TEST REPORT

Reference No.	:	WTU18S08121850W
FCC ID	:	RH2-HR-N5517
Applicant	:	Haier international(hk) limited
Address	:	Room1908 Harbour Centre, 25 Harbour Road, Wanchai, Hong Kong, China
Manufacturer	:	ANHUI KONKA ELECTRONIC CO., LTD
Address	:	NO.999, ZhongDu Road, Chu Zhou, An Hui, China
Product Name	:	LCD TV
Model No.	:	E4SFT5517, E4SW5518
Standards	:	FCC CFR47 Part 15 C Section 15.247:2018
Date of Receipt sample	:	2018-08-22
Date of Test	:	2018-08-23 to 2018-09-08
Date of Issue	:	2018-09-13
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.
The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:
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1 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation) of USA, Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), IC(Industry Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.

Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. Electro Magnetic Compatibility (EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

1.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Country/Region	Accreditation Body	Scope	Note
USA	International Services	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		WPC	-
Thailand		NTC	-
Singapore		IDA	-

Note:

1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
2. IC Canada Registration No.: 7760A

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

2 Contents

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTU18S08121850W	2018-08-22	2018-08-23 to 2018-09-08	2018-09-13	original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	LCD TV
Model(s):	E4SFT5517, E4SW5518
Model Difference:	Only the model name is different. The model E4SFT5517 is the test sample.
Operation Frequency:	802.11b/g/n HT20: 2412MHz ~ 2462MHz, 802.11n HT40: 2422MHz~2452MHz
Antenna Gain:	ANT A 2.4GHz Wi-Fi: 2.0 dBi ANT B 2.4GHz Wi-Fi: 2.0 dBi
Type of modulation:	IEEE 802.11b: DQPSK/DBPSK/DSSS/CCK IEEE 802.11g: QPSK/BPSK/16QAM/64QAM/OFDM IEEE 802.11n: QPSK/BPSK/16QAM/64QAM/OFDM
Number of transmitter chains:	Wi-Fi:2T2R (MIMO)

The device supports MIMO 2T2R, and the MIMO works with STBC(Space-Time Block Coding).
The antenna is omnidirectional, does not support any directional gain in any modes.
TX power for MIMO rate, the Wi-Fi chip has a power/rate table that controls TX power from chipout, it's preset in nvram, FW don't need to calculate it again when MIMO rate is fixed. Of course the real radiation power is also related to antenna efficient.
Two transmitter signals are not correlated with each other.
MIMO is only supported for 802.11 n mode, and not supported for 802.11b and 802.11g mode.

4.2 Details of E.U.T

Ratings:	Input Power: AC 120V~ 50/60Hz, 130W

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	-

4.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum conducted (average) output power	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Power Spectral Density	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Bandwidth	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Band Edge	802.11b	1 Mbps	1/11	TX
	802.11g	6 Mbps	1/11	TX
	802.11n HT20	MCS0	1/11	TX
	802.11n HT40	MCS0	3/9	TX
Transmitter Spurious Emissions	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX

Note :Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product .

5 Equipment Used during Test

5.1 Equipment's List

Conducted Emissions Test Site						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	2017-09-11	2018-09-10
2.	LISN	R&S	ENV216	100115	2017-09-11	2018-09-10
3.	Cable	Top	TYPE16(3.5M)	-	2017-09-11	2018-09-10
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2018-04-29	2019-04-28
2	Broad-band Horn Antenna(1-18GHz)	SCHWARZBECK	BBHA 9120 D	667	2018-04-29	2019-04-28
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2018-04-29	2019-04-28
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2018-04-29	2019-04-28
5	Spectrum Analyzer	R&S	FSP40	100501	2017-10-20	2018-10-19
6	Broad-band Horn Antenna(18-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170651	2017-10-25	2018-10-24
7	Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	100472	2017-10-25	2018-10-24
8	Cable	Top	18-40GHz	-	2017-10-25	2018-10-24
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2018-04-29	2019-04-28
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018-04-29	2019-04-28
3	Active Loop Antenna	Com-power	AL-130R	10160007	2018-04-17	2019-04-16
4	Amplifier	ANRITSU	MH648A	M43381	2018-04-29	2019-04-28
5	Cable	HUBER+SUHNER	CBL2	525178	2018-04-29	2019-04-28
6	Coaxial Cable (below 1GHz)	Top	TYPE16 (13M)	-	2017-09-12	2018-09-11
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	Spectrum Analyzer	R&S	FSP30	100091	2018-04-29	2019-04-28
2.	Coaxial Cable	Top	10Hz-30GHz	-	2017-09-12	2018-09-11
3	Antenna Connector*	Realacc	45RSm	-	2017-09-12	2018-09-11
4	DC Block	Gwave	GDCB-3G-N-SMA	140307001	2017-09-12	2018-09-11
"*": The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (30M~1000MHz)
	± 5.47 dB (1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guangdong, China.

6 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.247(d) 15.205(a) 15.209(a)	Pass
Conducted Emissions	15.207(a)	Pass
Bandwidth	15.247(a)(2)	Pass
Maximum conducted (average) output power	15.247(b)(3),(4)	Pass
Power Spectral Density	15.247(e)	Pass
Band Edge	15.247(d)	Pass
Antenna Requirement	15.203	Pass
RF Exposure	1.1307(b)(1)	Pass
Note: Pass=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

7 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity: Class B

Limit:

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

7.1 E.U.T. Operation

Operating Environment **:**

Temperature: 21.5 °C

Humidity: 51.9 % RH

Atmospheric Pressure: 101.2kPa

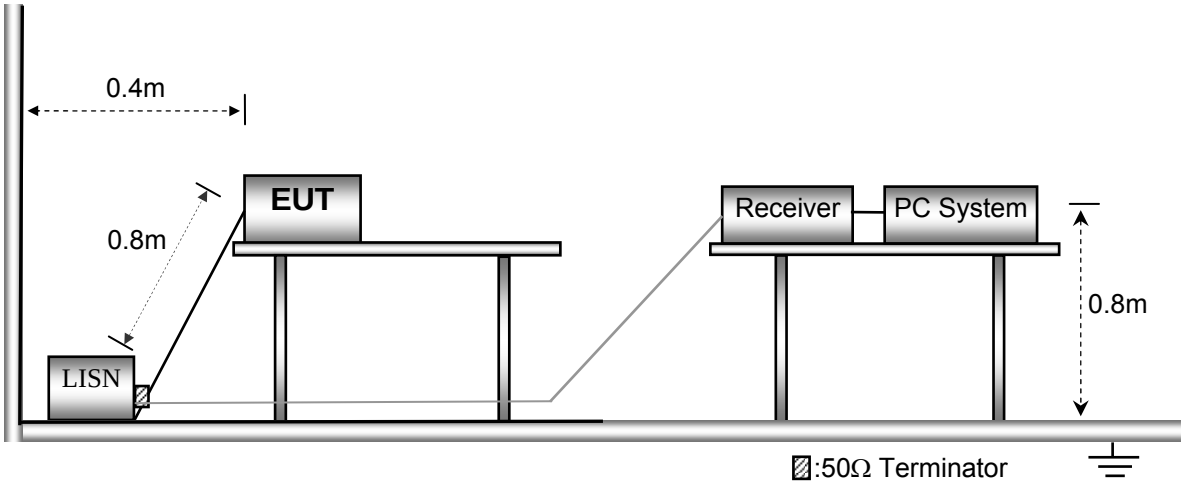
Test Voltage: AC 120V

EUT Operation:

The test was performed in Wi-Fi Transmitting mode, the worst test data (Wi-Fi b mode low channel for Antenna A) were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



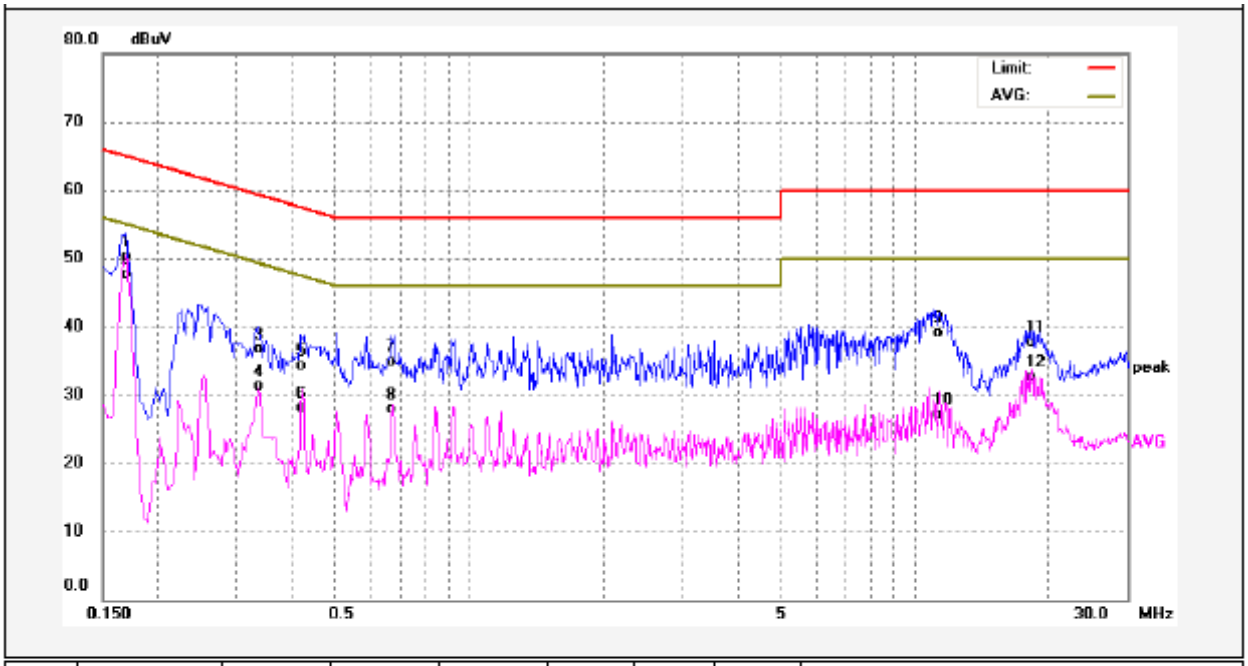
7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

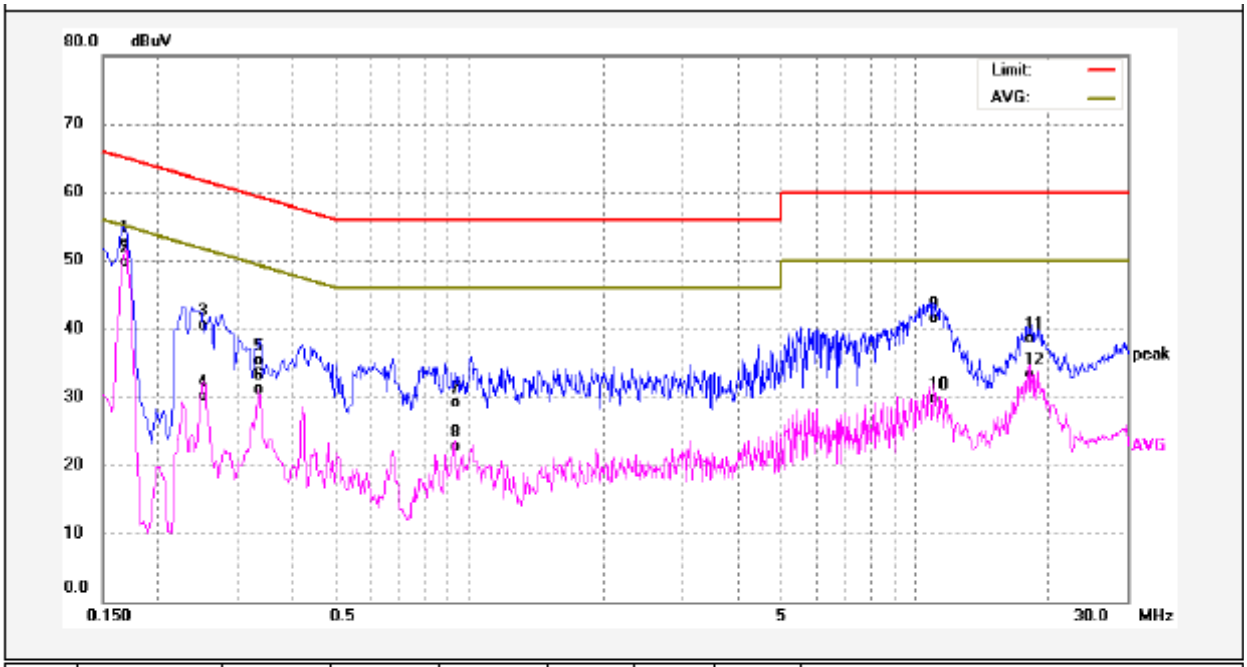
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	40.47	9.78	50.25	64.96	-14.71	QP	
2	0.1700	37.85	9.78	47.63	54.96	-7.33	AVG	
3	0.3379	26.83	9.80	36.63	59.25	-22.62	QP	
4	0.3379	21.56	9.80	31.36	49.25	-17.89	AVG	
5	0.4220	24.40	9.83	34.23	57.41	-23.18	QP	
6	0.4220	18.29	9.83	28.12	47.41	-19.29	AVG	
7	0.6740	25.01	9.83	34.84	56.00	-21.16	QP	
8	0.6740	18.14	9.83	27.97	46.00	-18.03	AVG	
9	11.3700	29.09	10.08	39.17	60.00	-20.83	QP	
10	11.3700	16.98	10.08	27.06	50.00	-22.94	AVG	
11	18.2860	27.52	10.24	37.76	60.00	-22.24	QP	
12	18.2860	22.40	10.24	32.64	50.00	-17.36	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	42.94	9.78	52.72	64.96	-12.24	QP	
2	0.1700	39.87	9.78	49.65	54.96	-5.31	AVG	
3	0.2540	30.67	9.76	40.43	61.62	-21.19	QP	
4	0.2540	20.33	9.76	30.09	51.62	-21.53	AVG	
5	0.3379	25.49	9.80	35.29	59.25	-23.96	QP	
6	0.3379	21.34	9.80	31.14	49.25	-18.11	AVG	
7	0.9300	19.20	9.87	29.07	56.00	-26.93	QP	
8	0.9300	12.85	9.87	22.72	46.00	-23.28	AVG	
9	11.0460	31.37	10.08	41.45	60.00	-18.55	QP	
10	11.0460	19.59	10.08	29.67	50.00	-20.33	AVG	
11	18.1500	28.19	10.23	38.42	60.00	-21.58	QP	
12	18.1500	23.08	10.23	33.31	50.00	-16.69	AVG	

8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

Test Voltage: AC 120V

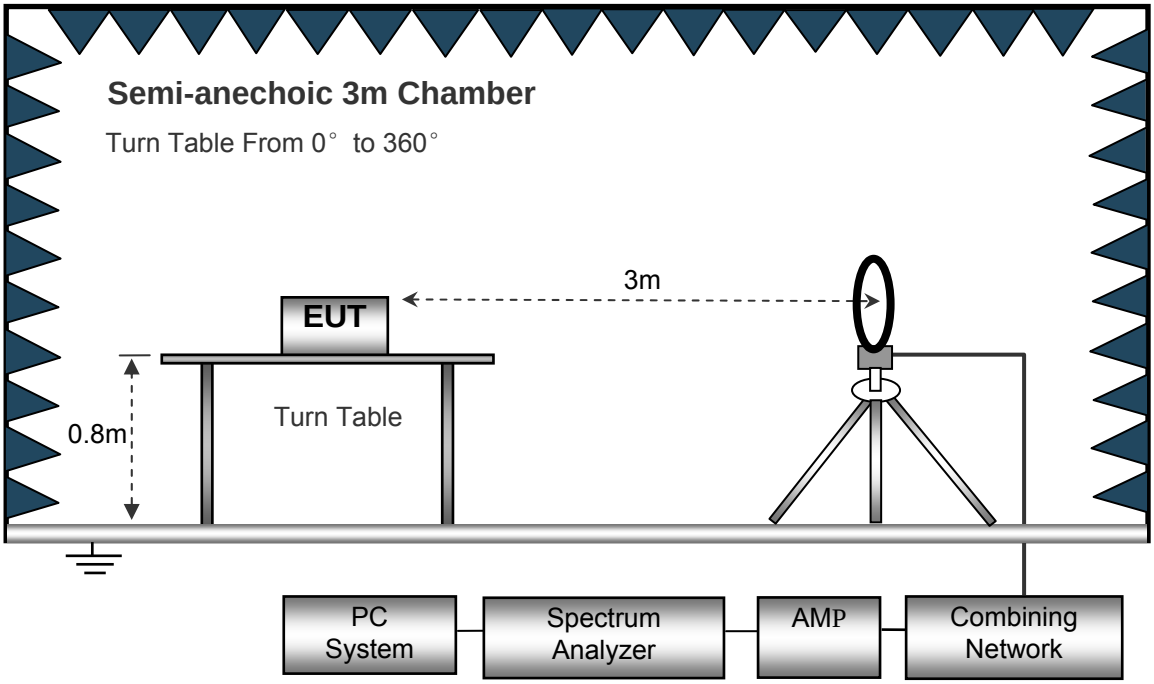
EUT Operation:

The test was performed in Wi-Fi Transmitting mode, the test data were shown in the report.

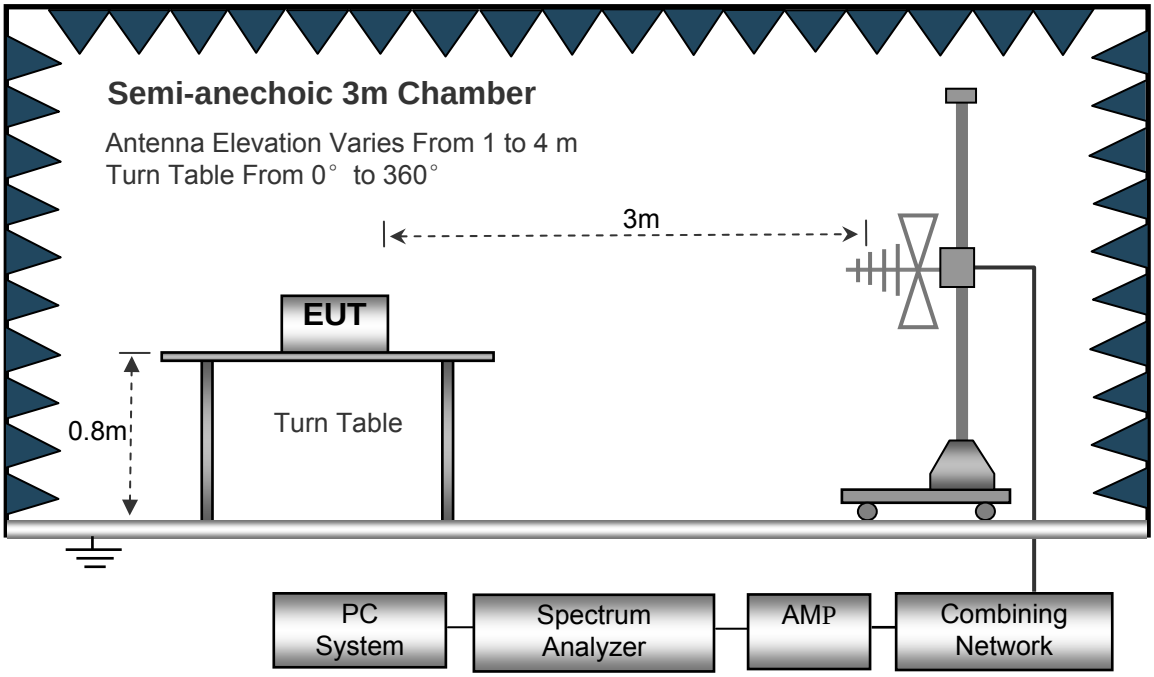
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10:2013.

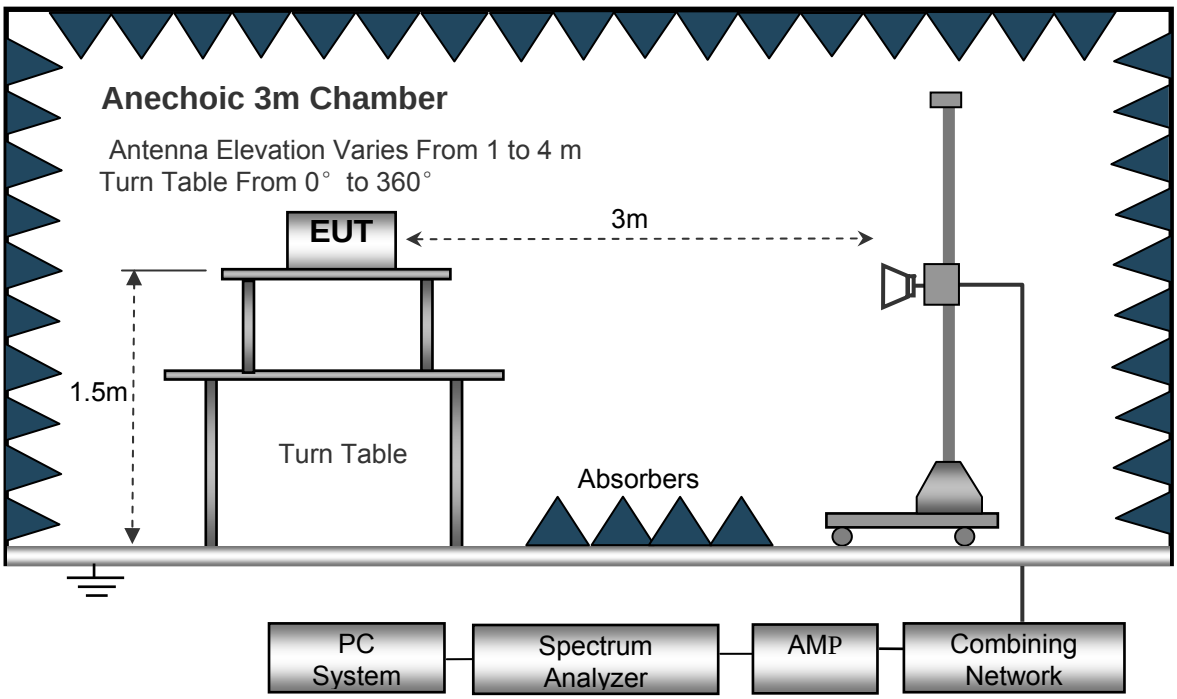
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane; For above1GHz, the EUT is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used druing radiated emissions above 1GHz measurement.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

8.6 Summary of Test Results

Test Frequency : 9kHz to 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 30MHz ~ 18GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11b: Low Channel 2412MHz									
906.48	43.16	QP	318	1.1	H	-3.19	39.97	46.00	-6.03
906.48	44.33	QP	25	1.6	V	-3.19	41.14	46.00	-4.86
4824.00	53.98	PK	45	1.1	V	-1.06	52.92	74.00	-21.08
4824.00	40.89	Ave	45	1.1	V	-1.06	39.83	54.00	-14.17
7236.00	52.77	PK	121	1.9	H	1.33	54.10	74.00	-19.90
7236.00	41.96	Ave	121	1.9	H	1.33	43.29	54.00	-10.71
2333.66	45.89	PK	173	1.1	V	-13.19	32.70	74.00	-41.30
2333.66	38.34	Ave	173	1.1	V	-13.19	25.15	54.00	-28.85
2382.30	42.54	PK	337	1.4	H	-13.14	29.40	74.00	-44.60
2382.30	37.43	Ave	337	1.4	H	-13.14	24.29	54.00	-29.71
2499.41	44.68	PK	218	1.1	V	-13.08	31.60	74.00	-42.40
2499.41	38.14	Ave	218	1.1	V	-13.08	25.06	54.00	-28.94

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11b: Middle Channel 2437MHz									
906.48	42.58	QP	273	1.5	H	-3.19	39.39	46.00	-6.61
906.48	44.24	QP	331	1.3	V	-3.19	41.05	46.00	-4.95
4874.00	53.35	PK	59	1.0	V	-1.06	52.29	74.00	-21.71
4874.00	40.18	Ave	59	1.0	V	-1.06	39.12	54.00	-14.88
7311.00	53.81	PK	142	1.7	H	2.21	56.02	74.00	-17.98
7311.00	40.93	Ave	142	1.7	H	2.21	43.14	54.00	-10.86
2335.93	46.85	PK	138	1.9	V	-13.19	33.66	74.00	-40.34
2335.93	39.22	Ave	138	1.9	V	-13.19	26.03	54.00	-27.97
2357.11	44.44	PK	219	1.2	H	-13.14	31.30	74.00	-42.70
2357.11	37.08	Ave	219	1.2	H	-13.14	23.94	54.00	-30.06
2499.79	43.03	PK	313	1.1	V	-13.08	29.95	74.00	-44.05
2499.79	38.91	Ave	313	1.1	V	-13.08	25.83	54.00	-28.17

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11b: High Channel 2462MHz									
906.48	42.25	QP	181	1.8	H	-3.19	39.06	46.00	-6.94
906.48	44.74	QP	112	1.2	V	-3.19	41.55	46.00	-4.45
4924.00	52.30	PK	359	1.8	V	-0.24	52.06	74.00	-21.94
4924.00	40.24	Ave	359	1.8	V	-0.24	40.00	54.00	-14.00
7386.00	52.98	PK	40	1.4	H	2.84	55.82	74.00	-18.18
7386.00	40.43	Ave	40	1.4	H	2.84	43.27	54.00	-10.73
2348.56	45.83	PK	263	1.2	V	-13.19	32.64	74.00	-41.36
2348.56	39.15	Ave	263	1.2	V	-13.19	25.96	54.00	-28.04
2367.87	44.27	PK	13	1.5	H	-13.14	31.13	74.00	-42.87
2367.87	37.23	Ave	13	1.5	H	-13.14	24.09	54.00	-29.91
2493.42	44.53	PK	133	1.5	V	-13.08	31.45	74.00	-42.55
2493.42	38.05	Ave	133	1.5	V	-13.08	24.97	54.00	-29.03

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11b: Low Channel 2412MHz									
906.48	42.22	QP	335	1.3	H	-3.19	39.03	46.00	-6.97
906.48	45.12	QP	317	1.3	V	-3.19	41.93	46.00	-4.07
4824.00	51.95	PK	106	1.2	V	-1.06	50.89	74.00	-23.11
4824.00	41.38	Ave	106	1.2	V	-1.06	40.32	54.00	-13.68
7236.00	51.67	PK	11	1.3	H	1.33	53.00	74.00	-21.00
7236.00	40.46	Ave	11	1.3	H	1.33	41.79	54.00	-12.21
2333.34	46.86	PK	154	1.6	V	-13.19	33.67	74.00	-40.33
2333.34	38.64	Ave	154	1.6	V	-13.19	25.45	54.00	-28.55
2365.10	43.09	PK	114	1.1	H	-13.14	29.95	74.00	-44.05
2365.10	38.91	Ave	114	1.1	H	-13.14	25.77	54.00	-28.23
2486.43	43.37	PK	106	1.2	V	-13.08	30.29	74.00	-43.71
2486.43	37.00	Ave	106	1.2	V	-13.08	23.92	54.00	-30.08

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11b: Middle Channel 2437MHz									
906.48	41.92	QP	318	1.2	H	-3.19	38.73	46.00	-7.27
906.48	43.66	QP	249	1.1	V	-3.19	40.47	46.00	-5.53
4874.00	50.59	PK	102	2.0	V	-1.06	49.53	74.00	-24.47
4874.00	40.10	Ave	102	2.0	V	-1.06	39.04	54.00	-14.96
7311.00	50.42	PK	67	1.8	H	2.21	52.63	74.00	-21.37
7311.00	39.21	Ave	67	1.8	H	2.21	41.42	54.00	-12.58
2316.80	45.08	PK	167	1.5	V	-13.19	31.89	74.00	-42.11
2316.80	38.27	Ave	167	1.5	V	-13.19	25.08	54.00	-28.92
2378.96	43.25	PK	308	1.3	H	-13.14	30.11	74.00	-43.89
2378.96	36.96	Ave	308	1.3	H	-13.14	23.82	54.00	-30.18
2497.32	44.76	PK	275	1.3	V	-13.08	31.68	74.00	-42.32
2497.32	36.45	Ave	275	1.3	V	-13.08	23.37	54.00	-30.63

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11b: High Channel 2462MHz									
906.48	41.31	QP	75	1.8	H	-3.19	38.12	46.00	-7.88
906.48	42.93	QP	325	1.4	V	-3.19	39.74	46.00	-6.26
4924.00	49.52	PK	224	1.5	V	-0.24	49.28	74.00	-24.72
4924.00	38.72	Ave	224	1.5	V	-0.24	38.48	54.00	-15.52
7386.00	49.92	PK	33	1.3	H	2.84	52.76	74.00	-21.24
7386.00	38.44	Ave	33	1.3	H	2.84	41.28	54.00	-12.72
2331.68	46.54	PK	165	1.7	V	-13.19	33.35	74.00	-40.65
2331.68	37.12	Ave	165	1.7	V	-13.19	23.93	54.00	-30.07
2384.25	44.14	PK	251	1.1	H	-13.14	31.00	74.00	-43.00
2384.25	37.06	Ave	251	1.1	H	-13.14	23.92	54.00	-30.08
2496.84	44.12	PK	144	1.0	V	-13.08	31.04	74.00	-42.96
2496.84	37.66	Ave	144	1.0	V	-13.08	24.58	54.00	-29.42

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11g: Low Channel 2412MHz									
906.48	40.29	QP	90	2.0	H	-3.19	37.10	46.00	-8.90
906.48	42.29	QP	25	1.8	V	-3.19	39.10	46.00	-6.90
4824.00	52.14	PK	25	1.6	V	-1.06	51.08	74.00	-22.92
4824.00	41.02	Ave	25	1.6	V	-1.06	39.96	54.00	-14.04
7236.00	52.14	PK	332	1.0	H	1.33	53.47	74.00	-20.53
7236.00	39.97	Ave	332	1.0	H	1.33	41.30	54.00	-12.70
2340.49	45.45	PK	44	2.0	V	-13.19	32.26	74.00	-41.74
2340.49	39.77	Ave	44	2.0	V	-13.19	26.58	54.00	-27.42
2350.51	44.08	PK	311	1.1	H	-13.14	30.94	74.00	-43.06
2350.51	37.29	Ave	311	1.1	H	-13.14	24.15	54.00	-29.85
2485.20	42.81	PK	313	1.5	V	-13.08	29.73	74.00	-44.27
2485.20	38.72	Ave	313	1.5	V	-13.08	25.64	54.00	-28.36

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11g: Middle Channel 2437MHz									
906.48	40.90	QP	62	1.5	H	-3.19	37.71	46.00	-8.29
906.48	44.57	QP	214	1.5	V	-3.19	41.38	46.00	-4.62
4874.00	53.32	PK	344	1.4	V	-0.62	52.70	74.00	-21.30
4874.00	39.56	Ave	344	1.4	V	-0.62	38.94	54.00	-15.06
7311.00	50.79	PK	9	1.7	H	2.21	53.00	74.00	-21.00
7311.00	38.77	Ave	9	1.7	H	2.21	40.98	54.00	-13.02
2349.61	46.26	PK	154	1.7	V	-13.19	33.07	74.00	-40.93
2349.61	38.18	Ave	154	1.7	V	-13.19	24.99	54.00	-29.01
2356.68	43.55	PK	155	1.4	H	-13.14	30.41	74.00	-43.59
2356.68	38.38	Ave	155	1.4	H	-13.14	25.24	54.00	-28.76
2495.81	42.57	PK	255	1.2	V	-13.08	29.49	74.00	-44.51
2495.81	37.54	Ave	255	1.2	V	-13.08	24.46	54.00	-29.54

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA 11g: High Channel 2462MHz									
906.48	43.32	QP	196	1.9	H	-3.19	40.13	46.00	-5.87
906.48	43.61	QP	195	1.5	V	-3.19	40.42	46.00	-5.58
4924.00	52.05	PK	258	1.6	V	-0.24	51.81	74.00	-22.19
4924.00	39.79	Ave	258	1.6	V	-0.24	39.55	54.00	-14.45
7386.00	51.16	PK	290	1.8	H	2.84	54.00	74.00	-20.00
7386.00	38.23	Ave	290	1.8	H	2.84	41.07	54.00	-12.93
2310.79	46.86	PK	50	1.8	V	-13.19	33.67	74.00	-40.33
2310.79	38.68	Ave	50	1.8	V	-13.19	25.49	54.00	-28.51
2353.34	42.29	PK	138	1.2	H	-13.14	29.15	74.00	-44.85
2353.34	37.98	Ave	138	1.2	H	-13.14	24.84	54.00	-29.16
2494.67	43.01	PK	335	1.8	V	-13.08	29.93	74.00	-44.07
2494.67	38.75	Ave	335	1.8	V	-13.08	25.67	54.00	-28.33

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11g: Low Channel 2412MHz									
906.48	42.33	QP	31	1.9	H	-3.19	39.14	46.00	-6.86
906.48	42.97	QP	239	1.2	V	-3.19	39.78	46.00	-6.22
4824.00	48.03	PK	165	2.0	V	-1.06	46.97	74.00	-27.03
4824.00	38.85	Ave	165	2.0	V	-1.06	37.79	54.00	-16.21
7236.00	49.30	PK	184	1.7	H	1.33	50.63	74.00	-23.37
7236.00	37.82	Ave	184	1.7	H	1.33	39.15	54.00	-14.85
2339.48	46.57	PK	167	1.9	V	-13.19	33.38	74.00	-40.62
2339.48	39.75	Ave	167	1.9	V	-13.19	26.56	54.00	-27.44
2374.26	43.00	PK	358	1.7	H	-13.14	29.86	74.00	-44.14
2374.26	36.88	Ave	358	1.7	H	-13.14	23.74	54.00	-30.26
2494.98	43.80	PK	101	1.1	V	-13.08	30.72	74.00	-43.28
2494.98	37.52	Ave	101	1.1	V	-13.08	24.44	54.00	-29.56

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11g: Middle Channel 2437MHz									
906.48	42.81	QP	121	1.2	H	-3.19	39.62	46.00	-6.38
906.48	43.01	QP	99	1.1	V	-3.19	39.82	46.00	-6.18
4874.00	48.66	PK	314	1.4	V	-0.62	48.04	74.00	-25.96
4874.00	39.48	Ave	314	1.4	V	-0.62	38.86	54.00	-15.14
7311.00	49.67	PK	172	1.3	H	2.21	51.88	74.00	-22.12
7311.00	39.17	Ave	172	1.3	H	2.21	41.38	54.00	-12.62
2346.75	46.51	PK	348	1.0	V	-13.19	33.32	74.00	-40.68
2346.75	39.59	Ave	348	1.0	V	-13.19	26.40	54.00	-27.60
2350.22	42.69	PK	355	1.5	H	-13.14	29.55	74.00	-44.45
2350.22	37.13	Ave	355	1.5	H	-13.14	23.99	54.00	-30.01
2496.05	44.29	PK	248	1.4	V	-13.08	31.21	74.00	-42.79
2496.05	37.45	Ave	248	1.4	V	-13.08	24.37	54.00	-29.63

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTB 11g: High Channel 2462MHz									
906.48	42.54	QP	67	1.5	H	-3.19	39.35	46.00	-6.65
906.48	43.57	QP	176	1.6	V	-3.19	40.38	46.00	-5.62
4924.00	48.89	PK	253	1.8	V	-0.24	48.65	74.00	-25.35
4924.00	39.63	Ave	253	1.8	V	-0.24	39.39	54.00	-14.61
7386.00	49.72	PK	44	1.8	H	2.84	52.56	74.00	-21.44
7386.00	40.63	Ave	44	1.8	H	2.84	43.47	54.00	-10.53
2316.58	46.09	PK	17	1.8	V	-13.19	32.90	74.00	-41.10
2316.58	37.13	Ave	17	1.8	V	-13.19	23.94	54.00	-30.06
2365.68	44.38	PK	190	1.9	H	-13.14	31.24	74.00	-42.76
2365.68	38.86	Ave	190	1.9	H	-13.14	25.72	54.00	-28.28
2484.36	44.81	PK	280	1.5	V	-13.08	31.73	74.00	-42.27
2484.36	38.11	Ave	280	1.5	V	-13.08	25.03	54.00	-28.97

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n20: Low Channel 2412MHz									
906.48	41.82	QP	255	1.6	H	-3.19	38.63	46.00	-7.37
906.48	44.48	QP	203	1.3	V	-3.19	41.29	46.00	-4.71
4824.00	53.53	PK	354	1.9	V	-1.06	52.47	74.00	-21.53
4824.00	39.48	Ave	354	1.9	V	-1.06	38.42	54.00	-15.58
7236.00	52.00	PK	23	1.1	H	1.33	53.33	74.00	-20.67
7236.00	37.26	Ave	23	1.1	H	1.33	38.59	54.00	-15.41
2344.95	46.38	PK	218	1.5	V	-13.19	33.19	74.00	-40.81
2344.95	37.86	Ave	218	1.5	V	-13.19	24.67	54.00	-29.33
2383.76	43.52	PK	296	1.0	H	-13.14	30.38	74.00	-43.62
2383.76	38.72	Ave	296	1.0	H	-13.14	25.58	54.00	-28.42
2499.75	44.50	PK	224	1.2	V	-13.08	31.42	74.00	-42.58
2499.75	37.16	Ave	224	1.2	V	-13.08	24.08	54.00	-29.92

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n20: Middle Channel 2437MHz									
906.48	43.29	QP	173	1.1	H	-3.19	40.10	46.00	-5.90
906.48	43.14	QP	113	1.7	V	-3.19	39.95	46.00	-6.05
4874.00	53.51	PK	64	1.2	V	-0.62	52.89	74.00	-21.11
4874.00	40.55	Ave	64	1.2	V	-0.62	39.93	54.00	-14.07
7311.00	51.05	PK	67	1.5	H	2.21	53.26	74.00	-20.74
7311.00	36.13	Ave	67	1.5	H	2.21	38.34	54.00	-15.66
2328.14	45.69	PK	352	1.2	V	-13.19	32.50	74.00	-41.50
2328.14	37.81	Ave	352	1.2	V	-13.19	24.62	54.00	-29.38
2385.79	42.29	PK	85	1.6	H	-13.14	29.15	74.00	-44.85
2385.79	36.28	Ave	85	1.6	H	-13.14	23.14	54.00	-30.86
2492.48	43.36	PK	24	1.2	V	-13.08	30.28	74.00	-43.72
2492.48	36.60	Ave	24	1.2	V	-13.08	23.52	54.00	-30.48

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n20: High Channel 2462MHz									
906.48	44.71	QP	191	1.5	H	-3.19	41.52	46.00	-4.48
906.48	42.13	QP	95	1.4	V	-3.19	38.94	46.00	-7.06
4924.00	52.62	PK	141	1.8	V	-0.24	52.38	74.00	-21.62
4924.00	39.67	Ave	141	1.8	V	-0.24	39.43	54.00	-14.57
7386.00	50.08	PK	101	1.7	H	2.84	52.92	74.00	-21.08
7386.00	35.23	Ave	101	1.7	H	2.84	38.07	54.00	-15.93
2348.55	45.66	PK	236	2.0	V	-13.19	32.47	74.00	-41.53
2348.55	38.27	Ave	236	2.0	V	-13.19	25.08	54.00	-28.92
2373.47	42.62	PK	35	1.1	H	-13.14	29.48	74.00	-44.52
2373.47	36.38	Ave	35	1.1	H	-13.14	23.24	54.00	-30.76
2494.26	44.18	PK	31	1.6	V	-13.08	31.10	74.00	-42.90
2494.26	36.13	Ave	31	1.6	V	-13.08	23.05	54.00	-30.95

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n40: Low Channel 2422MHz									
906.48	44.84	QP	188	1.5	H	-3.19	41.65	46.00	-4.35
906.48	42.53	QP	270	1.0	V	-3.19	39.34	46.00	-6.66
4844.00	50.02	PK	136	1.7	V	-1.06	48.96	74.00	-25.04
4844.00	37.38	Ave	136	1.7	V	-1.06	36.32	54.00	-17.68
7266.00	47.33	PK	121	1.1	H	1.33	48.66	74.00	-25.34
7266.00	33.54	Ave	121	1.1	H	1.33	34.87	54.00	-19.13
2321.62	46.66	PK	101	1.5	V	-13.19	33.47	74.00	-40.53
2321.62	37.16	Ave	101	1.5	V	-13.19	23.97	54.00	-30.03
2378.97	44.19	PK	283	1.9	H	-13.14	31.05	74.00	-42.95
2378.97	36.30	Ave	283	1.9	H	-13.14	23.16	54.00	-30.84
2496.94	44.43	PK	97	1.0	V	-13.08	31.35	74.00	-42.65
2496.94	37.86	Ave	97	1.0	V	-13.08	24.78	54.00	-29.22

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n40: Middle Channel 2437MHz									
906.48	44.85	QP	65	1.5	H	-3.19	41.66	46.00	-4.34
906.48	42.39	QP	118	1.0	V	-3.19	39.20	46.00	-6.80
4874.00	50.68	PK	134	1.3	V	-0.62	50.06	74.00	-23.94
4874.00	37.22	Ave	134	1.3	V	-0.62	36.60	54.00	-17.40
7311.00	46.63	PK	351	1.3	H	2.21	48.84	74.00	-25.16
7311.00	34.16	Ave	351	1.3	H	2.21	36.37	54.00	-17.63
2312.03	45.60	PK	80	1.8	V	-13.19	32.41	74.00	-41.59
2312.03	37.12	Ave	80	1.8	V	-13.19	23.93	54.00	-30.07
2367.17	43.98	PK	89	1.3	H	-13.14	30.84	74.00	-43.16
2367.17	37.52	Ave	89	1.3	H	-13.14	24.38	54.00	-29.62
2499.03	43.65	PK	37	1.9	V	-13.08	30.57	74.00	-43.43
2499.03	37.26	Ave	37	1.9	V	-13.08	24.18	54.00	-29.82

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
ANTA+ANTB n40: High Channel 2452MHz									
906.48	44.65	QP	323	1.4	H	-3.19	41.46	46.00	-4.54
906.48	43.52	QP	357	1.2	V	-3.19	40.33	46.00	-5.67
4904.00	49.89	PK	258	1.8	V	-0.24	49.65	74.00	-24.35
4904.00	37.24	Ave	258	1.8	V	-0.24	37.00	54.00	-17.00
7356.00	47.13	PK	87	1.8	H	2.84	49.97	74.00	-24.03
7356.00	33.72	Ave	87	1.8	H	2.84	36.56	54.00	-17.44
2326.46	45.29	PK	146	1.9	V	-13.19	32.10	74.00	-41.90
2326.46	39.64	Ave	146	1.9	V	-13.19	26.45	54.00	-27.55
2385.91	43.05	PK	114	1.2	H	-13.14	29.91	74.00	-44.09
2385.91	37.23	Ave	114	1.2	H	-13.14	24.09	54.00	-29.91
2495.70	42.76	PK	29	1.8	V	-13.08	29.68	74.00	-44.32
2495.70	37.04	Ave	29	1.8	V	-13.08	23.96	54.00	-30.04

Test Frequency: 18GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

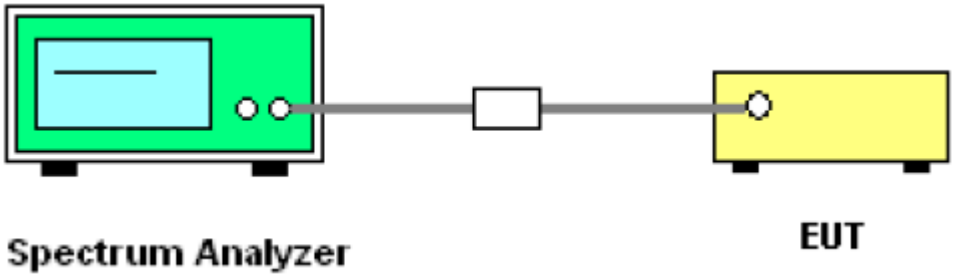
9 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 15.247 Meas Guidance v05, August 24, 2018
Test Limit:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting

9.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

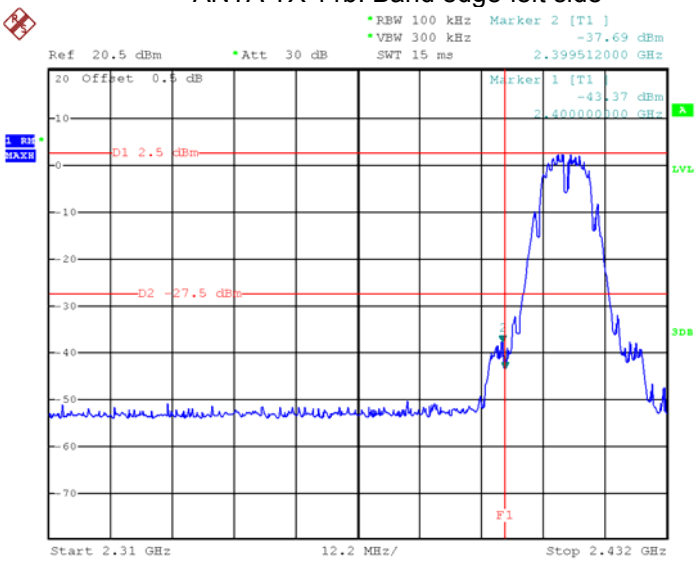
9.2 Test Setup



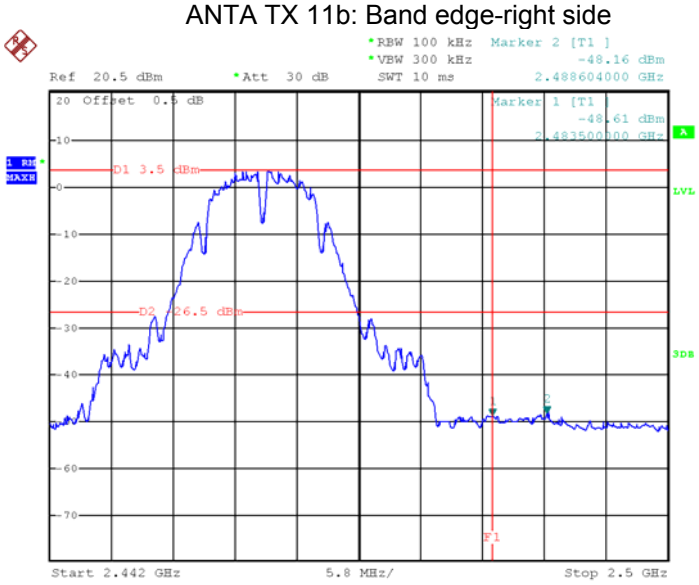
9.3 Test Result

Test result plots shown as follows:

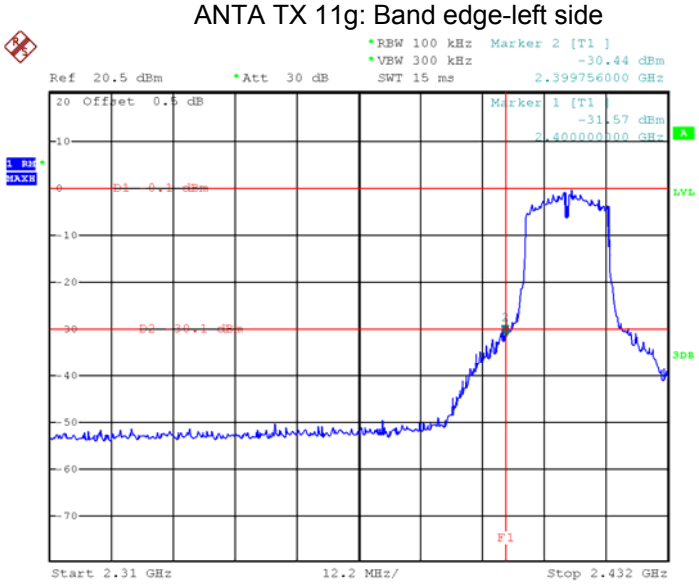
ANTA TX 11b: Band edge-left side



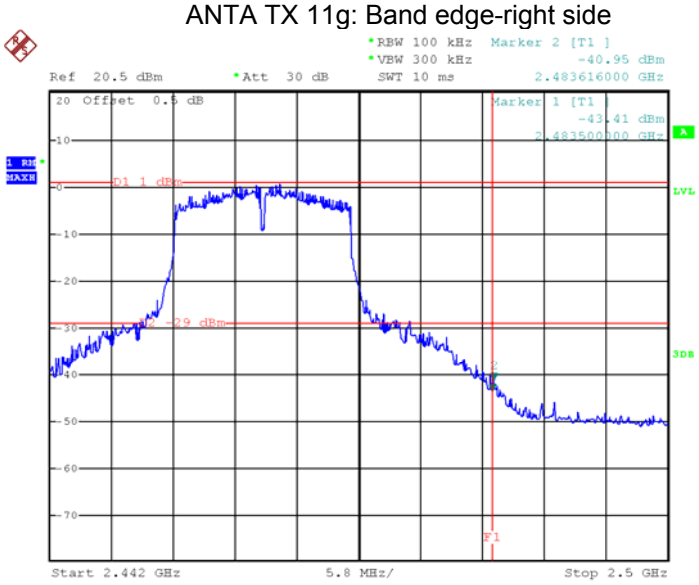
ANTA TX 11b: Band edge-right side



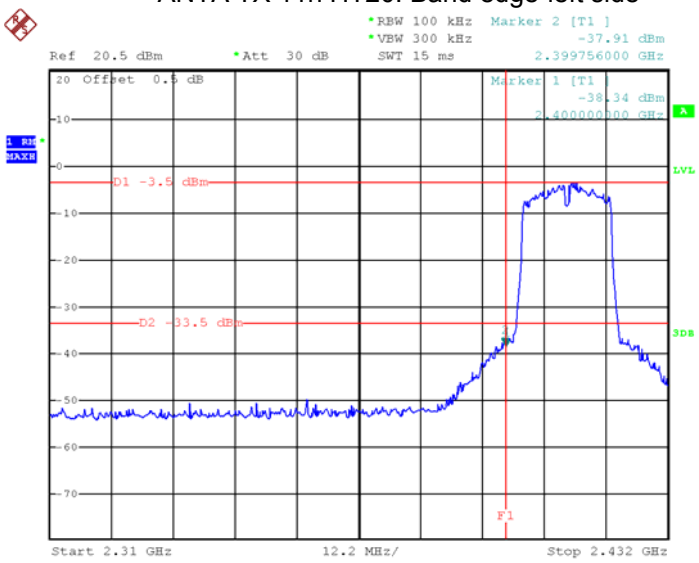
ANTA TX 11g: Band edge-left side



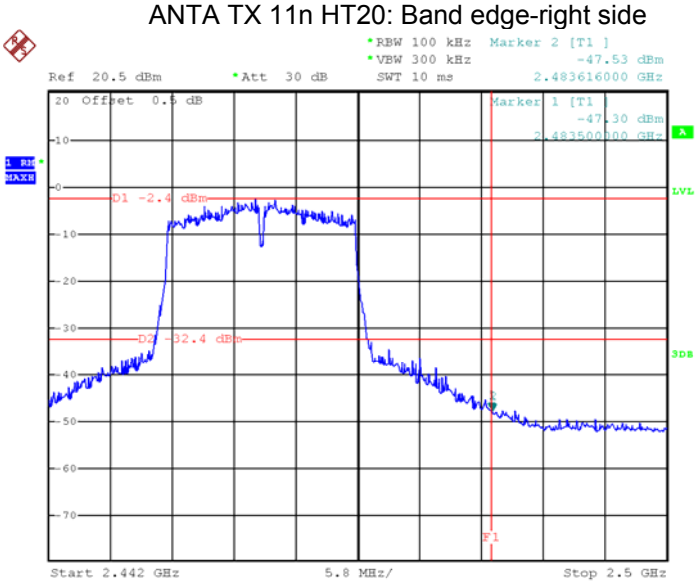
ANTA TX 11g: Band edge-right side



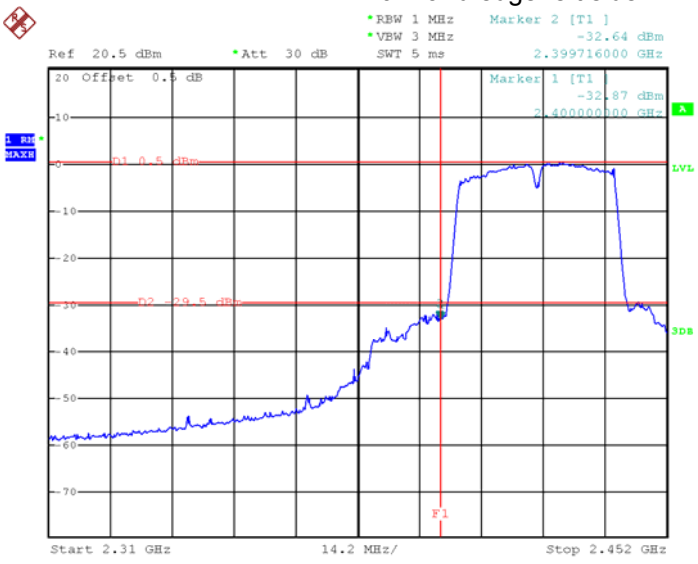
ANTA TX 11n HT20: Band edge-left side



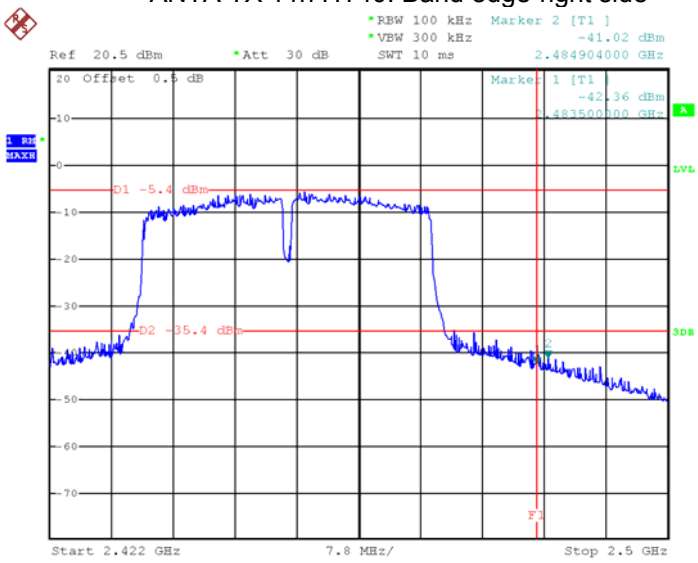
ANTA TX 11n HT20: Band edge-right side



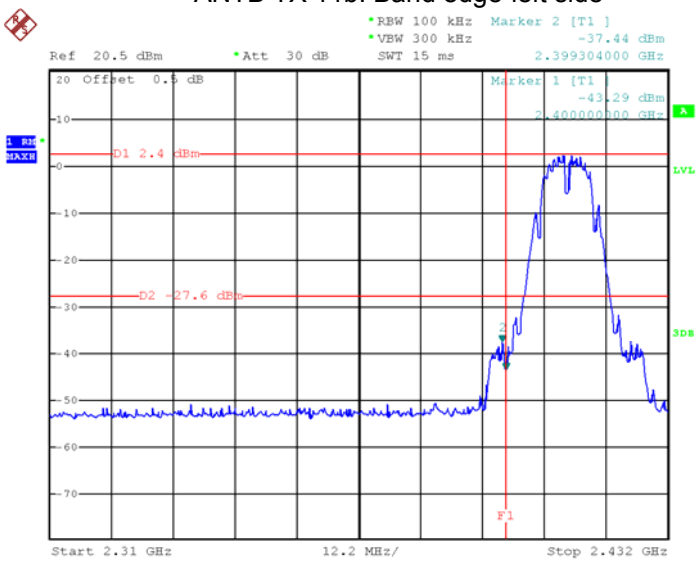
ANTA TX 11n HT40: Band edge-left side



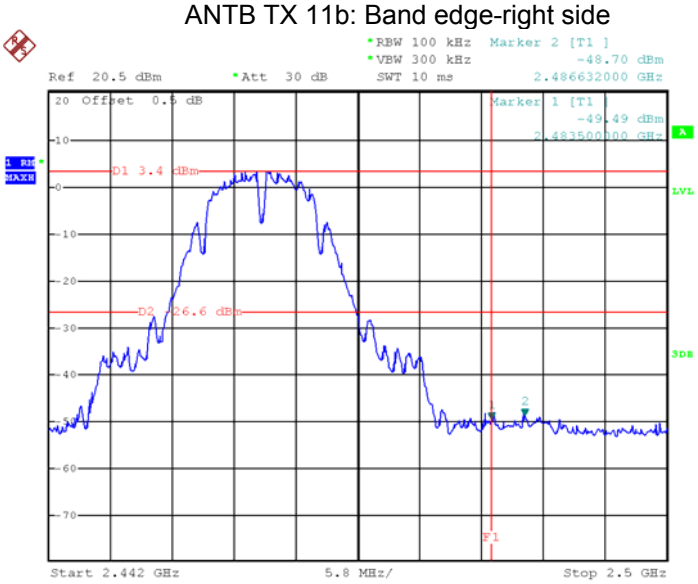
ANTA TX 11n HT40: Band edge-right side



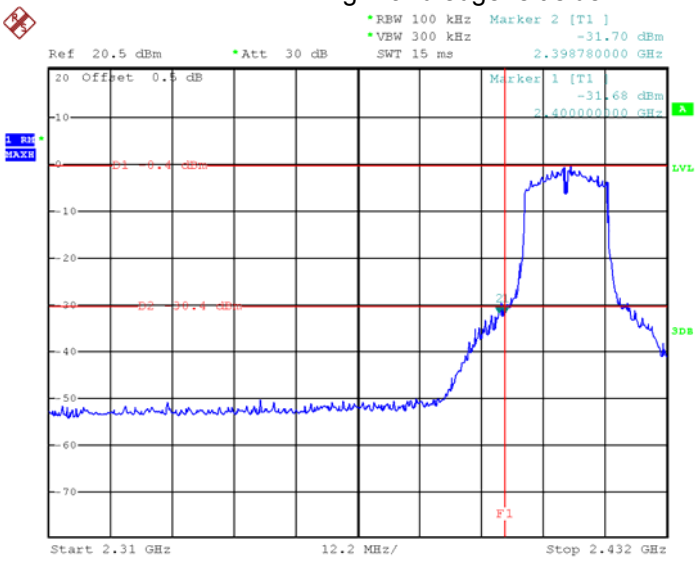
ANTB TX 11b: Band edge-left side



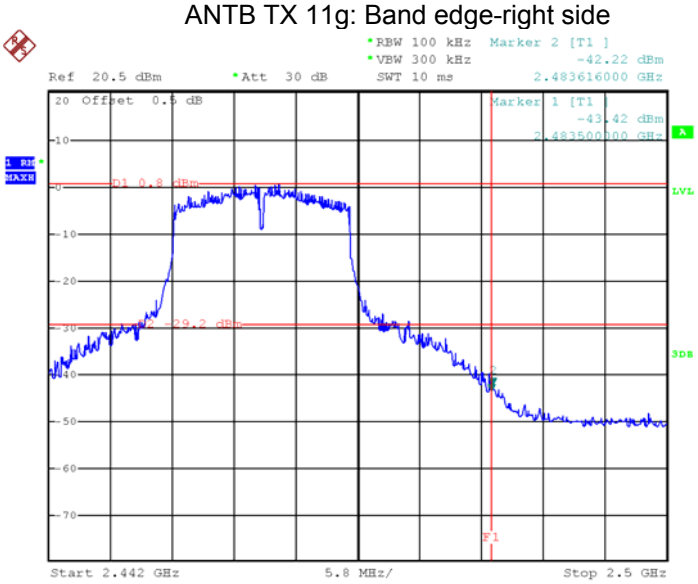
ANTB TX 11b: Band edge-right side



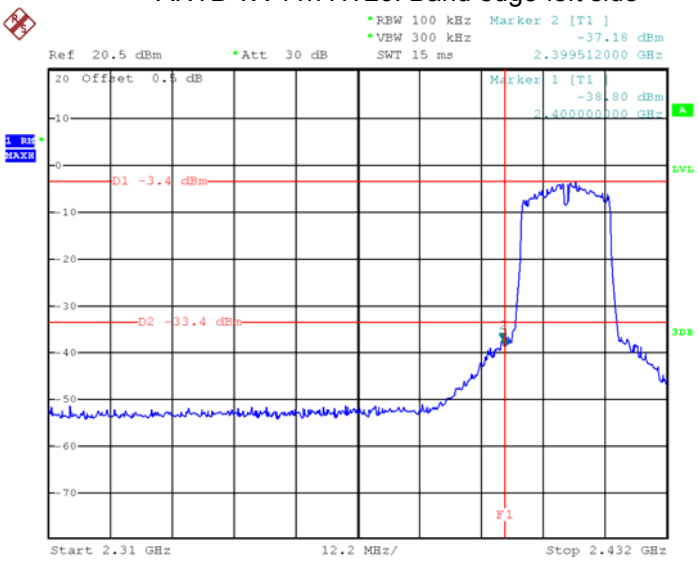
ANTB TX 11g: Band edge-left side



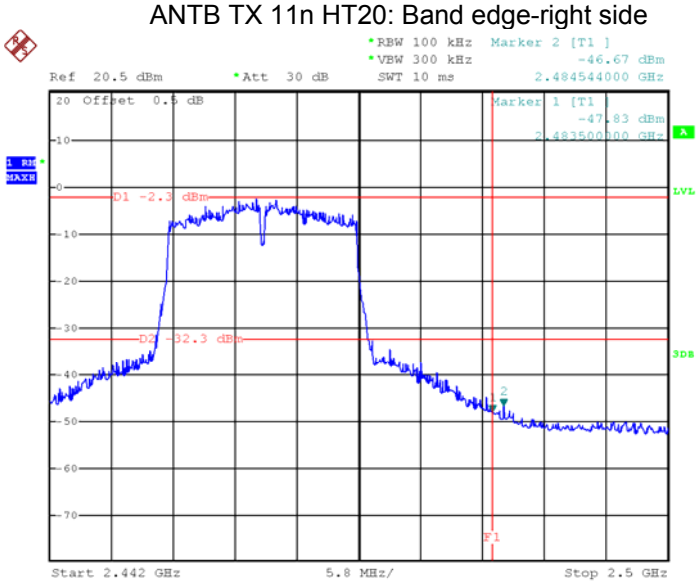
ANTB TX 11g: Band edge-right side



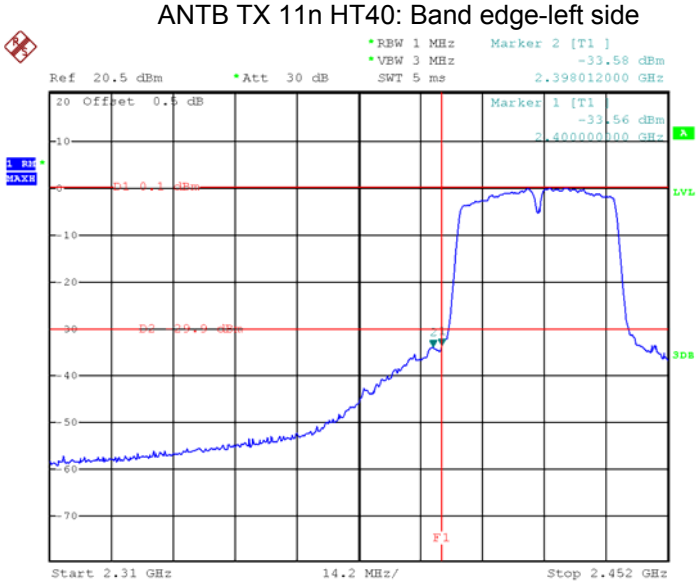
ANTB TX 11n HT20: Band edge-left side



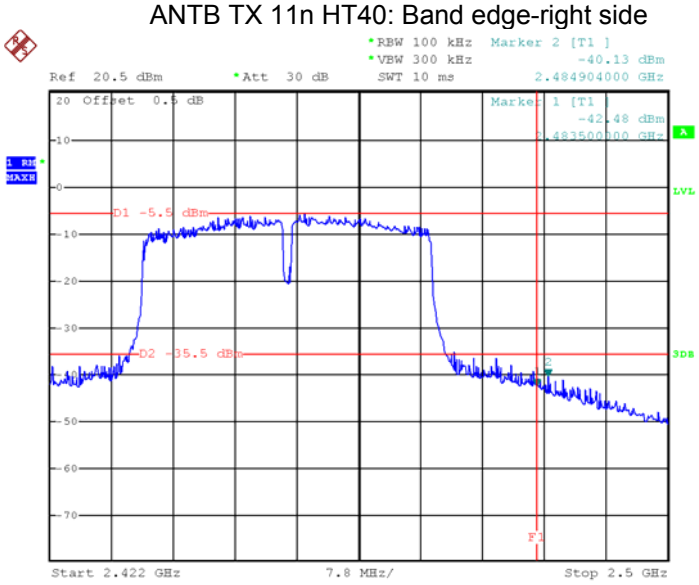
ANTB TX 11n HT20: Band edge-right side



ANTB TX 11n HT40: Band edge-left side



ANTB TX 11n HT40: Band edge-right side



10 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05, August 24, 2018

10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Setup

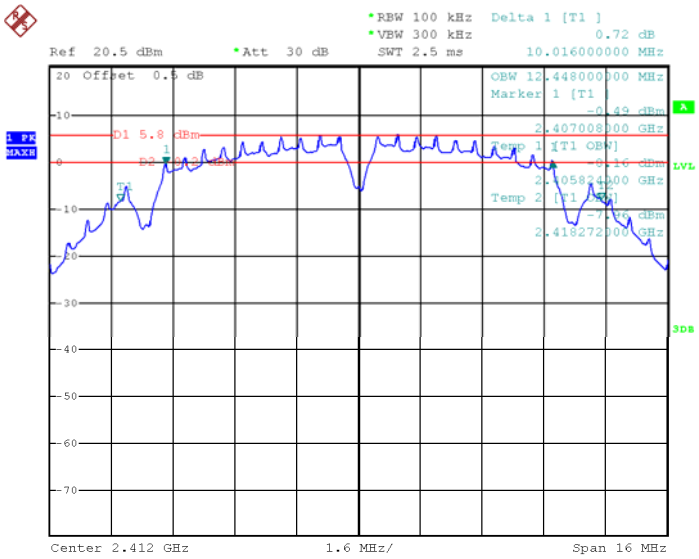
Spectrum Analyzer EUT

10.3 Test Result:

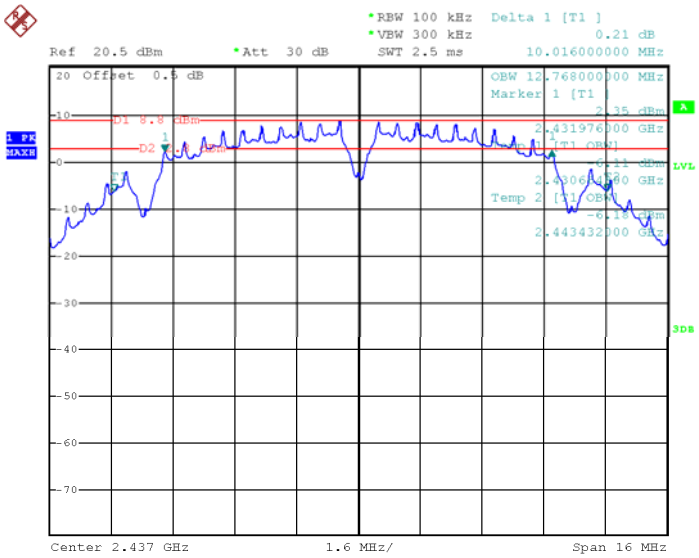
ANT	Operation mode	6dB Bandwidth (MHz)			99% Bandwidth (MHz)		
ANTA	TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		10.016	10.016	10.016	12.448	12.768	12.672
	TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		16.450	16.450	16.450	16.450	16.550	16.450
	TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		17.658	17.658	17.658	17.658	17.658	17.604
	TX 11n HT40	Channel 3	Channel 6	Channel 9	Channel 3	Channel 6	Channel 9
		36.190	36.190	36.190	35.970	35.970	35.970
ANTB	TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		10.016	10.016	10.016	12.448	12.768	12.672
	TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		16.450	16.450	16.450	16.450	16.450	16.450
	TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
		17.658	17.658	17.658	17.658	17.658	17.604
	TX 11n HT40	Channel 3	Channel 6	Channel 9	Channel 3	Channel 6	Channel 9
		36.190	36.190	36.190	35.970	35.970	35.970

Test result plot as follows:

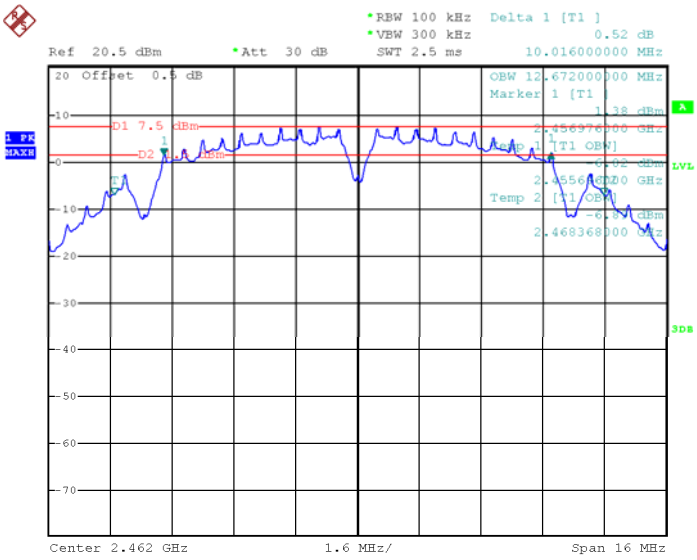
ANTA Mode: TX 11b channel 1



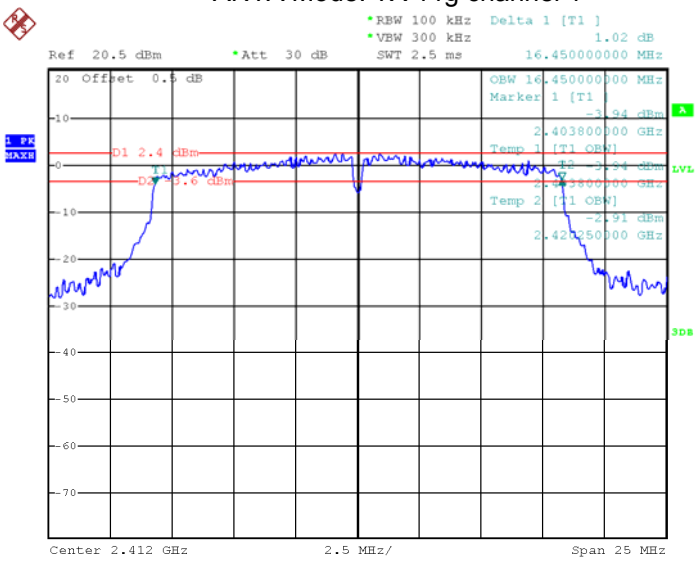
ANTA Mode: TX 11b channel 6



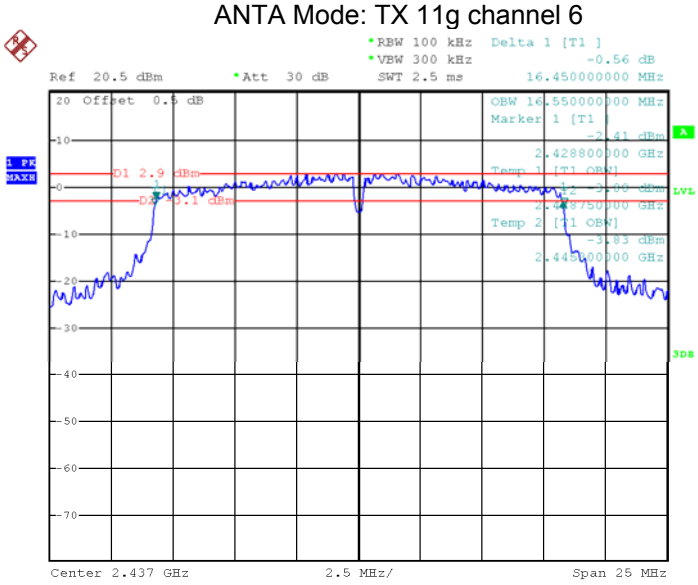
ANTA Mode: TX 11b channel 11



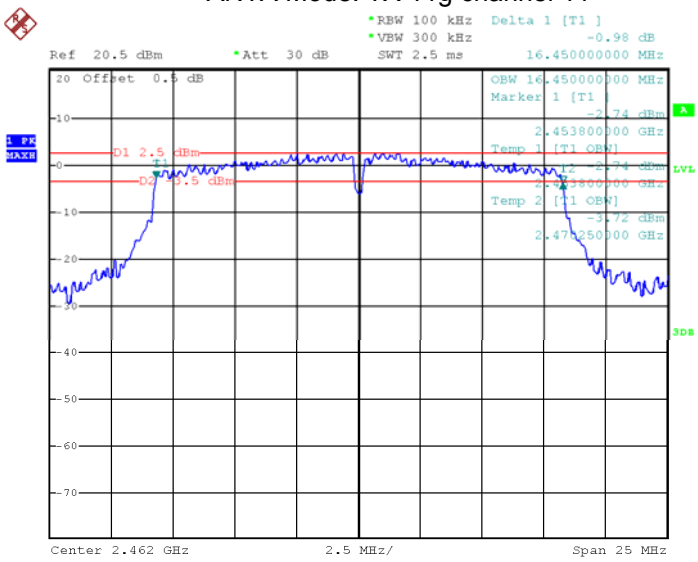
ANTA Mode: TX 11g channel 1



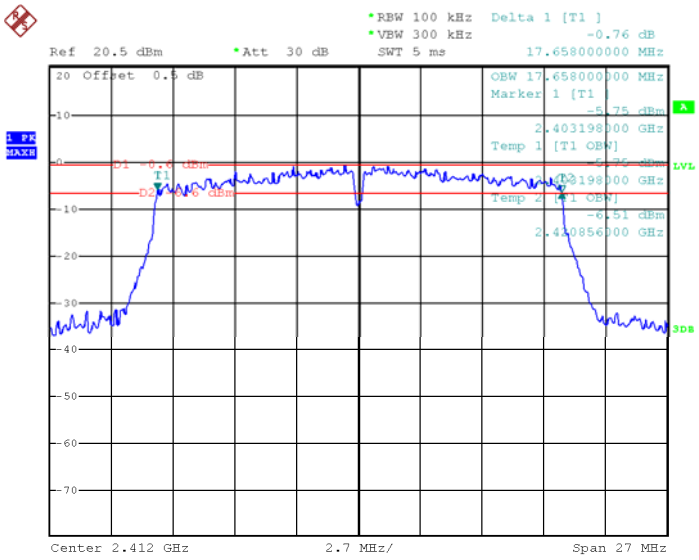
ANTA Mode: TX 11g channel 6



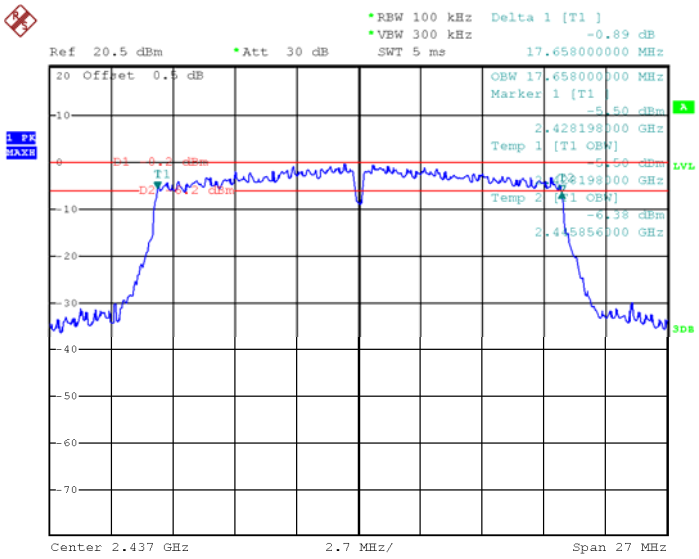
ANTA Mode: TX 11g channel 11



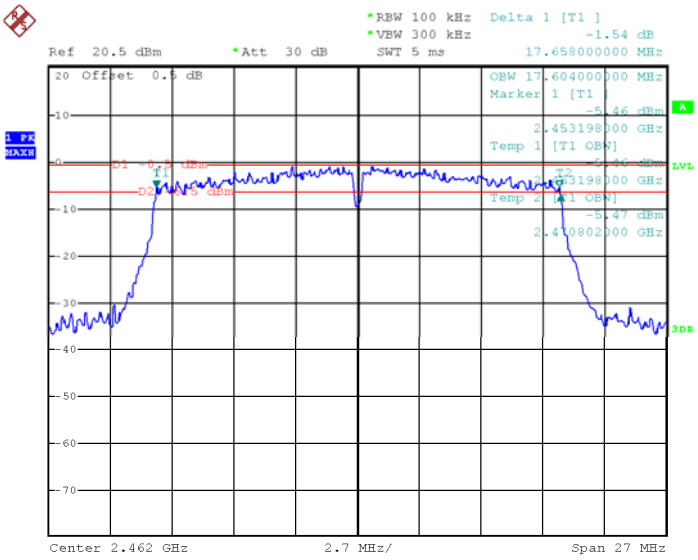
ANTA Mode: TX 11n HT20 channel 1



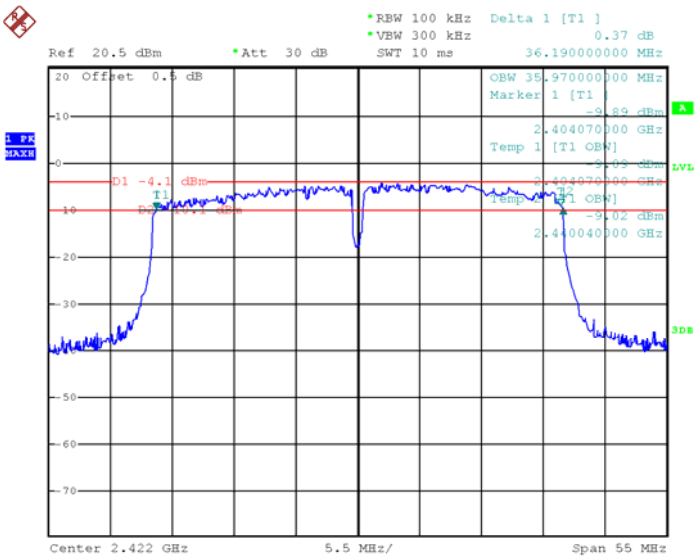
ANTA Mode: TX 11n HT20 channel 6



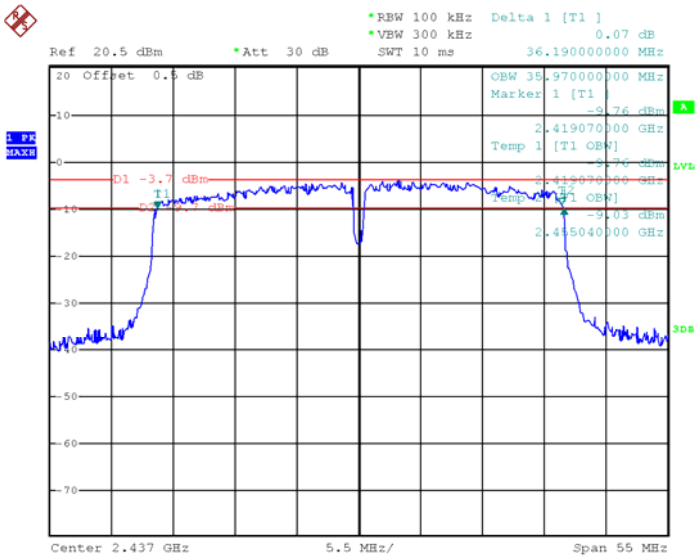
ANTA Mode: TX 11n HT20 channel 11



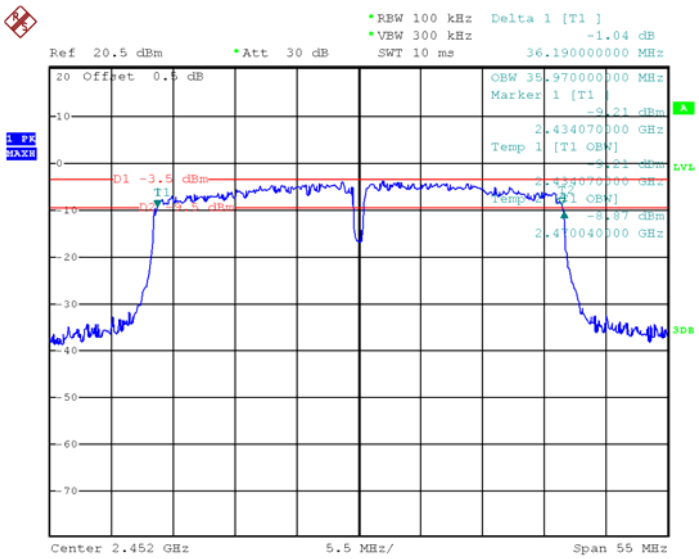
ANTA Mode: TX 11n HT40 channel 3



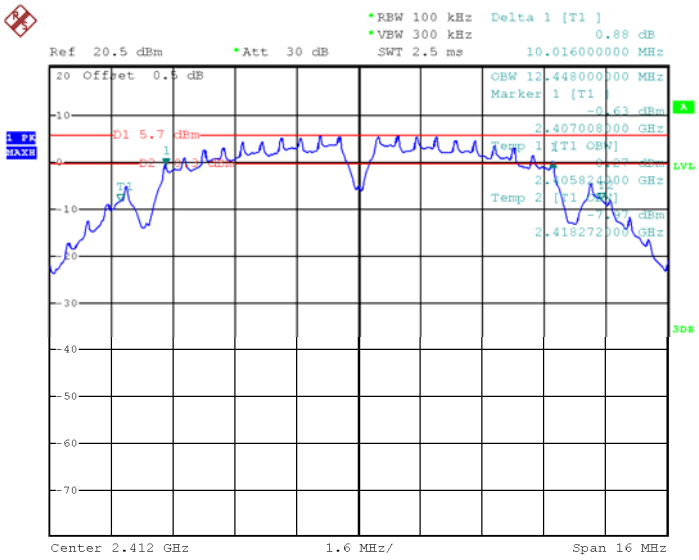
ANTA Mode: TX 11n HT40 channel 6



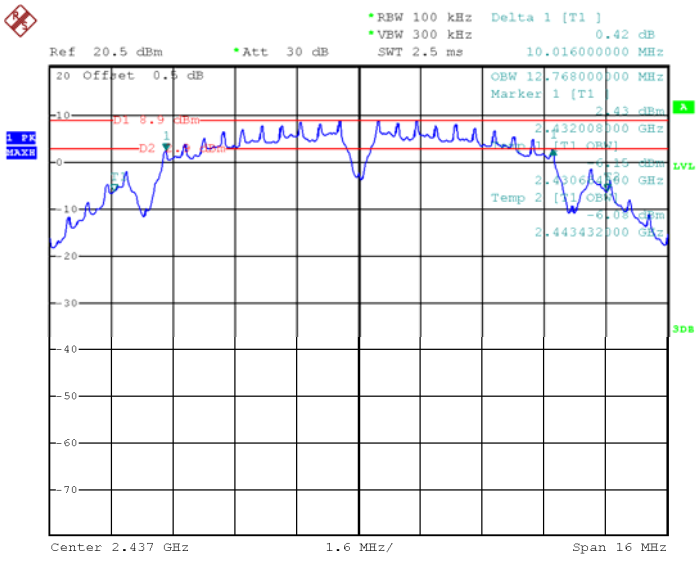
ANTA Mode: TX 11n HT40 channel 9



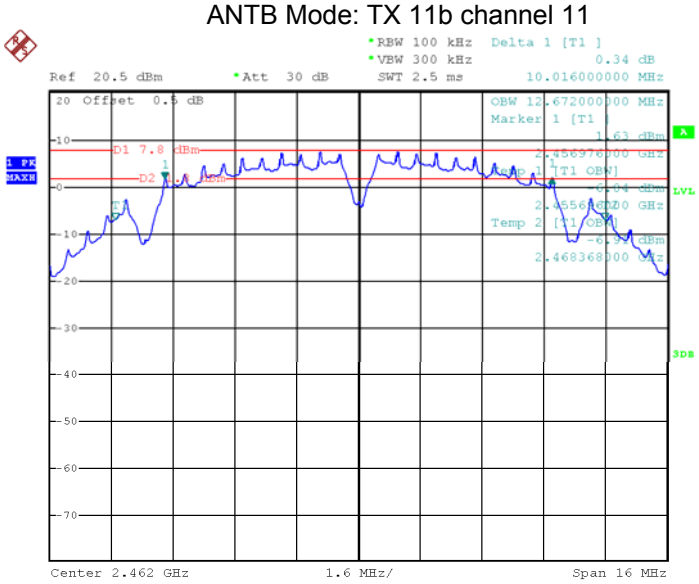
ANTB Mode: TX 11b channel 1



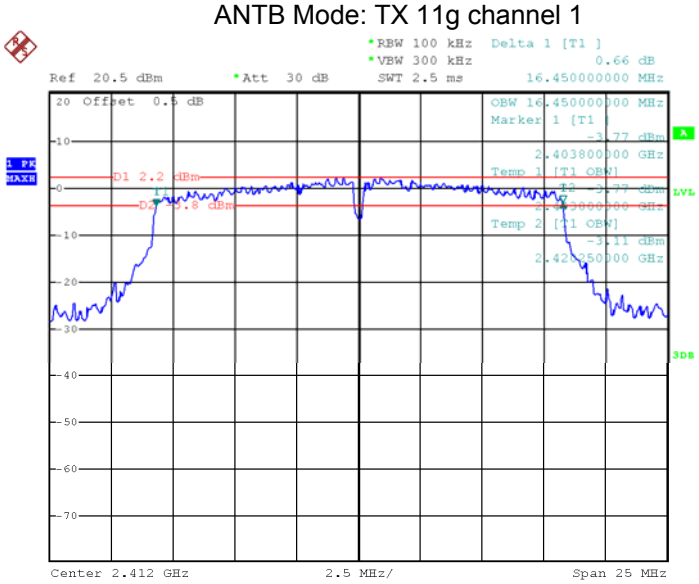
ANTB Mode: TX 11b channel 6



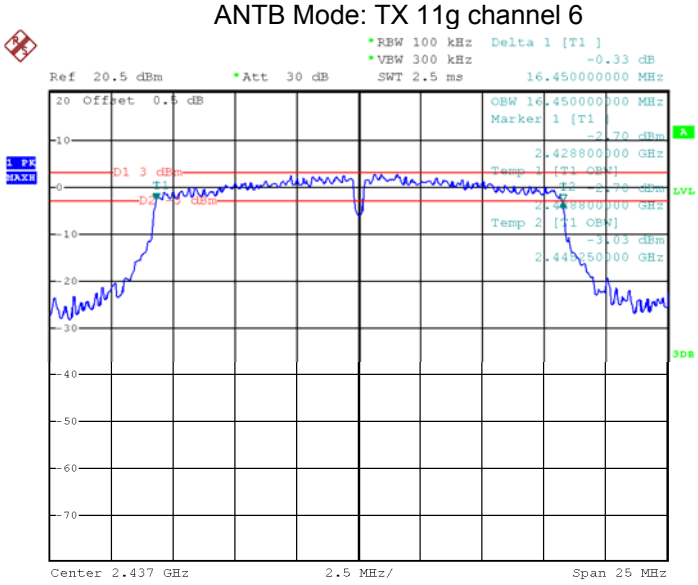
ANTB Mode: TX 11b channel 11



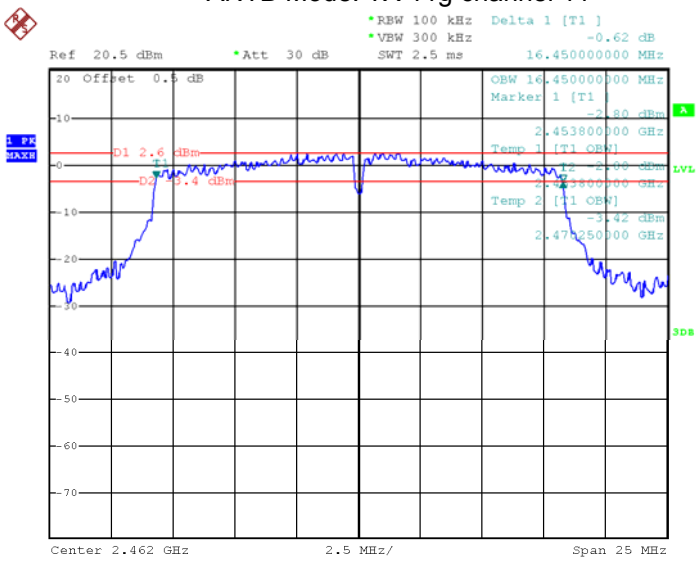
ANTB Mode: TX 11g channel 1



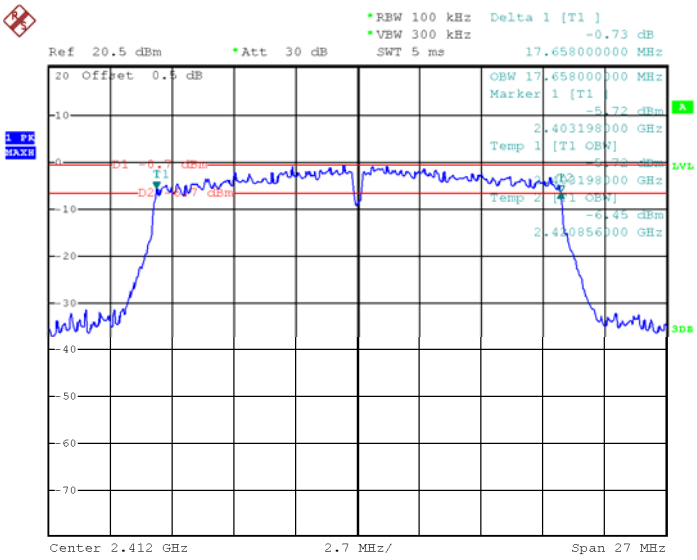
ANTB Mode: TX 11g channel 6



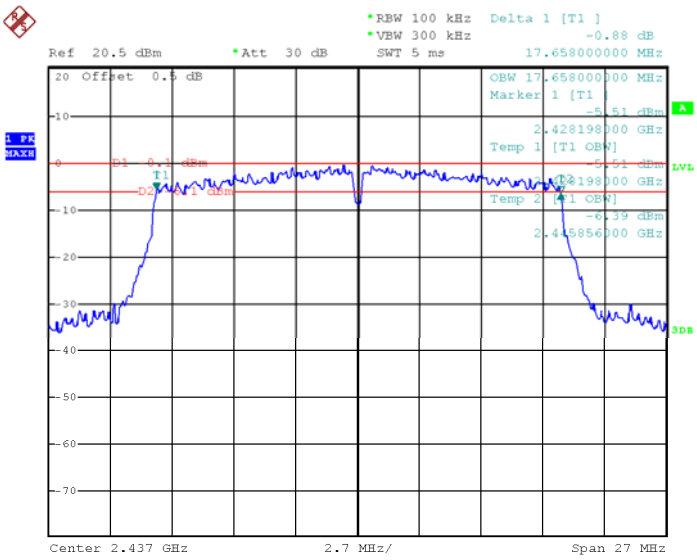
ANTB Mode: TX 11g channel 11



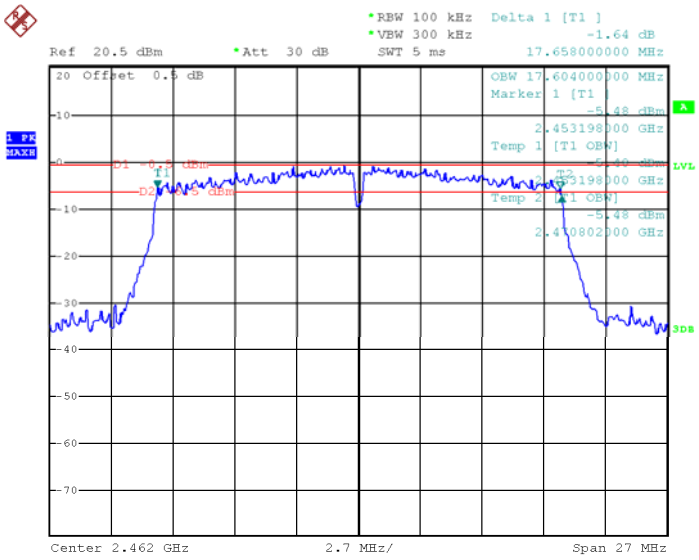
ANTB Mode: TX 11n HT20 channel 1



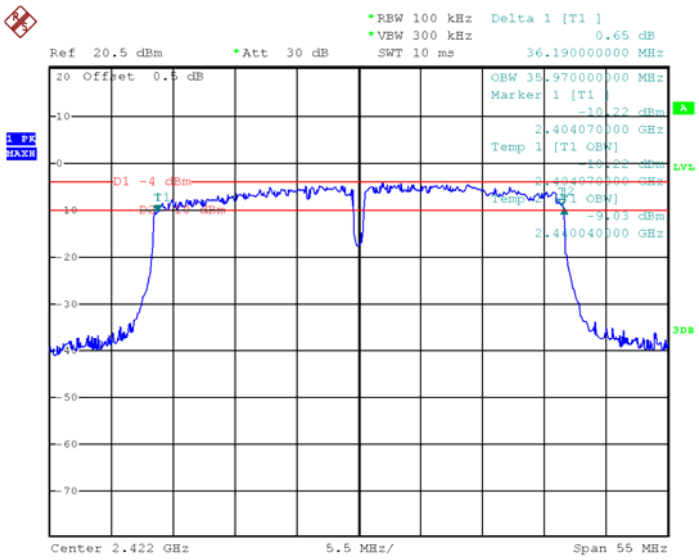
ANTB Mode: TX 11n HT20 channel 6



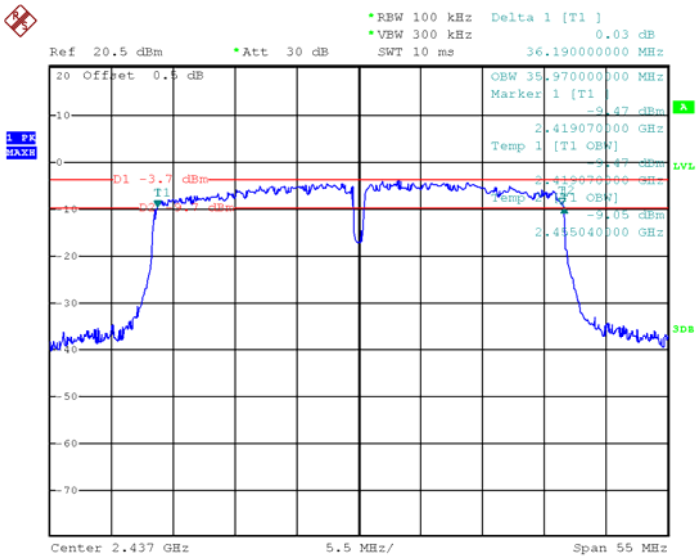
ANTB Mode: TX 11n HT20 channel 11



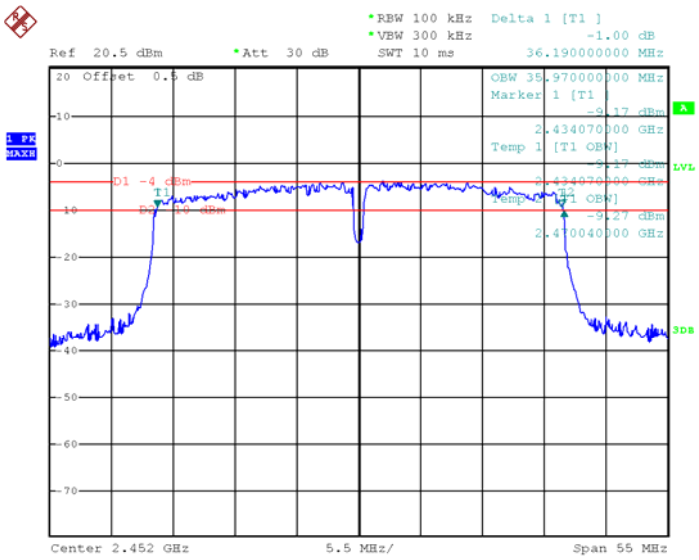
ANTB Mode: TX 11n HT40 channel 3



ANTB Mode: TX 11n HT40 channel 6



ANTB Mode: TX 11n HT40 channel 9



11 Maximum conducted (average) output power

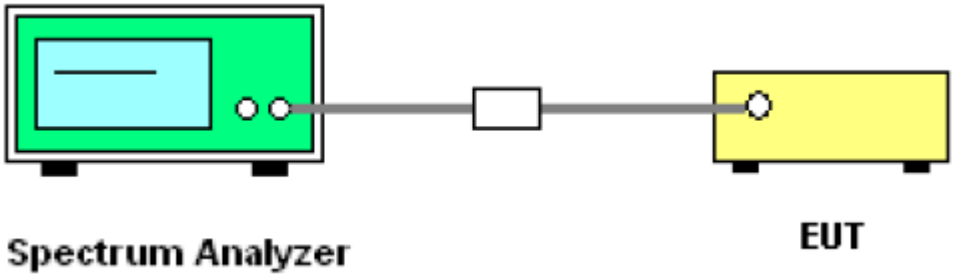
Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05, August 24, 2018

11.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = RMS, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

11.2 Test Setup



11.3 Test Result:

ANTA

Test mode :TX 11b		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
17.16	**17.57**	17.40
Limit: 1W/30dBm		

Test mode :TX 11g		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
17.10	17.47	17.44
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
14.27	14.27	14.25
Limit: 1W/30dBm		

Test mode : TX 11n HT40		
Maximum conducted (average) output power (dBm)		
2422MHz	2437MHz	2452MHz
14.15	14.55	14.66
Limit: 1W/30dBm		

ANTB

Test mode :TX 11b		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
17.12	**17.54**	17.37
Limit: 1W/30dBm		

Test mode :TX 11g		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
17.11	17.45	17.24
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
14.25	14.24	14.25
Limit: 1W/30dBm		

Test mode : TX 11n HT40		
Maximum conducted (average) output power (dBm)		
2422MHz	2437MHz	2452MHz
14.09	14.37	14.61
Limit: 1W/30dBm		

ANTA+ANTB

Test mode :TX 11n HT20		
Maximum conducted (average) output power (dBm)		
2412MHz	2437MHz	2462MHz
17.27	17.27	17.26
Limit: 1W/30dBm		

Test mode : TX 11n HT40		
Maximum conducted (average) output power (dBm)		
2422MHz	2437MHz	2452MHz
17.13	17.47	**17.65**
Limit: 1W/30dBm		

12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05, August 24, 2018

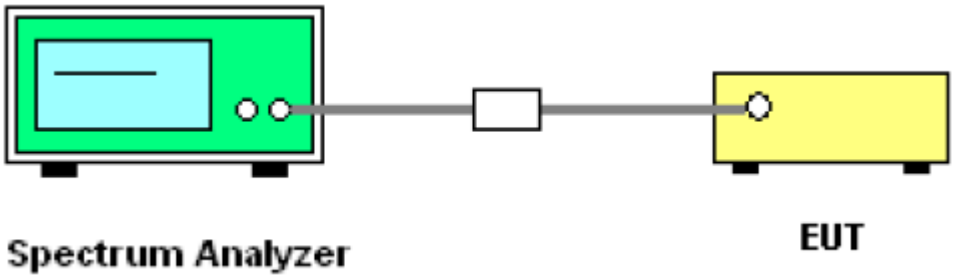
12.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

12.2 Test Setup



12.3 Test Result:

ANTA

Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-9.24	-5.71	-7.71
Limit: 8dBm per 3kHz		

Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-11.46	-10.99	-11.85
Limit: 8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-14.87	-14.97	-15.15
Limit: 8dBm per 3kHz		

Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-17.76	-17.41	-19.99
Limit: 8dBm per 3kHz		

ANTB

Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-10.09	-6.16	-6.65
Limit: 8dBm per 3kHz		

Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-11.47	-11.08	-11.73
Limit: 8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-14.55	-14.91	-15.12
Limit: 8dBm per 3kHz		

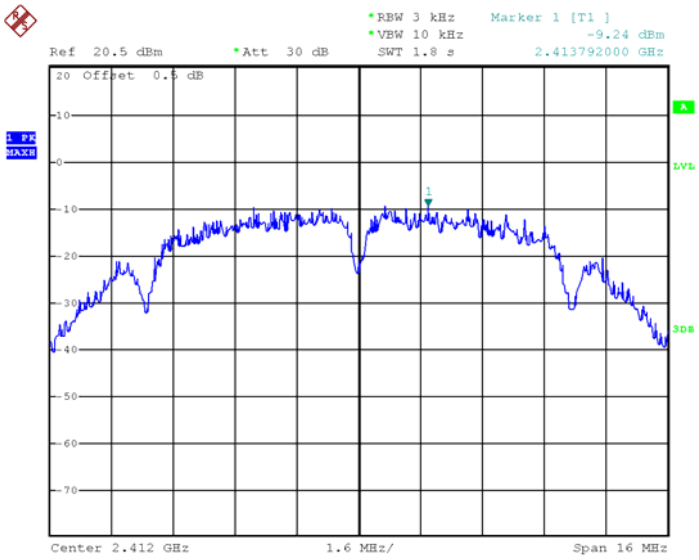
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-17.70	-18.25	-18.70
Limit: 8dBm per 3kHz		

ANTA+ANTB

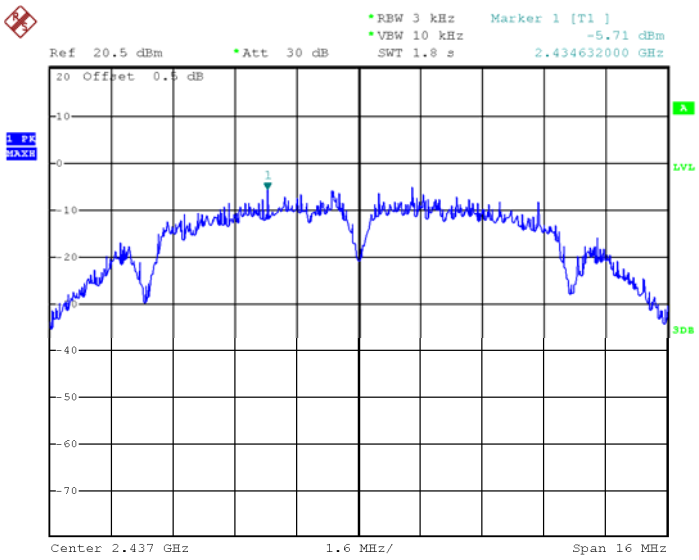
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-11.91	-11.93	-12.12
Limit: 8dBm per 3kHz		

Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-14.72	-14.80	-16.29
Limit: 8dBm per 3kHz		

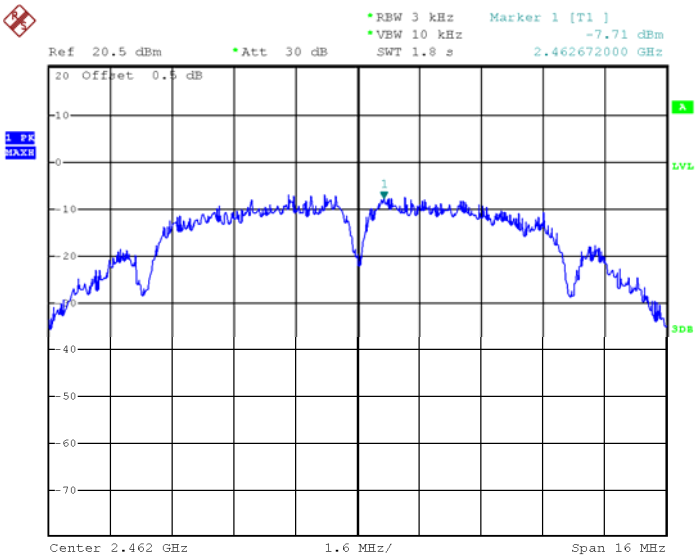
ANTA Mode: TX 11b 2412MHz



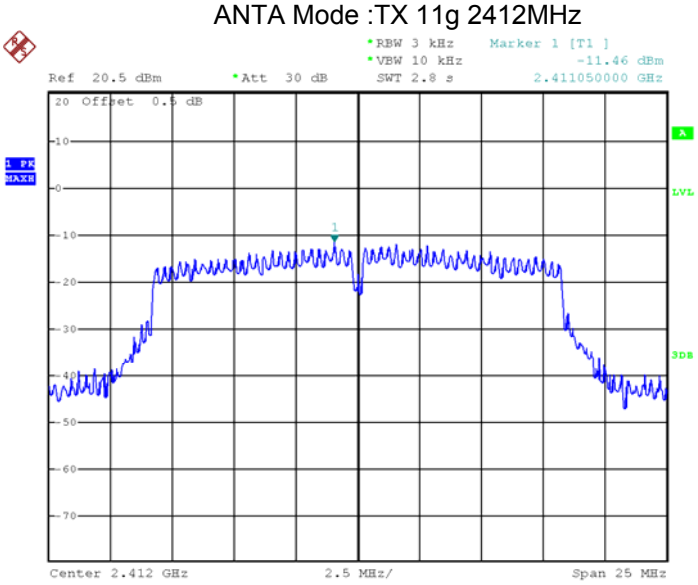
ANTA Mode: TX 11b 2437MHz



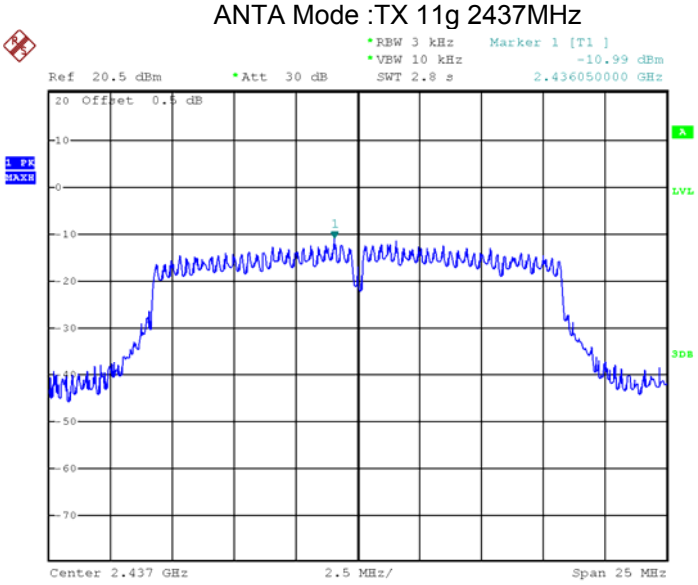
ANTA Mode: TX 11b 2462MHz



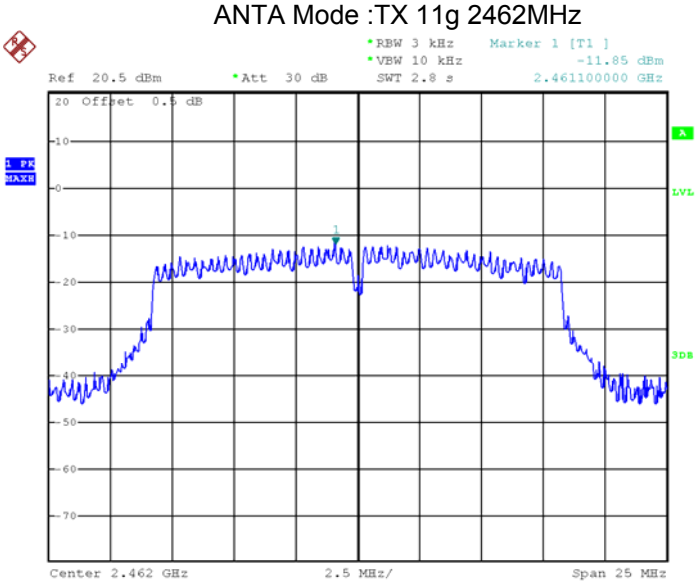
ANTA Mode :TX 11g 2412MHz



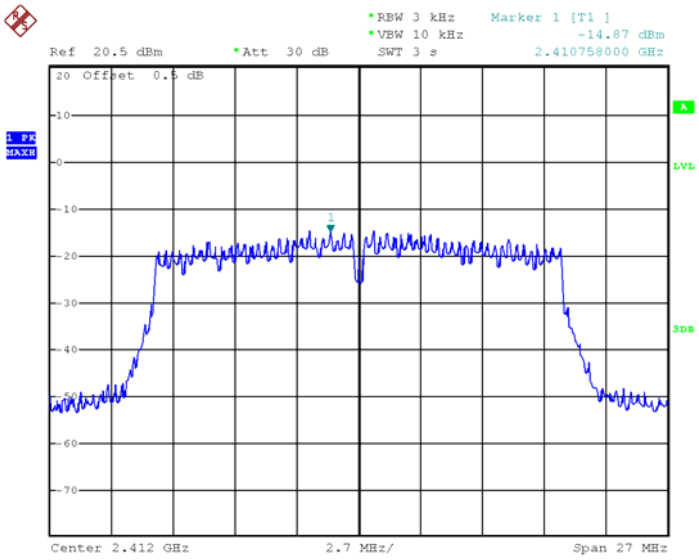
ANTA Mode :TX 11g 2437MHz



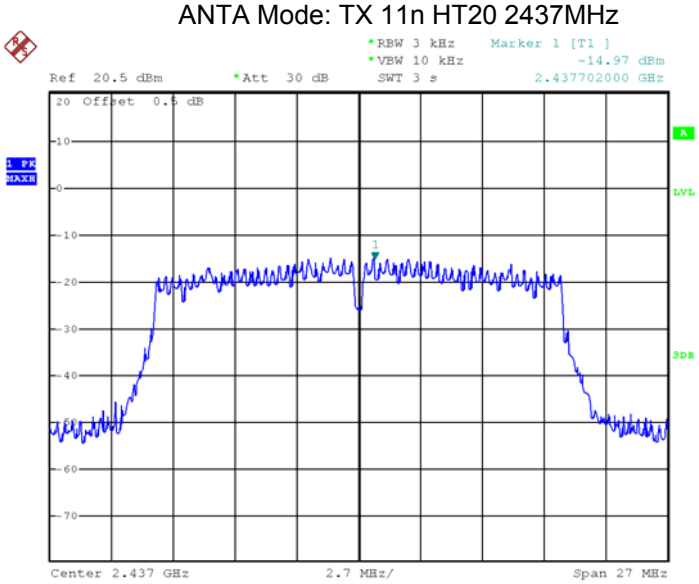
ANTA Mode :TX 11g 2462MHz



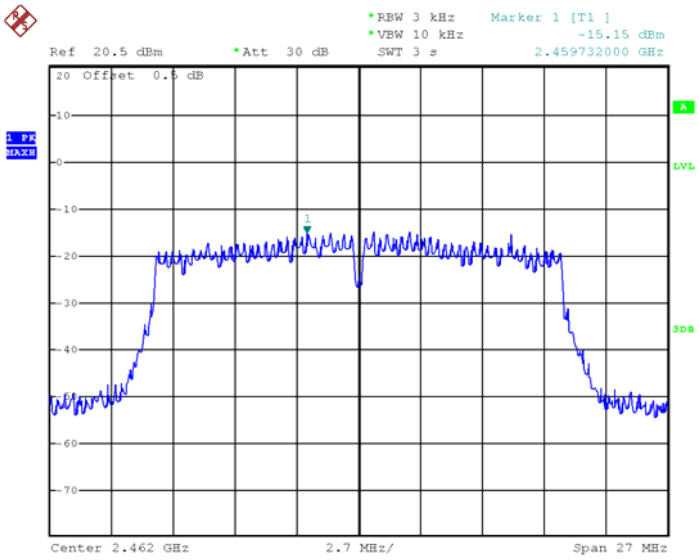
ANTA Mode: TX 11n HT20 2412MHz



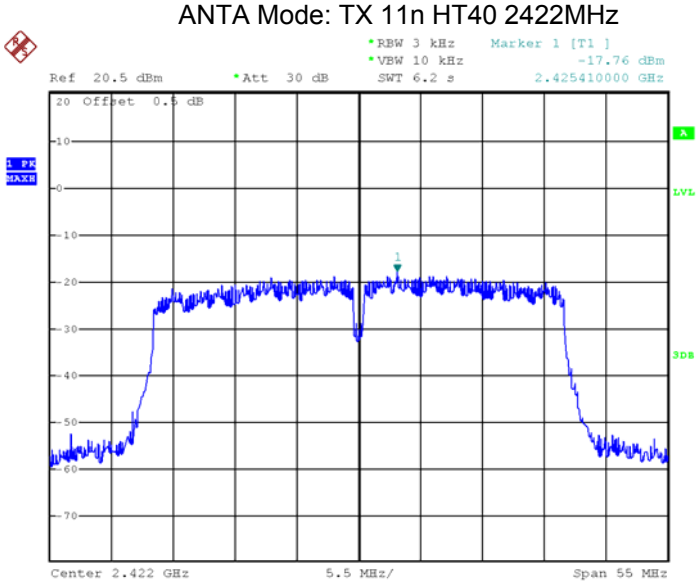
ANTA Mode: TX 11n HT20 2437MHz



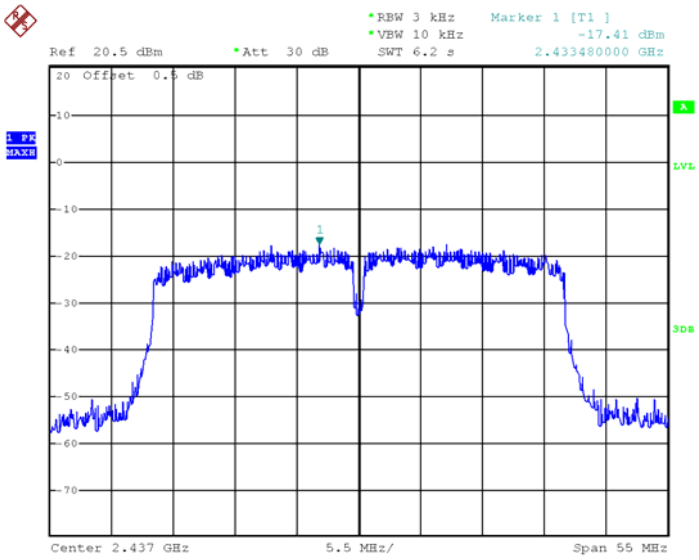
ANTA Mode: TX 11n HT20 2462MHz



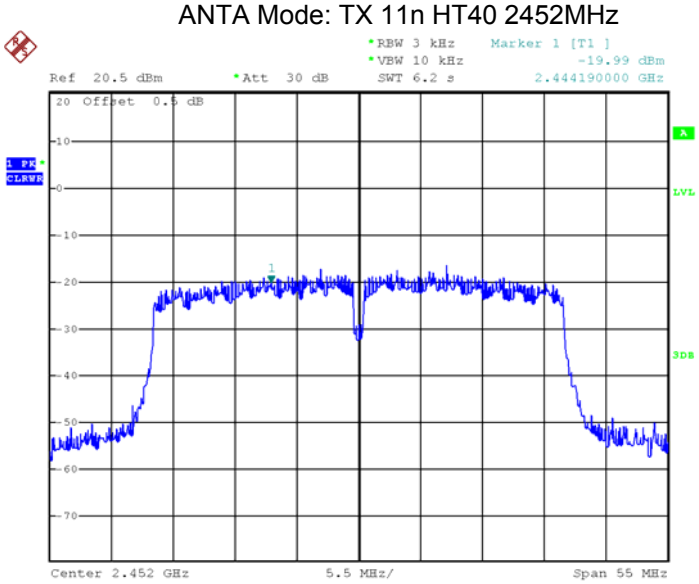
ANTA Mode: TX 11n HT40 2422MHz



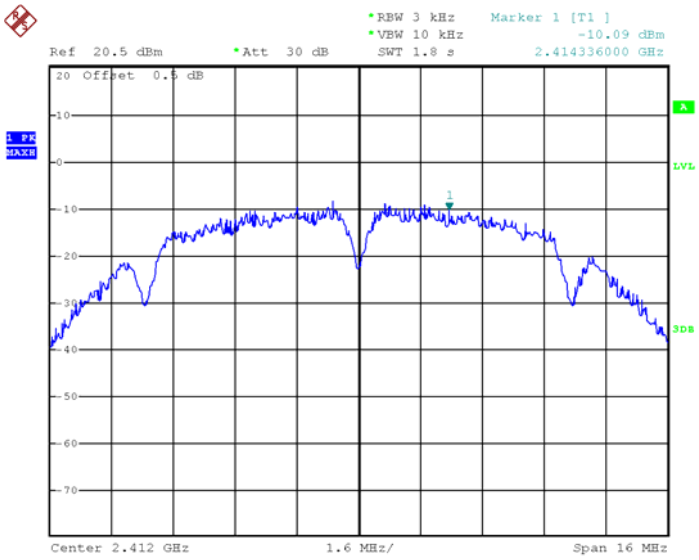
ANTA Mode: TX 11n HT40 2437MHz



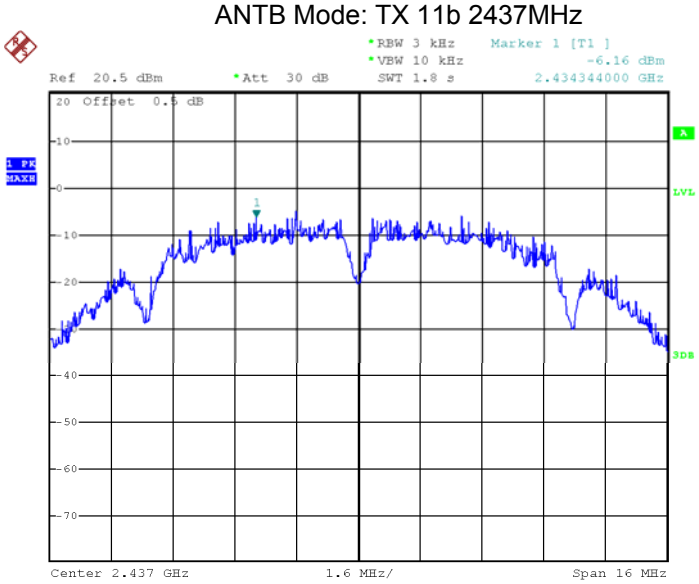
ANTA Mode: TX 11n HT40 2452MHz



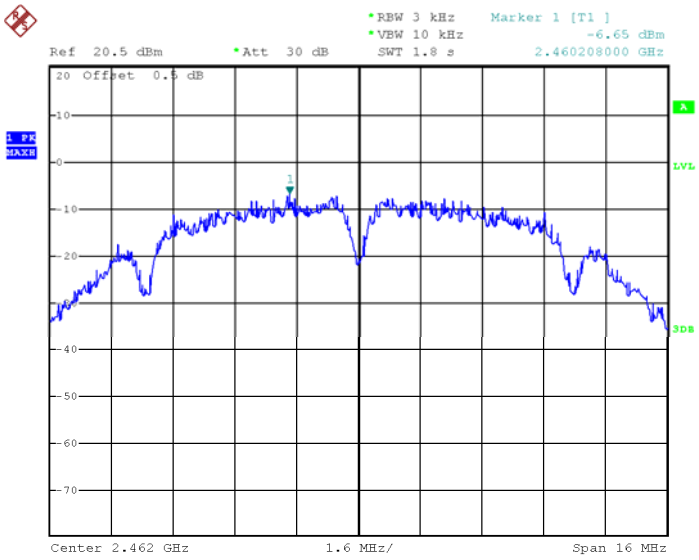
ANTB Mode: TX 11b 2412MHz



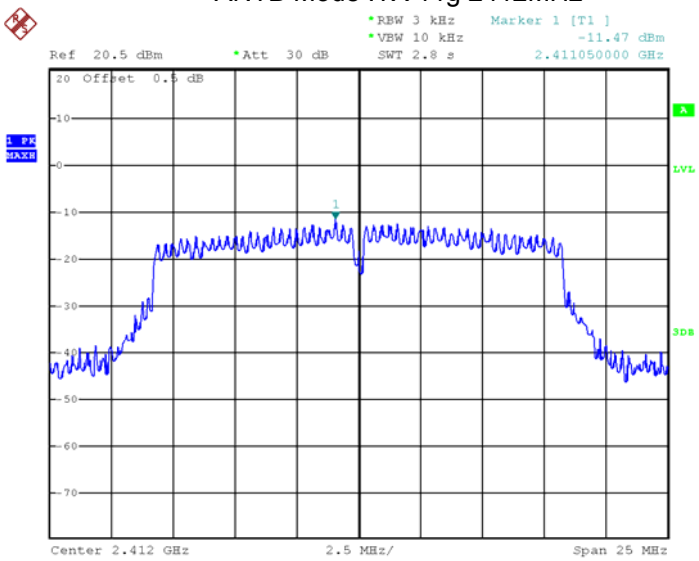
ANTB Mode: TX 11b 2437MHz



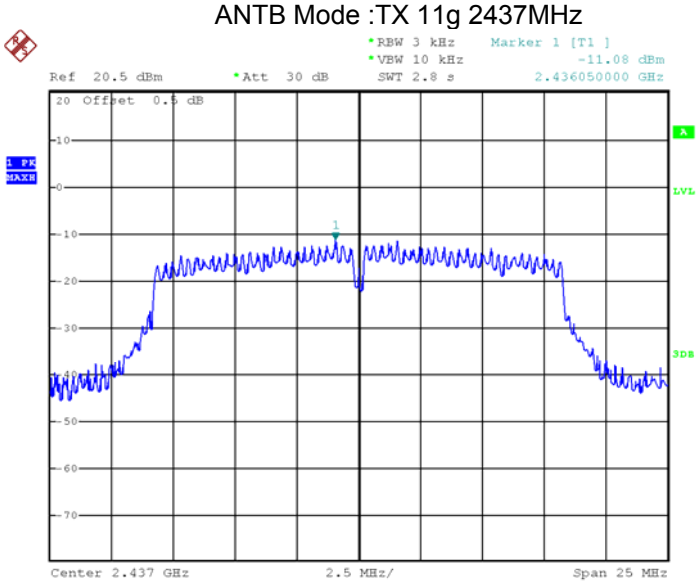
ANTB Mode: TX 11b 2462MHz



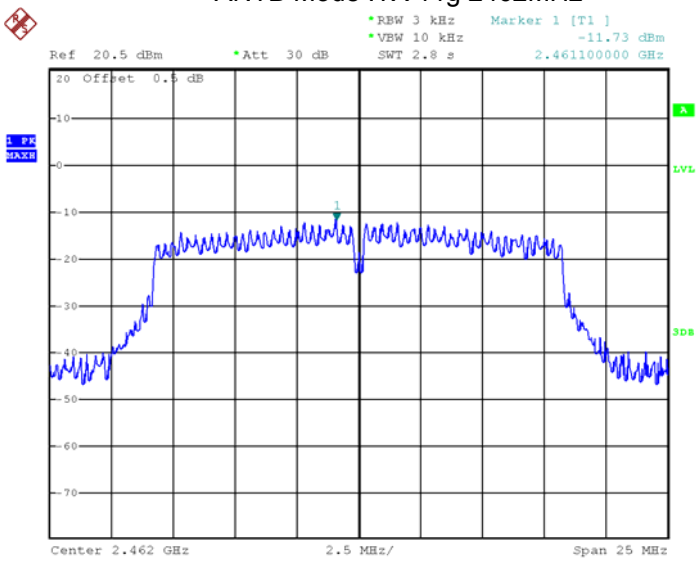
ANTB Mode :TX 11g 2412MHz



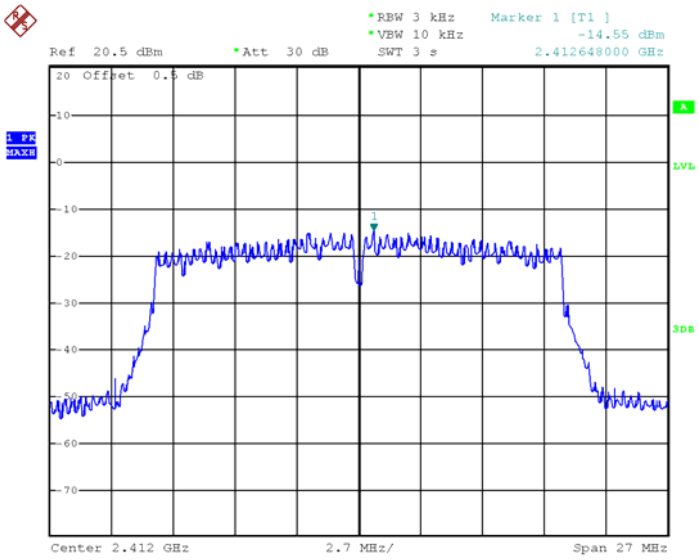
ANTB Mode :TX 11g 2437MHz



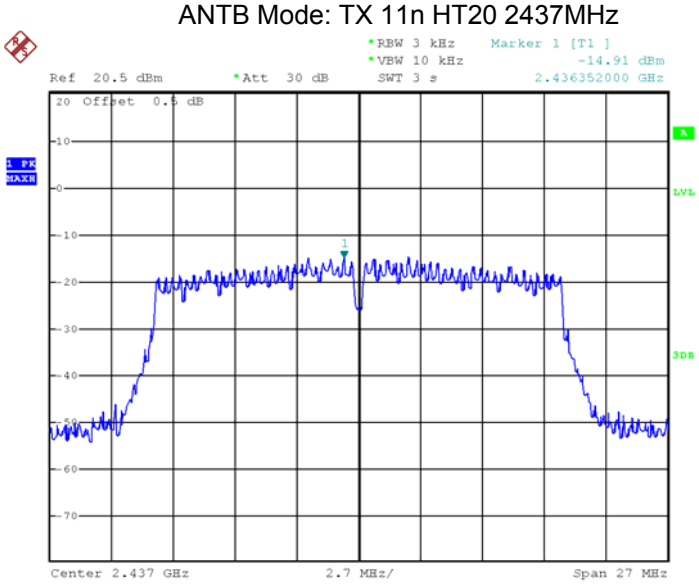
ANTB Mode :TX 11g 2462MHz



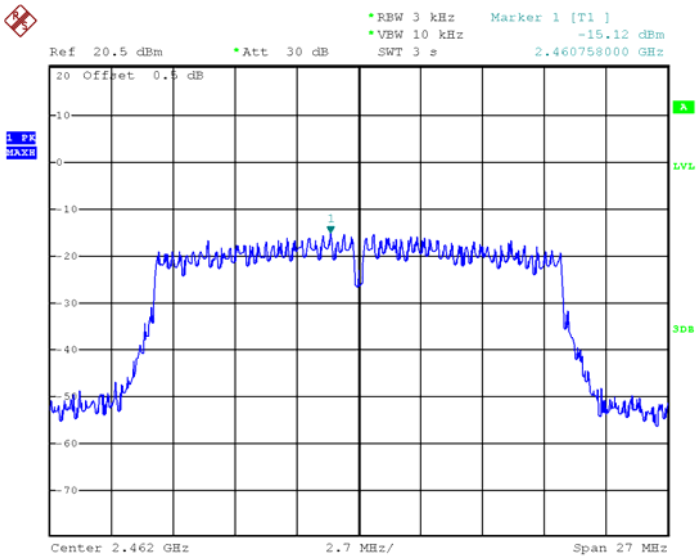
ANTB Mode: TX 11n HT20 2412MHz



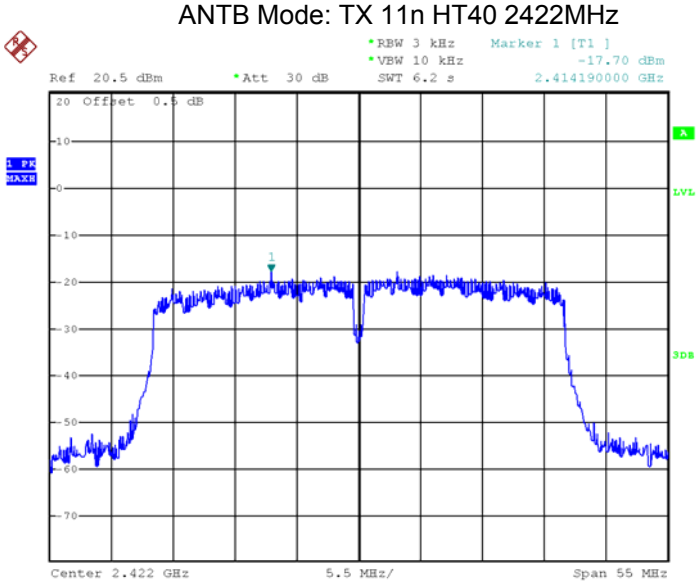
ANTB Mode: TX 11n HT20 2437MHz



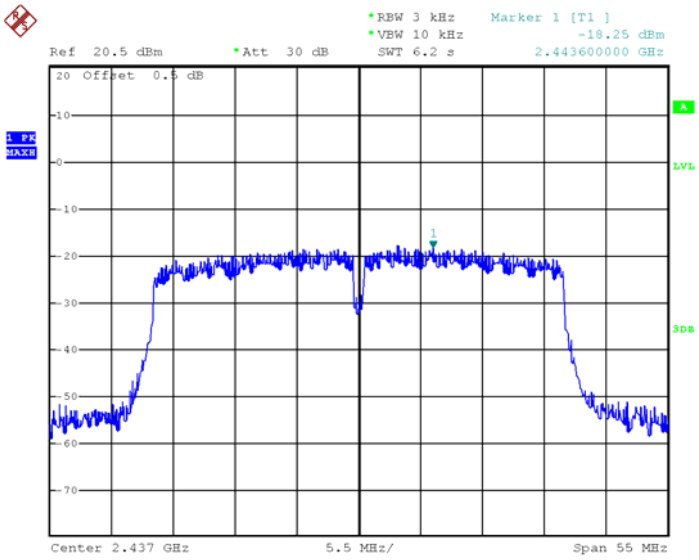
ANTB Mode: TX 11n HT20 2462MHz



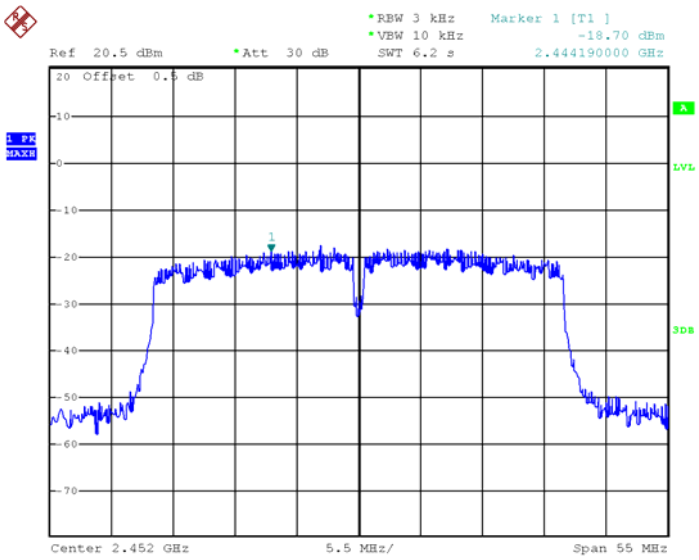
ANTB Mode: TX 11n HT40 2422MHz



ANTB Mode: TX 11n HT40 2437MHz



ANTB Mode: TX 11n HT40 2452MHz



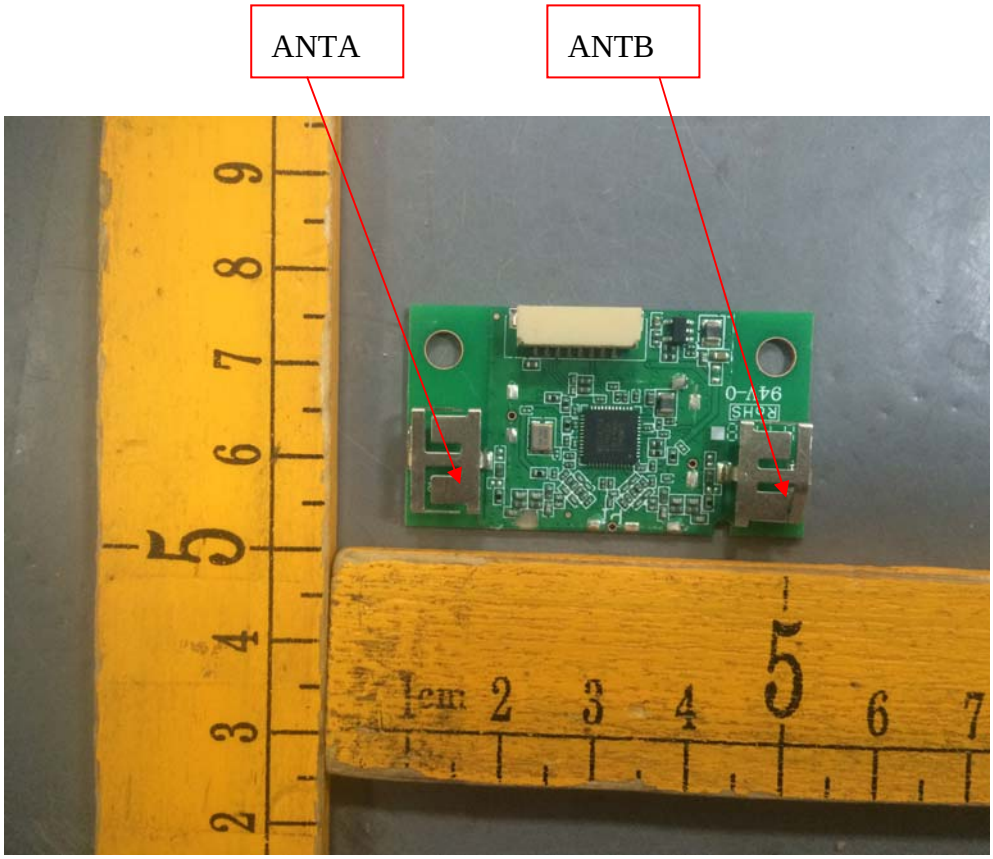
13 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Result:

The EUT has two Internal Metal Antenna, meets the requirements of FCC 15.203.



14 FCC ID: RH2-HR-N5517 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091 & KDB 447498 D01 General RF Exposure Guidance v06

14.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

14.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

14.3 MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = output power to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

From the peak EUT RF output power, the minimum mobile separation distance, R=20cm, as well as the gain of the used antenna, the RF power density can be obtained

ANTA

Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum conducted (average) output power (dBm)	Maximum conducted (average) output power (mw)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)	Result
2.00	1.585	17.57	57.15	0.0180	1	Compliance

ANTB

Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum conducted (average) output power (dBm)	Maximum conducted (average) output power (mw)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)	Result
2.00	1.585	17.54	56.75	0.0179	1	Compliance

ANTA+ANTB

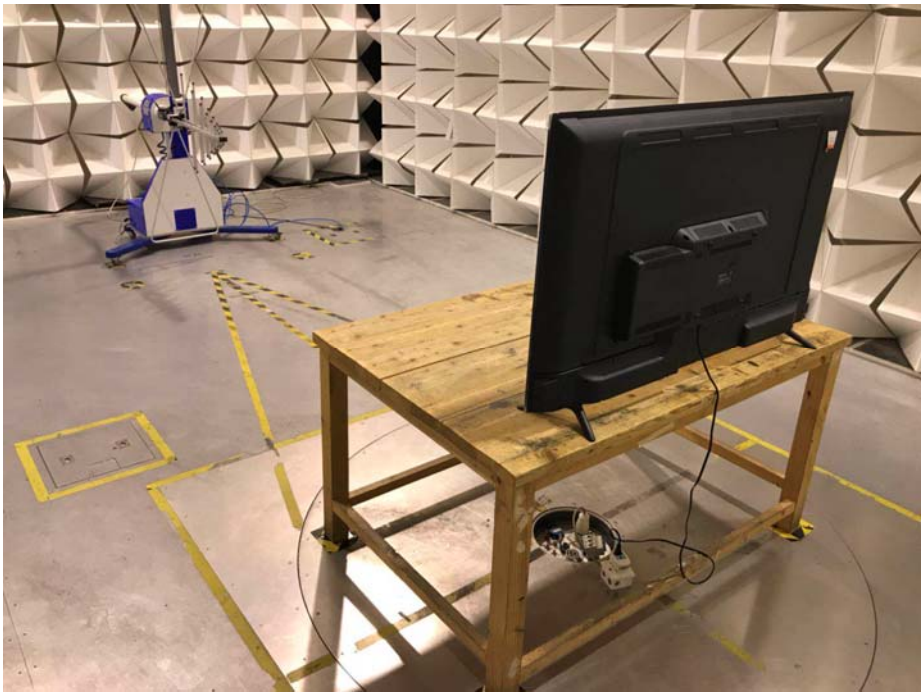
Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum conducted (average) output power (dBm)	Maximum conducted (average) output power (mw)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)	Result
2.00	1.585	17.65	58.21	0.0184	1	Compliance

15 Photographs – Model E4SFT5517 Test Setup

15.1 Radiated Emission

Test frequency 9kHz to 30MHz

Test frequency from 30MHz to 1GHz



Test frequency above 1GHz

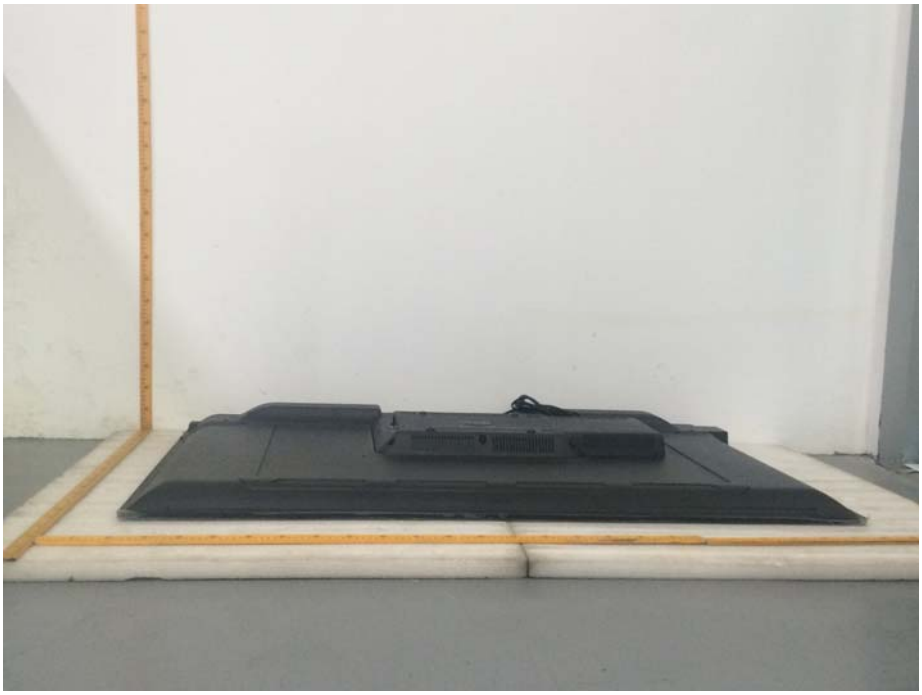
15.2 Conducted Emission

16 Photographs - Constructional Details

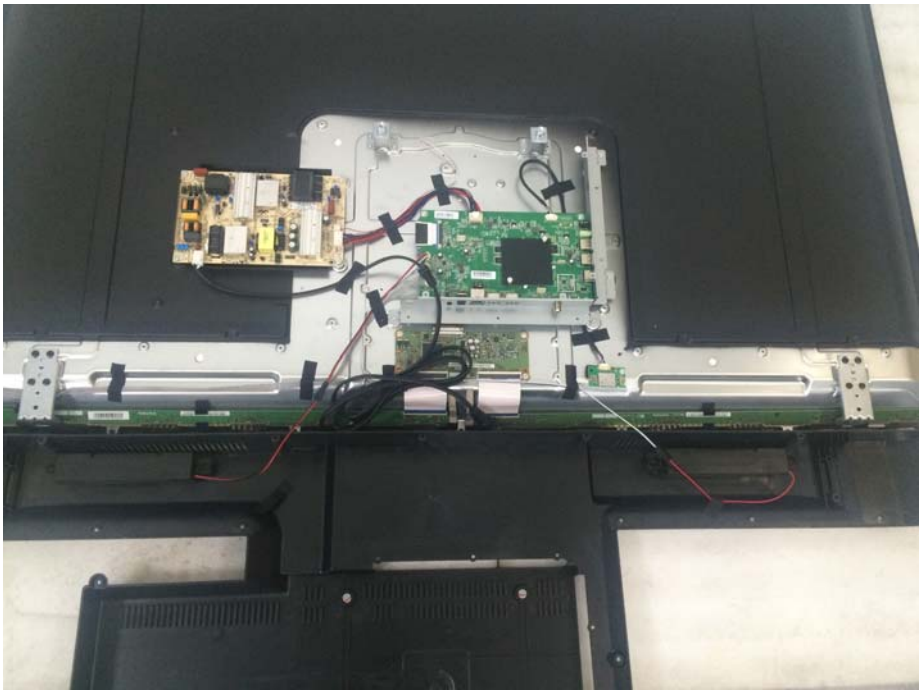
16.1 Model E4SFT5517-External Photos

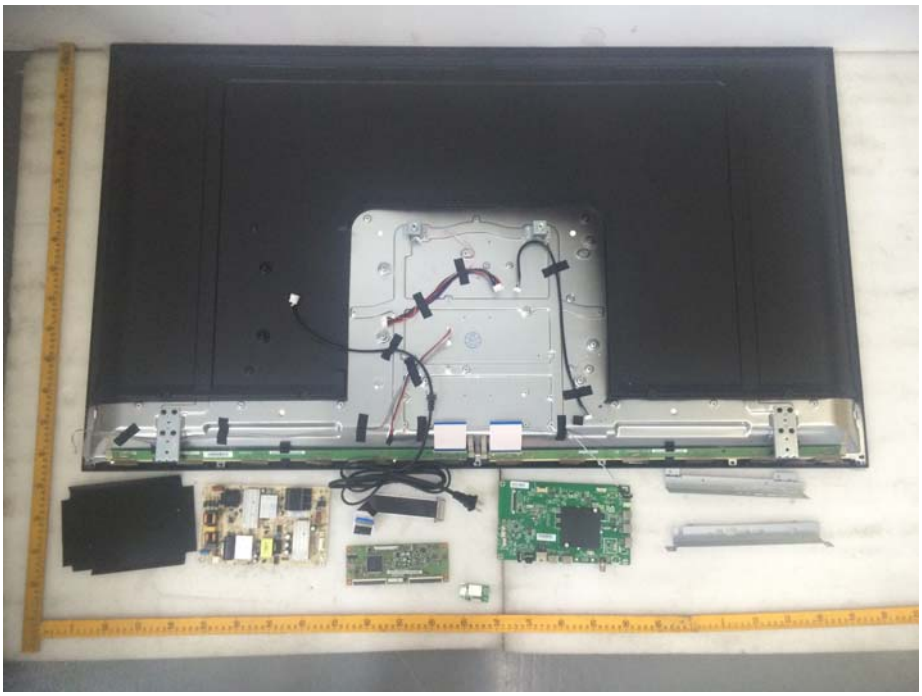

HDMI 1
USB1
5V 500mA
USB2
5V 500mA
YPBPR
AV
AUDIO
L/R

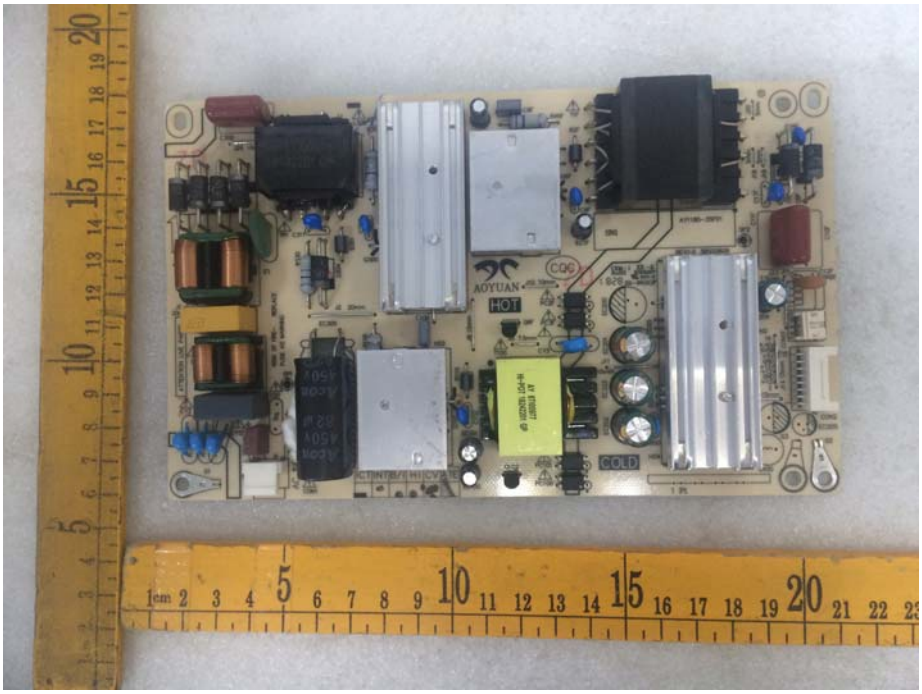

OPTICAL
LAN
HDMI 3
HDMI 2

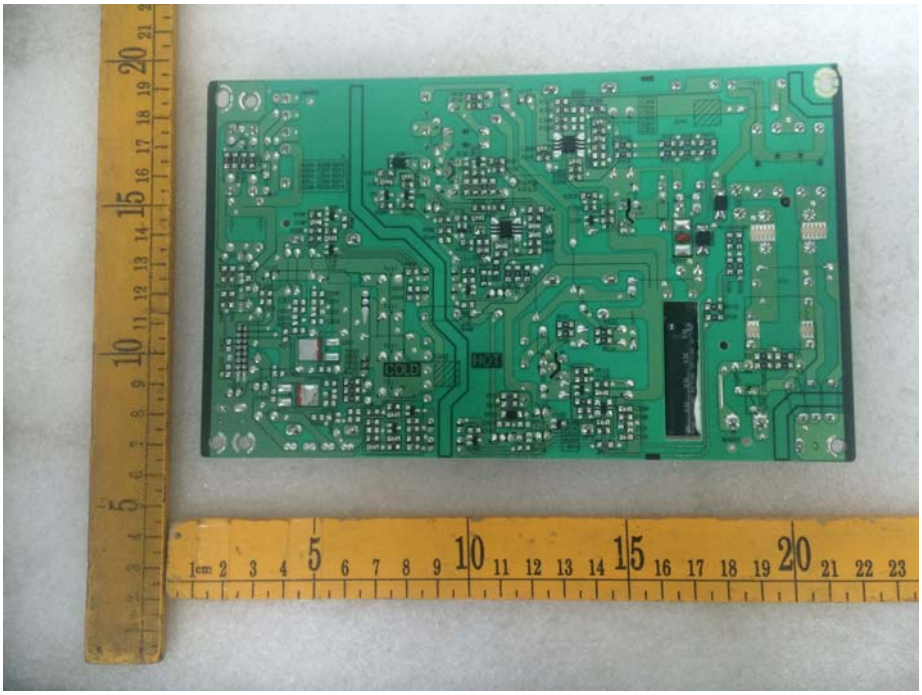


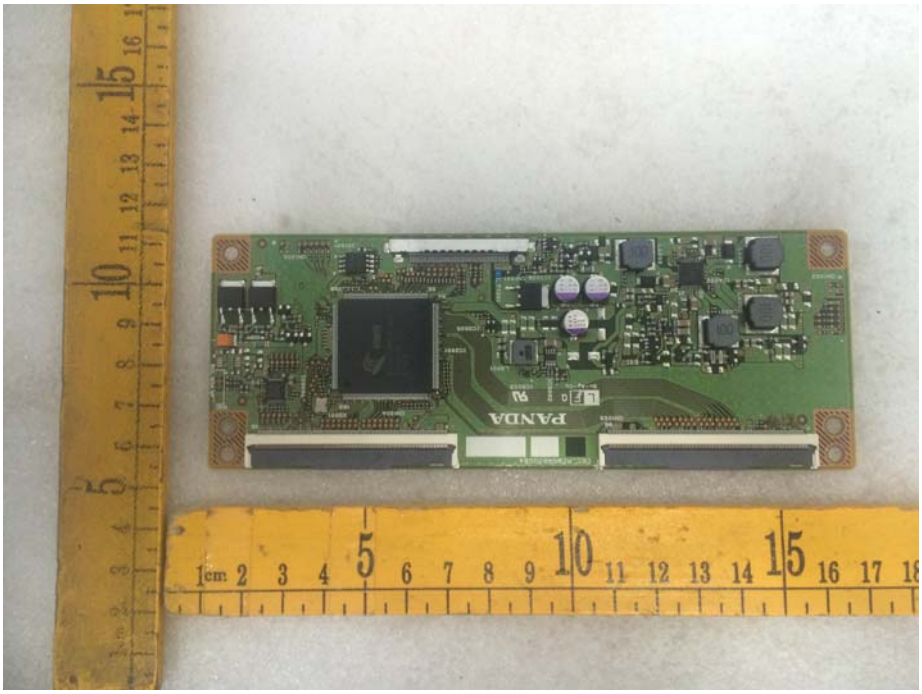
16.2 Model E4SFT5517-Internal Photos



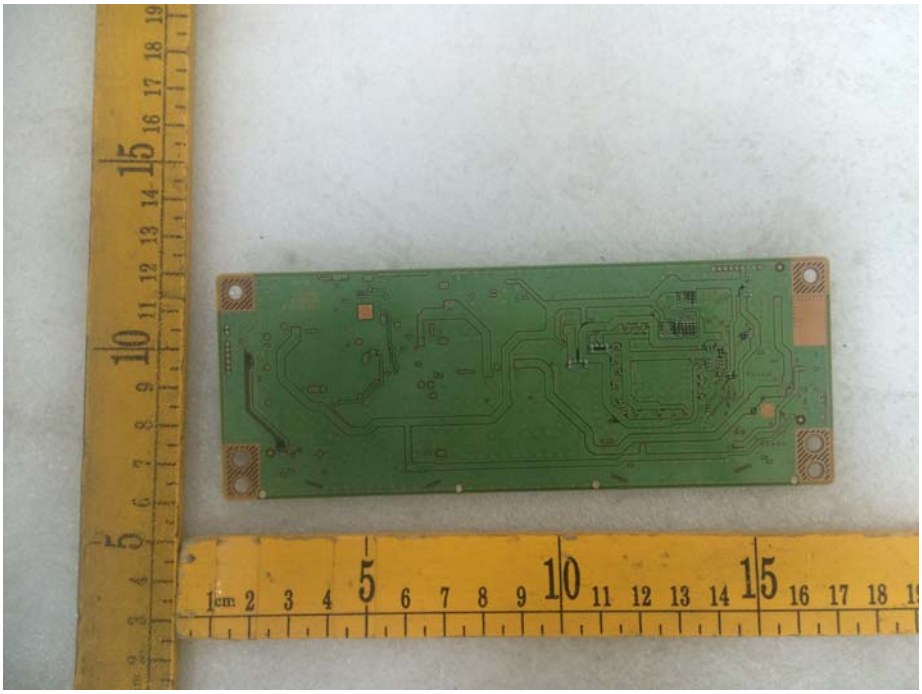


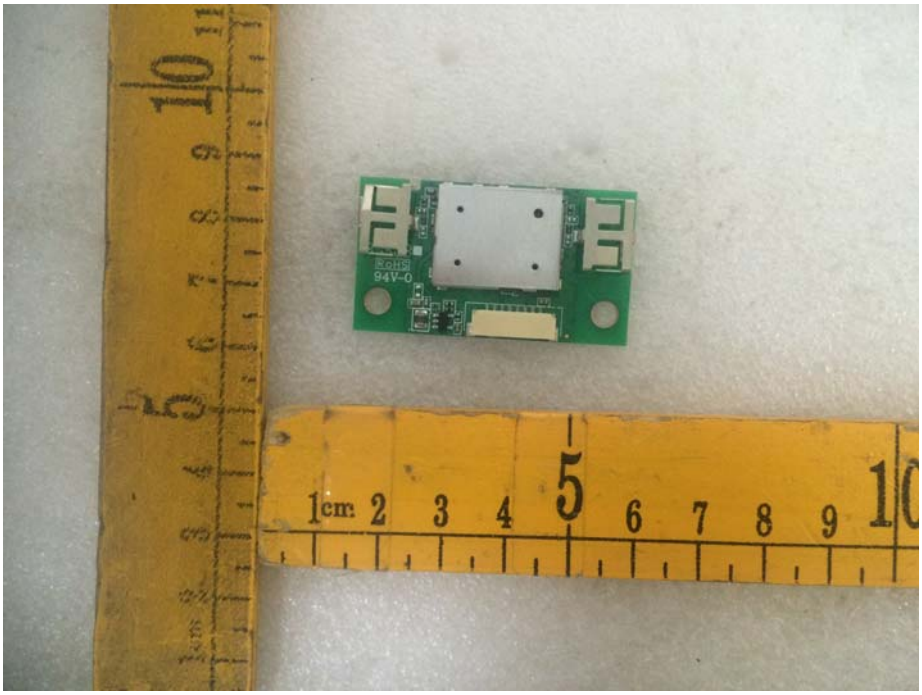

AOYUAN
HOT
COLD

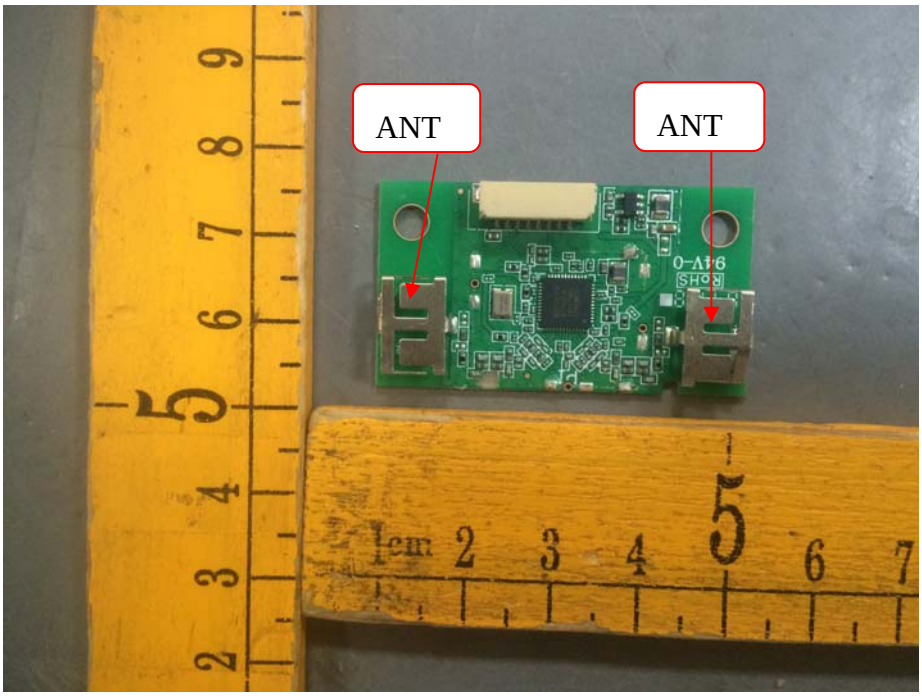

HOT
COLD


PANDA
1cm 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

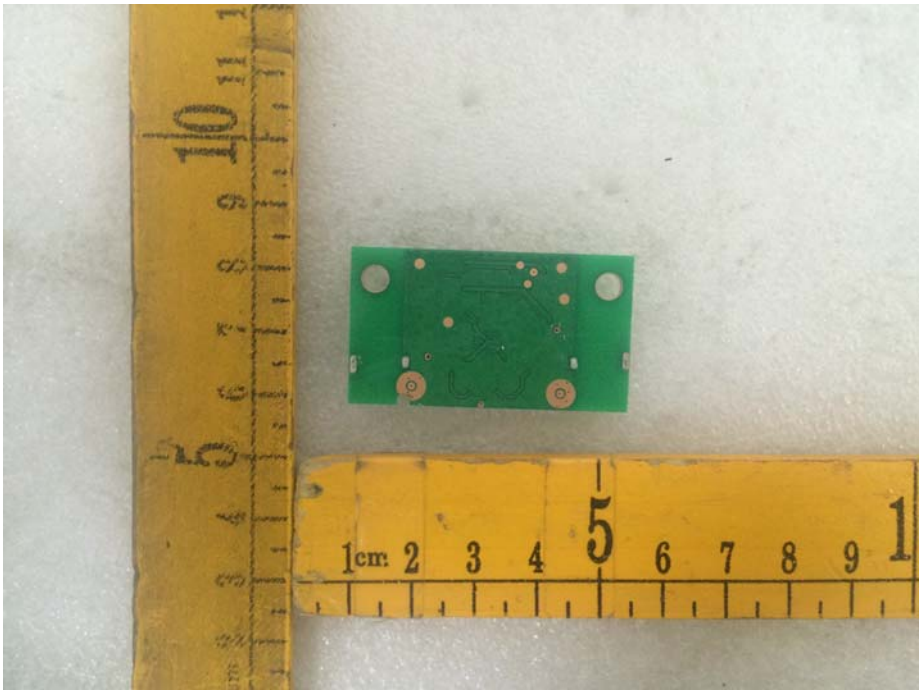

GND
COM
CN1005
IC3004
X2001
IC1001
NOVATEK
NT71788MFG-000
1811-AB
K79LR
CN1004
IC2001
IC3005

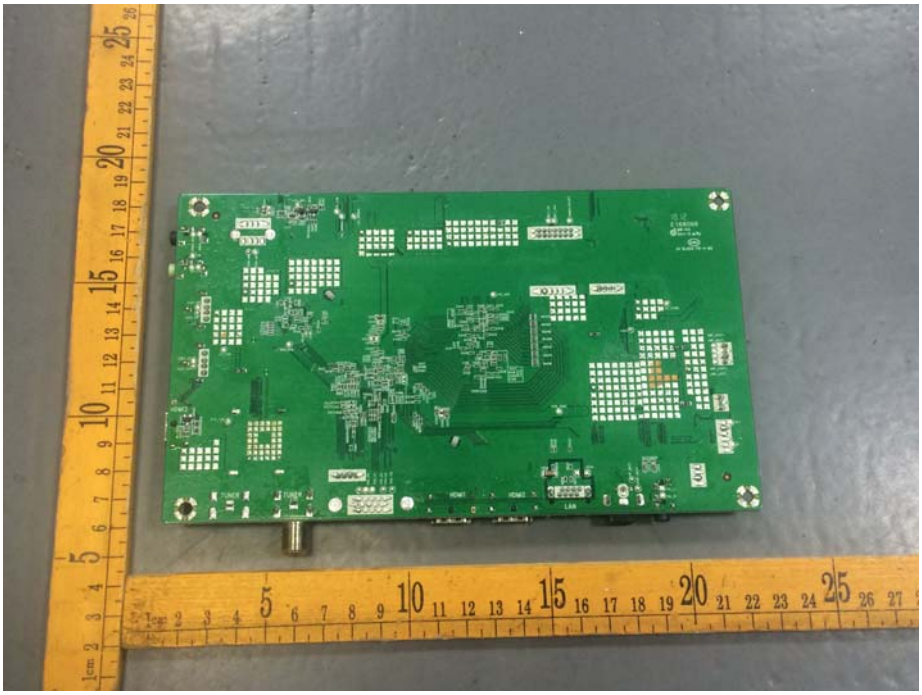


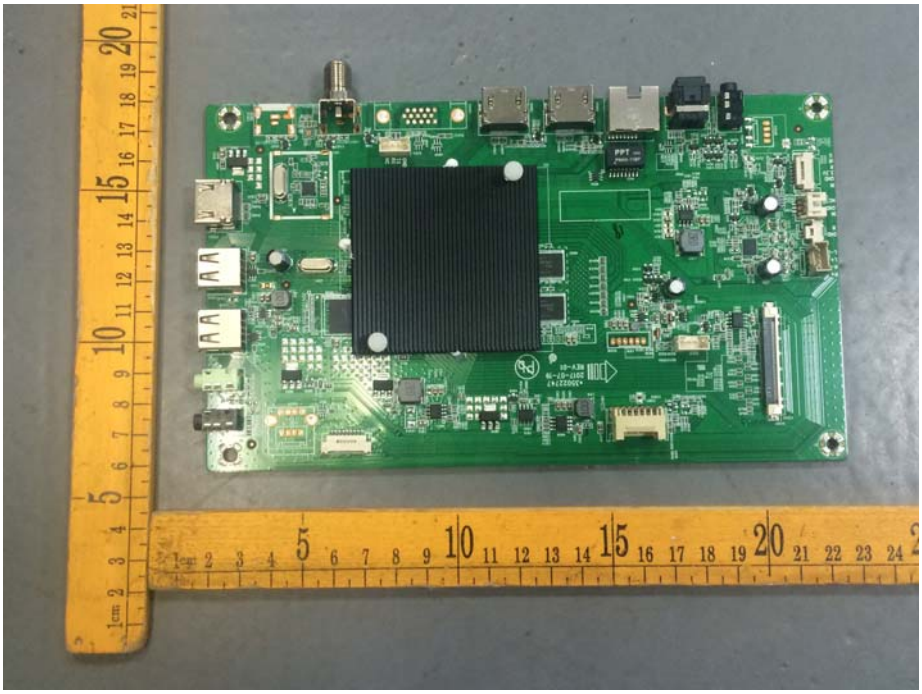


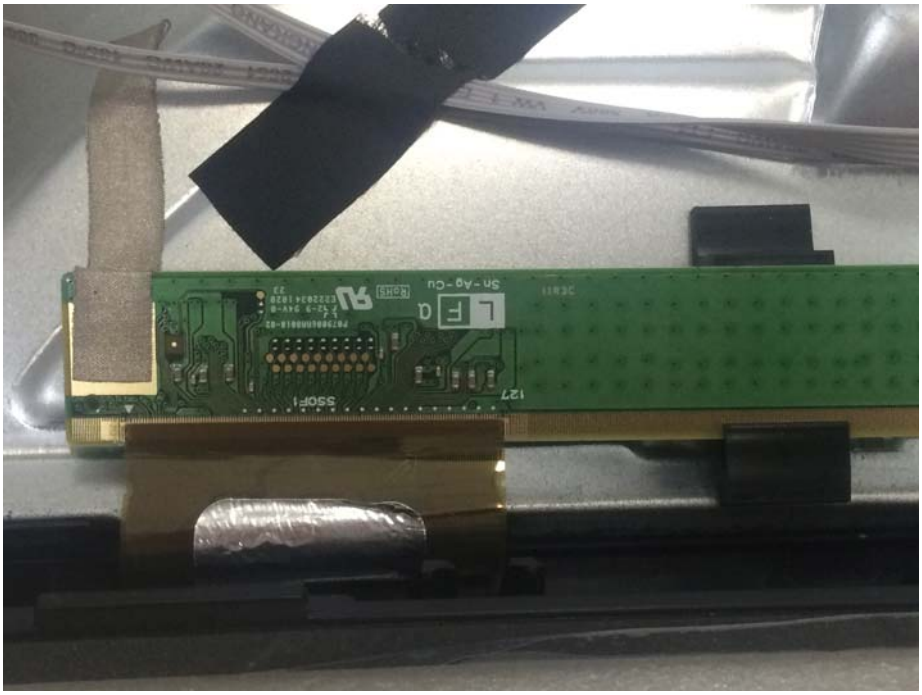

ANT
ANT
1cm

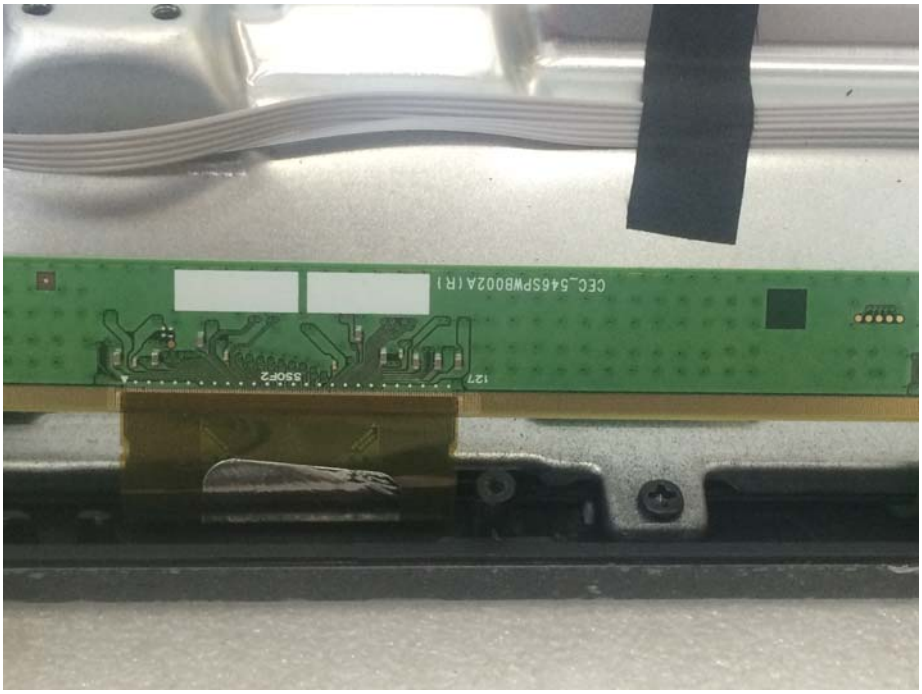

MEDIATEK
MT7603UN
1804-BMAL
CTPH3M33







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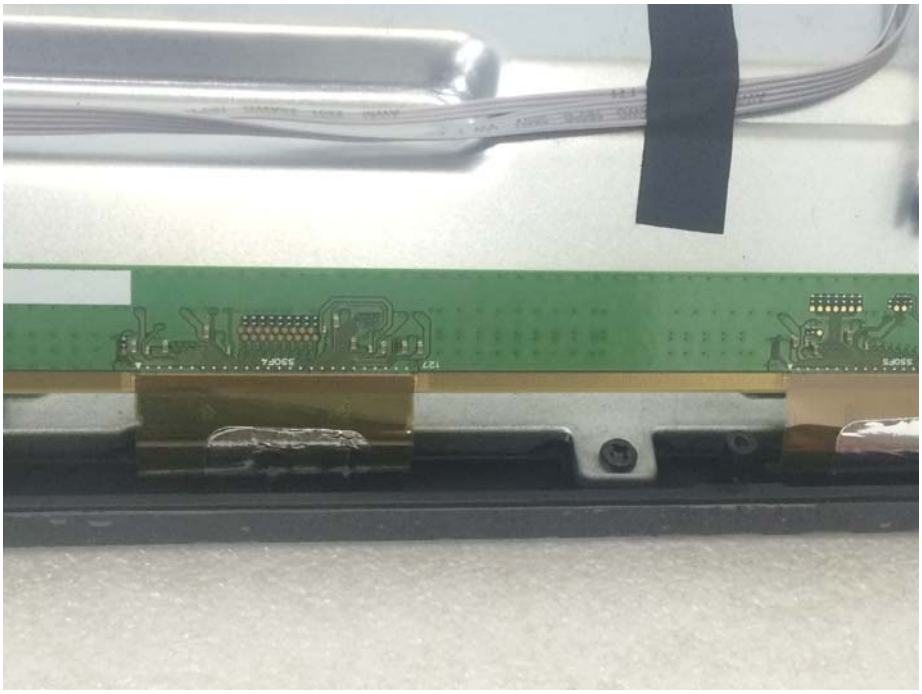

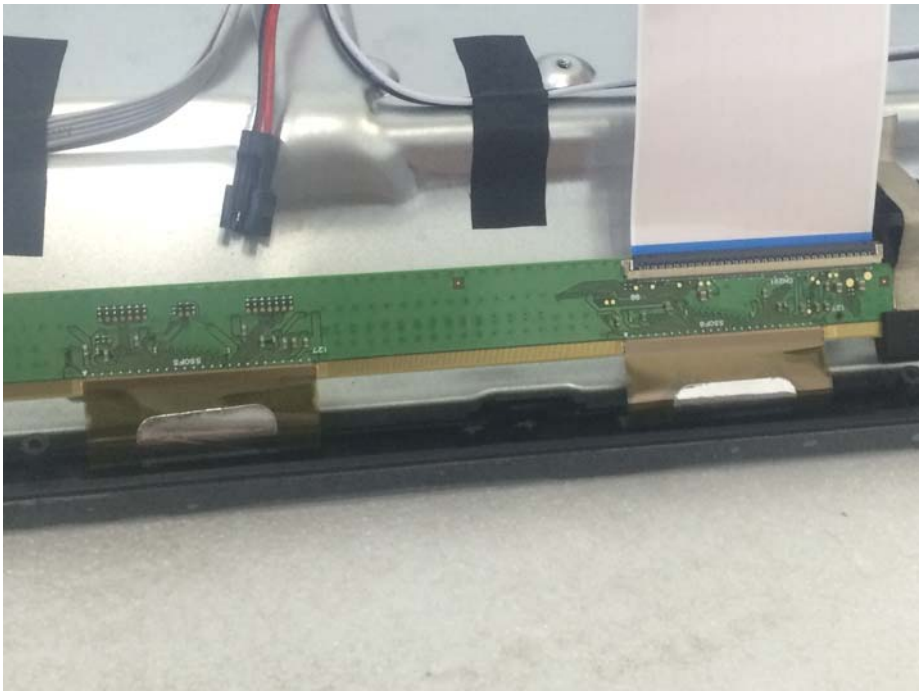

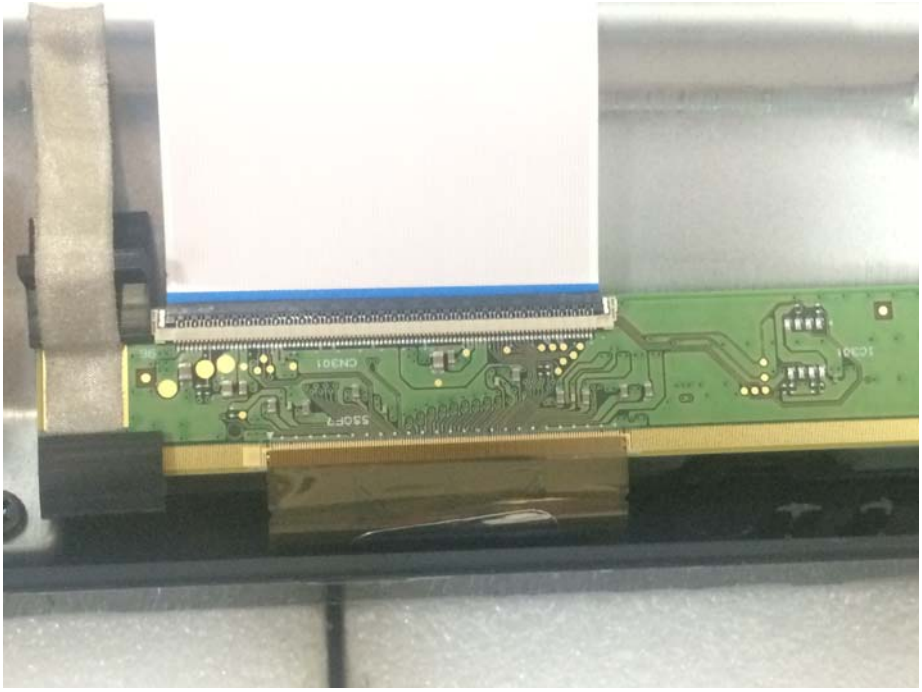

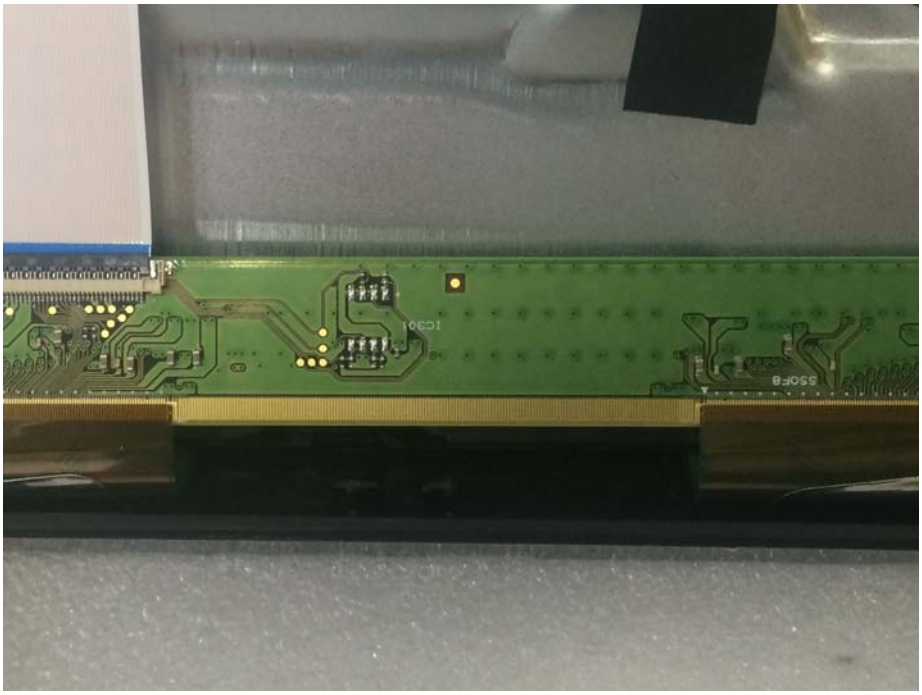


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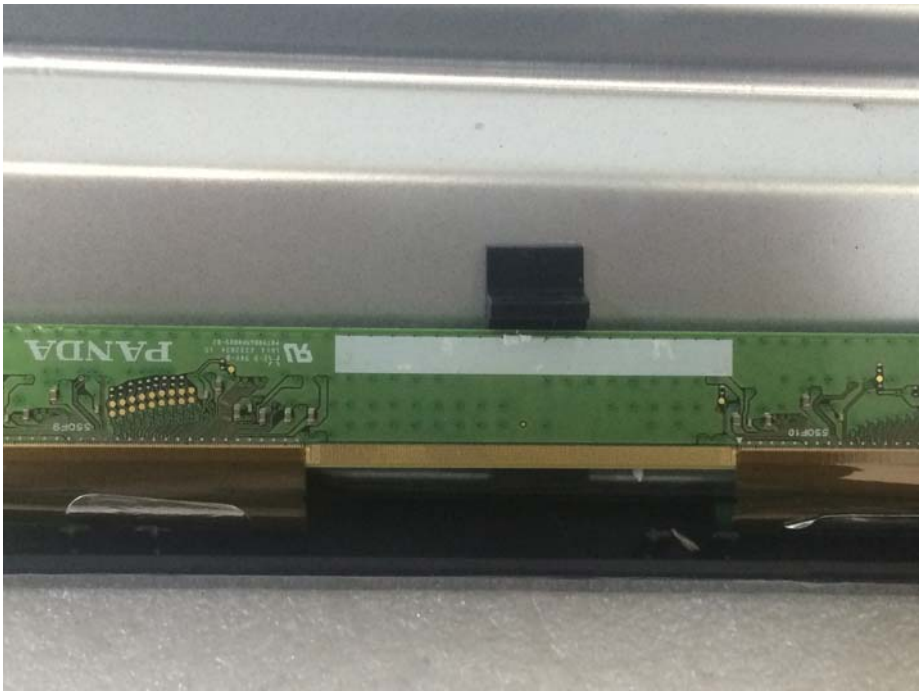
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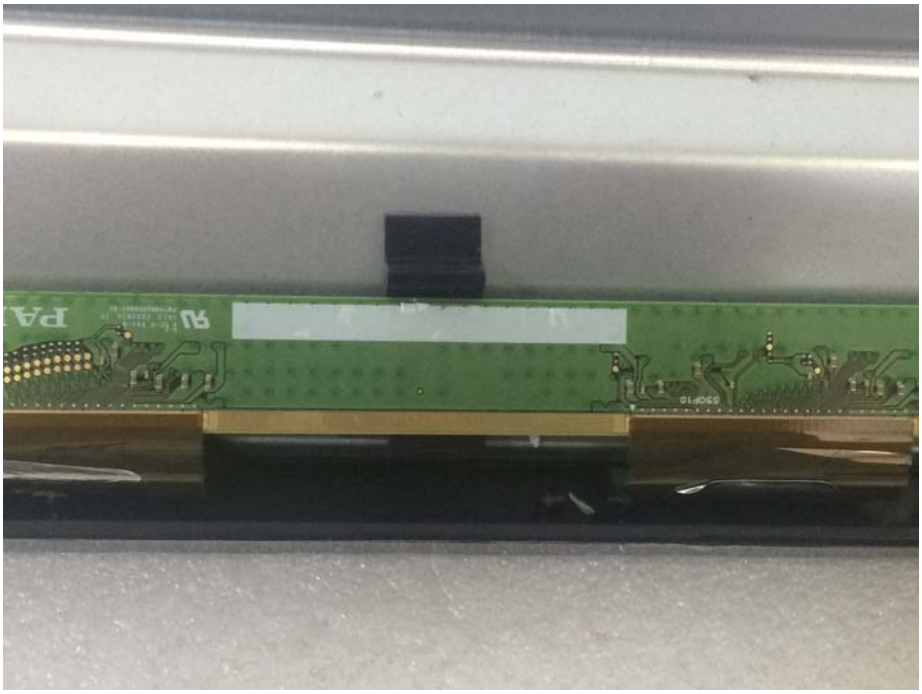

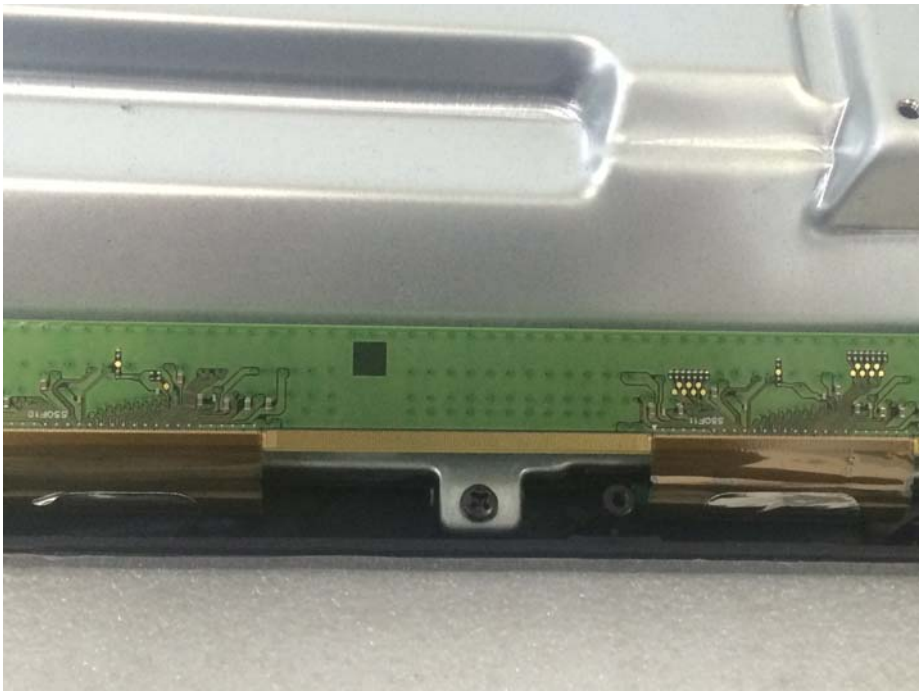

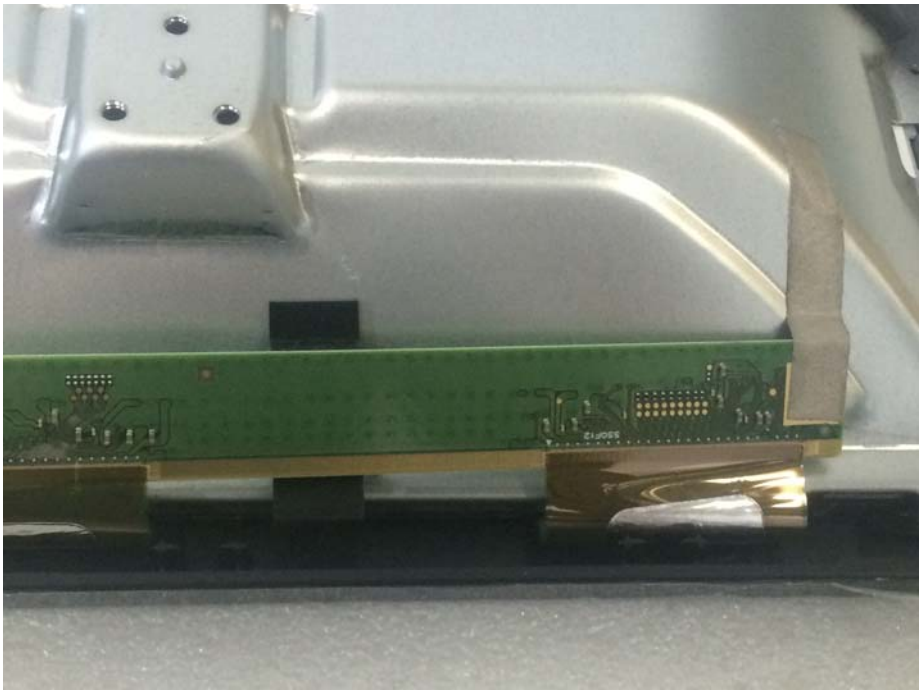

======End of Report======