

CTC Laboratories, Inc.

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TEST REPORT			
Report No. ·····:	CTC20201356E01		
FCC ID······:	ATI-AW01		
Applicant:	Action Electronics Co., Ltd.		
Address	2480, THNGKAT PERSUAHAAN ENA ZONE, 13600, PERAI, PENANG, MAL		
Manufacturer:	Action Electronics Co., Ltd.		
Address	2480, THNGKAT PERSUAHAAN ENA ZONE, 13600, PERAI, PENANG, MAL		
Product Name······:	802.11b/g/n Wi-Fi Module		
Trade Mark······:	Action		
Model/Type reference······:	AW-01		
Listed Model(s) ······:	N/A		
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247		
Date of receipt of test sample:	Aug. 27, 2020		
Date of testing	Aug. 27, 2020 to Sep. 07, 2020		
Date of issue	Sep. 15, 2020		
Result:	PASS		
Compiled by:		Tim Jiang	
(Printed name+signature)	Jim Jiang	Jin Jiang Miller Ma	
Supervised by:		naillair AN a	
(Printed name+signature)	Miller Ma	NW(B) NVA	
Approved by:		-t /	
(Printed name+signature)	Walter Chen Mutten chrs		
Testing Laboratory Name:	CTC Laboratories, Inc.		
Address	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China		
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should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CTC. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.



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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

<u>RSS 247 Issue 2:</u> Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz. <u>ANSI C63.10-2013</u>: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report Version

Revised No.	Date of issue	Description
01	Sep. 15, 2020	Original



1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 2					
Test Item	Standard Section		Result	Test Engi-	
rest item	FCC	IC	Result	neer	
Antenna Requirement	15.203	/	Pass	Rod Lou	
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Jim Jiang	
Band Edge Emissions	15.247(d)	RSS 247 5.5	Pass	Rod Lou	
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Rod Lou	
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Rod Lou	
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Rod Lou	
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Jim Jiang	

Note: (1) The measurement uncertainty is not included in the test result.



1.4. Test Facility

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth		(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



EN

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Action Electronics Co., Ltd.
Address:	2480, THNGKAT PERSUAHAAN ENAM, PRAI FREE TRADE ZONE, 13600, PERAI, PENANG, MALAYSIA.
Manufacturer:	Action Electronics Co., Ltd.
Address:	2480, THNGKAT PERSUAHAAN ENAM, PRAI FREE TRADE ZONE, 13600, PERAI, PENANG, MALAYSIA.
Factory:	Shenzhen ThingsTurn Technology Co., Ltd.
Address:	303#, Building B, Tengyao Building, No.268 Gushu Second Road, Bao'an.

2.2. General Description of EUT

Product Name:	802.11b/g/n Wi-Fi Module		
Trade Mark:	Action		
Model/Type reference:	AW-01		
Listed Model(s):	N/A		
Power supply:	3.3Vdc 300mA		
Hardware version:	V1.0		
Software version:	V1.0		
WIFI 802.11b/ g/ n(HT20)/ n(HT40)			
Modulation:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK, QPSK, 16QAM, 64QAM)		
Operation frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz		
Channel number:	802.11b/g/n(HT20): 11channels 802.11n(HT40): 7channels		
Channel separation:	5MHz		
Antenna type:	PCB Antenna		
Antenna gain:	2.0dBi		



2.3. Accessory Equipment Information

Equipment Information				
Name	Model	S/N	Manufacturer	
Notebook	X220	R9-NCMYL 12/04	Lenovo	
/	/	/	/	
Cable Information				
Name	Shielded Type	Ferrite Core	Length	
/	/	/	/	
Test Software Information				
Name	Software version	/	/	
w600_rf_test_tool	V1.1.01	1	/	



2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

Note: CH 01~CH 11 for 802.11b/g/n(HT20), CH 03~CH 09 for 802.11n(HT40)

Data Rated

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS0
802.11n(HT40)	HT-MCS0

Test mode

For RF test items: The engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions:

The EUT was set to connect with the WLAN AP under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.



Measurement Instruments List 2.5.

Tonsce	Tonscend JS0806-2 Test system				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 27, 2020
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 27, 2020
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 27, 2020
5	Power Sensor	Agilent	U2021XA	MY5365004	Dec. 27, 2020
6	Power Sensor	Agilent	U2021XA	MY5365006	Dec. 27, 2020
7	Simultaneous Sam- pling DAQ	Agilent	U2531A	TW54493510	Dec. 27, 2020
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec. 27, 2020
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 27, 2020
10	Climate Chamber	ESPEC	MT3065	/	Dec. 27, 2020
11	300328 v2.2.2 test system	TONSCEND	v2.6	/	/

Radiate	d Emission and Transmi	tter spurious emissior	าร		
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 27, 2020
2	High pass filter	micro-tranics	HPM50111	142	Dec. 27, 2020
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 27, 2020
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 27, 2020
5	Loop Antenna	LAPLAC	RF300	9138	Dec. 27, 2020
6	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 27, 2020
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Dec. 27, 2020
8	Pre-Amplifier	HP	8447D	1937A03050	Dec. 27, 2020
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 27, 2020
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 27, 2020
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX 102	DA1580	Dec. 27, 2020
14	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 27, 2020
15	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 27, 2020
16	RF Connection Cable	Chengdu E-Microwave			Dec. 27, 2020

CTC Laboratories, Inc.



17	High pass filter	Compliance Direc- tion systems	BSU-6	34202	Dec. 27, 2020
18	Attenuator	Chengdu E-Microwave	EM- CAXX-10RN Z-3		Dec. 27, 2020
19	High and low temper- ature box	ESPEC	MT3065	12114019	Dec. 27, 2020
Conduc	ted Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 27, 2020
2	LISN	R&S	ENV216	101113	Dec. 27, 2020
3	EMI Test Receiver	R&S	ESCI	100658	Dec. 27, 2020

Note: (1) The Cal. Interval was one year.

(2) The cable loss has calculated in test result which connection between each test instruments.



3. TEST ITEM AND RESULTS

3.1. Conducted Emission

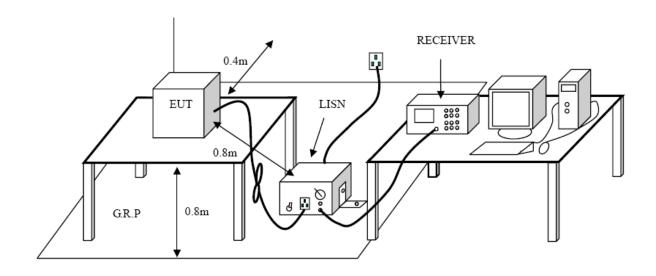
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8:

	Limit (d	BuV)
Frequency range (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration





Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.

2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.

3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

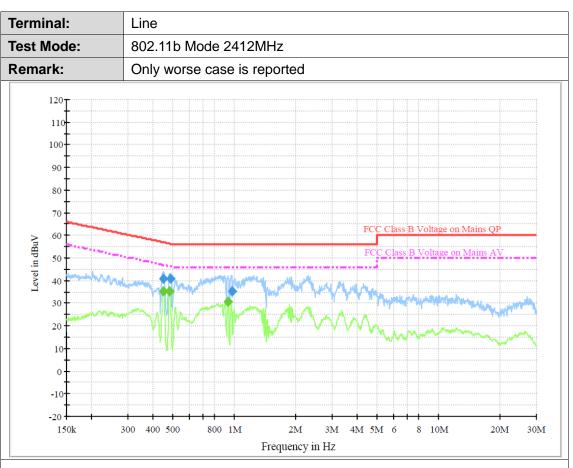
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode

Please refer to the clause 2.4

Test Results





Final Measurement Detector 1

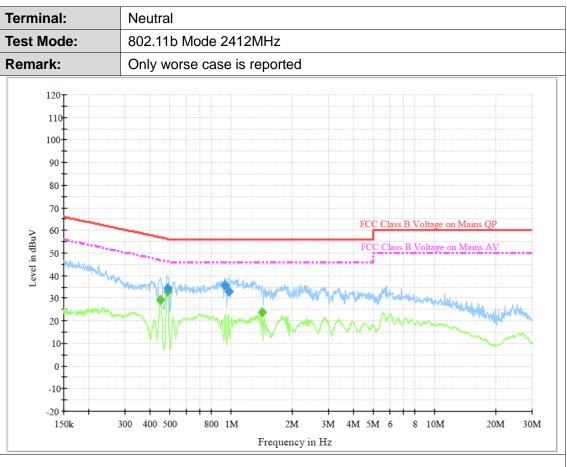
	Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
ľ	0.447850	41.0	1000.00	9.000	On	L1	9.4	15.9	56.9	
Ī	0.483140	40.8	1000.00	9.000	On	L1	9.4	15.5	56.3	
[0.967690	35.4	1000.00	9.000	On	L1	9.5	20.6	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.447850	35.1	1000.00	9.000	On	L1	9.4	11.8	46.9	
0.481210	35.3	1000.00	9.000	On	L1	9.4	11.0	46.3	
0.929820	30.8	1000.00	9.000	On	L1	9.5	15.2	46.0	

Emission Level = Read Level + Correct Factor





Final Measurement Detector 1

	Frequency (MHz)	QuasiPeak (dBµ ∀)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ ∀)	Comment
ſ	0.487010	34.2	1000.00	9.000	On	Ν	9.4	22.0	56.2	
ſ	0.929820	35.6	1000.00	9.000	On	Ν	9.5	20.4	56.0	
	0.971560	33.1	1000.00	9.000	On	Ν	9.5	22.9	56.0	

Final Measurement Detector 2

	Frequency (MHz)	Average (dBµ ∨)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ ∀)	Comment
Γ	0.447850	29.4	1000.00	9.000	On	N	9.4	17.5	46.9	
	0.483140	33.1	1000.00	9.000	On	Ν	9.4	13.3	46.3	
	1.413960	23.6	1000.00	9.000	On	N	9.5	22.4	46.0	

Emission Level = Read Level + Correct Factor



3.2. Radiated Emission

<u>Limit</u>

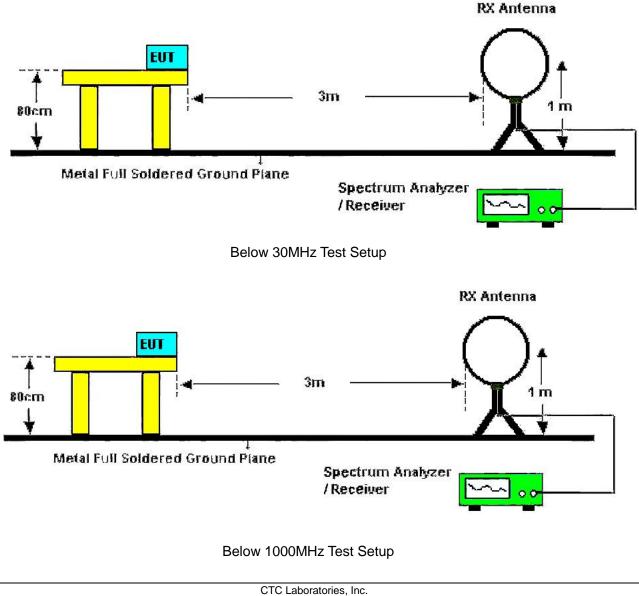
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9:

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 CHz	54.00	Average
Above 1 GHz	74.00	Peak

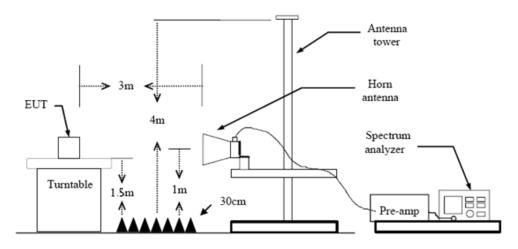
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration







Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013

2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.

3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

- 6. Use the following spectrum analyzer settings
- (1) Span shall wide enough to fully capture the emission being measured;
- (2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

(3) From 1 GHz to 10th harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW≥1/T Peak detector for Average value.

Note 1: For the 1/T& Duty Cycle please refer to clause 3.7 Duty Cycle.

Test Mode

Please refer to the clause 2.4

Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



-4.70

-3.80

46.00

46.00

QP

QP

30MHz-1GHz

Ant. Pol	-	Horizontal										
Test Mo	de:	802.	11b N	lode 2	412M	Hz						
Remark	:	Only	wors	e case	e is rep	oortec	ł					
90.0 dBu	V/m				*		34	F	CC Part15 Class B	3M Radiation Margin		
-10	40 50	60 70	0 80			(MHz)		30	00 400 5	00 600 70	0 1000.000	
No.	Frequer (MHz	-		ctor /m)	Read (dBi	_	Leve (dBuV/		Limit (dBuV/m)	Margin (dB)	Detector	
1	148.44	10	-16	6.91	56.	21	39.30	D	43.50	-4.20	QP	
2	191.74	-50	-20).26	56.	96	36.70	D	43.50	-6.80	QP	
3	252.06	27	-19	9.07	59.	67	40.60	0	46.00	-5.40	QP	
4	263.81	90	-18	8.82	59.	62	40.80	0	46.00	-5.20	QP	

Remarks:

5

6

276.1234

312.1792

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

59.79

59.78

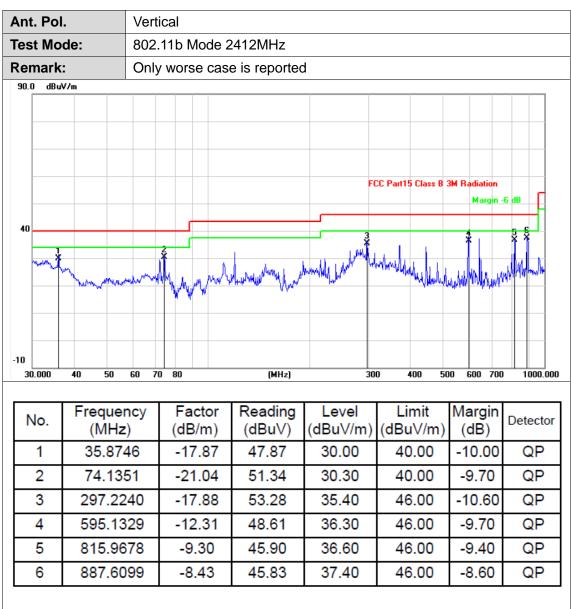
41.30

42.20

-18.49

-17.58





Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

es				Horizontal											
	t Mo	de:		TX E	B Mo	de 2	2412	2MHz							
(en	nark	:		No report for the emission which more than 10 dB below the pre- scribed limit.											
90.0	dBu\	//m	_											1	
											FCC Pa	rt15 (Class C 3M A	bove-1G Peak	
-															
											FCC		F. Cl	Above-1G A	
┝			K K								FLL	Parti	5 Llass L JI	A Above-16 A	,
		· · · · · ·													
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		Frequ	uend		Fa	acto	r	Rea	ding	Le	vel		Limit	Margin	
	lo.	Frequ			Fa		r		ding	Le				Margin	
		Frequ	ueno Hz)	cy	Fa (dl	acto	or)	Rea	ding uV)	Le (dBu	vel	(dl	Limit	Margin	
N	lo.	Frequ (M	ueno Hz) 4.06	су 9	Fa (dl	acto B/m))	Rea (dB	ding uV) 79	Le (dBu 55	vel V/m)	(dl	Limit BuV/m)	Margin (dB)	Detector
N	lo. 1 2	Freq (M 4824 4824	ueno Hz) 4.06 4.07	су 9 2	Fa (dl -2	acto B/m 2.76)))	Rea (dB 57. 52.	ding uV) 79 60	Le (dBu 55 49	vel V/m) .03 .84	(dl	Limit BuV/m) 74.00 54.00	Margin (dB) -18.97	Detector peak AVG



est N	lod	e:		TX B Mode 2412MHz											
ema	rk:			No report for the emission which more than 10 dB below the pre- scribed limit.											
0.0 d	lBuV/n	n													
											FCC Pa	ırt15 Cla	ass C 3M A	bove-1G Peak	
			2												
			2 1 1 ×								FCC	Part15	Class C 36	Above-1G A	,
40															
0 1 000.0	00 01			0.00	050	0.00	110	00.00	13500.0	0 100	00.00	18500.0)0 2100	0.00	26000.00 M
No.		Freq (M	uen IHz)		1	actor B/m)		Read (dBu	-		vel V/m)	1	imit uV/m)	Margin (dB)	Detector
1		482	3.9	04	-	2.76	\neg	55.2	24	52	.48	5	4.00	-1.52	AVG
2		482	3.9	79	-	2.76	1	60.1	19	57	.43	7	4.00	-16.57	peak



	t. Pol.				ontal									
	st Moo		Т	TX B Mode 2437MHz No report for the emission which more than 10 dB below the pre-										
Sei	mark:				port fo ed limit		emis	sion v	vhich	more t	han 1	0 dB l	below the	e pre-
90.0) dBuV	/m												
										FCC Pa	rt15 Class	C 3M At	iove-1G Peak	
			1 X							FCC	Part15 Cl	ass C 3M	Above-1G AV	
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	-									.17			-18.83	peak
	2	487	4.174	4	-2.6	51	52	.19	49	.58	54	.00	-4.42	AVG
	2	407	4.17	+	-2.0	,,	52	.13	43	.00	04	.00	-4.42	AVG



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	1	492	24.1	92	-	2.47	7	57	7.73		55	.26		74.	00	-18.74	peak
	2	492	24.1	17	-	2.47	7	52	2.80		50	.33	\square	54.	00	-3.67	AVG

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				46	<u> </u>	2.47	\top	44.2	5	41	.78	54.00	-12.22	AVG



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	1	48	323.	841		-2.7	6	53	.97	51	.21	74	1.00	-22.79	peak
	2	48	324.	039		-2.7	6	38	.31	35	.55	54	1.00	-18.45	AVG
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Test Mode: Remark: 90.0 dBuV/m 40	No	G Mode 241 report for the bed limit.			nan 10 dB l	oove-16 Peak	
90. 0 dBuV/m 40	scri			FCC Part	15 Class C 3M At	oove-16 Peak	
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1 48	23.973	-2.76	51.77	49.01	54.00	-4.99	AVG
2 48	23.997	-2.76	57.05	54.29	74.00	-19.71	peak



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	1		74.1			2.61	· ·		3.01			.40	- ·	54.		-18.60	AVG
	2	48	74.3	321	-	2.61		52	2.86	+	50	.25		74.	00	-23.75	peak



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4873.9	952	-2.61	38.1	5	35.54	54.00	-18.46	AVG
4874.3	346	-2.61	52.80	3	50.25	74.00	-23.75	peak
	3500.00 GC		Image: second system Image: second system Image: second system Image: second system 3500.00 6000.00 8500.00 Frequency (MHz) Factor (dB/m) 4873.952 -2.61	Image: second system Image: se	Frequency (MHz) Factor (dB/m) Reading (dBuV) (dBuV) 4873.952 -2.61 38.15	Frequency (MHz) Factor (dB/m) Reading (dBuV) Level (dBuV/m) 4873.952 -2.61 38.15 35.54	Frequency Factor Reading (dBuV) Level (dBuV/m) Level (dBuV/m) Limit (dBuV/m)	FCC Part15 Class C 3M Above-16 Peak FCC Part16 Peak FCC Part16 Peak </td



62MHz The emission which more than 10 dB below the pre-
FCC Part15 Class C 3M Above-1G Peak
FCC Part15 Class C 3M Above-1G AV
11000.00 13500.00 16000.00 18500.00 21000.00 26000.00
ReadingLevelLimitMargin(dBuV)(dBuV/m)(dBuV/m)(dB)
48.93 46.45 74.00 -27.55 peak
36.85 34.38 54.00 -19.62 AVG



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1	No.	Fre (1	que //Hz		1	actor IB/m)		Readi (dBu	<u> </u>		vel V/m)	1	nit V/m)	Margin (dB)	Detector
	1	48	24.5	582	-	2.76		50.6	2	47	.86	74	.00	-26.14	peak
	2	48	23.8	320	-	2.76		36.1	0	33	.34	54	.00	-20.66	AVG



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	1	48	24.0)96	-	-2.76)	54.	.01	51	.25	74.	00	-22.75	peak
	2	48	24.0)87		-2.76	;	38.	15	35	.39	54.	00	-18.61	AVG



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1	4824.	783	-2.76	50.43	47.67	74.00	-26.33	peak
2	4823.	979	-2.76	36.03	33.27	54.00	-20.73	AVG
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-	-				- 1					Margin (dB)	Detector					
4874.2	226	-2.6	1	37.35		34	.74	- 54	.00	-19.26	AVG					
4874.8	354	-2.6	1	50.74		48	.13	74	.00	-25.87	peak					
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Ant. Pol. Test Mode:			Ver	Vertical											
			TX	TX N20 Mode 2437MHz											
hark	:			No report for the emission which more than 10 dB below the pre- scribed limit.											
dBu\	//m														
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0.000	3500.00) (5000.00	850	0.00	110	00.00	13500	.00 10	000.00	1850	00.00 2	1000).00	26000.00 M
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1					-2.61		36.51		-	33.90				-20.10	AVG
2	48	4874.361			-2.61		50.61		4	48.00		74.00		-26.00	peak
	0.000	ark: dBuV/m dBuV/m 0.000 3500.00 0.000 3500.00 Free (1 48	ark: dBuV/m 2 2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4	No dBuV/m dBuV/m <td>No repose dBuV/m dBuV/m 2 3 3 4 1 4874.028</td> <td>No report for scribed limit. dBuV/m dBuV/m 2 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 <t< td=""><td>No report for the scribed limit. dBuV/m dBuV/m</td><td>No report for the emis scribed limit. dBuV/m dBuV/m 2 2 2 2 2 2 2 2 3 4</td><td>No report for the emission scribed limit. dBuV/m dBuV/m 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3</td><td>No report for the emission which scribed limit. dBuV/m dBuV/m 2 2 1 0.000 3500.00 6000.00 6000 3500.00</td><td>Aark: No report for the emission which more scribed limit. dBuV/m FCC F dBuV/m FCC F 2 FCC F 2 FCC F 2 FCC F 2 2 1 2</td><td>Aark: No report for the emission which more that scribed limit. dBuV/m FCC Part15 dBuV/m FCC Part15</td><td>Aark: No report for the emission which more than 10 c scribed limit. #BuV/m FCC Part15 Class C 3 #BuV/m FCC Part15 Class C 3 FCC Part15 Class C 3 FCC Part15 Class C 3 X FCC Part15 Class C 3</td><td>No report for the emission which more than 10 dB the scribed limit. FCC Part15 Class C 3M Athen a scribed limit. 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Test Mode:			TX N20 Mode 2462MHz No report for the emission which more than 10 dB below the pre- scribed limit.											
lemar														
90. O dB	uV/m													
										FCC Pa	rt15 Cla	ss C 3M At	oove-1G Peak	
										FCC	Pad15.1	Close C 3M	Above-1G AV	
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1000.00	0 3500.00	60	00.00	8500). 00	11000	.00 13	500.00) 160	DD.00 1	18500.0	0 21000).00	26000.00 M
No.		Frequency (MHz)			actor B/m)		Reading (dBuV)		Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	Detector
1	49	24.3	57	-2.47			51.17		48.70		74.00		-25.30	peak
2	49	4924.027		-2.47			36.70		34.23		54.00		-19.77	AVG
-	49												L	•



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scrib						pre-
1			FCC Par	t15 Class C 3M Ab	ove-16 Peak	
*			FCC Par	t15 Class C 3M Ab	ove-1G Peak	
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X						
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×			FCC	Part15 Class C 3M .	Above-1G AV	
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6000.00	8500.00 110	00.00 13500.00	0 16000.00 1	8500.00 21000.	.00	26000.00 M
uency 1Hz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
4.852	-2.47	50.73	48.26	74.00	-25.74	peak
4.171	-2.47	35.83	33.36	54.00	-20.64	AVG
	uency 1Hz) 24.852	uency Factor 1Hz) (dB/m) 24.852 -2.47	Juency Factor Reading 1Hz) (dB/m) (dBuV) 24.852 -2.47 50.73	uency Factor Reading Level 1Hz) (dB/m) (dBuV) (dBuV/m) 24.852 -2.47 50.73 48.26	Juency IHz)Factor (dB/m)Reading (dBuV)Level (dBuV/m)Limit (dBuV/m)1Hz)(dB/m)(dBuV)(dBuV/m)(dBuV/m)24.852-2.4750.7348.2674.00	Juency IHz)Factor (dB/m)Reading (dBuV)Level (dBuV/m)Limit (dBuV/m)Margin (dB)1Hz)(dB/m)(dBuV)(dBuV/m)(dB)(dB)24.852-2.4750.7348.2674.00-25.74



es	t Mod	de:		ТΧ	N40	Mode	e 24	422MF	Ηz						
ler	nark:					rt for t limit.	the	emis	sion v	vhich i	more t	han	10 dB	below the	e pre-
90.0) dBu¥	/m													
											FCC Pa	rt15 Cla	ss C 3M A	bove-1G Peak	
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0	00.000	2500.00		00.00	050	0.00	110	00.00	13500.0	0 100	DD.00	18500.0	0 2100	0.00	26000.00 M
Ν	No.	Free (N	quei //Hz		1	actor B/m)	I	Rea (dB		1	vel V/m)	1	imit uV/m)	Margin (dB)	Detector
	1	484	14.8	304		-2.70		50.	86	48	.16	74	4.00	-25.84	peak
	2	484	14.8	379		-2.70		35.	85	33	.15	5	4.00	-20.85	AVG



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est N		le:						422M							
ema	rk:					rt for limit.	' the	e emis	ssion v	vhich	more t	han 1	0 dB	below the	e pre-
0.0 d	BuV∕	m													
											FCC Par	t15 Class	C 3M At	oove-1G Peak	
											FCC F	Part15 Cla	is≎ C 3M	Above 1G AV	
			1 X												
40			2 X												
1000.0	100 3	500.00	60	00.00	850	u. UU		00.00	13500.0	1 1600	00.00 1	8500.00	21000	1.00	26000.00 MI
		_						-							
No.		Freq (N			1	acto IB/m			iding BuV)		vel iV/m)		nit V/m)	Margin (dB)	Detector
1	(MF			11	-	2.70)	49	.62	46	.92	74	.00	-27.08	peak
2		484	5.1	22	-	2.70)	35	.63	32	.93	54	.00	-21.07	AVG



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90.0 dBu	ıV/m													
										FCC Pa	t15 Clas	s C 3M Ab	ove-16 Peak	
										FCC	Part15 C	oss C 3M	Above-1G AV	
		1 X												
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	000.000 3500.00													
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	3500.00	600	0.00	8500	1 00	11(00.00	13500.00	160	DD.00 1	8500.00	21000		26000.00 MI
														1
No.		luen 1Hz)			acto B/m		Rea (dB			vel vV/m)		mit ıV/m)	Margin (dB)	Detector
1	487	4.3	56	-	2.61		50.	48	47	.87	74	.00	-26.13	peak
2	487	4.46	68	-	2.61		36.	30	33	.69	54	.00	-20.31	AVG
Remark														



nt	. Pol	•		Ver	tical											
est	t Mo	de:		ТΧ	N40	Mode	e 24	437N	lHz							
len	nark:	1			repo bed		the	emis	ssion	which	more	thai	n 10 d	Вb	elow the	e pre-
90.0	dBu∀	/m														
												.45			10.0	
											FLL Fa		LIGSS C ON	1 40	ove-16 Peak	
											FCC	Part1	5 Class C	3М /	Above-1G AV	
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40			2									_				
			*													
0 100	D0.00D	3500.00	600)0.00	850	0.00	11(00.00	13500.	00 160	00.00	19500).00 21	000.	.00	26000.00 M
N	lo.	Free (N	quer 1Hz			acto			ading BuV)		evel JV/m)		Limit BuV/n		Margin (dB)	Detecto
	1	487	73.8	54		-2.61	*	51	.17		3.56	<u> </u>	74.00	-	-25.44	peak
	2	487	74.2	36	-	-2.61		36	.45	33	3.84		54.00		-20.16	AVG
	2	101	1.2			2.01						<u> </u>	01.00		20.10	



\nt	t. Pol				Hori	zont	al											
	st Mo								452N									
Rer	mark	:					rt foi limit.		e emi	ssior	ı wł	nich	more	tha	n 1() dB	below the	e pre-
90.C	0 dBu	//m											ì					
													FCC Pa	art15	Class	C 3M AL	oove-1G Peak	
													FCC	Part	15 Cla	ss C 3M	Above-1G AV	,
40			X															
10																		
10	000.000	3500.0)0	6000). 00	850	0.00	110	00.00	1350	0.00	160	00.00	1850	0.00	21000).00	26000.00 MI
١	No.		equ (Mł		су	1	acto			ading BuV)	· ·		vel V/m)	(d	Lim Bu\		Margin (dB)	Detector
	1	4	905	.19)1	-	2.5	3	51	.04		48	.51		74.	00	-25.49	peak
	2	4	903	.10	9	-	2.5	3	35	5.88		33	.35		54.	00	-20.65	AVG
		<u> </u>																· ·



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es	st Mo	de:		ТΧ	N40	Moc	le 2	452N	lHz						
er	nark	:			repo bed			e emis	ssion v	vhich	more	han 1	0 dB	below the	e pre-
90. O) dBu\	//m						1			1		Î		
											FCC Pa	t15 Class	С ЗМ АЬ	ove-16 Peak	
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40			2												
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- L	00.000	3500.00	60	00.00	850	0.00	110)00.00	13500.0	0 160	00.00 1	8500.00	21000	.00	26000.00 MI
Ν	No.		que MHz	ncy ː)		acto			ading BuV)	1	vel IV/m)	Lir (dBu		Margin (dB)	Detector
	1	49	02.9	983	-	2.5	3	49	.78	47	.25	74	.00	-26.75	peak
	2	49	03.5	580	-	2.5	3	35	.70	33	.17	54	.00	-20.83	AVG



3.3. Band Edge Emissions

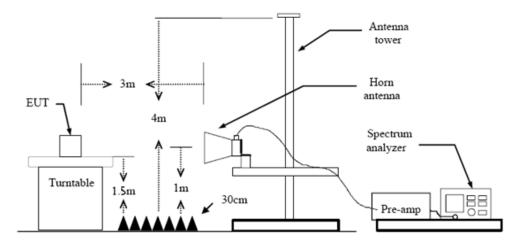
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band	(dBuV/m	ı)(at 3m)
(MHz)	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

Conducted band edge limit: The highest point of the operating frequency waveform down 20dB

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5. The receiver set as follow:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.7 Duty Cycle.

Test Mode

Please refer to the clause 2.4

Test Results



(1) Radiation Test

nt. I	Pol.			Hori	zont	al									
est l	Mod	le:		ΒM	ode	2412	M	Ηz							
10.0	dBuV	/m													
											FCC Pa	nt15 Cla	105 C 3M A	bove-16 Peak	
60											FCG	Part15	Elijasis C 314	Above-1G AV	
												, A	V		- ¹
-											ذ				
10.0															
2310	.000	2322.00	23	34.00	234	6.00	23	58.00	2370.00	2382	2.00	2394.00	2406	.00	2430.00 M
No			ΛНz)	(d	acto B/m)	(dB	ding uV)	(dBu	vel V/m)	(dB	imit uV/m)		Detector
1		239	90.0	00	3	1.10		24	.76	55	.86	7	4.00	-18.14	peak
2	2	239	90.0	00	3	1.10		11	.77	42	.87	5	4.00	-11.13	AVG
		200													

es	t Mo	de:		E	3 Ma	ode :	2412	2M⊢	łz									
10.0						546			-									
													FCC Pa	art15	Class C	эм 🗛	ove-16 Pea	
60																ſ		
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0.0	10.000			2334		2340			8.00	2370			2.00	2394		2406		2430.00 M
		F	requ	enr	τ.V	E	acto	or	Re	adin	a		vel	1	Lim	it	Margin	1
Ν	lo.		(MF		- 7		B/m			BuV)	~ .		iV/m)					Detector
	1	1	2390	00.0	0	3	1.10)	21	1.49		52	.59		74.0	0	-21.41	peak
	2	1	2390	.00	0	3	1.10)	9	.27		40	.37		54.0	0	-13.63	AVG
														-				



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110.0) dBuV	//m	1	i				1	
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						FCC Pa	rt15 Class C 3M Ab	ove-16 Peak	
60		\mathcal{A}			1				
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10.0		2448.80	2460.90	2472.90 24	184.90 2496.90) 2508.80 2	2520.80 2532.0		2556.80 MH
		Frequ	ency	Factor	Reading	Level	Limit	Margin	Detector
	lo.	(MH	-	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	Detector
	1	2483	.500	31.50	24.19	55.69	74.00	-18.31	peak
	2	2483	.500	31.50	12.30	43.80	54.00	-10.20	AVG
	narks								



Ant. F	Pol.		Vertio	cal											
lest l	Mode:		B Mo	de 2	462 N	ИНz									
110.0	dBu∀/m														-
		N	huh							FCC Par	t15 Class	С ЭМ АЬ	ove-16 Peak		
		1													
60		1		+	,	ļ				FCC	Part15 Cl	ass C 3M	Above-1G AV	•	
	\bigwedge			V	n.	2									
					~	*						····			
10.0	.000 2450	00 24	62.00	2474.0	0 2	486.00	240	8.00	2510	100 2	522.00	2534.0		2558.00	
No). F	requer (MHz	-		ictor 3/m)		eadin IBuV	_		vel V/m)	Lir (dBu	nit V/m)	Margin (dB)	Detec	tor
1	1	2483.5	00		1.50		23.12		54	.62	74	.00	-19.38	pea	ık
2	2	2483.5	00	31	.50		9.79		41	.29	54	.00	-12.71	AV	G
	arks:														



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	t Mo			GΜ	ode	241	2Mł	Ηz										
110.0) dBu∛	//m																-
												FCC Pa	urt15	Class (: 3M ÂÌ	oove-16 Pea	κ).	
60																		
00												FCC	Part	15 Clas	∮ C 3M	Above-1G A	v \	
													,				\sim	
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10.0 23	10.000	2322.00	233	4.00	2340	; 00	235	8.00	2370		2382	> 00	2394	L NN	2406.	00	2430.00	 1H
N	l o.	Freq	uen 1Hz)	-		acto B/m			ading BuV)			vel V/m)	(0	Lim IBu\		Margir (dB)	Deteo	ctor
⊢	1		0.00			1.10			3.70	+	-	.80		74.	-	-19.20) pea	ak
\vdash	2		0.00			1.10			1.73	+		.83	+	54.		-11.1	· ·	
	2	239	0.00	0	3	1.1	J	- 1	.13		42	.83		54.	00	-11.1		G
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Test N	lode:		G	Э Mc	de :	2412	2MF	łz										
110.0 d	lBuV/m																	_
60															(bove-1G Peak Above-1G AV		
10.0	000 2322	2.00	2334.	.00	2346	00	235	8.00	2370.0	0	2382	2.00	2394	l. 00	2406.	00	2430.00	MH
No.	F	requ (MF		y		acto B/m			iding BuV)		Lev Bu'	vel V/m)	(d	Limit BuV/		Margin (dB)	Detec	tor
1	1	2390	.00(0	3	1.10		21	.14		52.	24		74.0	0	-21.76	pea	ık
2	1	2390	.00(0	3	1.10		9.	17	4	40.	27	\square	54.0	0	-13.73	AV	G



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	t Mod		GM	ode 246	52MI	HZ					
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ŀ								FCC Pa	nt15 Class C 3M A	bove-16 Peak	
60		1			1 X			FCC	Part15 Class C 3	Above-1G AV	
		1									
	_				~\$						
10.0											
243	38.000 2	450.00	2462.00	2474.00	24	86.00 2498	.00	2510.00	2522.00 2534	.00	2558.00 M
N	lo.	Frequ (MF	-	Fact (dB/r		Readin (dBuV		Level IBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	2483		31.5		24.89		56.39	74.00	-17.61	peak
	2	2483	.500	31.5	50	11.42		42.92	54.00	-11.08	AVG
Por	narks:										



۱nt.	Pol.		Ver	tical										
est	Мос	le:	GN	lode 2	2462M	Hz								
110.0	dBu¥	/m												_
														1
														1
									FCC Pa	rt15 Class (: 3M AL	ove-16 Peak		
			- marine											
60														
				\rightarrow		ļ			FCC	Part15 Clas	s C 3M	Above-1G AV		
)													1
ŕ				<u> </u>		ŧ			<u> </u>					
10.0														1
	15.000	2455.00	2465.00	2475	.00 24	185.00	2495.00	2505.	00 2	2515.00	2525.	00	2545.00	_ MI
N	0.	-	uency Hz)		actor 3/m)	Rea (dB	-	Lev (dBu\		Lim (dBuV		Margin (dB)	Detect	tor
	1	248	3.500	3	1.50	22	28	53.7	78	74.0	00	-20.22	pea	k
	2	248	3.500	3	1.50	9.	75	41.2	25	54.0	00	-12.75	AVC	
	arks													



	. Pol t Mo					zont		do (2/12	MHz									
10.0					N(I I	120)	IVIO		2412										
													FCC Pa	art15	Class (: 3M A	bove-1G Pea	k	
60													FCC	Par	15 Clas	¢ C 31	Above-1G A	v \	
													į					L	
0.0	10.000	2322	.00	2334	4.00	234	G. 00	23!	58.00	2370	.00	2382	2.00	2394	1.00	2406	.00	2430.00	_ Mł
N	lo.	F	requ (Mi	ueno Hz)	cy		acto B/m			ading BuV)		Le [.] (dBu	vel V/m)	(0	Lim IBuV		Margin (dB)	Detec	:tor
	1	2	2390	0.00	0	3	1.10)	24	4.27		55.	.37		74.(00	-18.63	B pea	ak
	2	2	2390	0.00	0	3	1.10)	1	1.39		42	49		54.0	00	-11.51	AV	G



Ant. Po	I.	Verti	cal					
Test Mo	ode:	N(H	T20) Mode	2412MHz				
110.0 dBu	ıV/m							
60						rt15 Close C 3M Ab Part15 Clase C 3M		
10.0) 2322.21	2334.42	2346.63 23	950.04 2371.05	; 2383.26	2395.47 2407.	68	2432.09 MH
No.	Freque (MH	-	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.	.000	31.10	21.99	53.09	74.00	-20.91	peak
2	2390.	.000	31.10	9.26	40.36	54.00	-13.64	AVG



Ant	. Pol.			Hori	zont	al												
Fes	t Moo	de:		N(H	T20)) Mc	de	246	2MH	z								
110.0 I) dBuV	'/m																
		m	~							_		FCC P	art15 (Class C	3M AL	ove-16 Pea		
																	-	
60																		
	/				X							FC	C Part1	5 Class	C 3M	Above-1G A	V	
	\searrow			K	- 2													
	0 2442.800 2457 No. 1 2				*													
	No. (1 24																	
10.0																		
. L	42.800	2457.32	247	1.84	248	6.36	25	00.88	25	i 15.40	252	29.92	2544.	44	2558.	96	2588.00	MF
N	lo.	Freq (N	juen 1Hz)	cy		acto IB/m			eadii IBu\	-	1	evel		Limi BuV/		Margin (dB)	Detec	tor
	1	248	3.50	0		31.5		2	5.7	7	57	.27		74.0	0	-16.73	pea	ık
	2	248	3.50	0	3	31.5	0	1	1.4	8	42	.98	+	54.0	0	-11.02	· ·	
Ren	narks	:									·		1					



Ant. Po	ol.	Verti	cal					
est M	ode:	N(H	T20) Mode	2462MHz				
110.0 dE	Bu∀/m				i			
					ECC Par	t15 Class C 3M Ab	ove 10 Beak	
			<u></u>		FUC Pa	CTO CIOSS C 3M AD	overta Peak	
60					FCC	Part15 Class C 3M	Above-1G AV	
				•				
2445.00	0 2455.00	2465.00	2475.00 24	85.00 2495.00	2505.00 2	2515.00 2525.0	0	2545.00 MI
No.	Frequ	iency	Factor	Reading	Level	Limit	Margin	Detector
NO.	(MI	Hz)	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	Delector
1	2483	3.500	31.50	21.65	53.15	74.00	-20.85	peak
2	2483	3.500	31.50	9.64	41.14	54.00	-12.86	AVG



Ant. Pol		Hori	zontal					
Fest Mo	de:	N(H	T40) Mode	2422MHz				
110.0 dBu	V/m							
60						Port15 Closs C 3M A		
10.0 2302.300	2317.30	2332.30	2347.30	2362.30 2377.3	10 2392.30	2407.30 2422	. 30	2452.30 M
No.	Freque (MH:		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m	Limit) (dBuV/m)	Margin (dB)	Detector
1	2390.	000	31.10	24.94	56.04	74.00	-17.96	peak
2	2390.	000	31.10	12.27	43.37	54.00	-10.63	AVG



	. Pol			-	tical													
	t Mo	de:		N(F	IT40)) Mo	de 2	2422	MHz									
110.0) dBu\	//m																٦
												FCC	C Par	15 Clas	s C 3M A	bove-1G Peak		
																may prove	man -	
60	0											1		(V		
	0											2	FCC I	art15/C	lass C 3I	Above-1G A	/	-
	0											3	-	-			1	
	0							+										
								_										
10.0																		
22	294.500 23	2309.50) 2	324.50	233	9.50	23	54.50	2369	.50	238	4.50	2	399.50	2414	. 50	2444.50	Ш
N	lo.		que MHz	ncy z)		acto B/m			ading BuV)		Le (dBu	evel IV/n			mit IV/m)	Margin (dB)	Detec	tor
	1	23	90.0	000	3	81.1	0	25	5.73		56	.83		74	.00	-17.17	pea	k
	2	23	90.0	000	3	31.1	0	13	3.48		44	.58		54	.00	-9.42	AV	G
													1					



\nt	. Pol	•	Ho	prizont	al										
ſes	t Moo	de:	N(HT40)	Mo	de 2	2452MHz	2							
110.0) dBuV	//m													7
															1
										ECC Par	+15 Class	C 2M AL	oove-16 Peak		
		mm	m							ree r a		C ON AL	JOTE TO TEAK		
60		V	(7											
60						1				FCC	Part15 Cla	iss C 3M	Above-1G AV	1	1
				-+											ł
	-			<u>۱</u>	hun	3									
															1
10.0 24	29.500	2444.50	2459.50) 247	4.50	248	9.50 250	4.50	2519.5	50 2	534.50	2549.	50	2579.50	_
N	۱o.		Jency Hz)		acto		Readin (dBuV	-	Lev (dBuV		Lin (dBu)		Margin (dB)	Detect	tor
	1		3.500		31.50		21.47		52.9		74.		-21.03	pea	k
1	2		3.500	_	31.50		10.45		41.9		54		-12.05	· ·	
\vdash					/1.UU		10.40		71.0	,0	04.	00	-12.00		

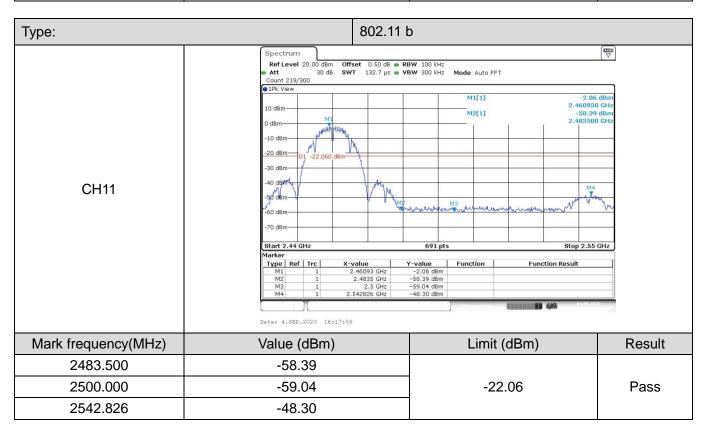


Ant	. Pol		Verti	cal							
Гes	t Moo	de:	N(H	T40) Mo	de 2	2452MHz					
110.0) dBuV	//m									
							FCC P	art15 Class C 3M At	ove-16 Peak		
60	5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									
					1 X		FCC	CPart15 Class C 3M	Above-1G AV		
	/			them	3						
						<u></u>					
10.0 24	29.500	2444.50	2459.50	2474.50	248	9.50 2504.50	2519.50	2534.50 2549.	50	2579.50	мн
N	٩o.	Frequ (MF	-	Facto		Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto	01
	1	2483	.500	31.50)	24.40	55.90	74.00	-18.10	peak	(
	2	2483	.500	31.50)	12.86	44.36	54.00	-9.64	AVG	
	narks										



(2) Conducted Test

Туре:		802.11 b			
		et 0.50 dB e RBW 100 kHz 151.7 μs e VBW 300 kHz			
CH01		691 pt: alue Y-value 41147 GHz -2.5.0 dBm		-2.50 2.41140 -4.20 M12.400000 M12.400000 M12.400000 M12.400000 M12.40000 M12.40000000 M12.400000 M12.400000 M12.40000000000000000000000	I GHZ GHZ
	M2 1 M3 1 M4 1 Date: 4.SEP.2020	2.4 GHz -44.20 dBm 2.39 GHz -57.57 dBm 998536 GHz -37.46 dBm	Measuring	G arang 49	•
Mark frequency(MHz)	Value (dBm)		Limit (dBm)	Result
2400.000	-44.20				
2390.000	-57.57		-22.	.50	Pass
2398.536	-37.46				





Туре:	8	02.11 g
		0.50 dB • RBW 100 kHz 151.7 µs • VBW 300 kHz Mode Auto FFT М1[1] -6.81 dBm 2.406950 GHz -42.59 dBm 2.400000 GHz М1[1] -6.81 dBm
CH01	-70 dBm	hunderproducer bridge and have a second
	M2 1 2	95 GHz -6.81 dBm .4 GHz -42.59 dBm 9 GHz -55.69 dBm
Mark frequency(MHz)	Value (dBm)	Limit (dBm) Result
2400.000	-42.59	
2390.000	-55.69	-26.81 Pass
2398.348	-40.15	

Туре:	80	2.11 g		
CH11	Att 30 dB SWT 132 Count 212/300 IPk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm D1 -27.270 dBm -40 dBm	M	12[1] -7.27 12[1] -7.27 2.46364 12[1] -54.53 2.48350 2.48350 	0 GHz I dBm GHz
	Start 2.44 GHz Marker Type Ref Trc X-value M1 1 2.46364 M2 1 2.43364 M3 1 2.5 M4 1 2.542029 Date: 28.AUG.2020 18:36:11	GHz -54.53 dBm GHz -56.84 dBm	Stop 2.55	GHZ
Mark frequency(MHz)	Value (dBm)	l	Limit (dBm)	Result
2483.500	-54.53			
2500.000	-56.84		-22.27	Pass
2542.029	-45.74			



Туре:	802.	11 n(HT20)	
		2.4069 M2[1] -42.	(₩) 83 dBm 550 GHz 53 dBm 000 GHz
CH01	-20 dBm 01 -26.830 dBm	maleren den such werden den den den den den den den den den	te
	Start 2.3 GHz Marker Type [Ref Trc X-value M1 1 2.40695 GHz M2 1 2.4 GHZ M3 1 2.39 GHZ M4 1 2.39655 GHZ Date: 10.582P.2020 10:01:36	-42.53 dBm -52.48 dBm	13 GHz
Mark frequency(MHz)	Value (dBm)	Limit (dBm)	Result
2400.000	-42.53		
2390.000	-52.48	-26.83	Pass
2396.652	-34.40		

Туре:	802	2.11 n(HT20	0)		
CH11	Att 30 dB SWT 132 Count 219/300 IPk View 10 dBm 0 dBm M1 -10 dBm -20 dBm 01 -27.550 dBm -30 dBm 01 -27.550 dBm	0 dB • RBW 100 kHz 7 μs • VBW 300 kHz	M1[1] M2[1]	-7.5 2.45457	18 dBm 300 GHz
	-70 dBm -70 dBm Start 2.44 GHz Marker Type Ref Trc X-value M1 1 2.44351 M2 1 2.435457 M3 1 2.54570 M4 1 2.542029 Date: 28.AUG.2020 18:50:12	Hz -56.08 dBm Hz -56.52 dBm	S Function	Function Result	5 GHz
Mark frequency(MHz)	Value (dBm)		Limit	(dBm)	Result
2483.500	-56.08				
2500.000	-56.52		-2	7.55	Pass
2452.029	-47.02				



Туре:	802.11	n(HT40)	
	Count 195/300 IPk View 10 dBm -10 dBm -20 dBm	BW 300 kHz Mode Auto FFT M1[1] -10.85 M2[1] -44.07 M2[1] -44.0 2.40000 M1 M1 M1 M1 M1 M1 M1	0 GHz ŧ dBm
CH01	-40 dBm -40 dBm -50 dBm -50 dBm -50 dBm -70	Maximum Maximum 691 pts Stop 2.43 691 pts Stop 2.43 -10.89 dBm Function -44.04 dBm -44.04 dBm -40.72 dBm -40.72 dBm	GHz
Mark frequency(MHz)	Value (dBm)	Limit (dBm)	Result
2400.000	-44.04		
2390.000	-45.21	-30.89	Pass
2397.029	-40.72		

Туре:		802.11 r	n(HT40	D)				
CH11	Spectrum Ref Level 20.00 dBm Offs Att 30 dB SW Count 234/300 FIPk View 10 dBm 0 dBm 0 dBm 10 dBm -20 dBm -20 dBm -20 dBm -40 dBm -50 dBm -60 dBm		300 kHz	Mode Auto FF 		2.456 -50 2.483	.52 dBm 950 GHz .79 dBm 500 GHz	
	M1 1 2 M2 1 M3 1	.45695 GHz 2.4835 GHz 2.5 GHz 531986 GHz	691 pts 	5 Function	Func	Stop 2.	55 GHz	
Mark frequency(MHz)	Value (dBm)			Limit	(dBm)			Result
2483.500	-50.79							
2500.000	-55.03			-2	9.52			Pass
2531.986	-45.53							



3.4. Bandwidth

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration

EUT	Spectrum Analyzer

Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. DTS Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.
 - OCB Spectrum Setting:
 - (1) Set RBW = $1\% \sim 5\%$ occupied bandwidth.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.4



Test Results

Туре	Channel	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
	01	14.785	9.160		
802.11b	06	14.785	9.160	≥500	Pass
	11	15.145	10.080		
	01	16.783	15.560		
802.11g	06	17.143	16.360	≥500	Pass
	11	16.983	16.360		
	01	18.022	15.240		
802.11n(HT20)	06	17.982	17.400	≥500	Pass
	11	18.022	17.640		
	03	36.603	35.600		
802.11n(HT40)	06	37.003	35.840	≥500	Pass
	09	36.763	36.240		



99% Bandwidth	Type: 802.11 b
99% Bandwidth	Spectrum Image: constraint of the constraint
CH06	Deter 4.552P.2020 16:13:56 Spectrum Image: Control of the con
CH11	Spectrum Image: Current to Status Ref level 30.00 dlm offset 0.50 dl # RBW 500 kHz Mater 40 dl B SWT 11.4 µs * VBW 2 MHz Current 100/100 Image: Current 100/100 IPK View M1[1] 2.4634790 GHz O dBm M1 0 dbm 00 cc Bw 15.1144853145 MHz I d dBm M1 M1 0 dbm 0 dbm 0 dbm I d dBm M1 M1 0 dbm 0 dbm 0 dbm I d dBm M1 M1 0 dbm 0 dbm 0 dbm I d dBm M1 M1 0 dbm 0 dbm 0 dbm I d dBm M1 M1 M1 0 dbm 0 dbm I d dBm M1 M1 M1 0 dbm 0 dbm I d dBm M1 M1 M1 M1 0 dbm I d dBm M1 M1 M1 M1 M1 M1 I d dBm M1



99% Bandwidth	Type: 802.11 g
	Spectrum T
	Ref Level 30.00 dBm Offset 0.50 dB ● RBW 500 kHz ● Att 40 dB SWT 11.4 μs ● VBW 2 MHz Mode Auto FFT Count 100/100
	●1Pk View
	20 dBm 0cc Bw 16.782316783 MHz
	10 dBm
2	-10 dBm
CH01	-20 dBm
	-30 dBm
	regeter have have have have have have have have
	-50 dBm
	-60 dBm
	-00 uun
	CF 2.412 CHz 1001 pts Span 40.0 MHz
	Date: 28.AUG.2020 18:29:07
	Spectrum
	RefLevel 30.00 dBm Offset 0.50 dB RBW 500 kHz
	 Att 40 dB SWT 11.4 µs → VBW 2 MHz Mode Auto FFT Count 100/100 ● IPk View
	M1[1] -0.14 dBm 2.4340830 GHz
	20 dBm Occ Bw 17.142857143 MHz
	10 dBm
	0 dBm
	-10 dBm
CH06	-20 dBm
0.100	
	-30 dBm
	And demandaria and a second and a
	-50 dBm
	-60 d8m
	CF 2.437 GHz 1001 pts Span 40.0 MHz
	Measuring
	Date: 28.AUG.2020 18:33:22
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB ● RBW 500 kHz ● Att 40 dB SWT 11.4 μs ● VBW 2 MHz Mode Auto FFT Count 100/100 FT FT FT FT FT
	Count 100/100 Ipk View M1[1] 0.15 dpm
	20 dBm 0cc Bw 16.993016983 MHz
	10 dBm
	0 dBm
	-10 dBm
CH11	-20 dBm
	-30 dBm
	AQ. den and a second and a se
	-50 dBm
	-60 dBm
	CF 2.462 GHz 1001 pts Span 40.0 MHz
	Measuring
	Date: 28.AUG.2020 18:35:35

CTC Laboratories, Inc. 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 下ax: (86)755-27521011 日は、(86)755-27521059 下ax: (86)755-27521011 日本: (86)755-27521011 日本: (86)755-27521059 下or anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <u>yz.cnca.cn</u>



99% Bandwidth	Type: 802.11n(HT20)
	Spectrum The second sec
	Ref Level 30.00 dBm Offset 0.50 dB ● RBW 500 kHz ● Att 40 dB SWT 11.4 µs ● VBW 2 MHz Mode Auto FFT
	Count 100/100
	M1[1] -1.70 dBm
	20 dBm 0Ccc Bw 18.021978022 MHz
CH01	10 dBm
	0 dBm
	174
	-10 dBm
	-20 dBm
	-30 dBm
	THE GBP AAA
	-50 dBm
	-60 dBm
	CF 2.412 GHz 1001 pts Span 40.0 MHz
	Measuring 2445-222
	Date: 28.AUG.2020 18:39:09
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB 🖷 RBW 500 kHz
	Att 40 dB SWT 11.4 µs ♥ VBW 2 MHz Mode Auto FFT Count 100/100 ● IPk View
	M1[1] -1.87 dBm
	20 dBm 0Ccc Bw 17.982017982 MHz
	10 dBm
	0 dBm
	-10 dBm
CH06	-20 dBm
	-30 dBm
	Att day and the second se
	-50 dBm
	-60 dBm
	CF 2.437 GHz 1001 pts Span 40.0 MHz
	Date: 28.AUG.2020 18:42:29
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB ● RBW 500 kHz ● Att 40 dB SWT 11.4 µs ● VBW 2 MHz Mode Auto FFT
	Count 100/100
	M1[1] -1.19 dBm
	20 dBm 0cc Bw 18.021978022 MHz
	10 dBm
	0.48m
	0 dBm
	0 dBm
CH11	0 dBm



99% Bandwidth	Type: 802.11n(HT40)
	Spectrum Ref Level 30.00 dBm Offset 0.50 dB ● RBW 1 MHz
CH03	● Att 40 dB SWT 11.4 µs ● VBW 3 MHz Mode Auto FFT Count 100/100 ●1Pk View
	20 dBm 0cc Bw 36.603396603 MHz
	10 dBm
	0 dBm
	-20 dBm
	-30 dBm
	-50 dBm
	CF 2.422 GHz 1001 pts Span 80.0 MHz
	Date: 28.AUG.2020 18:56:31
	Spectrum Ref Level 30.00 dBm Offset 0.50 dB RBW 1 MHz
	Att 40 dB SWT 11.4 µs VBW 3 MHz Mode Auto FFT Count 100/100
	20 dBm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 dBm
CH06	-10 dBm
01100	-20 dBm
	ND 48m Mm
	-50 dBm
	-60 dBm
	CF 2.437 GHz 1001 pts Span 80.0 MHz
	Date: 28.AUG.2020 19:01:19 Spectrum
CH09	RefLevel 30.00 dBm Offset 0.50 dB ● RBW 1 MHz ● Att 40 dB SWT 11.4 µs ● VBW 3 MHz Count 100/100
	●1Pk View M1[1] -0.99 dBm 2.4626290 GHz
	20 dBm Occ Bw 36.763236763 MHz
	10 dBm
	-10 dBm
	-20 dBm
	-30 dBm
	-50 dBm
	-60 dBm



6dB Bandwidth	Type: 802.11 b
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz ● Att 40 40 SWT 56.9 µs ● VBW 300 kHz
	Count 100/100 1Pk View
	M1[1] -8.05 dBm
	20 dBm M2[1] -1.43 dBm 2.4114600 GHz
	10 dBm M2
	0 dBm M1 11 LAND MULLIL
	-10 dBm D1 -7.433 dBm
	-20 dBm
CH01	-30 d8m
	- 40 dependent and a second and a
	-50 dBm
	-60 dBm-
	CF 2.412 GHz 1001 pts Span 40.0 MHz
	Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.4074 GHz -8.05 dBm
	M2 1 2.41148 GHz -1.43 dBm D3 M1 1 9.16 MHz -1.03 dB
	Metaevelog. Det 1911
	Date: 4.SEP.2020 16:13:45
	Spectrum 🕎
	RefLevel 30.00 dBm Offset 0.50 dB ● RBW 100 kHz ● Att 40 dB SWT 56.9 µs ● VBW 300 kHz Mode Auto FFT
	Count 100/100
	●1Pk View M1[1] -4.01 dBm
	20 dBm 2.4324400 GHz 2.4324400 GHz 3.52 dBm
	2.4365200 GHz
	0 dBm 01 -2.484 dBm 01 -2.484 dBm
	-20 dBm
CH06	-30 dBm
CIIOO	
	-40 dBm
	-60 dBm
	-00 UBII
	CF 2.437 GHz 1001 pts Span 40.0 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.43244 GHz -4.01 dBm M2 1 2.43652 GHz 3.52 dBm D3 M1 9.16 MHz -0.39 dB
	D3 M1 1 9.16 MHz -0.39 dB
	Date: 28.AUG.2020 18:21:54
	Spectrum (100 mm) Ref Level 30.00 dBm Offset 0.50 dB ● RBW 100 kHz
	Att 40 dB SWT 56.9 µs • VBW 300 kHz Mode Auto FFT Count 100/100
	IPk View
	20 dBm
	20 dBm M2[1] -1.72 dBm 2.4609600 GHz
	N2
	0 dBm- 10 dBm- 11 dBm- 11 dBm- 11 dBm- 11 dBm- 11 dBm- 12 dBm- 12 dBm- 12 dBm- 13 dBm- 14 dBm- 14 dBm- 15 dBm- 16 d
	- with the second secon
	-20 dem
CH11	-30 dam
	-40 ARM WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
	-50 dBm
	-60 dBm
	CF 2.462 GHz 1001 pts Span 40.0 MHz
	Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.45692 GHz -8.17 dBm - - - - - 1.7 dBm - <
	M2 1 2.46096 GHz -1.72 dBm D3 M1 1 10.08 MHz 0.28 dB
	Measuring - 🖉 (MHARA) 🎶 (HECH222)
	Date: 4.SEP.2020 16:17:08

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6dB Bandwidth	Type: 802.11 g
	Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz
	Att 40 dB SWT 56.9 μs VBW 300 kHz Mode Auto FFT Count 100/100
	● 1Pk View M1[1] -12.63 dBm
	20 dBm 22.4040400 GHz M2[1] -6.55 dBm
	10 dBm 2.4144800 GHz
	0 dBm
	-10 dBm D1 -12 550 dBm Angled the frage of t
	-20 dBm
CH01	-30 dBm
CHOT	
	40 dBm
	-60 dBm
	CF 2.412 GHz 1001 pts Span 40.0 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.40404 GHz -12.63 dBm
	M2 1 2.41448 GHz -6.55 dBm
	D3 M1 1 15.56 MHz -1.31 dB
	Date: 11.SEP.2020 14:46:56
	Ref Level 30.00 dBm Offset 0.50 dB 🖷 RBW 100 kHz
	■ Att 40 dB SWT 56.9 µs ● VBW 300 kHz Mode Auto FFT Count 100/100
	● 1Pk View
	M1[1] -10.86 dBm 2.4288000 GHz
	10 dBm
	0 d8m
	-10 dBm - D1 - 10.403 dBm - M hu Jully law have when here but you by 103
	-20 dBm
01100	
CH06	-30 dBm
	40 dem human
	-30 UBIII"
	-60 d8m-
	CF 2.437 GHz 1001 pts Span 40.0 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.4288 GHz -10.86 dBm M2 1 2.43952 GHz -4.40 dBm
	D3 M1 1 16.36 MHz -0.33 dB Measuring 21.61.22 20
	Date: 28.AUG.2020 18:33:09
	Spectrum □□□□ Ref Level 30.00 dBm Offset 0.50 dB ● RBW 100 kHz
	Att 40 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT Count 100/100
	1Pk View
	20 dBm 22.4538000 GHz
	10 dBm
	0 dBm
	-20 dam 01 -10.415 dam 04.00 -
01144	-20 dBm-
CH11	-30 dBm
	-40 dBm-
	-60 dBm
	CF 2.462 GHz 1001 pts Span 40.0 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	M2 1 2.46452 GHz -4.41 dBm
	D3 M1 1 16.36 MHz -0.33 dB
	Mit als verding au 🖉 and water and a state and a sta
	Date: 28.AUG.2020 18:35:22

CTC Laboratories, Inc.



dB Bandwidth	Type: 802.11n(HT20)
	Spectrum III Spectrum
	RefLevel 30.00 dBm Offset 0.50 dB RBW 100 kHz
	Att 40 dB SWT 56.9 µs ● VBW 300 kHz Mode Auto FFT Count 100/100
	PIR View M1[1] -14.86 dBm
	20 dBm 22.4043600 GHz M2[1] -6.46 dBm
	10 dBm 2.4170000 GHz
	0 dBm M2
	-10 dBm D1 -12.463 dBm and the barlen and and and and and and and and and an
	-20 d8m
CH01	-30 d8m
01101	40 dBm www.www.wet.prove
	-40 dbm
	-60 dBm
	CF 2.412 GHz 1001 pts Span 40.0 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.40436 GHz -14.86 dBm
	M2 1 2.417 GHz -6.46 dBm D3 M1 1 15.24 MHz 1.11 dB
	Date: 10.SEP.2020 10:04:51
	Spectrum Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz
	Att 40 dB SWT 56.9 µs ● VBW 300 kHz Mode Auto FFT Count 100/100
	IPk View
	20 dBm M1[1]13.48 dBm2.4281600 GHz
	MZ[1]
	10 dBm-
	D1 -11.553 dBm - white at the company and a start in the
	-20 dBm
CH06	-30 dBm
	-40 dBm
	-50 dBm
	-60 dBm
	CF 2.437 GHz 1001 pts Span 40.0 MHz
	Marker
	M1 1 2.42816 GHz -13.48 dBm
	D3 M1 1 17.4 MHz 1.54 dB
	Measuring
	Date: 28.AUG.2020 18:42:16
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz ➡ Att 40 dB SWT 56.9 μs ♥ BW 300 kHz Mode Auto FFT
	Count 100/100
	●1Pk View M1[1] -13.64 dBm
	20 dBm 22.4531600 GHz M2[1] -5.53 dBm
	10 dBm 2.4645200 GHz
	0 dBm
	-10.dBm
	-20 dBm
CH11	-30 dBm
	-40 dBm
	So dem
	-60 dBm
	CF 2.462 GHz 1001 pts Span 40.0 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.45316 GHz -13.64 dBm M2 1 2.46452 GHz -5.53 dBm
	D3 M1 1 17.64 MHz 0.90 dB
	Measuring 28.08.2020



3 Bandwidth	Type: 802.11n(HT40)
	Spectrum (V)
	Ref Level 30.00 dBm Offset 0.50 dB
	Count 100/100
	●1Pk View M1[1] -15.20 dBm
	20 dBm 2.4042400 GHz 2.4042400 GHz 8.14 dBm
	10 dBm 2.4257600 GHz
	0 dBm
	-10 dBm
CU 102	-30 dBm
CH03	
	-40 dBm-
	-50 dBm
	-60 dBm
	CF 2.422 GHz 1001 pts Span 80.0 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	Mi 1 2.40424 GHz -15.20 dBm M2 1 2.42576 GHz -8.14 dBm
	M2 1 2.42576 GHz -0.14 UBM D3 M1 1 35.6 MHz 0.35 dB
	N/2350ring (11111) (22.63.2223
	Date: 28.AUG.2020 18:56:18
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz
	Att 40 dB SWT 94.8 µs
	●1Pk View M1[1] -14.45 dBm
	20 dBm 20 dBm 21 -7.89 dBm
	10 dBm 2.4420400 GHz
	0.49m
	M2
01100	-20 dBm
CH06	-30 dBm
	-40 dBm
	-50 dBm
	-60 dBm-
	CF 2.437 GHz 1001 pts Span 80.0 MHz
	Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.41908 GHz -14.45 dBm -
	M2 1 2.44204 GHz -7.89 dBm D3 M1 1 35.84 MHz 0.42 dB
	Measuring (HERERE) 440 28.02.223
	Date: 28.AUG.2020 19:01:06
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB 🖷 RBW 100 kHz
	■ Att 40 dB SWT 94.8 µs ■ VBW 300 kHz Mode Auto FFT Count 100/100
	1Pk View
	20 dBm 2.4340000 GHz
	M2[1] -8.02 0Bm
	0 dBm
	-10 dBm D1 -14.022 dBm 7 and Libertal the astrony product of the state of 3
	-20 dBm
CH09	-30 dBm
	-40 dBm
	-40 dbm - Willing with Willing
	-60 dBm
	-50 UDIII
	CF 2.452 GHz 1001 pts Span 80.0 MHz
	CF 2.452 GHz 1001 pts Span 80.0 MHz Marker
	GF 2.452 GHz 1001 pts Span 80.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.434 GHz -15.21 dBm -15.21 dBm -15.21 dBm
	CF 2.452 GHz 1001 pts Span 80.0 MHz Marker
	CF 2.452 CHz 1001 pts Span 80.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.434 GHz -15.21 dBm



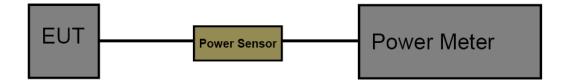
3.5. Peak Output Power

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

- 1. The maximum conducted output power may be measured using a broadband Peak RF power meter.
- 2. Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
- 3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
- 4. Record the measurement data.

Test Mode

Please refer to the clause 2.4

Test Result



Test Mode	Antenna	Channel	Result [Peak dBm]	Limit [dBm]	Verdict
		2412	10.28	<=30	PASS
11B	Ant1	2437	10.18	<=30	PASS
		2462	10.78	<=30	PASS
		2412	10.64	<=30	PASS
11G	Ant1	2437	12.92	<=30	PASS
		2462	13.05	<=30	PASS
11N20SISO	Ant1	2412	13.80	<=30	PASS
		2437	12.09	<=30	PASS
		2462	12.23	<=30	PASS
	Ant1	2422	11.89	<=30	PASS
11N40SISO		2437	12.30	<=30	PASS
		2452	12.61	<=30	PASS

Note: Test results increased RF cable loss by 0.5dB.



3.6. Power Spectral Density

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)	
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5	

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz

Set the VBW to: 10 kHz

Detector: Peak

Sweep time: Auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4



Test Result

Туре	Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result	
	01	-6.22			
802.11b	06	-6.49	≤8.00	Pass	
	11	-2.33		ļ	
	01	-12.97			
802.11g	06	-13.20	≤8.00	Pass	
	11	-13.49			
	01	-11.23			
802.11n(HT20)	06	-11.65	≤8.00	Pass	
	11	-5.11			
	03	-14.19			
802.11n(HT40)	06	-14.92	≤8.00	Pass	
	09	-15.29			



Туре:	802.11 b
	Spectrum (177) Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz Att 30 dB SWT 3.2 ms VBW 10 kHz Mode Auto FFT Count 78/100 Count 78/100 Count 78/100 Count 78/100 Count 78/100 Count 78/100
	10 dBm 10 dBm
	0 dBm
CH01	-20 dBm + +++++++++++++++++++++++++++++++++
	-50 dBm
	-70 dBm -70 dBm CF 2.412 GHz 30000 pts Span 18.32 MHz
	Date: 4.5EP.2020 16:14:24
	Att 30 dB SWT 3.2 ms VBW 3 kHz Mode Auto FFT Count 78/100 ID kHz Mode Multiple ID kHz
	10 dBm
CH06	-10 dBm
	-50 dBm
	-60 dBm
	CF 2.437 GHz 30000 pts Span 18.32 MHz Date: 28.AUG.2020 18:22:31 Measuring Measuring
	Spectrum Image: Construct of the system of th
	Pik View M1[1] -16.11 dBm 2.462583630 GHz
CH11	0 dBm
	-20 dbm
	-60 dBm
	-70 dBm CF 2.462 GHz 30000 pts Span 20.16 MHz Meaning Alebration
	Date: 4.5EP.2020 16:17:46



Туре:	802.11 g
	Spectrum []] Ref Level 20.50 dBm Offset 0.50 dB ● RBW 3 kHz Att 30 dB SWT 3.2 ms ● VBW 10 kHz
	Count 78/100
	10 dBm
	0 dBm
01107	
CH01	
	-40 de 1
	-60 dBm
	-70 dBm
	CF 2.412 GHz 30000 pts Span 19.36 MHz Measuring Measuring 20.01.2326
	Date: 28.AUG.2020 18:29:32
	RefLevel 20.50 dBm Offset 0.50 dB RBW 3 kHz ● Att 30 30 WT 5.1 ms ● VBW 10 kHz Mode Auto FFT Count<64/100
	●1Pk View M1[1] -19.33 dBm 2.43535690 GHz
	10 dBm
	-10 dBm-
CH06	-20 dBm-
01100	-30 dBm-
	-50 dBm-
	-60 dBm
	nmih 1
	Date: 28.AUG.2020 18:33:47
	Spectrum 🕎
	Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz ● Att 30 dB SWT 5.1 ms ● VBW 10 kHz Mode Auto FFT Count 81/100 ● FFF ● FFF ●
	M1[1] -18.96 dBm 2.45946910 GHz
	0 dBm
	-10 dBm
CH11	-20 obiit and the state of the
	-30 dBm
	-50 dBm
	-60 dBm
	CF 2.462 CHz 30000 pts Span 32.72 MHz
	Measuring.



Туре:	802.11n(HT20)
	Spectrum 🕎
	RefLevel 20.50 dBm Offset 0.50 dB RefLevel 20.50 d
	Count 75/100 IPk View
	M1[1] -19.33 dBm 2.412657130 GHz
	10 dBm-
	0 dBm
	-10 dBm M1
CH01	-30 AM A MARKAWA WAARAA MAANAA MA -30 Am amaa maanaa ma
	and and the drive is a second se
	450 dBm
	-60 dBm
	-70 dBm-
	CF 2.412 GHz 30000 pts Span 19.28 MHz
	Date: 28.AUG.2020 18:39:34
	Spectrum 🕎
	Ref Level 20.50 dBm Offset 0.50 dB 👄 RBW 3 kHz
	 Att 30 dB SWT 5.1 ms ● VBW 10 kHz Mode Auto FFT Count 64/100 FFT View
	● JPK View M1[1] -20.35 dBm 2.43848770 GHz
	10 dBm
	0 dBm
	-10 dBm-
	-20 dBm
CH06	-30 dBm
	a statistical de la construction de
	-40 dBm
	-50 dBm
	CF 2.437 GHz 30000 pts Span 34.8 MHz
	Measuring
	Date: 28.AUG.2020 18:44:22
	Spectrum (TTT) Ref Level 20.50 dBm Offset 0.50 dB ● RBW 3 kHz
	●1Pk View
	10 dBm 2.46045300 GHz
	0 dBm
	-10 dBm M1
CH11	-30 dBm - A 1244 AVX (A 14 AVX
	-40 dBm
	-50 dBm
	-60 dBm
	A digit state bits of the stat
	CF 2.462 GHz 30000 pts Span 35.28 MHz
	Date: 28.AUG.2020 18:50:01

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Гуре:	802.11n(HT40)
	Spectrum RefLevel 20.50 dBm Offset 0.50 dB ⊕ RBW 3 kHz
	Att 30 dB SWT 10.1 ms
	●1Pk View M1[1] -22.89 dBm 2.42599790 GHz
	10 dBm
	0 dBm
	-10 dBm-
01100	-20 dBm-
CH03	-30 dBm - Frankrik Alexandrik A
	-50 dBm
	-60 dBm
	research for search and the search a
	CF 2.422 GHz 30000 pts Span 71.2 MHz
	Date: 28.AUG.2020 18:56:56
	Spectrum 🕎
	RefLevel 20.50 dBm Offset 0.50 dB RBW 3 kHz Att 30 dB SWT 10.1 ms VBW 10 kHz Mode Auto FFT Count 38/100
	Count 39/100
	10 dBm
	0 dBm
	-10 dBm
	-20 dBm
CH06	man all phone and a thread a share the stand of the stand
	-50 d8m
	-60 dBm-
	-b0 dBm / http://www.international.com/ public and a second and a se
	рын бил
	Measuring
	Date: 28.NUG.2020 19:01:44
	Spectrum Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
	 Att 30 dB SWT 10.7 ms VBW 10 kHz Mode Auto FFT Count 37/100 FFK View
	M1[1] -22.96 dBm 2.44735280 GHz
	10 dBm-
	0 dBm
	-10 dBm
CH09	-20 dBm
	-30 dam
	-40 dbm
	-50 d8m
	geeles kit with the state of th
	CF 2.452 GHz 30000 pts Span 72.48 MHz

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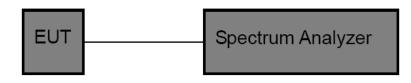


3.7. Duty Cycle

Limit

None, For report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency. Set the span to 0Hz Set the RBW to 10MHz Set the VBW to 10MHz **Detector: Peak** Sweep time: Auto Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4

Test Result

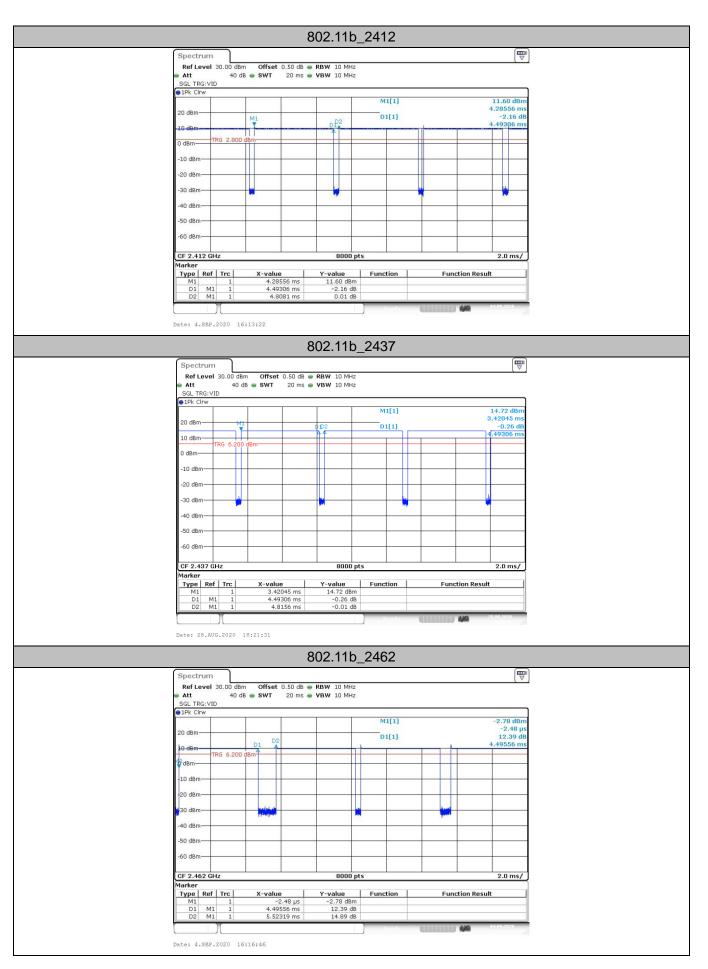
Test Mode	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
	2412	4.49	4.81	93.45	0.22	0.50
802.11b	2437	4.49	4.82	93.30	0.22	0.50
	2462	4.50	5.52	81.39	0.22	0.50
	2412	0.74	1.50	49.08	1.35	2.00
802.11g	2437	0.74	1.52	48.56	1.35	2.00
	2462	0.74	1.51	48.84	1.35	2.00
	2412	0.70	0.99	70.19	1.43	2.00
802.11n(HT20)	2437	0.70	0.99	70.15	1.43	2.00
	2462	0.70	1.00	69.66	1.43	2.00
802.11n(HT40)	2422	0.36	0.73	48.63	2.78	3.00
	2437	0.36	0.74	48.05	2.78	3.00
	2452	0.36	0.73	48.63	2.78	3.00

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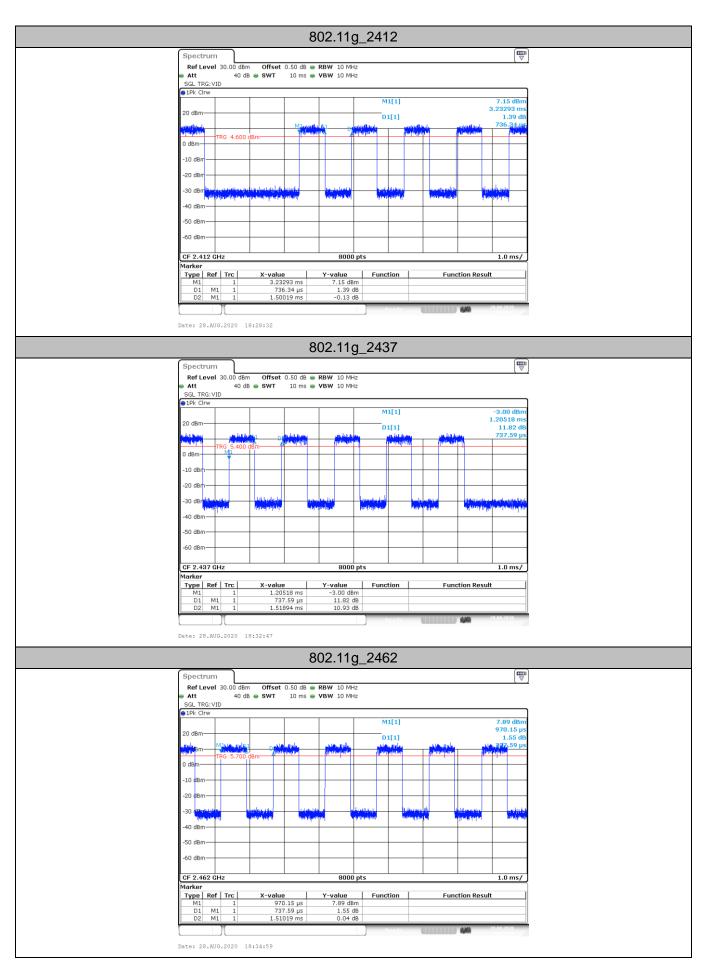
1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Fax: (86)755-27521011 Http://www.sz-ctc.org.cn For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn



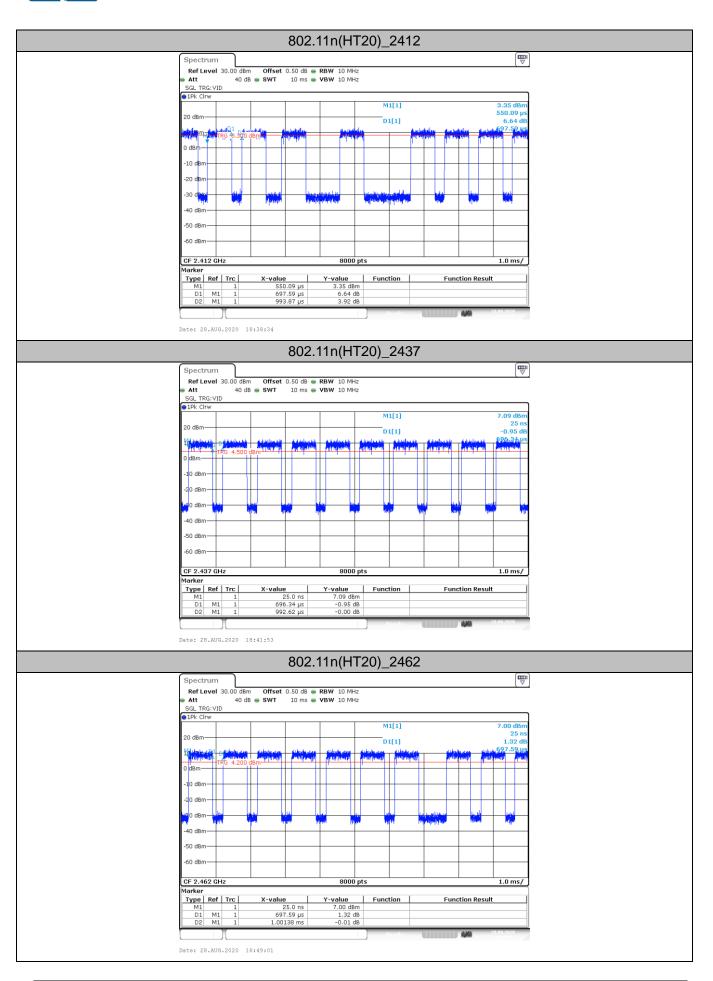




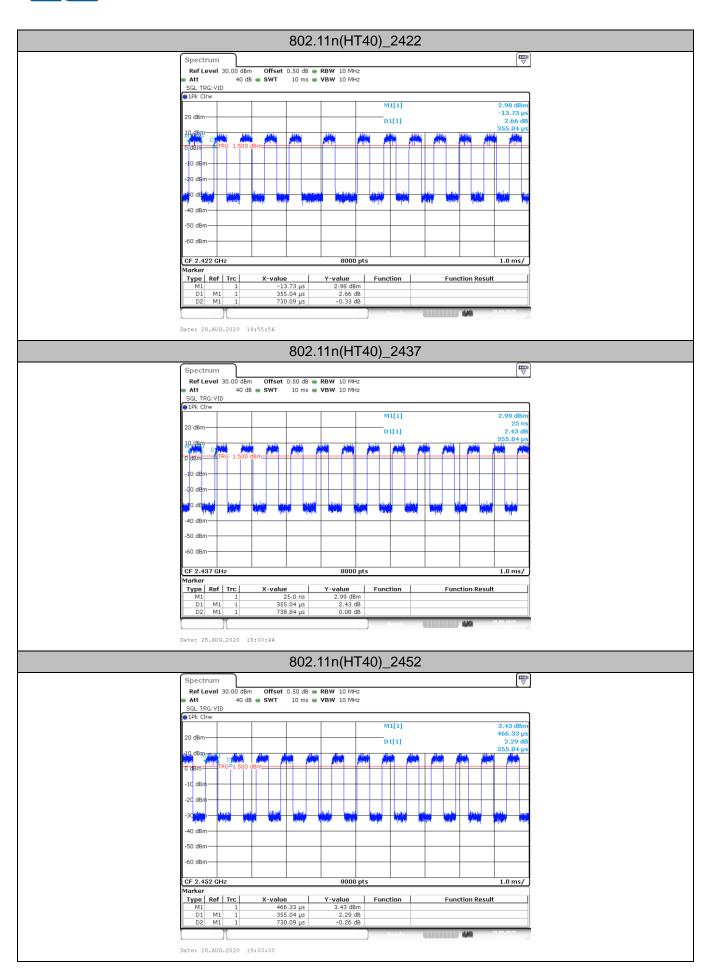
















3.8. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.