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Applicant	:	The Singing Ma	chine Company, inc.	
		6301 NW 5 th Wa	ay, Suite 2900, Fort Lauderdate, F	L 33309, USA
Supplier / Manufacturer		ZHUHAI FULL BRANCH.	WING ELECTRONIC CO., LTD	ZHONGSHAN
		4/F & 5/F, No 10 Guangdong, Chi), Xingye Road, Xinxu, San Xian na	g, Zhongshan,
Description of Sample(s)):	Submitted samp	ble(s) said to be	
		Product:	SINGCAST HOME STAGE MIN	I
		Brand Name:	Singing Machine	
		Model No.:	SMC2020	
		FCC ID:	2AAXO-SMC2020	
Date Samples Received	:	2023-04-26		
Date Tested	:	2023-04-26 to 20	023-05-18	
Investigation Requested	:	Perform Electro with FCC 47CF C63.10:2013 for	Magnetic Interference measureme R [Codes of Federal Regulations] FCC Certification.	ent in accordance Part 15 and ANSI
Conclusions	:	The submitted p Communications The tests were p above and on Se	roduct <u>COMPLIED</u> with the requise s Commission [FCC] Rules and R erformed in accordance with the s ction 2.2 in this Test Report.	irements of Federal egulations Part 15. standards described
Remarks	:	WIFI (802.11b/g	g/n20/n40)	
		For additional m	odel(s) details, please see page 3.	
Test by		Susu	NG KONG S	
			Briancher	MOARDS 416
			Dr.CHAN Kwok Hung B	rian

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Authorized Signatory



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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.EMC Laboratory10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong KongTelephone:852 2666 1888Fax:852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s) Product: SINGCAST HOME STAGE MINI ZHUHAI FULLWING ELECTRONIC CO., LTD Manufacturer: ZHONGSHAN BRANCH 4/F&5/F, No 10, Xingye Road, Xinxu, San Xiang, Zhongshan, Guangdong, China Brand Name: Singing Machine Model Number: SMC2020 Additional Model Number: SMC2024, SMC2027 Rating: 12Vd.c. by adapter The AC/DC adapter was provided by the applicant with following details: Brand name: REYIPOWER; Model no.: RY24D120125US Input: 100-240Va.c. 50-60Hz 1.0A MAX, Output:12Vd.c. 1250mA

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a SINGCAST HOME STAGE MINI. The transmission signal is digital modulated with channel frequency range 2412-2462MHz.

1.3 Antenna Details

integral antenna
2.0 dBi

- **1.4 Date of Order** 2023-04-26
- 1.5 Submitted Sample(s): 1 Sample
- **1.6 Test Duration** 2023-04-26 to 2023-05-18
- 1.7 Country of Origin China

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2.0 <u>Technical Details</u>

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10:2013 for FCC Certification. According FCC KDB 558074 DTS Measurement Guidance, Duty cycle \geq 98%. The test mode sample is provided by manufacturer.

2.1.0 Operating conditions for the EUT

The sample went into test mode handled by the manufacturer using the software and no the RF power for select.

💽 命令提示符 - adb shell

C:\Users\STC-EMD>adb shell root@rk3036:/ # ifconfig wlan0 down /system/bin/sh: ifconfig: not found 127|root@rk3036:/ # ifconfig wlan0 up /system/bin/sh: ifconfig: not found priv wlal27|root@rk3036:/ # iwpriv wlan0 mp_ctx stop 0M=0, shortGI=0 iwpriv wlan0 mp_ant_tx a wpriv wlan0 mp_rate 6 wpriv wlan0 mp_ctx background, pkt wpriv wlan0 mp_pwrctldm startwlan0 mp ctx:Error: can't tx , not in MP mode. coot@rk3036:/ # iwpriv wlan0 mp_stop coot@rk3036:/ # iwpriv wlan0 mp_start vlan0 mp_start:mp_start ok root@rk3036:/ # iwpriv wlan0 mp_channel 1 wlan0 mp_channel:Change channel 1 to channel 1 an0 mp_bandwidth 40M=0, shortGI=0 wlan0 mp_bandwidth:Change BW 0 to BW 0 root@rk3036:/ # iwpriv wlan0 mp_ant_tx a wlan0 mp_ant_tx:switch Tx antenna to a root@rk3036:/ # iwpriv wlan0 mp_rate 6 wlan0 rlan0 mp_rate;Set data rate to 6 index 0 root@rk3036:/ # iwpriv wlan0 mp_ctx background,pkt /lan0 mp_ctx: Start continuous DA=ffffffffffff len=1500 count=0

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2.1.1 EUT Duty cycle

The EUT shall be configured or modified to transmit continuously. The intent is to test at 100% duty cycle; however, a small reduction in duty cycle (to no lower than 98%) is permitted if required by the EUT for amplitude control purposes.

The test mode sample is provided by manufacturer.

Test setup



Results

110001100				
Mode	On Time	Period	Duty Cycle	Duty Cycle
	(msec)	(msec)	X (Linear)	(%)*
802.11b	1	1	1	100
802.11g	1	1	1	100
802.11n20	1	1	1	100
802.11n40	1	1	1	100

-*: If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.



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2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class /	Т	est Result	
			Severity	Pass	Failed	N/A
Output Power of Fundamental Emissions	FCC 47CFR 15.247(b)(3)	ANSI C63.10:2013	N/A	\boxtimes		
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A	\boxtimes		
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A	\boxtimes		
Power Spectral Density	FCC 47CFR 15.247(e)	ANSI C63.10:2013	N/A	\boxtimes		
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	ANSI C63.10:2013	N/A	\boxtimes		
Band Edge Emissions	FCC 47CFR 15.247(d)	ANSI C63.10:2013	N/A	\boxtimes		
Antenna requirement	FCC 47CFR 15.203	ANSI C63.10:2013	N/A	\boxtimes		

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

Test Requirement:	FCC 47CFR 15.247(b)(3)	
Test Method:	ANSI C63.10: 2013	
Test Date:	2023-05-05	
Mode of Operation:	WIFI Ix mode	
Ambient Temperature: 25°C	Relative Humidity: 51%	Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.



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Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

Results of V	WiFi mode 802.11 b, (2	412MHz to 2462M	(Hz) : Pass (T	K Unit)
Channel	Encourance (MILT)	Conducted	Antonno	EIDD(dDm)

Channel	Frequency (MHz)	Conducted	Antenna	E.I.R.P(dBm)	E.I.R.P
		power(dBm)	Gain(dBi)		(Watt)
Low	2412	17.726	2.0	19.726	0.093886
Middle	2437	17.315	2.0	19.315	0.085408
High	2462	17.014	2.0	19.014	0.079689

Results of WiFi mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit)

Channel	Frequency (MHz)	Conducted	Antenna	E.I.R.P(dBm)	E.I.R.P (Watt)
		power(dBm)	Gain(dBi)		
Low	2412	13.531	2.0	15.531	0.035736
Middle	2437	13.201	2.0	15.201	0.033121
High	2462	13.082	2.0	15.082	0.032226

Results of WiFi mode 802.11 n20, (2412MHz to 2462MHz) : Pass (TX Unit)

Channel	Frequency (MHz)	Conducted	Antenna Gain(dBi)	E.I.R.P(dBm)	E.I.R.P (Watt)
Low	2412	14.179	2.0	16.179	0.041486
Middle	2437	13.851	2.0	15.851	0.038468
High	2462	13.684	2.0	15.684	0.037017

Results of WiFi mode 802.11 n20, (2422MHz to 2452MHz) : Pass (TX Unit)

Channel	Frequency (MHz)	Conducted	Antenna	E.I.R.P(dBm)	E.I.R.P (Watt)
		power(dBm)	Gain(dBi)		
Low	2422	12.318	2.0	14.318	0.027027
Middle	2437	12.045	2.0	14.045	0.025380
High	2452	11.951	2.0	13.951	0.024837

Calculated measurement uncertainty

: 30MHz to 1GHz 1GHz to 26GHz

1.7dB 1.7dB

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3.1.2 Radiated Emissions

Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2023-05-06
Mode of Operation:	WIFI Tx mode

Ambient Temperature: 24°C Relative Humidity: 52%

Atmospheric Pressure: 101 kPa

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semianechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

 * Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with Registration Number: HK0001 Test Firm Registration Number: 367672



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Spectrum Analyzer Setting:		
9KHz – 30MHz (Pk & Av)	RBW:	10kHz
	VBW:	30kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
30MHz – 1GHz (QP)	RBW:	120kHz
	VBW:	120kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Pk)	RBW:	1MHz
	VBW:	1MHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Av)	RBW:	1MHz
	VBW:	10Hz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold

Test Setup:



Ground Plane

Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.

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Limits for Radiated Emissions FCC 47 CFR 15.247]:

Frequency Range	Quasi-Peak Limits
[MHz]	[µV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx mode (2412.0 MHz) (802.11b) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions									
Peak Value									
Frequency	Measured	Correction	Field	Field	Limit	E-Field			
	Level Factor Strength Strength Polarity								
MHz $dB\mu V$ dB/m $dB\mu V/m$ $\mu V/m$ $\mu V/m$									
Emissions detected are more than 20 dB below the FCC Limits									

Result of Tx mode (2412.0 MHz) (802.11b) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions										
Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4824.0	58.7	0.82	59.5	74.0	14.5	Vertical				
4824.0	58.2	0.52	58.7	74.0	15.3	Horizontal				
7236.0	50.1	7.00	57.1	74.0	16.9	Vertical				
7236.0	51.0	6.50	57.5	74.0	16.5	Horizontal				
9648.0	47.3	8.50	55.8	74.0	18.2	Vertical				
9648.0	47.1	8.30	55.4	74.0	18.7	Horizontal				
12060.0	45.3	10.90	56.2	74.0	17.8	Vertical				
12060.0	45.3	10.80	56.1	74.0	17.9	Horizontal				

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	Field Strength of Spurious Emissions								
		A	verage Valu	e					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4824.0	41.8	0.82	42.6	54.0	11.4	Vertical			
4824.0	42.3	0.52	42.8	54.0	11.2	Horizontal			
7236.0	35.1	7.00	42.1	54.0	11.9	Vertical			
7236.0	35.4	6.50	41.9	54.0	12.1	Horizontal			
9648.0	31.6	8.50	40.1	54.0	13.9	Vertical			
9648.0	31.2	8.30	39.5	54.0	14.5	Horizontal			
12060.0	29.3	10.90	40.2	54.0	13.8	Vertical			
12060.0	29.3	10.80	40.1	54.0	14.0	Horizontal			

Result of Tx mode (2437.0 MHz) (802.11b) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions									
Peak Value									
Frequency	Frequency Measured Correction Field Field Limit E-Field								
	Level	Factor	Strength	Strength		Polarity			
MHz $dB\mu V$ dB/m $dB\mu V/m$ $\mu V/m$ $\mu V/m$									
Emissions detected are more than 20 dB below the FCC Limits									

Result of Tx mode (2437.0 MHz) (802.11b) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions										
	Peak Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4874.0	57.9	0.82	58.7	74.0	15.3	Vertical				
4874.0	57.2	0.52	57.7	74.0	16.3	Horizontal				
7311.0	50.4	7.00	57.4	74.0	16.6	Vertical				
7311.0	51.3	6.50	57.8	74.0	16.2	Horizontal				
9748.0	48.2	8.50	56.7	74.0	17.3	Vertical				
9748.0	47.4	8.30	55.7	74.0	18.3	Horizontal				
12185.0	45.1	10.90	56.0	74.0	18.0	Vertical				
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal				

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Field Strength of Spurious Emissions									
		A	verage Valu	e					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB				
4874.0	42.0	0.82	42.8	54.0	11.2	Vertical			
4874.0	41.9	0.52	42.4	54.0	11.6	Horizontal			
7311.0	35.1	7.00	42.1	54.0	11.9	Vertical			
7311.0	34.9	6.50	41.4	54.0	12.6	Horizontal			
9748.0	33.2	8.50	41.7	54.0	12.3	Vertical			
9748.0	32.8	8.30	41.1	54.0	12.9	Horizontal			
12185.0	30.4	10.90	41.3	54.0	12.7	Vertical			
12185.0	30.3	10.80	41.1	54.0	13.0	Horizontal			

Result of Tx mode (2462.0 MHz) (802.11b) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions									
	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field			
	Level	Factor	Strength	Strength		Polarity			
MHz $dB\mu V$ dB/m $dB\mu V/m$ $\mu V/m$ $\mu V/m$									
	Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2462.0 MHz) (802.11b) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions											
	Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB						
4924.0	57.8	0.82	58.6	74.0	15.4	Vertical					
4924.0	58.3	0.52	58.8	74.0	15.2	Horizontal					
7386.0	50.9	7.00	57.9	74.0	16.1	Vertical					
7386.0	50.9	6.50	57.4	74.0	16.6	Horizontal					
9848.0	47.8	8.50	56.3	74.0	17.7	Vertical					
9848.0	47.5	8.30	55.8	74.0	18.2	Horizontal					
12310.0	45.6	10.90	56.5	74.0	17.5	Vertical					
12310.0	45.4	10.80	56.2	74.0	17.8	Horizontal					

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Field Strength of Spurious Emissions									
		A	verage Valu	e					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4924.0	42.1	0.82	42.9	54.0	11.1	Vertical			
4924.0	42.3	0.52	42.8	54.0	11.2	Horizontal			
7386.0	35.1	7.00	42.1	54.0	11.9	Vertical			
7386.0	35.4	6.50	41.9	54.0	12.1	Horizontal			
9848.0	32.7	8.50	41.2	54.0	12.8	Vertical			
9848.0	33.5	8.30	41.8	54.0	12.2	Horizontal			
12310.0	29.8	10.90	40.7	54.0	13.3	Vertical			
12310.0	30.4	10.80	41.2	54.0	12.8	Horizontal			

Result of Tx mode (2412.0 MHz) (802.11g) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions									
Peak Value									
Frequency Measured Correction Field Field Limit E-Field									
	Level	Factor	Strength	Strength		Polarity			
MHz $dB\mu V$ dB/m $dB\mu V/m$ $\mu V/m$									
Emissions detected are more than 20 dB below the FCC Limits									

Result of Tx mode (2412.0 MHz) (802.11g) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions									
	Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4824.0	57.8	0.82	58.6	74.0	15.4	Vertical			
4824.0	57.9	0.52	58.4	74.0	15.6	Horizontal			
7236.0	49.7	7.00	56.7	74.0	17.3	Vertical			
7236.0	50.9	6.50	57.4	74.0	16.6	Horizontal			
9648.0	47.8	8.50	56.3	74.0	17.7	Vertical			
9648.0	47.9	8.30	56.2	74.0	17.8	Horizontal			
12060.0	45.2	10.90	56.1	74.0	17.9	Vertical			
12060.0	45.0	10.80	55.8	74.0	18.2	Horizontal			

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Date : 2022-05-30 No. : HMD23040028

	Field Strength of Spurious Emissions								
		A	verage Valu	e					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4824.0	42.1	0.82	42.9	54.0	11.1	Vertical			
4824.0	41.8	0.52	42.3	54.0	11.7	Horizontal			
7236.0	34.2	7.00	41.2	54.0	12.8	Vertical			
7236.0	35.5	6.50	42.0	54.0	12.0	Horizontal			
9648.0	31.9	8.50	40.4	54.0	13.6	Vertical			
9648.0	33.1	8.30	41.4	54.0	12.6	Horizontal			
12060.0	30.6	10.90	41.5	54.0	12.5	Vertical			
12060.0	30.0	10.80	40.8	54.0	13.2	Horizontal			

Result of Tx mode (2437.0 MHz) (802.11g) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	μV/m			
Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2437.0 MHz) (802.11g) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4874.0	57.2	0.82	58.0	74.0	16.0	Vertical		
4874.0	57.8	0.52	58.3	74.0	15.7	Horizontal		
7311.0	49.5	7.00	56.5	74.0	17.5	Vertical		
7311.0	50.8	6.50	57.3	74.0	16.7	Horizontal		
9748.0	47.9	8.50	56.4	74.0	17.6	Vertical		
9748.0	47.3	8.30	55.6	74.0	18.4	Horizontal		
12185.0	45.2	10.90	56.1	74.0	17.9	Vertical		
12185.0	45.5	10.80	56.3	74.0	17.7	Horizontal		

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Field Strength of Spurious Emissions									
	Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4874.0	41.5	0.82	42.3	54.0	11.7	Vertical			
4874.0	41.7	0.52	42.2	54.0	11.8	Horizontal			
7311.0	34.9	7.00	41.9	54.0	12.1	Vertical			
7311.0	35.6	6.50	42.1	54.0	11.9	Horizontal			
9748.0	31.8	8.50	40.3	54.0	13.7	Vertical			
9748.0	32.4	8.30	40.7	54.0	13.3	Horizontal			
12185.0	31.1	10.90	42.0	54.0	12.0	Vertical			
12185.0	30.6	10.80	41.4	54.0	12.6	Horizontal			

Result of Tx mode (2462.0 MHz) (802.11g) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
	Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	μV/m			
	Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2462.0 MHz) (802.11g) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4924.0	57.2	0.82	58.0	74.0	16.0	Vertical		
4924.0	57.3	0.52	57.8	74.0	16.2	Horizontal		
7386.0	50.2	7.00	57.2	74.0	16.8	Vertical		
7386.0	51.3	6.50	57.8	74.0	16.2	Horizontal		
9848.0	47.6	8.50	56.1	74.0	17.9	Vertical		
9848.0	47.4	8.30	55.7	74.0	18.3	Horizontal		
12310.0	45.2	10.90	56.1	74.0	17.9	Vertical		
12310.0	45.2	10.80	56.0	74.0	18.0	Horizontal		

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	Field Strength of Spurious Emissions								
	Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4924.0	41.6	0.82	42.4	54.0	11.6	Vertical			
4924.0	41.4	0.52	41.9	54.0	12.1	Horizontal			
7386.0	35.3	7.00	42.3	54.0	11.7	Vertical			
7386.0	36.1	6.50	42.6	54.0	11.4	Horizontal			
9848.0	33.2	8.50	41.7	54.0	12.3	Vertical			
9848.0	32.1	8.30	40.4	54.0	13.6	Horizontal			
12310.0	29.8	10.90	40.7	54.0	13.3	Vertical			
12310.0	31.0	10.80	41.8	54.0	12.2	Horizontal			

Result of Tx mode (2412.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	$\mu V/m$			
Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2412.0 MHz) (802.11n20) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions									
	Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4824.0	56.6	0.82	57.4	74.0	16.6	Vertical			
4824.0	57.3	0.52	57.8	74.0	16.2	Horizontal			
7236.0	50.1	7.00	57.1	74.0	16.9	Vertical			
7236.0	50.2	6.50	56.7	74.0	17.3	Horizontal			
9648.0	47.3	8.50	55.8	74.0	18.2	Vertical			
9648.0	47.4	8.30	55.7	74.0	18.3	Horizontal			
12060.0	45.2	10.90	56.1	74.0	17.9	Vertical			
12060.0	45.5	10.80	56.3	74.0	17.7	Horizontal			

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Field Strength of Spurious Emissions									
	Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4824.0	41.1	0.82	41.9	54.0	12.1	Vertical			
4824.0	41.2	0.52	41.7	54.0	12.3	Horizontal			
7236.0	35.2	7.00	42.2	54.0	11.8	Vertical			
7236.0	35.3	6.50	41.8	54.0	12.2	Horizontal			
9648.0	31.9	8.50	40.4	54.0	13.6	Vertical			
9648.0	33.1	8.30	41.4	54.0	12.6	Horizontal			
12060.0	30.2	10.90	41.1	54.0	12.9	Vertical			
12060.0	30.7	10.80	41.5	54.0	12.5	Horizontal			

Result of Tx mode (2437.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	μV/m			
Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2437.0 MHz) (802.11n20) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	$dB\mu V/m$	dBµV/m	dB			
4874.0	57.2	0.82	58.0	74.0	16.0	Vertical		
4874.0	57.4	0.52	57.9	74.0	16.1	Horizontal		
7311.0	49.8	7.00	56.8	74.0	17.2	Vertical		
7311.0	50.7	6.50	57.2	74.0	16.8	Horizontal		
9748.0	47.3	8.50	55.8	74.0	18.2	Vertical		
9748.0	47.4	8.30	55.7	74.0	18.3	Horizontal		
12185.0	45.2	10.90	56.1	74.0	17.9	Vertical		
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal		

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	Field Strength of Spurious Emissions								
	Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4874.0	41.6	0.82	42.4	54.0	11.6	Vertical			
4874.0	41.4	0.52	41.9	54.0	12.1	Horizontal			
7311.0	35.4	7.00	42.4	54.0	11.6	Vertical			
7311.0	35.5	6.50	42.0	54.0	12.0	Horizontal			
9748.0	34.0	8.50	42.5	54.0	11.5	Vertical			
9748.0	32.8	8.30	41.1	54.0	12.9	Horizontal			
12185.0	30.1	10.90	41.0	54.0	13.0	Vertical			
12185.0	30.9	10.80	41.7	54.0	12.3	Horizontal			

Result of Tx mode (2462.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	μV/m			
	Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2462.0 MHz) (802.11n20) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4924.0	57.1	0.82	57.9	74.0	16.1	Vertical		
4924.0	56.9	0.52	57.4	74.0	16.6	Horizontal		
7386.0	49.8	7.00	56.8	74.0	17.2	Vertical		
7386.0	50.6	6.50	57.1	74.0	16.9	Horizontal		
9848.0	47.2	8.50	55.7	74.0	18.3	Vertical		
9848.0	47.2	8.30	55.5	74.0	18.6	Horizontal		
12310.0	45.2	10.90	56.1	74.0	17.9	Vertical		
12310.0	45.2	10.80	56.0	74.0	18.0	Horizontal		

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	Field Strength of Spurious Emissions								
Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4924.0	41.2	0.82	42.0	54.0	12.0	Vertical			
4924.0	41.4	0.52	41.9	54.0	12.1	Horizontal			
7386.0	34.3	7.00	41.3	54.0	12.7	Vertical			
7386.0	35.2	6.50	41.7	54.0	12.3	Horizontal			
9848.0	31.9	8.50	40.4	54.0	13.6	Vertical			
9848.0	32.8	8.30	41.1	54.0	12.9	Horizontal			
12310.0	31.2	10.90	42.1	54.0	12.0	Vertical			
12310.0	30.7	10.80	41.5	54.0	12.5	Horizontal			

Result of Tx mode (2422.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions							
Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field	
	Level	Factor	Strength	Strength		Polarity	
MHz	dBµV	dB/m	dBµV/m	μV/m	$\mu V/m$		
Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2422.0 MHz) (802.11n40) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4844.0	56.3	0.82	57.1	74.0	16.9	Vertical		
4844.0	56.8	0.52	57.3	74.0	16.7	Horizontal		
7266.0	49.7	7.00	56.7	74.0	17.3	Vertical		
7266.0	50.5	6.50	57.0	74.0	17.0	Horizontal		
9688.0	46.9	8.50	55.4	74.0	18.6	Vertical		
9688.0	47.1	8.30	55.4	74.0	18.6	Horizontal		
12110.0	45.2	10.90	56.1	74.0	17.9	Vertical		
12110.0	45.6	10.80	56.4	74.0	17.7	Horizontal		

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	Field Strength of Spurious Emissions								
Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB				
4844.0	41.3	0.82	42.1	54.0	11.9	Vertical			
4844.0	41.5	0.52	42.0	54.0	12.0	Horizontal			
7266.0	35.2	7.00	42.2	54.0	11.8	Vertical			
7266.0	35.4	6.50	41.9	54.0	12.1	Horizontal			
9688.0	32.7	8.50	41.2	54.0	12.8	Vertical			
9688.0	33.1	8.30	41.4	54.0	12.6	Horizontal			
12110.0	30.2	10.90	41.1	54.0	12.9	Vertical			
12110.0	30.8	10.80	41.6	54.0	12.4	Horizontal			

Result of Tx mode (2437.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	$\mu V/m$			
Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2437.0 MHz) (802.11n40) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4874.0	56.3	0.82	57.1	74.0	16.9	Vertical		
4874.0	56.7	0.52	57.2	74.0	16.8	Horizontal		
7311.0	50.1	7.00	57.1	74.0	16.9	Vertical		
7311.0	50.2	6.50	56.7	74.0	17.3	Horizontal		
9748.0	47.1	8.50	55.6	74.0	18.4	Vertical		
9748.0	47.3	8.30	55.6	74.0	18.4	Horizontal		
12185.0	45.1	10.90	56.0	74.0	18.0	Vertical		
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal		

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	Field Strength of Spurious Emissions								
	Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field			
	Level @3m	Factor	Strength	@3m		Polarity			
MHz	dBµV	dB/m	$dB\mu V/m$	dBµV/m	dB				
4874.0	41.1	0.82	41.9	54.0	12.1	Vertical			
4874.0	41.2	0.52	41.7	54.0	12.3	Horizontal			
7311.0	35.0	7.00	42.0	54.0	12.0	Vertical			
7311.0	35.2	6.50	41.7	54.0	12.3	Horizontal			
9748.0	32.5	8.50	41.0	54.0	13.0	Vertical			
9748.0	32.6	8.30	40.9	54.0	13.1	Horizontal			
12185.0	30.2	10.90	41.1	54.0	12.9	Vertical			
12185.0	30.9	10.80	41.7	54.0	12.3	Horizontal			

Result of Tx mode (2452.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBµV	dB/m	dBµV/m	μV/m	μV/m			
Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2452.0 MHz) (802.11n40) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions							
Peak Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
4904.0	56.1	0.82	56.9	74.0	17.1	Vertical	
4904.0	56.2	0.52	56.7	74.0	17.3	Horizontal	
7356.0	49.8	7.00	56.8	74.0	17.2	Vertical	
7356.0	49.7	6.50	56.2	74.0	17.8	Horizontal	
9808.0	47.1	8.50	55.6	74.0	18.4	Vertical	
9808.0	47.5	8.30	55.8	74.0	18.2	Horizontal	
12260.0	45.2	10.90	56.1	74.0	17.9	Vertical	
12260.0	45.3	10.80	56.1	74.0	17.9	Horizontal	

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Field Strength of Spurious Emissions							
Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
4904.0	41.2	0.82	42.0	54.0	12.0	Vertical	
4904.0	41.4	0.52	41.9	54.0	12.1	Horizontal	
7356.0	34.4	7.00	41.4	54.0	12.6	Vertical	
7356.0	35.5	6.50	42.0	54.0	12.0	Horizontal	
9808.0	32.4	8.50	40.9	54.0	13.1	Vertical	
9808.0	34.0	8.30	42.3	54.0	11.7	Horizontal	
12260.0	31.0	10.90	41.9	54.0	12.1	Vertical	
12260.0	30.7	10.80	41.5	54.0	12.5	Horizontal	

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Denotes restricted band of operation. Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement	(9kHz-30MHz): 2.0dB
uncertainty	(30MHz -1GHz): 4.9dB
	(1GHz -26GHz): 4.02dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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Radiated Emissions Measurement:

Limit :

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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

Result: RF Radiated Emissions (Lowest)-802.11b

Field Strength of Band-edge Compliance							
			Peak Value				
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
2390.0	67.5	-4.8	62.7	74.0	11.3	Vertical	
2390.0	67.0	-4.7	62.3	74.0	11.7	Horizontal	

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	52.5	-4.8	47.7	54.0	6.3	Vertical
2390.0	52.6	-4.7	47.9	54.0	6.1	Horizontal

Result: RF Radiated Emissions (Highest) -802.11b

	Field Strength of Band-edge Compliance							
	Peak Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
2483.5	67.3	-4.8	62.5	74.0	11.5	Vertical		
2483.5	67.6	-4.7	62.9	74.0	11.1	Horizontal		

Field Strength of Band-edge Compliance Average Value						
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	51.0	-4.8	46.2	54.0	7.8	Vertical
2483.5	51.7	-4.7	47.0	54.0	7.0	Horizontal

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Result: RF Radiated Emissions (Lowest)-802.11g

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	68.1	-4.8	63.3	74.0	10.7	Vertical
2390.0	68.6	-4.7	63.9	74.0	10.1	Horizontal

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	51.3	-4.8	46.5	54.0	7.5	Vertical
2390.0	52.1	-4.7	47.4	54.0	6.7	Horizontal

Result: RF Radiated Emissions (Highest) -802.11g

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	69.9	-4.8	65.1	74.0	8.9	Vertical
2483.5	68.4	-4.7	63.7	74.0	10.3	Horizontal

Field Strength of Band-edge Compliance							
		A	verage Valu	e			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
2483.5 54.4 -4.8 49.6 54.0 4.4 Vertical							
2483.5	54.0	-4.7	49.3	54.0	4.7	Horizontal	

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Result: RF Radiated Emissions (Lowest)-802.11n20

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	68.3	-4.8	63.5	74.0	10.5	Horizontal
2390.0	68.6	-4.7	63.9	74.0	10.2	Horizontal

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	54.3	-4.8	49.5	54.0	4.5	Vertical
2390.0	52.8	-4.7	48.1	54.0	5.9	Horizontal

Result: RF Radiated Emissions (Highest) -802.11n20

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	67.5	-4.8	62.7	74.0	11.3	Vertical
2483.5	67.3	-4.7	62.6	74.0	11.4	Horizontal

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	52.8	-4.8	48.0	54.0	6.0	Horizontal
2483.5	53.7	-4.7	49.0	54.0	5.0	Horizontal

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Result: RF Radiated Emissions (Lowest)-802.11n40

Field Strength of Band-edge Compliance							
	Peak Value						
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
2390.0	70.4	-4.8	65.6	74.0	8.4	Vertical	
2390.0	69.3	-4.7	64.6	74.0	9.4	Horizontal	

Field Strength of Band-edge Compliance								
	Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
2390.0	52.6	-4.8	47.8	54.0	6.2	Vertical		
2390.0	51.3	-4.7	46.6	54.0	7.5	Horizontal		

Result: RF Radiated Emissions (Highest) -802.11n40

Field Strength of Band-edge Compliance							
	Peak Value						
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
2483.5	68.2	-4.8	63.4	74.0	10.6	Vertical	
2483.5	67.2	-4.7	62.5	74.0	11.5	Horizontal	

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	54.3	-4.8	49.5	54.0	4.5	Horizontal
2483.5	54.6	-4.7	49.9	54.0	4.2	Horizontal

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Limits for Radiated Emissions FCC 47 CFR 15.247]:

Frequency Range	Quasi-Peak Limits
[MHz]	[µV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases) Horizontal





Relative Humidity : 50.6%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	197.893	36.18	43.50	-7.32	QP	Horizontal
2	227.691	35.66	46.00	-10.34	QP	Horizontal
3	332.519	36.73	46.00	-9.27	QP	Horizontal
4	446.414	40.33	46.00	-5.67	QP	Horizontal
5	744.866	39.60	46.00	-6.40	QP	Horizontal
6	979.180	41.55	54.00	-12.45	QP	Horizontal

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Limits for Radiated Emissions FCC 47 CFR 15.247 Class B]:

Frequency Range	Quasi-Peak Limits
[MHz]	[µV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases) Vertical





Relative Humidity : 50.6%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	32.634	32.51	40.00	-7.49	QP	Vertical
2	62.651	26.77	40.00	-13.23	QP	Vertical
3	206.398	35.14	43.50	-8.36	QP	Vertical
4	396.242	37.84	46.00	-8.16	QP	Vertical
5	446.414	39.47	46.00	-6.53	QP	Vertical
6	744.866	39.06	46.00	-6.94	QP	Vertical

Remarks: Calculated measurement uncertainty (30MHz - 1GHz): 4.9dB Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2023-05-18
Mode of Operation:	WIFI TX mode
Test Voltage:	120Va.c. 60Hz

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The test was performed in accordance with ANSI ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Receiver Setting:

Bandw. = 9 kHz, Meas. Time= 10.0 ms, Step Width = 5.0kHz Detector = MaxPeak and CISPR AV

Test Setup:



Limits for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range	Quasi-Peak Limits	Average		
[MHz]	[dBµV] [dBµV]			
0.15-0.5	66 to 56*	56 to 46*		
0.5-5.0	56	46		
5.0-30.0	60	50		

* Decreases with the logarithm of the frequency. Remarks:

Calculated measurement uncertainty (0.15MHz - 30MHz): 3.25dB

-*- Emission(s) that is far below the corresponding limit line.

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Results of WIFI TX mode (L): PASS

Please refer to the following diagram for individual results.



vol_0001

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Results of WIFI TX mode (N): PASS

Please refer to the following diagram for individual results.



vol_0001

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3.1.4 Power Spectral Density

FCC 47CFR 15.247(e)
ANSI C63.10:2013
2023-05-05
WIFI TX mode

Ambient Temperature: 25° CRelative Humidity: 51°

Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=100kHz , VBW= 300KHz , Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF=10log (3 kHz/100 kHz=-15.2dB)



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Results of WIFI TX Mode 802.11 b (Tx:2412MHz to 2462MHz): Pass (TX Unit) Maximum power spectral density

Transmitter Frequency	Maximum Power spectral density	Maximum Power spectral density /
(MHz)	level / 3kHz band	3kHz band limit
	(dBm)	
2412.0	-7.090	8dBm
2437.0	-7.527	8dBm
2462.0	-6.919	8dBm

Results of WIFI TX Mode 802.11 g (Tx:2412MHz to 2462MHz): Pass (TX Unit) Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band	Maximum Power spectral density / 3kHz band limit
	(dBm)	
2412.0	-13.354	8dBm
2437.0	-14.838	8dBm
2462.0	-14.748	8dBm

Results of WIFI TX Mode 802.11 n20 (Tx:2412MHz to 2462MHz): Pass (TX Unit) Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band	Maximum Power spectral density / 3kHz band limit
	(dBm)	
2412.0	-14.277	8dBm
2437.0	-14.616	8dBm
2462.0	-14.550	8dBm

Results of WIFI TX Mode 802.11 n40 (Tx:2422MHz to 2422MHz): Pass (TX Unit) Maximum power spectral density

Transmitter Frequency	Maximum Power spectral density	Maximum Power spectral density /		
(MHz)	level / 3kHz band	3kHz band limit		
	(dBm)			
2422.0	-15.507	8dBm		
2437.0	-15.877	8dBm		
2452.0	-15.228	8dBm		

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WiFi mode 802.11 b CH 1 (2412.0 MHz)



CH 6 (2437.0 MHz)

Marl	ker 1 2.4	3774482	28000 GH PI IFG	 Z NO: Fast ♀ Gain:Low	Trig: Free Atten: 28	Run dB	Avg Type Avg Hold:	: Log-Pwr 14/100	TRAC TYP DE	E 1 2 3 4 5 E MWWWW T P N N N N
10 dE	3/div R e	ef 17.00 d	IBm					Mkr1 2	.437 744 -7.5	18 GH 27 dBr
7.00										
-3.00						1				
-13.0		all		whipelphil	44 minuter and a	munting	hand which the second	d _a yatati	h-minimuter	
-23.0	higher when the second								10	nnuulyyyy
-33.0										
43.0										
-53.0										
-63.0										
10.0										
Cen #Re	ter 2.437 s BW 3.0	kHz		#VBW	10 kHz			Sweep	span 1 1.402 s (3.30 MH 1001 pts

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CH 11 (2462.0 MHz)



WiFi mode 802.11 g CH 1 (2412.0 MHz)



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CE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N

Span 24.63 MHz

Sweep 2.597 s (1001 pts)



#VBW 10 kHz

CH 11 (2462.0 MHz)

Center 2.43700 GĤz

#Res BW 3.0 kHz



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WiFi mode 802.11 n20 CH 1 (2412.0 MHz)



CH 6 (2437.0 MHz)



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CH 11 (2462.0 MHz)



WiFi mode 802.11 n40 CH 3 (2422.0 MHz)



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CH 6 (2437.0 MHz)



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3.1.5 6dB Spectrum Bandwidth Measurement

FCC 47CFR 15.247(a)(2)
ANSI C63.10:2013
2023-05-06
WIFI TX mode

Ambient Temperature: 25°C Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Spectrum Analyzer Setting:

RBW = 100kHz, $VBW \ge 3*RBW$, Sweep = Auto coupleDetector = Peak, Trace = Max. hold

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2412.0	7.955	> 500

6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz) x dB -6.00 dB Center Freq: 2.41200000 GHz Radio Std: None #IFGain.Low Trig: Free Run Avg|Hold>10/10 Radio Device: BTS Radio Device: BTS

		#IF	Saln:Low	Prices	. 94 00			Tradio Dr	Frice. DTS
0 d <u>B/div</u>	Ref 29.0	0 dBm							
.og 19.0									
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11.00			and another			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	n,		
21.0		/					- Mu		
31.0		AMPROV					¹ %	h	
41.0 51.0								The good and a second	hann Mandan
61.0									
Center 2 Res BW	.412 GHz 100 kHz			#	VBW 300 k	Hz		Sp	an 40 MH /eep 5 m
Occu	pied Band	width							
		13.2	38 N	1Hz					
Transı	nit Freq Err	or	22.723	3 kHz	OBW P	ower		99.00 %	
x dB E	Bandwidth		7.955	MHz	x dB			-6.00 dB	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2437.0	8.867	> 500

enter Fre	eq 2.43700000	GHZ Cer Trig	g: Free Run Avg	j Hold:>10/10	Radio Std: N	one
		#IFGain:Low #At	ten: 34 dB		Radio Device	e: BTS
dB/div	Ref 29.00 dBr	'n				
g				<u> </u>		
9.0						
.00			Antohan .			
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	and all the second and				wand he have needed	od.
" have a second	ere .					- Marin
enter 2.4	137 GHz				Span -	40 MI
Res BW	100 kHz		#VBW 300 kHz		Swee	p 5 n
Occur	ind Dondwidt	h				
Occup						
	1:	3.277 MHz				
Transm	nit Freq Error	-36.666 kHz	OBW Powe	r 9	9.00 %	
	andwidth	8 867 MHz	x dB	-6	00 dB	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2462.0	8.423	> 500

enter Fr	eq 2.46200000) GHz	Cente	r Freq: 2.46200 Free Run	Avg Hol	d:>10/10	Radio Std:	None
		#IFGain:Low	#Atten	n: 34 dB			Radio Dev	ice: BTS
) dB/div	Ref 29.00 dB	m						
og								
9.0								
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.00			and the second second		Mun Le			
1.0		- Jone and a company	_	_	<u> </u>			
1.0			_			<u> </u>		
1.0			_			<u> </u>		
1.0		1				hu	har	
10	the way have a second s						" "My your and	
1.0								- arr
enter 2.4	462 GHz		-44	VBM 200 I	/U-7		Spai	n 40 Mi
KES DW			#	VDVV JUUI	λΠZ		Swe	eh 21
Occup	ied Bandwid	th						
	1	3.253 N	/IHz					
Transm	nit Freq Error	-54.48	4 kHz	OBW F	ower	ç	9.00 %	
Transmit Freq Error -54.								

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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2412.0	16.45	> 500

6dB Bandwidth of Fundamental Emission on 802.11 g (2412MHz) Center Freq 2.412000000 GHz Trig: Free Run Avg|Hold> 10/10

		#IF	Gain:Low	#Atten: 3	4 dB			Radio Dev	ice: BTS
dB/div	Ref 29.00) dBm							
g									
.0									
0			Mynhalm	hervelying	montanting	manna			
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0	- And Marked							www.	
° malikaput	WWWWWWWWWW								n sa na
°									
enter 2.4 les BW	12 GHz 100 kHz			#VE	3W 300 k	Hz		Spa Swe	n 40 Mi ep 5 r
Occup	ied Band	width							
		16.3	891 MI	Hz					
Transmit Freg Error 5.120			5.120 I	kHz	OBW P	ower	99	.00 %	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2437.0	16.42	> 500

	- Water				wall for	ہے .	
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0 and a standard and a standard and a standard and a standard a	nh	adambar the	hanna	un warden war	an An		

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2462.0	16.43	> 500

enter Freq 2.4620000	0 GHz Cente	r Freq: 2.462000000 GHz	Radio	Std: None		
	#IFGain:Low #Atter	n: 34 dB	Radio I	Device: BTS		
0 dB/div Ref 29.00 dB	m					
. og						
3.00						
.00	- here low broken have been	wa manahanhanhanhanh	n			
1.0						
21.0	work		h.			
n.u	r		The second			
51.0 51.0 50 50 50 50 50 50 50 50 50 50 50 50 50			What it			
61.0				have been and a second s		
enter 2.462 GHz		WBW(300 kHz	S	pan 40 MH		
Occurried Developed		VBW 500 KHZ				
Occupied Bandwid						
1	6.400 MHZ					
Transmit Freq Error	-6.408 kHz	OBW Power	99.00 %			
x dB Bandwidth	16 43 MHz	l3 MHz x dB		-6.00 dB		

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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2412.0	17.65	> 500

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2412MHz) Center Freq 2.412000000 GHz Center Freq: 241200000 GHz

			#	IFGain:Lo	w #Atter	ree Run n:34 dB	AvgiHol	la:>10/10	Radio De	vice: BTS	
10 dB/	div	Ref 29.0	0 dBm								
Log 19.0											
9.00											
-1.00 -				malinati	ah. h. waw	hand	whether	Irra			
-21.0			لر ا					<u> </u>			
-31.0 —			and all a					- North			
-41.0 —		بر -	<i></i>						Mr.		
-51.0 "/ -61.0 —	handheann	apression for the							"hillinger	***********	
L Cente #Res	er 2.412 BW 10	2 GHz 0 kHz			#	VBW 30	0 kHz		Spa Sw	an 40 MHz eep 5 ms	
Oc	cupie	d Band	width	612	MU-3						
			17.	012							
Tra	ansmit	Freq Err	or	12.8	14 kHz	kHz OBW Power			99.00 %		
x d	IB Ban	dwidth		17.6	5 MHz	x dB		-(6.00 dB		

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2437.0	17.31	> 500

enter Freq 2.437000	000 GHz	Center F	req: 2.437000 e Run	0000 GHz AvalHold:>/	0/10	Radio Sto	I: None
	#IFGain:Low	#Atten: 3	4 dB			Radio De	vice: BTS
dB/div Ref 29.00	dBm						
9.0							
.00							
00	www.www	hunner	propagling	whatala	'n		
1.0			Ψ		ų		
1.0	N ^N				N. N. BAR		
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.0 malash have have all a second						""www.www.	June of the second
enter 2.437 GHz Res BW 100 kHz		#VE	300 k	H7		Spa Sw	an 40 MH eep 5 m
Occupied Bandw	vidth						
	17.573 Mł	Ηz					
Transmit Freq Erro	r -24.013 I	kHz	OBW P	ower	99	0.00 %	
v al D. Danadurialéh	47 94 B	.31 MHz x dB			6	ah 00	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2462.0	17.55	> 500

enter Fred	2.46200	0000 G	Hz	Center F	req: 2.46200	0000 GHz		Radio Ste	d: None
		#1	FGain:Low 🖵	#Atten: 3	e Run 84 dB	Avg Hold>	10/10	Radio De	vice: BTS
) dB/div	Ref 29.0	0 dBm					_		
90									
.00									
00		4	montan	hunna	1 water along	www.www.	4		
					¥		l,		
1.0		A A					Wood a		
	تير						" ["] "h,	h-	
1.0	William Martin							WWWWWWWWW	hall-ofference
enter 2.463 Res BW 10	2 GHz 00 kHz			 #VI	BW 300 k	Hz		Spa Sw	an 40 MH eep 5 m
Occupie	d Band	width							
		17.	581 M	Hz					
Transmit	Freq Err	or	-20.862	kHz	OBW P	ower	99	9.00 %	
x dB Bandwidth 17.55		47.55	MHz xdB			-6.00 dB			

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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2422.0	36.03	> 500

an 80.000 MH	Z		<u> </u>	Center Fi	req: 2.42200 e Run d R	0000 GHz Avg Hold:	> 10	0/10	Radio Std	: None
		#IFC	ain:Low	#Atten. It	00				Radio Dev	nce. BTS
dB/div Ref	20.00 aBn	1								
0		-								
0										
		h.M	philiphertarily/1444	and the second	alunhurhurhurhurh	elen skiplepige	h			
)		4		1				[
)		1						h		
	M							<u> </u>	1.	
1. Martingungarily	And							γı.	ully have with	alm and man
nter 2.422 GH	2			#)/E	W 200 P	U-7			Spa	n 80 MH:
ES BW TUUKH.	2			#VE	WW JUUK	ΠZ			oweep	9.955 III:
Occupied Ba	andwidt	h								
	35	. a	<u>ол кл</u> і	J 7						
				12						
Transmit Fred	Error		-24.172	kHz OBW Power				99	.00 %	
v dB Bandwidth 36.03		36 03 N	AHz xdB			-6.00 dB				

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2437.0	36.03	> 500

6 Cen	dB B ter Fre	andwidth q 2.43700	n of F 0000 (un GH:	idamen z	tal Em	ission (reg: 2.43700	оп 802. 000 GHz	11	n40	(24371 Radio Std	MHz) ∶None
			ŗ	¥IFG	ain:Low 두	#Atten: 1	e Run 0 dB	Avg Hold:	>10	1/10	Radio Dev	vice: BTS
10 d	B/div	Ref 20.0	0 dBm									
Log 10.0												
0.00				h.h	Javenterlaripathe	haladapad	, tunhuly, turhuly		ιų,			
-20.0		_	4			Į	é			Ì		
-30.0 -40.0	1. advidu	and the state of the	When	_						WWWWWWWWWWW	white white	almund down.
-50.0 -60.0	Mare										•	
-70.0												
Cen #Re	ter 2.4 sBW 1	37 GHz 100 kHz				#VE	3W 300 k	Hz			Spa Sweep	n 80 MHz 9.933 ms
C	ccupi	ed Band	width 36.	.0	19 MI	Ηz						
Т	ransmi	it Freq Err	or	-	42.783	κHz	OBW P	ower		99	.00 %	
х	dB Ba	ndwidth			36.03 N	IHz	x dB			-6.0	00 dB	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2452.0	35.52	> 500

enter Freq 2.	45200000) GHz	Center Fi	req: 2.45200 e Run	0000 GHz AvalHold:>10	0/10	Radio Std	None
		#IFGain:Low	#Atten: 1	0 dB	al		Radio Dev	ice: BTS
dB/div R e	f 20.00 dBi	n						
g .0								
		ก็มูลในเป็นเป็นเป็นเป็นไม่เป็นไม่	dududadadayad	, turkulantula	· htm:/htp/4/htp//			
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.0 44.4ph-4.pr/ph44.4mm .0	HALINAMPH AV					"YAU	44 Mathewskille	all white the
.0								
.0								
enter 2.452 G	Hz						Spa	n 80 MH
tes BW 100 k	Hz		#VE	300 k	Hz		Sweep	9.933 n
Occupied I	Bandwid	th						
	3	6.025 Mł	Ηz					
Transmit Fre	eq Error	-54.666 I	kHz OBW Power			99.00 %		
x dB Bandw	idth	35.52 N	Hz xdB			-6.00 dB		

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3.1.6 Band Edges Measurement

FCC 47CFR 15.247
ANSI C63.10:2013
2023-05-07
WIFI TX mode

Ambient Temperature: 25°C Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

Test Setup:

As Test Setup of clause 3.1.2 in this test report.

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Band-edge Compliance of RF Conducted Emissions Measurement:

Limit :

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. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: The worst-case measurement results were recorded in the test report The following plots include cable losses :0.3dB (There is no Attenuator)

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	7.747	-12.253	-40.834	Pass



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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	5.156	-14.844	-58.164	Pass

Band-edge Compliance of RF Emissions – Highest (802.11b)

Mar	ker	2 2	2.48	350000	00000 GH PN IFG	IZ 10: Fast iain:Low	, -	Trig: Free Atten: 28	n	Avg Avg F	Type lold:	: Log-Pwr >100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N		
10 d	B/div	,	Ref	f 18.00 c	lBm								Mkr2	2.483 -58.	500 GHz 164 dBm
LUG					∆1										
8.00				www											
-2.00			سلمهر	Nº Sea	//// ⁻	کسر	-								
-12.0			^			¥									
22.0		<i>.</i>					\mathcal{M}								
-22.0	7						Y	<u>,</u>							
-32.0	\vee		+					1							
-42.0								Mine the							
-52.0								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	A.A.A.			2_			
02.0										wallwww.	-two		hike yaroshana		atten man Maria
-62.0															
-72.0			-												
Stai #Re	rt 2. s B	452 W 1	00 00	GHz kHz		#V	BW	300 kHz				ę	Sweep 4	Stop 2.: .600 ms	50000 GHz (1001 pts)
MKR	MODE	TRC	SCL		×			Y		FUNC	TION	FUN	ICTION WIDTH	FUNC	TION VALUE
1	N	1	f		2.462 176	GHz		5.156 dE	3m						
2	N	1	1		2.483 500	GHZ		-58.164 dB	<u>sm</u>						
4									+						
5															=
6									-						
8									+						
9															
10									_						
<				ļ				Ш	-					<u> </u>	>

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	1.237	-18.763	-39.019	Pass

Band-edge Compliance of RF Emissions – Lowest (802.11g)

			IFGain:Low	Atten: 28 o	В			C	ET PINNI
dB/div	Ref 18	.00 dBm					Mkr1	2.413 2 ا 1.2	264 G 37 dE
g								A 1	
JU								•	
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under	har where	and have an and a second	and and any way	In all the second					
U									
.0	_								
art 2 37		7						Stop 2.4	2200 0
es BW	100 kH	2	#VB	W 300 kHz			Sweep #	5.000 ms ((1001 c
SI MODEL TR	ci sci i	×		Y	ELING	TION FI	INCTION WIDTH	ELINCTI	ON VALUE
N 1	f	2.413	264 GHz	1.237 dB	n				01111202
N 1	f	2.400	000 GHz	-39.019 dBi	n				
	+ $+$				+				

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	-0.093	-20.093	-56.459	Pass

Band-edge Compliance of RF Emissions – Highest (802.11g)

Mar	ker	22	2.48	3350000	00000 G P IF	Hz NO: Fast Gain:Lov	v v	Trig: Free Atten: 28	Run dB	Avg Ty Avg Ho	pe: Log-Pwr Id:>100/100	TRA T\ [CE 12345 PE MWWWWW DET P N N N N
10 d	B/div	,	Rei	f 18.00 d	dBm						Mkr	2 2.483 5 -56.4	500 GHz 59 dBm
Log					4								
8.00	,												
-2.00	· · · ·	/nh~c	haft	whatball	ปกษาใกรประเทศ	Y Angola	ĥ-						
-12.0	\vdash		+		4		H						
-22.0			_				<u>հ</u>	b					
-32.0	ľ		_					"UNG		-			
-42.0								×~~~~~					
52.0								- No.		▲2			
-32.0								Ĩ	and the state of t	wenny .	malpharman	en relificety war	ที่หรือเป็นแน่งเล
-62.U												1	1.4.
-72.0													
Sta	rt 2.	452	00	GH7								Stop 2.5	
#Re	s B	W 1	00	kHz		#V	ΒW	300 kHz			Sweep 4	4.600 ms	(1001 pts)
MKR	MODE	TRC	SCL		Х			Y	FUNC	CTION F	UNCTION WIDTH	I FUNCTI	ON VALUE
1	N	1	f		2.463 28	0 GHz		-0.093 dB	m				
3	IN		- 1		2.403 50			-00.409 UD					
4													
6													
7													
8		-		-									
10													
11		-	I	I				m					>

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	1.419	-18.581	-38.346	Pass

Band-edge Compliance o	of RF Emissions – Lowest (802.11n20)
------------------------	----------------------------	------------

Mar	ker	12	2.41	1326400	00000 GH PN IFG	lz 10: Fast ain:Low	F	Trig: Free Atten: 28	Run dB	Avg Avg l	Type: Hold:>	Log-Pwr 100/100	TRAC TY D	CE 123456 PE MWWWWW ET P N N N N N
10 d	3/div	,	Rei	f 18.00 d	IBm							Mkr1	2.413 2 1.4	264 GHz 19 dBm
8.00			-										↓ ¹	
-2.00											միչերեն	ብርጉታቸው የዲዲቲ ው	h had pringer and have	
-22.0 -32.0										ANN A				` ```
-42.0 -52.0						. Alu	wir-fr	Howwall	-ton for the					
-62.0 -72.0	pulliphi		r da w	┉୷୷୷୷ୄ୷ୄୢୢୄ୷୶୷୳୵୳୵ୄ୳	ร _ี มุรุกษาการการโรการ	/U_~~4# P 4/								
Star	t 2.:	370	00	GHz									Stop 2.42	2200 GHz
#Re	s Bl	W 1	00	kHz		#VE	зw	300 kHz	EUN	7101	S	weep 5	.000 ms (1001 pts)
1 2 3 4 5 6 7 8 9	N		f		2.413 264 2.400 000	I GHz) GHz		<u>1.419 de</u> -38.346 de	Sm Sm Sm				FUNCTION	
10 11 <								Ш						<u> </u>

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	-0.127	-20.127	-55.513	Pass

Mai	rker	22	2.48	8350000)0000 GH PN IFG	12 10: Fast Sain:Lov	, -	Trig: Free Atten: 28	Run dB		Avg T Avg H	Гуре lold⊃	: Log-Pwr ▶100/100		TRAC TYP DE	E 1 2 3 E MWW T P N N	456
10 c	IB/div	,	Re	f 18.00 c	lBm								Mkr	2 2.48 -5	3 5 5.51	00 G I3 dI	iHz Bm
LOG			. 1														
0.00		(Σ^{\dagger}														
-2.00) m	h	h	$\gamma_{\rm contractor}$	- Ambarta	ทุ่งณ์ใหม่	ใหญ										
-12.0			_		¥									-			
-22.0						<u> </u>											
27.0	r					l l		Nr.									
-32.0	, L							er a									
-42.0)											2					
-52.0) —							ላህ	esal prove	ww.	Phone Law	-		-			
-62.0)					<u> </u>						vwv	haimet and in	-	m	-Munus	franka.
.721																	
12.0	1																
Sta	rt 2.	452	00	GHz										Stop	2.50	000 0	GHz
#Re	es Bi	W 1	00	kHz			BW	300 kHz				5	Sweep 4	1.600 n	ns (1	1001	pts)
MKR	MODE	TRC	SCI		X			Y		FUNC	TION	FUN	CTION WIDTH	FL	INCTIO	N VALUE	~
1	N	1	f		2.455 744	1 GHz		-0.127 dE	<u>3m</u>								_
2	N	1	<u> </u>		2.483 500	JGHZ		-55.513 dE	sm								-
4																	_
5																	_ =
0 7			-														-
8																	_
9																	
11																	
<		•		+					'								>

Band-edge Compliance of RF Emissions – Highest (802.11n20)

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2422)	3.456	-16.544	-28.120	Pass

		B	an	d-edge	Comp	liance	<u>e of</u> E	RF En	nissio	ns -	- Low	<u>est (80)</u>	2.11n40)	
Mark	er	2 2	2.40	000000	00000 G	Hz 'NO: Fast Gain:Low	•	Trig: Free Atten: 28	e Run dB		Avg Type Avg Hold	e: Log-Pwr >100/100	TRA TY D	CE 1 2 3 4 5 PE MWWWWM ET P N N N N
10 dE	s/div	,	Rei	f 18.00 c	1Bm							Mkr	2 2.400 0 -28.1	00 GH2 20 dBm
Log											1			
0.00									66	1.1.5.	1. YIA/		LIARE A	1.6.6.1.1
-2.00 -									- Alapan	the off A	uvuru ya w	┶╖┸┲╝┛╓╖ ╎╎	[₽] ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	handahartaritari
-12.0			+						2			1		
-22.0								10 L - 0	2 <u> </u>					ا ا
-32.0			+		ы Да	n hay and	աղափիթ	UNMU.U.	¥'					
-42.0		. L. MA	الوارير	WWWW	WW Water U		_							
-52.0	N _{Y0} 1	rtmb .												
-62.0			-											
-72.0			_				_			_				
stan #Res	2. 8 B1	360 N 1	00	GHZ kHz		#V	BW 3	00 kHz			:	Sweep	Stop 2.44 7.867 ms (1001 pts
MKR M	IODE	TRC	SCL		×			Y	F	UNCTI	DN FUI	NCTION WIDTH	I FUNCTI	DN VALUE
1	N	1	f		2.413 30	O GHz	· ·	3.456 dl	3m 3m					
3		-			2.400 00		-2	.0.120 al	2111					
4														
6														
8														
9														
11														
<								Ш						>

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2452)	-1.234	-21.234	-49.136	Pass

Mar	ker	Ba 2 2	an(2.48	d-edg 335000	e Com	pliance GHz PNO: Fast IFGain:Lov	e of	RF Em	IISS Rui dB	sions	– Hi Avg Avg t	i ghe Type: told>	est (8 Log-Pv 100/100	02.	11n4 T	O) RACE 1 2 TYPE M₩ DET P N	3 4 5 6 WWWW N N N N
10 di	3/div	,	Re	f 18.00	dBm								Mk	r2 :	2.483 -49.	500 136 c	GHz IBm
8.00 -2.00 -12.0 -22.0 -32.0 -42.0 -52.0 -62.0 -72.0		1. 	4nd#			4 MUH	Jan Jung	nut nut a		Auto Internet	wruly	لمريول	Wortwood				vrule-gara
Star #Re	t 2. s Bi	432 W 1	200 00	GHz kHz		#V	вw	300 kHz				s	weep	ء 11	Stop 2. .33 ms	55000 s (1001	GHz I pts)
MKE 1 2 3 4 5 6 7 8 9	N		f		× 2.446 2.483	986 GHz 500 GHz		-1.234 dE -49.136 dE	im im	FUNC	CTION	FUNI	CTION WIE		FUNC	CTION VAL	JE ^

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RF Conducted Emissions Measurement:

Limit :

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. Attenuation below the general limits specified in Section 15.209(a) is not required.

		RF	Emis	ssions (80	2.11b	2412N	AHz)		_
Spectrum									
Ref Level	16.00 dBm		🥌 R	BW 100 kHz		15 - 115			
Att	35 dB	SWT 250	ms 🖷 V	BW 300 kHz	Mode A	uto Swee	эр		
●1Pk Max				-		M1[1]			0 44 dBm
10 dBm				-		HILI			2.4120 GH
0 dBm				_		M2[1]	31	T	-38.36 dBn 4.8180 GH
-10 dBm									-
-20 dBm									
-30 dBm	Ma			-		-	_		
-40 dBm						-			
-50 dBm	pourante	www.	Manda	uhanhan marin	muun	www	when my have	www.	Monum
-60 dBm									
-70 dBm		5		_					
-80 dBm									
Start 30.0 M	1Hz			691	pts			Ste	op 25.0 GHz
Marker									
Type Ref	Trc	X-value		Y-value	Fun	iction		Function Resu	ılt
M1	1	2.41	2 GHz	8.44 dB	m				
M2	1	4.81	8 GHZ	-38,36 QB	m		2		

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RF Emissions (802.11b 2462MHz)

Spectrum	i)					
Ref Level	16.00 dB	m 👄 F	RBW 100 kHz	N W N C NY		
Att	35 0	18 SWT 250 ms 👄 🛚	/BW 300 kHz M	lode Auto Swe	ер	
●1Pk Max						
10 dBm				M1[1]		6.88 dBm 2.4620 GHz
0 dBm				M2[1]	Г	-43.27 dBm 4.9260 GHz
-10 dBm						
-20 dBm						
-30 dBm						
-40 dBm		M2				
-50 dBm	uhorman hil	the word when the second	www.www	www.www.	manuture	methown the work
-50 dBm-						
-80 dBm-						
Start 30.0	MHZ		691 pts			Stop 25.0 GHz
Marker	1 1					
Type Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1	1	2.462 GHz	6.88 dBm			
M2	1	4.926 GHZ	-43.27 dBm			

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RF Emissions (802.11g 2437MHz)

Spectrum)					
Ref Level	16.00 dB	šm 👄 F	RBW 100 kHz			
Att	35 (dB 🛛 SWT 250 ms 🖷 🕅	VBW 300 kHz N	lode Auto Swe	ер	
1Pk Max						
10 40 -				M1[1]		0.24 dBm
10 uBm						2.4370 GHz
				M2[1]		-49.21 dBm
0 ubiii				1	1	
-10 dBm						
-20 dBm			_			
-30 dBm						
-40 dBm						
-50 dBm		M2				
autornorthe	howmany	to a contraction of the contract	. marmunally	mourouphal	work the My mary	1 March un marcher
-60 dBm		wwwwww	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	810-80		
0.000000						
-70 dBm						
-80 dBm						
Start 30.0 M	Hz	at the	691 pts	5		Stop 25.0 GHz
Marker						
Type Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1	1	2.437 GHz	0.24 dBm			
M2	1	5.758 GHz	-49.21 dBm			

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RF Emissions (802.11n20 2412MHz)

Spect	rum	- 1					
Ref L	evel	16.00 dBm		RBW 100 kHz			
Att		35 dB	SWT 250 ms 👄	VBW 300 kHz M	Mode Auto Swee	əp	
1Pk M	ax						
10 10					M1[1]		-0.13 dBm
IO aBW							2.4120 GHz
o	M	0			M2[1]		-48.94 dBm
и авт-	Ĩ			0			6.6610 GHZ
-10 dBm	n-						
-20 dBm	n-						
-30 dBrr	n-						
-40 dBm	n-						
50 d0m							
	JAN H	wanter	with the second s		Monumenter	han fill bere was	Mary man Hadre
-60 dBm		V21:	un and a second	Comparate and a	×		0
	~						
-70 dBm	n-+				0		
-80 dBm	n-+						
Start 3	0.0	MHz		691 pt	s		Stop 25.0 GHz
larker							
Type	Ref	Trc	X-value	Y-value	Function	Fund	ction Result
M1		1	2.412 GHz	-0.13 dBm			
M2		1	6.661 GHz	-48.94 dBm			

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RF Emissions (802.11n20 2462MHz)

Spectrum						
Ref Level	16.00 dB	m 😑 l	RBW 100 kHz	Inda, Auto Curo		
1Pk Max	33 0	10 3WI 250 ms 🖷	4 BW 300 KH2	IDUE AULO SWE	ер	
10 dBm				M1[1]		-0.96 dBm 2.4620 GHz -49.17 dBm
0 dBm					а	5.8300 GHz
-10 dBm						
-20 dBm						
-30 dBm						
-40 dBm						
-50 dBm ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	polatonours	M2 www.www.	www.www.ww	nunnanthin	mount	Madenugurante
-70 dBm						
-80 dBm						
Start 30.0 M	4Hz	<u>k</u> <u>k</u>	691 pts	5		Stop 25.0 GHz
Marker		2075 - Managaran				
Type Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1 M2	1	2.462 GHz 5.83 GHz	-0.96 dBm -49.17 dBm			

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RF Emissions (802.11n40 2437MHz)

Spectr	um	- 1								∇
Ref Le	vel	16.00 dBr	n	👄 RBW	100 kHz	22 % D				
1 Att	N.	35 d	B SWT 250 m	s 👄 VBW	300 kHz	Mode Au	ito Sweep			
10 dBm-						M	1[1]		:	-2.20 dBm 2.4370 GHz
0 dBm—	ML						2[1]	т		5.0110 GHz
-10 dBm-	+									
-20 dBm-	╉									
-30 dBm-	+									
-40 dBm-	╉		M2							
-50 dBm سریہ اسریں -60 dBm	who	broodellin	www.ture	mark	www.	utorunk	um	whenhave	Muranan	Murtunal
-70 dBm-	_									
-80 dBm-	+									
Start 30).0 N	IHz			691 p	ots			Stop	25.0 GHz
Marker	10/10/201									
Туре	Ref	Trc	X-value		r-value	Func	tion	Fun	ction Result	
M1 M2		1	2.437 0	GHZ GHZ	-2.20 dBn -48.77 dBn	า ก				
		-	olorr (

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		RF Emis	sions (802.	11n40 245	2MHz)			
Spectrum					ŗ			
Ref Level	16.00 dB	m 👄	RBW 100 kHz			×		
Att	35 c	IB SWT 250 ms 👄	VBW 300 kHz	Mode Auto Swi	эер			
1Pk Max								
				M1[1]		-3.15 dBm		
10 dBm						2.4520 GHz		
				M2[1]		-48.68 dBm		
0 dBm				1	1	6.9480 GHz		
-10 dBm								
-20 dBm								
-30 dBm		· · · · · ·						
-40 dBm								
-50 dBm	mul	white date of the second secon		in the des AV	Marka Rach	which as a set of the		
Margaren M	•	howeness	warmentunder	anne and an a		a and many many		
-60 dBm								
-70 dBm								
-80 dBm								
Start 30.0 M	IHz		691 pt	ts		Stop 25.0 GHz		
Marker								
Type Ref	Trc	X-value	Y-value	Function	Fu	nction Result		
M1	1	2.452 GHz	-3.15 dBm					
M2	1	6.948 GHz	-48.68 dBm					

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3.1.7 Antenna Requirement

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Requirements: § 15.203

Test Specification:

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

Test Results:

This is integral antenna. There is no external antenna, the antenna gain = 2.0 dBi. User is unable to remove or changed the Antenna.



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Appendix A

List of Measurement Equipment

Radiated Emission								
EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL		
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A		
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A		
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2019/04/16	2024/04/16		
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A		
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2022/11/25	2024/11/25		
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2022/11/24	2024/11/24		
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2022/11/25	2024/11/25		
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2022/11/25	2024/11/25		
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2022/06/10	2024/09/10		
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2022/06/17	2024/09/17		
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2022/10/11	2025/10/11		
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2022/11/08	2025/11/08		
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A		

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM232	LISN	SCHAFFNER	NNB41	04/100082	2022/07/20	2023/07/20
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2022/05/30	2023/05/30
EM179	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357.8810.52/54	2023/03/17	2025/03/17
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	2022/02/02	2027/02/02
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	BSIB-K1	V1.20	N/A	N/A

Remarks:-

CM Corrective Maintenance

N/A Not Applicable

TBD To Be Determined

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Appendix **B**

Photographs of EUT



Inner circuit view



Inner circuit top view





View of battery



Inner circuit bottom view



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Photographs of EUT



Inner circuit top view



Inner circuit bottom view



Inner circuit top view



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Photographs of EUT



Measurement of Radiated Emission Test Set Up (30MHz - 1000MHz)



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Photographs of EUT

Measurement of Radiated Emission Test Set Up (above 1000MHz)



Measurement of Conducted Emission Test Set Up



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Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").
- 2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
- The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party
 accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall
 attach to the Company's act of disclosure.
- 4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
- 6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
- 7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
- 9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
- 10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
- 12. Issuance records of the Report are available on the internet at www.stc.group. Further enquiry of validity or verification of the Reports should be addressed to the Company.