

TEST REPORT

Product Name	:	Pocket WiFi+LAN
Model Number	:	Pocket WiFi+LAN
FCC ID	:	2AMEHPOCKETWIFI-LAN

Prepared for Address	:	SOLAX POWER NETWORK TECHNOLOGY (ZHEJIANG) CO. ,LTD. No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province, 310000
Prepared by Address		EMTEK (DONGGUAN) CO., LTD. -1&2F., Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No. 9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China Tel : +86-0769-22807078 Fax: +86-0769-22807079
Report Number	:	EDG2301300046E01401R

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Date(s) of Tests	:	January 30, 2023 to February 20, 2023
Date of Issue		March 15. 2023



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 东莞市信遇科技有限公司

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TEST RESULT CERTIFICATION 1

Applicant	:	SOLAX POWER NETWORK TECHNOLOGY (ZHEJIANG) CO. ,LTD.
Address	:	No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province, 310000
Manufacturer	:	
Address	:	No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province, 310000
EUT	:	Pocket WiFi+LAN
Model Name	:	Pocket WiFi+LAN
Trademark	:	SolaX Power

Measurement Procedure Used:

APPLICABLE STANDARDS					
STANDARD	TEST RESULT				
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS				

The above equipment was tested by EMTEK (DONGGUAN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.247

The test results of this report relate only to the tested sample identified in this report.

Date of Test :	January 30, 2023 to February 20, 2023				
Prepared by :	Warren Deng				
	Warren deng /Engineer 7 im Do M				
Reviewer :	The Dame (Comparison of PONGGUAN)				
	Tim Dong /Supervisor				
Approved & Authorized Signer :	V * FSTING*				
	Sam Lv /Manager				



EUT TECHNICAL DESCRIPTION 2

Characteristics	Description
Product	Pocket WiFi+LAN
Model Number	Pocket WiFi+LAN
Sample Number	1#
IEEE 802.11 WLAN Mode Supported	⊠802.11b ⊠802.11g ⊠802.11n(20MHz channel bandwidth) ⊠802.11n(40MHz channel bandwidth)
Data Rate	802.11 b:1,2,5.5,11Mbps; 802.11 g:6,9,12,18,24,36,48,54Mbps; 802.11 n: MCS0~7,up to 150Mbps;
ModulationDSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/ CCK /16QAM/64QAM for 802.11g/n(HT20)/n(HT40);	
Operating Frequency Range	 ⊠2412-2462MHz for 802.11b/g/n(HT20); ⊠2422-2452MHz for 802.11n(HT40);
Number of Channels	⊠11 channels for 802.11b/g n(HT20); ⊠7 Channels for 802.11n(HT40);
Transmit Power Max	14.04 dBm
Smart system	SISO for802.11 b/g/n(HT20)/n(HT40); □MIMO for802.11n(HT20);
Antenna Type	PCB Antenna
Antenna Gain	3.16 dBi
Test Voltage	DC 5V for USB
Temperature Range	-35℃~+60℃
Date of Received	January 30, 2023

Note: for more details, please refer to the User's manual of the EUT.



FCC Part Clause	Test Parameter	Verdict	Remark		
15.247(a)(2)	DTS (6dB) Bandwidth	PASS			
15.247(b)(3)	Maximum Peak Conducted Output Power	PASS			
15.247(e)	Maximum Power Spectral Density Level	PASS			
15.247(d)	Unwanted Emission Into Non-Restricted	PASS			
	Frequency Bands				
15.247(d)	Unwanted Emission Into Restricted Frequency	PASS			
15.209	Bands (conducted)				
15.247(d)	Radiated Spurious Emission	PASS			
15.209					
15.207	Conducted Emission Test	PASS			
15.247(b)	Antenna Application	PASS			
	NOTE1:N/A (Not Applicable)				
	NOTE2: According to FCC OET KDB 558074, the report use radiated				
	measurements in the restricted frequency bands. In addition, the radiated				
	test is also performed to ensure the emissions emanating from the device				
	cabinet also comply with the applicable limits.				

3 SUMMARY OF TEST RESULT

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for 2AMEHPOCKET-LAN filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

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TEST METHODOLOGY 4

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards: FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C FCC KDB 558074 D01 15.247 Meas Guidance v05r02

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 **Conducted Emission Test Equipment**

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Test Receiver	Rohde& Schwarz	ESCI	100137	2022/05/19	1Year
L.I.S.N.	Rohde& Schwarz	ENV216	101209	2022/05/19	1Year
RF Switching Unit	CDS	RSU-M2	38401	2022/05/19	1Year

4.2.2 Radiated Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101415	2022/05/19	1Year
Power Amplifier	HP	8447F	OPTH64	2022/05/19	1Year
Bilog Antenna	Schwarzbeck	VULB9163	141	2022/05/22	1Year
Horn antenna	Schwarzbeck	BBHA9120D	1272	2022/05/22	1Year
Power Amplifier	LUNAR EM	LNA1G18-40	J1010000081	2022/05/19	1Year
Loop Antenna	Schwarzbeck	FMZB1513	1513-60	2022/05/22	2 Year
Signal Analyzer	R&S	FSV30	103039	2022/05/19	1Year
Bilog Antenna	Schwarzbeck	VULB9163	141	2022/05/22	1Year
Band reject Filter(50dB)	WI/DE	WRCGV-2400(2400- 2485MHz)	2	2022/05/20	1 Year

4.2.3 Radio Frequency Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Wireless Connectivity Tester	R&S	CMW270	102543	2022/06/21	1Year
Automatic Control Unit	Tonscend	JS0806-2	2118060480	2022/06/21	1Year
Signal Analyzer	KEYSIGHT	N9010B	MY60242456	2022/06/21	1Year
Analog Signal Generator	KEYSIGHT	N5173B	MY61252625	2022/06/21	1Year
UP/DOWN-Converter	R&S	CMW-Z800A	100274	2022/06/21	1Year
Vector Signal Generator	KEYSIGHT	N5182B	MY61252674	2022/06/21	1Year
Frequency Extender	KEYSIGHT	N5182BX07	MY59362541	2022/06/21	1Year
Temperature&Humidity test chamber	ESPEC	EL-02KA	12107166	2022/06/21	1 Year



4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

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

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (🛛 802.11b:1 Mbps; 🖾 802.11g: 6 Mbps; 🖾 802.11n(HT20): MCS0; 🖾 802.11n(HT40): MCS0) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel	Frequency	Channel	Frequency	Channel	Frequency		
Charmer	(MHz)	Chaine	(MHz)	Channel	(MHz)		
1	2412	6	2437	11	2462		
2	2417	7	2442				
3	2422	8	2447				
4	2427	9	2452				
5	2432	10	2457				

Frequency and Channel list for 802.11b/g/n (HT20):

Frequency and Channel list for 802.11n (HT40):

Channel	Frequency	Channel	Channel Frequency		Frequency	
Channel	(MHz)	Channel	(MHz)	Channel	(MHz)	
3	2422	6	2437	9	2452	
4	2427	7	2442			
5	2432	8	2447			

Test Frequency and Channel for 802.11b/g/n (HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462

Test Frequency and Channel for 802.11n (HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	6	2437	9	2452

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4.4 TEST SOFTWARE

Item	Software
Radiated Emission:	EMC (Ver. EMEC-3A1)
Conducted Emission	EZ-EMC (Ver. CON-03A1)



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FACILITIES AND ACCREDITATIONS 5

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at EMTEK (DONGGUAN) CO., LTD.

-1&2F., Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No. 9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and **CISPR** Publication 32.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description	
EMC Lab.	 Accredited by CNAS, 2020.08.27 The certificate is valid until 2024.07.05 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2018 The Certificate Registration Number is L3150
	Accredited by FCC
	Designation Number: CN1300 Test Firm Registration Number: 945551
	Accredited by A2LA, April 05, 2021 The Certificate Registration Number is 4321.02
	Accredited by Industry Canada The Certificate Registration Number is CN0113
Name of Firm Site Location	 EMTEK (Dongguan) Co., Ltd. -1&2/F.,Buiding 2,Zone A,Zhongda Marine Biotechnology Research and Development Base,N.9,Xincheng Avenue,Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China



6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	± 1x10^-5
Maximum Peak Output Power Test	± 1.0 dB
Conducted Emissions Test	± 2.0 dB
Radiated Emission Test	± 2.0 dB
Power Density	± 2.0 dB
Occupied Bandwidth Test	± 1.0 dB
Band Edge Test	± 3 dB
All emission, radiated	± 3 dB
Antenna Port Emission	± 3 dB
Temperature	± 0.5 °C
Humidity	± 3 %

Measurement Uncertainty for a level of Confidence of 95%



7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT androtated about its vertical axis formaximum response at each azimuth about the EUT. The center of the loopshall be 1 m above the ground. For certain applications, the loop antennaplane may also need to be positioned horizontally at the specified distance from the EUT.

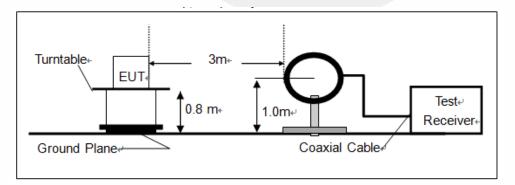
30MHz-1GHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

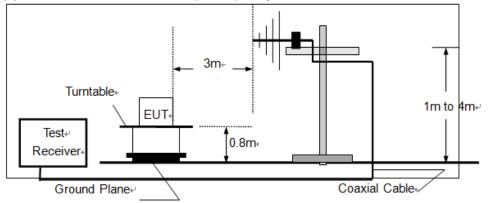
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



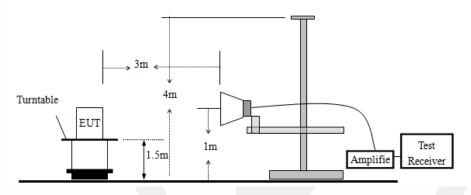
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(b)Radiated Emission Test Set-Up, Frequency Below 1000MHz

(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

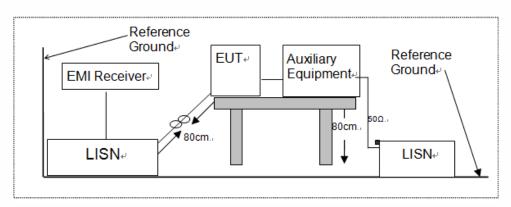


7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

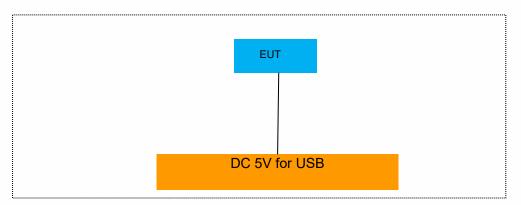
According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



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7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details							
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite				
1	1	1	/				

Auxiliary Cable List and Details								
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite					
1	1	1	1					

Auxiliary Equipment List and Details							
Description	Manufacturer	Model	Serial Number				
1	1	1	/				

Notes:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. Unless otherwise denoted as EUT in *[Remark]* column , device(s) used in tested system is a support equipment

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TEST REQUIREMENTS 8

8.1 DTS (6DB) BANDWIDTH

8.1.1 Applicable Standard

According to FCC Part15.247 (a)(2) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.1.2 **Conformance Limit**

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

8.1.3 **Test Configuration**

Test according to clause 7.1 radio frequency test setup 1

8.1.4 **Test Procedure**

The EUT was operating in IEEE 802.11b/g/n mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

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

Set RBW = 100 kHz.

Set the video bandwidth (VBW) =300kHz.

Set Span=2 times OBW

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measure and record the results in the test report.

8.1.5 **Test Results**

Temperature:	23° C
Relative Humidity:	56%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (MHz)	Limit (kHz)	Verdict
	1	2412	9.067	>500	PASS
802.11b	6	2437	9.542	>500	PASS
	11	2462	9.049	>500	PASS
	1	2412	16.340	>500	PASS
802.11g	6	2437	16.330	>500	PASS
	11	2462	16.360	>500	PASS
000.11m	1	2412	17.560	>500	PASS
802.11n	6	2437	17.580	>500	PASS
(HT20)	11	2462	17.560	>500	PASS
900 11p	3	2422	33.650	>500	PASS
802.11n (HT40)	5	2437	33.580	>500	PASS
(1140)	7	2452	33.450	>500	PASS

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est Model		DTS (6d 8	B) Bandwidth 02.11g	
			6: 2437MHz	
Spectrum Analyzer 1				Frequency v
Coupling: DC Cor	tt Ζ: 50 Ω Atten: 30 dB CCorr μW Path: Sta Ref: Int (S)	andard Gate: Off Av	nter Freq: 2.437000000 GHz g Hold:>10/10 dio Std: None	Center Frequency 2.437000000 GHz
1 Graph ▼ Scale/Div 10.0 dB	Ref LvI Offset Ref Value 10.			Span 30.000 MHz
Log 0.00 -10.0	m. Anzen Anzen Anzen Anzen	promon management	mhn	CF Step 3.000000 MHz
-20.0 -30.0 -40.0				Man 🖉
-50.0 -60.0 -70.0				0 Hz
-80.0 Center 2.43700 GHz #Res BW 100.00 kHz	#Video BW 30	0.00 kHz*	Span 30 M Sweep 3.73 ms (1001 p	
2 Metrics				
Occupied Bandwidth		Measure Trace	Trace 1	
16.490 MHz Transmit Freq Error x dB Bandwidth	17.296 kHz 16.33 MHz	Total Power % of OBW Power x dB	16.4 dBm 99.00 % -6.00 dB	
		x 35		
	b 15, 2023 :30:20 AM			
Test Model		DTS (6	dB) Bandwidth	
			802.11g I 11: 2462MHz	
Spectrum Analyzer 1 Occupied BW				Frequency v
Coupling: DC Cor	rt Ζ: 50 Ω Atten: 30 dB CCorr μW Path: Sta Ref: Int (S)	andard Gate: Off Av	nter Freq: 2.462000000 GHz g Hold:>10/10 dio Std: None	Center Frequency 2.46200000 GHz
1 Graph ▼ Scale/Div 10.0 dB	Ref LvI Offset Ref Value 10.0			Span 30.000 MHz CF Step
Log 0.00 -10.0	un Universite and the second strategy of the	porton som man market market	inter	3.000000 MHz
-20.0 -30.0 -40.0				
-50.0 -60.0 -70.0				0 Hz
-80.0 Center 2.46200 GHz #Res BW 100.00 kHz	#Video BW 30	00.00 kHz*	Span 30 M Sweep 3.73 ms (1001 p	
2 Metrics				
		Measure Trace	Trace 1	
Occupied Bandwidth 16.509 MHz		Total Power	17.3 dBm	
	-3.509 kHz 16.36 MHz	Total Power % of OBW Power x dB	17.3 dBm 99.00 % -6.00 dB	

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Channel 1: 24120HHz Centure dawyer Centure d	est Model		802.1	B) Bandwidth 1n (HT20)	
EEVSIGHT float.BF prod.2.90.0 Atten: 30.48 Trop. Free Run Conter Free 24120000 GHz Particle Free 2412000 GHz 10mph Free Rul NL (S) WPPAH: Standard Gaie Office 100.0 GB Conter Free 2412000 GHz Particle Free 2412000 GHz 200 Free Rul NL (Office 1.00.0 GB Ref Value 10.00 GB Conter Free 2412000 GHz Particle Free 2412000 GHz 200 Free Rul NL 100.0 GB Ref Value 10.00 GB Particle 100 GB Particle 100 GB 10mph Ref Value 10.00 GB Ref Value 10.00 GB Particle 100 GB Particle 100 GB 200 Free Rul NL 100 GB Free Rul NL 100 GB Particle 100 GB Particle 100 GB 200 Free Rul NL 100 GB Free Rul NL 100 GB Particle 100 GB Particle 100 GB 200 Free Rul NL 100 GB Free Rul NL 100 GB Particle 100 GB Particle 100 GB 200 Free Rul NL 100 GB 200 Free Rul NL 100 GB Free Rul NL 100 GB </th <th></th> <th></th> <th>Channe</th> <th>l 1: 2412MHz</th> <th></th>			Channe	l 1: 2412MHz	
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Test Model		802.1	B) Bandwidth 1n (HT20) 11: 2462MHz	
Spectrum Analyzer 1		Ondriner		Frequency v
KEYSIGHT Input: RF Input Coupling: DC Cor	ut Z: 50 Ω Atten: 30 dB r CCorr µW Path: Standa q Ref: Int (S)	ard Gate: Off Av	nter Freq: 2.462000000 GHz g Hold:>10/10 dio Std: None	Center Frequency Settings 2.462000000 GHz
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	eb 15, 2023 D:33:01 AM			
Test Model		802.1	B) Bandwidth 1n (HT40) 3: 2422MHz	
Spectrum Analyzer 1		Channe	13.242210172	Frequency V
KEYSIGHT Input: RF Input Coupling: DC Cor	ut Z: 50 Ω Atten: 30 dB r CCorr µW Path: Standa q Ref: Int (S)	ard Gate: Off Av	nter Freq: 2.422000000 GHz g Hold:>100/100 dio Std: None	Center Frequency 2.422000000 GHz Settings
1 Graph ▼ Scale/Div 10.0 dB	Ref LvI Offset 10 Ref Value 10.00			Span 60.000 MHz CF Step
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		Measure Trace	Trace 1	
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Occupied Bandwidth 34.841 MHz Transmit Freq Error x dB Bandwidth	-34.748 kHz 33.63 MHz	Total Power % of OBW Power x dB	15.3 dBm 99.00 % -6.00 dB	

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st Model		DTS 8	6 (6dB) Bandw 02.11n (HT40	natn 1)			
_		Cha	nnel 6: 2437M	/ /Hz			
	+					Frequency	、 米
KEYSIGHT Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Atten: : Corr CCorr μW Pa Freq Ref: Int (S)	30 dB Trig: Free Run th: Standard Gate: Off #IF Gain: Low	Center Freq: 2.43700 Avg Hold:>100/100 Radio Std: None	00000 GHz	Center Fre		Settings
1 Graph ▼ Scale/Div 10.0 dB		Offset 10.00 dB e 10.00 dBm			Span 60.000 M	Hz	
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-10.0	www.www.www.www.iphanahaning.org		man have a free free free free free free free f		Auto Man		
-30.0 -40.0 -50.0				munnun	Freq Offse 0 Hz	t	
-60.0							
Center 2.43700 GHz #Res BW 100.00 kHz	#Video I	BW 300.00 kHz	Sweep 5.8	Span 60 MHz 0 ms (1001 pts)			
2 Metrics v							
Occupied Bandwidth		Measure Tra					
	6 MHz -62.770 kHz	Total Power % of OBW P		.7 dBm 9.00 %			
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Transmit Freq Error x dB Bandwidth	33.58 MHz	A GD		5.00 dB			
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x dB Bandwidth) Mar 15, 2023	2					
x dB Bandwidth) Mar 15, 2023	DTS 8	(6dB) Bandw 02.11n (HT40	idth			
x dB Bandwidth	Mar 15, 2023 5:55:55 PM	DTS 8	(6dB) Bandw	idth	7	Frequency	, 52
x dB Bandwidth	Mar 15, 2023 5:55:55 PM	DTS 8 Cha 30 dB Trig: Free Run	(6dB) Bandw 02.11n (HT40 nnel 9: 2452M	ridth) 1Hz	Center Fre	Frequency	
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EMTEK (Dongguan) Co., Ltd. Add: -182/F ...Building 2.Zone A.Zhongda Marine Biotechnology Research and Development Rase No.9 Xincheng Augusta Songebacky Light Schoolagy Light Add: -1&2/F ...Building 2,Zone A,Zhongda Marine Biotechnology Research and Development Base ...No.9, Xincheng Avenue,Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China Http://www.emtek.com.cn E-mail: project@emtek.com.cn



8.2 MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part15.247 (b)(3) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.2.2 **Conformance Limit**

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

Test Configuration 8.2.3

Test according to clause 7.1 radio frequency test setup 1

8.2.4 **Test Procedure**

a) Set span to at least 1.5 times the OBW.

b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

c) Set VBW \geq 3 x RBW.

d) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)

e) Sweep time = auto.

f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle \geq 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

8.2.5	Test Results
-------	---------------------

Temperature:	23° C
Relative Humidity:	56%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
	1	2412	14.04	30	PASS
802.11b	6	2437	13.97	30	PASS
	11	2462	13.75	30	PASS
	1	2412	13.01	30	PASS
802.11g	6	2437	13.41	30	PASS
	11	2462	13.20	30	PASS
802.11n	1	2412	11.57	30	PASS
(HT20)	6	2437	12.14	30	PASS
(11120)	11	2462	12.18	30	PASS
802.11n	3	2422	10.91	30	PASS
(HT40)	5	2437	11.39	30	PASS
(1140)	7	2452	11.74	30	PASS

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Test Model	Duty cycle 802.11b Channel 1: 2412MHz				
Spectrum Analyzer 1	Input Z: 50 Ω #Atten: 30 dB PNO: Fast Corr CCorr μW Path: Standard Gate: Off Freq Ref: Int (S) IF Gain: Low Sig Track: Off	Avg Type: Log-Power 12 3 4 5 6 Trig: Free Run WWWWWW N N N N N N	Frequency Frequency Settings		
1 Spectrum Scale/Div 10 dB 0 0 0 0 0 0 0 0 0 0 0 0 0	Ref LvI Offset 10.00 dB Ref Level 20.00 dBm		0.0000000 Hz Swept Span Zero Span Full Span Start Freq 2.412000000 GHz Stop Freq 2.412000000 GHz		
40 0 50 0 60 0 70 0 Center 2.412000000 GHz Res BW 1.0 MHz (Res BW 1.0 MHz)	#Video BW 3.0 MHz Feb 17, 2023	Span 0 Hz Sweep 8.33 ms (1001 pts)	CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz X Axis Scale Log Lin		

st iviode	I _			Char	nel 1: 2412Ml	⊔ →		
Spectrum Ana	lvzer 1	•		Char	111 0 1.2412111			
Swept SA	ľ ľ	+					Frequency	/ 【法
Keysigh ⁻	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S)	#Atten: 30 dΒ μW Path: Standar	PNO: Fast d Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Trig: Free Run	123456 W\###### NNNNNN	Center Frequency 2.412000000 GHz Span	Settings
I Spectrum Scale/Div 10	v dB		ef LvI Offset 10.0 ef Level 20.00 di				0.00000000 Hz Swept Span	
.og							Zero Span	
10.0							Full Span	
0.00							Start Freq 2.412000000 GHz	
-20.0							Stop Freq 2.412000000 GHz	
-30.0							AUTO TUNE	
40.0							CF Step 1.000000 MHz	
50.0 60.0							Auto Man	
-70.0							Freq Offset 0 Hz	
Center 2.4120 Res BW 1.0			#Video BW 3.0 M	ЛНz	Sweep 8.33	Span 0 Hz ms (1001 pts)	X Axis Scale Log Lin	
4 5		Feb 17, 2023 9:17:18 AM					Signal Track (Span Zoom)	

Duty cycle

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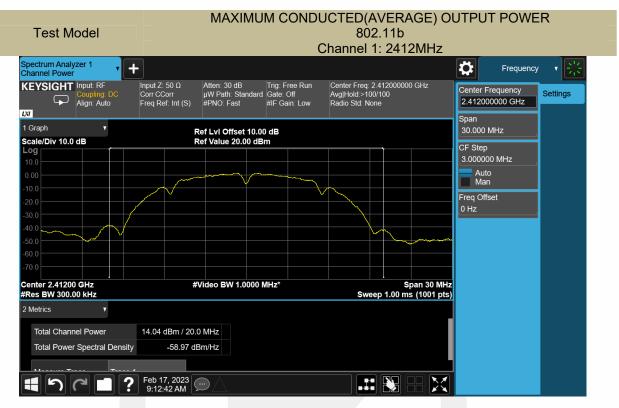
Test Mo	del	Duty cycle 802.11n(HT20) Channel 1: 2412MHz						
Spectrum Analyzo Swept SA	er 1	+					Frequenc	y y 😤
	nput: RF coupling: DC lign: Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S)	#Atten: 30 dB μW Path: Standard	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Trig: Free Run	123456 WWWWWW NNNNN	Center Frequency 2.412000000 GHz	Settings
I Spectrum Scale/Div 10 dB	V		ef Lvi Offset 10.0 ef Level 20.00 dB				Span 0.00000000 Hz Swept Span Zero Span	L
10.0							Full Span	
0.00							Start Freq 2.412000000 GHz	
20.0							Stop Freq 2.412000000 GHz	4
30.0							AUTO TUNE	
40.0 50.0							CF Step 1.000000 MHz	
60.0							Man Freq Offset	
-70.0							0 Hz X Axis Scale	
Center 2.412000 #Res BW 1.0 MH			#Video BW 3.0 M	Hz	Sweep 8.33	Span 0 Hz ms (1001 pts)	Log	
1 50		Feb 17, 2023 9:17:23 AM					Signal Track (Span Zoom)	

Test Model		Duty cycle 802.11n(HT40) Channel 3: 2422MHz					
Spectrum Analyzer 1 Swept SA	• +					Frequency v	$\frac{2^{4} \times 2^{4}}{2^{4} \times 2^{4}}$
KEYSIGHT Input: R Couplin Align: A	g: DC Corr CC		B PNO: Fast andard Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Trig: Free Run	123456 WWWWW NNNNNN	Center Frequency 2.422000000 GHz Span	js
1 Spectrum Scale/Div 10 dB Log	•	Ref LvI Offse Ref Level 20.0			_	0.000000000 Hz Swept Span Zero Span	
10.0						Full Span	
0.00						Start Freq 2.422000000 GHz	
20.0						Stop Freq 2.422000000 GHz	
30.0						AUTO TUNE	
40.0						CF Step 1.000000 MHz	
-60.0						Auto Man	
-70.0						Freq Offset 0 Hz	
Center 2.422000000 G #Res BW 1.0 MHz	GHz	#Video BW	3.0 MHz	Sweep 8.33	Span 0 Hz ms (1001 pts)		
1 7 7	Feb 1 [°] 9:17:	7, 2023 35 AM				Signal Track (Span Zoom)	

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Settings



MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11b





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Test Model

DJ

1 Graph

Loa

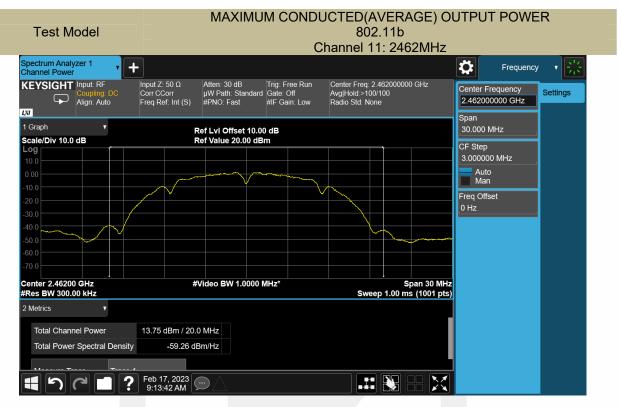
Spectrum Analyzer 1 Channel Power

Scale/Div 10.0 dB

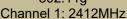
KEYSIGHT Input: RF

Align: Auto





MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11q





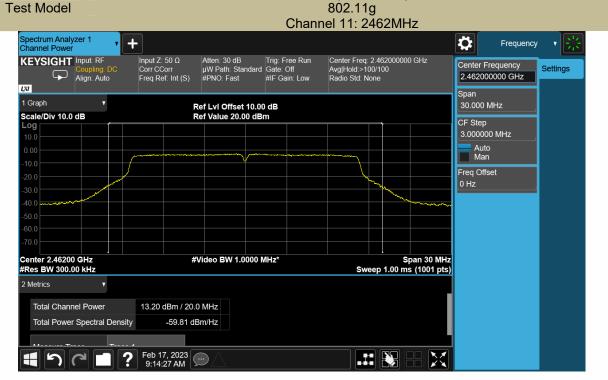
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	MAXIN	IUM COND	JCTED(AVERAGE)) OUTPUT POWER		
Test Model	802.11g					
		Channel 6: 2437MHz				
Spectrum Analyzer 1	Þ			Frequency v		
KEYSIGHT Input: RF Coupling: DC Align: Auto	Input Ζ: 50 Ω Atten: 30 dB Corr CCorr μW Path: Stan Freq Ref: Int (S) #PNO: Fast	dard Gate: Off #IF Gain: Low	Center Freq: 2.437000000 GHz Avg Hold:>100/100 Radio Std: None	Center Frequency 2.437000000 GHz		
Dor 1 Graph ▼ Scale/Div 10.0 dB	Ref LvI Offset 1 Ref Value 20.00			Span 30.000 MHz		
Log	Kei value 20.00			CF Step 3.000000 MHz		
10.0						
-10.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Man		
-20.0				Freq Offset 0 Hz		
-30.0						
-40.0						
-60.0						
-70.0						
Center 2.43700 GHz #Res BW 300.00 kHz	#Video BW 1.00	00 MHz*	Span 30 Sweep 1.00 ms (1001			
2 Metrics						
Total Channel Power	13.41 dBm / 20.0 MHz					
Total Power Spectral Density	-59.60 dBm/Hz					
T						
	Feb 17, 2023					

MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER



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Test Model	MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11n(HT20) Channel 1: 2412MHz				
Coupling: DC	Input Z: 50 Ω Atten: 30 dB Corr CCorr μW Path: Standar Freq Ref: Int (S) #PNO: Fast Ref LvI Offset 10.0	#IF Gain: Low	Center Freq: 2.412000000 GH; Avg Hold:>100/100 Radio Std: None	Frequency Center Frequency 2.41200000 GHz Span 30.000 MHz	
Scale/Div 10.0 dB	Ref Value 20.00 di			CF Step 3.00000 MHz Man Freq Offset 0 Hz	
Center 2.41200 GHz #Res BW 300.00 kHz 2 Metrics Total Channel Power Total Channel Power Total Power Spectral Density	#Video BW 1.0000 11.57 dBm / 20.0 MHz 61.44 dBm/Hz Feb 17, 2023	MHz*	Span 1 Sweep 1.00 ms (10	30 MHz 101 pts)	

MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11n(HT20)



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Test Model	MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11n(HT20) Channel 11: 2462MHz				
Spectrum Analyzer 1	Input Z: 50 Ω Atten: 30 dB Trig: Free Run Corr CCorr μW Path: Standard Gate: Off Freq Ref. Int (S) #PNO. Fast #IF Gain: Low	Center Freq: 2.462000000 GHz Avg]Hold.>100/100 Radio Std: None	Frequency Center Frequency Settings		
1 Graph v Scale/Div 10.0 dB	Ref LvI Offset 10.00 dB Ref Value 20.00 dBm	Span 30.000 MHz			
Log 10.0 0.00 -10.0 -20.0			CF Step 3.000000 MHz Auto Man Freq Offset		
-70 0			0 Hz		
Center 2.46200 GHz #Res BW 300.00 kHz 2 Metrics • Total Channel Power	#Video BW 1.0000 MHz*	Span 30 MH: Sweep 1.00 ms (1001 pts			
Total Chainler Power Total Power Spectral Density					
Test Model		UCTED(AVERAGE) C 802.11n(HT40) Channel 3: 2422MHz	DUTPUT POWER		
Spectrum Analyzer 1	-		Frequency v		
Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Atten: 30 dB Trig: Free Run Corr CCorr μW Path. Standard Gate: Off Freq Ref: Int (S) #PNO: Fast #F Gain: Low	Center Freq: 2.42200000 GHz Avg Hold.>100/100 Radio Std: None	Center Frequency 2.422000000 GHz Span 60.000 MHz		

Channel Power							Frequence	
KEYSIGHT	Input: RF Coupling: DC Align: Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S)	Atten: 30 dB µW Path: Standard #PNO: Fast	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 2.4 Avg Hold:>100/1 Radio Std: None	100	Center Frequency 2.422000000 GHz	Settings
1 Graph	•		Ref LvI Offset 10.0	0 dB			Span 60.000 MHz	
Scale/Div 10.0	dB		Ref Value 20.00 dE	lm			CF Step	
Log	ي م ک						6.000000 MHz	
10.0							Auto	
0.00							Man	
-10.0							Freq Offset	
-20.0							0 Hz	
-30.0								-
-40.0							~	
-50.0								
-70.0								
Center 2.4220		#	Video BW 3.0000	MHz*	C	Span 60 MH		
#Res BW 1.00	00 MHZ				Swee	o 1.00 ms (1001 pt	S)	
2 Metrics	▼							
Total Chanr	nel Power	10.91 dBm / 40.	0 MHz					
Total Power	r Spectral Density	/ -65.11 d	Bm/Hz					
15	C [] ?	Feb 17, 2023 9:21:30 AM	$\Box \triangle$					

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6.000000 MHz Auto Man Freq Offset 0 Hz

Test Model	MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11n(HT40) Channel 6: 2437MHz				
Spectrum Analyzer 1	Input Z. 50 Ω Corr CCorr Atten: 30 dB μW Path: Standard Trig: Free Run Gate: Off #IF Gain: Low Center Freq: 2.437000000 GHz Center Frequency V Freq Ref: Int (S) #PNO: Fast #IF Gain: Low Center String: AvglHold>100/100 Radio Std: None Center Frequency Settings Span				
1 Graph Scale/Div 10.0 dB Log 10.0 0.00 -10.0 -20.0 -30.0 -30.0 -30.0 -40.0 -50.0 -50.0 -60.0 -70.0 -70.0 Center 2.43700 GHz #Res BW 1.0000 MHz 2 Metrics 7 Total Channel Power Total Power Spectral Density 2 Metrics 7	Ref Lvi Offset 10.00 dB 60.000 MHz F Value 20.00 dBm 60.000 MHz Auto Auto Auto Man Freq Offset 0 Hvideo BW 3.0000 MHz Span 60 MHz Sweep 1.00 ms (1001 pts) 11.39 dBm / 40.0 MHz				
Test Model	MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER 802.11n(HT40) Channel 9: 2452MHz				
Spectrum Analyzer 1 Channel Power KEYSIGHT Input: RF Coupling: DC Align: Auto 1 Graph Scale/Div 10.0 dB	Input Z: 50 Ω Corr CCorr Freq Ref. Int (S) Atten: 30 dB μW Path: Standard Trig: Free Run #IF Gain: Low Center Freq: 2.452000000 GHz Avg Hold.>100/100 Radio Std: None Center Frequency 2.452000000 GHz Settings Ref Lvl Offset 10.00 dB Ref Value 20.00 dBm Span 60.000 MHz 60.000 MHz Span 60.000 MHz				

Center 2.45200 GHz #Res BW 1.0000 MHz Span 60 MHz Sweep 1.00 ms (1001 pts) #Video BW 3.0000 MHz* 2 Metrics 11.74 dBm / 40.0 MHz Total Channel Power Total Power Spectral Density -64.28 dBm/Hz \gtrsim Feb 17, 2023 9:21:56 AM 5 6

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8.3 MAXIMUM POWER SPECTRAL DENSITY

8.3.1 **Applicable Standard**

According to FCC Part15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.3.2 **Conformance Limit**

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

8.3.3 **Test Configuration**

Test according to clause 7.1 radio frequency test setup 1

8.3.4 **Test Procedure**

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance

The transmitter output (antenna port) was connected to the spectrum analyzer 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.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW. Note: If antenna Gain exceeds 6 dBi, then PSD Limit=8-(Gain- 6)

8.3.5 **Test Results**

Temperature:	23° C
Relative Humidity:	56%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
802.11b	1	2412	-7.29	8	PASS
	6	2437	-6.43	8	PASS
	11	2462	-6.65	8	PASS
802.11g	1	2412	-12.94	8	PASS
	6	2437	-11.33	8	PASS
	11	2462	-11.91	8	PASS
802.11n (HT20)	1	2412	-12.21	8	PASS
	6	2437	-11.40	8	PASS
	11	2462	-12.15	8	PASS
802.11n (HT40)	3	2422	-14.28	8	PASS
	6	2437	-14.13	8	PASS
	9	2452	-14.50	8	PASS

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Power Spectral Density 802.11b



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Power Spectral Density 802.11q



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Power Spectral Density 802.11g



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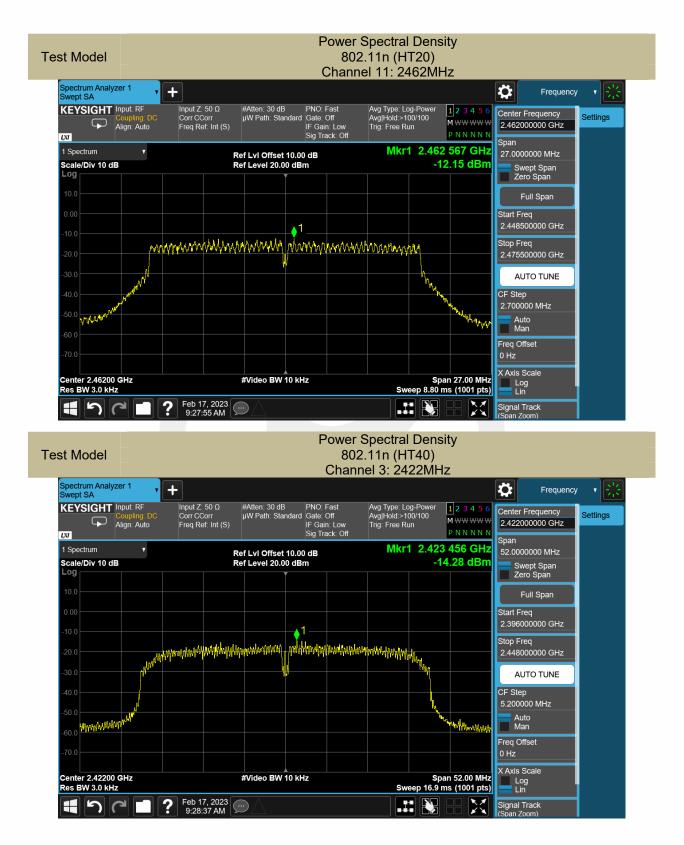
Power Spectral Density 802.11n (HT20) Channel 6: 2437MHz



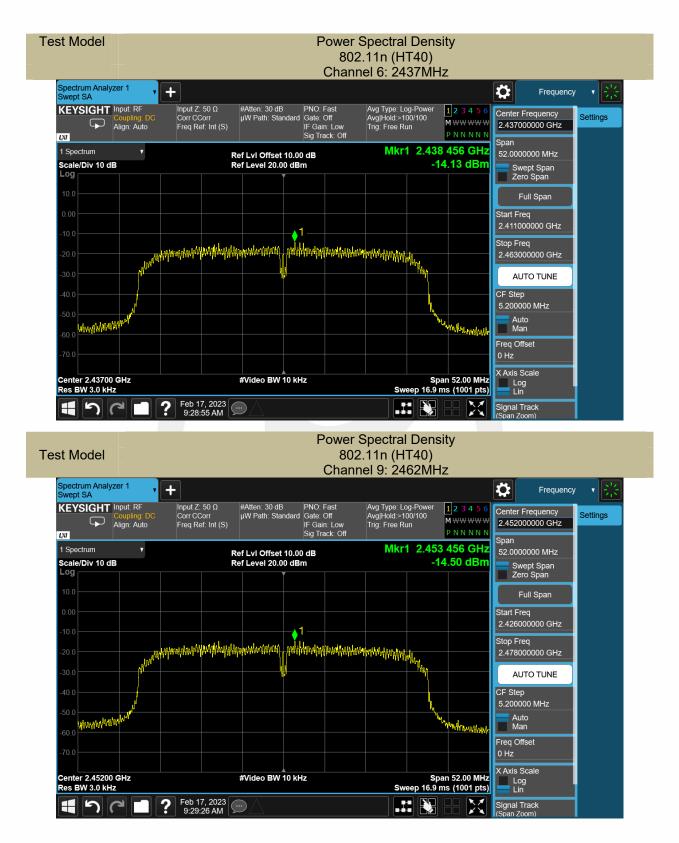
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8.4 NWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

8.4.1 Applicable Standard

According to FCC Part15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.4.2 **Conformance Limit**

According to FCC Part 15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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 8.4.3

Test according to clause 7.1 radio frequency test setup 1

8.4.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to \geq 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW \geq 3 x RBW.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.

Set the RBW = 100 kHz.

Set the VBW =300 kHz.

Set Detector = peak

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements . Report the three highest emissions relative to the limit.

8.4.5 Test Results



All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:



EMTEK (Dongguan) Co., Ltd.



