

FCC C2PC Test Report

FCC ID : NKR-P75
Equipment : Wireless LAN Adaptor
Model No. : DNUA-P75
Brand Name : Panasonic
Applicant : Wistron NeWeb Corp.
Address : 20 Park Avenue II, Hsinchu Science Park,
Hsinchu 308, Taiwan, R.O.C.
Standard : 47 CFR FCC Part 15.407
Received Date : Apr. 15, 2016
Tested Date : Apr. 19 ~ Apr. 22, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:



Gary Chang / Manager



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	The Equipment List	8
1.5	Testing Applied Standards	9
1.6	Measurement Uncertainty	9
2	TEST CONFIGURATION	10
2.1	Testing Condition	10
2.2	The Worst Test Modes and Channel Details	10
3	TRANSMITTER TEST RESULTS.....	11
3.1	Conducted Emissions.....	11
3.2	Emission Bandwidth	14
3.3	RF Output Power	16
3.4	Peak Power Spectral Density	17
3.5	Transmitter Radiated and Band Edge Emissions	19
3.6	Frequency Stability	56
4	TEST LABORATORY INFORMATION	58

Release Record

Report No.	Version	Description	Issued Date
FR381701-03	Rev. 01	Initial issue	May 05, 2016

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.391MHz 34.55 (Margin -13.48dB) - AV	Pass
15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 11490.00MHz 52.99 (Margin -1.01dB) - AV [dBuV/m at 3m]: 11570.00MHz 52.99 (Margin -1.01dB) - AV	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	RF Output Power	Max Power [dBm]: 18.49	Pass
15.407(a)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

This report is issued as a FCC Class II Permissive Change for complying with New U-NII rule requirement. Only test results of U-NII band 3 are recorded in this report. There are No test results of U-NII band 1/2A/2C in this report since

- 1) Output power of U-NII band 1 is not changed.
- 2) Requirement of U-NII band 2A/2C is not changed.
- 3) Device keeps all conditions of U-NII band 1/2A/2C as grant.

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5725-5850	a	5745-5825	149-165 [5]	2	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	MCS 0-15
5725-5850	n (HT40)	5755-5795	151-159 [2]	2	MCS 0-15

Note 1: RF output power specifies that Maximum Conducted Output Power.
Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

1.1.2 Antenna Details

Ant. No.	Model	Type	Connector	Gain (dBi)
1	ANT0 (Left)	Printed	NA	2.32
2	ANT1 (Right)	Printed	NA	2.2

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from host
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1.1.4 Accessories

N/A

1.1.5 Channel List

For Frequency band 5725~5850 MHz			
802.11 a / HT20		HT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
149	5745	151	5755
153	5765	159	5795
157	5785	---	---
161	5805	---	---
165	5825	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	artgui, version 2.3		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	98.94%	0.05
	HT20	99.25%	0.03
	HT40	98.18%	0.08

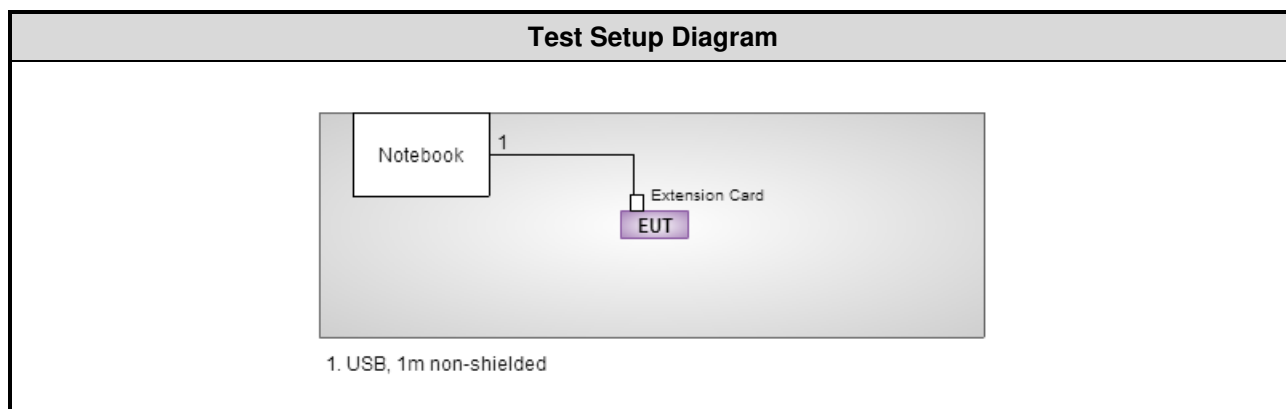
1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11a	5745	19
11a	5785	16
11a	5825	14.5
HT20	5745	18.5
HT20	5785	16
HT20	5825	14.5
HT40	5755	19
HT40	5795	17.5

1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5420	B6FT9T1	DoC	USB, 1m non-shielded.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Dec. 17, 2015	Dec. 16, 2016
Receiver	R&S	ESR3	101657	Jan. 12, 2016	Jan. 11, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-523	Nov. 09, 2015	Nov. 08, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Oct. 07, 2015	Oct. 06, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Preamplifier	Burgeon	BPA-530	100218	Nov. 03, 2015	Nov. 02, 2016
Preamplifier	Agilent	83017A	MY39501309	Sep. 22, 2015	Sep. 21, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 10, 2015	Dec. 09, 2016
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-003	Dec. 10, 2015	Dec. 09, 2016
LF cable 10M	EMCC	CFD400-E	CFD400-001	Dec. 10, 2015	Dec. 09, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 27, 2015	Nov. 26, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Testing Applied Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.407

ANSI C63.10-2013

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02

FCC KDB 644545 D03 Guidance for IEEE 802.11ac New Rules v01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Frequency error	±34.134 Hz
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.87 dB
Radiated emission > 1GHz	±5.60 dB
Time	±0.1%
Temperature	±0.6 °C

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 57%	Howard Huang
Radiated Emissions	03CH02-WS	24°C / 62%	Allen Yu
RF Conducted	TH01-WS	21°C / 67%	Anderson Hung

➤ FCC site registration No.: 181692

➤ IC site registration No.: 10807A-2

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11a	5745	6 Mbps	---
Radiated Emissions ≤1GHz	11a	5745	6 Mbps	---
RF Output Power	11a HT20 HT40	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795	6 Mbps MCS 0 MCS 0	---
Radiated Emissions >1GHz Emission Bandwidth 6dB bandwidth Peak Power Spectral Density	11a HT20 HT40	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795	6 Mbps MCS 0 MCS 0	---
Frequency Stability	Un-modulation	5785	---	---

NOTE:

- The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

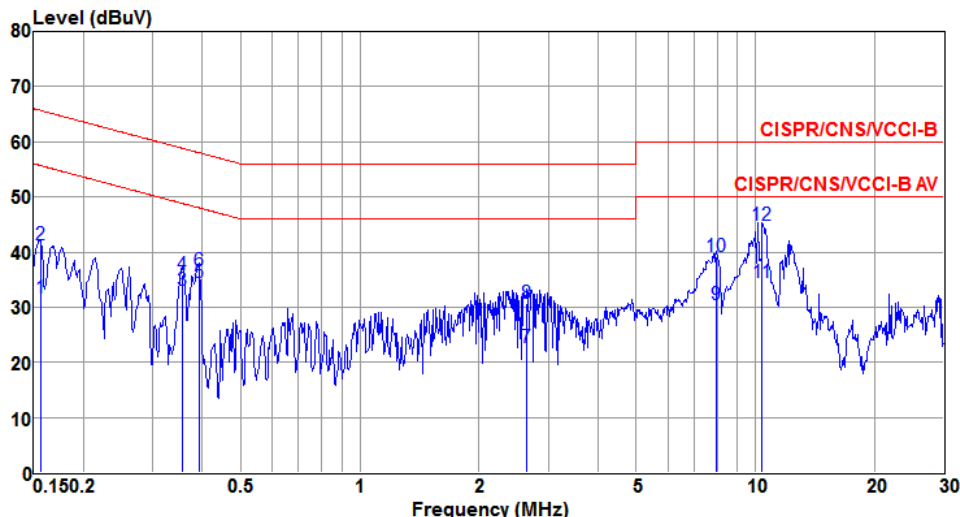
3.1.3 Test Setup



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

3.1.4 Test Result of Conducted Emissions

Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	31.55	55.65	-24.10	31.42	0.11	0.02	Average
2	0.156	41.41	65.65	-24.24	41.28	0.11	0.02	QP
3	0.356	33.00	48.83	-15.83	32.84	0.13	0.03	Average
4	0.356	35.80	58.83	-23.03	35.64	0.13	0.03	QP
5@	0.391	34.55	48.03	-13.48	34.39	0.13	0.03	Average
6	0.391	36.67	58.03	-21.36	36.51	0.13	0.03	QP
7	2.650	22.61	46.00	-23.39	22.34	0.17	0.10	Average
8	2.650	30.74	56.00	-25.26	30.47	0.17	0.10	QP
9	7.977	30.53	50.00	-19.47	30.15	0.23	0.15	Average
10	7.977	39.07	60.00	-20.93	38.69	0.23	0.15	QP
11	10.397	34.45	50.00	-15.55	34.04	0.25	0.16	Average
12	10.397	44.91	60.00	-15.09	44.50	0.25	0.16	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Neutral		

Level (dBuV)

	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.156	28.91	55.65	-26.74	28.76	0.13	0.02	Average
2	0.156	42.75	65.65	-22.90	42.60	0.13	0.02	QP
3	0.356	33.96	48.83	-14.87	33.80	0.13	0.03	Average
4	0.356	36.85	58.83	-21.98	36.69	0.13	0.03	QP
5@	0.391	34.22	48.03	-13.81	34.05	0.14	0.03	Average
6	0.391	36.58	58.03	-21.45	36.41	0.14	0.03	QP
7	1.135	26.26	46.00	-19.74	26.06	0.14	0.06	Average
8	1.135	30.32	56.00	-25.68	30.12	0.14	0.06	QP
9	3.190	22.50	46.00	-23.50	22.22	0.17	0.11	Average
10	3.190	32.25	56.00	-23.75	31.97	0.17	0.11	QP
11	10.019	25.91	50.00	-24.09	25.48	0.27	0.16	Average
12	10.019	36.39	60.00	-23.61	35.96	0.27	0.16	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).

Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Emission Bandwidth

3.2.1 Limit of Emission bandwidth

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.2.2 Test Procedures

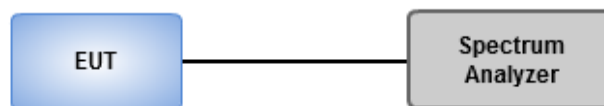
26dB Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW, Detector = Peak.
3. Trace mode = max hold.
4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

6dB Bandwidth

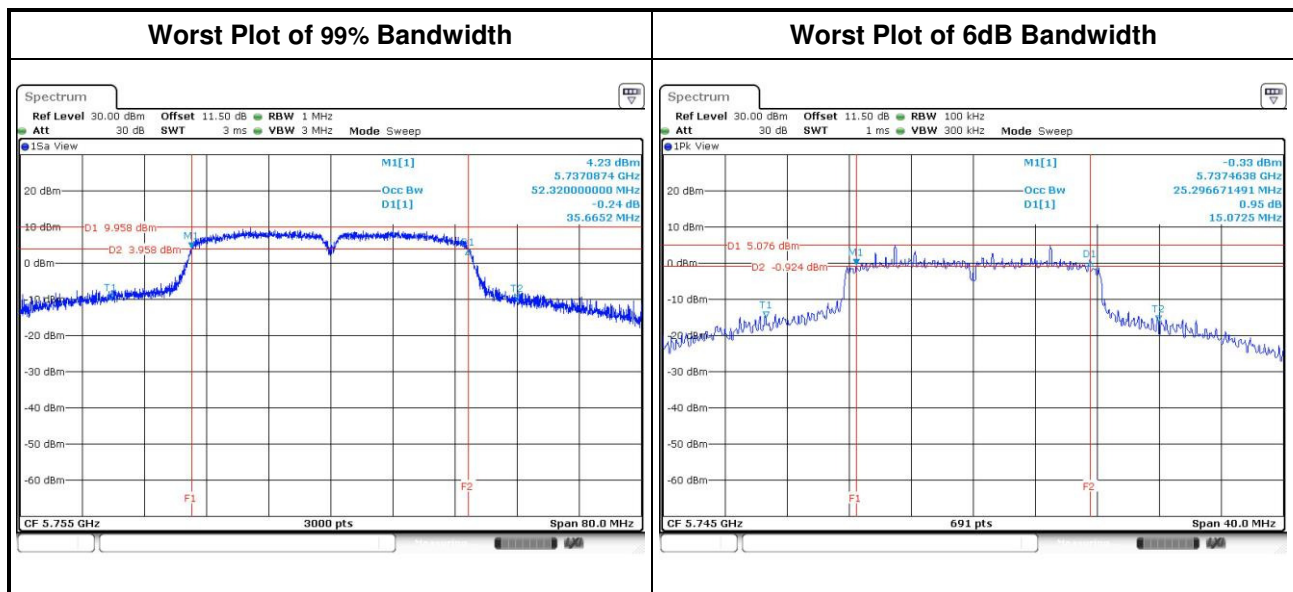
1. Set RBW = 100kHz, VBW = 300kHz
2. Detector = Peak, Trace mode = max hold.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

3.2.3 Test Setup



3.2.4 Test Result of Emission Bandwidth

Emission Bandwidth											
Mode	N _{TX}	Freq. (MHz)	OBW Bandwidth (MHz)				6dB Bandwidth (MHz)				6dB BW Limit (MHz)
			Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	
11a	2	5745	24.95	25.88	--	--	15.36	15.07	--	--	0.5
11a	2	5785	21.77	21.65	--	--	15.83	15.71	--	--	0.5
11a	2	5825	18.84	21.08	--	--	15.94	16.29	--	--	0.5
HT20	2	5745	25.39	25.65	--	--	16.23	15.65	--	--	0.5
HT20	2	5785	22.05	23.92	--	--	16.23	15.65	--	--	0.5
HT20	2	5825	19.55	22.16	--	--	16.52	16.06	--	--	0.5
HT40	2	5755	52.32	51.09	--	--	35.36	35.01	--	--	0.5
HT40	2	5795	48.05	50.21	--	--	35.25	35.01	--	--	0.5



3.3 RF Output Power

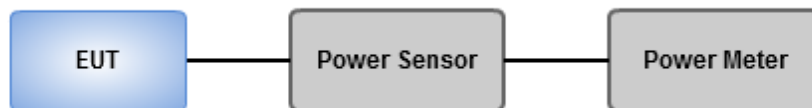
3.3.1 Limit of RF Output Power

The maximum conducted output power over the frequency band of operation shall not exceed 1 W

3.3.2 Test Procedures

- ☒ **Method PM-G (Measurement using a gated RF average power meter)**
 - ☒ Measurements may is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Conducted Output Power

Mode	N _{TX}	Freq. (MHz)	Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11a	2	5745	15.00	15.91	--	--	70.617	18.49	30.00
11a	2	5785	14.01	14.40	--	--	52.719	17.22	30.00
11a	2	5825	13.01	13.26	--	--	41.182	16.15	30.00
HT20	2	5745	14.71	15.72	--	--	66.905	18.25	30.00
HT20	2	5785	13.91	14.01	--	--	49.780	16.97	30.00
HT20	2	5825	12.78	13.42	--	--	40.946	16.12	30.00
HT40	2	5755	14.80	15.60	--	--	66.507	18.23	30.00
HT40	2	5795	14.16	15.07	--	--	58.198	17.65	30.00

3.4 Peak Power Spectral Density

3.4.1 Limit of Peak Power Spectral Density

The maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

3.4.2 Test Procedures

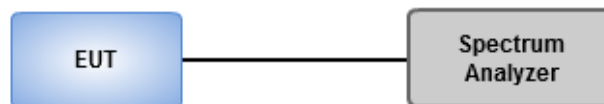
☒ Method SA-1

1. Set RBW = 500 kHz, VBW = 2 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

☐ Method SA-2 Alternative

1. Set RBW = 500 kHz, VBW = 2 MHz, Detector = RMS.
2. Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

3.4.3 Test Setup

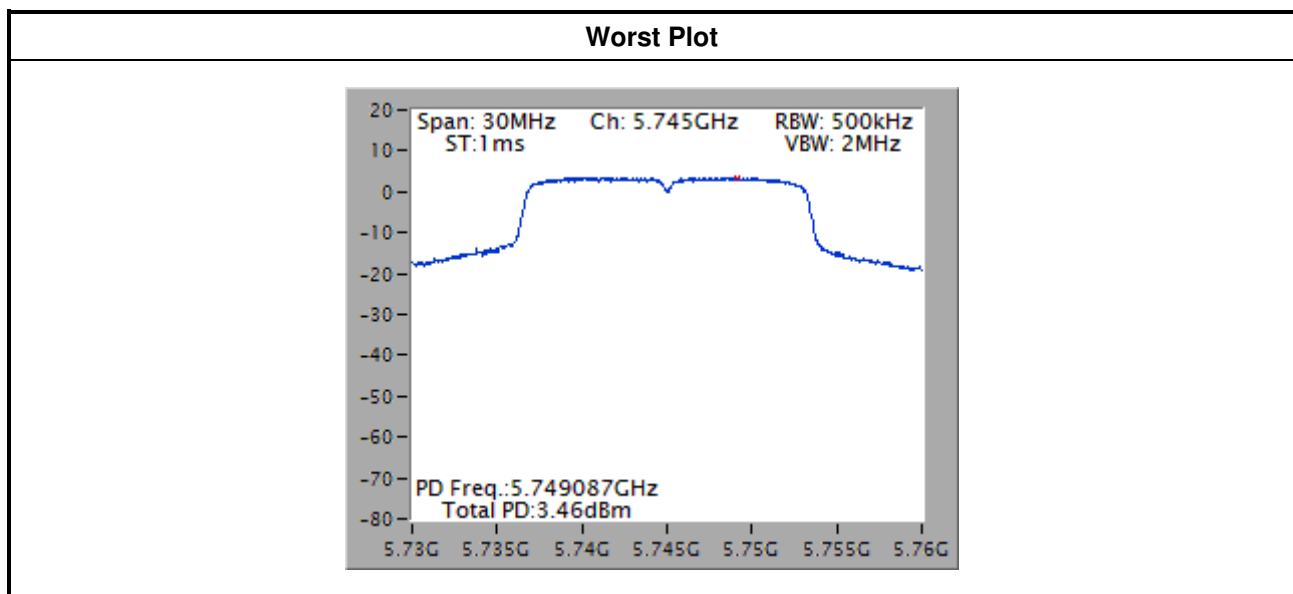


3.4.4 Test Result of Peak Power Spectral Density

Condition			Peak Power Spectral Density (dBm/500kHz)			
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/500kHz)	Duty Factor (dB)	PPSD with D.F (dBm/500kHz)	PPSD Limit (dBm/500kHz)
11a	2	5745	3.46	0.00	3.46	30.00
11a	2	5785	2.57	0.00	2.57	30.00
11a	2	5825	1.98	0.00	1.98	30.00
HT20	2	5745	3.43	0.00	3.43	30.00
HT20	2	5785	2.55	0.00	2.55	30.00
HT20	2	5825	1.74	0.00	1.74	30.00
HT40	2	5755	0.46	0.00	0.46	30.00
HT40	2	5795	0.02	0.00	0.02	30.00

Note:

1. D.F is duty factor.
2. Test results are bin-by-bin summing measured value of each TX port.



3.5 Transmitter Radiated and Band Edge Emissions

3.5.1 Limit of Transmitter Radiated and Band Edge Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit		
Operating Band	Limit	
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]	
5.725 - 5.850 GHz	☒	15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
	☐	15.407(b)(4)(ii) ,compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. 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))

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

3.5.2 Test Procedures

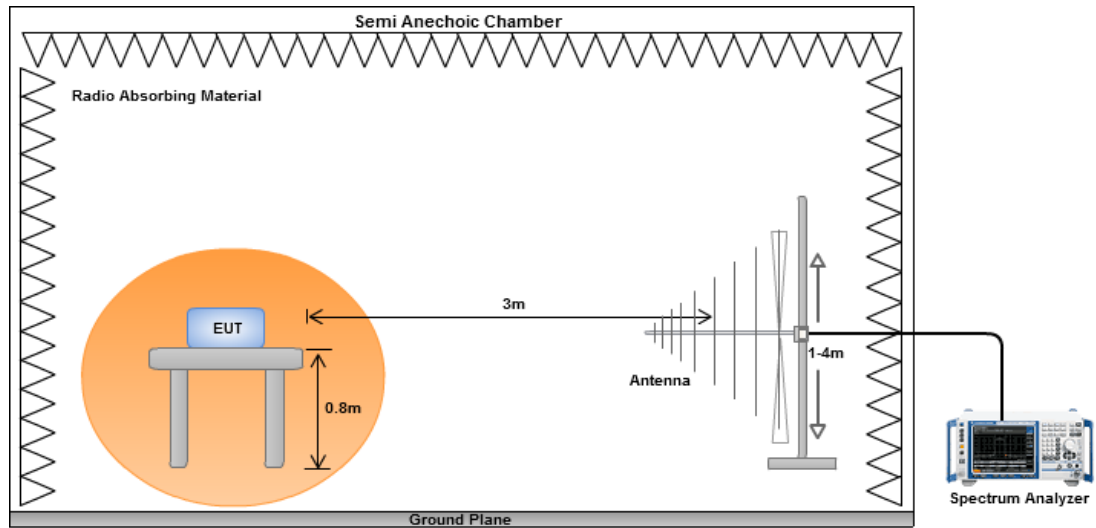
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

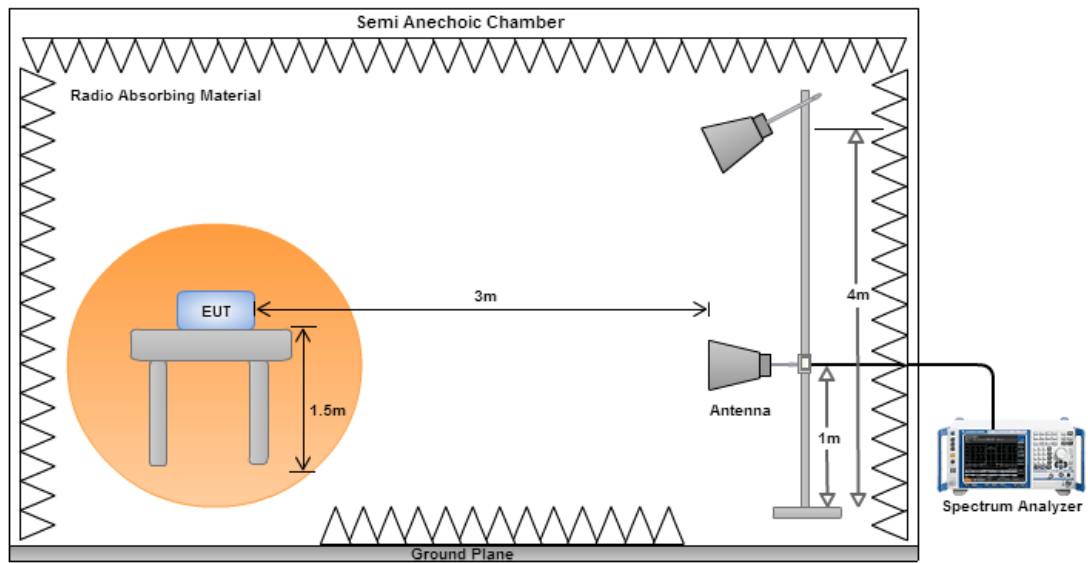
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

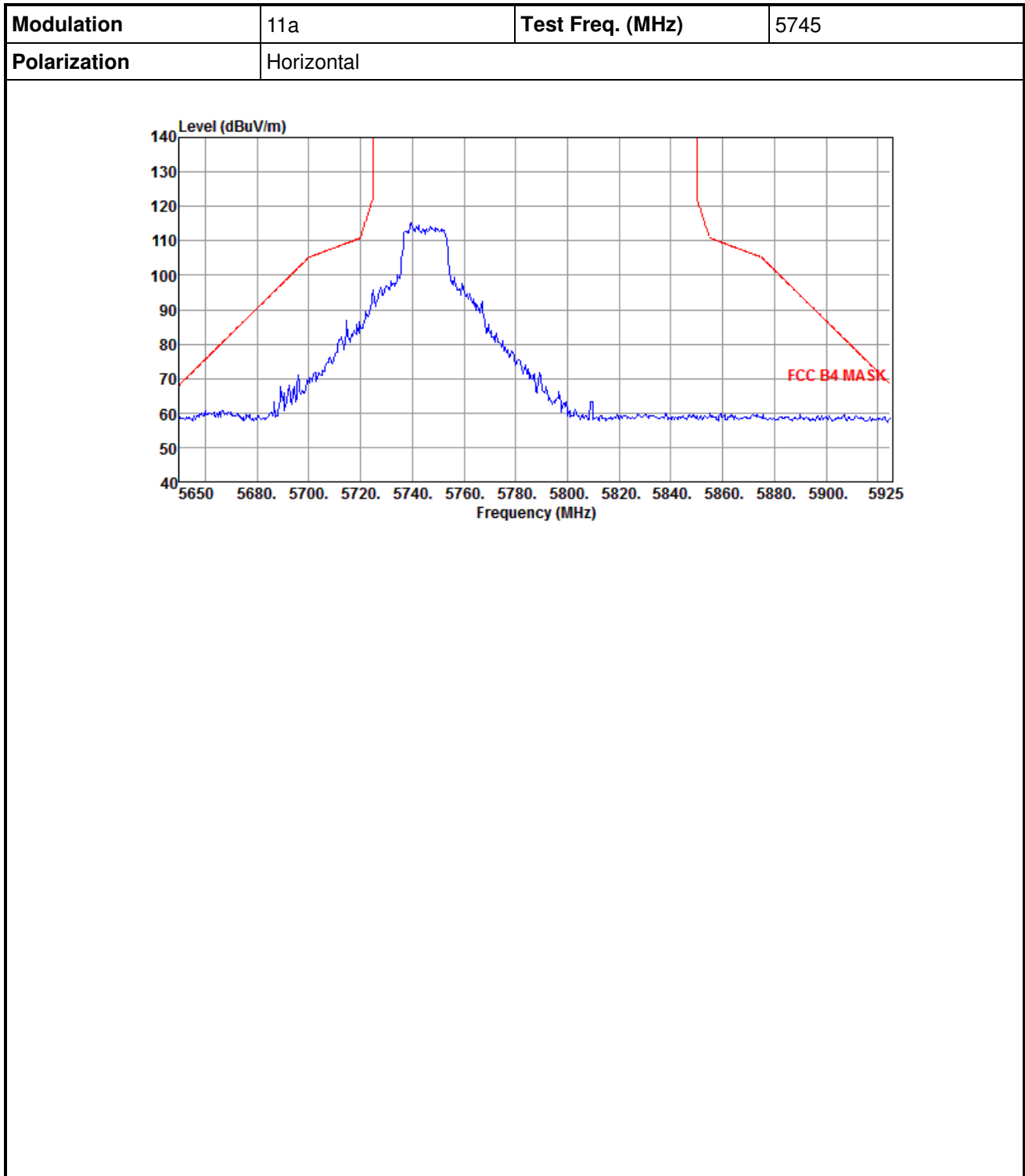
Radiated Emissions below 1 GHz



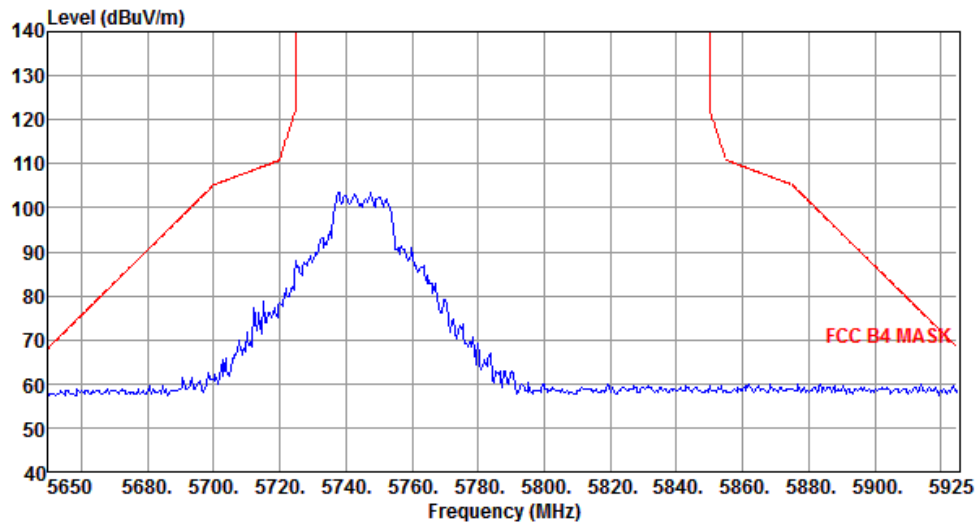
Radiated Emissions above 1 GHz



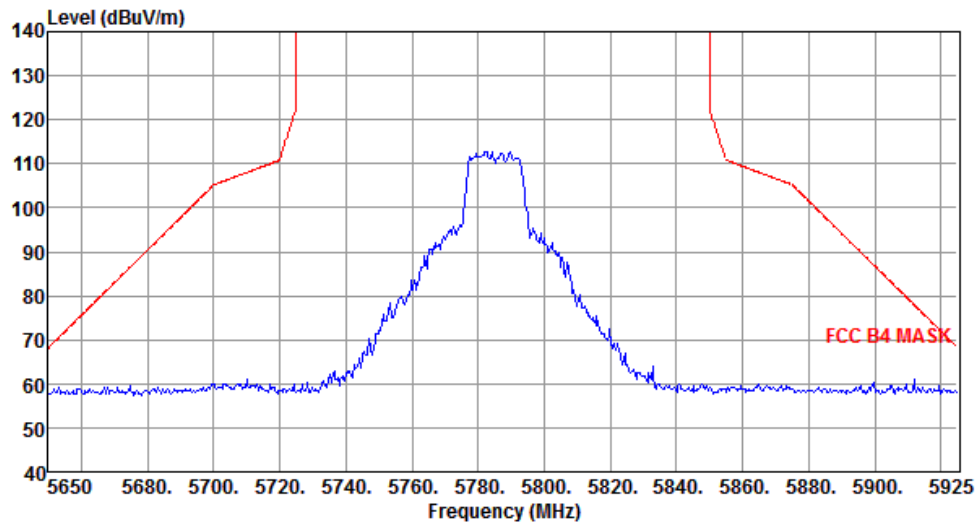
3.5.4 Transmitter Radiated Band Edge for 11a



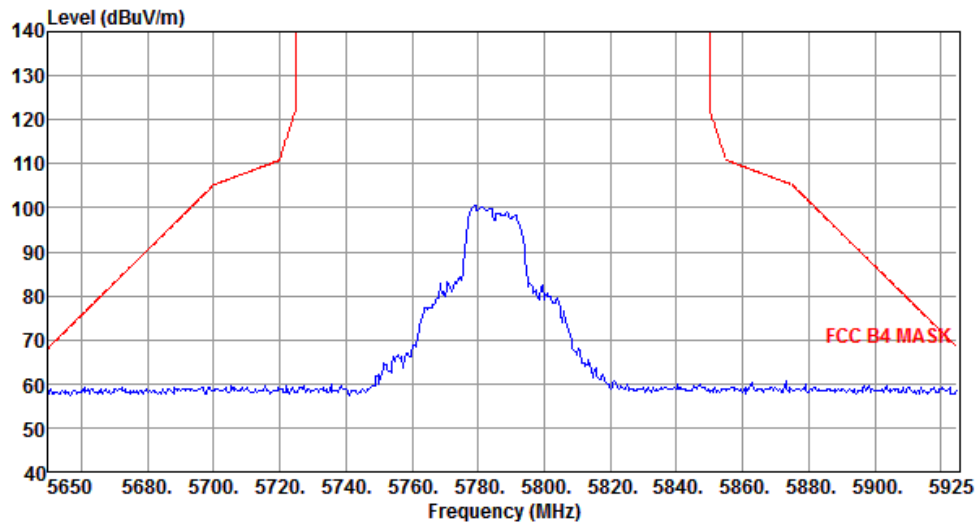
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		



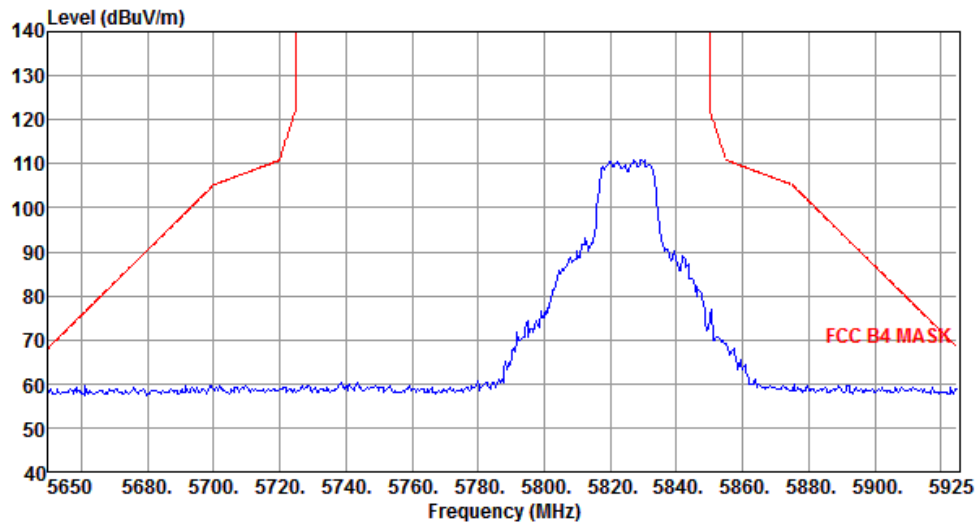
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		



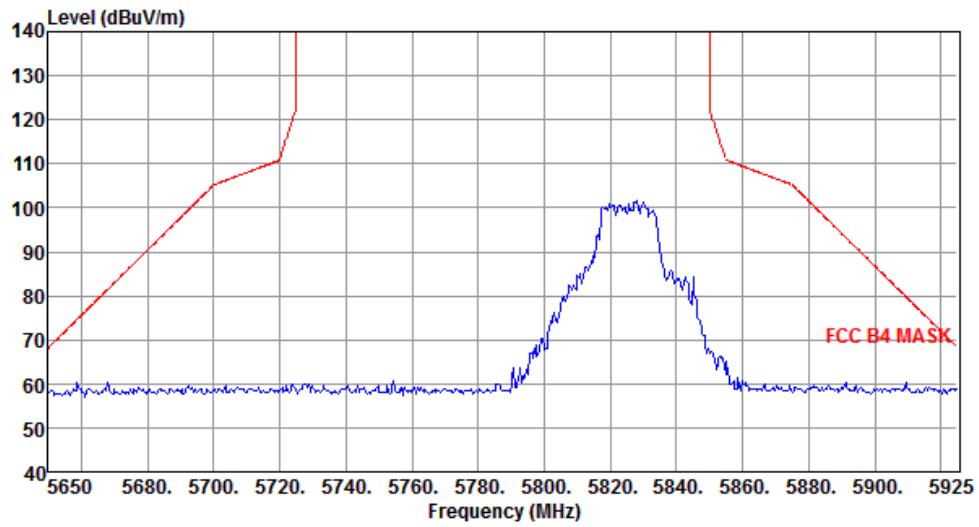
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		



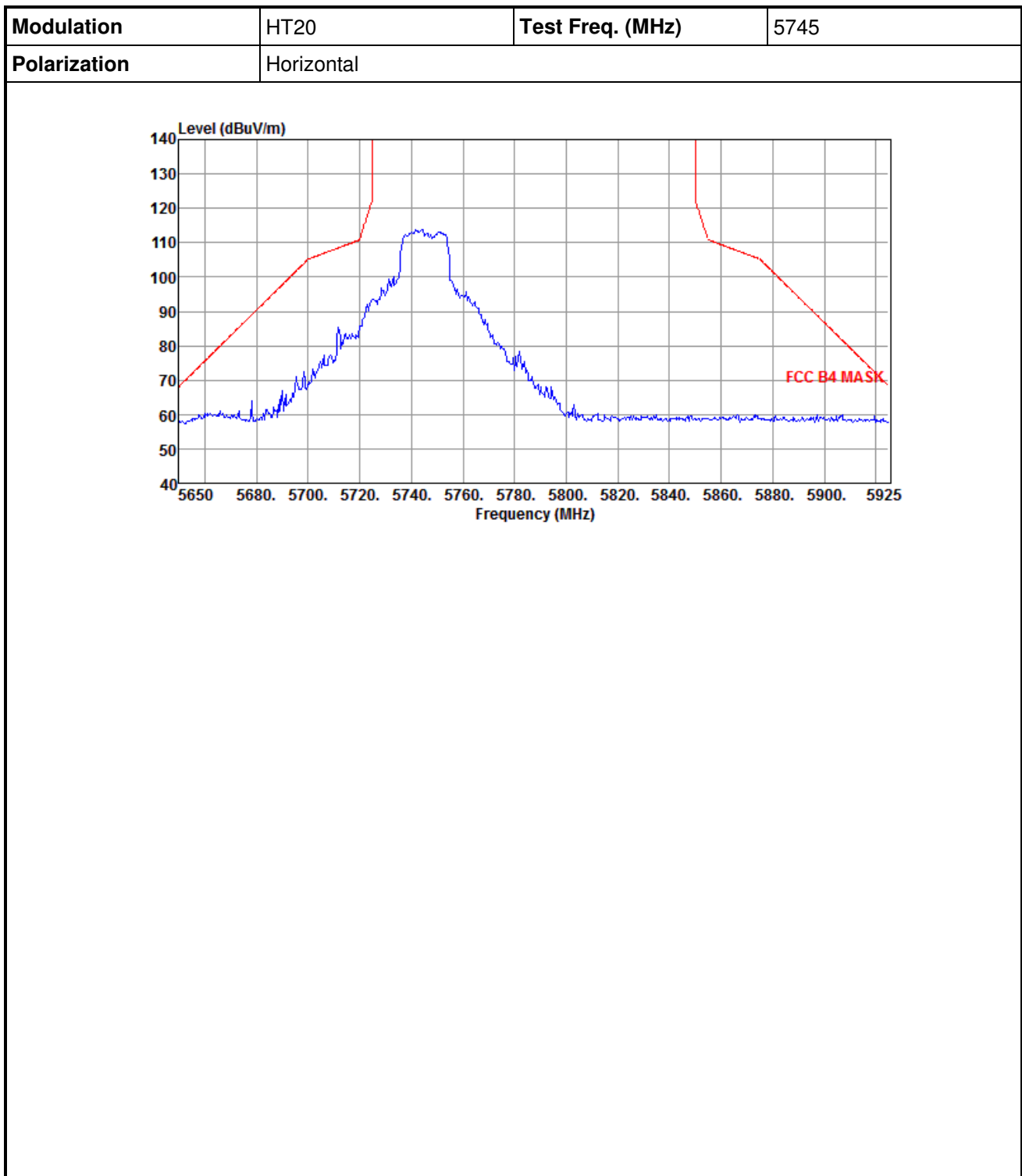
Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		



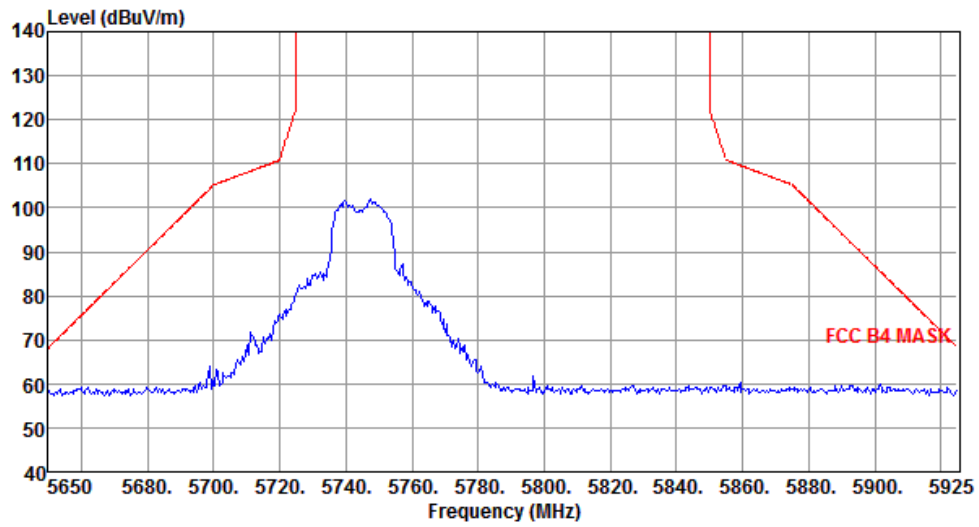
Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		



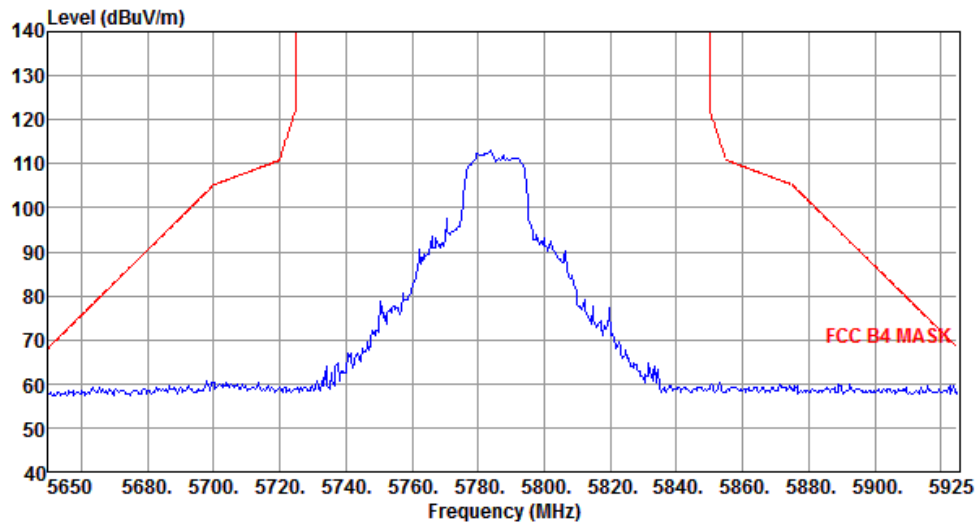
3.5.5 Transmitter Radiated Band Edge for HT20



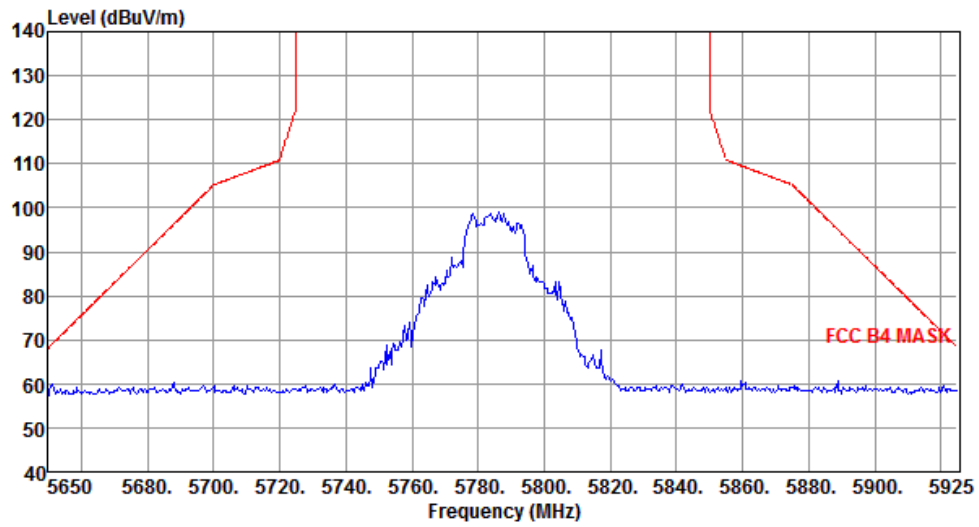
Modulation	HT20	Test Freq. (MHz)	5745
Polarization	Vertical		



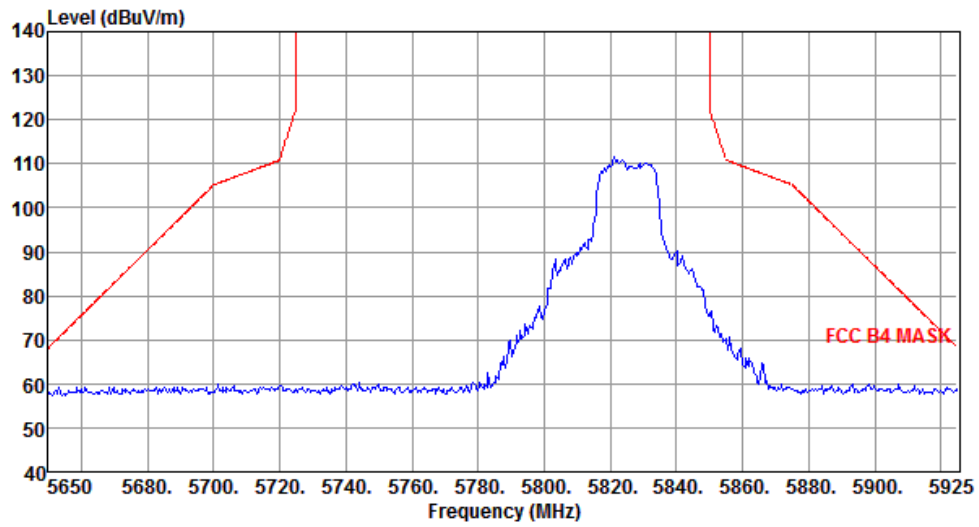
Modulation	HT20	Test Freq. (MHz)	5785
Polarization	Horizontal		



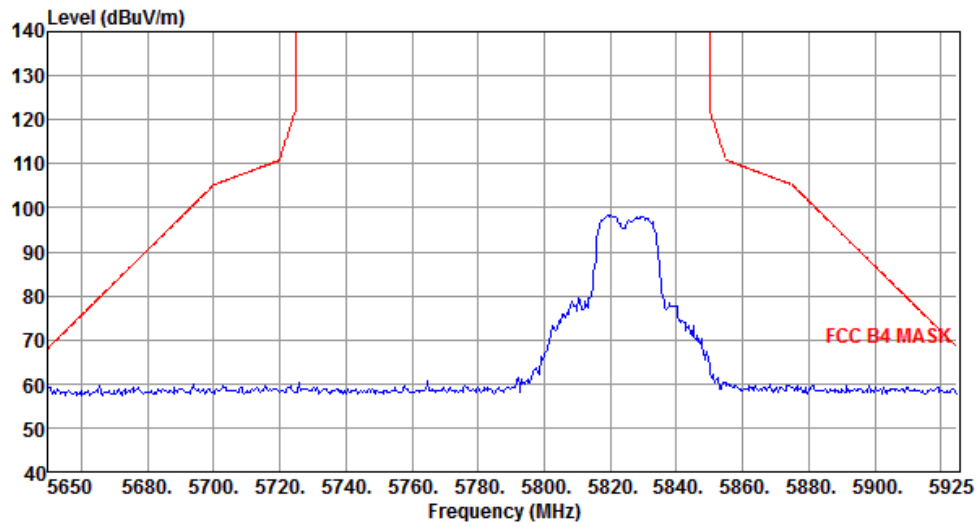
Modulation	HT20	Test Freq. (MHz)	5785
Polarization	Vertical		



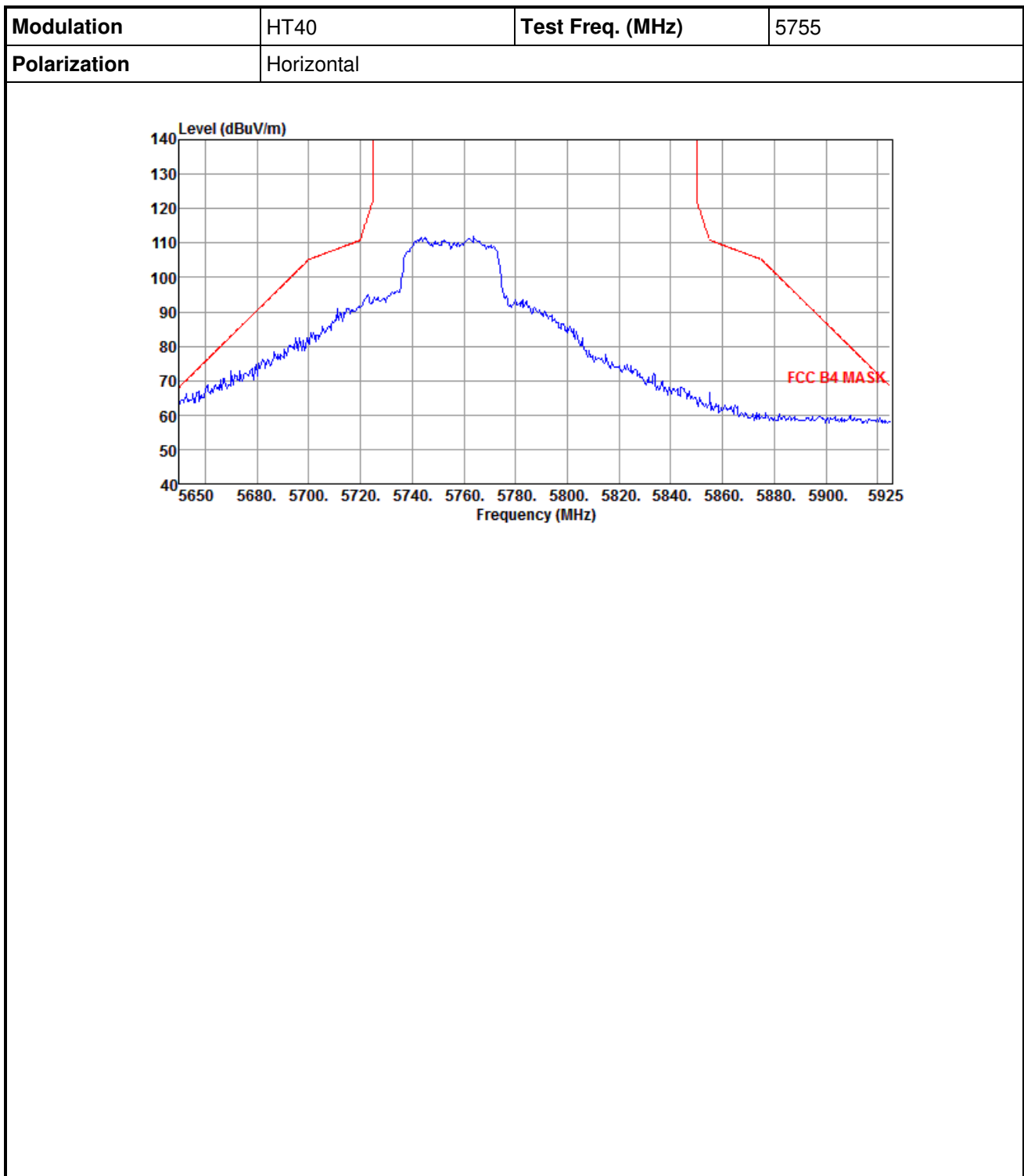
Modulation	HT20	Test Freq. (MHz)	5825
Polarization	Horizontal		



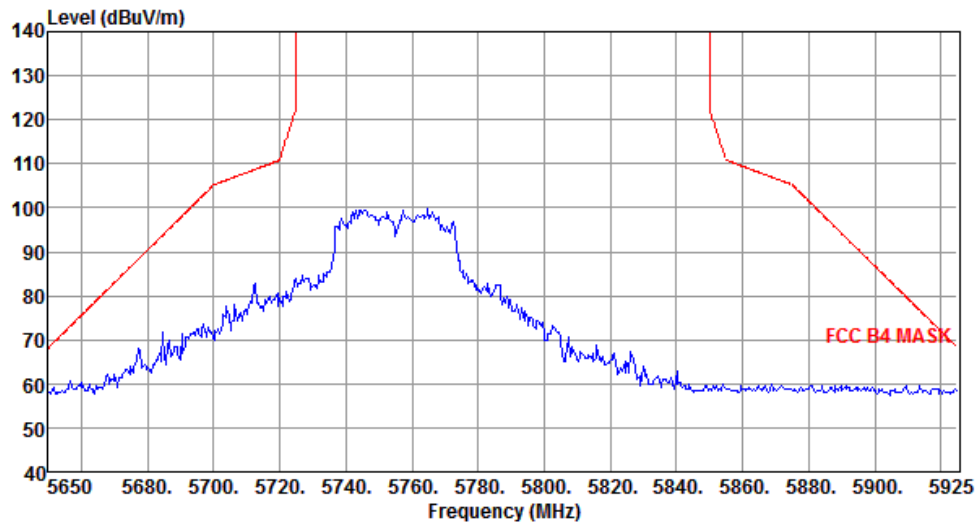
Modulation	HT20	Test Freq. (MHz)	5825
Polarization	Vertical		



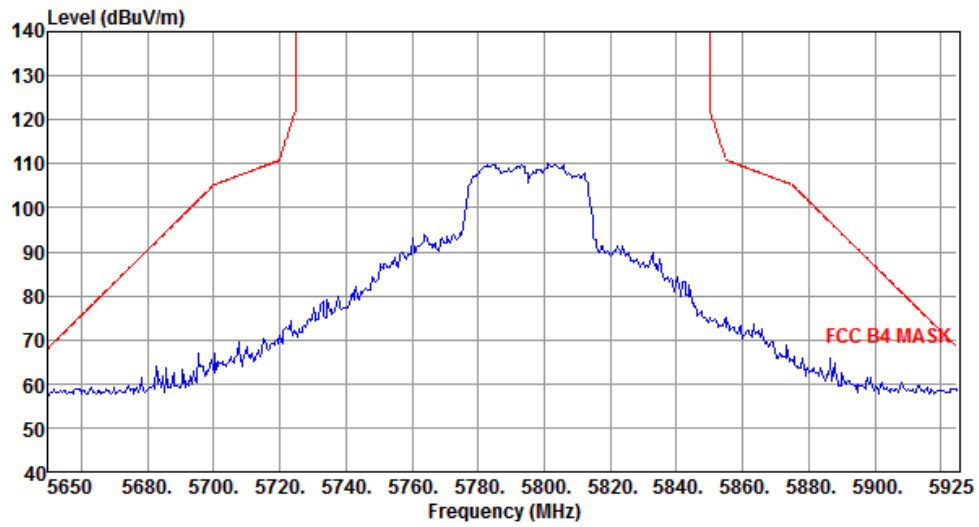
3.5.6 Transmitter Radiated Band Edge for HT40



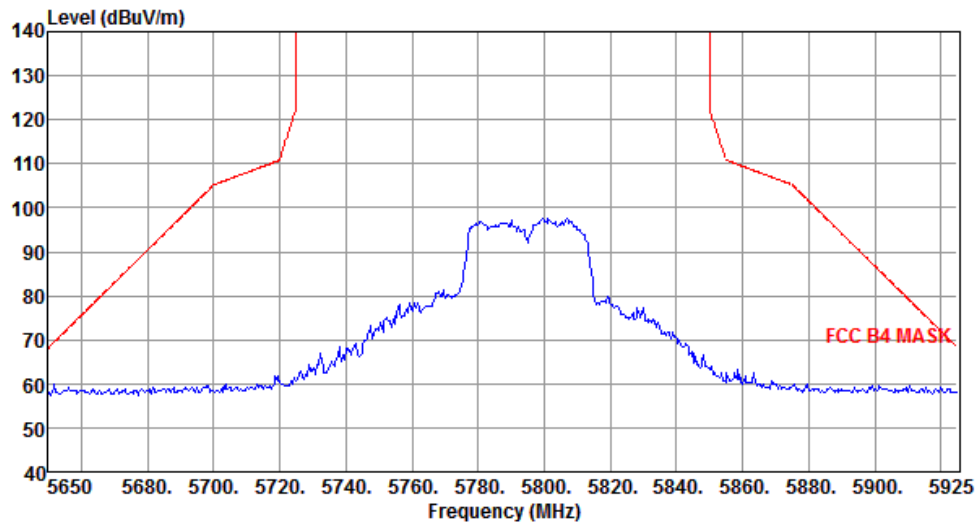
Modulation	HT40	Test Freq. (MHz)	5755
Polarization	Vertical		



Modulation	HT40	Test Freq. (MHz)	5795
Polarization	Horizontal		



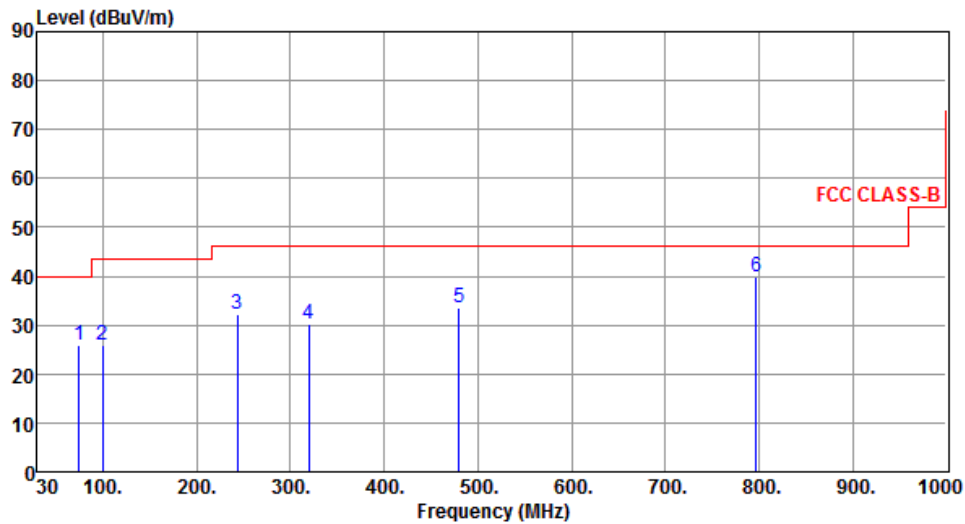
Modulation	HT40	Test Freq. (MHz)	5795
Polarization	Vertical		



3.5.7 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		
Level (dBuV/m)			

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	74.62	25.86	40.00	-14.14	41.08	-15.22	Peak	---	---
2	99.84	26.06	43.50	-17.44	42.73	-16.67	Peak	---	---
3	243.40	32.15	46.00	-13.85	45.08	-12.93	Peak	---	---
4	320.03	30.31	46.00	-15.69	40.98	-10.67	Peak	---	---
5	480.08	33.51	46.00	-12.49	40.44	-6.93	Peak	---	---
6	797.27	39.96	46.00	-6.04	41.87	-1.91	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

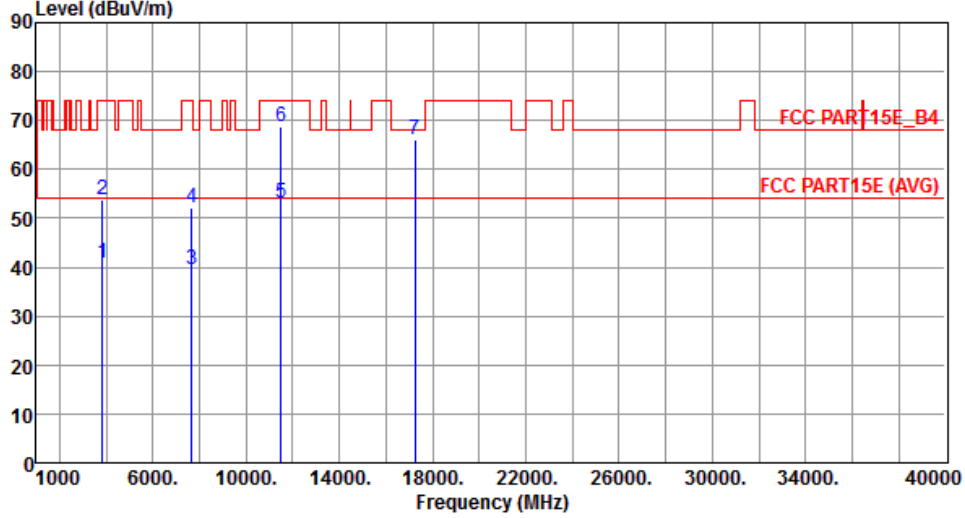
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		
Level (dBUV/m)			

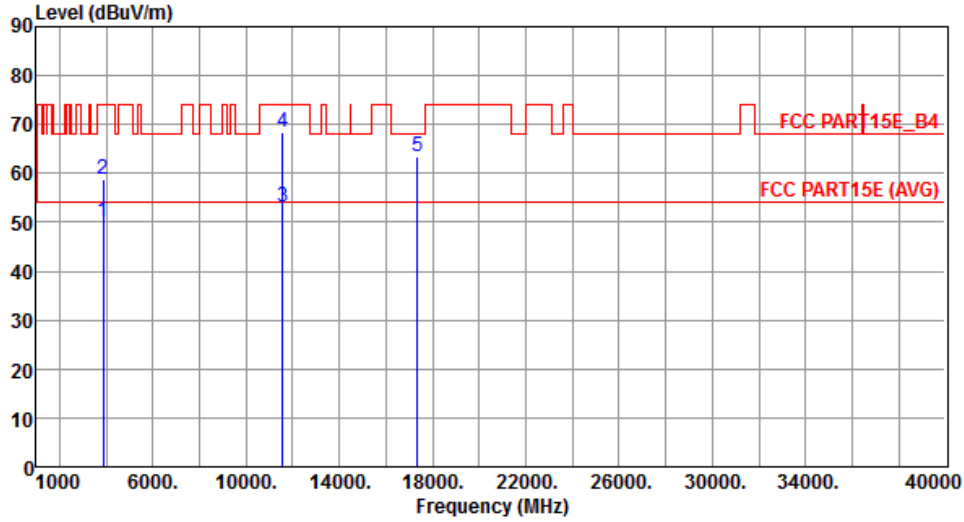
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3830.00	40.70	54.00	-13.30	39.54	1.16	Average	100	35
2	3830.00	53.64	74.00	-20.36	52.48	1.16	Peak	100	35
3	7660.00	39.52	54.00	-14.48	29.80	9.72	Average	100	25
4	7660.00	52.23	74.00	-21.77	42.51	9.72	Peak	100	25
5	11490.00	52.98	54.00	-1.02	38.36	14.62	Average	100	162
6	11490.00	68.91	74.00	-5.09	54.29	14.62	Peak	100	162
7	17235.00	65.97	68.20	-2.23	45.33	20.64	Peak	100	157

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		

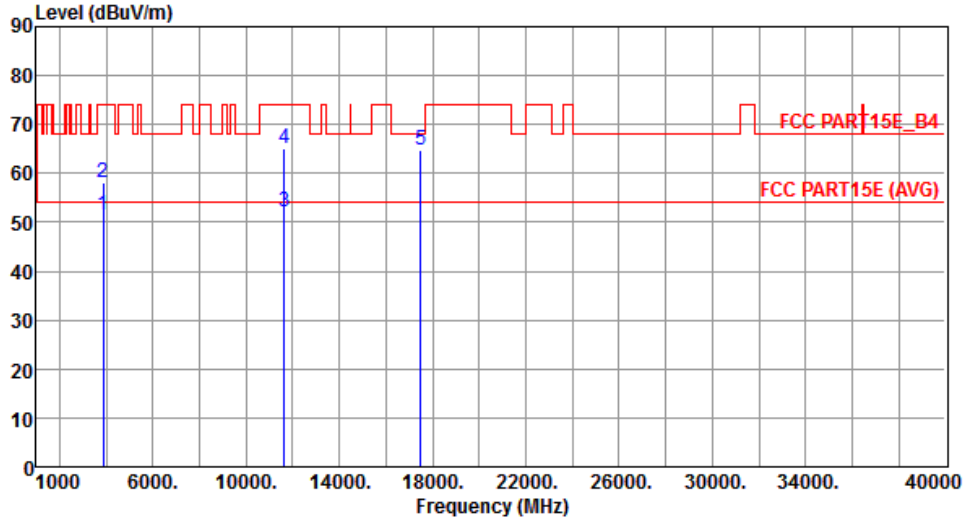


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3856.66	50.18	54.00	-3.82	48.92	1.26	Average	114	20
2	3856.66	58.70	74.00	-15.30	57.44	1.26	Peak	114	20
3	11570.00	52.99	54.00	-1.01	38.47	14.52	Average	100	234
4	11570.00	68.46	74.00	-5.54	53.94	14.52	Peak	100	234
5	17355.00	63.43	68.20	-4.77	42.14	21.29	Peak	100	123

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5785																																																												
Polarization	Vertical																																																														
Level (dBuV/m) 90 80 70 60 50 40 30 20 10 0 1000 6000 10000 14000 18000 22000 26000 30000 34000 40000 Frequency (MHz) 1 2 3 4 5 FCC PART15E (AVG) FCC PART15E_B4 <table><thead><tr><th></th><th>Freq. MHz</th><th>Emission level dBuV/m</th><th>Limit dBuV/m</th><th>Margin dB</th><th>SA reading dBuV</th><th>Factor dB</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr></thead><tbody><tr><td>1</td><td>3856.66</td><td>40.62</td><td>54.00</td><td>-13.38</td><td>39.36</td><td>1.26</td><td>Average</td><td>100</td><td>120</td></tr><tr><td>2</td><td>3856.66</td><td>53.66</td><td>74.00</td><td>-20.34</td><td>52.40</td><td>1.26</td><td>Peak</td><td>100</td><td>120</td></tr><tr><td>3</td><td>11570.00</td><td>52.38</td><td>54.00</td><td>-1.62</td><td>37.86</td><td>14.52</td><td>Average</td><td>100</td><td>165</td></tr><tr><td>4</td><td>11570.00</td><td>65.75</td><td>74.00</td><td>-8.25</td><td>51.23</td><td>14.52</td><td>Peak</td><td>100</td><td>165</td></tr><tr><td>5</td><td>17355.00</td><td>64.05</td><td>68.20</td><td>-4.15</td><td>42.76</td><td>21.29</td><td>Peak</td><td>100</td><td>165</td></tr></tbody></table> Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).					Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	3856.66	40.62	54.00	-13.38	39.36	1.26	Average	100	120	2	3856.66	53.66	74.00	-20.34	52.40	1.26	Peak	100	120	3	11570.00	52.38	54.00	-1.62	37.86	14.52	Average	100	165	4	11570.00	65.75	74.00	-8.25	51.23	14.52	Peak	100	165	5	17355.00	64.05	68.20	-4.15	42.76	21.29	Peak	100	165
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																						
1	3856.66	40.62	54.00	-13.38	39.36	1.26	Average	100	120																																																						
2	3856.66	53.66	74.00	-20.34	52.40	1.26	Peak	100	120																																																						
3	11570.00	52.38	54.00	-1.62	37.86	14.52	Average	100	165																																																						
4	11570.00	65.75	74.00	-8.25	51.23	14.52	Peak	100	165																																																						
5	17355.00	64.05	68.20	-4.15	42.76	21.29	Peak	100	165																																																						

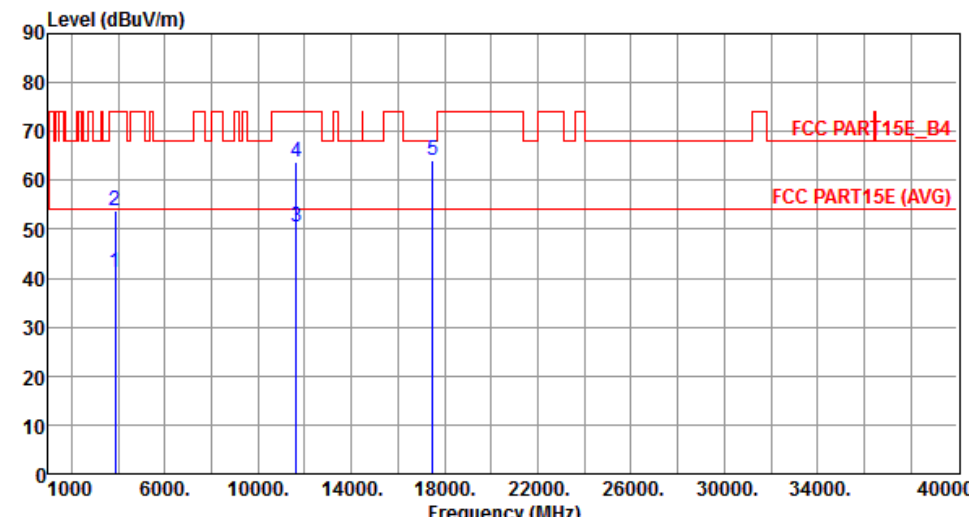
Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3883.33	51.49	54.00	-2.51	50.13	1.36	Average	109	20
2	3883.33	58.26	74.00	-15.74	56.90	1.36	Peak	109	20
3	11650.00	52.15	54.00	-1.85	37.75	14.40	Average	100	234
4	11650.00	65.04	74.00	-8.96	50.64	14.40	Peak	100	234
5	17475.00	64.76	68.20	-3.44	42.82	21.94	Peak	100	124

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		

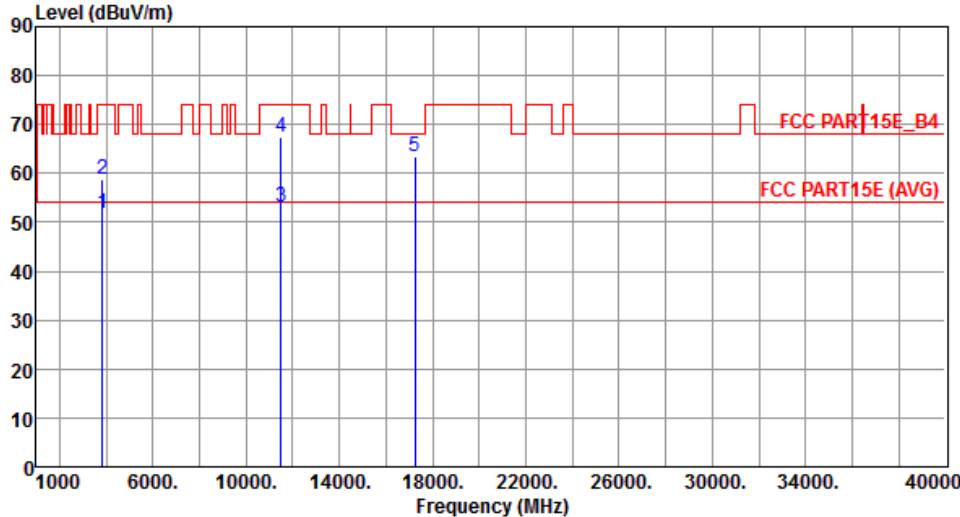


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3883.33	41.04	54.00	-12.96	39.68	1.36	Average	100	120
2	3883.33	53.76	74.00	-20.24	52.40	1.36	Peak	100	120
3	11650.00	50.33	54.00	-3.67	35.93	14.40	Average	100	336
4	11650.00	63.72	74.00	-10.28	49.32	14.40	Peak	100	336
5	17475.00	63.95	68.20	-4.25	42.01	21.94	Peak	100	136

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.5.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

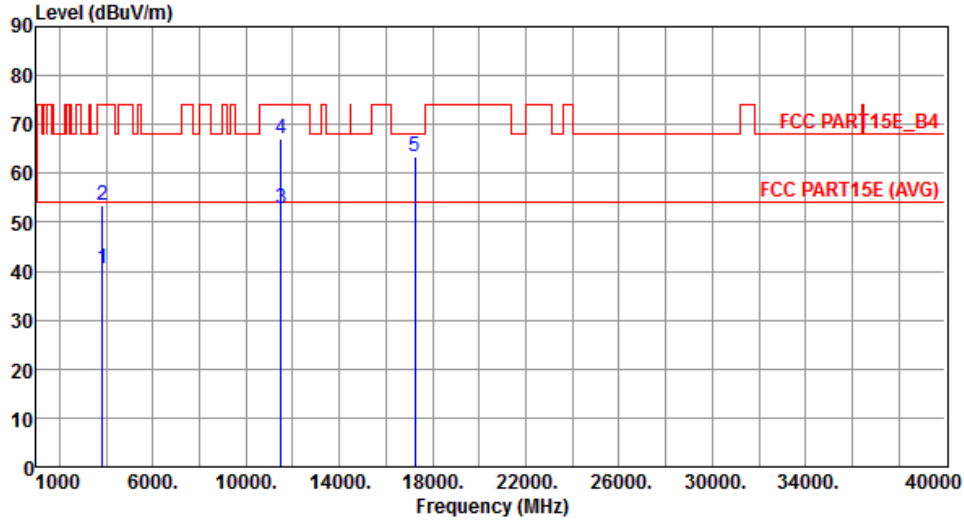
Modulation	HT20	Test Freq. (MHz)	5745
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3830.00	51.76	54.00	-2.24	50.60	1.16	Average	100	21
2	3830.00	58.92	74.00	-15.08	57.76	1.16	Peak	100	21
3	11490.00	52.98	54.00	-1.02	38.36	14.62	Average	100	234
4	11490.00	67.38	74.00	-6.62	52.76	14.62	Peak	100	234
5	17235.00	63.28	68.20	-4.92	42.64	20.64	Peak	100	159

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT20	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3830.00	40.36	54.00	-13.64	39.20	1.16	Average	100	34
2	3830.00	53.51	74.00	-20.49	52.35	1.16	Peak	100	34
3	11490.00	52.77	54.00	-1.23	38.15	14.62	Average	100	160
4	11490.00	67.16	74.00	-6.84	52.54	14.62	Peak	100	160
5	17235.00	63.58	68.20	-4.62	42.94	20.64	Peak	100	348

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

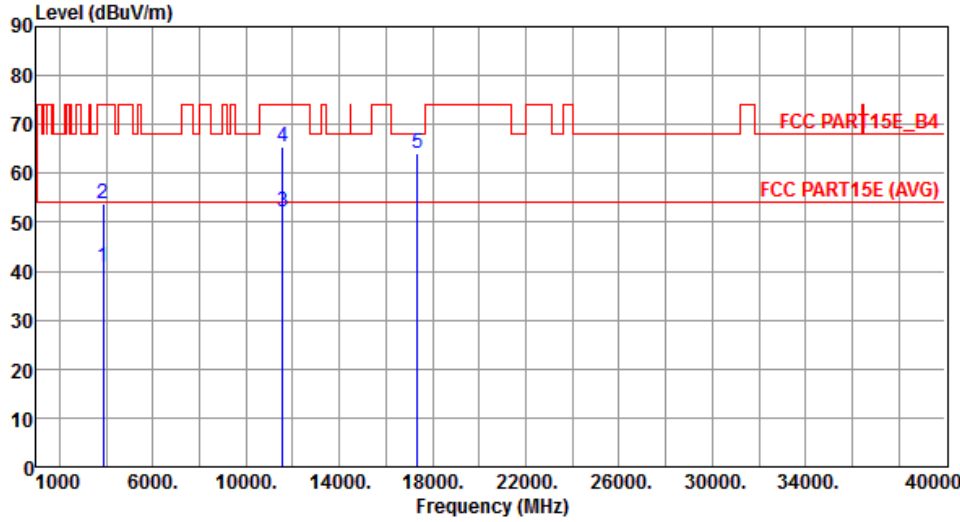
Modulation	HT20	Test Freq. (MHz)	5785
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3856.66	49.86	54.00	-4.14	48.60	1.26	Average	115	20
2	3856.66	58.92	74.00	-15.08	57.66	1.26	Peak	115	20
3	11570.00	52.97	54.00	-1.03	38.45	14.52	Average	100	229
4	11570.00	67.71	74.00	-6.29	53.19	14.52	Peak	100	229
5	17355.00	63.54	68.20	-4.66	42.25	21.29	Peak	100	125

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

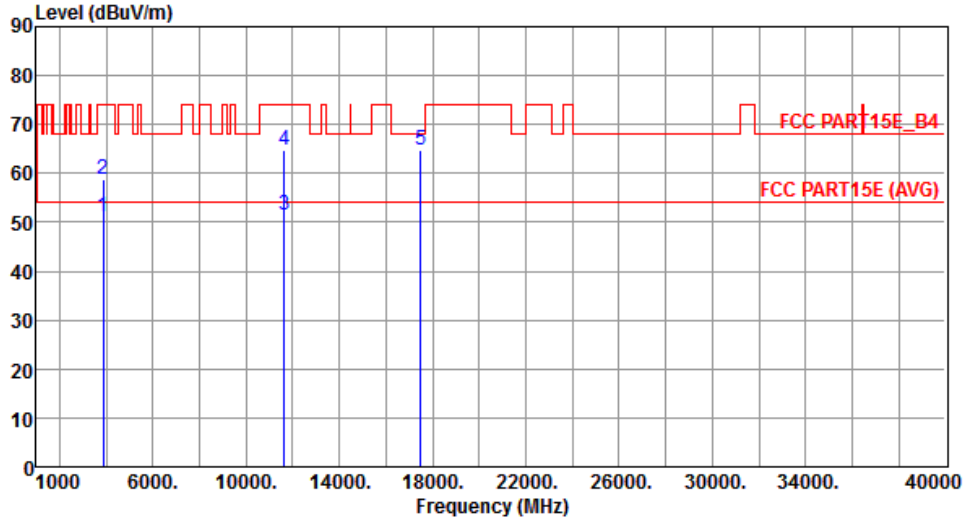
Modulation	HT20	Test Freq. (MHz)	5785
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3856.66	40.71	54.00	-13.29	39.45	1.26	Average	100	121
2	3856.66	53.86	74.00	-20.14	52.60	1.26	Peak	100	121
3	11570.00	52.06	54.00	-1.94	37.54	14.52	Average	100	164
4	11570.00	65.53	74.00	-8.47	51.01	14.52	Peak	100	164
5	17355.00	64.20	68.20	-4.00	42.91	21.29	Peak	100	170

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

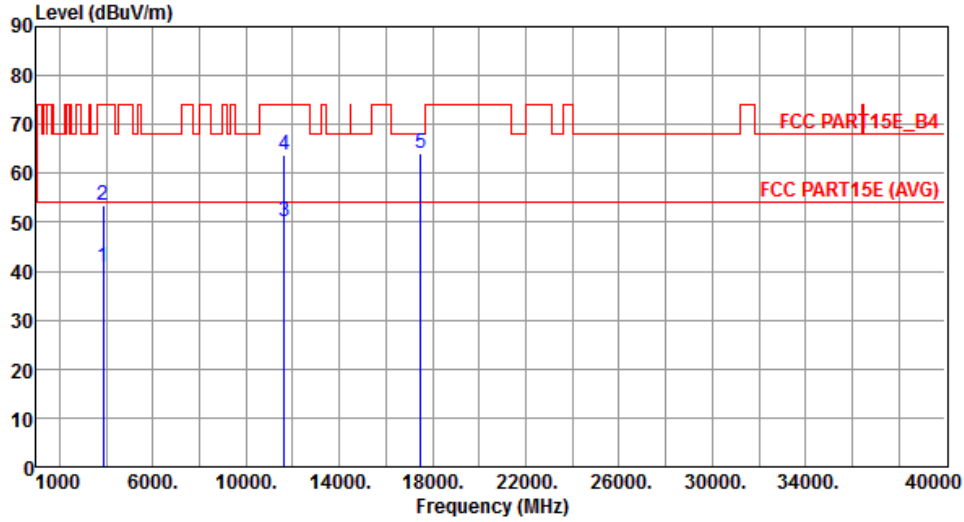
Modulation	HT20	Test Freq. (MHz)	5825
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3883.33	51.11	54.00	-2.89	49.75	1.36	Average	114	18
2	3883.33	58.80	74.00	-15.20	57.44	1.36	Peak	114	18
3	11650.00	51.63	54.00	-2.37	37.23	14.40	Average	100	231
4	11650.00	64.86	74.00	-9.14	50.46	14.40	Peak	100	231
5	17475.00	64.88	68.20	-3.32	42.94	21.94	Peak	100	126

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT20	Test Freq. (MHz)	5825
Polarization	Vertical		

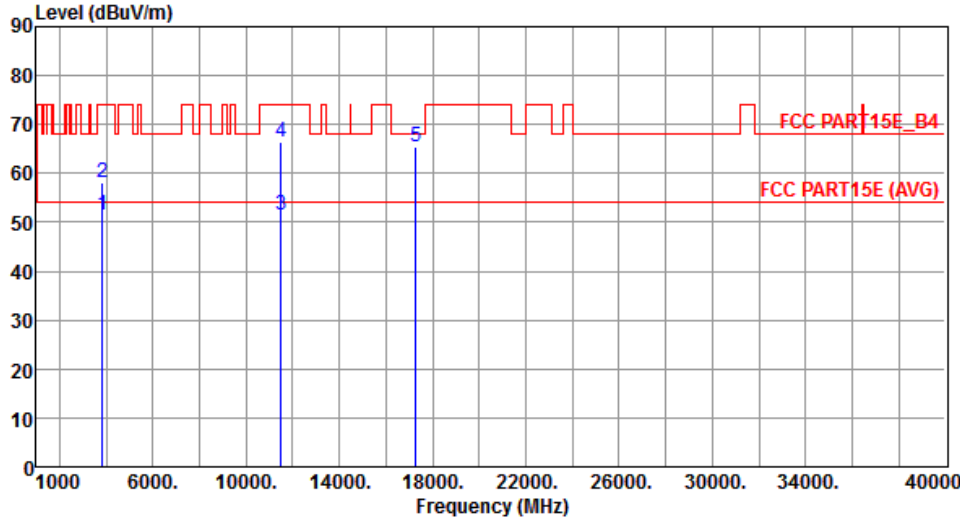


	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3883.33	40.86	54.00	-13.14	39.50	1.36	Average	100	122
2	3883.33	53.56	74.00	-20.44	52.20	1.36	Peak	100	122
3	11650.00	50.24	54.00	-3.76	35.84	14.40	Average	100	338
4	11650.00	63.74	74.00	-10.26	49.34	14.40	Peak	100	338
5	17475.00	64.06	68.20	-4.14	42.12	21.94	Peak	100	140

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

3.5.10 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

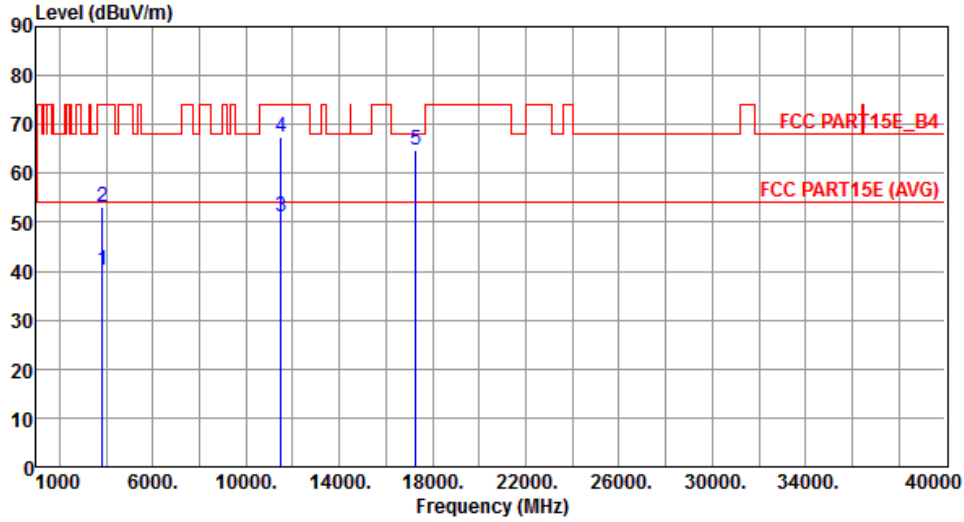
Modulation	HT40	Test Freq. (MHz)	5755
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3836.66	51.42	54.00	-2.58	50.23	1.19	Average	100	21
2	3836.66	58.11	74.00	-15.89	56.92	1.19	Peak	100	21
3	11510.00	51.47	54.00	-2.53	36.85	14.62	Average	100	233
4	11510.00	66.32	74.00	-7.68	51.70	14.62	Peak	100	233
5	17265.00	65.35	68.20	-2.85	44.54	20.81	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT40	Test Freq. (MHz)	5755
Polarization	Vertical		

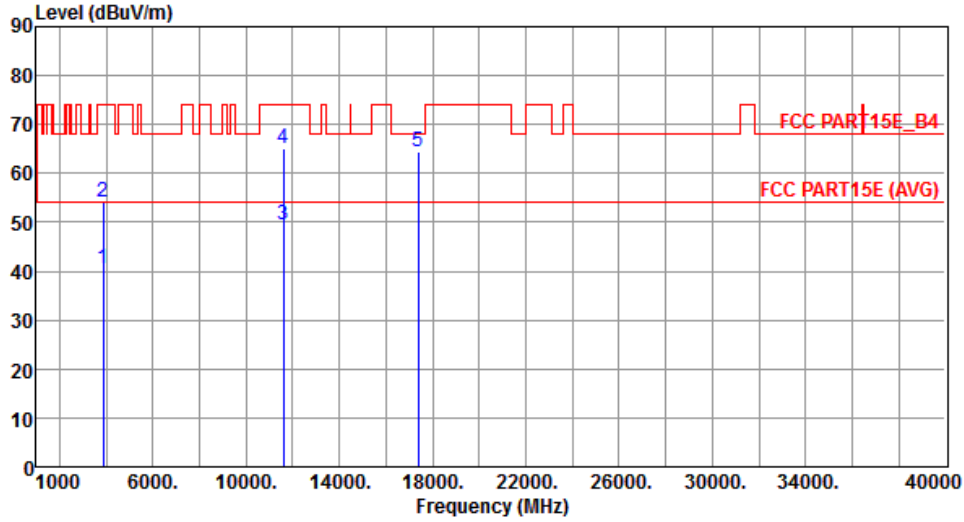


	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3836.66	40.22	54.00	-13.78	39.03	1.19	Average	100	36
2	3836.66	53.09	74.00	-20.91	51.90	1.19	Peak	100	36
3	11510.00	51.13	54.00	-2.87	36.51	14.62	Average	100	162
4	11510.00	67.50	74.00	-6.50	52.88	14.62	Peak	100	162
5	17265.00	64.82	68.20	-3.38	44.01	20.81	Peak	100	160

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT40	Test Freq. (MHz)	5795
Polarization	Horizontal		
Level (dBuV/m) <			

Modulation	HT40	Test Freq. (MHz)	5795
Polarization	Vertical		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3863.33	40.47	54.00	-13.53	39.19	1.28	Average	100	125
2	3863.33	53.97	74.00	-20.03	52.69	1.28	Peak	100	125
3	11590.00	49.65	54.00	-4.35	35.15	14.50	Average	100	345
4	11590.00	65.18	74.00	-8.82	50.68	14.50	Peak	100	345
5	17385.00	64.43	68.20	-3.77	42.97	21.46	Peak	100	140

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

3.6 Frequency Stability

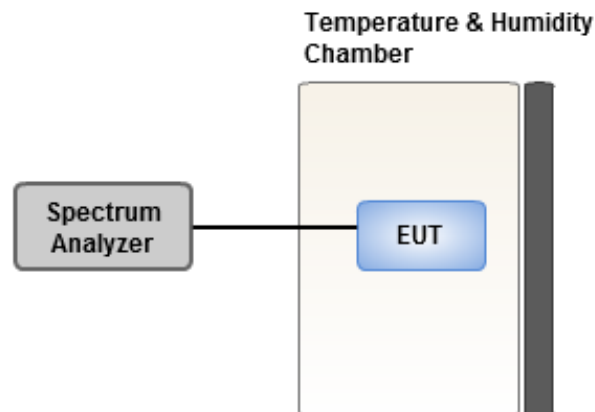
3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.6.2 Test Procedures

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Frequency: 5785 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°CVmax	0.44	0.71	0.84	0.58
T20°CVmin	0.81	0.97	0.84	1.04
T60°CVnom	0.80	0.98	0.47	1.10
T50°CVnom	0.84	1.03	0.49	1.06
T40°CVnom	-0.22	-0.08	-0.36	0.39
T30°CVnom	-0.05	-0.26	0.08	0.29
T20°CVnom	0.53	0.96	0.05	1.04
T10°CVnom	-0.11	0.37	-0.03	-0.17
T0°CVnom	-0.20	0.60	-0.45	-0.04
T-10°CVnom	0.34	0.45	0.75	0.41
T-20°CVnom	-0.36	-0.47	0.22	-0.57
T-30°CVnom	0.08	0.10	-0.06	0.28
Vnom [Vac]: 120		Vmax [Vac]: 138		Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 60		Tmin [°C]: -30

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

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