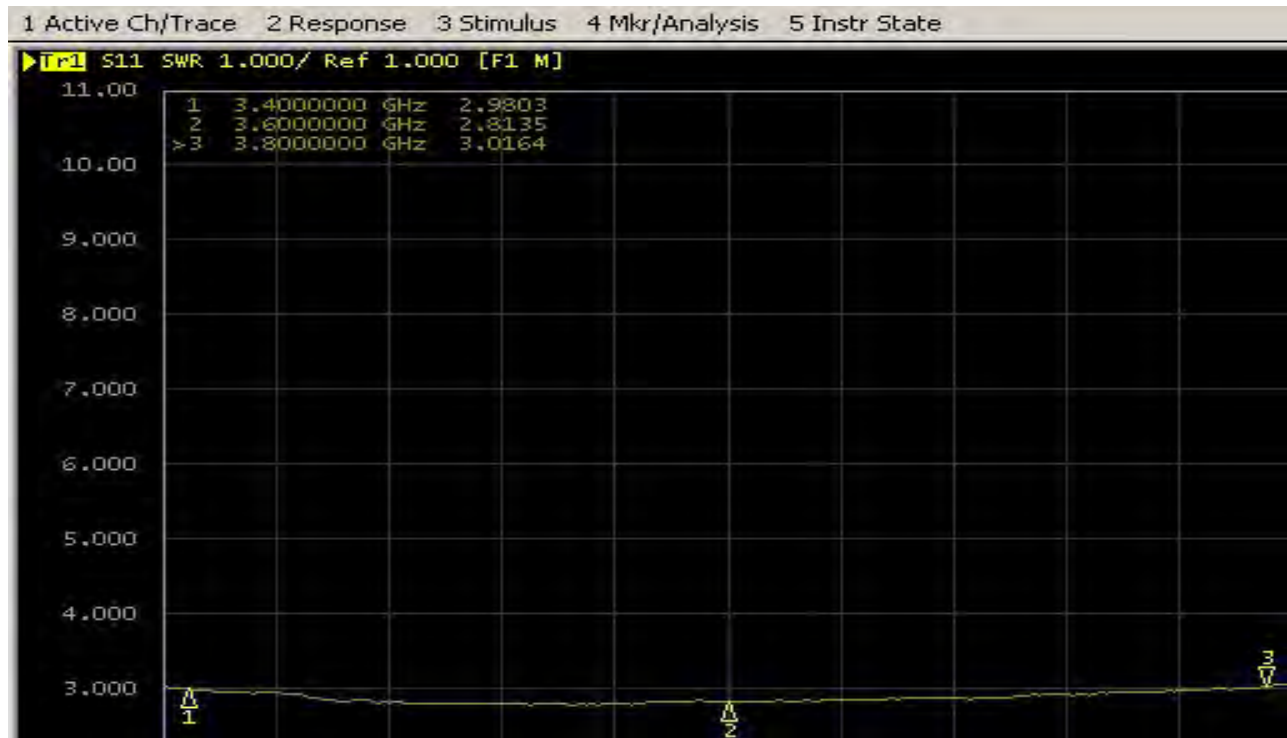


Return Loss



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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

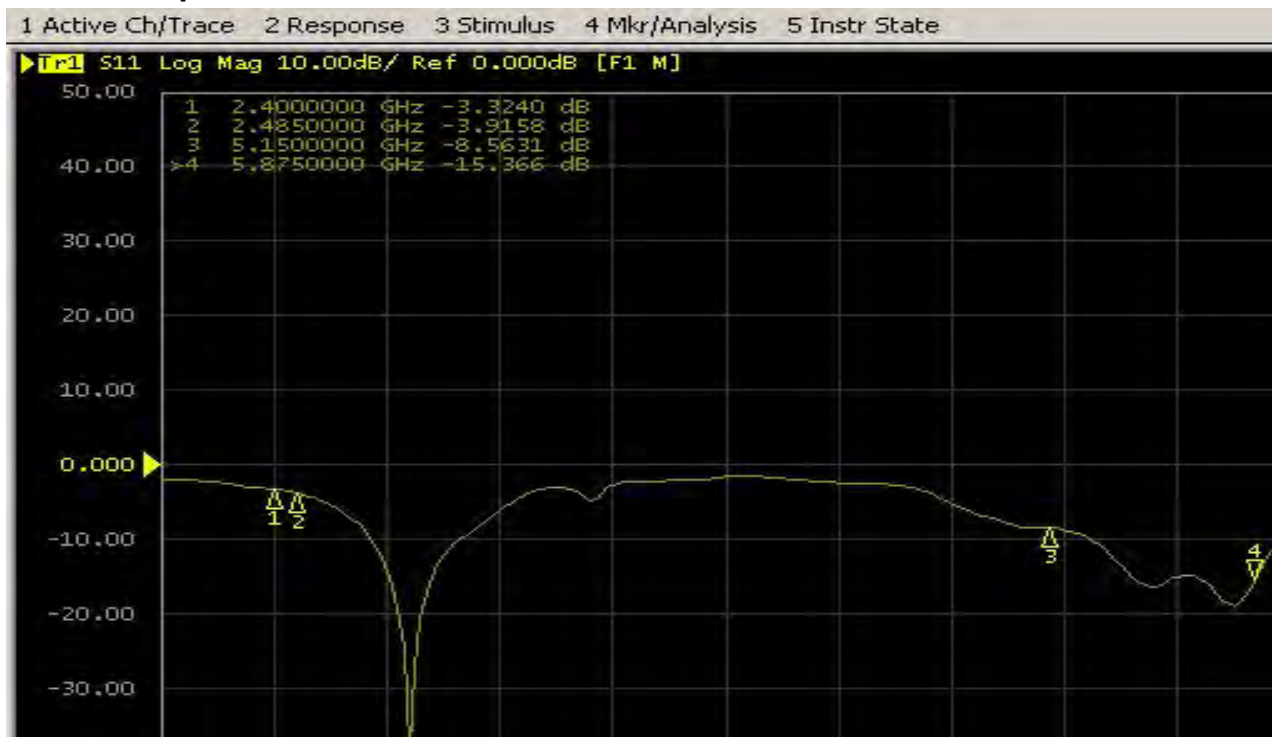
5.4 Electrical characteristics data – Single product measurement conditions (WiFi dual)

	MAIN			
Frequency Range	2400MHz	2485MHz	5150MHz	5875MHz
(V.S.W.R)	5.28	4.51	2.19	1.41
	DIV			
Frequency Range	2400MHz	2485MHz	5150MHz	5875MHz
(V.S.W.R)	4.32	3.46	2.16	1.42

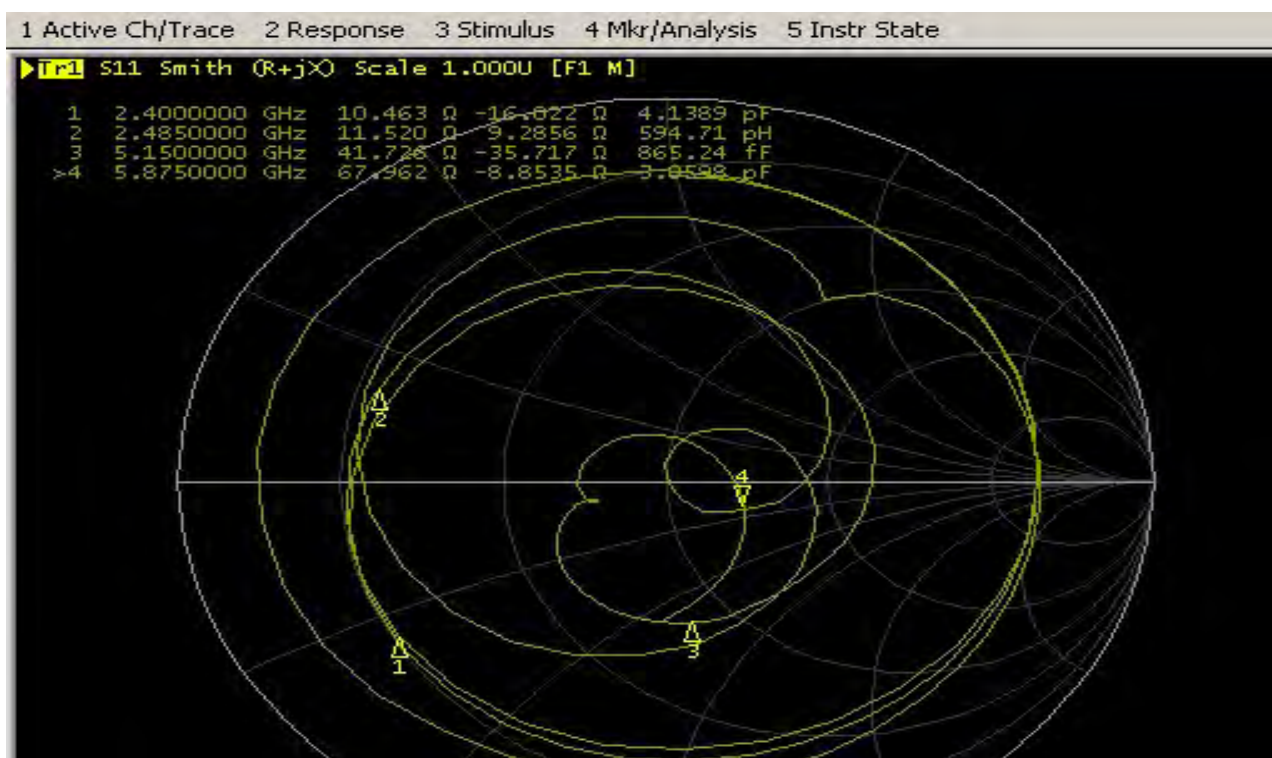


	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

5.4.1 Input Return Loss : Main



Return Loss



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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



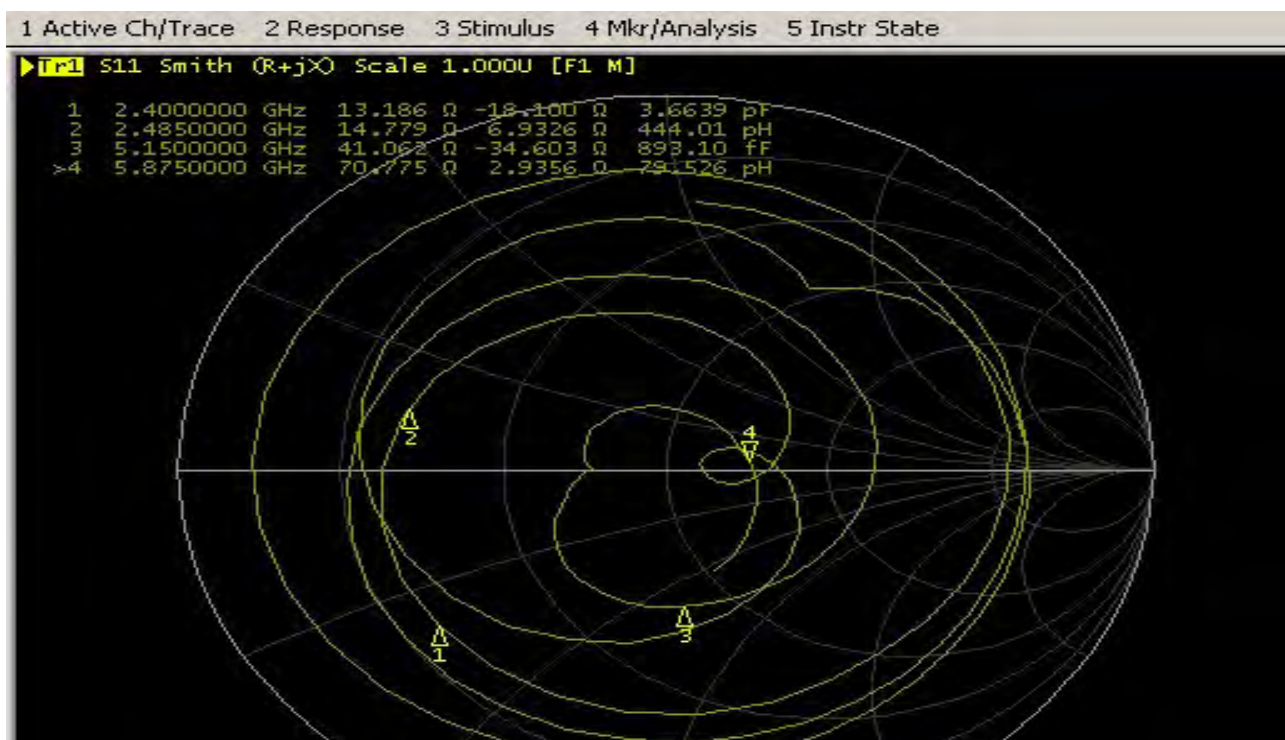
V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

5.4.2 Input Return Loss : Div

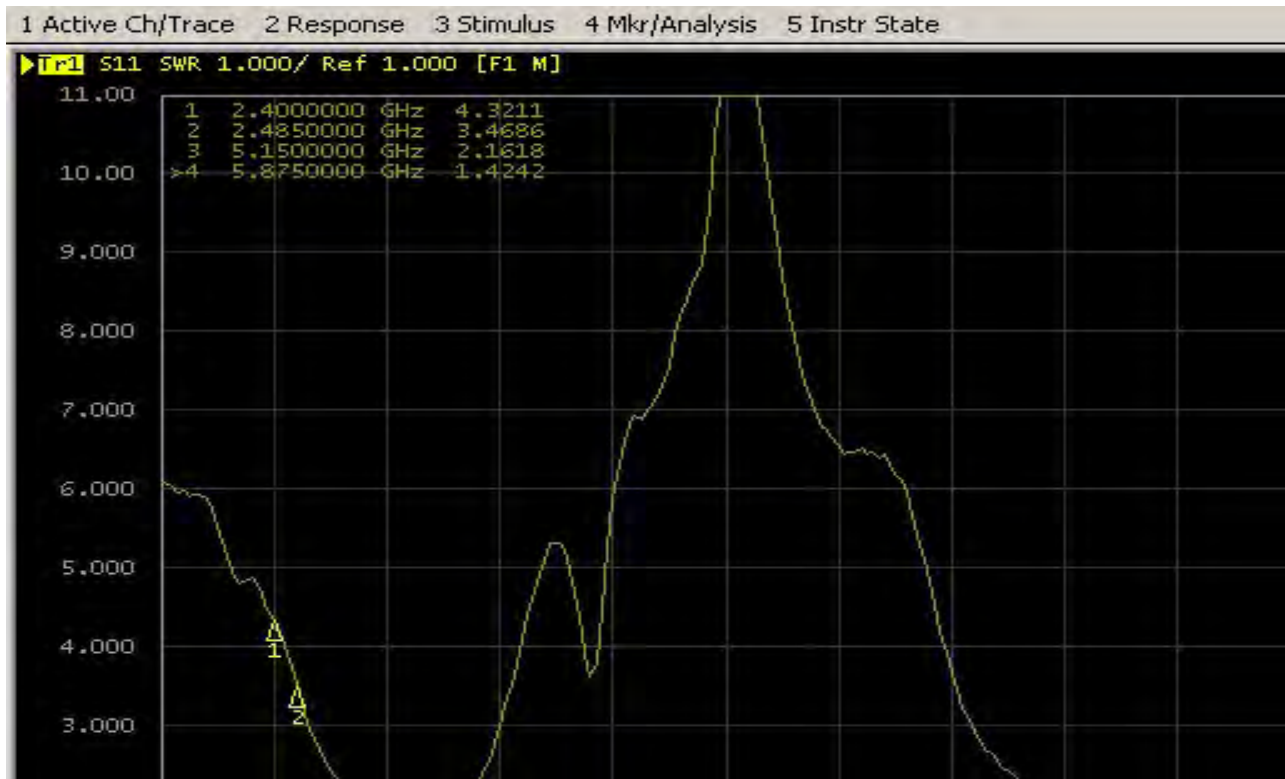


Return Loss



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	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			



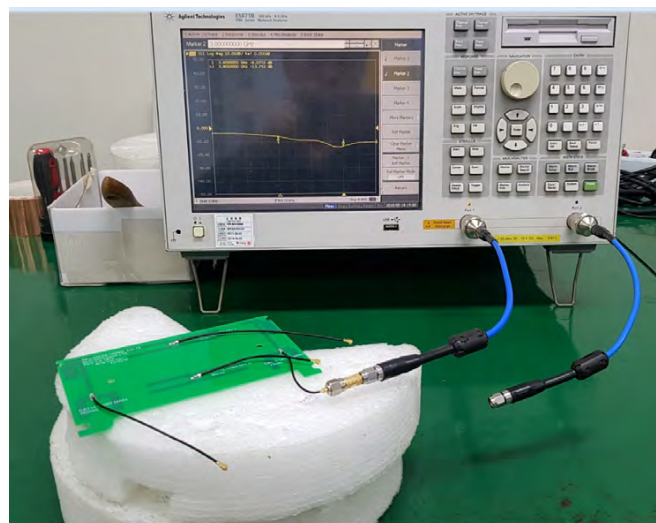
V.S.W.R

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

6 ANTENNA UNIT

6.1 ANTENNA UNIT – Single product measurement conditions(It is affected by the cable) LTE

category	VSWR (MAX)			
standard	MAIN U1	MAIN U0	DIV U0	DIV U1
division / Frequency	3400~3800MHz	3400~3800MHz	3400~3800MHz	3400~3800MHz
1	3.49	3.80	3.09	3.01
2	3.58	3.91	3.02	2.89
3	3.62	3.72	2.99	2.92
4	3.55	3.92	3.12	3.03
5	3.48	3.99	3.15	3.05
6	3.52	3.95	3.14	3.11
7	3.55	3.85	3.15	2.98
8	3.46	3.84	3.02	3.02
9	3.65	3.89	3.11	3.05
10	3.56	3.92	2.98	3.09



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD	SEOWONINTECH	1.0	FEP 07, 2022
	TP-WDS-189M , D			

6.2 ANTENNA UNIT – Single product measurement conditions (It is affected by the cable) WiFi dual

category	VSWR							
standard	MAIN				DIV			
division / Frequency	2400MHz	2485MHz	5150MHz	5875MHz	2400MHz	2485MHz	5150MHz	5875MHz
1	5.28	4.51	2.19	1.41	4.32	3.46	2.16	1.42
2	5.15	4.52	2.31	1.49	4.32	3.45	2.15	1.43
3	5.32	4.62	2.25	1.51	4.31	3.41	2.14	1.49
4	5.26	4.49	2.32	1.48	4.39	3.33	2.26	1.51
5	5.18	4.59	2.21	1.56	4.35	3.42	2.21	1.48
6	5.42	4.61	2.25	1.49	4.42	3.45	2.19	1.53
7	5.36	4.68	2.24	1.48	4.41	3.49	2.12	1.49
8	5.35	4.52	2.21	1.52	4.35	3.47	2.22	1.52
9	5.28	4.53	2.45	1.55	4.32	3.48	2.42	1.43
10	5.24	4.61	2.32	1.49	4.32	3.45	2.41	1.49



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

7 Mechanical requirements

7.1 Appearance and structure

Visually check whether the requirements of the applicable matters and mechanical characteristics are satisfied

7.2 Appearance dimension

Company approval drawing or customer's approval specification must be satisfied

7.3 Drop test

After mounting the antenna to the drop test Jig, drop it on a steel plate with a height of 1.5m, 1,000mm wide, and 20mm thick.(Figure 4)

After two tests on each side of the device, the mechanical properties and electrical requirements shall be satisfied.

W(g)	device weight
H(Cm)	150cm
times(N)	Each side 2 times
note	-

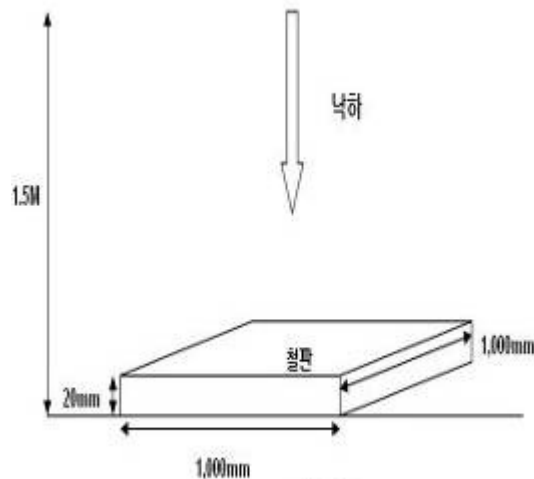
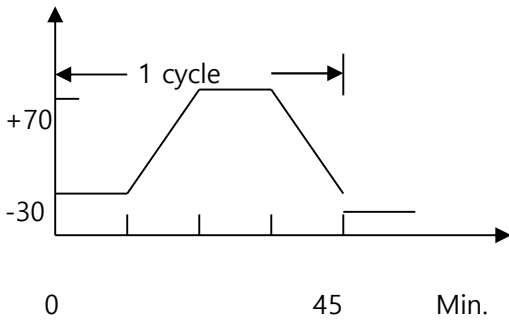


그림 4.

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

8 Reliability

NO	Items	Specifications	
6-1	LOW TEMP EXPOSURE TEST	TEMPERATURE : -30°C TIME : 48 HOURS	AFTER 2HOURS EXPOSURE IN ORDINARY FROM TEST , ANTENNAS SHALL BE APPROVED AS SPECIFIED IN ITEM 5 AND 6
6-2	HIGHTEMP EXPOSURE TEST	TEMPERATURE : 70°C TIME : 48 HOURS	
6-3	HUMIDITY EXPOSURE TEST	TEMPERATURE : 60°C±2°C HUMIDITY : 85%RH TIME : 48 HOURS	
6-4	THERMAL SHOCK	Temperature(°C)  0 45 Min. Test cycle : 5 cycles	
6-5	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 5 DROPS.	



Description

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9 Cable specification

材 质 证 明

编制日期: 2015.5.8

公司名稱 Company Name	137/50-003	产品名称 Product Name	同轴电缆 Coaxial Cable	产品重量 Product Weight	4.271 g/m
Product No.	137/50-015 137/50-016	客户料号 Customer No.		E-Mail	
填写人部门 Dept.	品保部 QA	姓名 Name		聯絡電話 Telephone	

茲證明向貴公司銷售的產品和半成品中，使用之原材料，包裝材料以及生產過程中，不含有規定的相關禁止使用物質。另，向貴公司報告成品、半成品中使用的原材料、包裝材料以及生產工程中的添加劑成分如下所述：

使用材料(Use material)

項次	零件名稱	原料廠	材質	重量(g)	組成成份	含百分比	化驗報告NO.	限用物質含量(單位: PPM)														
Item	Material Name	Vendor	Substance	Weight	Substance Composition	Substance Amount	Test Report No.	鉛	鎘	汞	六價鉻	PBB	PBD	PCB	多氯聯苯	PCT	CP	甲醯	石棉	AZO	有機錫	PVC
								(Pb)	(Cd)	(Hg)	(Cr+6)	E	s	PC	醒	Asbestos	偶氮類	錫	C			
1	導體	恒丰	鍍銀銅線	0.519	銅	11.91%	SHAEET 407373515 A01	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	絕緣	大金	FEP	1.254	銀	0.24%	SHAEET 500664111	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
					FEP	29.36%		ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3	編織	正導	鍍銀銅線	1.462	銅	33.20%	EEL03600367502E	21	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
					錫	1.03%		ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
4.1	护套	大金	FEP		FEP	22.56%	SHAEET 500664109	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4.2	色母料(黑)	冠兰	FEP	1.036	FEP	1.70%	SHAEET 500900602	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	色母料(白)	冠兰	FEP		FEP		SHAEET 500900620	ND	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	色母料(灰)	冠兰	FEP		FEP		SHAEET 500900618	ND	ND	ND	ND	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

使用材料請貼圖示於此欄，並標項次：



化驗報告注意事項：

- (1) 須為通過 ISO 17025 認證之公司所提供之化驗報告資料 (如 SGS, ITS, ETC, BVQI)
- (2) 有效期限為一年
- (3) 報告內容文字必須清晰，易辨別 (不可模糊不清)
- (4) 限用物質含量之未測項目請填 "N/A"，ND, =Not Detected (報告限定值)

蓋 章 處

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No. TP-L42SS4-188MD TP-WDS-189M , D	Customer. SEOWONINTECH	Rev. 1.0	Date FEP 07, 2022

9-1 FR-4 raw material specification

 浙江华正新材料股份有限公司
ZHEJIANG HUAZHENG NEW MATERIAL GROUP CO., LTD.

H150HF Halogen-free

特性/ Features

无卤 Tg: 150±5℃, Halogen-free Tg: 150±5℃
 Dicy Cure, 优秀的剥离强度 Dicy Cure ,Excellent peel strength
 优异耐热性 Td=358℃ T288=30min Excellent thermal resistance Td=358℃ T288=30min
 低 Z 轴热膨胀系数 Low Z-CTE 3.5%

应用领域/ Applications

手机、电脑、通讯设备、仪器仪表、摄像机、电视机等。
 Mobile phone, Computer, Communication equipment , Instrumentation, VCR, Television, etc.

主要特性 / General properties

检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Spec	典型值 Typical Value
玻璃化转变温度 T _g	℃	DSC	150±5℃	150.2
剥离强度 1oz Peel Strength	N/mm	288℃, 10S	≥1.05	1.52
热应力 Thermal stress	S	288℃, solder dip	>10	180 s No delamination
弯曲强度 Flexural Strength	N/mm ²	经向 LW	≥415	580
		纬向 CW	≥345	475
燃烧性 Flammability	—	E 24/125	UL94V-0	V-0
表面电阻 Surface Resistivity	MΩ	After moisture	≥1.0×10 ⁴	5.21×10 ⁷
体积电阻 Volume Resistivity	MΩ·cm	After moisture	≥1.0×10 ⁶	5.10×10 ⁸
介电常数 Dielectric Constant	—	1 MHZ C 24/23/50	≤5.4	4.6
介质损耗角正切 Loss Tangent	—	1 MHZ C 24/23/50	≤0.035	0.015
耐电弧 Arc Resistance	S	D48/50+D0.5/23	≥60	120
击穿电压 Dielectric Breakdown	KV	D48/50+D0.5/23	≥40	57
吸水率 Moisture Absorption	%	D24/23	≤0.35	0.16
热分解温度 Td	℃	Weight Loss 5%	≥325	358
T288 (不覆铜)	min	TMA	≥5	30
Z-CTE /50 - 260 ℃	%	TMA	≤4.0	3.5
相比漏电起痕指数 CTI	V	IEC-60112	175~250	200
卤素含量 Halogen content	Cl	ppm	EDX-GP	≤900
	Br	ppm		≤900
	Cl+Br	ppm		≤1500

Specimen Thickness : 1.6mm ; Specification sheet: IPC-4101C/127, is for your reference only
 Explanation: C: Humidity conditioning; D: Immersion conditioning in distilled water;
 E: Temperature conditioning ;



Description				
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10 Process chart

제조 및 품질 공정도									
제품/모델		SLC-150842GA L1W WIFI		도		문서번호		제정일	
변		공정명		주관 부서		직업 내용		사용설비/계측기	
1		지체		지체		지체 입고		도면	
2		수입검사		QA		지체 수입검사		·버니어캘리퍼스 ·재질성분	
3		지체		지체		PCB 포장 및 외관 치수 검사		·Loa 구분	
4		특성검사		생산		PCB +PEX 조립 및 세척 특성 검사		·Network Analyzer ·전기적 특성 검사	
5		포장		생산		·비닐백과 박스에 제품을 포장		·육안 ·포장 상태, 수량	
6		출하검사		QA		·제품 특성 및 외관, 포장 상태를 확인		·제품 포장 및 육안 검사	
7		출하		QA		식별표 부착		육안	
번호		개정일		개정 내용		개정자		확인	
번호		개정일		개정 내용		개정자		확인	

TSQP-0401-10

(주)텔레스타

A4(210×297)



Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

Rev.

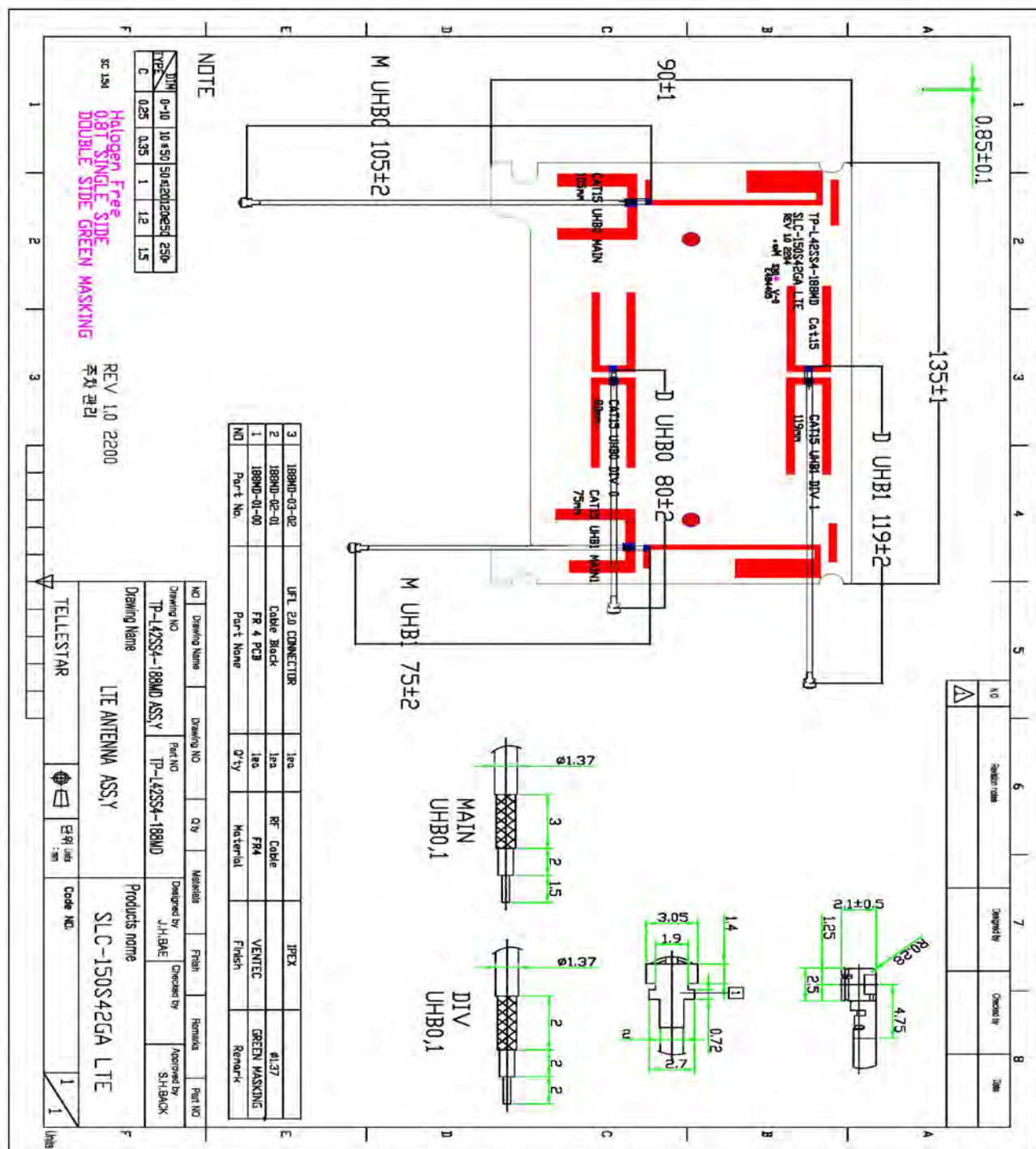
1.0

Date

FEP 07, 2022

11 Antenna drawing

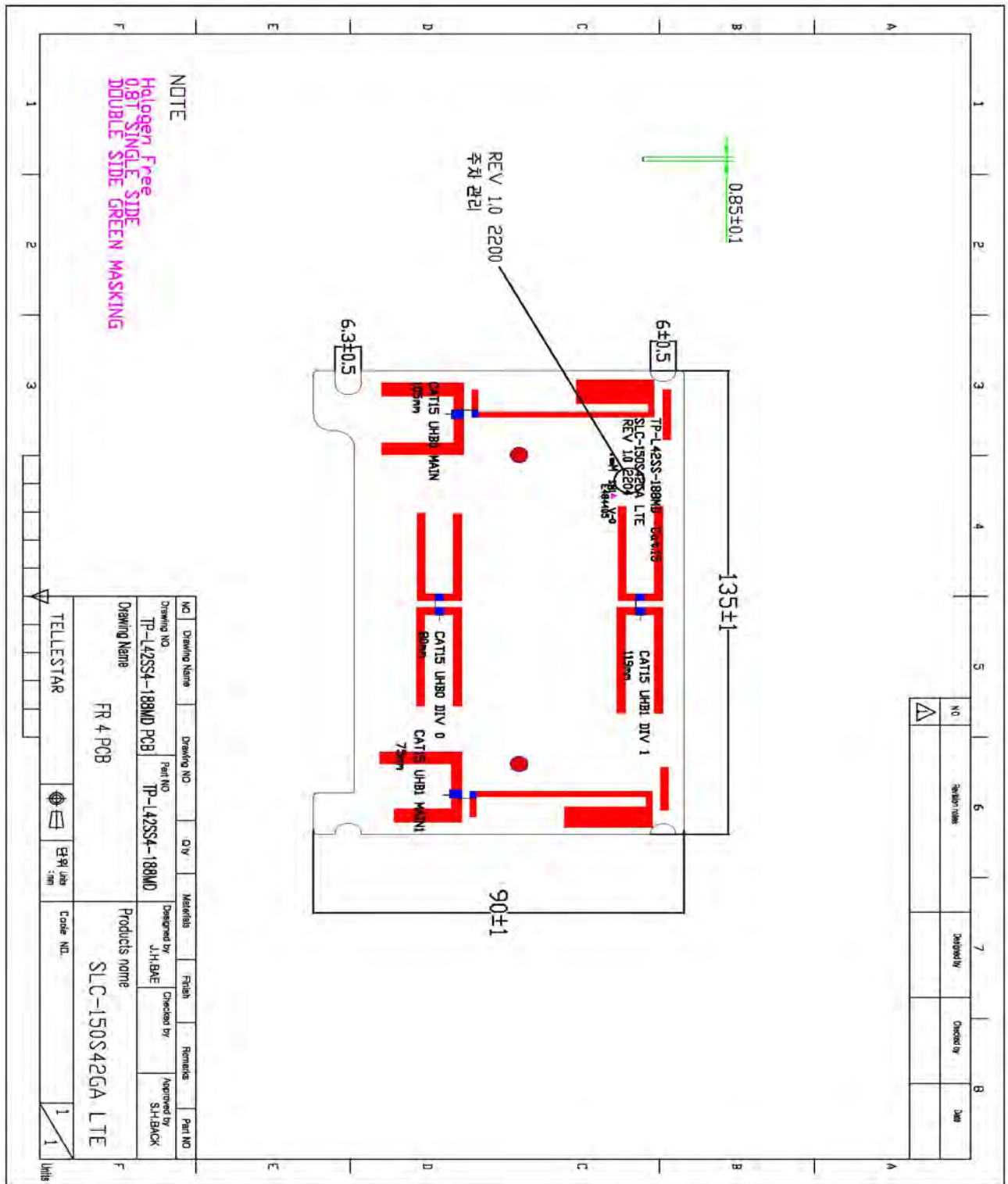
11.1 LTE ASS,Y





Description			
LTE & WiFi DUAL Antenna Product Specification			
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PCB





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

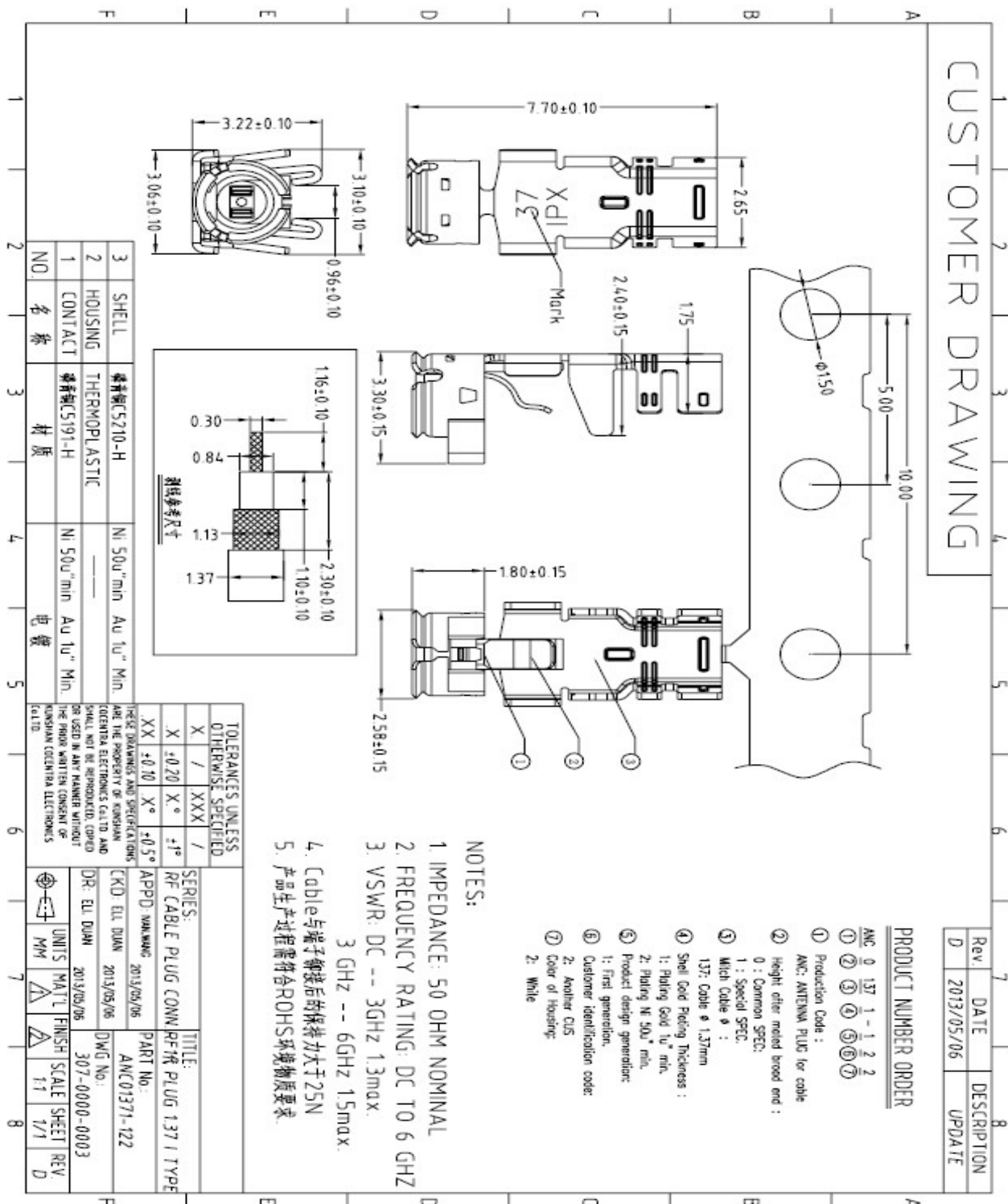
Rev.

1.0

Date

FEP 07, 2022

IPEX CONNECTOR





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

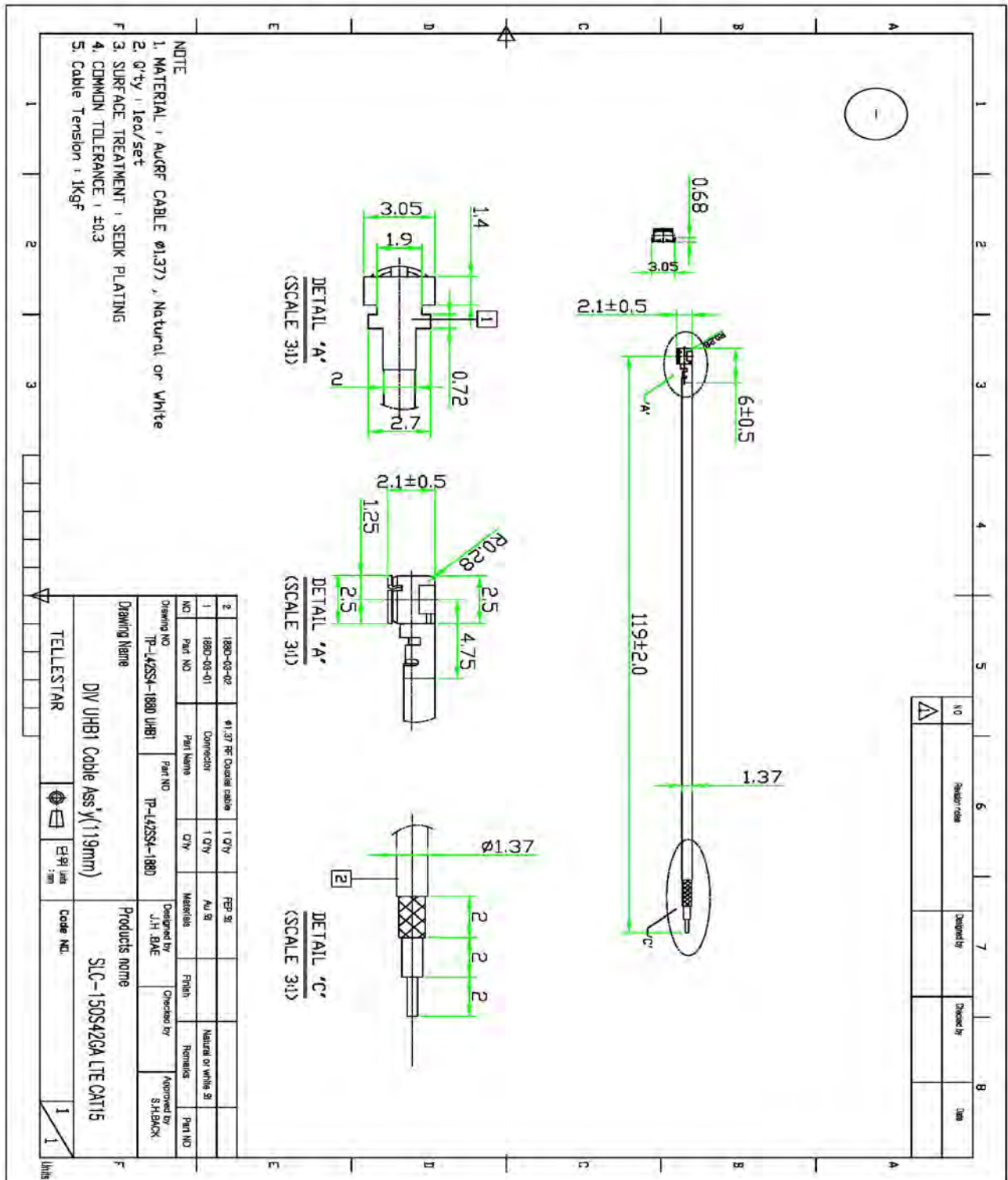
Rev.

1.0

Date

FEP 07, 2022

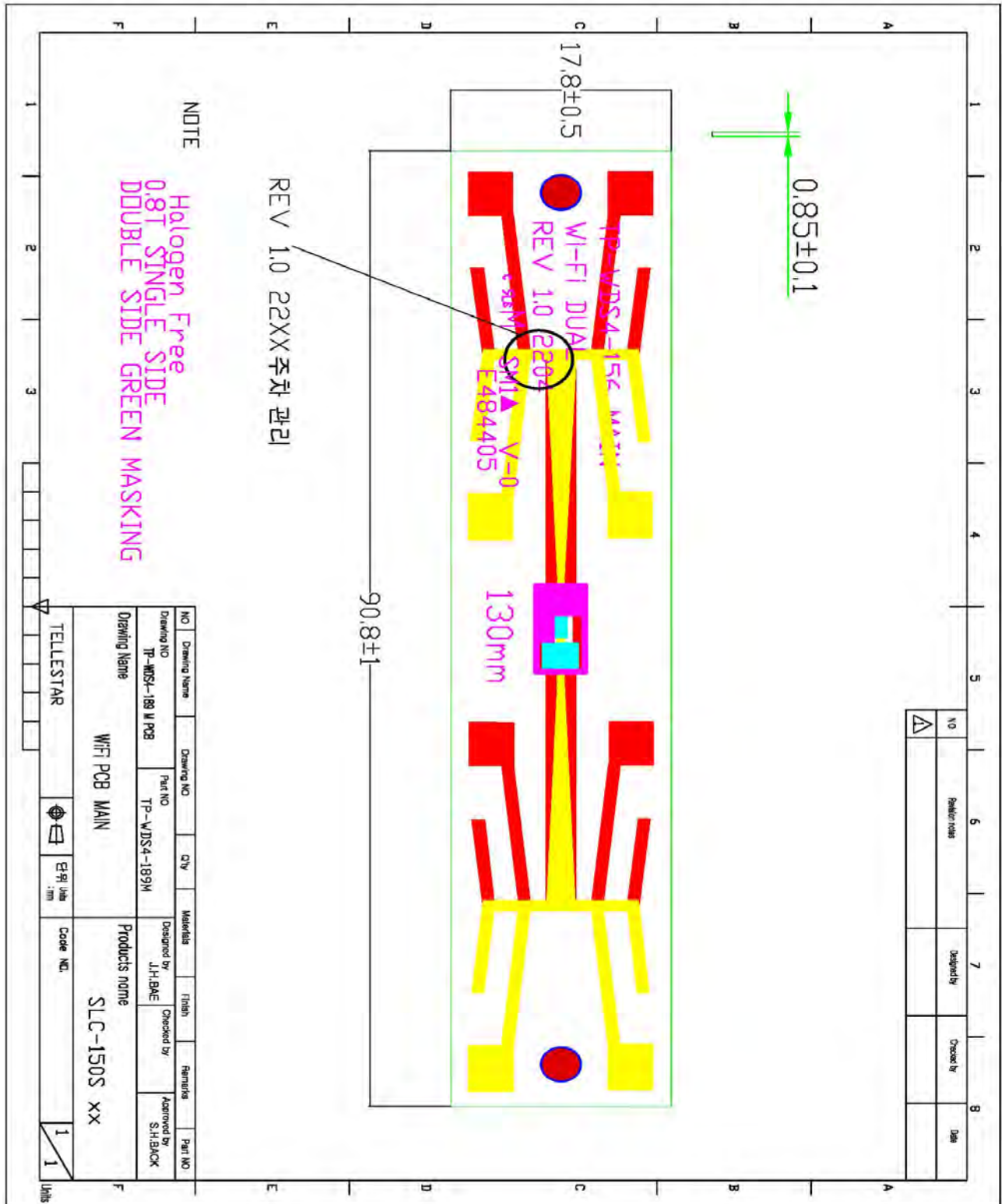
IPEX CABLE ASS,Y DIV UHB1 119mm





Description			
LTE & WiFi DUAL Antenna Product Specification			
Specification No.	Customer.	Rev.	Date
TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

MAIN PCB





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD
TP-WDS-189M , D

Customer.

SEOWONINTECH

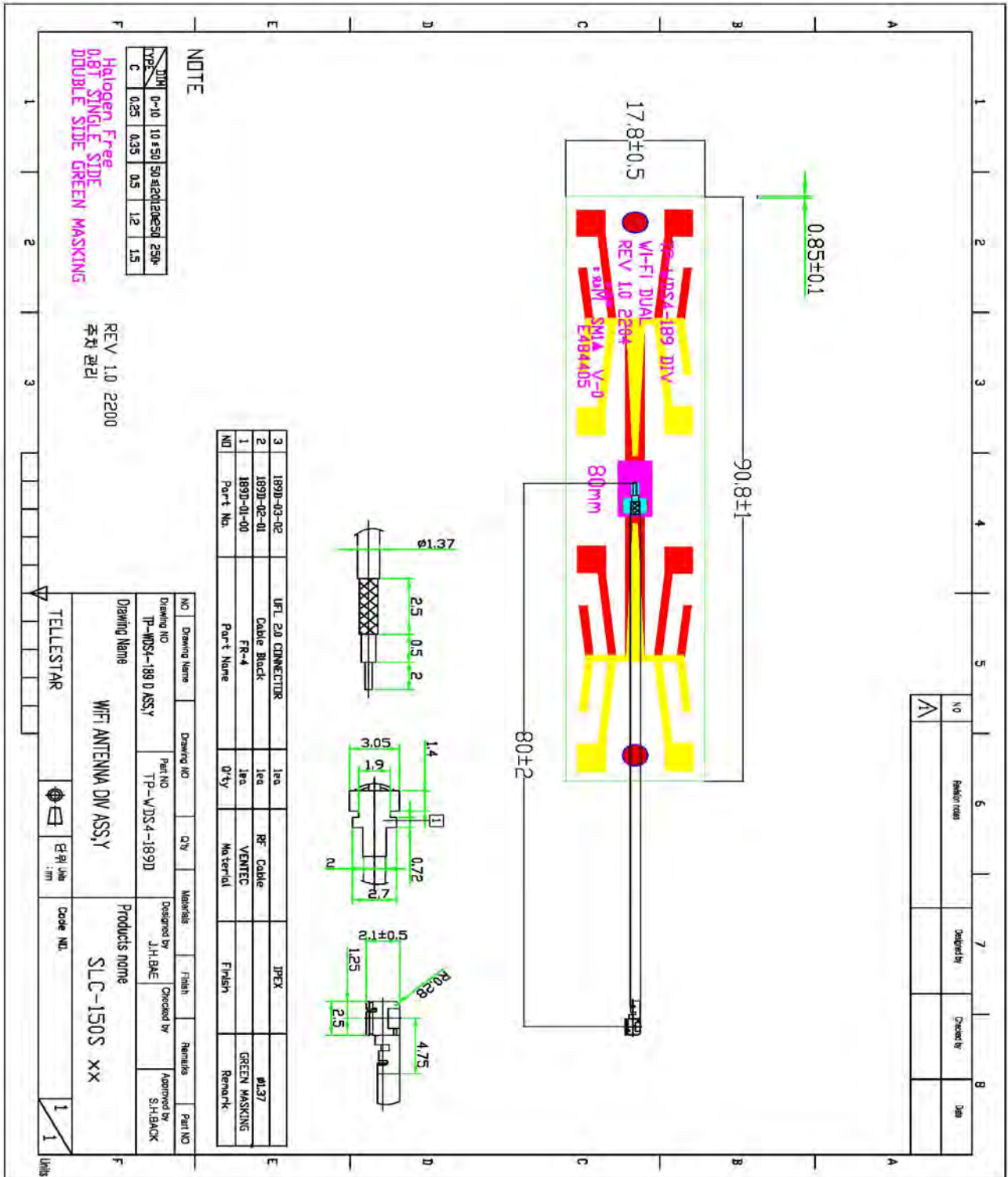
Rev.

1.0

Date

FEP 07, 2022

DIV ASS,Y





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

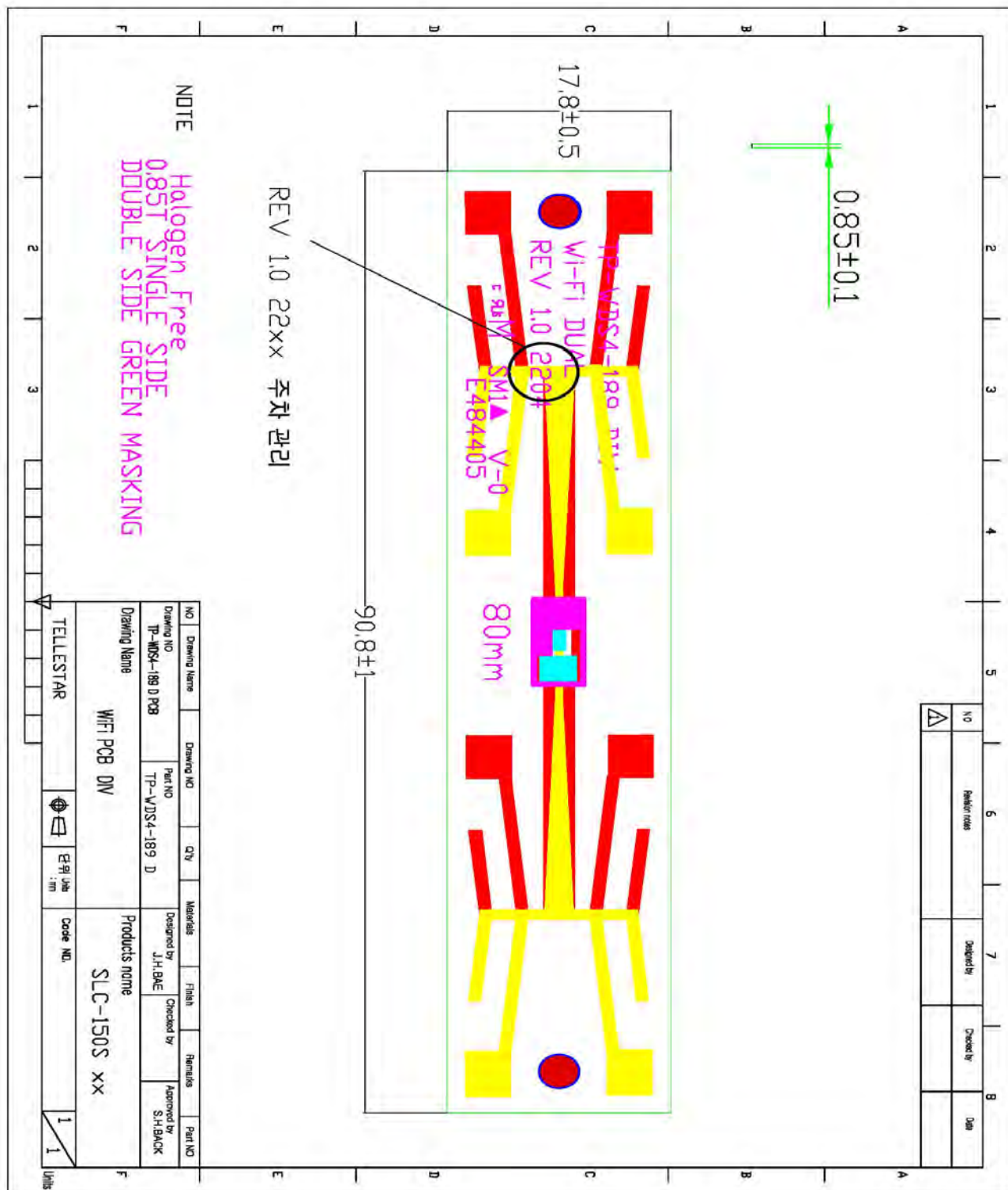
Rev.

1.0

Date

FEP 07, 2022

DIV PCB





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

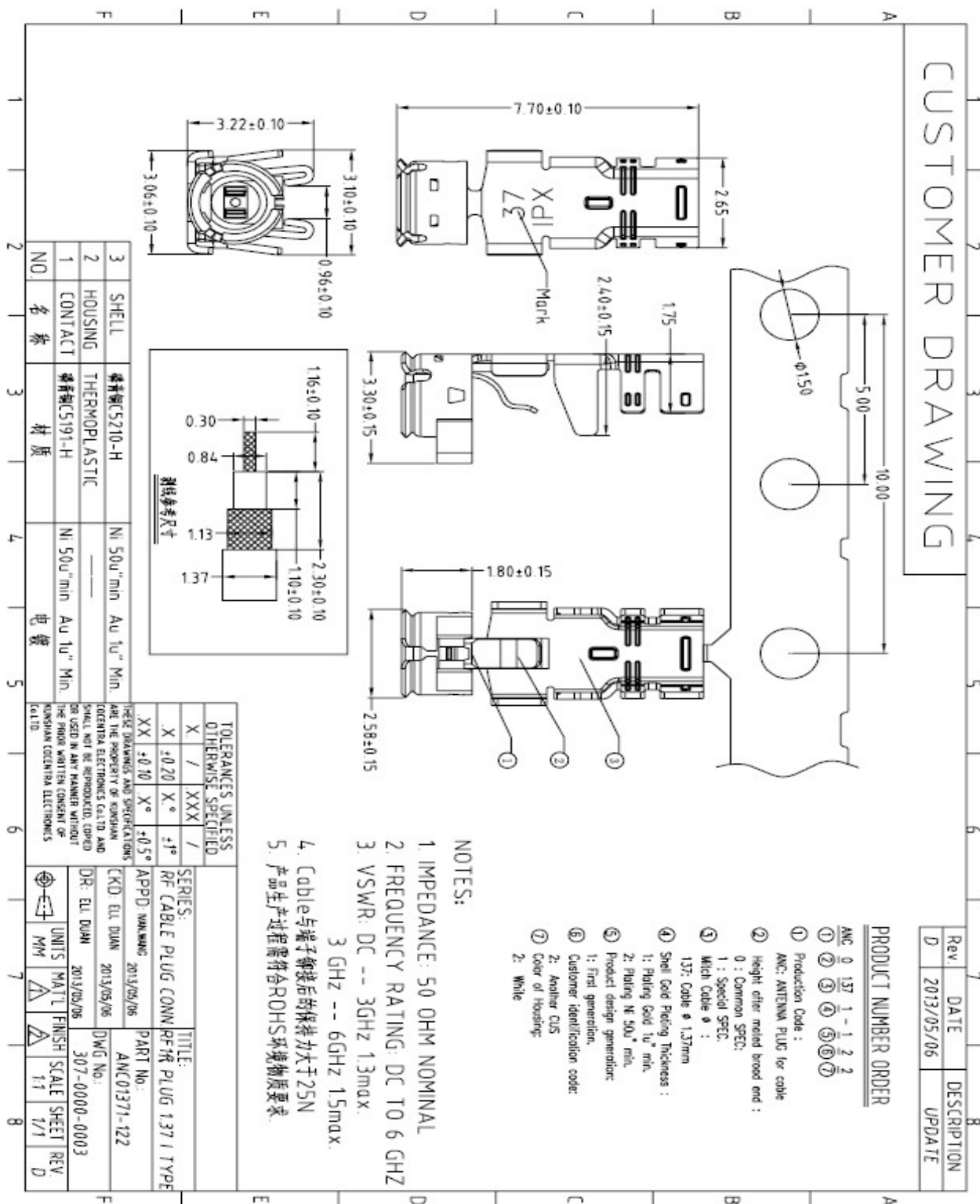
Rev.

1.0

Date

FEP 07, 2022

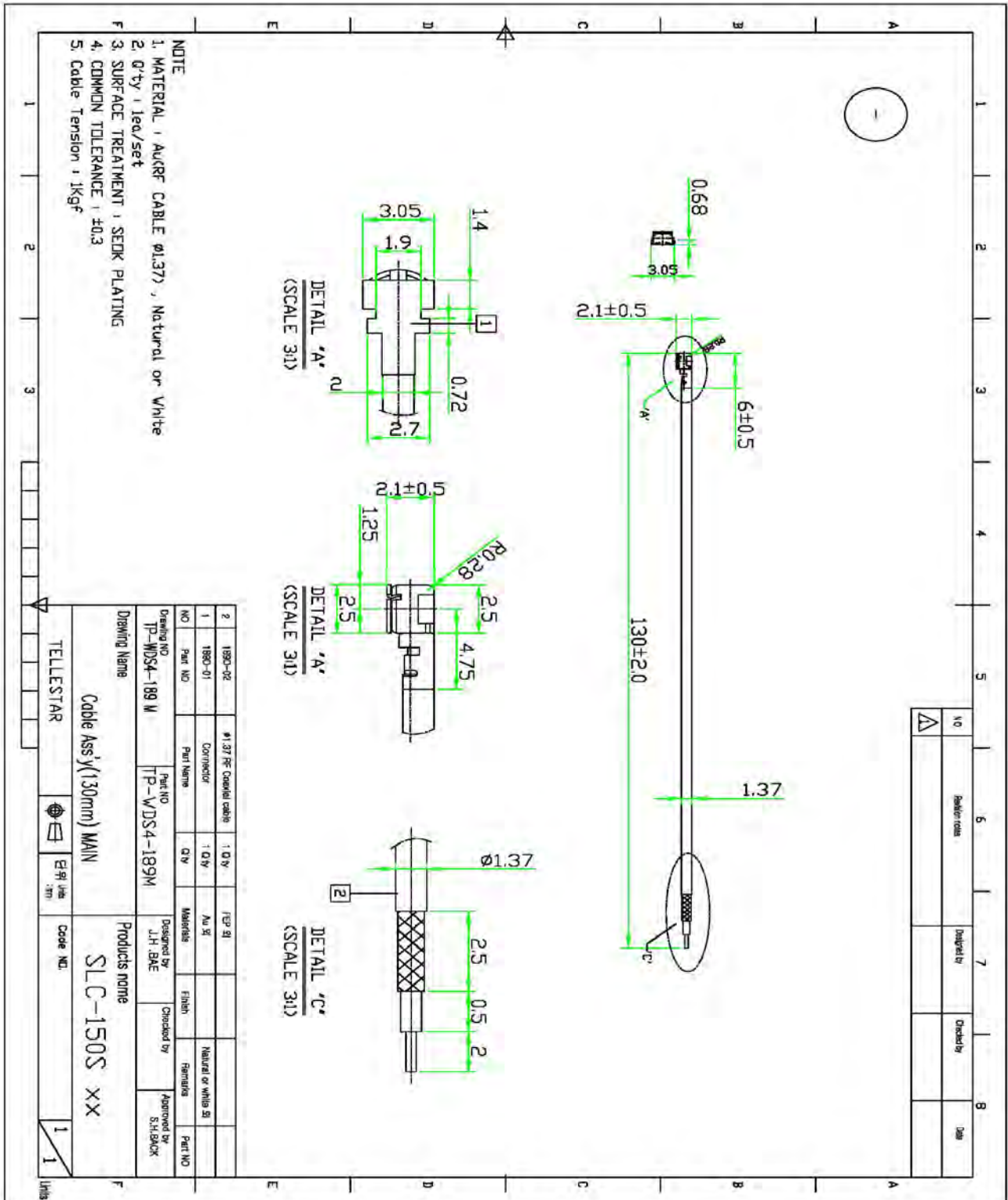
IPEX CONNECTOR





Description			
LTE & WiFi DUAL Antenna Product Specification			
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MAIN CABLE ASS,Y 130mm





Description

LTE & WiFi DUAL Antenna Product Specification

Specification No.

TP-L42SS4-188MD

TP-WDS-189M , D

Customer.

SEOWONINTECH

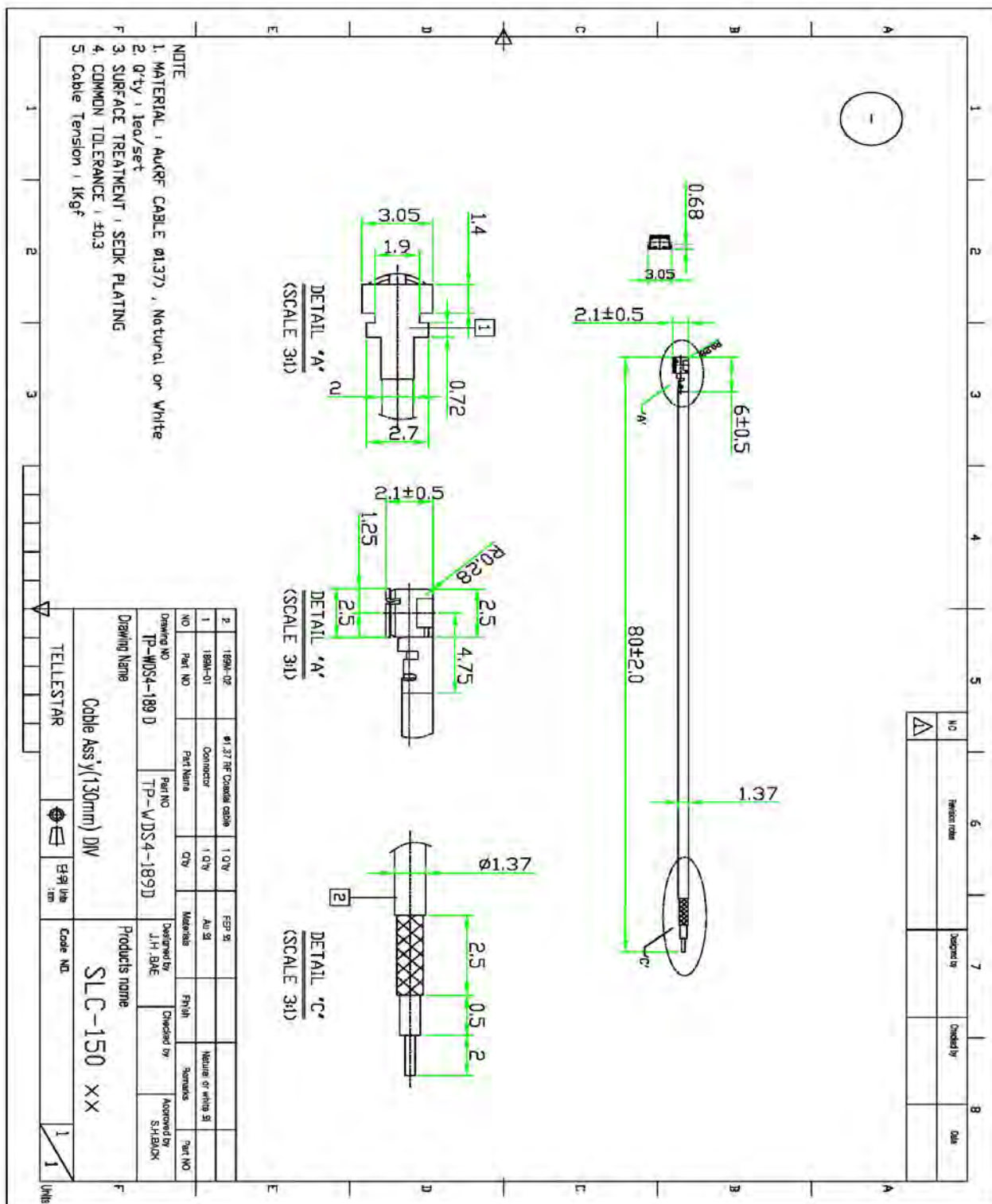
Rev.

1.0

Date

FEP 07, 2022

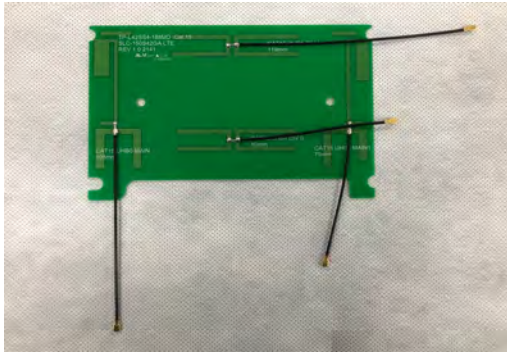
DIV CABLE ASS,Y 80mm



	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

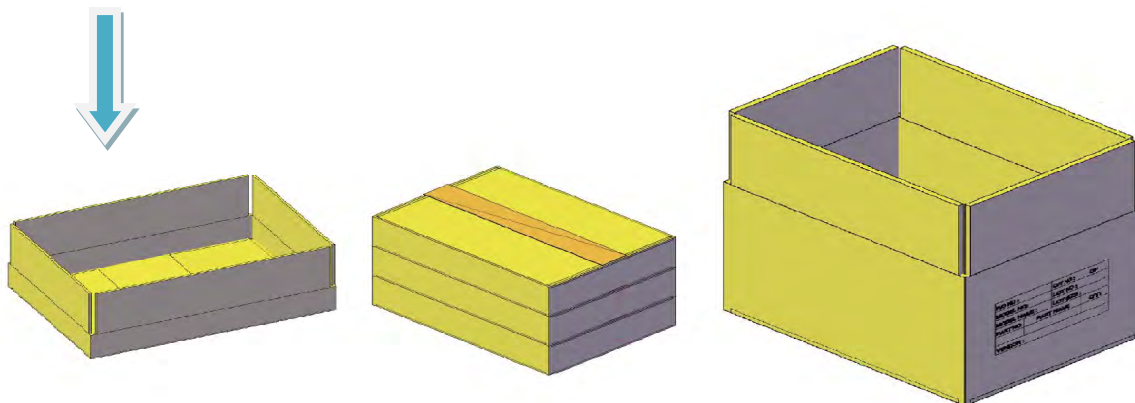
12 Packing

- LTE
- Packaging is done in the same way as in the picture above
- LTE ANT



신규 초품 New Product	
출하일자	00000000
출하 Lot No	1 ~3 Lot

- PE packing (zipper bag) 10ea



C-corrugated

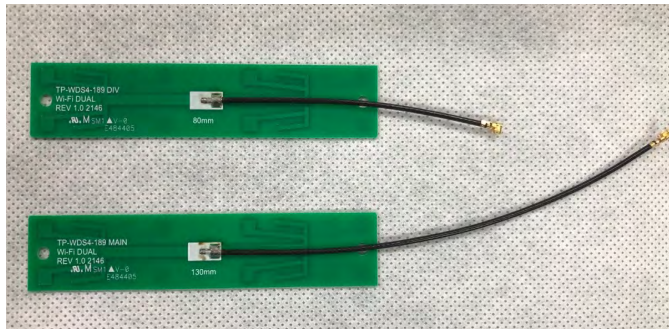
BC- corrugated

	PART NAME	Q.TY
1	PE	10EA
2	INNER BOX 330*250*80mm	50EA
3	OUTBOX 365*260*250mm	100EA

- It can be changed according to the circumstances of the manufacturer
- Warranty Exchange if defective (1:1)

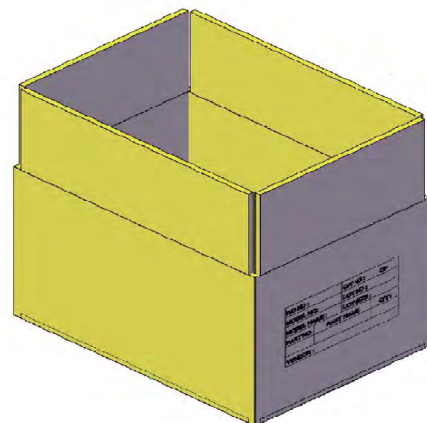
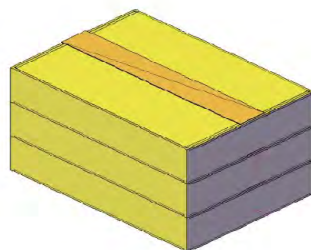
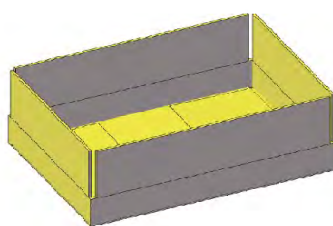
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	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

- **WiFi**
- Packaging is done in the same way as in the picture above



신규 초품 New Product	
출하일자	00000000
출하 Lot No	1 ~3 Lot

PE packing (zipper bag) 10ea



C-corrugated

BC- corrugated

	PART NAME	Q.TY
1	VINYL BAG	50EA
2	INNER BOX 330*250*80mm	1000EA
3	OUTBOX 365*260*250mm	3000EA

- It can be changed according to the circumstances of the manufacturer
- **Warranty** Exchange if defective (1:1)

	Description			
	LTE & WiFi DUAL Antenna Product Specification			
	Specification No.	Customer.	Rev.	Date
	TP-L42SS4-188MD TP-WDS-189M , D	SEOWONINTECH	1.0	FEP 07, 2022

13 UL

2021, 5, 6.

ZPMV2.E484405 - Wiring, Printed - Component | UL Product iQ™

UL Product iQ™



ZPMV2.E484405 - Wiring, Printed - Component Wiring, Printed - Component

[See General Information for Wiring, Printed - Component](#)

SM CORPORATION CO.,LTD.
61-11, WONCHANG-RO, SEO-GU
INCHEON, 22770 REPUBLIC OF KOREA

E484405

Cond Width		Cond	SS/ DS/ BSG	Max Area Diam (in)(mm)	Solder Limits	Max Oper Temp	Flame	Mark	C		
Min	Edge	Thk						UL796	T		
Type	(mil)(in)	(mil)(in)	(mil)(in)		(mil)(in)	C	sec	C	Class	BSR	I
Printed Wiring Boards:											
SM1	0.1 (0.004)	0.1 (0.004)	17 (0.67)	DS	50.8 (2.0)	360	10	130	V-0	All	2
SM2	0.05 (0.004)	0.05 (0.004)	12 (0.47) min.68	DS	50.8 (2.0)	260	10	130	V-0	All	3

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[Last Updated](#) on 2020-05-28

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