

Shenzhen Toby Technology Co., Ltd.

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FCC Radio Test Report FCC ID: 2ASAQ-A10C

Original Grant

Report No.	:	TB-FCC163785
Applicant	1	Hangzhou Vision Insight Technology Co., Ltd.
Equipment Under T	est	(EUT)
EUT Name	:	Smart Home Camera
Model No.	:	A10C
Series Model No.	1	A10,A10F,A10S,A10D
Brand Name		blurams
Receipt Date		2018-12-25
Test Date	1	2018-12-26 to 2019-01-18
Issue Date	÷	2019-01-19
Standards	8:	FCC Part 15: 2018, Subpart C(15.247)
Test Method	:	ANSI C63.10: 2013
Conclusions	:	PASS
		In the configuration tested, the EUT complied with the standards specified above,
		The EUT technically complies with the FCC and IC requirements
Test/Witness		Tacan XW
Engineer	-	Jason Xu
Engineer		INAN SU hum Su
Supervisor		Ivan Su
Engineer Manager	-	Jason XII Jason XII Jason XII Ivan SU Jug Lai Ray Lai
his report details the re		s of the testing carried out on one sample. The results contained in this

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TB-RF163785	Rev.01	Initial issue of report	2019-01-19
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1. General Information about EUT

1.1 Client Information

Applicant	: Hangzhou Vision Insight Technology Co., Ltd.				
Address	Room 1009, Zhejiang Middle And Small Enterprise Building, No.553, Wensan Road, Xihu Dist., Hangzhou, Zhejiang China				
Manufacturer	: Hangzhou Vision Insight Technology Co., Ltd.				
Address	Room 1009, Zhejiang Middle And Small Enterprise Building, No.553, Wensan Road, Xihu Dist., Hangzhou, Zhejiang China				

1.2 General Description of EUT (Equipment Under Test)

EUT Name		Smart Home Camera	MUBA AUL			
Models No.	2	A10C ,A10,A10F,A10S,A10D				
Model Difference	-	 All these models are identical in the same PCB layout and electric circuit, The only difference is the difference in packing and models 				
a Tops		Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz			
	3	Number of Channel:	802.11b/g/n(HT20):11 channels see note(3) 802.11n(HT40):7 channels see note(3)			
	5	Max Output Power:	802.11b: 16.70 dBm			
Product		Antenna Gain:	2.02dBi PIFA Antenna			
Description	3	Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM, 64QAM)			
		Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps			
B		Transmitter.	802.11n:up to 150Mbps			
Power Supply	-	DC Voltage supplied by				
Power Rating	:	AC/DC Adapter (RD05 Input: AC 100~240V, 5 Output: DC 5V, 1A.				
Connecting I/O Port(S)	:	Please refer to the Use	er's Manual			

Note:

- (1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC KDB 558074 D01v05.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Channel List:



Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		
Note:CH 01~CH 11	l for 802.11b/g/n(HT2	0), CH 03~CH 09 for	802.11n(HT40)		

(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

Adapter + TX Mode

Adapter	EUT		

EUT

1.4 Description of Support Units

	Equipment Information						
	Name	Model	FCC ID/VOC	Manufacturer	Used "√"		
5							
			Cable Information				
2	Number	Shielded Type	Ferrite Core	Length	Note		
3							

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test



system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test		
Final Test Mode	Description	
Mode 1	Adapter + TX B Mode	

For Radiated Test				
Final Test Mode	Description			
Mode 2 Adapter +TX Mode B Mode Channel 01/06/				
Mode 3 Adapter +TX Mode G Mode Channel 01/0				
Mode 4 Adapter +TX Mode N(HT20) Mode Cha 01/06/11				
Mode 5	Adapter +TX Mode N(HT40) Mode Channel 03/06/09			

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, Middle, lowest available channels, and the worst case data rate as follows:

802.11b Mode: CCK (1 Mbps)

802.11g Mode: OFDM (6 Mbps)

802.11n (HT20) Mode: MCS 0 (6.5 Mbps)

802.11n (HT40) Mode: MCS 0 (13 Mbps)

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a portable unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.



1.6 Description of Test Software Setting

During testing channel&Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software Version	A MOD	CMD.exe	T
Channel	CH 01	CH 06	CH 11
IEEE 802.11b DSSS	DEF	DEF	DEF
IEEE 802.11g OFDM	DEF	DEF	DEF
IEEE 802.11n (HT20)	DEF	DEF	DEF
Channel	CH 03	CH 06	CH 09
IEEE 802.11n (HT40)	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement y \pm U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy:	
	9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy:	14.40 dB
	30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy:	±4.20 dB
	Above 1000MHz	14.20 UD



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1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC Accredited Test Site Number: 854351.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

TOBY

2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1				
Standa	rd Section		ludament	
FCC	IC	Test Item	Judgment	Remark
15.203	1	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A
15.247(d)& 15.209	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A

Note: "/" for no requirement for this test item.

N/A is an abbreviation for Not Applicable.



3. Test Equipment

Conducted Emiss	ion Test				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul.18, 2018	Jul. 17, 2019
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul.18, 2018	Jul. 17, 2019
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul.18, 2018	Jul. 17, 2019
LISN	Rohde & Schwarz	ENV216	101131	Jul.18, 2018	Jul. 17, 2019
Radiation Emissio	on Test		-		
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul.18, 2018	Jul. 17, 2019
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul.18, 2018	Jul. 17, 2019
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.16, 2018	Mar. 15, 2019
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar.16, 2018	Mar. 15, 2019
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.16, 2018	Mar. 15, 2019
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar.16, 2018	Mar. 15, 2019
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 15, 2018	Jul. 14, 2019
Pre-amplifier	Sonoma	310N	185903	Mar.16, 2018	Mar. 15, 2019
Pre-amplifier	HP	8449B	3008A00849	Mar.16, 2018	Mar. 15, 2019
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.16, 2018	Mar. 15, 2019
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conduct	ed Emission				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul.18, 2018	Jul. 17, 2019
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul.18, 2018	Jul. 17, 2019
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 15, 2018	Sep. 14, 2019
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 15, 2018	Sep. 14, 2019
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO26	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO29	Sep. 15, 2018	Sep. 14, 2019
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO31	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO33	Sep. 15, 2018	Sep. 14, 2019



4. Conducted Emission Test

- 4.1 Test Standard and Limit
 - 4.1.1Test Standard FCC Part 15.207
 - 4.1.2 Test Limit

	Conducted	Emission	Test Limit
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Eroguanay	Maximum RF Line Voltage (dBμV)		
Frequency	Quasi-peak Level	Average Level	
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *	
500kHz~5MHz	56	46	
5MHz~30MHz	60	50	

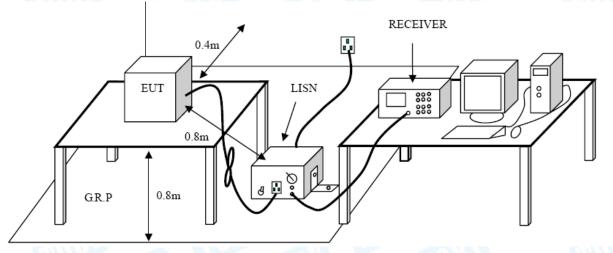
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please refer to the Attachment A.



5. Radiated Emission Test

- 5.1 Test Standard and Limit
 - 5.1.1 Test Standard
 - FCC Part 15.209
 - 5.1.2 Test Limit

Radiated Emission Limits (9 kHz~1000 MHz)

Frequency (MHz	Field Strength (microvolt/meter)	Measurement Distance (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
Above 960	500	3

Radiated En	nission Limit (Above 1000)MHz)
Frequency	Distance of 3	3m (dBuV/m)
(MHz)	Peak	Average
Above 1000	74	54

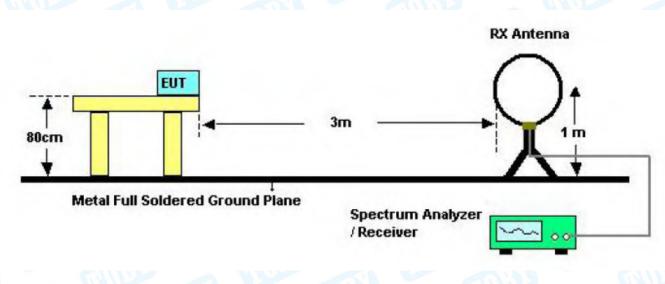
Note:

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

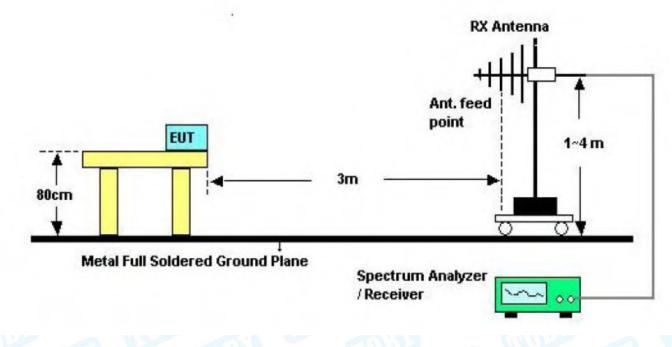
(2) Emission Level(dBuV/m)=20log Emission Level(uV/m)



5.2 Test Setup

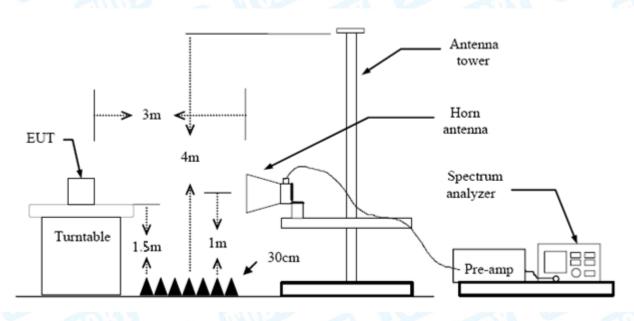


Below 30MHz Test Setup



Below 1000MHz Test Setup





Above 1GHz Test Setup

5.3 Test Procedure

- (1) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (6) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (7) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.



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5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values. Please refer to the Attachment B.

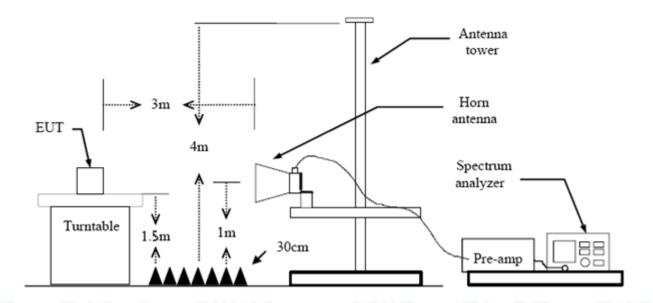


6. Restricted Bands Requirement

- 6.1 Test Standard and Limit
 - 6.1.1 Test Standard FCC Part 15.247(d) FCC Part 15.209 FCC Part 15.205
 - 6.1.2 Test Limit

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

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.



- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Please refer to the Attachment C.

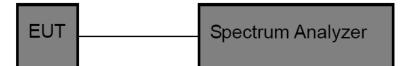


7. Bandwidth Test

- 7.1 Test Standard and Limit
 - 7.1.1 Test Standard
 - FCC Part 15.247 (a)(2)
 - 7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210			
Test Item	Limit	Frequency Range(MHz)	
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5	

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Digital photo framesdle and high channel for the test.

7.5 Test Data

Please refer to the Attachment D.

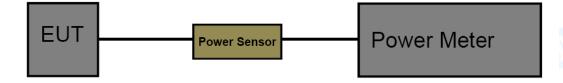


8. Peak Output Power Test

- 8.1 Test Standard and Limit
 - 8.1.1 Test Standard
 - FCC Part 15.247 (b)
 - 8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

The measurement is according to section 9.1.2 of KDB 558074 D01 15.247 Meas Guidance v05. The EUT was connected to RF power meter via a broadband power sensor as show the block above. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

8.5 Test Data

Please refer to the Attachment E.

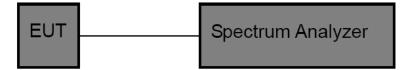


9. Power Spectral Density Test

- 9.1 Test Standard and Limit
 - 9.1.1 Test Standard
 - FCC Part 15.247 (e)
 - 9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

9.2 Test Setup



9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 15.247 Meas Guidance v05.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequency.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz
- (5) Set the VBW to: 10 kHz
- (6) Detector: peak
- (7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Digital photo framesdle and high channel for the test.

9.5 Test Data

Please refer to the Attachment F.



10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard

FCC Part 15.203

10.1.2 Requirement

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

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 2.02dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

Result

The EUT antenna is a PIFA Antenna. It complies with the standard requirement.

	Antenna Type	
100	Permanent attached antenna	JU.
3	Unique connector antenna	
D	Professional installation antenna	10

Attachment A-- Conducted Emission Test Data

TOBY

Tempe	erature:	25 ℃		Rela	ative Humidi	ity:	55%	ALC: N	
Test V	oltage:	AC 12	0V/60Hz			61	6617		
Termir	nal:	Line		au					
Test M	lode:	Chargi	ing with TX B	3 Mode 243	7Mhz			NO.	
Remar	ˈk:	Only w	vorse case is	reported				6	
40	BuV VWMMMM VWMMMM			during white			QP: AVG:	Minimum peak	
0.150		0.5		(MHz)	5			30.000	
No.		req. //Hz	Reading Level dBu∀	Correct Factor	Measure- ment	Limit dBuV	Over dB	Detector	
1					32.25		-30.34	QP	
2		2260	22.67	9.58	32.25	02.00	<u> </u>	· •	
-	0.2	2260 2260	22.67	9.58	17.28	52.59	-35.31	AVG	
3						52.59		AVG QP	
	0.4	2260	7.70	9.58	17.28	52.59	-23.24		
3	0.4	2260 1900	7.70 23.33	9.58 9.60	17.28 32.93	52.59 56.17 46.17	-23.24	QP	
3	0.4 0.4 3.0	2260 1900 1900	7.70 23.33 12.56	9.58 9.60 9.60	17.28 32.93 22.16	52.59 56.17 46.17 56.00	-23.24 -24.01	QP AVG	
3 4 5	0.4 0.4 3.0 3.0	2260 1900 1900 0180	7.70 23.33 12.56 25.78	9.58 9.60 9.60 9.65	17.28 32.93 22.16 35.43	52.59 56.17 46.17 56.00 46.00	-23.24 -24.01 -20.57	QP AVG QP	
3 4 5 6	0.4 0.4 3.0 3.0 3.6	2260 4900 4900 0180 0180	7.70 23.33 12.56 25.78 16.78	9.58 9.60 9.60 9.65 9.65	17.28 32.93 22.16 35.43 26.43	52.59 56.17 46.17 56.00 46.00 56.00	-23.24 -24.01 -20.57 -19.57	QP AVG QP AVG	
3 4 5 6 7	0.4 0.4 3.0 3.0 3.6 * 3.6	2260 4900 4900 0180 0180 0180	7.70 23.33 12.56 25.78 16.78 26.56	9.58 9.60 9.60 9.65 9.65 9.67	17.28 32.93 22.16 35.43 26.43 36.23	52.59 56.17 46.17 56.00 46.00 56.00	-23.24 -24.01 -20.57 -19.57 -19.77	QP AVG QP AVG QP	
3 4 5 6 7 8	0.4 0.4 3.0 3.0 * 3.6 * 3.6	2260 4900 0180 0180 0180 0300	7.70 23.33 12.56 25.78 16.78 26.56 19.80	9.58 9.60 9.65 9.65 9.65 9.67 9.67	17.28 32.93 22.16 35.43 26.43 36.23 29.47	52.59 56.17 46.17 56.00 46.00 56.00 56.00	-23.24 -24.01 -20.57 -19.57 -19.77 -16.53	QP AVG QP AVG QP AVG	
3 4 5 6 7 8 9	0.4 0.4 3.0 3.0 * 3.6 * 3.6 4.1 4.1	2260 4900 0180 0180 0180 0300 0300	7.70 23.33 12.56 25.78 16.78 26.56 19.80 25.62	9.58 9.60 9.65 9.65 9.67 9.67 9.69	17.28 32.93 22.16 35.43 26.43 36.23 29.47 35.31	52.59 56.17 46.17 56.00 46.00 56.00 46.00 46.00	-23.24 -24.01 -20.57 -19.57 -19.77 -16.53 -20.69	QP AVG QP AVG QP AVG QP	

TB-RF-074-1.0



					1
Temperature:	25 ℃	Relative	Humidity:	55%	3
Test Voltage:	AC 120V/60Hz	13.5	AUS		8
Terminal:	Neutral	TOP'S	6		
Test Mode:	Charging with T>	K B Mode 2437Mhz			
Remark:	Only worse case	is reported		100	~
90.0 dBuV	" With summary			monther	pea AV(
-10 0.150	0.5	(MHz)	5	30.000	i

			Reading	Correct	Measure-			
No.	Mk.	Freq.	Level	Factor	ment	Limit	Over	
		MHz	dBuV	dB	dBu∨	dBuV	dB	Detector
1		0.1700	22.43	9.64	32.07	64.96	-32.89	QP
2		0.1700	5.98	9.64	15.62	54.96	-39.34	AVG
3		0.2300	22.55	9.63	32.18	62.45	-30.27	QP
4		0.2300	8.02	9.63	17.65	52.45	-34.80	AVG
5		0.4860	23.30	9.58	32.88	56.24	-23.36	QP
6		0.4860	12.11	9.58	21.69	46.24	-24.55	AVG
7	*	3.1660	28.98	9.67	38.65	56.00	-17.35	QP
8		3.1660	18.94	9.67	28.61	46.00	-17.39	AVG
9		3.8020	26.86	9.71	36.57	56.00	-19.43	QP
10		3.8020	18.92	9.71	28.63	46.00	-17.37	AVG
11		11.0060	17.43	10.31	27.74	60.00	-32.26	QP
12		11.0060	9.98	10.31	20.29	50.00	-29.71	AVG

Emission Level= Read Level+ Correct Factor

Remark: All modes and channels have been tested and only listed WiFi link mode that is worst data



Attachment B-- Radiated Emission and Restricted Bands

Requirement Test Data

9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

30MHz~1GHz

Temperature:	25 ℃	Relative Humidity: 55%	
Test Voltage:	AC 120/60Hz		9
Ant. Pol.	Horizontal		0
Test Mode:	TX B Mode 2462MHz	MILLE	61
Remark:	Below 1GHz test data. This r TX IEEE 802.11b 2462MHz.	eport only shall the worst case mod	e fo
80.0 dBu∀/m			
30 1 2		(RF)FCC 15C 3M Radiation Margin -6 dB	
-20 30.000 40 50	60 70 80 (MHz)	300 400 500 600 700 10	000.00

No	. Mk	Freq.	Reading Le∨el	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	37.5479	47.08	-17.95	29.13	40.00	-10.87	QP
2		47.3255	35.22	-22.35	12.87	40.00	-27.13	QP
3		297.2241	43.97	-16.25	27.72	46.00	-18.28	QP
4		334.8589	44.71	-15.07	29.64	46.00	-16.36	QP
5		372.0045	36.18	-13.56	22.62	46.00	-23.38	QP
6		410.3825	34.59	-12.21	22.38	46.00	-23.62	QP

*:Maximum data x:Over limit !:over margin



	25 ℃) a lativa I lunai ditur						
Temperature:			Relative Humidity:	55%					
fest Voltage:	AC 120/60	Ηz							
Ant. Pol.	Vertical								
fest Mode:	TX B Mode 2462MHz								
Remark:		z test data. This 2.11b 2462MHz	report only shall th z.	he worst case r	mode for				
80.0 dBu∀/m									
			(RI	F)FCC 15C 3M Radiation					
				Margin -6					
4									
30 2 X									
	m m	× × ×	*	monordation					
20 30.000 40 50	3 50 70	4 5 4 7 (MHz)	5 X M 300 40		1000.000				
30.000 40 50	60 70 Read	ding Correct		0 500 600 700	1000.000				
30.000 40 50 No. Mk. Fr	Read	ding Correct el Factor	Measure- ment Lin	0 500 600 700	1000.000				
30.000 40 50 No. Mk. Fr	Read req. Lev	ding Correct rel Factor	Measure- ment Lin dBuV/m dBu	0 500 600 700 nit O∨er					
30.000 40 50 No. Mk. Fr M 1 * 38.0	Read req. Lev	ding Correct rel Factor ^{IV} dB/m 81 -18.21	Measure- ment Lin dBuV/m dBu 32.60 40	0 500 600 700 nit O∨er uV/m dB	Detector				
30.000 40 50 No. Mk. Fr M 1 * 38.0 2 47.6	Read req. Lev Hz dBu 0783 50.	ding Correct Yel Factor IV dB/m 81 -18.21 62 -22.46	300 40 300 40 Measure- ment Lin dBuV/m dBu 32.60 40 26.16 40	o 500 600 700 nit O∨er uV/m dB 0.00 -7.40	Detector				
30.000 40 50 No. Mk. Fr M 1 1 * 38.0 2 47.6 3 77.3	Read req. Lev Hz dBu 0783 50. 0586 48.	ding Correct Yel Factor IV dB/m 81 -18.21 62 -22.46 37 -22.79	300 40 300 40 Measurement Lin dBuV/m dBu 32.60 40 26.16 40 17.58 40	o 500 600 700 nit O∨er uV/m dB 0.00 -7.40 0.00 -13.84	Detector QP QP				

*:Maximum data x:Over limit !:over margin

33.48

-19.61

13.87

43.50

-29.63

QP

206.3976

6

TOBY

Above 1GHz

Test Mode: IEEE 802.11b

Low channe	el: 241	2 MHz								
Frequency (MHz)	Ant. Pol.	Peak reading	AV reading (dBuV)	Correction Factor	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin	AV
	H/V	(dBµV)		(dB/m)	(* F)	(* F /	(uphauli)	(ασμν/π)	(dB)	Margin (dB)
2390	Н	48.85	41.69	0.77	49.62	42.46	74	54	-24.38	-11.54
4824	Н	43.26	31.27	13.68	56.94	44.95	74	54	-17.06	-9.05
	Н	4				F			J	
	50		61	133		NUC	-	L.	-	2.0
2390	V	42.95	31.28	0.77	43.72	32.05	74	54	-30.28	-21.95
4824	V	43.51	30.47	13.68	57.19	44.15	74	54	-16.81	-9.85
	V					1.12				

Middle chan	nel: 2	437 MHz								
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)
									. ,	
4874	Н	44.13	30.18	13.86	57.99	44.04	74	54	-16.01	-9.96
	Н		152							(
	Н			<u></u>	(442				
6	1	6					1			55
4874	V	43.37	30.25	13.86	57.23	44.11	74	54	-16.77	-9.89
	V	177.02		AV			-	2405		
	V				a \					X

	1 0 1 0									
High channe	el: 246	52 MHz								
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin	AV Margin
				, , ,					(dB)	(dB)
2483.5	H	41.35	31.22	1.17	42.52	32.39	74	54	-31.48	-21.61
4924	Н	43.3	30.47	14.03	57.33	44.5	74	54	-16.67	-9.5
	Н		6							24
	NU				(B)		600			
2483.5	Н	41.41	30.33	1.17	42.58	31.5	74	54	-31.42	-22.5
4924	V	44.46	31.47	14.03	58.49	45.5	74	54	-15.51	-8.5
	V		<u></u>		N				(AL)	22

Note:

1. Emission Level= Read Level+ Correct Factor

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

3. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

4. Data of measurement shown "----"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

	1 0 1 1	0.1.11			IOUO. IEE		5			
Low channe	el: 241	2 MHz								
Frequency (MHz)	Ant. Pol. H/V	Peak reading	AV reading (dBuV)	Correction Factor	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin	AV Margin
		(dBµV)		(dB/m)					(dB)	(dB)
2390	Н	50.88	39.87	0.77	51.65	40.64	74	54	-22.35	-13.36
4824	Н	45.11	31.16	13.68	58.79	44.84	74	54	-15.21	-9.16
	Н			6	NH- 2			<	<u>)</u> ()	
23		CIT OF	L'AND			and i			5	
2390	V	51.62.	30.54	0.77	52.39	31.31	74	54	-21.61	-22.69
4824	V	43.30	30.12	13.56	56.98	43.8	74	54	-17.02	-10.2
·	V	(A)	<			4				1

Test Mode: IEEE 802.11g

	Middle chan	nel: 2	437 MHz								
	Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)
	4874	Н	43.21	31.53	13.86	57.07	45.39	74	54	-16.93	-8.61
		Н		4				H	<u>}</u>	\	
		Н	-				ľ				1
3	111:00								GHI		
	4874	V	44.29	30.24	13.86	58.15	44.1	74	54	-15.85	-9.9
		V		5		13					
		V	(aV				'S		

High chann	el: 246	62 MHz								
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin
		,		. ,					. ,	(dB)
2483.5	H	51.26	38.73	1.17	52.43	39.9	74	54	-21.57	-14.1
4924	Н	44.39	30.72	14.15	58.42	44.75	74	54	-15.58	-9.25
	Н	6							3-	
				11:00		GUL				1º
2483.5	Η	50.38	36.28	1.17	51.55	37.45	74	54	-22.45	-16.55
4924	V	42.24	30.87	14.15	56.27	44.9	74	54	-17.73	-9.1
10-22	V	110		<u></u> U				(74)D		· \
NI-C										

Note:

5. Emission Level= Read Level+ Correct Factor

6. The emission levels of other frequencies are very lower than the limit and not show in test report.

7. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

8. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

				1000111100							
Low channe	Low channel: 2412 MHz										
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)	
2390	Н	60.6	40.85	0.77	61.37	41.62	74	54	-12.63	-12.38	
4824	Н	44.08	30.24	13.56	57.64	43.80	74	54	-16.36	-10.2	
	Н		<u>-</u>	6	040		(14-U)		<u>a</u> ()		
Cer			L'and		1			CON!	3	~	
2390	V	59.74	43.44	0.77	60.51	44.21	74	54	-13.49	-9.79	
4824	V	44.32	30.14	13.56	57.88	43.70	74	54	-16.12	-10.30	
· · · ·	V	4	>								
	L									I	

Test Mode: IEEE 802.11n TH20

	Middle chan	inel: 2	437 MHZ								
	Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)
	4874	Н	43.28	30.53	13.85	57.13	44.38	74	54	-16.87	-9.62
	1	Η		Ŧ		T			<u></u>		
	The second secon	Н			\					S S	
5	U	~	av		10		200		NU I		
	4874	V	44.04	30.34	13.87	57.9	44.2	74	54	-16.1	-9.8
		V				02					
1		V	44.05	1	<u>a</u> V						·
		1									

High chan	nel: 246	62 MHz								
Frequency (MHz)	, Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)
2483.5	H	56.85	37.01	1.17	58.02	38.18	74	54	-15.98	-15.82
4924	Н	45.36	30.46	14.15	59.51	44.61	74	54	-14.49	-9.39
(n	Н			T					52	
	-		5	TUD		VIUE				0.5
2483.5	Н	58.14	39.36	1.17	59.31	40.53	74	54	-14.69	-13.47
4924	V	43.67	30.77	14.15	57.82	44.92	74	54	-16.18	-9.08
	V				6					N

Note:

9. Emission Level= Read Level+ Correct Factor

10. The emission levels of other frequencies are very lower than the limit and not show in test report.

11. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

12. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

Low channel: 2422 MHz										
Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)	
н	60.19	45.17	0.77	60.96	45.94	74	54	-13.04	-8.06	
Н	43.63	30.27	13.68	57.31	43.95	74	54	-16.69	-10.05	
Н		5-	6	24		040				
	CITO I	1.10			100		CON!	5		
V	59.04	44.39	0.77	59.81	45.16	74	54	-14.19	-8.84	
V	43.38	30.18	13.68	57.06	43.86	74	54	-16.94	-10.14	
V	(A-D)									
	Ant. Pol. H/V H H H V V	Ant. Peak Pol. reading (dBµV) H 60.19 H 43.63 H V 59.04 V 43.38	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) H 60.19 45.17 H 43.63 30.27 H V 59.04 44.39 V 43.38 30.18	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) H 60.19 45.17 0.77 H 43.63 30.27 13.68 H V 59.04 44.39 0.77 V 43.38 30.18 13.68	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) Emissic Peak (dBµV/m) H 60.19 45.17 0.77 60.96 H 43.63 30.27 13.68 57.31 H V 59.04 44.39 0.77 59.81 V 43.38 30.18 13.68 57.06	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) Emission Level Peak (dBµV/m) H 60.19 45.17 0.77 60.96 45.94 H 43.63 30.27 13.68 57.31 43.95 H V 59.04 44.39 0.77 59.81 45.16 V 43.38 30.18 13.68 57.06 43.86	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) Emission Level Peak (dBµV/m) Peak limit (dBµV/m) H 60.19 45.17 0.77 60.96 45.94 74 H 43.63 30.27 13.68 57.31 43.95 74 H V 59.04 44.39 0.77 59.81 45.16 74 V 43.38 30.18 13.68 57.06 43.86 74	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) Emission Level Peak (dBµV/m) Peak limit (dBµV/m) AV limit (dBµV/m) H 60.19 45.17 0.77 60.96 45.94 74 54 H 43.63 30.27 13.68 57.31 43.95 74 54 H V 59.04 44.39 0.77 59.81 45.16 74 54 V 43.38 30.18 13.68 57.06 43.86 74 54	Ant. Pol. H/V Peak reading (dBµV) AV reading (dBuV) Correction Factor (dB/m) Emission Level Peak (dBµV/m) Peak limit (dBµV/m) AV limit (dBµV/m) Peak Margin (dB) H 60.19 45.17 0.77 60.96 45.94 74 54 -13.04 H 43.63 30.27 13.68 57.31 43.95 74 54 -16.69 H V 59.04 44.39 0.77 59.81 45.16 74 54 -14.19 V 43.38 30.18 13.68 57.06 43.86 74 54 -16.94	

Test Mode: IEEE 802.11n TH40

Mi	ddle chan	nel: 24	437 MHz								
	equency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)
	4874	Н	43.37	30.29	13.86	57.23	44.15	74	54	-16.77	-9.85
		Η		Ŧ				E	<u></u>	\	
1	ł	Н					ľ				
19		~					100		ANU		T
	4874	V	43.24	30.29	13.86	57.1	44.15	74	54	-16.9	-9.85
	1	V				02					
		V					4-				

High channe	High channel: 2452 MHz										
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Emissio Peak (dBµV/m)		Peak limit (dBµV/m)	AV limit (dBµV/m)	Peak Margin (dB)	AV Margin (dB)	
2483.5	H	58.76	42.43	1.17	59.93	43.6	74	54	-14.07	-10.4	
4924	н	43.72	30.6	14.03	57.75	44.63	74	54	-16.25	-9.37	
	Н	\							25		
	T		5	TUD		VVV					
2483.5	Н	57.23	41.73	1.17	58.4	42.9	74	54	-15.6	-11.1	
4924	V	43.47	30.25	14.03	57.5	44.28	74	54	-16.5	-9.72	
	V			<u></u>	0					N	

Note:

13. Emission Level= Read Level+ Correct Factor

14. The emission levels of other frequencies are very lower than the limit and not show in test report.

15. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

16. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.



(1) Conducted Test

nperature:	25 ℃	Relative Humidity:	55%				
t Voltage:	AC 120/60Hz						
t Mode:	TX B Mode 2412MHz /	TX B Mode 2462MHz					
nark:	The EUT is programed	n continuously transmitting	, mode				
🎉 Keysight Spectrum	n Analyzer - Swept SA						
	RF 75 Ω AC CORREC SENSE:INT 2.3770000000 GHz Trig:	ALIGN AUTO Avg Type: Log-Pwr Free Run Avg Hold:>100/100	07:44:31 PM Jan 08, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N				
	IFGain:Low Atten	: 30 dB	2.412 4 GHz				
10 dB/div Ro	ef Offset 3.63 dB ef 23.63 dBm		5.841 dBm				
13.6 3.63		Land Market	1				
-6.37			14.01 dBm				
-16.4 -26.4		2,					
-36.4		4 3 million /					
-56.4	Henry martine and the state of the second	man manager and a man					
-66.4							
Start 2.32700 #Res BW 100			op 2.42700 GHz 00 ms (1001 pts)				
MKR MODE TRC SC 1 N 1 f 2 N 1 f	2.412 4 GHz 5.841 dBm	FUNCTION FUNCTION WIDTH FUNCTION	VALUE				
3 N 1 f 4 N 1 f	2.390 0 GHz -52.988 dBm						
5 6 7			E				
8							
10							
	т	STATUS					
MSG Keysight Spectrum	n Analyzer - Swept SA						
11 MSG Keysight Spectrum	RF 75 Ω AC CORREC SENSE:INT 2.4970000000 GHz Trig:	ALIGN AUTO Avg Type: Log-Pwr Free Run Avg[Hold:>100/100	07:49:32 PM Jan 08, 2019 TRACE 1 2 3 4 5 6				
11 // C MSG III Keysight Spectrum VA R F Center Freq	RF 75 Ω AC CORREC SENSE:NT 2.497000000 GHz PNO: Fast IFGain:Low Atten	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 PMJan 08, 2019 TRACE 2 3 4 5 6 TYPE MWWWWW DET P NNNNN 2.462 9 GHz				
MSG MSG MSG Center Freq 10 dB/div R	RF 75 Ω AC CORREC SENSE:INT 2.4970000000 GHz Trig:	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 PM Jan 08, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N				
MSG MSG MSG Center Freq 10 d5/cliv R	RF 75 Ω AC CORREC SENSE:NT 2.497000000 GHz PNO: Fast IFGain:Low Atten	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 PMJan 08, 2019 TRACE 2 3 4 5 6 TYPE MWWWWW DET P NNNNN 2.462 9 GHz				
11 MSG IIII Keysight Spectrum Center Freq 10 dB/div 13 6 3.60 -6.40	RF 75 Ω AC CORREC SENSE:NT 2.497000000 GHz PNO: Fast IFGain:Low Atten	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 PMJan 08, 2019 TRACE 2 3 4 5 6 TYPE MWWWWW DET P NNNNN 2.462 9 GHz				
11 MSG IIII Keysight Spectrum IVI R Center Freq 10 dB/div 13 6 3.60	RF 75 Ω AC CORREC SENSE:NT 2.497000000 GHz PNO: Fast IFGain:Low Atten	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 M1an 08, 2019 TRACE 12:3:4:5:0 TYPE 01:2:4:5:0 TYPE 01:0 TYPE 01:0				
11 MSG Image: Second secon	eF 75 0 AC CORREC SENSE:INT 2.497000000 GHz PNO: Fast IFGain:Low Trig: Atten ef Offset 3.6 dB ef 23.60 dBm	Tree Run Auto Tree Run Avg Type: Log-Pwr 30 dB Mkr1	07:49:32 M1an 08, 2019 TRACE 12:3:4:5:0 TYPE 01:2:4:5:0 TYPE 01:0 TYPE 01:0				
11 MSG III Keysight Spectrum XX R F Center Freq 10 dB/cliv 13 6 3 60 -6 4 -26 4	RF 75 Ω AC CORREC SENSE:NT 2.497000000 GHz PNO: Fast IFGain:Low Atten	ALIGN AUTO Âvg Type: Log-Pwr Free Run Avg Hold:>100/100 : 30 dB	07:49:32 M1an 08, 2019 TRACE 12:3:4:5:0 TYPE 01:2:4:5:0 TYPE 01:0 TYPE 01:0				
11 MSG Image: Second secon	eF 75 0 AC CORREC SENSE:INT 2.497000000 GHz PNO: Fast IFGain:Low Trig: Atten ef Offset 3.6 dB ef 23.60 dBm	ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1	07:49:32 M1an 08, 2019 TRACE 12:3:4:5:0 TYPE 01:2:4:5:0 TYPE 01:0 TYPE 01:0				
11 MSG Image: Keysight Spectrum	PE 175 0. AC CORREC SENSE:INT 2.497000000 GHz PNO: Fast IFGain:Low Trig: Atter ef Offset 3.6 dB ef 23.60 dBm 4 4 4 4 4 4 4 4 4 4 4 4 4	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 MKr1	07:49:32 M1an 08, 2019 TRACE 12:3:4:5:0 TYPE 01:2:4:5:0 TYPE 01:0 TYPE 01:0				
II Reysight Spectrum MSG E Center Freq R IO dB/div R IO IO R R IO IO IO R R	PF 75 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Attended of offset 3.6 dB ef 23.60 dBm 0 GHz 0 GHz 0 KHz #VBW 300 CL X Y	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 MKr1	07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4				
11 MSG IIII Keysight Spectrum IIII R IIII R IIIII R IIIIII R IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0	ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6	07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4				
11 MSG III Keysight Spectrum III Keysight Spectrum III R III Center Freq III G III G III G III G IIII G IIII G IIIII G IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0	ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6	07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4				
11 MSG IIII Keysight Spectrum VI R Center Freq 10 dB/div 13 6 14 40.4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 46 4 40 4 1 1 f 1 1 1 1 1 1 1 1 1 1 1 1 1 <td>SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0</td> <td>ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6</td> <td>07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4</td>	SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0	ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6	07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4				
11 MSG III Keysight Spectrum III R Center Freq 10 dB/div 13 6 300 640 -66 -664 -664 </td <td>SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0</td> <td>ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6</td> <td>07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4</td>	SF 175 0 AC CORREC SENSE:INT 2.497000000 GHz PN0: Fast IFGain:Low Trig: Trig: Attention Trig: Trig: Attention Trig: Trig: Attention Trig: Attention ef Offset 3.6 dB ef 23.60 dBm 0 0 0 0 0 0	ALIGN AUTO Avg Type: Log-Pwr AvgIHold:>100/100 Mkr1 AvgIHold:>100/100 Mkr1 AvgIHz Sweep 9.6	07.4932 PM an 08.2019 TRACE 19.24.5 0 TYPE 11.23.4 5 0 CET 21.41.1 10 14.32.4 0 CET 21.41.2 (CEN 14.32.4 0 CET 21.41.4 (CEN 14.41.4 0 CET 21.4				



			TUD.
erature:	25 ℃	Relative Humidity:	55%
/oltage:	AC 120/60Hz	AUST	
/lode:	TX G Mode 2412MHz /	TX G Mode 2462MHz	133
rk:	The EUT is programed	in continuously transmitting	g mode
Keysight Spectrum A	Analyzer - Swept SA 75 Q AC CORREC SENSE:IN 2.377000000 GHz PNO: Fast IFGain:Low Trig Atter Offset 3.63 dB 7 23.63 dB 7 24.64 dB 7 25.64 dB	AT ALIGN AUTO AVG Type: Log-Pwr Avg]Hold:>100/100 MKr1	07:52:46 PMJan 08, 2019 TRACE 2 3 4 5 TRACE 2 3 5
Ref	Correc SENSEIN 2.497000000 GHz PNO: Fast IFGain:Low Trig PNO: Fast IFGain:Low Attended Offset 3.6 dB 1 1 1 1 1 1 1 1 1 1 1 1 1	Arg Type: Log-Pwr Avg Hold:>100/100 Mkr1	07:55:56 PM Jan 08, 2019 TRACE 12 3 4 5 6 TYPE 23 4 5 TYPE 23 5



Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120/60Hz	AUU	
Test Mode:	TX N(HT20) Mode 2412M	Hz / TX N(HT20) Mode 2	462MHz
Remark:	The EUT is programed in a	continuously transmitting	mode
Re		0 dB	08:00:39 PM Jan 08, 2019 TRACE 12:34:56 TYPE DET PNNNNN 12:414 5 GHz -1.836 dBm
3 63 -6 37 -16.4 -26.4 -36.4 -46.4 -46.4 -66.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -56.4 -57 -57 -57 -57 -57 -57 -57 -57			22.39 dbm
#Res BW 100			600 ms (1001 pts)
1 N 1 f 2 N 1 f 3 N 1 f 3 N 1 f 5 0 1 f 6 0 0 1 7 8 0 0 10 1 0 0 11 0 0 0	2.414 5 GHz -1.836 dBm 2.400 0 GHz -36.538 dBm 2.390 0 GHz -50.118 dBm		-
MSG		STATUS	
III Keysight Spectrum (X) R R Center Freq		i0 dB	08:05:13 PM Jan 08, 2019 TRACE 12:34 5 6 TYPE M WWWWW DET P. NN NN
10 dB/div Re Log 13.6 3.60	f Offset 3.6 dB		1 2.463 2 GHz -1.426 dBm
-26.4 -36.4 -46.4 -66.4	the second secon		- CHP-south & Party-hands / January
Start 2.44700 #Res BW 100			top 2.54700 GHz i00 ms (1001 pts)
MKR MODE TRC SC 1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5 6 6 7 8 9 9 9 10 11 4 0 11 4 0 1 f 5 0 1	2.463 2 GHz -1.426 dBm 2.483 5 GHz -52.849 dBm 2.500 0 GHz -54.809 dBm		N VALUE



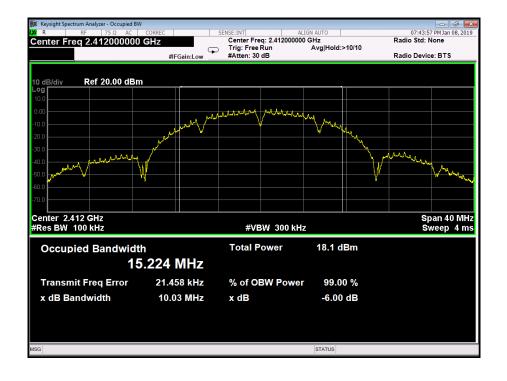
Temperature:	25 °CRelative Humidity:55%
Test Voltage:	AC 120/60Hz
Test Mode:	TX N(HT40) Mode 2422MHz / TX N(HT40) Mode 2452MHz
Remark:	The EUT is programed in continuously transmitting mode
Remark: Image: Center Frequencies Image: Center Frequencies	The EUT is programed in continuously transmitting mode
5 6 7 9 10 11	
MSG	STATUS

Attachment D-- Bandwidth Test Data

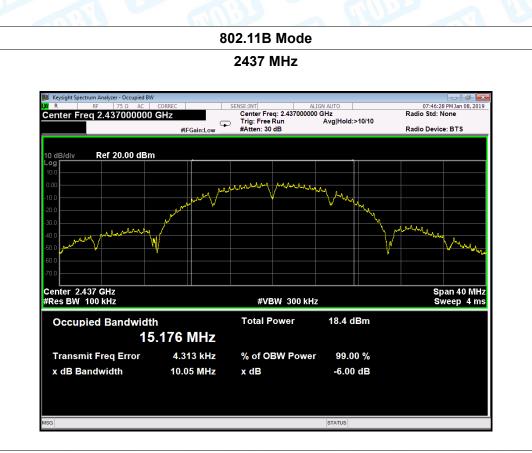
Temperature:	25	5°C	Relative Humidity:	55%	
Test Voltage:	A	C 120/60Hz	DY L		
Test Mode:	Т	X 802.11B Mode			
Channel frequency		6dB Bandwidth	99% Bandwidth	Limit	
(MHz)		(MHz)	(MHz)	(MHz)	
2412		10.03	15.224		
2437		10.05	15.176	>=0.5	
2462		9.577	15.274		
		000 440	Mada		

802.11B Mode

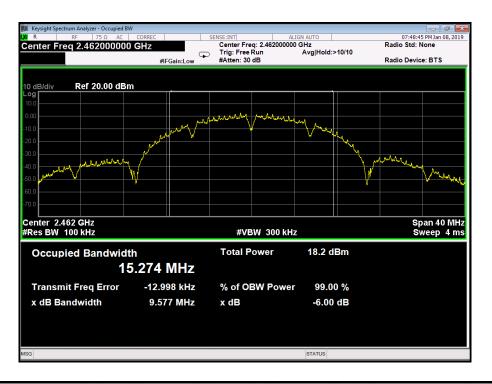






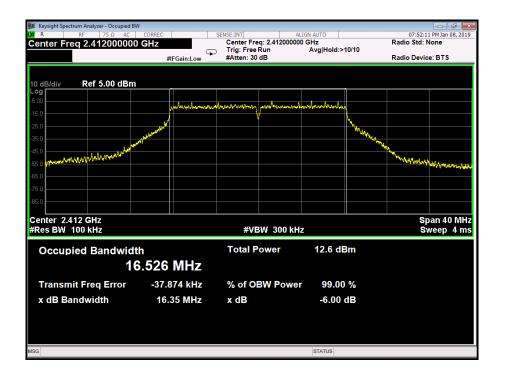


802.11B Mode

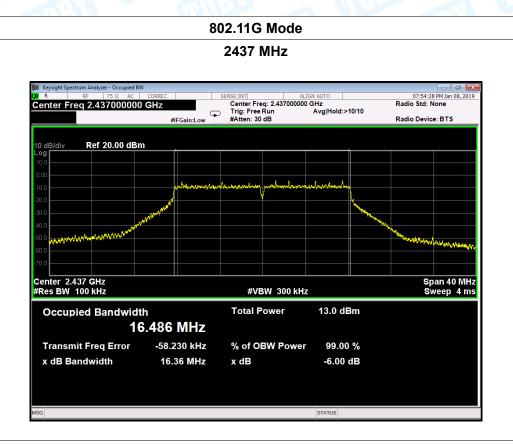




Temperature:	25 ℃		55%	
Test Voltage:	AC 12	20/60Hz	AUD	
Test Mode:	TX 80	2.11G Mode		139
Channel frequen	су	6dB Bandwidth	99% Bandwidth	Limit
(MHz)		(MHz)	(MHz)	(MHz)
2412		16.35	16.526	
2437		16.36	16.486	>=0.5
2462 16.39			16.512	
		802.11G	Mode	1







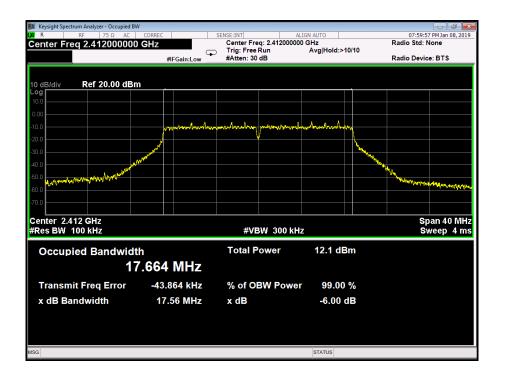
802.11G Mode

Keysight Spectrum Analyzer - Occupied B R RF 75 Ω AC	W	SENSE:INT ALIG	SN AUTO	07:56:21 PM Jan 08, 201
enter Freq 2.46200000		Center Freq: 2.462000000		Radio Std: None Radio Device: BTS
dB/div Ref 5.00 dBm	۱ ۱			
0	manyme	almatination water marked	ndrammarting	
0	- WANNAMAN			
Marthan Martin and Martin and Martin				When a low when he was been a free
0				
0				
enter 2.462 GHz les BW 100 kHz		#VBW 300 kHz		Span 40 MH Sweep 4 m
Occupied Bandwid	th 6.512 MHz	Total Power	12.9 dBm	
	-47.442 kHz	% of OBW Power	99.00 %	
Transmit Freq Error				
Transmit Freq Error x dB Bandwidth	16.39 MHz	x dB	-6.00 dB	

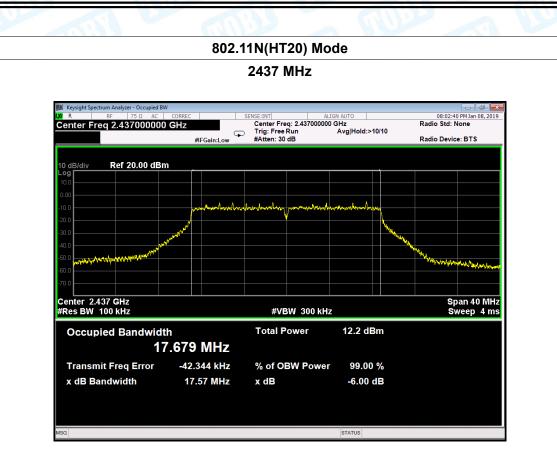


Temperature:	25	°C	55%	
Test Voltage:	AC	120/60Hz		
Test Mode:	ТΧ	802.11N(HT20) Mode		133
Channel frequency 6dB Bandwidth 99% Bandwidth				Limit
(MHz)		(MHz)	(MHz)	(MHz)
2412		17.56	17.664	
2437		17.57	17.679	>=0.5
2462		17.56	17.675	
				1

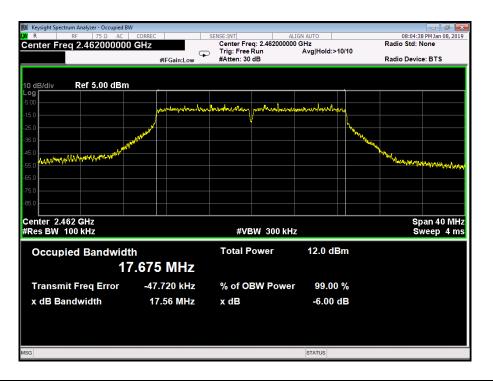
802.11N(HT20) Mode







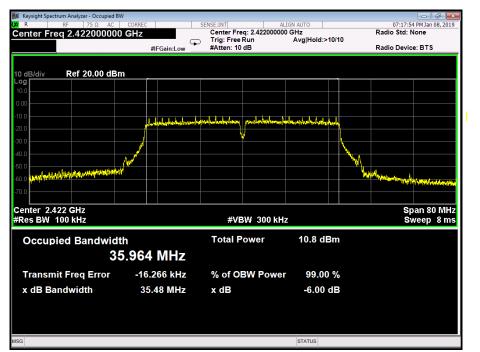
802.11N(HT20) Mode



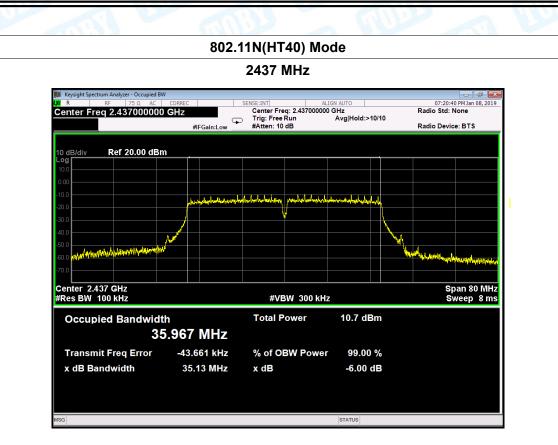


Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120/60Hz	TUDE -	
Test Mode:	TX 802.11N(HT40) Mode		132
Channel frequen	cy 6dB Bandwidth	99% Bandwidth	Limit
(MHz)	(MHz)	(MHz)	(MHz)
2422	35.48	35.964	
2437	35.13	35.967	>=0.5
2452	35.58	35.972	
-	00.00	00.012	

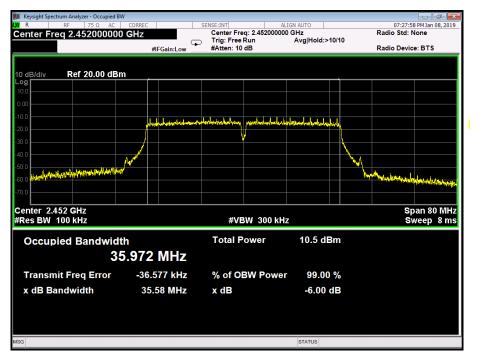
802.11N(HT40) Mode







802.11N(HT40) Mode

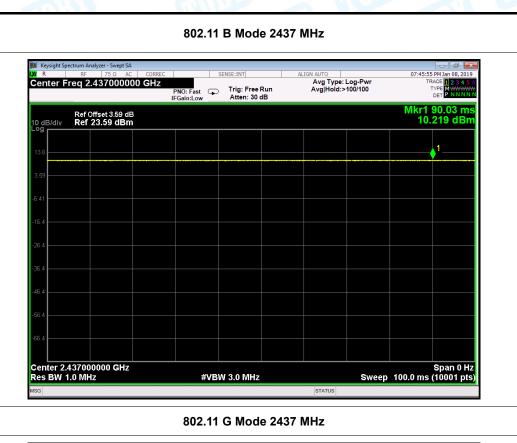


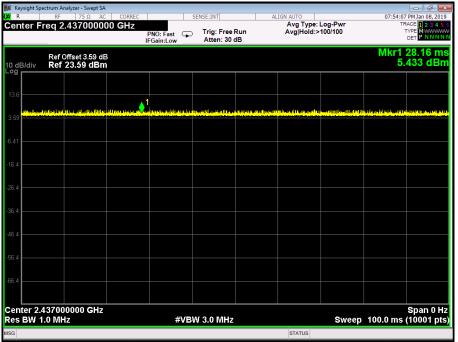
Attachment E-- Peak Output Power Test Data

Test Conditions	Continuous transmitting Mode					
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	AC 120/60Hz					
Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)			
802.11b	2412	16.39				
	2437	16.70				
	2462	16.55				
802.11g	2412	15.50				
	2437	15.88				
	2462	15.80	30			
000 11-	2412	14.93	30			
802.11n	2437	14.96				
(HT20)	2462	14.88				
	2422	13.78				
802.11n (HT40)	2437	13.73				
(1140)	2452	13.47				
I	Resi	ult: PASS				

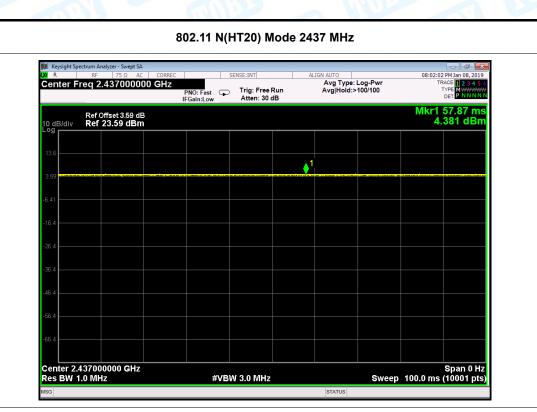
Duty Cycle					
Mode	Channel frequency (MHz)	Test Result			
	2412				
802.11b	2437				
	2462				
	2412				
802.11g	2437				
	2462	>009/			
200 44-	2412	>98%			
802.11n (HT20)	2437				
(1120)	2462				
000 44	2422				
802.11n (HT40)	2437				
(HT40)	2452				











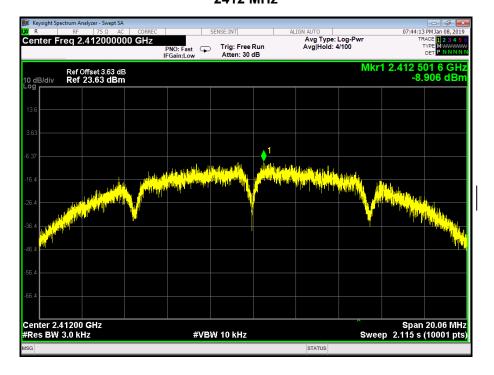
802.11 N(HT40) Mode 2437 MHz

R	ectrum Analyzer - Swept SA RF 75 Ω AC			SENSE:INT	AL	IGN AUTO		07:20:33	2 PM Jan 08, 201
enter F	req 2.4370000	F	PNO: Fast 🖵 FGain:Low	Tains Free I	Run 1B	Avg Type: Avg Hold:>	Log-Pwr 100/100	TF	RACE 1 2 3 4 5 TYPE MWWWW DET PNNNN
dB/div	Ref Offset 3.59 dE Ref 23.59 dBm	3						Mkr1 -1.	89.93 m .776 dBr
3.6									
59									
			الربسا ومرابع					مربول ما محمد به مربوط	
41									
5.4									
5.4									
5.4									
5.4									
5.4									
5.4									
	437000000 GHz I.0 MHz		#VB	W 3.0 MHz			Sweep	100.0 ms	Span 0 H (10001 pt
3						STATUS			

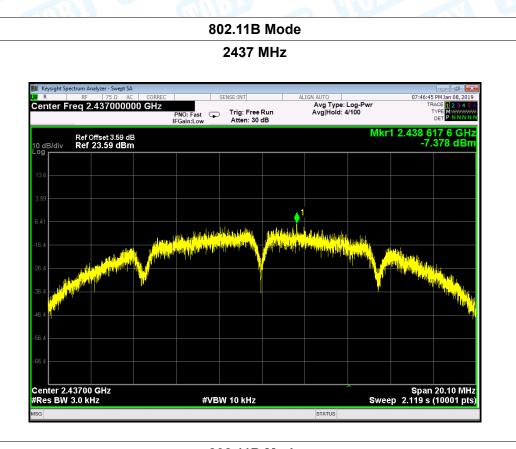
Attachment F-- Power Spectral Density Test Data

TOBY

Temperature:	25 ℃		Relative Humidity:	55%		
Test Voltage:	AC 120/6	120/60Hz				
Test Mode:	TX 802.1	TX 802.11B Mode				
Channel Freq	luency	Power Density Limit				
(MHz)		(dBm/3 kHz)		(dBm)		
2412		-8.90	06			
2437		-7.378		8		
2462		-8.4	55			
		802.11B	Mode			

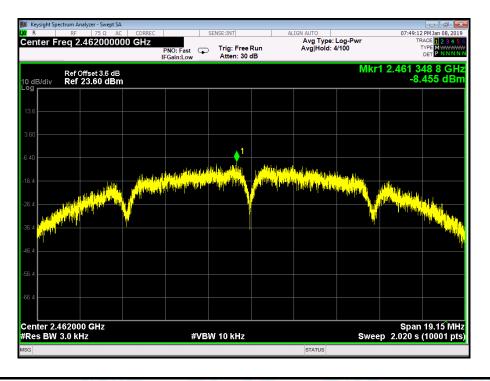






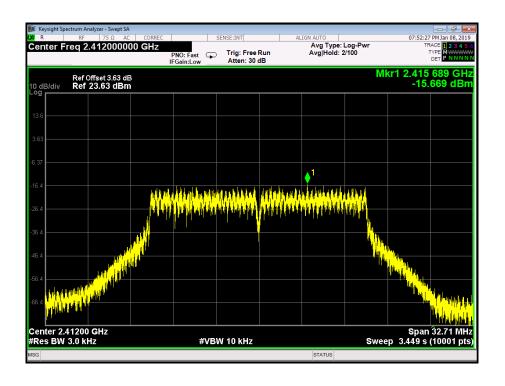
802.11B Mode



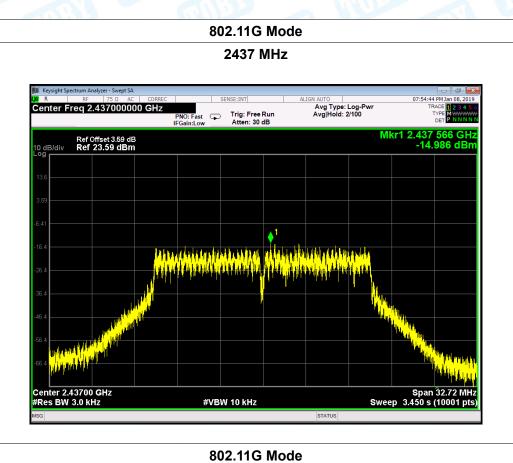


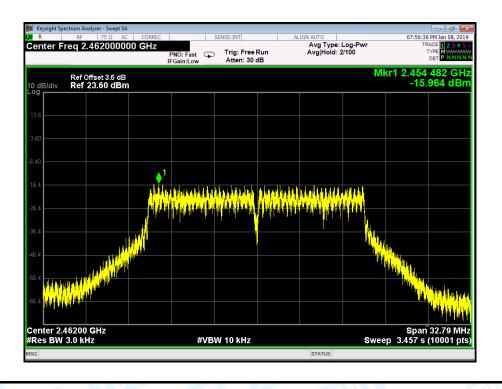


			Temperature:	
Temperature:	25 ℃		25 ℃	
Test Voltage:	AC 120/6	0Hz		
Test Mode:	TX 802.1	1G Mode		INBY
Channel Freq	uency	Power Den	sity	Limit
(MHz)		(dBm/3 kH	lz)	(dBm)
2412		-15.669		
2437		-14.986		8
2462		-15.964		
		802.11G Mo	ode	





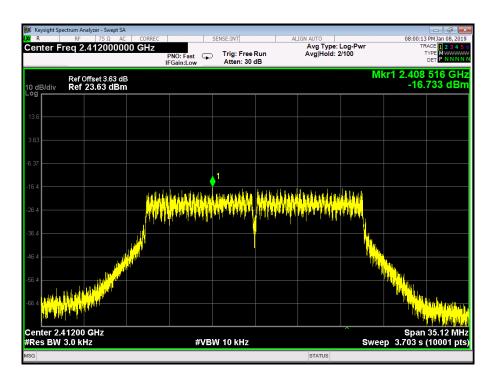




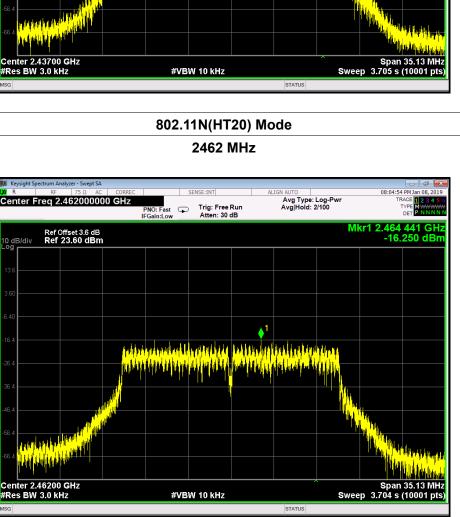


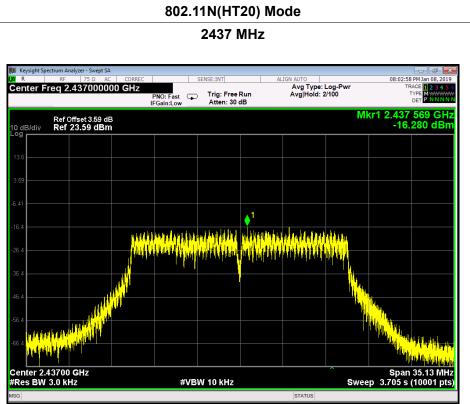
Temperature:	25 ℃	Temperature:		25 ℃	2	
Test Voltage:	AC 120/6	AC 120/60Hz				
Test Mode:	TX 802.1	TX 802.11N(HT20) Mode				
Channel Freq	uency	Power De	nsity	Limit		
(MHz)		(dBm/3 kHz)		(dBm)		
2412	2412		3			
2437		-16.280		8		
2462	2462 -16.250		0			

802.11N(HT20) Mode



TB-RF-074-1.0





Report No.: TB-FCC163785 Page:

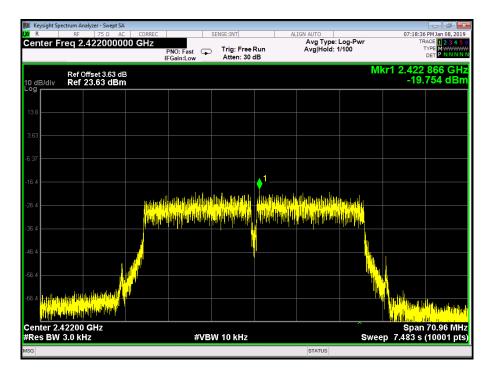


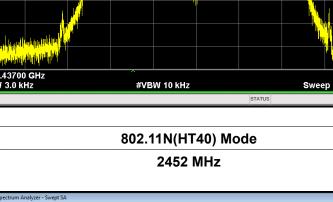
52 of 54

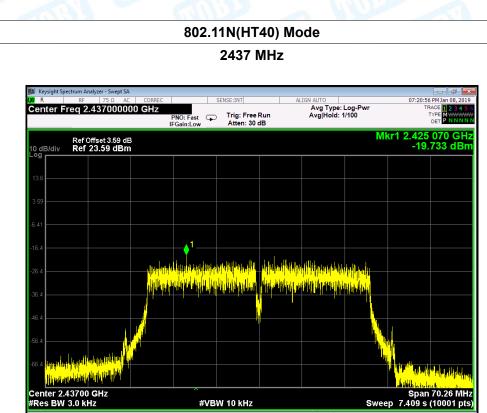


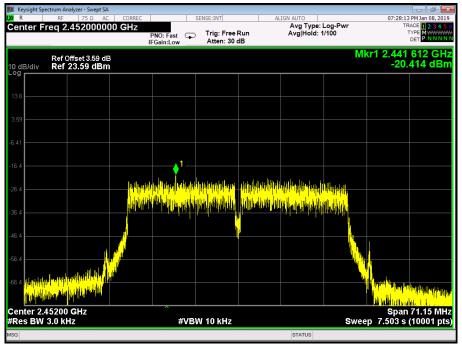
Temperature:	25 ℃	Temperature:		25 ℃	
Test Voltage:	AC 120/6	0Hz			
Test Mode:	TX 802.1	2.11N(HT40) Mode			
Channel Freq	nannel Frequency Power Density			Limit	
(MHz)		(dBm/3 kHz)		(dBm)	
2422	2422				
2437		-19.733		8	
2452 -20.414					
		I			

802.11N(HT40) Mode









-----END OF REPORT-----



