

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant:	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan
Product Name:	Clover Station Pro Terminal
Brand Name:	clover
Model No.:	C503
HVIN:	C503W
Model Difference:	N/A
Report Number:	E2/2021/60096
FCC ID	HFS-CX03W
IC:	1787B-CX03W
Issue Date:	Aug. 03, 2021
Date of Test:	Jul. 01, 2021~Jul. 12, 2021
Date of EUT Received:	Jul. 01, 2021

Jay Lin Approved By

Jav Lin

# We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab 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 comply with FCC rule part §15.247, ISED RSS-247.

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

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Revision History				
Report Number Revision Description Issue Date Revised By				Revised By
E2/2021/60096	Rev.00	Original.	Aug. 03, 2021	Yi-Shan Tsai

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#### **GENERAL INFORMATION** 1

# **1.1 Product Description**

Product Name:	Clover Station Pro Terminal
Brand Name:	clover
Model No.:	C503
HVIN:	C503W
Model Difference:	N/A
Hardware Version:	C503W
Firmware Version:	N/A
EUT Series No.:	PJ216216001 (Radiated) C053UQ11620145 (Conducted) C153UQ11620149 (Conduction)
Power Supply:	12V from AC/DC Adapter

# 1.2 **RF Specification**

# WLAN 2 4GHz

WLAN 2:40112					
Wi-Fi	Frequency	Channels	Rated Power	Modulation	
	Range		in dBm (Peak)	Technology	
802.11b	2412~2462	11	18.21	DSSS	
802.11g	2412~2462	11	19.58	OFDM	
802.11n20	2412~2462	11	23.12	OFDM	
802.11n40	2422~2452	7	24.06	OFDM	
		CCK, DQPSK, DBPSK for DSSS			
Modulation type:		64QAM, 16QAM, QPSK, BPSK for OFDM			
		802.11 b: 1/2/5.5/11 Mbps			
Data Rate:		802.11 g: 6/9/12/18/24/36/48/54 Mbps			
		802.11 n_20MHz:6.5 - 144.4Mbps			
		802.11 n_40MHz:13.5 - 300Mbps			

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# WLAN 2.4GHz for IC

Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Peak)	Rated Power in dBm (EIRP)	Modulation Technology	
802.11b	2412~2462	11	18.21	17.56	DSSS	
802.11g	2412~2462	11	19.58	16.95	OFDM	
802.11n20	2412~2462	11	23.12	20.39	OFDM	
802.11n40	2422~2452	7	24.06	21.88	OFDM	
Modulation type:		CCK, DQPSK, DBPSK for DSSS				
		64QAM, 16QAM, QPSK, BPSK for OFDM				
	802.11 b: 1/2/5.5/11 Mbps					
Data Rate:		802.11 g: 6/9/12/18/24/36/48/54 Mbps				
		802.11 n_20MHz:6.5 - 144.4Mbps				
		802.11 n_40MHz:13.5 - 300Mbps				

# **1.3 Antenna Designation**

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
	SAA	GD9320-15-001-R	2402~2480	1.15	
PIFA	SAA	GD9321-15-001-R	2402~2480	-0.2	
PIFA	Luxshare-ICT	LA81FP017-1H	2402~2480	2.1	V
	Luxshare-ICT	LA81FP018-1H	2402~2480	0.9	

# Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by

using the antenna with the highest gain as the worst case scenarios.

2. Antenna information is provided by the applicant.

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# **1.4 Test Methodology of Applied Standards**

FCC Part 15, Subpart C §15.247 FCC KDB 558074 D01 15.247 Meas Guidance v05r02 FCC KDB 662911 D01 Multiple Transmitter Output v02r01 RSS-247 issue 2 Feb. 2017 RSS-Gen. issue 5 ANSI C63.10:2013

# **1.5 Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier	
		SAC 1			
		SAC 3			
		Conduction 1			
	No.134, Wu Kung Road, New Taipei	Conducted 1			
	Industrial Park, Wuku District, New	Conducted 2	TW0027		
	Taipei City, Taiwan.	Conducted 3		TW3702	
		Conducted 4			
		Conducted 5			
SGS Taiwan Ltd.		Conducted 6			
Central RF Lab.	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction A	TW0028		
(TAF code 3702)		SAC C			
		SAC D			
		SAC G			
		Conducted A			
		Conducted B			
		Conducted C	-		
		Conducted D	-		
		Conducted E	-		
		Conducted F			
Conducted G					
<b>Note:</b> Test site name is remarked on the equipment list in each section of this report as an indica- tion where measurements occurred in specific test site and address.					

# **1.6 Special Accessories**

There are no special accessories used while test was conducted.

# **1.7 Equipment Modifications**

There was no modification incorporated into the EUT.

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# 2 SYSTEM TEST CONFIGURATION

# 2.1 EUT Configuration

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

# 2.2 EUT Exercise

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

# 2.3 Test Procedure

# 2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

# 2.3.2 Conducted Test (RF)

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

# 2.3.3 Radiated Emissions

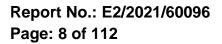
The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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# 2.4 Measurement Results Explanation Example

### 2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*9m\*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

### 2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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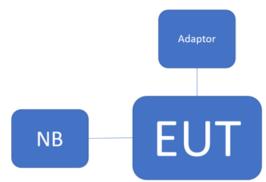


# 2.5 Configuration of Tested System

Fig. 2-1 Conduction (AC Power Line)



Fig. 2-2 Conducted (Antenna Port) Configuration & Radiated Emission



**Table 2-1 Equipment Used in Tested System** 

ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Adapter	clover	FSP040-RHBN3	N/A	N/A	N/A
3.	Notebook	Lenovo	L440	P0000367	N/A	N/A

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#### SUMMARY OF TEST RESULTS 3

FCC Rules	IC Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4 d	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §5.5 RSS-Gen §8.9 RSS-Gen §8.10 RSS-Gen §6.13	Radiated & Conducted Band Edge and Spurious Emission	Compliant
§15.247(e)	RSS-247 §5.2 b	Power Spectral Density	Compliant
§15.203 §15.247(b)	N/A	Antenna Requirement	Compliant

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#### **DESCRIPTION OF TEST MODES** 4

# **4.1 Operatin Frequencies**

Modulation of 20MHz nominal bandwidth

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

# Modulation of 40MHz nominal bandwidth

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

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# 4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

The gevin UE is pre-scanned among below modes.

Modulation	Transmission Chain	Single Transmission Spatial	Multiple Transmission Spatial
🛛 802.11 b	🖾 Ch0 🖾 Ch1 🗆 Ch2 🗆 Ch3	🖾 1TX	□ 2TX
⊠ 802.11 g	🖾 Ch0 🖾 Ch1 🗆 Ch2 🗆 Ch3	🛛 1TX	🗆 2TX
🛛 802.11 n	🖾 Ch0 🖾 Ch1 🗆 Ch2 🗆 Ch3		🛛 MIMO

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

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# 4.3 Radiated Emission Test:

RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE AVAILABLE TESTED MODULATION DATA RATE ANTENNA CHANNEL CHANNEL MODULATION (Mbps) PORT							
802.11g	1 to 11	6	OFDM	6	ch0		
802.11n (HT40)	3 to 9	6	OFDM	MCS8	MIMO		

RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11b	1 to 11	1,6,11	DSSS	1	ch0	
802.11g	1 to 11	1,6,11	OFDM	6	ch0	
802.11n (HT20)	1 to 13	1,6,11	OFDM	MCS8	MIMO	
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS8	MIMO	

# Note:

The field strength of radiation emission was measured as EUT three orthogonal planes, E1 / E2 / H, are positioned to pre-scan the emission generating the highest one. The worst position is tested and recorded.

# **4.4 Antenna Port Conducted Mesurement:**

Conducted						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11b	1 to 11	1,6,11	DSSS	1	ch0	
802.11g	1 to 11	1,6,11	OFDM	6	ch0	
802.11n (HT20)	1 to 13	1,6,11	OFDM	MCS8	MIMO	
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS8	MIMO	

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# 5 MEASUREMENT UNCERTAINTY

Test Items	Un	certain	ty
AC Power Line Conducted Emission	+/-	2.34	dB
Emission Bandwidth	+/-	1.53	Hz
The Maximum Output Power Measurement	+/-	1	dB
Peak Power Spectral Density Measurement	+/-	1.53	dB
Frequency Stability	+/-	1.53	Hz
Temperature	+/-	0.4	°C
Humidity	+/-	3.5	%
DC / AC Power Source		1	%

Radiated Spurious Emission Measurement Uncertainty				
Polarization: Vertical	+/-	2.64	dB	9kHz~30MHz
	+/-	4.93	dB	30MHz - 1000MHz
	+/-	4.81	dB	1GHz - 18GHz
	+/-	4.52	dB	18GHz - 40GHz
	+/-	2.64	dB	9kHz~30MHz
Deleviantieus Heviaeu (el	+/-	4.45	dB	30MHz - 1000MHz
Polarization: Horizontal	+/-	4.81	dB	1GHz - 18GHz
	+/-	4.52	dB	18GHz - 40GHz

# Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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#### CONDUCTED EMISSION TEST 6

# 6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range	Limits (dBuV)				
MHz	Quasi-peak Áverage				
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60 50				
Note					
1.The lower limit shall apply at the transition frequencies					
2. The limit decreases linearly wit	h the logarithm of the frequency ir	n the range 0.15 MHz to 0.50 MHz.			

# 6.2 Measurement Equipment Used

Radiated Emission Test Site: Conduction A						
EQUIPMENT	MFR	MODEL NUM-		LAST CAL.	CAL DUE.	
TYPE		BER	BER			
Test Software	audix	e3	Ver. 6.11- 20180419c	N.C.R	N.C.R	
LISN	SCHWARZBECK Mess- Elektronik	NSLK8127	973	03/25/2021	03/24/2022	
EMI Test Receiver	R&S	ESCI	101342	04/27/2021	04/26/2022	
Coaxial Cable	EC Lab	RF-HY-CAB- 250	RF-HY-CAB-250- 01	03/27/2021	03/26/2022	
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2021	03/26/2022	

# 6.3 EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

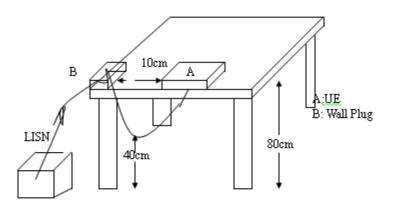
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# 6.4 Test SET-UP (Block Diagram of Configuration)



# 6.5 Measurement Procedure

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

# 6.6 Measurement Result

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

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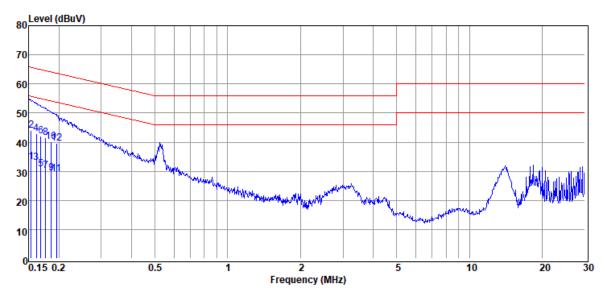
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# AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:E2/2021/60096
Test Mode	:WLAN 2.4G
Power	:120V/60Hz
Probe	:L1
Note:	: Adapter:FSP040-RHBN3

Test Site	:Conduction Room C
Test Date	:2021-07-09
Temp./Humi.	:25.5/52
Engineer	:Ashton Chiu



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.15	Average	23.13	10.22	33.35	55.78	-22.43
0.15	QP	33.79	10.22	44.01	65.78	-21.77
0.16	Average	22.62	10.22	32.84	55.38	-22.54
0.16	QP	32.73	10.22	42.95	65.38	-22.43
0.17	Average	20.51	10.22	30.73	55.03	-24.30
0.17	QP	31.97	10.22	42.19	65.03	-22.84
0.18	Average	19.92	10.22	30.14	54.64	-24.50
0.18	QP	31.23	10.22	41.45	64.64	-23.19
0.19	Average	19.25	10.22	29.47	54.20	-24.73
0.19	QP	29.96	10.22	40.18	64.20	-24.02
0.20	Average	18.74	10.22	28.96	53.80	-24.84
0.20	QP	29.42	10.22	39.64	63.80	-24.16

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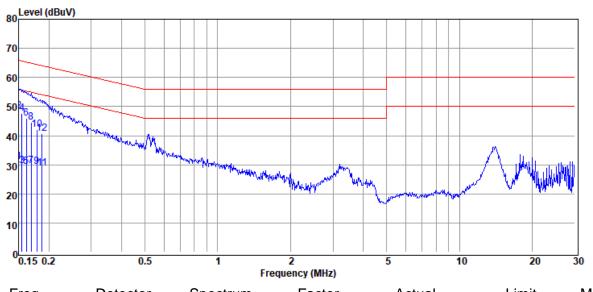
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Report Number	:E2/2021/60096	Test Site	:Conduction Room C
Test Mode	:WLAN 2.4G	Test Date	:2021-07-09
Power	:120V/60Hz	Temp./Humi.	:25.5/52
Probe	:N	Engineer	:Ashton Chiu
Note:	: Adapter:FSP040-RHBN3		



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.15	Average	20.69	10.31	31.00	55.99	-24.99
0.15	QP	38.00	10.31	48.31	65.99	-17.68
0.15	Average	19.46	10.21	29.67	55.74	-26.07
0.15	QP	37.39	10.31	47.70	65.74	-18.04
0.16	Average	19.26	10.21	29.47	55.38	-25.91
0.16	QP	35.65	10.21	45.86	65.38	-19.52
0.17	Average	19.36	10.21	29.57	54.99	-25.42
0.17	QP	34.48	10.21	44.69	64.99	-20.30
0.18	Average	19.22	10.21	29.43	54.55	-25.12
0.18	QP	31.92	10.21	42.13	64.55	-22.42
0.19	Average	18.62	10.21	28.83	54.15	-25.32
0.19	QP	30.51	10.21	40.72	64.15	-23.43

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#### DUTY CYCLE OF TEST SIGNAL 7

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

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

# 7.1 Measurement Procedure:

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

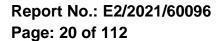
# 7.2 Duty Cycle:

	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log ( 1/Duty Cycle )	1/T (kHz)	VBW setting (kHz)
802.11b	99.28	0.03	0.08	0.01
802.11g	97.86	0.09	0.49	1.00
802.11n_20	97.44	0.11	0.52	1.00
802.11n_40	94.89	0.23	1.05	2.00

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# 7.3 Duty Cycle test plots

### 802.11b 20MHz Chain0 2412MHz

			- Swept SA						
R		RF [3	50.9 DC	PNO: Fast		SENSE: INT	ALIGN	07:36:51 PM Jul 02, 2021 TRACE 1 2 3 4 5 6 TVPE WWWWWW DET P NNNNN	Frequency
) dB/di			t 11.1 dB	IFGain:Lov	N	Atten: 20 dB	Δ	Mkr3 12.54 ms 0.04 dB	Auto Tur
og 11.1	X				-	3∆4			Center Fre 2.412000000 GH
1.9									Start Fre 2.412000000 Gi
3.9 3.9 3.9	1		_		-				Stop Fre 2.412000000 Gi
	V 1.0		0 GHz	VE	3W 1.	0 MHz	Sweep 3	Span 0 Hz 0.07 ms (1001 pts)	CF Ste 1.000000 Mi Auto Mi
							FONCTION FONCTION WIDTH	FUNCTION VALUE	
2 F 3 Δ4 4 F 5 6 7	1	(Δ) (Δ)		12.45 ms 1.924 ms 12.54 ms 1.924 ms		0.07 dB 3.71 dBm 0.04 dB 3.71 dBm			Freq Offs 0 H

### 802.11g\_20MHz\_Chain0\_2412MHz

R RF 50.0	DC	SENSE:INT	ALIGN ALITO	07:41:07 PM Jul 02, 2021	Frequency
	PNO: Fast	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNNN	Frequency
Ref Offset 11.1 0 dB/div Ref 21.10 dB			Δ	Mkr3 2.105 ms 2.91 dB	Auto Tune
99 11.1 1.10 20-20-10-10-10-10-10-10-10-10-10-10-10-10-10	and the second second	agaictratic analytic	perspersion and and and		Center Free 2.412000000 GH:
8.90					Start Free 2.412000000 GH
88.9 58.9 58.9					Stop Free 2.412000000 GH
tes BW 1.0 MHz	VBW 1	I.0 MHz		Span 0 Hz 000 ms (1001 pts)	1.000000 MH
Center 2.412000000 GH Res BW 1.0 MHz Control to the factor of the fac			Sweep 5.		CF Step 1.00000 MH Auto Mar Freq Offse 0 H

### 802.11n\_20MHz\_Chain0\_2412MHz

	12-102 2021	07:45:12 P	JGN AUTO		SEUNT				yzer - Swept SA	RF-		R
Frequency	E123456	TRAC		Avg Type				PNO: Fas	1.56.34 DA	MP.		K
Auto Tur	PNNNNN				dB	Atten: 20		IFGain:Lo				_
Auto Tu	960 ms 0.13 dB		Δι						fset 11.1 d 1.10 dBr			dB
Center Fre				-		3∆4						og
2.412000000 G	and the second	a showing	presidente	algorithmore	Acres	with Synams	wellow	and the second second	when		-	.10
Start Fre		1				1						8.9
2.412000000 G		-			-	-		_				8.9
01 F												8.9
Stop Fre 2.412000000 Gi		1	-		-	Y		-		-		8.9
CF Ste	pan 0 Hz	8							000 GHz	2000	pr 2 413	
1.000000 Mi Auto M	1001 pts)	000 ms (				.0 MHz	BW 1			MH	BW 1.0	es l
	ON VALUE	FUNCTION	TION WIDTH	TION FUN		-0.46	is (A)	x 1.910 ms	)	set t (/	2 1	
				-	dB	1.61 di -0.13	is (Δ)	255.0 µs 1.960 ms	)	t t u	4 1	3 2
Freq Offs	- 1							255.0 us		t		4
Freq Offs 01			_		3m	1.61 di	s	200.0 µa		-		5
	_				3m	1.61 di	IS.	200.0 µa				6
					3m	1.61 di	5	200.0 µ				6

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	_		Æ	50.0	DC		1	SE	NSE:IN)			ALIGN AUTO			4 Jul 02, 2021	Frequency
-	-	_	-			PNO: F	ast ++	Trig: Fre Atten: 2			Avg Ty	pe: Log-Pwr		TYP	E 1 2 3 4 5 6 WWWWWWW P NNNN	
0 dB/	div			ffset 11 21.10 c									ΔMkr		99.0 µs 0.13 dB	Auto Tun
11.1 1.10	_		-				-			Δ2	-					Center Fre 2.422000000 GH
8.90	hyd	why	JH.	Address	NVA	-loss-bul	hillou	Ronhenbul	11	344	ananthalla	dian planta	milpilate	1	handlicht	2.422000000 61
18.9 28.9 38.9	_			_	q*2		_							ſ		Start Fre 2.422000000 GH
48.9 58.9	_	_	-	_		+	_		hu			-		pr		Stop Fre 2.422000000 GH
	W	1.0	MH	0000 G z	Hz		VBW	1.0 MHz		FUNC	TION F	Sweep		ns (	pan 0 Hz 1001 pts)	CF Ste 1.000000 MH Auto Ma
1 A:	2	1	t (	Δ)		948.0		9.83					1			
2 F			-		_	633.0 999.0	IS (A)	-14.67 d	Bm	_	-		-			Freq Offs
4 F	-			<u>0</u> ]	_	633.0		-14.67 d		_	-			_		01
7 8 9	+	+	+				-		+		-			_	=	
	-													_	-	
10									-							



#### PEAK OUTPUT POWER MEASUREMENT 8

# 8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W.

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

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

# Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

• DirectionalGain = 
$$10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

 $g_{j,k} = 10^{Gk/20}$  if the kth antenna is being fed by spatial stream j, or zero if it is not;

G<sub>k</sub> is the gain in dBi of the kth antenna.

The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

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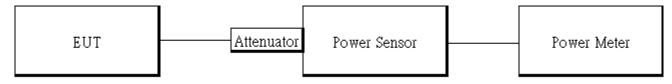


# 8.2 Measurement Equipment Used

	Conducte	d Emission Test S	ite: Conducted	d D	
EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER- NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Soft- ware	Ver.21	N.C.R	N.C.R

# 8.3 Test Set-up

Power Meter:



# 8.4 Measurement Procedure

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

# **Power Meter:**

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

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

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

# 8.5 Measurement Result

802.1	1b Ch0					
СН	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	15.5	18.21	30.00	PASS
6	2437	1	15.5	18.05	30.00	PASS
11	2462	1	15.5	18.01	30.00	PASS
802.1	1b Ch0					
СН	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	1	15.5	15.95	30.00	PASS
6	2437	1	15.5	15.74	30.00	PASS
11	2462	1	15.5	15.87	30.00	PASS

802.1	1g Ch0					
СН	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	13	19.29	30.00	PASS
6	2437	6	14	19.25	30.00	PASS
11	2462	6	14	19.14	30.00	PASS
802.1	1g Ch0					
СН	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	6	13	13.91	30.00	PASS
6	2437	6	14	14.91	30.00	PASS
11	2462	6	14	14.94	30.00	PASS

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СН	Freq.	Data	Power	Peak Output Power	Limit	RESULT
on	(MHz)	Rate	set	(dBm)	(dBm)	RECOL
1	2412	MCS0	13.5	20.35	30.00	PASS
2	2417	MCS0	15	20.24	30.00	PASS
6	2437	MCS0	15	20.28	30.00	PASS
11	2462	MCS0	14	20.24	30.00	PASS
802.1	1n_HT20M	Ch0				
				Max. Avg. Output		
СН	Freq.	Data	Power	include tune up	Limit	RESULT
CII	(MHz)	Rate	set	tolerance Power	(dBm)	RESOLI
				(dBm)		
1	2412	MCS0	13.5	13.93	30.00	PASS
2	2417	MCS0	15	15.27	30.00	PASS
6	2437	MCS0	15	15.46	30.00	PASS
11	2462	MCS0	14	14.40	30.00	PASS
802.1	1n_HT20M	I Ch1				
	Freq.	Data	Power	Peak Output	Limit	
СН	-			Power		RESULT
	(MHz)	Rate	set	(dBm)	(dBm)	
1	2412	MCS0	13.5	20.03	30.00	PASS
2	2417	MCS0	15	20.02	30.00	PASS
6	2437	MCS0	15	20.01	30.00	PASS
11	2462	MCS0	14	19.97	30.00	PASS
802.1	1n_HT20N	I Ch1				
				Max. Avg. Output		
СН	Freq.	Data	Power	include tune up	Limit	RESULT
СП	(MHz)	Rate	set	tolerance Power	(dBm)	REJULI
				(dBm)		
1	2412	MCS0	13.5	13.76	30.00	PASS
2	2417	MCS0	15	15.22	30.00	PASS
6	2437	MCS0	15	15.08	30.00	PASS
					-	

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802.1	1n_HT20M	Λ ΜΙΜΟ						
СН	Freq.	Data	Power		Dutput wer	Total Peak Output Power	Limit	RESULT
	(MHz)	Rate	set	CH 0	CH 1	(dBm)	(dBm)	
1	2412	MCS8	15	20.27	19.94 <b>23.12</b>		30.00	PASS
2	2417	MCS8	15	20.03	19.86	22.96	30.00	PASS
6	2437	MCS8	15	20.21	18.92	22.62	30.00	PASS
11	2462	MCS8	14	20.19	19.87	23.04	30.00	PASS
802.1	1n_HT20N	/ MIMO						
				Avg. C	Dutput	Max. Avg. Output		
СН	Freq.	Data	Power	Po	wer	include tune up	Limit	RESULT
	(MHz)	Rate	set	(dE	Bm)	tolerance Power	(dBm)	RESOLI
				CH 0	CH 1	(dBm)		
1	2412	MCS8	15	15.41	14.90	18.29	30.00	PASS
2	2417	MCS8	15	15.14	14.94	18.16	30.00	PASS
6	2437	MCS8	15	15.21	14.93	18.20	30.00	PASS
11	2462	MCS8	14	14.52	14.17	17.47	30.00	PASS

### 802.11n HT40M Ch0

СН	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	20.72	30.00	PASS
4	2427	MCS0	13	20.60	30.00	PASS
5	2432	MCS0	14	20.41	30.00	PASS
6	2437	MCS0	14	20.37	30.00	PASS
7	2442	MCS0	14	20.24	30.00	PASS
8	2447	MCS0	13	20.34	30.00	PASS
9	2452	MCS0	12	20.58	30.00	PASS

802.11n\_HT40M Ch0

СН	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	12.35	30.00	PASS
4	2427	MCS0	13	13.04	30.00	PASS
5	2432	MCS0	14	14.05	30.00	PASS
6	2437	MCS0	14	14.16	30.00	PASS
7	2442	MCS0	14	14.10	30.00	PASS
8	2447	MCS0	13	13.01	30.00	PASS
9	2452	MCS0	12	12.25	30.00	PASS

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802.1	1n_HT40I	VI Ch1				
СН	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	20.51	30.00	PASS
4	2427	MCS0	13	20.48	30.00	PASS
5	2432	MCS0	14	20.47	30.00	PASS
6	2437	MCS0	14	20.28	30.00	PASS
7	2442	MCS0	14	20.55	30.00	PASS
8	2447	MCS0	13	20.47	30.00	PASS
9	2452	MCS0	12	20.31	30.00	PASS
802.1	1n_HT40I	V Ch1				
				Max. Avg. Output		
СН	Freq.	Data	Power	include tune up	Limit	RESULT
СП	(MHz)	Rate	set	tolerance Power	(dBm)	REJULI
				(dBm)		
3	2422	MCS0	12	12.26	30.00	PASS
4	2427	MCS0	13	12.88	30.00	PASS
5	2432	MCS0	14	14.00	30.00	PASS
6	2437	MCS0	14	14.01	30.00	PASS
7	2442	MCS0	14	14.02	30.00	PASS
8	2447	MCS0	13	12.89	30.00	PASS
9	2452	MCS0	12	12.10	30.00	PASS

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802.1 <sup>-</sup>	1n_HT40							
СН	Freq.	Data	Power		Dutput wer	Total Peak Output Power	Limit	RESULT
	(MHz)	Rate	set	CH 0	CH 1	(dBm)	(dBm)	
3	2422	MCS8	12	21.08	20.78	23.94	30.00	PASS
4	2427	MCS8	14.5	20.57	20.72	23.66	30.00	PASS
5	2432	MCS8	14.5	20.74	20.78	23.77	30.00	PASS
6	2437	MCS8	14.5	21.06	21.04	24.06	30.00	PASS
7	2442	MCS8	14.5	20.92	20.79	23.87	30.00	PASS
8	2447	MCS8	14.5	20.79	20.72	23.77	30.00	PASS
9	2452	MCS8	12	21.02	20.43	23.75	30.00	PASS
802.1 <sup>-</sup>	1n_HT40							
				Avg. C	Dutput	Max. Avg. Output		
СН	Freq.	Data	Power	Po	wer	include tune up	Limit	RESULT
	(MHz)	Rate	set	(dE	Bm)	tolerance Power	(dBm)	RESOLI
				CH 0	CH 1	(dBm)		
3	2422	MCS8	12	12.31	12.05	15.42	30.00	PASS
4	2427	MCS8	14.5	14.13	14.04	17.32	30.00	PASS
5	2432	MCS8	14.5	14.05	14.10	17.31	30.00	PASS
6	2437	MCS8	14.5	14.14	14.08	17.35	30.00	PASS
7	2442	MCS8	14.5	14.03	14.12	17.31	30.00	PASS
8	2447	MCS8	14.5	14.12	14.05	17.32	30.00	PASS
9	2452	MCS8	12	12.28	11.92	15.34	30.00	PASS

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

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# EIRP

# 802 11h Ch0

002.1							
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	15.95	0.90	16.85	36	PASS
6	2437	1	15.74	0.90	16.64	36	PASS
11	2462	1	15.87	0.90	16.77	36	PASS

# 802.11a Ch0

••=	ig ono						
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	13.91	0.90	14.81	36	PASS
6	2437	6	14.91	0.90	15.81	36	PASS
11	2462	6	14.94	0.90	15.84	36	PASS

802.11	802.11n_HT20M Ch0											
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT					
1	2412	MCS0	13.93	0.90	14.83	36	PASS					
6	2437	MCS0	15.46	0.90	16.36	36	PASS					
11	2462	MCS0	14.40	0.90	15.30	36	PASS					

802.11	802.11n_HT20M Ch1											
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT					
1	2412	MCS0	13.76	2.10	15.86	36	PASS					
6	2437	MCS0	15.08	2.10	17.18	36	PASS					
11	2462	MCS0	14.25	2.10	16.35	36	PASS					

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802.11	302.11n_HT20M MIMO											
СН	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power	Antenna Gain	EIRP (dBm)	Limit (dBm)	RESULT			
	(11172)	Nale	CH 0	CH 1	(dBm)	(dBi)	(ubiii)	(ubiii)				
1	2412	MCS8	20.27	19.94	18.29	4.53	22.82	36	PASS			
2	2417	MCS8	20.03	19.86	18.16	4.53	22.69	36	PASS			
6	2437	MCS8	20.21	18.92	18.20	4.53	22.73	36	PASS			
11	2462	MCS8	20.19	19.87	17.47	4.53	22.00	36	PASS			

# 802.11n HT40M Ch0

СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12.35	0.90	13.25	36	PASS
6	2437	MCS0	14.16	0.90	15.06	36	PASS
9	2452	MCS0	12.25	0.90	13.15	36	PASS

802.11	802.11n_HT40M Ch1										
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT				
3	2422	MCS0	12.26	2.10	14.36	36	PASS				
6	2437	MCS0	14.01	2.10	16.11	36	PASS				
9	2452	MCS0	12.10	2.10	14.20	36	PASS				

802.11	802.11n_HT40M MIMO								
СН	Freq. (MHz)	Data Rate	-	Dutput wer	Total Avg. Output Power	Antenna Gain	EIRP (dBm)	Limit (dBm)	RESULT
	(11112)	Nate	CH 0	CH 1	(dBm)	(dBi)	(abiii)	(abiii)	
3	2422	MCS8	12.31	12.05	15.42	4.53	19.95	36	PASS
4	2427	MCS8	14.13	14.04	17.32	4.53	21.85	36	PASS
5	2432	MCS8	14.05	14.10	17.31	4.53	21.84	36	PASS
6	2437	MCS8	14.14	14.08	17.35	4.53	21.88	36	PASS
7	2442	MCS8	14.03	14.12	17.31	4.53	21.84	36	PASS
8	2447	MCS8	14.12	14.05	17.32	4.53	21.85	36	PASS
9	2452	MCS8	12.28	11.92	15.34	4.53	19.87	36	PASS

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#### **EMISSION BANDWIDTH MEASUREMENT** 9

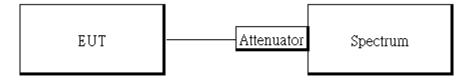
# 9.1 Standard Applicable

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

# 9.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D						
EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.	
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022	
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021	
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021	
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021	
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021	
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021	
DC Block	PASTER- NACK	PE8210	RF152	11/19/2020	11/18/2021	
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021	
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R	
Test Software	SGS Taiwan	Radio Test Soft- ware	Ver.21	N.C.R	N.C.R	

# 9.3 Test Set-up



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# 9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3 X RBW, Span= 2 to 5 times of the OBW, Sweep=auto, Detector = Peak, and Max hold for -6dB Bandwidth test.
- 5. Set the spectrum analyzer as RBW= 1 % to 5% of 99% Bandwidth , VBW  $\geq$  3 X RBW, Span= large enough to capture all products of the modulation process, Sweep=auto, Detector = Peak, and Max hold for 99% Bandwidth test.
- 6. Turn on the 99% bandwidth function, max reading.
- 7. Repeat above procedures until all test default channel is completed

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### 9.5 6dB Bandwidth

802.11b Ch0				
Freq.	6dB BW	Limit	Result	
(MHz)	(kHz)	(kHz)	Result	
2412	9047.00	≧ 500	PASS	
2437	9057.00	≧ 500	PASS	
2462	8597.00	≧ 500	PASS	
802.11g Ch0				
Freq.	6dB BW	Limit	Result	
(MHz)	(kHz)	(kHz)	Nesuit	
2412	15820.00	≧ 500	PASS	
2437	15460.00	≧ 500	PASS	
2462	15970.00	≧ 500	PASS	
802.11_n_HT20 Ch0				
Freq.	6dB BW	Limit	Result	
(MHz)	(kHz)	(kHz)	Result	
2412	16560.00	≧ 500	PASS	
2437	15520.00	≧ 500	PASS	
2462	16670.00	≧ 500	PASS	
802.11_n_HT20 Ch1				
Freq.	6dB BW	Limit	Result	
(MHz)	(kHz)	(kHz)	Result	
2412	16280.00	≧ 500	PASS	
2437	15430.00	≧ 500	PASS	
2462	16360.00	≧ 500	PASS	
000 44 117 40 01 0				
802.11_n_HT40 Ch0				
802.11_n_H140 Ch0 Freq.	6dB BW	Limit	Result	
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	
Freq.			Result PASS	
Freq. (MHz)	(kHz)	(kHz)		
Freq. (MHz) 2422	(kHz) 35350.00	(kHz) ≧ 500	PASS	
Freq. (MHz) 2422 2437	(kHz) 35350.00 35180.00	(kHz) ≧ 500 ≧ 500 ≧ 500	PASS PASS	
Freq. (MHz) 2422 2437 2452 802.11_n_HT40 Ch1 Freq.	(kHz) 35350.00 35180.00	(kHz) ≧ 500 ≧ 500 ≧ 500 Limit	PASS PASS PASS	
Freq. (MHz) 2422 2437 2452 802.11_n_HT40 Ch1 Freq. (MHz)	(kHz) 35350.00 35180.00 <b>35750.00</b>	(kHz) ≧ 500 ≧ 500 ≧ 500	PASS PASS	
Freq. (MHz) 2422 2437 2452 802.11_n_HT40 Ch1 Freq. (MHz) 2422	(kHz) 35350.00 35180.00 <b>35750.00</b> 6dB BW (kHz) 35180.00	(kHz) ≧ 500 ≧ 500 ≧ 500 Limit	PASS PASS PASS	
Freq. (MHz) 2422 2437 2452 802.11_n_HT40 Ch1 Freq. (MHz)	(kHz) 35350.00 35180.00 <b>35750.00</b> 6dB BW (kHz)	(kHz) ≧ 500 ≧ 500 ≧ 500 Limit (kHz)	PASS PASS PASS Result	

\*Refer to next page for plots

35460.00

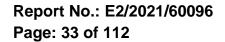
 $\geq 500$ 

PASS

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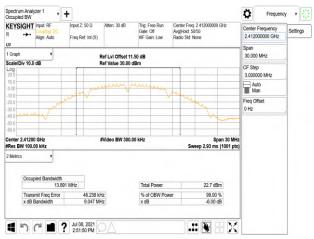
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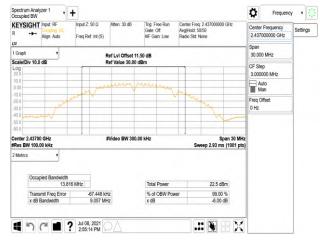




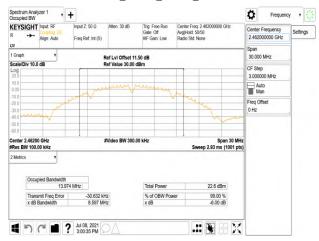
#### 802.11b 20MHz Chain0 2412MHz



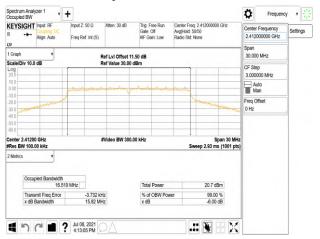
### 802.11b\_20MHz\_Chain0\_2437MHz



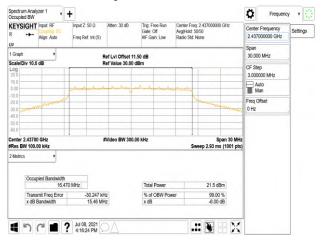
#### 802.11b 20MHz Chain0 2462MHz



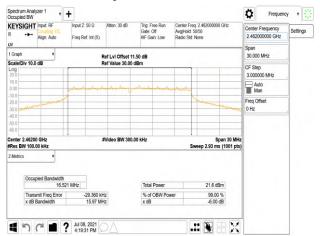
#### 802.11g 20MHz Chain0 2412MHz



#### 802.11g\_20MHz\_Chain0\_2437MHz



### 802.11g 20MHz Chain0 2462MHz



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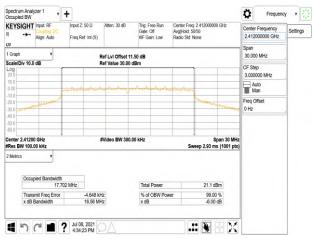
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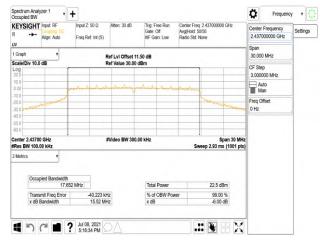
# Report No.: E2/2021/60096 Page: 34 of 112



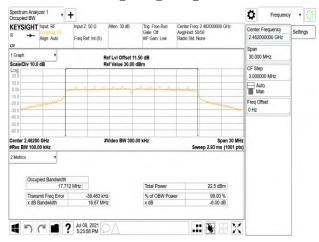
### 802.11n 20MHz Chain0 2412MHz



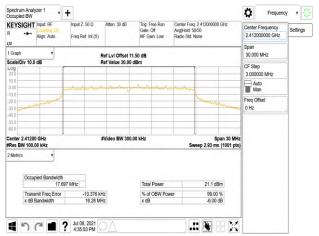
#### 802.11n\_20MHz\_Chain0\_2437MHz



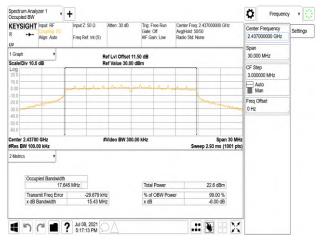
#### 802.11n 20MHz Chain0 2462MHz



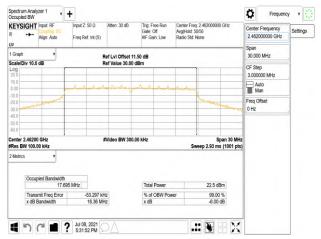
#### 802.11n 20MHz Chain1 2412MHz



#### 802.11n\_20MHz\_Chain1\_2437MHz



### 802.11n 20MHz Chain1 2462MHz



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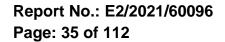
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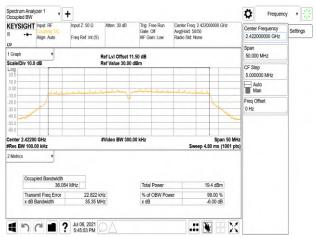
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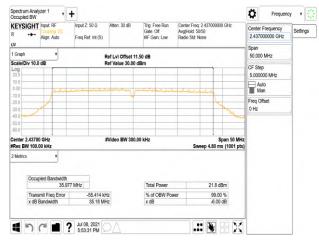
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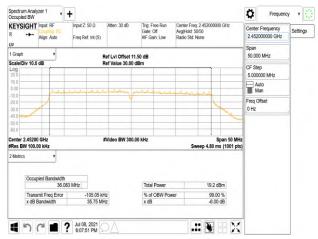
### 802.11n 40MHz Chain0 2422MHz



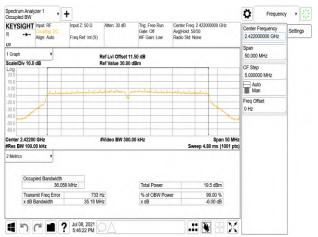
### 802.11n\_40MHz\_Chain0\_2437MHz



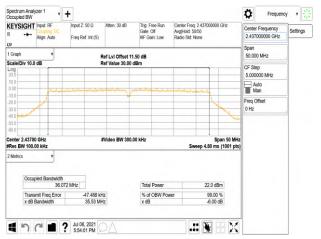
### 802.11n 40MHz Chain0 2452MHz



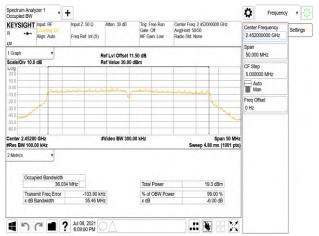
#### 802.11n 40MHz Chain1 2422MHz



### 802.11n\_40MHz\_Chain1\_2437MHz



### 802.11n 40MHz Chain1 2452MHz



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# 9.6 99% Bandwidth

### 802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.911
2437	13.83
2462	14

### 802.11g Ch0

Freq.	99% BW
(MHz)	(MHz)
2412	16.85
2437	16.745
2462	16.881

### 802.11n HT20M Ch0

Freq.	99% BW
(MHz)	(MHz)
2412	18.032
2437	17.907
2462	18.054

### 802.11n\_HT20M Ch1

Freq.	99% BW
(MHz)	(MHz)
2412	17.941
2437	17.877
2462	17.963

### 802.11n HT40M Ch0

Freq.	99% BW
(MHz)	(MHz)
2422	36.258
2437	36.155
2452	36.298

### 802.11n HT40M Ch1

Freq.	99% BW
(MHz)	(MHz)
2422	36.237
2437	36.221
2452	36.196

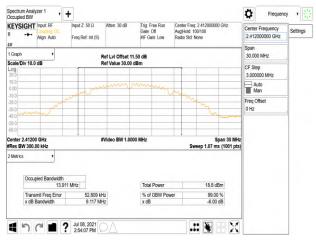
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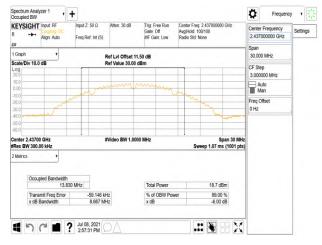
### Report No.: E2/2021/60096 Page: 37 of 112



#### 802.11b 20MHz Chain0 2412MHz



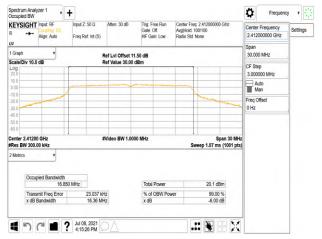
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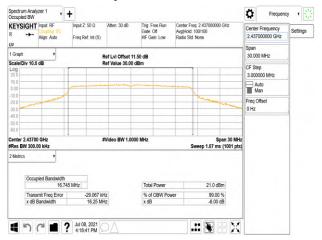
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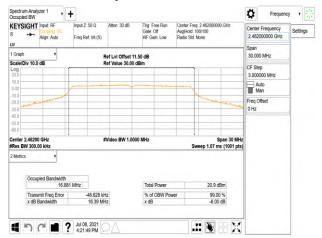
#### 802.11g 20MHz Chain0 2412MHz



802.11g\_20MHz\_Chain0\_2437MHz



#### 802.11g\_20MHz\_Chain0\_2462MHz



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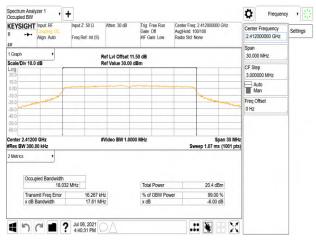
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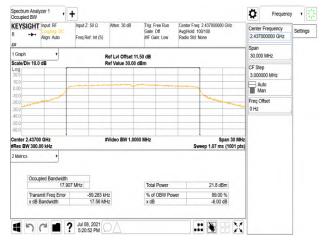
### Report No.: E2/2021/60096 Page: 38 of 112



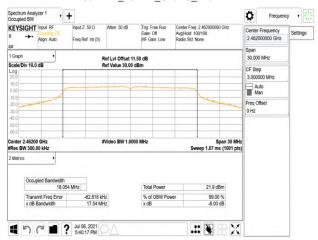
#### 802.11n 20MHz Chain0 2412MHz



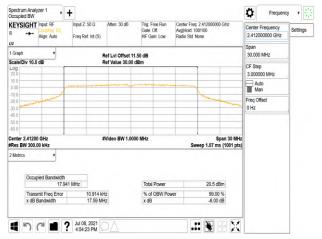
802.11n\_20MHz\_Chain0\_2437MHz



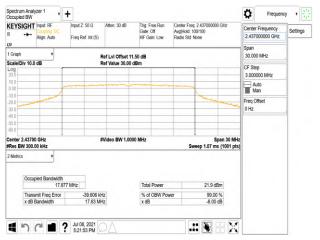
#### 802.11n\_20MHz\_Chain0\_2462MHz



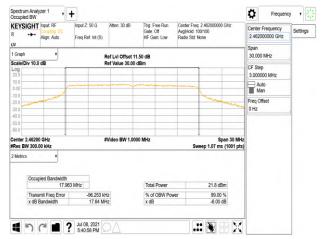
#### 802.11n 20MHz Chain1 2412MHz



802.11n\_20MHz\_Chain1\_2437MHz



#### 802.11n 20MHz Chain1 2462MHz



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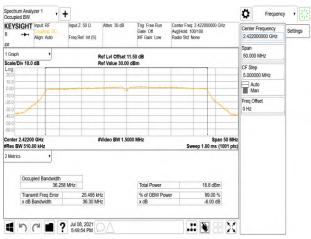
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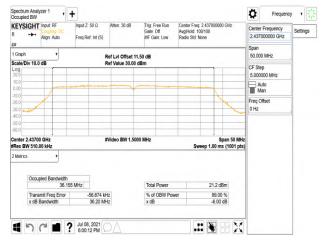
### Report No.: E2/2021/60096 Page: 39 of 112



#### 802.11n 40MHz Chain0 2422MHz



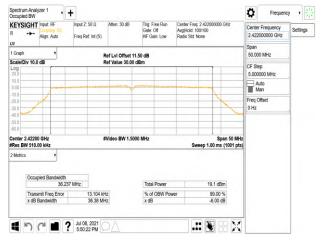
802.11n\_40MHz\_Chain0\_2437MHz



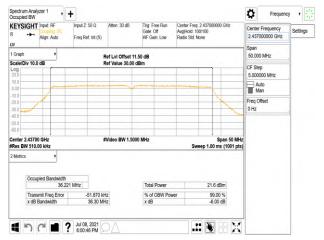
#### 802.11n 40MHz Chain0 2452MHz



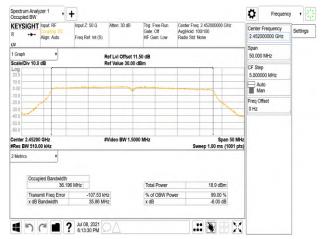
#### 802.11n 40MHz Chain1 2422MHz



802.11n\_40MHz\_Chain1\_2437MHz



#### 802.11n 40MHz Chain1 2452MHz



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# **10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT**

## 10.1 Standard Applicable

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

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9.

	Conducte	d Emission Test S	ite: Conducted	d D	
EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER- NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Soft- ware	Ver.21	N.C.R	N.C.R

### **10.2 Measurement Equipment Used**

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# Attenuator EUT Spectrum

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### **10.4 Measurement Procedure**

### **Reference Level of Emission Limit:**

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 100kHz & VBW = 300 kHz.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss +  $10 \log (N)$ , where N is number of transmitting antenna.

# **Conducted Band Edge:**

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Set DL as the limit = reading on marker of reference level measurement 20dBm
- 8. Mark the highest readings of the emissions outside of 2400MHz~2483.5MHz.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.
- 10. MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss +  $10 \log (N)$ , where N is number of transmitting antenna.

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# **Conducted Spurious Emission:**

- 1. To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.
- 7. MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss +  $10 \log (N)$ , where N is number of transmitting antenna.

### Note:

For test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

### 10.5 Measurement Result

Refere	Reference Level of Limit 802.11b mode			Reference Level of Limit 802.11g mode			
Freq.	PSD	Reference Level of Limit	Freq.	PSD	Reference Level of Limit		
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)		
2412	6.95	-13.05	2412	3.78	-16.22		
2437	6.75	-13.25	2437	4.37	-15.63		
2462	6.91	-13.09	2462	4.50	-15.50		

Referen	ce Level	of Limit 802.11n20 mode	Referen	of Limit 802.11n40 MODE	
Freq.	PSD	Reference Level of Limit	Freq.	PSD	Reference Level of Limit
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2412	7.00	-13.00	2422	2.133	-17.87
2437	8.81	-11.19	2437	4.24	-15.76
2462	8.73	-11.27	2452	1.759	-18.24

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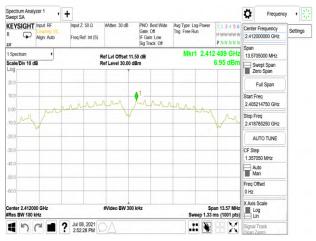
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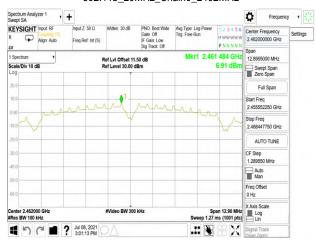
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802.11b\_20MHz\_Chain0\_2437MHz



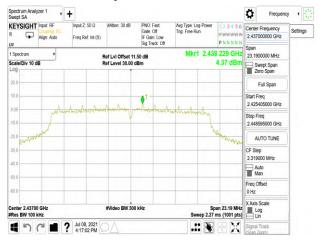
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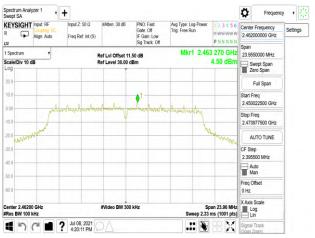


#### 802.11g\_20MHz\_Chain0\_2412MHz



802.11g\_20MHz\_Chain0\_2437MHz





802.11g\_20MHz\_Chain0\_2462MHz

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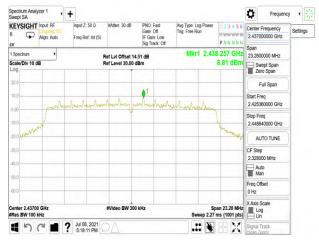
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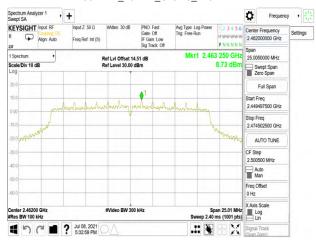
#### 802.11n 20MHz Chain0 2412MHz



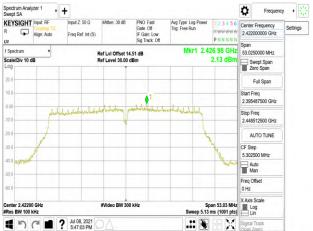
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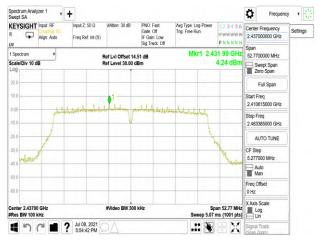
#### 802.11n\_20MHz\_Chain0\_2462MHz



#### 802.11n\_40MHz\_Chain0\_2422MHz



802.11n\_40MHz\_Chain0\_2437MHz





802.11n\_40MHz\_Chain0\_2452MHz

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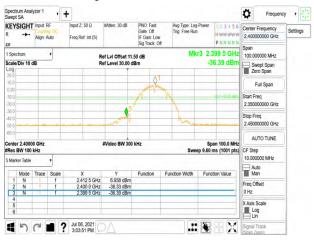
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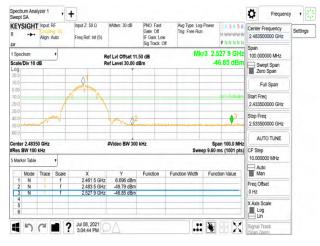
### Report No.: E2/2021/60096 Page: 46 of 112



#### Band\_Edge 802.11b\_20MHz\_Chain0\_2412MHz



802.11b\_20MHz\_Chain0\_2462MHz



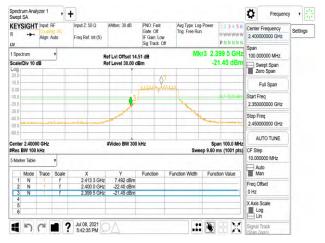
#### 802.11g\_20MHz\_Chain0\_2412MHz



#### 802.11g\_20MHz\_Chain0\_2462MHz



802.11n\_20MHz\_Chain0\_2412MHz





#### 802.11n\_20MHz\_Chain0\_2462MHz

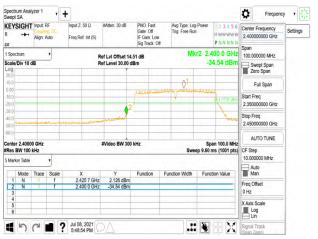
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#### 802.11n 40MHz Chain0 2422MHz



802.11n\_40MHz\_Chain0\_2452MHz



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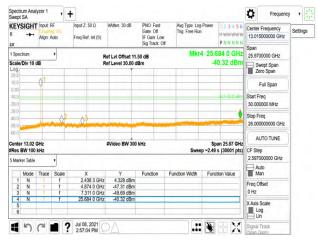
### Report No.: E2/2021/60096 Page: 48 of 112



#### Spurious Emission 802.11b 20MHz Chain0 2412MHz

	SA	_		+		-				Ö	Frequency	• •	•
(EY	SIGHT	Align: A		Input Z: 50 Ω Freq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: C			123456 MWWWWW PNNNNN		Frequency 5000000 GHz	Settin	gs
Sper	trum	-			Ref Lvi Offset 11.			r4 2.	399 3 GHz	Span 25.97	00000 GHz		
cale	Div 10 d	B	2		Ref Level 30.00 d				9.09 dBm		wept Span		
.0g		1			1						ero Span		
0.05		A1	_										
0.00		V									Full Span		
						_			01-11-5-685	Start F	rea		
20.0			_								0000 MHz		
30.0		44-	-			_	_		-				
40.0	_	1	$\wedge^2$	03			1.000			Stop F			
50.0	-	-	-							26.00	0000000 GHz		
60,0										Δ	UTO TUNE		
	r 13.02 (				#Video BW 300	kHz			an 25.97 GHz				
Res	BW 100	kHz					Swee	p~2.49	s (30001 pts)				
	er Table									2.597	000000 GHz		
5 Mark		_	_								uto		
i Mark		Trace	Scale	X 2.412 3 GHz	Y 4.164 dBm	Function	Function Width	Fund	tion Value	M	an		
	Mode	THUC	- I - I					-		Freq C	Iffset		
1	N	1	6					-		0 Hz			
1 2	N N	1	f	4.824 0 GHz 7.236 0 GHz									
1	N	1	f 1 1	4.824 0 GHz 7.236 0 GHz 2.399 3 GHz	-49.76 dBm			-					
1 2 3 4 5	N N N	1	f f f	7.236 0 GHz	-49.76 dBm					X Axis			
1 2 3 4	N N N	1	f I T	7.236 0 GHz	-49.76 dBm						og		
1 2 3 4 5	N N N		1	7.236 0 GHz	-49.76 dBm					X Axis	ng Track		

802.11b\_20MHz\_Chain0\_2437MHz



#### 802.11b\_20MHz\_Chain0\_2462MHz

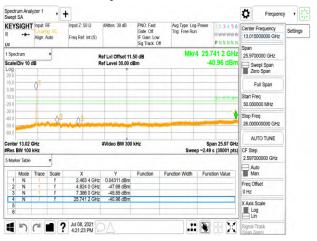


#### 802.11g 20MHz Chain0 2412MHz



802.11g\_20MHz\_Chain0\_2437MHz





#### 802.11g\_20MHz\_Chain0\_2462MHz

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#### 802.11n\_20MHz\_Chain0\_2412MHz

Swept		_		+						Ö	Frequency	•
R	SIGHT			Input Z: 50 Q Freq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Lou Sig Track: C			123456 MWWWWW PNNNNN		Frequency 5000000 GHz	Setting
Spec	trum	-			Ref Lvi Offset 14	1.2		r4 2	399 3 GHz	Span	0000 GHz	
	Div 10 d	B			Ref Level 30.00 d				5.15 dBm		vept Span	
.og r		_	-		1			_	1		ro Span	
20.0		41				-				-		
0.00		0									Full Span	
10.0			_						011-13-03-080	Start Fr	req	
20.0		♦4 —	-							30.000	0000 MHz	
30.0		1	12	13			_			Stop Fr	ea	
40.0		Distant of	- V.	and a state of the second	distance of	A CONTRACTOR					0000000 GHz	
60.0												
	13.02 0				#Video BW 300				an 25.97 GHz	AL	JTO TUNE	
	3W 100				#VIDEO BVV 300	KMZ	Swee		s (30001 pts)	CF Ste	0	
Made	er Table							-	- 1		000000 GHz	
India	el lane	_	<u> </u>							- AL	to	
		Trace	Scale	х	Y	Function	Function Width	Fund	tion Value	Ma	an	
1	N		1	2.413 2 GHz	1.290 dBm			-		Freq O	fiset	
2	N	-	1	4.824 0 GHz				-		0 Hz		
3	N	-	1	7.236 0 GHz 2.399 3 GHz		_		_		Uniz		
4	N	-	- 1	2.399 3 GHZ	-20.10 OBm			-		X Axis	Scale	
6		_									ig n	
	10	-	2	Jui 08, 2021	2.4			1251	M	Signal		
1	5			4:40:05 PM								

#### 802.11n\_20MHz\_Chain0\_2437MHz



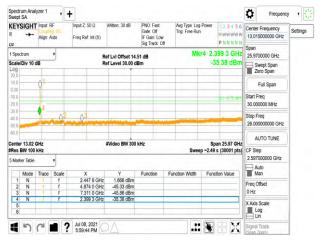
#### 802.11n\_20MHz\_Chain0\_2462MHz



#### 802.11n\_40MHz\_Chain0\_2422MHz



#### 802.11n\_40MHz\_Chain0\_2437MHz





#### 802.11n\_40MHz\_Chain0\_2452MHz

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# 11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

# **11.1 Standard Applicable**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 and RSS-Gen §8.9 Table 5 and 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13.2.a, for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### Note:

1. The lower limit shall apply at the transition frequencies.

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### **11.2 Measurement Equipment Used:**

	Radiate	d Emission Tes	t Site: SAC C		
EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
Broadband Antenna	TESEQ	CBL 6112D	35240	09/08/2020	09/07/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	07/30/2020	07/29/2021
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/11/2021	01/10/2022
Loop Antenna	ETS.LIND- GREN	6502	143303	05/07/2021	05/06/2022
EMI Test Receiver	R&S	ESU 40	100363	04/28/2021	04/27/2022
Pre-Amplifier	EMC Instru- ments	EMC330	980096	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instru- ments	EMC0011830	980199	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instru- ments	EMC184045B	980135	10/27/2020	10/26/2021
Attenuator	Marvelous	WATT-218FS- 10	RF20	11/19/2020	11/18/2021
Band Rejection Filter	Micro-Tronics	BRM50701-01	RF201	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/19/2020	11/18/2021
Test Software	audix	e3	20923 sgs Ver.9	N.C.R	N.C.R

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

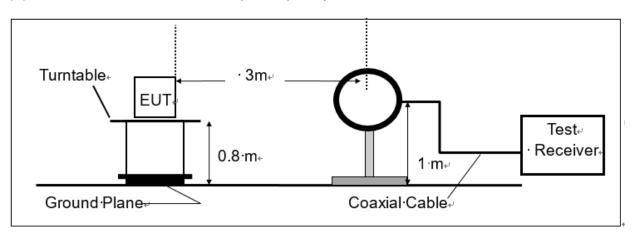
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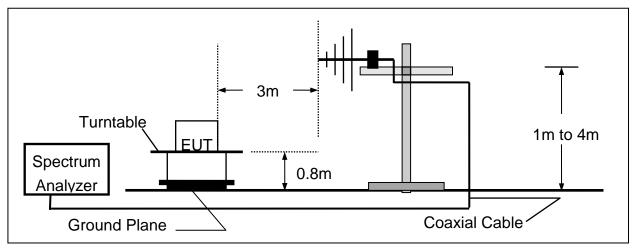


# 11.3 Test SET-UP

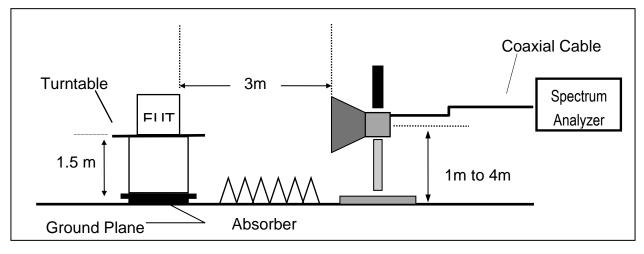
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz



(C) Radiated Emission Test Set-Up, Frequency Above 1GHz



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			Member of SGS Group			



### **11.4 Measurement Procedure**

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. Set the spectrum analyzer as RBW=100 kHz and VBW=300 kHz for Peak Detector (PK) at frequency between 30MHz and 1 GHz.
- 6. Use receiver mode as RBW=120 kHz for Quasi-peak (QP) at frequency between 30MHz and 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Emission Measurements at frequency above 1 GHz.
- 9. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 12. Repeat above procedures until all default test channel measured were complete.

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# **11.5 Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

# FS = RA + AF + CL - AG

*Where FS* = *Field Strength* 

*CL* = *Cable Attenuation Factor (Cable Loss)* AG = Amplifier Gain

AF = Antenna Factor

RA = Reading Amplitude

The limit of the emission level is expressed in dBuV/m, which converts 20\*log(uV/m)

Actual  $FS(dB\mu V/m) = SPA$ . Reading level(dB $\mu V$ ) + Factor(dB) Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) & RSS-GEN §6.13.2 was not reported.

# **11.7 Measurement Result**

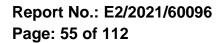
### Note:

- 1. Refer to next page spectrum analyzer data chart and tabular data sheets.
- 2. Measurements are completed at peak and average level, the mark of average is the highest emission in restricted bands

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### 11.7.1 Radiated Band Edge Measurement Result

Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11b :2412 MHz :BE CH 01 :H Plane	096		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
105.0 90.0 75.0 60.0 45.0 30.0 15.0	BuV/m)					
2310	2334.	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq.	Detector Mode F	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	35.65	5.18	40.83	54.00	-13.17
2390.000	Peak	47.18	5.18	52.36	74.00	-21.64

```
f (886-2) 2298-0488
```



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11b :2412 MHz :BE CH 01 :H Plane	0096		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 15.0 0 2310	2334.	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	31.41 44.18	5.18 5.18	36.59 49.36	54.00 74.00	-17.41 -24.64



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11b :2462 MHz :BE CH 11 :H Plane	0096	ד ד <i>A</i>	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 30.0 15.0 2450	BuV/m)	2490.		2530.	2550	
2450	2470.	Frequen	2510. cy (MHz)	2000	2550	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode F	Reading Level		FS	@3m	
MHz I	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500	Average Peak	33.07 43.38	4.04 4.04	37.11 47.42	54.00 74.00	-16.89 -26.58



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11b :2462 MHz :BE CH 11 :H Plane	096	T T A	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 30.0 15.0 2450	BuV/m)			2530.	2550	
2450	2470.	2490. Frequen	2510. cy (MHz)	2530.	2550	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode F	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500	Average Peak	34.25 44.53	4.04 4.04	38.29 48.56	54.00 74.00	-15.71 -25.44



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11g :2412 MHz :BE CH 01 :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 15.0 0 2310	2334.	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBμV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	38.59 51.02	5.18 5.18	43.77 56.20	54.00 74.00	-10.23 -17.80



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11g :2412 MHz :BE CH 01 :H Plane		T T A	est Site est Date emp./Humi. ntenna Pol. ingineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 15.0 2310	2334.	2358.	2382.	2406.	2430	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
ricq.		Reading Level	T deter	FS	@3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000 2390.000	Average Peak	45.34 57.15	5.18 5.18	50.52 62.33	54.00 74.00	-3.48 -11.67



Report Number Operation Mode Test Frequency Test Mode	:E2/2021/6 :802.11g :2462 MHz :BE CH 11		т т	est Site est Date emp./Humi. antenna Pol.	:966 Chamber C :2021-07-05 :24.2/52 :Vertical	
EUT Pol	:H Plane		E	Ingineer	:Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 30.0 15.0 0 2450	3BuV/m)	2490. Frequen	су (MHz)	2530.		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	39.24	4.04	43.28	54.00	-10.72
2483.500	Peak	53.94	4.04	57.98	74.00	-16.02
2484.455	Average	39.59	4.03	43.62	54.00	-10.38
2484.455	Peak	54.53	4.03	58.56	74.00	-15.44



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11g :2462 MHz :BE CH 11 :H Plane	0096	ד ד 4	Fest Site Fest Date Femp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 30.0 15.0 2450	1BuV/m)	2490. Frequent	2510. cy (MHz)	2530.		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode I	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500 2484.455 2484.455	Average Peak Average Peak	43.58 55.19 41.22 56.44	4.04 4.04 4.03 4.03	47.62 59.22 45.25 60.47	54.00 74.00 54.00 74.00	-6.38 -14.78 -8.75 -13.53

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n20 :2412 MHz :BE CH 01 :H Plane	096		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 15.0 2310	2334.	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq. MHz	Detector Mode F PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	42.74 54.62	5.18 5.18	47.92 59.80	54.00 74.00	-6.08 -14.20



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6009 :802.11n20 :2412 MHz :BE CH 01 :H Plane	96		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 30.0 15.0 2310	BuV/m) □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	2358.	.2382.	2406.	2430	
		Frequenc				
Freq.		Spectrum	Factor	Actual	Limit	Margin
	Mode Rea	ading Level		FS	@3m	
MHz F	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000 2390.000	Average Peak	45.78 57.71	5.18 5.18	50.96 62.89	54.00 74.00	-3.04 -11.11



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/600 :802.11n20 :2462 MHz :BE CH 11 :H Plane	096	•	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
105.0 90.0 75.0 60.0 45.0 30.0 15.0	BuV/m)					
2450	2470.	2490. Frequen	2510. cy (MHz)	2530.	2550	
Freq.	Detector Mode R	Spectrum eading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500	Average Peak	44.80 55.52	4.04 4.04	48.84 59.56	54.00 74.00	-5.16 -14.44

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6009 :802.11n20 :2462 MHz :BE CH 11 :H Plane	96	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 30.0 15.0	BuV/m)					
2450	2470.	2490. Frequen	2510. cy (MHz)	2530.	2550	
Freq.	Detector S	Spectrum	Factor	Actual	Limit	Margin
	Mode Rea	ading Level		FS	@3m	
MHz F	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500	Average Peak	46.80 58.96	4.04 4.04	50.84 63.00	54.00 74.00	-3.16 -11.00



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6009 :802.11n40 :2422 MHz :BE CH 03 :H Plane	96		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 15.0 92310	1BuV/m)	2358. Frequent	2382. cy (MH2)	2406.	2430	
Freq. MHz		Spectrum ading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	37.85 50.20	5.18 5.18	43.03 55.38	54.00 74.00	-10.97 -18.62

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2422 MHz :BE CH 03 :H Plane		•	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 30.0 15.0 2310	1BuV/m)	2358.	2382.	2406.	2430	
		Frequen				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000 2390.000	Average Peak	45.37 57.32	5.18 5.18	50.55 62.50	54.00 74.00	-3.45 -11.50



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2427 MHz :BE CH 04 :H Plane	096	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (d 105.0 90.0 75.0 60.0 45.0 30.0 15.0	2334.	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq. MHz	Detector Mode F PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	38.19 48.75	5.18 5.18	43.37 53.93	54.00 74.00	-10.63 -20.07



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n40 :2427 MHz :BE CH 04 :H Plane	)	ר ר <i>ן</i>	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 30.0 15.0 0 2310	1BuV/m)	2358. Frequen	2382. cy (MHz)	2406.	2430	
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
2390.000 2390.000	Average Peak	45.60 55.85	5.18 5.18	50.78 61.03	54.00 74.00	-3.22 -12.97

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Report Number Operation Mode Test Frequency Test Mode	:E2/2021/6 :802.11n40 :2442 MHz :BE CH 07	) <u>.</u>	- - /	Test Site Test Date Temp./Humi. Antenna Pol.	:966 Chamber C :2021-07-05 :24.2/52 :Vertical						
EUT Pol	:H Plane		E	Engineer	:Andy Wang						
120 Level (d	IBuV/m)										
90.0											
75.0	$\rightarrow$										
60.0	home	mag									
45.0		3	an	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							
30.0											
15.0											
0 2450 2470. 2490. 2510. 2530. 2550 Frequency (MHz)											
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin					
	Mode	Reading Level		FS	@3m						
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB					
2483.500	Average	37.50	4.04	41.54	54.00	-12.46					
2483.500	Peak	50.16	4.04	54.20	74.00	-19.80					
2484.936	Average	36.66	4.02	40.68	54.00	-13.32					
2484.936	Peak	52.12	4.02	56.15	74.00	-17.85					

```
f (886-2) 2298-0488
```



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2442 MHz :BE CH 07 :H Plane	096	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang					
120 105.0 90.0 75.0 60.0 45.0 30.0 15.0										
0 2450 2470. 2490. 2510. 2530. 2550 Frequency (MHz)										
Freq.	Detector Mode R	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin				
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB				
2483.500 2483.500	Average Peak	46.43 57.96	4.04 4.04	50.47 62.00	54.00 74.00	-3.53 -12.00				

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n4( :2447 MHz :BE CH 08 :H Plane	)	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
120 Level (0 105.0 90.0 75.0 60.0 45.0 30.0 15.0	1BuV/m)	2490. Frequen	2510. cy (MHz)	2530.		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500 2484.615 2484.615	Average Peak Average Peak	37.46 51.94 37.78 52.05	4.04 4.04 4.03 4.03	41.50 55.98 41.81 56.07	54.00 74.00 54.00 74.00	-12.50 -18.02 -12.19 -17.93

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f (886-2) 2298-0488
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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/0 :802.11n4 :2447 MH :BE CH 08 :H Plane	0 z		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level ( 105.0 90.0 75.0 60.0 45.0 30.0 15.0 92450	1BuV/m)	2490. Frequen	2510. cy (MHz)	2530.		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500 2484.455 2484.455	Average Peak Average Peak	46.61 58.17 45.93 58.51	4.04 4.04 4.03 4.03	50.65 62.20 49.96 62.53	54.00 74.00 54.00 74.00	-3.35 -11.80 -4.04 -11.47

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/600 :802.11n40 :2452 MHz :BE CH 09 :H Plane	96	Te Te Al	est Site est Date emp./Humi. ntenna Pol. ngineer	:966 Chamber C :2021-07-05 :24.2/52 :Vertical :Andy Wang	
105.0 90.0 75.0 60.0 45.0 30.0 15.0						
2450	2470.	2490. Frequen	2510. cy (MHz)	2530.	2550	
Freq.	Detector Mode Re	Spectrum eading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500	Average Peak	44.76 55.40	4.04 4.04	48.80 59.43	54.00 74.00	-5.20 -14.57

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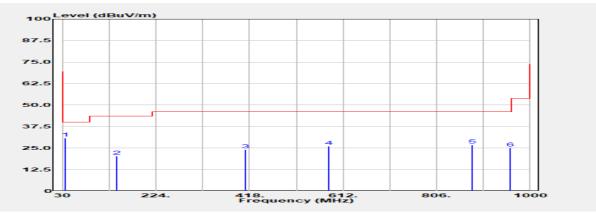
Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n4( :2452 MHz :BE CH 09 :H Plane	0 <u>z</u>	Т Т А	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-05 :24.2/52 :Horizontal :Andy Wang	
120 Level ( 105.0 90.0 75.0 60.0 45.0 30.0 15.0 92450	2470.	2490. Frequen	2510. cy (MHz)	2530.	2550	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500 2483.500 2484.455 2484.455	Average Peak Average Peak	46.37 57.10 46.56 57.56	4.04 4.04 4.03 4.03	50.41 61.14 50.59 61.59	54.00 74.00 54.00 74.00	-3.59 -12.86 -3.41 -12.41

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### 11.7.2 Below 1GHz Worst-Case Emission:

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2437 MHz	Temp./Humi.	:24.9/50
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plane	Engineer	:Ashton Chiu



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
36.218	Peak	40.79	-10.03	30.76	40.00	-9.24
141.923	Peak	37.70	-17.41	20.28	43.50	-23.22
409.295	Peak	36.23	-12.06	24.17	46.00	-21.83
581.843	Peak	34.72	-8.75	25.97	46.00	-20.03
878.750	Peak	33.29	-6.46	26.84	46.00	-19.16
958.029	Peak	30.73	-5.74	25.00	46.00	-21.00

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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:966 Chamber C



·F2/2021/60096

Report Number

Report Humbor	:EZ/2021/	00090				
Operation Mode	:802.11g			Test Date	:2021-07-05	
Test Frequency	:2437 MH	z		Temp./Humi.	:24.9/50	
Test Mode	:TX CH M	ID		Antenna Pol.	:HORIZONTAL	
EUT Pol	:H Plane			Engineer	:Ashton Chiu	
100 Level (	dBuV/m)					
87.5						
75.0						
62.5						
50.0						
37.5					_ 6	
25.0			4			
12.5						
0 <mark>100</mark> 30	224.	418. Frequer	612. icy (MHz)	806.	1000	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
33.109	Peak	32.14	-8.39	23.75	40.00	-16.25
89.071	Peak	40.28	-21.33	18.95	43.50	-24.55
409.295	Peak	37.73	-12.06	25.67	46.00	-20.33
581.843	Peak	32.95	-8.75	24.20	46.00	-21.80
909.840	Peak	30.79	-5.97	24.82	46.00	-21.18
989.119	Peak	31.73	-4.85	26.88	54.00	-27.12

**Test Site** 

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No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279 f (886-2) 2298-0488 www.sgs.com.tw



Report Number	:E2/2021/6	0096		Test Site	:966 Chamber C	
Operation Mode	:802.11n40	)		Test Date	:2021-07-05	
Test Frequency	:2437 MHz			Temp./Humi.	:24.9/50	
Test Mode	:TX CH MI	D		Antenna Pol.	:VERTICAL	
EUT Pol	:H Plane			Engineer	:Ashton Chiu	
100 Level (d	IBuV/m)					
87.5						
75.0						
62.5						
37.5						
25.0	2	3	4		5 6	
12.5						
0 30	224.	418.	612. cy (MHz)	806.	1000	
			cy (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
34.663	Peak	38.19	-8.86	29.33	40.00	-10.67
109.279	Peak	44.94	-18.13	26.80	43.50	-16.70
409.295	Peak	36.70	-12.06	24.64	46.00	-21.36
580.289	Peak	34.24	-8.62	25.62	46.00	-20.38
853.878	Peak	30.47	-6.13	24.34	46.00	-21.66
956.474	Peak	31.82	-5.47	26.35	46.00	-19.65



Report Number Operation Mode Test Frequency Test Mode EUT Pol	e :802.11n4	0 z	T T A	est Site est Date emp./Humi. ntenna Pol. ngineer	:966 Chamber C :2021-07-05 :24.9/50 :HORIZONTAL :Ashton Chiu	
100 Level (	(dBuV/m)				<b>1</b>	
87.5						
75.0						
62.5						
50.0						
37.5						
25.0		3	4		5 6	
12.5						
0 30	224.	418. Frequen	612. cy (MHz)	806.	1000	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	•
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
34.663	Peak	30.79	-8.86	21.93	40.00	-18.07
272.500	Peak	32.25	-15.83	16.42	46.00	-29.58
424.840	Peak	34.81	-11.48	23.33	46.00	-22.67
637.805	Peak	30.79	-8.12	22.67	46.00	-23.33
897.404	Peak	29.13	-5.70	23.43	46.00	-22.57
990.673	Peak	30.32	-4.79	25.53	54.00	-28.47



### 11.7.3 Above 1GHz Emission:

Report Number Operation Mode	:E2/2021/6 :802.11b	0096		Test Site Test Date	:966 Chamber C :2021-07-06	
Test Frequency	:2412 MHz			Temp./Humi.	:23.2/56	
Test Mode	:TX CH LO			Antenna Pol.	:Vertical	
EUT Pol	:H Plane			Engineer	:Enzo Chang	
100 Level (d	lBuV/m)		1			
87.5						
75.0						
62.5						
50.0	2					
37.5	1					
25.0						
12.5						
1000	6100.	11200. Frequen	16300 cy (MHz)	). 21400	. 26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	23.21	10.61	33.82	54.00	-20.18
4824.000	Peak	31.25	10.61	41.86	74.00	-32.14
7236.000	Average	19.11	17.62	36.73	54.00	-17.27
7236.000	Peak	28.99	17.62	46.61	74.00	-27.39



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11b :2412 MHz :TX CH LO :H Plane	1		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.2/56 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5	3BuV/m)	11200, Frequen	16300 су (MHz)	. 21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m		dB
4824.000 4824.000 7236.000 7236.000	Average Peak Average Peak	27.94 32.38 19.11 28.80	10.61 10.61 17.62 17.62	38.55 42.98 36.73 46.42	54.00 74.00 54.00 74.00	-15.45 -31.02 -17.27 -27.58

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11b :2437 MHz :TX CH MI :H Plane	2		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.2/56 :Vertical :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 1000	dBuV/m)	11200, Frequen	16300 су (MHz)	. 21400	. 26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000 4874.000 7311.000 7311.000	Average Peak Average Peak	21.19 30.00 19.02 29.64	10.38 10.38 17.97 17.97	31.57 40.37 36.99 47.61	54.00 74.00 54.00 74.00	-22.43 -33.63 -17.01 -26.39

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f (886-2) 2298-0488
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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11b :2437 MHz :TX CH MII :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.2/56 :Horizontal :Enzo Chang	
100 Level (0 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9000	1BuV/m)	11200. Frequen	16300 су (MHz)	. 21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4874.000 4874.000 7311.000	Average Peak Average	26.42 32.04 19.01	10.38 10.38 17.97	36.80 42.41 36.98	54.00 74.00 54.00	-17.20 -31.59 -17.02
7311.000	Peak	29.20	17.97	47.18	74.00	-26.82

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11b :2462 MHz :TX CH HI :H Plane	2		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.2/56 :Vertical :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5	1BuV/m)	11200. Frequen	16300. cy (MHz)	. 21400	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4924.000 4924.000 7386.000	Average Peak Average	20.86 31.53 19.02	10.12 10.12 18.22	30.98 41.65 37.24	54.00 74.00 54.00	-23.02 -32.35 -16.76
7386.000	Peak	29.18	18.22	47.40	74.00	-26.60

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11b :2462 MHz :TX CH HIG :H Plane	1		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.2/56 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5	dBuV/m)	11200, Frequen	16300. cy (MHz)	. 21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000 4924.000 7386.000 7386.000	Average Peak Average Peak	26.77 32.63 19.06 29.38	10.12 10.12 18.22 18.22	36.89 42.75 37.28 47.60	54.00 74.00 54.00 74.00	-17.11 -31.25 -16.72 -26.40

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11g :2412 MHz :TX CH LO :H Plane	1	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Vertical :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9	dBuV/m)	11200. Frequen	16300. cy (MH2)	21400	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4824.000 4824.000 7236.000 7236.000	Average Peak Average Peak	20.98 31.54 20.01 29.27	10.61 10.61 17.62 17.62	31.59 42.15 37.63 46.89	54.00 74.00 54.00 74.00	-22.41 -31.85 -16.37 -27.11



Report Number Operation Mode Test Frequency Test Mode EUT Pol	e :802.11g	Z		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9000	(dBuV/m) 2 2 3 4 2 3 6100.	11200. Frequen	16300 cy (MHz)	. 21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000 4824.000 7236.000 7236.000	Average Peak Average Peak	22.62 30.31 20.01 29.69	10.61 10.61 17.62 17.62	33.23 40.92 37.63 47.31	54.00 74.00 54.00 74.00	-20.77 -33.08 -16.37 -26.69

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11g :2437 MHz :TX CH MIE :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Vertical :Enzo Chang	
100 Level (0 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9	1BuV/m) □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	11200. Frequen	1630( су (MH2)	. 21400	. 26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	n dBµV/m	dB
4874.000 4874.000 7311.000 7311.000	Average Peak Average Peak	20.68 29.94 19.94 29.27	10.38 10.38 17.97 17.97	31.06 40.31 37.91 47.24	54.00 74.00 54.00 74.00	-22.94 -33.69 -16.09 -26.76



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11g :2437 MHz :TX CH MII :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 1000	dBuV/m)	11200. Frequen	16300. су (MHz)	. 21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000 4874.000 7311.000 7311.000	Average Peak Average Peak	20.71 29.45 19.93 30.45	10.38 10.38 17.97 17.97	31.09 39.83 37.90 48.42	54.00 74.00 54.00 74.00	-22.91 -34.17 -16.10 -25.58



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11g :2462 MHz :TX CH HIG :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Vertical :Enzo Chang	;
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 000	1BuV/m)	11200. Frequen	1630/ cy (MHz)	0. 21400	. 26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	n dBµV/m	dB
4924.000 4924.000 7386.000 7386.000	Average Peak Average Peak	20.55 30.65 19.91 29.83	10.12 10.12 18.22 18.22	30.67 40.76 38.13 48.05	54.00 74.00 54.00 74.00	-23.33 -33.24 -15.87 -25.95



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/600 :802.11g :2462 MHz :TX CH HIGH :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.5/59 :Horizontal :Enzo Chang	;
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 1000	BuV/m)	11200. Frequent	1630( cy (MHz)	0. 21400	. 26500	
Freq.		Spectrum eading Level	Factor	Actual FS	Limit @3m	Margin
MHz F	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4924.000 4924.000 7386.000 7386.000	Average Peak Average Peak	20.51 30.88 20.14 29.78	10.12 10.12 18.22 18.22	30.63 41.00 38.36 48.00	54.00 74.00 54.00 74.00	-23.37 -33.00 -15.64 -26.00

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n20 :2412 MHz :TX CH LO :H Plane	)		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Vertical :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9	dBuV/m)	11200. Frequen	(16300 су (MH2)	. 21400	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000 4824.000 7236.000 7236.000	Average Peak Average Peak	20.99 29.54 20.02 27.81	10.61 10.61 17.62 17.62	31.60 40.14 37.64 45.43	54.00 74.00 54.00 74.00	-22.40 -33.86 -16.36 -28.57

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n20 :2412 MHz :TX CH LO :H Plane	)		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Horizontal :Enzo Chang	
100 Level (0 87.5 75.0 62.5 50.0 37.5 25.0 12.5	dBuV/m)	11200. Frequen	16300 су (MHz)	. 21400	. 26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000 4824.000 7236.000 7236.000	Average Peak Average Peak	22.02 30.73 20.12 28.67	10.61 10.61 17.62 17.62	32.63 41.34 37.74 46.29	54.00 74.00 54.00 74.00	-21.37 -32.66 -16.26 -27.71



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n20 :2437 MHz :TX CH MIE :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Vertical :Enzo Chang	:
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 1000	BuV/m)	11200. Frequen	16300 cy (MHz)	). 21400		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000 4874.000 7311.000 7311.000	Average Peak Average Peak	20.67 29.89 19.89 29.38	10.38 10.38 17.97 17.97	31.05 40.27 37.86 47.36	54.00 74.00 54.00 74.00	-22.95 -33.73 -16.14 -26.64

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n20 :2437 MHz :TX CH MII :H Plane	)	-	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Horizontal :Enzo Chang	
100 Level (0 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9000	1BuV/m)	11200. Frequen	16300. cy (MHz)	21400		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4874.000 4874.000 7311.000 7311.000	Average Peak Average Peak	20.67 30.04 19.99 29.38	10.38 10.38 17.97 17.97	31.05 40.42 37.96 47.36	54.00 74.00 54.00 74.00	-22.95 -33.58 -16.04 -26.64
7311.000	rean	29.00	17.97	47.30	74.00	-20.04



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n2 :2462 MH2 :TX CH HI :H Plane	0 z		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Vertical :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9000	dBuV/m)	11200. Frequen	16300 cy (MHz)	. 21400		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000 4924.000 7386.000 7386.000	Average Peak Average Peak	20.68 29.34 19.93 29.51	10.12 10.12 18.22 18.22	30.80 39.46 38.15 47.73	54.00 74.00 54.00 74.00	-23.20 -34.54 -15.85 -26.27



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n20 :2462 MHz :TX CH HI :H Plane	0 <u>z</u>		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.8/58 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 0 1000	dBuV/m) ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	11200. Frequen	16300 су (MHz)	. 21400		
Freq.	Detector Mode	Spectrum	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	Reading Level dBµV	dB	гз dBµV/m	_	dB
		υσμν	UD	υσμν/Π	υσμν/Π	UD
4924.000	Average	20.53	10.12	30.65	54.00	-23.35
4924.000	Peak	30.22	10.12	40.34	74.00	-33.66
7386.000	Average	20.09	18.22	38.31	54.00	-15.69
7386.000	Peak	29.43	18.22	47.65	74.00	-26.35

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f (886-2) 2298-0488
```



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2422 MHz :TX CH LO :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.6/54 :Vertical :Enzo Chang	
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 000	1BuV/m)	11200. Frequen	1630/ cy (MHz)	0. 21400	. 26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	n dBµV/m	dB
4844.000 4844.000 7266.000 7266.000	Average Peak Average Peak	20.89 30.17 20.00 29.35	10.77 10.77 17.79 17.79	31.66 40.94 37.79 47.14	54.00 74.00 54.00 74.00	-22.34 -33.06 -16.21 -26.86

```
f (886-2) 2298-0488
```



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n40 :2422 MHz :TX CH LO :H Plane	)	•	Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.6/54 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9	dBuV/m)	11200. Frequen	16300. cy (MHz)	. 21400		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4844.000 4844.000 7266.000 7266.000	Average Peak Average Peak	21.40 29.82 20.58 27.93	10.77 10.77 17.79 17.79	32.17 40.59 38.37 45.71	54.00 74.00 54.00 74.00	-21.83 -33.41 -15.63 -28.29



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2437 MHz :TX CH MIE :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.6/54 :Vertical :Enzo Chang	
100 Level (0 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9 000	dBuV/m)	11200. Frequen	16300 cy (MHz)	. 21400		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode I PK/QP/AV	Reading Level	dB	FS dBu\//m	@3m dBu\//m	dB
		dBµV	UD	dBµV/m	dBµV/m	UD
4874.000	Average	21.29	10.38	31.67	54.00	-22.33
4874.000	Peak	30.08	10.38	40.46	74.00	-33.54
7311.000	Average	23.45	17.97	41.42	54.00	-12.58
7311.000	Peak	30.00	17.97	47.97	74.00	-26.03



Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/6 :802.11n40 :2437 MHz :TX CH MII :H Plane	)		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.6/54 :Horizontal :Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5 9000	1BuV/m)	11200. Frequen	1630( су (MHz)	D. 21400	. 26500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Reading Level	٩D	FS dBu\//m	@3m	٩D
MHz	PK/QP/AV	dBµV	dB	dBµV/m	n dBµV/m	dB
4874.000	Average	21.26	10.38	31.64	54.00	-22.36
4874.000	Peak	30.13	10.38	40.50	74.00	-33.50
7311.000	Average	20.49	17.97	38.46	54.00	-15.54
7311.000	Peak	30.15	17.97	48.12	74.00	-25.88

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Report Number Operation Mode Test Frequency Test Mode	:2452 MHz :TX CH HI0	)		Test Site Test Date Temp./Humi. Antenna Pol.	:966 Chamber C :2021-07-06 :23.6/54 :Vertical	
EUT Pol	:H Plane			Engineer	:Enzo Chang	
100 Level ( 87.5 75.0 62.5 50.0 37.5 25.0 12.5	dBuV/m)					
9000	6100.	11200. Frequen	16300 су (MHz)	. 21400	. 26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4904.000	Average	21.11	10.20	31.31	54.00	-22.69
	Average					
4904.000	Peak	30.81	10.20	41.01	74.00	-32.99
7356.000	Average	20.68	17.95	38.63	54.00	-15.37
7356.000	Peak	28.75	17.95	46.70	74.00	-27.30

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Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/60 :802.11n40 :2452 MHz :TX CH HIG :H Plane			Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-07-06 :23.6/54 :Horizontal :Enzo Chang	
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 0000	IBuV/m)		16300 су (MHZ)	D. 21400	. 26500	
Freq.	Detector Mode R	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	_	dB
4904.000	Average	21.24	10.20	31.44	54.00	-22.56
4904.000	Peak	31.20	10.20	41.40	74.00	-22.50
7356.000	Average	20.56	17.95	38.51	54.00	-15.49
7356.000	Peak	29.91	17.95	47.86	74.00	-26.14

```
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# **12 POWER SPECTRAL DENSITY**

## **12.1 Standard Applicable**

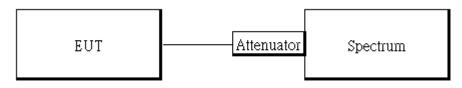
### Per Part 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

## 12.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D								
EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL. CAL				
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022			
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021			
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021			
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021			
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021			
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021			
DC Block	PASTER- NACK	PE8210	RF152	11/19/2020	11/18/2021			
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021			
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R			
Test Software	SGS Taiwan	Radio Test Soft- ware	Ver.21	N.C.R	N.C.R			

### 12.3 Test Set-up



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## **12.4 Measurement Procedure**

- Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz & VBW = 10 kHz.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

### Note:

For the test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

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## 12.5 As per FCC KDB 662911 D01

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

• DirectionalGain = 
$$10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

 $g_{i,k} = /2010$  Gk if the kth antenna is being fed by spatial stream j, or zero if it is not;  $G_k$  is the gain in dBi of the kth antenna.

The antenna gain is not grater than 6 dBi. Therefore, reduction of power is not required.

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### 12.6 Power spectral density

POWER DENSITY 802.11b							
Freq.	Ch0	Ch1	PSD	Limit	Result		
(MHz)	PSD	PSD	(dBm/3kHz)	(dBm/3kHz)	Result		
2412	-7.67	-	-7.67	8.00	PASS		
2437	-7.409	-	-7.41	8.00	PASS		
2462	-6.902	-	-6.90	8.00	PASS		

POWER DENSITY 802.11g								
Freq.	Ch0	Ch1	PSD	Limit	Result			
(MHz)	PSD	PSD	(dBm/3kHz)	(dBm/3kHz)	Nesul			
2412	-11.78	-	-11.78	8.00	PASS			
2437	-11.21	-	-11.21	8.00	PASS			
2462	-10.87	-	-10.87	8.00	PASS			

POWER DENSITY 802.11n HT20								
Freq.	Ch0	Ch1	PSD	Limit	Result			
(MHz)	PSD	PSD	(dBm/3kHz)	(dBm/3kHz)				
2412	-12.84	-12.01	-9.39	8.00	PASS			
2437	-10.14	-11.16	-7.61	8.00	PASS			
2462	-9.896	-11	-7.40	8.00	PASS			

POWER DENSITY 802.11n HT40								
Freq.	Ch0	Ch1	PSD	Limit	Result			
(MHz)	PSD	PSD	(dBm/3kHz)	(dBm/3kHz)				
2422	-16.5	-15.54	-12.98	8.00	PASS			
2437	-13.79	-13.4	-10.58	8.00	PASS			
2452	-16.52	-15.54	-12.99	8.00	PASS			

\*Refer to next page for plots

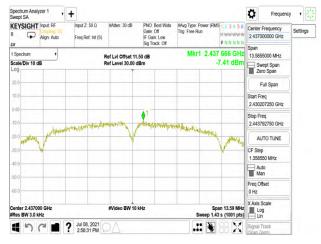
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#### 802.11b\_20MHz\_Chain0\_2412MHz



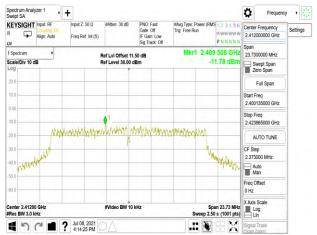
802.11b\_20MHz\_Chain0\_2437MHz



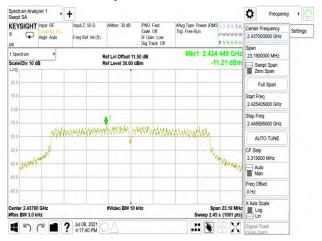
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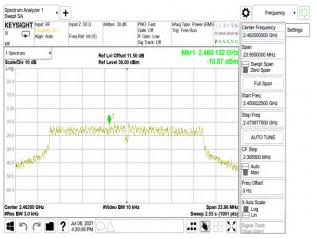


#### 802.11g\_20MHz\_Chain0\_2412MHz



802.11g\_20MHz\_Chain0\_2437MHz





802.11g\_20MHz\_Chain0\_2462MHz

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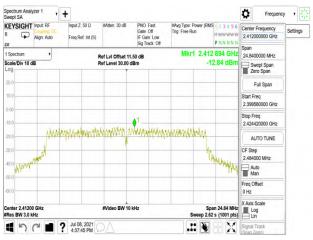
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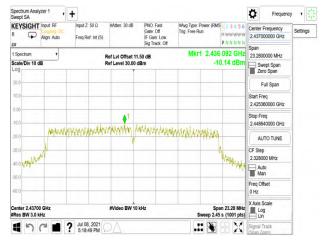
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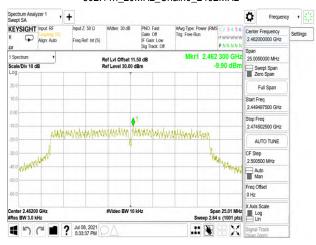
#### 802.11n 20MHz Chain0 2412MHz



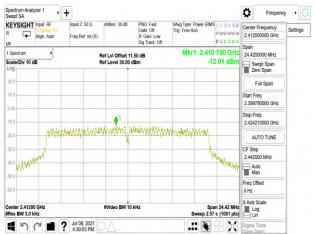
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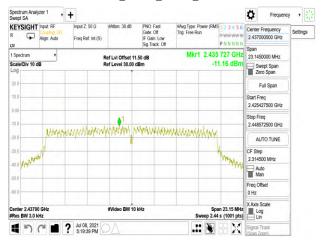
#### 802.11n 20MHz Chain0 2462MHz

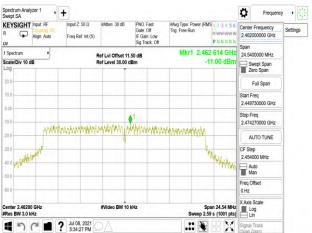


#### 802.11n 20MHz Chain1 2412MHz



802.11n\_20MHz\_Chain1\_2437MHz





802.11n 20MHz Chain1 2462MHz

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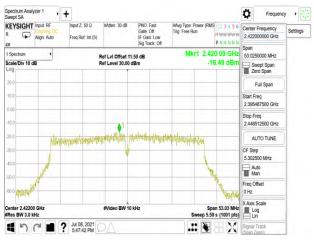
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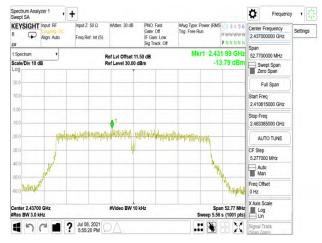
### Report No.: E2/2021/60096 Page: 111 of 112



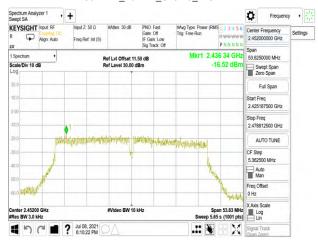
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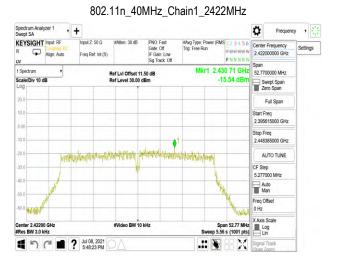


#### 802.11n\_40MHz\_Chain0\_2437MHz

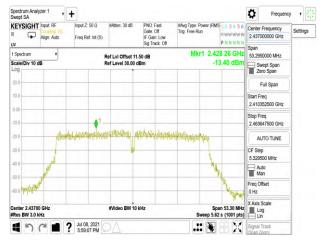


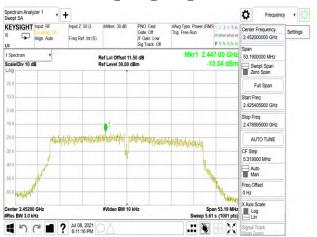
### 802.11n\_40MHz\_Chain0\_2452MHz





#### 802.11n\_40MHz\_Chain1\_2437MHz





#### 802.11n\_40MHz\_Chain1\_2452MHz

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# **13 ANTENNA REQUIREMENT**

## 13.1 Standard Applicable

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

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

### **13.2 Antenna Connected Construction**

The antenna is designed with unique RF connector and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

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