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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

0F

Applicant: Quanta Computer Inc.

No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377,

Taiwan

Product Name: Clover Mini Enterprise/Clover Station Pro Terminal

Brand Name: clover

Model No.: C303, C503

Model Difference: C303 is a standalone POS terminal. C503 includes the same

POS terminal (C303) but comes with an included peripheral

display (S503).

 FCC ID:
 HFS-CX03U

 IC:
 1787B-CX03U

 Report Number:
 T190612W02-RP4

 FCC Rule Part:
 §15.247, Cat: DTS

IC Rule Part: RSS-247 issue 2 Feb 2017

Issue Date: Jul. 12, 2019

Date of Test: Jun. 14, 2019 ~ Jul. 09, 2019

Date of EUT Received: Jun. 14, 2019

Issued by Compliance Certification Services Inc.Wugu Lab.

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Tai-

wan. (R.O.C.) service@ccsrf.com

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report. The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By:

Hone Hsieh / Engineer

Approved By:

Kevin Tsai / Deputy Manager





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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190612W02-RP4	Rev.00	Initial creation of document	All	Jul. 12, 2019	Elle Chang

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1 GENERAL INFORMATION

1.1 Product description

General:

Octional.			
Product Name:	Clover Mini Enterprise/Clover Station Pro Terminal		
Brand Name:	clover		
Model No.:	C303, C503		
Model Difference:	C303 is a standalone POS terminal. C503 includes the same POS terminal (C303) but comes with an included peripheral display (S503)		
Product SW/HW version:	N/A / 4.01		
Radio SW/HW version:	N/A / N/A		
Test SW Version:	N/A		
RF power setting in TEST SW:	N/A		
Micro Hub:	Model No.: H303, Supplier: clover		
	12V from F	lub and Adapter	
Power Supply:	Battery:	Model No.: YJ3B, Supplier: N/A	
	Adapter:	Model No.: FSP040-RHBN3, Supplier: FSP	

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WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	HT/VHT mode	Rated Power in dBm (Peak)	Rated Power in dBm (EIRP)	Type of Emission	Modulation Technology
802.11b				20.54	19.59	12M9G1D	DSSS,
802.11g	2412-2462	11		21.40	18.59	16M8D1D	
802.11n HT20			HT	24.70	24.32	18M0D1D	OFDM
802.11n HT40	2422-2452	7	HT	24.13	22.25	36M2D1D	
Antenna D	PIFA Antenna, 1. P/N: LA81FP017-1H, Supplier: Luxshare-ICT Antenna Gain: 2.1 (Main) P/N: LA81FP018-1H, Supplier: Luxshare-ICT Antenna Gain: 0.9dBi (Aux) 2. P/N: GD9320-15-001-R, Supplier: SAA, Antenna Gain: 0.08dBi (Main) P/N: GD9321-15-001-R, Supplier: SAA, Antenna Gain: -0.2dBi (Aux)						
Modulation type: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM							
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 – 144.4Mbps 802.11 n_40MHz: 13.5 – 300.0Mbps							

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 v05 DTS Meas. Guidance

FCC KDB 662911 D01 Multiple Transmitter Output

Canada RSS-247 issue 2 Feb. 2017

Canada RSS-Gen issue 5 Apr. 2018

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

Canada Registration Number: TW1309 .

1.4 Special Accessories

AC Adapter is used while the test is conducted and there is no other accessory attached. This is the worst case condition.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT is configured to operate in a continuous transmission mode. EUT placement and various angles were checked to find worst mode where the emission characteristics are maximized.

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 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.

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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 and attenuator.

Offset:

= RF cable loss (dB)+ attenuation factor(dB) dB =10.4 (dB)

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2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration

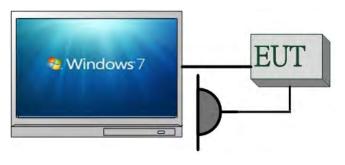


Fig. 2-2 Conducted Emission Configuration



Fig.2-3 Conduction (AC Power Line)

Configuration

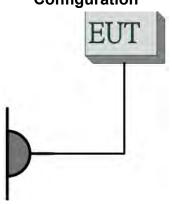


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	L420	S0012467	Shielded	Unshielded

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3 SUMMARY OF TEST RESULTS

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 §6.7	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	RSS- Gen §6.8	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

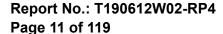
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	8	2447 MHz
2	2417 MHz	9	2452 MHz
3	2422 MHz	10	2457 MHz
4	2427 MHz	11	2462 MHz
5	2432 MHz		
6	2437 MHz		
7	2442 MHz		

7 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	8	2447 MHz
4	2427 MHz	9	2452 MHz
5	2432 MHz		
6	2437 MHz		
7	2442 MHz		

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- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.
- 4. For MIMO modes, the 2TX emission testing was considered as a worst case scenario and was performed at power levels, per transimit chain, greater than or equal to the maximum power in any 1TX mode.
- 5. Power line conducted emission were performed with the EUT set to transimit at the channel with highest output power as worst-case scenario.

AC POWER LINE CONDUCTED EMISSION TEST:

Test Condition	AC Power line conducted emission for line and neutral		
Worst Case	Operation in normal mode		

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE AVAILABLE TESTED MODULATION DATA RATE ANTENNA (Mbps) PORT						
802.11g	1 to 11	6	OFDM	6	MAIN	
802.11n HT40	3 to 9	6	OFDM	MCS 8	MIMO	

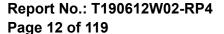
RADIATED EMISSION TEST (ABOVE 1 GHz)							
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN		
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN		
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO		
802.11n HT40	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO		

Note:

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

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ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST							
MODE	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA		
INIODE	CHANNEL	CHANNEL	MODULATION	(Mbps)	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 8	MIMO		
802.11n HT40	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO		

Directional gain (MIMO)

The Tx transmission to construct MIMO operation is cyclic delay diversity, and the following deduction to obtain the array gain of MIMO operation is based on the approach given by KDB 662911 D01.

- d) Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi
 - (i) If transmit signals are correlated, then Directional gain = 10 log[(10^{G₁/20} + 10^{G₂/20} + ... + 10^{G_N/20})²/N_{ANT}] dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

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5 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575 dB
Peak Output Power	+/- 1.92 dB
6dB Bandwidth	+/- 61.248 Hz
100 kHz Bandwidth of Frequency Band Edges	+/- 1.92 dB
Peak Power Density	+/- 1.996 dB
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68 dB
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18 dB
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47 dB
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81 dB
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87 dB

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

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

Frequency range	Lin dB(nits 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

6.2 Measurement Equipment Used

	Conducted Emission Test Site							
EQUIPMENT TYPE	MFR	MODEL Number	SERIAL NUMBER	LAST CAL.	CAL DUE.			
CABLE	EMCI	CFD300-NL	CERF	06/29/2018	06/28/2019			
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019			
LISN	SCHWARZ- BECK	NSLK 8127	8127-541	01/31/2019	01/30/2020			
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020			
Software		EZ-EMC(CCS-3A1-CE)					

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.
- 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.

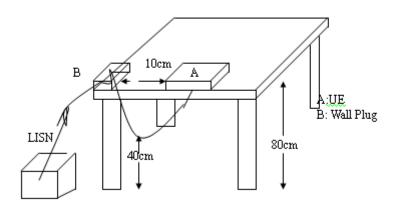
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^{1.} The lower limit shall apply at the transition frequencies

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



6.4 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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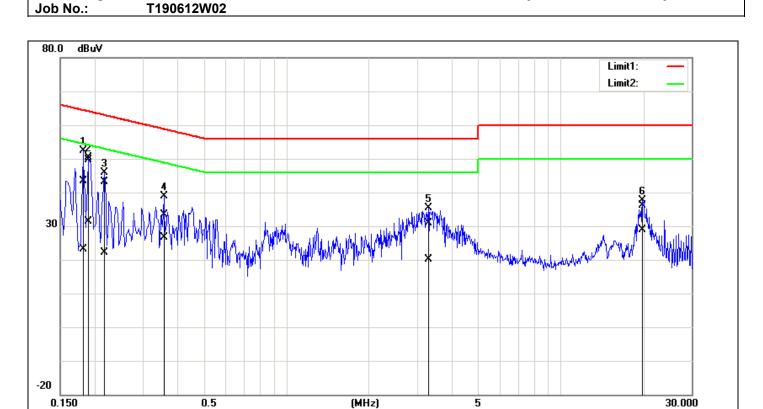


 Description:
 Operation
 Date:
 2019/6/21

 Line:
 L1
 Temp.(°C)/Hum.(%):
 26.9(°C)/67%

AC POWER LINE CONDUCTED EMISSION TEST DATA

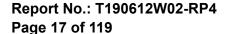
Test Voltage: AC 120V/60Hz Test By: Henry



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1819	33.32	13.08	10.13	43.45	23.21	64.39	54.40	-20.94	-31.19	Pass
2*	0.1900	39.57	21.21	10.13	49.70	31.34	64.03	54.04	-14.33	-22.70	Pass
3	0.2180	33.06	11.91	10.13	43.19	22.04	62.89	52.89	-19.70	-30.85	Pass
4	0.3580	23.24	16.59	10.14	33.38	26.73	58.77	48.77	-25.39	-22.04	Pass
5	3.3020	20.69	9.81	10.22	30.91	20.03	56.00	46.00	-25.09	-25.97	Pass
6	19.9180	25.72	18.45	10.37	36.09	28.82	60.00	50.00	-23.91	-21.18	Pass

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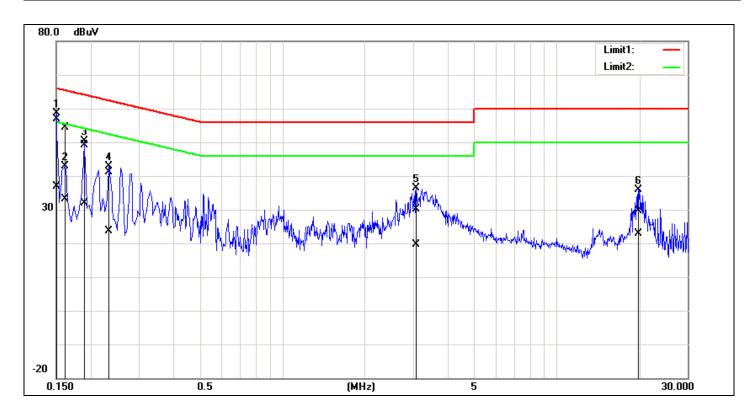




Description: Operation Date: 2019/6/21 Line: N Temp.($^{\circ}$)/Hum.($^{\circ}$): 26.9($^{\circ}$)/67%

Test Voltage: AC 120V/60Hz Test By: Henry

Job No.: T190612W02



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1500	46.87	26.82	10.02	56.89	36.84	65.99	56.00	-9.10	-19.16	Pass
2	0.1620	44.27	23.03	10.02	54.29	33.05	65.36	55.36	-11.07	-22.31	Pass
3	0.1900	39.05	21.93	10.02	49.07	31.95	64.03	54.04	-14.96	-22.09	Pass
4	0.2340	31.20	13.69	10.02	41.22	23.71	62.30	52.31	-21.08	-28.60	Pass
5	3.0820	20.00	9.45	10.08	30.08	19.53	56.00	46.00	-25.92	-26.47	Pass
6	19.9100	19.28	12.68	10.27	29.55	22.95	60.00	50.00	-30.45	-27.05	Pass

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7 DUTY CYCLE OF TEST SIGNAL

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)	1/T (kHz)	VBW setting (kHz)
802.11b	99.20	0.03	0.08	0.01
802.11g	95.38	0.21	0.48	1.00
802.11n_20	91.71	0.38	1.02	2.00
802.11n_40	84.35	0.74	2.02	3.00

b = 99.2%, *g* = 95.38%,*n*_*ht*_20 = 91.71%*n*_*ht*_40 = 84.35%

Duty Cycle Factor: 10 * log(1/0.992) = 0.03 Duty Cycle Factor: 10 * log(1/0.9538) = 0.21 Duty Cycle Factor: 10 * log(1/0.9171) = 0.38 Duty Cycle Factor: 10 * log(1/0.8435) = 0.74

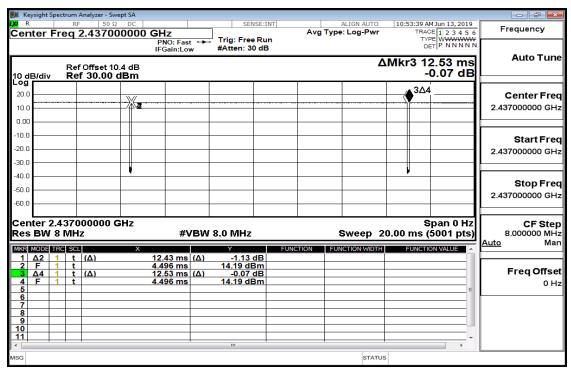
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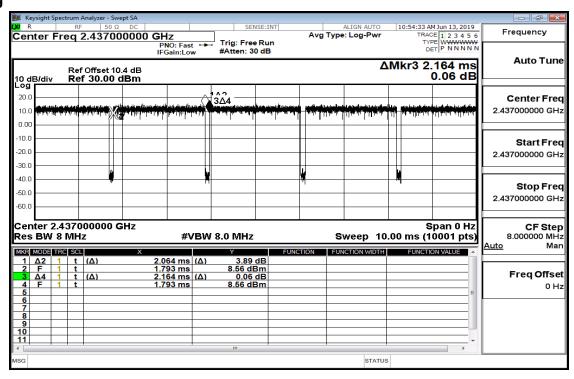


7.1 DUTY CYCLE TEST SIGNAL Measurement Result

802.11 b



802.11 g

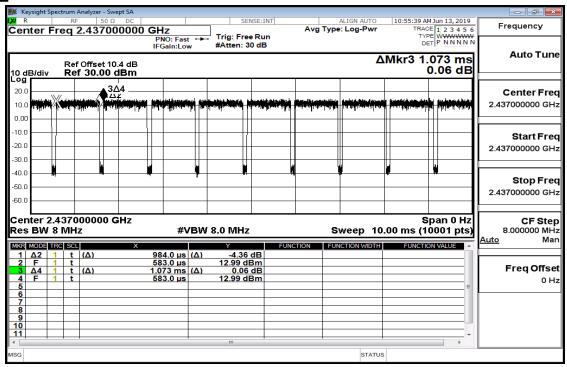


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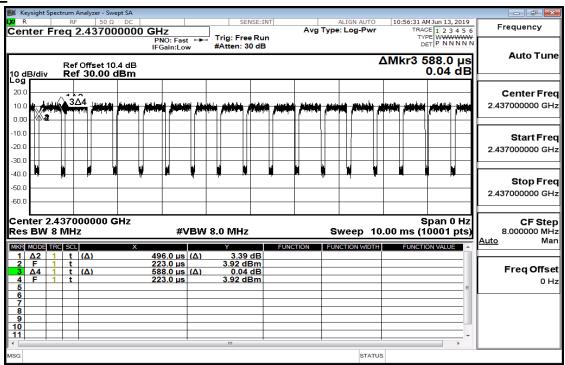
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802.11 n 20 MHz

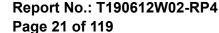


802.11 n 40 MHz



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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

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

Per RSS-247 §5.4(4)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

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.

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

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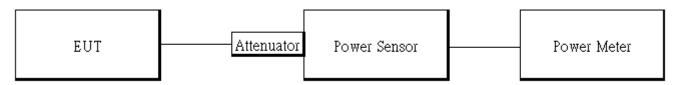


8.2 Measurement Equipment Used

	Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Power Meter	Anritsu	ML2496A	1326001	08/03/2018	08/02/2019				
Power Sensor	Anritsu	MA2411B	1315048	08/03/2018	08/02/2019				
Power Sensor	Anritsu	MA2411B	1315049	08/03/2018	08/02/2019				
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020				
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020				
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019				

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.

Note: The reported CH0 and CH1 power values in the 2Tx and MIMO tables were measured whe performing additional measurements and all reported values are within compliance.

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8.5 Measurement Result

802.1	802.11b Ch0								
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT				
1	2412	1	20.48	30.00	PASS				
6	2437	1	20.54	30.00	PASS				
11	2462	1	20.36	30.00	PASS				
802.1	1b Ch0				-				
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT				
1	2412	1	17.46	30.00	PASS				
6	2437	1	17.49	30.00	PASS				
11	2462	1	17.46	30.00	PASS				

002.1	1b Ch1				
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	20.40	30.00	PASS
6	2437	1	20.47	30.00	PASS
11	2462	1	20.26	30.00	PASS
802.1	1b Ch1				
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	1	17.37	30.00	PASS
6	2437	1	17.40	30.00	PASS
11	2462	1	17.39	30.00	PASS

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802.1	802.11g Ch0								
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT				
1	2412	6	21.33	30.00	PASS				
6	2437	6	21.40	30.00	PASS				
11	2462	6	21.36	30.00	PASS				
802.1	1g Ch0								
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT				
1	2412	6	16.46	30.00	PASS				
6	2437	6	16.49	30.00	PASS				
11	2462	6	16.48	30.00	PASS				

802.1	302.11g Ch1								
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT				
1	2412	6	21.24	30.00	PASS				
6	2437	6	21.32	30.00	PASS				
11	2462	6	21.28	30.00	PASS				
802.1	1g Ch1								
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT				
1	2412	6	16.40	30.00	PASS				
6	2437	6	16.43	30.00	PASS				
11	2462	6	16.41	30.00	PASS				

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802.1	302.11n_HT20M Ch0							
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT			
1	2412	MCS0	21.93	30.00	PASS			
6	2437	MCS0	21.89	30.00	PASS			
11	2462	MCS0	21.69	30.00	PASS			
802.1	1n_HT20	M Ch0						
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT			
1	2412	MCS0	16.78	30.00	PASS			
6	2437	MCS0	16.82	30.00	PASS			
11	2462	MCS0	16.77	30.00	PASS			

802.1	1n_HT20	M Ch1			
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	21.38	30.00	PASS
6	2437	MCS0	21.36	30.00	PASS
11	2462	MCS0	21.46	30.00	PASS
802.1	1n_HT20	M Ch1		-	-
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	16.70	30.00	PASS
6	2437	MCS0	16.57	30.00	PASS
11	2462	MCS0	16.44	30.00	PASS

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802.1	1n_HT20	M MIMO					
СН	Freq. (MHz)	Data Rate	Peak Output Power (dRm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
	0.410	14000	CH 0	CH 1	, ,	20.00	DAGG
1	2412	MCS8	19.06	19.13	22.11	30.00	PASS
2	2417	MCS8	21.98	21.33	24.68	30.00	PASS
6	2437	MCS8	21.93	21.43	24.70	30.00	PASS
11	2462	MCS8	21.72	21.50	24.62	30.00	PASS
802.1	1n_HT20	M MIMO)				
СН	Freq. (MHz)	Data Rate	Po	Output wer Bm)	Max. Avg. Output include tune up tolerance Power	Limit (dBm)	RESULT
			CH 0	CH 1	(dBm)		
1	2412	MCS8	13.84	13.91	17.26	30.00	PASS
2	2417	MCS8	16.38	16.13	19.64	30.00	PASS
6	2437	MCS8	16.49	16.28	19.77	30.00	PASS
U	2107	111000					

802.1	1n_HT40	M Ch0			
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.84	30.00	PASS
4	2427	MCS0	21.87	30.00	PASS
5	2432	MCS0	21.93	30.00	PASS
6	2437	MCS0	22.56	30.00	PASS
7	2442	MCS0	21.77	30.00	PASS
8	2447	MCS0	21.84	30.00	PASS
9	2452	MCS0	21.14	30.00	PASS
802.1	1n_HT40	M Ch0	-		-
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	15.51	30.00	PASS
4	2427	MCS0	15.83	30.00	PASS
5	2432	MCS0	15.85	30.00	PASS
6	2437	MCS0	15.91	30.00	PASS
7	2442	MCS0	15.82	30.00	PASS
8	2447	MCS0	15.88	30.00	PASS
9	2452	MCS0	14.89	30.00	PASS

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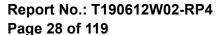
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802.1	1n_HT40	M Ch1			
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.67	30.00	PASS
4	2427	MCS0	21.95	30.00	PASS
5	2432	MCS0	22.05	30.00	PASS
6	2437	MCS0	22.11	30.00	PASS
7	2442	MCS0	22.07	30.00	PASS
8	2447	MCS0	21.79	30.00	PASS
9	2452	MCS0	20.91	30.00	PASS
802.1	1n_HT40	M Ch1		-	
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	15.43	30.00	PASS
4	2427	MCS0	15.82	30.00	PASS
5	2432	MCS0	15.94	30.00	PASS
6	2437	MCS0	15.93	30.00	PASS
7	2442	MCS0	15.90	30.00	PASS
8	2447	MCS0	15.42	30.00	PASS
9	2452	MCS0	14.82	30.00	PASS

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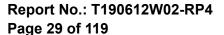


802.1	1n_HT40	M MIMO					
СН	Freq. (MHz)	Data Rate	Pov	ver Rm) CH 1	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS8	19.68	18.73	22.24	30.00	PASS
4	2427	MCS8	19.63	19.75	22.70	30.00	PASS
5	2432	MCS8	20.12	20.23	23.19	30.00	PASS
6	2437	MCS8	21.29	20.95	24.13	30.00	PASS
7	2442	MCS8	21.01	20.51	23.78	30.00	PASS
8	2447	MCS8	19.78	19.44	22.62	30.00	PASS
9	2452	MCS8	18.57	18.13	21.37	30.00	PASS
802.1	1n_HT40	M MIMO					-
СН	Freq. (MHz)	Data Rate	Pov (dE	Output wer Bm)	Max. Avg. Output include tune up tolerance Power	Limit (dBm)	RESULT
			CH 0	CH 1	(dBm)		
3	2422	MCS8	12.35	11.59	15.74	30.00	PASS
4	2427	MCS8	12.56	12.49	16.27	30.00	PASS
5	2432	MCS8	12.98	12.95	16.71	30.00	PASS
6	2437	MCS8	13.98	13.92	17.70	30.00	PASS
7	2442	MCS8	13.55	13.48	17.26	30.00	PASS
8	2447	MCS8	12.25	12.11	15.93	30.00	PASS
9	2452	MCS8	11.26	11.10	14.93	30.00	PASS

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





EIRP

802.11	lb Ch0									
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT			
1	2412	1	17.46	2.10	19.56	36	PASS			
6	2437	1	17.49	2.10	19.59	36	PASS			
11	2462	1	17.46	2.10	19.56	36	PASS			
802.11	lb Ch1									
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT			
1	2412	1	17.37	0.90	18.27	36	PASS			
6	2437	1	17.40	0.90	18.30	36	PASS			
11	2462	1	17.39	0.90	18.29	36	PASS			
802.11	802.11g Ch0									
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT			
1	2412	6	16.46	2.10	18.56	36	PASS			
6	2437	6	16.49	2.10	18.59	36	PASS			
11	2462	6	16.48	2.10	18.58	36	PASS			
802.11	lg Ch1									
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT			
1	2412	6	16.40	0.90	17.30	36	PASS			
6	2437	6	16.43	0.90	17.33	36	PASS			
11	2462	6	16.41	0.90	17.31	36	PASS			

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802.11n_HT20M Ch0											
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT				
1	2412	MCS0	16.78	2.10	18.88	36	PASS				
6	2437	MCS0	16.82	2.10	18.92	36	PASS				
11	2462	MCS0	16.77	2.10	18.87	36	PASS				
802.1	802.11n_HT20M Ch1										
	_	VI () III									
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT				
CH 1	Freq.	Data	•	Gain		-	RESULT PASS				
	Freq. (MHz)	Data Rate	Power (dBm)	Gain (dBi)	(dBm)	(dBm)					

802.1	1n_HT20N	/ MIMO							
СН	H Freq. Data (MHz) Rate	Power (dBm)		Total Avg. Output Power	Antenna Gain	EIRP (dBm)	Limit (dBm)	RESULT	
	(111112)	rtato	CH 0	CH 1	(dBm)	(dBi)	(aBiii)	(aBiii)	
1	2412	MCS8	19.06	19.13	17.26	4.55	21.81	36	PASS
2	2417	MCS8	21.98	21.33	19.64	4.55	24.19	36	PASS
6	2437	MCS8	21.93	21.43	19.77	4.55	24.32	36	PASS
11	2462	MCS8	21.72	21.50	19.65	4.55	24.20	36	PASS

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802.1	1n_HT40N	/I Ch0					
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	15.51	2.10	17.61	36	PASS
4	2427	MCS0	15.83	2.10	17.93	36	PASS
5	2432	MCS0	15.85	2.10	17.95	36	PASS
6	2437	MCS0	15.91	2.10	18.01	36	PASS
7	2442	MCS0	15.82	2.10	17.92	36	PASS
8	2447	MCS0	15.88	2.10	17.98	36	PASS
9	2452	MCS0	14.89	2.10	16.99	36	PASS
802.1	1n_HT40N	/I Ch1					
			Avg. Output Power (dBm) Antenna Gain (dBi) Antenna (dBm)				
СН	Freq. (MHz)	Data Rate	• .	Gain		Limit (dBm)	RESULT
CH 3			• .	Gain			RESULT PASS
	(MHz)	Rate	Power (dBm)	Gain (dBi)	(dBm)	(dBm)	
3	(MHz)	Rate MCS0	Power (dBm) 15.43	Gain (dBi) 0.90	(dBm) 16.33	(dBm) 36	PASS
3 4	(MHz) 2422 2427	Rate MCS0 MCS0	Power (dBm) 15.43 15.82	Gain (dBi) 0.90 0.90	(dBm) 16.33 16.72	(dBm) 36 36	PASS PASS
3 4 5	(MHz) 2422 2427 2432	MCS0 MCS0 MCS0	Power (dBm) 15.43 15.82 15.94	Gain (dBi) 0.90 0.90 0.90	(dBm) 16.33 16.72 16.84	(dBm) 36 36 36	PASS PASS PASS
3 4 5 6	(MHz) 2422 2427 2432 2437	MCS0 MCS0 MCS0 MCS0	Power (dBm) 15.43 15.82 15.94 15.93	Gain (dBi) 0.90 0.90 0.90 0.90	(dBm) 16.33 16.72 16.84 16.83	(dBm) 36 36 36 36 36	PASS PASS PASS PASS

802.1	802.11n_HT40M MIMO											
CH Freq. (MHz)	Data Rate	Power (dBm)		Total Avg. Output Power	Antenna Gain	EIRP (dBm)	Limit (dBm)	RESULT				
	(CH 0	CH 1	(dBm)	(dBi)	(4211)	(42)				
3	2422	MCS8	12.35	11.59	15.74	4.55	20.29	36	PASS			
4	2427	MCS8	12.56	12.49	16.27	4.55	20.83	36	PASS			
5	2432	MCS8	12.98	12.95	16.71	4.55	21.27	36	PASS			
6	2437	MCS8	13.98	13.92	17.70	4.55	22.25	36	PASS			
7	2442	MCS8	13.55	13.48	17.26	4.55	21.82	36	PASS			
8	2447	MCS8	12.25	12.11	15.93	4.55	20.48	36	PASS			
9	2452	MCS8	11.26	11.10	14.93	4.55	19.48	36	PASS			

* Note: EIRP = Average Power + Gain

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9 6DB & 99% BANDWIDTH MEASUREMENT

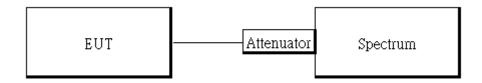
9.1 Standard Applicable

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.				
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020			
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019			
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020			

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 .
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. 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=Peak, 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 Ch0 80	02.11b Ch	11
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Freq.	6dB BW	Limit	Result	Freq.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	Result	(MHz)	(kHz)	(kHz)	Resuit
2412	8061.00	> 500	PASS	2412	8061.00	> 500	PASS
2437	8060.00	> 500	PASS	2437	8062.00	> 500	PASS
2462	8066.00	> 500	PASS	2462	8065.00	> 500	PASS

802.11g Ch0 802.11g Ch1

Freq.	6dB BW	Limit	Result	Freq.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	Result	(MHz)	(kHz)	(kHz)	Resuit
2412	15370.00	> 500	PASS	2412	15380.00	> 500	PASS
2437	15170.00	> 500	PASS	2437	15180.00	> 500	PASS
2462	15380.00	> 500	PASS	2462	15500.00	> 500	PASS

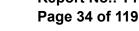
802.11_n_HT20 Ch0 802.11_n_HT20 Ch1

_								
	Freq.	6dB BW	Limit	Result	Freq.	6dB BW	Limit	Result
	(MHz)	(kHz)	(kHz)	Result	(MHz)	(kHz)	(kHz)	Result
	2412	15490.00	> 500	PASS	2412	15480.00	> 500	PASS
	2437	15170.00	> 500	PASS	2437	15180.00	> 500	PASS
	2462	15510.00	> 500	PASS	2462	15530.00	> 500	PASS

802.11 n HT40 Ch0	802.11 n HT40 Ch1
00Z.11_11_01140 CHU	00Z.11_II_F1140 CI11

Freq.	6dB BW	Limit	Result	Freq.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	Resuit	(MHz)	(kHz)	(kHz)	Resuit
2422	35190.00	> 500	PASS	2422	35190.00	> 500	PASS
2437	35170.00	> 500	PASS	2437	35180.00	> 500	PASS
2452	35180.00	> 500	PASS	2452	35340.00	> 500	PASS

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99% Bandwidth

802.11b Ch	0	802.11b Ch1		
Freq. (MHz)	99% BW (MHz)	Freq. (MHz)	99% BW (MHz)	
2412	12.645	2412	12.64	
2437	12.678	2437	12.673	
2462	12.931	2462	12.929	

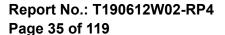
802.11g Ch	0	802.11g Ch1		
Freq. (MHz)	99% BW (MHz)	Freq. (MHz)	99% BW (MHz)	
2412	16.72	2412	16.732	
2437	16.625	2412	16.654	
2462	16.771	2462	16.774	

802.11n_H7	20M Ch0	802.11n_HT20M Ch1		
Freq.	99% BW	Freq.	99% BW	
(MHz) (MHz)		(MHz)	(MHz)	
2412	17.88	2412	17.904	
2437	17.808	2437	17.821	
2462	17.957	2462	17.953	

802.11n_H7	T40M Ch0	802.11n_HT40M Ch1		
Freq.	99% BW	Freq.	99% BW	
(MHz)	(MHz) (MHz)		(MHz)	
2422	36.205	2422	36.238	
2437	36.075	2437	36.083	
2452	36.234	2452	36.241	

^{*}Refer to next page for plots

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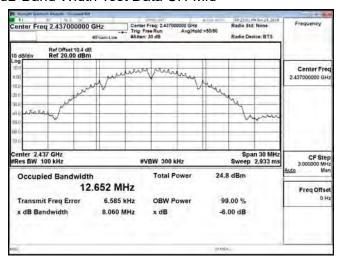


802.11b (CH0)

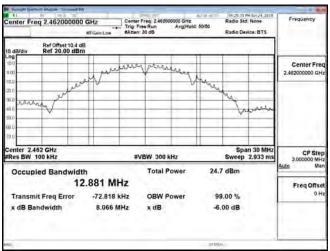
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

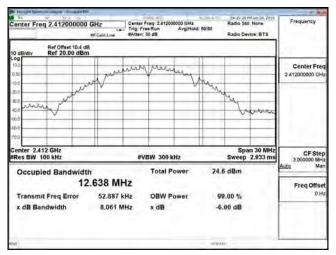


6dB Band Width Test Data CH-High

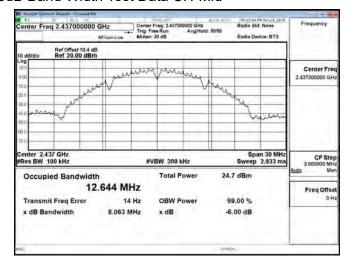


802.11b (CH1)

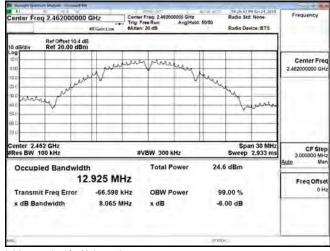
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High

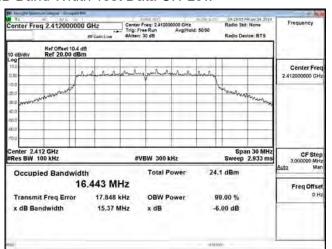


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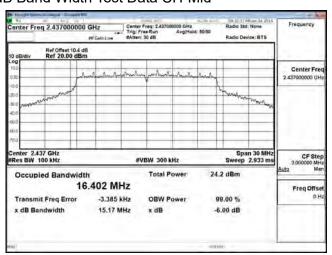
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802.11g (CH0) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

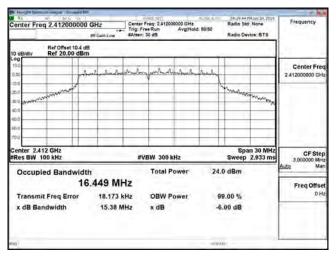


6dB Band Width Test Data CH-High

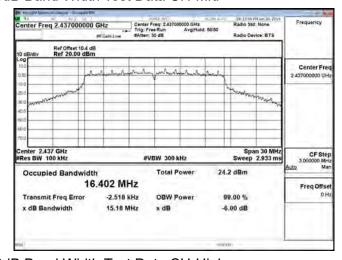


802.11g (CH1)

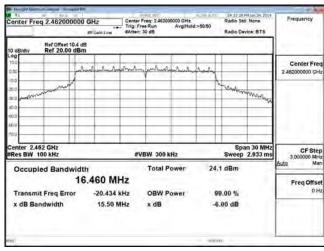
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



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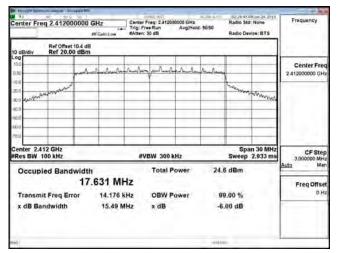
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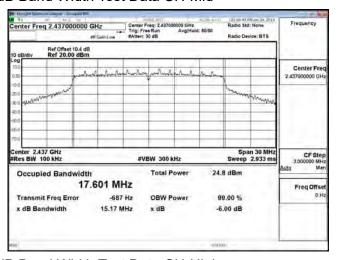


802.11n_20M (CH0)

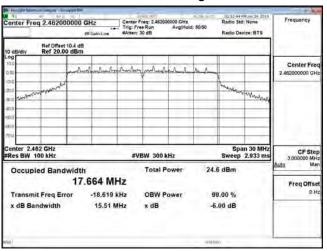
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

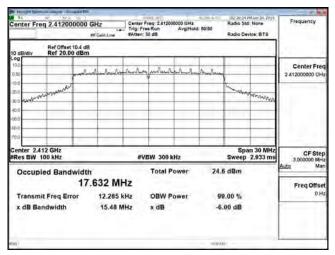


6dB Band Width Test Data CH-High

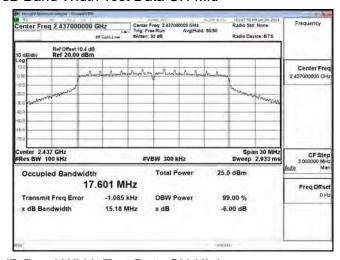


802.11n_20M (CH1)

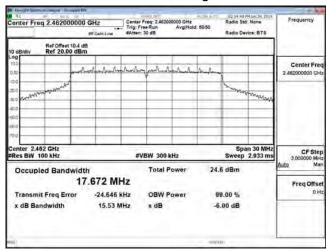
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

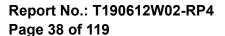


6dB Band Width Test Data CH-High



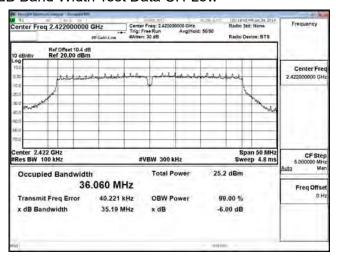
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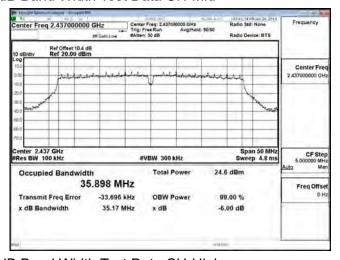




802.11n_40M (CH0) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

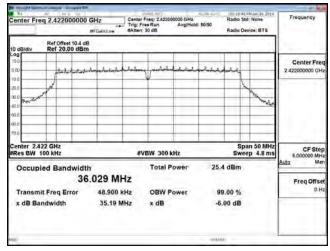


6dB Band Width Test Data CH-High

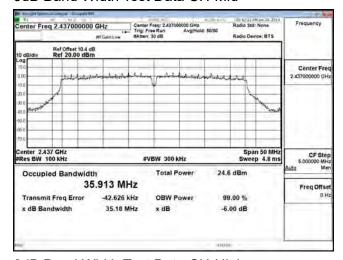


802.11n_40M (CH1)

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



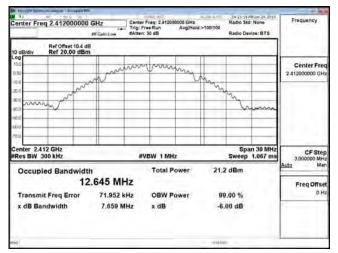
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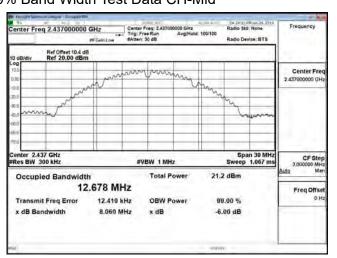


802.11b (CH0)

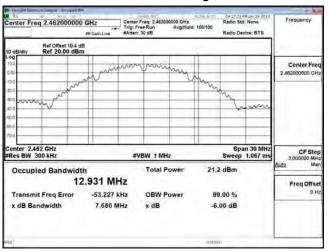
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

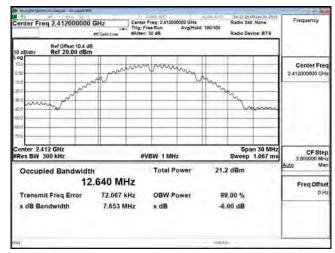


99% Band Width Test Data CH-High

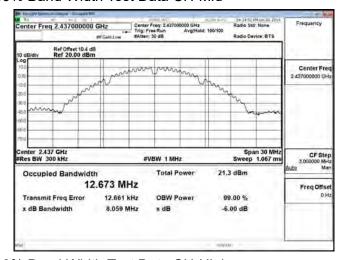


802.11b (CH1)

99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

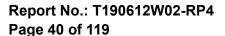


99% Band Width Test Data CH-High



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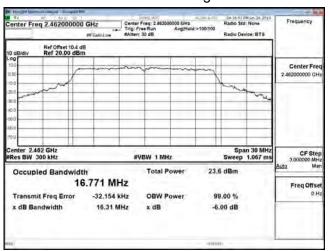
802.11g (CH0) 99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

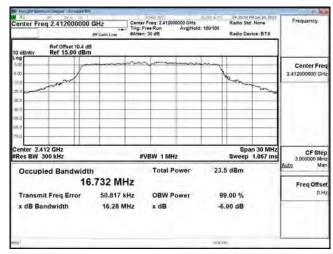


99% Band Width Test Data CH-High

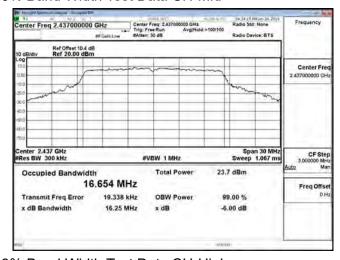


802.11g (CH1)

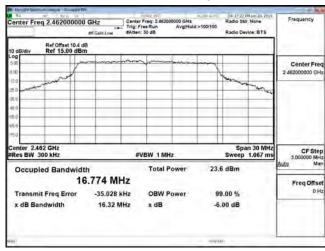
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

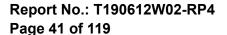


99% Band Width Test Data CH-High



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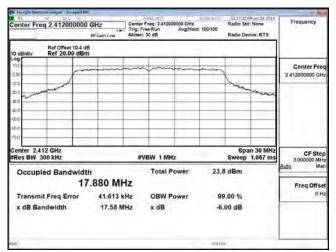
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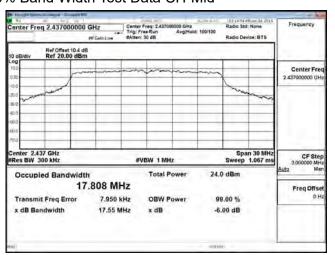


802.11n_20M (CH0)

99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

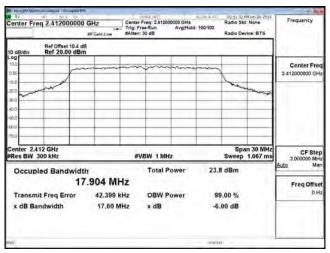


99% Band Width Test Data CH-High

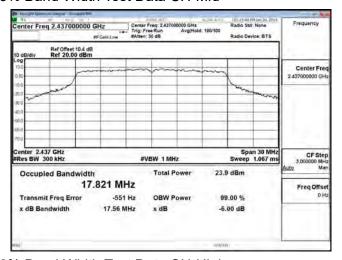


802.11n_20M (CH1)

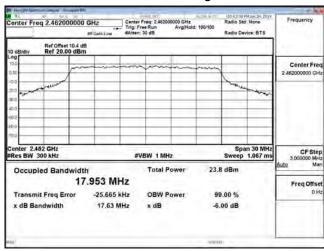
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



99% Band Width Test Data CH-High



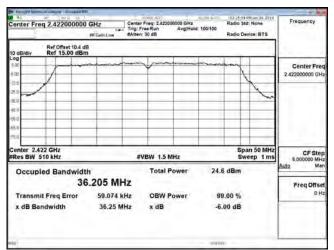
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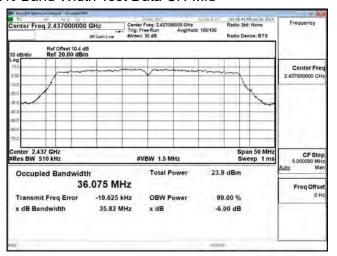




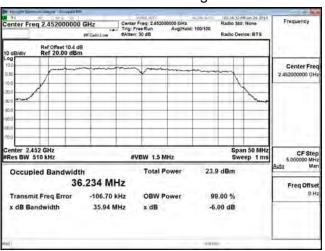
802.11n_40M (CH0) 99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

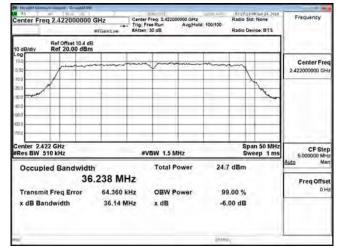


99% Band Width Test Data CH-High

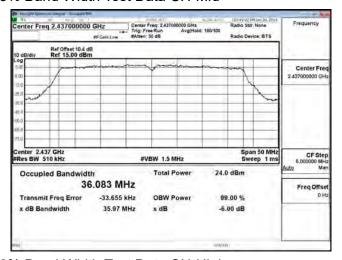


802.11n_40M (CH1)

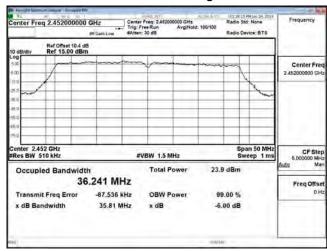
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

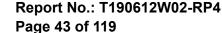


99% Band Width Test Data CH-High



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10 CONDUCTED BAND EDGE 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.

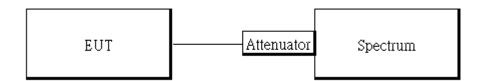
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.8.

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.

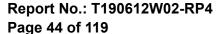
10.2 Measurement Equipment Used

Conducted Emission Test Site										
EQUIPMENT MFR MODEL SERIAL LAST CAL D										
TYPE		NUMBER	NUMBER	CAL.						
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020					
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019					
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020					

10.3 Test SET-UP



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10.4 Measurement Procedure

Conducted Band Edge Limt

- 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 = 100kHz & VBW = 300 kHz.
- Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9.Use the peak marker function to determine the maximum amplitude level.

Conducted Band Edge:

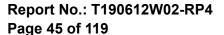
- 1. To connect Antenna Port of EUT to Spectrum.
- The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop 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.
- 7. 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
- The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. 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.

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7. 802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application for the test of PSD at MIMO mode, the highest emission of worst case is employing.

10.5 Measurement Result

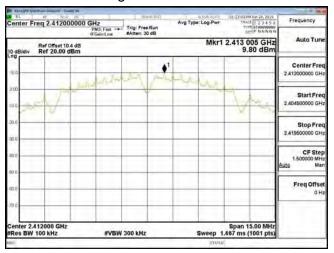
Refere	nce Leve	of Limit 802.11b mode	Reference Level of Limit 802.11g mode		
Freq.	PSD	Reference Level of Limit	Freq.	PSD	Reference Level of Limit
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2412	9.80	-10.20	2412	6.98	-13.02
2437	9.88	-10.12	2437	7.13	-12.87
2462	9.81	-10.19	2462	6.70	-13.30

Reference Level of Limit 802.11n20 mode Reference Level of Limit 802.11n40 MOD								
Fr	req.	PSD	Reference Level of Limit	Freq.	PSD	Reference Level of Limit		
(N	1Hz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)		
2	412	8.58	-11.42	2422	3.62	-16.38		
2	437	11.17	-8.83	2437	5.14	-14.86		
2	462	10.74	-9.26	2452	2.76	-17.24		

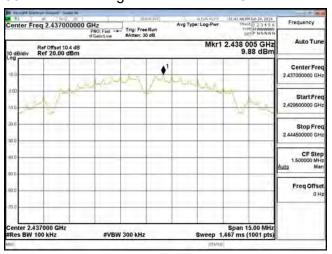
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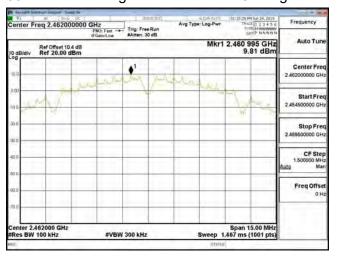
802.11b Band Edge Limit Test Data CH-Low



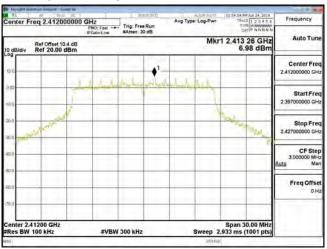
802.11b Band Edge Limit Test Data CH-Mid



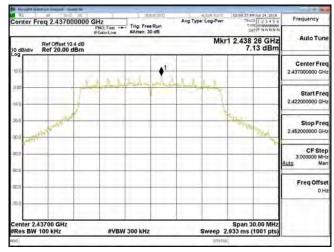
802.11b Band Edge Limit Test Data CH-High



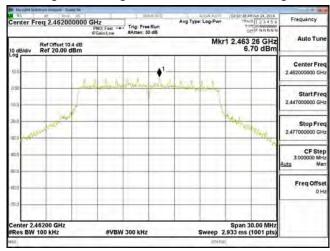
802.11g Band Edge Limit Test Data CH-Low



802.11g Band Edge Limit Test Data CH-Mid



802.11g Band Edge Limit Test Data CH-High

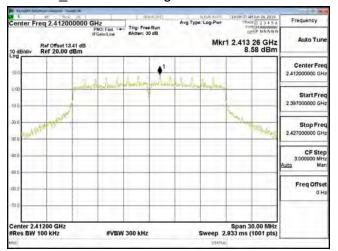


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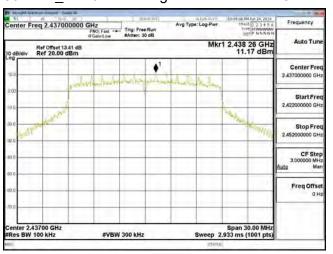
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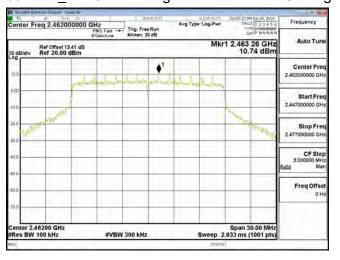
802.11n HT20 Band Edge Limit Test Data CH-Low



802.11n HT20 Band Edge Limit Test Data CH-Mid



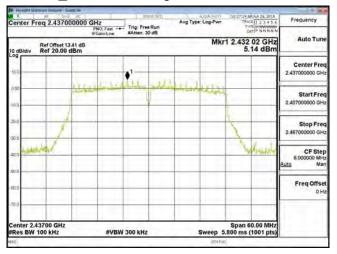
802.11n HT20 Band Edge Limit Test Data CH-High



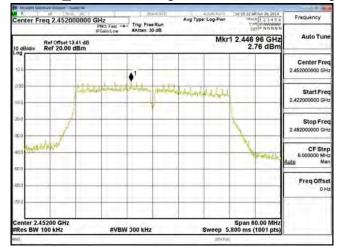
802.11n HT40 Band Edge Limit Test Data CH-Low



802.11n_HT40 Band Edge Limit Test Data CH-Mid



802.11n HT40 Band Edge Limit Test Data CH-High

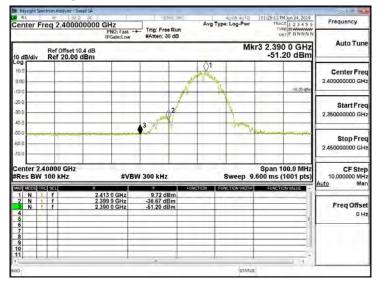


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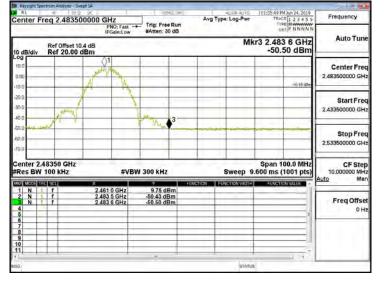
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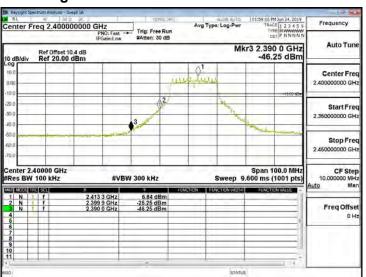
802.11b Band Edge Test Data CH-Low



Band Edge Test Data CH-High



802.11g Band Edge Test Data CH-Low



Band Edge Test Data CH-High



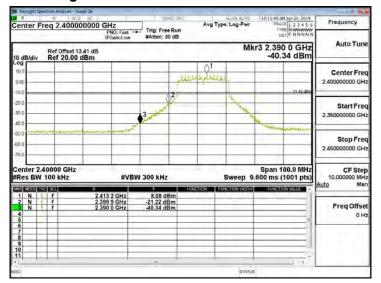
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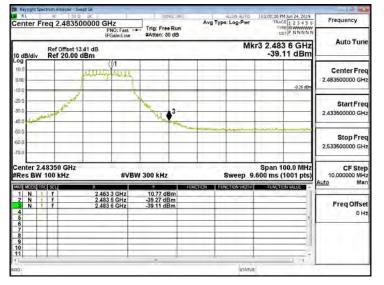
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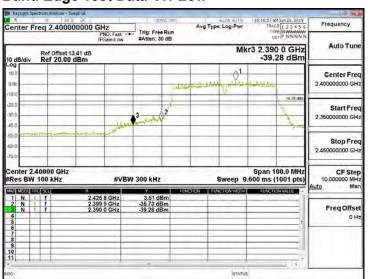
802.11n_HT20 Band Edge Test Data CH-Low



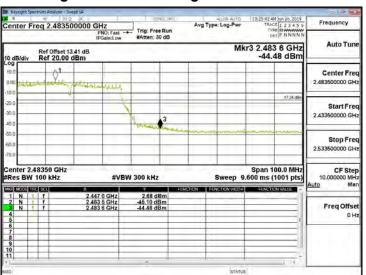
Band Edge Test Data CH-High



802.11n_HT40 Band Edge Test Data CH-Low



Band Edge Test Data CH-High



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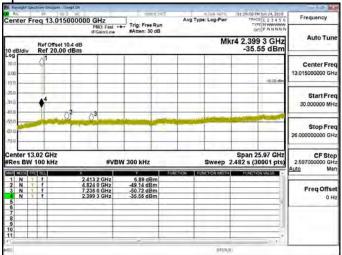
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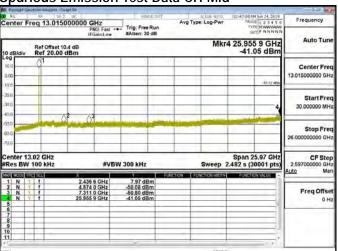


802.11b

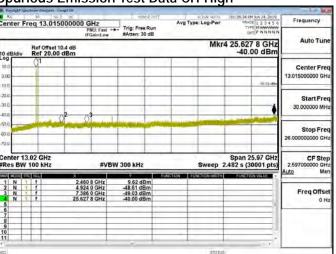
Spurious Emission Test Data CH-Low



Spurious Emission Test Data CH-Mid

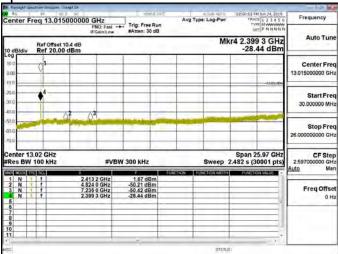


Spurious Emission Test Data CH-High

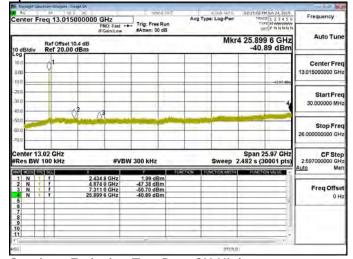


802.11g

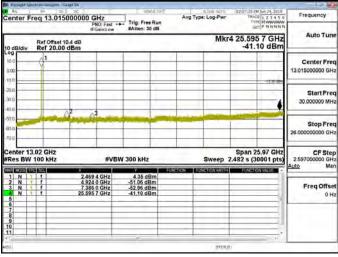
Spurious Emission Test Data CH-Low



Spurious Emission Test Data CH-Mid



Spurious Emission Test Data CH-High



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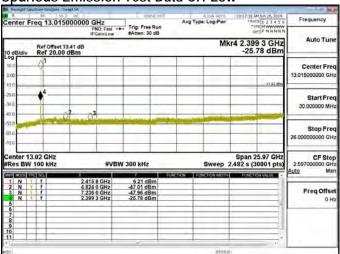
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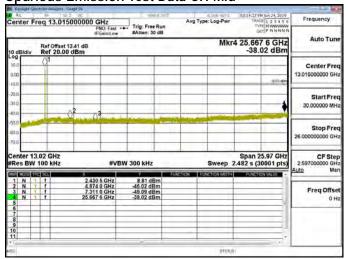


802.11n HT20

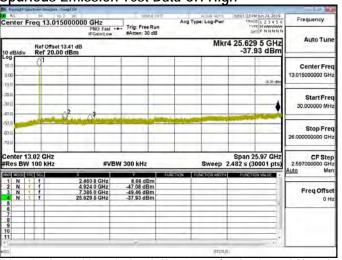
Spurious Emission Test Data CH-Low



Spurious Emission Test Data CH-Mid

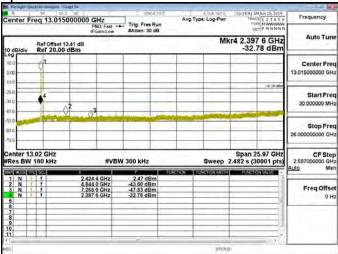


Spurious Emission Test Data CH-High

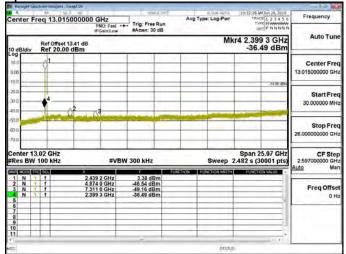


802.11n_HT40

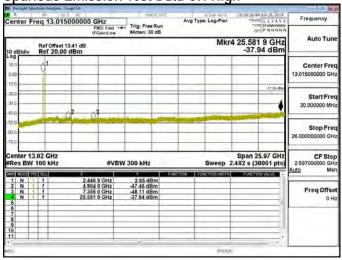
Spurious Emission Test Data CH-Low



Spurious Emission Test Data CH-Mid



Spurious Emission Test Data CH-High



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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.
- 2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m)

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11.2 Measurement Equipment Used:

966A Chamber									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Low Pass Filter	EWT	EWT-56-0019	RF46	02/26/2019	02/25/2020				
High Pass Filter	R&S	F13 HPF 3GHz	RF64	02/26/2019	02/25/2020				
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/26/2019	02/25/2020				
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019				
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020				
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020				
Digital Ther- mo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020				
double Ridged Guide Horn Anten- na	ETC	MCTD 1209	DRH13M02003	08/20/2018	08/19/2019				
Loop Antenna	COM-POWER	AL-130	121051	03/22/2019	03/21/2020				
Horn Antenna	ETS LINDGREN	3116	00026370	12/26/2018	12/25/2019				
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020				
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020				
PSA Series Spec- trum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020				
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R				
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R				
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R				
Software		e3 V6	.11-20180413						

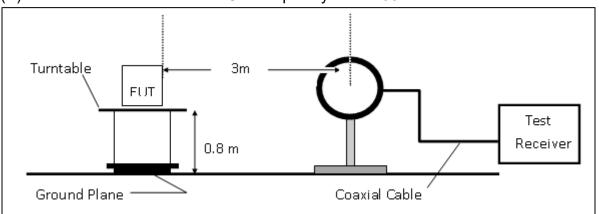
N.C.R refers to Not Calibrated Required.

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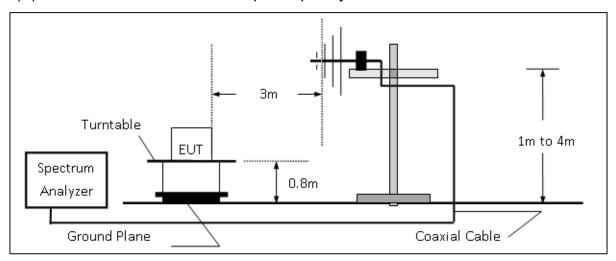
SGS

11.3 Test SET-UP

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



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



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

Turntable

1.5m

Spectrum
Analyzer

Absorber

Coaxial Cable

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11.4 Measurement Procedure

- 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.
- 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	9	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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

Factor(dB) = Antenna Factor(dB/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

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site. And there is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

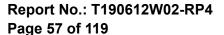
After Pre-scanned the low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 Measurement Result

Note: WLAN/BT coexistence cases were investigated and there are no new emissions to report.

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

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Radiated Band Edge Measurement Result (802.11b)

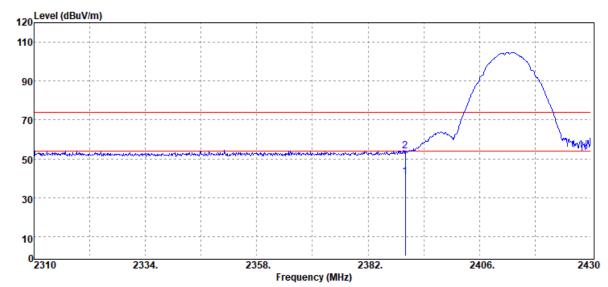
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11b Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

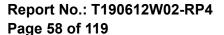
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
2390.00	Average	43.96	-3.38	40.58	54.00	-13.42
2390.00	Peak	57.35	-3.38	53.97	74.00	-20.03

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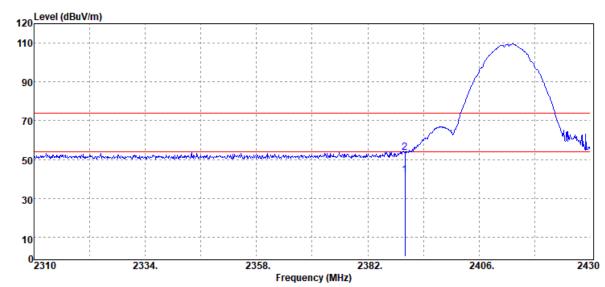


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

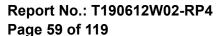
Operation Mode :BE CH Low Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	45.27	-3.38	41.89	54.00	-12.11
2390.00	Peak	57.01	-3.38	53.63	74.00	-20.37

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



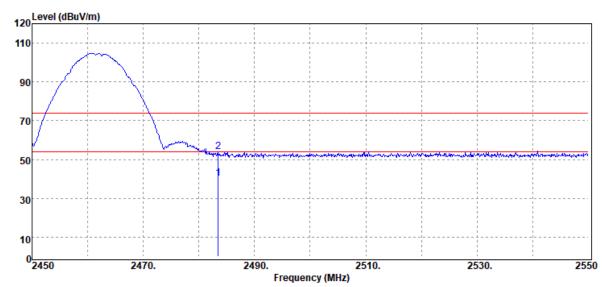


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

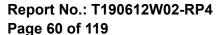
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	43.09	-2.83	40.26	54.00	-13.74
2483.50	Peak	56.83	-2.83	54.00	74.00	-20.00

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.

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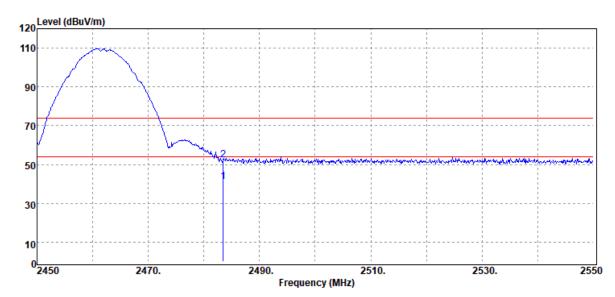


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

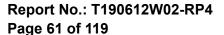
EUT Pol. :E2 Plan



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	43.79	-2.83	40.96	54.00	-13.04
2483.50	Peak	55.19	-2.83	52.36	74.00	-21.64

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.

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Radiated Band Edge Measurement Result (802.11g)

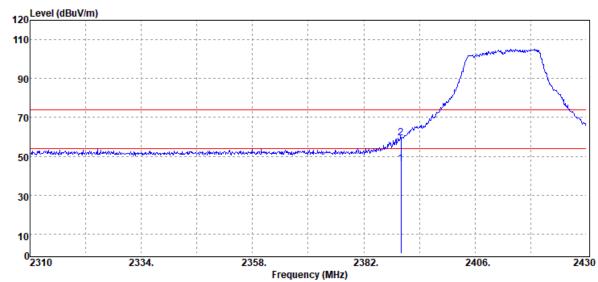
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11g Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

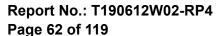
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
2390.00	Average	49.46	-3.38	46.08	54.00	-7.92
2390.00	Peak	62.56	-3.38	59.18	74.00	-14.82

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.

除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



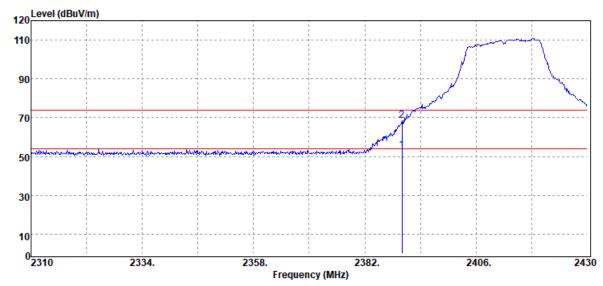


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

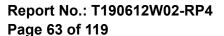
Operation Mode :BE CH Low Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
2390.00	Average	56.34	-3.38	52.96	54.00	-1.04
2390.00	Peak	71.84	-3.38	68.46	74.00	-5.54

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



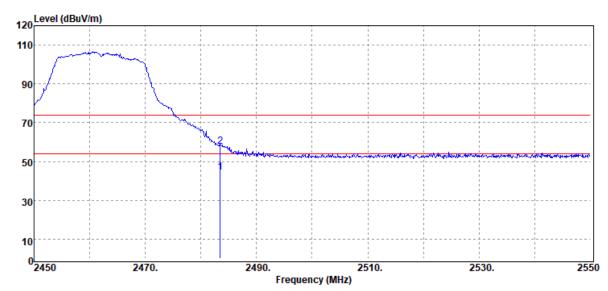


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

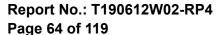
Operation Mode :BE CH High Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμ̈V	dB	dBµV/m	dΒμV/m	dB
2483.50	Average	47.12	-2.83	44.29	54.00	-9.71
2483.50	Peak	60.67	-2.83	57.84	74.00	-16.16

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。





:E2 Plan

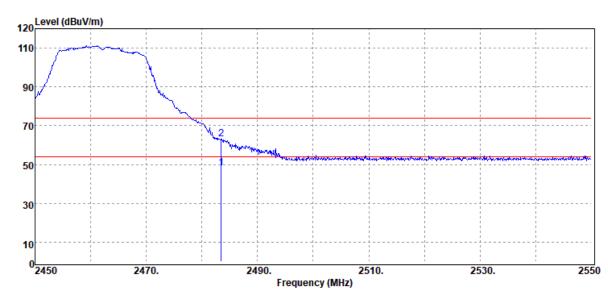
EUT Pol.

Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11g Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

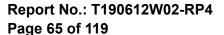
Operation Mode :BE CH High Engineer :Kane



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
2483.50	Average	51.01	-2.83	48.18	54.00	-5.82
2483.50	Peak	65.95	-2.83	63.12	74.00	-10.88

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.

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Radiated Band Edge Measurement Result (802.11_HT20)

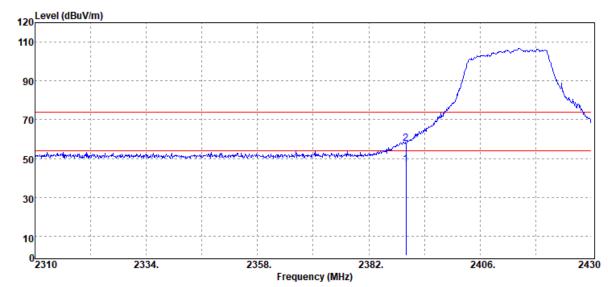
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

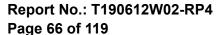
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	50.11	-3.38	46.73	54.00	-7.27
2390.00	Peak	61.19	-3.38	57.81	74.00	-16.19

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.

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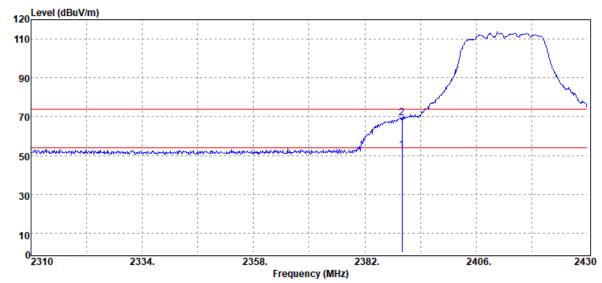


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane

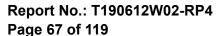
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	56.26	-3.38	52.88	54.00	-1.12
2390.00	Peak	72.77	-3.38	69.39	74.00	-4.61

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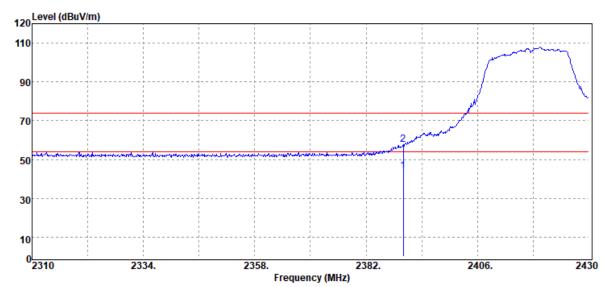


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2417 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

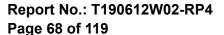
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	47.56	-3.38	44.18	54.00	-9.82
2390.00	Peak	60.98	-3.38	57.60	74.00	-16.40

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.

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:E2 Plan

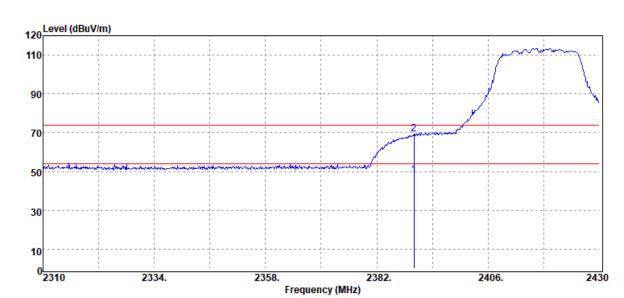
EUT Pol.

Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11n20 Temp./Humi. :21/53

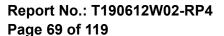
Frequency :2417 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	51.34	-3.38	47.96	54.00	-6.04
2390.00	Peak	72.55	-3.38	69.17	74.00	-4.83

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



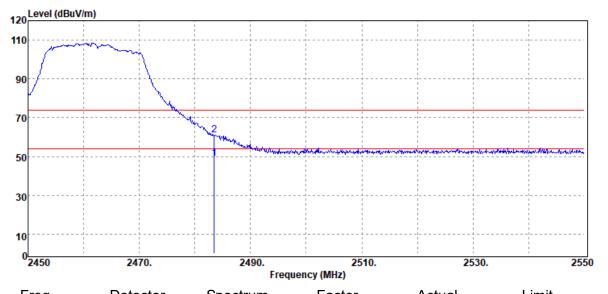


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

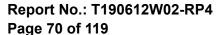
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμ̈V	dB	dBµV/m	dΒμV/m	dB
 2483.50	Average	51.69	-2.83	48.86	54.00	-5.14
2483.50	Peak	63.97	-2.83	61.14	74.00	-12.86

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.

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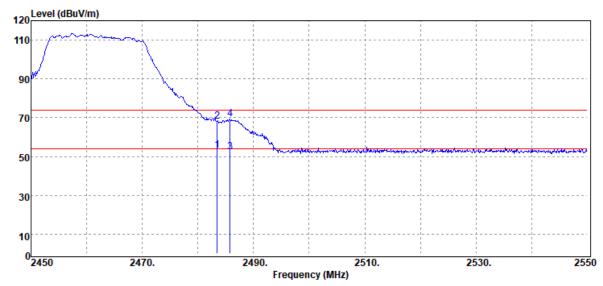


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

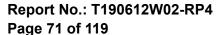
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	55.79	-2.83	52.96	54.00	-1.04
2483.50	Peak	71.09	-2.83	68.26	74.00	-5.74
2485.80	Average	55.10	-2.82	52.28	54.00	-1.72
2485.80	Peak	72.10	-2.82	69.28	74.00	-4.72

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Radiated Band Edge Measurement Result (802.11_HT40)

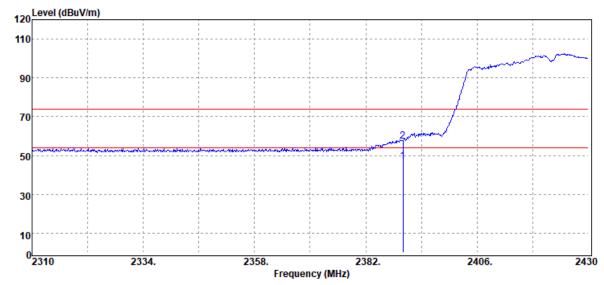
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2422 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

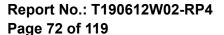
EUT Pol. :E2 Plan



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	_
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	50.12	-3.38	46.74	54.00	-7.26
2390.00	Peak	60.69	-3.38	57.31	74.00	-16.69

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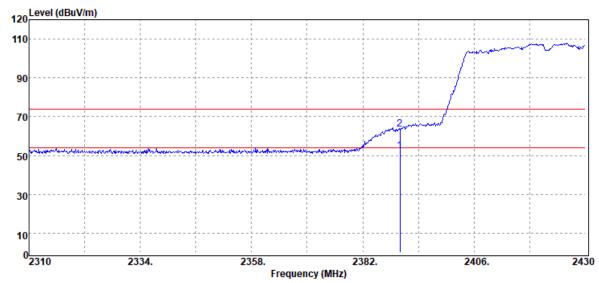


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2422 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane

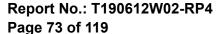
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	55.70	-3.38	52.32	54.00	-1.68
2390.00	Peak	66.95	-3.38	63.57	74.00	-10.43

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。

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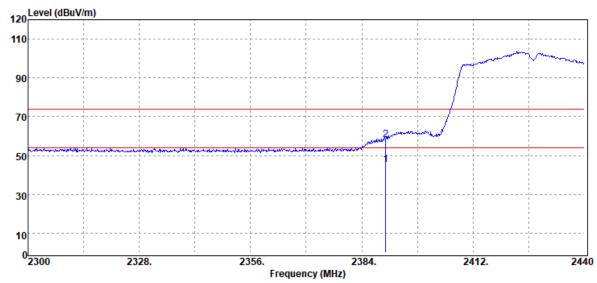


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2427 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

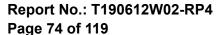
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	48.76	-3.38	45.38	54.00	-8.62
2390.00	Peak	61.71	-3.38	58.33	74.00	-15.67

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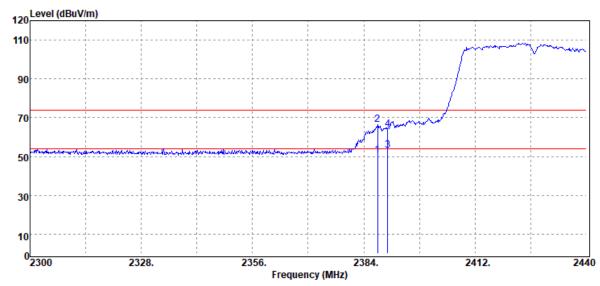


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2427 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane

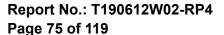
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2387.50	Average	54.17	-3.39	50.78	54.00	-3.22
2387.50	Peak	69.92	-3.39	66.53	74.00	-7.47
2390.00	Average	56.36	-3.38	52.98	54.00	-1.02
2390.00	Peak	67.17	-3.38	63.79	74.00	-10.21

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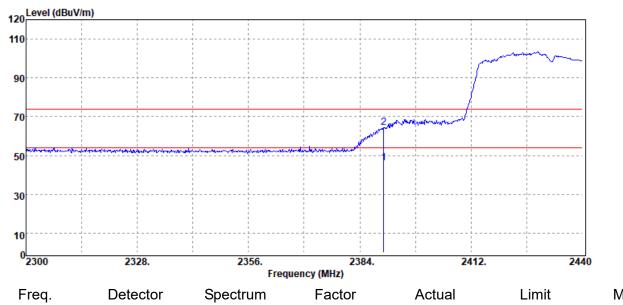


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2432 MHz Antenna Pol. :VERTICAL

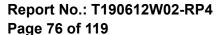
Operation Mode :BE CH Low Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμ̈V	dB	dBµV/m	dΒμV/m	dB
2390.00	Average	49.34	-3.38	45.96	54.00	-8.04
2390.00	Peak	67.76	-3.38	64.38	74.00	-9.62

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



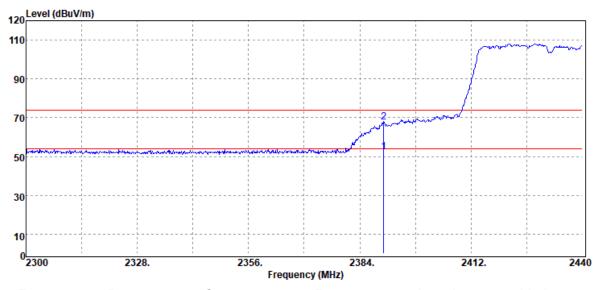


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2432 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane

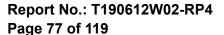
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	55.72	-3.38	52.34	54.00	-1.66
2390.00	Peak	71.17	-3.38	67.79	74.00	-6.21

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.

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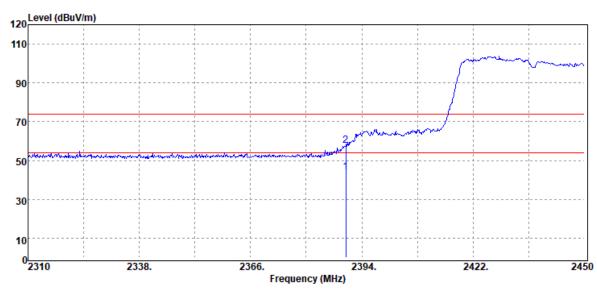


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH Low Engineer :Kane

EUT Pol. :E2 Plan

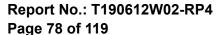


Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	47.33	-3.38	43.95	54.00	-10.05
2390.00	Peak	60.94	-3.38	57.56	74.00	-16.44

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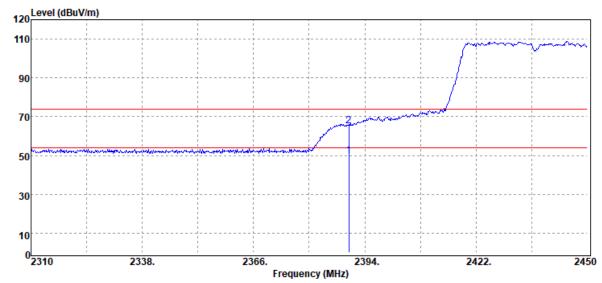


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH Low Engineer :Kane

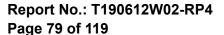
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	53.25	-3.38	49.87	54.00	-4.13
2390.00	Peak	68.49	-3.38	65.11	74.00	-8.89

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.

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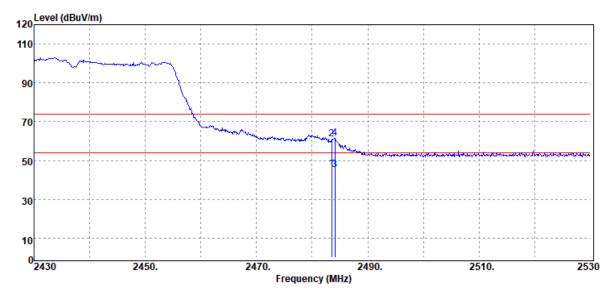


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

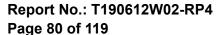
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	48.64	-2.83	45.81	54.00	-8.19
2483.50	Peak	63.74	-2.83	60.91	74.00	-13.09
2484.10	Average	48.08	- 2.82	45.26	54.00	-8.74
2484.10	Peak	64.25	-2.82	61.43	74.00	-12.57

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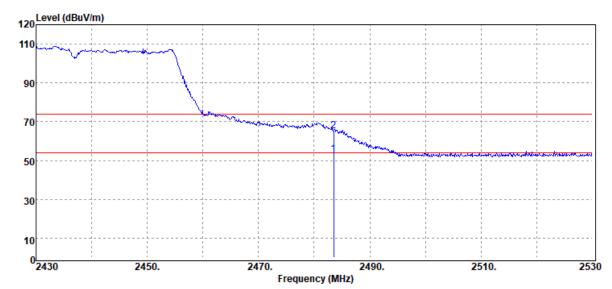


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

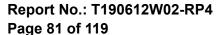
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	55.81	-2.83	52.98	54.00	-1.02
2483.50	Peak	68.15	-2.83	65.32	74.00	-8.68

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.

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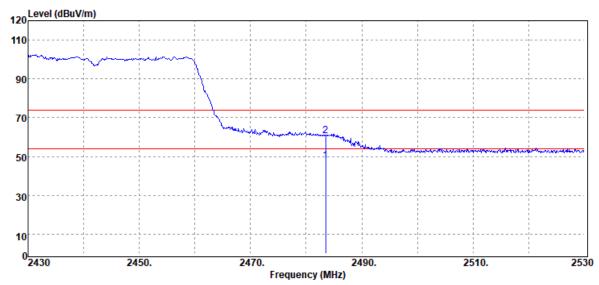


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2442 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

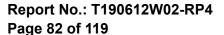
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	50.78	-2.83	47.95	54.00	-6.05
2483.50	Peak	63.58	-2.83	60.75	74.00	-13.25

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.

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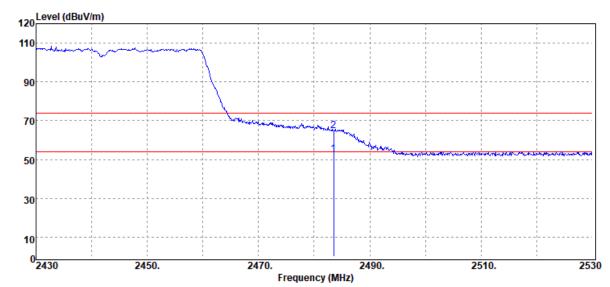


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2442 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

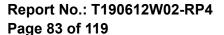
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dΒμV/m	dB
2483.50	Average	55.49	-2.83	52.66	54.00	-1.34
2483.50	Peak	67.48	-2.83	64.65	74.00	-9.35

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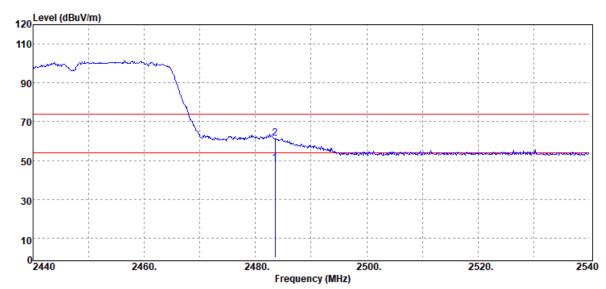


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2447 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

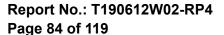
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
2483.50	Average	51.49	-2.83	48.66	54.00	-5.34
2483.50	Peak	64.22	-2.83	61.39	74.00	-12.61

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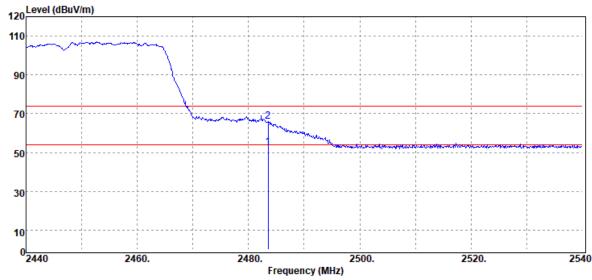


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2447 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

EUT Pol. :E2 Plan

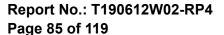


Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	55.77	-2.83	52.94	54.00	-1.06
2483.50	Peak	68.73	-2.83	65.90	74.00	-8.10

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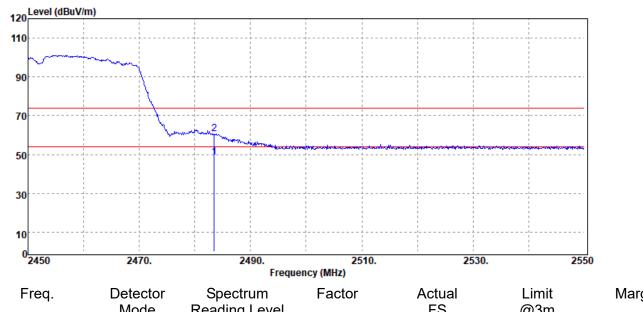


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2452 MHz Antenna Pol. :VERTICAL

Operation Mode :BE CH High Engineer :Kane

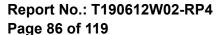
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
2483.50	Average	51.34	-2.83	48.51	54.00	-5.49
2483.50	Peak	63.31	-2.83	60.48	74.00	-13.52

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.

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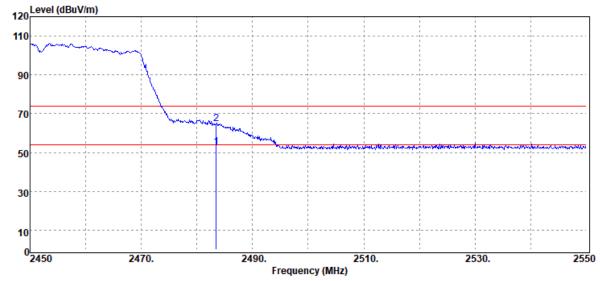


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2452 MHz Antenna Pol. :HORIZONTAL

Operation Mode :BE CH High Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	55.73	-2.83	52.90	54.00	-1.10
2483.50	Peak	67.59	-2.83	64.76	74.00	-9.24

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Below 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result (802.11 g)

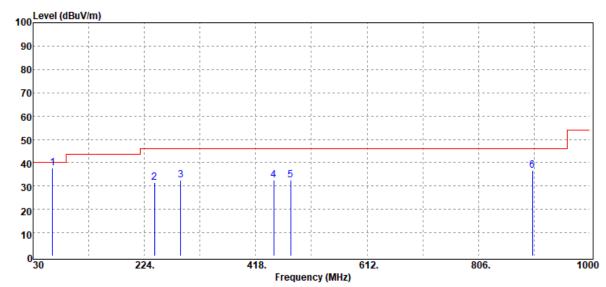
Report Number :T190612W02 Test Date :2019-06-28

Operation Band :802.11g Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

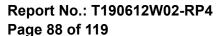
Operation Mode :Tx CH Mid Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
63.95	Peak	52.84	-15.28	37.56	40.00	-2.44
241.46	Peak	41.68	-10.25	31.43	46.00	-14.57
287.05	Peak	40.90	-8.41	32.49	46.00	-13.51
449.04	Peak	36.30	-3.88	32.42	46.00	-13.58
479.11	Peak	35.45	-2.98	32.47	46.00	-13.53
900.09	Peak	32.59	4.19	36.78	46.00	-9.22

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. 除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



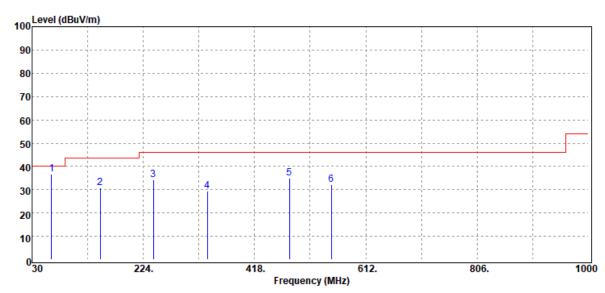


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

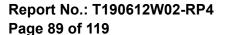
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
63.95	Peak	51.87	-15.28	36.59	40.00	-3.41
149.31	Peak	40.92	-10.10	30.82	43.50	-12.68
241.46	Peak	44.55	-10.25	34.30	46.00	-11.70
335.55	Peak	36.61	-7.18	29.43	46.00	-16.57
479.11	Peak	38.05	-2.98	35.07	46.00	-10.93
551.86	Peak	34.42	-2.22	32.20	46.00	-13.80

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Radiated Spurious Emission Measurement Result (802.11n 40)

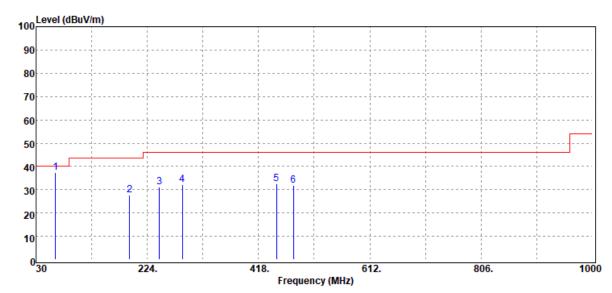
Report Number :T190612W02 Test Date :2019-06-28

Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Mid Engineer :Kane

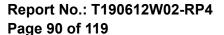
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
63.95	Peak	52.68	-15.28	37.40	40.00	-2.60
192.96	Peak	38.11	-10.44	27.67	43.50	-15.83
245.34	Peak	41.48	-10.28	31.20	46.00	-14.80
285.11	Peak	40.71	-8.46	32.25	46.00	-13.75
449.04	Peak	36.54	-3.88	32.66	46.00	-13.34
479.11	Peak	34.96	-2.98	31.98	46.00	-14.02

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.

除非另有說明·此報告結果僅對測試之樣品負責·同時此樣品僅保留90天。本報告未經本公司書面許可·不可部份複製。



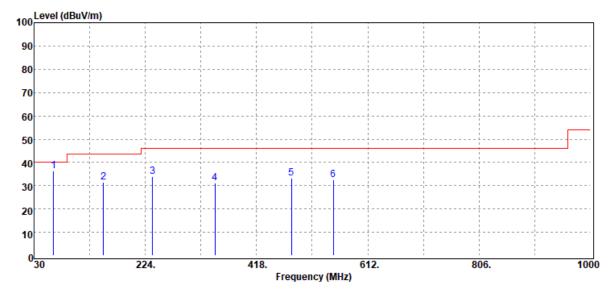


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
63.95	Peak	51.77	-15.28	36.49	40.00	-3.51
151.25	Peak	41.49	-9.90	31.59	43.50	-11.91
236.61	Peak	44.43	-10.51	33.92	46.00	-12.08
345.25	Peak	38.12	-7.12	31.00	46.00	-15.00
479.11	Peak	36.21	-2.98	33.23	46.00	-12.77
551.86	Peak	34.66	-2.22	32.44	46.00	-13.56

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.

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Above 1GHz Data:

Radiated Spurious Emission Measurement Result (802.11 b)

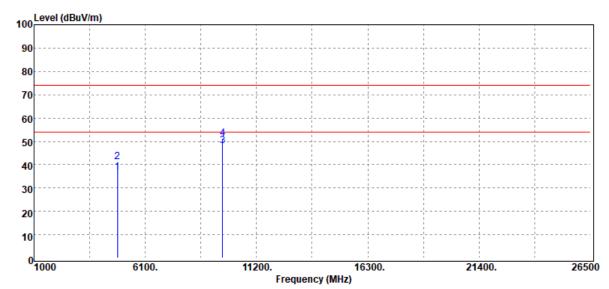
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11b Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Low Engineer :Kane

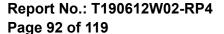
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Average	33.79	3.05	36.84	54.00	-17.16
4824.00	Peak	38.16	3.05	41.21	74.00	-32.79
9648.00	Average	35.22	13.04	48.26	54.00	-5.74
9648.00	Peak	38.14	13.04	51.18	74.00	-22.82

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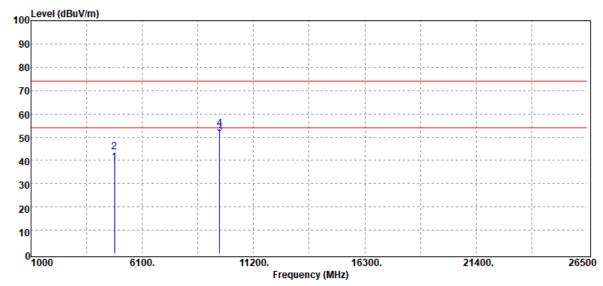


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Low Engineer :Kane

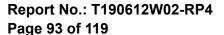
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Average	35.97	3.05	39.02	54.00	-14.98
4824.00	Peak	40.63	3.05	43.68	74.00	-30.32
9648.00	Average	38.43	13.04	51.47	54.00	-2.53
9648.00	Peak	40.51	13.04	53.55	74.00	-20.45

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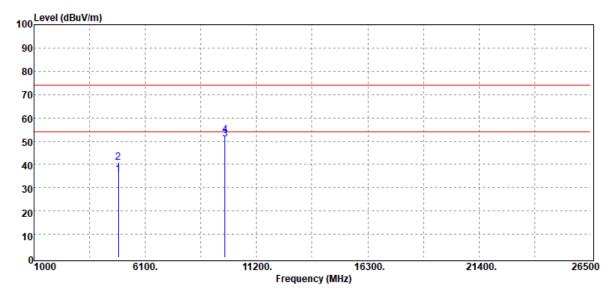


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Mid Engineer :Kane

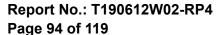
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	32.42	3.31	35.73	54.00	-18.27
4874.00	Peak	37.51	3.31	40.82	74.00	-33.18
9748.00	Average	38.22	12.65	50.87	54.00	-3.13
9748.00	Peak	40.06	12.65	52.71	74.00	-21.29

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:2019-06-22



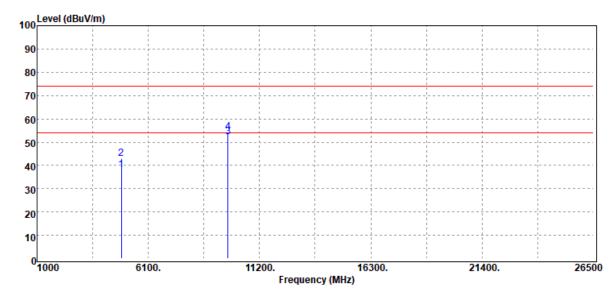
Report Number :T190612W02 Test Date

Operation Band :802.11b Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

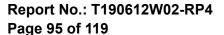
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4874.00	Average	34.84	3.31	38.15	54.00	-15.85
4874.00	Peak	39.48	3.31	42.79	74.00	-31.21
9748.00	Average	39.61	12.65	52.26	54.00	-1.74
9748.00	Peak	41.81	12.65	54.46	74.00	-19.54

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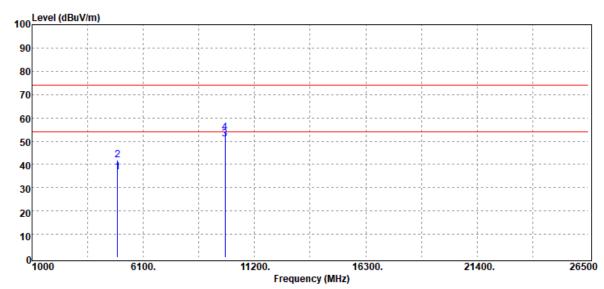


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH High Engineer :Kane

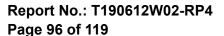
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	33.08	3.75	36.83	54.00	-17.17
4924.00	Peak	38.02	3.75	41.77	74.00	-32.23
9848.00	Average	37.83	13.21	51.04	54.00	-2.96
9848.00	Peak	40.47	13.21	53.68	74.00	-20.32

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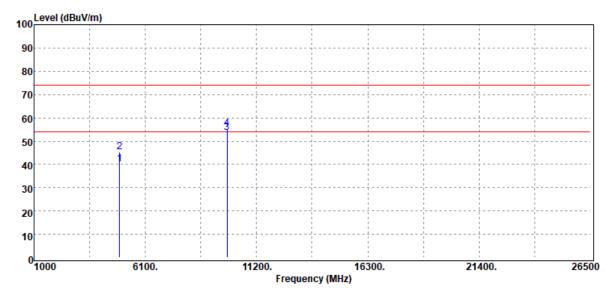


Operation Band :802.11b Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH High Engineer :Kane

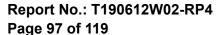
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	36.38	3.75	40.13	54.00	-13.87
4924.00	Peak	41.48	3.75	45.23	74.00	-28.77
9848.00	Average	40.45	13.21	53.66	54.00	-0.34
9848.00	Peak	42.21	13.21	55.42	74.00	-18.58

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Radiated Spurious Emission Measurement Result (802.11 g)

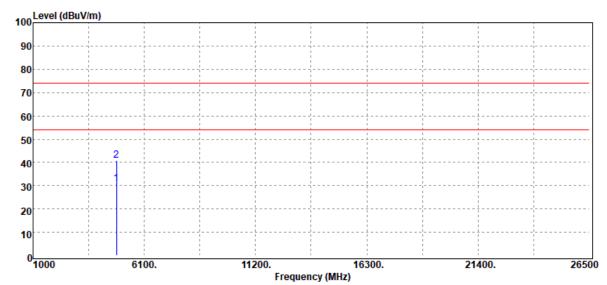
Report Number :T190612W02 Test Date :2019-06-22

Operation Band :802.11g Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Low Engineer :Kane

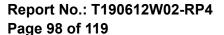
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
 4824.00	Average	27.85	3.05	30.90	54.00	-23.10
4824.00	Peak	37.67	3.05	40.72	74.00	-33.28

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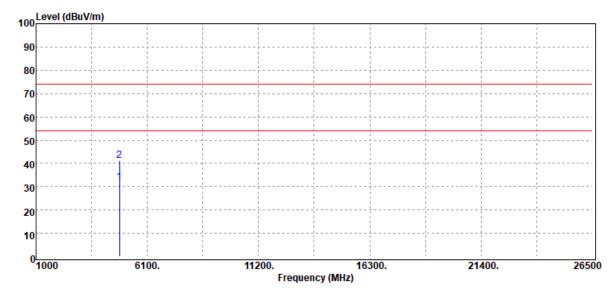


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Low Engineer :Kane

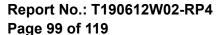
EUT Pol. :E2 Plan



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4824.00	Average	28.62	3.05	31.67	54.00	-22.33
4824.00	Peak	38.06	3.05	41.11	74.00	-32.89

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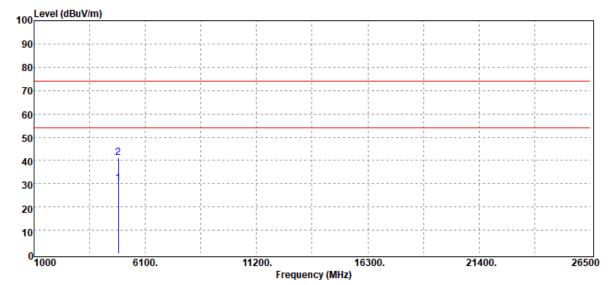


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Mid Engineer :Kane

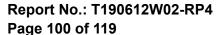
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	26.90	3.31	30.21	54.00	-23.79
4874.00	Peak	37.77	3.31	41.08	74.00	-32.92

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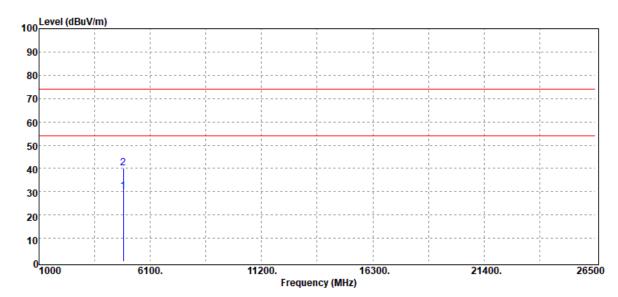


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

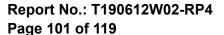
EUT Pol. :E2 Plan



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4874.00	Average	26.84	3.31	30.15	54.00	-23.85
4874.00	Peak	36.98	3.31	40.29	74.00	-33.71

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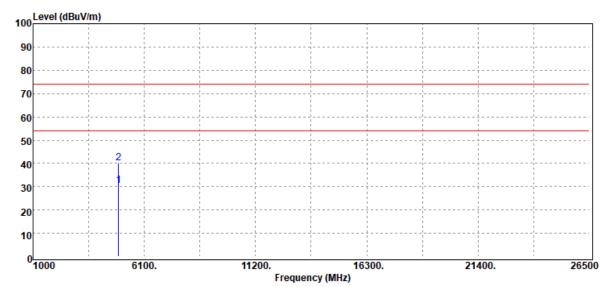


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH High Engineer :Kane

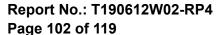
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
4924.00	Average	26.80	3.75	30.55	54.00	-23.45
4924.00	Peak	36.29	3.75	40.04	74.00	-33.96

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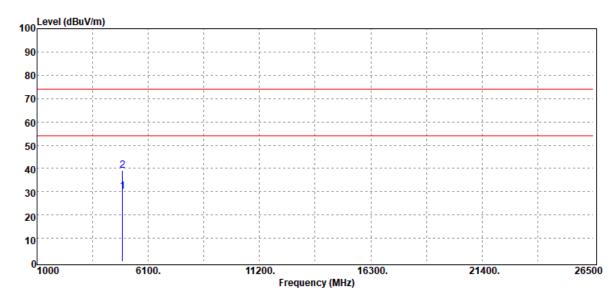


Operation Band :802.11g Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH High Engineer :Kane

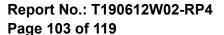
EUT Pol. :E2 Plan



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4924.00	Average	26.44	3.75	30.19	54.00	-23.81
4924.00	Peak	35.47	3.75	39.22	74.00	-34.78

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Radiated Spurious Emission Measurement Result (802.11n_HT20)

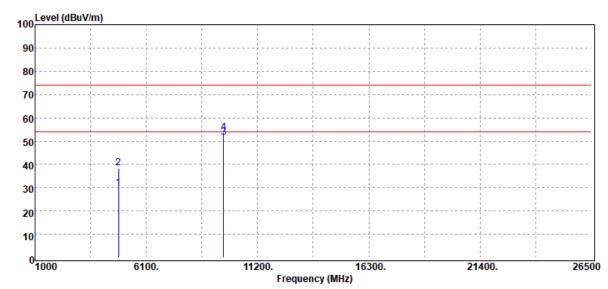
Report Number :T190612W02 Test Date :2019-06-25

Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Low Engineer :Kane

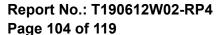
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4824.00	Average	26.77	3.05	29.82	54.00	-24.18
4824.00	Peak	35.20	3.05	38.25	74.00	-35.75
9648.00	Average	38.49	13.04	51.53	54.00	-2.47
9648.00	Peak	40.68	13.04	53.72	74.00	-20.28

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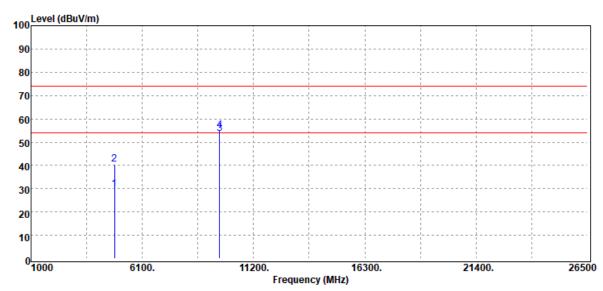


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2412 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Low Engineer :Kane

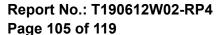
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4824.00	Average	26.87	3.05	29.92	54.00	-24.08
4824.00	Peak	37.29	3.05	40.34	74.00	-33.66
9648.00	Average	40.64	13.04	53.68	54.00	-0.32
9648.00	Peak	41.95	13.04	54.99	74.00	-19.01

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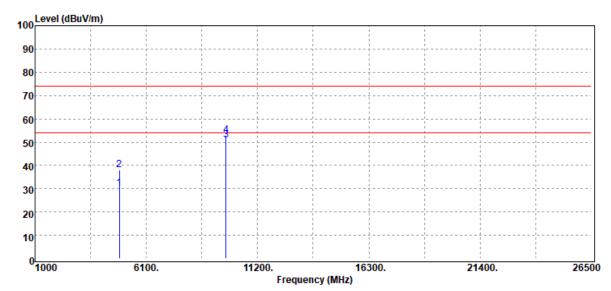


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Mid Engineer :Kane

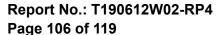
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	26.82	3.31	30.13	54.00	-23.87
4874.00	Peak	34.74	3.31	38.05	74.00	-35.95
9748.00	Average	38.15	12.65	50.80	54.00	-3.20
9748.00	Peak	40.37	12.65	53.02	74.00	-20.98

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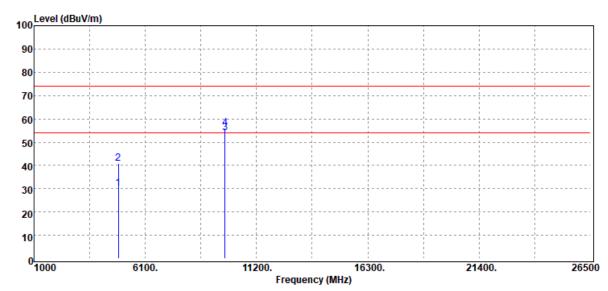


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

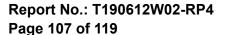
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	26.74	3.31	30.05	54.00	-23.95
4874.00	Peak	37.66	3.31	40.97	74.00	-33.03
9748.00	Average	41.18	12.65	53.83	54.00	-0.17
9748.00	Peak	43.34	12.65	55.99	74.00	-18.01

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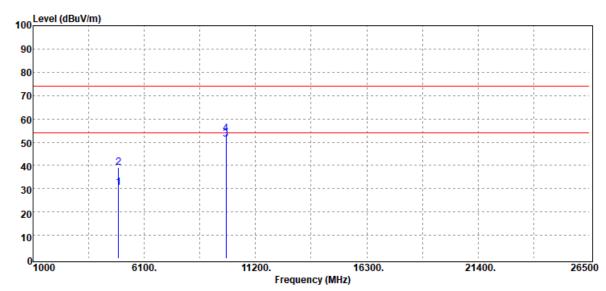


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH High Engineer :Kane

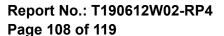
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4924.00	Average	26.53	3.75	30.28	54.00	-23.72
4924.00	Peak	35.20	3.75	38.95	74.00	-35.05
9848.00	Average	37.90	13.21	51.11	54.00	-2.89
9848.00	Peak	40.39	13.21	53.60	74.00	-20.40

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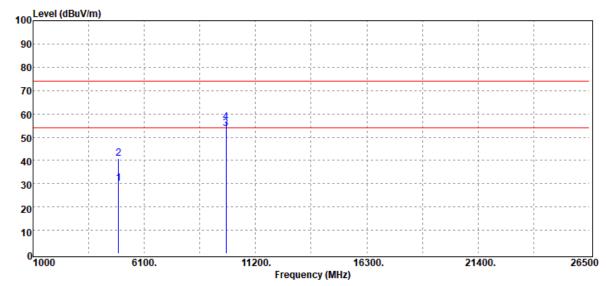


Operation Band :802.11n20 Temp./Humi. :21/53

Frequency :2462 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH High Engineer :Kane

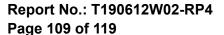
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4924.00	Average	26.34	3.75	30.09	54.00	-23.91
4924.00	Peak	36.95	3.75	40.70	74.00	-33.30
9848.00	Average	40.50	13.21	53.71	54.00	-0.29
9848.00	Peak	43.05	13.21	56.26	74.00	-17.74

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Radiated Spurious Emission Measurement Result (802.11n_HT40)

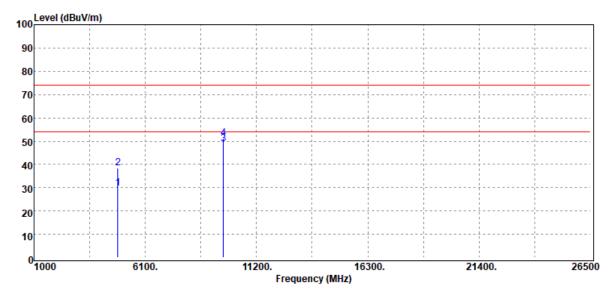
Report Number :T190612W02 Test Date :2019-06-25

Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2422 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Low Engineer :Kane

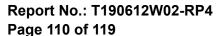
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4844.00	Average	26.59	3.09	29.68	54.00	-24.32
4844.00	Peak	35.27	3.09	38.36	74.00	-35.64
9688.00	Average	35.77	13.01	48.78	54.00	-5.22
9688.00	Peak	38.06	13.01	51.07	74.00	-22.93

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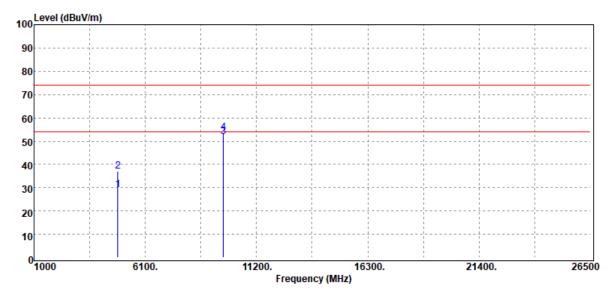


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2422 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Low Engineer :Kane

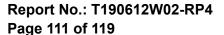
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4844.00	Average	25.89	3.09	28.98	54.00	-25.02
4844.00	Peak	34.00	3.09	37.09	74.00	-36.91
9688.00	Average	38.82	13.01	51.83	54.00	-2.17
9690.00	Peak	40.68	12.99	53.67	74.00	-20.33

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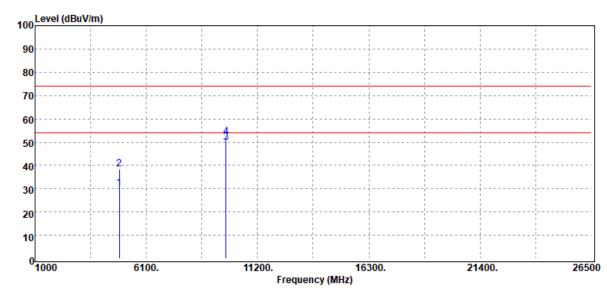


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH Mid Engineer :Kane

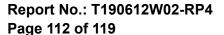
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
4874.00	Average	26.76	3.31	30.07	54.00	-23.93
4874.00	Peak	35.25	3.31	38.56	74.00	-35.44
9748.00	Average	37.01	12.65	49.66	54.00	-4.34
9748.00	Peak	39.62	12.65	52.27	74.00	-21.73

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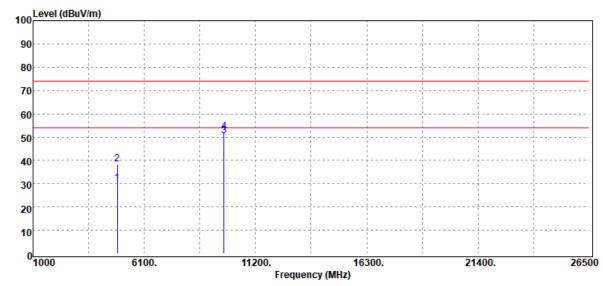


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2437 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH Mid Engineer :Kane

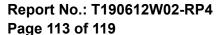
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	26.83	3.31	30.14	54.00	-23.86
4874.00	Peak	34.99	3.31	38.30	74.00	-35.70
9748.00	Average	37.85	12.65	50.50	54.00	-3.50
9748.00	Peak	39.50	12.65	52.15	74.00	-21.85

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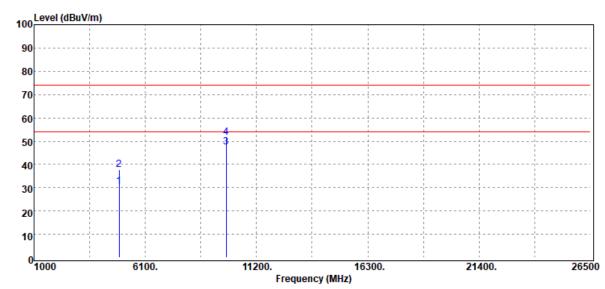


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2452 MHz Antenna Pol. :VERTICAL

Operation Mode :Tx CH High Engineer :Kane

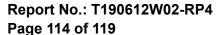
EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4904.00	Average	26.95	3.56	30.51	54.00	-23.49
4904.00	Peak	34.26	3.56	37.82	74.00	-36.18
9808.00	Average	34.43	13.01	47.44	54.00	-6.56
9808.00	Peak	38.52	13.01	51.53	74.00	-22.47

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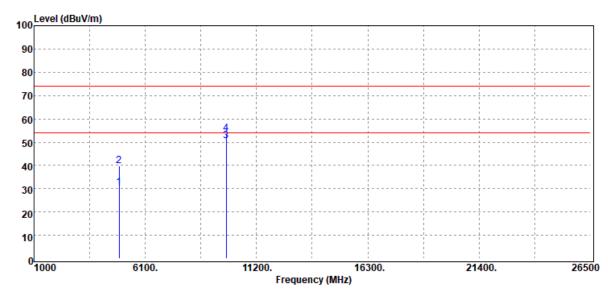


Operation Band :802.11n40 Temp./Humi. :21/53

Frequency :2452 MHz Antenna Pol. :HORIZONTAL

Operation Mode :Tx CH High Engineer :Kane

EUT Pol. :E2 Plan



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4904.00	Average	26.87	3.56	30.43	54.00	-23.57
4904.00	Peak	36.12	3.56	39.68	74.00	-34.32
9808.00	Average	37.46	13.01	50.47	54.00	-3.53
9808.00	Peak	40.48	13.01	53.49	74.00	-20.51

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12 MAXIMUM POWER SPECTRAL DENSITY

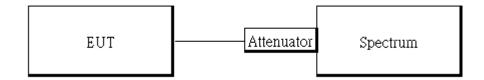
Standard Applicable 12.1

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.				
TYPE		NUMBER	NUMBER	CAL.					
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020				
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019				
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020				

12.3 Test Set-up

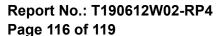


12.4 Measurement Procedure

- 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. & the 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.
- 11.802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application for the test of PSD at MIMO mode, the highest emission of worst case is employing.

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POWER DENSITY 802.11b				POWER DENSITY 802.11g				
Freq.	PSD	Limit	Result	Freq.	PSD	Limit	Result	
(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	
2412	-7.32	8.00	PASS	2412	-10.92	8.00	PASS	
2437	-5.12	8.00	PASS	2437	-11.14	8.00	PASS	
2462	-6.60	8.00	PASS	2462	-11.66	8.00	PASS	

POWER DENSITY 802.11n HT20					POWER DENSITY 80	2.11n HT40	
Freq.	PSD	Limit	Result	Freq.	PSD	Limit	Result
(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	(MHz)	(dBm/3kHz)	(dBm/3kHz)	Resuit
2412	-8.84	8.00	PASS	2422	-12.49	8.00	PASS
2437	-6.24	8.00	PASS	2437	-9.53	8.00	PASS
2462	-7.59	8.00	PASS	2452	-14.23	8.00	PASS

Note

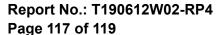
Cable Loss 10.40 dВ

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^{*}Refer to next page for plots



SGS

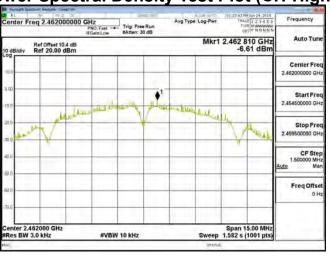
802.11b Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

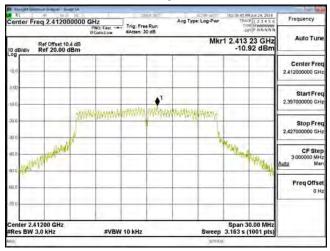


Power Spectral Density Test Plot (CH-High)

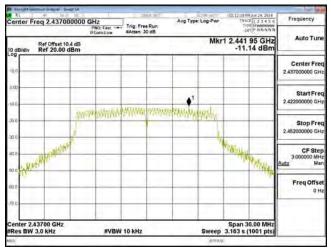


802.11g

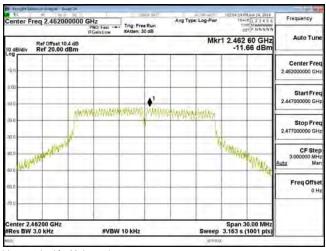
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



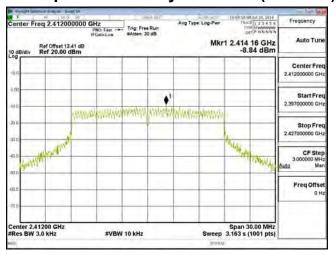
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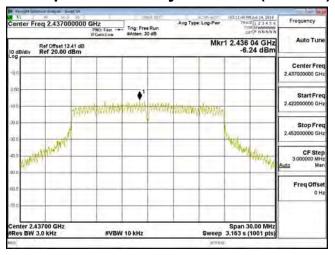


802.11n_HT20

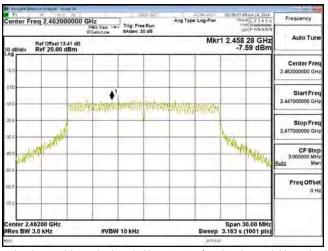
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

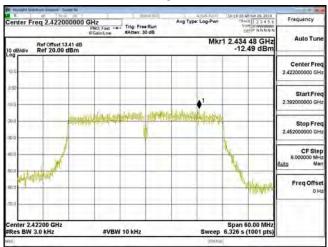


Power Spectral Density Test Plot (CH-High)

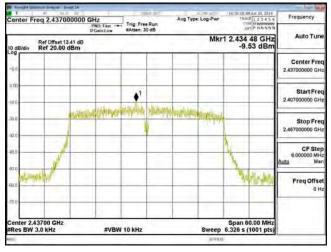


802.11n_HT40

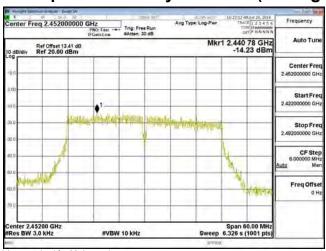
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

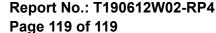


Power Spectral Density Test Plot (CH-High)



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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.

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.

~ End of Report ~

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