

CTC Laboratories, Inc.

2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

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TEST REPORT		
Report No	CTC20231341E03	
FCC ID	WNA-HP46H	
Applicant:	Shenzhen Skyworth Digital Tech	nology Co.,LTD
Address:	14/F,Block A,Skyworth Building,Ga District,Shenzhen,China	oxin Ave.1.S.,Nanshan
Manufacturer	Shenzhen Skyworth Digital Techno	logy Co.,LTD
Address	14/F,Block A,Skyworth Building,Ga District,Shenzhen,China	oxin Ave.1.S.,Nanshan
Product Name:	4K UHD Streaming TV Box	
Trade Mark:	SKYWORTH, STRONG, QVWI, M 9MAX, coocaa, COOCAA, TESLA,	
Model/Type reference:	HP46H	
Listed Model(s):	Leap-S3, LEAP-S3, Leap S3, MECOOL, THOMSON, KM7 PLUS, THA 200, THA200, XG500, Start-4K, 9MAX, ATBOX001 THE ULTRA, atbox001 the ultra, QQBOX s100	
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247	
Date of receipt of test sample:	Jul. 01, 2023	
Date of testing	Jul. 01, 2023 ~ Jul. 12, 2023	
Date of issue	Aug. 03, 2023	
Result:	PASS	
Compiled by: (Printed name+signature)	Lucy Lan	luoy lan
Supervised by:		
(Printed name+signature)	Eric Zhang	Zic shang Jeras
Approved by:		1 Inas
(Printed name+signature)	Totti Zhao	/ <b>*</b>
Testing Laboratory Name:	CTC Laboratories, Inc.	
Address:	.: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China	
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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 902–928MHz, 2400–2483.5MHz, and 5725-5850MHz.

ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

# **1.2. Report Version**

Revised No.	Date of issue	Description
01	Aug. 03, 2023	Original

# **1.3. Test Description**

FCC Part 15 Subpart C (15.247)			
Test Item	Test Item Standard Section		Test Engineer
Antenna Requirement	15.203	Pass	Lucy
Conducted Emission	15.207	Pass	Lucy
Conducted Band Edge and Spurious Emissions	15.247(d)	Pass	Lucy
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	Pass	Lucy
6dB Bandwidth	15.247(a)(2)	Pass	Lucy
Conducted Max Output Power	15.247(b)(3)	Pass	Lucy
Power Spectral Density	15.247(e)	Pass	Lucy
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Lucy

Note:

1. The measurement uncertainty is not included in the test result.

N/A: means this test item is not applicable for this device according to the technology characteristic of 2. device.

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# 1.4. Test Facility

#### Address of the report laboratory

#### CTC Laboratories, Inc.

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

#### Laboratory accreditation

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

#### 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 radio equipment characteristics; Part 2" 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.

Test Items	Measurement Uncertainty	Notes
DTS Bandwidth	±0.0196%	(1)
Maximum Conducted Output Power	±0.686 dB	(1)
Maximum Power Spectral Density Level	±0.743 dB	(1)
Band-edge Compliance	±1.328 dB	(1)
Unwanted Emissions In Non-restricted Freq Bands	9kHz-1GHz: ±0.746dB 1GHz-26GHz: ±1.328dB	(1)
Conducted Emissions 9kHz~30MHz	±3.08 dB	(1)
Radiated Emissions 30~1000MHz	±4.51 dB	(1)
Radiated Emissions 1~18GHz	±5.84 dB	(1)
Radiated Emissions 18~40GHz	±6.12 dB	(1)

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

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

# 1.6. Environmental Conditions

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

Temperature:	15 °C to 35 °C
Relative Humidity:	20 % to 75 %
Air Pressure:	101 kPa

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# 2. GENERAL INFORMATION

# **2.1. Client Information**

Applicant:	Shenzhen Skyworth Digital Technology Co.,LTD	
Address:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China	
Manufacturer:	Shenzhen Skyworth Digital Technology Co.,LTD	
Address:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China	
Factory:	Shenzhen Skyworth Digital Technology Co.,LTD	
Address:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China	

# 2.2. General Description of EUT

P	
Product Name:	4K UHD Streaming TV Box
Trade Mark:	SKYWORTH, STRONG, QVWI, MECOOL, XG500, Next, NEXT, 9MAX, coocaa, COOCAA, TESLA, SVI studio, QQBOX
Model/Type reference:	HP46H
Listed Model(s):	Leap-S3, LEAP-S3, Leap S3, MECOOL, THOMSON, KM7 PLUS, THA 200, THA200, XG500, Start-4K, 9MAX, ATBOX001 THE ULTRA, atbox001 the ultra, QQBOX s100
Model Difference:	All these models are identical in the same PCB, layout and electrical circuit, Different is Trade Mark and model number.
Power Supply:	DC12V 1A from AC/DC Adapter
Adapter Model 1:	YS-SKY120100U00P <sup>Note1</sup> Input: 100-240Vac 50/60Hz 0.5A Output:12Vdc 1A
Adapter Model 2:	RJ-SKY120100U00S <sup>Note2</sup> Input: 100-240Vac 50/60Hz 0.5A Output:12Vdc 1A
Hardware Version:	/
Software Version:	/

Note:

1. YS-SKY120100U0XP, (where X represents for marketing purpose with no safety impact, it can be 0-9)

2. RJ-SKY120100UXXS (XX=00-99, stands for customer code)

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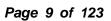
2.4G Wi-Fi	
Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/ n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Operation Frequency:	802.11b/ g/ n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
Channel Number:	802.11b/ g/ n(HT20): 11 channels 802.11n(HT40): 7 channels
Channel Separation:	5MHz
Antenna Type:	PCBA Antenna
Antenna Gain:	2.6dBi

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# 2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkBook 14G3 ACL	MP246QDR	Lenovo
Displayer	EW3270-T	EW3270U	BenQ
Cable Information	Cable Information		
Name	Shielded Type	Ferrite Core	Length
LAN Cable	Without	Without	1.5M
HDMI Cable	Without	Without	1.5M
Test Software Information			
Name	Version	/	/
SecureCRT	/	/	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 the worsted case mode.

Test Mode	Data Rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)/ (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.



## 2.5. Measurement Instruments List

Tonsce	end RF Test System				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	1 MXA Signal Analyzer Keysight		N9020A	MY46471737	Dec. 16, 2023
2	2 Spectrum Analyzer R&S		FSU26	100105	Dec. 16, 2023
3	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024
4	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 16, 2023
5	PSG Analog Signal Generator			MY46521908	Dec. 16, 2023
6	Power Sensor	Keysight	U2021XA	MY55130004	Mar. 14, 2024
7	Power Sensor	Keysight	U2021XA	MY55130006	Mar. 14, 2024
8	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 16, 2023
9	High and low temperature box	ESPEC	MT3035	/	Mar. 24, 2024
10	JS1120 RF Test System	TONSCEND	v2.6	/	/

Radiate	Radiated Emission (3m chamber 2)								
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until				
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Dec. 07, 2024				
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-648	Dec. 07, 2024				
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023				
4	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024				
5	Pre-Amplifier	SONOMA	310	186194	Dec. 16, 2023				
6	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 16, 2023				
7	Test Receiver	R&S	ESCI7	100967	Dec. 16, 2023				
8	3m chamber 2	Frankonia	EE025	/	Oct. 23, 2024				

Radiate	Radiated Emission (3m chamber 3)									
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until					
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024					
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 01, 2024					
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 16, 2023					
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 16, 2023					
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 16, 2023					
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023					

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Conducted Emission								
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until			
1	LISN	LISN R&S		101112	Dec. 16, 2023			
2	LISN	LISN R&S ENV216 101113		Dec. 16, 2023				
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 16, 2023			
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 16, 2023			
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 16, 2023			

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

2. The Cal. Interval was three years of the antenna.

3. The cable loss has been calculated in test result which connection between each test instruments.

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# 3. TEST ITEM AND RESULTS

# 3.1. Conducted Emission

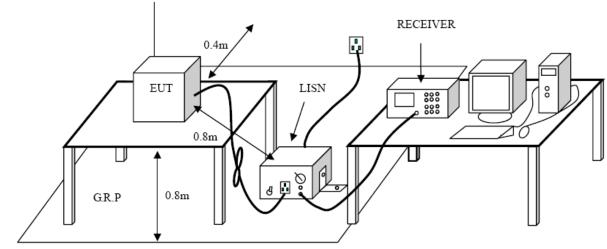
### <u>Limit</u>

### FCC CFR Title 47 Part 15 Subpart C Section 15.207

	Conducte	ed Limit (dBμV)
Frequency (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.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting 2. 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.

The EUT and simulators are connected to the main power through a line impedance stabilization 3 network (LISN). The LISN provides a 50 ohm / 50 µH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the 4. block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was 5. individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and 6. forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a 7. receiver bandwidth of 9 kHz.

During the above scans, the emissions were maximized by cable manipulation. 8.

#### **Test Mode**

Please refer to the clause 2.4.

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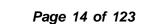


Test V	oltage	:	AC 120V	//60Hz							
Fermir	nal:		Line								
Remark:			Only worse case is reported								
	120 <del>.</del>										
	+									_	
	110										
	100										
	90										
	80										
	70										
٦	60									FCC Pa	rt15BQP
dB	50	· · · · · · · · · · · · ·								FCC Pa	rt 15 BAV
Level in dBµ	- <del>1</del> -5	William a									
Ē	40			1 ~		-			A.M.N		
	30	in			$\sqrt{2}$				M	Mullin	
	20		JAK	_	(/ )	$\langle V \rangle$	ΛΛΛ	$\Lambda M$	v m m	A SHARE	
	10			- M	¥					- Million W	the second
	+										
	0										
	-10										
	-20									1	-
	150k	30(	0 400 500	800 1M	ĺ	2M	3M	4M 5M	6 8 1	0 M 0	20M 30M
					Fr	requen	cy in H	Z			
Fina	al Me	asure	ment [	Detect	or 1	1					
Frequ	uency	QuasiPea	ak Meas	. Band	dwidth	Filte	r Lin				Comment
(M	Hz)	(dBµ V)	) Time (ms)	(k	Hz)			(dB	) (dB)	(dBµ	
0.1	51810	41		00	9.000	On	L1	9.	7 24.9	V) 9 65.9	
0.2	56100	36	6.9 1000.0	00	9.000	On	L1	9.	7 24.	7 61.6	
0.5	33840	46	6.2 1000.0	00	9.000	On	L1	9.	7 9.	8 56.0	
Fina	al Me	asurer	nent D	etecto	r 2						
	uency	Average	Meas.	Bandwi		Filter	Line	Corr.	Margin	Limit	Comment
	Hz)	(dBµ V)	Time	(kHz	)			(dB)	(dB)	(dBµ	
0.5	40270	42.3	(ms) 1000.00	Q	.000	On	L1	9.7	3.7	V) 46.0	
	91150	27.1				On	L1	9.7	18.9	46.0	
	85180	32.3				On	L1	9.9	17.7	50.0	

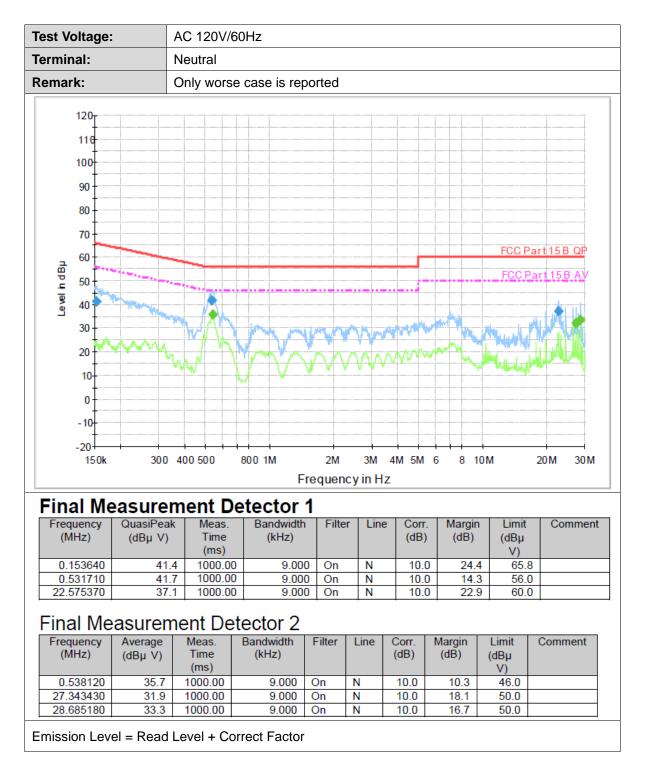
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# 3.2. Radiated Emission

### <u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009~0.490	2400/F (kHz)	300
0.490~1.705	24000/F (kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Frequency Range (MHz)	dBµV/m (at 3 meters)				
	Peak	Average			
Above 1000	74	54			

#### Note:

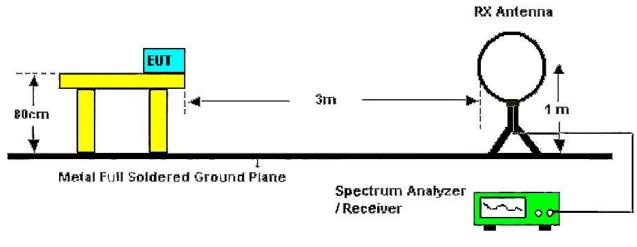
ΞN

(1) The tighter limit applies at the band edges.

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(2) Emission Level ( $dB\mu V/m$ )=20log Emission Level ( $\mu V/m$ ).

#### **Test Configuration**



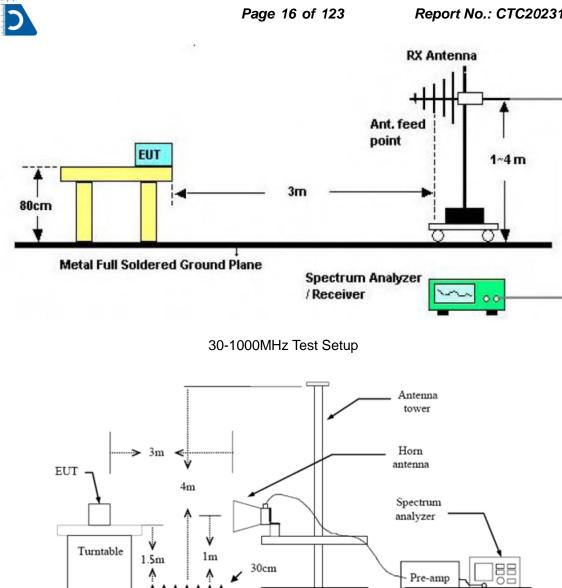
Below 30MHz Test Setup

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Above 1GHz Test Setup

## **Test Procedure**

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

The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for 2. 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.

For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna 4. 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.

- Set to the maximum power setting and enable the EUT transmit continuously. 5.
- Use the following spectrum analyzer settings 6.
- Span shall wide enough to fully capture the emission being measured; (1)
- (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 guasi-peak detector and reported.

(3) From 1 GHz to 10<sup>th</sup> harmonic:

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

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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 3.8 Duty Cycle.

#### Test Mode

Please refer to the clause 2.4.

#### Test Result

#### 9 kHz~30 MHz

From 9 kHz to 30 MHz: The conclusion is PASS.

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

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Remark:     Only worse case is reported.       90.0     dBuV/m       80	Class B 3M Radiation
Remark:     Only worse case is reported.       90.0     dBuV/m       80	
90.0 dBuV/m 80 70 60 50 40	
80 70 60 50 40	
70 60 50 40	
60 50 40	
40 FCC Part1	
40	
40	1B
30	§
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30.000 60.00 (MHz) 300.00	1000

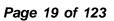
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	62.8707	36.34	-19.13	17.21	40.00	-22.79	QP
2	131.7577	40.75	-18.35	22.40	43.50	-21.10	QP
3	166.0680	41.90	-17.61	24.29	43.50	-19.21	QP
4	278.0668	37.86	-17.80	20.06	46.00	-25.94	QP
5	369.4047	37.57	-15.53	22.04	46.00	-23.96	QP
6 *	787.8512	34.91	-7.47	27.44	46.00	-18.56	QP

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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Ant. No.		Ant	1							
Ant. Pol.	•	Ver	Vertical							
Test Mod	de:	ΤХ	802.1	1b Mo	de 2412MHz					
Remark:	:	Onl	Only worse case is reported.							
90.0 dBu	V/m			1						
80										
70										
60										
50							CC Part15 Class B 3 argin -6 dB	M Radiation		
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					_					
No.	Frequenc (MHz)	У	Rea (dB	-	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
1	44.9006		42.	.45	-17.73	24.72	40.00	-15.28	QP	
2 *	61.9951		49.	.35	-18.97	30.38	40.00	-9.62	QP	
3	123.6985	5	42.	20	-19.00	23.20	43.50	-20.30	QP	
4	362.9844	F [	39.	64	-15.67	23.97	46.00	-22.03	QP	

5 6

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

-12.67

-11.01

28.64

26.52

46.00

46.00

-17.36

-19.48

QP

QP

41.31

37.53

2.Margin value = Level -Limit value

499.4247

586.8437

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Above	1GHz
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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4824.000	48.18	-2.36	45.82	74.00	-28.18	peak
2 *	4824.000	35.17	-2.36	32.81	54.00	-21.19	AVG

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

Ant. No.	Ant 1			
Ant. Pol.	Vertical			
Test Mode:	TX 802.11b Mode 2412MHz			
Remark:	No report for the emission which more than 20 dB below the prescribed limit.			

	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
Γ	1	4824.000	47.18	-2.36	44.82	74.00	-29.18	peak
Γ	2 *	4824.000	33.78	-2.36	31.42	54.00	-22.58	AVG

Remarks:

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

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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4873.999	34.23	-2.14	32.09	54.00	-21.91	AVG
2	4874.001	47.65	-2.14	45.51	74.00	-28.49	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4874.000	33.82	-2.14	31.68	54.00	-22.32	AVG
2	4874.001	47.25	-2.14	45.11	74.00	-28.89	peak

Remarks:

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

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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4924.000	33.55	-1.93	31.62	54.00	-22.38	AVG
2	4924.001	47.23	-1.93	45.30	74.00	-28.70	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4924.000	33.39	-1.93	31.46	54.00	-22.54	AVG
2	4924.001	46.89	-1.93	44.96	74.00	-29.04	peak

Remarks:

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

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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4824.000	34.91	-2.36	32.55	54.00	-21.45	AVG
2	4824.001	48.26	-2.36	45.90	74.00	-28.10	peak

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

Ant. No.	Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4824.001	47.20	-2.36	44.84	74.00	-29.16	peak
2 *	4824.001	33.84	-2.36	31.48	54.00	-22.52	AVG

Remarks:

EN

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

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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4874.000	48.47	-2.14	46.33	74.00	-27.67	peak
2 *	4874.000	34.07	-2.14	31.93	54.00	-22.07	AVG

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
ĺ	1	4874.000	46.78	-2.14	44.64	74.00	-29.36	peak
ľ	2 *	4874.000	33.68	-2.14	31.54	54.00	-22.46	AVG

Remarks:

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

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Ant. No.	Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4924.001	46.96	-1.93	45.03	74.00	-28.97	peak
2 *	4924.001	33.73	-1.93	31.80	54.00	-22.20	AVG

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4924.000	46.60	-1.93	44.67	74.00	-29.33	peak
2 *	4924.000	33.35	-1.93	31.42	54.00	-22.58	AVG

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4824.000	47.28	-2.36	44.92	74.00	-29.08	peak
2 *	4824.000	33.84	-2.36	31.48	54.00	-22.52	AVG

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

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4823.999	47.36	-2.36	45.00	74.00	-29.00	peak
2 *	4824.001	33.80	-2.36	31.44	54.00	-22.56	AVG

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4874.000	47.45	-2.14	45.31	74.00	-28.69	peak
2 *	4874.001	33.81	-2.14	31.67	54.00	-22.33	AVG

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4873.999	47.12	-2.14	44.98	74.00	-29.02	peak
2 *	4874.000	33.76	-2.14	31.62	54.00	-22.38	AVG

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4923.999	33.51	-1.93	31.58	54.00	-22.42	AVG
2	4924.001	47.31	-1.93	45.38	74.00	-28.62	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4923.999	47.16	-1.93	45.23	74.00	-28.77	peak
2 *	4924.000	33.61	-1.93	31.68	54.00	-22.32	AVG

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2422MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4843.999	47.48	-2.27	45.21	74.00	-28.79	peak
2 *	4843.999	33.86	-2.27	31.59	54.00	-22.41	AVG

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

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2422MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4844.000	48.15	-2.27	45.88	74.00	-28.12	peak
2 *	4844.000	33.81	-2.27	31.54	54.00	-22.46	AVG

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4873.999	47.17	-2.14	45.03	74.00	-28.97	peak
2 *	4874.000	33.71	-2.14	31.57	54.00	-22.43	AVG

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4873.999	33.83	-2.14	31.69	54.00	-22.31	AVG
2	4874.000	47.25	-2.14	45.11	74.00	-28.89	peak

Remarks:

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

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Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2452MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4903.999	33.52	-2.01	31.51	54.00	-22.49	AVG
2	4904.000	47.88	-2.01	45.87	74.00	-28.13	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2452MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	4903.999	33.73	-2.01	31.72	54.00	-22.28	AVG
2	4904.000	46.74	-2.01	44.73	74.00	-29.27	peak

Remarks:

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

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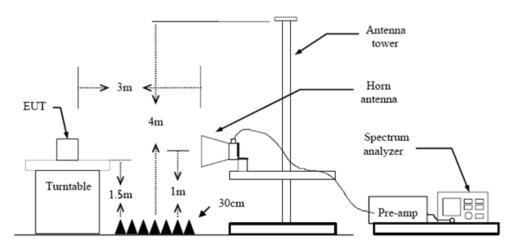
# 3.3. Band Edge Emissions (Radiated)

<u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)

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

### 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 3.8 Duty Cycle.

#### Test Mode

Please refer to the clause 2.4.

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Ant.	No.			Ant 1											
Ant.	Pol.			Horiz	zontal										
Test	Mod	e:		TX 8	02.11b	Мо	de 241	2M⊦	Ιz						
120.0	dBu¥	/m			1										1
110 _															
100 -								_					~~ <u>~~</u>		
90 -								_						h	
80 -											FCC Parl	150 30	Above-1G P	ak .	
70											TCC T UN				
60 -												$\mathcal{A}$		$-\Delta$	
50											FCC Parl	1950 30	Above-1G A	/ • ·	
40											2				
30											~ ×				
20 _															
10 _															
0.0					- 00										
2281	0.000	2295.00	2310.0	U 232	5.00	2340	I) UU.	4Hzj	237	0.00	2385.00	2400.	.00 2415	).UU 243	ē0.00
No		Frequ	iency	Re	ading	3	Facto	or	Le	vel	Li	mit	Margir	Deter	
	J.	(MI	Hz)	(d	BuV)		(dB/n	า)	(dBuV/m)				(dB)	Detect	or
1		2386	.800	5	8.11	+	-7.73	3	50	.38	74	.00	-23.62	2 peal	k
2	*	2386	.800	5	58.11 50.88		-7.73	3	43	.15	54	.00	-10.85	AVC	5
3		2390	.000	5	5.87	1	-7.72	2	48	.15	74	.00	-25.85	j peal	k
4		2390	.000	4	4.00	1	Factor (dB/m) -7.73 -7.72 -7.72		36	.28	54	.00	-17.72	AVG	5
L															
Rema	<u>.</u>														

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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Ant. No.			Ant 1											
Ant. Pol.			Vertical TX 802.11b Mode 2412MHz											
Test Mod	de:													
120.0 dBu	V/m		1											
110														
90														
BO											5	m l		
70									FCC Parl	15C 3M /	Above/1G F	eak h		
50														
									FCC Parl	15C 3M /	Above-1G A	v (		
50						1 X				3 X	1			
10						2				4	V	V		
30						-	·			~				
20														
0.0														
	2290.50	2305.50	2320.50	23	:35.50 (M	IHz)	236	5.50	2380.50	2395.	.50 241	0.50 2425		
No.		uency Hz)	Readi (dBu\		Factor (dB/m)			vel V/m)	Limit (dBuV/m)		Margi (dB)			
1	2353	3.380	49.7	8	-7.89	)	41	.89	74	.00	-32.1	1 peak		
2 *	2353	3.380	40.5	1	-7.89	)	32	.62	54	.00	-21.3	8 AVG		
3	2390	000.	49.7	2	-7.72	2	42.00		74.00		-32.0	0 peak		
4	2390	000.	38.8	5	-7.72	2	31	.13	54	.00	-22.8	7 AVG		

..., 2.Margin value = Level -Limit value

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Ant	. No.				Ant 1	1													
Ant	. Pol.				Horiz	Horizontal													
Tes	t Mod	le:			TX 802.11b Mode 2462MHz														
120.0	) dBu\	//m				Ì													1
110																			
100			~~~																
90		N V	h																
80																			
70													FCC	C Part	15C 3M	Above	1G Pea	ak	
	$\square$			$\mathbb{V}$	h														1
60	<u>/'</u>			<u> </u>	1.	3 X							FC	2 Part	15C 3M	Above	16 AV		
50	/				× g	<b>4</b>													
40					- &								·						
30																			
20																			
10																			
0.0 24	41.500	2456.50	247	71.50	248	36.50	250	)1.50	(MH:	z)	253	1.50	254	6.50	2561	.50	2576.	50 259	 91.50
<u> </u>																		1	
	<b>1</b> 0.		quen	су		adir	-		ctor			vel		Lin			rgin	Detect	tor
Ľ		(N	/Hz)		(d	lBuV	)	(dE	3/m)		(dBu	V/m)	(C	Bu	√/m)	(d	B)		
	1	248	3.50	0	5	8.65	5	-7	.32		51	.33		74.	00	-22.67		pea	k
	2	248	3.50	0	4	7.62	2	-7	.32		40	.30		54.	00	-13	8.70	AVC	3
	3	248	8.06	0	6	1.81		-7	-7.30		54	.51	$\uparrow$	74.00		-19.49		pea	k
	4 *	248	8.06	0	5	2.96	;	-7	.30		45	.66	$\vdash$	54.	00	-8	.34	AVC	3
					1								1						
	narks	: (dB/m)	A		-	1 / .													

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2.Margin value = Level -Limit value

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Ant. No.		Ant 1	Ant 1 Vertical											
Ant. Pol.		Vertical												
est Mod	de:	TX 802.	TX 802.11b Mode 2462MHz											
20.0 dBu	V/m										1			
10														
00														
	-m													
	<u>`</u> \						FCC Part 15C	3M Abov	e-1G Pea	k				
								_						
י							FCC Part 15C	3M Abov	e-1G AV					
		1												
) <del> </del>	h	1 X												
יין נ		2												
D								_						
0								_						
0.0														
2450.000	2465.00 2480	.00 2495.00	2510.00	(MHz)	2540.	00 2	2555.00 2	570.00	2585.0	)0 260	0.0			
No.	Frequenc (MHz)	y Read (dBu	-	Factor (dB/m)		rel //m)	Limit (dBuV/m)		argin (dB)	Detect	toı			
1	2483.500	) 49.4	0 -7	.32	42.08		74.00	-3	31.92	pea	k			
2 *	* 2483.500 39.18		8 -7	.32	31.8	36	54.00	-2	2.14	AVC	3			
emarks														

ntenna ⊢actor ( Cable Factor (dB) 2.Margin value = Level -Limit value

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Ant	. No.			Ant 1									
Ant	. Pol.			Horiz	contal								
Test	t Mod			TX 8	02.11g N	lode 2	412MF	Ηz					
120.0	dBu\	//m											
110													
100													
90											_	m	
80										ECC Dark 11		Above-1G Pea	L
70													
60										1 X		1	
50											5C 3M /	Above-1G AV	$\rightarrow$
40										2			
30										/			
20													
10													
0.0													
22้	84.500	2299.50	2314.5	0 232	9.50 23	44.50	(MHz)	237	4.50	2389.50	2404.	50 2419.	50 2434.50
N	lo.		uency Hz)		ading BuV)		ctor /m)	1	vel	Lim (dBuV		Margin (dB)	Detector
-	1	2390	-		8.68	-7.			.96	74.0		-13.04	peak
				_									· ·
2	<u> </u>	2390	0.000	5	2.12	-7.	12	44	.40	54.0	U	-9.60	AVG
Der													

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



Ant. No			Ant 1									
Ant. Po	I.		Vertica	ıl								
Fest Mo	de:		TX 802	2.11g N	lode 241	2MF	Ηz					
120.0 dB	uV/m											
110												
90												
30												
70									FCC Parl	: 15C 3M /	Above-1G Pea	k
50												
50									FCC Parl	: 15C 3M /	Above-1G AV	
						X				3 X		
30						2				4		V.
20												
0.0												
2277.000	) 2292.00 23	307.00	2322.	00 23	37.00 (	MHz)	236	7.00	2382.00	2397.	00 2412.0	0 2427
No.	Frequer (MHz)	-		ding uV)	Fact (dB/r		1	vel iV/m)		mit IV/m)	Margin (dB)	Detecto
1	2352.84	40	51	.27	-7.8	9	43	.38	74	.00	-30.62	peak
2 *	2352.84	40	40	.89	-7.8	9	33	.00	54	.00	-21.00	AVG
3	2390.00	00	51	.92	-7.7	2	44	.20	74	.00	-29.80	peak
	2390.00	00	38	.63	-7.7	2	30	.91	54	.00	-23.09	AVG
4												

2.Margin value = Level -Limit value



nt. No.		Ant 1					
nt. Pol.		Horizontal					
est Mod	de:	TX 802.11g	Mode 2462M	Ηz			
20.0 dBu	V/m			i			
10							
00							
1 [							
'					FCC Part 15C 3M /	Above-16 Pea	k
'   -  -  -		1 X					
					FCC Part 15C 3M /	Above-1G AV	
		2					
·							
۱							
۱							
ı							
).0 2447.470	2462.37 2477.2	27 2492.17 2	2507.07 (MHz)	2536.87	2551.77 2566.	67 2581.5	57 2596.4
	1			1			
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2483.500	75.13	-7.32	67.81	74.00	-6.19	peak
2	2483.500	54.24	-7.32	46.92	54.00	-7.08	AVG
2	2483.500	54.24	-7.32	46.92	54.00	-7.08	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



Ant. No.		Ant 1					
Ant. Pol.		Vertical					
Fest Mod	de:	TX 802.11g	Mode 2462MI	Ηz			
20.0 dBu	V/m					1	
10							
00							
0							
0							
0					FCC Part 15C 3M /	Above-1G Pea	ik
0							
o					FCC Part 15C 3M /	Above-1G AV	
0		1 X					
- Y		2					
			······································				
0							
0							
2450.500	2465.50 2480	.50 2495.50	2510.50 (MHz)	2540.50	2555.50 2570.	50 2585.	50 2600.5
N	Frequenc	y Reading	Factor	Level	Limit	Margin	
No.	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)		Detector
1	2483.500	50.42	-7.32	43.10	74.00	-30.90	peak
2 *	2483.500	38.98	-7.32	31.66	54.00	-22.34	AVG

2.Margin value = Level -Limit value



		Ant	1 + Ant 2					
Ant. Pol.		Hor	izontal					
est Mod	de:	TX	802.11n(H	IT20) Mode 2	2412MHz			
20.0 dBu	V/m				i			
10								
00								
o								
						FCC Part 15C 3M /	Above-1G Pea	k
0						^ ,		
						FCC Part 15C 8M /	Above-1G AV	
						×1		Υ.
)								
•						-		
D								
D.0 2236.000	2256.00 2270	6.00 22	296.00 23	16.00 (MHz)	2356.00	2376.00 2396.	00 2416.0	0 2436.0
No.	Frequenc (MHz)		eading dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	2390.000	2	77.62	-7.72	69.90	74.00	-4.10	peak
1	1		57.74	-7.72	50.02	54.00	-3.98	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



No.			Ant 1 + A	nt 2									
. Pol.			Vertical										
t Mode:			TX 802.1	1n(HT	20) Moc	de 2	412M	Hz					
dBu∀/m								1		1			
													u
									FCC Part	15C 3M /	Above-16	Peak	
													+
									FCC Part	15C 3M /	Above-1G	AV	-+
											1 X		
													-+
											2 X		
26.000 22	46.00	2266.00	2286.00	2306	.00 (M	Hz)	234	6.00	2366.00	2386.	00 24	06.00	2426
lo. F	Freque	-	Readi (dBu'	<b>-</b>	Facto (dB/m			vel IV/m)	Lir (dBu'		Marg (dB)		etecto
1 :	2390.	000	54.5	5	-7.72		46	.83	74.	00	-27.1	7	peak
2 *	2390.	000	38.4	5	-7.72		30	.73	54.	00	-23.2	27	AVG
													-

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2.Margin value = Level -Limit value

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Ant. No.		Ant 1 + Ant	2				
Ant. Pol.		Horizontal					
Fest Mod	de:	TX 802.11n	(HT20) Mode 2	2462MHz			
20.0 dBu	₩/m	_					
10							
00							
0							
	$\left( \right)$						
					FCC Part 15C 3M /	Above-1G Pea	ik
	×						
	No. No.				FCC Part 15C 3M	Above-1G AV	
•	×						
D		<u> </u>					
0							
o							
0							
0.0 2440.000	2460.00 2480.0	0 2500.00	2520.00 (MHz)	2560.00	2580.00 2600.	00 2620.0	00 2640.0
No.	Frequency (MHz)	v Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2483.500	76.90	-7.32	69.58	74.00	-4.42	peak
2	2483.500	56.68	-7.32	49.36	54.00	-4.64	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



nt. No.	·	Ant 1 + A	Ant 2				
nt. Pol		Vertical					
est Mo	de:	TX 802.1	11n(HT20) Mode	2462MHz			
20.0 dBu	ıV/m			Ì		1	
10							
					FCC Part 15C 3M /	Above-1G Pea	k
$\parallel$							
					FCC Part 15C 3M /	Above-1G AV	
	1 X						
	2						
	×						
·							
·							
.0 2448.000	2468.00 2488	.00 2508.00	2528.00 (MHz	2568.00	2588.00 2608.	00 2628.0	00 2648.0
No.	Frequenc (MHz)	y Readi (dBu		Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	) 53.2	.8 -7.32	45.96	74.00	-28.04	peak
2 *	2483.500	) 38.6	68 -7.32	31.36	54.00	-22.64	AVG
		·	·			-	
emarks							

2.Margin value = Level -Limit value

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	Horizontal TX 802.11n(I	HT40) Mode 2	2422MHz			
	TX 802.11n(l	HT40) Mode 2	2422MHz			
					- Andrew -	
				FCC Part 15C 3M A	\bove-1G Peal	ĸ
				X		
				FCC Part 15C 3M A	bove-1G AV	
				- Arter Pr		
70.00 2290.0(	1 2310.00 2	330.00 (MHz)	2370.00	2390.00 2410.0	00 2430.0	10 2450.0
-						
(MHz)	(dBuV)	(dB/m)			Margin (dB)	Detecto
2390.000	74.25	-7.72	66.53	74.00	-7.47	peak
2390.000	59.42	-7.72	51.70	54.00	-2.30	AVG
	requency (MHz) 2390.000	requency (MHz) Reading (dBuV) 2390.000 74.25	requency (MHz) Reading (dBuV) Factor (dB/m) 2390.000 74.25 -7.72	Trequency (MHz) Reading (dBuV) Factor (dB/m) Level (dBuV/m) 2390.000 74.25 -7.72 66.53	Trequency (MHz)Reading (dBuV)Factor (dB/m)Level (dBuV/m)Limit (dBuV/m)2390.00074.25-7.7266.5374.00	Trequency (MHz)Reading (dBuV)Factor (dB/m)Level (dBuV/m)Limit (dBuV/m)Margin (dB)2390.00074.25-7.7266.5374.00-7.47

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



Ant. M	No.			Ant 1	+ Ant 2									
Ant. F	Pol.			Verti	cal									
Test I	Mode	e:		TX 8	02.11n(H	T40) Mod	de 2	422M	Hz					
120.0	dBu¥	/m				1								
10 -														
00														
0														
0										FCC Part	150 30	Above-16, Bea		
70 <b>–</b>														
50 –														
50										FLC Part	15C 3M /	Above-1G AV		
io										×				
10										2 X				
20 -														
IO -														
0.0	000	2264.00	2284.00	220	4.00 23	24.00 (M	Hz)		4.00 2	2384.00	2404.	00 2424.	00 244	
No	<b>)</b> .		uency Hz)		ading BuV)	Facto (dB/m		I	vel V/m)		nit V/m)	Margin (dB)	Detect	tor
1		2390	000.	5	3.81	-7.72		46	.09	74	.00	-27.91	peal	k
2	*	2390	000.	3	9.06	-7.72		31	.34	54	.00	-22.66	AVG	3
Rema														

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





Ant. No.			Ant 1	+ Ant 2	2							
Ant. Pol	-		Horiz	ontal								
Test Mo	de:		TX 8	)2.11n(	HT40)	Mode 2	2452M	Hz				
120.0 dBu	uV/m							1				
110												
00												
0												
an and a second	~~~~~	2										
									FCC Part	15C 3M /	Above-1G Pea	ak
0			1 X									
0		-1							FCC Part	15C 3M A	bove-1G AV	
i0		~~~	2 Martin Martin									
0			K	~								
0				han								
0												
0												
0.0												
2436.000	2456.00	2476.00	249	6.00 2	2516.00	(MHz)	255	6.00	2576.00	2596.	00 2616.	00 2636.
No.		uency Hz)		ading BuV)		ictor 3/m)	1	vel IV/m)	Lir (dBu		Margin (dB)	Detecto
1	2483	3.500	7	1.31	-7	.32	63	.99	74.	00	-10.01	peak
2 *	2483	3.500	5	7.50	-7	.32	50	.18	54.	00	-3.82	AVG
Remarks												

2.Margin value = Level -Limit value

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nt. No.		Ant 1 + Ant	2				
nt. Pol.		Vertical					
est Mod	de:	TX 802.11r	(HT40) Mode 2	2452MHz			
20.0 dBu	V/m						
10							
,							
, ,							
	mark and a second				FCC Part 15C 3M A	Above-1G Pea	k
! [					FCC Part 15C 3M /	Above-1G AV	
'   <del> </del>		1 X					
' /		2					
)		- Andrew - Contraction - Contr					
)							
)							
).0 2430.000	2450.00 2470.0	0 2490.00	2510.00 (MHz)	2550.00	2570.00 2590.1	00 2610.0	0 2630.0
No.	Frequency (MHz)	Reading (dBuV)		Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	2483.500	54.08	-7.32	46.76	74.00	-27.24	nook
-							peak
2 *	2483.500	39.65	-7.32	32.33	54.00	-21.67	AVG

2.Margin value = Level -Limit value



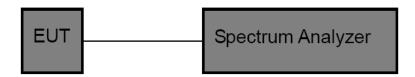
# 3.4. Band Edge and Spurious Emissions (Conducted)

### <u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. 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.

#### Test Configuration



#### **Test Procedure**

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10<sup>th</sup> harmonic. Sweep = auto, Detector function = peak, Trace = max hold.
- 4. Measure and record the results in the test report.

#### Test Mode

Please refer to the clause 2.4.



## Test Result

### (1) Band Edge Conducted Test

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.63	-49.51	≤-27.37	PASS
	Ant2	Low	2412	-0.32	-50.94	≤-30.32	PASS
ПD	Ant1	High	2462	0.86	-51.87	≤-29.14	PASS
	Ant2	High	2462	-2.03	-52.52	≤-32.03	PASS
	Ant1	Low	2412	-4.11	-43.55	≤-34.11	PASS
11G	Ant2	Low	2412	-1.87	-43.26	≤-31.87	PASS
TIG	Ant1	High	2462	-4.24	-52.58	≤-34.24	PASS
	Ant2	High	2462	-2.70	-52.47	≤-32.7	PASS
11N20MIMO	Ant1	Low	2412	-2.44	-38.76	≤-32.44	PASS
	Ant2	Low	2412	-4.80	-42.32	≤-34.8	PASS
	Ant1	High	2462	-3.37	-51.65	≤-33.37	PASS
	Ant2	High	2462	-3.88	-52.51	≤-33.88	PASS
11N40MIMO	Ant1	Low	2422	-6.82	-46.85	≤-36.82	PASS
	Ant2	Low	2422	-9.20	-49.99	≤-39.2	PASS
	Ant1	High	2452	-6.46	-52.91	≤-36.46	PASS
	Ant2	High	2452	-9.03	-53.08	≤-39.03	PASS

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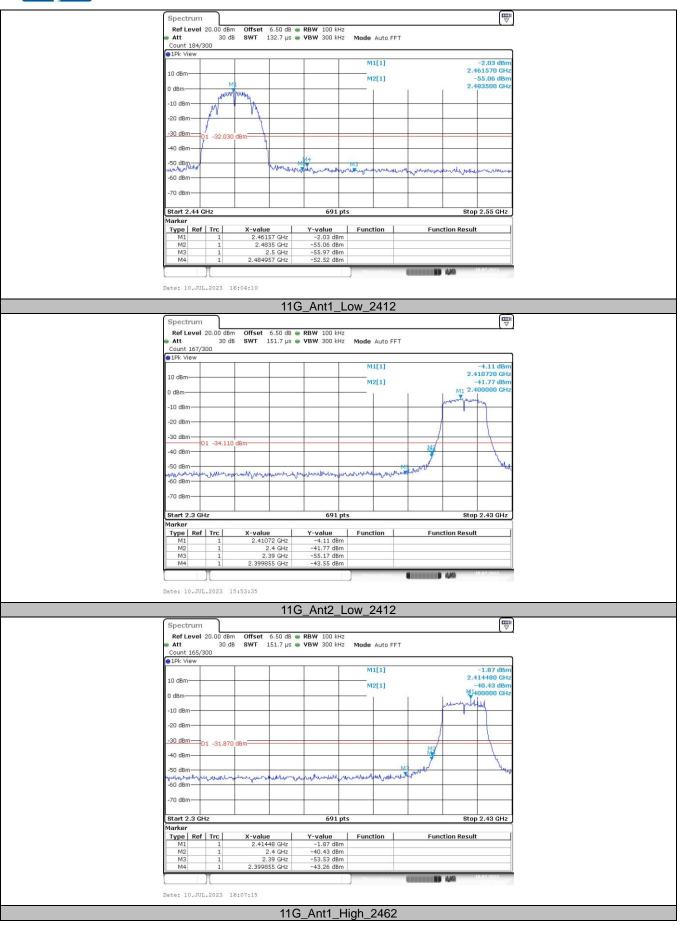
#### 11B\_Ant1\_Low\_2412 Spectrum Ref Level 20.00 dBm Offset 6.50 dB ■ RBW 100 kHz SWT 151.7 μs ■ VBW 300 kHz Mode Auto FFT ount 164/300 1Pk Viev M1[1] 2.63 dB 2.411470 GF 10 dBm M1 -5 M2[1] -50.41 dE dBr 00 GH 10 dBm 20 dBm 30 dB D1 -27.37 40 dB 114M2 50 di holometres ah A day и. 60 dE 70 dB 691 pt Stop 2.43 GHz Start 2.3 G 1arke X-value 2.41147 GHz 2.4 GHz 2.39 GHz 2.397029 GHz Type Ref Tro Function Result Y-value 2.63 dBm Function 2.63 dBm -50.41 dBm -53.53 dBm -49.51 dBm Date: 10.JUL.2023 15:48:15 11B\_Ant2\_Low\_2412 ₽ Spectrum RefLevel 20.00 dBm Att 30 dB 00 dBm Offset 6.50 dB - RBW 100 kHz 30 dB SWT 151.7 μs - VBW 300 kHz Mode Auto FFT Count 162/300 ●1Pk Vi M1[1] 2.4109 O GI 10 dBn M2[1] -51.33 dB O GH 0 dBn and plasta -10 dBm -20 dBm 30 dBr D1 -30.32 40 dBn -50 dB in monor mining Mergehousenergenouse unada whente whenter -60 dB 70 dBr Stop 2.43 GHz 691 pts Start 2.3 GH larke X-value 2.4109 GHz 2.4 GHz 2.39 GHz 2.397971 GHz Y-value -0.32 dBm -51.33 dBm -54.00 dBm -50.94 dBm Type Ref Tro Function Function Result Date: 10.JUL.2023 16:01:38 11B\_Ant1\_High\_2462 Spectrum RefLevel 20.00 dBm Att 30 dB Offset 6.50 dB ■ RBW 100 kHz SWT 132.7 μs ■ VBW 300 kHz 30 dB Mode Auto FFT Count 1 1Pk Vie nt 188/300 M1[1] 2.461570 GH 10 dBm M2[1] -53.46 dB 2.483500 GH dBr 10 dBm 20 dBn -29.14 30 dB 40 dBi -50 dBm under a manage when when here ho -60 dBm 70 dB Start 2.44 GH 691 pts Stop 2.55 GHz lark X-value 2.46157 GHz 2.4835 GHz 2.5 GHz 2.503768 GHz Y-value 0.86 dBm -53.46 dBm -54.51 dBm -51.87 dBm Type Ref Trc Function Result Function M3 M4 Date: 10.JUL.2023 15:50:11 11B\_Ant2\_High\_2462

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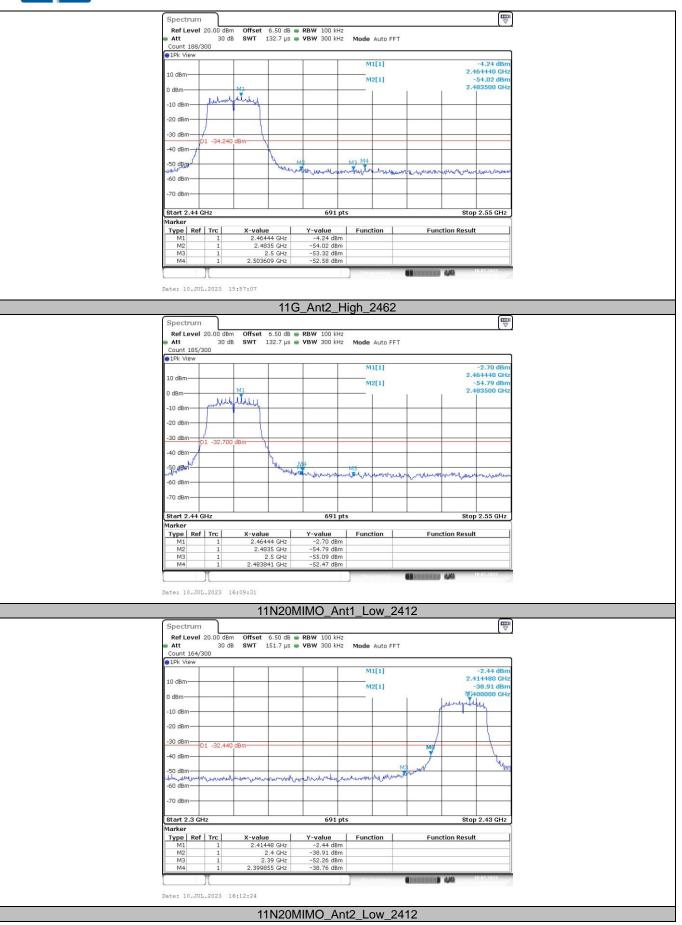




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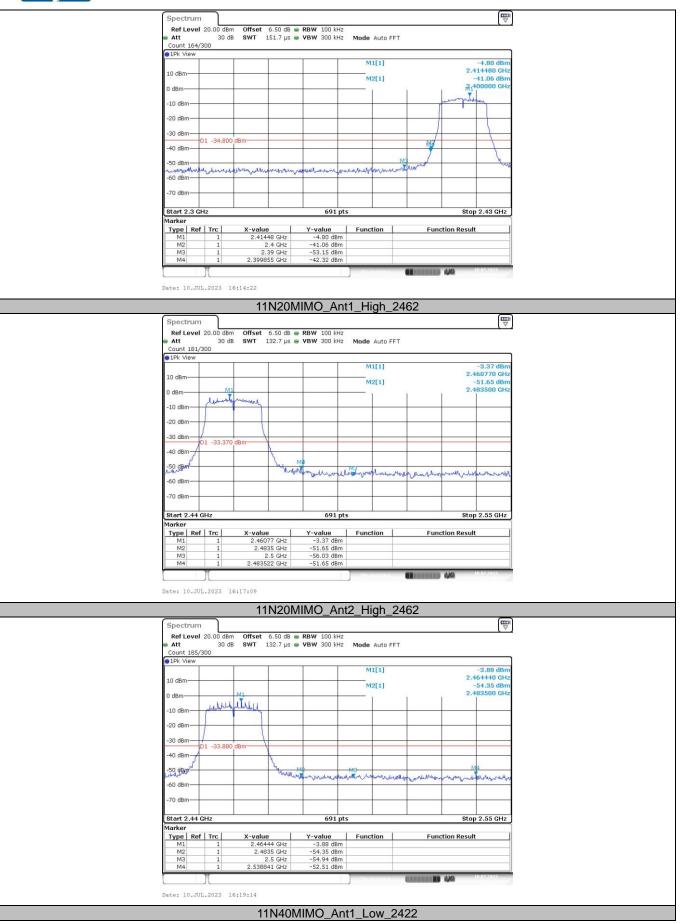




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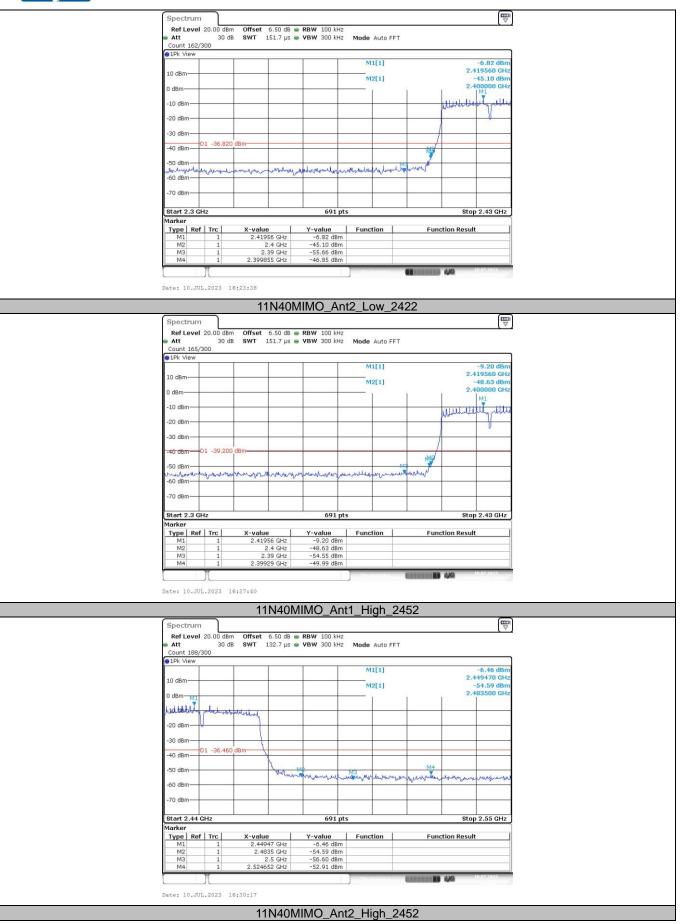




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Att	l 20.00 dBn 30 dB			Mode Auto FF	т	
Count 180,	/300					•
1Pk View				114541	0.00 Jp	-
5 - E				M1[1]	-9.03 dBm 2.456950 GHz	
10 dBm				M2[1]	-55.44 dBm	
0 dBm	Landa da				2.483500 GHz	
10.10	M1					
19 dent	merelitet	while				1
-20 dBm						
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-30 ubm						
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-50 dBm				M4		
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-60 dBm						
-70 dBm						
-/U dBm						J
Start 2.44	GHz		691 pts	12	Stop 2.55 GHz	1
Start 2.44 Marker					·	
Start 2.44 Marker Type   Re	f   Trc	X-value 2.45695 GHz	Y-value	Function	Stop 2.55 GHz	(
Start 2.44 Marker Type Re M1 M2		2.45695 GHz 2.4835 GHz	Y-value -9.03 dBm -55.44 dBm		·	
Start 2.44 Marker Type Re M1	f Trc	2.45695 GHz	Y-value -9.03 dBm		·	

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#### (2) Spurious Emissions Conducted Test

TestMode	Antenna	Channel	FreqRange	RefLevel	Result	Limit	Verdict
- Connode	, internita	Channel	[Mhz]	[dBm]	[dBm]	[dBm]	
			Reference	1.56	1.56		PASS
	Ant1	2412	30~1000	1.56	-53.63	≤-28.44	PASS
			1000~26500	1.56	-37.32	≤-28.44	PASS
			Reference	-0.54	-0.54		PASS
	Ant2	2412	30~1000	-0.54	-54.76	≤-30.54	PASS
			1000~26500	-0.54	-37.71	≤-30.54	PASS
	Ant1	2437	Reference	4.48	4.48		PASS
			30~1000	4.48	-59.75	≤-25.52	PASS
11B			1000~26500	4.48	-41.35	≤-25.52	PASS
			Reference	3.74	3.74		PASS
	Ant2	2437	30~1000	3.74	-60.55	≤-26.26	PASS
			1000~26500	3.74	-41.41	≤-26.26	PASS
			Reference	1.55	1.55		PASS
	Ant1	2462	30~1000	1.55	-54.64	≤-28.45	PASS
			1000~26500	1.55	-36.94	≤-28.45	PASS
			Reference	-0.79	-0.79		PASS
	Ant2	2462	30~1000	-0.79	-54.21	≤-30.79	PASS
			1000~26500	-0.79	-36.92	≤-30.79	PASS
	_		Reference	-1.43	-1.43		PASS
	Ant1	2412	30~1000	-1.43	-53.87	≤-31.43	PASS
			1000~26500	-1.43	-37.38	≤-31.43	PASS
	Ant2	2412	Reference	-2.72	-2.72		PASS
			30~1000	-2.72	-53.7	≤-32.72	PASS
			1000~26500	-2.72	-36.92	≤-32.72	PASS
	Ant1	2437	Reference	2.88	2.88		PASS
			30~1000	2.88	-60.72	≤-27.12	PASS
11G			1000~26500	2.88	-41.68	≤-27.12	PASS
	Ant2	2437	Reference	1.68	1.68		PASS
			30~1000	1.68	-60.51	≤-28.32	PASS
			1000~26500	1.68	-41.37	≤-28.32	PASS
	Ant1	2462	Reference	-4.04	-4.04		PASS
			30~1000	-4.04	-54.45	≤-34.04	PASS
			1000~26500	-4.04	-37.27	≤-34.04	PASS
	_		Reference	-2.84	-2.84		PASS
	Ant2	2462	30~1000	-2.84	-53.96	≤-32.84	PASS
			1000~26500	-2.84	-37.51	≤-32.84	PASS
	Ant1	2412	Reference	-0.72	-0.72		PASS
			30~1000	-0.72	-53.58	≤-30.72	PASS
			1000~26500	-0.72	-36.85	≤-30.72	PASS
	Ant2	2412	Reference	-3.68	-3.68		PASS
			30~1000	-3.68	-54.71	≤-33.68	PASS
_			1000~26500	-3.68	-37.16	≤-33.68	PASS
	Ant1	2437	Reference	-0.11	-0.11		PASS
			30~1000	-0.11	-60.93	≤-30.11	PASS
11N20MIMO			1000~26500	-0.11	-41.51	≤-30.11	PASS
	Ant2	2437	Reference	-2.26	-2.26		PASS
			30~1000	-2.26	-60.13	≤-32.26	PASS
			1000~26500	-2.26	-41.15	≤-32.26	PASS
			Reference	-2.53	-2.53		PASS
	Ant1	2462	30~1000	-2.53	-53.84	≤-32.53	PASS
		[[	1000~26500	-2.53	-37.77	≤-32.53	PASS
	Ant2	2462	Reference	-3.87	-3.87		PASS
			30~1000	-3.87	-54.69	≤-33.87	PASS
			1000~26500	-3.87	-37.55	≤-33.87	PASS
		2422	Reference	-6.23	-6.23		PASS
	Ant1		30~1000	-6.23	-55.06	≤-36.23	PASS
			1000~26500	-6.23	-44.31	≤-36.23	PASS
11N40MIMO	Ant2	Ant2 2422	Reference	-9.66	-9.66		PASS
			30~1000	-9.66	-54.14	≤-39.66	PASS
1							

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			Reference	-4.34	-4.34		PASS
	Ant1	2437	30~1000	-4.34	-60.47	≤-34.34	PASS
			1000~26500	-4.34	-41.39	≤-34.34	PASS
	Ant2		Reference	-5.93	-5.93		PASS
		2437	30~1000	-5.93	-60.41	≤-35.93	PASS
			1000~26500	-5.93	-41.75	≤-35.93	PASS
		2452	Reference	-8.61	-8.61		PASS
	Ant1		30~1000	-8.61	-54.46	≤-38.61	PASS
			1000~26500	-8.61	-44.39	≤-38.61	PASS
		2 2452	Reference	-9.05	-9.05		PASS
	Ant2		30~1000	-9.05	-53.84	≤-39.05	PASS
			1000~26500	-9.05	-43.77	≤-39.05	PASS

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#### 11B\_Ant1\_2412\_0~Reference Spectrum Ref Level 26.50 dBm Att 30 dB Offset 6.50 dB · RBW 100 kHz SWT 37.9 μs · VBW 300 kHz Mode Auto FFT ount 10/10 ●1Pk Viev M1[1] 1.56 d 2.4104800 GH 20 dBm 10 dBn M1 Y dB May Alate 11 -10 dBn -20 dBm 30 di 40 dB 50 dBm 60 d8 70 dBn Span 30.0 MHz CF 2.412 GH 691 pts Date: 10.JUL.2023 15:48:23 11B\_Ant1\_2412\_30~1000 Spectrum Ref Level 20.00 dBm Offset Att 30 dB SWT Offset 6.50 dB ● RBW 100 kHz SWT 1.1 ms ● VBW 300 kHz Mode Auto FFT Count 10/10 1Pk Vi M1[1] -53.63 0 787.2380 MH 10 dBm d -10 dBr -20 dBn -30 dBn 40 d 50 dBn out of the second s in the second second distant sheets Indian day Stop 1.0 GHz 30001 pts Start 30.0 MH: Date: 10.JUL.2023 15:48:28 11B\_Ant1\_2412\_1000~26500 Spectrum RefLevel 20.00 dBm Att 30 dB Offset 6.50 dB ● RBW 100 kHz SWT 255 ms ● VBW 300 kHz 30 dB SWT Mode Auto Sweep Count 10/10 M1[1] 0.96 0 2.412230 GH 10 dB M2[1] -37.32 dB 19.830900 GH 0 dB 10 d -20 0 -30 d www.www. 61.0 -60 dBm 70 Stop 26.5 GHz 30001 pt Start 1.0 GH Date: 10.JUL.2023 15:48:52 11B\_Ant2\_2412\_0~Reference

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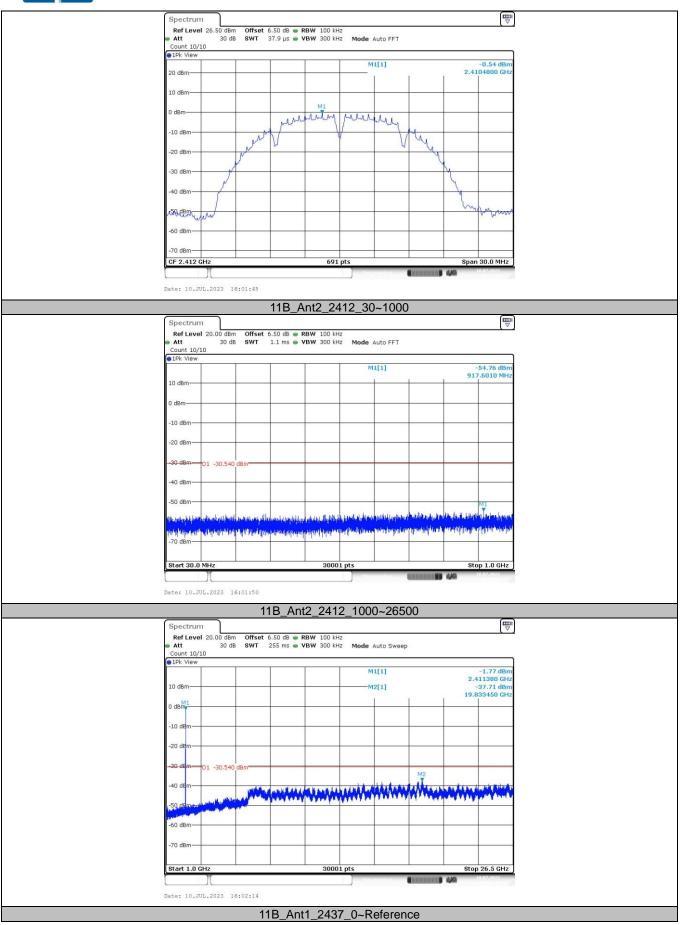
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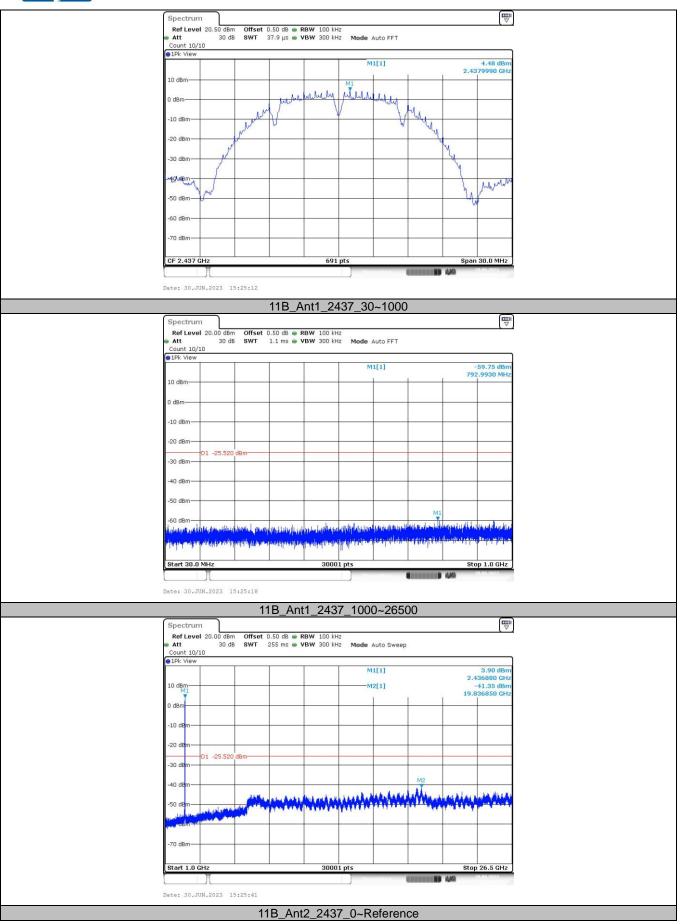




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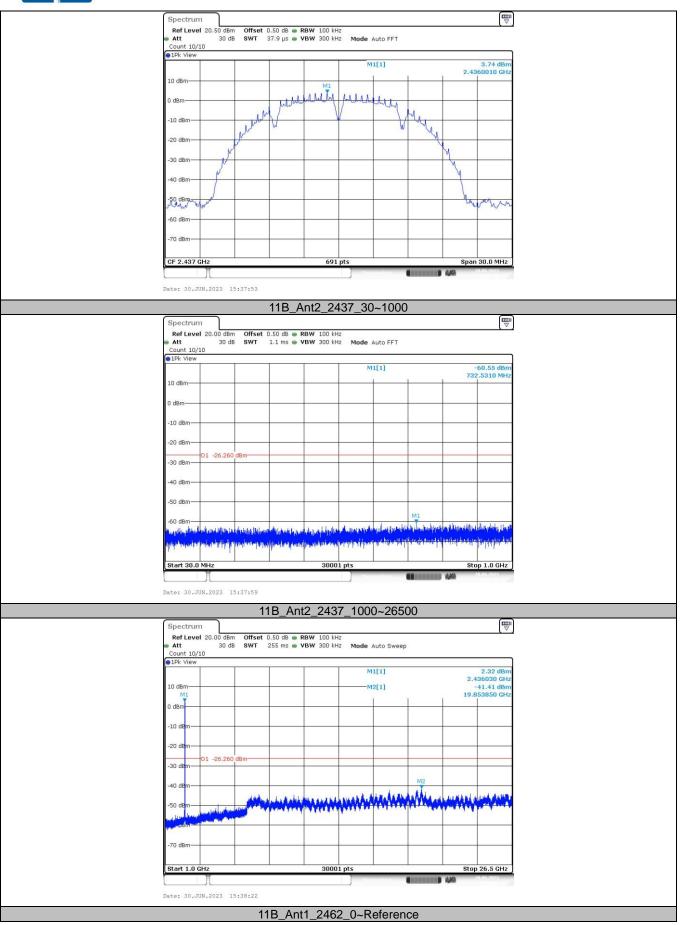




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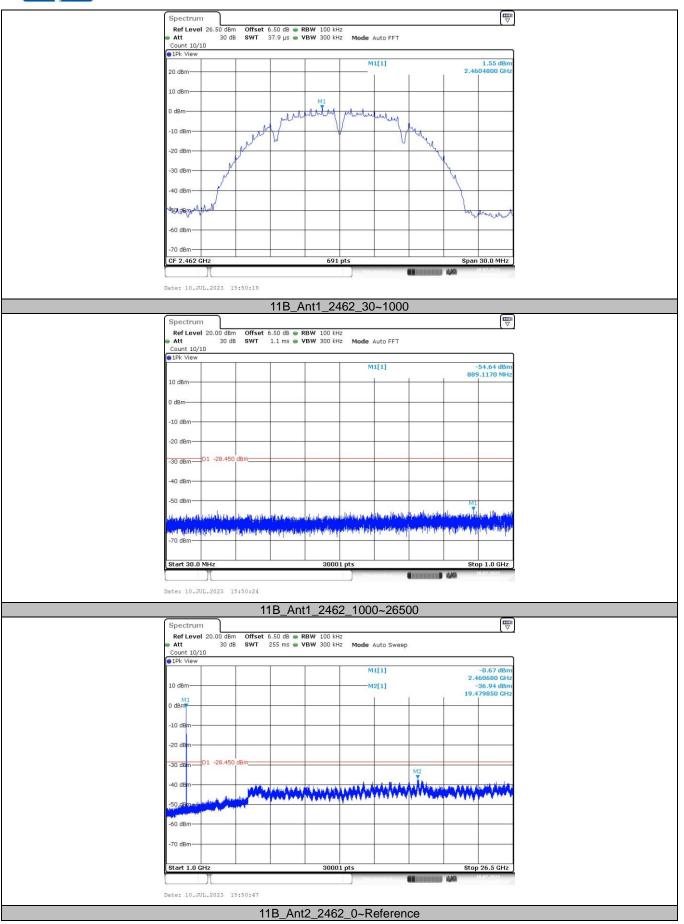




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