

## 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:	SW3-013
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.:	E2/2015/10017-02
Issue Date:	Mar. 07, 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 No.2, Keji 1st Rd., Guishan Dist., Taoyuan 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.
Product Name of Host:	Tablet Computer
Brand Name of Host:	acer
Model No. of Host:	P0KCC
Marketing Name of Host:	SW3-013
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:	E2/2015/10017-02
Date of test:	Feb. 17, 2016 ~ Mar. 04, 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. 07, 2016
—	Aken Huang / Engineer		
Prepared By:	Tiffany Kao	Date	Mar. 07, 2016
	Tiffany Kao / Clerk		
Approved By:	Jim Chang	Date	Mar. 07, 2016
	Jim Chang / Asst. Manager		
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or ap-



# **Revision History**

Report Number	Revision	Description	Issue Date	
E2/2015/10017-02	Rev.00	Initial creation of document	Mar. 07, 2016	

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### **1. GENERAL INFORMATION**

#### **1.1. Product Description**

#### General:

Product Name:	Tablet Cor	Tablet Computer			
Brand Name:	acer	acer			
Model No.:	P0KCC				
Marketing Name of Host:	SW3-013				
Hardware Version:	R1.1				
Software Version:	Win8.1	Win8.1			
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:	For the requirement that certain National Information Infrastruc- ture (U-NII) devices must comply with revised Section 15.407 rules in order to be certified.				
	3.75Vdc f adapter	orm Rechargeable Li-ion Battery or 5.35Vdc from			
Power Supply:	Battery:	Model No.: AP15A3R, Supplier: SANYO			
	Adapter:	<ol> <li>Model No.:PA-1100-25, Supplier: LITEON</li> <li>Model No.: ADP-10HW A, Supplier: DELTA</li> </ol>			

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#### WLAN:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
11a	5725~5850	5	13.40dBm	OFDM	
11n	HT20 5725-5850	5	n: 14.47dBm (MIMO)	OFDM	
1 1 1 1	HT40 5725-5850	2	n: 13.81dBm (MIMO)	OFDM	
Antenna Designation Modulation type Transition Rate:			PIFA Antenna 1. Antenna Main, Gain:0.24dBi 2. Antenna Aux, Gain:0.34dBi		
			64QAM, 16QAM, QPSK, BPSK for OFDM		
			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 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 662911 D01 Multiple Transmitter Output

ANSI C63.10:2013

Note:

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

#### 1.3. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City, Taiwan 333

(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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#### SYSTEM TEST CONFIGURATION 2.

#### 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 a placed on as 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 30MHz,. 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 a placed on as 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.

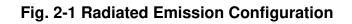
#### 2.4. Measurement Results Explanation Example For all conducted test items:

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



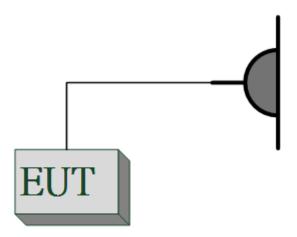


Table 2-1 Equipment Used in Tested System

lte m	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

#### SUMMARY OF TEST RESULT 3.

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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#### **DESCRIPTION OF TEST MODES** 4.

#### 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	AUX	
	RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5745~5825	140 to 165	CE 140 1E7 1CE	OFDM	6	AUX	
802.11n_HT20	5745~5625	149 to 165	149,157,165	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 WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

#### 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	Aux
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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#### **MEASUREMENT UNCERTAINTY** 5.

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:

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

	9kHz-30MHz: +/-2.87dB		
•• • • • •	30MHz - 167MHz: +/- 4.22dB		
Measurement uncertainty (Polarization : <b>Horizontal</b> )	167MHz -500MHz: +/- 3.44dB		
(i olarization : horizontar)	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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#### MAXIUM CONDUCTED OUTPUT POWER MEASUREMENT 6. 6.1 Standard Applicable

OPERZTION Band	EUT CATEGORY	LIMIT
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U-NII-1

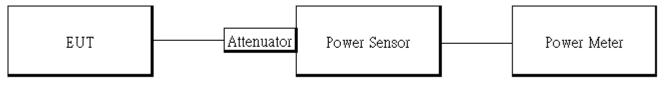
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#### **6.3 Measurement Equipment Used:**

SGS Conducted Room						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2015	04/13/2016	
Power Meter	Anritsu	ML2496A	1326001	06/23/2015	06/22/2016	
Power Sensor	Anritsu	MA2411B	1315048	06/23/2015	06/22/2016	
Power Sensor	Anritsu	MA2411B	1315049	06/23/2015	06/22/2016	
Coaxial Cable		00100A1F1A		40/40/0045	40/44/0040	
30cm	WOKEN	195C	RF01	12/12/2015	12/11/2016	
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016	
Our little a		RFLT2W1G1	DEGE	40/40/0045	40/44/0040	
Splitter	RF-LAMBAD	8G	RF35	12/12/2015	12/11/2016	
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016	
Temperature	TEDOUN		1000500	00/00/0045	06/00/0040	
Chamber	TERCHY	MHK-120LK	1020582	06/23/2015	06/22/2016	

#### 6.4 Test Set-up:



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#### 6.5 Measurement Result (Worst case)

#### 802.11a (Main)

		Avg. Out	out Power	REQUIRED		
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	LIMIT (dBm)	RESULT	
149	5745	13.25	21.135	30	PASS	
157	5785	13.36	21.677	30	PASS	
165	5825	13.15	20.654	30	PASS	

#### 802.11a (Aux)

		Avg. Outp	ut Power	REQUIRED	
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	LIMIT (dBm)	RESULT
149	5745	13.36	21.677	30	PASS
157	5785	13.40	21.878	30	PASS
165	5825	13.20	20.893	30	PASS

#### 802.11n 20M (MIMO)

		Avg. Outpu	t Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency (MHz)	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
149	5745	10.80	12.03	14.47	27.981	30	PASS
157	5785	10.80	12.01	14.46	27.908	30	PASS
165	5825	10.81	11.94	14.42	27.682	30	PASS

#### 802.11n\_40M (MIMO)

		Avg. Outpu	t Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency (MHz)	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
151	5755	8.78	10.12	12.51	17.831	30	PASS
159	5795	10.10	11.41	13.81	24.069	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	FIELD STRE	ENGTH AT 3m	
v01r01	ΡΚ: 74 (dBμV/m)	AV 54 (dBµV/m)	
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m	
15.407(b)(1)			
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)	
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 =  $((E^*d)^2) / 30$ , 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.
- Emission level (dBµV/m) = 20 log Emission level (dBµV/m)

#### 7.2 Measurement Equipment Used:

966 Chamber								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
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	Agilent 8447D 2944A07676		01/02/2016	01/01/2017			
Pre-Amplifier	EMC Instruments Corp.	EMC012653 0	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			

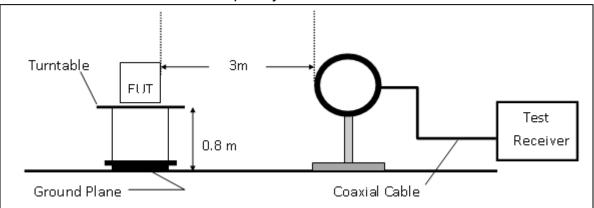
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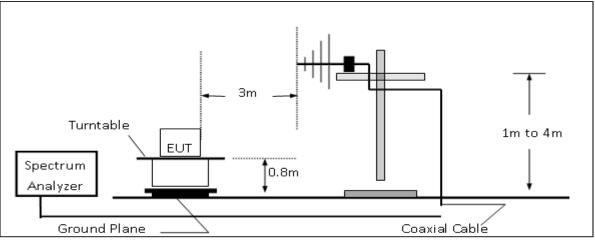


### 7.3 Test SET-UP

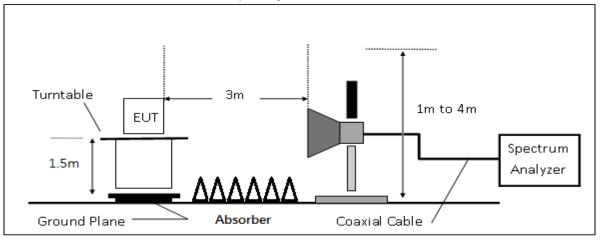




#### (B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(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.
- The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequen-3. cy> 1GHz above ground plane.
- 4. 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 5. the highest emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) 6. and Quasi-peak (QP) at frequency below 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency 7. above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 8. 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 + AE + CI = AG

	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(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + 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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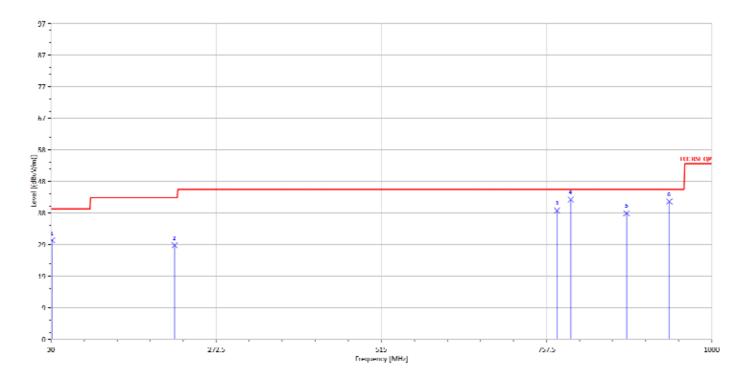
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#### **Below 1GHz Worst-Case Data:**

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

Operation Mode :	802.11a	Test Date :	2016/2/24
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

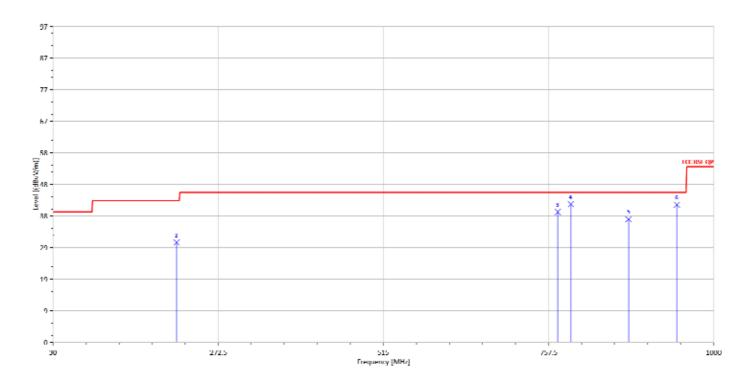


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
31.94	S	Peak	38.58	-8.22	30.36	40	-9.64
211.39	S	Peak	45.92	-17.10	28.82	43.5	-14.68
773.02	S	Peak	44.14	-4.59	39.55	46	-6.45
793.39	S	Peak	47.03	-4.17	42.86	46	-3.14
874.87	S	Peak	41.53	-2.78	38.75	46	-7.25
937.92	S	Peak	43.97	-1.71	42.26	46	-3.74

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Operation Mode :	802.11a	Test Date :	2016/2/24
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

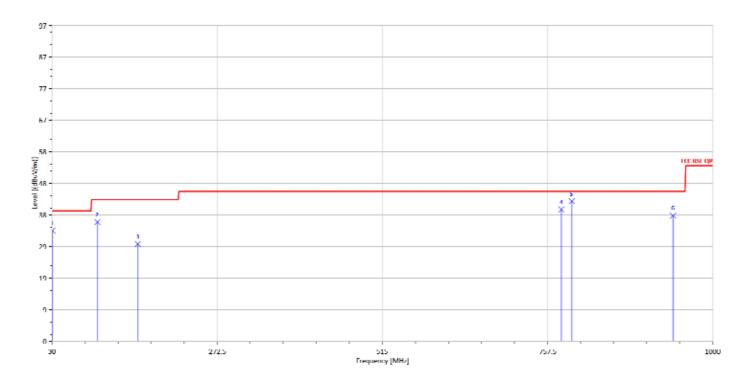


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.00	S	Peak	38.37	-7.18	31.19	40	-8.81
211.39	S	Peak	47.72	-17.10	30.62	43.5	-12.88
771.08	S	Peak	44.36	-4.35	40.02	46	-5.98
790.48	S	Peak	46.46	-4.13	42.33	46	-3.67
874.87	S	Peak	40.60	-2.78	37.82	46	-8.18
945.68	S	Peak	43.99	-1.82	42.17	46	-3.83



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

Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

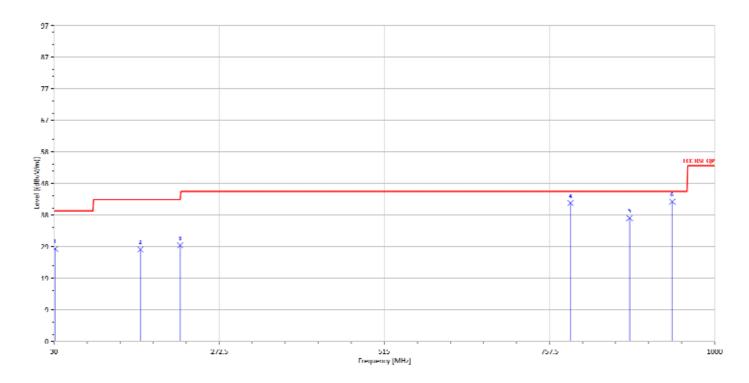


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.97	S	Peak	41.69	-7.70	33.99	40	-6.01
96.93	S	Peak	54.89	-18.27	36.62	43.5	-6.88
156.10	S	Peak	46.98	-17.14	29.84	43.5	-13.66
777.87	S	Peak	45.03	-4.56	40.47	46	-5.53
793.39	S	Peak	47.13	-4.17	42.96	46	-3.04
941.80	S	Peak	40.58	-1.97	38.60	46	-7.40

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Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



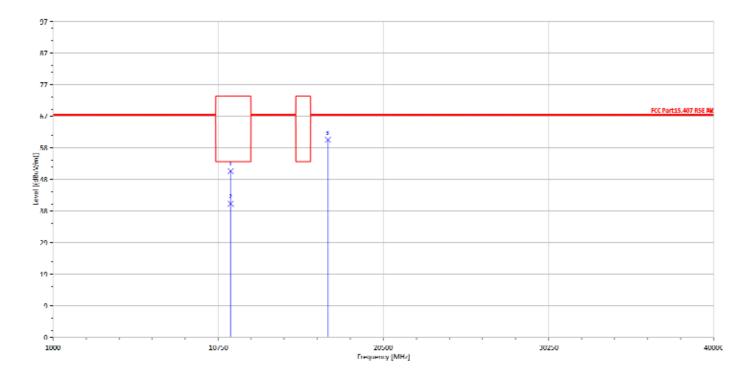
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
31.94	S	Peak	36.56	-8.22	28.34	40	-11.66
157.07	S	Peak	45.39	-17.22	28.17	43.5	-15.33
215.27	S	Peak	46.56	-17.14	29.42	43.5	-14.08
788.54	S	Peak	46.76	-4.37	42.39	46	-3.61
874.87	S	Peak	40.66	-2.78	37.89	46	-8.11
937.92	S	Peak	44.53	-1.71	42.82	46	-3.18



#### Above 1GHz Worst-Case Data:

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

Operation Mode :	802.11a	Test Date :	2016/2/24
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



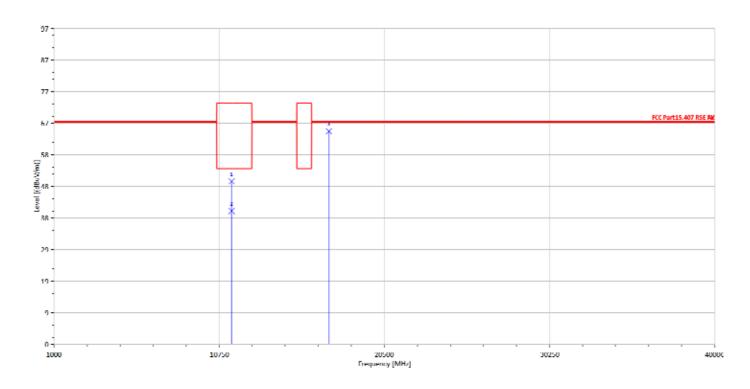
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Peak	32.67	18.39	51.06	74	-22.94
11490.00	Н	Average	22.60	18.39	40.99	54	-13.01
17235.00	Н	Peak	32.78	27.84	60.63	68.3	-7.67

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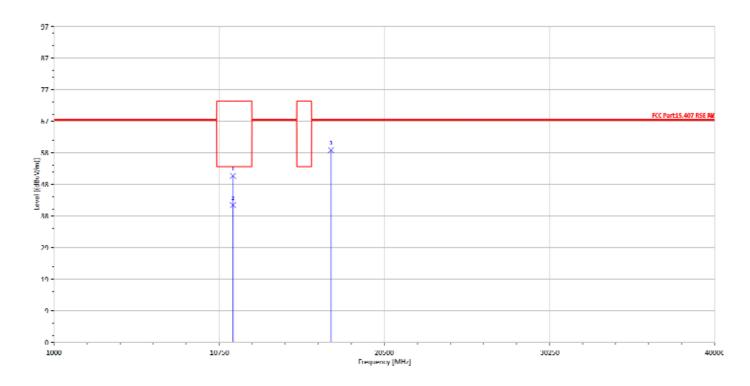
Operation Mode :	802.11a	Test Date :	2016/2/24
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Peak	31.68	18.39	50.07	74	-23.93
11490.00	Н	Average	22.50	18.39	40.89	54	-13.11
17235.00	Н	Peak	37.59	27.84	65.44	68.3	-2.86



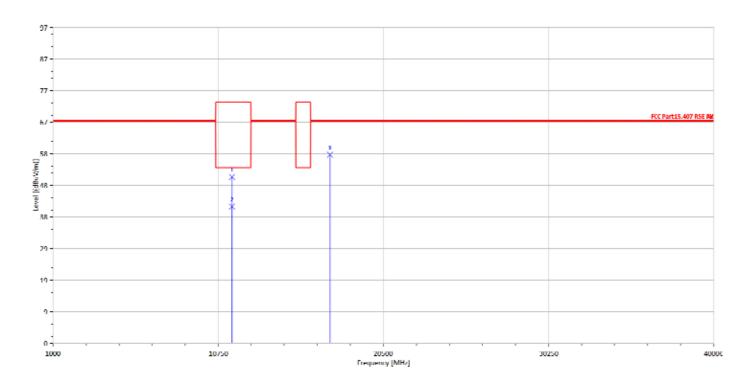
Operation Mode :	802.11a	Test Date :	2016/2/24
Fundamental Frequency :	5785 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Peak	31.77	19.38	51.15	74	-22.85
11570.00	Н	Average	22.68	19.38	42.06	54	-11.94
17355.00	Н	Peak	32.07	26.92	58.98	68.3	-9.32



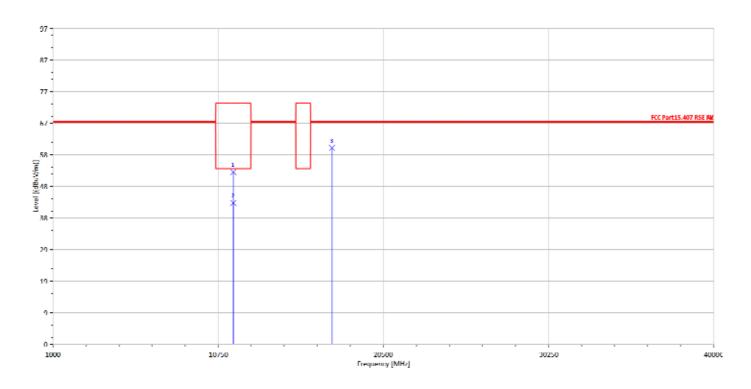
Operation Mode :	802.11a	Test Date :	2016/2/24
Fundamental Frequency :	5785 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Peak	31.73	19.38	51.12	74	-22.88
11570.00	Н	Average	22.55	19.38	41.93	54	-12.07
17355.00	Н	Peak	30.96	26.92	57.88	68.3	-10.42



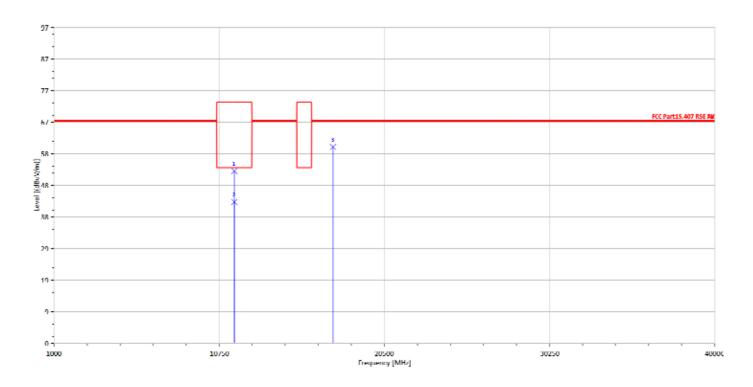
802.11a	Test Date :	2016/2/24
5825 MHz	Temp. / Humi. :	22.7 deg_C/57RH
Tx CH High	Test Engineer :	Pony
E2	Measurement Antenna Pol.:	Vertical
	5825 MHz Tx CH High	5825 MHz Temp. / Humi. : Tx CH High Test Engineer :



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
		F/H/E/S	PK/QP/AV	•	ЧD	-	0	dD
_	MHz	F/N/E/3	PN/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	11650.00	Н	Peak	32.71	20.23	52.95	74	-21.05
	11650.00	Н	Average	23.12	20.23	43.35	54	-10.65
	17475.00	Н	Peak	32.22	28.08	60.30	68.3	-8.00



Operation Mode :	802.11a	Test Date :	2016/2/24
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7 deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal

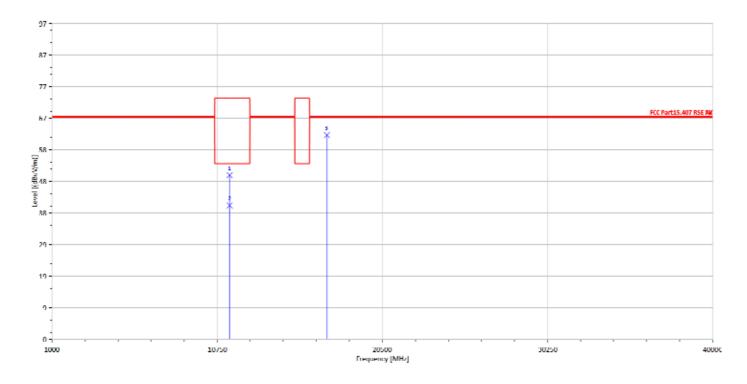


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Peak	32.14	20.23	52.37	74	-21.63
11650.00	Н	Average	22.29	20.23	42.52	54	-11.48
17475.00	Н	Peak	32.28	28.08	60.36	68.3	-7.94



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

Operation Mode :	802.11n20	Test Date :	2016/2/24
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

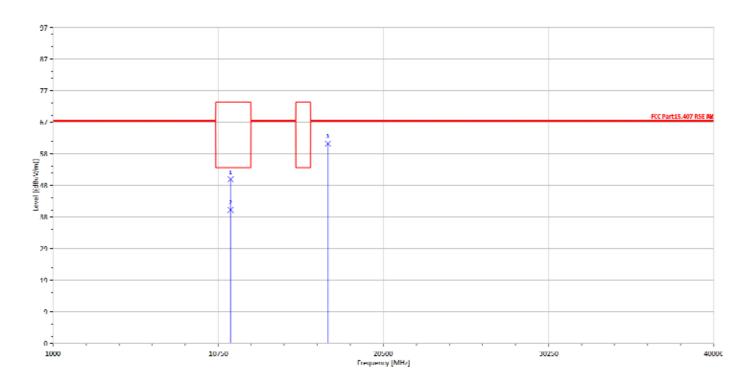


Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
 MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
 11490.00	Н	Peak	32.04	18.39	50.43	74	-23.57
11490.00	Н	Average	22.66	18.39	41.05	54	-12.95
17235.00	Н	Peak	34.86	27.84	62.71	68.3	-5.59

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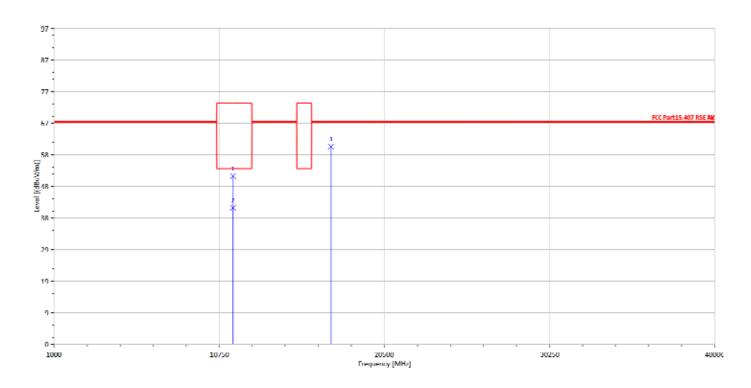
Operation Mode :	802.11n20	Test Date :	2016/2/24
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Peak	31.99	18.39	50.37	74	-23.63
11490.00	Н	Average	22.55	18.39	40.94	54	-13.06
17235.00	Н	Peak	33.46	27.84	61.31	68.3	-6.99



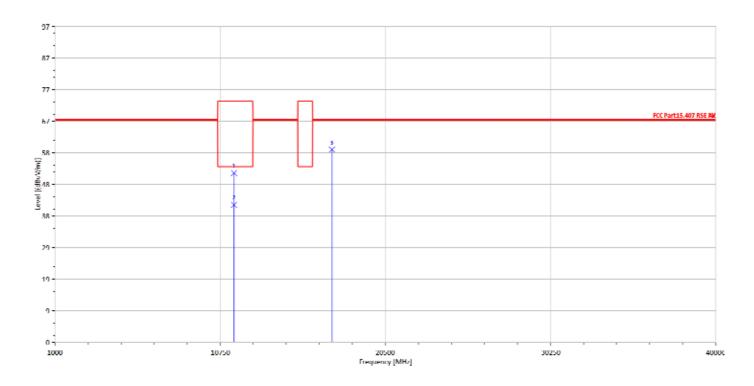
Operation Mode :	802.11n20	Test Date :	2016/2/24
Fundamental Frequency :	5785 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Peak	32.31	19.38	51.70	74	-22.30
11570.00	Н	Average	22.48	19.38	41.86	54	-12.14
17355.00	Н	Peak	33.79	26.92	60.70	68.3	-7.60



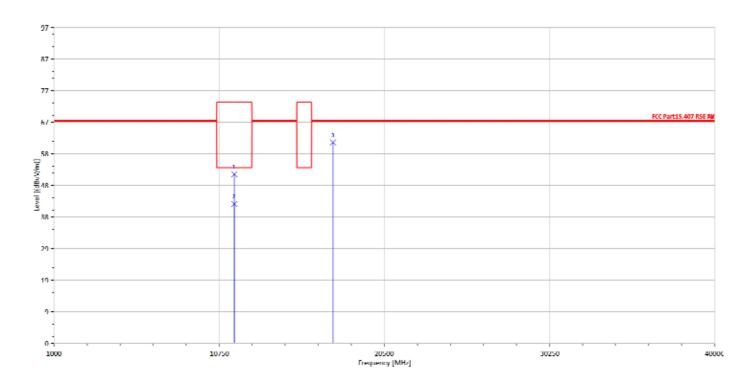
Operation Mode :	802.11n20	Test Date :	2016/2/24
Fundamental Frequency :	5785 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Peak	32.64	19.38	52.02	74	-21.98
11570.00	Н	Average	22.78	19.38	42.16	54	-11.84
17355.00	Н	Peak	32.23	26.92	59.15	68.3	-9.15



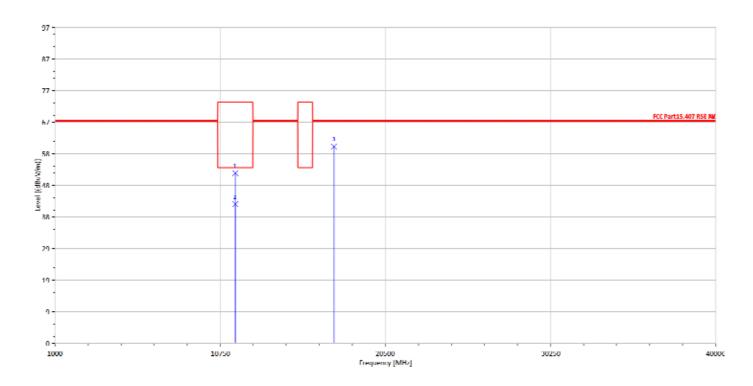
Operation Mode :	802.11n20	Test Date :	2016/2/24
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Peak	31.71	20.23	51.94	74	-22.06
11650.00	Н	Average	22.51	20.23	42.74	54	-11.26
17475.00	Н	Peak	33.62	28.08	61.69	68.3	-6.61



Operation Mode :	802.11n20	Test Date :	2016/2/24
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

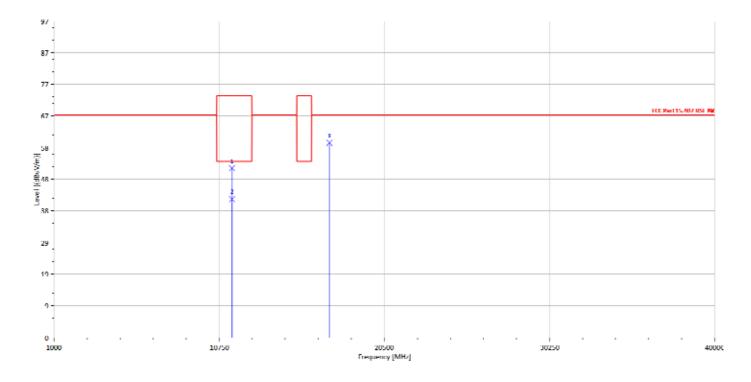


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Peak	32.07	20.23	52.31	74	-21.69
11650.00	Н	Average	22.45	20.23	42.68	54	-11.32
17475.00	Н	Peak	32.31	28.08	60.39	68.3	-7.91



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

Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

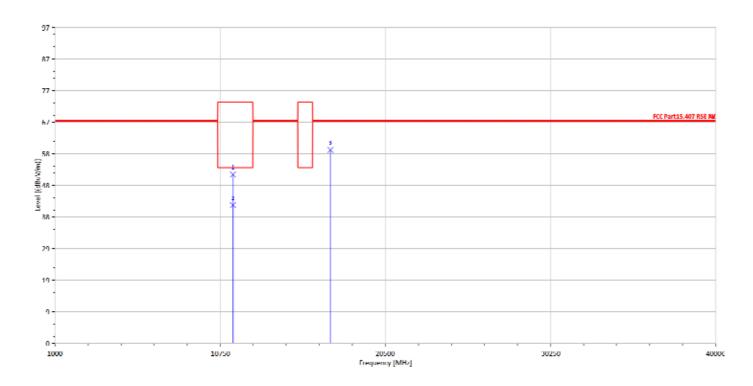


Freq	. Note	e Detector	Spectum	Factor	Actual	Limit	Margin	
		Mode	Reading Leve	el	FS	@3m		
MH	z F/H/E/	/S PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
11510	.00 H	Peak	31.99	19.90	51.89	74	-22.11	-
11510	.00 H	Average	22.55	19.90	42.45	54	-11.55	
17265	.00 H	Peak	31.95	27.69	59.65	68.3	-8.65	

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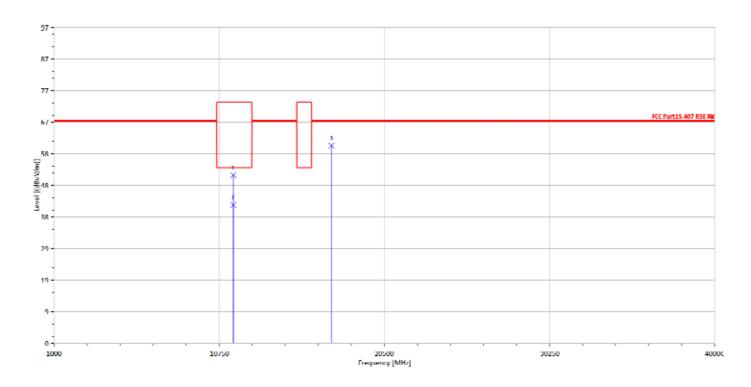
Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11510.00	Н	Peak	31.96	19.90	51.86	74	-22.14
11510.00	Н	Average	22.47	19.90	42.37	54	-11.63
17265.00	Н	Peak	31.66	27.69	59.35	68.3	-8.95



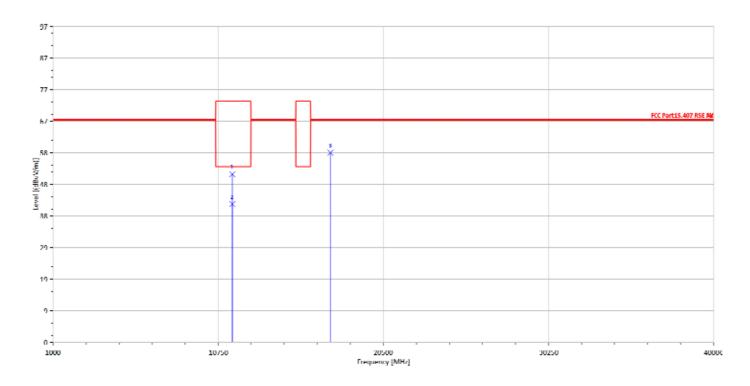
Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11590.00	Н	Peak	31.83	19.85	51.68	74	-22.32
11590.00	Н	Average	22.58	19.85	42.43	54	-11.57
17385.00	Н	Peak	33.47	27.25	60.71	68.3	-7.59



Operation Mode :	802.11n40	Test Date :	2016/2/24
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11590.00	Н	Peak	31.80	19.85	51.65	74	-22.35
11590.00	Н	Average	22.53	19.85	42.38	54	-11.62
17385.00	Н	Peak	30.93	27.25	58.17	68.3	-10.13



#### Band edge falling to restricted band

#### 802.11a mode

Fundamental Frequency : 57		y : 5745 M	802.11a         Test Date :           5745 MHz         Temp. / Humi. :		2016/2/24 22.7deg_C/5		C/57RH
Operation B	and :	BE CH		igineer :		Pony	
EUT Pol. : E2 Measurement A			ement Anten	ina Pol. :	Vertical		
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5724.70	S	Peak	55.43	12.01	67.44	78.2	-10.76
5725.00	E	Peak	54.52	12.01	66.53	78.2	-11.67

Operation Mode :802.11aFundamental Frequency :5745 MHzOperation Band :BE CH LowEUT Pol. :E2			Hz Temp. / H Low Test Engi	lumi. :	na Pol. :	2016/2/24 22.7deg_C Pony Horizontal	C/57RH
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5713.80	S	Peak	54.40	11.97	66.37	68.3	-1.93
5724.50	S	Peak	61.57	12.01	73.58	78.2	-4.62
5725.00	Е	Peak	61.11	12.01	73.12	78.2	-5.08

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Operation Mode :802.11aFundamental Frequency :5825 MHzOperation Band :BE CH HigEUT Pol. :E2		Hz Temp. / High Test Eng	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :			2016/2/24 22.7deg_C/57RH Pony Vertical	
Freq.	Note	Detector Mode	Spectum 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	48.69	12.15	60.84	78.2	-17.36
5852.50	S	Peak	50.73	12.19	62.92	78.2	-15.28

Operation Mode : 802.11a			a -	Test Date	:		2016/2/24	
Fundamenta	al Frequency	/: 5825 M	Hz <sup>-</sup>	Temp. / H	lumi. :		22.7deg_C/57RH	
Operation B	and :	BE CH	BE CH High Test Eng		gineer :		Pony	
EUT Pol. :		E2	E2 Measurement Antenna Pol. :		Horizontal			
Freq.	Note	Detector Mode	Spec Reading		Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dB	μV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	55.	.56	12.15	67.71	78.2	-10.49
5851.50	S	Peak	56.	.91	12.18	69.08	78.2	-9.12

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#### 802.11n20 HT mode

Operation Mode : 802.11n20			n20 Test Date	e :		2016/2/24	
Fundamenta	al Frequenc	y: 5745 M	Hz Temp. / H	łumi. :		22.7deg_0	C/57RH
Operation B	Band :	BE CH	Low Test Eng	ineer :		Pony	
EUT Pol. :	EUT Pol. : E2 Measurement Antenna Pol. :				Vertical		
_			<b>a</b> <i>i</i>				
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5712.70	S	Peak	50.12	11.97	62.09	68.3	-6.21
5724.80	S	Peak	56.03	12.01	68.04	78.2	-10.16
5725.00	E	Peak	52.30	12.01	64.31	78.2	-13.89

Operation Mode :802.11n20Fundamental Frequency :5745 MHzOperation Band :BE CH LowEUT Pol. :E2		IHz Temp. / H Low Test Engi	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :			2016/2/24 22.7deg_C/57RH Pony Horizontal	
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5713.60 5725.00	S E	Peak Peak	55.80 62.95	11.97 12.01	67.77 74.96	68.3 78.2	-0.53 -3.24

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Operation M	lode :	802.11r	802.11n20		Test Date :			2016/2/24	
Fundamenta	al Frequency	y : 5825 M	Hz	Temp. / Humi. :			22.7deg_C/57RH		
Operation B	and :	BE CH	•	Test Engineer :			Pony		
EUT Pol. :		E2 Measurem		ment Antenna Pol.:		Vertical			
Freq.	Note	Detector Mode	Spectum 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	48.41		12.15	60.56	78.2	-17.64	
5850.30	S	Peak	49	.84	12.15	61.99	78.2	-16.21	

Operation M Fundamenta Operation B EUT Pol. :	al Frequency	/:  5825 M	802.11n20Test Da5825 MHzTemp. /BE CH HighTest EnE2Measure		na Pol. :	2016/2/24 22.7deg_C/57RH Pony Horizontal	
Freq.	Note	Detector Mode	Spectum 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	Е	Peak	56.65	12.15	68.80	78.2	-9.40
5865.90	S	Peak	53.87	12.34	66.21	68.3	-2.09

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#### 802.11n40 HT mode

Operation N Fundamenta Operation E EUT Pol. :	al Frequenc	802.11i y : 5755 M BE CH E2	IHz Tei Low Tei	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :			2016/2/24 22.7deg_C/57RH Pony Vertical	
Freq.	Note	Detector Mode	Spectum Reading Level		Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV		dB	dBµV/m	dBµV/m	dB
5724.60	S	Peak	53.46		12.01	65.47	78.2	-12.73
5725.00	E	Peak	51.03	i	12.01	63.04	78.2	-15.16

Operation M Fundamenta Operation B EUT Pol. :	al Frequenc	y : 5755 M	802.11n40Test Date5755 MHzTemp. / HBE CH LowTest EngirE2Measuren		na Pol. :	2016/2/24 22.7deg_C/57RH Pony Horizontal	
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5714.60	S	Peak	54.61	11.97	66.58	68.3	-1.72
5724.20	S	Peak	57.68	12.01	69.69	78.2	-8.51
5725.00	Е	Peak	54.85	12.01	66.86	78.2	-11.34

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Operation M	lode :	802.11r	802.11n40		Test Date :			2016/2/24	
Fundamenta	y: 5795 M	5795 MHz		Temp. / Humi. :			22.7deg_C/57RH		
Operation B	and :	BE CH	BE CH High		Test Engineer :				
EUT Pol. :		E2	E2 Measure		ment Antenna Pol.:		Vertical		
Freq.	Note	Detector	Spectum		Factor	Actual	Limit	Margin	
-		Mode	Reading Level			FS	@3m	-	
MHz	F/H/E/S	PK/QP/AV	dBµV		dB	dBµV/m	dBµV/m	dB	
5850.00	E	Peak	46.34		12.15	58.49	78.2	-19.71	

Operation M Fundamenta Operation B EUT Pol. :	al Frequency	802.11r / : 5795 M BE CH E2	Hz Temp High Test I	Date : o. / Humi. : Engineer : ourement Anter	2016/2/24 22.7deg_C/57RH Pony Horizontal		
Freq.	Note	Detector Mode	Spectum Reading Lev	Factor /el	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	51.36	12.15	63.51	78.2	-14.69
5851.70	S	Peak	54.16	12.18	66.34	78.2	-11.86

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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.

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