

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

	OF
Applicant:	Barco NV President Kennedypark 35 8500 Kortrijk Belgium
Product Name:	ClickShare
Brand Name:	Barco
Model No.:	R9861600D01C
Model Difference:	N/A
Report Number:	T190521W02-RP1
FCC ID:	2AAED-R9861600D01
FCC Rule Part:	§15.247, Cat: DTS
Issue Date:	Aug. 14, 2019
Date of Test:	May 21, 2019 ~ Jul. 24, 2019
Date of EUT Received:	May 21, 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:

Wena / Engineer

Approved By:

Kevin Tsai / Deputy Manager



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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190521W02-RP1	Rev.00	Initial creation of docu- ment	All	Aug. 05, 2019	Violetta Tang
T190521W02-RP1	Rev.01	Add statement of test mode on section 4.2	9	Aug. 14, 2019	Violetta Tang

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GENERAL INFORMATION 1

1.1 Product description

Product Name:	ClickShare
Brand Name:	Barco
Model No.:	R9861600D01C
Model Difference:	N/A
Hardware Version:	DVT
Software Version:	4.5.23.1 (SX-2.03)
Power Supply:	5Vdc from USB Port

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (dBm)	Modulation Technology
b			18.67	DSSS
g	2412-2462	11	22.24	
n_HT20			22.56	OFDM
n_HT40	2422-2452	7	21.69	
			PSK, DBPSK for DSSS 16QAM, QPSK, BPSK for OFDM	
Transitio	n Rate:	802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 - 150.0Mbps		

1.2 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)
Ceramic Chip	Pulse Electronics	W3078	2400 - 2483.5	1.7

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1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247 FCC KDB 558074 D01 15.247 Meas. Guidance v05r02 ANSI C63.10:2013 Note: All test items have been performed and record as per the above standards.

1.4 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

1.5 Special Accessories

There are no special accessories used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

1.7 Radiated Emission Test Sites For Measurements From 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. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 **Conducted Emissions**

The EUT is a placed on a 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 **Conducted Test (RF)**

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 **Radiated Emissions**

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground 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 Configuration of Tested System

Fig. 2-1 Conducted & Radiated Emission Configuration

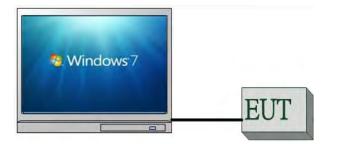


Fig. 2-2 Conducted Emission (AC Power Line) Configuration



Table 2-1 Equipment Used in Tested System

ltem	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	T420	S0012407	N/A	N/A

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SUMMARY OF TEST RESULTS 3

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB & 99% Emission Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203 §15.247(b)	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz Band 4.1

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

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

7 channels are provided for 802.11n HT40

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

4.2 The Worst Test Modes and Channel Details

- 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. The given UE is pre-scanned among below modes.

Modulation	Transmission Chain				Multiple Transmission Spatial
🛛 802.11 b	🛛 Ch0	🛛 Ch1	□ Ch2	🗆 Ch3	□ 2TX
🛛 802.11 g	🛛 Ch0	🛛 Ch1	🗆 Ch2	🗆 Ch3	
🛛 802.11 n	🛛 Ch0	🛛 Ch1	□ Ch2	🗆 Ch3	

Note: The device didn't support MIMO mode.

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

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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:

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT						
RADIATED EMISSION TEST (BELOW 1 GHz)											
802.11g	1 to 11	1,6,11	OFDM	6	Ch1						
	RADIA	TED EMISSI	ON TEST (ABOV	E 1 GHz)							
802.11b	1 to 11	1,6,11	DSSS	1	Ch1						
802.11g	1 to 11	1,6,11	OFDM	6	Ch1						
802.11n (HT20)	1 to 11	1,6,11	OFDM	MCS 0	Ch1						
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS 0	Ch1						
Note:											

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

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST										
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT					
802.11b	1 to 11	1,6,11	DSSS	1	Ch1					
802.11g	1 to 11	1,6,11	OFDM	6	Ch1					
802.11n (HT20)	1 to 11	1,6,11	OFDM	MCS 0	Ch1					
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS 0	Ch1					

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MEASUREMENT UNCERTAINTY 5

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575 dB
Peak Output Power	+/- 1.922 dB
6dB Bandwidth	+/- 61.248 Hz
100 kHz Bandwidth of Frequency Band Edges	+/- 1.922 dB
Peak Power Density	+/- 2.004 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. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.
- 3. 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.

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

Note

1. The lower limit shall apply at the transition frequencies

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

6.2 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
CABLE	EMCI	CFD300-NL	CERF	06/29/2019	06/28/2020				
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.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

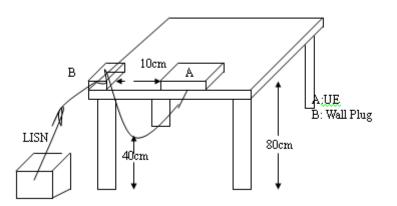
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6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

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

6.6 Measurement Result

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

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2019/7/11 **Description:** Operation Date: Line: L1 Temp.(°C)/Hum.(%): 24.2(°C)/65% AC 120V/60Hz **Test Voltage:** Test By: Gary 80.0 dBuV Limit1: Limit2: all follow many many any any any any 30 MINTANANA -20 0.150 (MHz) 5 30.000 0.5

AC POWER LINE	CONDUCTED	EMISSION TEST	ΔΤΔ
			DAIA

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*	0.1860	42.39	30.72	10.13	52.52	40.85	64.21	54.21	-11.69	-13.36	Pass
2	0.2380	35.57	25.82	10.13	45.70	35.95	62.17	52.17	-16.47	-16.22	Pass
3	0.3020	29.12	18.43	10.14	39.26	28.57	60.19	50.19	-20.93	-21.62	Pass
4	0.3340	23.29	14.34	10.14	33.43	24.48	59.35	49.35	-25.92	-24.87	Pass
5	0.5100	27.79	14.83	10.14	37.93	24.97	56.00	46.00	-18.07	-21.03	Pass
6	0.9220	22.38	12.69	10.17	32.55	22.86	56.00	46.00	-23.45	-23.14	Pass

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-20 0.150

30.000

Description:	Operation	Date:	2019/7/11
_ine:	N	Temp.(℃)/Hum.(%):	24.2(°C)/65%
Test Voltage:	AC 120V/60Hz	Test By:	Gary
80.0 dBuV			
			Limit1: — Limit2: —
12			
Y		un Marche and	W
30	* * Multing and & which a part of the second s	when we want the second for the second	MANN A MAN
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5

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*	0.1740	43.37	30.71	10.02	53.39	40.73	64.76	54.77	-11.37	-14.04	Pass
2	0.1860	42.34	30.94	10.02	52.36	40.96	64.21	54.21	-11.85	-13.25	Pass
3	0.2380	35.36	26.58	10.02	45.38	36.60	62.16	52.17	-16.78	-15.57	Pass
4	0.3700	29.60	20.05	10.03	39.63	30.08	58.50	48.50	-18.87	-18.42	Pass
5	0.5220	29.03	18.31	10.03	39.06	28.34	56.00	46.00	-16.94	-17.66	Pass
6	0 9460	19.96	12 26	10.04	30.00	22 30	56 00	46 00	-26 00	-23 70	Pass

(MHz)

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0.5

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DUTY CYCLE OF TEST SIGNAL 7

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

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

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

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

Duty Cycle:

	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW setting (kHz)
802.11b	99.04	0.04	0.07	0.01
802.11g	95.12	0.22	0.48	1.00
802.11n_20	94.31	0.25	0.52	1.00
802.11n_40	89.10	0.50	1.05	2.00

b = 99.04%, g = 95.12%,n_ht_20 = 94.31%n_ht_40 = 89.1%

Duty Cycle Factor: $10 * \log(1/0.9904) = 0.04$ Duty Cycle Factor: 10 * log(1/0.9512) = 0.22 Duty Cycle Factor: 10 * log(1/0.9431) = 0.25

Duty Cycle Factor: $10 * \log(1/0.891) = 0.5$

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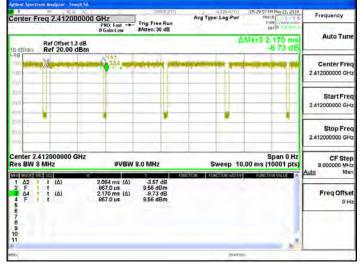


7.1 DUTY CYCLE TEST SIGNAL Measurement Result

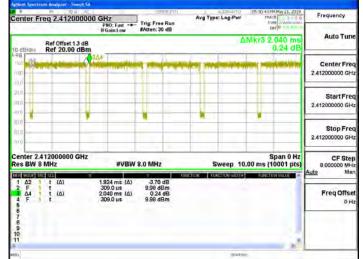
Duty Cycle_802.11b_20MHz_Chain1_2412MHz

Center Freq 2.412000000	GHz Pho: Fast	Trig: Free Run	Avg Type: Log-Pwr	05/28 42 PM May 21, 2019 TRACE 3 < 5 6 TVHE	Frequency
	FGaint ow	#Atten: 30 dB		per/or a second	Auto Tun
Ref Offset 1.3 dB Ref 20.00 dBm			4	Mkr3 12,55 ms 0.34 dB	(this fail
89 100 100	- Wat			14	Center Fre 2.412000000 GH
20,0 81,2 91,0					Start Fre 2.412000000 GH
510 610 700					Stop Fre 2.412000000 GH
Center 2.412000000 GHz Res BW 8 MHz	#VBW	8.0 MHz		Span 0 Hz 0.00 ms (5001 pts)	CF Ste 8.000000 MH Auto Ma
VLT WORF FOR VC1 ***********************************	12.43 ms (Δ) 7.152 ms 12.55 ms (Δ) 7.152 ms	0.63 dB 11.82 dBm 0.34 dB 11.82 dBm	NCTON BUNCTION WILTON	FUNSITERATALLE	Freq Offse
9 10 11			gratue	*	-

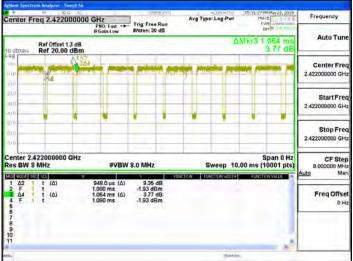
Duty Cycle 802.11g 20MHz Chain1 2412MHz



Duty Cycle_802.11n_20MHz_Chain1_2412MHz



Duty Cycle 802.11n 40MHz Chain1 2422MHz



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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.

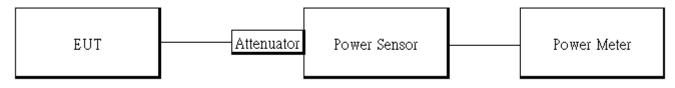
If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

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

8.2 Measurement Equipment Used

EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Power Meter	Anritsu	ML2496A	1242004	10/23/2018	10/22/2019
Power Sensor	Anritsu	MA2411B	1207365	10/23/2018	10/22/2019
Power Sensor	Anritsu	MA2411B	1207368	10/24/2018	10/23/2019
Attenuator	Mini-Circuit	BW-S10W2+	1	02/26/2019	02/25/2020

8.3 Test Set-up



8.4 Measurement Procedure

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

Power Meter:

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

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

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8.5 Measurement Result

802.1	1b Ch1					
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	1	18.40	69.18	30.00	PASS
6	2437	1	18.67	73.62	30.00	PASS
11	2462	1	18.65	73.28	30.00	PASS
802.1	1b Ch1					
сн	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit (dBm)	RESULT
1	2412	1	15.85	38.48	30.00	PASS
6	2437	1	15.97	39.55	30.00	PASS
11	2462	1	15.92	39.10	30.00	PASS
CH	1g Ch1 Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	6	21.54	142.56	30.00	PASS
6	2437	6	21.14	130.02	30.00	PASS
11	2462	6	22.24	167.49	30.00	PASS
802.1	1g Ch1					•
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit (dBm)	RESULT
1	2412	6	14.88	30.74	30.00	PASS
6	2437	6	14.93	31.10	30.00	PASS
11	2462	6	15.90	38.88	30.00	PASS

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	IN_HIZU	M Ch1				
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	MCS0	21.46	139.96	30.00	PASS
6	2437	MCS0	21.44	139.32	30.00	PASS
11	2462	MCS0	22.56	180.30	30.00	PASS
802.1	1n_HT20	M Ch1				
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit (dBm)	RESULT
1	2412	MCS0	14.96	31.36	30.00	PASS
6	2437	MCS0	14.88	30.79	30.00	PASS
11	2462	MCS0	15.89	38.85	30.00	PASS
802.1	1n_HT40	M Ch1				
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
CH 3			Power	Power		RESULT PASS
	(MHz)	Rate	Power (dBm)	Power (mW)	(dBm)	
3	(MHz) 2422	Rate MCS0	Power (dBm) 21.31	Power (mW) 135.21	(dBm) 30.00	PASS
3 6 9	(MHz) 2422 2437	Rate MCS0 MCS0 MCS0	Power (dBm) 21.31 21.56	Power (mW) 135.21 143.22	(dBm) 30.00 30.00	PASS PASS
3 6 9	(MHz) 2422 2437 2452	Rate MCS0 MCS0 MCS0	Power (dBm) 21.31 21.56	Power (mW) 135.21 143.22	(dBm) 30.00 30.00	PASS PASS
3 6 9 802.1	(MHz) 2422 2437 2452 1n_HT40 Freq.	Rate MCS0 MCS0 MCS0 M Ch1 Data	Power (dBm) 21.31 21.56 21.69 Max. Avg. Output include tune up tolerance Power	Power (mW) 135.21 143.22 147.57 Max. Avg. Output include tune up tolerance Power	(dBm) 30.00 30.00 30.00 Limit	PASS PASS PASS
3 6 9 802.1 CH	(MHz) 2422 2437 2452 1n_HT40 Freq. (MHz)	Rate MCS0 MCS0 MCS0 M Ch1 Data Rate	Power (dBm) 21.31 21.56 21.69 Max. Avg. Output include tune up tolerance Power (dBm)	Power (mW) 135.21 143.22 147.57 Max. Avg. Output include tune up tolerance Power (mW)	(dBm) 30.00 30.00 30.00 Limit (dBm)	PASS PASS PASS RESULT

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

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9 6DB BANDWIDTH MEASUREMENT

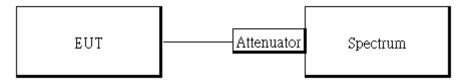
9.1 Standard Applicable

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

9.2 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/13/2019	02/12/2020
DC Block	Mini-Circuits	BLK-18-S+	31129(1)	02/26/2019	02/25/2020
Attenuator	Mini-Circuit	BW-S10W2+	1	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.
- 3. 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. Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

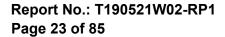
6dB Bandwidth 002 11h Ch1

Ch1			802.11g Ch1			
6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
8077.00	> 500	PASS	2412	15140.00	> 500	PASS
8077.00	> 500	PASS	2437	15160.00	> 500	PASS
9042.00	> 500	PASS	2462	16150.00	> 500	PASS
n_HT20 Ch1			802.11	_n_HT40 Ch1		
6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
15150.00	> 500	PASS	2422	35140.00	> 500	PASS
15150.00	> 500	PASS	2437	35140.00	> 500	PASS
15120.00	> 500	PASS	2452	35150.00	> 500	PASS
ſ	(kHz) 8077.00 9042.00 -HT20 Ch1 6dB BW (kHz) 15150.00 15150.00	(kHz) (kHz) 8077.00 > 500 8077.00 > 500 9042.00 > 500 n_HT20 Ch1 6dB BW Limit (kHz) (kHz) 15150.00 > 500	(kHz) (kHz) Result 8077.00 > 500 PASS 8077.00 > 500 PASS 9042.00 > 500 PASS 0_HT20 Ch1 - - 6dB BW Limit Result (kHz) (kHz) PASS 15150.00 > 500 PASS	(kHz) (kHz) Result (MHz) 8077.00 > 500 PASS 2412 8077.00 > 500 PASS 2437 9042.00 > 500 PASS 2462 0_HT20 Ch1 802.11_ 802.11_ 6dB BW Limit Result Freq. (MHz) 15150.00 > 500 PASS 2422 15150.00 > 500 PASS 2437	(kHz) (kHz) Result (MHz) (kHz) 8077.00 > 500 PASS 2412 15140.00 8077.00 > 500 PASS 2437 15160.00 9042.00 > 500 PASS 2462 16150.00 9042.00 > 500 PASS 802.11_n_HT40 Ch1 6dB BW Limit (kHz) Result Freq. (MHz) 6dB BW 15150.00 > 500 PASS 2422 35140.00 15150.00 > 500 PASS 2437 35140.00	(kHz) (kHz) Result (MHz) (kHz) (kHz) 8077.00 > 500 PASS 2412 15140.00 > 500 8077.00 > 500 PASS 2437 15160.00 > 500 9042.00 > 500 PASS 2462 16150.00 > 500 0_HT20 Ch1 802.11_n_HT40 Ch1 > 500 > 500 6dB BW Limit Result Freq. 6dB BW Limit (kHz) 0 > 500 PASS 2422 35140.00 > 500 15150.00 > 500 PASS 2437 35140.00 > 500

*Refer to next page for plots

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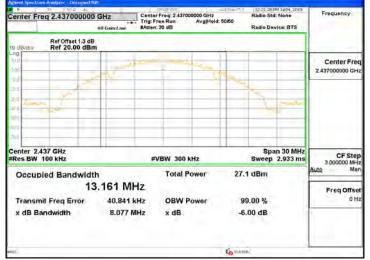
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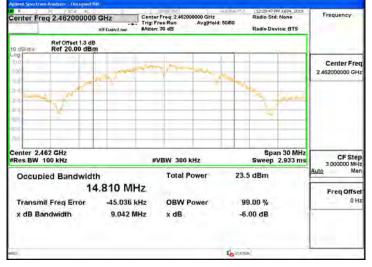
OBW 6dB 802.11b 20MHz Chain1 2412MHz



OBW 6dB 802.11b 20MHz Chain1 2437MHz



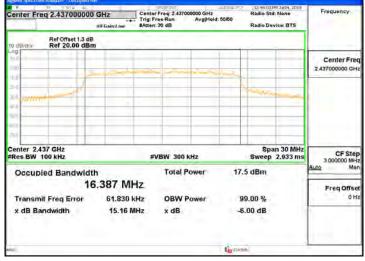
OBW 6dB 802.11b 20MHz Chain1 2462MHz



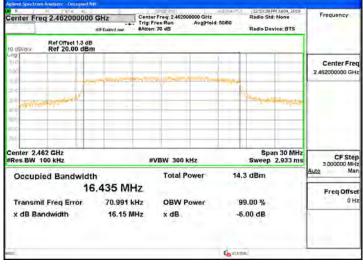
OBW 6dB_802.11g_20MHz_Chain1_2412MHz

Center Freq 2.4	112000000	-+- Tri		z old: 50/50	Radio Std		Frequency	
		dif Gain; Low #A	ten: 30 dB	_	Radio De	vice: BTS		
	Offset 1.3 dB f 20.00 dBm							
100			-		-		Center Free	
0.00		-	minute	- too			2.412000000 GH	
0.0	1							
0.0	and a feature					-		
10.0								
10.0		-		_	-	-		
20.0			_			-		
Center 2.412 G #Res BW 100 k			#VBW 300 kHz		Sweep	2.933 ms	CF Ste	
Occupied E	Bandwidth	1	Total Power 1		14.7 dBm		Auto Mar	
		.376 MHz					Freq Offse	
Transmit Freg Error 69.230 k		69.230 kHz	OBW Power	9	99.00 %		0 Ha	
x dB Bandwi	dth	15.14 MHz	x dB	-6	5.00 dB			
AUGC .				10 STAD	LS.			

OBW 6dB 802.11g 20MHz Chain1 2437MHz



OBW 6dB 802.11g 20MHz Chain1 2462MHz



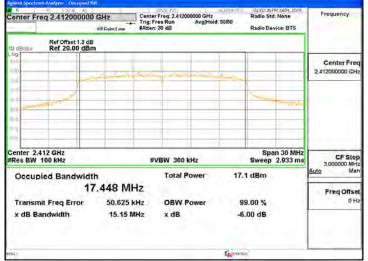
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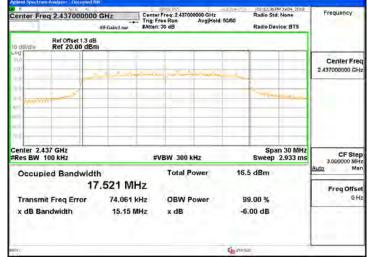
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OBW 6dB 802.11n 20MHz Chain1 2412MHz



OBW 6dB 802.11n 20MHz Chain1 2437MHz



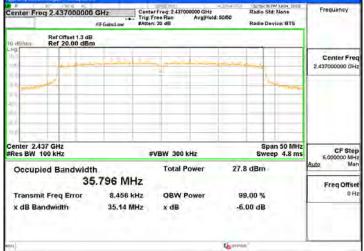
OBW 6dB 802.11n 20MHz Chain1 2462MHz



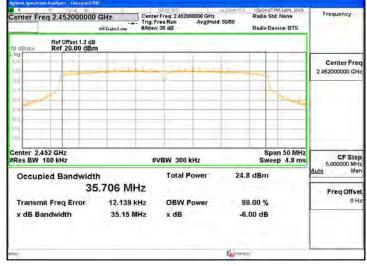
OBW 6dB 802.11n 40MHz Chain1 2422MHz

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Center 2.4	22 GHz	_	_	-			Sp	an 50 MHz	
#Res BW	100 kHz		#	/BW 300 k	Hz			ep 4.8 ms	CF Step 5,000000 MH
Occup	ied Bandwidt	h		Total P	ower	25.1 dBm			Auto Man
	35	5.668 MH	łz.						Freq Offsel
Transmit Freq Error 23.860		23.860 k	Hz	OBW P	ower	9	9.00 %		OH
x dB Ba	andwidth	35.14 M	Hz	x dB		-6.	00 dB		
MBQ						Thomas	_		

OBW 6dB 802.11n 40MHz Chain1 2437MHz



OBW 6dB 802.11n 40MHz Chain1 2452MHz



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10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT 10.1 Standard Applicable

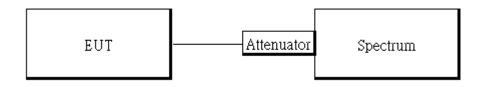
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

10.2 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/13/2019	02/12/2020
DC Block	Mini-Circuits	BLK-18-S+	31129(1)	02/26/2019	02/25/2020
Attenuator	Mini-Circuit	BW-S10W2+	1	02/26/2019	02/25/2020

10.3 Test SET-UP



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10.4 Measurement Procedure Reference Level of Emission Limit:

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 100kHz & VBW = 300 kHz.
- 5. 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:

- To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 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:

- 1. To connect Antenna Port of EUT to Spectrum
- 2. 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.

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- 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.
- Repeat above procedures until all default test channel measured were complete.

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10.5 Measurement Result

Referen	nce Level	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	12.05	-7.95	2412	-1.80	-21.80		
2437	3.19	-16.81	2437	0.23	-19.77		
2462	6.98	-13.02	2462	-1.84	-21.84		
Reference	ce Level	of Limit 802.11n20 mode	Reference	Reference Level of Limit 802.11n40 MODE			
Freq.	PSD	Reference Level of Limit	Freq.	PSD	Reference Level of Limit		
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)		
2412	-0.15	-20.15	2422	4.09	-15.91		
2437	-0.71	-20.71	2437	6.90	-13.10		
2462	-0.37	-20.37	2452	3.77	-16.23		

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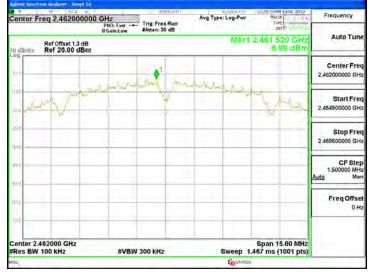
Reference Level_802.11b_20MHz_Chain1_2412MHz



Reference Level 802.11b 20MHz Chain1 2437MHz



Reference Level_802.11b_20MHz_Chain1_2462MHz



Reference Level_802.11g_20MHz_Chain1_2412MHz



Reference Level_802.11g_20MHz_Chain1_2437MHz



Reference Level_802.11g_20MHz_Chain1_2462MHz



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Reference Level_802.11n_20MHz_Chain1_2412MHz



Reference Level 802.11n 20MHz Chain1 2437MHz



Reference Level_802.11n_20MHz_Chain1_2462MHz



Reference Level_802.11n_40MHz_Chain1_2422MHz



Reference Level 802.11n 40MHz Chain1 2437MHz



Reference Level_802.11n_40MHz_Chain1_ 2452MHz

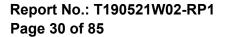


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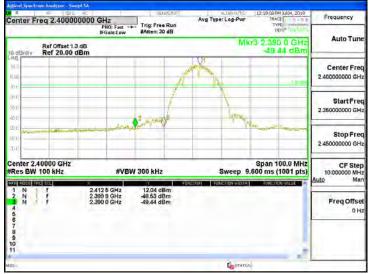
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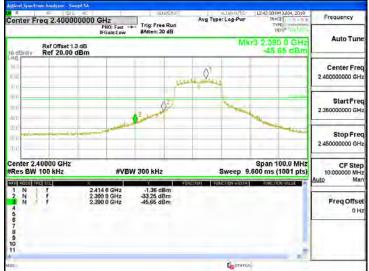
Band Edge_802.11b_20MHz_Chain1_2412MHz



Band Edge_802.11b_20MHz_Chain1_ 2462MHz



Band Edge_802.11g_20MHz_Chain1_2412MHz



Band Edge_802.11g_20MHz_Chain1 2462MHz

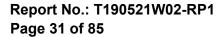


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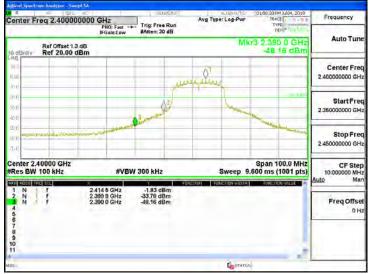
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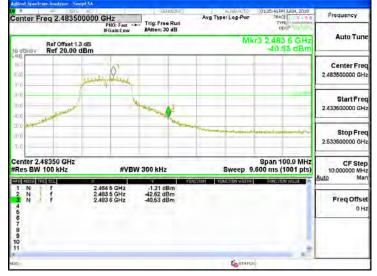
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Band Edge_802.11n_20MHz_Chain1_2412MHz



Band Edge_802.11n_20MHz_Chain1_ 2462MHz



Band Edge_802.11n_40MHz_Chain1_2422MHz



Band Edge_802.11n_40MHz_Chain1 2452MHz



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Spurious Emission_802.11b_20MHz_Chain1_2412MHz

SG



Spurious Emission 802.11b 20MHz Chain1 2437MHz



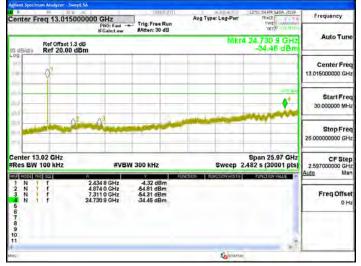
Spurious Emission_802.11b_20MHz_Chain1_2462MHz



Spurious Emission_802.11g_20MHz_Chain1_2412MHz



Spurious Emission_802.11q_20MHz_Chain1_2437MHz



Spurious Emission 802.11g 20MHz Chain1 2462MHz



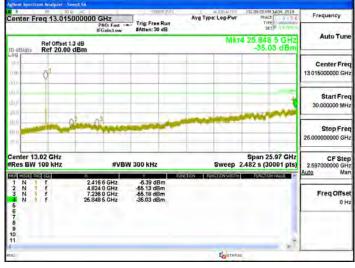
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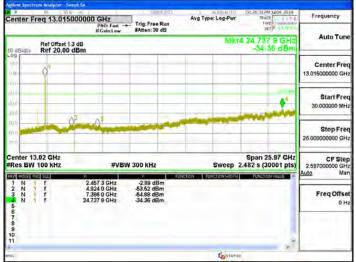
Spurious Emission_802.11n_20MHz_Chain1_2412MHz



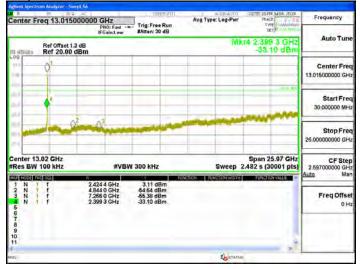
Spurious Emission_802.11n_20MHz_Chain1_2437MHz



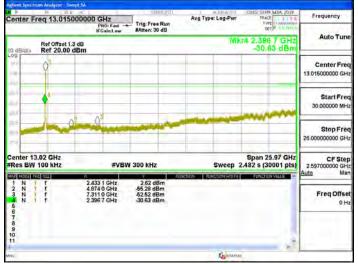
Spurious Emission 802.11n 20MHz Chain1 2462MHz



Spurious Emission_802.11n_40MHz_Chain1_2422MHz



Spurious Emission_802.11n_40MHz_Chain1_2437MHz



Spurious Emission 802.11n 40MHz Chain1 2452MHz



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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 limit as below.

And according to §15.33(a) (1), 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 $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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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	JB1	A052609	03/06/2019	03/05/2020			
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 Antenna	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								

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

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.

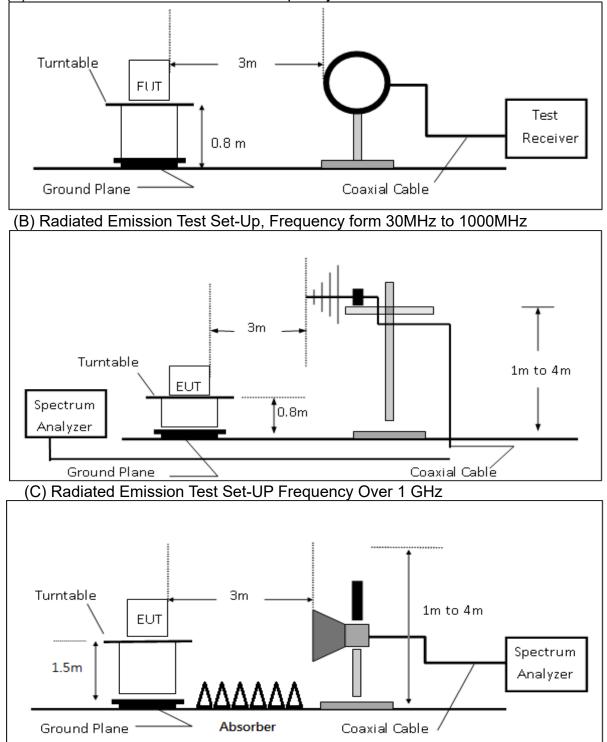
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11.3 Test SET-UP

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



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11.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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	0	CL = Cable Attenuation Factor (Cable Loss)					
	RA = Reading Amplitude	AG = Amplifier Gain					
	AF = Antenna Factor						
Actual	Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)						
Factor	(dB) = Antenna Factor(dBµV/m) + Ca	able Loss(dB) – Pre_Amplifier Gain(dB)					

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11.6 Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

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

11.7 Measurement Result

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

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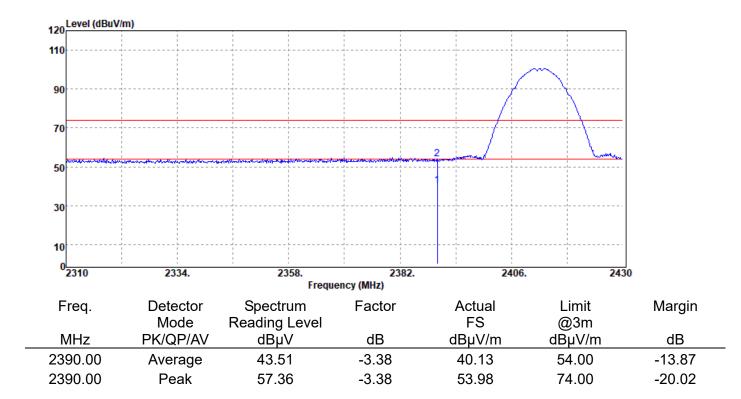
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Radiated Band Edge Measurement Result

Report Number	:T190521W02
Operation Band	:802.11b
Frequency	:2412 MHz
Operation Mode	:BE CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-07-24
Temp./Humi.	:21.5/48
Antenna Pol.	:VERTICAL
Engineer	:Kane



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·2019-07-24

Test Date



Report Number

:T190521W02

Report Number	.11905210	VUZ		lest Date	:2019-07-24	4
Operation Band	:802.11b			Temp./Humi.	:21.5/48	
Frequency	:2412 MHz			Antenna Pol.	:HORIZON	ΤΑΙ
Operation Mode	:BE CH Lo				:Kane	.,
-		vv		Engineer	.nane	
EUT Pol.	:E2 Plan					
120 Level (dBuV/m)						
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0 <mark></mark> 2310	2334.	2358.	2382.	2406.	2430	
		Freque	ency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	44.89	-3.38	41.51	54.00	-12.49
2390.00	Peak	57.92	-3.38	54.54	74.00	-19.46

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·2019-07-24

Test Date



Report Number

:T190521W02

Dperation Band Frequency Dperation Mode EUT Pol.	:2462 MH	z		Test Date Temp./Humi. Antenna Pol. Engineer		
120 Level (dBuV/m))					
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10						
0 <mark>2450</mark>	2470.	2490.	2510.	2530.	2550	
2.00			ency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level	dB	FS dBµV/m	@3m dBu\//m	dB
2483.50	Average	<u>dB</u> μV 43.57	-2.83	40.74	dBµV/m 54.00	-13.26
2483.50	Peak	56.11	-2.83	53.28	74.00	-20.72
2100.00	i oun	00.11	2.00	30.20	14.00	20.12

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Test Date



Report Number

:T190521W02

Operation Band Frequency Operation Mode EUT Pol.	:802.11b :2462 MHz :BE CH Hi :E2 Plan	Z		Temp./Humi. Antenna Pol. Engineer	:2013-07-2 :21.5/48 :HORIZON :Kane	
120 Level (dBuV/m)						
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	\sum					
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0 2450	2470.	2490.	2510.	2530.	2550	
2450	2470.		ency (MHz)	2550.	2550	,
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level	dB	FS dBu\//m	@3m dBu\//m	dB
2483.50	Average	<u>dBμV</u> 44.37	-2.83	dBµV/m 41.54	dBµV/m 54.00	-12.46
2483.50 2483.50	Peak	57.30	-2.83 -2.83	41.34 54.47	54.00 74.00	-12.40
2700.00	i can	57.50	-2.00	57.77	77.00	-10.00

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·2019-07-24

Test Date



Report Number

:T190521W02

		.11903210	V02		Test Date	:2019-07-24	
	Operation Band	:802.11g			Temp./Humi.	:21.5/48	
	Frequency	:2412 MHz			Antenna Pol.	:VERTICAL	
	Operation Mode	:BE CH Lo	W		Engineer	:Kane	
	EUT Pol.	:E2 Plan					
	120 Level (dBuV/m)						
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	⁰ 2310	2334.	2358. Freque	2382. ncy (MHz)	2406.	2430	
	Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
-	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	2390.00	Average	44.34	-3.38	40.96	54.00	-13.04
	2390.00	Peak	57.35	-3.38	53.97	74.00	-20.03

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·2019-07-24

Test Date



Report Number

:T190521W02

Operation Band Frequency Operation Mode EUT Pol.	:802.11g :2412 MHz :BE CH Lo :E2 Plan			Temp./Humi. Antenna Pol. Engineer		
120 Level (dBuV/m)						
110						
90				/		
70						
50		and the stand of the		2		
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10						
0 <mark></mark> 2310	2334.	2358.	2382.	2406.	2430	
2010	20011		ncy (MHz)	21001	2100	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
2390.00	Average	46.53	-3.38	43.15	54.00	-10.85
2390.00	Peak	59.63	-3.38	56.25	74.00	-17.75

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521W0 :802.11g :2462 MHz :BE CH High :E2 Plan			Test Date Temp./Humi Antenna Pol Engineer		
120 Level (dBuV/m)						
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30						
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0 2450	2470.	2490.	2510.	2530.	2550	
			ncy (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	44.89	-2.83	42.06	54.00	-11.94
2483.50	Peak	57.82	-2.83	54.99	74.00	-19.01

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Report Number Operation Band Frequency	:T190521W0 :802.11g :2462 MHz	02		Test Date Temp./Hum Antenna Po		
Operation Mode	:BE CH High	า		Engineer	:Kane	
EUT Pol.	:E2 Plan					
120 Level (dBuV/m)						
120						
90						
	$\langle \cdot \rangle$					
70						
	- Andrew	ww.Z.				
50						
30		J LLL				
10						
0 <mark></mark> 2450	2470.	2490. Freque	2510. ncy (MHz)	2530.	2550	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
-		Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	45.99	-2.83	43.16	54.00	-10.84
2483.50	Peak	57.96	-2.83	55.13	74.00	-18.87

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521V :802.11n20 :2412 MHz :BE CH Lo :E2 Plan) z			Test Date Temp./Humi. Antenna Pol. Engineer	:2019-07-24 :21.5/48 :VERTICAL :Kane	L
Level (dBuV/m)							
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0 <mark></mark> 2310	2334.	2358.	2382.	1	2406.	2430	
		-	ncy (MHz)				
Freq.	Detector	Spectrum	Factor		Actual FS	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	Ċ	го IBµV/m	@3m dBµV/m	dB
2390.00	Average	45.14	-3.38		41.76	54.00	-12.24
2390.00	Peak	57.81	-3.38		54.43	74.00	-19.57

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:2412 MH:	0 z		Test Date Temp./Hum Antenna Po Engineer		
120 Level (dBuV/m)					
110						
90						
70					- Ly	
50 march 4 march 4 march 4 march	anger der einer	understand with a stand of the	and a second	24,		
30						
10				-		
0 2310	2334.	2358. Freque	2382. ency (MHz)	2406.	243	0
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2388.84	Average	47.05	-3.39	43.66	54.00	-10.34
2388.84	Peak	61.60	-3.39	58.21	74.00	-15.79
2390.00 2390.00	Average Peak	47.70 61.00	-3.38 -3.38	44.32 57.62	54.00 74.00	-9.68 -16.38
2000.00	i Jun	01.00	0.00	01.02	1 1.00	10.00

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521W :802.11n20 :2462 MHz :BE CH Hig :E2 Plan			Test Date Temp./Humi. Antenna Pol. Engineer	:2019-07-24 :21.5/48 :VERTICAL :Kane	
120 Level (dBuV/m)						
110						
90			111-111-111-11-11-11-11-11-11-11-11-11-			
30						
10					1 1 1	
0 <mark></mark> 2450	2470.	2490. Freque	2510. ency (MHz)	2530.	2550	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	45.41	-2.83	42.58	54.00	-11.42
2483.50	Peak	58.08	-2.83	55.25	74.00	-18.75

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521W0 :802.11n20 :2462 MHz :BE CH Higl :E2 Plan			Test Date Temp./Humi. Antenna Pol. Engineer	:2019-07-24 :21.5/48 :HORIZONT/ :Kane	AL.
120 Level (dBuV/m)						
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10						
0 2450	2470.	2490. Freque	2510. ncy (MHz)	2530.	2550	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB		dBµV/m	dB
2483.50	Average	46.86	-2.83	44.03	54.00	-9.97
2483.50	Peak	59.34	-2.83	56.51	74.00	-17.49

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521\ :802.11n4 :2422 MH: :BE CH Lo :E2 Plan	0 z		Test Date Temp./Hum Antenna Po Engineer		
120 Level (dBuV/m)						
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0 <mark></mark> 2310	2334.	2358.	2382.	2406.	243	j 10
			ency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual FS	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	dBµV/m	@3m dBµV/m	dB
2388.24	Average	46.87	-3.39	43.48	54.00	-10.52
2388.24	Peak	69.24	-3.39	65.85	74.00	-8.15
2390.00	Average	47.58	-3.38	44.20	54.00	-9.80
2390.00	Peak	67.71	-3.38	64.33	74.00	-9.67

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Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190521\ :802.11n4(:2422 MH; :BE CH Lc :E2 Plan	0 z		Test Date Temp./Hum Antenna Po Engineer		
120 Level (dBuV/m)						_
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0 <mark></mark> 2310	2334.	2358. Freque	2382. ency (MHz)	2406.	24	_ 30
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
	PK/QP/AV	dBµV	dB	<u>dBµV/m</u>	dBµV/m	dB
2388.84	Average	51.50	-3.39	48.11	54.00	-5.89
2388.84 2390.00	Peak Average	73.72 51.87	-3.39 -3.38	70.33 48.49	74.00 54.00	-3.67 -5.51
2390.00	Peak	72.49	-3.38	69.11	74.00	-4.89

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Report Number	· :T190521	W02		Test Date	:2019-07-2	24
Operation Band	d :802.11n4	0		Temp./Hum	ni. :21.5/48	
Frequency	:2452 MH	Z		Antenna Po	ol. :VERTICA	L
Operation Mod	e :BE CH H	igh		Engineer	:Kane	
EUT Pol.	:E2 Plan					
120 Level (dBuV/r	n)					
110						
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		an and the second of the second	where the state of	American and a second second		
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0 <mark></mark> 2450	2470.	2490. Frequ	2510. ency (MHz)	2530.	255	0
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
1104.	Mode	Reading Level		FS	@3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	48.66	-2.83	45.83	54.00	-8.17
2483.50	Peak	64.83	-2.83	62.00	74.00	-12.00
2484.90	Average	48.88	-2.82	46.06	54.00	-7.94
2484.90	Peak	67.97	-2.82	65.15	74.00	-8.85

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·2019-07-24

Test Date



Report Number

:T190521W02

Opera Frequ Opera EUT F	ition Mode Pol.	:802.11n4(:2452 MHz :BE CH Hi :E2 Plan) z			Test Dat Temp./H Antenna Enginee	lumi. :21.5/48 Pol. :HORIZ	i
120	Level (dBuV/m)							_
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	2450	2470.		2490. Frequ	2510. ency (MHz)	20	30. 2	2550
F	req.	Detector	Sp	ectrum	Factor	Actual	Limit	Margin
	·	Mode	Read	ding Level		FS	@3m	C C
N	ЛНz	PK/QP/AV	(dBµV	dB	dBµV/m	dBµV/m	dB
24	83.50	Average	Ę	51.82	-2.83	48.99	54.00	-5.01
	83.50	Peak		66.54	-2.83	63.71	74.00	-10.29
	85.40	Average		50.47	-2.82	47.65	54.00	-6.35
24	85.40	Peak	-	70.39	-2.82	67.57	74.00	-6.43

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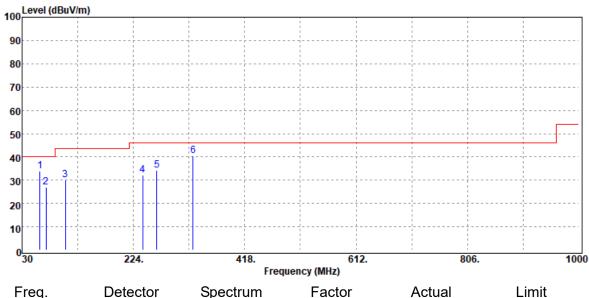
Report No.: T190521W02-RP1 Page 55 of 85



Radiated Spurious Emission Measurement Result

Below 1GHz Worst-Case Data:

Report Number	:T190521W02	Test Date	:2019-07-24
Operation Band	:802.11g	Temp./Humi.	:21.5/48
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	dBµV	dB	dBµV/m	dBµV/m	dB
61.04	Peak	49.60	-15.64	33.96	40.00	-6.04
71.71	Peak	41.84	-14.74	27.10	40.00	-12.90
105.66	Peak	41.26	-11.02	30.24	43.50	-13.26
240.49	Peak	42.43	-10.25	32.18	46.00	-13.82
264.74	Peak	43.17	-8.95	34.22	46.00	-11.78
327.79	Peak	47.67	-7.25	40.42	46.00	-5.58

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Operat Freque Operat	Operation Band:802.11gToFrequency:2437 MHzA		Test Date Temp./Hum Antenna Po Engineer				
100	evel (dBuV/m)						1
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70							
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0 ₃	1						
-3	0	224.	418. Freque	612. ency (MHz)	806.	100	0
Fr	eq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	•	Mode	Reading Level		FS	@3m	0
Μ	lHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
12	0.21	Peak	45.56	-8.88	36.68	43.50	-6.82
14	4.46	Peak	46.19	-9.92	36.27	43.50	-7.23
24	0.49	Peak	48.11	-10.25	37.86	46.00	-8.14
	4.74	Peak	42.93	-8.95	33.98	46.00	-12.02
	7.79	Peak	47.23	-7.25	39.98	46.00	-6.02
43	2.55	Peak	41.18	-4.32	36.86	46.00	-9.14

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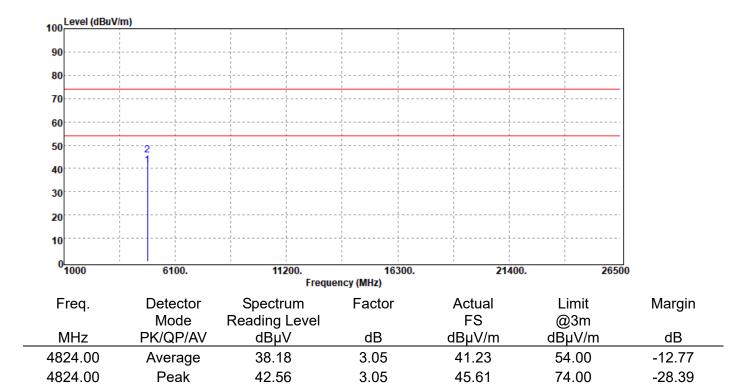
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Above 1GHz Data:

Report Number:T190521W02Operation Band:802.11bFrequency:2412 MHzOperation Mode:Tx CH LowEUT Pol.:E2 Plan

Test Date	:2019-07-24
Temp./Humi.	:21.5/48
Antenna Pol.	:VERTICAL
Engineer	:Kane



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Test Date



:T190521W02

Report Number

Operation Bar Frequency Operation Mod EUT Pol.	:2412 MHz de :Tx CH Lo :E2 Plan			Temp./Humi. Antenna Pol. Engineer		NTAL
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0 <mark></mark>	6100.	11200.	16300.	21400.	265	
1000	0100.		uency (MHz)	2 1400.	205	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Average	41.50	3.05	44.55	54.00	-9.45
4824.00	Peak	43.24	3.05	46.29	74.00	-27.71

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2437 MHz :Tx CH Mi :E2 Plan			Temp./Humi Antenna Po Engineer		-
100 Level (dBuV/m)					
90						
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0 <mark></mark> 1000	6100.	11200. Frequ	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	39.76	3.31	43.07	54.00	-10.93
4874.00	Peak	42.32	3.31	45.63	74.00	-28.37

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2437 MHz :Tx CH Mid :E2 Plan			Temp./Humi Antenna Po Engineer		NTAL
100						7
90						
80						
70						-
60						
50			· · · · · · · · · · · · · · · · · · ·			-
40						
30						
20						
10						
0 ¹ 1000	6100.	11200. Frequ	16300. iency (MHz)	21400.	265	00
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	41.67	3.31	44.98	54.00	-9.02
4874.00	Peak	44.88	3.31	48.19	74.00	-25.81

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2462 MH :Tx CH Hi :E2 Plan			Temp./Hum Antenna Po Engineer		-
100 Level (dBuV/m)			i i	i	
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80						
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0 <mark></mark> 1000	6100.	6100. 11200. 16300. 21400. 26500 Frequency (MHz)				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	38.81	3.75	42.56	54.00	-11.44
4924.00	Peak	40.93	3.75	44.68	74.00	-29.32

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Ba Frequency Operation Mo EUT Pol.	:2462 MH: ode :Tx CH Hig :E2 Plan			Temp./Hu Antenna Engineer	Pol. :HORIZO	DNTAL
100 Level (dBu						7
90						
80						
70						_
60						
						-
50						
40						
30						
20						
10	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
0 ^L 1000	6100.	11200. Frea	16300 Juency (MHz)). 2140	0. 26	500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	43.48	3.75	47.23	54.00	-6.77
4924.00	Peak	44.36	3.75	48.11	74.00	-25.89

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2412 MHz			Temp./Humi. Antenna Pol. Engineer		
100 Level (dBuV/m)					
90						
80						
70	 					
60	 					
50						
40	2					
30						
20						
10						
0 <mark></mark>	6100.	11200.	16300.	21400.	26500	
1000	0100.		ency (MHz)	21400.	20500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
N 41 1	Mode	Reading Level		FS	@3m	15
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Average	28.32	3.05	31.37	54.00	-22.63
4824.00	Peak	39.19	3.05	42.24	74.00	-31.76

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation I Frequency Operation I EUT Pol.	Mode	:802.11 :2412 M :Tx CH :E2 Pla	MHz Low				Temp./H Antenna Enginee	ı Pol.	:21.5/48 :HORIZC :Kane	NTAL
100										7
90										
80										
70										-
60					, , ,		 	 	¹	
50		2	 	L						-
40			 							
30										
20										
10										
0										
0 ^L 1000		6100.		11200. Frequer	163 ncy (MHz)	300.	214	400.	265	00
Freq.		Detecto	or Spec	trum	Factor		Actual		Limit	Margin
		Mode	Readin	g Level			FS		@3m	-
MHz		PK/QP/A	₩ dB	μV	dB	C	dBµV/m	d	BµV/m	dB
4824.00	C	Average	e 29.	75	3.05		32.80		54.00	-21.20
4824.00	C	Peak	41.	37	3.05		44.42		74.00	-29.58

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:E2 Plan			Temp./Humi. Antenna Pol. Engineer		
100 Level (dBuV/m)		i	- i			
90						
80						
70						
60						
50	2					
40		·		·····		
30						
20		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		
10						
0 ^L 1000	6100.	11200. Frequ	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
-	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	29.37	3.31	32.68	54.00	-21.32
4874.00	Peak	40.37	3.31	43.68	74.00	-30.32

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Ba Frequency Operation Mo EUT Pol.	:2437 MH ode :Tx CH Mi :E2 Plan			Temp./Hum Antenna Po Engineer		DNTAL
						7
90						
80						
70						
60				·		
50	2	· · · · · · · · · · · · · · · · · · ·	·			-
40						
30						
20				· · · · · · · · · · · · · · · · · · ·		
10						
0 ^L 1000	6100.	11200. Freq	16300. uency (MHz)	21400.	265	500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
• • • •	Mode	Reading Level		FS	@3m	15
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	30.38	3.31	33.69	54.00	-20.31
4874.00	Peak	41.22	3.31	44.53	74.00	-29.47

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11g :2462 MH: :Tx CH Hig :E2 Plan			Temp./Hum Antenna Po Engineer		-
100 Level (dBuV/m)						
90						
80						
70	· · · · · · · · · · · · · · · · · · ·					
60						
50	2					
40	2					
30						
20	· · · · · · · · · · · · · · · · · · ·					
10						
0 <mark></mark>	C100	44200	40200	24.400	20500	
1000	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	28.93	3.75	32.68	54.00	-21.32
4924.00	Peak	39.38	3.75	43.13	74.00	-30.87

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2462 MH: :Tx CH Hig :E2 Plan			Temp./Hum Antenna Po Engineer		NTAL
100]
90		· · · · · · · · · · · · · · · · · · ·				
80		·				
70						
60						
50	2	· · · · · · · · · · · · · · · · · · ·				
40						
30						
20				·		
10					 	
0 ¹ 1000	6100.	11200. Frequ	16300. ency (MHz)	21400.	265	Ĵ0
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	29.46	3.75	33.21	54.00	-20.79
4924.00	Peak	40.38	3.75	44.13	74.00	-29.87

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n2(:2412 MHz :Tx CH Lo :E2 Plan	Z		Temp./Humi. Antenna Pol. Engineer	:21.5/48 :VERTICAL :Kane	
100 Level (dBuV/m)						
100						
90				·		
80						
70				· · · · · · · · · · · · · · · · · · ·		
60						
50						
40	2					
30						
20						
10	L			· · · · · · · · · · · · · · · · · · ·		
0 1000	6100.	11200. Frequ	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
-	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Average	29.38	3.05	32.43	54.00	-21.57
4824.00	Peak	40.22	3.05	43.27	74.00	-30.73

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Test Date



:T190521W02

Report Number

•							
Operation Band	:802.11n2	0		Temp./Humi.	:21.5/48		
Frequency	:2412 MH	Z		Antenna Pol.	:HORIZONT	AL	
Operation Mode	:Tx CH Lo	w		Engineer	:Kane		
EUT Pol.	:E2 Plan			0			
100 Level (dBuV/m)						
90							
80							
70							
60							
50	2			1 1 			
40		1 1 1 1 1 1					
30							
20							
10							
0 <mark></mark>	6100.	11200.	16300.	21400.	26500		
			ency (MHz)				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
MHz	Mode PK/QP/AV	Reading Level	dB	FS dBu\//m	@3m dBu\//m	dB	
4824.00		dBµV 31.82	3.05	dBµV/m 34.87	dBµV/m 54.00	-19.13	
	Average						
4824.00	Peak	41.94	3.05	44.99	74.00	-29.01	

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n2(:2437 MHz :Tx CH Mic :E2 Plan	<u>.</u>		Temp./Humi. Antenna Pol. Engineer	:21.5/48 :VERTICAL :Kane	
100 Level (dBuV/m)						
90						
80						
70						
60						
50	2					
40						
30						
20						
10						
0 <mark></mark>	6100.	11200.	16300.	21400.	26500	
1000	0100.		ency (MHz)	21400.	20500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
4874.00	Average	<u>30.22</u>	3.31	33.53	54.00	-20.47
4874.00	Peak	40.39	3.31	43.70	74.00	-30.30

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n2(:2437 MHz :Tx CH Mic :E2 Plan	2		Temp./Humi Antenna Pol Engineer		ITAL
100 Level (dBuV/m)				i i		
90			· · · · · · · · · · · · · · · · · · ·			
80						
70				1 1 1 1 1 1 1 1 1 1 1 1		
60						
50	2					
40						
30						
20		· · · · · · · · · · · · · · · · · · ·				
10						
0 <mark>1000 6100. 11200. 16300. 21400. 26500 Frequency (MHz)</mark>)
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	31.94	3.31	35.25	54.00	-18.75
4874.00	Peak	42.02	3.31	45.33	74.00	-28.67

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

•						•
Operation Band Frequency Operation Mode	:2462 MHz	2		Temp./Hum Antenna Po Engineer		-
EUT Pol.	:E2 Plan					
100 Level (dBuV/m)					
90						
80						
70		· · · · · · · · · · · · · · · · · · ·		 		
60						
50	2				 	
40						
30						
1						
20						
10						
0						
0 <mark>1000</mark>	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
rieq.	Mode	Reading Level		FS	@3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	30.16	3.75	33.91	54.00	-20.09
4924.00	Peak	40.58	3.75	44.33	74.00	-29.67

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n20 :2462 MHz :Tx CH Hig :E2 Plan	2		Temp./Humi. Antenna Pol. Engineer	:21.5/48 :HORIZON :Kane	TAL
100 Level (dBuV/m)						
90						
80						
70	 			1 1 1 1 		
60	 					
50	2		· · · · · · · · · · · · · · · · · · ·	1 1 1 1 1 1	1	
40						
30						
20						
10						
0						
0 ^L 1000	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Average	31.57	3.75	35.32	54.00	-18.68
4924.00	Peak	42.77	3.75	46.52	74.00	-27.48

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程智科技股份有限公司

Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n4(:2422 MHz :Tx CH Lo :E2 Plan	Z		Temp./Humi. Antenna Pol. Engineer		
100 Level (dBuV/m)						
90						
80						
70						
60						
50						
40	2					
30						
20						
10						
0 <mark></mark> 1000	6100.	11200. Frequ	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz		Reading Level	dB	FS dBuV/m	@3m dBu\//m	dP
4844.00	PK/QP/AV	dBµV 26.94	3.09	dBµV/m 30.03	dBµV/m 54.00	dB -23.97
4844.00	Average Peak	26.94 38.48	3.09 3.09	30.03 41.57	54.00 74.00	-23.97 -32.43
4044.00	r can	50.40	0.09	41.57	14.00	-52.45

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode		2		Temp./Humi. Antenna Pol. Engineer	:21.5/48 :HORIZON :Kane	TAL
EUT Pol.	:E2 Plan					
100 Level (dBuV/m)						
90						
80						
70						
60	·					
50	0					
40	2					
30						
20						
10						
0 <mark>1000</mark>	6100.	11200. Frequ	16300. ency (MHz)	21400.	26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4844.00	Average	29.87	3.09	32.96	54.00	-21.04
4844.00	Peak	40.00	3.09	43.09	74.00	-30.91

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n40 :2437 MHz :Tx CH Mic :E2 Plan	2		Temp./Humi Antenna Pol Engineer		-
100 Level (dBuV/m)						
90						
80						
70	 					
60						
50						
40	2					
30	1					
20						
10						
0						
0 <mark>1000</mark>	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	27.34	3.31	30.65	54.00	-23.35
4874.00	Peak	38.10	3.31	41.41	74.00	-32.59

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Test Date



:T190521W02

Report Number

Operation Ban Frequency Operation Mod EUT Pol. 100	:2437 MHz de :Tx CH Mie :E2 Plan	2		Temp./Hum Antenna Po Engineer		NTAL
100]
90	1 7					
80	· · · · · · · · · · · · · · · · · · ·					
70						•
60					· · · · · · · · · · · · · · · · · · ·	
50	· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , ,	· · · · · · · · · · · · · · · · · · ·			
40	2					
30						
20						
10						
0 <mark></mark> 1000	6100.	11200. Frequ	16300. iency (MHz)	21400.	265	00
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Average	26.50	3.31	29.81	54.00	-24.19
4874.00	Peak	37.77	3.31	41.08	74.00	-32.92

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:2452 MH: :Tx CH Hig :E2 Plan	Z		Temp./Hum Antenna Pc Engineer		-
100 Level (dBuV/m)	· · · ·	i i	; ;	i	
90						
80						
70				·		
60						
50		· · · · · · · · · · · · · · · · · · ·				
40	2			·		
30						
20				·		
10				·		
0		11000	10000			
0 ¹ 1000	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	1
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4904.00	Average	26.82	3.56	30.38	54.00	-23.62
4904.00	Peak	37.95	3.56	41.51	74.00	-32.49

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Test Date



:T190521W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:802.11n4 :2452 MH :Tx CH Hig :E2 Plan	z		Temp./Humi. Antenna Pol. Engineer		
100 Level (dBuV/m)			-::			1
90						
80						
70						
60						
50	2					
40						
30						
20						
10		·				
0 1000	6100.	11200. Freque	16300. ency (MHz)	21400.	2650	0
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
4904.00	Average	28.28	3.56	31.84	54.00	-22.16
4904.00	Peak	39.89	3.56	43.45	74.00	-30.55

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12 POWER SPECTRAL DENSITY

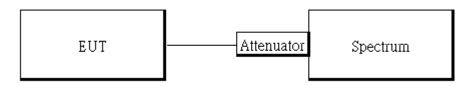
12.1 Standard Applicable

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

12.2 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/13/2019	02/12/2020
DC Block	Mini-Circuits	BLK-18-S+	31129(1)	02/26/2019	02/25/2020
Attenuator	Mini-Circuit	BW-S10W2+	1	02/26/2019	02/25/2020

12.3 Test Set-up



12.4 Measurement Procedure

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

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12.5 Measurement Result

	POWER DENSITY 802.11b_Ch1				POWER DENSITY 802.11g_Ch1			
Freq.	PSD	Limit	Result	Freq.	PSD	Limit	Result	
(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	
2412	-6.41	8.00	PASS	2412	-9.30	8.00	PASS	
2437	-5.86	8.00	PASS	2437	-9.38	8.00	PASS	
2462	-5.98	8.00	PASS	2462	-8.22	8.00	PASS	
	POWER DENSITY 802.1	11n HT20_Ch	1	POWER DENSITY 802.11n HT40_Ch1				
Freq.	PSD	Limit	Result	Freq.	PSD	Limit	Result	
(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	(MHz)	(dBm/3kHz)	(dBm/3kHz)	Result	
2412	-10.60	8.00	PASS	2422	-13.79	8.00	PASS	
2437	-9.96	8.00	PASS	2437	-11.54	8.00	PASS	
2462	-10.05	8.00	PASS	2452	-15.85	8.00	PASS	

*Refer to next page for plots

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Power Density_802.11b_20MHz_Chain1_2412MHz



Power Density_802.11b 20MHz Chain1 2437MHz



Power Density_802.11b_20MHz_Chain1_2462MHz



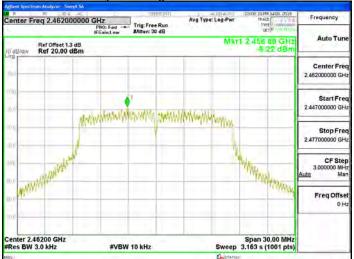




Power Density_802.11g_20MHz Chain1 2437MHz



Power Density_802.11g_20MHz_Chain1_2462MHz



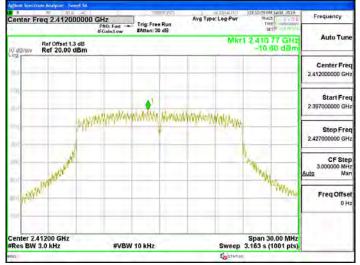
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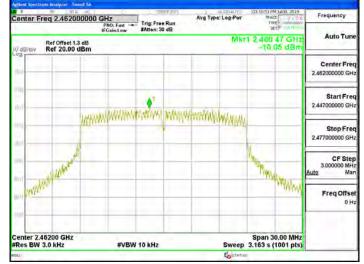
Power Density_802.11n_20MHz_Chain1_2412MHz



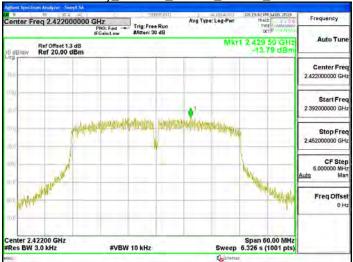
Power Density_802.11n_20MHz Chain1 2437MHz



Power Density_802.11n_20MHz_Chain1_2462MHz







Power Density_802.11n_40MHz Chain1 2437MHz



Power Density_802.11n_40MHz_Chain1_2452MHz



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13 ANTENNA REQUIREMENT

13.1 Standard Applicable

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

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

13.2 Antenna Connected Construction

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

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