

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

OF

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 247

	OF			
Product Name:	Pi SOLO			
Brand Name:	QCI			
FCC Model No.:	Q-cam-wu1-bk, Q-cam******(* Can be 0-9, A-Z, a-z, blank or symbol "-")			
IC Model No.:	Q-cam-wu1-bk, Q-cam-wu1-wh			
FCC Model Difference:	For marketing purpose, only different model des- ignations on the marking plate for different mar- kets. No RF concern.			
IC Model Difference:	Color difference			
FCC ID:	HFSEY5			
IC:	1787B-EY5			
Report No.:	E2/2016/90051			
Issue Date:	Oct. 13, 2016			
FCC Rule Part:	§15.247, Cat: DTS			
IC Rule Part:	RSS-247 issue 1 :2015			
Prepared for:	Quanta Computer Inc. No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan SGS Taiwan Ltd.			
Prepared by:	Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333			
Tac MRA BC MRA Testing Laboratory 0513	Note: This report shall not be reproduced except in full, without the written approval of SGS Taiwan Ltd. This docu- ment may be altered or revised by SGS Taiwan Ltd. per- sonnel only, and shall be noted in the revision section of the document.			

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VERIFICATION OF COMPLIANCE

Applicant: Product Name:	Quanta Computer Inc. No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan Pi SOLO
Brand Name:	QCI
FCC Model No.:	Q-cam-wu1-bk, Q-cam*******(* Can be 0-9, A-Z, a-z, blank or symbol "-")
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FCC ID:	HFSEY5
IC:	1787B-EY5
File Number:	E2/2016/90051
Date of Test:	Sep. 14, 2016 ~ Oct. 13, 2016
Date of EUT Received:	Sep. 14, 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:	Oct. 13, 2016
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Prepared By:	Yun	Tsori	Date:	Oct. 13, 2016
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Revision History

Report Number	Revision	Description	Issue Date
E2/2016/90051	Rev.00	Initial creation of document	Oct. 13, 2016

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



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GENERAL INFORMATION 1

1.1 Product description General:

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IC Model No.:	Q-cam-wu1-	bk, Q-cam-wu1-wh		
FCC Model Difference:		g purpose, only different model designations on the e for different markets. No RF concern.		
IC Model Difference:	Color differe	nce		
Product SW/HW version:	0.3.46 / D			
Radio SW/HW version:	fw_bcm43438a0_mfg / A0			
Test SW Version:	N/A			
RF power setting in TEST SW:	N/A			
Micro USB Cable:	 Model No.: N/A, Supplier: N/A Model No.: N/A, Supplier: N/A 			
Type A USB cable:	1. Model No	o.: N/A, Supplier: N/A		
	2. Model No	o.: N/A, Supplier: N/A		
Type C USB cable	1. Model No.: N/A, Supplier: N/A			
	2. Model No	o.: N/A, Supplier: N/A		
Power Supply:	3.7Vdc from Rechargeable Li-ion Battery			
	Battery:	Model No.: N/A, Supplier: N/A		

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WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power / (EIRP)	Type of Emission	Modulation Technology
11b/g	2412-2462	11	b: 18.25dBm b: 19.20dBm (EIRP) g: 23.54dBm g: 18.34dBm (EIRP)	b: 14M3G1D g:16M8D1D	DSSS, OFDM
11n	HT20 2412-2462	11	23.2dBm 17.40Bm (EIRP)	17M7D1D	OFDM
Antenna D	esignation:	Printed An	tenna, Gain: 3.45dBi		
Modulation type: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM					
Transition Rate: 802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65Mbps					

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1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) supporting Wi-Fi 802.11b/g/n features, and below is details of information.

Product Feature			
Product Name:	Pi SOLO		
Brand Name:	QCI		
FCC Model No.:	Q-cam-wu1-bk, Q-cam*******(* Can be 0-9, A-Z, a-z, blank or symbol "-")		
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IC Model Difference:	Color difference		
FCC ID:	HFSEY5		
IC :	1787B-EY5		
Wi-Fi- Specification	802.11 b/g/n		

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247 FCC KDB 558074 D01 DTS Meas. Guidance Canada RSS-247 issue 1 May 2015 Canada RSS-Gen issue 4 Nov. 2014 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 a DoC procedure.

1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305

Canada Registration Number: 4620A-5.

1.5 Special Accessories

There are no special accessories used while test was conducted.

1.6 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 plane. 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. Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 0.9dB and 10dB attenuator.

Offset:

= RF cable loss (dB)+ attenuation factor(dB) dB =10.9dB

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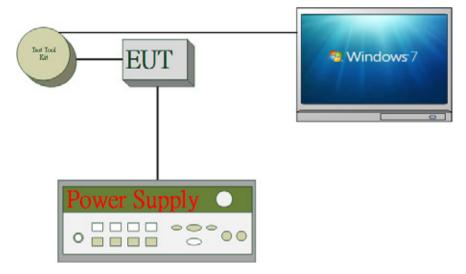


2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission & AC Power Line Conducted Emission



Fig. 2-2 Conducted (Antenna Port) Configuration Emission



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
2.	Notebook	Lenovo	L430	R9-YYG88	N/A	Un-shielded
3.	Test Tool Kit	N/A	N/A	N/A	N/A	N/A
4.	DC Power Supply	Agilent	E3640A	MY53140006	N/A	Un-shielded

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SUMMARY OF TEST RESULTS 3

FCC Rules / IC Rules	Description Of Test	Result
§15.207(a) RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3) RSS-247 §5.4(4)	Peak Output Power	Compliant
§15.247(a)(2) RSS-247 §5.2 (1) RSS-Gen §6.6	6dB & 99% Emission Bandwidth	Compliant
§15.247(d) RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d) RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e) RSS-247 §5.2(2)	Power Spectral Density	Compliant
§15.203 §15.247(b) RSS- Gen §6.7 RSS- Gen §8.3	Antenna Requirement	Compliant

DESCRIPTION OF TEST MODES 4

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

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RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE AVAILABLE CHANNEL		TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
802.11g	1 to 11	1,6,11	OFDM	6	MAIN		
	RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE AVAILABLE CHANNEL		TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN		
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN		
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 0	MAIN		

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g/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		
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN		
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN		
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS0	MAIN		

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MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, 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

	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	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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CONDUCTED EMISSION TEST 6

6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

	Limits				
Frequency range	dB((uV)			
MHz	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			
Note					

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2 Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT	MFR	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI 7	100950	12/12/2015	12/11/2016			
Coaxial Cables	N/A	N30N30-1042-150 cm	N/A	02/07/2016	02/06/2017			
LISN	Schwarzbeck	NSLK 8127	8127-648	03/11/2016	03/10/2017			
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.			

6.3 EUT Setup

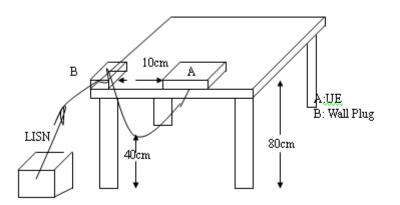
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6 Measurement Result

Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit

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AC POWER LINE CONDUCTED EMISSION TEST DATA

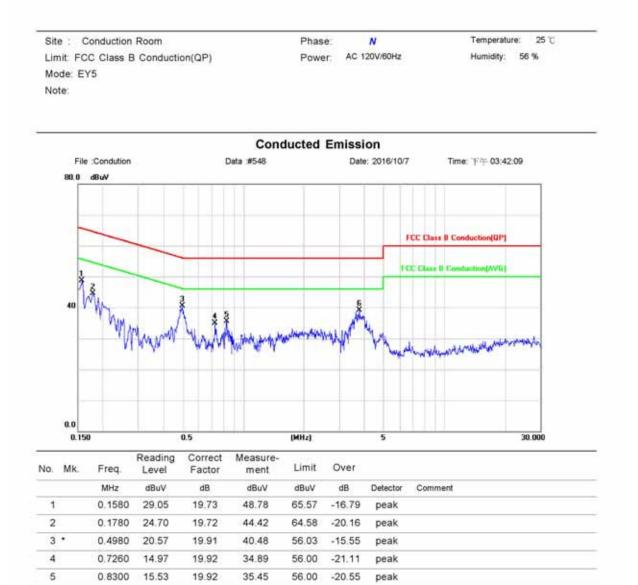
Operation Mode: Operation mode Temperature: 20

Test Date: Oct. 07, 2016

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19.97

39.03

56.00

-16.97

peak

6

3.7860

19.06

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DUTY CYCLE OF TEST SIGNAL 7

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz.
- 4. Detector = Peak

Duty Cycle:

	Duty Cycle (%)	Duty Factor (dB)
802.11b	98.75	0.05
802.11g	93.38	0.30
802.11n_20	92.96	0.32

b = 98.75%, *g* = 93.38%, *n_ht_*20 = 92.96%, *n_ht*40 = %

Duty Cycle Factor: $10 * \log(1/0.9875) = 0.05$ Duty Cycle Factor: $10 * \log(1/0.9338) = 0.3$ Duty Cycle Factor: $10 * \log(1/0.9296) = 0.32$

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7.1 DUTY CYCLE TEST SIGNAL Measurement Result

802.11 b

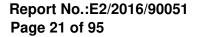


802.11 g



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802.11 n_20 MHz

Keysight Spectrum Analyzer - Swept SA				
RL RF 50 Ω DC Center Freq 2.437000000 0		Aug Type: Log-Pwr	17:26:20 PM Sep 22, 2016 TRACE 1 2 3 4 5 6 TYPE	Frequency
Ref Offset 10.9 dB 10 dB/div Ref 30.00 dBm	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	ΔΜ	kr3 1.406 ms -0.63 dB	Auto Tune
	/~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	lalan turan darah salarah salarah dalah d	1 J-20-70-10-161,622-944	Center Free 2.437000000 GH
-10.0				Start Free 2.437000000 GH
-40.0				Stop Free 2.437000000 GH
Center 2.437000000 GHz Res BW 8 MHz	#VBW 8.0 MHz	Sweep 3.53	Span 0 Hz 3 ms (1001 pts)	CF Stej 8.000000 MH <u>Auto</u> Ma
2 F 1 t 3 Δ4 1 t (Δ)	1.307 ms (Δ) 2.38 dB 233.2 μs 15.63 dBm 1.406 ms (Δ) -0.63 dB 233.2 μs 15.63 dBm			Freq Offse 0 H
9 10				
4 MSG		STATUS	,	

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PEAK OUTPUT POWER MEASUREMENT 8

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

8.2 Measurement Equipment Used

	Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017				
Power Meter	Anritsu	ML2496A	1326001	06/23/2016	06/22/2017				
Power Sensor	Anritsu	MA2411B	1315048	06/23/2016	06/22/2017				
Power Sensor	Anritsu	MA2411B	1315049	06/23/2016	06/22/2017				
Coaxial Cable 30cm	WOKEN	00100A1F1A19 5C	RF01	12/12/2015	12/11/2016				
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016				
Splitter	RF-LAMBAD	RFLT2W1G18 G	RF35	12/12/2015	12/11/2016				
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016				
DC Power Supply	Agilent	E3640A	MY53140006	05/04/2016	05/03/2017				

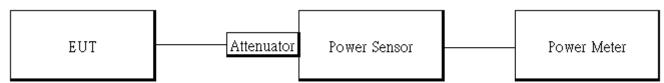
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8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

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8.5 Measurement Result

802.11	b Main							
СН	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
1	2412	1	18.25	66.83	1 Watt =	30.00	dBm	PASS
6	2437	1	18.23	66.53	1 Watt =	30.00	dBm	PASS
11	2462	1	18.06	63.97	1 Watt =	30.00	dBm	PASS
802.11	b Main				-			
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
1	2412	1	15.69	37.07	1 Watt =	30.00	dBm	PASS
6	2437	1	15.75	37.58	1 Watt =	30.00	dBm	PASS
11	2462	1	15.59	36.22	1 Watt =	30.00	dBm	PASS
CH	g Main Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
1	2412	6	23.15	206.54	1 Watt =	30.00	dBm	PASS
6	2437	6	23.54	225.94	1 Watt =	30.00	dBm	PASS
11	2462	6	21.06	127.64	1 Watt =	30.00	dBm	PASS
802.11	g Main			•				
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit		RESULT	
1	2412	6	14.23	26.49	1 Watt =	30.00	dBm	PASS
6	2437	6	14.89	30.83	1 Watt =	30.00	dBm	PASS
v	-							

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802.11	n_HT20M Main							
сн	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
1	2412	MCS0	21.46	139.96	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	23.2	208.93	1 Watt =	30.00	dBm	PASS
11	2462	MCS0	21.56	143.22	1 Watt =	30.00	dBm	PASS
802.11	n_HT20M Main							
сн	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit		RESULT	
1	2412	MCS0	12.56	18.03	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	13.95	24.83	1 Watt =	30.00	dBm	PASS
11	2462	MCS0	12.46	17.62	1 Watt =	30.00	dBm	PASS

* Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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EIRP

802.1	802.11b Main									
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit		RESULT		
1	2412	1	15.69	3.45	19.14	4W=	36	dBm	PASS	
6	2437	1	15.75	3.45	19.20	4W=	36	dBm	PASS	
11	2462	1	15.59	3.45	19.04	4W=	36	dBm	PASS	

802 11a Main

СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit		RESULT
1	2412	6	14.23	3.45	17.68	4W=	36	dBm	PASS
6	2437	6	14.89	3.45	18.34	4W=	36	dBm	PASS
11	2462	6	12.46	3.45	15.91	4W=	36	dBm	PASS

802.1	802.11n_HT20M Main									
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit		RESULT		
1	2412	MCS0	12.56	3.45	16.01	4W=	36	dBm	PASS	
6	2437	MCS0	13.95	3.45	17.40	4W=	36	dBm	PASS	
11	2462	MCS0	12.46	3.45	15.91	4W=	36	dBm	PASS	

* Note: EIRP = Average Power + Gain

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6dB & 99% BANDWIDTH MEASUREMENT 9

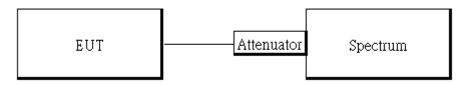
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017				
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016				
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016				

9.3 Test Set-up



9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- For 6dB Bandwidth:

Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.

- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:

Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.

- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

6dB Bandwidth

802.11b Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	9083	> 500	PASS
2437	9062	> 500	PASS
2462	9560	> 500	PASS

802.11g Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	15510	> 500	PASS
2437	16040	> 500	PASS
2462	15490	> 500	PASS

802.11_n_HT20 Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	15680	> 500	PASS
2437	17530	> 500	PASS
2462	15610	> 500	PASS

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99% Bandwidth

802.11b Main					
Frequency (MHz)	99%Bandwidth (MHz)				
2412	14.337				
2437	13.950				
2462	14.250				

802.11g Main					
Frequency	99%Bandwidth				
(MHz)	(MHz)				
2412	14.268				
2437	16.416				
2462	16.892				

802.11n_HT20M Main					
Frequency	99%Bandwidth				
(MHz)	(MHz)				
2412	17.036				
2437	17.710				
2462	13.955				

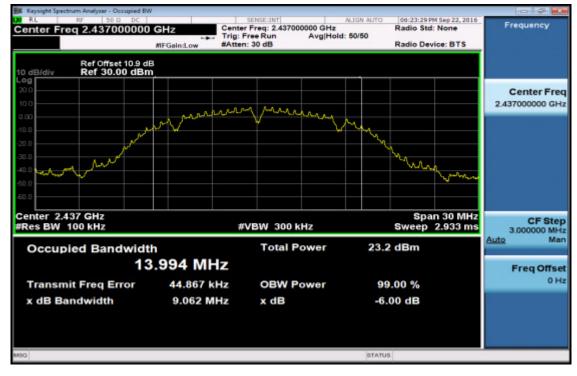
*Refer to next page for plots



802.11b 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

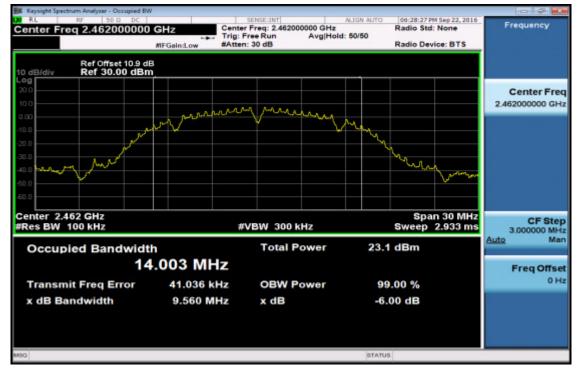


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6dB Band Width Test Data CH-High



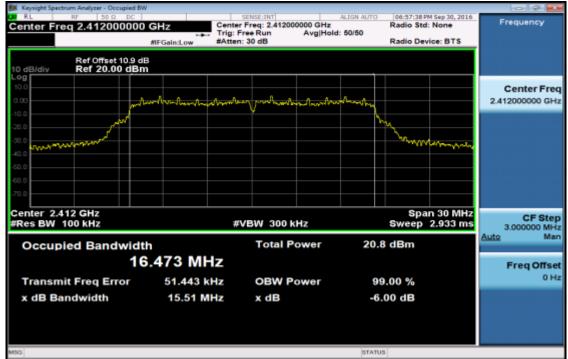
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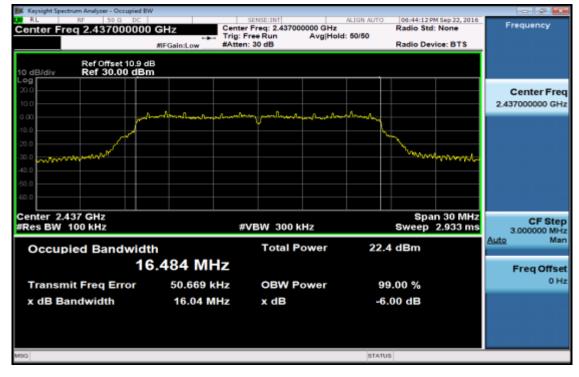
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802.11q 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

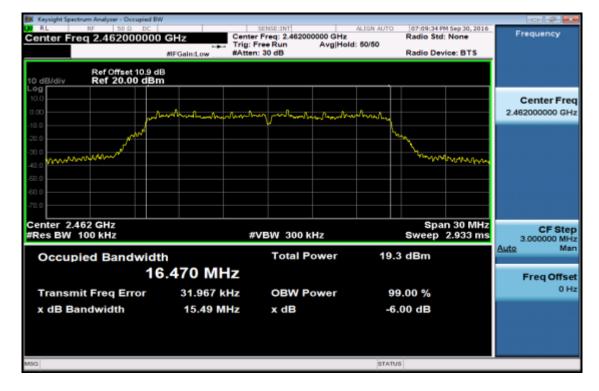


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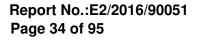


6dB Band Width Test Data CH-High



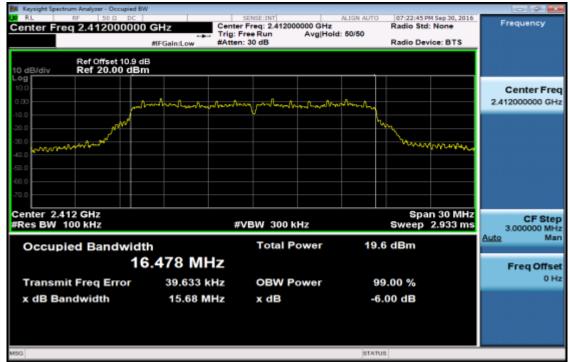
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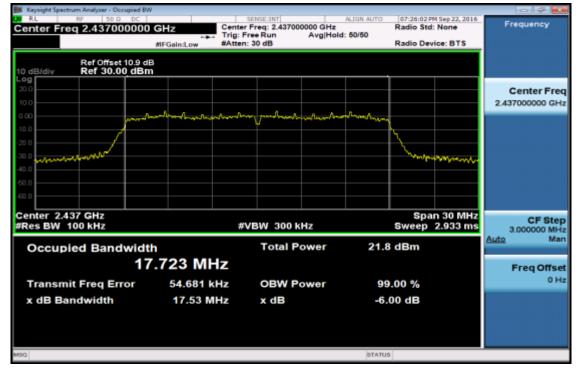




802.11n 20M 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

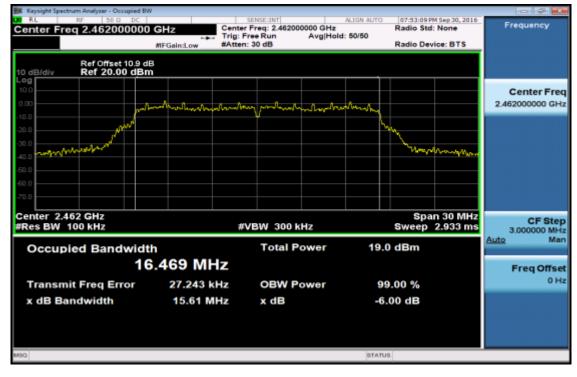


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6dB Band Width Test Data CH-High



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10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

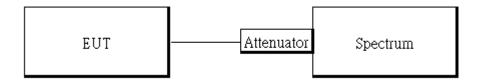
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.8.

If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

10.2 Measurement Equipment Used

Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017				
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016				
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016				

10.3 Test SET-UP



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10.4 Measurement Procedure

Conducted Band Edge:

- To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- Set DL as the limit = reading on marker 1 20dBm
- 8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

- To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

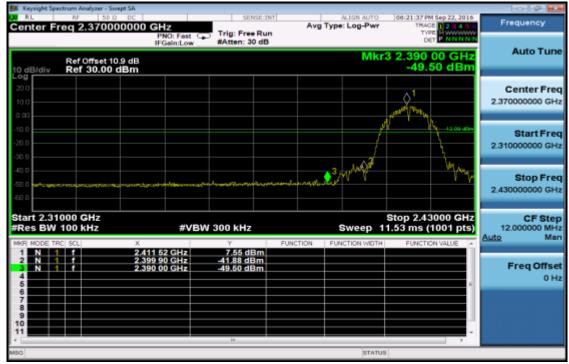
10.5 Measurement Result

- 1. Refer to next page spectrum analyzer data chart and tabular data sheets.
- 2. For restricted Band Edge Limit, please refer to section 12.5 of this report for measurement result.

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802.11b **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High

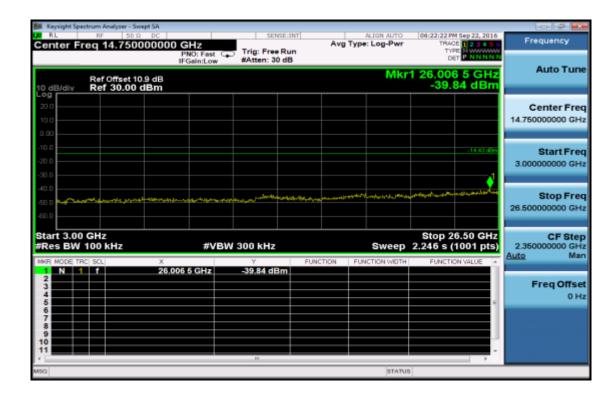


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802.11b **Spurious Emission Test Data CH-Low**

🗱 Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000	GHz	Avg Type: Log-Pwr	06:22:04 PM Sep 22, 2016 TRACE 1 2 3 4 5 6	Frequency
Ref Offset 10.9 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB		cr1 2.411 9 GHz 5.57 dBm	Auto Tune
20.0			↓ 1 	Center Freq 1.51500000 GHz
-10.0			-14.63 dBm	Start Free 30.000000 MHz
-40.0 -60.0 -60.0		موريو العربي المراجع والمراجع العربي المراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع وا	Reconcernence	Stop Free 3.00000000 GHz
Start 30 MHz #Res BW 100 kHz MKR MODE TRC SCL X	#VBW 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Step 297.000000 MH Auto Mar
2 3 4 5 6 7 8	111 9 GHz 5.57 dBm			Freq Offse 0 H
9 10 11 4 MISO		STATU		

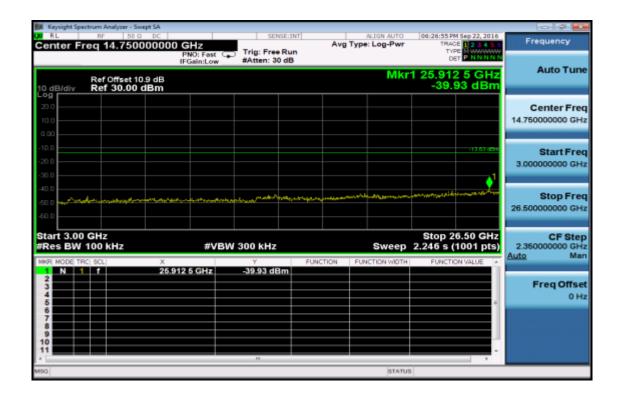


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Spurious Emission Test Data CH-Mid

Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000	GHz	ALIGN AUTO Avg Type: Log-Pwr	06:26:25 PM Sep 22, 2016 TRACE 1 2 3 4 5 6	Frequency
Ref Offset 10.9 dB	PN0: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Mk	r1 2.435 7 GHz 6.38 dBm	Auto Tune
20.0 0.00			↑	Center Freq 1.51500000 GHz
-10.0			-13 &3 dBm	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	المراجع المراجع المراجع المراجع المراجع المراجع والمراجع المراجع المراجع المراجع المراجع المراجع الم	مايىرىرال ارك ى مەنباللار ۋەرىرىرىرىي	Hand and the second sec	Stop Free 3.000000000 GH2
Start 30 MHz #Res BW 100 kHz MKR MODE TRC SCL X	#VBW 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts) FUNCTION VALUE	CF Step 297.000000 MHz Auto Mar
1 N 1 f 2.4 3 4 6 6	435 7 GHz 6.38 dBm			Freq Offset 0 Hz
7 8 9 10 11				
MSG	19	STATUS	3	

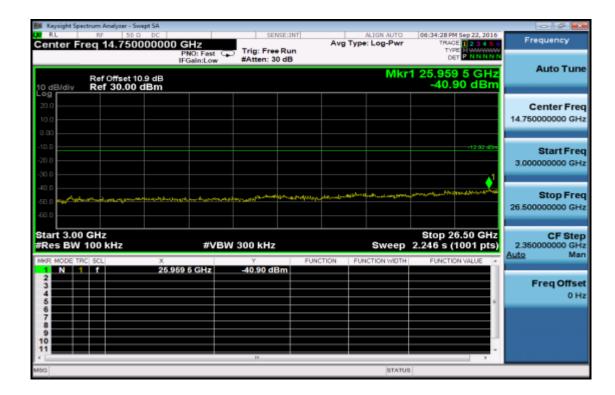


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Spurious Emission Test Data CH-High

Keysight Spectrum Analyzer - Swept SA			
enter Freq 1.515000000		ALIGN AUTO 06:33:59 PM Seg Avg Type: Log-Pwr TRACE	Frequency
Ref Offset 10.9 dB 0 dB/div Ref 30.00 dBm	PND: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Mkr1 2.462 4	GHz Auto Tun dBm
20.0			Center Fre 1.515000000 GH
20.0			1320 401 Start Fre 30.000000 MH
0.0 0.0 0.0 0.0	n mana ana ang ang ang ang ang ang ang ang	an ang ang ang ang ang ang ang ang ang a	Stop Fre 3.000000000 Gi
tart 30 MHz Res BW 100 kHz KRI MODE TRCI SCLI X	#VBW 300 kHz	Stop 3.00 Sweep 283.9 ms (100	01 pts) 297.000000 MI Auto M
	462 4 GHz 7.09 dBm		Freq Offs 01



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802.11g **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High

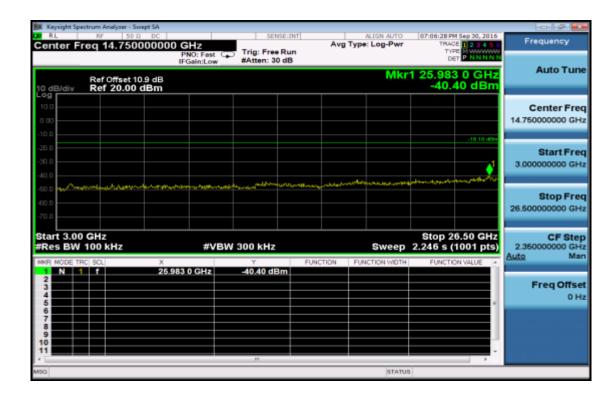


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802.11g **Spurious Emission Test Data CH-Low**

Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000		Avg Type: Log-Pwr	07:05:13 PM Sep 30, 2016 TRACE 1 2 3 4 5 6 TYPE	Frequency
Ref Offset 10.9 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB		r1 2.406 0 GHz 3.83 dBm	Auto Tune
10.0 0.00 -10.0			1	Center Fred 1.515000000 GHz
-20.0			-16.18 dbm	Start Free 30.000000 MH
-50.0		erseletermenter in serie ander and and and and and	Mederson freed from the second s	Stop Free 3.000000000 GH
Start 30 MHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Step 297.000000 MH Auto Mar
	2,406 0 GHz 3,83 dBm			Freq Offse 0 H
4 MBG		STATU	3	

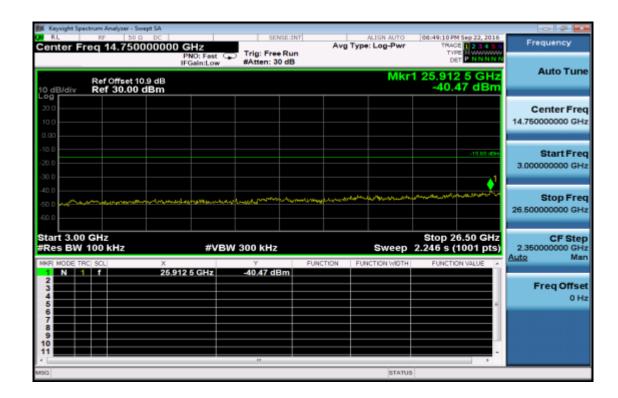


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Spurious Emission Test Data CH-Mid

Keysight Spectrum Analyzer - Swept SA			
Center Freq 1.515000000		Avg Type: Log-Pwr T	PPM Sep 22, 2016 RACE 1 2 3 4 5 0 Type
Ref Offset 10.9 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Mkr1 2.4	29 8 GHz Auto Tune 4.35 dBm
20.0		1	Center Free 1.515000000 GH
-10.0			30.000000 MH
-40.0 -50.0 -60.0	and the second	and have a second se	Stop Free 3.000000000 GH
Start 30 MHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 283.9 m	3.000 GHz s (1001 pts) CTION VALUE
1 N 1 f 2.4	429 8 GHz 4.35 dBm		Freq Offse
6 7 8 9 10			
4		STATUS	,



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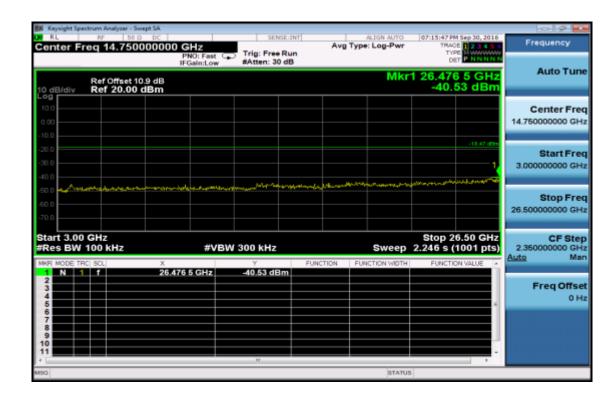
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Spurious Emission Test Data CH-High

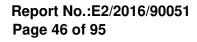
Keysight Spectrum Analyzer - Swept SA				
enter Freq 1.515000000		Avg Type: Log-Pwr	07:15:31 PM Sep 30, 2016 TRACE 1 2 3 4 5 6 TYPE	Frequency
Ref Offset 10.9 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB		1 2.462 4 GHz 1.53 dBm	Auto Tun
10.0 10.0			↓1	Center Fre 1.515000000 GF
20.0			-18.47 dBn	Start Fre 30.000000 MF
50.0 70.0	مى بەر مەرىپىيە بەر مەرىپى بولەر تەرىپ يېرىلەر تەرىپ بەر مەرىپ بەر مەرىپ بەر مەرىپ بەر مەرىپ بەر مەرىپ بەر مەر مەرىپ بەر مەرىپ بەر م	ng pangangan na ang pang pang pang pang	Vetalanderskipskipskipskips	Stop Fre 3.000000000 GH
tart 30 MHz Res BW 100 kHz	#VBW 300 kHz	Sweep 28	Stop 3.000 GHz 3.9 ms (1001 pts)	CF Ste 297.000000 Mi Auto Mi
1 N 1 f 2 2 3 4 5 5	.462 4 GHz 1.53 dBm			Freq Offs 01
6 7 8 9 0 0				



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802.11n HT20 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High

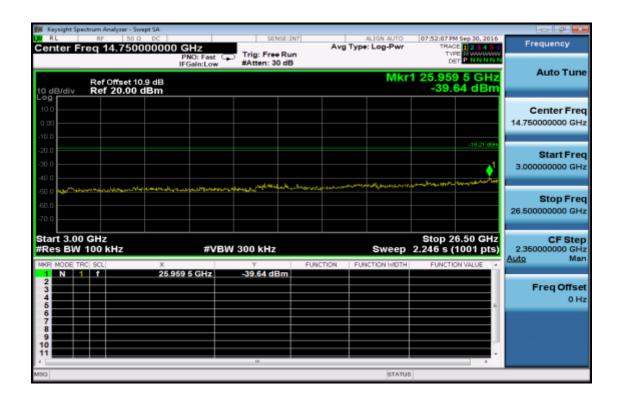


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802.11n HT20 **Spurious Emission Test Data CH-Low**

Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000		Avg Type: Log-Pwr	07:51:22 PM Sep 30, 2016 TRACE 1 2 3 4 5 0 TYPE	Frequency
Ref Offset 10.9 dB	PN0: Fast Difference Run IFGain:Low #Atten: 30 dB	Mk	r1 2.406 0 GHz 1.79 dBm	Auto Tune
10.0 0.00			1	Center Freq 1.51500000 GHz
-20.0			-18.21.06m	Start Freq 30.000000 MHz
-50.0 		⁴ الانتخابة من افعة المحمد (لم مدينة منهور ميا	New Joseph Contractory of Contractor	Stop Freq 3.00000000 GHz
Start 30 MHz #Res BW 100 kHz MKR MODE TRC SCL X	#VBW 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts) FUNCTION VALUE	CF Step 297.000000 MHz Auto Man
2 3 4 5 7 7 8 9 9 9 9 10	406 0 GHZ 1,79 dBM		6	Freq Offset 0 Hz
493	17	STATUS	•	



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Spurious Emission Test Data CH-Mid

Keysight Spect	rum Anelyzer - Swept SA							
Center Fre	eq 1.51500000	OGHZ	Trig: Free Ru	Avg	Type: Log-Pwr	TRAC	4 Sep 22, 2016 E 1 2 3 4 5 6 E 0 00000000	Frequency
10 dB/div	Ref Offset 10.9 dB Ref 30.00 dBm	IFGain:Low	#Atten: 30 dB		Mk	r1 2.441	6 GHz B3 dBm	Auto Tune
20.0 10.0						∲ ¹		Center Fred 1.515000000 GHz
-10.0 -20.0 -30.0							.18.17. d Bn	Start Free 30.000000 MHz
-40.0	and a share of the state of the	an a			ig din base yang bela kasal sa sa baga d	-	م. Alicense and	Stop Free 3.000000000 GH
Start 30 MH #Res BW 1	00 kHz	#VB1	W 300 kHz	FUNCTION	Sweep 2	83.9 ms (.000 GHz 1001 pts)	CF Step 297.000000 MH Auto Mar
1 N 1 2 3 4 5 6		.441 6 GHz	1.83 dBm	- Chief Chief		T STREETS		Freq Offse 0 Hi
7 8 9 10 11								
MBG					STATUS	1	,	

RL	req 14.7500000	DOD GHz PNO: Fast	Trig: Free R #Atten: 30 d	Avg	ALIGN AUTO	07:32:10 PM Sep 22, 2 TRACE 1 2 3 4 TYPE NUMB DET P NN	5.6	Frequency
10 dB/div	Ref Offset 10.9 dE Ref 30.00 dBm		#Atten: 30 0	D	Mkr	1 25.959 5 G -40.54 dB		Auto Tun
20.0								Center Fre 14.750000000 GH
-10.0						.18.17	<u></u>	Start Fre 3.000000000 GH
40.0 50.0 60.0	and the state of the	Sind and a second state	l-anald distriction	an a	المجاذرون ويعالم والمستجدارو	^{يور ر} يرو ^ر هومو ^ر الرور ورور والر	<u>.</u>	Stop Fre 26.500000000 Gi
Start 3.00 Res BW	100 kHz	#VB\	V 300 kHz Y	FUNCTION	Sweep	Stop 26.50 G 2.246 s (1001 p	Hz its)	CF Ste 2.350000000 Gi Auto Mi
1 N 1 2 3 4 5		25.959 5 GHz	-40.54 dBm					Freq Offs 01
6 7 8 9 10								
11					STATU	5		

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Spurious Emission Test Data CH-High

Keysight Spectrum Analyzer - Swept SA				- 2 -
Center Freq 1.515000000	GHz PNO: Fast C	Avg Type: Log-Pwr	07:58:22 PM Sep 30, 2016 TRACE 1 2 3 4 5 6 TYPE NNNNN DET PNNNNN	Frequency
Ref Offset 10.9 dB 10 dB/div Ref 20.00 dBm	IFGain:Low #Atten: 30 dB	Mkr1	2.456 5 GHz 2.08 dBm	Auto Tun
0.00			1	Center Fre 1.515000000 GH
20.0			-17.92 dBn	Start Fre 30.000000 MF
50.0	and a second	en e	Nelsofficing provide all of the	Stop Fre 3.000000000 GH
tart 30 MHz Res BW 100 kHz kR MODE TRCI SCLI X	#VBW 300 kHz	Sweep 283	Stop 3.000 GHz 9 ms (1001 pts)	CF Ste 297.000000 Mi Auto Mi
1 N 1 f 2.4 2 3 4 5	156 5 GHz 2.08 dBm			Freq Offs 01
6 7 8 9 10				
50		STATUS		

Keysight Spect	trum Analyzer - Swept SA RF 50 Ω DC		SENSE:	INT	ALIGN AUTO	07:58:37 PM Sep 30, 2	016	- 2 -
Center Fre	eq 14.7500000	00 GHz PNO: Fast	Trig: Free Ru	Avg	Type: Log-Pwr	TRACE 1 2 3 4 TYPE 1 4444 DET P N N	5.6	Frequency
10 dB/div	Ref Offset 10.9 dB Ref 20.00 dBm	IFGain:Low	#Atten: 30 dl	8	Mkr	1 25.936 0 GI -40.61 dB		Auto Tune
10.0 0.00 -10.0								Center Free 14.750000000 GH
-20.0 -30.0 -40.0					mindet des set and	-17.92 بوطري المراجع	•1	Start Fre 3.000000000 GH
-50.0	Alder Control Control	highing and an and	and the second s					Stop Fre 26.50000000 GH
Start 3.00 (#Res BW 1	00 kHz		W 300 kHz	FUNCTION	Sweep	Stop 26.50 G 2.246 s (1001 p	Hz (ts)	CF Ste 2.35000000 GH Auto Ma
1 N 1 2 3 4 5 6	f 2	5.936 0 GHz	-40.61 dBm					Freq Offs 0 F
7 8 9 10 11								
493			17		BTATU	5		

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11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 & RSS-Gen §8.8, 8.9 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13(a), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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)

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11.2 Measurement Equipment Used:

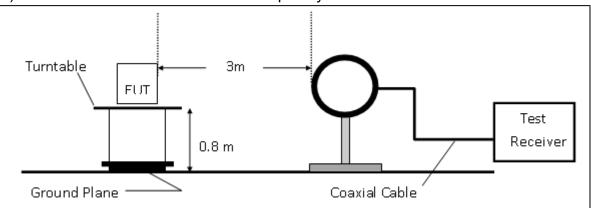
SGS SAC-III									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
EMI Test Receiver	R&S	ESU 40	100363	04/12/2016	04/11/2017				
Loop Antenna	ETS-Lindgren	6502	00143303	12/23/2015	12/22/2016				
Broadband Antenna	TESEQ	CBL 6112D	35240	10/28/2015	10/27/2016				
Horn Antenna	ETS-Lindgren	3117	00143272	12/16/2015	12/15/2016				
Horn Antenna	Schwarzbeck	BBHA9170	185	07/18/2016	07/17/2017				
Pre Amplifier	EMC Instruments	EMC330	980096	12/12/2015	12/11/2016				
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/12/2015	12/11/2016				
Pre Amplifier	R&S	SCU-18	10204	12/12/2015	12/11/2016				
Pre Amplifier	R&S	SCU-26	100780	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/12/2015	12/11/2016				
Attenuator	WOKEN	218FS-10	RF27	12/12/2015	12/11/2016				
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017				
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017				
DC Power Supply	HOLA	DP-3003	D7070035	05/04/2016	05/03/2017				
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.				
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.				
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.				
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.				

Note: N.C.R refers to Not Calibrated Required.

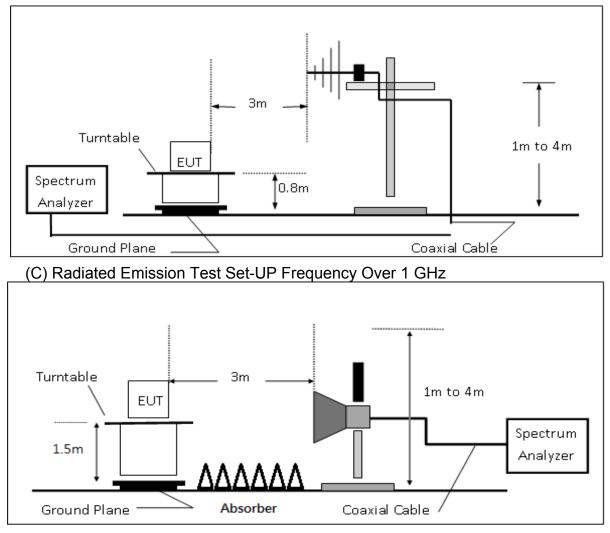


11.3 Test SET-UP





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



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11.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. When 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.
- 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 ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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11.5 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	6	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(dB μ V/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.

11.6 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.

11.7 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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Radiated Band Edge Measurement Result (802.11b)

Fundamenta	beration Mode :802.11bTest Date :ndamental Frequency :2412 MHzTemp. / Humi. :beration Band :BE CH LOWTest Engineer :JT Pol. :E2Measurement Antenna Pol. :			nna Pol. :	2016/9/26 22.7deg_0 Tank 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
2390.00	E	Peak	59.76	-6.84	52.91	74	-21.09
2390.00	E	Average	48.06	-6.84	41.22	54	-12.78
Fundamenta	damental Frequency : 2412 MHz ration Band : BE CH LOW		Hz Temp./ _OW Test Eng	Humi.:	nna Pol. :	2016/9/26 22.7 deg_0 Tank 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
2390.00	E	Peak	62.19	-6.84	55.34	74	-18.66
2390.00	Е	Average	52.19	-6.84	45.35	54	-8.65



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Radiated Band Edge Measurement Result (802.11g)

Operation Mode :802.11Fundamental Frequency :2412 M				Test Date : z Temp. / Humi. :		2016/9/26 22.7deg_C/57RH		
Operation B	and :	BE CH L	_OW Test Eng	ineer:		Tank		
EUT Pol. :		E2	Measure	ment Anter	nna 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	
2390.00	E	Peak	70.09	-6.84	63.25	74	-10.75	
2390.00	Е	Average	52.09	-6.84	45.25	54	-8.75	
Operation M	odo :	802.11g	Toot Dot	o ·		2016/9/26		
Operation M		•		Test Date : z Temp. / Humi. :				
	I Frequency	BE CH L				22.7deg_C/57RH		
Operation B EUT Pol. :	anu .		0	ment Anter	na Dal i	Tank		
EUT FUL.		E2	iviea sui e	ment Anter	IIIa F01	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	
2390.00	E	Peak	79.30	-6.84	72.45	74	-1.55	
2390.00	E	Average	59.37	-6.84	52.53	54	-1.47	
2000.00	L	/ Weldge	00.07	-0.0-	02.00	57	-1.71	



Fundamenta	Operation Mode :802.11gTest Date :Fundamental Frequency :2462 MHzTemp. / Humi. :Operation Band :BE CH HIGHTest Engineer :EUT Pol. :E2Measurement Antenna Pol. :		nna Pol. :	2016/9/26 22.7deg_C/57RH Tank Vertical				
Freq.	Note	Detector Mode	Spect		Factor	Actual FS	Limit	Margin
N 41 1-			Reading		٩D		@3m	d٦
MHz	F/H/E/S	PK/QP/AV	dBµ\		dB	dBµV/m	dBµV/m	dB
2483.50	E	Peak	74.1		-6.38	67.81	74	-6.19
2483.50	E	Average	53.7)	-6.38	47.32	54	-6.68
-	Operation Mode : Fundamental Frequency :		802.11g Test : 2462 MHz Tem		: ımi. :		2016/9/26 22.7deg_0	C/57RH
Operation B	• •	BE CH F	HIGH Te	est Engin	eer:		Tank	
EUT Pol. :		E2		0		nna Pol. :	Horizontal	
Freq.	Note	Detector	Spectu	um	Factor	Actual	Limit	Margin
1 -		Mode	Reading		`	FS	@3m	- 0
MHz	F/H/E/S	PK/QP/AV	dBμ		dB	dBµV/m	dBµV/m	dB
2483.50	E	Peak	78.5	6	-6.38	72.18	74	-1.82
2483.50	Е	Average	56.8	9	-6.38	50.51	54	-3.49

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Radiated Band Edge Measurement Result (802.11_HT20)

Operation M	ode :	802.11n	802.11n20 Test Date :		2016/9/26			
Fundamental Frequency : 2412 MHz		Hz Temp./I	Temp. / Humi. :		22.7deg_C/57RH			
Operation B	and :	BE CH I	_OW Test Eng	ineer:		Tank		
EUT Pol. :		E2	Measure	ment Anter	nna Pol. :	Vertical		
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin	
•		Mode	Reading Level		FS	@3m	0	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2390.00	E	Peak	70.85	-6.84	64.00	74	-10.00	
2390.00	Е	Average	52.47	-6.84	45.63	54	-8.37	
Operation M	ode ·	802.11n	20 Test Dat	<u>م</u> .		2016/9/26		
Fundamenta				Temp. / Humi. :			22.7deg_C/57RH	
Operation B		BE CH I				Tank		
EUT Pol. :		E2	0	ment Anter	na Pol	Horizontal		
			Medoure			TIONZONIA		
		_	_	_				
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	
2390.00	E	Peak	79.53	-6.84	72.69	74	-1.31	
2390.00	E	Average	45.83	-6.84	38.99	54	-15.01	



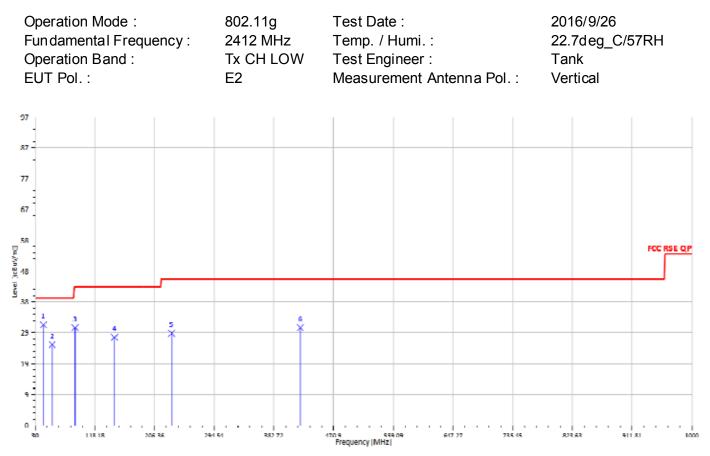
Operation Mode :802.11n20Fundamental Frequency :2462 MHzOperation Band :BE CH HIGHEUT Pol. :E2		Hz Temp. / HIGH Test Er	ate : / Humi. : ngineer : ement Anter	nna Pol. :	2016/9/26 22.7deg_0 Tank Vertical	C/57RH	
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	E	Peak	76.49	-6.38	70.11	74	-3.89
2483.50	Ē	Average	56.51	-6.38	50.13	54	-3.87
Operation Mode : Fundamental Frequency : Operation Band : EUT Pol. :		802.11n : 2462 Mł BE CH ł E2	Hz Temp. / HIGH Test Er	ate: /Humi.: ngineer: ement Anter	nna Pol. :	2016/9/26 22.7deg_0 Tank 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
2483.50	E	Peak	77.53	-6.38	71.14	74	-2.86
2483.50	E	Average	57.04	-6.38	50.66	54	-3.34

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有说明,此報告结果僅對測試之樣品負責,同時此樣品僅保留00天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u></u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction form exercising all their rights and obligations under the transaction documents unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeindustrict,NewTaipeiCliy,Taiwan24803/新北市五股區新北產業園區五工路 134 號



Below 1GHz Worst-Case Data:

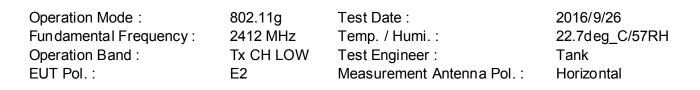
Radiated Spurious Emission Measurement Result (802.11 g)

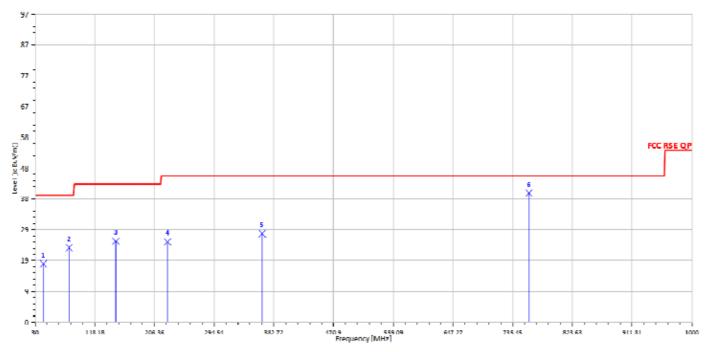


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	54.80	-23.11	31.69	40	-8.31
55.22	S	Peak	49.55	-24.16	25.38	40	-14.62
89.17	S	Peak	58.45	-27.71	30.73	43.5	-12.77
147.37	S	Peak	50.15	-22.42	27.73	43.5	-15.77
231.76	S	Peak	52.78	-23.80	28.98	46	-17.02
421.88	S	Peak	48.90	-18.16	30.74	46	-15.26

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



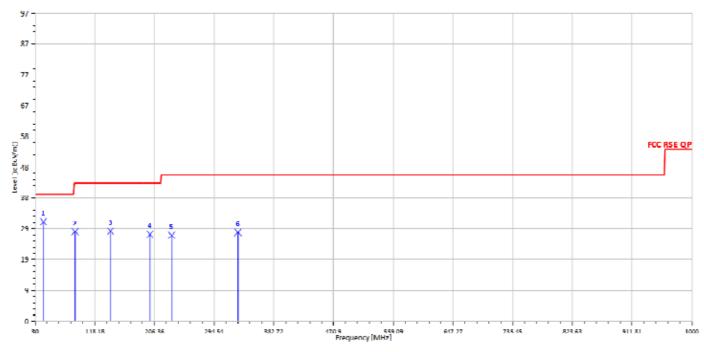




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	41.50	-23.11	18.39	40	-21.61
80.44	S	Peak	51.30	-27.84	23.46	40	-16.54
149.31	S	Peak	47.75	-22.27	25.48	43.5	-18.02
225.94	S	Peak	49.57	-24.29	25.28	46	-20.72
365.62	S	Peak	47.69	-19.79	27.90	46	-18.10
759.44	S	Peak	52.10	-11.45	40.65	46	-5.35

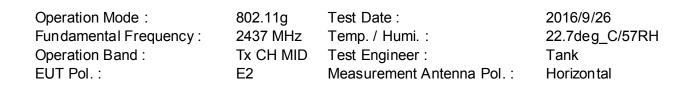


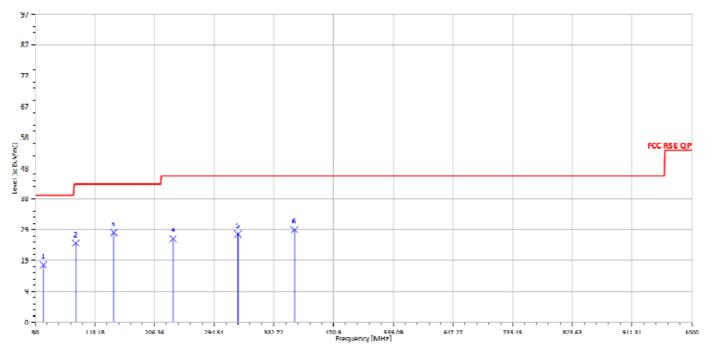
Operation Mode:	802.11g	Test Date :	2016/9/26
Fundamental Frequency:	2437 MHz	Temp. / Humi. :	22.7deg C/57RH
Operation Band :	Tx CH MID	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



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
42.61	S	Peak	54.41	-23.11	31.30	40	-8.70
89.17	S	Peak	55.91	-27.71	28.20	43.5	-15.30
141.55	S	Peak	51.21	-22.89	28.32	43.5	-15.18
199.75	S	Peak	52.72	-25.37	27.35	43.5	-16.15
231.76	S	Peak	50.87	-23.80	27.07	46	-18.93
329.73	S	Peak	48.48	-20.50	27.98	46	-18.02

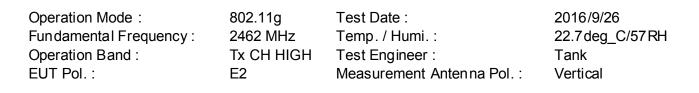


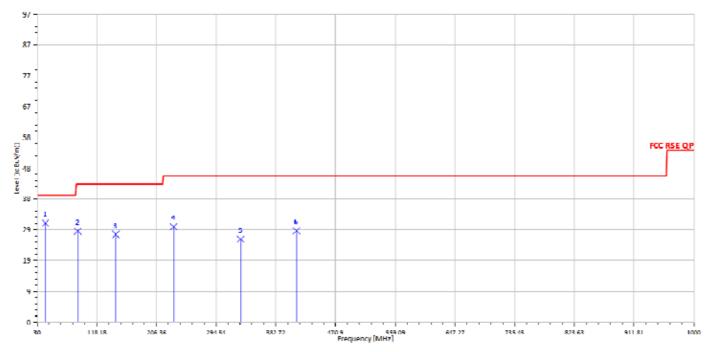




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	41.18	-23.11	18.07	40	-21.93
90.14	S	Peak	52.53	-27.69	24.84	43.5	-18.66
146.40	S	Peak	50.69	-22.50	28.19	43.5	-15.31
233.70	S	Peak	49.98	-23.66	26.33	46	-19.67
329.73	S	Peak	48.22	-20.50	27.72	46	-18.28
413.15	S	Peak	47.12	-18.05	29.07	46	-16.93

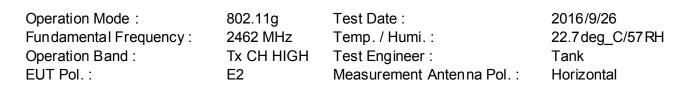


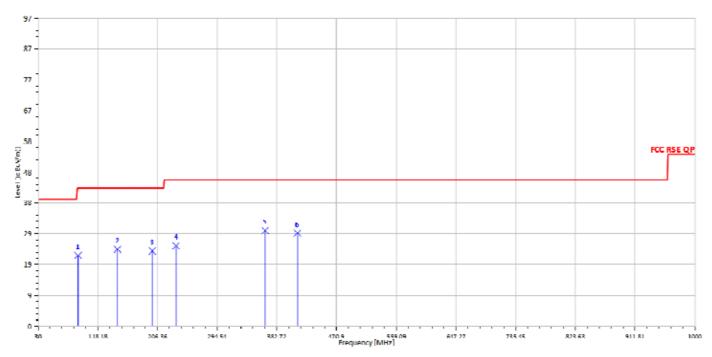




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	54.31	-23.11	31.20	40	-8.80
90.14	S	Peak	56.33	-27.69	28.64	43.5	-14.86
146.40	S	Peak	50.15	-22.50	27.65	43.5	-15.85
231.76	S	Peak	53.87	-23.80	30.07	46	-15.93
330.70	S	Peak	46.64	-20.48	26.16	46	-19.84
413.15	S	Peak	46.81	-18.05	28.76	46	-17.24





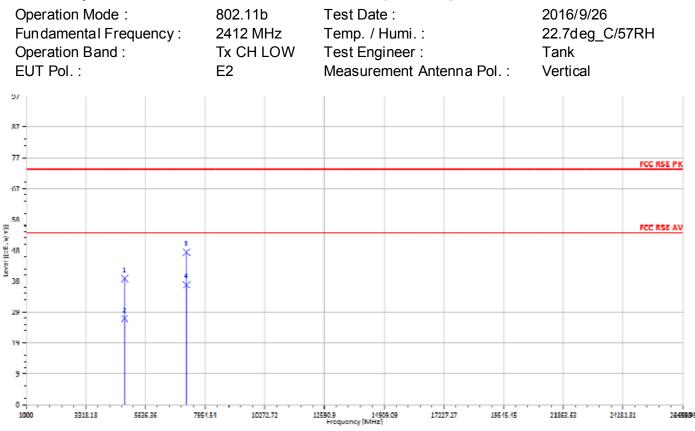


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	50.00	-27.71	22.29	43.5	-21.21
147.37	S	Peak	46.59	-22.42	24.17	43.5	-19.33
198.78	S	Peak	49.04	-25.34	23.70	43.5	-19.80
233.70	S	Peak	48.96	-23.66	25.30	46	-20.70
365.62	S	Peak	49.91	-19.79	30.13	46	-15.87
413.15	S	Peak	47.34	-18.05	29.29	46	-16.71



Above 1GHz Data:

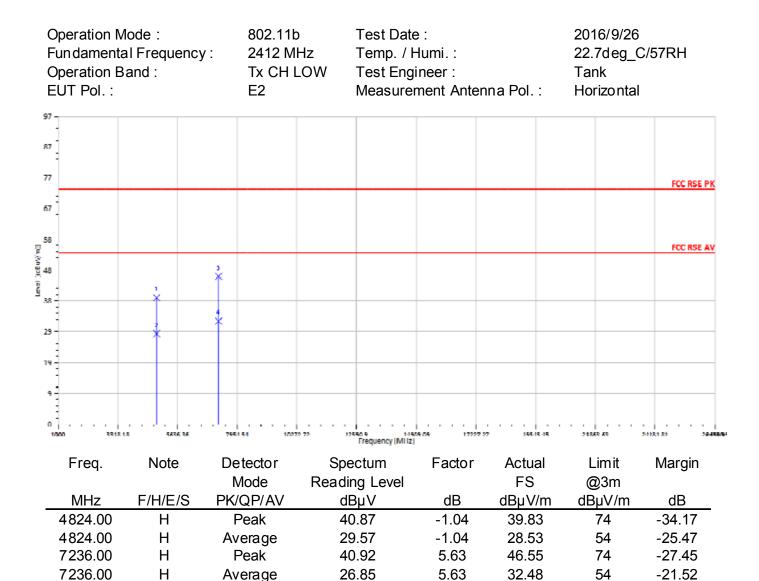
Radiated Spurious Emission Measurement Result (802.11 b)



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
4824.00	Н	Peak	40.65	-1.04	39.61	74	-34.39
4824.00	Н	Average	28.10	-1.04	27.06	54	-26.94
7236.00	Н	Peak	42.29	5.63	47.92	74	-26.08
7236.00	Н	Average	32.00	5.63	37.63	54	-16.37

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





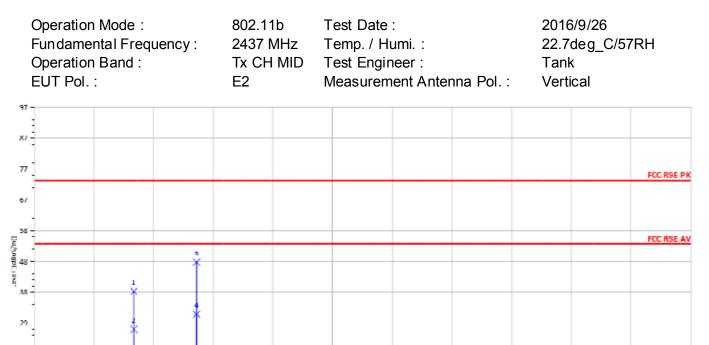


7311.00

7311.00

Н

Н



19							
9 -							
0	2 5676 76	7454 54 1027	2 72 12560 9 149 Frequency [MI[2]	19 09 17227	77 19545 AS		Printing Parameter
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
•		Mode	Reading Level		FS	@3m	Ū

6.10

6.10

48.28

31.90

74

54

-25.72 -22.10

42.18

25.80

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Peak

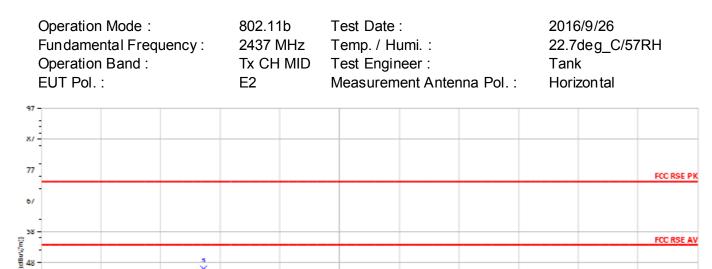
Average



48 ł 25

19

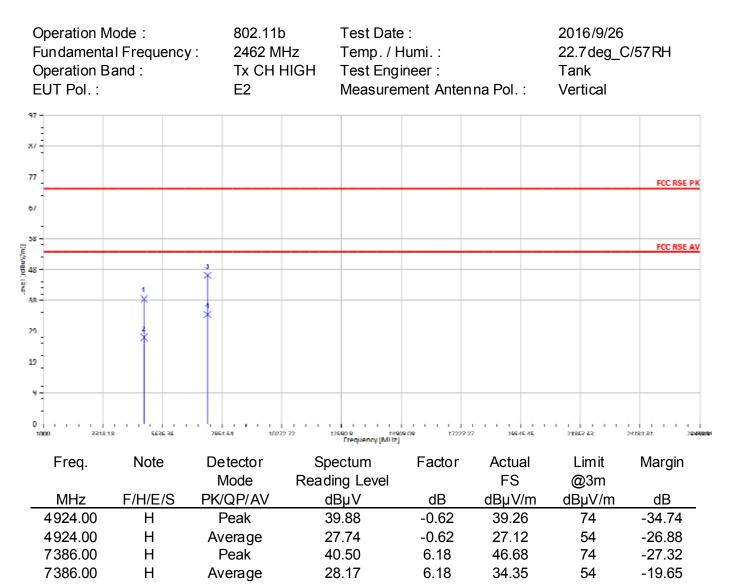
0



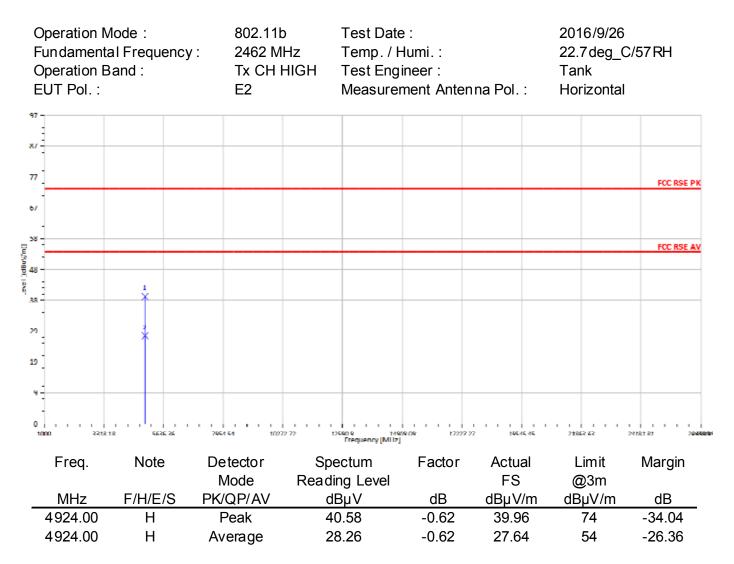
0 I I I 1000 - 221818	4636.36	7954 54 1027	772 12540.9 1440 Trequency [Mil2]	9.09 17227 22	7 19545.45	21862.62	24181.81 2 94	i Agra
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4874.00	Н	Peak	39.90	-0.75	39.15	74	-34.85	
4874.00	Н	Average	27.26	-0.75	26.51	54	-27.49	
7311.00	Н	Peak	40.42	6.10	46.52	74	-27.48	
7311.00	Н	Average	25.34	6.10	31.44	54	-22.56	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





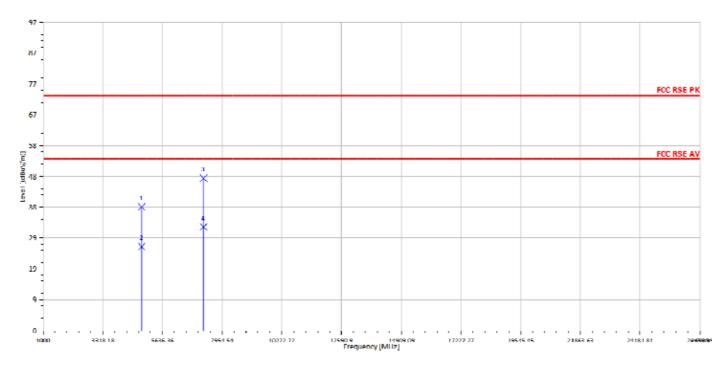






Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode :	802.11g	Test Date :	2016/9/26
Fundamental Frequency :	2412 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH LOW	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol.:	Vertical

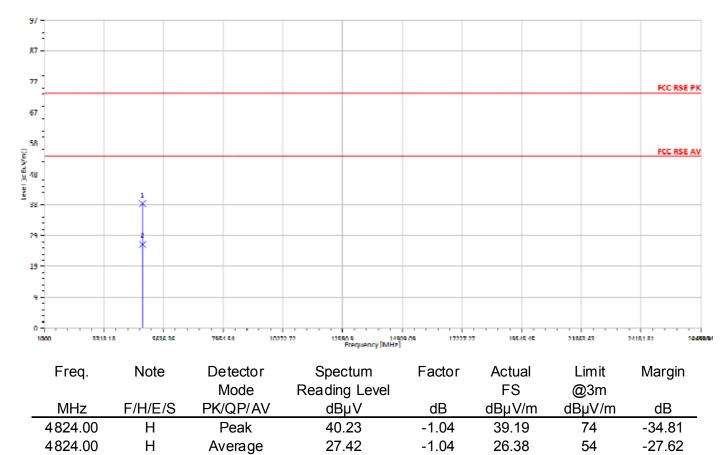


Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	39.96	-1.04	38.92	74	-35.08
4824.00	Н	Average	27.45	-1.04	26.41	54	-27.59
7236.00	Н	Peak	42.29	5.63	47.92	74	-26.08
7236.00	Н	Average	26.97	5.63	32.60	54	-21.40

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

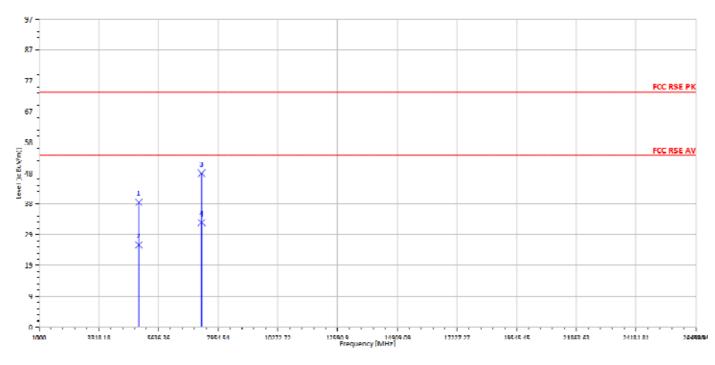


Operation Mode :	802.11g	Test Date :	2016/9/26
Fundamental Frequency :	2412 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH LOW	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal





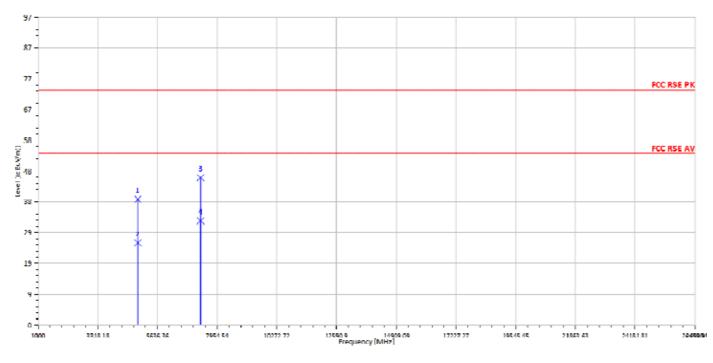
Operation Mode:	802.11g	Test Date :	2016/9/26
Fundamental Frequency:	2437 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH MID	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



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
4874.00	Н	Peak	40.01	-0.75	39.27	74	-34.73
4874.00	Н	Average	26.64	-0.75	25.89	54	-28.11
7311.00	Н	Peak	42.32	6.10	48.42	74	-25.58
7311.00	Н	Average	26.79	6.10	32.89	54	-21.11



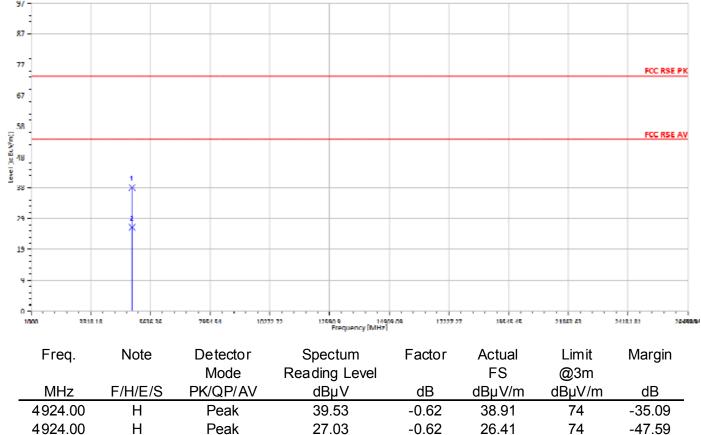
Operation Mode:	802.11g	Test Date :	2016/9/26
Fundamental Frequency:	2437 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH MID	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizon tal



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
4874.00	Н	Peak	40.39	-0.75	39.65	74	-34.35
4874.00	Н	Average	26.67	-0.75	25.92	54	-28.08
7311.00	Н	Peak	40.33	6.10	46.43	74	-27.57
7311.00	Н	Average	26.72	6.10	32.82	54	-21.18



Operation Mode :	802.11g	Test Date :	2016/9/26
Fundamental Frequency :	2462 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH HIGH	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical
87-			

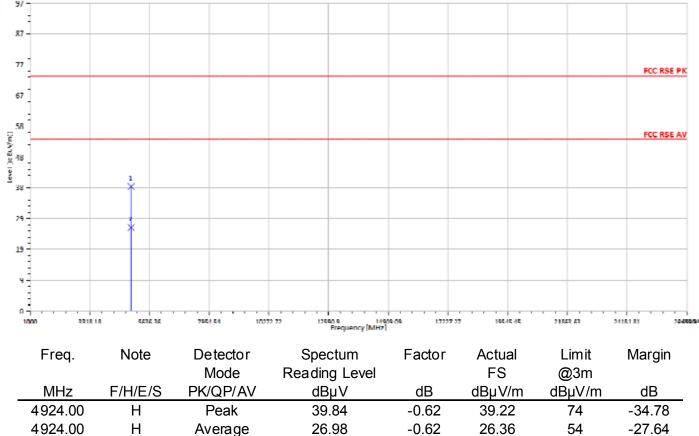


Peak

Н



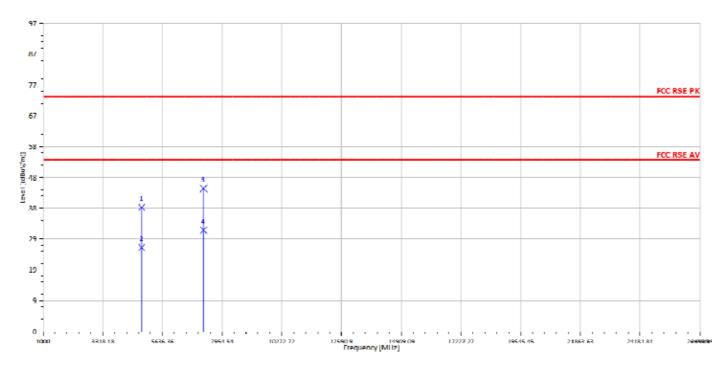
Operation Mode:	802.11g	Test Date :	2016/9/26
Fundamental Frequency:	2462 MHz	Temp. / Humi. :	22.7 deg_C/57 RH
Operation Band:	Tx CH HIGH	Test Engineer :	Tank
EUT Pol.:	E2	Measurement Antenna Pol. :	Horizontal





Radiated Spurious Emission Measurement Result (802.11_HT20)

Operation Mode :	802.11n20	Test Date :	2016/9/26
Fundamental Frequency :	2412 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

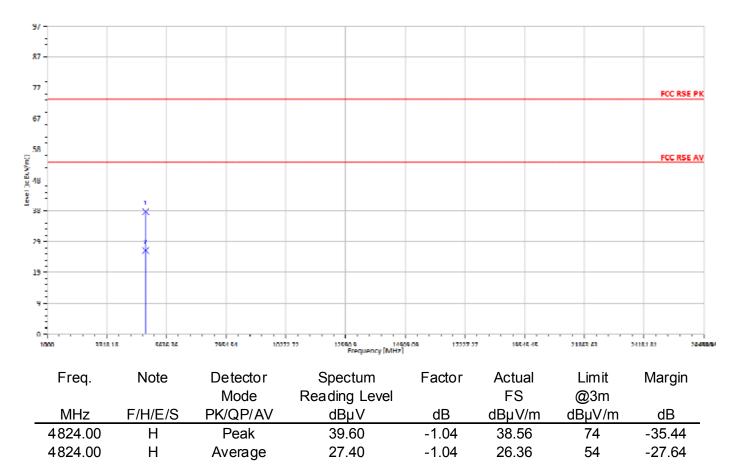


Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	40.15	-1.04	39.11	74	-34.89
4824.00	Н	Average	27.50	-1.04	26.46	54	-27.54
7236.00	Н	Peak	39.34	5.63	44.97	74	-29.03
7236.00	Н	Average	26.29	5.63	31.92	54	-22.08

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

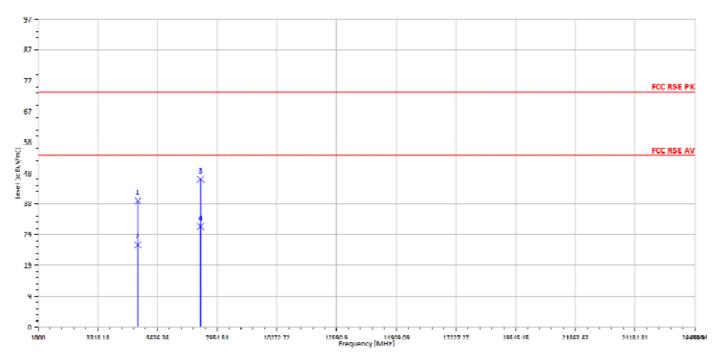


Operation Mode :	802.11n20	Test Date :	2016/9/26
Fundamental Frequency :	2412 MHz	Temp. / Humi. :	22.7deg C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal





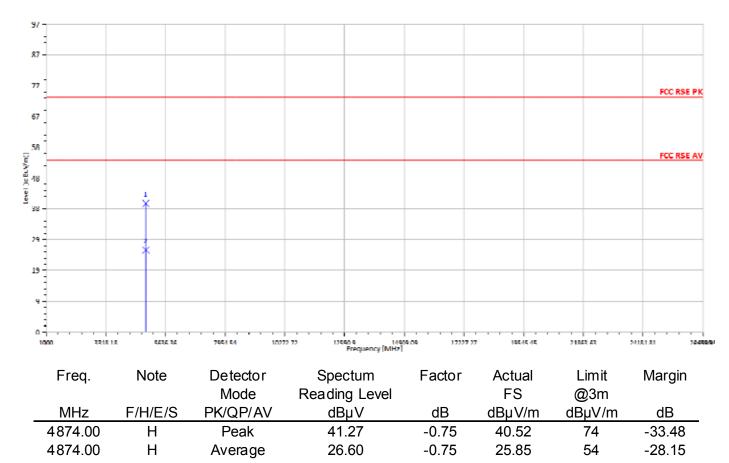
Operation Mode:	802.11n20	Test Date :	2016/9/26
Fundamental Frequency:	2437 MHz	Temp. / Humi. :	22.7deg C/57RH
Operation Band :	Tx CH MID	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



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
4874.00	Н	Peak	40.49	-0.75	39.75	74	-34.25
4874.00	Н	Average	26.66	-0.75	25.91	54	-28.09
7311.00	Н	Peak	40.45	6.10	46.55	74	-27.45
7311.00	Н	Average	25.57	6.10	31.67	54	-22.33

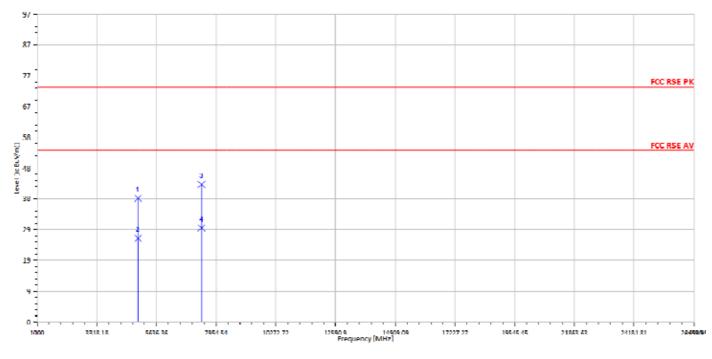


Operation Mode:	802.11n20	Test Date :	2016/9/26
Fundamental Frequency:	2437 MHz	Temp. / Humi. :	22.7deg C/57RH
Operation Band :	Tx CH MID	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal





Operation Mode :	802.11n20	Test Date :	2016/9/26
Fundamental Frequency :	2462 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH HIGH	Test Engineer :	Tank
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



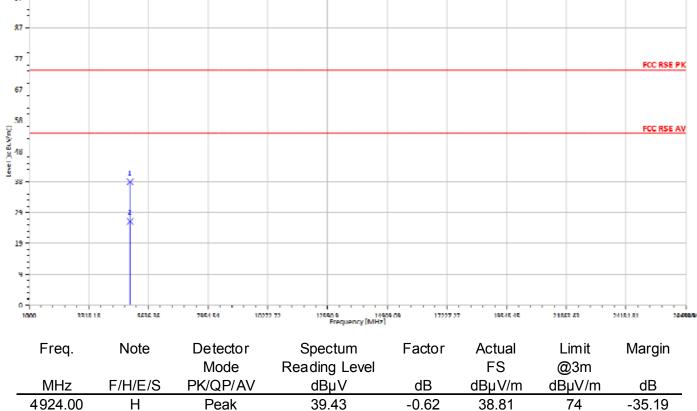
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Н	Peak	39.63	-0.62	39.01	74	-34.99
4924.00	Н	Average	27.04	-0.62	26.42	54	-27.58
7386.00	Н	Peak	37.19	6.18	43.37	74	-30.63
7386.00	Н	Average	23.46	6.18	29.64	54	-24.36



4924.00

Н

Operation Mode:	802.11n20	Test Date :	2016/9/26
Fundamental Frequency:	2462 MHz	Temp. / Humi. :	22.7 deg_C/57 RH
Operation Band:	Tx CH HIGH	Test Engineer :	Tank
EUT Pol.:	E2	Measurement Antenna Pol. :	Horizontal
9/			



27.00

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Average

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-0.62

26.38

54

-27.62



12 PEAK POWER SPECTRAL DENSITY

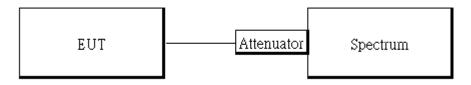
12.1 Standard Applicable

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

12.2 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017	
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016	
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016	

12.3 Test Set-up



12.4 Measurement Procedure

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz & VBW = 10 kHz.
- 5. For defining Restricted Band Edge Limit: Set the RBW = 100kHz & VBW = 300 kHz.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- 8. Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



12.5 Measurement Result

POWER DENSITY 802.11b MODE			POWER DENSITY 802.11g MODE				
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result	Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result
2412	-7.62	8.00	PASS	2412	-12.39	8.00	PASS
2437	-7.64	8.00	PASS	2437	-9.78	8.00	PASS
2462	-5.55	8.00	PASS	2462	-14.59	8.00	PASS

POWER DENSITY 802.11n HT20 MODE

Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result
2412	-14.97	8.00	PASS
2437	-11.16	8.00	PASS
2462	-15.41	8.00	PASS

*Refer to next page for plots

Bandedge Limit 802.11b MODE					
Frequency	RF Power	Bandedge			
(MHz)	Density	Limit			
	(dBm)	(dBm)			
2412	7.91	-12.09			
2462	7.87	-12.13			

Bandedge Limit 802.11g MODE					
Frequency	RF Power	Bandedge			
(MHz)	Density	Limit			
	(dBm)	(dBm)			
2412	3.67	-16.33			
2462	2.26	-17.74			

Bandedge Limit 802.11n20 MODE					
Frequency	RF Power	Bandedge			
(MHz)	Density	Limit			
	(dBm)	(dBm)			
2412	1.84	-18.16			
2462	2.07	-17.93			

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802.11b Power Spectral Density Test Plot (CH-Low)



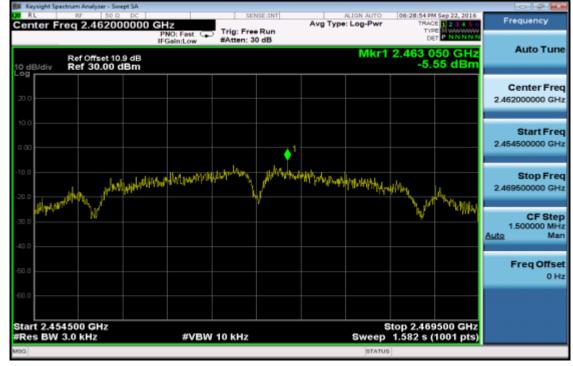
Power Spectral Density Test Plot (CH-Mid)



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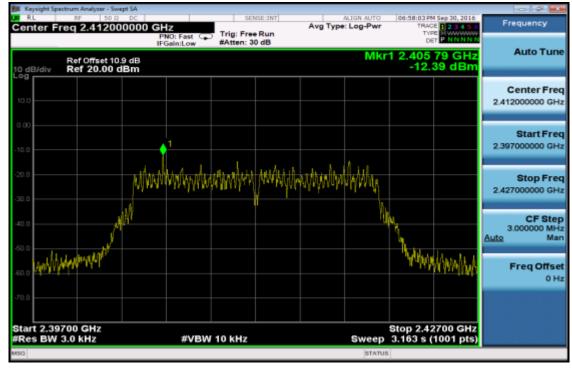


Power Spectral Density Test Plot (CH-High)



802.11g

Power Spectral Density Test Plot (CH-Low)



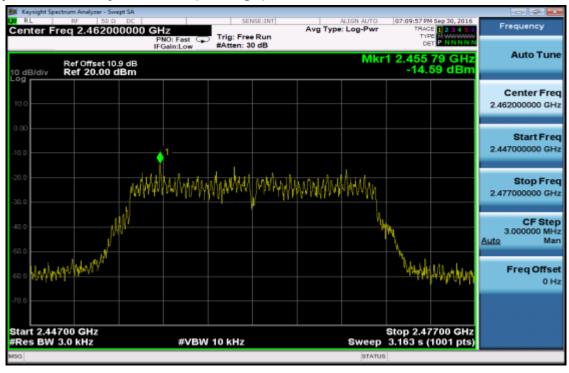
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Power Spectral Density Test Plot (CH-Mid)



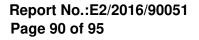
Power Spectral Density Test Plot (CH-High)



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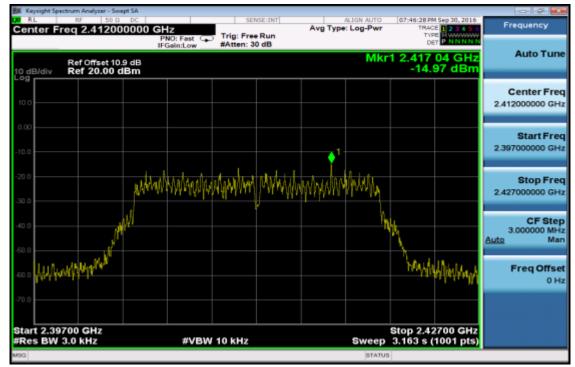
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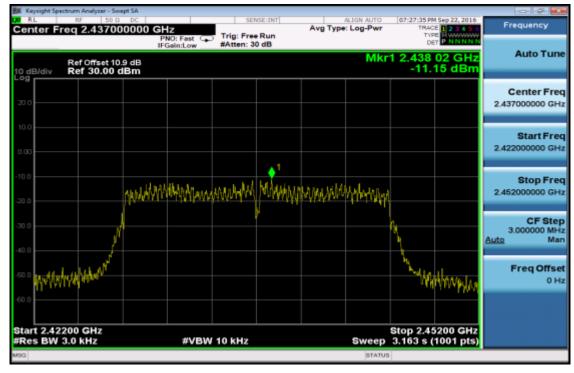




802.11n HT20 Power Spectral Density Test Plot (CH-Low)



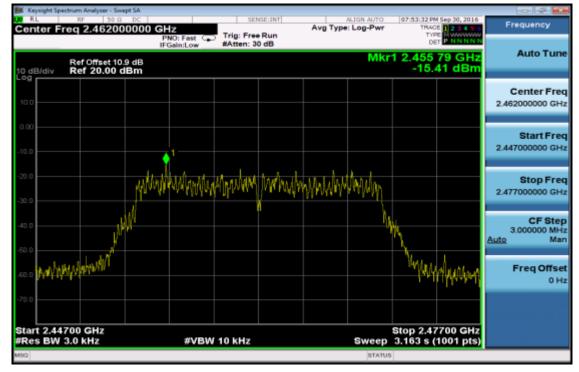
Power Spectral Density Test Plot (CH-Mid)



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Power Spectral Density Test Plot (CH-High)



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802.11b PSD for Band edge Limit (CH-Low)



802.11b PSD for Bandedge Limit(CH-High)



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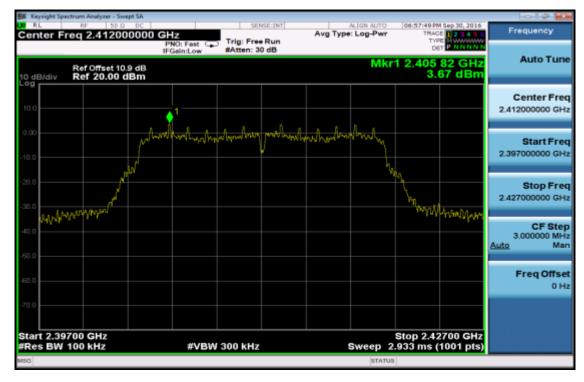
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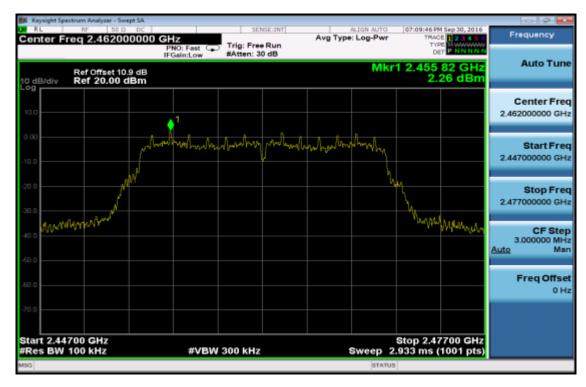




802.11g PSD for Bandedge Limit(CH-Low)



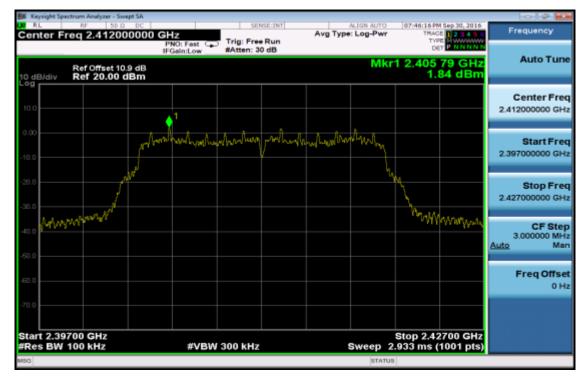
802.11g PSD for Bandedge Limit(CH-High)



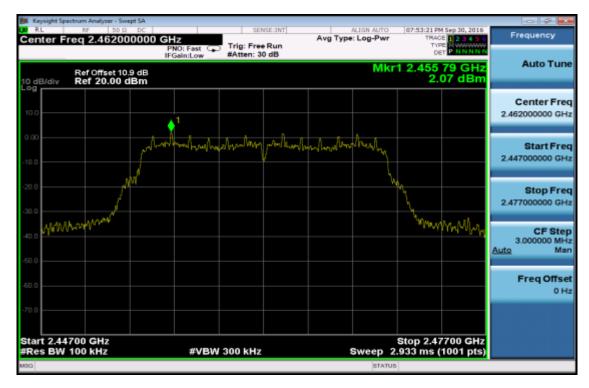
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802.11n_HT20 PSD for Bandedge Limit(CH-Low)



802.11n HT20 PSD for Bandedge Limit(CH-High)



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13 ANTENNA REQUIREMENT

13.1 Standard Applicable

For intentional device, 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.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

According to RSS-GEN 8.3

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

13.2 Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector 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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