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RADIO TESTREPORT

Report No.: STS1808196W01

Issued for

PerimeterSafe Home Monitoring Limited

The Atrium, 1321 Blanshard Street, Suite 301 Victoria, British Columbia, BC V8W 0B6, Canada

Product Name:	Smart Home Security Camera
Brand Name:	Kodak
Model Name:	CHERISH F685
Series Model:	N/A
FCC ID:	2APVD-F685
IC ID:	23907-F685
HVIN:	F685
Test Standard:	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109 RSS-247 Issue 2 February 2017 RSS-Gen Issue 5 April 2018 ICES-003 Issue 6 January 2016

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TEST RESULT CERTIFICATION

Applicant's name : **PerimeterSafe Home Monitoring Limited**
 Address : The Atrium, 1321 Blanshard Street, Suite 301 Victoria, British Columbia, BC V8W 0B6, Canada
Manufacture's Name : **Cinatic Technology Limited**
 Address : Unit 805, 8/F, Tower3, Phase1, Enterprise Square 9 Sheung Yuet Rd, Kowloon Bay, Kowloon, Hong Kong

Product description

Product Name : Smart Home Security Camera
 Brand Name : Kodak
 Model Name : CHERISH F685
 SeriesModel : N/A

Test Standards : CFR47 FCC Part 15: Subpart C Section 15.247
 CFR47 FCC Part 15: Subpart C Section 15.207
 CFR47 FCC Part 15: Subpart C Section 15.209
 CFR47 FCC Part 15: Subpart B Section 15.107
 CFR47 FCC Part 15: Subpart B Section 15.109
 RSS-247 Issue 2 February 2017
 RSS-Gen Issue 5 April 2018
 ICES-003 Issue 6 January 2016

Test procedure : ANSI C63.10: 2013, ANSI C63.4: 2014

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC/IC requirements. And it is applicable only to the tested sample identified in the report.


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Date of Test


Date (s) of performance of tests : 22 Aug. 2018 -31 Aug. 2018

Date of Issue : 04 Sept. 2018


Test Result : **Pass**

Testing Engineer : 

(Chris Chen)

Technical Manager : 

(Sean She)

Authorized Signatory : 

(Vita Li)





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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	04 Sept. 2018	STS1808196W01	ALL	Initial Issue





1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

KDB 558074 D01 DTS Meas Guidance v04

FCC Part 15, Subpart C RSS-247 Issue 2			
Standard Section	Test Item	Judgment	Remark
FCC Part 15.207(a) RSS-Gen Clause 8.8	Conducted Emission	PASS	
FCC Part 15.247(a)(2) RSS-247 Clause 5.2(a)	6dB Bandwidth	PASS	
RSS-Gen Clause 6.6	99% Bandwidth	PASS	
FCC Part 15.247(b)(3) RSS-247 Clause 5.4(d)	Output Power	PASS	
FCC Part 15.247(d) RSS-247 Clause 3.3	Radiated Spurious Emission	PASS	
FCC Part 15.247(d) RSS-247 Clause 5.5	Conducted Spurious & Band Edge Emission	PASS	
FCC Part 15.247(e) RSS-247 Clause 5.2(b)	Power Spectral Density	PASS	
FCC Part 15.205	Restricted Band Edge Emission	PASS	
FCC Part 15.247(d)&15.209(a) RSS-247 Clause 5.5	Band Edge Emission	PASS	
FCC Part 15.247(b)(4) &15.203	Antenna Requirement	PASS	

FCC Part 15, Subpart B ICES-003 Issue 6			
Standard Section	Test Item	Judgment	Remark
FCC Part 15.107(a) ICES-003	Conducted Emission	PASS	Class B limit
FCC Part 15.109(a) ICES-003	Radiated Emission	PASS	Class B limit

NOTE:

- 1) 'N/A' denotes test is not applicable in this test report
- 2) All tests were performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.



1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add.: 1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China

CNAS Registration No.: L7649
FCC Registration No.: 625569
IC Registration No.: 12108A
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	± 2.88 dB
2	Conducted Emission (150KHz-30MHz)	± 2.67 dB
3	RF power,conducted	± 0.71 dB
4	Spurious emissions,conducted	± 0.63 dB
5	All emissions,radiated (9KHz-30MHz)	± 3.02 dB
6	All emissions,radiated(30MHz-200MHz)	± 3.80 dB
7	All emissions,radiated(200MHz-1000MHz)	± 3.97 dB
8	All emissions,radiated(>1G)	± 3.03 dB



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Smart Home Security Camera	
Trade Name	Kodak	
Model Name	CHERISH F685	
Series Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a Smart Home Security Camera which supports Wi-Fi 802.11 b/g/n wireless technology.	
	Operation Frequency:	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
	Modulation Type:	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
	Bit Rate of Transmitter:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
	Number OfChannel:	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)
	Antenna Designation:	Please see Note 4
	AntennaGain(dBi):	0dBi
	Duty Cycle:	>98%
Channel List	Please refer to the Note 2.	
Adapter	Model: TPA-97050150U01 Input: AC 100-240V,50/60Hz, 0.3A Output: DC 5.0V, 1500mA	
Battery	Model: I9300 (Tianmao) DC 3.8V@2100mAh/7.98Wh Li-ion battery Limited charge voltage: 4.35V	
Hardware version	N/A	
Software version	N/A	
Radio Hardware version	N/A	
Radio Software version	N/A	
Test Software	N/A	
RF Power Setting TEST Software (power class)	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	



Note:

1 For a more detailed features description, please refer to the manufacturer’s specifications or the User’s Manual.

2

RF Channel and Frequency of Wi-Fi 802.11 b/g/n			
802.11b/g/n (HT20)		802.11n (HT40)	
RF Channel	Freq.(MHz)	RF Channel	Freq.(MHz)
01	2412	03	2422
02	2417	04	2427
03	2422	05	2432
04	2427	06	2437
05	2432	07	2442
06	2437	08	2447
07	2442	09	2452
08	2447	/	/
09	2452	/	/
10	2457	/	/
11	2462	/	/

3 Note:

- 1) In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test;
- 2) Test frequencies are lowest channel: 2412 MHz, middle channel: 2437 MHz and highest channel: 2462 MHz for 802.11b/g/n(HT20)
- 3) Test frequencies are lowest channel: 2422 MHz, middle channel: 2437 MHz and highest channel: 2452 MHz for 802.11n(HT40)

4

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	F685	Integral Antenna	N/A	0	WLAN Antenna



2.2 DESCRIPTION OF TEST MODES

Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11 b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH6	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH11	MCS 0
Mode 10	TX IEEE 802.11n HT40 CH3	MCS 0
Mode 11	TX IEEE 802.11n HT40 CH6	MCS 0
Mode 12	TX IEEE 802.11n HT40 CH9	MCS 0
Mode13	Wi-Fi transmitting mode	/
Mode 14	SD+Charging mode	/

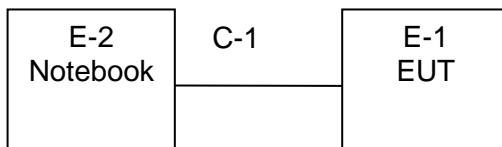
Note:

- 1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
- 2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/60Hz is shown in the report
- 3) Controlled using a bespoke application on the laptop PC supplied by the customer. The application was used to enable a continuous transmission mode and to select the test channels, data rates and modulation schemes as required.

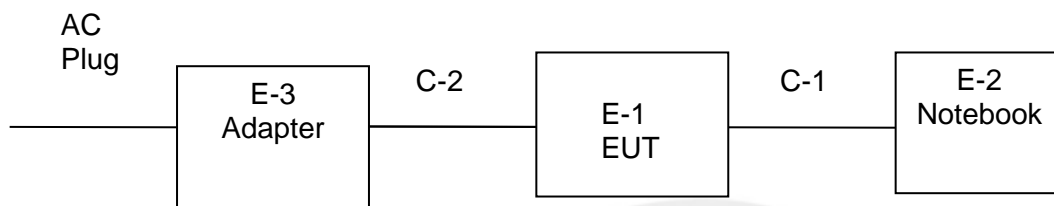


2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiation Test Set



Conduction Test Set



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	HP	500-320cx	N/A	N/A
E-3	Adapter	N/A	TPA-97050150U01	N/A	N/A
E-4	TF card	Kingston	32GB	N/A	N/A
E-5	Router	ASUS	RT-AC66UB1	H5IC0Z005723	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	NO	100cm	N/A
C-2	Adapter DC Cable	NO	200cm	N/A

Note:

- 1) The support equipment was authorized by Declaration of Confirmation.
- 2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- 3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test Equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	102086	2017.10.15	2018.10.14
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2018.11.01
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1343	2017.10.27	2018.10.26
SHF-EHF Horn Antenna(18G-40GHz)	A-INFO	LB-180400-KF	N/A	2018.03.11	2019.03.10
Temperature & Humidity	HH660	Mieo	N/A	2017.10.15	2018.10.14
Temperature & Humidity	HH660	Mieo	N/A	2017.10.15	2018.10.14
Pre-mpifier (0.1M-3GHz)	EM	EM330	60538	2018.03.11	2019.03.10
PreAmplifier (1G-26.5GHz)	Agilent	8449B	60538	2017.10.15	2018.10.14
Passive Loop(9K--30MHz)	ZHNAN	ZN3090C	16035	2018.03.11	2019.03.10
Low frequency cable	EM	R01	N/A	2018.03.11	2019.03.10
Low frequency cable	EM	R06	N/A	2018.03.11	2019.03.10
High frequency cable	SCHWARZBECK	R04	N/A	2018.03.11	2019.03.10
High frequency cable	SCHWARZBECK	R02	N/A	2018.03.11	2019.03.10
Semi-anechoic chamber	Changling	966	N/A	2017.10.15	2018.10.14
trun table	EM	SC100_1	60531	N/A	N/A
Antnna mast	EM	SC100	N/A	N/A	N/A
Max-full Antenna Corp	MF	MFA-440H	N/A	N/A	N/A

Conduction Test Equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
conduction Cable	EM	C01	N/A	2018.03.11	2019.03.10
Temperature & Humidity	Mieo	HH660	N/A	2017.10.15	2018.10.14



RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14
Power Meter	R&S	NRP	100510	2017.10.15	2018.10.14
Spectrum Analyzer	Agilent	N9020A	MY51110105	2018.03.08	2019.03.07
Signal Analyzer	Agilent	N9020A	MY49100060	2017.10.15	2018.10.14

Note:

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.





3 EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

operating frequency band. In case the emission fall within the restricted band specified on Part 15. 207(a), 107(a), RSS-Gen Table3 and ICES-003 Table2 limit in the table below has to be followed. This item was performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.

FREQUENCY (MHz)	Conducted Emission limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- 1) The tighter limit applies at the band edges.
- 2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

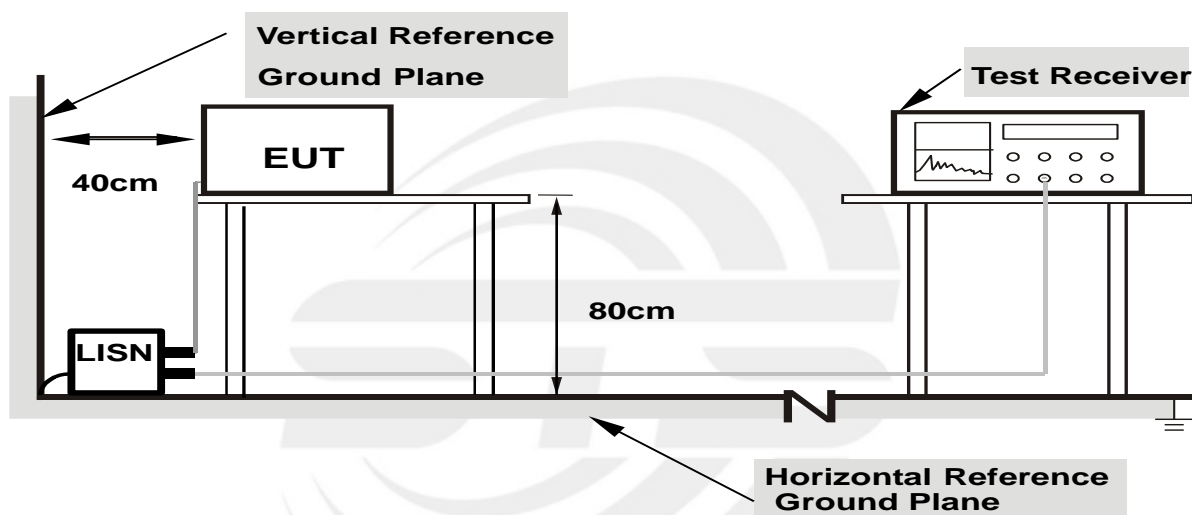
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



3.1.2 TEST PROCEDURE

- The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



- Note: 1. Support units were connected to second LISN.**
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.5 TEST RESULT

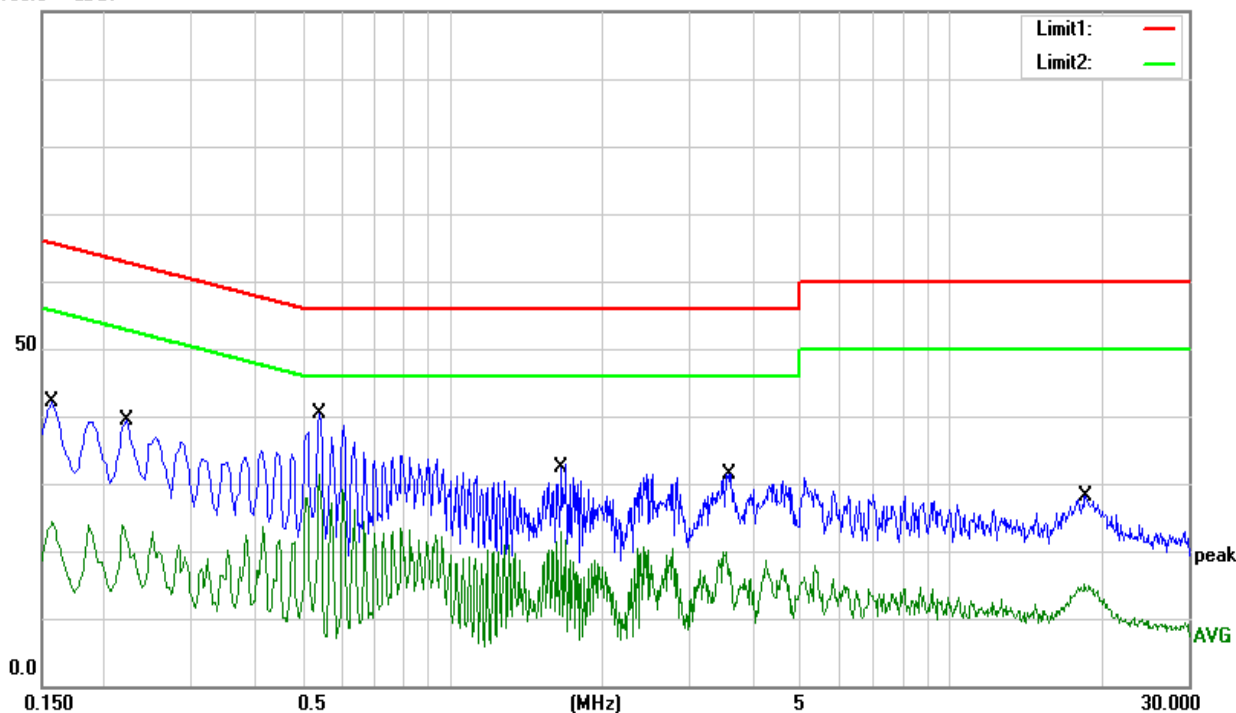
Temperature:	24.8°C	Relative Humidity:	66%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 13		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	32.37	9.79	42.16	65.57	-23.41	QP
0.1580	14.48	9.79	24.27	55.57	-31.30	AVG
0.2220	29.52	9.88	39.40	62.74	-23.34	QP
0.2220	14.00	9.88	23.88	52.74	-28.86	AVG
0.5420	30.27	9.99	40.26	56.00	-15.74	QP
0.5420	21.42	9.99	31.41	46.00	-14.59	AVG
1.6540	23.01	9.79	32.80	56.00	-23.20	QP
1.6540	13.03	9.79	22.82	46.00	-23.18	AVG
3.5620	21.61	9.82	31.43	56.00	-24.57	QP
3.5620	10.12	9.82	19.94	46.00	-26.06	AVG
18.5260	17.85	10.39	28.24	60.00	-31.76	QP
18.5260	4.65	10.39	15.04	50.00	-34.96	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit

100.0 dBuV



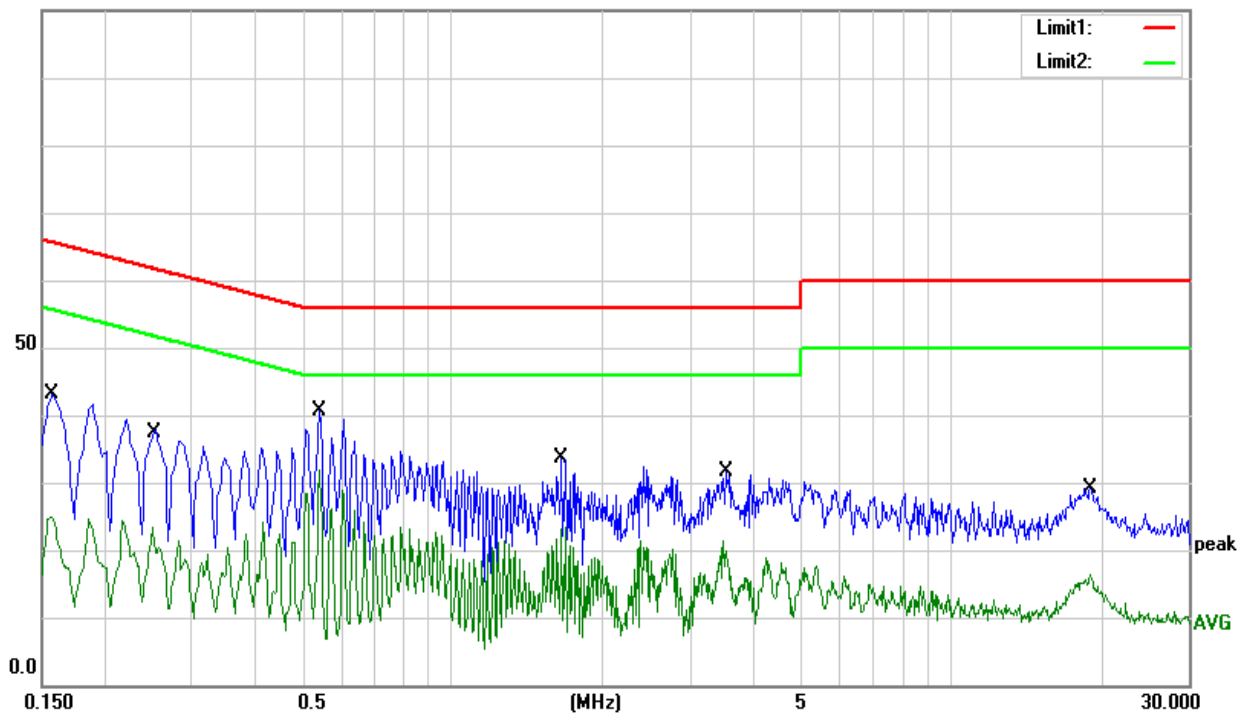


Temperature:	24.8°C	Relative Humidity:	60%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 13		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	33.36	9.77	43.13	65.57	-22.44	QP
0.1580	15.02	9.77	24.79	55.57	-30.78	AVG
0.2500	27.68	10.07	37.75	61.76	-24.01	QP
0.2500	13.26	10.07	23.33	51.76	-28.43	AVG
0.5420	30.75	9.95	40.70	56.00	-15.30	QP
0.5420	21.98	9.95	31.93	46.00	-14.07	AVG
1.6540	23.69	9.85	33.54	56.00	-22.46	QP
1.6540	13.60	9.85	23.45	46.00	-22.55	AVG
3.4980	21.69	9.92	31.61	56.00	-24.39	QP
3.4980	11.41	9.92	21.33	46.00	-24.67	AVG
19.0420	18.73	10.39	29.12	60.00	-30.88	QP
19.0420	6.01	10.39	16.40	50.00	-33.60	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) - Limit
100.0 dBuV



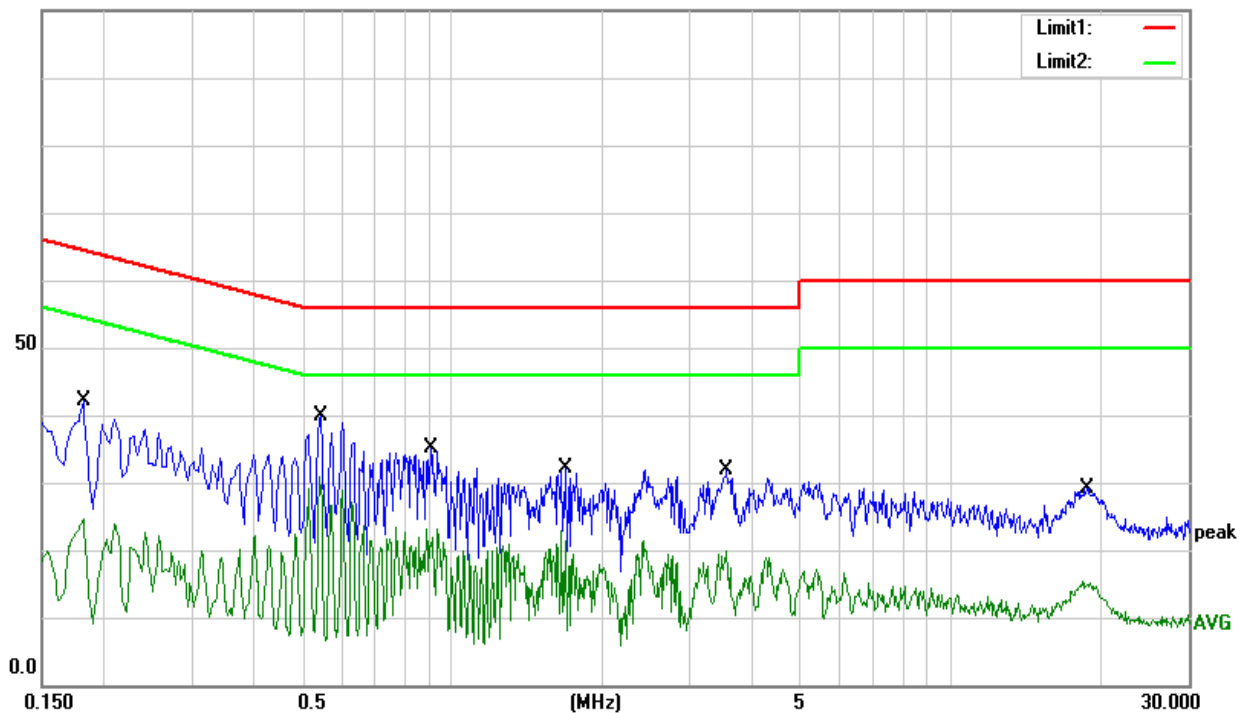


Temperature:	24.8 °C	Relative Humidity:	66%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 14 (Part 15B & ICES-003)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1820	32.38	9.78	42.16	64.39	-22.23	QP
0.1820	14.82	9.78	24.60	54.39	-29.79	AVG
0.5460	29.83	9.99	39.82	56.00	-16.18	QP
0.5460	20.94	9.99	30.93	46.00	-15.07	AVG
0.9060	25.30	9.82	35.12	56.00	-20.88	QP
0.9060	13.25	9.82	23.07	46.00	-22.93	AVG
1.6900	22.41	9.79	32.20	56.00	-23.80	QP
1.6900	12.98	9.79	22.77	46.00	-23.23	AVG
3.5580	22.15	9.82	31.97	56.00	-24.03	QP
3.5580	10.02	9.82	19.84	46.00	-26.16	AVG
18.7300	18.79	10.40	29.19	60.00	-30.81	QP
18.7300	4.90	10.40	15.30	50.00	-34.70	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit
100.0 dBuV



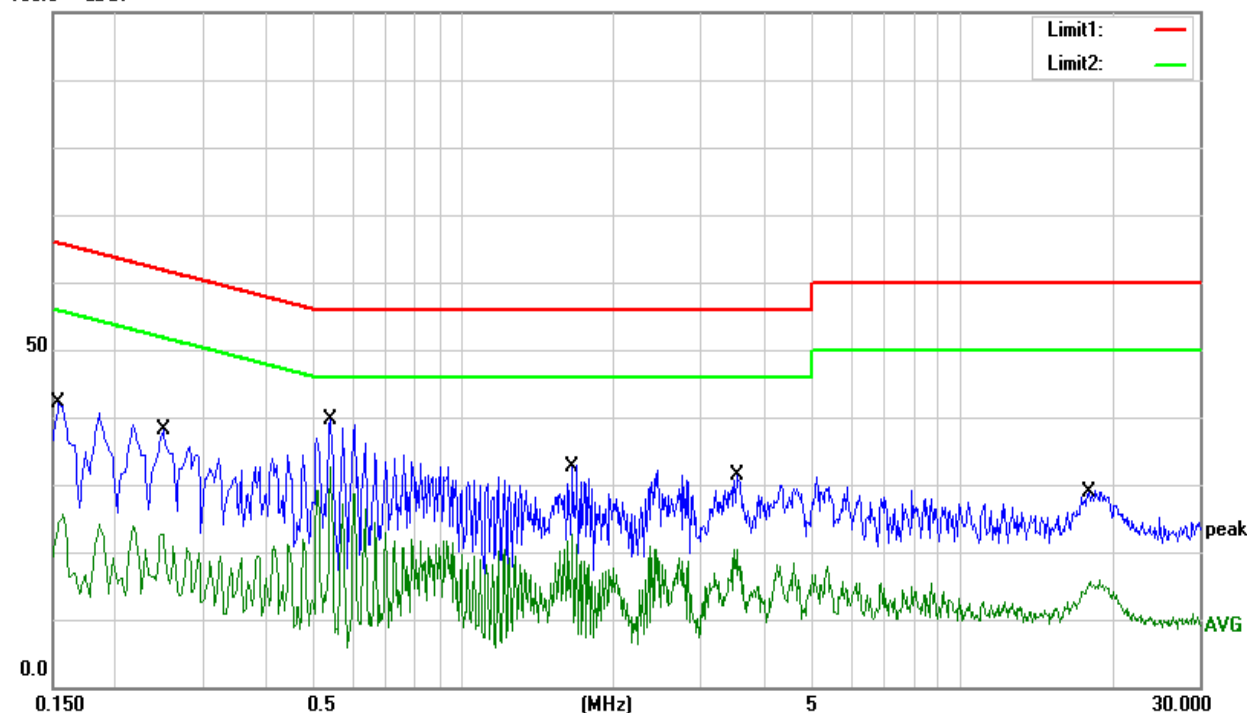


Temperature:	24.8 °C	Relative Humidity:	66%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 14 (Part 15B & ICES-003)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1540	32.35	9.76	42.11	65.78	-23.67	QP
0.1540	15.80	9.76	25.56	55.78	-30.22	AVG
0.2500	28.06	10.07	38.13	61.76	-23.63	QP
0.2500	12.54	10.07	22.61	51.76	-29.15	AVG
0.5420	29.76	9.95	39.71	56.00	-16.29	QP
0.5420	22.60	9.95	32.55	46.00	-13.45	AVG
1.6580	22.92	9.85	32.77	56.00	-23.23	QP
1.6580	12.72	9.85	22.57	46.00	-23.43	AVG
3.4980	21.48	9.92	31.40	56.00	-24.60	QP
3.4980	10.56	9.92	20.48	46.00	-25.52	AVG
18.1060	18.86	10.32	29.18	60.00	-30.82	QP
18.1060	5.22	10.32	15.54	50.00	-34.46	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Class A (at 10m) dBuV/m	Class B (at 3m) dBuV/m
30~88	39.0	40.0
88~216	43.5	43.5
216~960	46.5	46.0
Above 960	49.5	54.0

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Note:

- 1) The tighter limit applies at the band edges.
- 2) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

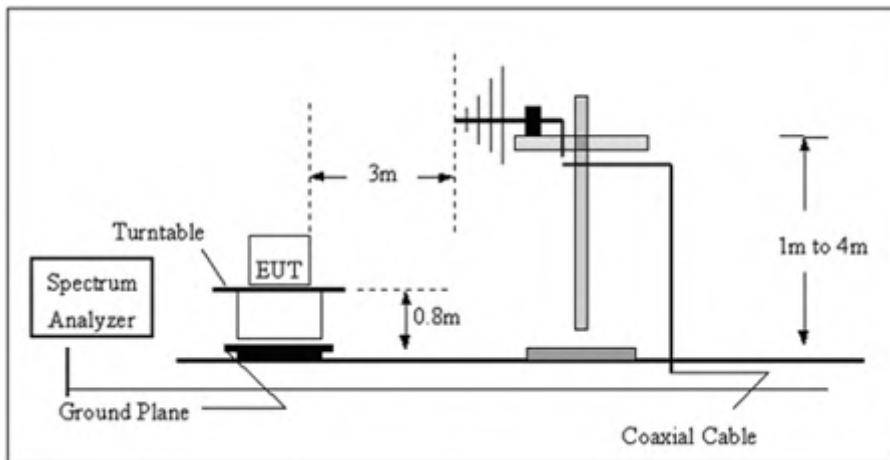
- a) The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 0.8 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

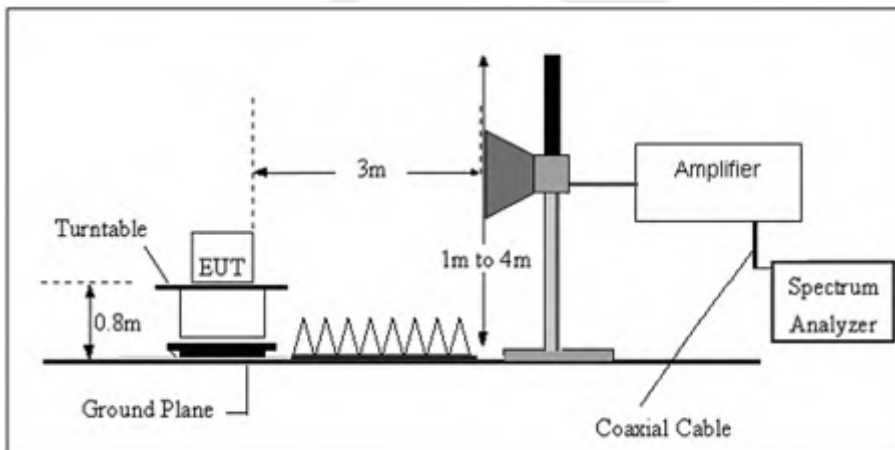


3.2.3 TEST SETUP

a) Radiated Emission Test-Up Frequency 30MHz~1GHz



b) Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.5 TEST RESULTS

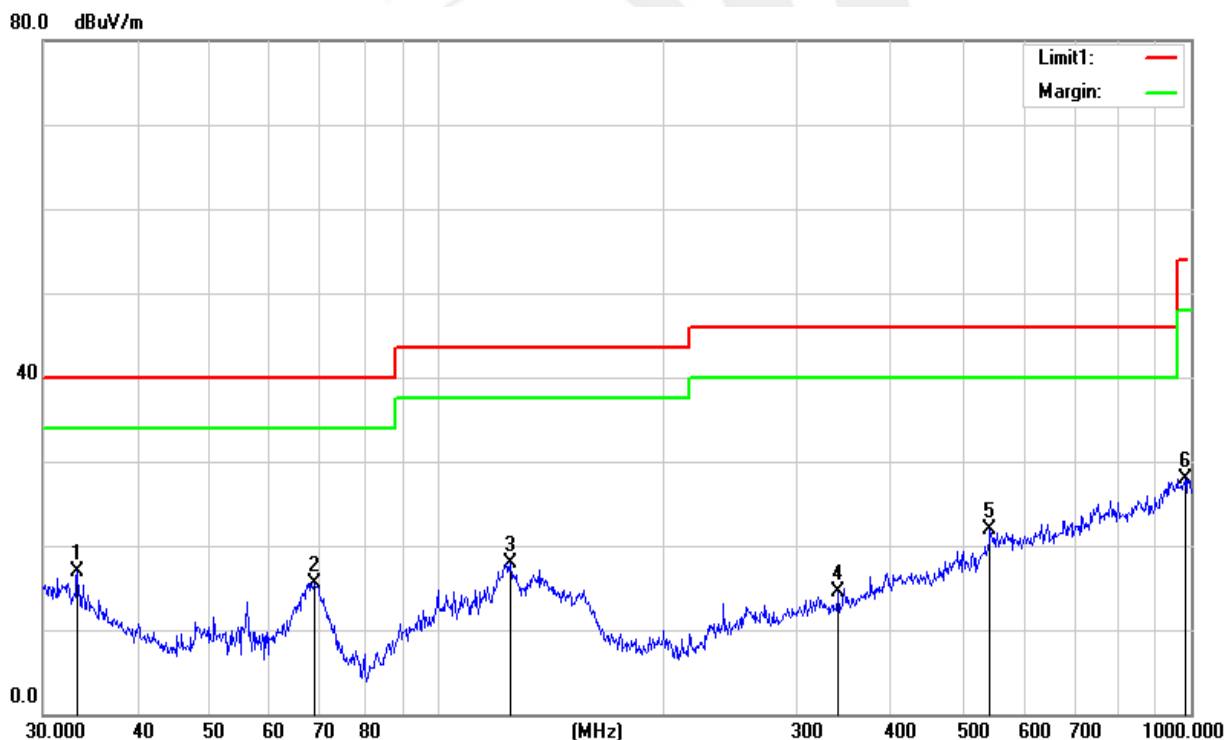
Between 30-1000MHz:

Temperature:	25.6 °C	Relative Humidity:	53%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 14 (Part 15B & ICES-003)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.3280	29.79	-12.90	16.89	40.00	-23.11	QP
2	68.8721	39.68	-24.13	15.55	40.00	-24.45	QP
3	125.0066	35.44	-17.61	17.83	43.50	-25.67	QP
4	340.7817	28.50	-13.98	14.52	46.00	-31.48	QP
5	541.3725	28.94	-6.97	21.97	46.00	-24.03	QP
6	982.6200	28.07	-0.14	27.93	54.00	-26.07	QP

Remark:

1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)-Limit



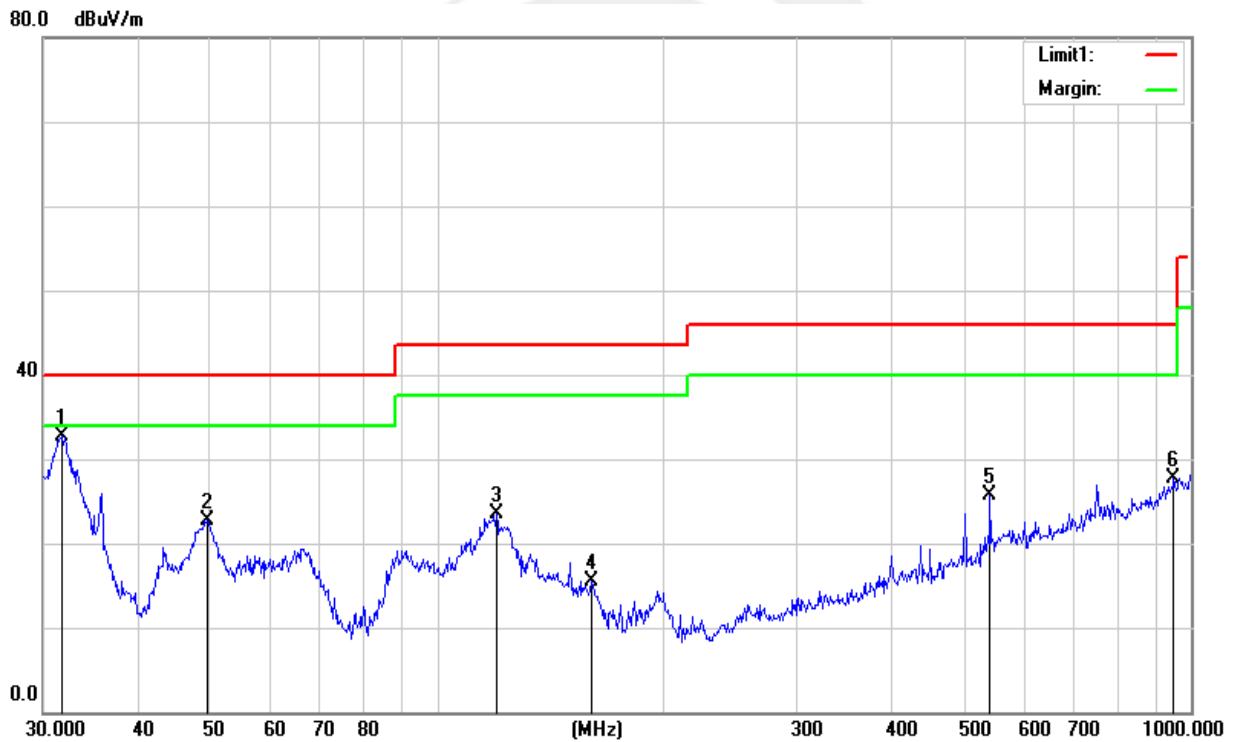


Temperature:	25.3 °C	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 14 (Part 15B & ICES-003)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.8427	44.92	-12.14	32.78	40.00	-7.22	QP
2	49.5328	44.01	-21.24	22.77	40.00	-17.23	QP
3	119.8556	41.15	-17.70	23.45	43.50	-20.05	QP
4	160.3456	34.11	-18.52	15.59	43.50	-27.91	QP
5	541.3725	32.72	-6.97	25.75	46.00	-20.25	QP
6	948.7610	28.06	-0.45	27.61	46.00	-18.39	QP

Remark:

1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)-Limit

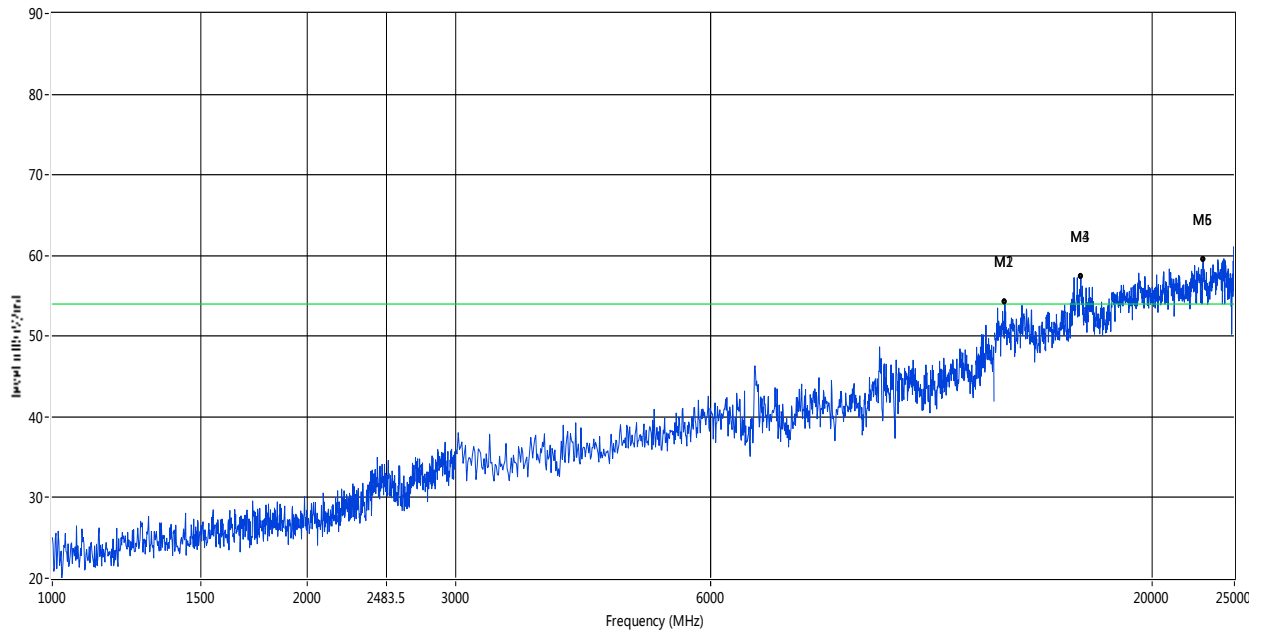




Between 1GHz – 25GHz:

Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1010hPa	Phase:	Horizontal

RE_FCC Test Case_FCC 15B 1GHz-25GHz

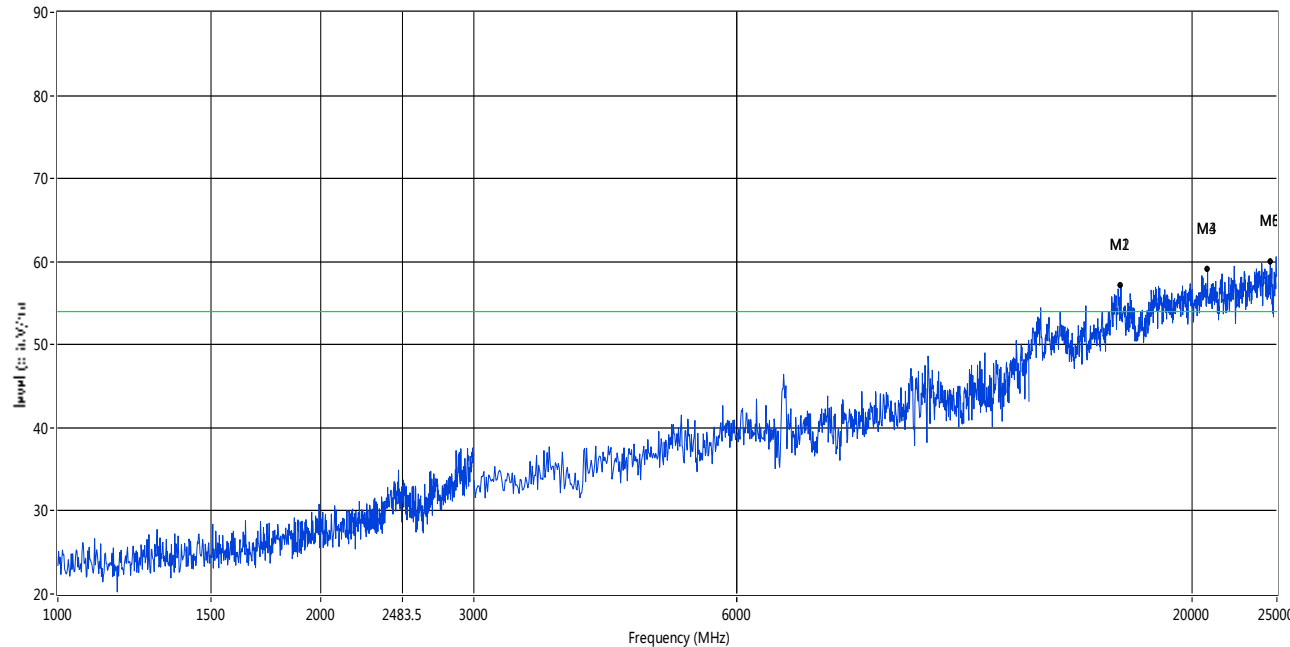


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	13383.616	43.09	2.13	54	-10.91	Av	H	Pass
1	13383.616	54.21	2.13	74	-19.79	Peak	H	Pass
2**	16452.547	46.29	5.51	54	-7.71	Av	H	Pass
2	16452.547	57.37	5.51	74	-16.63	Peak	H	Pass
3**	22962.038	48.44	6.52	54	-5.56	Av	H	Pass
3	22962.038	59.49	6.52	74	-14.51	Peak	H	Pass



Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1010hPa	Phase:	Vertical

RE_FCC Test Case_FCC 15B 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	16560.440	45.97	5.81	54	-8.03	Av	V	Pass
1	16560.440	57.15	5.81	74	-16.85	Peak	V	Pass
2**	20816.184	48.27	6.31	54	-5.73	Av	V	Pass
2	20816.184	59.00	6.31	74	-15.00	Peak	V	Pass
3**	24568.432	48.39	6.90	54	-5.61	Av	V	Pass
3	24568.432	59.88	6.90	74	-14.12	Peak	V	Pass



3.3 RADIATED SPURIOUS EMISSION MEASUREMENT

3.3.1 RADIATED EMISSION LIMITS

in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) and RSS-247 Issue 2 limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1000MHz-25GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz /3MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak/AV
Start/Stop Frequency	Lower Band Edge: 2300 to 2422 MHz Upper Band Edge: 2452to 2500 MHz
RB / VB (emission in restricted band)	1 MHz /3MHz



Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.3.2 TEST PROCEDURE

- a) The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b) The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarizations of the antenna are set to make the measurement
- d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

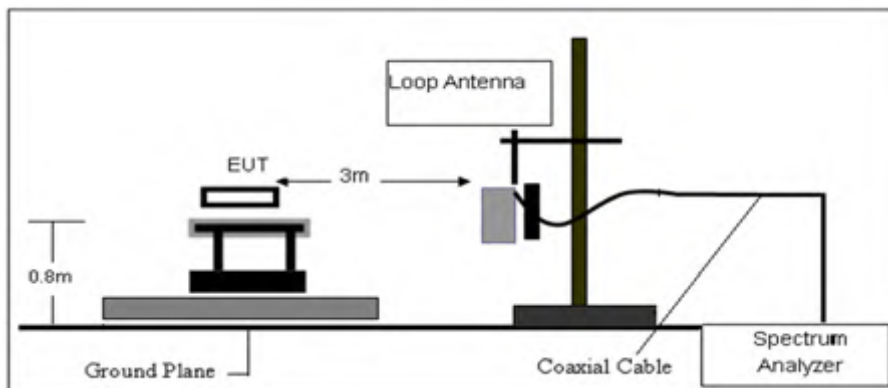
Note:

Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

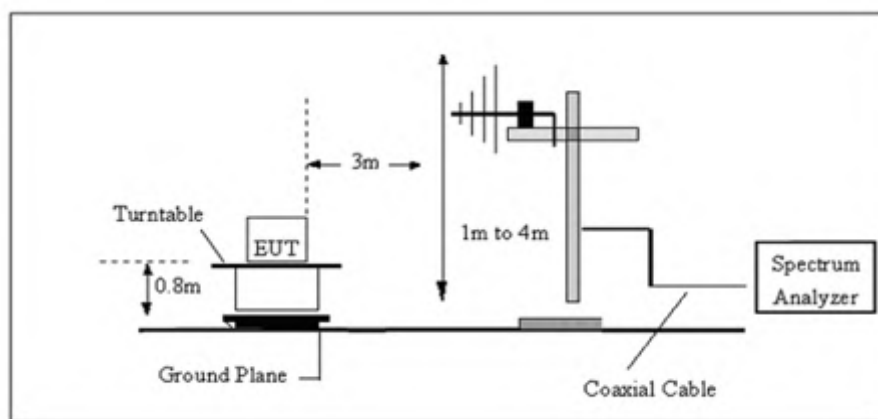


3.3.3 TEST SETUP

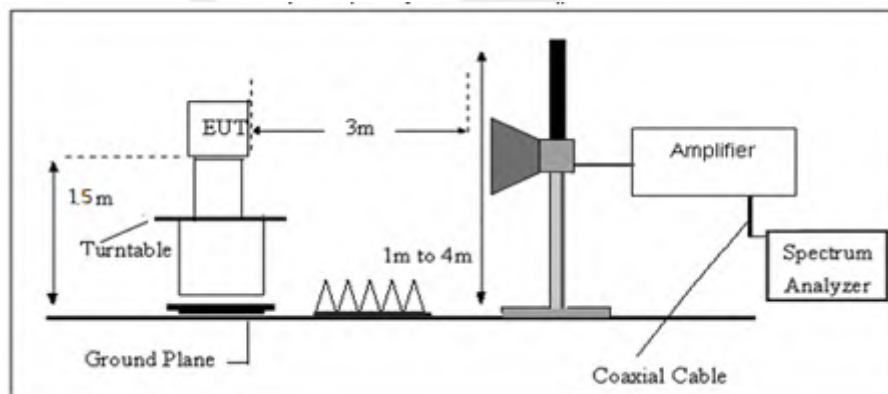
a) Radiated Emission Test-Up Frequency Below 30MHz



b) Radiated Emission Test-Up Frequency 30MHz~1GHz



c) Radiated Emission Test-Up Frequency Above 1GHz



3.3.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.3.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = AF + CL - AG$$

3.3.6 TEST RESULT

9KHz-30MHz

Temperature:	25.6°C	Relative Humidity:	53%
Test Voltage:	DC 3.8V	Polarization :	--
Test Mode :	TX Mode		

Freq.	Reading	Limit	Margin	State	Test Result
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	P/F	
--	--	--	--	--	PASS
--	--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance/test distance)(dB);

Limit line = specific limits(dB μ v) + distance extrapolation factor.



(30MHz - 1000MHz)

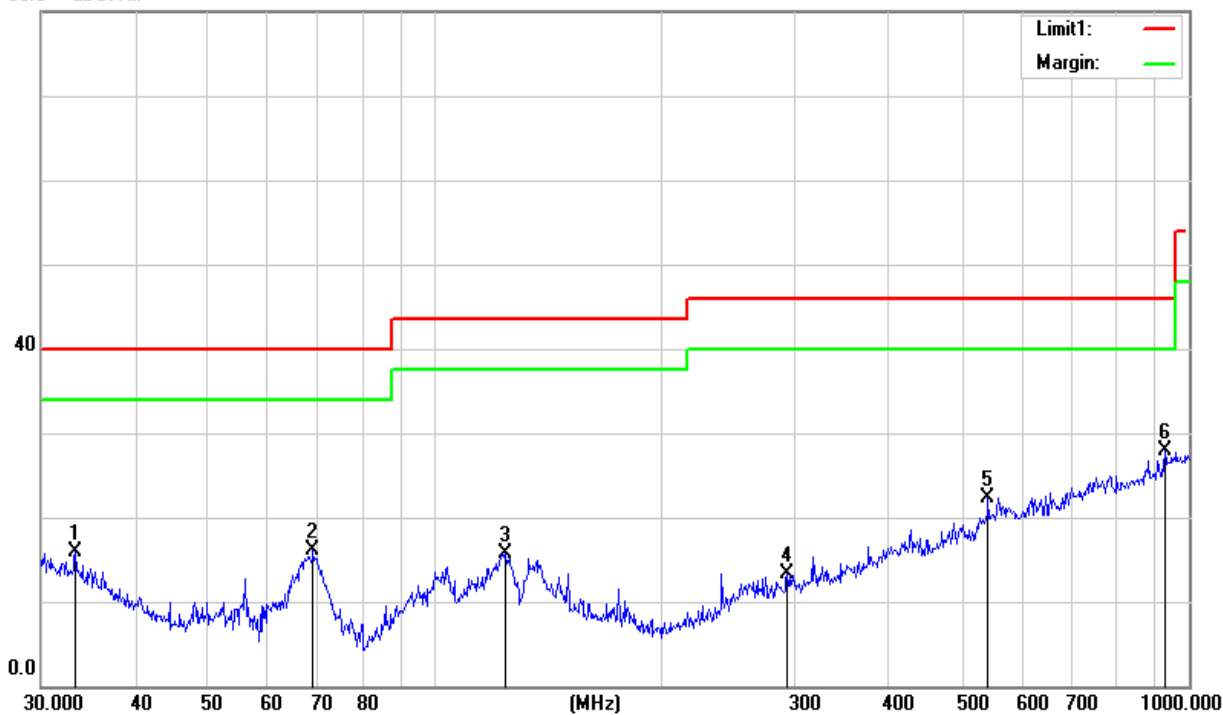
Temperature:	25.6°C	Relative Humidity:	53%
Test Voltage:	DC 3.8V	Polarization :	Horizontal
Test Mode :	Mode 1/2/3/4/5/6/7/8/9/10/11/12(Mode 2-1Mbps worst mode)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
33.3280	28.76	-12.90	15.86	40.00	-24.14	QP
68.8721	40.20	-24.13	16.07	40.00	-23.93	QP
124.1330	33.25	-17.64	15.61	43.50	-27.89	QP
293.0842	28.60	-15.24	13.36	46.00	-32.64	QP
541.3725	29.32	-6.97	22.35	46.00	-23.65	QP
929.0082	29.00	-1.19	27.81	46.00	-18.19	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit

80.0 dBuV/m





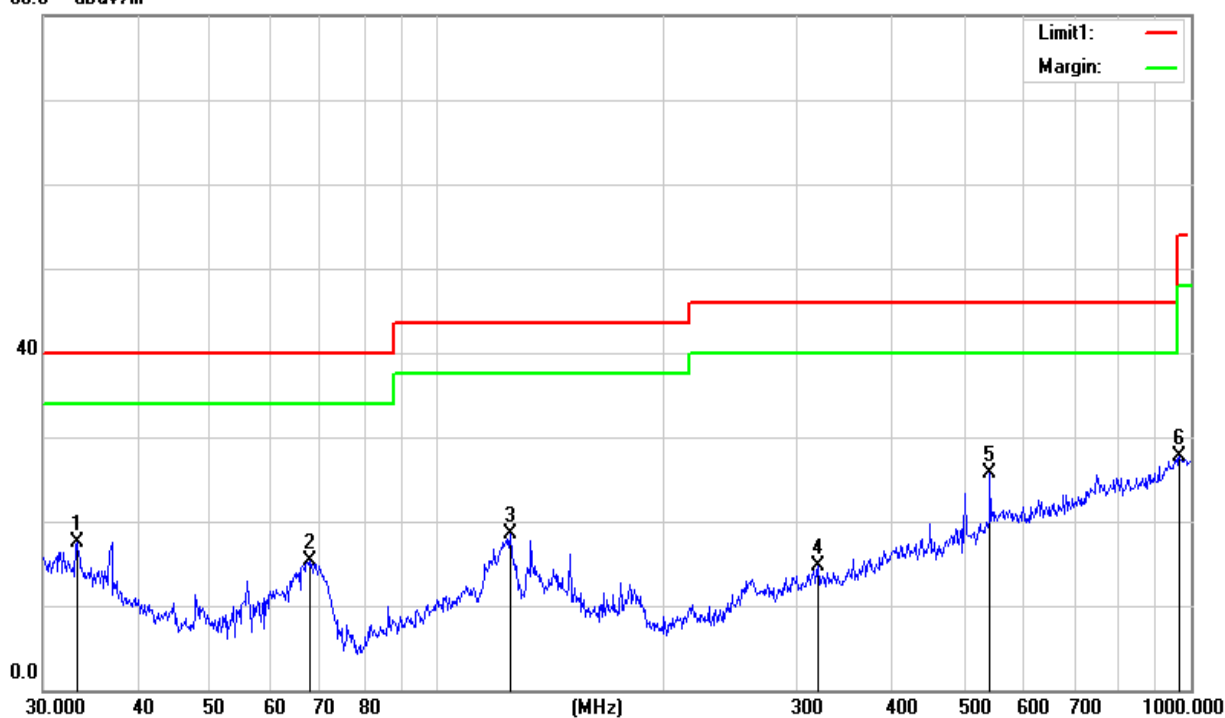
Temperature:	25.6°C	Relative Humidity:	53%
Test Voltage:	DC 3.8V	Polarization :	Vertical
Test Mode :	Mode 1/2/3/4/5/6/7/8/9/10/11/12(Mode 2-1Mbps worst mode)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
33.3280	30.45	-12.90	17.55	40.00	-22.45	QP
67.6751	39.41	-24.16	15.25	40.00	-24.75	QP
125.0066	36.11	-17.61	18.50	43.50	-25.00	QP
319.9370	28.92	-14.17	14.75	46.00	-31.25	QP
541.3725	32.75	-6.97	25.78	46.00	-20.22	QP
965.5421	27.92	-0.14	27.78	54.00	-26.22	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit

80.0 dBuV/m





(1GHz – 18GHz) Restricted band and Spurious emission Requirements

802.11b Low Channel

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (2412 MHz)										
3264.65	48.40	44.70	6.70	28.20	-9.80	38.60	74.00	-35.40	PK	Vertical
3264.65	38.17	44.70	6.70	28.20	-9.80	28.37	54.00	-25.63	AV	Vertical
3264.85	47.90	44.70	6.70	28.20	-9.80	38.10	74.00	-35.90	PK	Horizontal
3264.85	38.70	44.70	6.70	28.20	-9.80	28.90	54.00	-25.10	AV	Horizontal
4824.40	59.35	44.20	9.04	31.60	-3.56	55.79	74.00	-18.21	PK	Vertical
4824.40	50.16	44.20	9.04	31.60	-3.56	46.60	54.00	-7.40	AV	Vertical
4824.59	59.12	44.20	9.04	31.60	-3.56	55.56	74.00	-18.44	PK	Horizontal
4824.59	49.77	44.20	9.04	31.60	-3.56	46.21	54.00	-7.79	AV	Horizontal
5359.60	45.71	44.20	9.86	32.00	-2.34	43.37	74.00	-30.63	PK	Vertical
5359.60	38.28	44.20	9.86	32.00	-2.34	35.94	54.00	-18.06	AV	Vertical
5359.67	45.79	44.20	9.86	32.00	-2.34	43.45	74.00	-30.55	PK	Horizontal
5359.67	38.13	44.20	9.86	32.00	-2.34	35.79	54.00	-18.21	AV	Horizontal
7235.68	51.83	43.50	11.40	35.50	3.40	55.23	74.00	-18.77	PK	Vertical
7235.68	42.83	43.50	11.40	35.50	3.40	46.23	54.00	-7.77	AV	Vertical
7235.91	51.10	43.50	11.40	35.50	3.40	54.50	74.00	-19.50	PK	Horizontal
7235.85	41.92	43.50	11.40	35.50	3.40	45.32	54.00	-8.68	AV	Horizontal



802.11b Mid Channel

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Mid Channel (2437 MHz)										
3264.63	48.47	44.70	6.70	28.20	-9.80	38.67	74.00	-35.33	PK	Vertical
3264.63	39.09	44.70	6.70	28.20	-9.80	29.29	54.00	-24.71	AV	Vertical
3264.56	48.88	44.70	6.70	28.20	-9.80	39.08	74.00	-34.92	PK	Horizontal
3264.56	38.11	44.70	6.70	28.20	-9.80	28.31	54.00	-25.69	AV	Horizontal
4874.47	59.16	44.20	9.04	31.60	-3.56	55.60	74.00	-18.40	PK	Vertical
4874.47	39.42	44.20	9.04	31.60	-3.56	35.86	54.00	-18.14	AV	Vertical
4874.38	58.16	44.20	9.04	31.60	-3.56	54.60	74.00	-19.40	PK	Horizontal
4874.38	39.31	44.20	9.04	31.60	-3.56	35.75	54.00	-18.25	AV	Horizontal
5359.70	45.68	44.20	9.86	32.00	-2.34	43.34	74.00	-30.66	PK	Vertical
5359.70	37.09	44.20	9.86	32.00	-2.34	34.75	54.00	-19.25	AV	Vertical
5359.81	46.35	44.20	9.86	32.00	-2.34	44.01	74.00	-29.99	PK	Horizontal
5359.81	38.34	44.20	9.86	32.00	-2.34	36.00	54.00	-18.00	AV	Horizontal
7310.98	51.03	43.50	11.40	35.50	3.40	54.43	74.00	-19.57	PK	Vertical
7310.98	33.16	43.50	11.40	35.50	3.40	36.56	54.00	-17.44	AV	Vertical
7310.83	51.73	43.50	11.40	35.50	3.40	55.13	74.00	-18.87	PK	Horizontal
7310.83	33.72	43.50	11.40	35.50	3.40	37.12	54.00	-16.88	AV	Horizontal



802.11b High Channel

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna	Corrected	Emission		Margin (dB)	Detector Type	Comment
				Factor (dB/m)	Factor (dB)	Level (dBμV/m)	Limits (dBμV/m)			
High Channel (2462 MHz)										
3264.64	48.89	44.70	6.70	28.20	-9.80	39.09	74.00	-34.91	PK	Vertical
3264.64	38.44	44.70	6.70	28.20	-9.80	28.64	54.00	-25.36	AV	Vertical
3264.58	48.10	44.70	6.70	28.20	-9.80	38.30	74.00	-35.70	PK	Horizontal
3264.58	38.06	44.70	6.70	28.20	-9.80	28.26	54.00	-25.74	AV	Horizontal
4924.46	59.42	44.20	9.04	31.60	-3.56	55.86	74.00	-18.14	PK	Vertical
4924.46	39.30	44.20	9.04	31.60	-3.56	35.74	54.00	-18.26	AV	Vertical
4924.47	58.16	44.20	9.04	31.60	-3.56	54.60	74.00	-19.40	PK	Horizontal
4924.47	38.96	44.20	9.04	31.60	-3.56	35.40	54.00	-18.60	AV	Horizontal
5359.66	45.55	44.20	9.86	32.00	-2.34	43.21	74.00	-30.79	PK	Vertical
5359.66	37.59	44.20	9.86	32.00	-2.34	35.25	54.00	-18.75	AV	Vertical
5359.79	46.07	44.20	9.86	32.00	-2.34	43.73	74.00	-30.27	PK	Horizontal
5359.79	38.29	44.20	9.86	32.00	-2.34	35.95	54.00	-18.05	AV	Horizontal
7385.73	51.74	43.50	11.40	35.50	3.40	55.14	74.00	-18.86	PK	Vertical
7385.73	33.35	43.50	11.40	35.50	3.40	36.75	54.00	-17.25	AV	Vertical
7385.86	50.96	43.50	11.40	35.50	3.40	54.36	74.00	-19.64	PK	Horizontal
7385.86	34.00	43.50	11.40	35.50	3.40	37.40	54.00	-16.60	AV	Horizontal

Remark:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Scan with 802.11b, 802.11g, 802.11n (HT-20), 802.11n (HT-40) the worst case is 802.11b.
Emission Level = Reading + Factor
Margin = Limit - Emission Level
- The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



(18GHz – 25GHz)

802.11b Low Channel

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (2412 MHz)										
19523.59	39.09	32.16	12.57	43.60	24.01	63.10	74.00	-10.90	PK	Vertical
19523.59	27.72	32.16	12.57	43.60	24.01	51.73	54.00	-2.27	AV	Vertical
19523.73	39.00	32.16	12.57	43.60	24.01	63.01	74.00	-10.99	PK	Horizontal
19523.73	27.02	32.16	12.57	43.60	24.01	51.03	54.00	-2.97	AV	Horizontal
23890.76	38.71	30.57	13.92	43.20	26.55	65.26	74.00	-8.74	PK	Vertical
23890.76	25.89	30.57	13.92	43.20	26.55	52.44	54.00	-1.56	AV	Vertical
23890.68	37.94	30.57	13.92	43.20	26.55	64.49	74.00	-9.51	PK	Horizontal
23890.68	26.66	30.57	13.92	43.20	26.55	53.21	54.00	-0.79	AV	Horizontal
Mid Channel (2437 MHz)										
19523.53	37.88	32.16	12.57	43.60	24.01	61.89	74.00	-12.11	PK	Vertical
19523.53	27.05	32.16	12.57	43.60	24.01	51.06	54.00	-2.94	AV	Vertical
19523.66	38.72	32.16	12.57	43.60	24.01	62.73	74.00	-11.27	PK	Horizontal
19523.66	26.28	32.16	12.57	43.60	24.01	50.29	54.00	-3.71	AV	Horizontal
23890.77	38.08	30.57	13.92	43.20	26.55	64.63	74.00	-9.37	PK	Vertical
23890.77	27.59	30.57	13.92	43.20	26.55	54.14	54.00	0.14	AV	Vertical
23890.58	38.09	30.57	13.92	43.20	26.55	64.64	74.00	-9.36	PK	Horizontal
23890.58	27.56	30.57	13.92	43.20	26.55	54.11	54.00	0.11	AV	Horizontal
High Channel (2462 MHz)										
19523.67	38.96	32.16	12.57	43.60	24.01	62.97	74.00	-11.03	PK	Vertical
19523.67	26.28	32.16	12.57	43.60	24.01	50.29	54.00	-3.71	AV	Vertical
19523.74	39.22	32.16	12.57	43.60	24.01	63.23	74.00	-10.77	PK	Horizontal
19523.74	26.54	32.16	12.57	43.60	24.01	50.55	54.00	-3.45	AV	Horizontal
23890.75	38.36	30.57	13.92	43.20	26.55	64.91	74.00	-9.09	PK	Vertical
23890.75	27.11	30.57	13.92	43.20	26.55	53.66	54.00	-0.34	AV	Vertical
23890.77	38.04	30.57	13.92	43.20	26.55	64.59	74.00	-9.41	PK	Horizontal
23890.77	26.12	30.57	13.92	43.20	26.55	52.67	54.00	-1.33	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11b, 802.11g, 802.11n (HT-20), 802.11n (HT-40) the worst case is 802.11b.
 Emission Level = Reading + Factor
 Margin = Limit - Emission Level
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



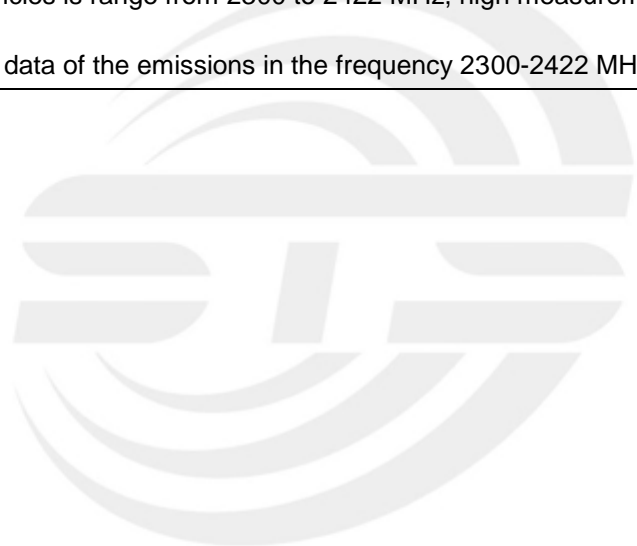
3.3.7 TEST RESULTS (BAND EDGE REQUIREMENTS)

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna	Corrected	Emission		Margin (dB)	Detector Type	Comment
				Factor (dB/m)	Factor (dB)	Level (dBμV/m)	Limits (dBμV/m)			
802.11b										
2390.00	67.19	43.80	4.91	25.90	-12.99	54.20	74.00	-19.80	PK	Vertical
2390.00	53.61	43.80	4.91	25.90	-12.99	40.62	54.00	-13.38	AV	Vertical
2390.00	69.11	43.80	4.91	25.90	-12.99	56.12	74.00	-17.88	PK	Horizontal
2390.00	52.13	43.80	4.91	25.90	-12.99	39.14	54.00	-14.86	AV	Horizontal
2483.50	69.61	43.80	5.12	25.90	-12.78	56.83	74.00	-17.17	PK	Vertical
2483.50	52.08	43.80	5.12	25.90	-12.78	39.30	54.00	-14.70	AV	Vertical
2483.50	70.42	43.80	5.12	25.90	-12.78	57.64	74.00	-16.36	PK	Horizontal
2483.50	52.25	43.80	5.12	25.90	-12.78	39.47	54.00	-14.53	AV	Horizontal
802.11g										
2390.00	66.75	43.80	4.91	25.90	-12.99	53.76	74.00	-20.24	PK	Vertical
2390.00	52.84	43.80	4.91	25.90	-12.99	39.85	54.00	-14.15	AV	Vertical
2390.00	65.76	43.80	4.91	25.90	-12.99	52.77	74.00	-21.23	PK	Horizontal
2390.00	53.40	43.80	4.91	25.90	-12.99	40.41	54.00	-13.59	AV	Horizontal
2483.50	66.32	43.80	5.12	25.90	-12.78	53.54	74.00	-20.46	PK	Vertical
2483.50	52.88	43.80	5.12	25.90	-12.78	40.10	54.00	-13.90	AV	Vertical
2483.50	65.90	43.80	5.12	25.90	-12.78	53.12	74.00	-20.88	PK	Horizontal
2483.50	52.36	43.80	5.12	25.90	-12.78	39.58	54.00	-14.42	AV	Horizontal
802.11n20										
2390.00	66.94	43.80	4.91	25.90	-12.99	53.95	74.00	-20.05	PK	Vertical
2390.00	52.88	43.80	4.91	25.90	-12.99	39.89	54.00	-14.11	AV	Vertical
2390.00	65.45	43.80	4.91	25.90	-12.99	52.46	74.00	-21.54	PK	Horizontal
2390.00	53.52	43.80	4.91	25.90	-12.99	40.53	54.00	-13.47	AV	Horizontal
2483.50	65.21	43.80	5.12	25.90	-12.78	52.43	74.00	-21.57	PK	Vertical
2483.50	52.58	43.80	5.12	25.90	-12.78	39.80	54.00	-14.20	AV	Vertical
2483.50	66.40	43.80	5.12	25.90	-12.78	53.62	74.00	-20.38	PK	Horizontal
2483.50	52.86	43.80	5.12	25.90	-12.78	40.08	54.00	-13.92	AV	Horizontal



Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11n40										
2390.00	66.43	43.80	4.91	25.90	-12.99	53.44	74.00	-20.56	PK	Vertical
2390.00	53.09	43.80	4.91	25.90	-12.99	40.10	54.00	-13.90	AV	Vertical
2390.00	65.83	43.80	4.91	25.90	-12.99	52.84	74.00	-21.16	PK	Horizontal
2390.00	53.79	43.80	4.91	25.90	-12.99	40.80	54.00	-13.20	AV	Horizontal
2483.50	65.99	43.80	5.12	25.90	-12.78	53.21	74.00	-20.79	PK	Vertical
2483.50	53.00	43.80	5.12	25.90	-12.78	40.22	54.00	-13.78	AV	Vertical
2483.50	66.22	43.80	5.12	25.90	-12.78	53.44	74.00	-20.56	PK	Horizontal
2483.50	52.20	43.80	5.12	25.90	-12.78	39.42	54.00	-14.58	AV	Horizontal

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 Low measurement frequencies is range from 2300 to 2422 MHz, high measurement frequencies is range from 2452 to 2500 MHz.
 Only show the worst point data of the emissions in the frequency 2300-2422 MHz and 2452-2500 MHz.





4 CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 APPLIED PROCEDURES / LIMIT

According to FCC Part 15.247(d) and RSS-247 Clause 5.5, in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

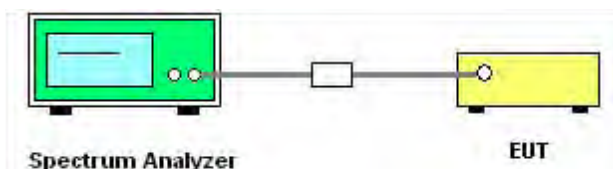
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 to 2422 MHz Upper Band Edge: 2452 to 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.5 EUT OPERATION CONDITIONS

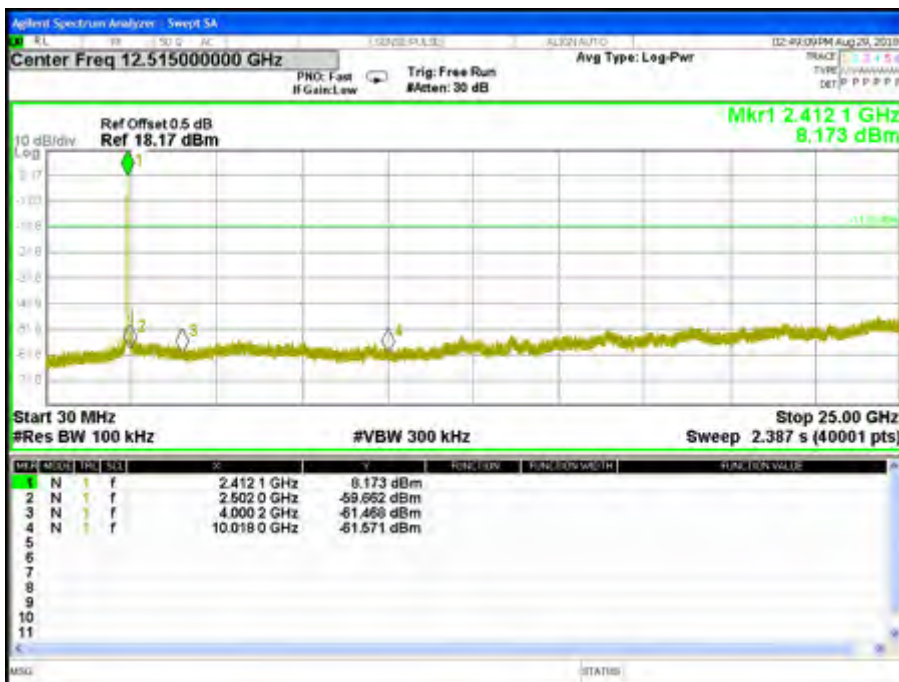
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



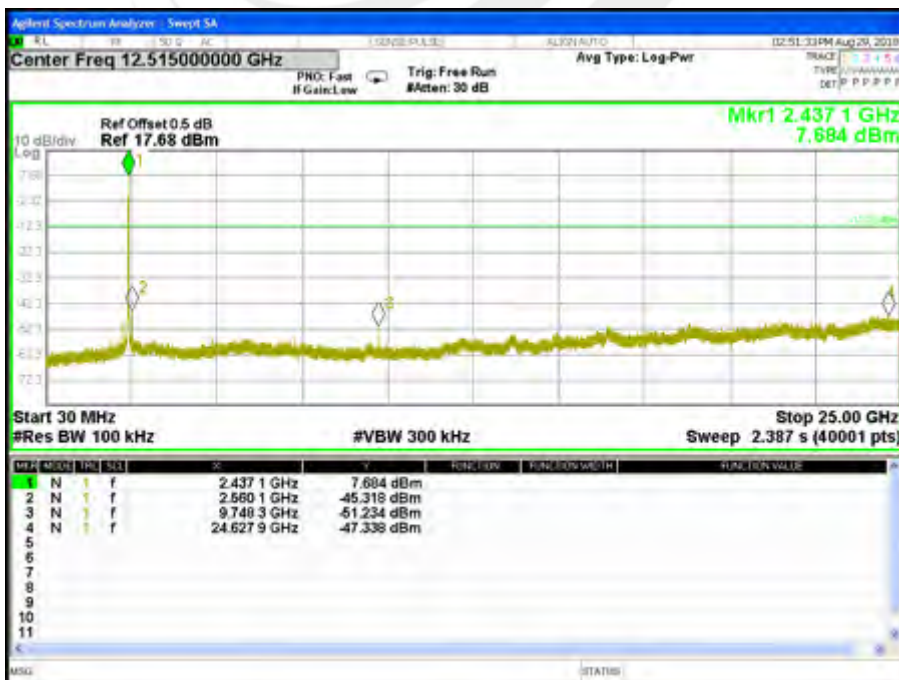
4.6 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 3.8V	Test Mode :	TX b Mode /CH01, CH06, CH11

CH 01

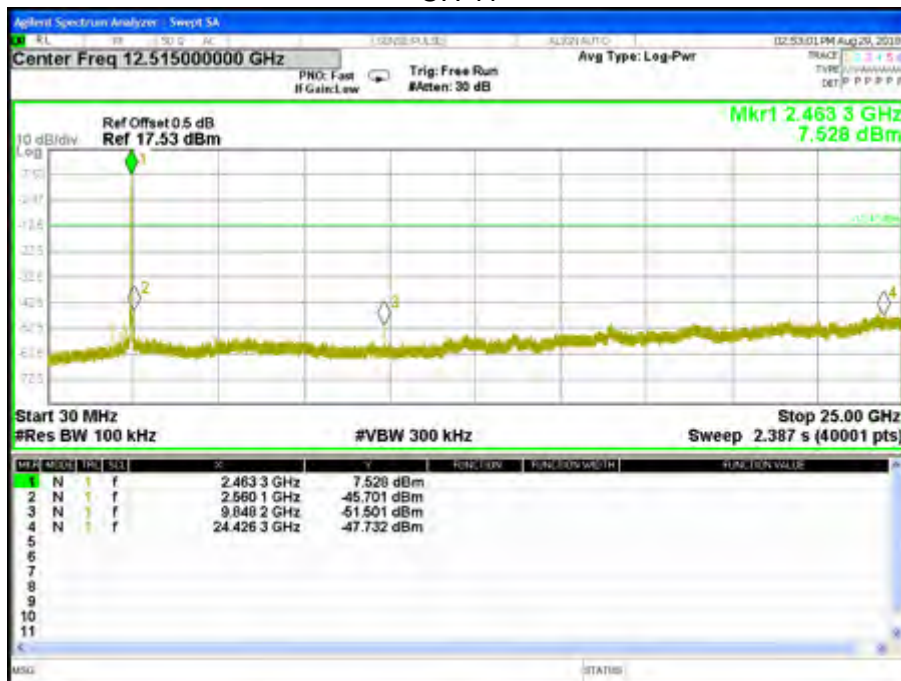


CH 06





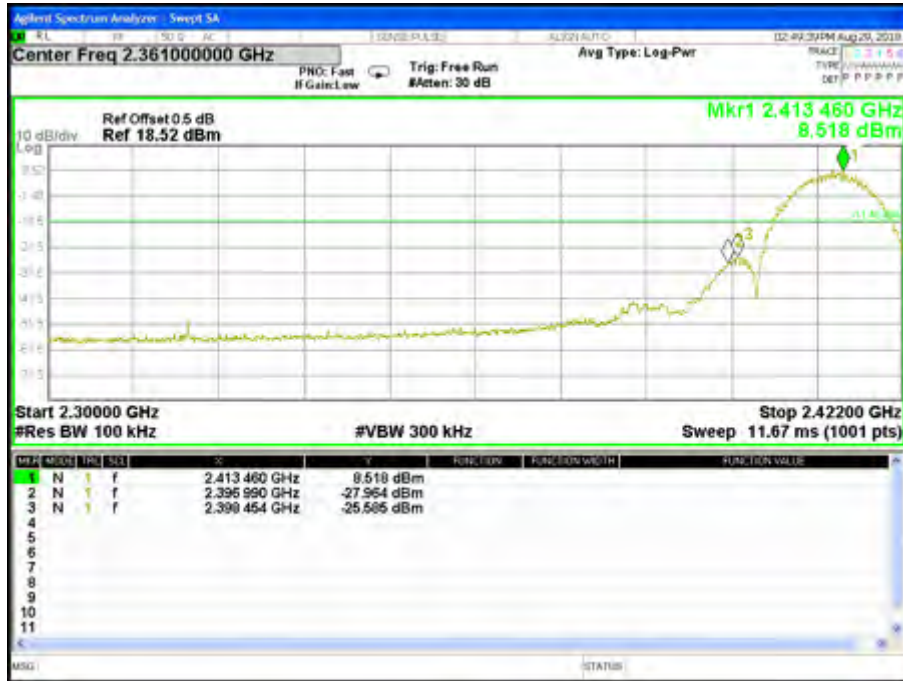
CH 11





Band edge

CH 01



CH 11



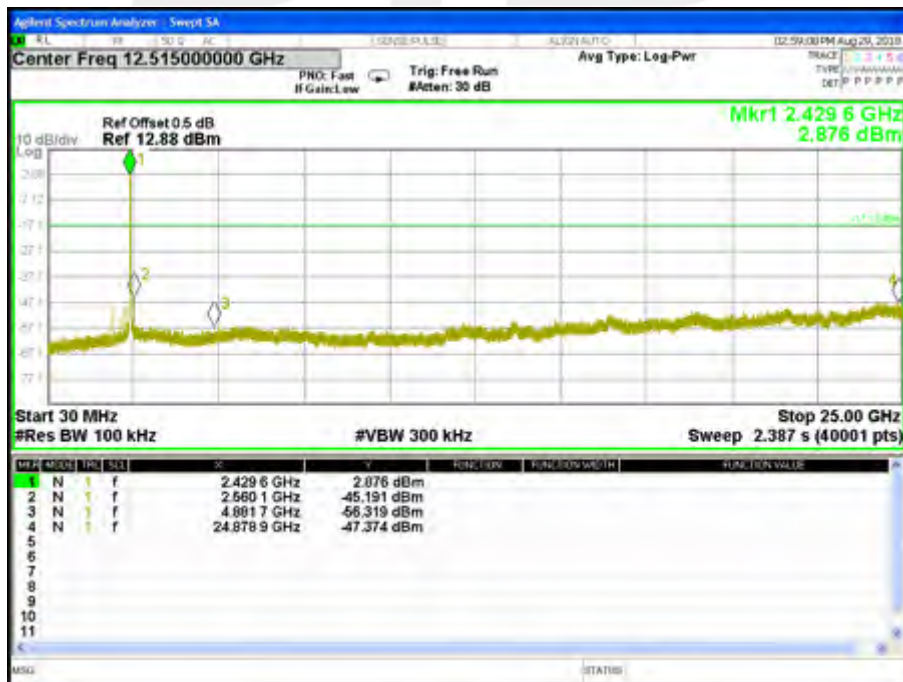


Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 3.8V	Test Mode :	TX g Mode /CH01, CH06, CH11

CH 01

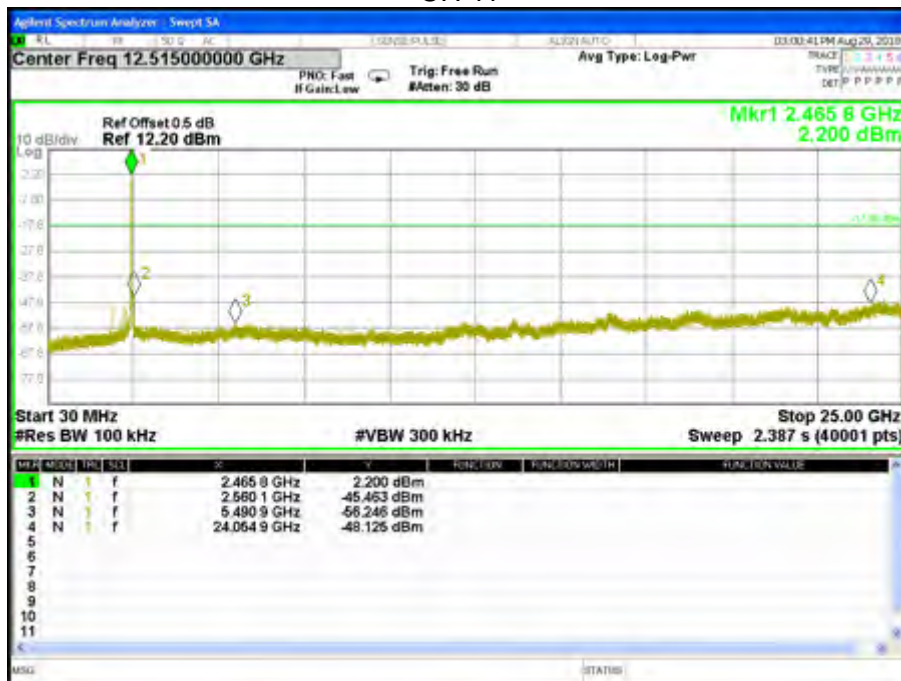


CH06





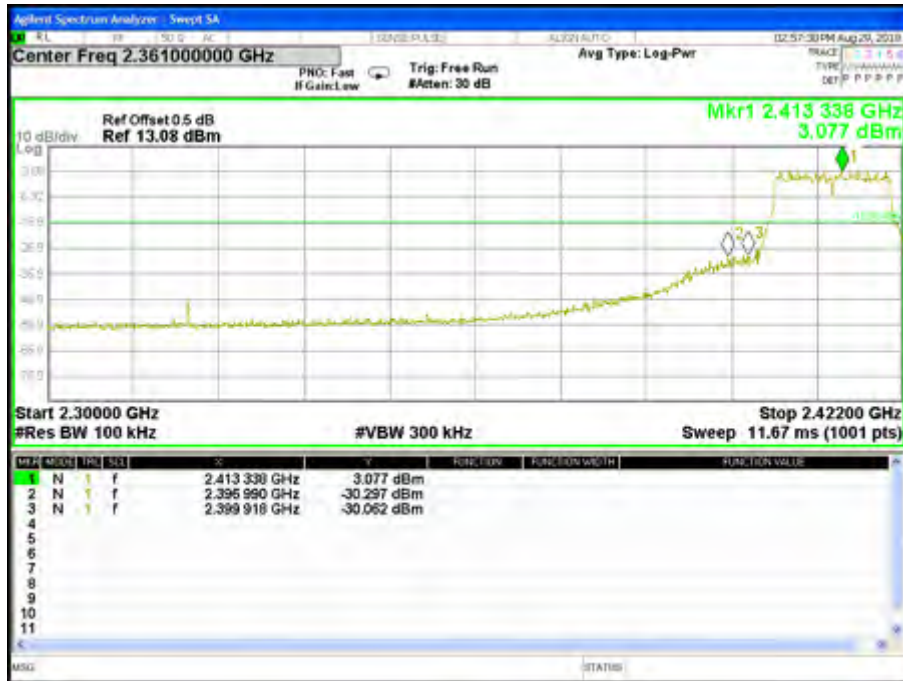
CH 11





Band edge

CH 01



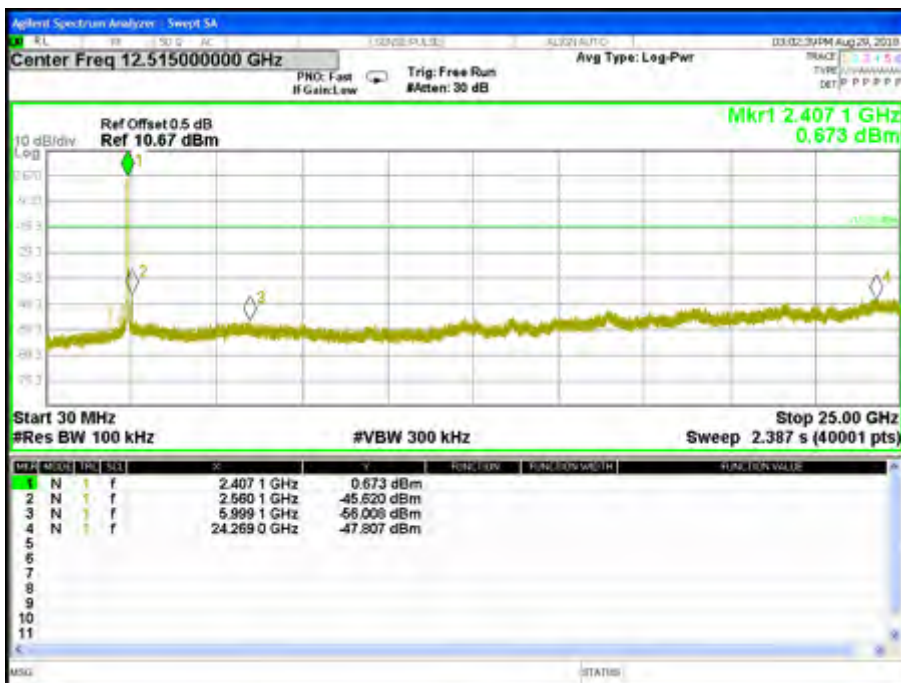
CH11





Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 3.8V	Test Mode :	TX n Mode(20M) /CH01, CH06, CH11

CH 01

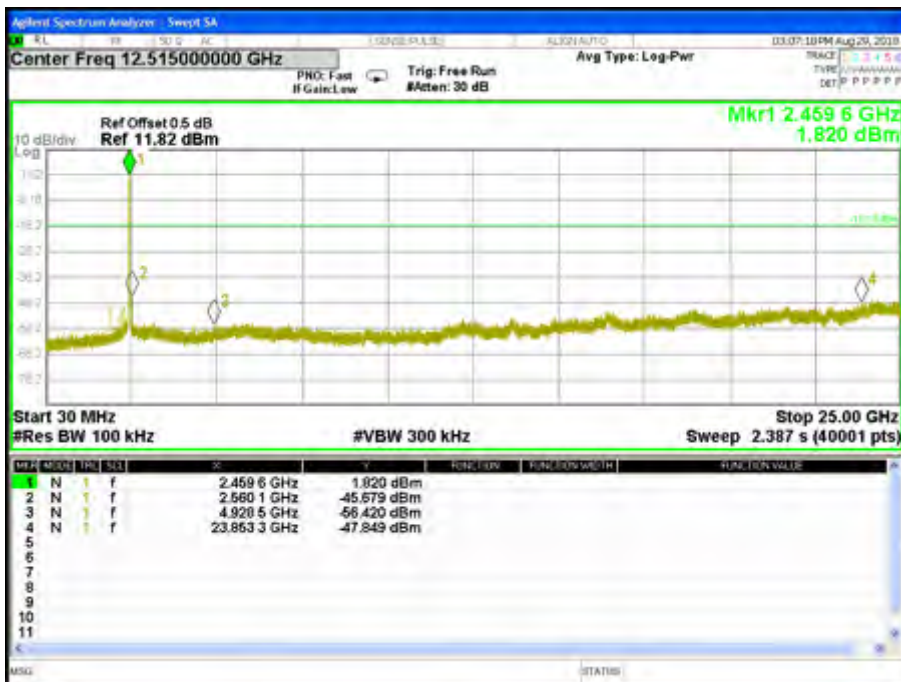


CH 06





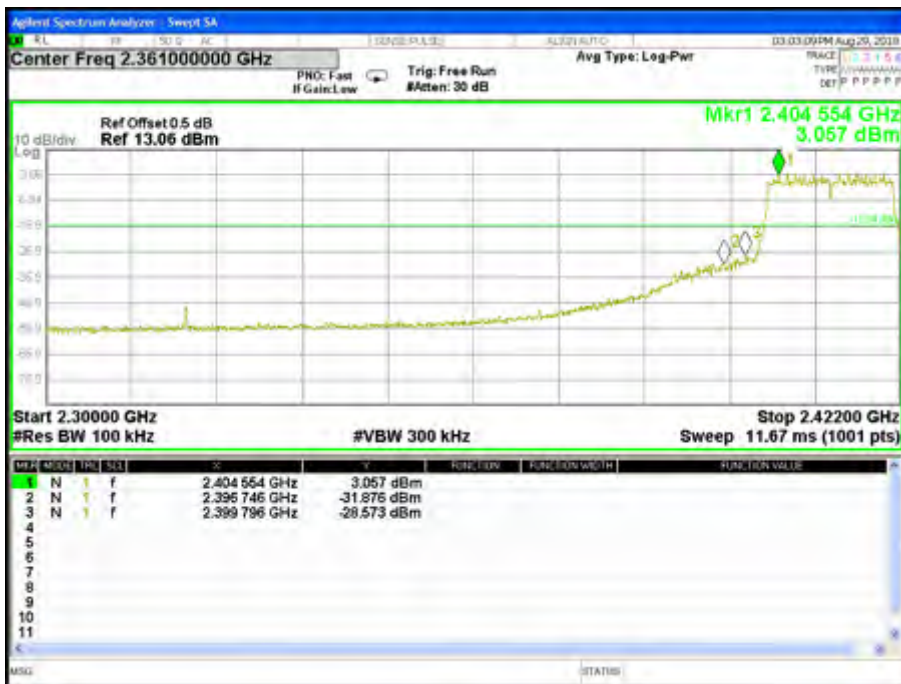
CH 11





Band edge

CH 01



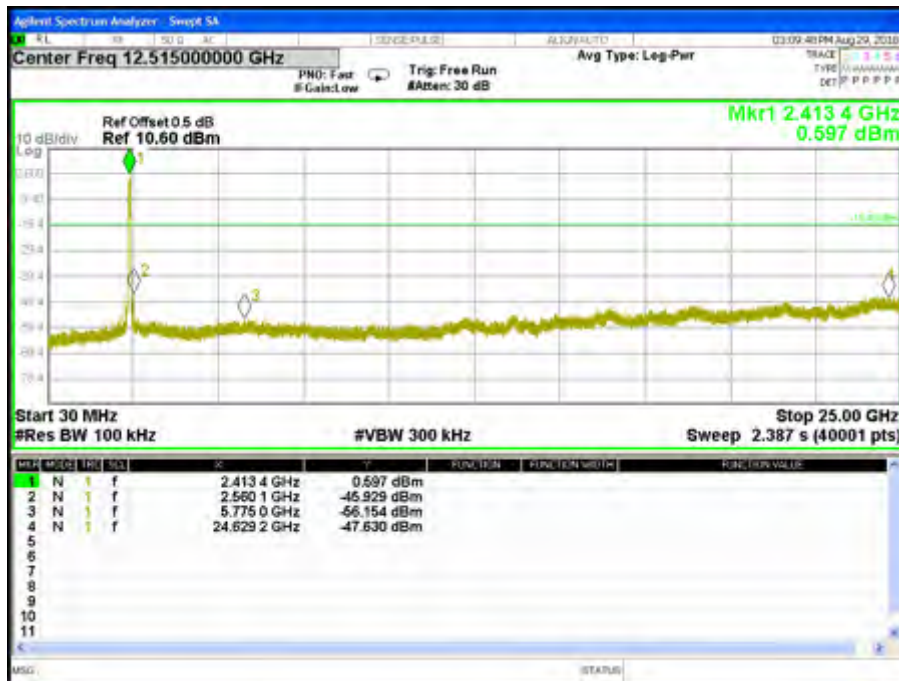
CH 11



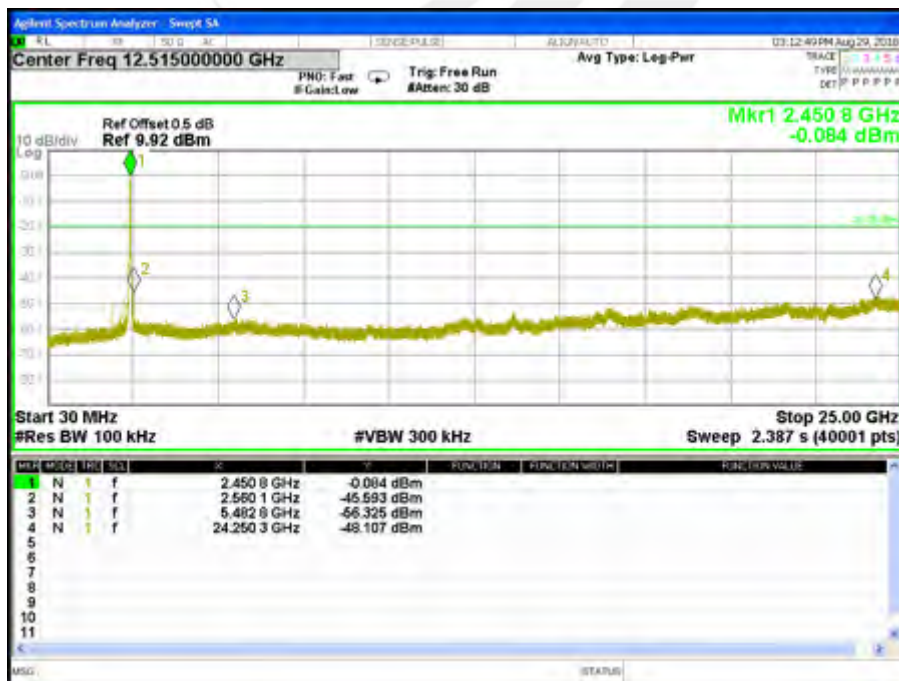


Temperature:	25 °C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

CH 03

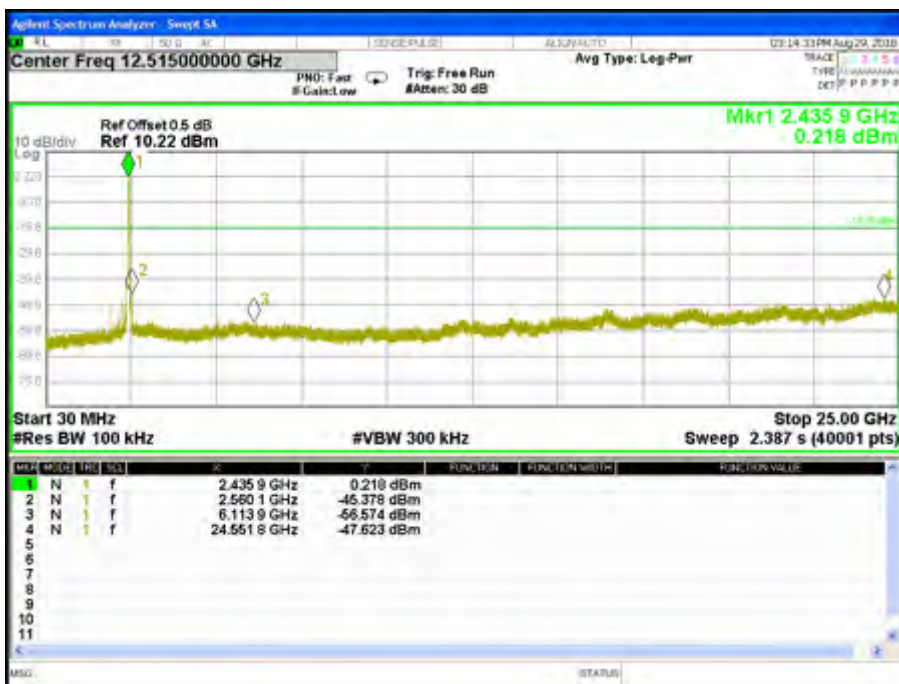


CH06





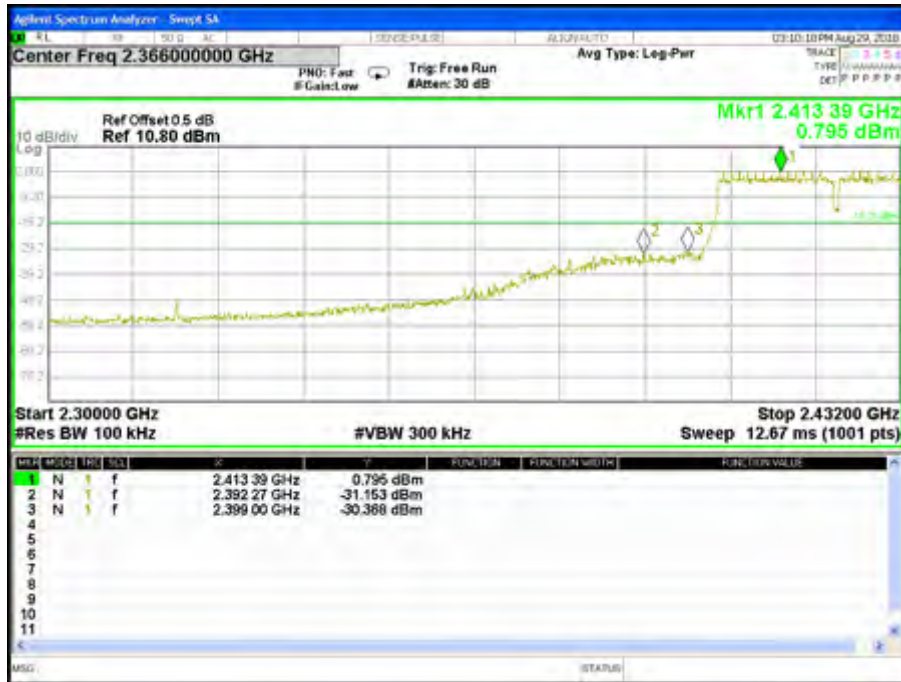
CH09



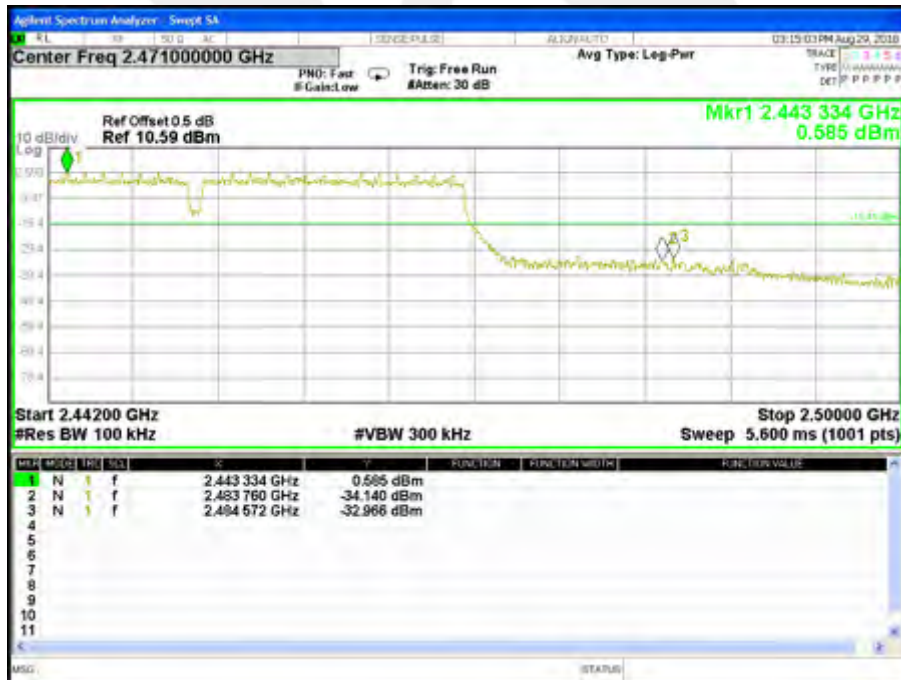


Band edge

CH03



CH 09





5 POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247, Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-247 Clause 5.2(b)	Power Spectral Density	≤ 8 dBm (RBW ≥ 3 kHz)	2400-2483.5	PASS

5.2 TEST PROCEDURE

- 1) Set analyzer center frequency to DTS channel center frequency.
- 2) Set the span to 1.5 times the DTS channel bandwidth.
- 3) Set the 100 kHz ≥ RBW ≥ 3 kHz.
- 4) Set the VBW ≥ 3 x RBW.
- 5) Detector = peak.
- 6) Sweep time = auto couple.
- 7) Trace mode = max hold.
- 8) Allow trace to fully stabilize.
- 9) Use the peak marker function to determine the maximum amplitude level.
- 10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

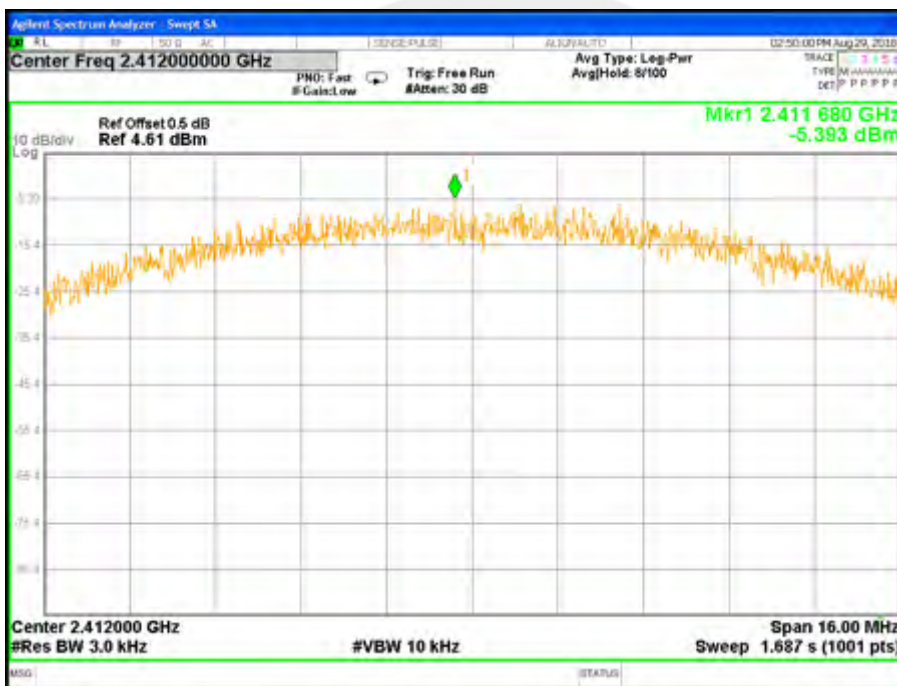


5.6 TEST RESULTS

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX b Mode /CH01, CH06, CH11

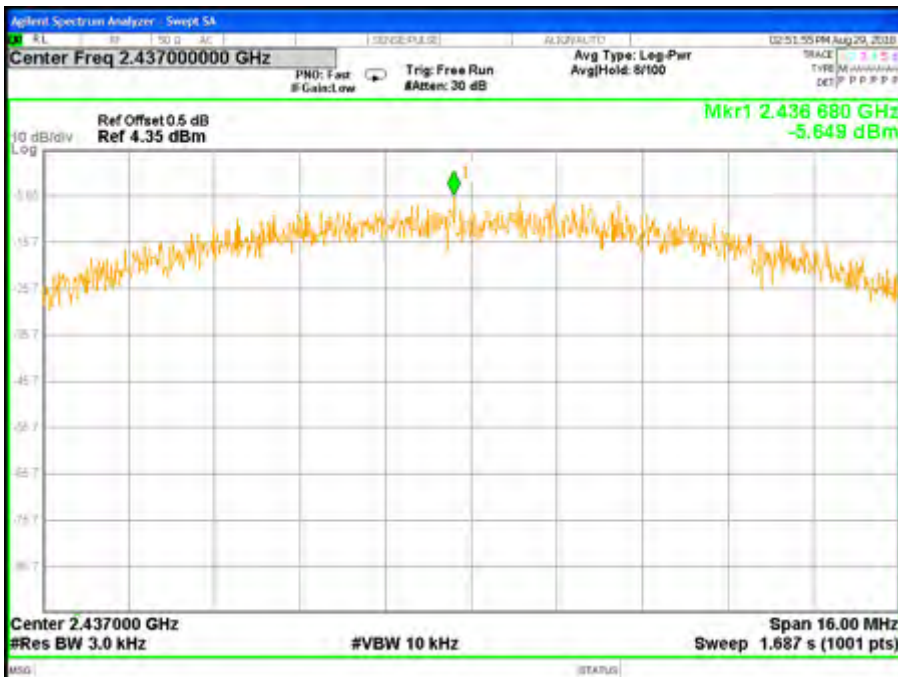
Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
b mode (1 Mbps)	2412.00	-5.393	≤ 8.00	PASS
	2437.00	-5.649	≤ 8.00	PASS
	2462.00	-5.877	≤ 8.00	PASS

TX CH01

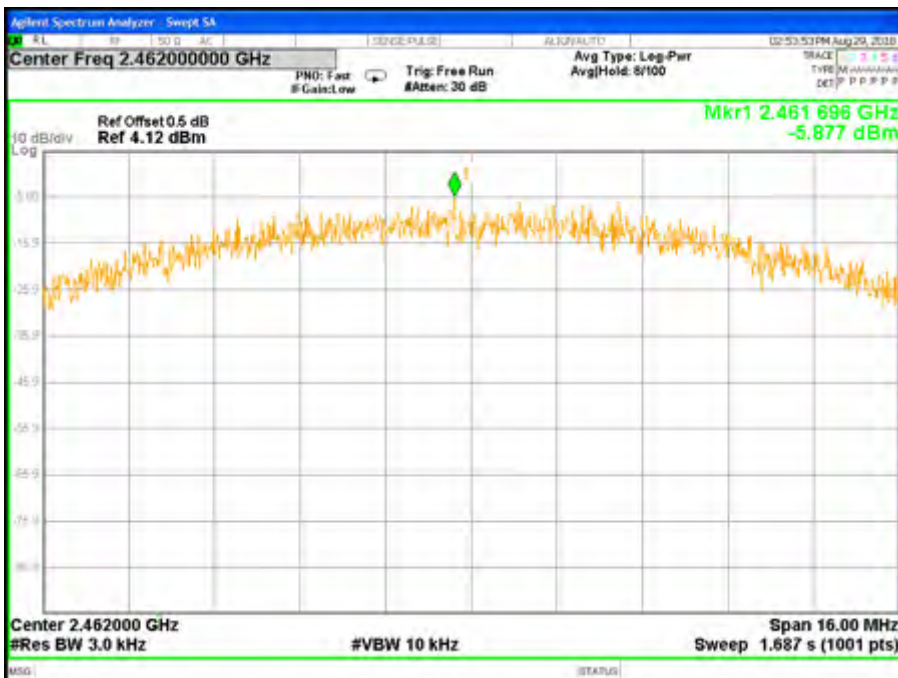




TX CH06



TX CH11





Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX g Mode /CH01, CH06, CH11

Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
g mode (6 Mbps)	2412.00	-10.273	≤ 8.00	PASS
	2437.00	-12.254	≤ 8.00	PASS
	2462.00	-11.474	≤ 8.00	PASS

TX CH01





TX CH06



TX CH11





Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

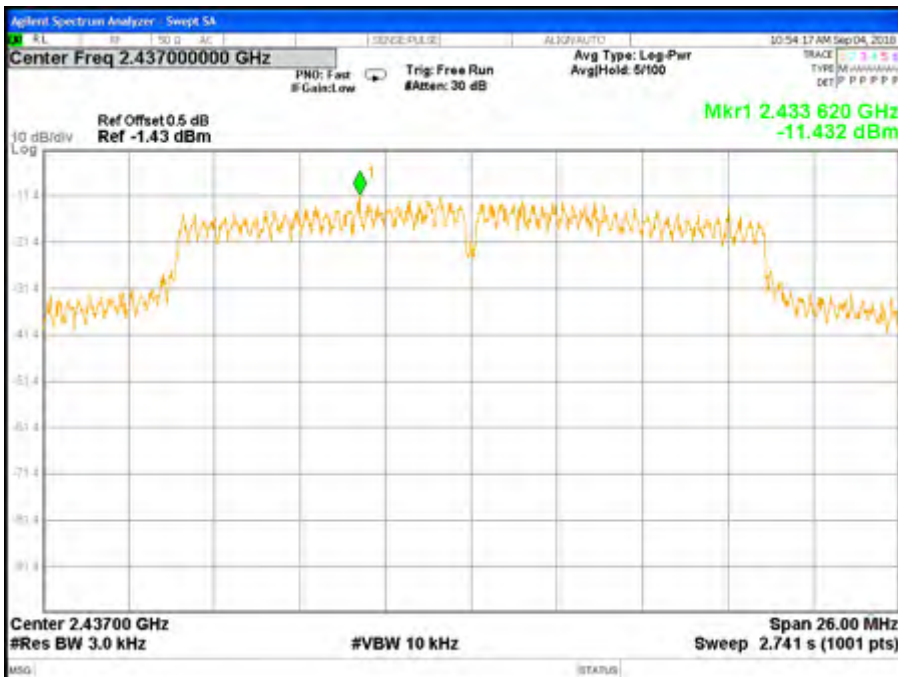
Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
n(HT20) mode (MCS0)	2412.00	-11.018	≤ 8.00	PASS
	2437.00	-11.432	≤ 8.00	PASS
	2462.00	-12.212	≤ 8.00	PASS

TX CH01





TX CH06



TX CH11

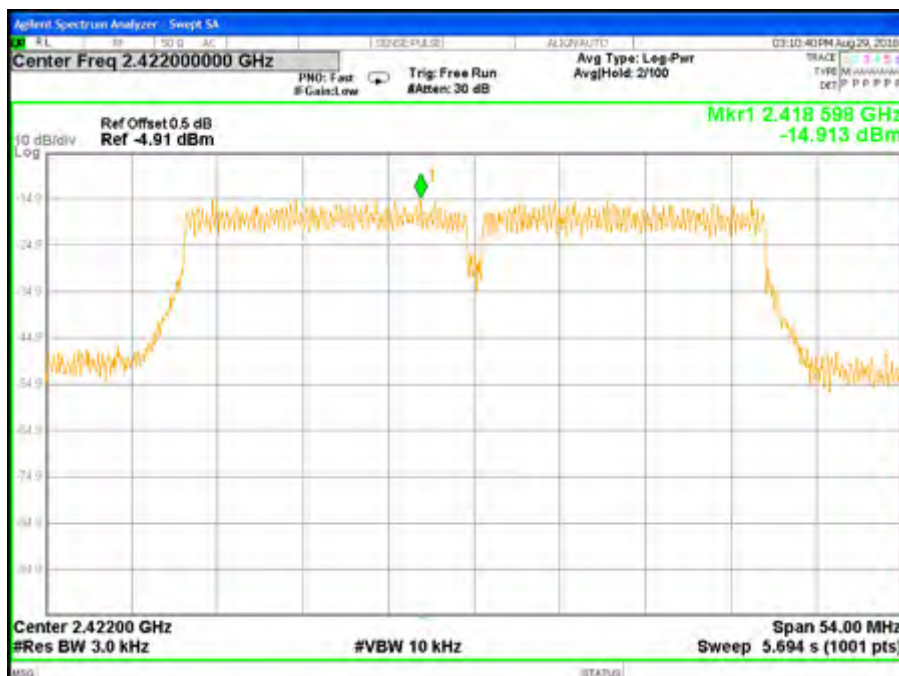




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
n(HT40) mode (MCS0)	2422.00	-14.913	≤ 8.00	PASS
	2437.00	-15.068	≤ 8.00	PASS
	2452.00	-15.196	≤ 8.00	PASS

TX CH03





TX CH06



TX CH09





6 BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C RSS-247 Issue 2&RSS-Gen Issue 5				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) RSS-247 Clause 5.2(b)	6dB Bandwidth	$\geq 500\text{KHz}$	2400-2483.5	PASS
RSS-Gen Clause 6.6	99%Bandwidth	-	2400-2483.5	PASS

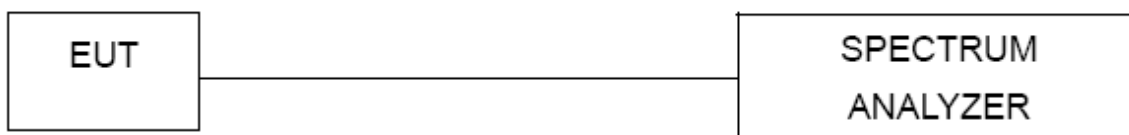
6.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW \geq 3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULTS

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX b Mode /CH01, CH06, CH11

Remark: PEAK DETECTOR IS USED

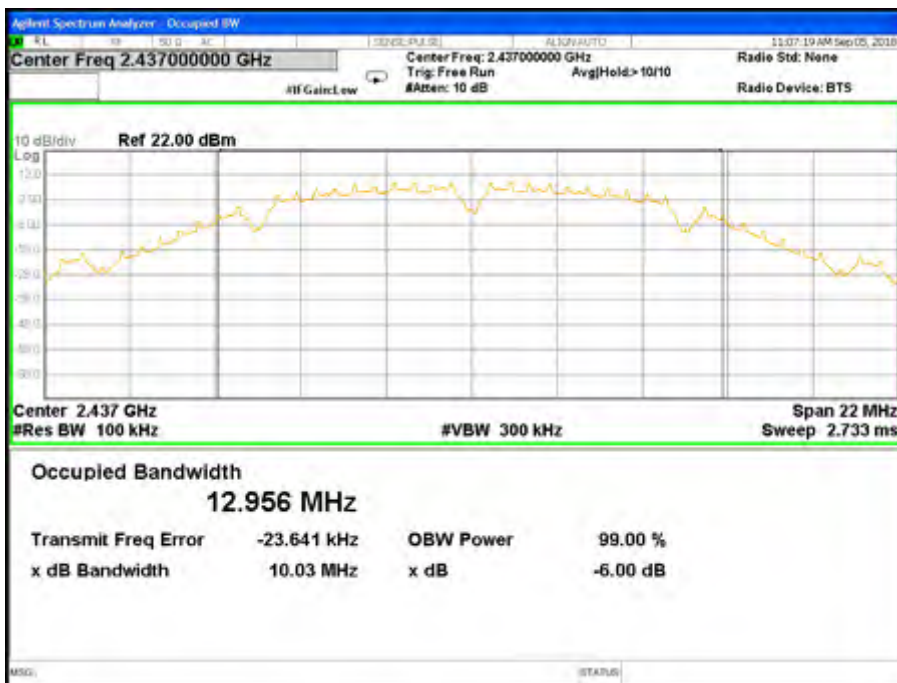
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
b mode (1 Mbps)	2412.00	9.55	12.54	≥ 0.50	PASS
	2437.00	10.03	12.98	≥ 0.50	PASS
	2462.00	9.56	13.00	≥ 0.50	PASS

6dB Bandwidth TX CH 01

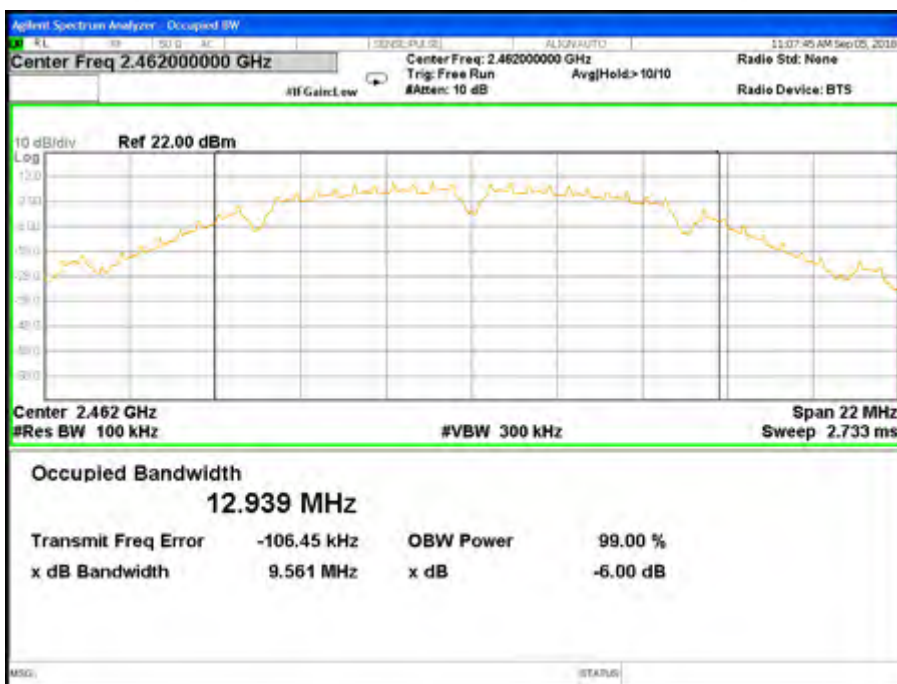




6dB Bandwidth TX CH 06

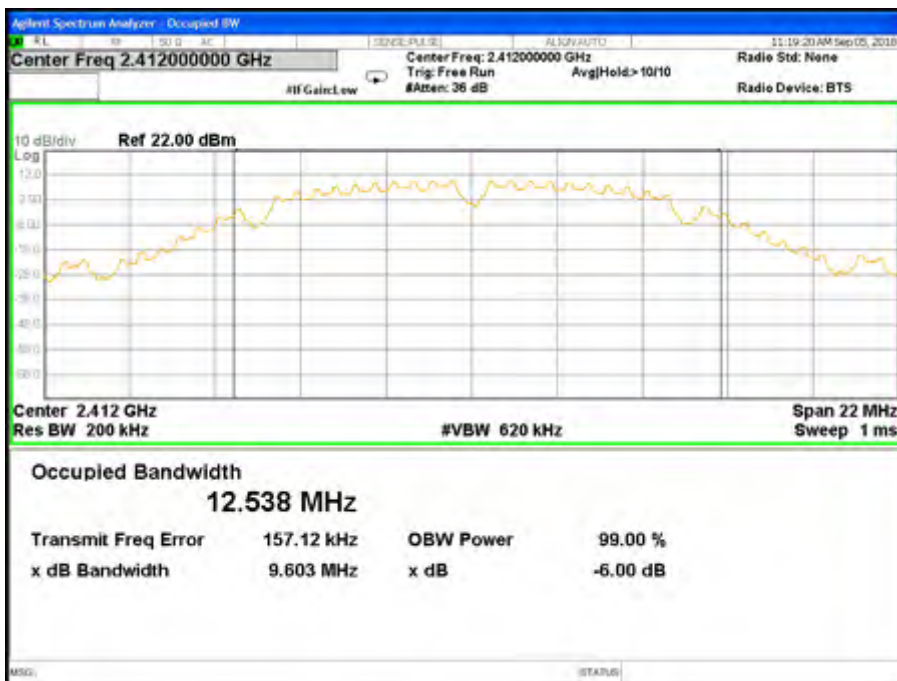


6dB Bandwidth TX CH 11

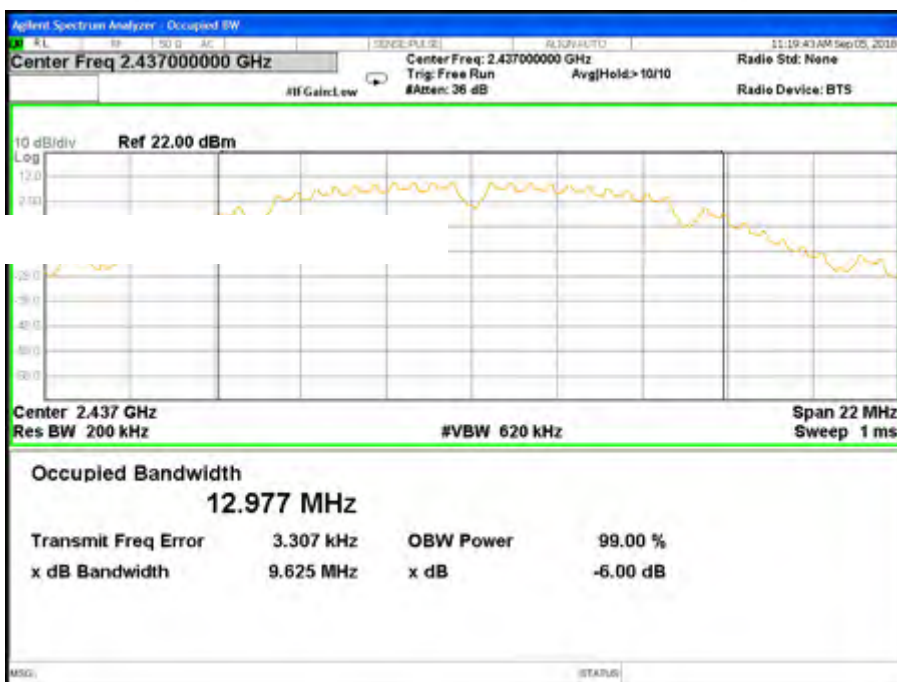




99% Bandwidth TX CH 01

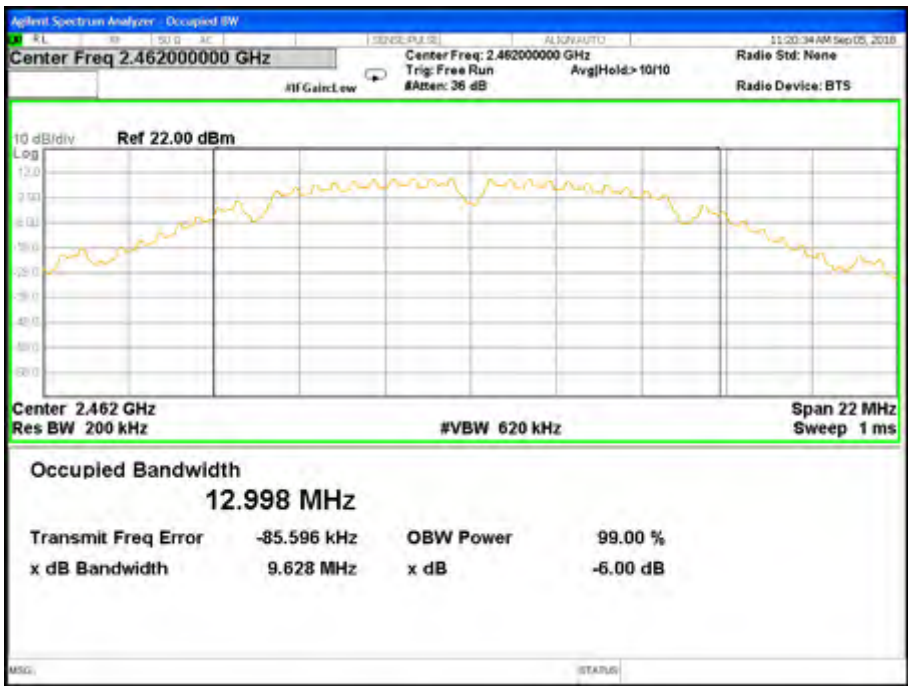


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11

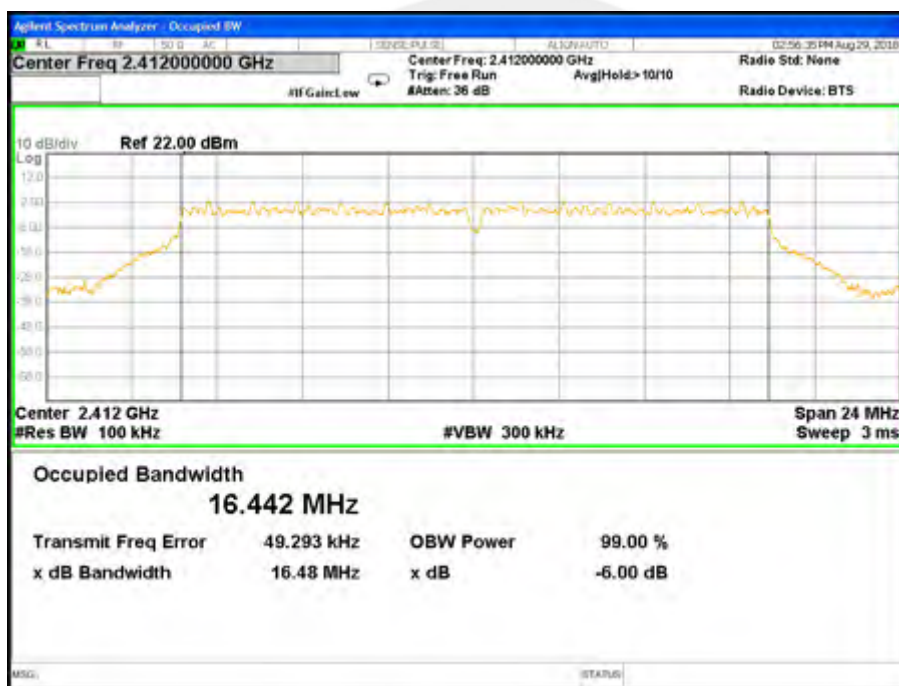




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX g Mode /CH01, CH06, CH11

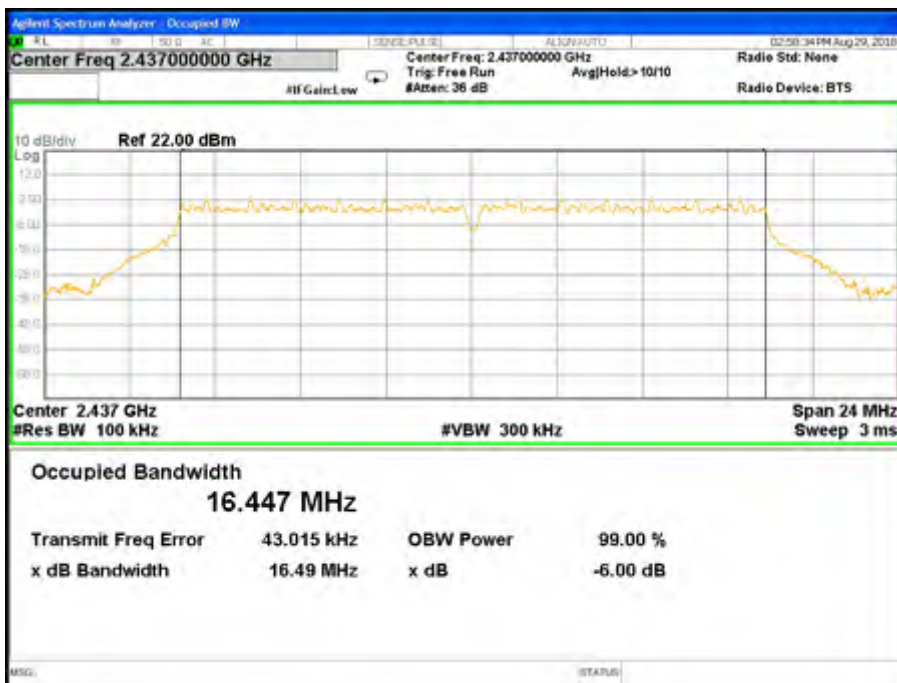
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
g mode (6 Mbps)	2412.00	16.48	16.43	≥ 0.50	PASS
	2437.00	16.49	16.41	≥ 0.50	PASS
	2462.00	16.48	16.40	≥ 0.50	PASS

6dB Bandwidth TX CH 01





6dB Bandwidth TX CH 06

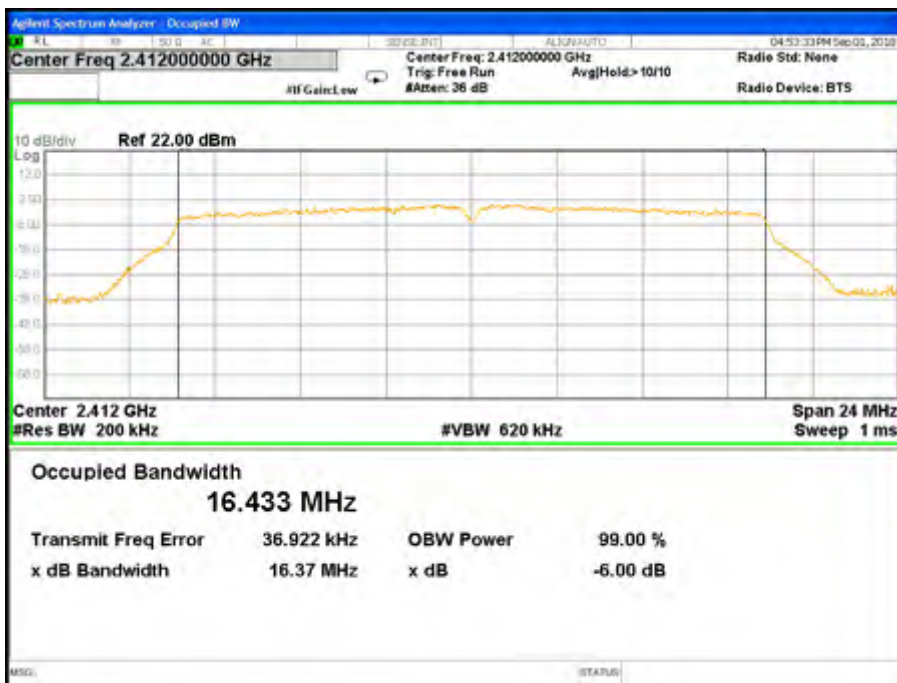


6dB Bandwidth TX CH 11

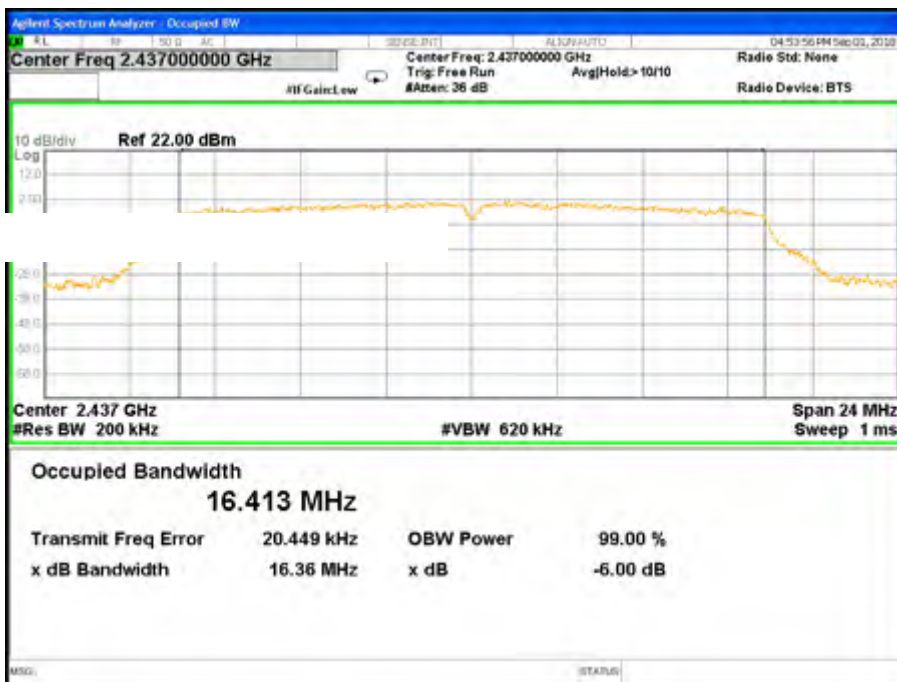




99% Bandwidth TX CH 01

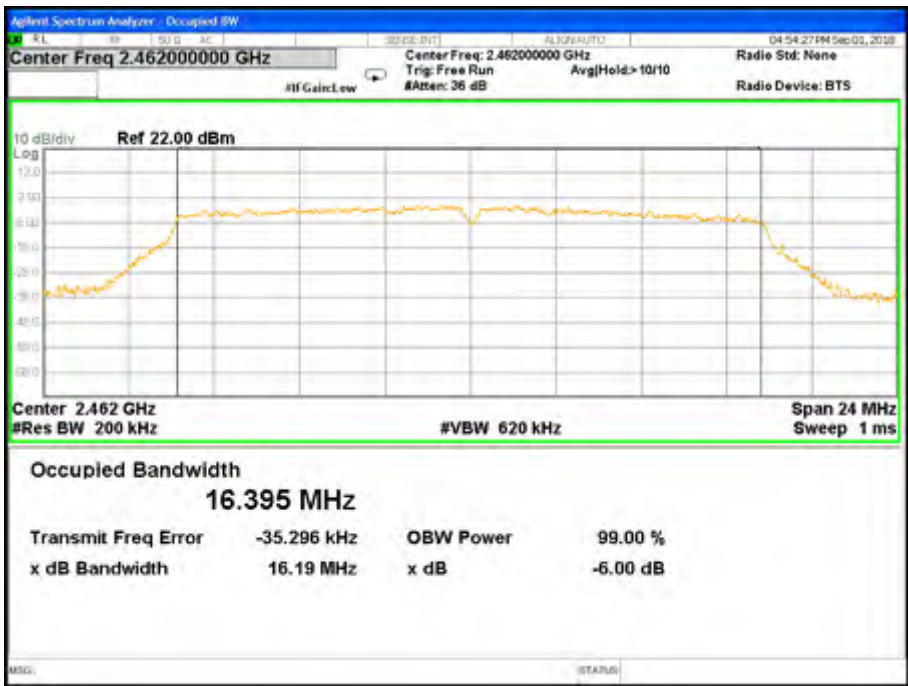


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11

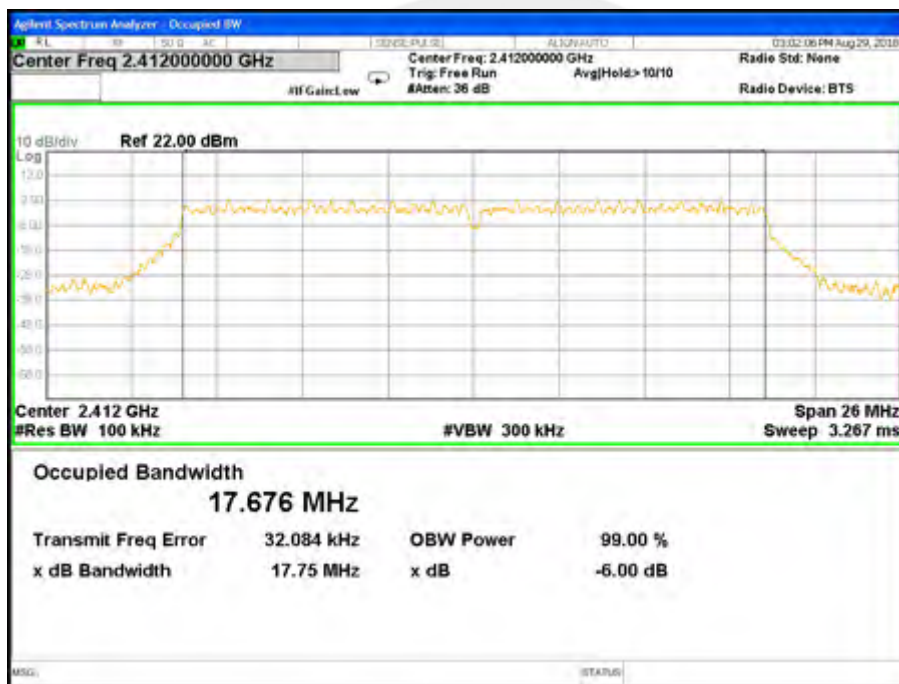




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

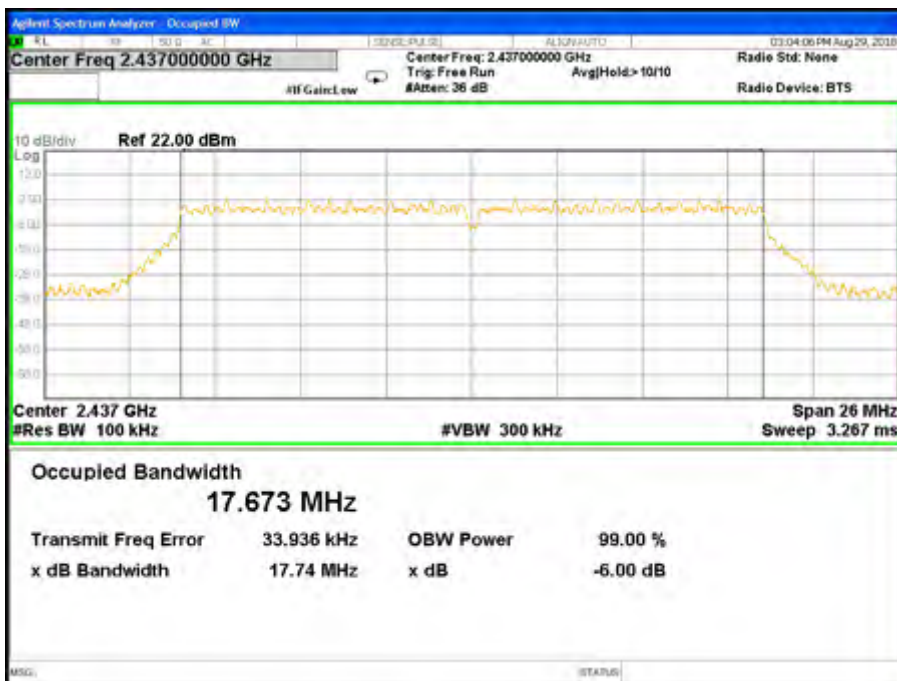
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
n(HT20) mode (MCS0)	2412.00	17.75	17.56	≥ 0.50	PASS
	2437.00	17.74	17.70	≥ 0.50	PASS
	2462.00	17.73	17.57	≥ 0.50	PASS

6dB Bandwidth TX CH 01

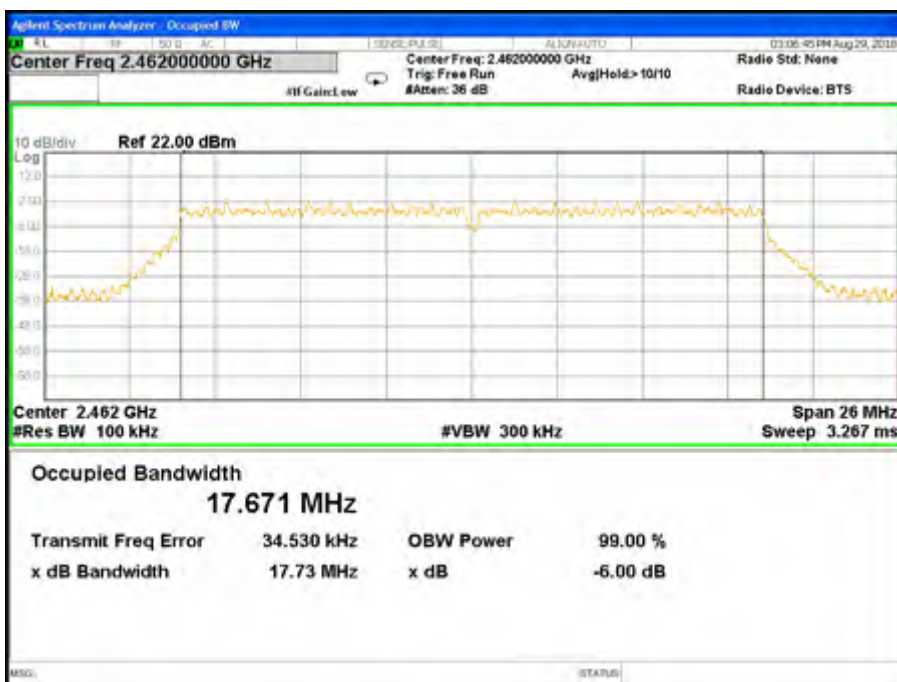




6dB Bandwidth TX CH 06

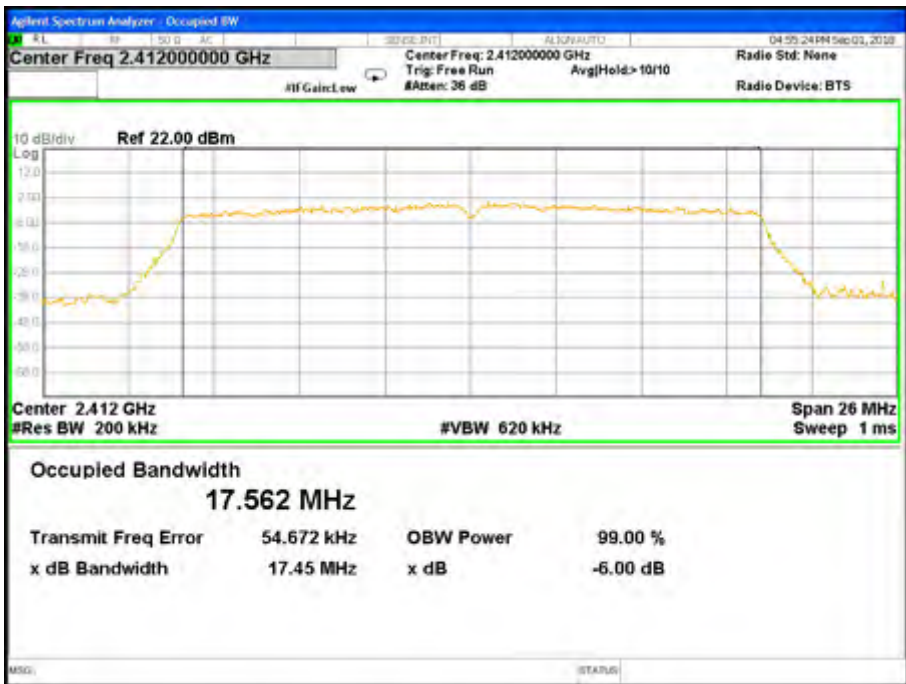


6dB Bandwidth TX CH 11

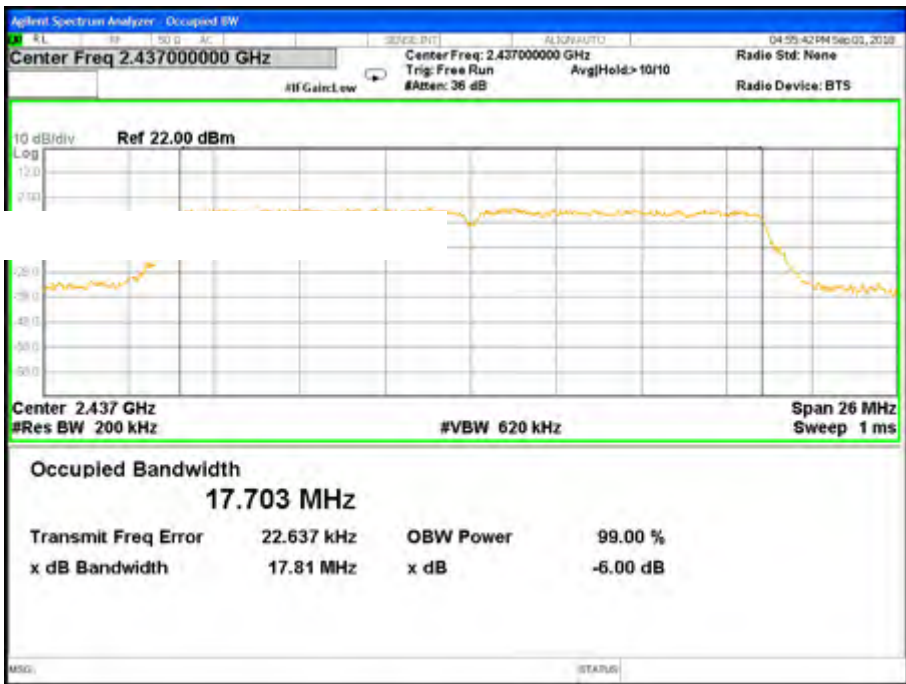




99% Bandwidth TX CH 01

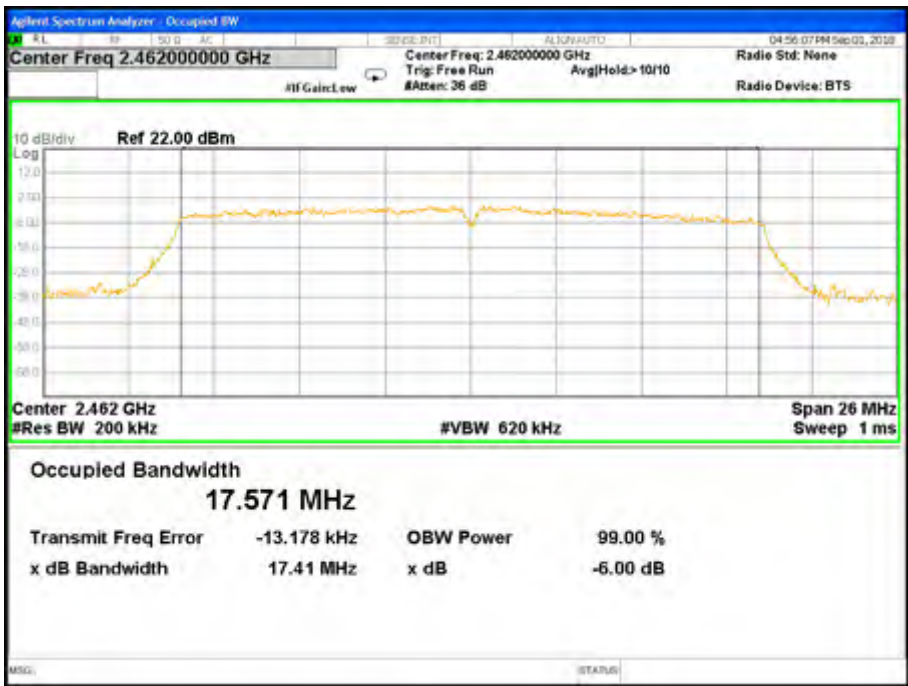


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11





Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

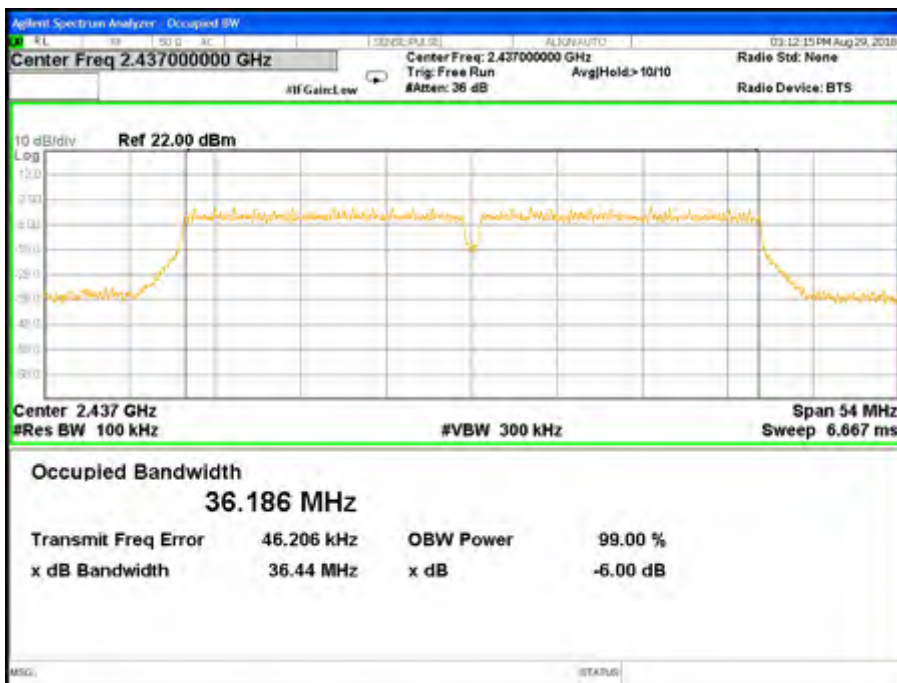
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
n(HT40) mode (MCS0)	2422.00	36.45	36.16	≥ 0.50	PASS
	2437.00	36.44	35.89	≥ 0.50	PASS
	2452.00	36.43	36.07	≥ 0.50	PASS

6dB Bandwidth TX CH 03

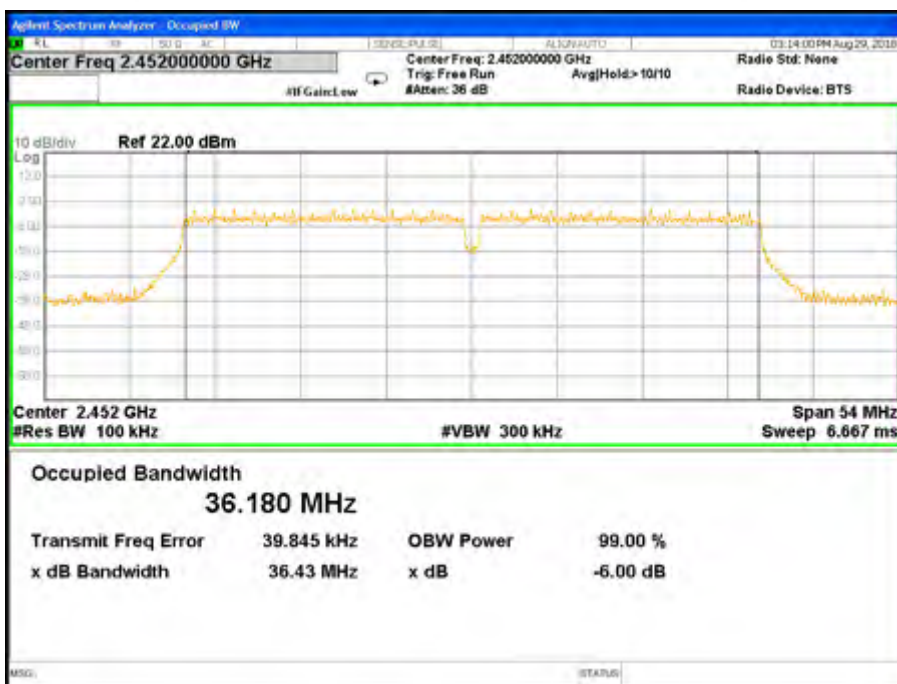




6dB Bandwidth TX CH 06

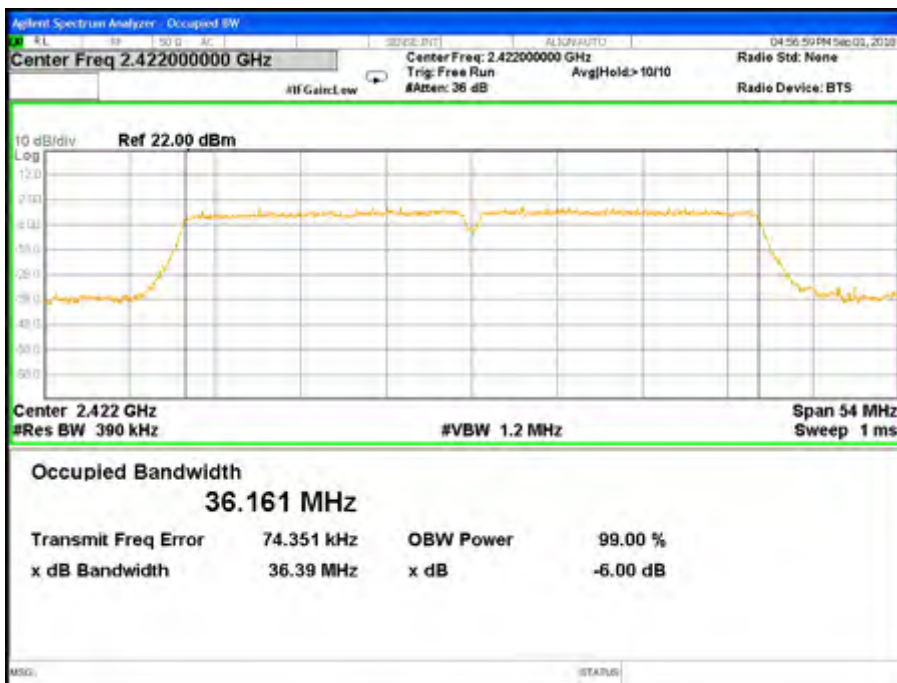


6dB Bandwidth TX CH 09

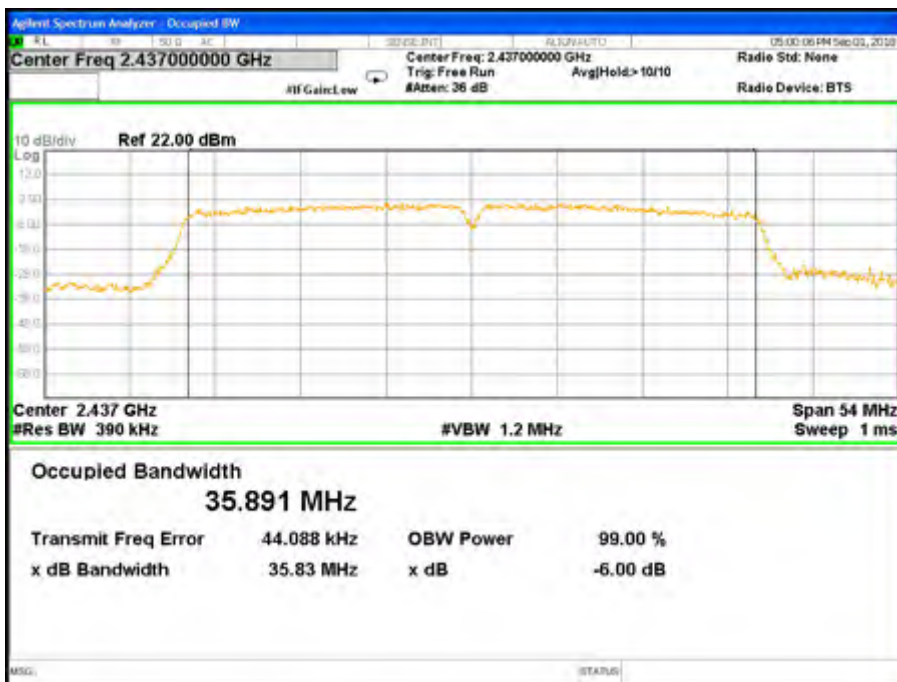




99% Bandwidth TX CH 03



99% Bandwidth TX CH 06





99% Bandwidth TX CH 09





7 PEAK OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247, Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS-247 Clause 5.4(d)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

7.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power Meter

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



7.6 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 3.8V		

TX 802.11 b mode (1 Mbps)				
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		Peak(dBm)	AVG(dBm)	
CH01	2412.00	18.26	17.34	30.00
CH06	2437.00	18.34	16.92	30.00
CH11	2462.00	17.07	16.52	30.00

TX 802.11 g mode (6 Mbps)				
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		Peak(dBm)	AVG(dBm)	
CH01	2412.00	15.51	15.27	30.00
CH06	2437.00	15.82	14.71	30.00
CH11	2462.00	14.48	14.27	30.00

TX 802.11 n(HT20) mode (MCS0)				
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		Peak(dBm)	AVG(dBm)	
CH01	2412.00	16.65	15.29	30.00
CH06	2437.00	16.21	14.93	30.00
CH11	2462.00	15.60	14.54	30.00

TX 802.11 n(HT40) mode (MCS0)				
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		Peak(dBm)	AVG(dBm)	
CH03	2422.00	16.73	15.72	30.00
CH06	2437.00	16.88	15.48	30.00
CH09	2452.00	16.27	15.37	30.00



8 ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 and RSS-Gen Issue 5 requirement: For intentional device, according to 15.203 and RSS-Gen Issue 5: 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.

8.2 EUT ANTENNA

The EUT antenna is Integral Antenna. It complies with the standard requirement.

