

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART E REQUIREMENT
CLASS II PC REPORT
OF**

Product Name of Host: Tablet Computer
Brand Name of Host: acer
Model No. of Host: N15P1
Marketing Name of Host: SW5-014, SW5-014P
Product Name of Module: 802.11abgn+BT4.0 module
Brand Name of Module: FOXCONN
Model No. of Module: T77H462
Model Difference: N/A
FCC ID: MCLT77H462
Report No.: E2/2015/90030-01
Issue Date: Mar. 04, 2016
FCC Rule Part: §15.407
Prepared for: HON HAI PRECISION IND. CO., LTD
5F-1, 5 Hsin-An Road, Hsinchu Sci-
ence-Based Industrial Park, Taiwan, R.O.C.
Prepared by: SGS Taiwan Ltd.
Electronics & Communication Laboratory
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City, Taiwan 333



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VERIFICATION OF COMPLIANCE

Applicant: HON HAI PRECISION IND. CO., LTD
5F-1, 5 Hsin-An Road, Hsinchu Science-Based Industrial Park,
Taiwan, R.O.C.

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Brand Name of Host: acer

Model No. of Host: N15P1

Marketing Name of Host: SW5-014, SW5-014P

Product Name of Module: 802.11abgn+BT4.0 module

Brand Name of Module: FOXCONN

Model No. of Module: T77H462

Model Difference: N/A

FCC ID: MCLT77H462

File Number: E2/2015/90030-01

Date of test: Feb. 17, 2016 ~ Mar. 03, 2016

Date of EUT Received: Feb. 17, 2016

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Test By:

Aken Huang

Date

Mar. 04, 2016

Aken Huang / Engineer**Prepared By:**

Karen Huang

Date

Mar. 04, 2016

Karen Huang / Clerk**Approved By:**

Jim Chang

Date

Mar. 04, 2016

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date
E2/2015/90030-01	Rev.00	Initial creation of document	Mar. 04, 2016

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1. GENERAL INFORMATION

1.1. Product Description

General:

Product Name:	Tablet Computer	
Brand Name:		
Model No.:	N15P1	
Marketing Name of Host:	SW5-014, SW5-014P	
Hardware Version:	R1.4	
Software Version:	Win 10	
Model No. for Module:	T77H462	
Module FCC ID:	MCLT77H462	
Scope:	The test report covers the radiated emissions requirements of the standards referenced in the report to allow system level approval of the module in this specific host.	
Class II Permissive change:	The purpose in the permissive change is to certify U-NII-3 band under new U-NII rule per adopted under Docket No. 13-49.	
Power Supply:	3.75Vdc from Rechargeable Li-ion Battery or 12V by AC/DC Power Adapter	
	Bat-tery:	1. Model No.: AP15A3R, Supplier: Sanyo 2. Model No.: AP15A8R, Supplier: LGC
	Adapt-er:	Model No.: ADP-18TB C, Supplier: Delta

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WLAN: 802.11 a

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology
11a	5725~5850	5	12.49dBm	OFDM
11n	HT20 5725-5850	5	n: 14.48dBm (MIMO)	OFDM
	HT40 5725-5850	2	n: 12.47dBm (MIMO)	OFDM
Antenna Designation			PIFA Antenna 1. Antenna Main, Gain: 0.41dBi 2. Antenna Aux, Gain:0.04dBi	
Modulation type			64QAM, 16QAM, QPSK, BPSK for OFDM	
Transition Rate:			802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144Mbps 802.11 n_40MHz: 13.5 – 300Mbps	

The EUT is compliance with IEEE 802.11 a Standard.

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1.2. Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01

FCC KDB 662311 D01 Multiple Transmitter Output

FCC KDB 644545 D03 Guidance for IEEE 802.11ac v01

ANSI C63.10:2013

Note:

1. All test items have been performed and record as per the above standards.
2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.
3. The EUT was placed 1.5m height for frequency above 1GHz in accordance with ANSI C63.10:2013.

1.3. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd.,
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(TAF code 0513)

FCC Registration Numbers are: 628985

1.4. Special Accessories

There are no special accessories used while test was conducted.

1.5. Equipment Modifications

There was no modification incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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2.5. Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration

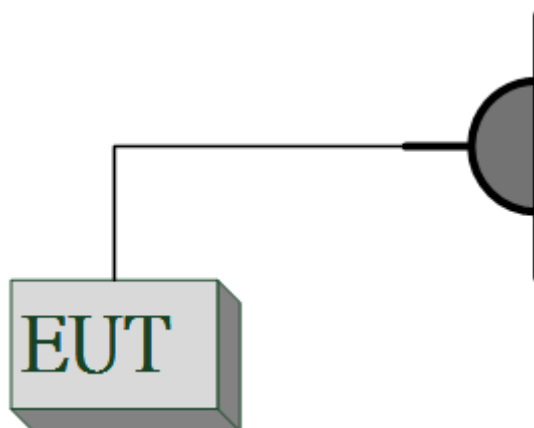


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

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3. SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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4. DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755 MHz	159	5795 MHz

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5745~5825	149 to 165	157	OFDM	6	MAIN
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

Pre-scanned was done on Antenna Main and Antenna Aux, Antenna Main results higher emission at 5.8GHz. Therefore, the completed set of measurement was done on Antenna Main to be presented on this test report.

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ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20	149 to 165	149,157,165	OFDM	MCS8	MIMO
802.11n_HT40	151 to 159	151,159	OFDM	MCS8	MIMO

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
6 dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 1.42 dB
Peak Power Spectral Density Measurement	+/- 1.55 dB
Frequency Stability	+/- 123.36 Hz
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz-30MHz: +/-2.87dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

6.1 Standard Applicable

OPERATION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	1 Watt(30dBm)
		Fixed point-to-point Access Point	1 Watt(30dBm)
		Mobile and portable client device	250mW(23.98dBm)
U-NII-2A			250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C			250mW(23.98dBm) or 11dBm+10 log B
U-NII-3	✓		1 Watt(30dBm)

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

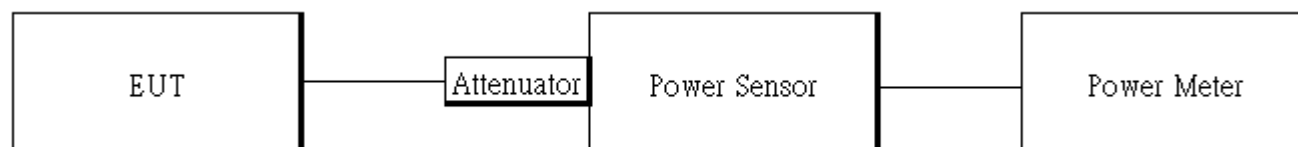
6.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Set the offset $10 \cdot \log(1/x)$
4. Record the max. reading.
5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.
6. Employing step 1 to 4 obtaining per-chain basis in MIMO operation, and sum the power in linear to result the output of MIMO operation at frequency of interest (, where MIMO is applicable).

6.3 Measurement Equipment Used:

Refer to section 7.3 for the plot.

6.4 Test Set-up:



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6.5 Measurement Result

802.11a (Main)

CH	Frequency (MHz)	Avg. Output Power		REQUIRED LIMIT (dBm)	RESULT
		TOTAL POWER (dBm)	TOTAL POWER (mW)		
149	5745	12.41	17.418	30	PASS
157	5785	12.49	17.742	30	PASS
165	5825	12.37	17.258	30	PASS

802.11a (Aux)

CH	Frequency (MHz)	Avg. Output Power		REQUIRED LIMIT (dBm)	RESULT
		TOTAL POWER (dBm)	TOTAL POWER (mW)		
149	5745	12.38	17.298	30	PASS
157	5785	12.44	17.539	30	PASS
165	5825	12.35	17.179	30	PASS

802.11n_20M (MIMO)

CH	Frequency (MHz)	Avg. Output Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
149	5745	11.36	11.41	14.40	27.513	30	PASS
157	5785	11.31	11.62	14.48	28.042	30	PASS
165	5825	11.20	11.71	14.47	28.008	30	PASS

802.11n_40M (MIMO)

CH	Frequency (MHz)	Avg. Output Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
151	5755	9.39	9.43	12.42	17.460	30	PASS
159	5795	9.39	9.53	12.47	17.664	30	PASS

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7. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

7.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
2. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

APPLICABLE TO	LIMIT	
FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01	FIELD STRENGTH AT 3m	
	PK: 74 (dBμV/m)	AV 54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.3 (dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)

$EIRP = (E \cdot d)^2 / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(KHz)	300
0.490-1.705	24000/F(KHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

7.2 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
Loop Antenna	ETS.LINDGREN	6502	148045	09/07/2015	09/06/2016
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/14/2015	12/13/2016
Horn antenna	ETS.LINDGREN	3117	123995	05/05/2015	05/04/2016
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017

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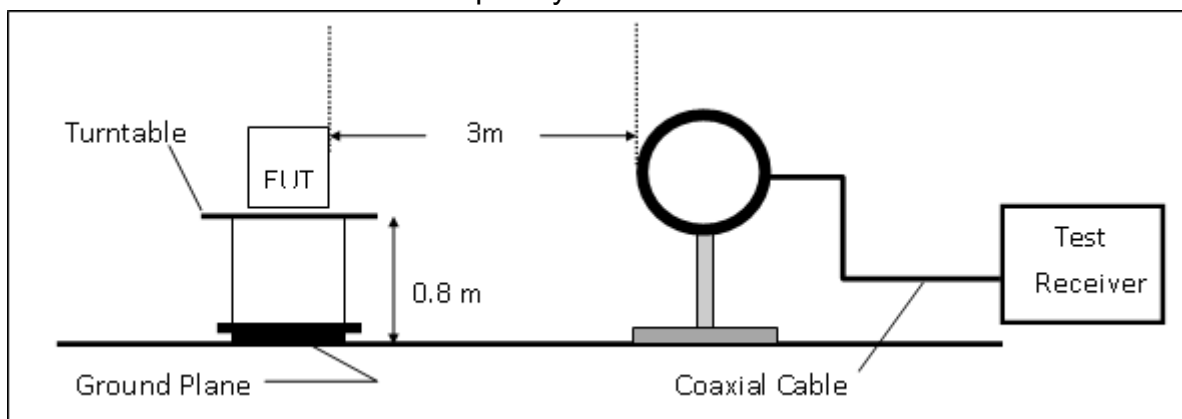
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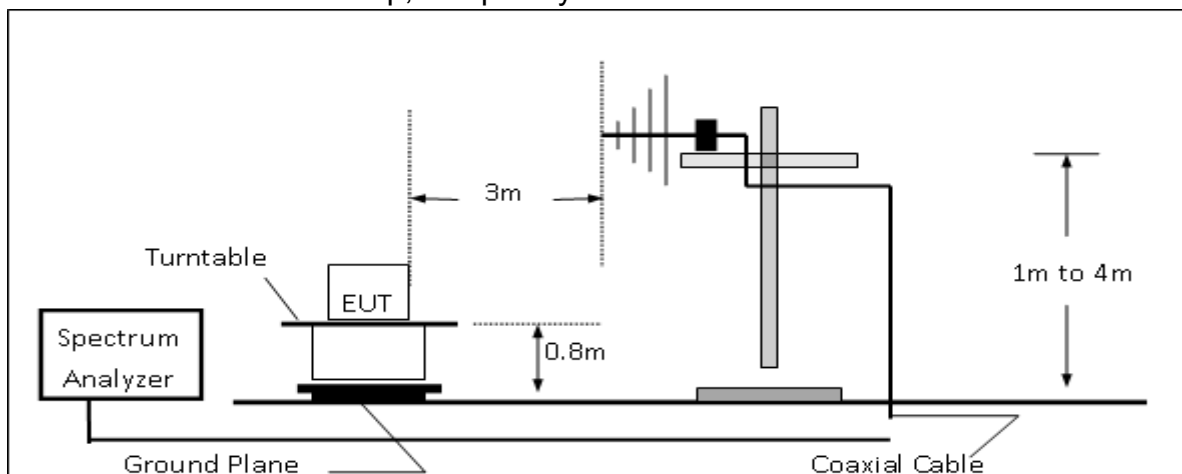
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7.3 Test SET-UP

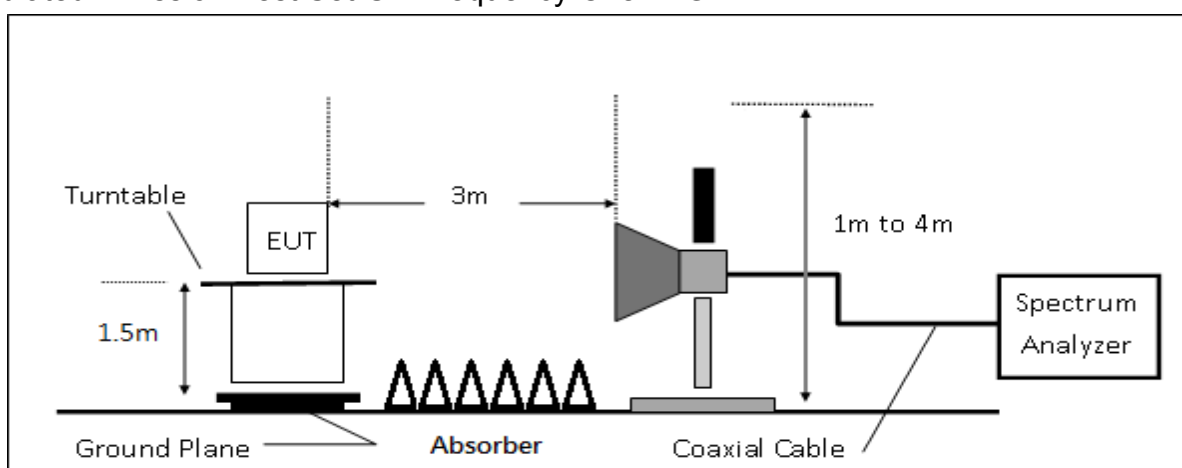
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-UP, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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7.4 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
3. The EUT was placed on a turn table with 0.8m for frequency < 1GHz and 1.5m for frequency > 1GHz above ground plane.
4. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
5. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW $\geq 1/T$ (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
11. Repeat above procedures until all frequency measured were complete.

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7.5 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	

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note :

“F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

7.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

7.7 Measurement Result

Refer to attach tabular data sheets.

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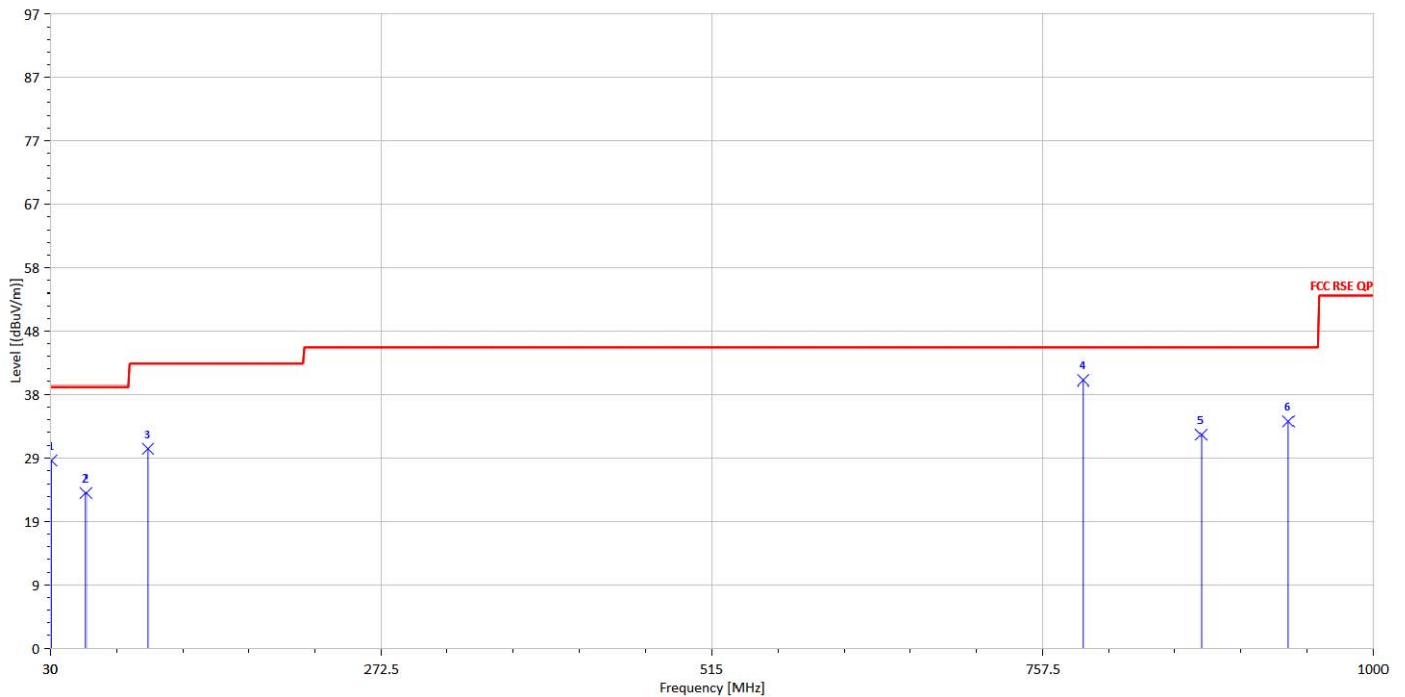
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802.11a, 5725~5850 MHz

Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5785 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
30.97	S	Peak	42.32	-13.64	28.69	40	-11.31
56.19	S	Peak	51.14	-27.33	23.81	40	-16.19
101.78	S	Peak	54.03	-23.54	30.49	43.5	-13.01
787.57	S	Peak	50.88	-9.93	40.95	46	-5.05
873.90	S	Peak	41.16	-8.50	32.66	46	-13.34
937.92	S	Peak	42.34	-7.62	34.72	46	-11.28

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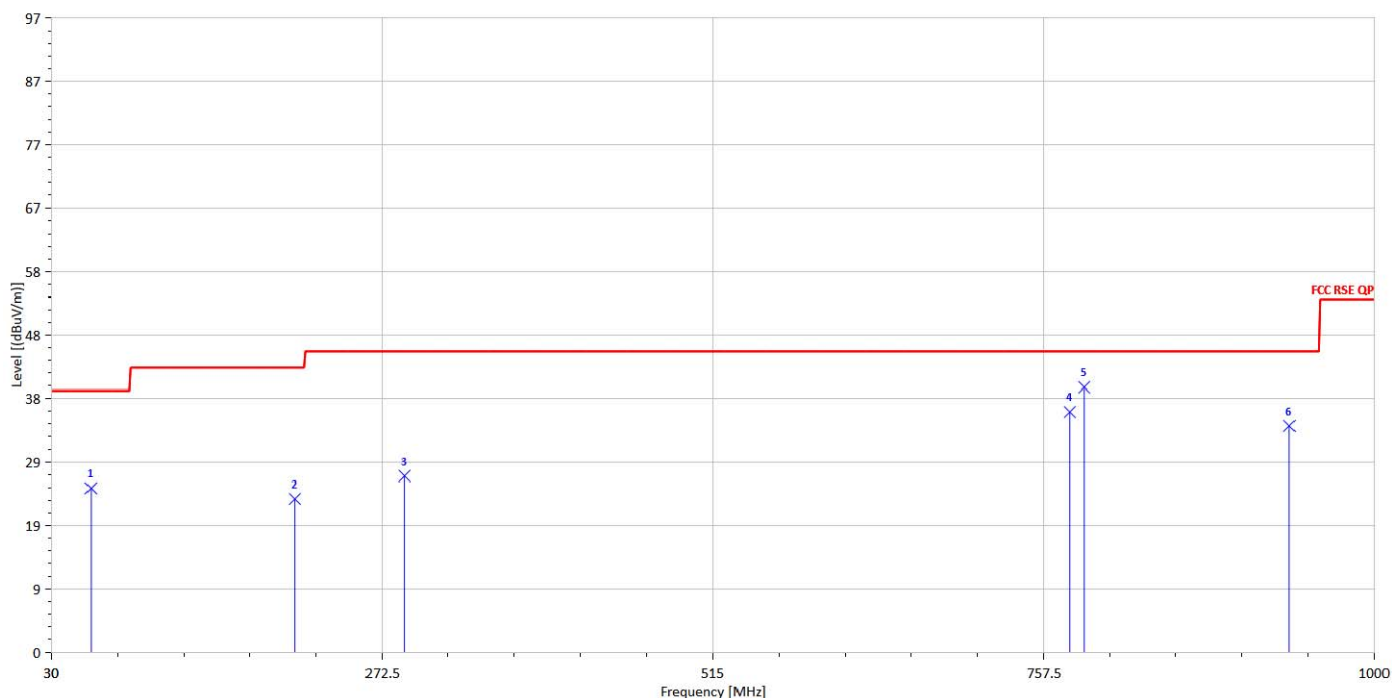
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Operation Mode : 802.11a Test Date : 2016/2/23
Fundamental Frequency : 5785 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Mid Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
59.10	S	Peak	53.35	-28.23	25.12	40	-14.88
208.48	S	Peak	46.45	-22.96	23.50	43.5	-20.00
288.99	S	Peak	46.36	-19.42	26.95	46	-19.05
776.90	S	Peak	47.13	-10.35	36.78	46	-9.22
787.57	S	Peak	50.45	-9.93	40.52	46	-5.48
937.92	S	Peak	42.26	-7.62	34.63	46	-11.37

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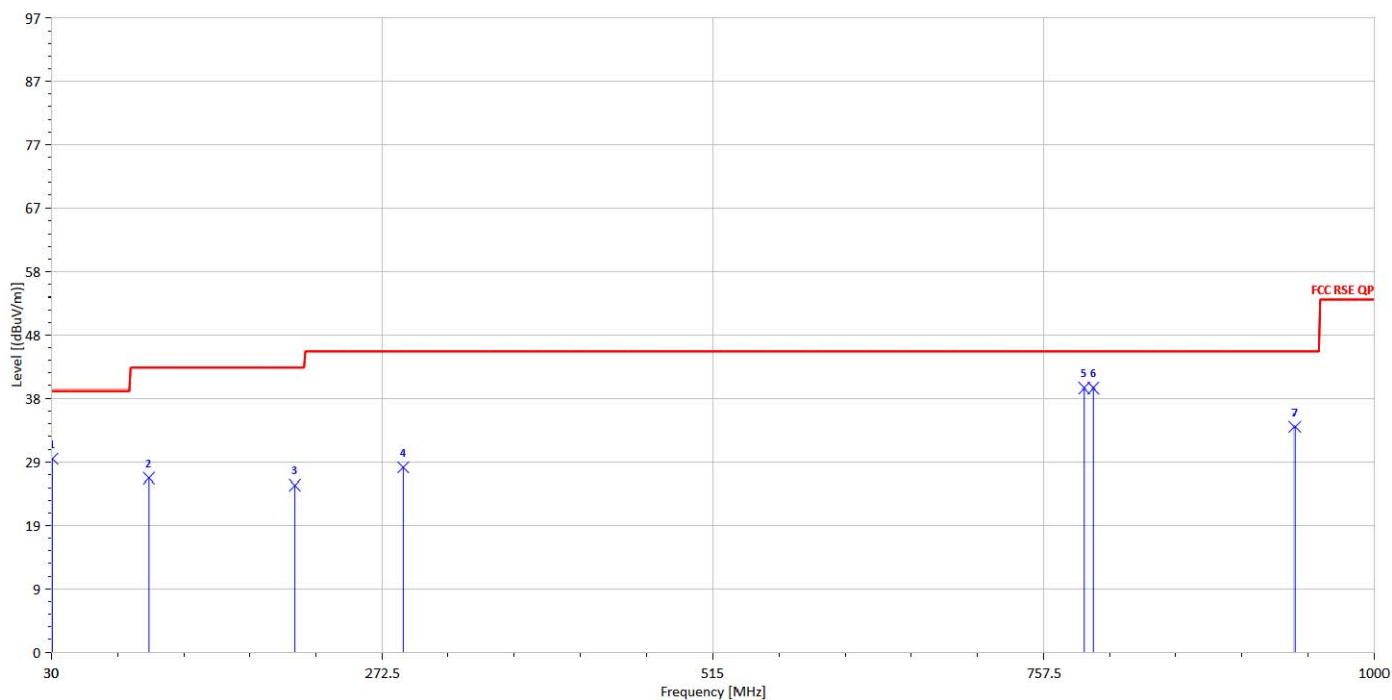
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Operation Mode : 802.11n40 Test Date : 2016/2/23
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
30.97	S	Peak	43.21	-13.64	29.57	40	-10.43
101.78	S	Peak	50.17	-23.54	26.63	43.5	-16.87
208.48	S	Peak	48.52	-22.96	25.56	43.5	-17.94
288.02	S	Peak	47.69	-19.45	28.24	46	-17.76
787.57	S	Peak	50.33	-9.93	40.40	46	-5.60
794.36	S	Peak	50.11	-9.71	40.40	46	-5.60
941.80	S	Peak	42.15	-7.64	34.51	46	-11.49

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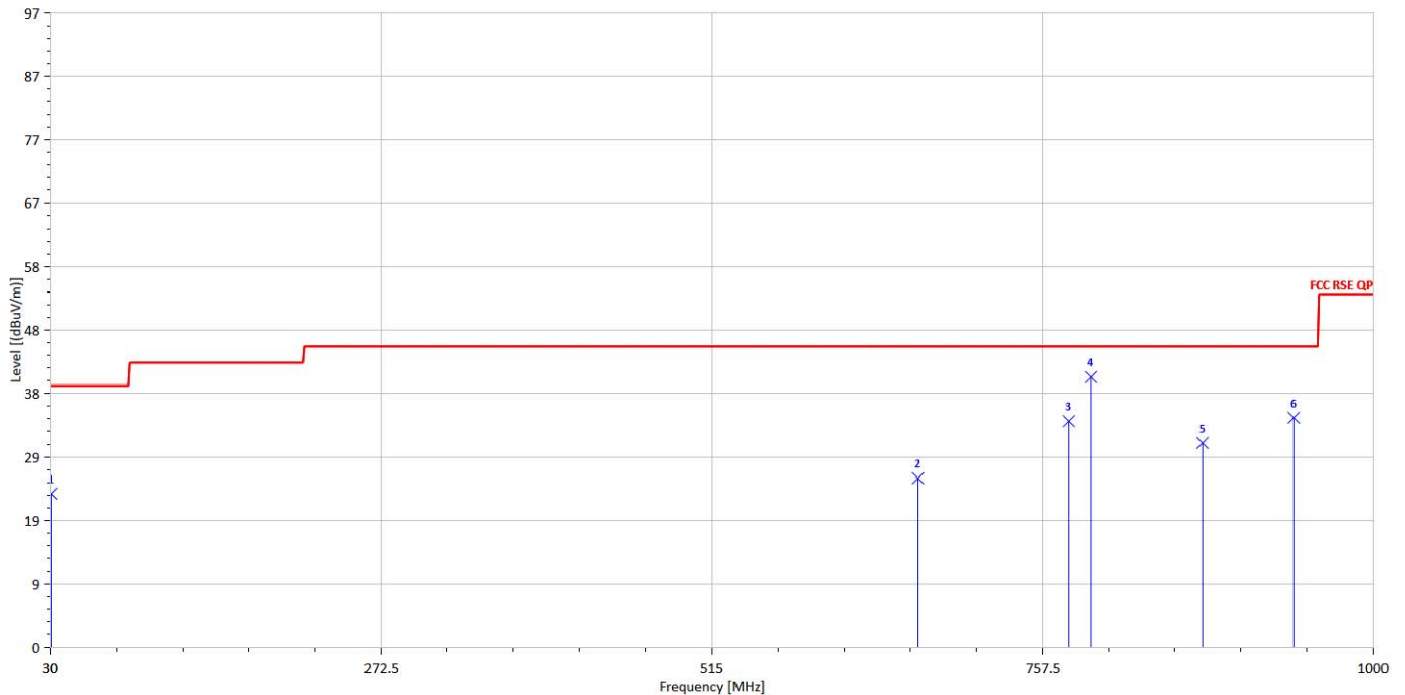
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Operation Mode : 802.11n40 Test Date : 2016/2/23
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBuV		dBuV/m	dBuV/m	
30.97	S	Peak	37.15	-13.64	23.51	40	-16.49
666.32	S	Peak	37.51	-11.65	25.86	46	-20.14
776.90	S	Peak	44.94	-10.35	34.59	46	-11.41
793.39	S	Peak	51.05	-9.75	41.30	46	-4.70
874.87	S	Peak	39.72	-8.49	31.23	46	-14.77
941.80	S	Peak	42.75	-7.64	35.11	46	-10.89

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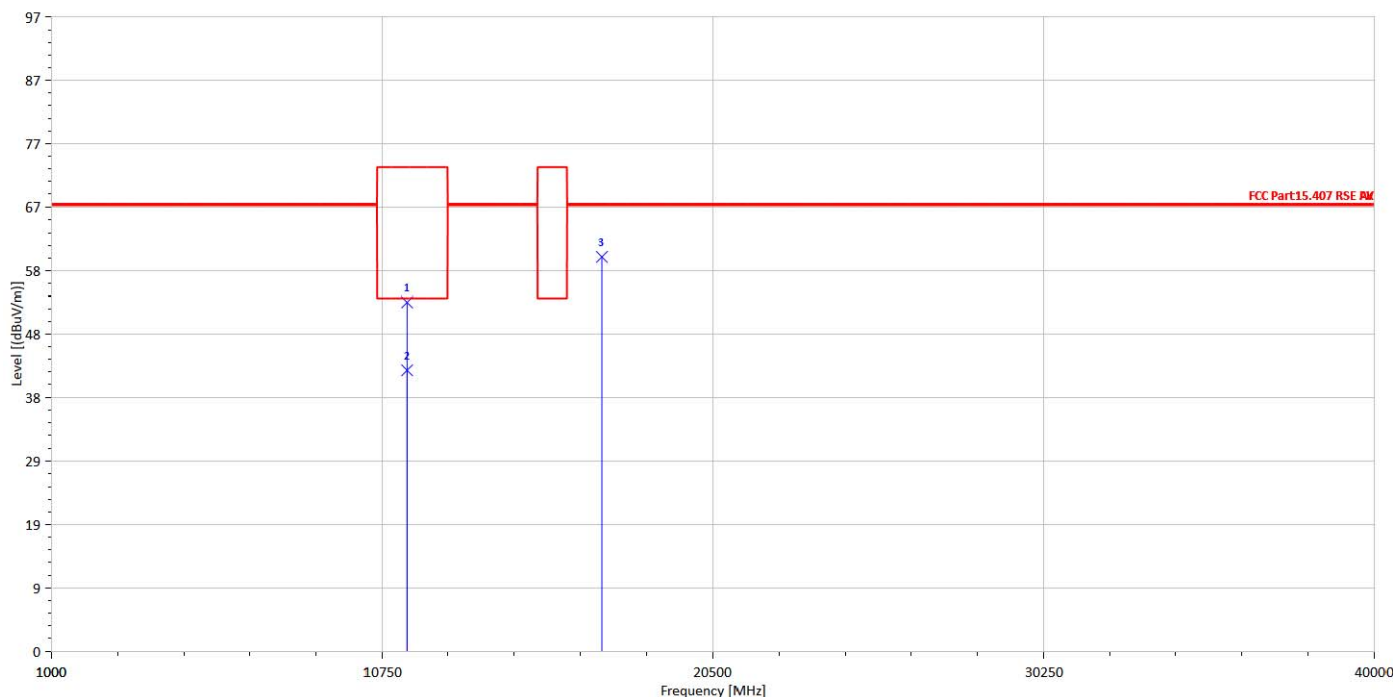
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Above 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11490.00	H	Peak	32.31	21.08	53.39	74	-20.61
11490.00	H	Average	21.84	21.08	42.92	54	-11.08
17235.00	H	Peak	32.23	28.06	60.28	68.3	-8.02

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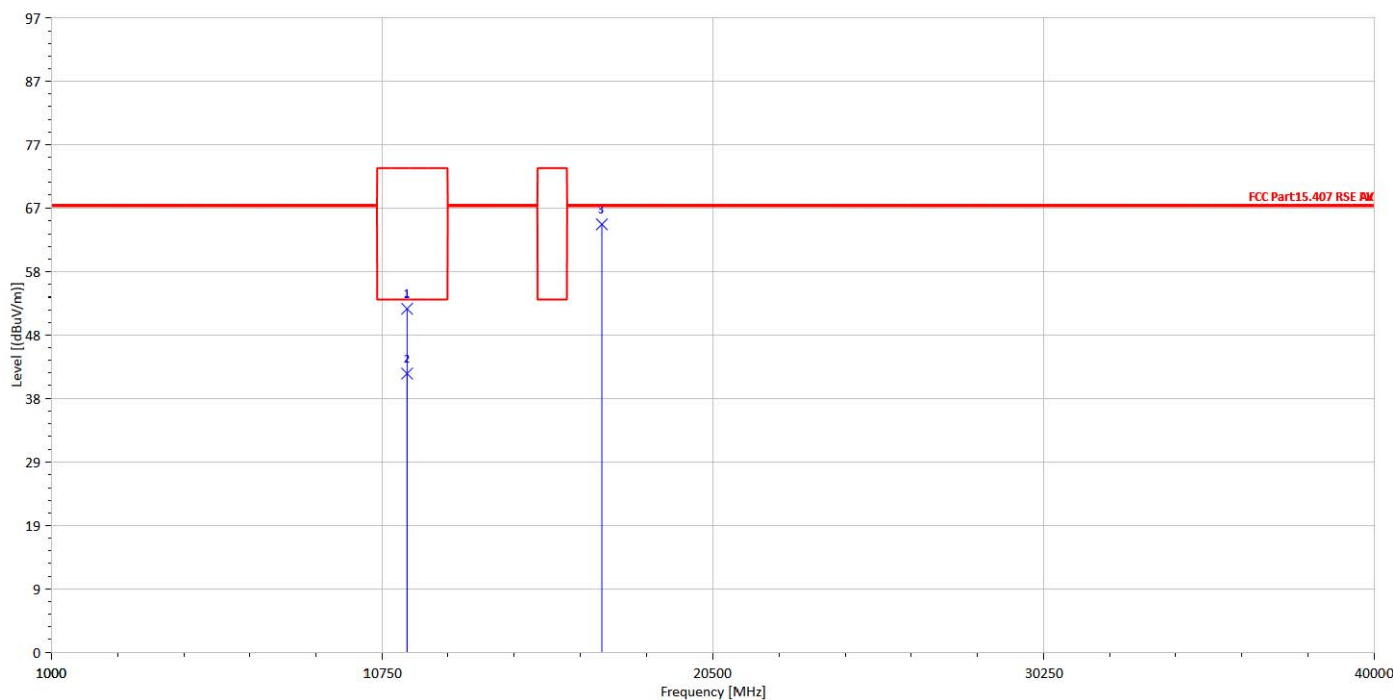
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Operation Mode : 802.11a Test Date : 2016/2/23
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	H	Peak	31.49	21.08	52.57	74	-21.43
11490.00	H	Average	21.49	21.08	42.57	54	-11.43
17235.00	H	Peak	37.41	28.06	65.47	68.3	-2.83

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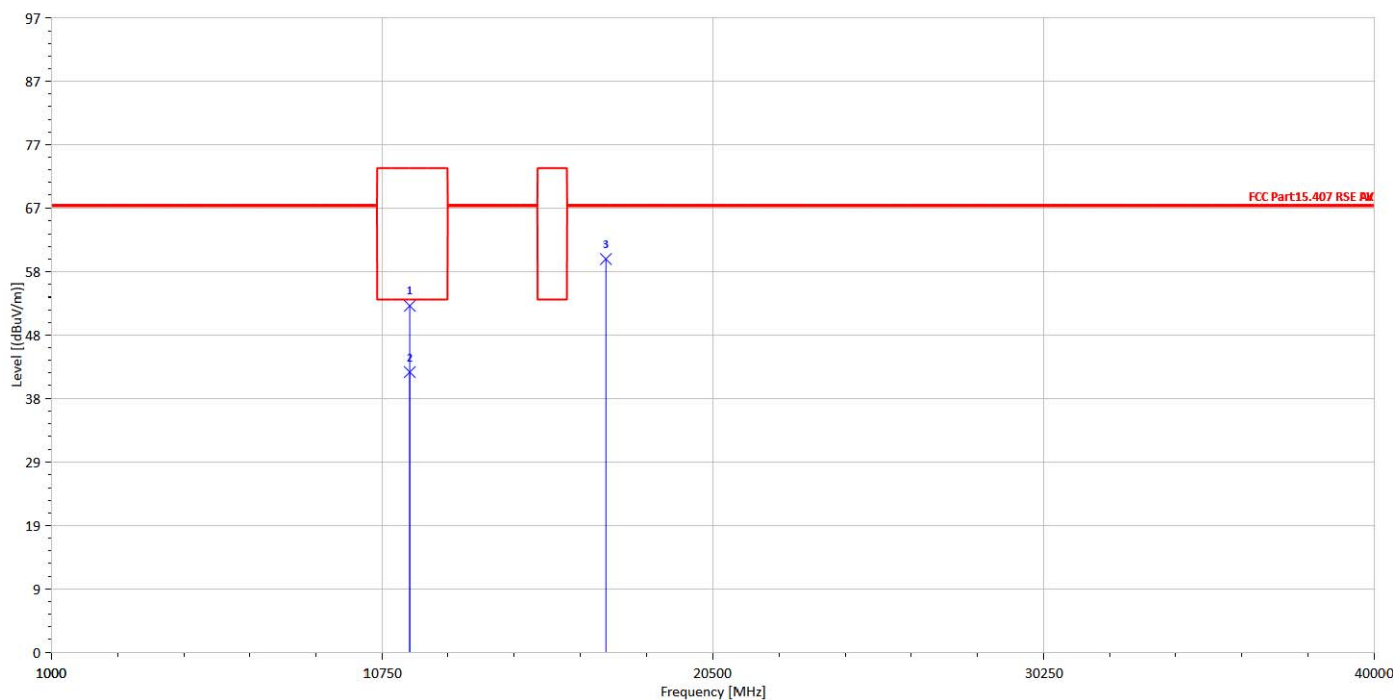
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Operation Mode : 802.11a Test Date : 2016/2/23
Fundamental Frequency : 5785 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Mid Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11570.00	H	Peak	31.90	21.14	53.04	74	-20.96
11570.00	H	Average	21.67	21.14	42.81	54	-11.19
17355.00	H	Peak	32.23	27.87	60.10	68.3	-8.20

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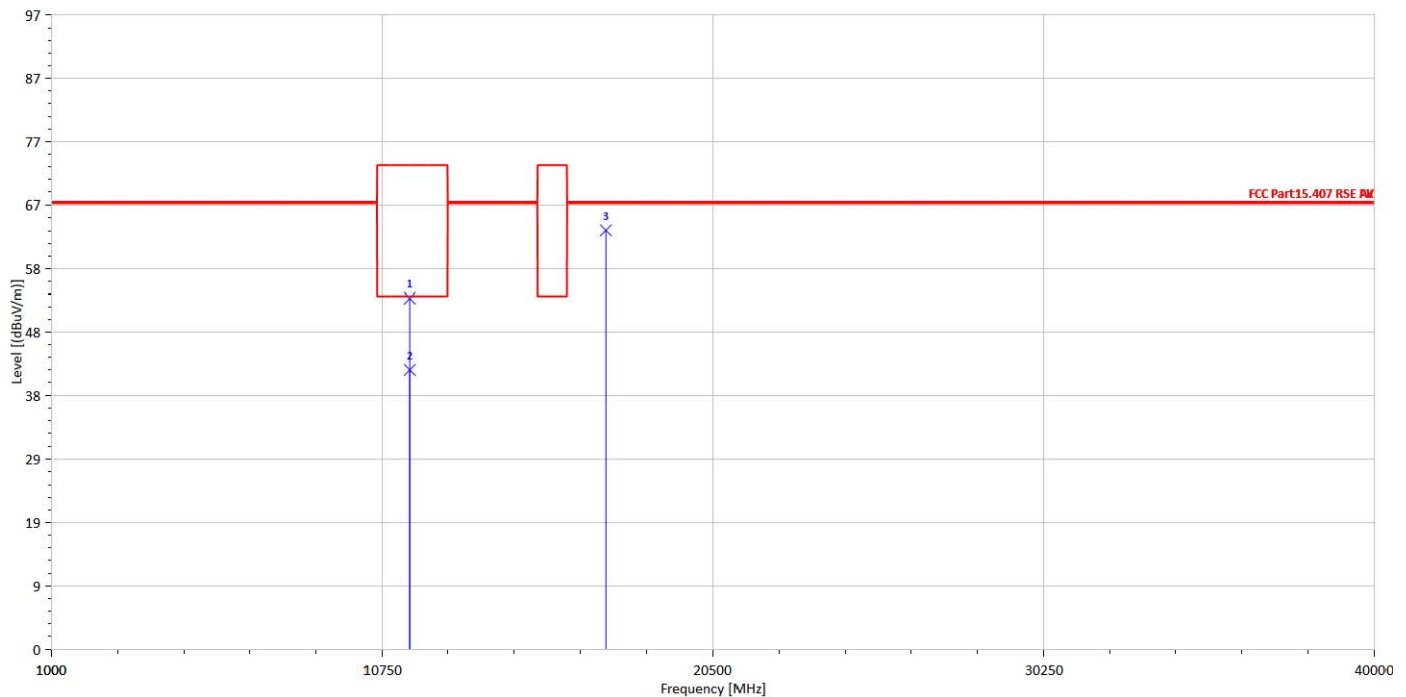
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Operation Mode : 802.11a Test Date : 2016/2/23
Fundamental Frequency : 5785 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Mid Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11570.00	H	Peak	32.54	21.14	53.68	74	-20.32
11570.00	H	Average	21.53	21.14	42.67	54	-11.33
17355.00	H	Peak	36.20	27.87	64.07	68.3	-4.23

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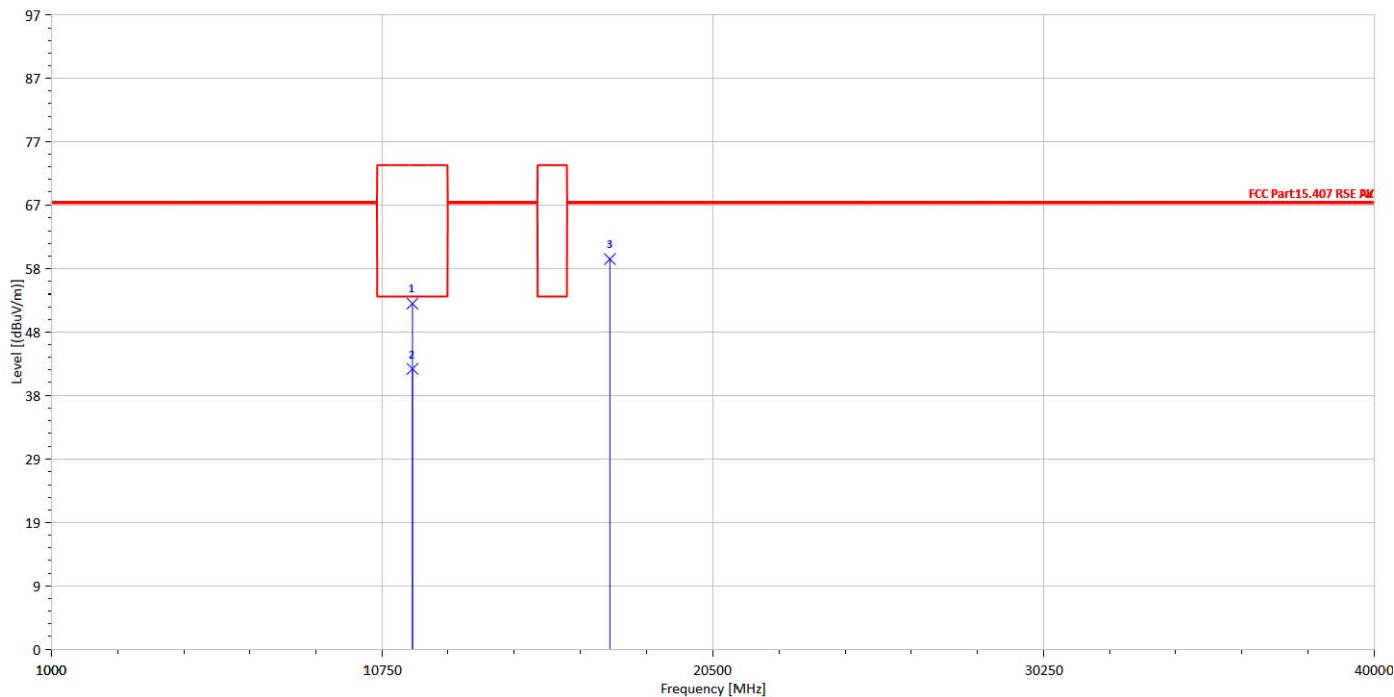
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Operation Mode : 802.11a Test Date : 2016/2/23
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	H	Peak	31.64	21.27	52.91	74	-21.09
11650.00	H	Average	21.56	21.27	42.83	54	-11.17
17475.00	H	Peak	31.99	27.65	59.64	68.3	-8.66

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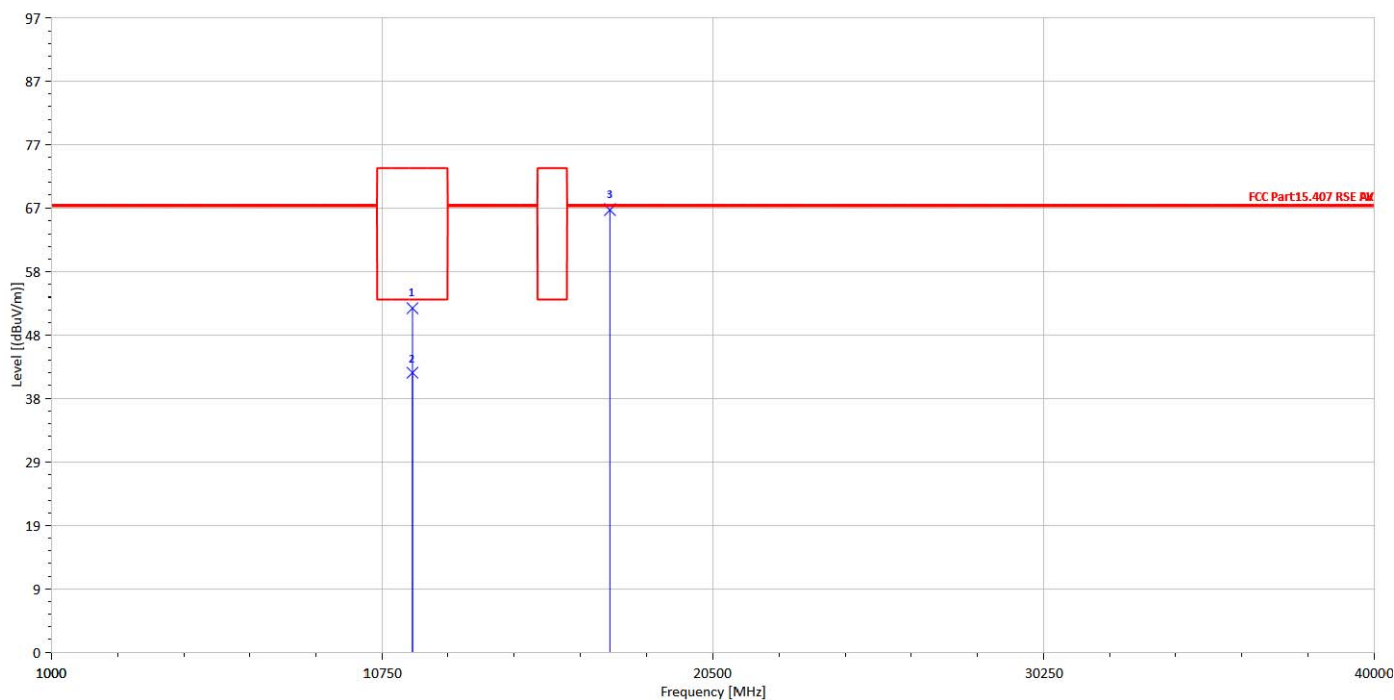
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Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	H	Peak	31.39	21.27	52.67	74	-21.33
11650.00	H	Average	21.43	21.27	42.70	54	-11.30
17475.00	H	Peak	40.03	27.65	67.68	68.3	-0.62

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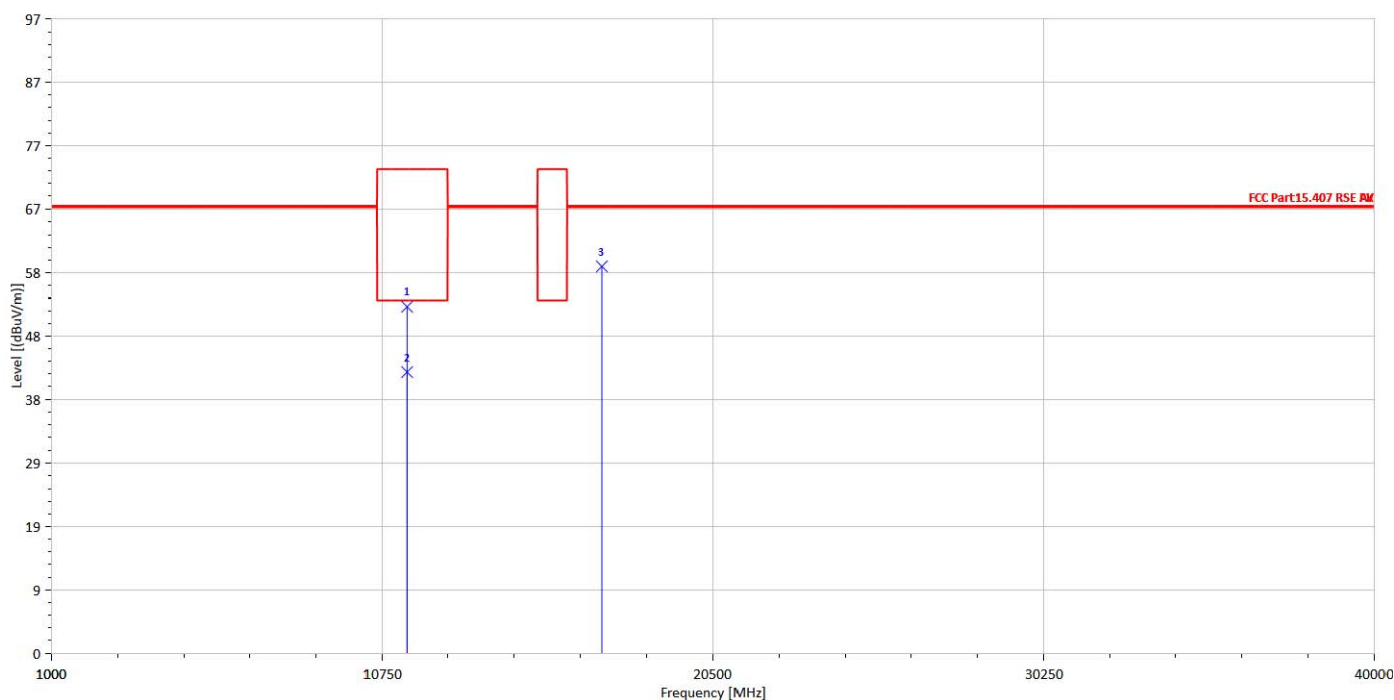
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Mode :	802.11n20	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7 deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	H	Peak	31.96	21.08	53.04	74	-20.96
11490.00	H	Average	21.87	21.08	42.95	54	-11.05
17235.00	H	Peak	31.08	28.06	59.14	68.3	-9.16

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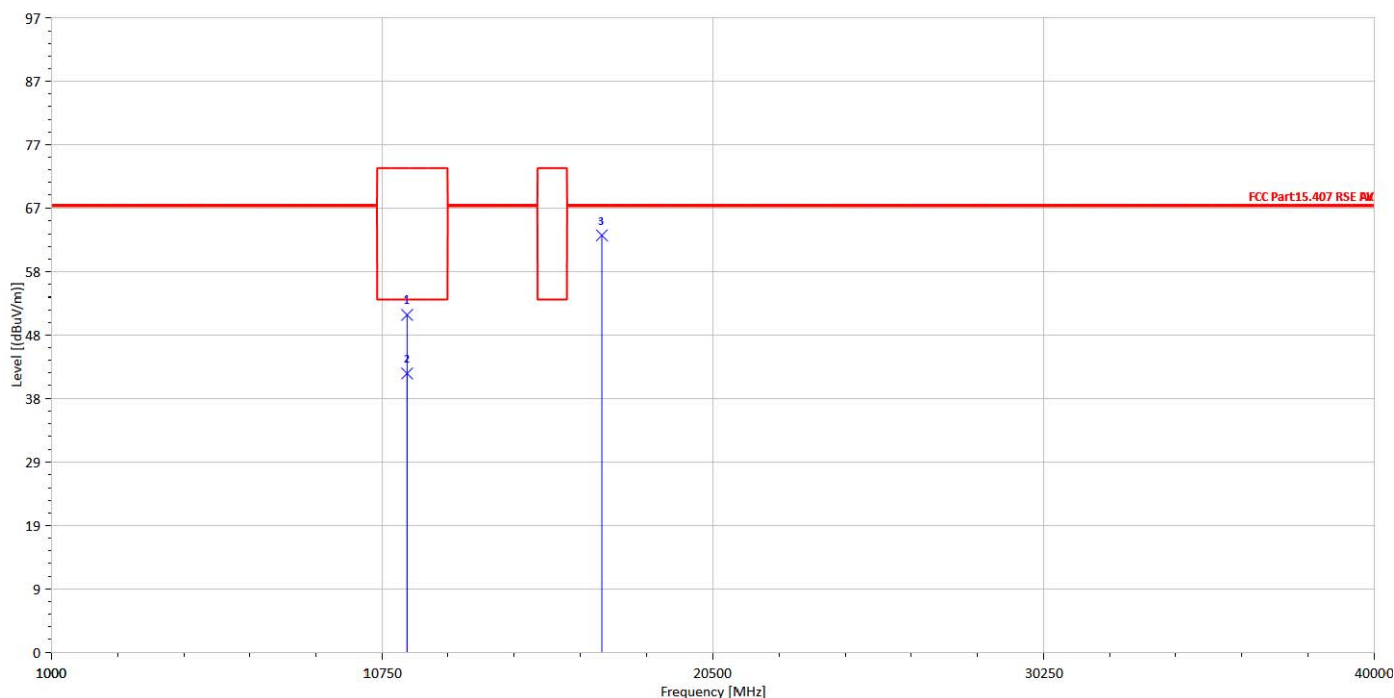
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Operation Mode : 802.11n20 Test Date : 2016/2/23
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Low Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11490.00	H	Peak	30.55	21.08	51.63	74	-22.37
11490.00	H	Average	21.51	21.08	42.59	54	-11.41
17235.00	H	Peak	35.71	28.06	63.77	68.3	-4.53

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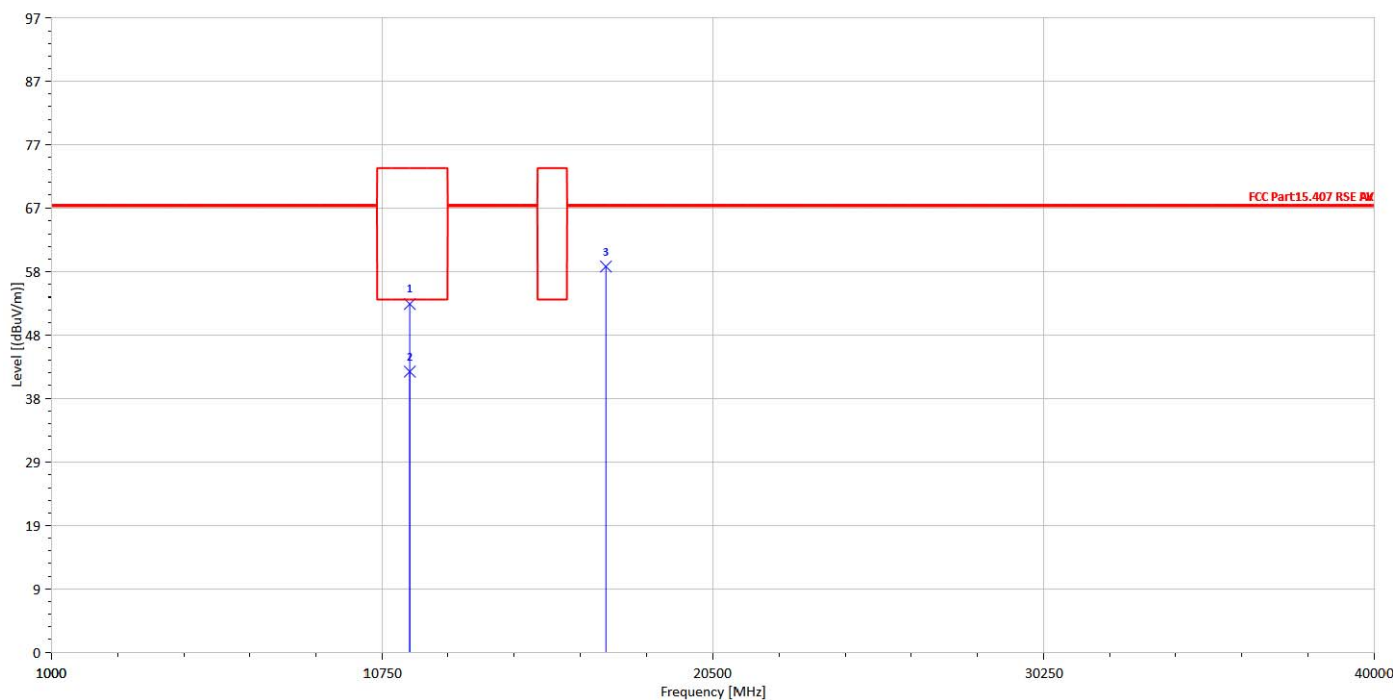
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Operation Mode : 802.11n20 Test Date : 2016/2/23
Fundamental Frequency : 5785 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Mid Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11570.00	H	Peak	32.18	21.14	53.32	74	-20.68
11570.00	H	Average	21.74	21.14	42.88	54	-11.12
17355.00	H	Peak	31.09	27.87	58.96	68.3	-9.34

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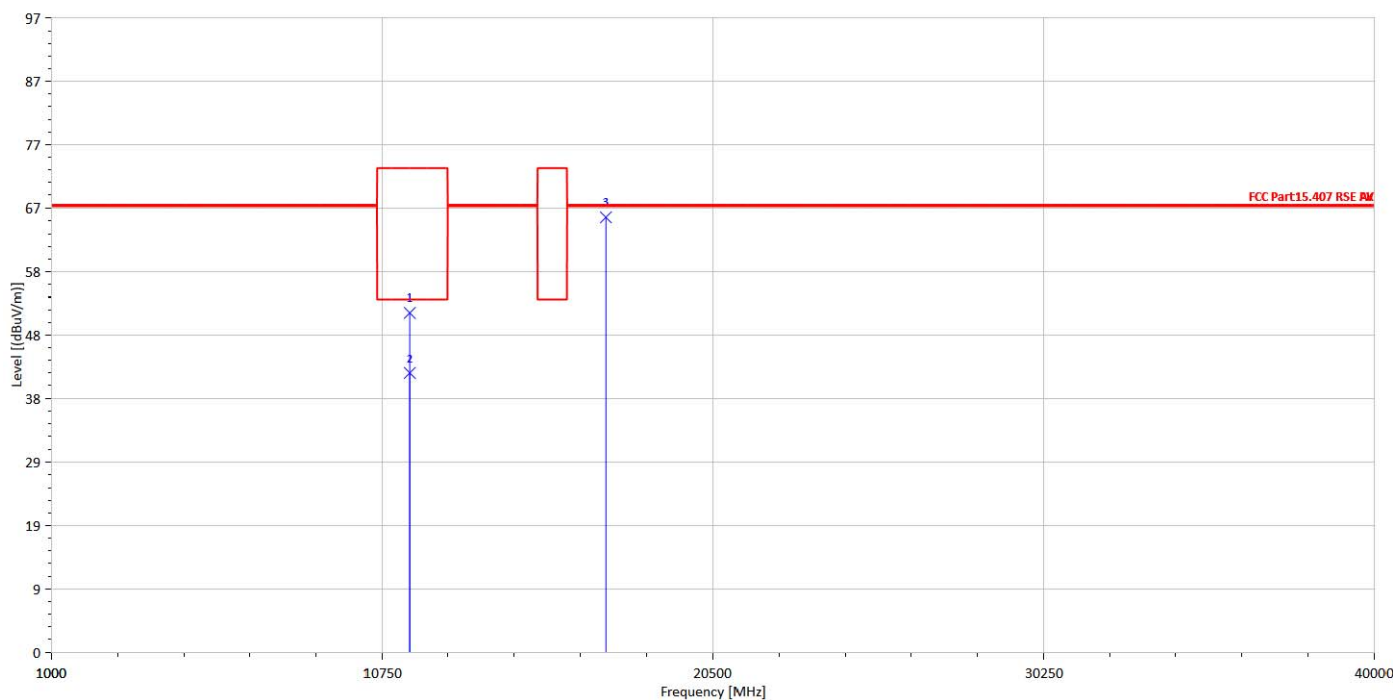
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Operation Mode : 802.11n20 Test Date : 2016/2/23
Fundamental Frequency : 5785 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Mid Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11570.00	H	Peak	30.80	21.14	51.94	74	-22.06
11570.00	H	Average	21.53	21.14	42.67	54	-11.33
17355.00	H	Peak	38.68	27.87	66.55	68.3	-1.75

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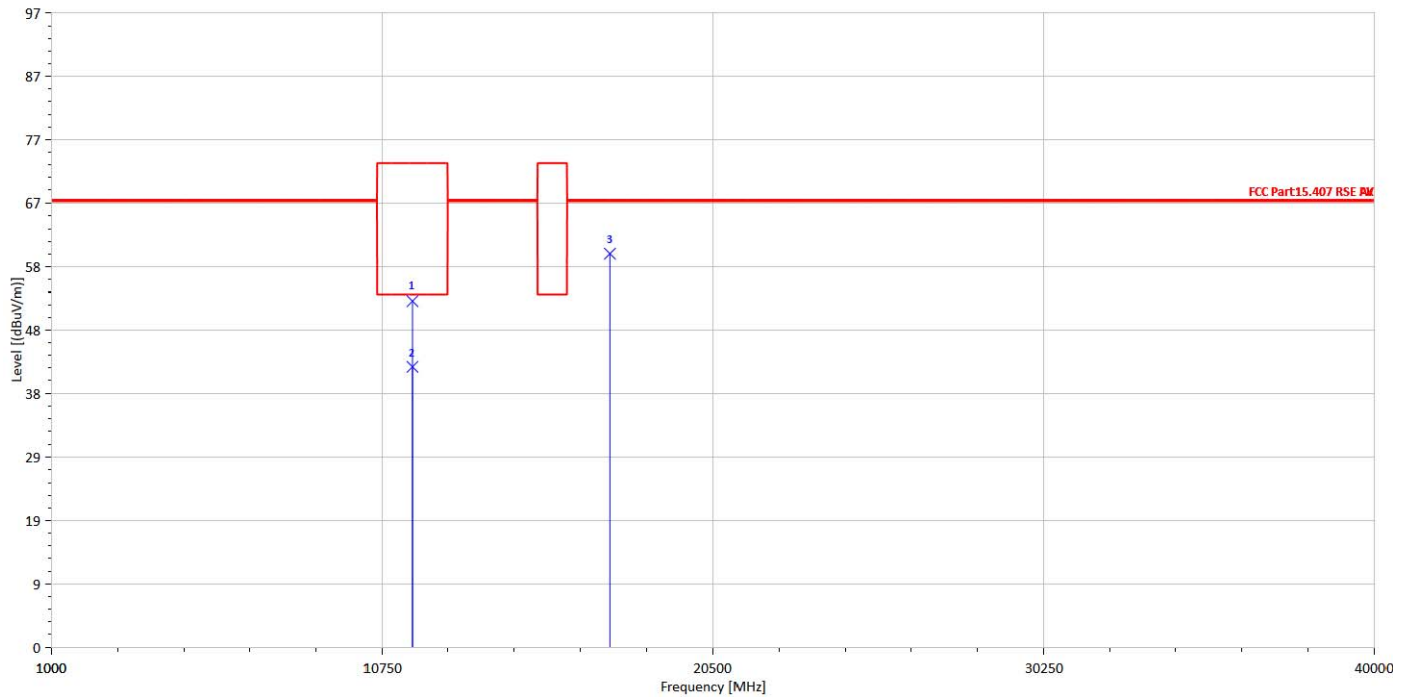
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Operation Mode : 802.11n20 Test Date : 2016/2/23
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH High Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	H	Peak	31.71	21.27	52.98	74	-21.02
11650.00	H	Average	21.57	21.27	42.84	54	-11.16
17475.00	H	Peak	32.51	27.65	60.16	68.3	-8.14

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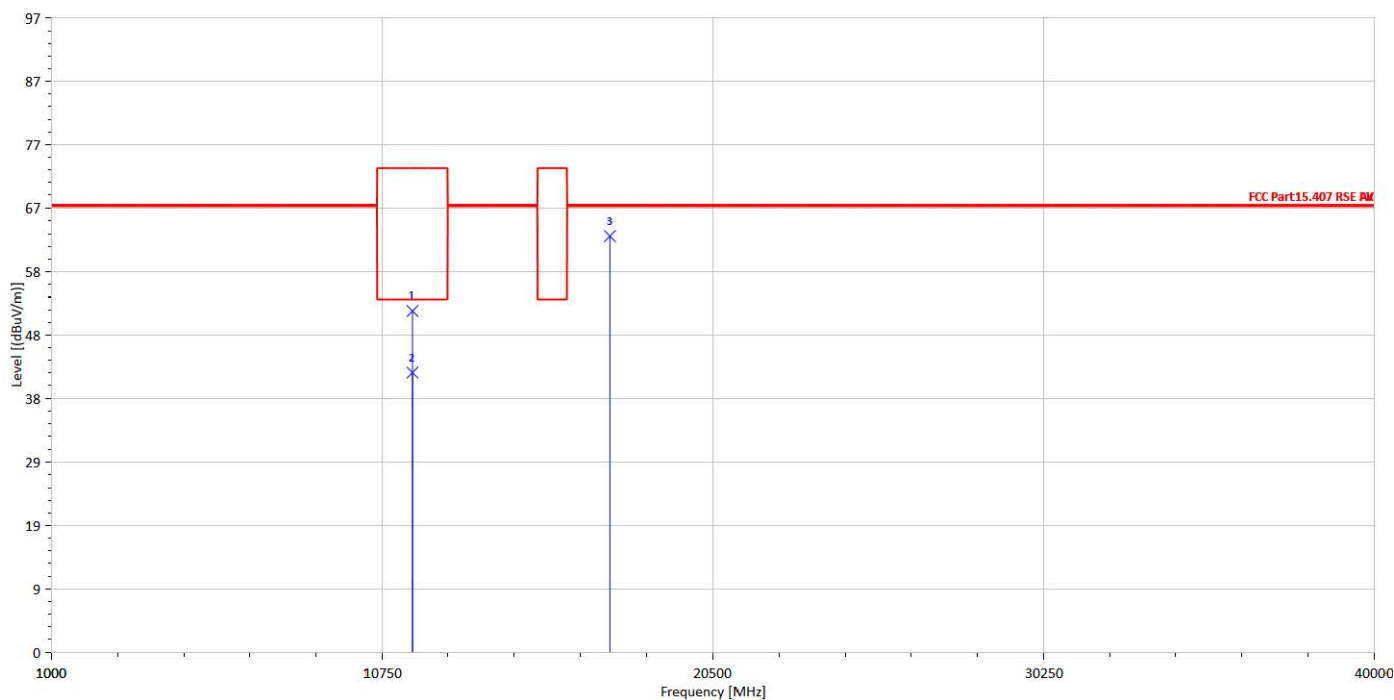
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Operation Mode : 802.11n20 Test Date : 2016/2/23
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH High Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11650.00	H	Peak	30.96	21.27	52.23	74	-21.77
11650.00	H	Average	21.45	21.27	42.72	54	-11.28
17475.00	H	Peak	36.00	27.65	63.65	68.3	-4.65

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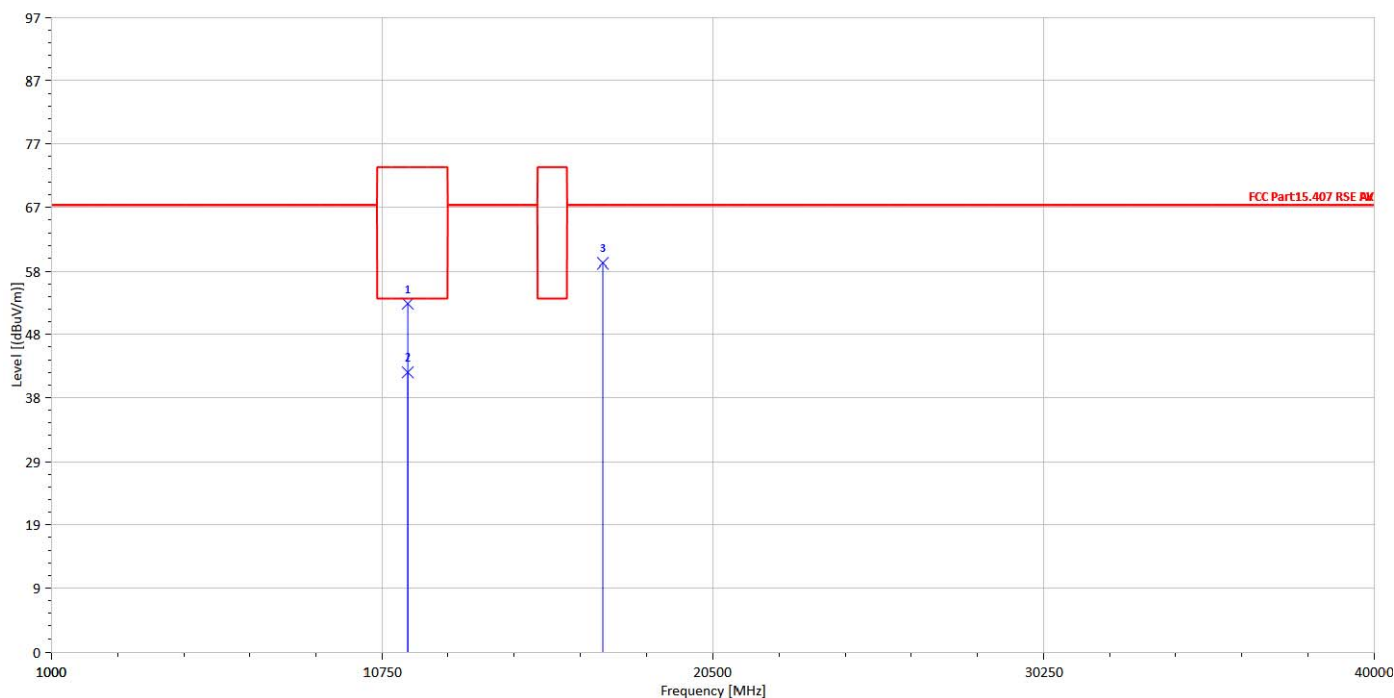
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/2/23
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7 deg_C/57 RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11510.00	H	Peak	32.05	21.17	53.22	74	-20.78
11510.00	H	Average	21.59	21.17	42.76	54	-11.24
17265.00	H	Peak	31.54	27.82	59.36	68.3	-8.94

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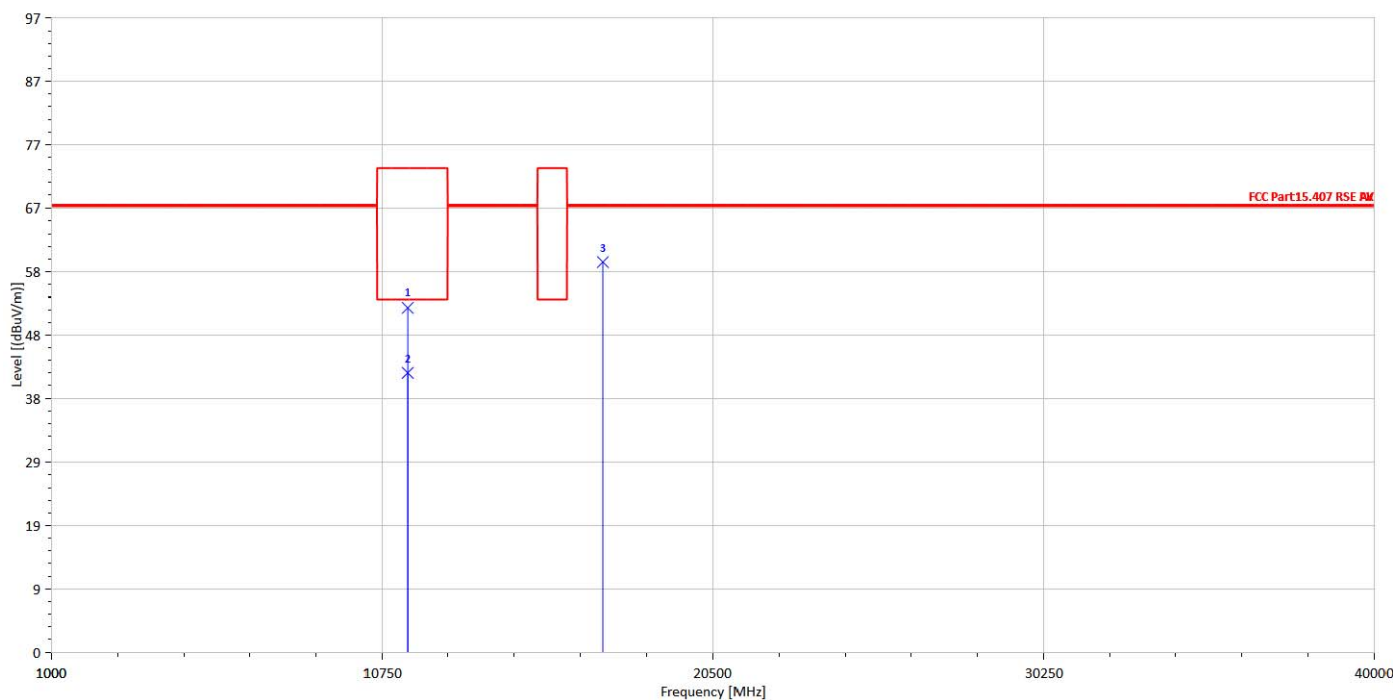
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Operation Mode : 802.11n40 Test Date : 2016/2/23
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH Low Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11510.00	H	Peak	31.54	21.17	52.71	74	-21.29
11510.00	H	Average	21.51	21.17	42.68	54	-11.32
17265.00	H	Peak	31.81	27.82	59.64	68.3	-8.66

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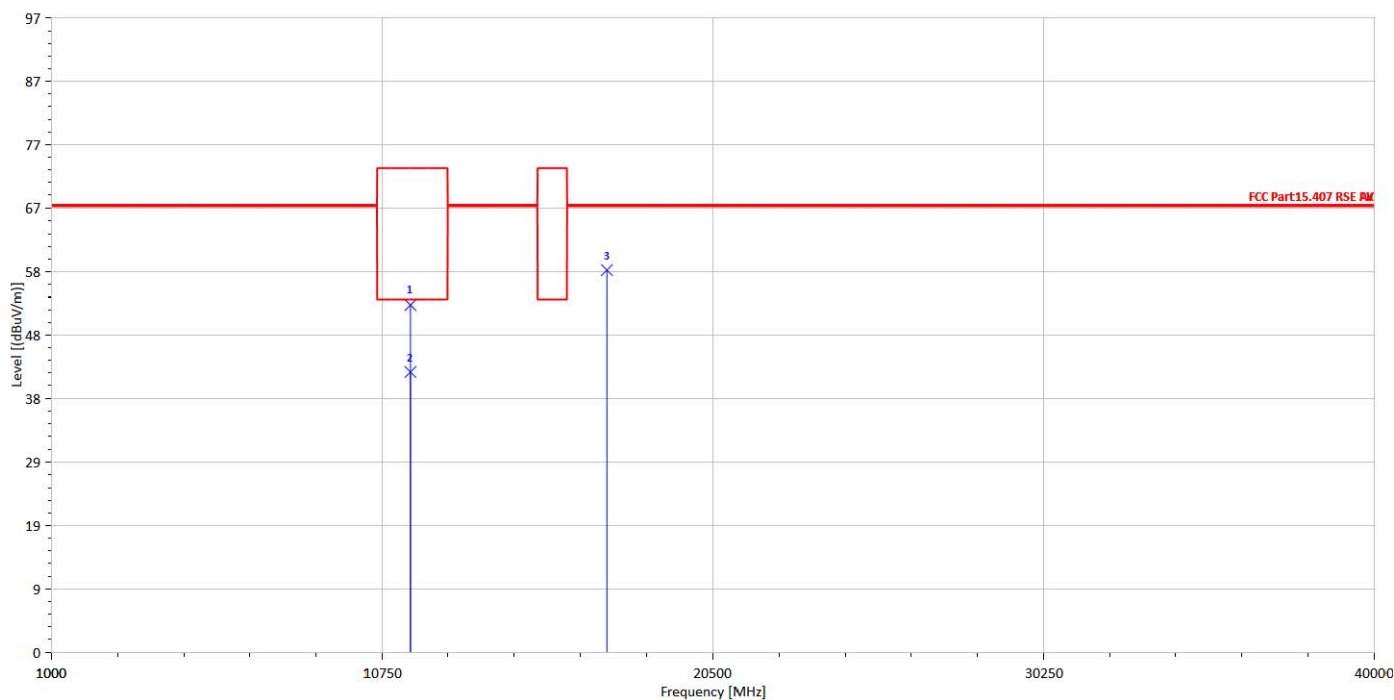
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Operation Mode : 802.11n40 Test Date : 2016/2/23
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH High Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11590.00	H	Peak	31.88	21.28	53.16	74	-20.84
11590.00	H	Average	21.54	21.28	42.82	54	-11.18
17385.00	H	Peak	30.79	27.61	58.40	68.3	-9.90

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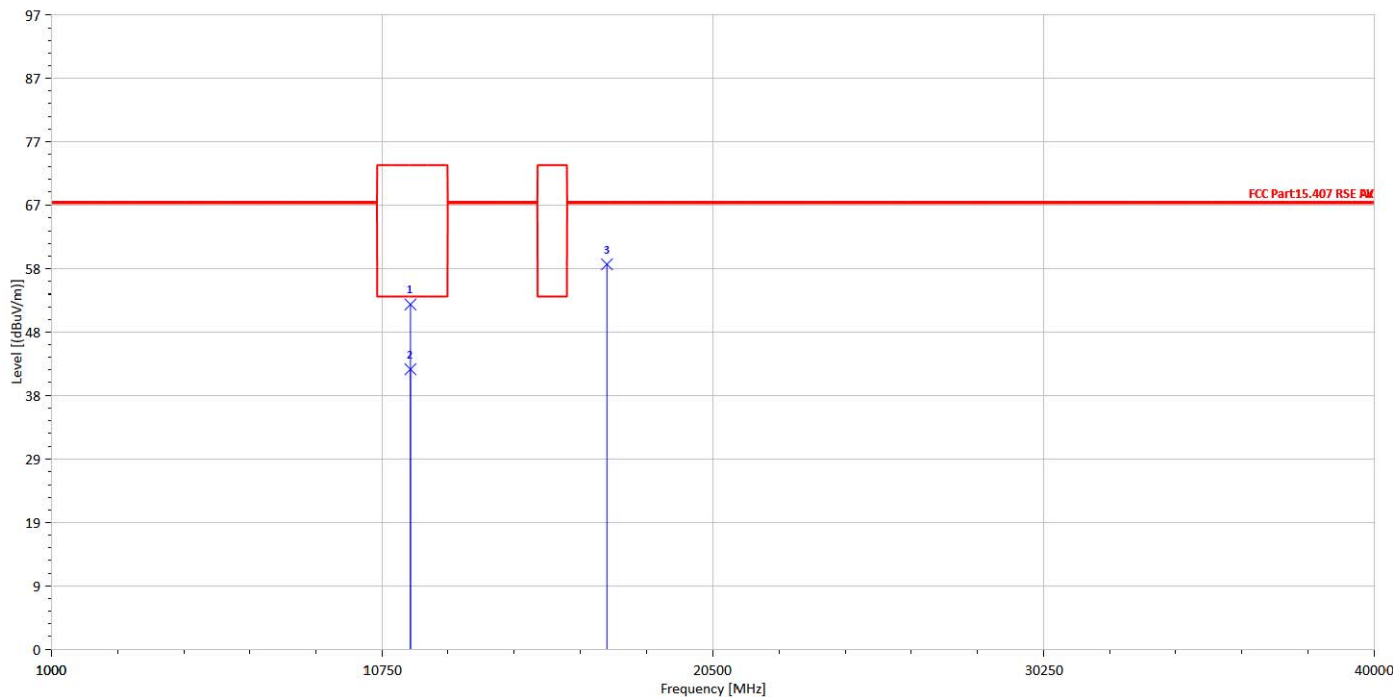
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Operation Mode : 802.11n40 Test Date : 2016/2/23
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7 deg_C/57 RH
Operation Band : Tx CH High Test Engineer : Pony
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11590.00	H	Peak	31.51	21.28	52.79	74	-21.21
11590.00	H	Average	21.50	21.28	42.78	54	-11.22
17385.00	H	Peak	31.22	27.61	58.83	68.3	-9.47

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Band edge falling to restricted band

802.11a mode

Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5713.90	S	Peak	53.34	12.31	65.65	68.3	-2.65
5723.90	S	Peak	62.39	12.27	74.66	78.2	-3.54
5725.00	E	Peak	61.55	12.27	73.82	78.2	-4.38

Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.50	S	Peak	52.96	12.30	65.26	68.3	-3.04
5725.00	S	Peak	62.21	12.27	74.48	78.2	-3.72

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Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	45.79	12.61	58.40	78.2	-19.80
5853.70	S	Peak	48.04	12.65	60.69	78.2	-17.51
5864.10	S	Peak	47.20	12.74	59.94	68.3	-8.36

Operation Mode :	802.11a	Test Date :	2016/2/23
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	53.65	12.61	66.26	78.2	-11.94
5855.90	S	Peak	53.94	12.67	66.61	78.2	-11.59
5862.20	S	Peak	52.28	12.73	65.01	68.3	-3.29

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802.11n20 HT mode

Operation Mode :	802.11n20	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5713.70	S	Peak	44.92	12.31	57.23	68.3	-11.07
5724.20	S	Peak	53.18	12.27	65.46	78.2	-12.74
5725.00	E	Peak	52.42	12.27	64.69	78.2	-13.51

Operation Mode :	802.11n20	Test Date :	2016/2/23
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.30	S	Peak	50.94	12.31	63.24	68.3	-5.06
5725.00	E	Peak	60.48	12.27	72.75	78.2	-5.45

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Operation Mode :	802.11n20	Test Date :	2016/2/23
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	49.34	12.61	61.95	78.2	-16.25
5850.40	S	Peak	48.97	12.62	61.58	78.2	-16.62
5862.40	S	Peak	44.43	12.73	57.16	68.3	-11.14

Operation Mode :	802.11n20	Test Date :	2016/2/23
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	54.27	12.61	66.88	78.2	-11.32
5850.40	S	Peak	55.56	12.62	68.17	78.2	-10.03
5860.30	S	Peak	51.00	12.71	63.71	68.3	-4.59

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802.11n40 HT mode

Operation Mode :	802.11n40	Test Date :	2016/2/23
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.07	S	Peak	53.01	12.31	65.32	68.3	-2.98
5725.00	E	Peak	57.99	12.27	70.26	78.2	-7.94

Operation Mode :	802.11n40	Test Date :	2016/2/23
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5712.75	S	Peak	53.23	12.31	65.54	68.3	-2.76
5725.00	E	Peak	57.24	12.27	69.51	78.2	-8.69

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Operation Mode :	802.11n40	Test Date :	2016/2/23
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	46.03	12.61	58.64	78.2	-19.56
5852.00	S	Peak	47.30	12.63	59.93	78.2	-18.27
5860.50	S	Peak	45.24	12.71	57.96	68.3	-10.34

Operation Mode :	802.11n40	Test Date :	2016/2/23
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	48.00	12.61	60.61	78.2	-17.59
5864.90	S	Peak	45.64	12.74	58.38	68.3	-9.92

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8. ANTENNA REQUIREMENT

8.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2 Antenna Connected Construction

The antenna is designed with permanent attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

~ End of Report ~

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