

FCC 47 CFR PART 15 SUBPART C ISED RSS 247 ISSUE 2 CERTIFICATION TEST REPORT

For

SMART VACUUM CLEANER

MODEL NUMBER: VS100100US

ADDITIONAL MODEL NUMBER: VS100100CA, VS100200CA, VS100200US, VS100300CA, VS100300US, VS100400CA, VS100400US, VS100500CA, VS100500US

PROJECT NUMBER: 4789476876

REPORT NUMBER: 4789476876-1

FCC ID: 2AV7A-S10

IC ID: 26039-S10

ISSUE DATE: Jun. 24, 2020

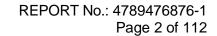
Prepared for

Tineco Intelligent Technology Co., Ltd.

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	06/24/2020	Initial Issue	



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Tineco Intelligent Technology Co., Ltd.

Address: No. 108 Shihu Road West, Wuzhong Zone, Suzhou, 215128

P.R.China

Manufacturer Information

Company Name: Tineco Intelligent Technology Co., Ltd.

Address: No. 108 Shihu Road West, Wuzhong Zone, Suzhou, 215128

P.R.China

Factory Information

Company Name: Tineco Intelligent Technology Co., Ltd.

Address: No. 108 Shihu Road West, Wuzhong Zone, Suzhou, 215128

P.R.China

EUT Description

Product Name SMART VACUUM CLEANER

Model Name VS100100US

Additional No. VS100100CA, VS100200CA, VS100200US, VS100300CA,

VS100300US, VS100400CA, VS100400US, VS100500CA,

VS100500US

Sample Number 2913906
Data of Receipt Sample Feb. 28, 2020

Date Tested May. 02, 2020~ May. 26, 2020

APPLICABLE STANDARDS					
STANDARD	TEST RESULTS				
CFR 47 Part 15 Subpart C	PASS				
ISED RSS-247 Issue 2	PASS				
ISED RSS-GEN Issue 5	PASS				



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	Summary of Test Results					
Clause	Test Items	FCC/IC Rules	Test Results			
1	6db DTS Bandwidth and 99% FCC 15.247 (a) (2) Comp		Complied			
2	Peak Conducted Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	Complied			
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	Complied			
4	Conducted Band edge And FCC 15.247 (d) RSS-247 Clause 5.5		Complied			
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Complied			
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	Complied			
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	Complied			

Remark:

Laboratory Leader

2) The product is powered by battery.

Prepared By:	Reviewed By:
Jason Yang	Tom Tang
Jason Yang Engineer	Tom Tang Engineer Project Associate
Authorized By:	
Chris Zhong	
Chris Zhong	

¹⁾ The measurement result for the sample received is <Pass> according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15C, ISED RSS-GEN Issue5, ISED RSS-247 Issue2> > when <Accuracy Method> decision rule is applied.



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15 ISED RSS-GEN ISSUE5 and ISED RSS-247 ISSUE2.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4829.01) UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1247) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (IC Designation No.: 25056) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.
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Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.



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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty	
Conduction emission	3.00dB	
Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	3.31dB	
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	3.31dB	
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	3.83dB (1GHz-18Gz)	
(1.6.12 to 2661.2)(marado i directino interiori	4.13dB (18GHz-26.5Gz)	

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



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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Product Name	SMART VACUUM CLEANER			
Model No.	VS100100US			
Operating Frequency	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz			
Type of Modulation	IEEE for 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE for 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK)			
Channels Step	Channels with 5MHz step			
Test power grade	NA (manufacturer declare)			
Test software of EUT	EspRFtestTool_2.0 (manufacturer declare)			
Antenna Type	Meandered printed inverted-F antenna			
	2.3 dBi			
Antenna Gain	Remark: This data is provided by customer and our lab isn't responsible for this data			
Battery	NAME: Rechargeable Li-ion Battery OUTPUT:21.6V DC 260W			
Adapter	MODEL:YLS0241A-T260070 INPUT:100-240V~50/60Hz 0.8A Max OUTPUT:26V 700 mA			

Model No.:

Number:	Name:	Number:	Name:	Number:	Name:
1	VS100100CA	2	VS100100US	3	VS100200CA
4	VS100200US	5	VS100300CA	6	VS100300US
7	VS100400CA	8	VS100400US	9	VS100500CA
10	VS100500US				

Remark: Only the main model **VS100100US** was tested and only the data of this model is shown in this test report. Since Their electrical circuit design, layout, components used and internal wiring are identical, only the model name, product color, marketing channel and sale country.



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5.2. MAXIMUM OUTPUT POWER

Number of Transmit Chains (NTX)	IEE Std. 802.11	Channel Number	Max PK Conducted Power (dBm)
1	IEEE 802.11B	1-11[11]	10.78
1	IEEE 802.11G	1-11[11]	14.93
1	IEEE 802.11n HT20	1-11[11]	14.87

5.3. CHANNEL LIST

	Channel List for 802.11b/g/n (20 MHz)						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452		



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5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX (802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX (802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX (802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Softw	vare	EspRFte			estTool_2.0		
	Transmit		Test C				
Modulation Mode	Antenna	1	NCB: 20MH	łz	N	NCB: 40MHz	
Mode	Number	CH 1	CH 6	CH 11	CH 3	CH 6	CH 9
802.11b	1	NA	NA	NA			
802.11g	1	NA NA NA				/	
802.11n HT20	1	NA	NA	NA			

Remark: The ATT in the software is setting 0.



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5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2400-2483.5	Meandered printed inverted-F antenna	2.3

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	⊠1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.
IEEE 802.11g	⊠1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.
IEEE 802.11N (HT20)	⊠1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.

5.7. THE WORSE CASE CONFIGURATIONS

For the product, there two transmission antennas, and pre-testing both of them, only the worse data for the antenna is recorded in the report.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps 802.11b mode: 6 Mbps 802.11n HT20 mode: MCS0



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5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests			
Relative Humidity	55 ~ 65%			
Atmospheric Pressure:	1	01kPa		
Temperature	TN	23 ~ 28°C		
	VL	N/A		
Voltage:	VN	DC 21.6V		
	VH	N/A		

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature

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5.9. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Description
1	Laptop	ThinkPad	E590	N/A
2	Fixed Frequency Board	N/A	N/A	Supply by Customer
3	USB Cable	N/A	N/A	Supply by UL Lab(100cm length)

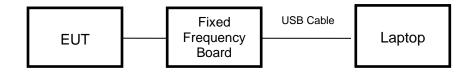
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Battery	Rechargeable Li-ion Battery	A12NA-02	OUTPUT:21.6V 260W
2	Adapter	NA	YLS0241A- T260070	INPUT:100-240V~50/60Hz 0.8A Max OUTPUT:26V 700 mA

TEST SETUP

The EUT can work in an engineer mode with a software through a table PC.

SETUP DIAGRAM FOR TESTS





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5.10. MEASURING INSTRUMENT AND SOFTWARE USED

	5.10. MEASURING INSTRUMENT AND SOFTWARE USED									
		Cor	nducte	d Emis	sions	(Instrur	ment)			
Used	Equipment	Manufacturer	Mode	el No.	Seria	al No.	Upper Last Cal.	Last Cal.	Next Cal.	
\checkmark	EMI Test Receiver	R&S	ES	ESR3		6700	2018-12-13	2019-12-07	2020-12-06	
V	Two-Line V-Network	R&S	EN∖	/216	126	5701	2018-12-13	2019-12-07	2020-12-06	
$\overline{\checkmark}$	Artificial Mains Networks	R&S	EN'	Y81	126	6711	2018-12-13	2019-12-07	2020-12-06	
	Software									
Used	Des	cription		Ma	anufac	turer	Name	Version		
\checkmark	Test Software for 0	Conducted distur	bance		R&S		EMC32	Ver. 9.25		
		Ra	diated	Emiss	ions (Instrum	ent)			
Used	Equipment	Manufacturer	Mode	el No.	Seria	al No.	Upper Last Cal.	Last Cal.	Next Cal.	
$\overline{\checkmark}$	Spectrum Analyzer	Keysight		10B	MY57	110128	2019-05-29	2020-05-28	2021-05-27	
$\overline{\mathbf{V}}$	EMI test receiver	R&S	ESI	R26	126	7603	2018-12-13	2019-12-07	2020-12-06	
	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZE	3 1513	513	-265	2018-06-17	2019-06-16	2022-06-15	
	Receiver Antenna (30MHz-1GHz)	SunAR RF Motion	JE	31	126	6704	N/A	2019-01-28	2022-01-27	
	Receiver Antenna (1GHz-18GHz)	R&S	HF	907	126	6705	2018-01-27	2019-01-26	2022-01-26	
	Receiver Antenna (18GHz-26.5GHz)	Schwarzbeck	BBHA	\9170	126	6706	2018-02-07	2019-02-06	2022-02-05	
	Receiver Antenna (26.5GHz-40GHz)	TOYO	HAP 2	6-40W	0000	00012	2018-07-25	2019-07-23	2020-07-22	
Ø	Pre-amplification (To 18GHz)	Compliance Direction System Inc.	PAP-10	G18-50	14140	-13467	2019-04-09	2020-02-20	2021-02-19	
	Pre-amplification (To 26.5GHz)	R&S		-26D	134	1668	2019-03-18	2020-02-20	2021-02-19	
Ø	Band Reject Filter	Wainwright	2350- 2483.5-	CJV8- 2400- 2533.5- SS		1	2019-02-06	2020-01-23	2021-01-22	
V	Highpass Filter	Wainwright	2700-	X10- 3000- -40SS		2	2019-05-29	2020-01-23	2021-01-22	
				Soft	ware					
Used	Desci	ription	N	/lanufac	turer		Name	Version		
\checkmark	Test Software for R	adiated disturbar	nce	Tonsce	end		JS32	V1.0		
			Ot	her ins	trume	ents				
Used	Equipment	Manufacturer	Mode	el No.	Seria	al No.	Upper Last Cal.	Last Cal.	Next Cal.	
	Spectrum Analyzer	Keysight	N90	10B	MY57	110128	2019-05-29	2020-05-28	2021-05-27	
	Power Meter	Keysight	U202	21XA	MY57	110002	2019-06-12	2020-06-11	2021-06-10	



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6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth and 99% Bandwidth	KDB 558074 D01 15.247 Meas Guidance v05r02	8.2
2	Peak Output Power	KDB 558074 D01 15.247 Meas Guidance v05r02	8.3.1.3/8.3.2.3
3	Power Spectral Density	KDB 558074 D01 15.247 Meas Guidance v05r02	8.4
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2

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7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

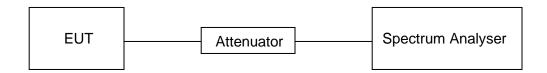
LIMITS

None; for reporting purposes only

PROCEDURE

FCC KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 21.6V

RESULTS

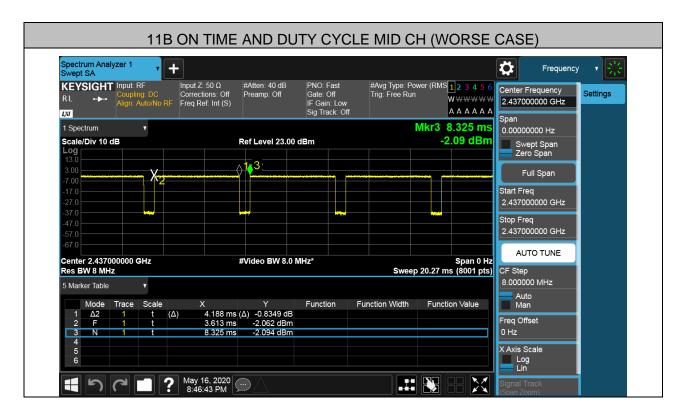
Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)	Final VBW (kHz)
11B	4.188	4.712	0.889	88.9	0.51	0.24	1
11G	0.6906	0.7951	0.869	86.9	0.61	1.45	2
11N HT20	0.655	0.76	0.862	86.2	0.64	1.53	2

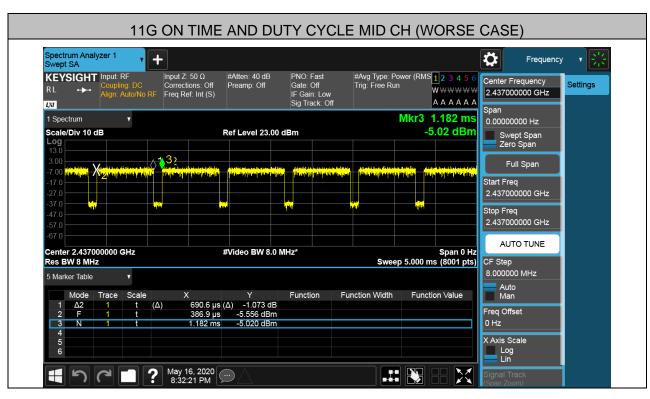
Note: 1) Duty Cycle Correction Factor= $10\log(1/x)$.

2) Where: x is Duty Cycle (Linear)

3) Where: T is On Time (transmit duration)

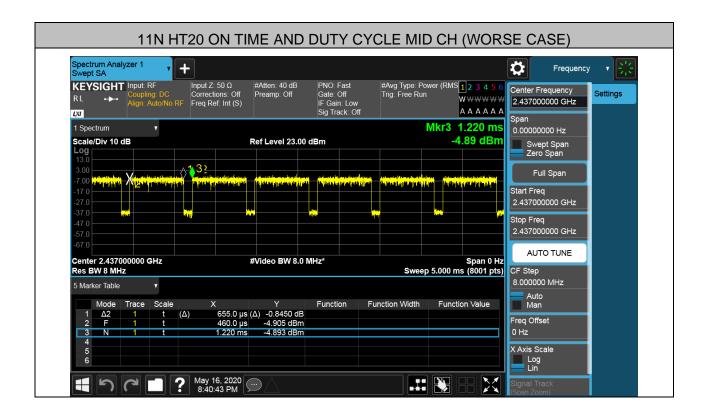








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7.2. 6 dB BANDWIDTH AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C, ISED RSS-247 Issue 2						
Section	Test Item	Limit	Frequency Range (MHz)			
FCC 15.247(a)(2)	6dB Bandwidth	>= 500KHz	2400-2483.5			
ISED RSS-Gen Clause 6.7	99% Occupied Bandwidth	For reporting purposes only.	2400-2483.5			

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
IRRW	For 6dB Bandwidth :100K For 99% Occupied Bandwidth :1% to 5% of the occupied bandwidth
IV/RW/	For 6dB Bandwidth: ≥3 × RBW For 99% Occupied Bandwidth: ≥ RBW
Trace	Max hold
Sweep	Auto couple

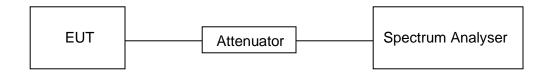
Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 21.6V

TEST SETUP



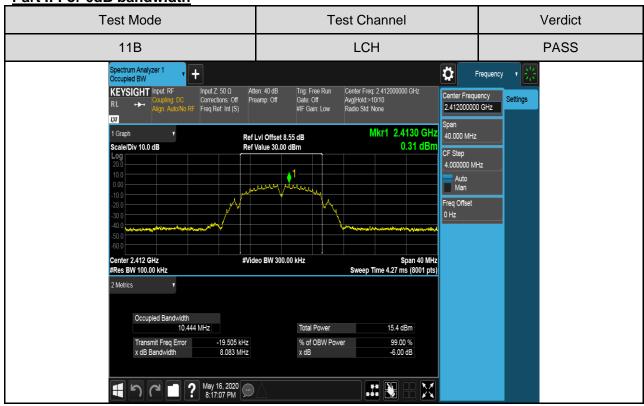
RESULTS TABLE

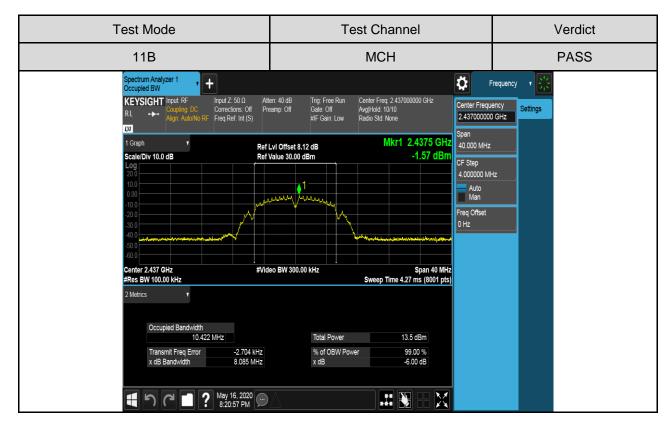
Test Mode	Test Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Verdict
11B	LCH	8.083	10.541	PASS
11B	MCH	8.085	10.547	PASS
11B	HCH	8.062	10.617	PASS
11G	LCH	16.05	16.413	PASS
11G	MCH	15.82	16.388	PASS
11G	HCH	16.05	16.400	PASS
11N HT20	LCH	16.56	17.381	PASS
11N HT20	MCH	16.28	17.379	PASS
11N HT20	HCH	16.54	17.365	PASS



Test Graphs

Part I: For 6dB bandwidth





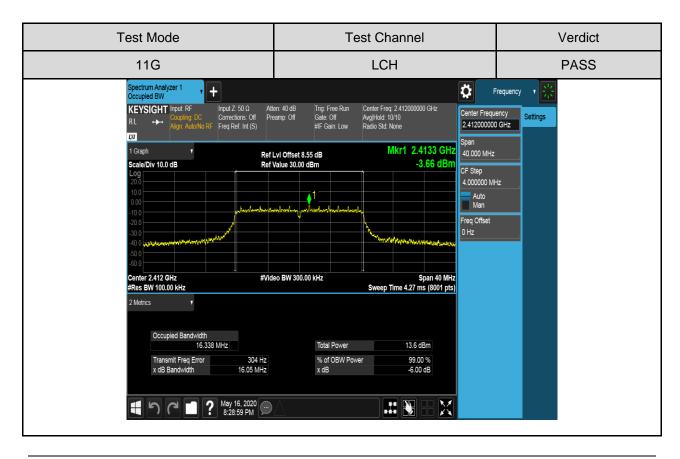


Test Mode Test Channel Verdict **HCH PASS** 11B Spectrum Analyzer 1 Occupied BW Ö Frequency KEYSIGHT Input RF Input Z: 50 Ω Atten: 40 dB Center Freq: 2.462000000 GHz Coupling: DC Corrections: Off Align: Auto/No RF Freq Ref: Int (S) Avg|Hold:>10/10 Radio Std: None Settings 2.462000000 GHz L)XI Mkr1 2.4610 GHz Ref LvI Offset 8.51 dB Ref Value 30.00 dBm 40.000 MHz Scale/Div 10.0 dB -2.15 dBr CF Step 4.000000 MHz Auto Man Freq Offset Center 2.462 GHz #Video BW 300.00 kHz Span 40 MHz #Res BW 100.00 kHz Sweep Time 4.27 ms (8001 pts) Occupied Bandwidth 10.449 MHz Total Power 12.9 dBm -7.632 kHz 8.062 MHz Transmit Freq Error x dB Bandwidth % of OBW Power 99.00 % -6.00 dB

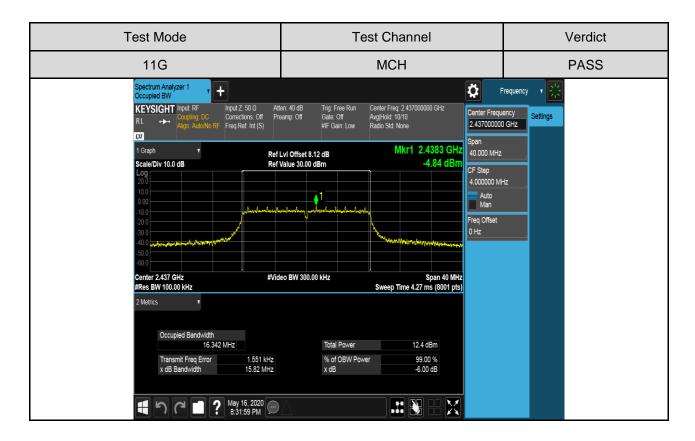
X

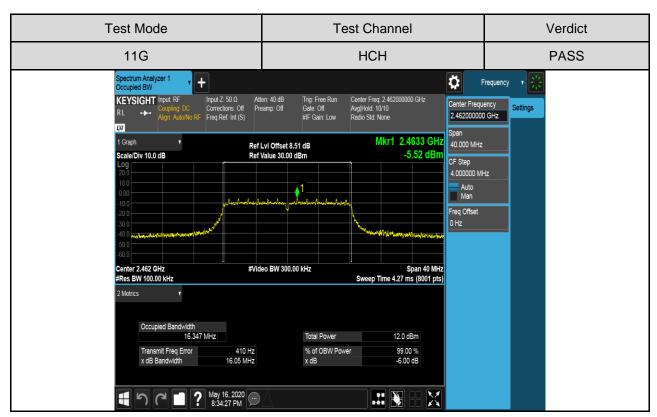
? May 16, 2020 8:24:11 PM

4761

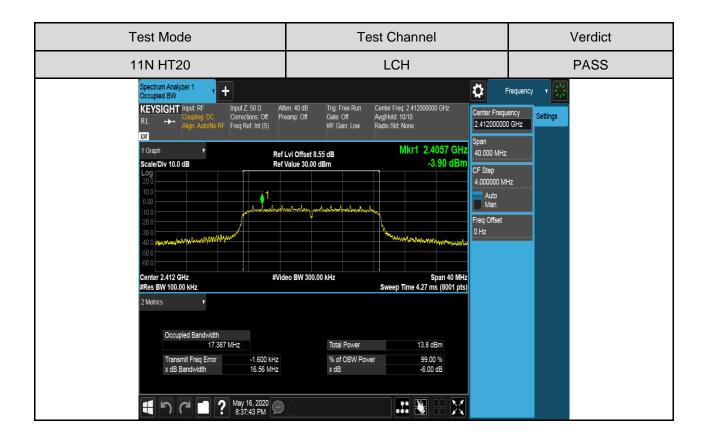


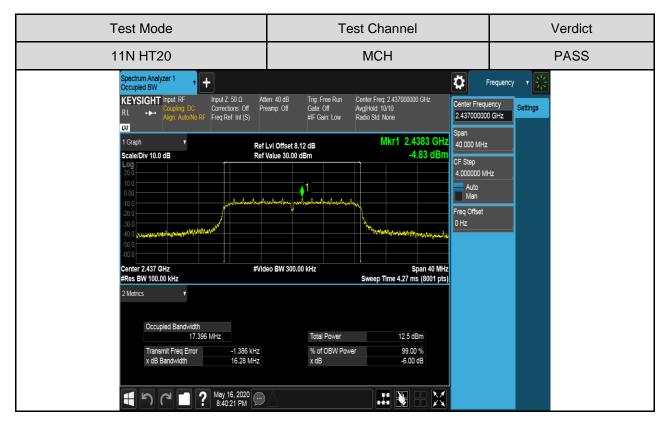






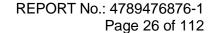






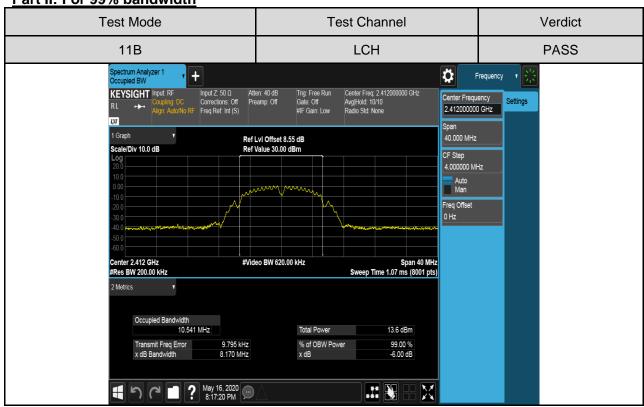


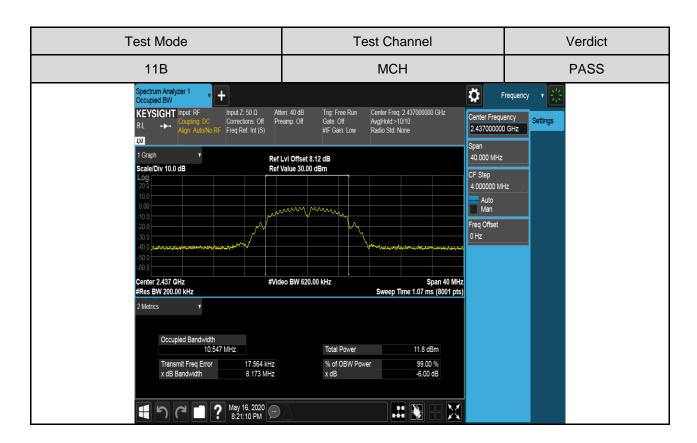
Test Mode Test Channel Verdict **HCH PASS** 11N HT20 Spectrum Analyzer 1 Ö Frequency Occupied BW Input Z: 50 Ω Atten: 40 dB Center Freq: 2.462000000 GHz KEYSIGHT Input: RF Trig: Free Run Center Frequency Gate: Off Avg|Hold: 10/10 Settings Corrections: Off Preamp: Off Coupling: DC Corrections: Off
Align: Auto/No RF Freq Ref: Int (S) 2.462000000 GHz #IF Gain: Low Radio Std: None L)XI Mkr1 2.4633 GHz 1 Graph 40.000 MHz Ref LvI Offset 8.51 dB -5.50 dBm Scale/Div 10.0 dB Ref Value 30.00 dBm CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz Center 2.462 GHz #Video BW 300.00 kHz Span 40 MHz #Res BW 100.00 kHz Sweep Time 4.27 ms (8001 pts) 2 Metrics Occupied Bandwidth Total Power 11.8 dBm 17.379 MHz % of OBW Power 99.00 % Transmit Freq Error 9.871 kHz 16.54 MHz -6.00 dB x dB Bandwidth $x\,dB$ May 16, 2020 8:42:56 PM



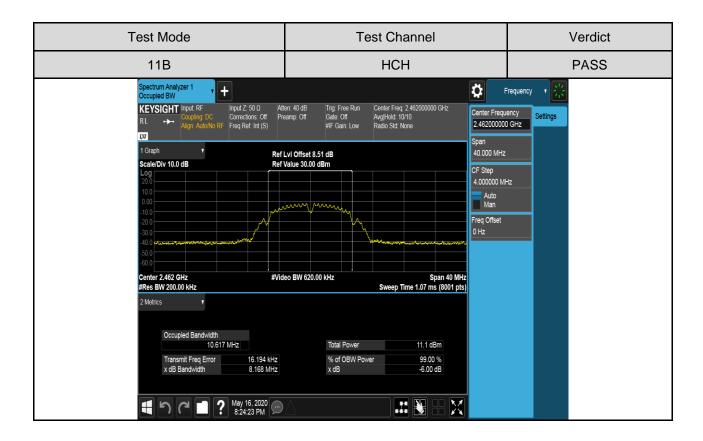


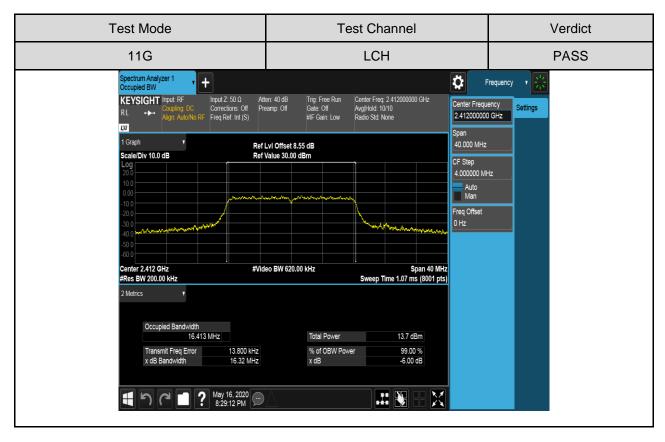
Part II: For 99% bandwidth



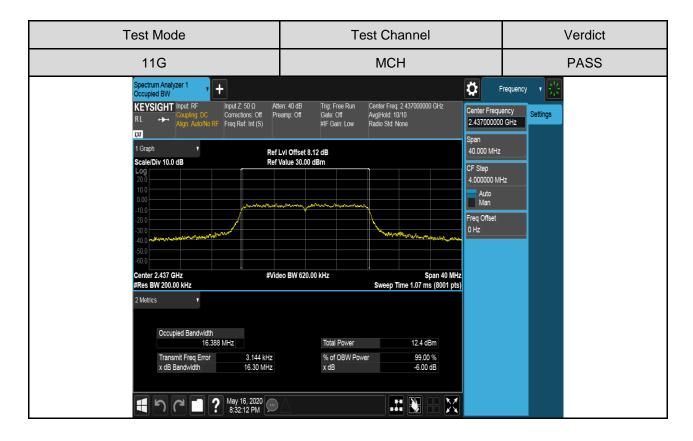


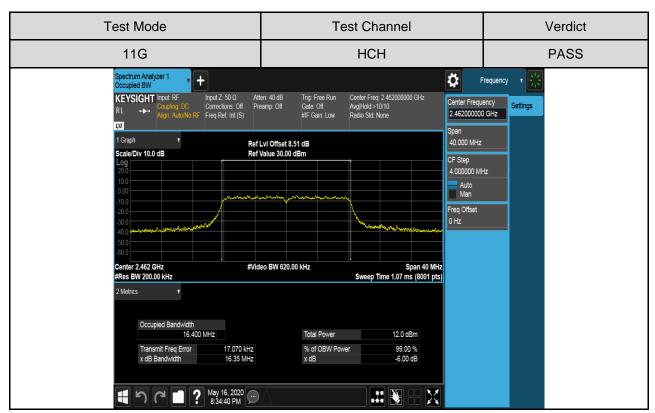




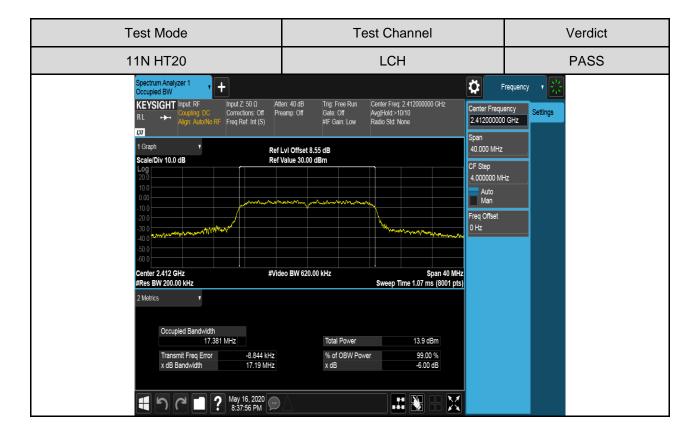


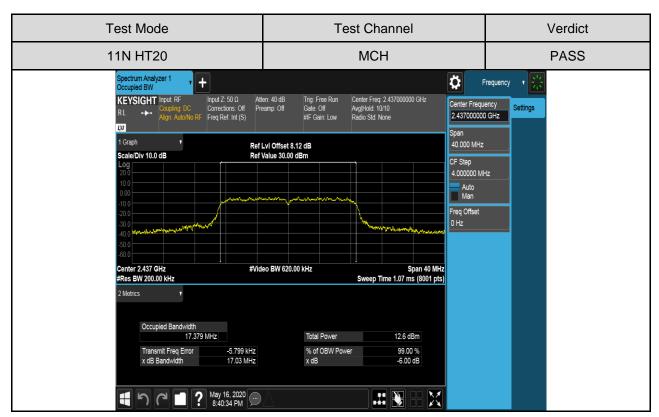














Test Mode Test Channel Verdict **HCH PASS** 11N HT20 Spectrum Analyzer 1 Occupied BW Ö + Frequency Atten: 40 dB Preamp: Off Trig: Free Run Gate: Off #IF Gain: Low Center Freq: 2.462000000 GHz Avg|Hold: 10/10 Radio Std: None KEYSIGHT Input RF Input Z: 50 Ω Center Frequency 2.462000000 GHz Settings Coupling: DC Corrections: Off Align: Auto/No RF Freq Ref: Int (S) ĻXI Ref Lvi Offset 8.51 dB Ref Value 30.00 dBm 40.000 MHz Scale/Div 10.0 dB CF Step 4.000000 MHz Auto Man Freq Offset Center 2.462 GHz #Res BW 200.00 kHz Span 40 MHz Sweep Time 1.07 ms (8001 pts) #Video BW 620.00 kHz Occupied Bandwidth 17.365 MHz Total Power 11.9 dBm 9.058 kHz 17.17 MHz Transmit Freq Error x dB Bandwidth % of OBW Power 99.00 % -6.00 dB x dB

X

May 16, 2020 Side 18:43:09 PM

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7.3. CONDUCTED OUTPUT POWER

LIMITS

FCC Part15 (15.247) Subpart C, ISED RSS-247 ISSUE 2				
Section	Test Item	Limit	Frequency Range (MHz)	
FCC 15.247(b)(3) ISED RSS-247 5.4 (d) RSS-Gen Clause 6.12	Output Power	1 watt or 30dBm	2400-2483.5	

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.

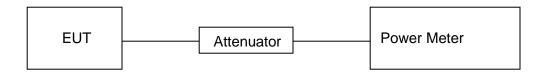
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure the power of each channel.

Peak Detector use for Peak result.

AVG Detector use for AVG result.

TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 21.6V



RESULTS

Maximum Conducted Output Power(dBm)

Test Mode	Test Channel	Maximum Conducted Output Power (PK)	Maximum Conducted Output Power (AV)	LIMIT
		dBm	dBm	dBm
	LCH	10.78	7.94	30
11B	MCH	9.37	6.55	30
	HCH	8.44	5.78	30
11G	LCH	14.93	7.17	30
	MCH	13.70	5.97	30
	HCH	13.23	5.45	30
11n HT20	LCH	14.87	7.09	30
	MCH	13.60	5.88	30
	HCH	12.96	5.16	30



7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C, ISED RSS-247 ISSUE 2				
Section	Test Item	Limit	Frequency Range (MHz)	
FCC §15.247 (e) ISED RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5	

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test	
Detector	Peak	
RBW	3 kHz ≤ RBW ≤100 kHz	
VBW	≥3 × RBW	
Span	1.5 x DTS bandwidth	
Trace	Max hold	
Sweep time	Auto couple.	

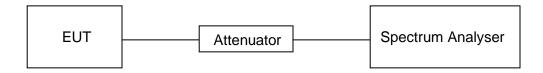
Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 21.6V

TEST SETUP



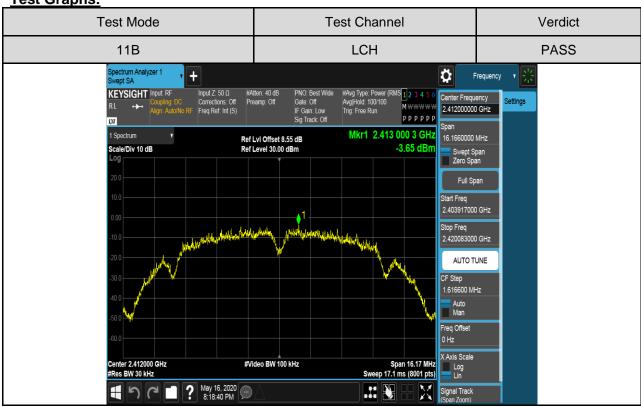


RESULTS

Test Mode	Test Channel	Maximum Peak power spectral density (dBm/30KHz)	Result
	LCH	-3.65	Pass
11B	MCH	-5.29	Pass
	HCH	-5.98	Pass
	LCH	-8.98	Pass
11G	MCH	-10.22	Pass
	HCH	-10.68	Pass
	LCH	-8.30	Pass
11N HT20	MCH	-9.58	Pass
	HCH	-10.32	Pass

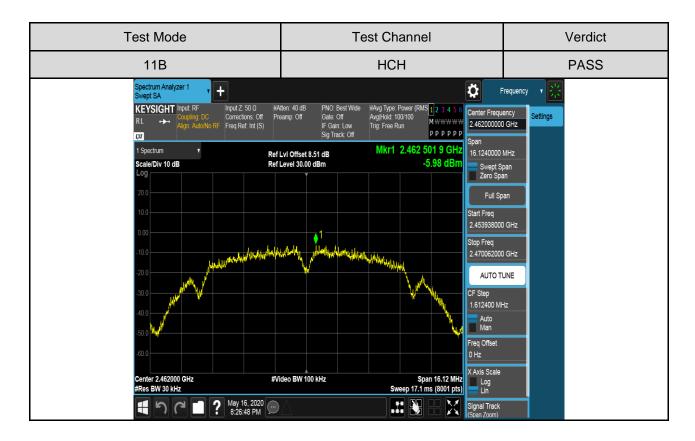


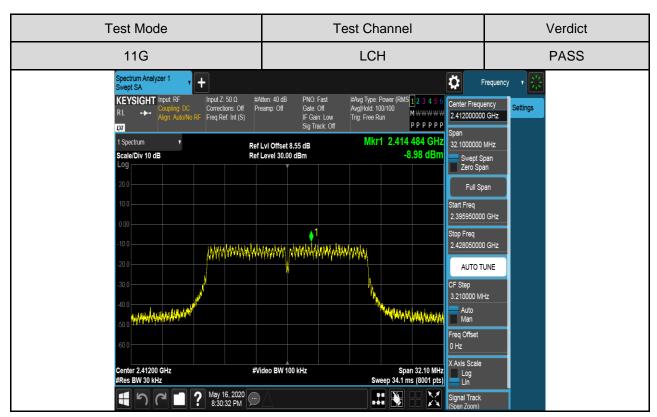
Test Graphs:



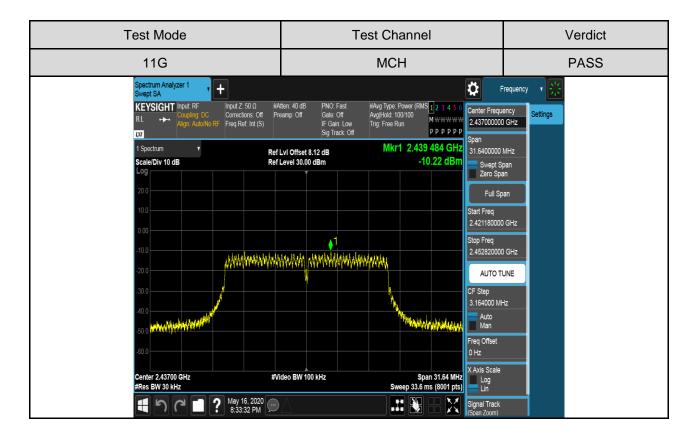


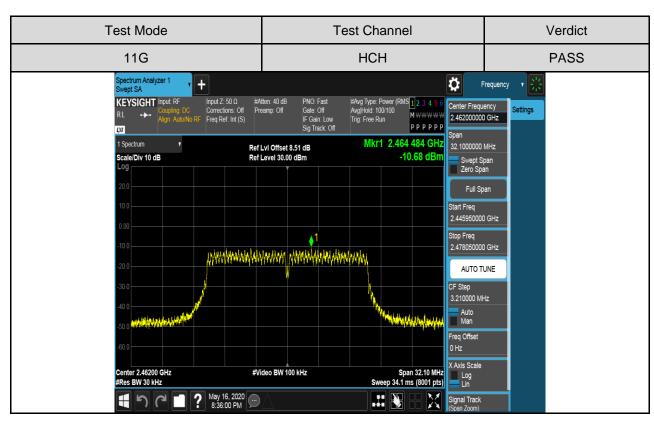




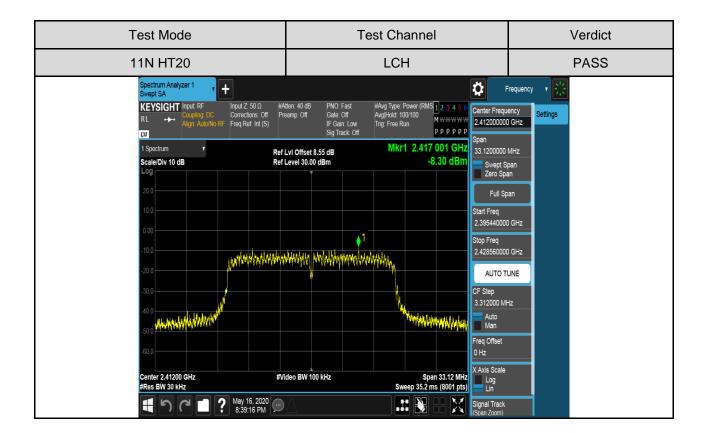


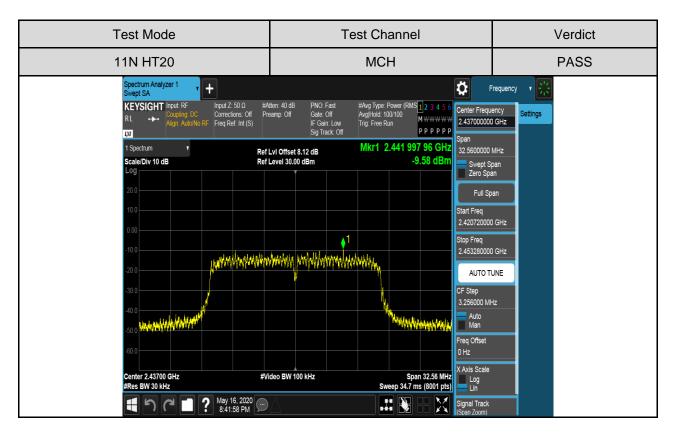






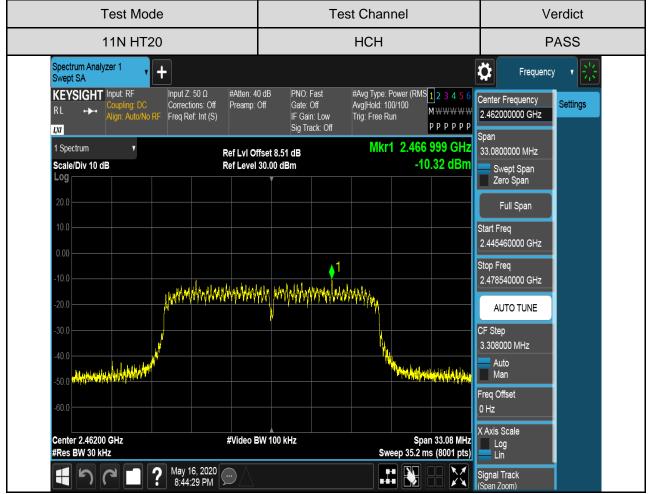








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7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) Subpart C, ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	
FCC §15.247 (d) RSS-247 Clause 5.5 RSS-GEN Clause 6.13	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power	

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following

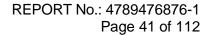
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

settings:

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

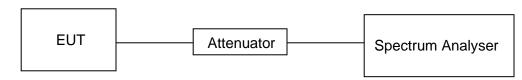
Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

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





TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 21.6V



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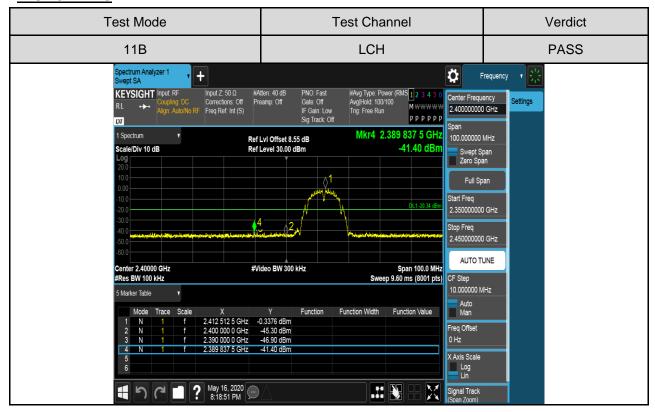
Part I: Conducted Bandedge

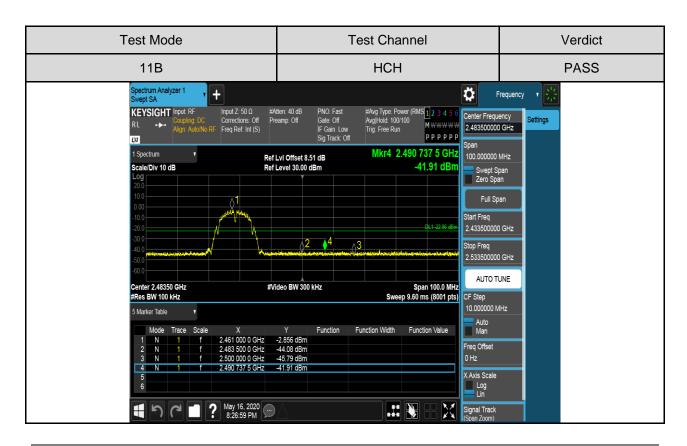
RESULTS TABLE

Test Mode	Test Antenna	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	Antonno 1	LCH	-0.3376	-41.40	-20.34	PASS
IID	Antenna 1	HCH	-2.856	-41.91	-22.86	PASS
110	Antonno 1	LCH	-4.123	-40.75	-24.12	PASS
11G	Antenna 1	HCH	-5.875	-40.84	-25.88	PASS
44N UT20	0 Antenna 1	LCH	-3.686	-40.87	-23.69	PASS
11N HT20		HCH	-5.556	-41.57	-25.56	PASS



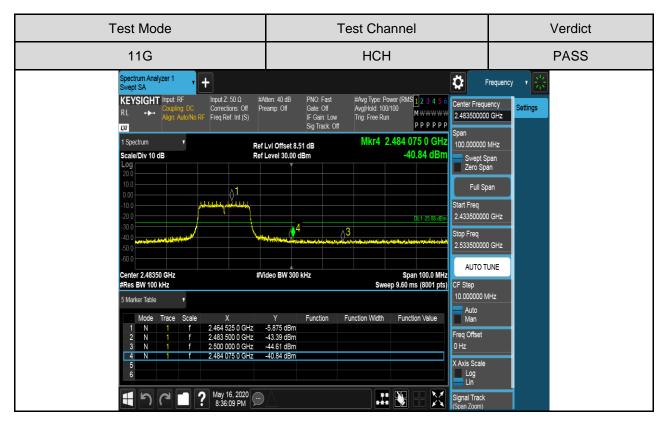
TEST GRAPHS



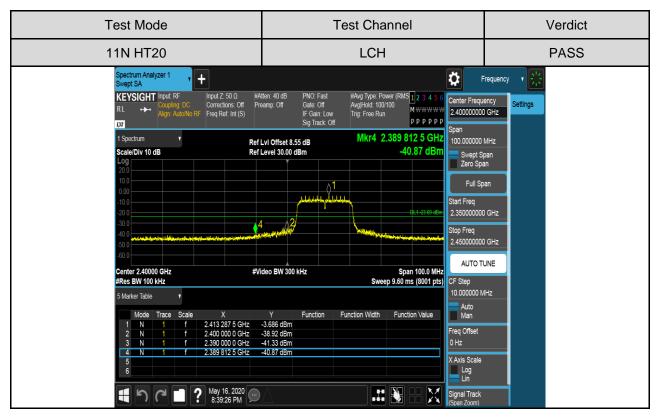


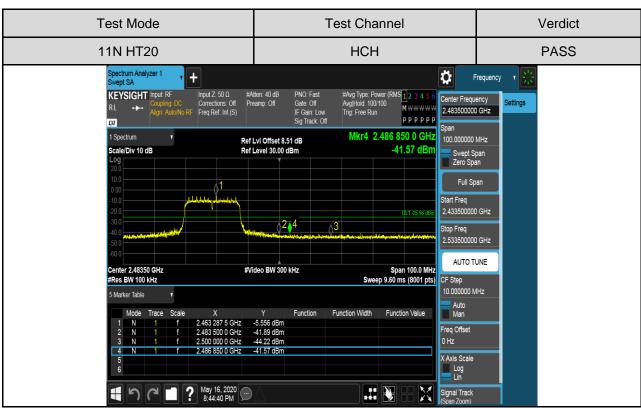
















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Part II: Conducted Emission

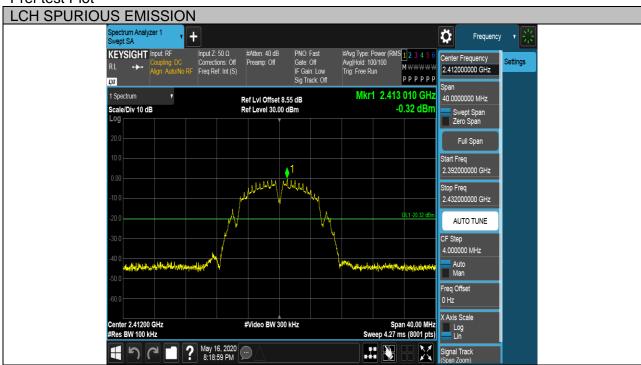
Test Result Table

Test Mode	Channel	Pref(dBm)	Puw(dBm)	Verdict
	LCH	-0.32	<limit< td=""><td>PASS</td></limit<>	PASS
11B	MCH	-1.54	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-2.28	<limit< td=""><td>PASS</td></limit<>	PASS
	LCH	-4.10	<limit< td=""><td>PASS</td></limit<>	PASS
11G	MCH	-4.90	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-5.40	<limit< td=""><td>PASS</td></limit<>	PASS
	LCH	-3.67	<limit< td=""><td>PASS</td></limit<>	PASS
11N HT20	MCH	-5.36	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-5.64	<limit< td=""><td>PASS</td></limit<>	PASS

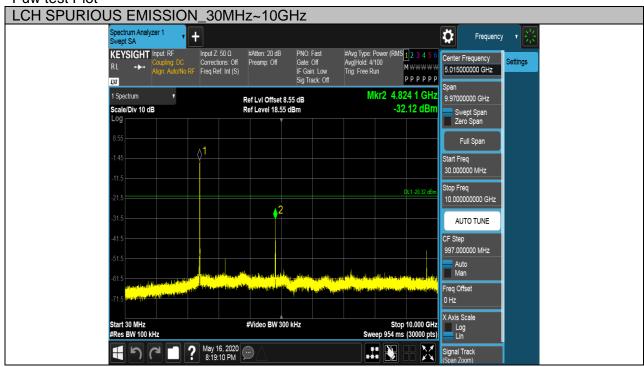


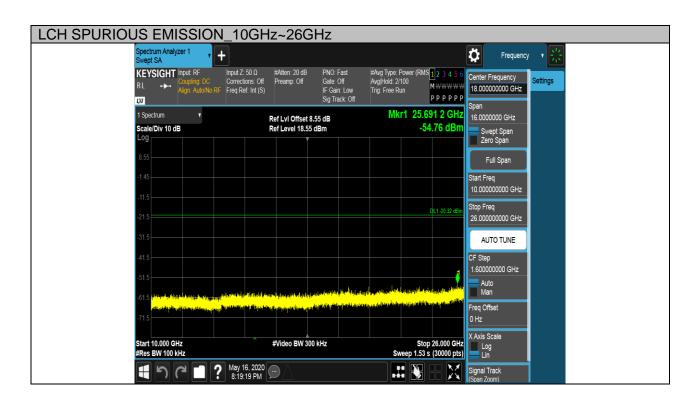
Test Plots

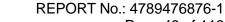
Test Mode	Channel	Verdict
11B	LCH	PASS











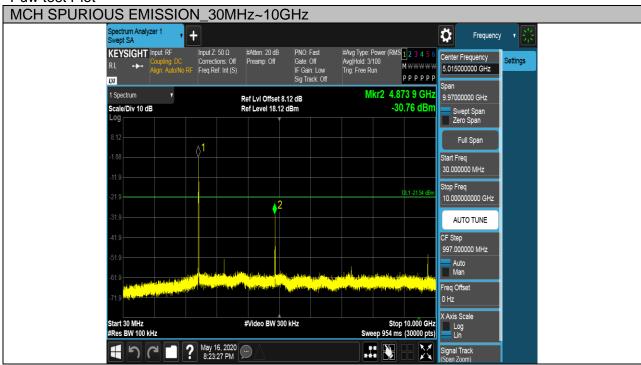


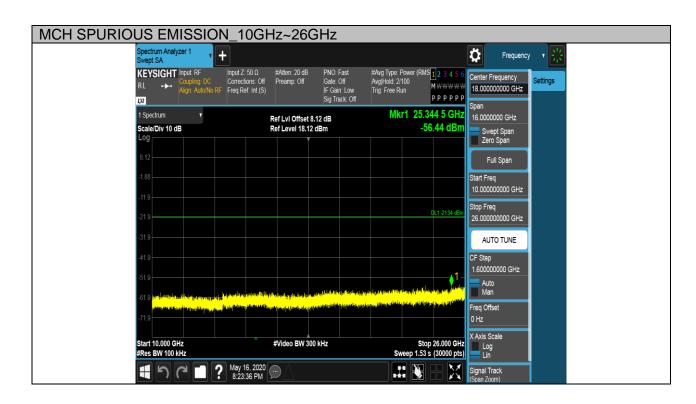
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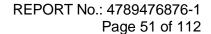
Test Mode	Channel	Verdict
11B	MCH	PASS





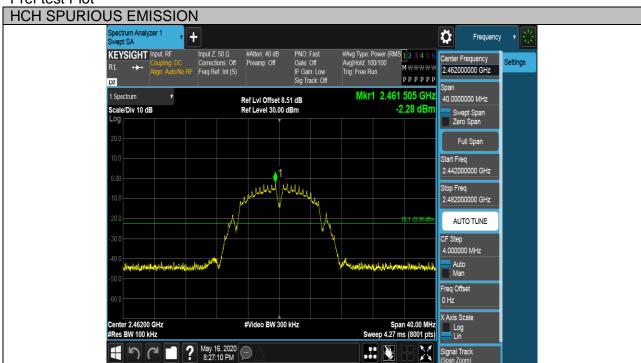




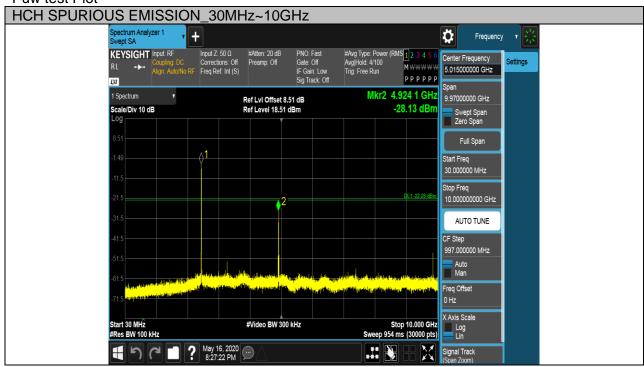




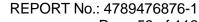
Test Mode Channel Verdict
11B HCH PASS







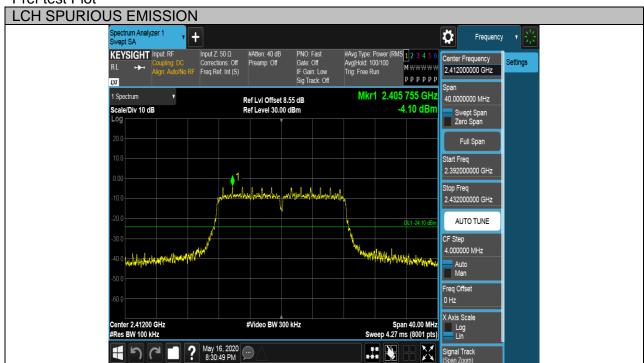




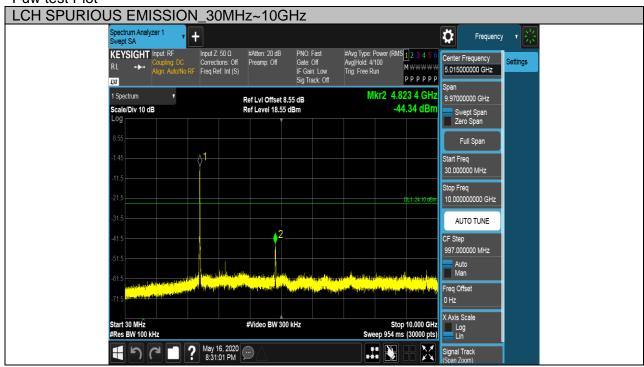


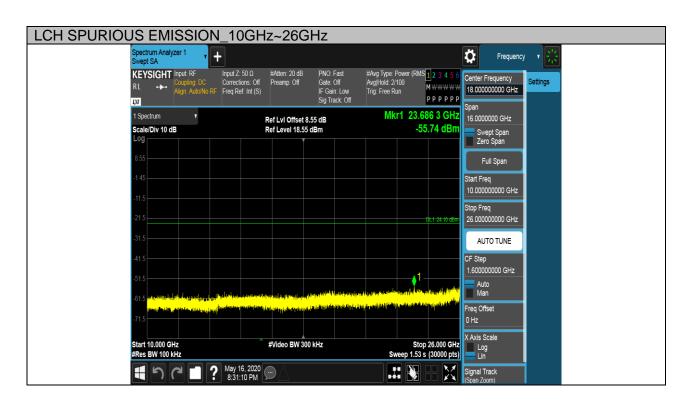
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Test Mode	Channel	Verdict
11G	LCH	PASS

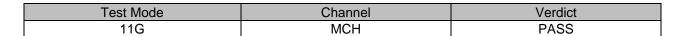


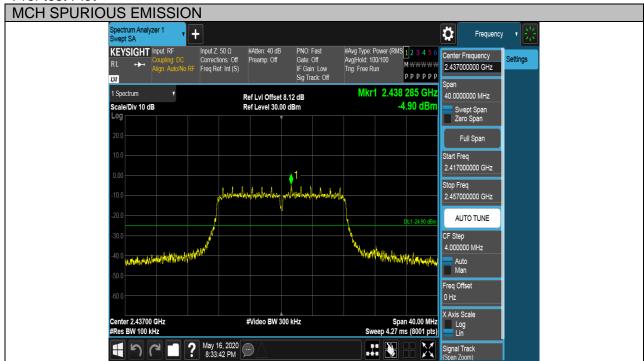




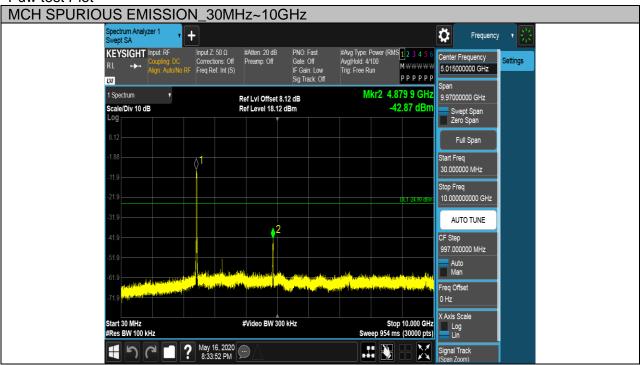


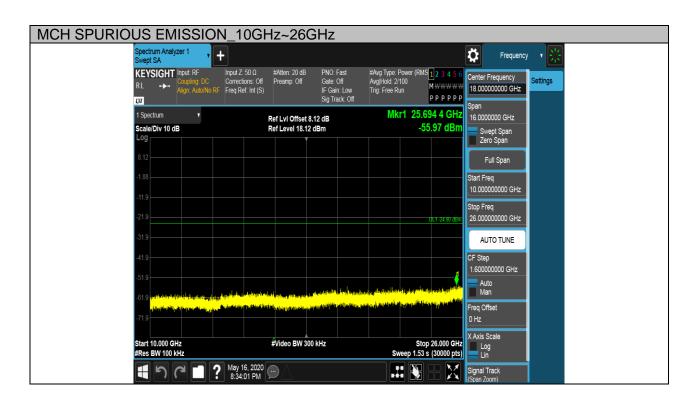


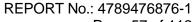














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Test Mode	Channel	Verdict
11G	HCH	PASS





