

TEST REPORT

Reference No. : WTS18S03105612W
FCC ID : 2AIOC-RGB01W
Applicant : HANK ELECTRONICS CO., LTD.
Address : Floor 2nd-7th,A8,Hongye Industry City, Lezhujiao, Zhoushi Road,Baoan District,Shenzhen,China
Manufacturer : HANK ELECTRONICS CO., LTD.
Address : Floor 2nd-7th,A8,Hongye Industry City, Lezhujiao, Zhoushi Road,Baoan District,Shenzhen,China
Product : Smart Bulb
Model(s) : HKWL-LED02W, EAW2-1001-SWT, XLB7-1211-WHT, HKWL- RGB01W, EAC2-1001-RGB
Standards : FCC CFR47 Part 15 C Section 15.247: 2017
Date of Receipt sample..... : 2018-03-20
Date of Test : 2018-03-21 to 2018-03-27
Date of Issue : 2018-04-03
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:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Tested by:

Jack Wen

Jack Wen / Test Engineer

Approved by:



Philo Zhong

Philo Zhong / Manager

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. ElectroMagnetic 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.

2.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Country/Region	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01)	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		International Services	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

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4 Revision History

Test report #	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS18S03105612W	2018-03-20	2018-03-21 to 2018-03-27	2018-04-03	Original	-	Valid

5 General Information

5.1 General Description of E.U.T

Product:	Smart Bulb
Model(s):	HKWL-LED02W, EAW2-1001-SWT, XLB7-1211-WHT, HKWL- RGB01W, EAC2-1001-RGB
Model Difference:	The models HKWL-RGB01W, EAC2-1001-RGB are same but the model names. The models HKWL-LED02W, EAW2-1001-SWT, XLB7-1211-WHT are same but the model names. The models HKWL-RGB01W, HKWL-LED02W are same in PCB layout, RF module and appearance. The difference test was performed between the HKWL-RGB01W and HKWL-LED02W
Operation Frequency:	802.11b/g/n HT20: 2412MHz ~ 2462MHz
RF output power	Wifi: 15.77dBm
The Lowest Oscillator:	26MHz
Antenna installation:	Integrated Antenna
Antenna Gain:	0dBi
Type of modulation:	IEEE 802.11b (CCK/QPSK/BPSK,11Mbps max.) IEEE 802.11g (BPSK/QPSK/16QAM/64QAM,54Mbps max.) IEEE 802.11n (BPSK/QPSK/16QAM/64QAM,HT20:72Mbps max.)

5.2 Details of E.U.T

Ratings	Input:100-240V 50/60Hz
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5.3 Model Difference

	HKWL- LED02W	EAW2-1001- SWT	XLB7-1211- WHT	HKWL- RGB01W	EAC2-1001- RGB
LED components: D5, D6, D7, D8	X	X	X	√	√
Others	√	√	√	√	√
Remark: "√" represent that the components was contained in the models. Otherwise check "X"					

5.4 Channel List

WIFI

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	-

5.5 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
Power Spectral Density	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
Frequency Range	802.11b	11 Mbps	1/11	TX
	802.11g	54 Mbps	1/11	TX
	802.11n HT20	108 Mbps	1/11	TX
Transmitter Spurious Emissions	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	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.

6 Equipment Used during Test

6.1 Equipments 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	101155	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limitter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	LARGE	RF300	-	2017-09-12	2018-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP30	100091	2017-04-29	2018-04-28
2	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-04-09	2018-04-08
3	Broadband Preamplicifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2017-04-13	2018-04-12
5	Spectrum Analyzer	R&S	FSP40	100501	2017-10-20	2018-10-19
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2017-09-14	2018-09-13
7	Microwave Broadband Preamplicifier	SCHWARZBECK	BBV 9721	100472	2017-10-25	2018-10-24
8	Cable	Top	18GHz-40GHz	-	2017-10-25	2018-10-24
3m Semi-anechoic Chamber for Radiation Emissions Test site						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Ative Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-10-17	2018-10-16
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2017-04-08	2018-04-07
4	Amplifier	ANRITSU	MH648A	M43381	2017-04-13	2018-04-12
5	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12
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.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2017-09-14	2018-09-13

2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2017-09-12	2018-09-11
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2017-09-12	2018-09-11
4.	Coaxial Cable (10Hz-30GHz)	/	/	/	2017-09-12	2018-09-11
5.	Antenna Connector*	/	/	/	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.

6.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
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)

6.3 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.

7 Test Summary

Test Items	Test Requirement	Result
Spurious Radiated Emissions	15.247 15.205(a) 15.209(a)	C
Conducted Emissions	15.207(a)	C
Bandwidth	15.247(a)(2)	C
Maximum Peak Output Power	15.247(b)(3),(4)	C
Power Spectral Density	15.247(e)	C
Band Edge	15.247(d)	C
Antenna Requirement	15.203	C
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	C
Note: C=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

8 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:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

8.1 E.U.T. Operation

Operating Environment :

Temperature: 21.5 °C

Humidity: 51.9 % RH

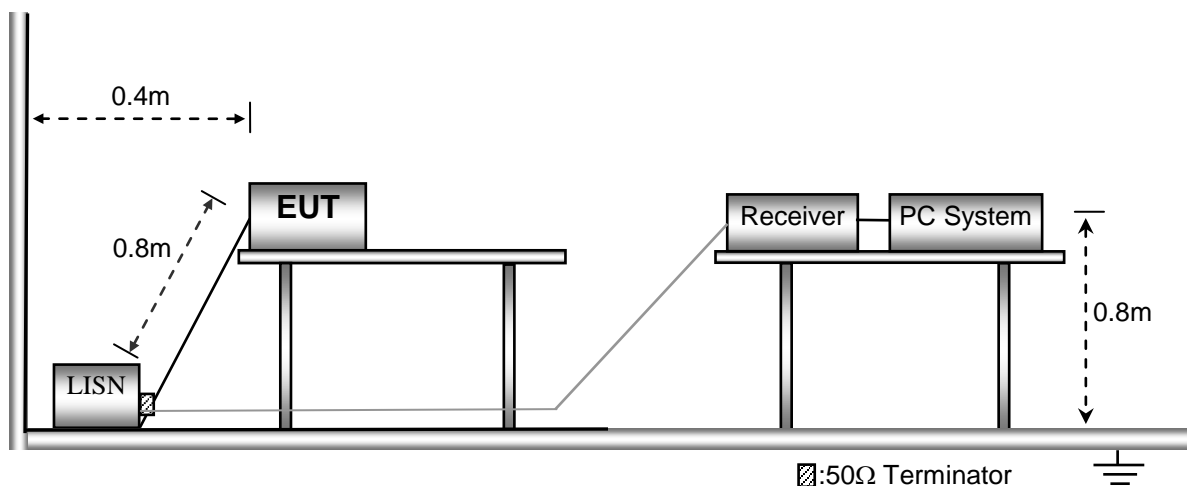
Atmospheric Pressure: 101.2kPa

EUT Operation : Transmitting mode

The test was performed in Transmitting mode(For WIFI), Only the worst case 802.11b mode were record in the report.

8.2 EUT Setup

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



8.3 Measurement Description

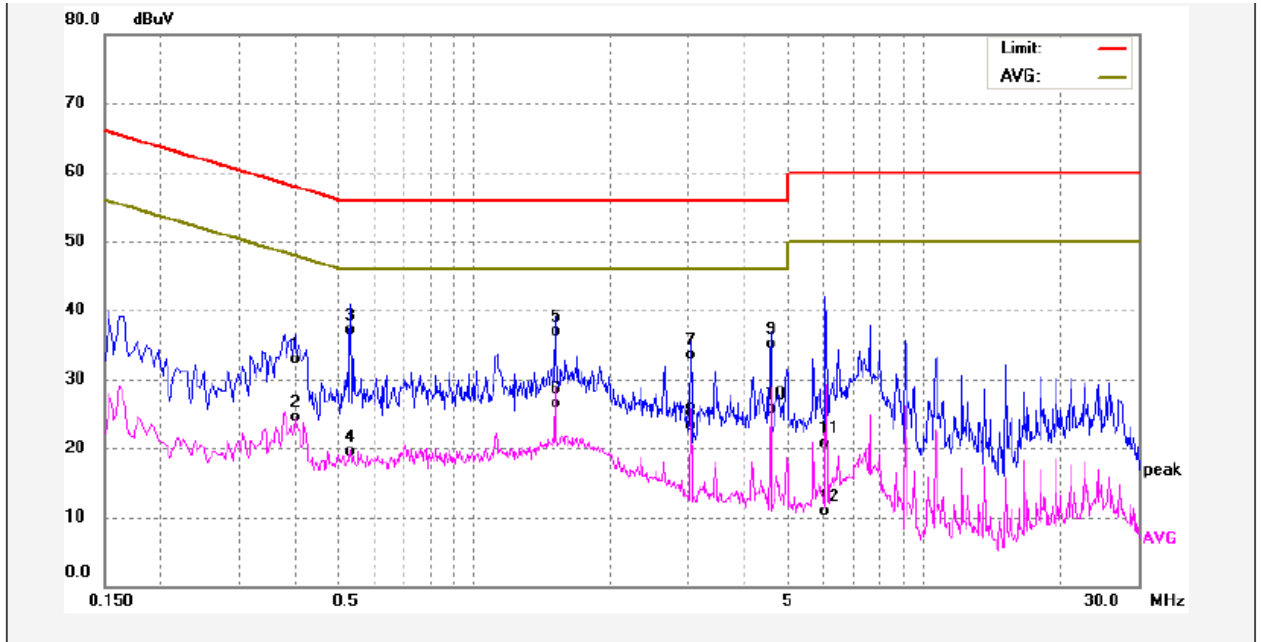
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

8.4 Conducted Emission Test Result

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

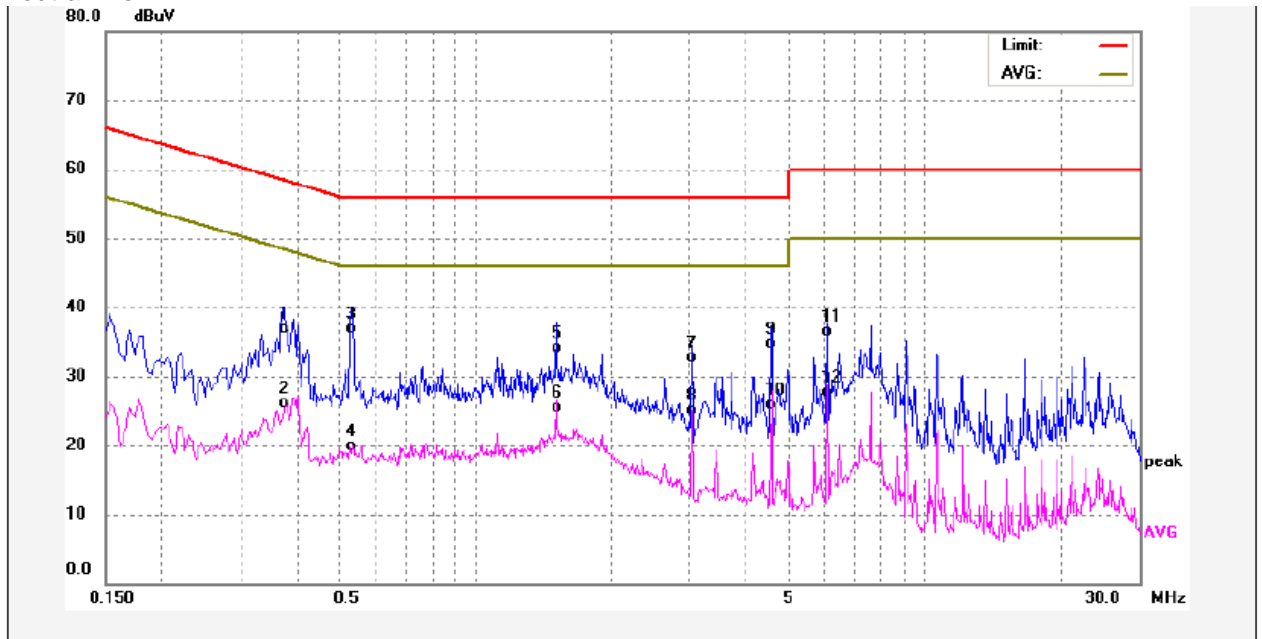
Model- HKWL-RGB01W

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3980	22.91	10.03	32.94	57.89	-24.95	QP	
2	0.3980	14.49	10.03	24.52	47.89	-23.37	AVG	
3	0.5299	27.00	10.07	37.07	56.00	-18.93	QP	
4	0.5299	9.51	10.07	19.58	46.00	-26.42	AVG	
5	1.5180	26.69	10.15	36.84	56.00	-19.16	QP	
6	1.5180	16.43	10.15	26.58	46.00	-19.42	AVG	
7	3.0380	23.32	10.24	33.56	56.00	-22.44	QP	
8	3.0380	13.02	10.24	23.26	46.00	-22.74	AVG	
9	4.5540	24.88	10.26	35.14	56.00	-20.86	QP	
10	4.5540	15.47	10.26	25.73	46.00	-20.27	AVG	
11	6.0300	10.43	10.27	20.70	60.00	-39.30	QP	
12	6.0300	0.66	10.27	10.93	50.00	-39.07	AVG	

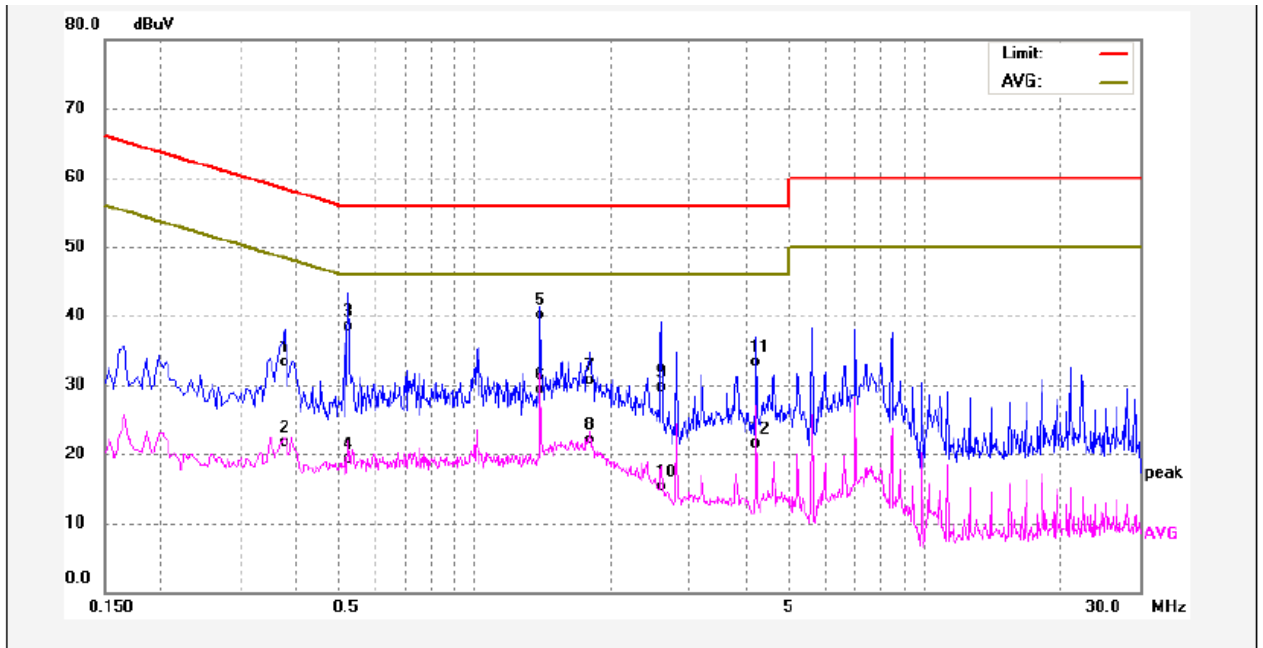
Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3740	26.79	10.05	36.84	58.41	-21.57	QP	
2	0.3740	16.09	10.05	26.14	48.41	-22.27	AVG	
3	0.5299	26.82	10.07	36.89	56.00	-19.11	QP	
4	0.5299	9.80	10.07	19.87	46.00	-26.13	AVG	
5	1.5140	23.88	10.15	34.03	56.00	-21.97	QP	
6	1.5140	15.29	10.15	25.44	46.00	-20.56	AVG	
7	3.0340	22.56	10.24	32.80	56.00	-23.20	QP	
8	3.0340	14.90	10.24	25.14	46.00	-20.86	AVG	
9	4.5460	24.38	10.26	34.64	56.00	-21.36	QP	
10	4.5460	15.68	10.26	25.94	46.00	-20.06	AVG	
11	6.0660	26.18	10.27	36.45	60.00	-23.55	QP	
12	6.0660	17.49	10.27	27.76	50.00	-22.24	AVG	

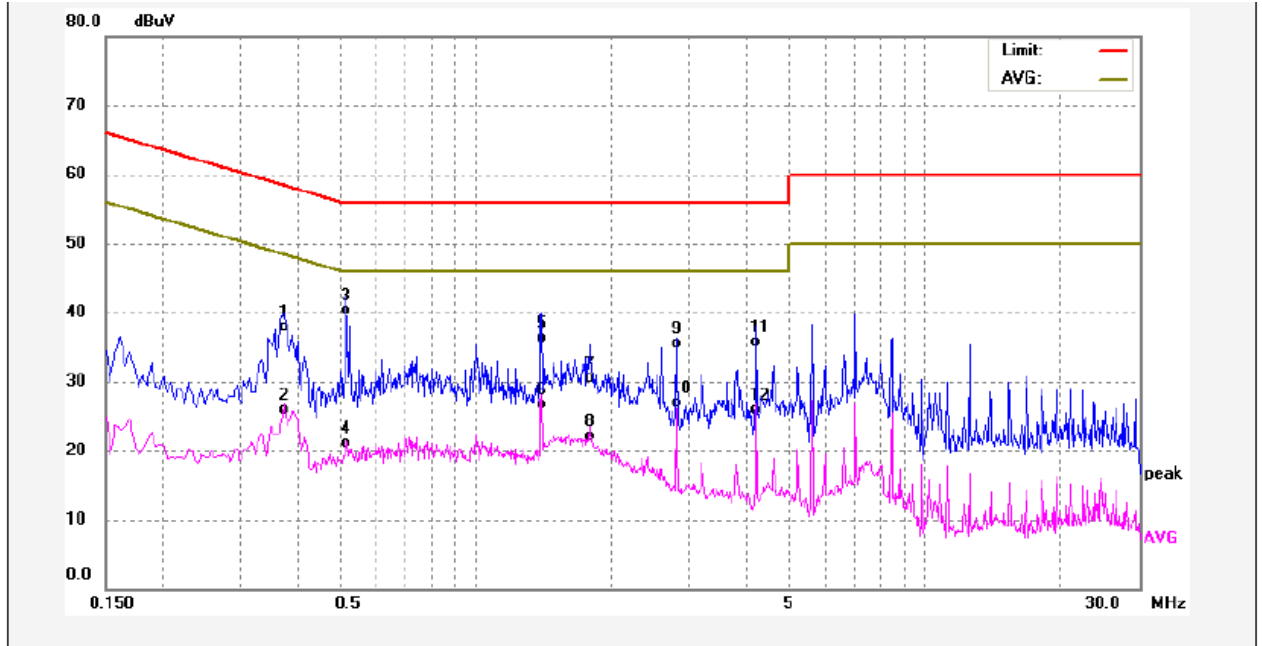
Model- HKWL-LED02W

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3780	23.31	10.04	33.35	58.32	-24.97	QP	
2	0.3780	11.58	10.04	21.62	48.32	-26.70	AVG	
3	0.5220	28.43	10.08	38.51	56.00	-17.49	QP	
4	0.5220	9.27	10.08	19.35	46.00	-26.65	AVG	
5	1.4020	29.82	10.23	40.05	56.00	-15.95	QP	
6	1.4020	19.03	10.23	29.26	46.00	-16.74	AVG	
7	1.8020	20.56	10.18	30.74	56.00	-25.26	QP	
8	1.8020	11.87	10.18	22.05	46.00	-23.95	AVG	
9	2.5980	19.41	10.23	29.64	56.00	-26.36	QP	
10	2.5980	5.16	10.23	15.39	46.00	-30.61	AVG	
11	4.2100	22.95	10.27	33.22	56.00	-22.78	QP	
12	4.2100	11.30	10.27	21.57	46.00	-24.43	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3740	27.91	10.05	37.96	58.41	-20.45	QP	
2	0.3740	15.79	10.05	25.84	48.41	-22.57	AVG	
3	0.5180	30.26	10.08	40.34	56.00	-15.66	QP	
4	0.5180	11.04	10.08	21.12	46.00	-24.88	AVG	
5	1.4060	26.01	10.23	36.24	56.00	-19.76	QP	
6	1.4060	16.53	10.23	26.76	46.00	-19.24	AVG	
7	1.7980	20.25	10.18	30.43	56.00	-25.57	QP	
8	1.7980	11.94	10.18	22.12	46.00	-23.88	AVG	
9	2.8060	25.30	10.24	35.54	56.00	-20.46	QP	
10	2.8060	16.74	10.24	26.98	46.00	-19.02	AVG	
11	4.2100	25.41	10.27	35.68	56.00	-20.32	QP	
12	4.2100	15.57	10.27	25.84	46.00	-20.16	AVG	

9 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)	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(\text{kHz}))} + 40$
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	$20\log^{(500)}$

9.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

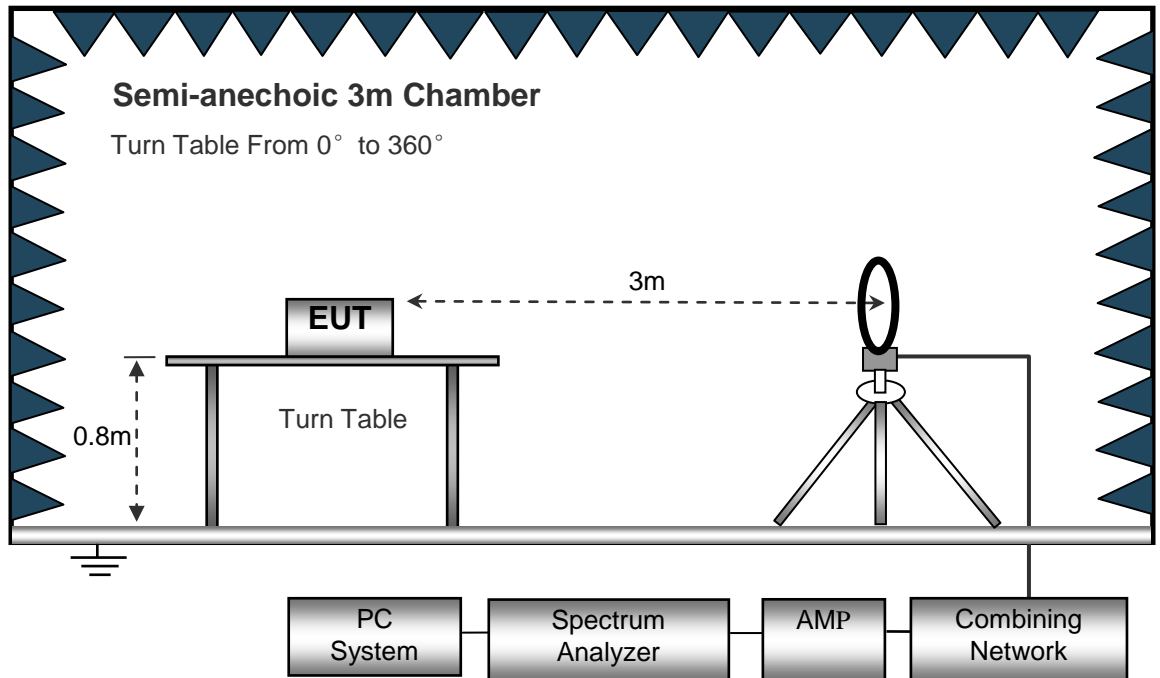
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

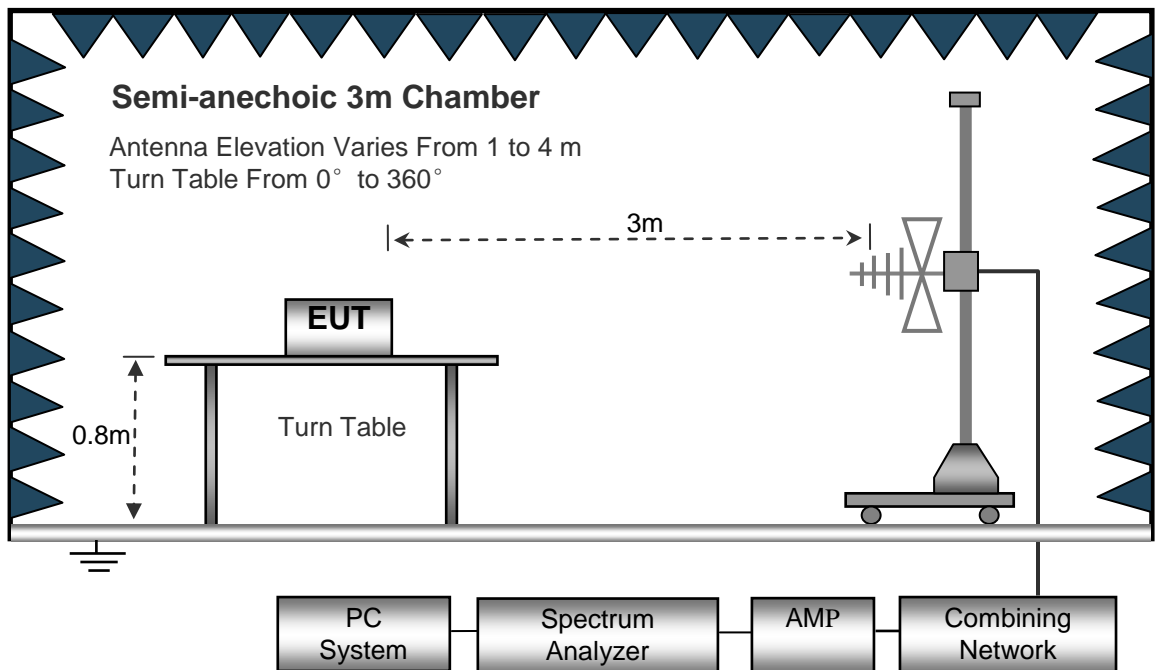
9.2 Test Setup

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

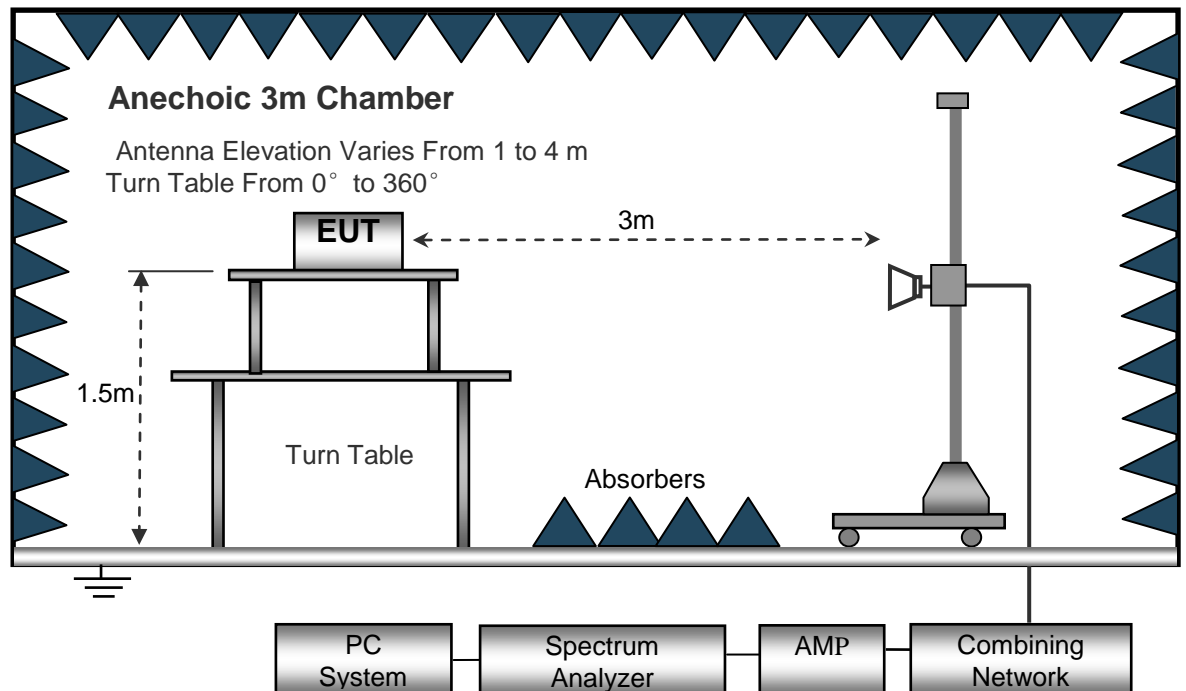
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



9.3 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

9.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane;
For above 1GHz, 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 during radiated emissions above 1GHz measurement.

9.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

9.6 Summary of Test Results

Model- HKWL-RGB01W:

Test Frequency: 26MHz ~ 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)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: Low Channel 2412MHz									
485.07	13.11	PK	356	1.4	H	21.09	34.20	45.00	-10.80
485.07	12.22	PK	326	1.6	V	21.09	33.31	45.00	-11.69
4824.00	50.91	PK	53	1.1	V	-1.05	49.86	74.00	-24.14
4824.00	41.94	Ave	53	1.1	V	-1.05	40.89	54.00	-13.11
7236.00	45.84	PK	77	1.6	H	1.34	47.18	74.00	-26.82
7236.00	39.69	Ave	77	1.6	H	1.34	41.03	54.00	-12.97
2333.18	46.86	PK	275	1.2	V	-13.19	33.67	74.00	-40.33
2333.18	37.22	Ave	275	1.2	V	-13.19	24.03	54.00	-29.97
2373.44	43.20	PK	247	1.2	H	-13.15	30.05	74.00	-43.95
2373.44	37.09	Ave	247	1.2	H	-13.15	23.94	54.00	-30.06
2489.95	42.05	PK	166	1.7	V	-13.08	28.97	74.00	-45.03
2489.95	37.76	Ave	166	1.7	V	-13.08	24.68	54.00	-29.32

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: Middle Channel 2437MHz									
485.07	12.50	PK	83	1.1	H	21.09	33.59	45.00	-11.41
485.07	15.35	PK	117	1.2	V	21.09	36.44	45.00	-8.56
4874.00	50.64	PK	177	1.8	V	-0.63	50.01	74.00	-23.99
4874.00	43.12	Ave	177	1.8	V	-0.63	42.49	54.00	-11.51
7311.00	43.69	PK	14	2.0	H	2.21	45.90	74.00	-28.10
7311.00	42.40	Ave	14	2.0	H	2.21	44.61	54.00	-9.39
2321.72	46.70	PK	43	1.5	V	-13.19	33.51	74.00	-40.49
2321.72	37.86	Ave	43	1.5	V	-13.19	24.67	54.00	-29.33
2368.09	42.36	PK	234	1.0	H	-13.14	29.22	74.00	-44.78
2368.09	36.23	Ave	234	1.0	H	-13.14	23.09	54.00	-30.91
2483.57	43.83	PK	23	1.4	V	-13.08	30.75	74.00	-43.25
2483.57	37.51	Ave	23	1.4	V	-13.08	24.43	54.00	-29.57

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: High Channel 2462MHz									
485.07	11.50	PK	162	1.6	H	21.09	32.59	45.00	-12.41
485.07	14.11	PK	174	1.4	V	21.09	35.20	45.00	-9.80
4924.00	48.01	PK	120	1.4	V	-0.25	47.76	74.00	-26.24
4924.00	43.40	Ave	120	1.4	V	-0.25	43.15	54.00	-10.85
7386.00	43.97	PK	231	1.7	H	2.85	46.82	74.00	-27.18
7386.00	43.41	Ave	231	1.7	H	2.85	46.26	54.00	-7.74
2330.18	46.55	PK	72	1.0	V	-13.19	33.36	74.00	-40.64
2330.18	38.44	Ave	72	1.0	V	-13.19	25.25	54.00	-28.75
2389.92	43.43	PK	188	1.8	H	-13.14	30.29	74.00	-43.71
2389.92	37.05	Ave	188	1.8	H	-13.14	23.91	54.00	-30.09
2487.12	44.87	PK	223	1.3	V	-13.08	31.79	74.00	-42.21
2487.12	38.18	Ave	223	1.3	V	-13.08	25.10	54.00	-28.90

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: Low Channel 2412MHz									
485.07	14.03	PK	149	1.8	H	21.09	35.12	45.00	-9.88
485.07	14.40	PK	189	1.6	V	21.09	35.49	45.00	-9.51
4824.00	12.33	PK	346	1.5	V	-1.06	11.27	74.00	-62.73
4824.00	52.39	Ave	346	1.5	V	-1.06	51.33	54.00	-2.67
7236.00	48.97	PK	313	1.0	H	1.35	50.32	74.00	-23.68
7236.00	47.52	Ave	313	1.0	H	1.35	48.87	54.00	-5.13
2318.11	45.98	PK	352	1.7	V	-13.19	32.79	74.00	-41.21
2318.11	37.36	Ave	352	1.7	V	-13.19	24.17	54.00	-29.83
2386.24	43.61	PK	163	1.2	H	-13.14	30.47	74.00	-43.53
2386.24	37.80	Ave	163	1.2	H	-13.14	24.66	54.00	-29.34
2490.18	42.45	PK	301	1.0	V	-13.08	29.37	74.00	-44.63
2490.18	37.62	Ave	301	1.0	V	-13.08	24.54	54.00	-29.46

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: Middle Channel 2437MHz									
485.07	13.11	PK	287	1.1	H	21.09	34.20	45.00	-10.80
485.07	14.70	PK	1	1.0	V	21.09	35.79	45.00	-9.21
4874.00	51.45	PK	46	1.5	V	-0.62	50.83	74.00	-23.17
4874.00	49.12	Ave	46	1.5	V	-0.62	48.50	54.00	-5.50
7311.00	48.62	PK	60	1.5	H	2.20	50.82	74.00	-23.18
7311.00	47.20	Ave	60	1.5	H	2.20	49.40	54.00	-4.60
2314.33	46.82	PK	106	1.5	V	-13.19	33.63	74.00	-40.37
2314.33	37.88	Ave	106	1.5	V	-13.19	24.69	54.00	-29.31
2385.38	42.70	PK	82	1.8	H	-13.15	29.55	74.00	-44.45
2385.38	37.40	Ave	82	1.8	H	-13.15	24.25	54.00	-29.75
2499.56	44.05	PK	7	1.8	V	-13.08	30.97	74.00	-43.03
2499.56	37.03	Ave	7	1.8	V	-13.08	23.95	54.00	-30.05

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: High Channel 2462MHz									
485.07	14.35	PK	99	1.6	H	21.09	35.44	45.00	-9.56
485.07	17.28	PK	31	1.5	V	21.09	38.37	45.00	-6.63
4924.00	51.19	PK	215	1.6	V	-0.25	50.94	74.00	-23.06
4924.00	44.24	Ave	215	1.6	V	-0.25	43.99	54.00	-10.01
7386.00	43.75	PK	42	1.8	H	2.86	46.61	74.00	-27.39
7386.00	41.08	Ave	42	1.8	H	2.86	43.94	54.00	-10.06
2327.31	45.67	PK	158	1.0	V	-13.19	32.48	74.00	-41.52
2327.31	39.71	Ave	158	1.0	V	-13.19	26.52	54.00	-27.48
2360.69	42.56	PK	359	1.9	H	-13.14	29.42	74.00	-44.58
2360.69	38.40	Ave	359	1.9	H	-13.14	25.26	54.00	-28.74
2490.30	43.06	PK	211	1.2	V	-13.08	29.98	74.00	-44.02
2490.30	37.26	Ave	211	1.2	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)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: Low Channel 2412MHz									
485.07	17.30	PK	101	1.6	H	21.09	38.39	45.00	-6.61
485.07	13.44	PK	149	1.6	V	21.09	34.53	45.00	-10.47
4824.00	52.36	PK	59	1.0	V	-1.06	51.30	74.00	-22.70
4824.00	49.64	Ave	59	1.0	V	-1.06	48.58	54.00	-5.42
7236.00	47.58	PK	133	1.8	H	1.34	48.92	74.00	-25.08
7236.00	45.71	Ave	133	1.8	H	1.34	47.05	54.00	-6.95
2344.39	45.61	PK	351	1.3	V	-13.19	32.42	74.00	-41.58
2344.39	38.43	Ave	351	1.3	V	-13.19	25.24	54.00	-28.76
2378.80	42.63	PK	218	2.0	H	-13.14	29.49	74.00	-44.51
2378.80	38.75	Ave	218	2.0	H	-13.14	25.61	54.00	-28.39
2498.45	44.32	PK	222	1.3	V	-13.08	31.24	74.00	-42.76
2498.45	36.00	Ave	222	1.3	V	-13.08	22.92	54.00	-31.08

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: Middle Channel 2437MHz									
485.07	13.50	PK	212	1.1	H	21.09	34.59	45.00	-10.41
485.07	13.55	PK	330	1.3	V	21.09	34.64	45.00	-10.36
4874.00	48.28	PK	11	1.1	V	-0.61	47.67	74.00	-26.33
4874.00	47.87	Ave	11	1.1	V	-0.61	47.26	54.00	-6.74
7311.00	45.46	PK	63	1.2	H	2.21	47.67	74.00	-26.33
7311.00	42.80	Ave	63	1.2	H	2.21	45.01	54.00	-8.99
2321.67	46.61	PK	35	1.4	V	-13.19	33.42	74.00	-40.58
2321.67	38.75	Ave	35	1.4	V	-13.19	25.56	54.00	-28.44
2365.72	42.13	PK	334	1.2	H	-13.14	28.99	74.00	-45.01
2365.72	38.43	Ave	334	1.2	H	-13.14	25.29	54.00	-28.71
2488.07	43.43	PK	301	1.4	V	-13.08	30.35	74.00	-43.65
2488.07	36.81	Ave	301	1.4	V	-13.08	23.75	54.00	-30.27

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: High Channel 2462MHz									
485.07	13.48	PK	299	1.9	H	21.09	34.57	45.00	-10.43
485.07	14.19	PK	160	1.8	V	21.09	35.28	45.00	-9.72
4924.00	52.19	PK	68	1.0	V	-0.24	51.95	74.00	-22.05
4924.00	49.19	Ave	68	1.0	V	-0.24	48.95	54.00	-5.05
7386.00	48.44	PK	359	1.6	H	2.83	51.27	74.00	-22.73
7386.00	45.20	Ave	359	1.6	H	2.83	48.03	54.00	-5.97
2367.89	45.13	PK	169	1.3	V	-13.19	31.94	74.00	-42.06
2367.89	39.92	Ave	169	1.3	V	-13.19	26.73	54.00	-27.27
2380.23	44.94	PK	109	1.6	H	-13.14	31.80	74.00	-42.20
2380.23	36.37	Ave	109	1.6	H	-13.14	23.23	54.00	-30.77
2493.22	42.16	PK	326	1.7	V	-13.08	29.08	74.00	-44.92
2493.22	37.24	Ave	326	1.7	V	-13.08	24.16	54.00	-29.84

Test Frequency: 18GHz~25GHz

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

Model-HKWL-LED02W:**Test Frequency: 26MHz ~ 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)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: Low Channel 2412MHz									
485.07	12.10	PK	316	1.2	H	21.09	33.19	45.00	-11.81
485.07	13.18	PK	223	1.6	V	21.09	34.27	45.00	-10.73
4824.00	50.94	PK	171	1.5	V	-1.05	49.89	74.00	-24.11
4824.00	41.90	Ave	171	1.5	V	-1.05	40.85	54.00	-13.15
7236.00	44.77	PK	204	2.0	H	1.34	46.11	74.00	-27.89
7236.00	39.47	Ave	204	2.0	H	1.34	40.81	54.00	-13.19
2333.18	46.11	PK	142	1.7	V	-13.19	32.92	74.00	-41.08
2333.18	39.23	Ave	142	1.7	V	-13.19	26.04	54.00	-27.96
2372.71	43.31	PK	194	1.2	H	-13.15	30.16	74.00	-43.84
2372.71	38.85	Ave	194	1.2	H	-13.15	25.70	54.00	-28.30
2489.89	44.92	PK	155	1.8	V	-13.08	31.84	74.00	-42.16
2489.89	38.76	Ave	155	1.8	V	-13.08	25.68	54.00	-28.32

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: Middle Channel 2437MHz									
485.07	11.40	PK	198	1.7	H	21.09	32.49	45.00	-12.51
485.07	15.44	PK	238	1.6	V	21.09	36.53	45.00	-8.47
4874.00	49.42	PK	49	1.2	V	-0.63	48.79	74.00	-25.21
4874.00	42.44	Ave	49	1.2	V	-0.63	41.81	54.00	-12.19
7311.00	45.06	PK	166	1.3	H	2.21	47.27	74.00	-26.73
7311.00	43.64	Ave	166	1.3	H	2.21	45.85	54.00	-8.15
2321.72	45.85	PK	120	1.4	V	-13.19	32.66	74.00	-41.34
2321.72	39.37	Ave	120	1.4	V	-13.19	26.18	54.00	-27.82
2371.59	43.15	PK	106	1.1	H	-13.14	30.01	74.00	-43.99
2371.59	37.03	Ave	106	1.1	H	-13.14	23.89	54.00	-30.11
2494.78	44.88	PK	40	1.7	V	-13.08	31.80	74.00	-42.20
2494.78	37.40	Ave	40	1.7	V	-13.08	24.32	54.00	-29.68

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: High Channel 2462MHz									
485.07	11.87	PK	267	1.4	H	21.09	32.96	45.00	-12.04
485.07	14.22	PK	81	1.2	V	21.09	35.31	45.00	-9.69
4924.00	50.84	PK	79	1.8	V	-0.25	50.59	74.00	-23.41
4924.00	41.28	Ave	79	1.8	V	-0.25	41.03	54.00	-12.97
7386.00	44.45	PK	111	1.9	H	2.85	47.30	74.00	-26.70
7386.00	44.29	Ave	111	1.9	H	2.85	47.14	54.00	-6.86
2330.18	46.37	PK	82	1.2	V	-13.19	33.18	74.00	-40.82
2330.18	39.64	Ave	82	1.2	V	-13.19	26.45	54.00	-27.55
2372.87	44.69	PK	334	1.5	H	-13.14	31.55	74.00	-42.45
2372.87	38.44	Ave	334	1.5	H	-13.14	25.30	54.00	-28.70
2490.30	42.26	PK	125	1.0	V	-13.08	29.18	74.00	-44.82
2490.30	37.91	Ave	125	1.0	V	-13.08	24.83	54.00	-29.17

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: Low Channel 2412MHz									
485.07	12.82	PK	54	1.7	H	21.09	33.91	45.00	-11.09
485.07	14.53	PK	17	1.9	V	21.09	35.62	45.00	-9.38
4824.00	11.14	PK	182	1.8	V	-1.06	10.08	74.00	-63.92
4824.00	51.99	Ave	182	1.8	V	-1.06	50.93	54.00	-3.07
7236.00	48.80	PK	217	1.1	H	1.35	50.15	74.00	-23.85
7236.00	47.26	Ave	217	1.1	H	1.35	48.61	54.00	-5.39
2318.11	46.73	PK	148	1.7	V	-13.19	33.54	74.00	-40.46
2318.11	38.87	Ave	148	1.7	V	-13.19	25.68	54.00	-28.32
2385.21	44.40	PK	210	2.0	H	-13.14	31.26	74.00	-42.74
2385.21	36.40	Ave	210	2.0	H	-13.14	23.26	54.00	-30.74
2490.17	42.36	PK	199	1.6	V	-13.08	29.28	74.00	-44.72
2490.17	36.43	Ave	199	1.6	V	-13.08	23.35	54.00	-30.65

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: Middle Channel 2437MHz									
485.07	12.30	PK	92	1.0	H	21.09	33.39	45.00	-11.61
485.07	13.48	PK	240	1.8	V	21.09	34.57	45.00	-10.43
4874.00	51.81	PK	125	1.6	V	-0.62	51.19	74.00	-22.81
4874.00	49.82	Ave	125	1.6	V	-0.62	49.20	54.00	-4.80
7311.00	48.36	PK	41	2.0	H	2.20	50.56	74.00	-23.44
7311.00	48.29	Ave	41	2.0	H	2.20	50.49	54.00	-3.51
2314.33	46.37	PK	56	1.4	V	-13.19	33.18	74.00	-40.82
2314.33	37.03	Ave	56	1.4	V	-13.19	23.84	54.00	-30.16
2386.48	42.71	PK	88	1.6	H	-13.15	29.56	74.00	-44.44
2386.48	37.33	Ave	88	1.6	H	-13.15	24.18	54.00	-29.82
2497.36	43.02	PK	23	2.0	V	-13.08	29.94	74.00	-44.06
2497.36	38.02	Ave	23	2.0	V	-13.08	24.94	54.00	-29.06

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11g: High Channel 2462MHz									
485.07	12.87	PK	305	1.7	H	21.09	33.96	45.00	-11.04
485.07	18.64	PK	287	1.5	V	21.09	39.73	45.00	-5.27
4924.00	51.59	PK	61	1.1	V	-0.25	51.34	74.00	-22.66
4924.00	44.72	Ave	61	1.1	V	-0.25	44.47	54.00	-9.53
7386.00	44.19	PK	163	1.1	H	2.86	47.05	74.00	-26.95
7386.00	42.21	Ave	163	1.1	H	2.86	45.07	54.00	-8.93
2327.31	46.23	PK	85	1.8	V	-13.19	33.04	74.00	-40.96
2327.31	38.86	Ave	85	1.8	V	-13.19	25.67	54.00	-28.33
2388.64	42.66	PK	349	1.9	H	-13.14	29.52	74.00	-44.48
2388.64	38.68	Ave	349	1.9	H	-13.14	25.54	54.00	-28.46
2490.27	42.42	PK	354	1.8	V	-13.08	29.34	74.00	-44.66
2490.27	37.04	Ave	354	1.8	V	-13.08	23.96	54.00	-30.04

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: Low Channel 2412MHz									
485.07	16.20	PK	229	1.7	H	21.09	37.29	45.00	-7.71
485.07	12.55	PK	130	1.8	V	21.09	33.64	45.00	-11.36
4824.00	53.65	PK	122	1.6	V	-1.06	52.59	74.00	-21.41
4824.00	50.12	Ave	122	1.6	V	-1.06	49.06	54.00	-4.94
7236.00	47.01	PK	163	1.2	H	1.34	48.35	74.00	-25.65
7236.00	46.71	Ave	163	1.2	H	1.34	48.05	54.00	-5.95
2344.39	46.91	PK	61	1.8	V	-13.19	33.72	74.00	-40.28
2344.39	39.39	Ave	61	1.8	V	-13.19	26.20	54.00	-27.80
2379.53	42.26	PK	232	1.8	H	-13.14	29.12	74.00	-44.88
2379.53	37.72	Ave	232	1.8	H	-13.14	24.58	54.00	-29.42
2496.31	44.66	PK	188	1.8	V	-13.08	31.58	74.00	-42.42
2496.31	37.53	Ave	188	1.8	V	-13.08	24.45	54.00	-29.55

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: Middle Channel 2437MHz									
485.07	14.40	PK	0	1.1	H	21.09	35.49	45.00	-9.51
485.07	13.86	PK	86	1.9	V	21.09	34.95	45.00	-10.05
4874.00	48.89	PK	49	2.0	V	-0.61	48.28	74.00	-25.72
4874.00	46.54	Ave	49	2.0	V	-0.61	45.93	54.00	-8.07
7311.00	44.64	PK	193	1.1	H	2.21	46.85	74.00	-27.15
7311.00	43.30	Ave	193	1.1	H	2.21	45.51	54.00	-8.49
2321.67	46.55	PK	348	1.1	V	-13.19	33.36	74.00	-40.64
2321.67	39.07	Ave	348	1.1	V	-13.19	25.88	54.00	-28.12
2382.24	43.22	PK	107	1.9	H	-13.14	30.08	74.00	-43.92
2382.24	37.75	Ave	107	1.9	H	-13.14	24.61	54.00	-29.39
2489.03	42.10	PK	357	1.3	V	-13.08	29.02	74.00	-44.98
2489.03	36.72	Ave	357	1.3	V	-13.08	23.64	54.00	-30.36

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
n20: High Channel 2462MHz									
485.07	13.67	PK	315	1.6	H	21.09	34.76	45.00	-10.24
485.07	14.30	PK	159	1.0	V	21.09	35.39	45.00	-9.61
4924.00	51.31	PK	120	1.0	V	-0.24	51.07	74.00	-22.93
4924.00	48.37	Ave	120	1.0	V	-0.24	48.13	54.00	-5.87
7386.00	47.50	PK	139	1.3	H	2.83	50.33	74.00	-23.67
7386.00	43.85	Ave	139	1.3	H	2.83	46.68	54.00	-7.32
2367.89	45.30	PK	205	1.7	V	-13.19	32.11	74.00	-41.89
2367.89	37.54	Ave	205	1.7	V	-13.19	24.35	54.00	-29.65
2381.45	42.83	PK	328	1.3	H	-13.14	29.69	74.00	-44.31
2381.45	38.99	Ave	328	1.3	H	-13.14	25.85	54.00	-28.15
2494.17	42.49	PK	114	2.0	V	-13.08	29.41	74.00	-44.59
2494.17	38.92	Ave	114	2.0	V	-13.08	25.84	54.00	-28.16

Test Frequency: 18GHz~25GHz

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

10 Band Edge Measurement

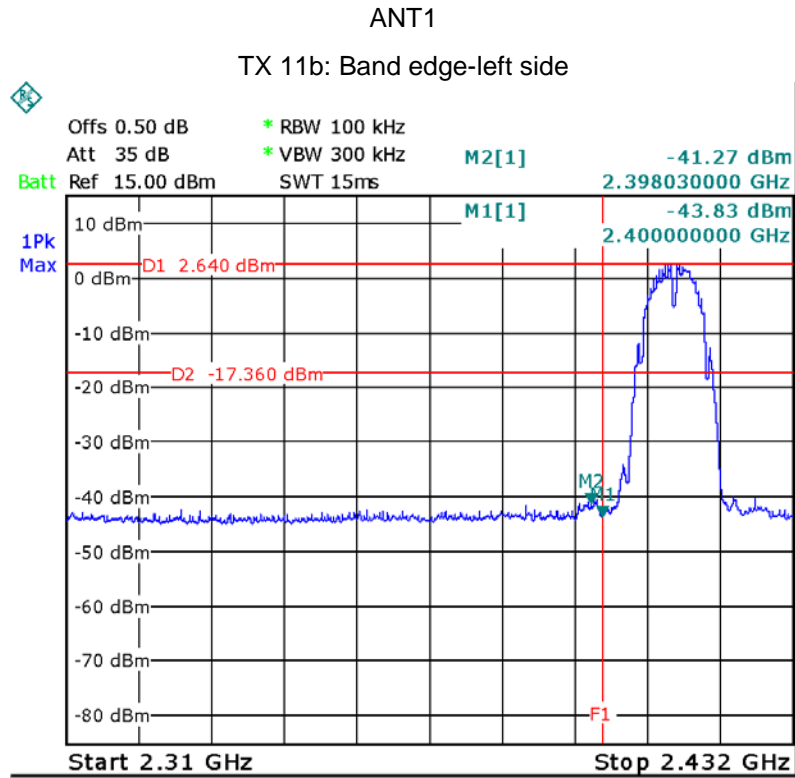
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 DTS Meas Guidance V04
Test Limit:	Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that 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

10.1 Test Produce

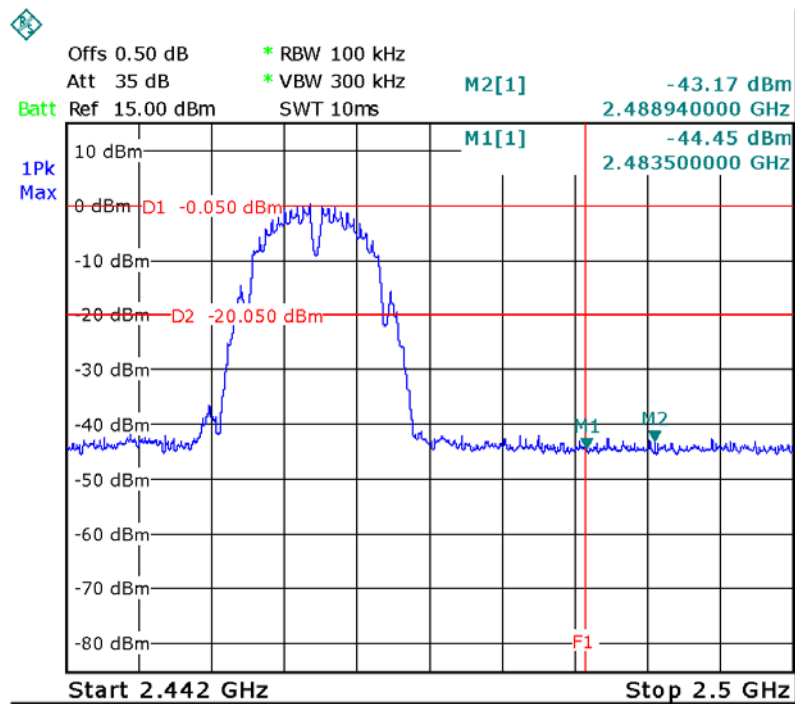
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then 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.

10.2 Test Result

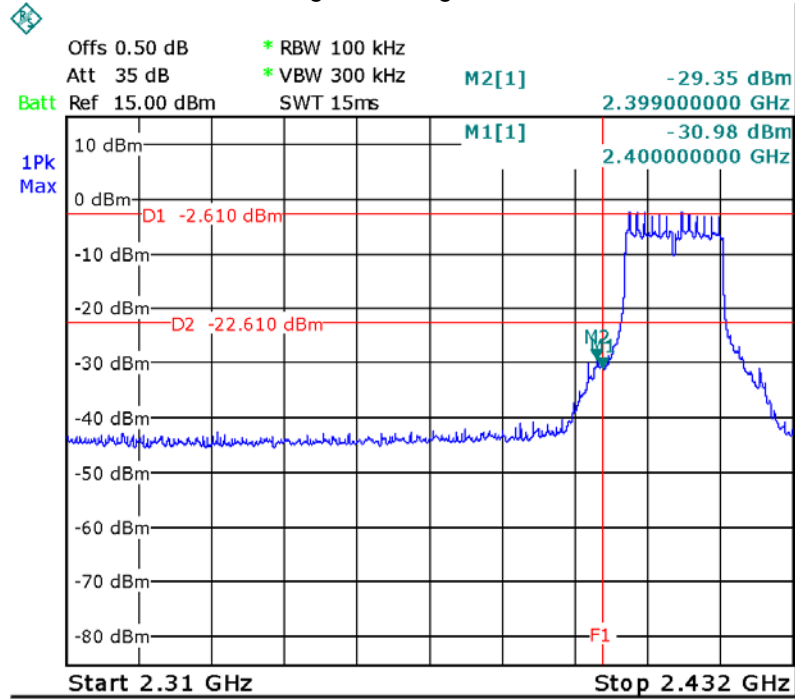
Test result plots shown as follows:



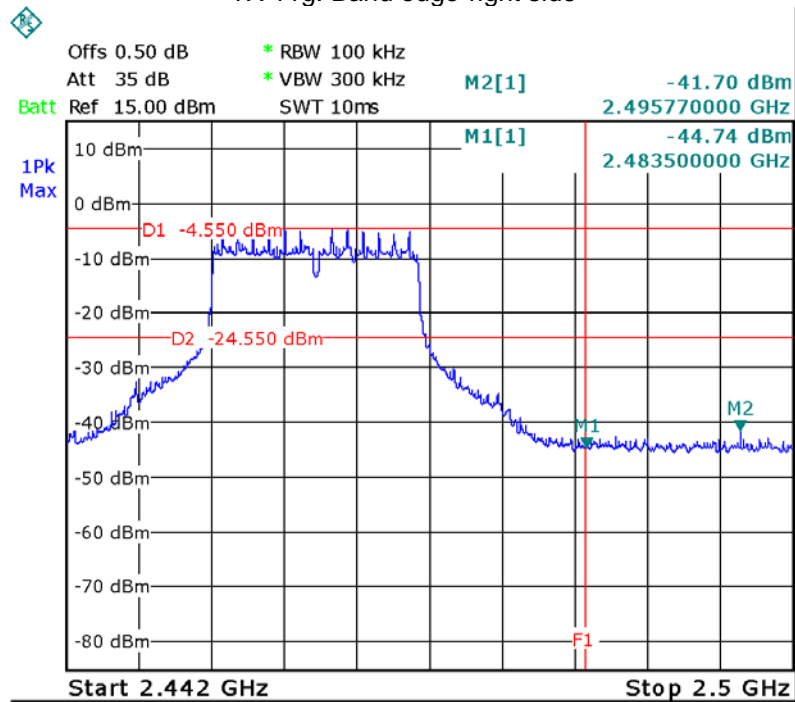
TX 11b: Band edge-right side



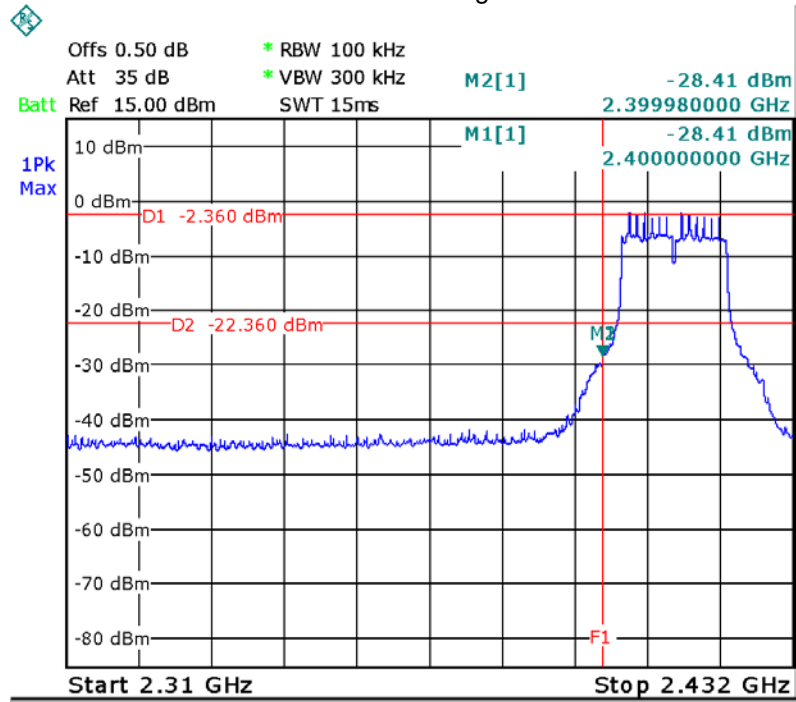
TX 11g: Band edge-left side



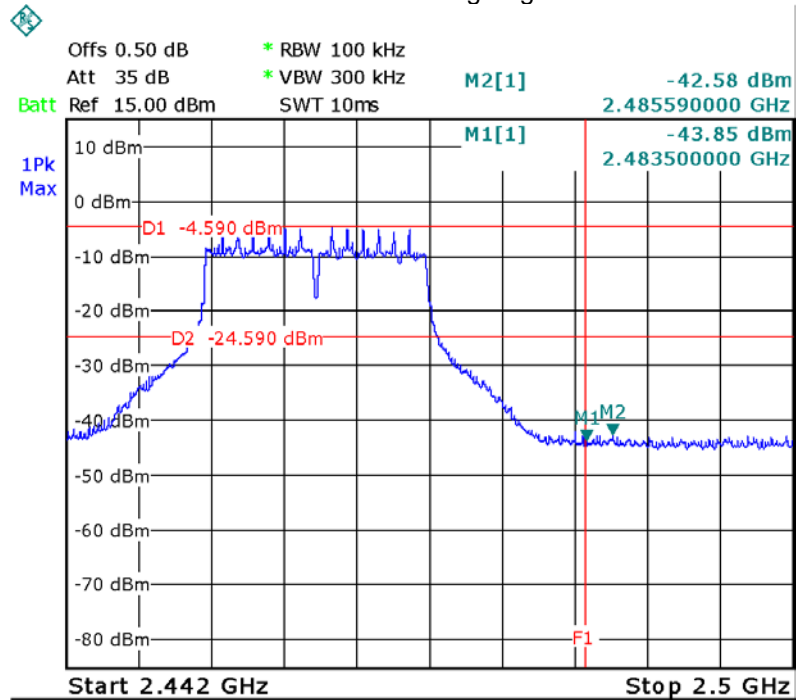
TX 11g: Band edge-right side



TX 11n HT20: Band edge-left side



TX 11n HT20: Band edge-right side



11 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

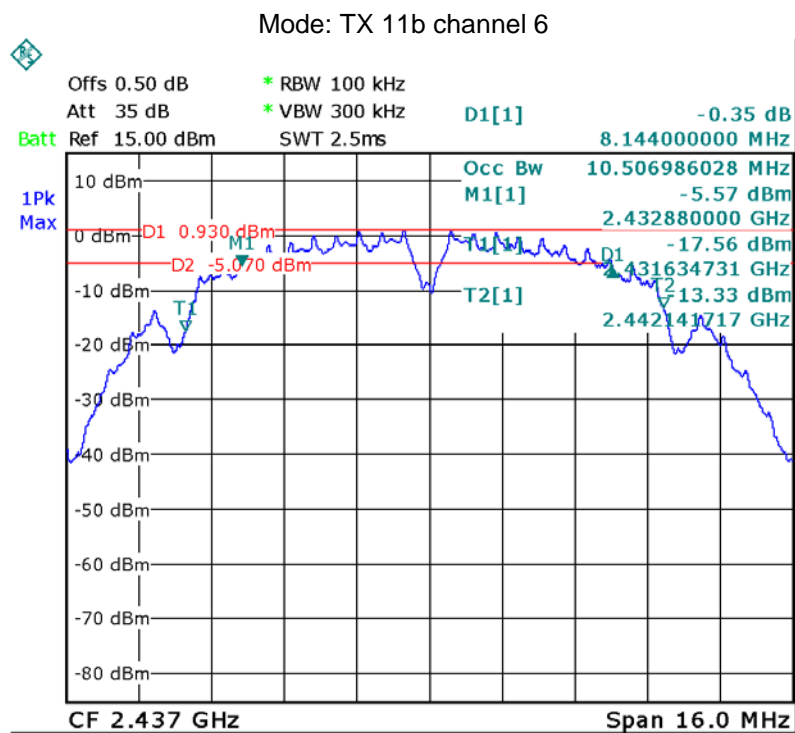
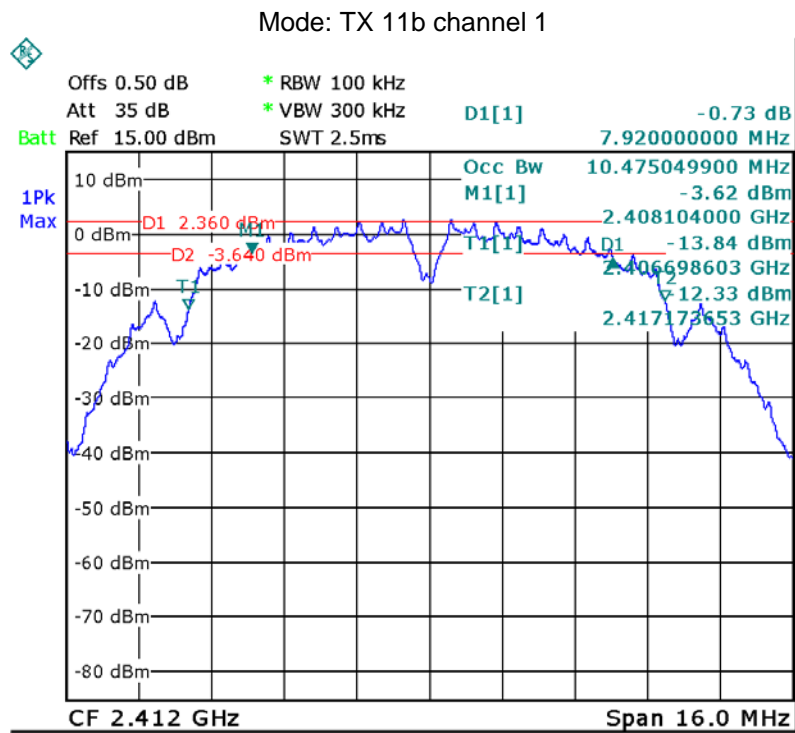
Test Method: 558074 D01 DTS Meas Guidance V04

11.1 Test Procedure:

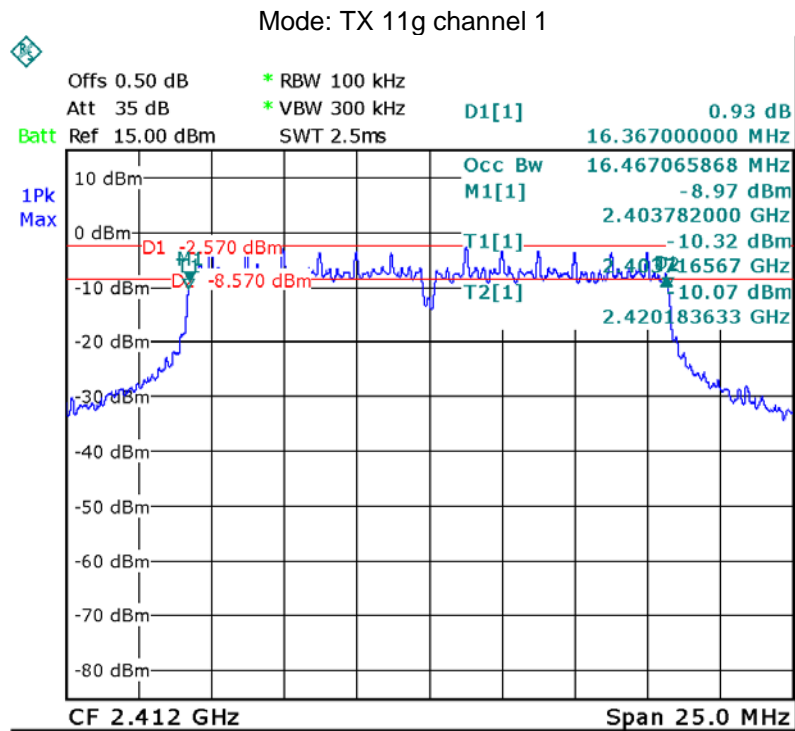
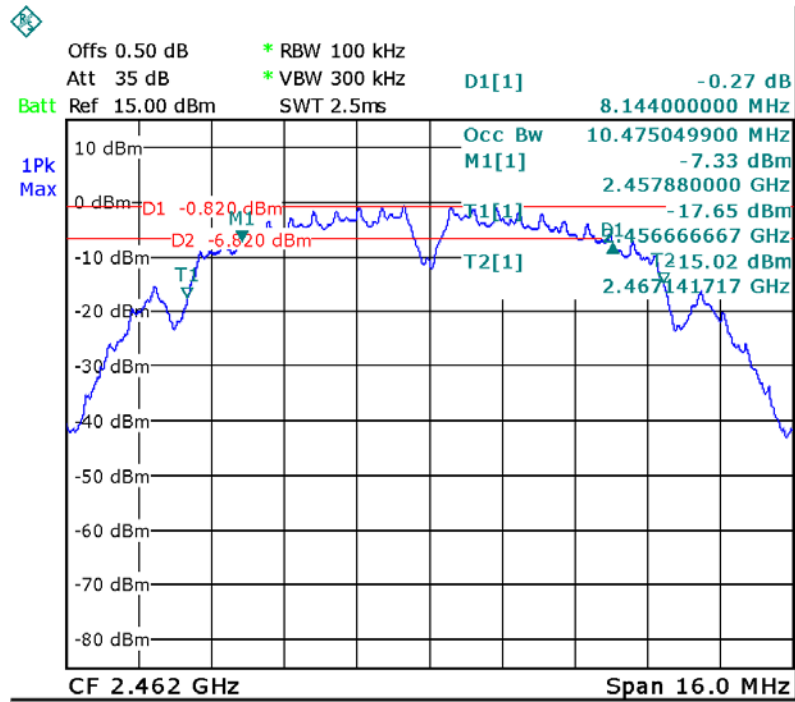
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

11.2 Test Result:

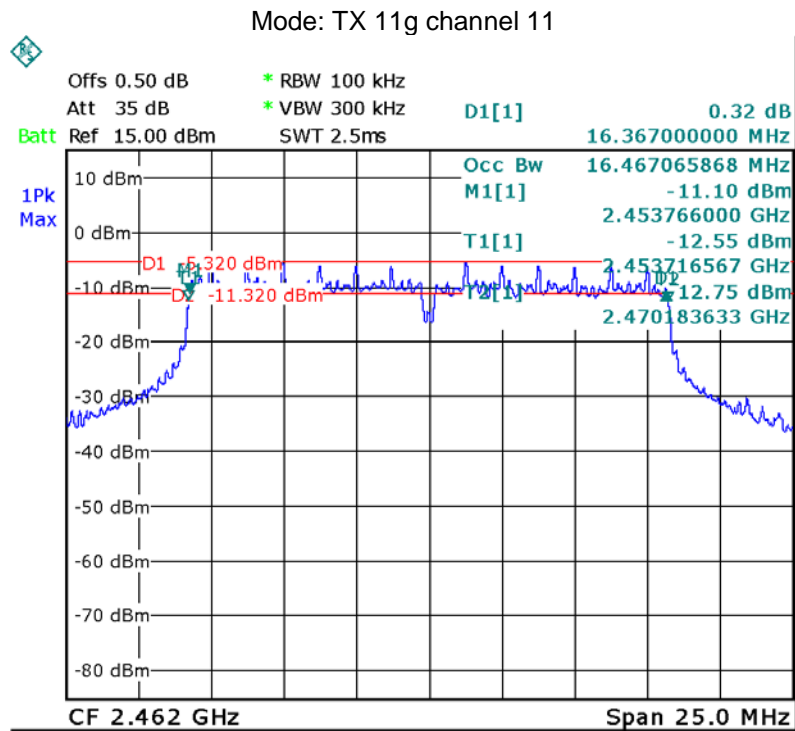
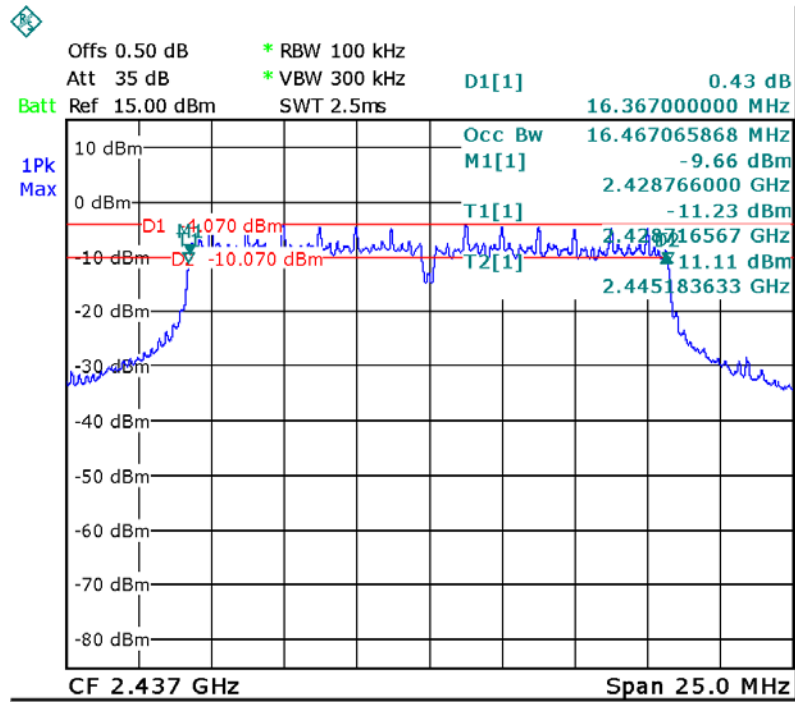
Operation mode	6dB Bandwidth (MHz)			99% Bandwidth (MHz)		
	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	7.92	8.144	8.144	10.475	10.507	10.475
TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	16.367	16.367	16.367	16.467	16.467	16.467
TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	15.729	15.737	16.006	17.245	17.245	17.246

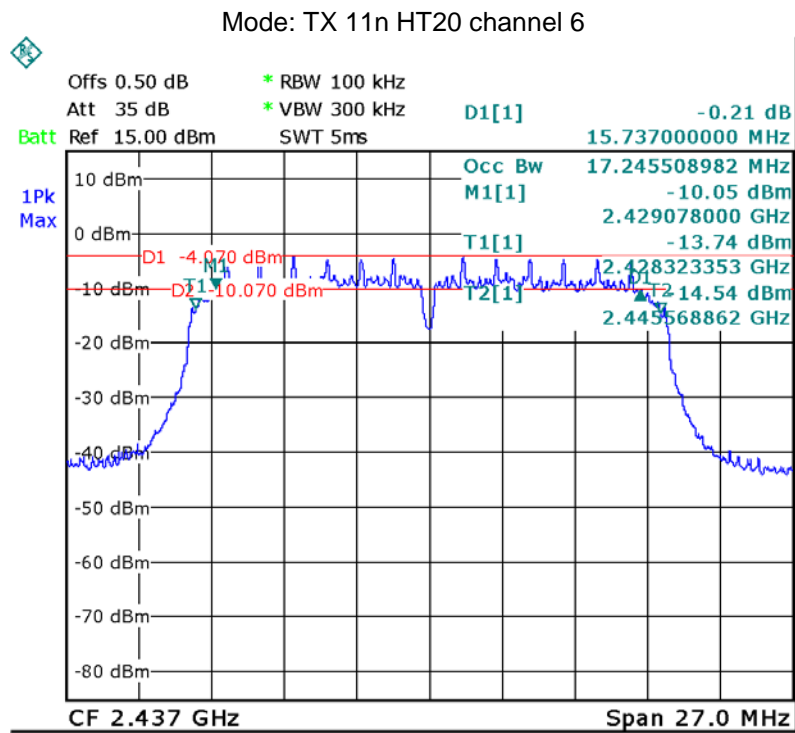
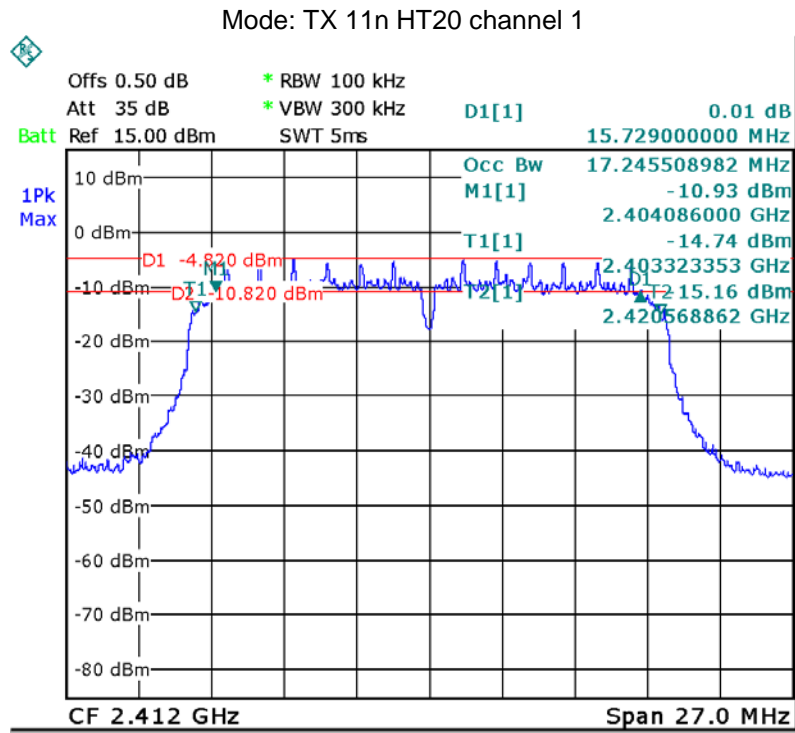


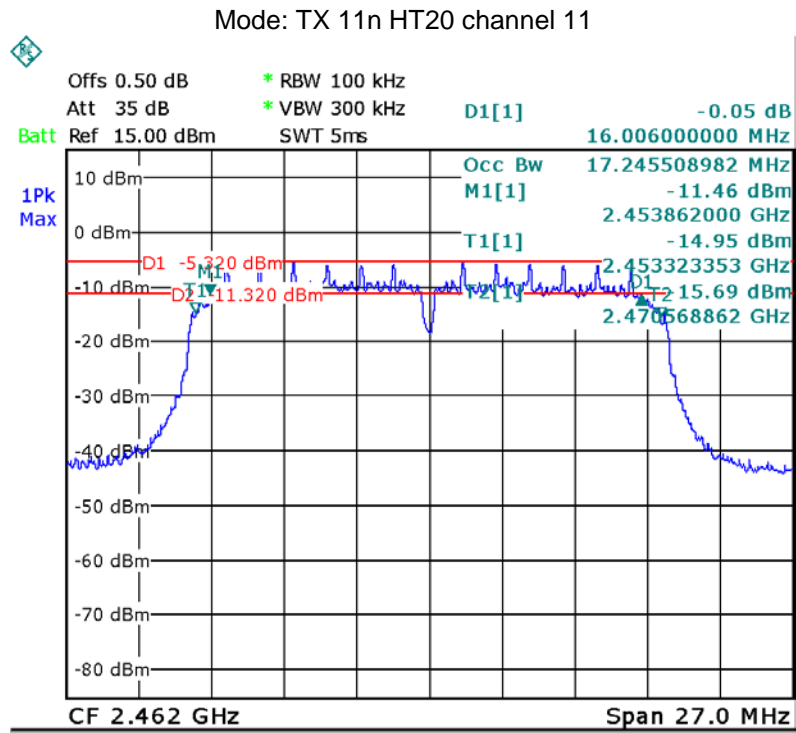
Mode: TX 11b channel 11



Mode: TX 11g channel 6







12 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance V04

12.1 Test Procedure:

558074 D01 DTS Meas Guidance V04

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 = Peak, 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.

12.2 Test Result:

Test mode :TX 11b		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
14.61	13.18	11.65
Limit: 1W/30dBm		

Test mode :TX 11g		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
15.77	14.49	13.86
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
14.03	13.71	12.36
Limit: 1W/30dBm		

13 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance V04

13.1 Test Procedure:

558074 D01 DTS Meas Guidance V04

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.

13.2 Test Result:

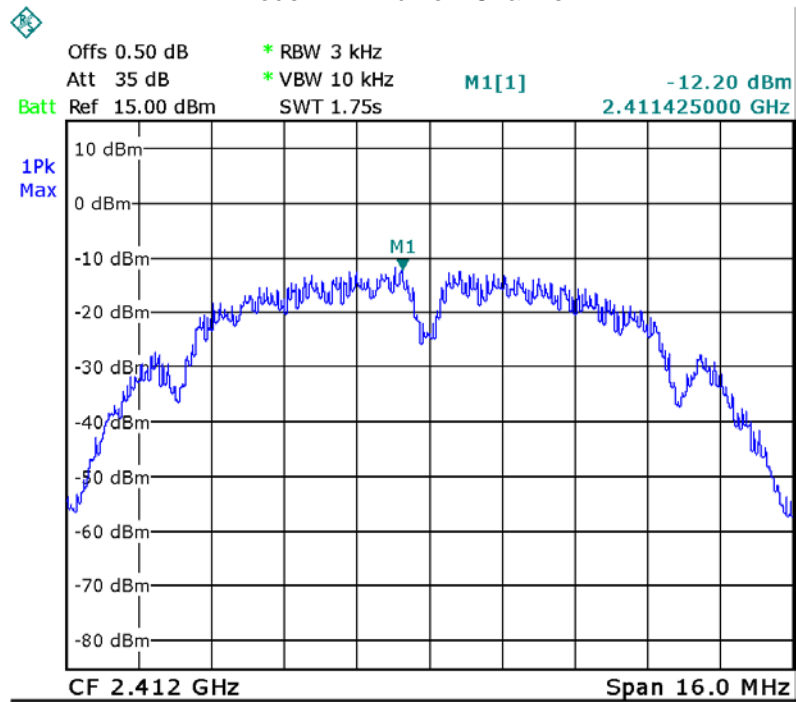
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-12.20	-13.34	-14.58
Limit: 8dBm per 3kHz		

Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-16.97	-18.42	-19.32
Limit: 8dBm per 3kHz		

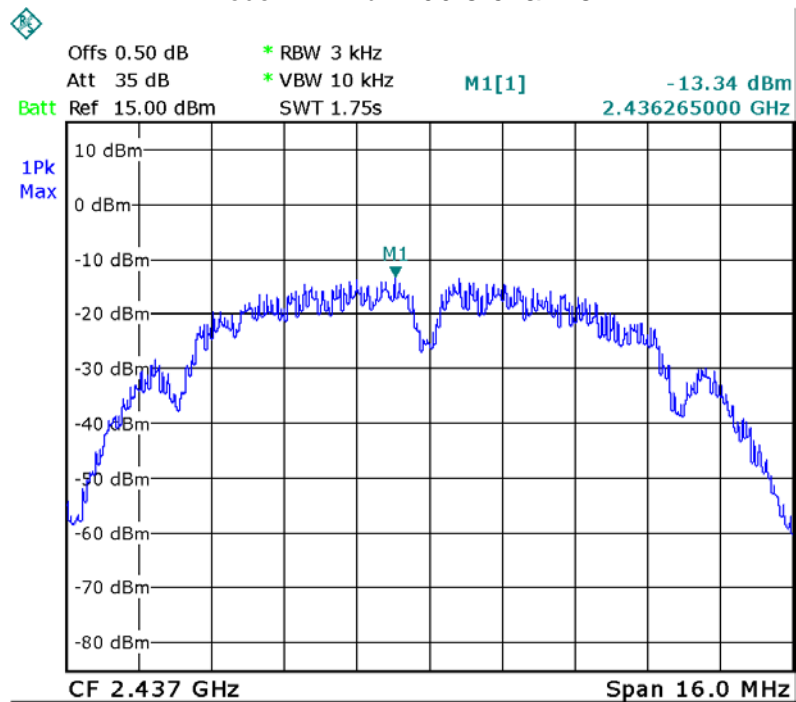
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-16.98	-18.81	-19.80
Limit: 8dBm per 3kHz		

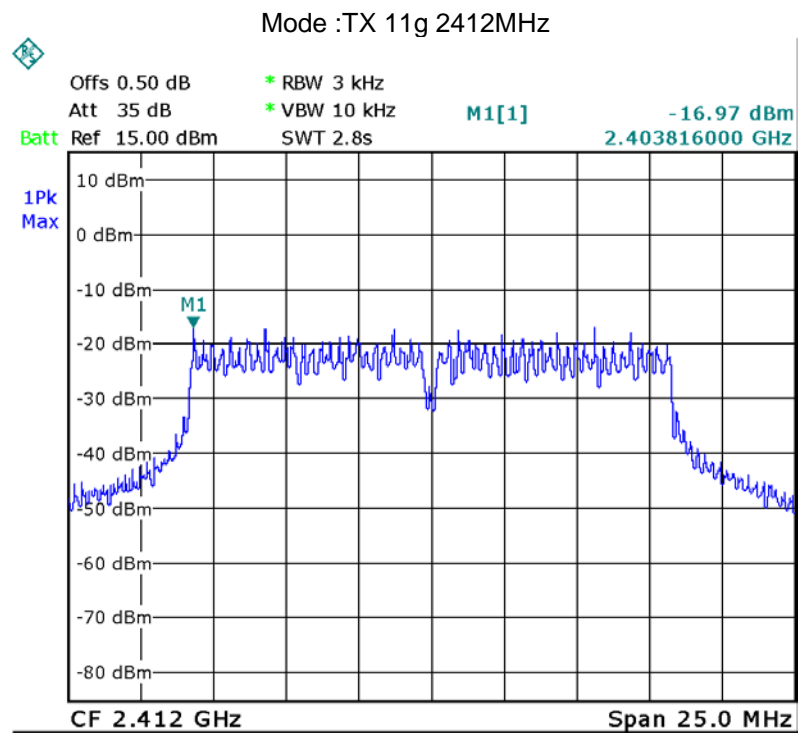
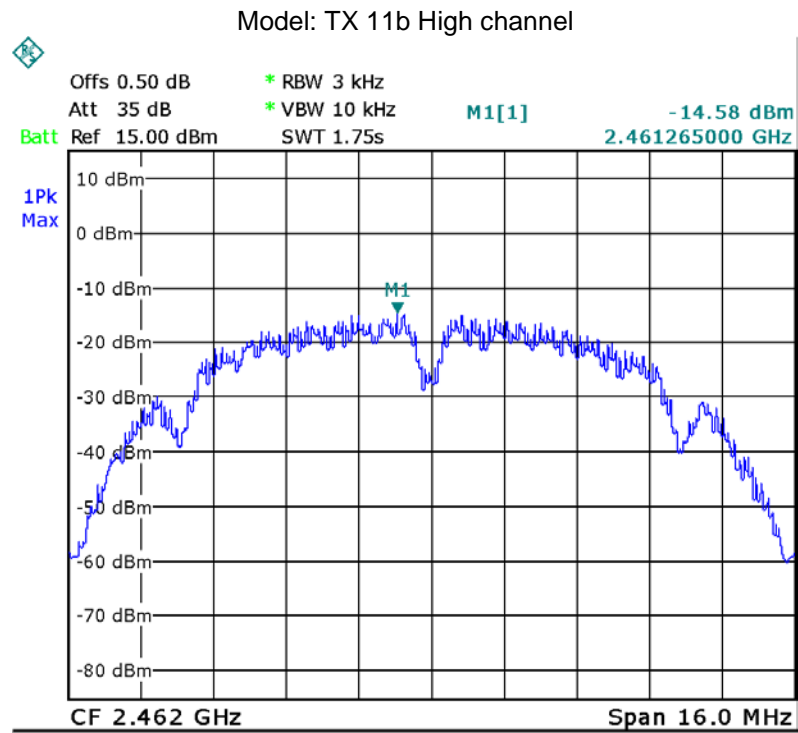
ANT1:

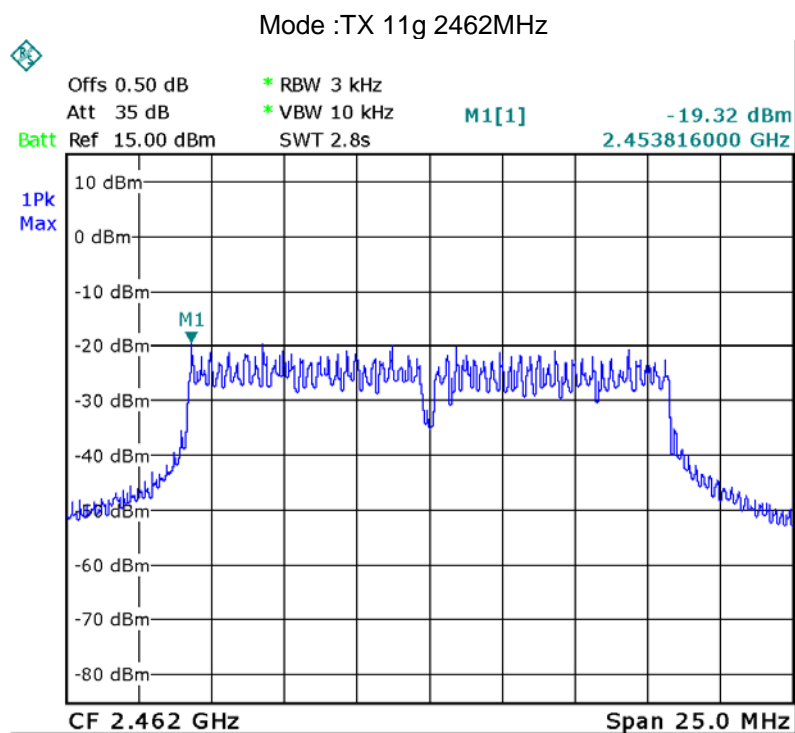
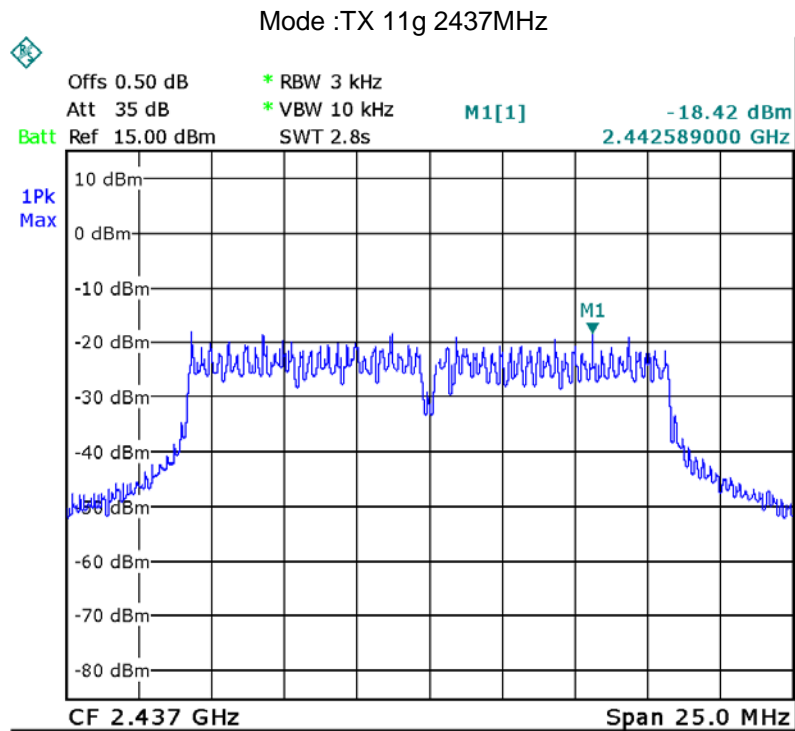
Model: TX 11b Low Channel

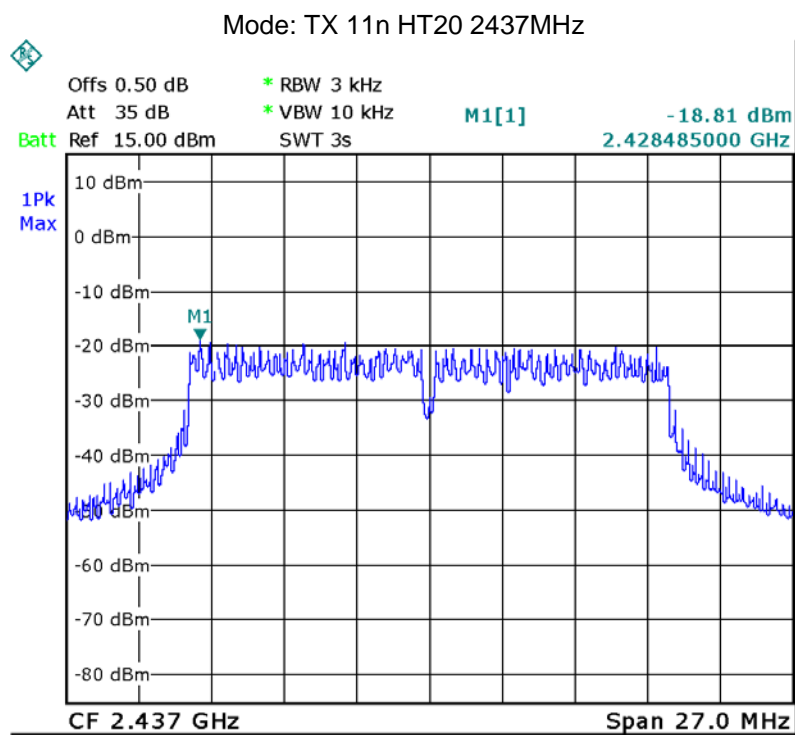
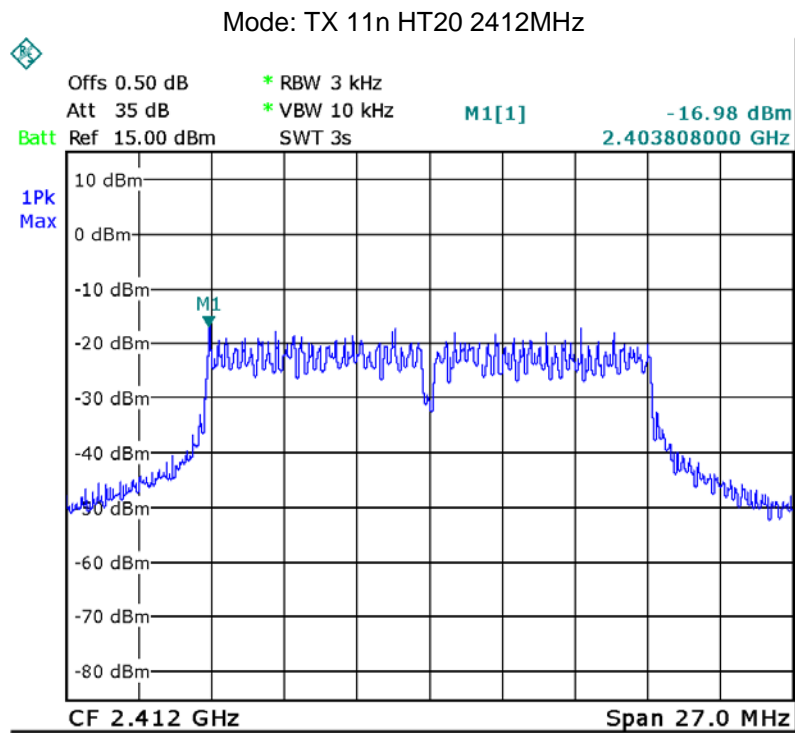


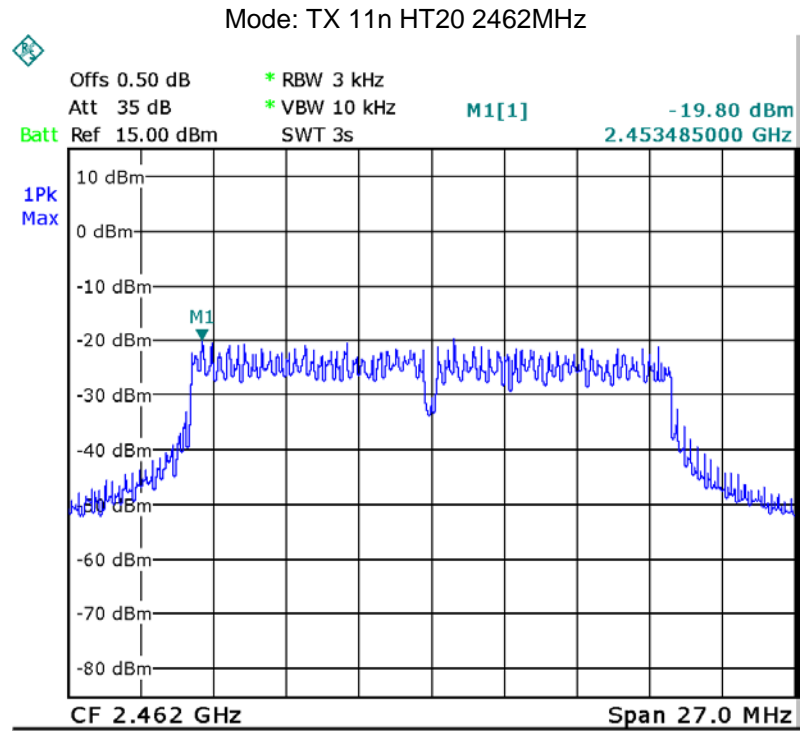
Model: TX 11b Middle channel











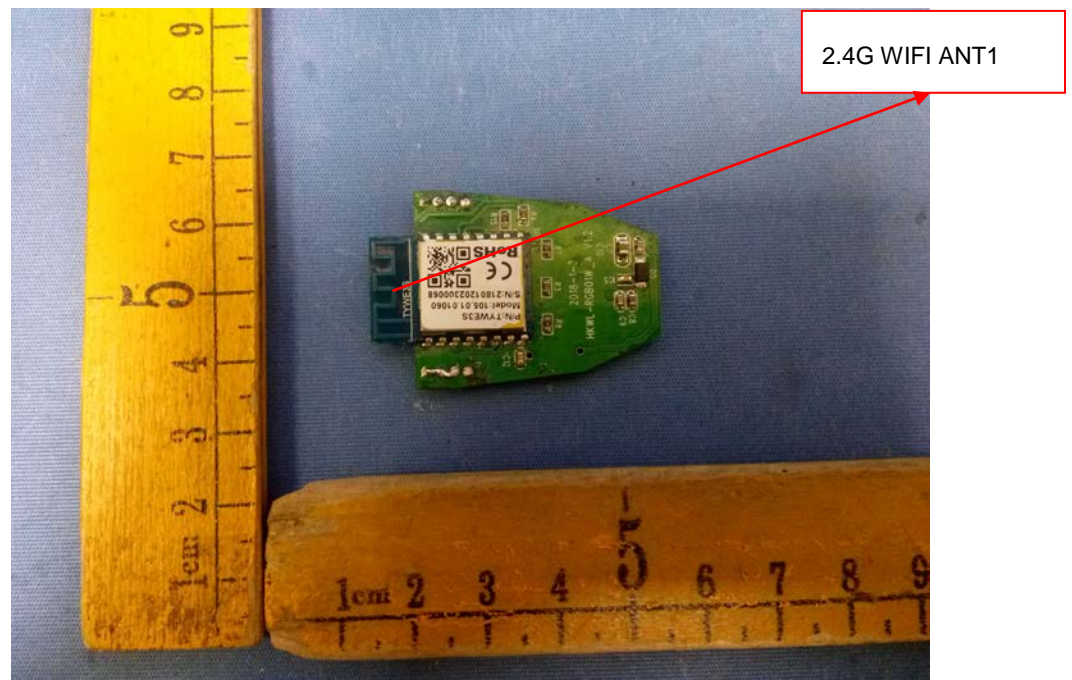
14 Antenna Requirement

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 have one Integrated Antenna, meets the requirements of FCC 15.203.



15 SAR Evaluation

Please refer to SAR report.

16 Photographs – Test Setup and EUT Photos

Refer to the file Ext Photos, Int Photos and Tsup Photos.

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