

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

	OF
Applicant:	FUJITSU CONNECTED TECHNOLOGIES Ltd. 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki
	211-8588, Japan
Product Name:	Smart Phone
Brand Name:	FUJITSU
Model No.:	F-01L
Model Difference:	N/A
FCC ID:	2AQYEFMP167
Report Number:	ER/2018/70057
FCC Rule Part:	§15.407, Cat: NII
Issue Date:	Sep. 20th, 2018
Date of Test:	Aug. 28th, 2018 ~ Sep.14th, 2018
Date of EUT Re- ceived:	Aug. 28th, 2018

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

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

Tested By:

Marcus Iseng

Marcus Tsena / Engineer

Approved By:

Blue Yang / Supervisor





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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/70057	Rev.00	Initial creation of docu- ment	All	Sep. 20th, 2018	Stefanie Yu / Clerk

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GENERAL INFORMATION 1

1.1 **Product Description**

General:

Product Name:	Smart Phone	
Brand Name:	FUJITSU	
Model No.:	F-01L	
Model Difference:	N/A	
Product SW/HW version:	V01R028Ae / V2.1.0	
		n Rechargeable Li-ion Battery or 5Vdc /9Vdc / AC/DC Adapter
Power Supply:	Power Supply: Battery:	Model No.: CA54310-0075-A1, Supplier: FUJITSU CONNECTED TECHNOLOGIES LIMITED
	Adapter:	Model No.: AC Adapter 06 Supplier: NTT docomo

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WLAN 5GHz:

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (Avg.) (dBm)	Modulation Technology	
	5150~5250	4	11.32		
а	5250~5350	4	11.34	OFDM	
	5470~5725	12	11.29		
n_HT	5150~5250	4	HT: 11.34 (Worst Case)		
ac_VHT	5250~5350	4	HT: 11.25 (Worst Case)	OFDM	
20M	5470~5725	11	HT: 11.36 (Worst Case)		
n HT	5150~5250	2	HT: 11.46 (Worst Case)		
ac_VHT	5250~5350	2	HT: 11.37 (Worst Case)	OFDM	
40M	5470~5725	5	HT: 11.58 Worst Case)		
	5150~5250		11.07		
ac_VHT 80M 5250~5350 1 5470~5725 2		1	11.01	OFDM	
		11.18			
Antenna Designation		5GHz Gain:	le Antenna -2dBi (5150MHz-5250MHz) -2dBi (5250MHz-5350MHz) -2dBi (5470MHz-5725MHz)		
		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:		802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 – 150Mbps 802.11 ac_20MHz: 6.5 –86.7Mbps 802.11 ac_40MHz: 13.5 –200Mbps 802.11 ac_80MHz: 29.3 – 433.3Mbps			

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

Note:

All test items have been performed and record as per the above standards. 1.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Number and Designation are: 509634 / TW0001

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION 2

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

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

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2.4 Measurement Results Explanation Example For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example.

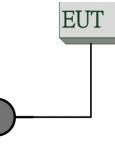
2.5 Configuration of Tested System

Fig. 2-1 Conducted (Antenna Port) Emission Configuration



Fig 2-2 Radiated Emission

Fig 2-3 Conduction (AC Power Line) Radiated Emission



ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	Notebook	Lenovo	L430	R9-WR6X4	Shielded	Unshielded
2.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

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3 SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.403(i) §15.407(e)	26 dB & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES 4

Operated in U-NII Bands 4.1

Operated band in 5150 MHz ~5250 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode		
Channel	Frequency	
36	5180	
40	5200	
44	5220	
48	5240	

802.11 n HT40 Mode, 802.11ac VHT40 Mode			
channel	Frequency		
38	5190		
46	5230		

802.11ac VHT80 Mode		
channel	Frequency	
42	5210	

Operated band in 5250 MHz ~5350 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode		
channel	Frequency	
52	5260	
56	5280	
60	5300	
64	5320	

802.11 n HT40 Mode, 802.11ac VHT40 Mode				
channel Frequency				
54 5270				
62	5310			

802.11ac V	VHT80 Mode	
Channel	Frequency	
58	5290	

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Operated band in 5500 MHz ~5700 MHz:

802.11a / n HT20 Mode,			
802.11ac VHT20 Mode			
Channel	Frequency		
100	5500		
104	5520		
108	5540		
112	5560		
116	5580		
120	5600		
124	5620		
128	5640		
132	5660		
136	5680		
140	5700		

802.11 n HT40 Mode,				
802.11ac VHT40 Mode				
channel	Frequency			
102	5510			
110	5550			
118	5590			
126	5630			
134	5670			

802.11ac VHT80 Mode			
channel	Frequency		
106	5530		
122	5610		

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.

2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.

3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST. RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
	BAND (MHz)	CHANNEL	CHANNEL		(Mbps)	PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Ch0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Ch0
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Ch0
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Ch0
	RADIA	TED EMISSIO	N TEST (ABO	VE 1 GHz)		
	FREQUENCY BAND (MHz)	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
		CHANNEL	CHANNEL		(Mbps)	PORT
802.11a	5180~5240	36 to 48	26 14 19	OFDM	6	Ch0
802.11n_HT20	5160~5240	30 10 40	36,44,48	OFDM	MCS0	Ch0
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Ch0
802.11ac_VHT80	5210	42	42	OFDM	VHT0	Ch0
802.11a	5260~5320	52 to 64	52 60 64	OFDM	6	Ch0
802.11n_HT20	5200~5520	52 10 64	52,60,64	OFDM	MCS0	Ch0
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	Ch0
802.11ac_VHT80	5290	58	58	OFDM	VHT0	Ch0

RADIATED EMISSION TEST:

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

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ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
		CHANNEL	CHANNEL		(Mbps)	PORT
802.11a				OFDM	6	Ch0
802.11n_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	Ch0
802.11ac_VHT20					MOOD	0110
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Ch0
802.11ac_VHT40		00 10 40	00,40			
802.11ac_VHT80	5210	42	42	OFDM	VHT0	Ch0
802.11a	5260~5320			OFDM	6	Ch0
802.11n_HT20		52 to 64	52,60,64	OFDM	MCS0	Ch0
802.11ac_VHT20					NIC30	CIIU
802.11n_HT40	5270~5310	270~5310 54 to 62 54,62	54,62	OFDM	MCS0	Ch0
802.11ac_VHT40	3270-3310	54 10 02	54,02			0110
802.11ac_VHT80	5290	58	58	OFDM	VHT0	Ch0
802.11a				OFDM	6	Ch0
802.11n_HT20	5500~5700	100 to 140	100,116,140	OFDM	MCS0	Ch0
802.11ac_VHT20					NC30	Chi
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	Ch0
802.11ac_VHT40	3310~3070	102 10 134 102,110,134			10030	CIIU
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	VHT0	Ch0

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MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty	
AC Power Line Conducted Emission	+/- 2.586 dB	
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz	
The Maximum Output Power Measurement	+/- 0.96 dB	
Peak Power Spectral Density Measurement	+/- 1.67 dB	
Frequency Stability	+/- 123.36 Hz	
Temperature	+/- 0.65 °C	
Humidity	+/- 4.6 %	
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%	

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz-30MHz: +/-2.87dB	
	30MHz - 180MHz: +/- 3.37dB	
	180MHz -417MHz: +/- 3.19dB	
	0.417GHz-1GHz: +/- 3.19dB	
	1GHz - 18GHz: +/- 4.04dB	
	18GHz - 40GHz: +/- 4.04dB	

Measurement uncertainty (Polarization : Horizontal)	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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

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CONDUCTED EMISSION TEST 6

6.1 **Standard Applicable**

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

Frequency range	Limits dB(uV)			
MHz	Quasi-peak Average			
0.15 to 0.50	66 to 56	56 to 46		
0.50 to 5	56 46			
5 to 30	60 50			
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.				

6.2 **Measurement Equipment Used**

Conducted Emission Test Site						
EQUIPMENT MFR MODEL SERIAL LAST CAL DUE.						
TYPE NUMBER NUMBER CAL.						
EMI Test Receiver	R&S	ESCI7	100335	Feb. 2nd, 2018	Feb. 1st, 2019	
LISN	SCHWARZBECK	NSLK 8127	8127-649	May 18th, 2018	May 17th, 2019	

6.3 **EUT Setup**

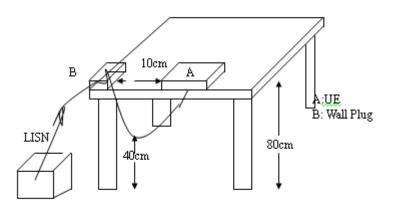
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz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

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Test SET-UP 6.4



6.5 **Measurement Procedure**

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

6.6 **Measurement Result**

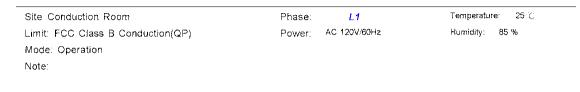
Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit

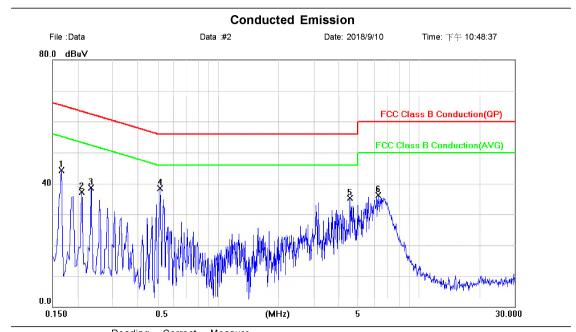
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AC POWER LINE CONDUCTED EMISSION TEST DATA



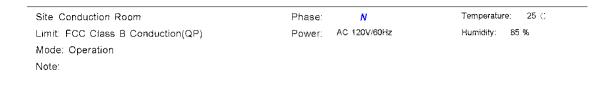


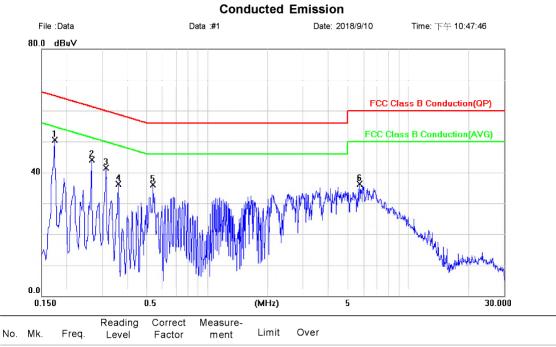
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1660	44.17	0.04	44.21	65.16	-20.95	peak	
2	0.2100	37.19	0.04	37.23	63.21	-25.98	peak	
3	0.2340	38.62	0.04	38.66	62.31	-23.65	peak	
4 *	0.5140	38.38	0.04	38.42	56.00	-17.58	peak	
5	4.5300	35.08	0.18	35.26	56.00	-20.74	peak	
6	6.2540	36.04	0.23	36.27	60.00	-23.73	peak	

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	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1740	50.47	0.04	50.51	64.77	-14.26	peak	
2	0,2660	44.16	0.04	44.20	61.24	-17.04	peak	
3	0.3140	41.54	0.04	41.58	59.86	-18.28	peak	
4	0.3620	36.31	0.04	36.35	58.68	-22.33	peak	
5	0,5380	36.13	0.04	36.17	56.00	-19.83	peak	
6	5,7220	36.09	0.22	36.31	60.00	-23,69	peak	

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DUTY CYCLE TEST SIGNAL 7

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

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

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

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

Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	99.85	0.01	0.18	1.00
802.11n_20	99.84	0.01	0.20	1.00
802.11n_40	99.18	0.04	1.02	2.00
802.11ac_80	98.98	0.04	1.02	2.00

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DUTY CYCLE TEST SIGNAL Measurement Result 802.11a

Agilen	t Spe	ctru																		
ux∥ Cen	ter	Fre	RF eq :		50 Ω 000					Tria	SENSE:I		A٧		ALIGNAUTO E: Log-Pw		TRA	M Aug 28, 2 CE <u>1 2 3 4</u> PE Manada	156	Frequency
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-50.0 -60.0 -70.0																			_	Stop Fred 5.180000000 GH:
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8 9 10 11										100									~	
ISG 🤇	Po	oints	cha	inged	l; all t	races	clear	ed							STAT	TUS				

802.11n HT20

^a R Center Fred	RF 50 Ω	AC		SENSE:INT					
		0000 GHz			Avg Typ	ALIGNAUTO e: Log-Pwr	TRACE	Aug 28, 2018	Frequency
R	Ref Offset 11.	PNO: Fas IFGain:Lo		Free Run en: 30 dB		Δ	Mkr3 5.		Auto Tun
10 dB/div	Ref 20.00 d	Bm		trola kata matata	3∆4	all setting and a set of the	line of the states	0.04 dB	Center Fre
10.00	يدرعا فريقا ليشرم لامان	innet genetigenistigen ander genetigen.	and a set of the set o	rin and and an and a second state	alle or all resident office. Its	ير أو معام الراب ال		lander of the particular of th	5.180000000 GH
20.0									Start Fr 5.180000000 G
50.0 50.0 70.0									Stop Fr 5.180000000 Gi
enter 5.180 es BW 8 M		#\	/BW 8.0 N			weep 10	S 00 ms (10.		CF Sto 8.000000 M Auto M
1 Δ2 1 2 F 1 3 Δ4 1 4 F 1 5 6	t (Δ) t t (Δ) t (Δ)	× 5.080 ms 1.105 ms 5.088 ms 1.105 ms	10.0 (Δ) -	0.58 dB 95 dBm 9.04 dB 95 dBm			FUNCTIO		Freq Offs 0
7 8 9 10								×	

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802.11n HT 40

		halyzer -										
a R Center F	RF req		ם אכ 00000				SE:INT	Avg Typ	e: Log-Pwi	TRA	M Aug 29, 2018 CE 1 2 3 4 5 6	Frequency
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-50.0 -60.0 -70.0												Stop Fre 5.190000000 GH
Center 5. Res BW 3	8 MH	Iz) GHz		#VBW	8.0 MHz			Sweep 1	0.00 ms (1	pan 0 Hz 0001 pts)	CF Ste 8.000000 MH Auto Ma
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802.11 ac VHT 80

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) dB/div		Offset f 20.0																					<u> </u>	/k	r3	25 2.	8.0 85) h	IS B	Auto Tur
	∆Â		1		in fin																							ų den	Y	Center Fre 5.210000000 GH
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7 8 9 0																												>		

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26DB & 6DB EMISSION BANDWIDTH MEASUREMENT 8

Standard Applicable 8.1

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

Measurement Procedure 8.2

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.

b. Mark the peak frequency and –26dB (upper and lower) frequency.

- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
 - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=Peak.
 - Sweep=auto
 - b. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:

Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.

- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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8.3 **Measurement Equipment Used**

	SGS Conducted Room											
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due							
Spectrum Analyzer	R&S	FSV-30	101398	Oct. 19th, 2017	Oct. 18th, 2018							
DC Power Supply	Anritsu	E3640A	MY52410006	Nov. 28th, 2017	Nov. 27th, 2018							
Temperature Chamber	TERCHY	MHG-120LF	911009	May 18th, 2018	May 17th, 2019							
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019							
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019							
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019							
Notebook	Lenovo	L430	R9-WGNK5	N/A	N/A							

Test Set-up 8.4



8.5 **Measurement Result**

26dB Bandwidth

802.11a Ch0

802.11n HT20 Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	21.74	13.373	5180	22.27	13.478
5220	19.66	12.936	5220	21.78	13.380
5240	21.56	13.337	5240	22.21	13.465
5260	21.92	13.408	5260	21.89	13.403
5300	21.09	13.240	5300	21.54	13.332
5320	21.54	13.332	5320	21.89	13.402
5500	22.05	13.433	5500	22.34	13.490
5580	21.75	13.374	5580	22.13	13.450
5700	21.52	13.329	5700	22.08	13.439

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802.11n HT40 Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	42.68	16.302
5230	43.07	16.341
5270	43.17	16.352
5310	43.18	16.353
5510	38.91	15.901
5550	43.47	16.382
5670	42.42	16.276

802.11ac VHT80 Ch0

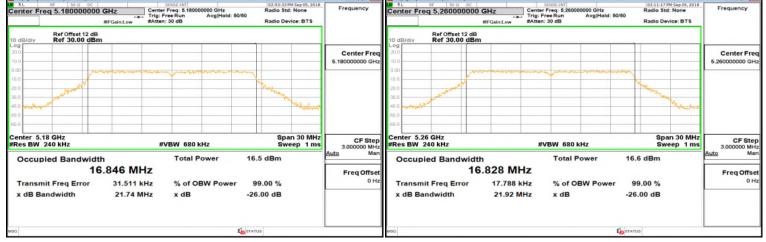
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	83.88	19.236
5290	83.06	19.194
5530	84.02	19.244
5610	83.29	19.206

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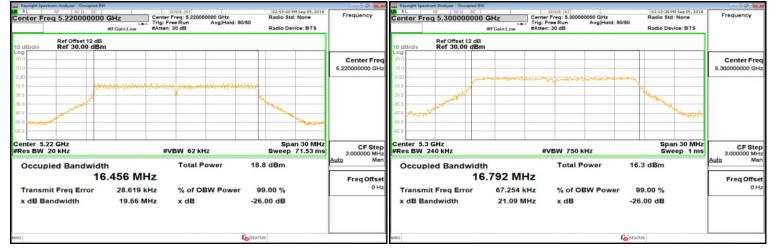
802.11a, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180MHz)

802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



26dB Band Width Test Data CH-Mid (5220MHz)

26dB Band Width Test Data CH-Mid (5300MHz)



26dB Band Width Test Data CH-High (5240MHz)

26dB Band Width Test Data CH-High (5320MHz)



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t (886-2) 2299-3279

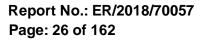
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f (886-2) 2298-0488

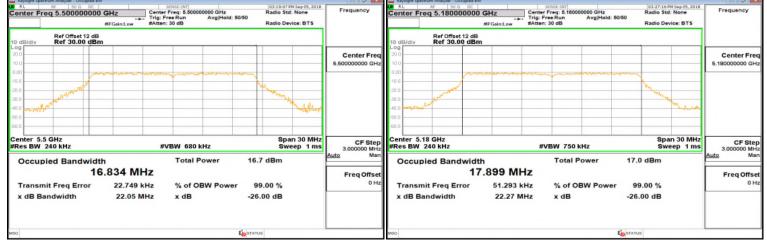
www.tw.sas.com





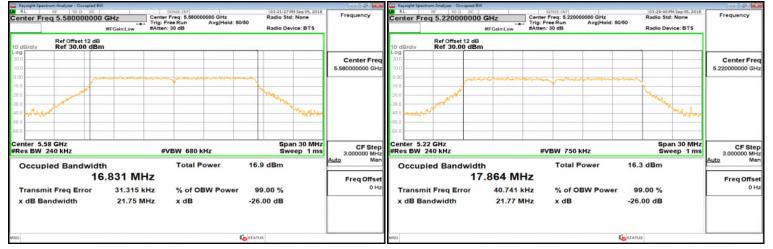
802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)

802.11n HT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



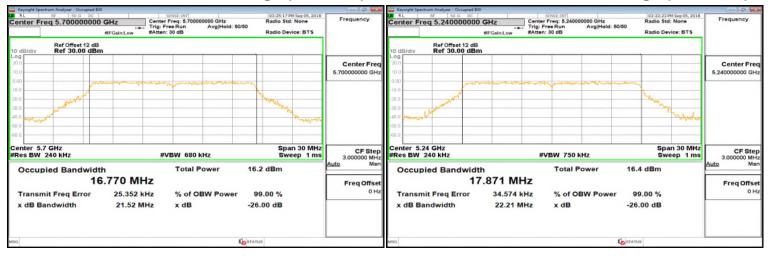
26dB Band Width Test Data CH-Mid (5580MHz)

26dB Band Width Test Data CH-Mid (5220 MHz)



26dB Band Width Test Data CH-High (5700MHz)

26dB Band Width Test Data CH-High (5240 MHz)



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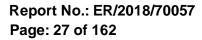
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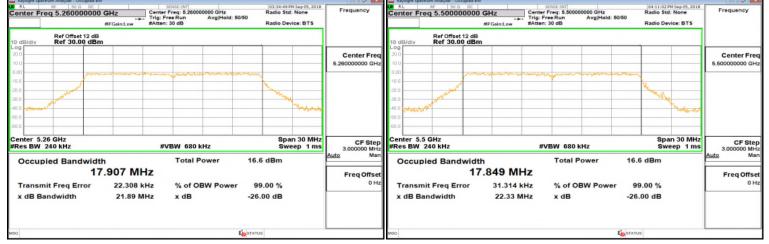
Member of SGS Group





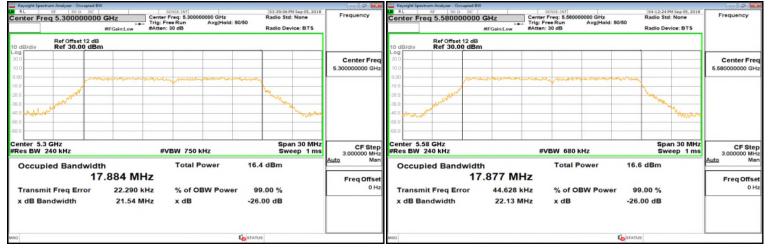
802.11n HT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)

802.11n HT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



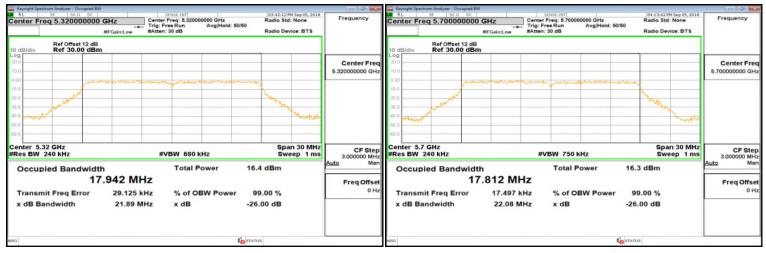
26dB Band Width Test Data CH-Mid (5300 MHz)

26dB Band Width Test Data CH-Mid (5580 MHz)



26dB Band Width Test Data CH-High (5320 MHz)

26dB Band Width Test Data CH-High (5700 MHz)



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口,与你做个 12,02,00 月 12,25 月

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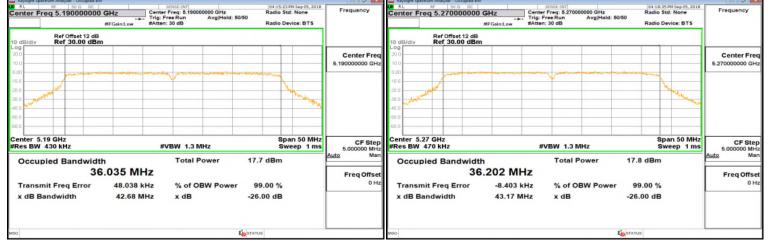
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Member of SGS Group



802.11n HT40, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5190 MHz)

802.11n HT40, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5270 MHz)



26dB Band Width Test Data CH-High (5230 MHz) 26dB Band Width Test Data CH-High (5310MHz)

Keysight Spectrum		er - Occu 50 D				SENSE-INT			4:16:54 PM Sep 05, 2018	0-0-0-00	Keysight Spec	trum Analyzer - Oct IU: 50 D			SENSE:INT		5 PM Sep 05, 2018	
Center Freq	5.23 Ref 0		1000 G #	Hz FGain:Low	Center Trig: F	Freq: 5.2300 ree Run : 30 dB	00000 GHz Avg Hold: 50	Ra	dio Std: None dio Device: BTS	Frequency		Ref Offset Ref 30.00	12 dB	Center Trig: F	Freq: 5.310000000 GHz ree Run Avg Hold: 5	Radio S	itd: None	Frequency
200 10.0			1							Center Freq 5.230000000 GHz	20.0				. Jung to the group have a state			Center Freq 5.310000000 GHz
-10.0 -20.0 -30.0 -40.0	Γ					Ý					-10.0 -20.0 -30.0 -40.0	and the second second					Wardow Stor	
Center 5.23 0 #Res BW 470	0 kHa				#	VBW 1.3 M			Span 50 MHz Sweep 1 ms		#Res BW	470 kHz		#	VBW 1.3 MHz	S	oan 50 MHz weep 1 ms	CF Step 5.000000 MHz Auto Man
Occupie	d Ba	andv		150 N	IHz	Total F	Power	17.8 dE	3m	Freq Offset		ied Band	width 36.092	MHz	Total Power	17.2 dBm		Freq Offset
Transmit x dB Band				36.372 43.07	kHz	% of O x dB	BW Power	99.00 -26.00		0 Hz	Transm	iit Freq Err andwidth	or 13.19	2 kHz 8 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0 Hz
MSG											MSG					STATUS		

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DISTANT DUCK WISTING	(000 L) LL00 0L10	1 (000 2) 2200 0 100	



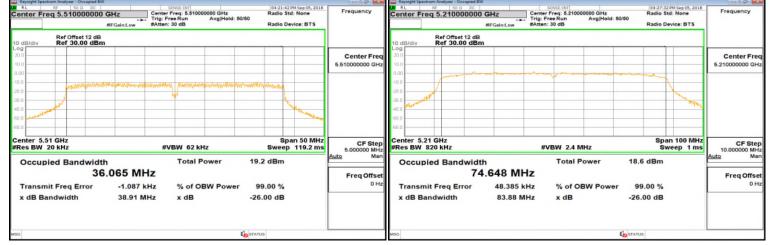
Th STATUS

802.11n HT40, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5510 MHz)

SGS

802.11ac VHT80, 5150~5250 MHz 26dB Band Width Test Data CH-Mid (5210 MHz)

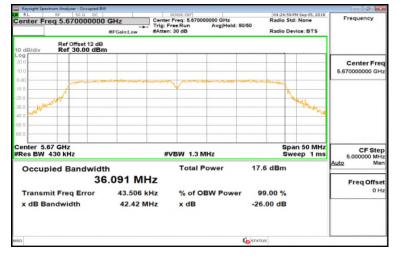
802.11ac VHT80, 5250~5350 MHz



26dB Band Width Test Data CH-Mid (5550 MHz)

26dB Band Width Test Data CH-Mid (5290 MHz) 04:23:32 PM Sep 05, 2018 Radio Std: None Center Freq: 5.550000000 GHz Trig: Free Run Avg|Hold: 50/50 enter Freq 5.550000000 GHz Radio Device: BTS 04:28:57 PM Sep 05 Radio Std: None Center Freq: 5.290000000 GHz Trig: Free Run Avg|Hold: 50/50 w #Atten: 30 dB Center Freq 5.290000000 GHz Ref Offset 12 dB Ref 30.00 dB Radio Device: BTS Center Fre Ref Offset 12 dB Ref 30.00 dBr Center Fre 5.290000000 GH enter 5.55 GHz Res BW 470 kHz Span 50 MHz Sweep 1 ms CF Step 5.000000 MHz #VBW 1.3 MHz 18.1 dBm **Occupied Bandwidth** Total Power r 5.29 GH Span 100 MH Sweep 1 ms CF Step 10.000000 MHz 36.199 MHz Res BW 820 kHz #VBW 2.4 MHz Freq Offse 0 H 17.7 dBm Total Power Transmit Freg Error 33,548 kHz % of OBW Power 99.00 % **Occupied Bandwidth** 74.661 MHz x dB Bandwidth 43.47 MHz x dB -26.00 dB Freq Offse OH: 44.667 kHz % of OBW Power 99.00 % Transmit Freq Error 83.06 MHz x dB -26.00 dB dB Bandwidth 10 STA

26dB Band Width Test Data CH-High (5670 MHz)



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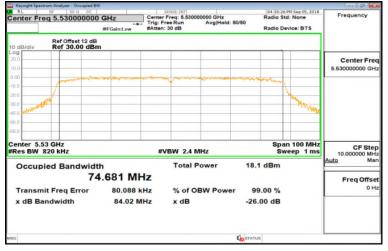
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802.11ac VHT80, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5530 MHz)



802.11ac VHT80, 5470~5725 MHz 26dB Band Width Test Data CH-High (5610 MHz)



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MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 9

9.1 **Standard Applicable**

OPERZTION Band		EUT CATEGORY	LIMIT							
		Access Point (Master device)	1 Watt(30dBm)							
U-NII-1		Fixed point-to-point Access Ponit	1 Watt(30dBm)							
		Mobile and portable client device	250mW(23.98dBm)							
U-NII-2A			250mW(23.98dBm) or 11dBm+10 log B							
U-NII-2C			250mW(23.98dBm) or 11dBm+10 log B							
U-NII-3			1 Watt(30dBm)							
	If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum transmit power shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6									

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

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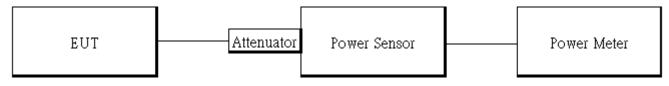
9.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules . 2.
- Remove the antenna from the EUT and then connect a low loss RF cable from the an-3. tenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- Repeat above procedures until all frequency (low, middle, and high channel) measured 6. were complete.

	SGS Conducted Room											
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due							
Power Meter	Anritsu	ML2496A	1804001	Feb. 01st, 2018	Jan. 31th, 2019							
Power Sensor	Anritsu	MA2411B	1726104	Feb. 01st, 2018	Jan. 31th, 2019							
Power Sensor	Anritsu	MA2411B	1726107	Feb. 01st, 2018	Jan. 31th, 2019							
DC Power Supply	Anritsu	E3640A	MY52410006	Nov. 28tg, 2017	Nov. 27th, 2018							
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019							
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019							
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019							
Notebook	Lenovo	L430	R9-WGNK5	N/A	N/A							

Measurement Equipment Used 9.3

9.4 Test Set-up



9.5 Measurement Result Conducted output power (FCC)

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802.11a_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	6	11.32	13.541		23.98		PASS
44	5220	6	11.28	13.417		23.98		PASS
48	5240	6	11.30	13.479		23.98		PASS
52	5260	6	11.34	13.604	23.98	or 11+10log(B) =	24.41	PASS
60	5300	6	11.12	12.932	23.98	or 11+10log(B) =	24.24	PASS
64	5320	6	11.06	12.754	23.98	or 11+10log(B) =	24.33	PASS
100	5500	6	11.28	13.417	23.98	or 11+10log(B) =	24.43	PASS
116	5580	6	11.14	12.991	23.98	or 11+10log(B) =	24.37	PASS
140	5700	6	11.29	13.448	23.98	or 11+10log(B) =	24.33	PASS

802.11n_HT20_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	MCS0	11.34	13.605		23.98		PASS
44	5220	MCS0	11.32	13.542		23.98		PASS
48	5240	MCS0	11.24	13.295		23.98		PASS
52	5260	MCS0	11.19	13.143	23.98	or 11+10log(B) =	24.40	PASS
60	5300	MCS0	11.19	13.143	23.98	or 11+10log(B) =	24.33	PASS
64	5320	MCS0	11.25	13.326	23.98	or 11+10log(B) =	24.40	PASS
100	5500	MCS0	11.36	13.668	23.98	or 11+10log(B) =	24.49	PASS
116	5580	MCS0	11.11	12.903	23.98	or 11+10log(B) =	24.45	PASS
140	5700	MCS0	11.32	13.542	23.98	or 11+10log(B) =	24.44	PASS

802.11n_HT40_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	11.46	13.989		23.98		PASS
46	5230	MCS0	11.43	13.893		23.98		PASS
54	5270	MCS0	11.36	13.670	23.98	or 11+10log(B) =	27.35	PASS
62	5310	MCS0	11.37	13.702	23.98	or 11+10log(B) =	27.35	PASS
102	5510	MCS0	11.58	14.381	23.98	or 11+10log(B) =	26.90	PASS
110	5550	MCS0	11.44	13.925	23.98	or 11+10log(B) =	27.38	PASS
134	5670	MCS0	11.38	13.734	23.98	or 11+10log(B) =	27.28	PASS

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802.11ac_VHT80_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
42	5210	MCS0	11.07	12.799		23.98		PASS
58	5290	MCS0	11.01	12.624	23.98	or 11+10log(B) =	30.19	PASS
106	5530	MCS0	11.18	13.128	23.98	or 11+10log(B) =	30.24	PASS
122	5610	MCS0	10.65	11.619	23.98	or 11+10log(B) =	30.21	PASS

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10 MAXIMUM POWER SPECTRAL DENSITY

10.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT				
U-NII-1		Access Point (Master device)	17dBm/ MHz				
		Fixed point-to-point Access Ponit					
		Mobile and portable client device	11dBm/ MHz				
U-NII-2A			11dBm/ MHz				
U-NII-2C	\checkmark		11dBm/ MHz				
U-NII-3			30dBm/ 500kHz				
If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.							

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

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10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- 4. For U-NII1, U-NII-2A, U-NII-2C Band:

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth) For U-NII-3 Band:

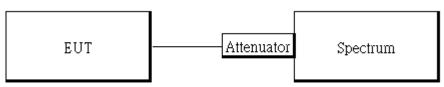
Set RBW=500 kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

- User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

SGS Conducted Room								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Spectrum Analyzer	R&S	FSV-30	101398	Feb. 01st, 2018	Jan. 31th, 2019			
DC Power Supply	Anritsu	E3640A	MY52410006	Feb. 01st, 2018	Jan. 31th, 2019			
Temperature Chamber	TERCHY	MHG-120LF	911009	Feb. 01st, 2018	Jan. 31th, 2019			
Attenuator	Mini-Circuit	BW-S10W2+	2	Nov. 28tg, 2017	Nov. 27th, 2018			
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019			
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019			
Notebook	Lenovo	L430	R9-WGNK5	Jan. 02nd, 2018	Jan. 01st, 2019			

10.3 Measurement Equipment Used

10.4 Test Set-up



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10.5 Measurement Result

	POWER DENSITY 802.11a MODE					
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-0.31	12.00	0.01	-0.30	11	-11.30
5220	-0.92	12.00	0.01	-0.91	11	-11.91
5240	-1.12	12.00	0.01	-1.11	11	-12.11
5260	-0.97	12.00	0.01	-0.96	11	-11.96
5300	-1.30	12.00	0.01	-1.29	11	-12.29
5320	-0.94	12.00	0.01	-0.93	11	-11.93
5500	-1.20	12.00	0.01	-1.19	11	-12.19
5580	-0.37	12.00	0.01	-0.36	11	-11.36
5700	-0.32	12.00	0.01	-0.31	11	-11.31
	POWER D	ENSITY 8	302.11n H	T20 MODE		
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-0.45	12.00	0.01	-0.44	11	-11.44
5220	-0.44	12.00	0.01	-0.43	11	-11.43
5240	-0.69	12.00	0.01	-0.68	11	-11.68
5260	-1.21	12.00	0.01	-1.20	11	-12.20
5300	-1.27	12.00	0.01	-1.26	11	-12.26
5320	-1.56	12.00	0.01	-1.55	11	-12.55
5500	-1.45	12.00	0.01	-1.44	11	-12.44
5580	-0.12	12.00	0.01	-0.11	11	-11.11
5700	-0.41	12.00	0.01	-0.40	11	-11.40

	POWER DENSITY 802.11n HT40 MODE					
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5190	-3.99	12.00	0.04	-3.95	11	-14.95
5230	-4.27	12.00	0.04	-4.23	11	-15.23
5270	-4.1	12.00	0.04	-4.06	11	-15.06
5310	-3.92	12.00	0.04	-3.88	11	-14.88
5510	-4.28	12.00	0.04	-4.24	11	-15.24
5550	-3.87	12.00	0.04	-3.83	11	-14.83
5670	-3.55	12.00	0.04	-3.51	11	-14.51

POWER DENSITY 802.11ac VHT80 MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5210	-7.26	12.00	0.04	-7.22	11	-18.22
5290	-7.51	12.00	0.04	-7.47	11	-18.47
5530	-7.08	12.00	0.04	-7.04	11	-18.04
5610	-6.54	12.00	0.04	-6.50	11	-17.50

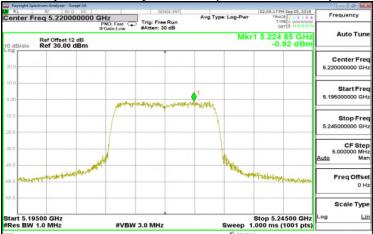
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802.11a 5150~5250 MHz Power Spectral Density Data Plot (CH Low 5180 MHz)

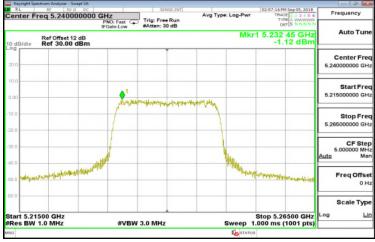
SGS



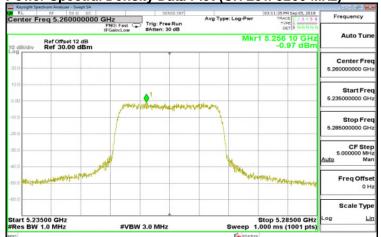
Power Spectral Density Data Plot (CH Mid 5220 MHz)



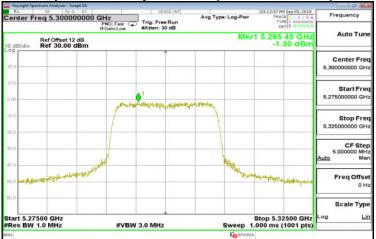
Power Spectral Density Data Plot (CH High 5240 MHz)



802.11a 5250~5350 MHz Power Spectral Density Data Plot (CH Low 5260 MHz)



Power Spectral Density Data Plot (CH Mid 5300 MHz)



Power Spectral Density Data Plot (CH High 5320 MHz)



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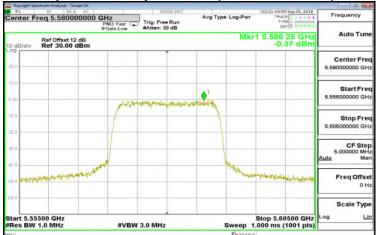
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802.11a 5470~5725 MHz Power Spectral Density Data Plot (CH Low 5500 MHz)

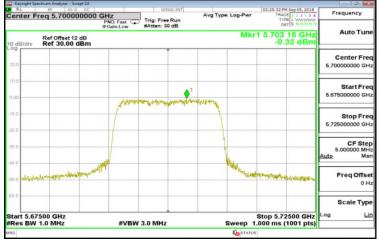
SGS



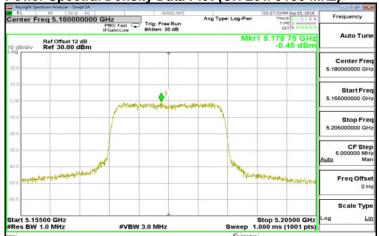
Power Spectral Density Data Plot (CH Mid 5580 MHz)



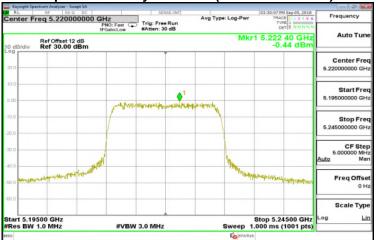
Power Spectral Density Data Plot (CH High 5700 MHz)



802.11n HT20, 5150~5250 MHz Power Spectral Density Data Plot (CH Low 5180 MHz)



Power Spectral Density Data Plot (CH Mid 5220 MHz)



Power Spectral Density Data Plot (CH High 5240 MHz)



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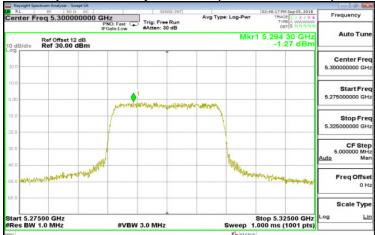
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802.11n HT20, 5250~5350 MHz Power Spectral Density Data Plot (CH Low 5260MHz)

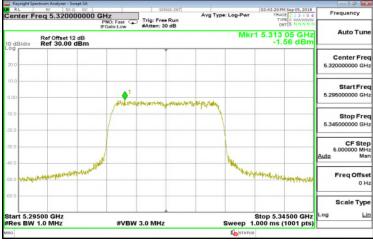
SGS



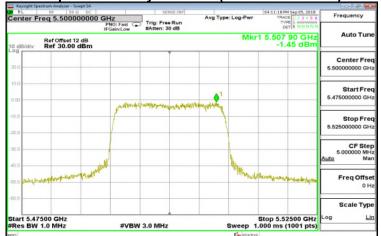
Power Spectral Density Data Plot (CH Mid 5300 MHz)



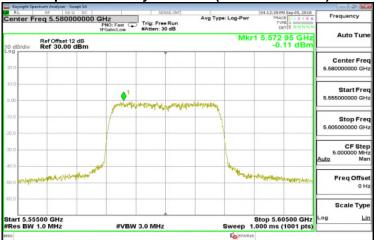
Power Spectral Density Data Plot (CH High 5320 MHz)



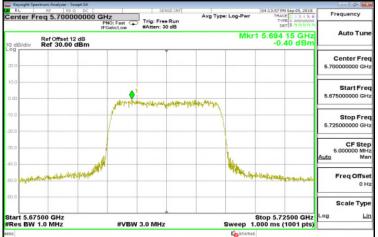
802.11n HT20, 5470~5725 MHz Power Spectral Density Data Plot (CH Low 5500 MHz)



Power Spectral Density Data Plot (CH Mid 5580MHz)



Power Spectral Density Data Plot (CH High 5700 MHz)



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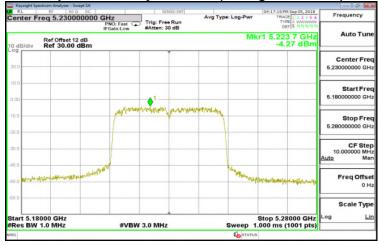
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02.11n HT40, 5150~5250 MHz Power Spectral Density Data Plot (CH Low 5190 MHz)

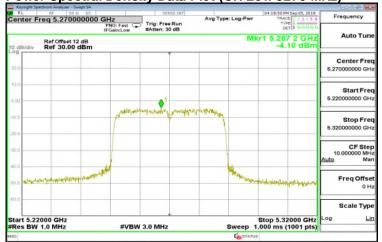
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Power Spectral Density Data Plot (CH High 5230 MHz)



802.11n HT40, 5250~5350 MHz Power Spectral Density Data Plot (CH Low 5270 MHz)



Power Spectral Density Data Plot (CH High 5310 MHz)



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802.11n HT40, 5470~5725 MHz Power Spectral Density Data Plot (CH Low 5510 MHz)

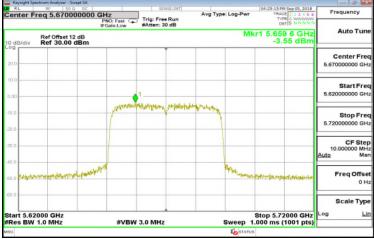
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Power Spectral Density Data Plot (CH Mid 5550 MHz)



Power Spectral Density Data Plot (CH High 5670 MHz)



802.11ac VHT80, 5150~5250 MHz Power Spectral Density Data Plot (CH Mid 5210 MHz)



802.11ac VHT80, 5250~5350 MHz Power Spectral Density Data Plot (CH Mid 5290 MHz)



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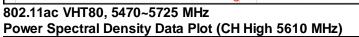
	-
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802.11ac VHT80, 5470~5725 MHz Power Spectral Density Data Plot (CH Low 5530 MHz)





Keysight Spectrum Analyzer - Swept SA				
RL 10 50 D DC Center Freq 5.610000000 GHz PN0: Fast	Trig: Free Run	Avg Type: Log-Pwr	04:32:28 PM Sep 05, 2018 TRACE 1 2 3 4 5 6 TYPE & WWWWW DET 5 TM M M M	Frequency
IFGain:Low Ref Offset 12 dB 10 dB/div Ref 30.00 dBm	#Atten: 30 dB	Mkr1	5.583 00 GHz -6.54 dBm	Auto Tune
20.0				Center Free 5.610000000 GH
10.0				Start Free 5.550000000 GH
10.0	washing and and	and harbyrough	١	Stop Free 5.670000000 GH
30.0				CF Step 12.000000 MH Auto Mar
50.0 mentelimentarivander			White a here when you are	Freq Offse 0 H
-60.0				Scale Type
Start 5.55000 GHz #Res BW 1.0 MHz #V	BW 3.0 MHz	Sweep 1.	Stop 5.67000 GHz 000 ms (1001 pts)	Log <u>Lin</u>
DRM CRAW		Co STATUS		

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11 UNDESIRABLE RADIATED EMISSION MEASUREMENT

11.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- 1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 2. For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

LIMIT		
FIELD STRENGTH AT 3m		
PK: 74 (dBµV/m)	AV 54 (dBµV/m)	
EIRP LIMIT	FIELD STRENGTH AT 3m	
PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)	
PK:-27 (dBm/MHz) *1	PK: 68.2(dBµV/m) *1	
PK:10 (dBm/MHz) *2	PK:105.2 (dBµV/m) *2	
PK:15.6 (dBm/MHz) *3	PK: 110.8(dBµV/m) *3	
PK:27 (dBm/MHz) *4	PK:122.2 (dBµV/m) *4	
	FIELD STRE PK: 74 (dBµV/m) EIRP LIMIT PK: -27 (dBm/MHz) PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3	

1 beyond 75 MHz or more above of the bandedge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27

dBm/MHz at the band edge.

 $EIRP = ((E^*d)^2) / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRPis the equivalent isotropically radiated power in Watts.

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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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

Note:

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

2. Emission level $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

11.2 Measurement Equipment Used

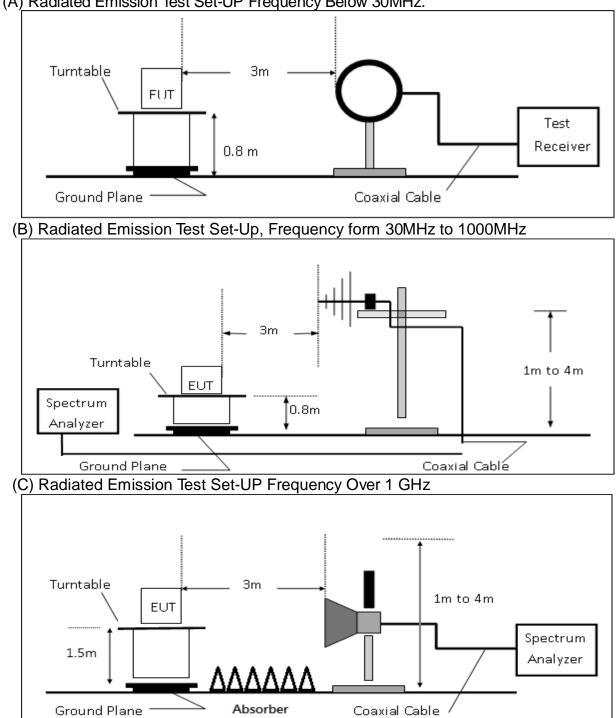
SGS SAC-III								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Bi-log Antenna	SCHWAZBECK	VULB9168	378	Dec. 29th, 2017	Dec. 28th, 2018			
Horn Antenna	Schwarzbeck	BBHA9120D	1441	Aug. 16th, 2018	Aug. 15th, 2019			
Horn Antenna	Schwarzbeck	BBHA9170	184	Dec. 12th, 2017	Dec. 11th, 2018			
Loop Antenna	ETS.LINDGREN	6502	148045	Sep. 26th, 2017	Sep. 25th, 2018			
3m Site NSA	SGS	966 chamber	N/A	Jan. 02nd, 2018	Jan. 01st, 2019			
Spectrum Analyzer	Agilent	E4446A	MY51100003	May 15th, 2018	May 14th, 2019			
EMI Test Receiver	R&S	ESCI7	100335	Feb. 02nd, 2018	Feb. 01st, 2019			
Pre-Amplifier	HP	8449B	3008A00578	Jan. 02nd, 2018	Jan. 01st, 2019			
Pre-Amplifier	HP	8447D	2944A07676	Jan. 02nd, 2018	Jan. 01st, 2019			
Pre-Amplifier	EMC Instruments	EMC184045B	980135	Oct. 27th, 2017	Oct. 26th, 2018			
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019			
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	Jan. 02nd, 2018	Jan. 01st, 2019			
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	Jan. 02nd, 2018	Jan. 01st, 2019			
Low Loss Cable	Huber Suhner	966_RX	9	Jan. 02nd, 2018	Jan. 01st, 2019			
Notebook	Lenovo	L430	R9-X11BG	N/A	N/A			

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11.3 Test SET-UP



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

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11.4 Measurement Procedure

- The EUT was placed on a turn table which is 0.8m above ground plane. 1.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequen-3. cy> 1GHz above ground plane.
- The turn table shall rotate 360 degrees to determine the position of maximum emission 4. level.
- EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out 5. the highest emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) 6. and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 8. 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- Maximum procedure was performed on the six highest emissions to ensure EUT com-9. pliance.
- 10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 11. Repeat above procedures until all frequency measured were complete.

11.5 Field Strength Calculation

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

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	
	Where	

FS = RA + AF + CL - AG

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB) Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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11.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

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

11.7 Measurement Result

Refer to attach tabular data sheets.

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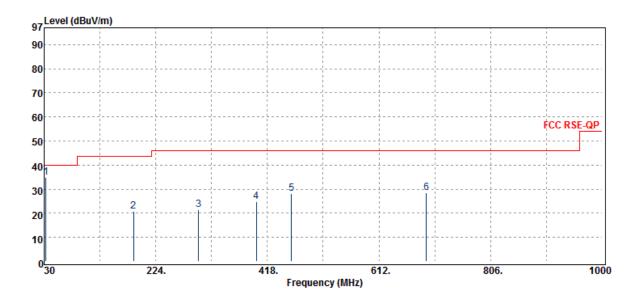


Radiated Spurious Emission Measurement Result Below 1GHz Worst-Case Data: 802.11a 5150~5250 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5220 MHz :Tx CH MID :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	43.72	-8.82	34.90	40.00	-5.10
185.20	Peak	29.49	-8.64	20.85	43.50	-22.65
298.69	Peak	26.92	-5.55	21.37	46.00	-24.63
398.60	Peak	28.25	-3.41	24.84	46.00	-21.16
459.71	Peak	30.53	-2.46	28.07	46.00	-17.93
694.45	Peak	27.69	0.94	28.63	46.00	-17.37

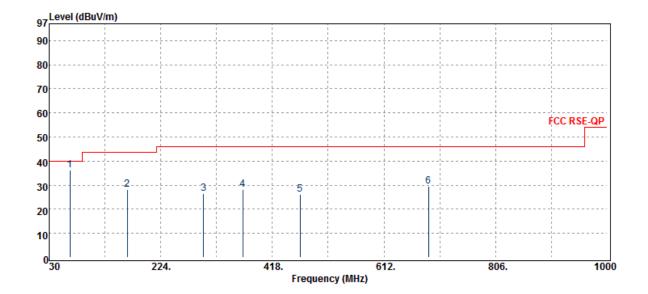
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Operation Mode:Tx CH MIDEngineer:TinEUT Pol.:H PlaneMeasurement Antenna Pol.:HORIZONTAL			U	
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Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.45	-9.20	36.25	40.00	-3.75
165.80	Peak	35.50	-7.32	28.18	43.50	-15.32
298.69	Peak	31.92	-5.55	26.37	46.00	-19.63
366.59	Peak	32.32	-4.02	28.30	46.00	-17.70
466.50	Peak	28.33	-2.07	26.26	46.00	-19.74
689.60	Peak	27.82	1.88	29.70	46.00	-16.30

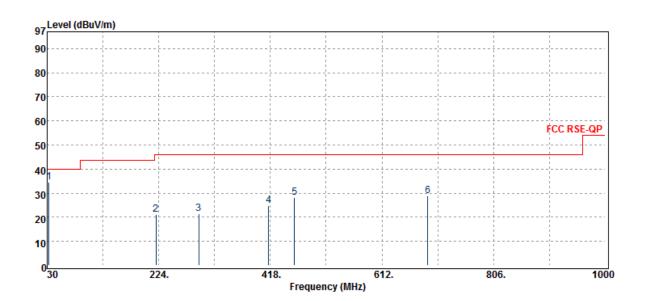
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802.11a 5250~5350 MHz

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



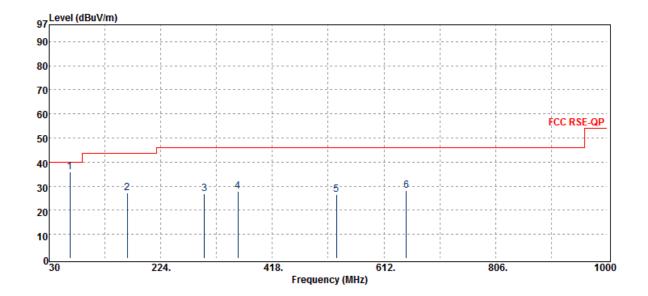
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	43.24	-8.82	34.42	40.00	-5.58
219.15	Peak	30.07	-9.08	20.99	46.00	-25.01
293.84	Peak	27.30	-5.69	21.61	46.00	-24.39
415.09	Peak	27.70	-2.95	24.75	46.00	-21.25
459.71	Peak	30.66	-2.46	28.20	46.00	-17.80
691.54	Peak	27.23	1.57	28.80	46.00	-17.20

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Operation Mode :Tx CH MID Engineer :Tin	undamental Frequency : peration Mode :	ration Mode :Tx CH MID	Engineer	
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Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.18	-9.20	35.98	40.00	-4.02
165.80	Peak	34.65	-7.32	27.33	43.50	-16.17
299.66	Peak	32.40	-5.52	26.88	46.00	-19.12
357.86	Peak	32.25	-4.22	28.03	46.00	-17.97
529.55	Peak	27.72	-1.18	26.54	46.00	-19.46
650.80	Peak	27.79	0.50	28.29	46.00	-17.71

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

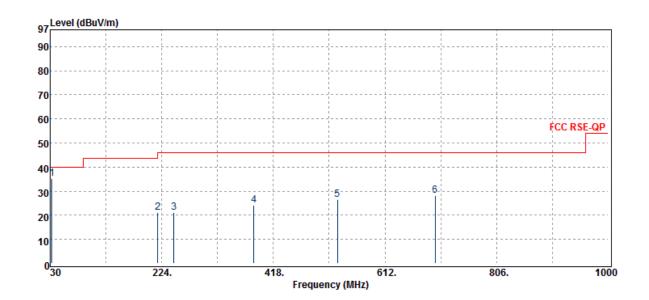


Report No.: ER/2018/70057 Page: 53 of 162

802.11a, 5470~5725 MHz

Operation Band :802.11aB3 Fundamental Frequency :5580 MHz **Operation Mode** :Tx CH MID EUT Pol. :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



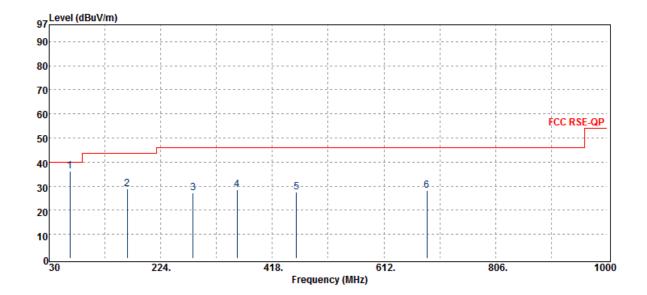
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	44.03	-8.82	35.21	40.00	-4.79
217.21	Peak	30.33	-9.12	21.21	46.00	-24.79
245.34	Peak	28.56	-7.49	21.07	46.00	-24.93
384.05	Peak	27.81	-3.79	24.02	46.00	-21.98
529.55	Peak	27.67	-1.18	26.49	46.00	-19.51
699.30	Peak	26.52	1.74	28.26	46.00	-17.74

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Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



Report No.: ER/2018/70057 Page: 54 of 162



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.30	-9.20	36.10	40.00	-3.90
165.80	Peak	36.31	-7.32	28.99	43.50	-14.51
280.26	Peak	33.35	-6.12	27.23	46.00	-18.77
356.89	Peak	32.64	-4.21	28.43	46.00	-17.57
459.71	Peak	30.10	-2.46	27.64	46.00	-18.36
686.69	Peak	26.58	1.70	28.28	46.00	-17.72

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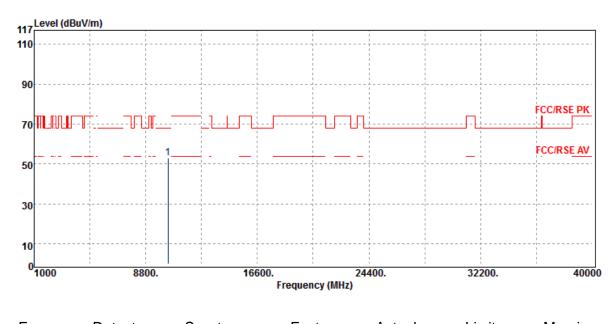
Above 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5180 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



⊢req.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	33.23	19.71	52.94	68.20	-15.26

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50

30

10

0<mark>1000</mark>

8800.

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FCC/RSE AV

32200.

40000

Funda	ation Band amental Frequency ation Mode Pol.	:802.11aB1 :5180 MHz :Tx CH LOW :H Plane	T E	Fest Date Femp./Humi. Engineer Measurement Ante	enna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117 110	Level (dBuV/m)					
90						
70	₩₽ ₩₽₽₽₽₽₽₽			_	FCC/RSE PM	<u> </u>

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	33.56	19.71	53.27	68.20	-14.93

Frequency (MHz)

16600.

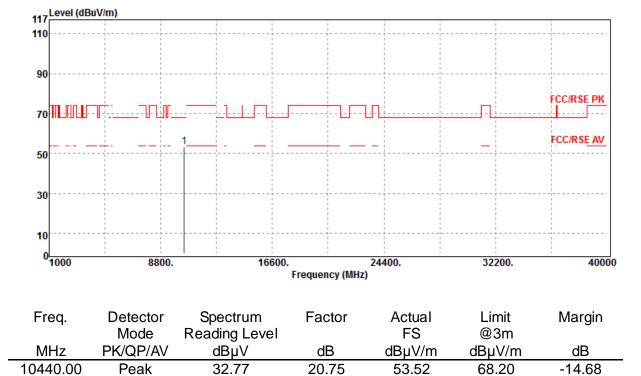
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Report No.: ER/2018/70057 Page: 57 of 162

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



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32.77

Peak

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53.52

-14.68

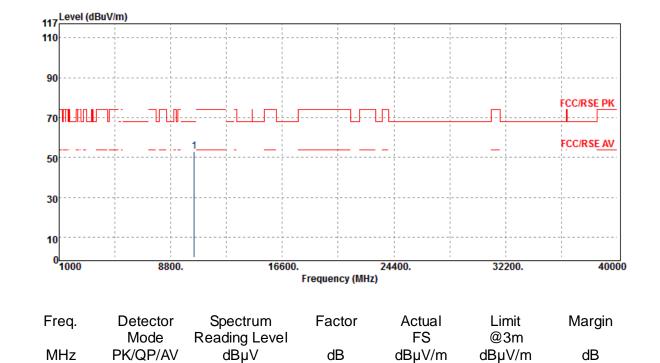


10440.00

Peak

Report No.: ER/2018/70057 Page: 58 of 162

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



20.05

53.11

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33.06

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68.20

-15.09

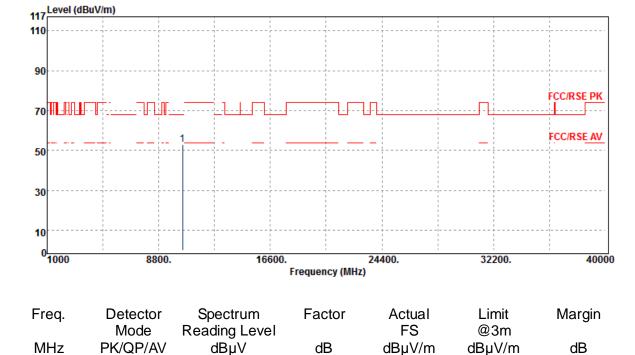


10480.00

Peak

Report No.: ER/2018/70057 Page: 59 of 162

i. :2018-08-30 i. :21 deg_C / 62 RH :Tin ent Antenna Pol. :VERTICAL



20.79

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

32.19

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

68.20

52.98

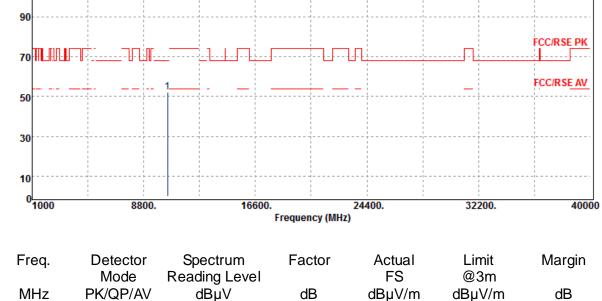
-15.22



10480.00

Peak

Report No.: ER/2018/70057 Page: 60 of 162



20.07

52.18

68.20

-16.02

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32.11

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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

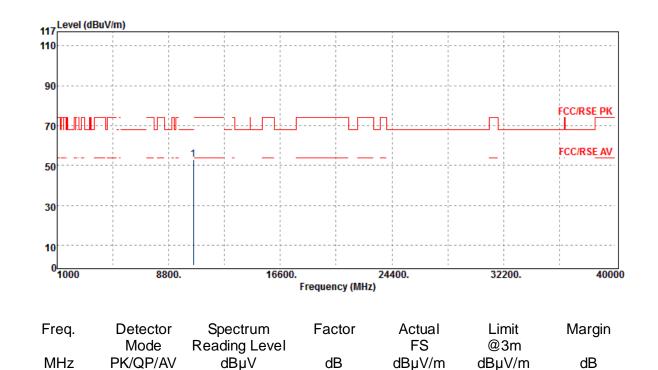
10520.00

Peak

:802.11aB2 :5260 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL

-15.20



20.78

53.00

68.20

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32.22

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:802.11aB2

Operation Band

30

10

0^L 1000

Freq.

MHz

10520.00

8800.

Detector

Mode

PK/QP/AV

Peak

Report No.: ER/2018/70057 Page: 62 of 162

40000

Margin

dB

-15.46

32200.

Limit

@3m

dBµV/m

68.20

:2018-08-30

Η

undamental Frequency peration Mode UT Pol.	:5260 MHz :Tx CH LOW :H Plane	Temp./Humi. Engineer Measurement Anter	nna Pol.	:21 deg_C / 62 :Tin :HORIZONTAL
117 Level (dBuV/m)		 		-
110				
90		 	 	
70			FCC/RSE PH	<u> </u>
			FCC/RSE AV	
50	1		FUC/RSE AV	

24400.

Actual

FS

dBµV/m

52.74

Frequency (MHz)

Factor

dB

20.00

Test Date

I inless otherwise stated the results shown in this test report refer on	ly to the sample(s) tested and such sample(s) are retained for 90 days only.
offices officiated the results shown in this test report refer of	

16600.

Spectrum

Reading Level

dBµV

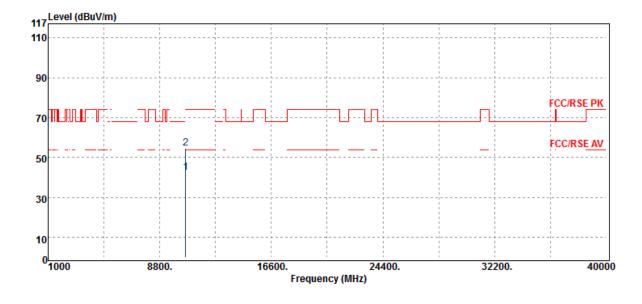
32.74

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Report No.: ER/2018/70057 Page: 63 of 162

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



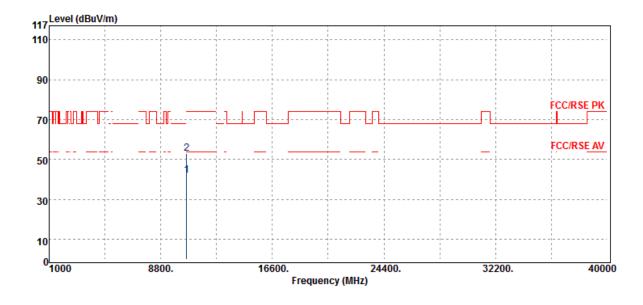
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.35	21.18	42.53	54.00	-11.47
10600.00	Peak	33.44	21.18	54.62	74.00	-19.38

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Report No.: ER/2018/70057 Page: 64 of 162

Operation Band	:802.11aB2	Temp./Humi.	:2018-08-30
Fundamental Frequency	:5300 MHz		:21 deg_C / 62 RH
Operation Mode	:Tx CH MID		:Tin
EUT Pol.	:H Plane		:HORIZONTAL



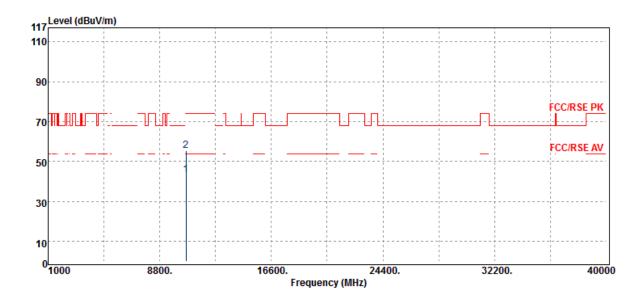
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
		Ū.		. •			
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
10600.00	Average	21.59	20.38	41.97	54.00	-12.03	-
10600.00	Peak	32.69	20.38	53.07	74.00	-20.93	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Report No.: ER/2018/70057 Page: 65 of 162

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual FS	Limit	Margin
	Mode	Reading Level		го	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.96	21.24	43.20	54.00	-10.80
10640.00	Peak	34.09	21.24	55.33	74.00	-18.67

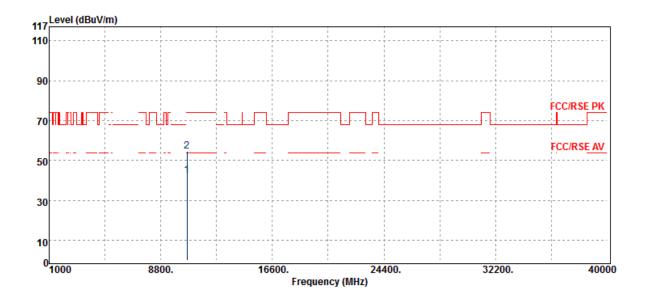
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Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	22.09	20.44	42.53	54.00	-11.47
10640.00	Peak	34.13	20.44	54.57	74.00	-19.43

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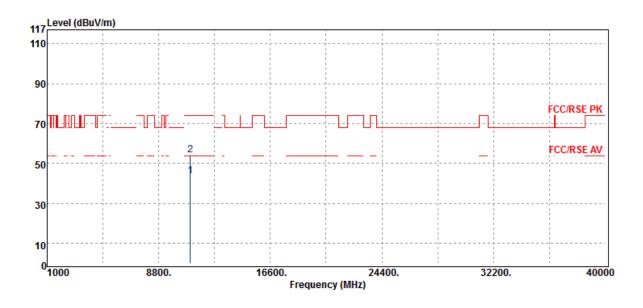
Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi. Engineer :Tin Measurement Antenna Pol.

:2018-08-30 :21 deg_C / 62 RH :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.59	22.17	43.76	54.00	-10.24
11000.00	Peak	31.88	22.17	54.05	74.00	-19.95

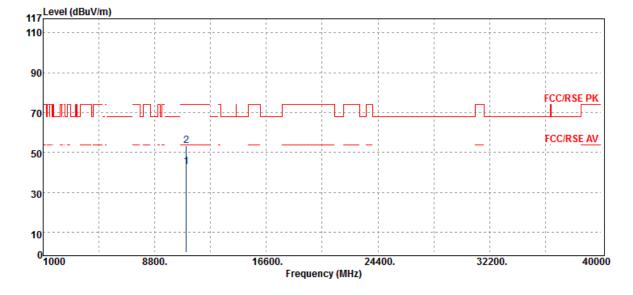
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Report No.: ER/2018/70057 Page: 68 of 162

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL
!		U	

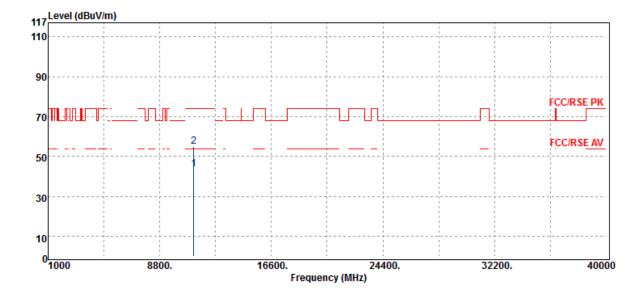


Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.74	21.37	43.11	54.00	-10.89
11000.00	Peak	32.12	21.37	53.49	74.00	-20.51

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



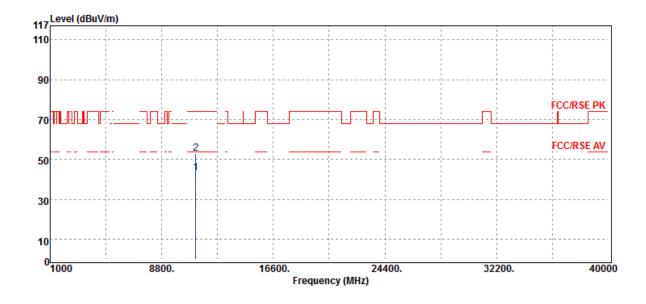
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.52	22.31	43.83	54.00	-10.17
11160.00	Peak	32.60	22.31	54.91	74.00	-19.09

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Report No.: ER/2018/70057 Page: 70 of 162

Operation Band	:802.11aB3	:2018-08-30
Fundamental Frequency	:5580 MHz	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	:Tin
EUT Pol.	:H Plane	:HORIZONTAL



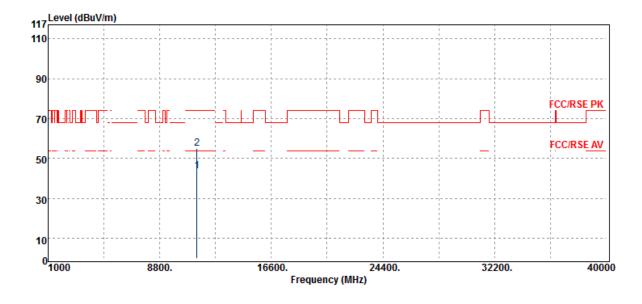
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.65	21.51	43.16	54.00	-10.84
11160.00	Peak	31.70	21.51	53.21	74.00	-20.79

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Report No.: ER/2018/70057 Page: 71 of 162

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Average	21.11	22.42	43.53	54.00	-10.47
11400.00	Peak	32.44	22.42	54.86	74.00	-19.14

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Report No.: ER/2018/70057 Page: 72 of 162

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Level (dBuV/m) 117 110 90 CC/RSE PK 70 FCC/RSE AV 50 30 10 0<mark>1000</mark> 40000 8800. 16600. 24400. 32200. Frequency (MHz)

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Average	21.31	21.62	42.93	54.00	-11.07
11400.00	Peak	32.41	21.62	54.03	74.00	-19.97

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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

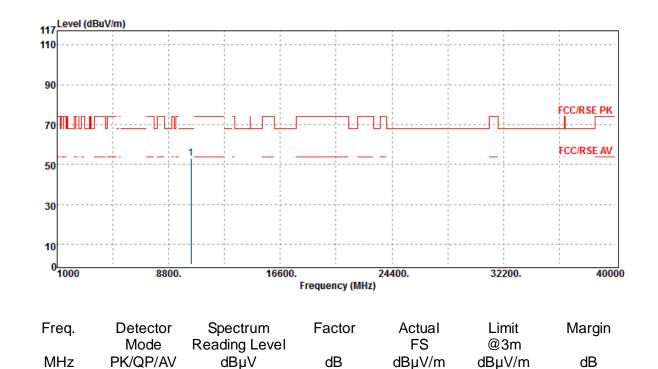
10360.00

Peak

:802.11n20B1 :5180 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL

-15.36



20.41

52.84

68.20

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

32.43

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:2018-08-30



:802.11n20B1

Operation Band

10360.00

Peak

JT Pol.	Frequency	y :5180 MHz :Tx CH LOW :H Plane			b./Humi. neer surement Ante	:2018-08-50 :21 deg_C / 62 :Tin :HORIZONTA	
117 Level (dBuV	//m)						7
110							
90							
70				<u></u>		FCC/RSE PK	
50		1				FCC/RSE AV	<u>.</u>
30							
10							
0 <mark></mark> 1000	8800.	16600.	Frequency (MHz)	24400.	32200.	400	_] 100
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

19.71

52.35

68.20

-15.85

Test Date

32.64

Report No.: ER/2018/70057 Page: 75 of 162

:2018-08-30



:802.11n20B1

Operation Band

10440.00

Peak

Frequency de	:5220 MHz :Tx CH MID :H Plane			neer	:21 deg_C / :Tin :VERTICAL	
V/m)						7
				F1	FCC/RSE PK	-
_	1		_	_	FCC/RSE <u>AV</u>	-
8800.	16600.			32200.	400	 00
Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
	Frequency de //m) 	Frequency :5220 MHz :Tx CH MID :H Plane //m) 	Frequency :5220 MHz de :Tx CH MID :H Plane //m) //m //m //m //m //m //m //m //m //	Frequency :5220 MHz Temp de :Tx CH MID Engin :H Plane Meas //m) //m) //m //m //m //m //m //m //m /	Frequency :5220 MHz Temp./Humi. de :Tx CH MID Engineer :H Plane Measurement Ante //m)	Frequency :5220 MHz Temp./Humi. de :Tx CH MID Engineer :H Plane Measurement Antenna Pol. //m)

20.75

52.67

68.20

-15.53

Test Date

31.92

Report No.: ER/2018/70057 Page: 76 of 162

:2018-08-30



PK/QP/AV

Peak

MHz

10440.00

:802.11n20B1

Operation Band

damental damental eration Mo F Pol.	Frequency	:5220 MHz :Tx CH MID :H Plane		Test Date Temp./Humi. Engineer Measurement A	:2018-08-30 :21 deg_C / 62 :Tin :HORIZONTA	
117 Level (dBu)	V/m)					٦
90						
70	<u> </u>				FCC/RSE PK	-
50		1			FCC/RSE AV	-
30						
10					 	
0 ^L 1000	8800.	16600.	24400. Frequency (MHz)	32200.	400	លី០
Freq.	Detector Mode	Spectrum Reading Level		ctual Limit FS @3m	Margin	

dB

20.05

dBµV/m

52.45

dBµV/m

68.20

dB -15.75

Test Date

dBµV

32.40

Report No.: ER/2018/70057 Page: 77 of 162

:2018-08-30



:802.11n20B1

Operation Band

⁰ 1000	8800.	1	6600. Frequei	244 ncy (MHz)	00.	32200.	400	00
0						1	1	
10							 	
30								
50		1				_	FCC/RSE AV	
70 ML AA							FCC/RSE PK	
90								
17 Level ((dBuV/m)							

Test Date

	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	32.38	20.79	53.17	68.20	-15.03

:802.11n20B1

Operation Band

0^L 1000

Freq.

MHz

10480.00

8800.

Detector

Mode

PK/QP/AV

Peak

Report No.: ER/2018/70057 Page: 78 of 162

40000

Margin

dB

-16.02

32200.

Limit

@3m

dBµV/m

68.20

:2018-08-30

Dperation Mode		:5240 MHz :Tx CH HIGH :H Plane			Eng	Temp./Humi. Engineer Measurement Antenna Pol.			:21 deg_C / 62 RH :Tin :HORIZONTAL	
117 110 110										
90			, , , , , , , , , , , , , , , , , , ,							
70 TIL #ULL-1							F_		FCC/RSE PK	-
50		1							FCC/RSE <u>AV</u>	
30		-								

24400.

Actual

FS

dBµV/m

52.18

Frequency (MHz)

Factor

dB

20.07

Test Date

Unless otherwise stated the results shown in this	s test report refer only	to the sample(s) tested and	dsuchsample(s) are retaine	d for 90 days only.
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16600.

Spectrum

Reading Level

dBµV

32.11



Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

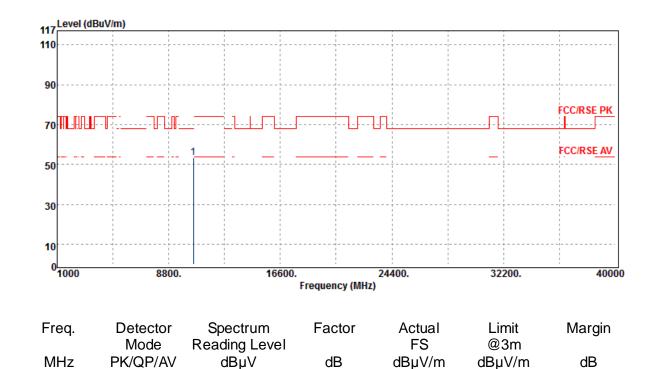
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

10520.00

Peak

:802.11n20B2 :5260 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



20.78

53.32

68.20

-14.88

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

32.54

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:2018-08-30



:802.11n20B2

Operation Band

10520.00

Peak

peration Ba undamenta peration Me JT Pol.	tal Frequency :5260 MHz			Engir	./Humi.	:2018-08-30 :21 deg_C / 62 :Tin :HORIZONTAL	
117	uV/m)						_
110							
90							
70 <mark> _ </mark> -	-B					FCC/RSE PK	
50		1		_	_	FCC/RSE AV	<u>.</u>
30							
10			 				
0 ^L 1000	8800.	16600.	Frequency (MHz)	24400.	32200.	400	 00
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

20.00

Test Date

68.20

-14.58

53.62

33.62

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FCC/RSE AV

32200.

40000



50

30

10

0<mark>1000</mark>

2

8800.

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n20B2 :5300 MHz :Tx CH MID :H Plane	Test Date Temp./Humi. Engineer Measurement Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :VERTICAL	
117 Level (dBuV/m) 110				
90				
70		FCC/RSE P	<u>K</u>	

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.42	21.18	42.60	54.00	-11.40
10600.00	Peak	33.66	21.18	54.84	74.00	-19.16

Frequency (MHz)

16600.

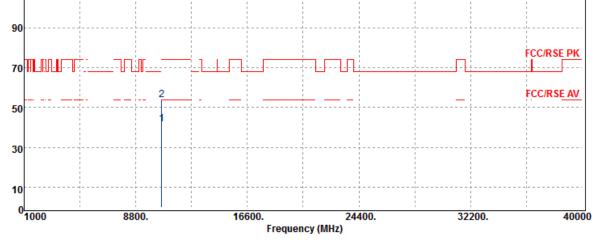
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Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n20B2 :5300 MHz :Tx CH MID :H Plane	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
110				



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
10600.00	Average	21.47	20.38	41.85	54.00	-12.15	
10600.00	Peak	33.41	20.38	53.79	74.00	-20.21	

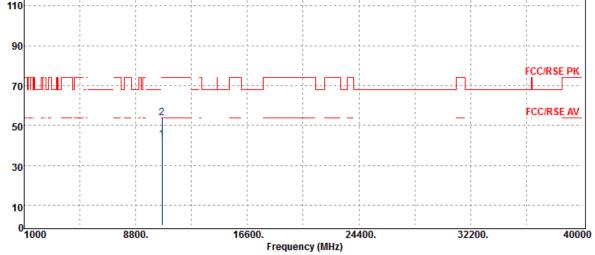
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Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n20B :5320 MHz :Tx CH HIGH :H Plane			Ten Enç	t Date np./Humi jineer asuremei		na Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :VERTICAL
110	1	1	1	1	1	1	1	
110	1		1	1	1	1		



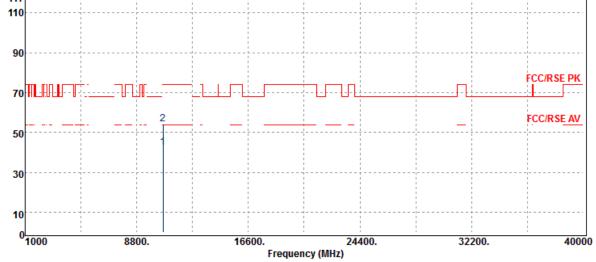
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBuV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.52	21.24	42.76	54.00	-11.24
10640.00	Peak	32.70	21.24	53.94	74.00	-20.06

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL
117 Level (dBuV/m)			_



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.98	20.44	42.42	54.00	-11.58
10640.00	Peak	33.89	20.44	54.33	74.00	-19.67

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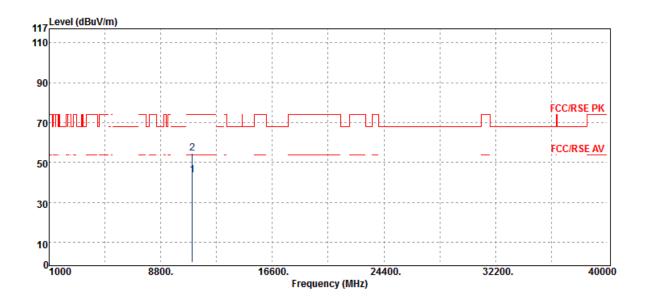


Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.58	22.17	43.75	54.00	-10.25
11000.00	Peak	32.49	22.17	54.66	74.00	-19.34

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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40000

32200.

:2018-08-30



:802.11n20B3

Operation Band

10

0^L 1000

8800.

	amental Freque ation Mode Pol.	ency		0 MHz CH LOW ane			En	np./Humi gineer asureme		na Pol.	:21 deg_C / 62 RH :Tin :HORIZONTAL
117	Level (dBuV/m)										
117	· · · · ·								; ; ; ;		
					1 1 1	1	1 1 1				
90		 			: : : 	 	 	 	 	 	
50					1	1	1				
70	╶ <mark>╔╢</mark> ╘╶╢╢╿╘┻╏╌╌╢╶┊╴╴╴╴╴╴╴╴╴	חרור		1 1 🗖			1 1 1			FCC/RSE PK	
70		- U- 1-10	-						1		*
			2					_		FCC/RSE AV	
50			1								
					1 1 1	1	1 1 1				
30		 			1 	1 1	1 7		1 7	 	

Test Date

		24400.
Frequency	(MHz)	

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.75	21.37	43.12	54.00	-10.88
11000.00	Peak	33.18	21.37	54.55	74.00	-19.45

16600.

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:2018-08-30



:802.11n20B3

Operation Band

Opera EUT F		•	:5580 MHz :Tx CH MID :H Plane		Engineer			:21 deg_C / 62 RH :Tin :VERTICAL	
117	Level (dBuV/m	1)							_
110									
110									
90			 		: : : : d===============================	 			
	╒╫╟╌╟ ╽┚╌║╴╌		2	1	╌┠╍╌╌┠┚┠╧╍╸			CC/RSE PK	
50			1					CC/RSEAV	
30									
10						 	+		
0	1								
	1000	8800.		6600.	2440	0. 32	200.	400	0

Test Date

Frequency	(MHz)

Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.47	22.31	43.78	54.00	-10.22
11160.00	Peak	32.17	22.31	54.48	74.00	-19.52

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FCC/RSE AV

40000

32200.



50

30

10

0<mark>1000</mark>

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n20B3 :5580 MHz :Tx CH MID :H Plane	Test Date Temp./Humi. Engineer Measurement Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117 117 110			
90			
70		FCC/RSE F	<u>K</u>

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.57	21.51	43.08	54.00	-10.92
11160.00	Peak	32.31	21.51	53.82	74.00	-20.18

Frequency (MHz)

16600.

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2

8800.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

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:2018-08-30



:802.11n20B3

Operation Band

damental Frequency ration Mode Pol.	:5700 MHz :Tx CH HIGH :H Plane	Te Er	emp./Humi. ngineer easurement Ante	:2010 00 00 :21 deg_C / 6 :Tin enna Pol. :VERTICAL
17 Level (dBuV/m)				
10				
90				
	······································			FCC/RSE PK
50				FCC/RSE AV
30				
10				
10				
0 1000 8800		24400.	32200.	40000
	Frequ	iency (MHz)		
Freq. Detector	Spectrum F	actor Actua	I Limit	Margin

Test Date

rieq.	Delector		T actor	Actual		margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
11400.00	Peak	32.27	22.42	54.69	74.00	-19.31	

S

70

50

30

10

0<mark>1000</mark>

8800.

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FCC/RSE AV

32200.

40000

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n20B3 :5700 MHz :Tx CH HIGH :H Plane	Test Date Temp./Humi. Engineer Measurement Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117 110 110		· · · · · · · · ·	
90		FCC/RSE	 PK

24400.

	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
_	11400.00	Peak	32.22	21.62	53.84	74.00	-20.16

Frequency (MHz)

16600.

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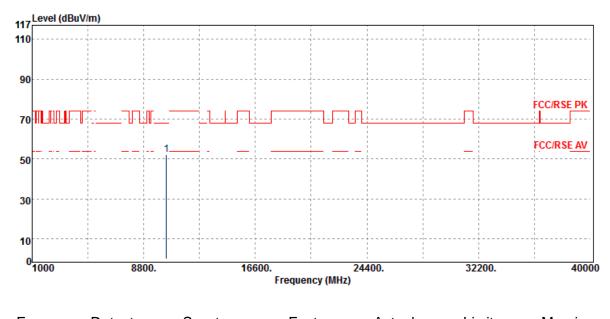


Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Band
Fundamental Frequency
Operation Mode
EUT Pol.

:802.11n40B1 :5190 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



⊢req.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Peak	31.64	20.48	52.12	68.20	-16.08

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Report No.: ER/2018/70057

Test Date



:802.11n40B1

Operation Band

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:2018-08-30

Fundamenta Operation M EUT Pol.	al Frequency	:5190 MHz :Tx CH LOW :H Plane		Engi	o./Humi. neer surement Ante	nna Pol.	:21 deg_C / 62 RH :Tin :HORIZONTAL
117 ^{Level (de}	BuV/m)						7
110			 		 		
90							
70-111-110-1	U- <u></u> -U- <u>L-</u> U-			1		FCC/RSE PK	
						FCC/RSE AV	
50		1		_			-
30							
10							
0 <mark></mark> 1000	8800.		Frequency (MHz)	24400.	32200.	400	00
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
10380.00	Peak	32.17	19.78	51.95	68.20	-16.25	

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40000

32200.



0 1000

8800.

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11n40B1 :5230 MHz :Tx CH HIGH :H Plane	Test Date Temp./Humi. Engineer Measuremer	nt Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :VERTICAL
Level (dBuV/m)				
117				
90				
			FCC/RSE PK	
70	<u></u>		<mark></mark>	
	1		FCC/RSE AV	
50				
30				
10				

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	32.61	20.77	53.38	68.20	-14.82

Frequency (MHz)

16600.

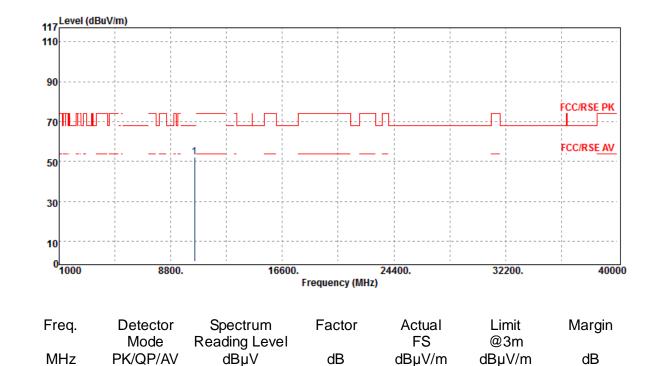


10460.00

Peak

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Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5230 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



20.07

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

31.99

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

68.20

52.06

-16.14



Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

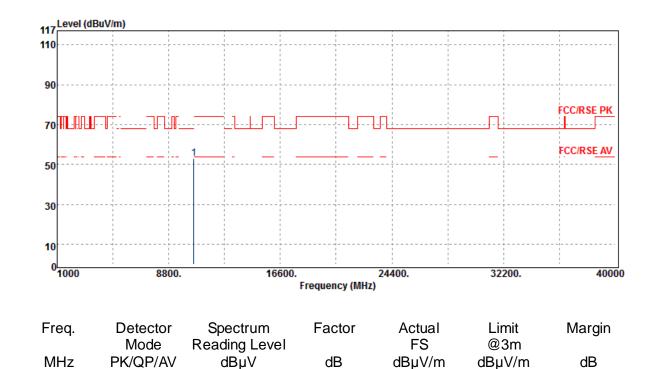
10540.00

Peak

:802.11n40B2 :5270 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL

-15.10



20.82

53.10

68.20

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

32.28

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:2018-08-30



:802.11n40B2

Operation Band

damental Frequency eration Mode F Pol.	:5270 MHz :Tx CH LOW :H Plane	Temp./Humi. Engineer Measurement Anten	:21 deg_C / 6: :Tin na Pol. :HORIZONTA
117 Level (dBuV/m)			;]
110			
90			
70	<u></u>		FCC/RSE PK
50	1		FCC/RSE <u>AV</u>
50			
30			
10			
0 <mark></mark> 1000 8800.	16600. Frequency (N	24400. 32200. IHz)	40000
Freq. Detector	Spectrum Factor	Actual Limit	Margin

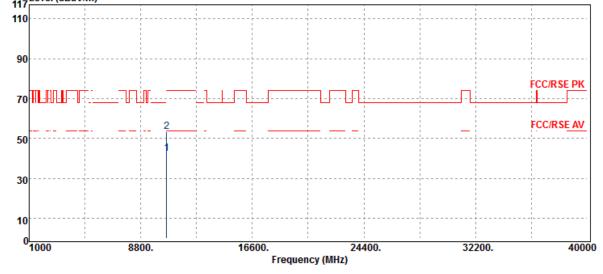
Test Date

	1109.	Mode	Reading Level	i dotoi	FS	@3m	margin	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
_	10540.00	Peak	32.17	20.02	52.19	68.20	-16.01	-

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Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5310 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL
117 Level (dBuV/m)			



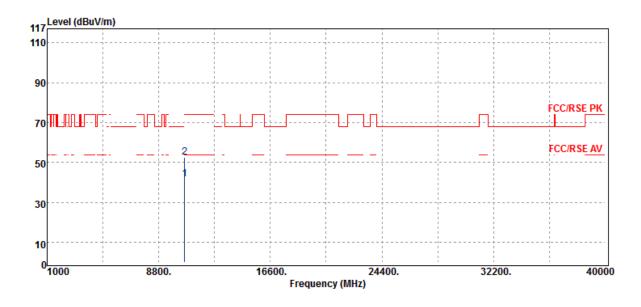
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Average	21.32	21.21	42.53	54.00	-11.47
10620.00	Peak	32.21	21.21	53.42	74.00	-20.58

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Fundamental Frequency Operation Mode			:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
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Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Average	21.45	20.41	41.86	54.00	-12.14
10620.00	Peak	32.20	20.41	52.61	74.00	-21.39

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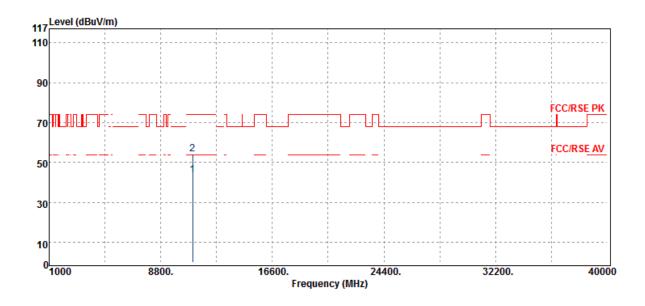


Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :21 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Average	21.40	22.28	43.68	54.00	-10.32
11020.00	Peak	31.88	22.28	54.16	74.00	-19.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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40000

32200.

:2018-08-30

Η



:802.11n40B3

Operation Band

0<mark>1000</mark>

8800.

	amental Frequency ation Mode ^{>} ol.	:5510 MHz :Tx CH LOW :H Plane	I	Temp./Hum Engineer Measureme	i. ent Antenna Pol.	:21 deg_C / 62 RH :Tin :HORIZONTAL
11/		i	i i	i i	i	
110						
90						
70					FCC/RSE PI	<u><</u>
		2		_	FCC/RSE A	<u>/</u>
50		1				
30						
10				· · · · · · · · · · · · · · · · · · ·		

24400.

Test Date

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Average	21.51	21.46	42.97	54.00	-11.03
11020.00	Peak	32.74	21.46	54.20	74.00	-19.80

Frequency (MHz)

16600.

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Funda Opera EUT F		:802.11n40B :5550 MHz :Tx CH MID :H Plane	3		Te E	est Date emp./Humi. ngineer leasuremer		a Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :VERTICAL
117	Level (dBuV/m)								_
110									
90		 		· · · · · · · · · · · · · · · · · · ·			 		
		,						CC/RSE PK	
70	╢╻╢ ╢╻┛╎ <u>╴</u> ╶╴╴╴╴╴	<u> </u>	· · · · · · · · · · · · · · · · · · ·	╎╴╴╂╌┠╶╴╴┨╌┠╶┾╴					•
		2						FCC/RSE AV	
50						_			-
50		1							
30							,		
30									

10 0	8800.	16600.		24400.	32200.	40000
1000	0000.		Frequency (MH		J2200.	40000
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00 11100.00	Average Peak	21.24 31.77	22.38 22.38	43.62 54.15	54.00 74.00	-10.38 -19.85

Report No.: ER/2018/70057 Page: 102 of 162

40000

32200.

FCC/RSE AV



50

30

10

0<mark>1000</mark>

Funda	ation Band Imental Freq Ition Mode Pol.	uency	:5550	11n40B3) MHz H MID ane	3	Тe E	est Date emp./Humi ngineer leasureme		na Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117 110	Level (dBuV/m)					- - - 		- - - -	- - - - -	
90			 			 			1 1 1 1 1 1 1 1 1	
70	╫╢╴╟╢┦╌╢╴╴║╶╶╴╴╴╸					 	·		FCC/RSE PK	

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00	Average	21.33	21.53	42.86	54.00	-11.14
11100.00	Peak	33.08	21.53	54.61	74.00	-19.39

Frequency (MHz)

16600.

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FCC/RSE PK

FCC/RSE AV

32200.

40000



70

50

30

10

0<mark>1000</mark>

8800.

2

Funda Opera EUT F		:802.11n40 :5670 MHz :Tx CH HIG :H Plane		Ter Eng	it Date np./Humi gineer asureme	nt Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :VERTICAL
117	Level (dBuV/m)						
110					1		
110		1	1	1	1		
00							

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Average	21.44	22.34	43.78	54.00	-10.22
11340.00	Peak	32.33	22.34	54.67	74.00	-19.33

Frequency (MHz)

16600.

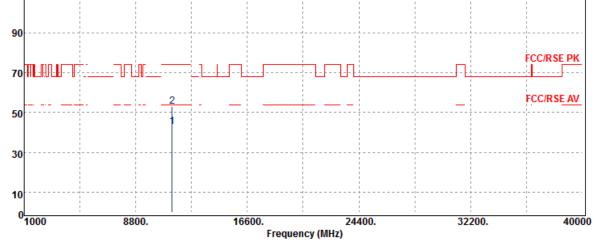
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Operation Band :802.11n40B3 Fundamental Frequency :5670 MHz Operation Mode :Tx CH HIGH EUT Pol. :H Plane 117 Level (dBuV/m)		Test Date Temp./Humi. Engineer Measurement	t Antenna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL	
110					



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Average	21.42	21.54	42.96	54.00	-11.04
11340.00	Peak	31.48	21.54	53.02	74.00	-20.98

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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

Operation Band
Fundamental Frequency
Operation Mode
EUT Pol.

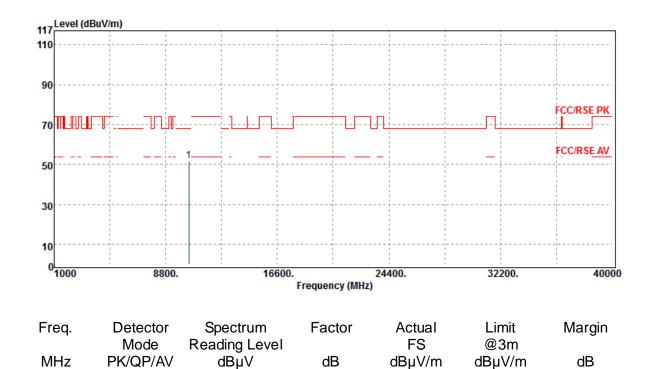
10420.00

Peak

:802.11ac80B1 :5210 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi. Engineer :Tin Measurement Antenna Pol.

:2018-08-30 :21 deg_C / 62 RH :VERTICAL



20.69

51.84

68.20

-16.36

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Unless otherwise stated the results shown in this test report refer on	ly to the sample(s) tested and such sample(s) are retained for 90 days only.

31.15

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10420.00

Peak

Operation B Fundamenta Operation M EUT Pol.	al Frequency	:802.11ac80B1 :5210 MHz :Tx CH LOW :H Plane		Tem Engi	Date p./Humi. neer surement Ante	nna Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117	3uV/m)						
110						 	
90							
						FCC/RSE PK	
70					<u> </u>	· <mark></mark>	-
50		1			_	FCC/RSE AV	-
30							
10						 	
0 1000	8800.	16600.	24 Frequency (MHz)	400.	32200.	400	 00
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

19.99

51.93

68.20

-16.27

31.94



Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

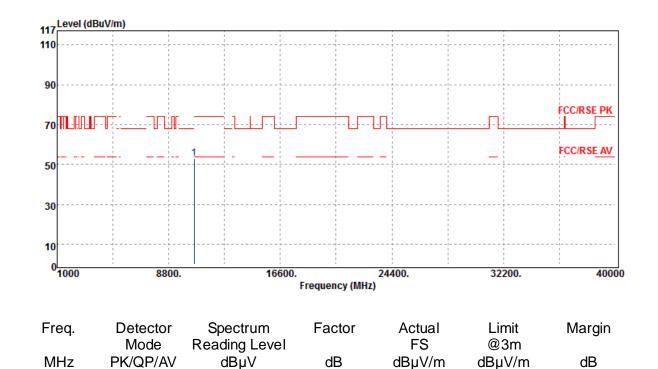
10580.00

Peak

:802.11ac80B2 :5290 MHz :Tx CH HIGH :H Plane

Test Date :2018-08-30 :21 deg_C / 62 RH Temp./Humi. Engineer :Tin Measurement Antenna Pol. :VERTICAL

-15.02



21.03

53.18

68.20

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32.15

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:2018-08-30



:802.11ac80B2

Operation Band

10580.00

Peak

Fundamental Frequency Operation Mode EUT Pol.		:5290 MHz :Tx CH HIGH :H Plane	Engir	./Humi. leer urement Ante	:21 deg_C / 62 F :Tin :HORIZONTAL		
117 110	l (dBuV/m)						
90							
70 AL A	₽₩ <u>0</u>			Γι		FCC/RSE PK	<u>.</u>
50		1		_	_	FCC/RSE AV	<u>,</u>
30							
10							
°1000	8800.	16600.	Frequency (MHz)	24400.	32200.	400	000
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

20.23

52.98

Test Date

68.20

-15.22

32.75

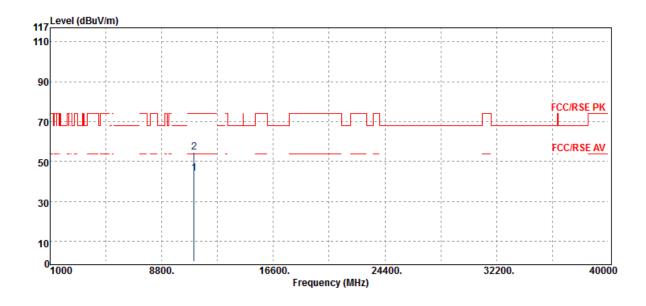


Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz :Tx CH LOW :H Plane

Test Date :2018-08-30 :21 deg_C / 62 RH Temp./Humi. Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11060.00	Average	21.71	22.41	44.12	54.00	-9.88
11060.00	Peak	32.13	22.41	54.54	74.00	-19.46

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Funda Opera	operation Band undamental Frequency operation Mode UT Pol.		:802.11ac80B3 y :5530 MHz :Tx CH LOW :H Plane			Test Date Temp./Hu Engineer Measuren		:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL	
117	Level (dBuV	//m)							
110									
90			 	 					
70	₩₽₩₽₽₽	╔╴╴						FCC/RSE PK	-
50			2					FCC/RSE AV	-
30								- - 	
10									
0	1000	8800.		16600. Freque	2440(ncy (MHz)).	32200.	400	oo

Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
11060.00	Average	21.54	21.53	43.07	54.00	-10.93	
11060.00	Peak	32.88	21.53	54.41	74.00	-19.59	

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·2018-08-30



·802 11ac80B3

Operation Band

	- undamental Frequency Operation Mode		Frequency :5610 MHz			Er	Temp./Humi. Engineer Measurement Antenna Pol.			:21 deg_C / 62 RH :Tin :VERTICAL	
117 ^{Level (1}	dBuV/m)					- - - -		- - -	, , , , ,		
90									1 1 1 1 1 1 1 1 1		
70	<u>₩-₩-</u>					 	<u></u>	 	FCC/RSE PK	-	
50		2		· · · · · · · · · · · · · · · · · · ·					FCC/RSE AV	-	
30						 					

Test Date

10						
01000	8800.	16600.		24400.	32200.	40000
			Frequency (MHz	-)		
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00 11220.00	Average Peak	21.32 32.29	22.36 22.36	43.68 54.65	54.00 74.00	-10.32 -19.35

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FCC/RSE AV

32200.

40000



50

30

10

0^L 1000

8800.

Funda Opera EUT F	ition Moo Pol.	Frequency de	:802.11a :5610 M :Tx CH F :H Plane	Hz HIGH			Tem Eng	: Date ip./Humi ineer asureme	nt Anten	na Pol.	:2018-08-30 :21 deg_C / 62 RH :Tin :HORIZONTAL
117	Level (dBuV	//m)									-
110											
90				 					· · ·		
50											
		m	1		r					FCC/RSE PK	
70	╺╫╢┫╌╝╫╢┾╽═┫╝╛╴╼╴╢╵			<u></u>		- 1 1					

24400.

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00	Average	21.44	21.56	43.00	54.00	-11.00
11220.00	Peak	31.61	21.56	53.17	74.00	-20.83

Frequency (MHz)

16600.

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Client's instructions, if any. The Company subject to its Client and this document does not exonerate parties to a transaction documents. This document is instructions, if any. The Company subject to its Client's advised that information contained herein a reflect the full days of the instructions of the company subject to a subject to its document is advised that information contained herein a reflect to a subject to the imitation of liability, indemnification and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.thm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document is unsubject to the parties of the company. Any unauthorized alteration, forgery or falsification of the content or approval of the low. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

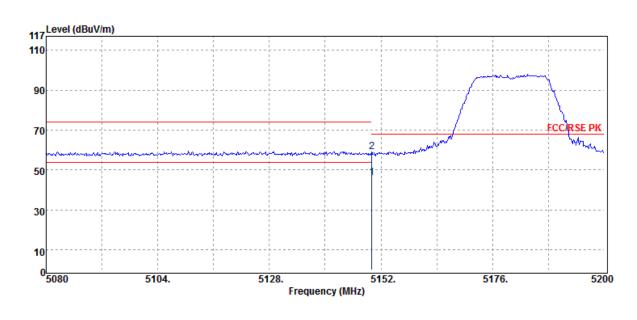


Band edge falling to restricted band

802.11a mode **Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11aB1 :5180 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	38.01	8.32	46.33	54.00	-7.67
5150.00	Peak	50.90	8.32	59.22	74.00	-14.78

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

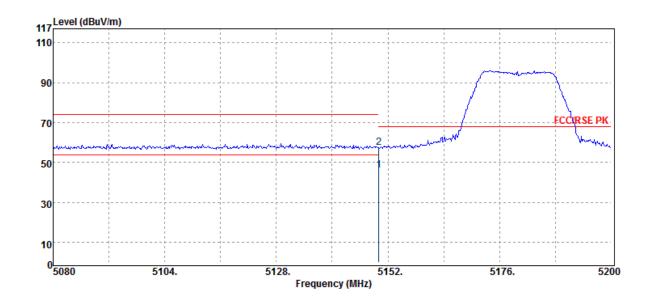
Report No.: ER/2018/70057 Page: 114 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5180 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.84	8.32	46.16	54.00	-7.84
5150.00	Peak	49.02	8.32	57.34	74.00	-16.66

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

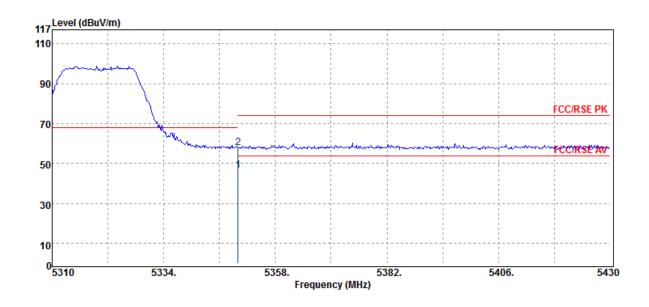
Report No.: ER/2018/70057 Page: 115 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.75	8.63	46.38	54.00	-7.62
5350.00	Peak	49.21	8.63	57.84	74.00	-16.16

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

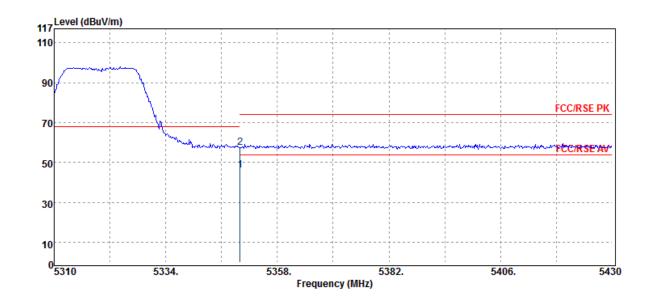
Report No.: ER/2018/70057 Page: 116 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



	Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
Ę	5350.00	Average	37.55	8.63	46.18	54.00	-7.82	
Ę	5350.00	Peak	48.84	8.63	57.47	74.00	-16.53	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

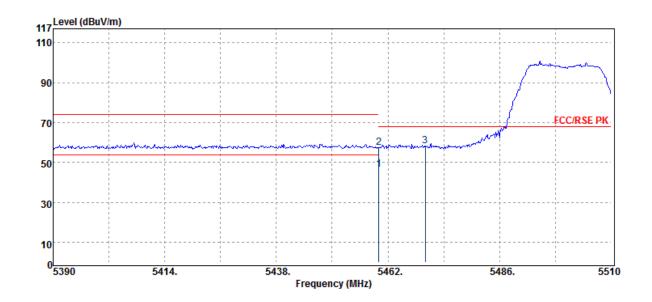
Report No.: ER/2018/70057 Page: 117 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.64	8.75	46.39	54.00	-7.61
5460.00	Peak	48.76	8.75	57.51	74.00	-16.49
5470.00	Peak	49.65	8.74	58.39	68.20	-9.81

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

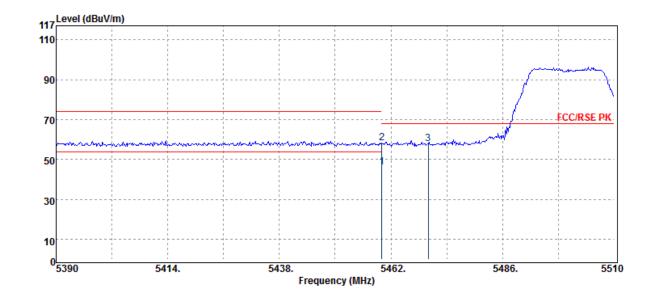
Report No.: ER/2018/70057 Page: 118 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.52	8.75	46.27	54.00	-7.73
5460.00	Peak	49.35	8.75	58.10	74.00	-15.90
5470.00	Peak	48.95	8.74	57.69	68.20	-10.51

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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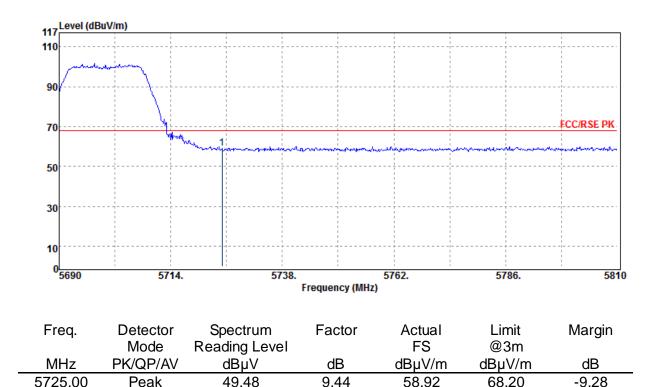


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

Peak

:802.11aB3 :5700 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

58.92

68.20

-9.28

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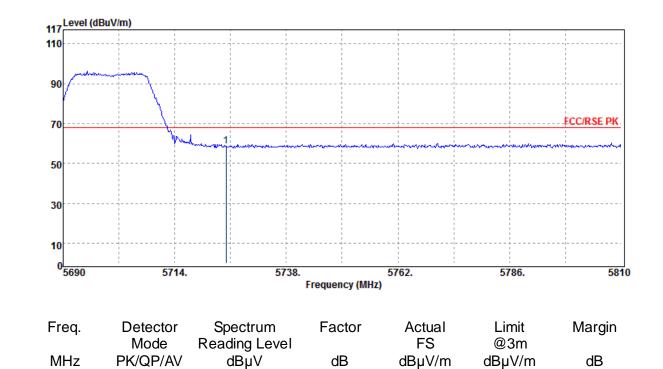
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

5725.00

Peak

:802.11aB3 :5700 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



9.44

58.53

68.20

-9.67

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

49.09

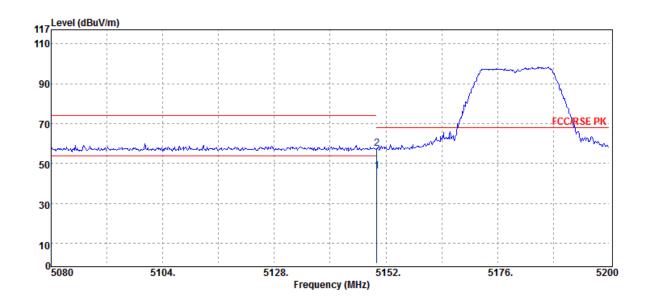
Report No.: ER/2018/70057 Page: 121 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5180 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.80	8.32	46.12	54.00	-7.88
5150.00	Peak	49.22	8.32	57.54	74.00	-16.46

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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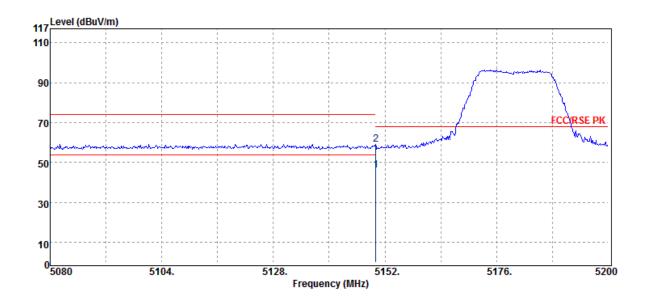
802.11n20 HT mode

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11n20B1 :5180 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Tin Measurement Antenna Pol.

:2018-08-29 :23 deg_C / 62 RH :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.83	8.32	46.15	54.00	-7.85
5150.00	Peak	50.76	8.32	59.08	74.00	-14.92

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

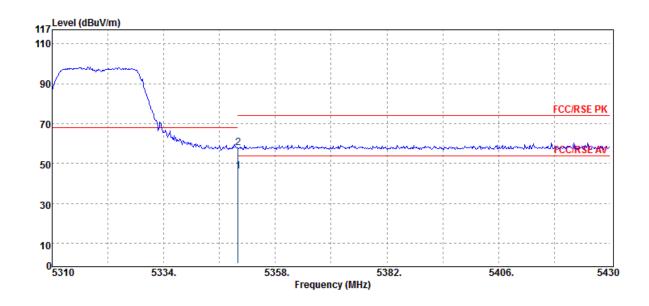
Report No.: ER/2018/70057 Page: 123 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5320 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
 5350.00	Average	37.66	8.63	46.29	54.00	-7.71
5350.00	Peak	49.23	8.63	57.86	74.00	-16.14

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

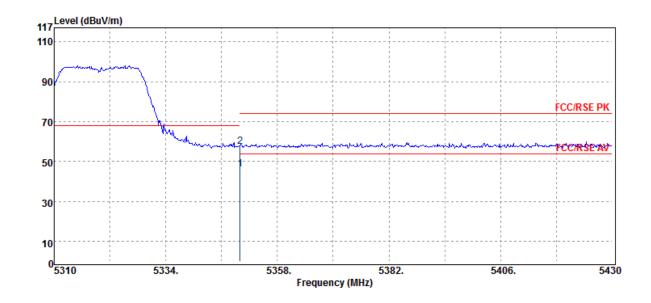
Report No.: ER/2018/70057 Page: 124 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5320 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-29 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector Mode	Spectrum	Factor	Actual FS	Limit @3m	Margin
	Mode	Reading Level		го	@SIII	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.67	8.63	46.30	54.00	-7.70
5350.00	Peak	49.01	8.63	57.64	74.00	-16.36

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

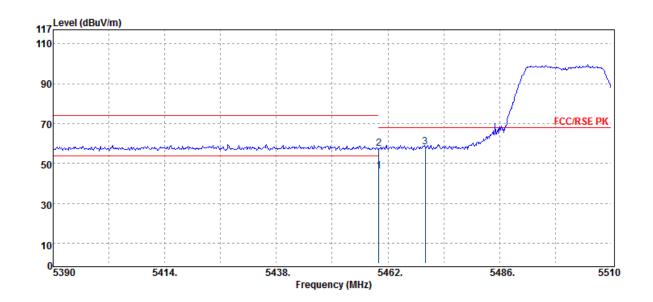
Report No.: ER/2018/70057 Page: 125 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.56	8.75	46.31	54.00	-7.69
5460.00	Peak	48.66	8.75	57.41	74.00	-16.59
5470.00	Peak	49.39	8.74	58.13	68.20	-10.07

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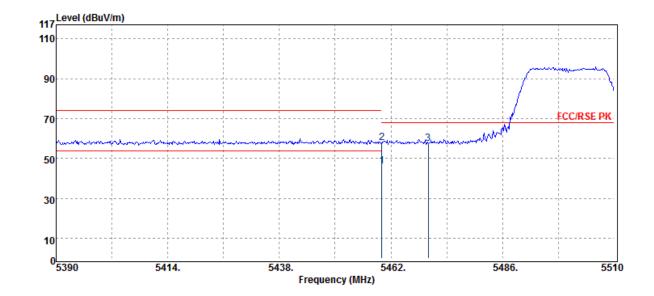
Report No.: ER/2018/70057 Page: 126 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.44	8.75	46.19	54.00	-7.81
5460.00	Peak	48.95	8.75	57.70	74.00	-16.30
5470.00	Peak	48.67	8.74	57.41	68.20	-10.79

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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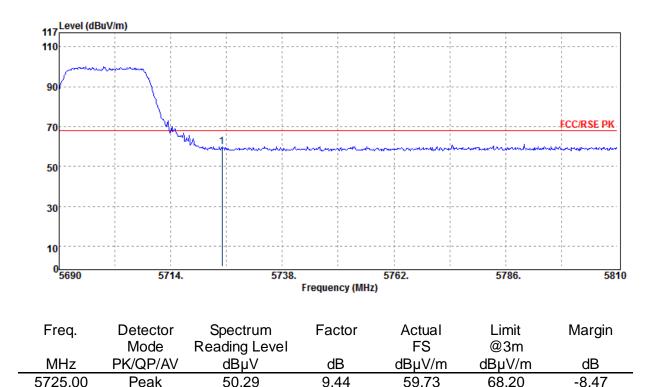


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

Peak

:802.11n20B3 :5700 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

59.73

68.20

-8.47

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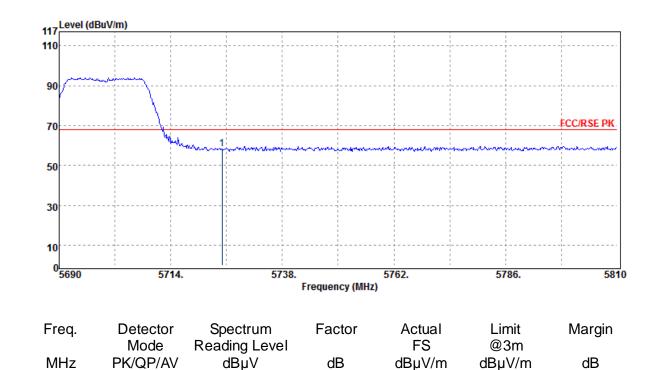
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

5725.00

Peak

:802.11n20B3 :5700 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



9.44

58.36

68.20

-9.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

48.92



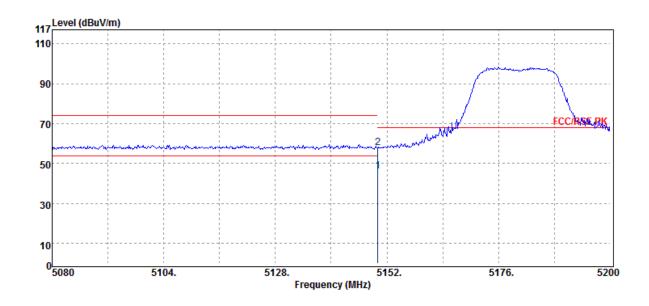
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802.11n40 HT mode

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11n40B1 :5190 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.93	8.32	46.25	54.00	-7.75
5150.00	Peak	49.59	8.32	57.91	74.00	-16.09

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

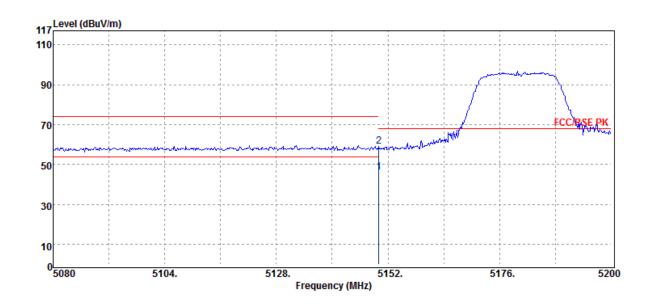
Report No.: ER/2018/70057 Page: 130 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B1 :5190 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



	Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	5150.00	Average	37.87	8.32	46.19	54.00	-7.81
	5150.00	Peak	50.70	8.32	59.02	74.00	-14.98

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

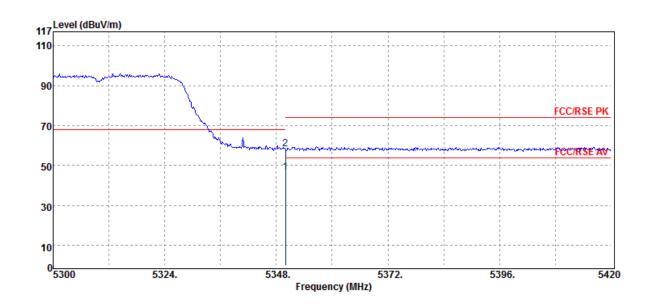
Report No.: ER/2018/70057 Page: 131 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.80	8.63	46.43	54.00	-7.57
5350.00	Peak	49.76	8.63	58.39	74.00	-15.61

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

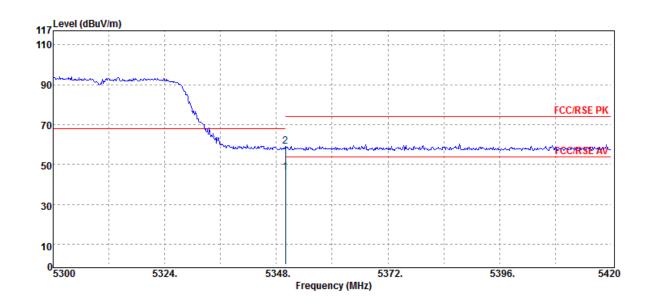
Report No.: ER/2018/70057 Page: 132 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.54	8.63	46.17	54.00	-7.83
5350.00	Peak	50.39	8.63	59.02	74.00	-14.98

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

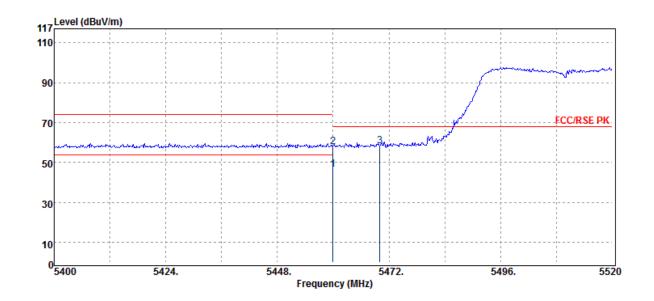
Report No.: ER/2018/70057 Page: 133 of 162



Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.67	8.75	46.42	54.00	-7.58
5460.00	Peak	49.30	8.75	58.05	74.00	-15.95
5470.00	Peak	49.39	8.74	58.13	68.20	-10.07

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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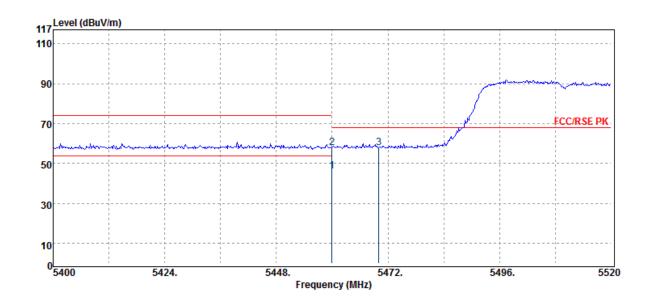


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Tin Measurement Antenna Pol.

:2018-08-30 :23 deg_C / 62 RH :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.59	8.75	46.34	54.00	-7.66
5460.00	Peak	48.95	8.75	57.70	74.00	-16.30
5470.00	Peak	49.03	8.74	57.77	68.20	-10.43

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

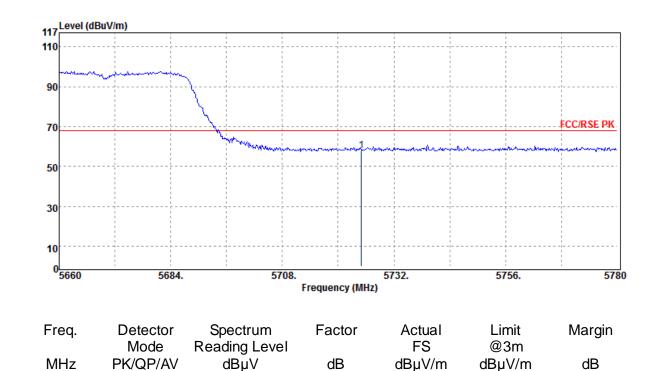
5725.00

Peak

:802.11n40B3 :5670 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL

-10.22



9.44

57.98

68.20

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

48.54

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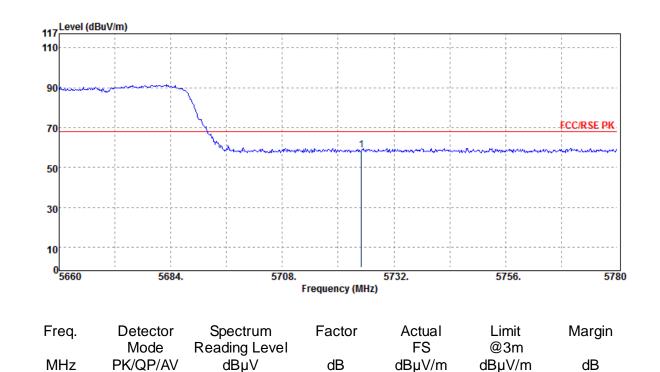
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

5725.00

Peak

:802.11n40B3 :5670 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



9.44

58.55

68.20

-9.65

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

49.11



802.11ac80 VHT mode

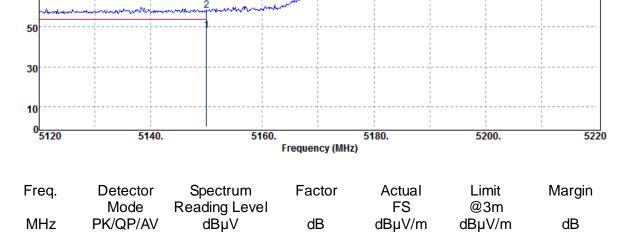
5150.00

5150.00

Average

Peak

Operation Band Fundamental Frequence Operation Mode EUT Pol.	:802.11ac80 cy :5210 MHz :Bandedge (:H Plane	Test Date Temp./Humi. Engineer Measuremen	t Antenna Pol.	:2018-08-30 :23 deg_C / 62 RH :Tin :VERTICAL
11/				7
110		 · · · · · · · · · · · · · · · · · · ·		
90		 	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	_
70			ECC/RSE PH	<u>L</u>



8.32

8.32

48.18

58.46

54.00

74.00

-5.82

-15.54

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

39.86

50.14

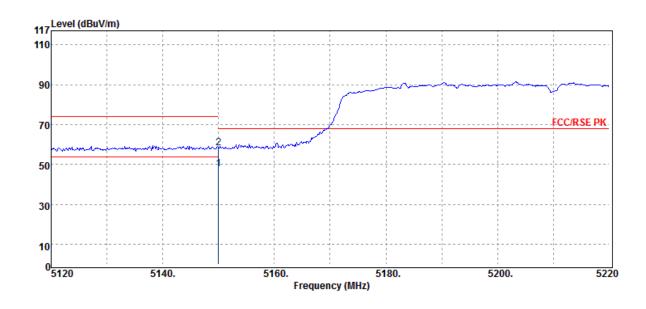
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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B1 :5210 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	39.44	8.32	47.76	54.00	-6.24
5150.00	Peak	50.14	8.32	58.46	74.00	-15.54

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

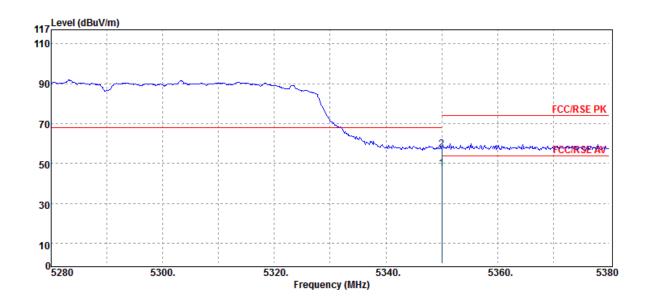
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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B2 :5290 MHz :Bandedge CH HIGH :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	38.66	8.63	47.29	54.00	-6.71
5350.00	Peak	48.56	8.63	57.19	74.00	-16.81

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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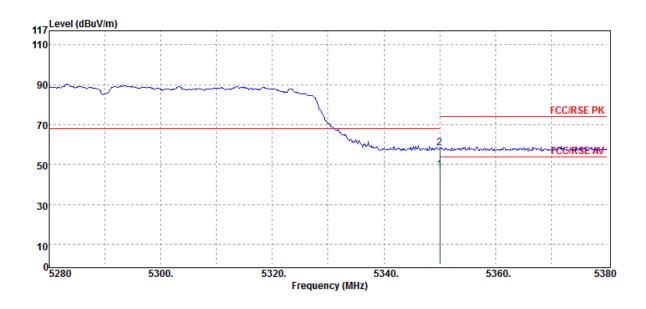


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B2 :5290 MHz :Bandedge CH HIGH :H Plane

Test Date Temp./Humi. Engineer :Tin Measurement Antenna Pol.

:2018-08-30 :23 deg_C / 62 RH :HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	38.65	8.63	47.28	54.00	-6.72
5350.00	Peak	49.68	8.63	58.31	74.00	-15.69

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

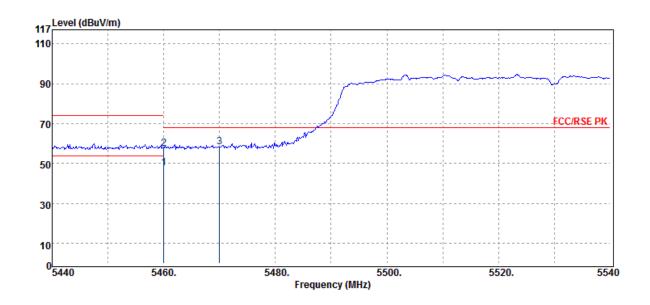
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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	38.83	8.75	47.58	54.00	-6.42
5460.00	Peak	48.85	8.75	57.60	74.00	-16.40
5470.00	Peak	49.62	8.74	58.36	68.20	-9.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

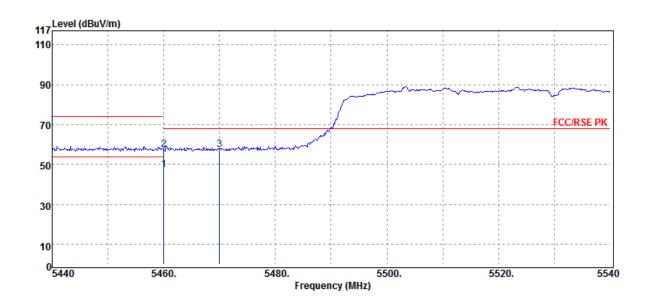
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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz :Bandedge CH LOW :H Plane

Test Date :2018-08-30 Temp./Humi. :23 deg_C / 62 RH Engineer :Tin Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	38.68	8.75	47.43	54.00	-6.57
5460.00	Peak	48.86	8.75	57.61	74.00	-16.39
5470.00	Peak	48.69	8.74	57.43	68.20	-10.77

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



TRANSMISSION IN THE ABSENCE OF DATA 12

12.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

12.2 Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



13 FREQUENCY STABILITY

13.1 Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

13.2 Measurement Procedure

- 1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
- 2. Set EUT as normal operation.
- 3. Turn the EUT on and couple its output to spectrum.
- 4. Turn the EUT off and set the chamber to the highest temperature specified.
- 5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
- 6. Repeat step with the temperature chamber set to the lowest temperature.

13.3 Test SET-UP

Temperature Chamber Antenna EUT Spectrum analyzer Variable AC Power Supply

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



13.4 Measurement Equipment Used:

SGS Conducted Room							
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Spectrum Analyzer	R&S	FSV-30	101398	Feb. 01st, 2018	Jan. 31th, 2019		
DC Power Supply	Anritsu	E3640A	MY52410006	Feb. 01st, 2018	Jan. 31th, 2019		
Temperature Chamber	TERCHY	MHG-120LF	911009	Feb. 01st, 2018	Jan. 31th, 2019		
Attenuator	Mini-Circuit	BW-S10W2+	2	Nov. 28tg, 2017	Nov. 27th, 2018		
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019		
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019		
Notebook	Lenovo	L430	R9-WGNK5	Jan. 02nd, 2018	Jan. 01st, 2019		



13.5 Measurement Result

Startup:

Operation Mode Temperature Humidity		802.11 a		Test Date	2018.09.13
		:23 ℃		Test By	Gary
		:68 %		•	-
Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180	5,179.99335	0.00000128
		44	5220	5,220.00680	-0.00000130
		48	5240	5,240.00206	-0.0000039
		52	5260	5,259.99751	0.00000047
		60	5300	5,299.99772	0.00000043
	4.29V	64	5320	5,320.00463	-0.00000087
		100	5500	5,500.00918	-0.00000167
		116	5580	5,579.99452	0.0000098
		140	5700	5,700.00588	-0.00000103
-10 °C		36	5180	5,179.99862	0.00000027
		44	5220	5,219.99415	0.00000112
		48	5240	5,239.99528	0.00000090
		52	5260	5,259.99637	0.0000069
		60	5300	5,300.00970	-0.00000183
	3.51V	64	5320	5,320.00142	-0.00000027
		100	5500	5,499.99668	0.0000060
		116	5580	5,579.99867	0.0000024
		140	5700	5,699.99363	0.00000112
		36	5180	5,180.00206	-0.00000040
		44	5220	5,220.00280	-0.00000054
		48	5240	5,240.00238	-0.00000045
		52	5260	5,260.00474	-0.00000090
		60	5300	5,299.99619	0.00000072
25 °C	3.8V	64	5320	5,319.99091	0.00000171
-		100	5500	5,499.99200	0.00000146
		116	5580	5,580.00346	-0.00000062
		140	5700	5,700.00199	-0.0000035



		36	5180	5,179.99166	0.00000161
		44	5220	5,220.00974	-0.00000187
		48	5240	5,240.00653	-0.00000125
		52	5260	5,260.00783	-0.00000149
		60	5300	5,300.00391	-0.00000074
		64	5320	5,319.99123	0.00000165
	4.29V	100	5500	5,499.99546	0.0000083
		116	5580	5,580.00072	-0.00000013
		140	5700	5,699.99032	0.00000170
55 ℃		36	5180	5,180.00785	-0.00000151
		44	5220	5,220.00771	-0.00000148
		48	5240	5,240.00076	-0.00000015
		52	5260	5,259.99863	0.00000026
		60	5300	5,300.00804	-0.00000152
	3.51V	64	5320	5,320.00208	-0.00000039
		100	5500	5,499.99782	0.00000040
		116	5580	5,580.00020	-0.00000004
		140	5700	5,700.00039	-0.00000007

Operation Mode		802.11 n_HT40		Test Date	2018.09.13
Temperature		: 23 ℃		Test By	Gary
Humidity		:68 %			•
Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,190.00645	-0.00000124
	4.29V	46	5230	5,229.99261	0.00000141
		54	5270	5,269.99578	0.00000080
		62	5310	5,310.00887	-0.00000167
		102	5510	5,510.00765	-0.00000139
		110	5550	5,550.00685	-0.00000123
-10 °C		134	5670	5,669.99236	0.00000135
		38	5190	5,190.00552	-0.00000106
		46	5230	5,229.99507	0.00000094
		54	5270	5,270.00604	-0.00000115
	3.51V	62	5310	5,310.00439	-0.0000083
		102	5510	5,509.99503	0.00000090
		110	5550	5,549.99334	0.00000120
		134	5670	5,669.99685	0.00000056



		38	5190	5,189.99694	0.00000059
		46	5230	5,229.99049	0.00000182
		54	5270	5,269.99235	0.00000145
25 ℃	3.8V	62	5310	5,309.99283	0.00000135
		102	5510	5,510.00464	-0.00000084
		110	5550	5,550.00220	-0.00000040
		134	5670	5,670.00677	-0.00000119
		38	5190	5,189.99752	0.00000048
	4.29V	46	5230	5,229.99348	0.00000125
		54	5270	5,270.00995	-0.00000189
		62	5310	5,309.99743	0.00000048
		102	5510	5,509.99831	0.00000031
		110	5550	5,549.99944	0.00000010
		134	5670	5,669.99314	0.00000121
55 °C		38	5190	5,190.00975	-0.00000188
		46	5230	5,230.00517	-0.00000099
		54	5270	5,270.00802	-0.00000152
	3.51V	62	5310	5,310.00055	-0.00000010
		102	5510	5,510.00610	-0.00000111
		110	5550	5,549.99320	0.00000122
		134	5670	5,670.00093	-0.00000016



Operation Mode Temperature		802.11 ac_VHT8	30	Test Date	2018.09.13
		:23 ℃		Test By	Gary
Humidity		:68 %			
Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00234	-0.00000045
	4.29V	58	5290	5,290.00699	-0.00000132
		106	5530	5,529.99146	0.00000155
-10 °C		122	5610	5,609.99432	0.00000101
		42	5210	5,209.99433	0.00000109
	3.51V	58	5290	5,289.99917	0.00000016
		106	5530	5,530.00236	-0.00000043
		122	5610	5,610.00320	-0.00000057
		42	5210	5,210.00325	-0.00000062
		58	5290	5,289.99661	0.00000064
25 °C	3.8V	106	5530	5,530.00403	-0.00000073
		122	5610	5,609.99400	0.00000107
		42	5210	5,210.00823	-0.00000158
		58	5290	5,289.99126	0.00000165
	4.29V	106	5530	5,530.00824	-0.00000149
		122	5610	5,610.00288	-0.00000051
55 °C		42	5210	5,210.00530	-0.00000102
		58	5290	5,290.00465	-0.00000088
	3.51V	106	5530	5,529.99954	0.00000008
		122	5610	5,610.00841	-0.00000150



2 minutes:

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180	5,179.99690	0.00000060
		44	5220	5,219.99118	0.00000169
		48	5240	5,240.00340	-0.00000065
		52	5260	5,260.00832	-0.00000158
		60	5300	5,299.99968	0.0000006
	4.29V	64	5320	5,320.00874	-0.00000164
		100	5500	5,499.99660	0.00000062
		116	5580	5,579.99329	0.00000120
		140	5700	5,700.00493	-0.00000086
-10 °C		36	5180	5,179.99694	0.00000059
		44	5220	5,220.00802	-0.00000154
		48	5240	5,239.99818	0.0000035
		52	5260	5,260.00111	-0.00000021
		60	5300	5,299.99721	0.00000053
	3.51V	64	5320	5,319.99796	0.0000038
		100	5500	5,500.00374	-0.00000068
		116	5580	5,579.99906	0.00000017
		140	5700	5,700.00667	-0.00000117
		36	5180	5,179.99419	0.00000112
		44	5220	5,220.00033	-0.00000006
		48	5240	5,239.99306	0.00000132
25 ℃		52	5260	5,260.00924	-0.00000176
	3.8V	60	5300	5,299.99177	0.00000155
		64	5320	5,320.00293	-0.00000055
		100	5500	5,499.99426	0.00000104
		116	5580	5,580.00311	-0.00000056
		140	5700	5,699.99069	0.00000163



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		36	5180	5,180.00202	-0.00000039
		44	5220	5,219.99215	0.00000150
		48	5240	5,239.99139	0.00000164
		52	5260	5,260.00009	-0.00000002
		60	5300	5,299.99813	0.0000035
		64	5320	5,320.00174	-0.00000033
	4.29V	100	5500	5,500.00166	-0.00000030
		116	5580	5,579.99215	0.00000141
		140	5700	5,700.00508	-0.00000089
55 °C		36	5180	5,179.99535	0.00000090
		44	5220	5,220.00613	-0.00000117
		48	5240	5,239.99565	0.0000083
		52	5260	5,260.00264	-0.00000050
		60	5300	5,299.99032	0.00000183
	3.51V	64	5320	5,319.99782	0.00000041
		100	5500	5,499.99888	0.00000020
		116	5580	5,580.00088	-0.00000016
		140	5700	5,699.99522	0.00000084
-					

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,190.00705	-0.00000136
		46	5230	5,230.00945	-0.00000181
		54	5270	5,270.00042	-0.00000008
		62	5310	5,309.99850	0.00000028
	4.29V	102	5510	5,509.99811	0.00000034
		110	5550	5,549.99592	0.00000074
		134	5670	5,669.99821	0.00000032
-10 °C		38	5190	5,189.99850	0.00000029
		46	5230	5,230.00196	-0.00000038
		54	5270	5,269.99602	0.00000076
		62	5310	5,310.00231	-0.00000044
	3.51V	102	5510	5,510.00183	-0.0000033
		110	5550	5,550.00100	-0.00000018
		134	5670	5,669.99680	0.00000057



		38	5190	5,189.99498	0.00000097
		46	5230	5,229.99446	0.00000106
		54	5270	5,269.99110	0.00000169
25 °C	3.8V	62	5310	5,310.00659	-0.00000124
		102	5510	5,510.00548	-0.00000099
		110	5550	5,550.00381	-0.00000069
		134	5670	5,670.00170	-0.00000030
		38	5190	5,190.00890	-0.00000172
		46	5230	5,230.00736	-0.00000141
	4.29V	54	5270	5,270.00645	-0.00000122
		62	5310	5,310.00388	-0.00000073
		102	5510	5,509.99289	0.00000129
		110	5550	5,549.99461	0.00000097
		134	5670	5,669.99772	0.00000040
55 °C	3.51V	38	5190	5,189.99679	0.00000062
		46	5230	5,230.00164	-0.00000031
		54	5270	5,270.00434	-0.00000082
		62	5310	5,309.99302	0.00000132
		102	5510	5,509.99980	0.00000004
		110	5550	5,549.99290	0.00000128
		134	5670	5,670.00711	-0.00000125



Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,209.99370	0.00000121
		58	5290	5,289.99079	0.00000174
	4.29V	106	5530	5,529.99260	0.00000134
-10 °C		122	5610	5,610.00742	-0.00000132
		42	5210	5,210.00857	-0.00000164
		58	5290	5,290.00817	-0.00000154
	3.51V	106	5530	5,529.99631	0.0000067
		122	5610	5,609.99209	0.00000141
		42	5210	5,209.99424	0.00000110
		58	5290	5,289.99021	0.00000185
25 °C	3.8V	106	5530	5,529.99017	0.00000178
		122	5610	5,610.00544	-0.00000097
		42	5210	5,210.00766	-0.00000147
		58	5290	5,289.99995	0.00000001
	4.29V	106	5530	5,529.99805	0.0000035
		122	5610	5,610.00605	-0.00000108
55 °C		42	5210	5,209.99489	0.0000098
		58	5290	5,290.00418	-0.00000079
	3.51V	106	5530	5,530.00785	-0.00000142
		122	5610	5,609.99567	0.00000077



5 minutes

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency	Spectrum Frequency	ΔFrequency (MHz)
			(MHz)	(MHz)	, , ,
		36	5180	5,179.99756	0.00000047
		44	5220	5,220.00461	-0.0000088
		48	5240	5,240.00652	-0.00000124
		52	5260	5,259.99506	0.00000094
		60	0	5,299.99605	0.00000074
	4.29V	64	5320	5,319.99665	0.0000063
		100	5500	5,500.00942	-0.00000171
		116	5580	5,579.99994	0.00000001
		140	5700	5,699.99681	0.00000056
-10 ℃		36	5180	5,180.00449	-0.0000087
		44	5220	5,220.00660	-0.00000126
		48	5240	5,240.00305	-0.00000058
		52	5260	5,259.99903	0.00000018
		60	5300	5,300.00930	-0.00000176
	3.51V	64	5320	5,319.99428	0.00000108
		100	5500	5,499.99790	0.0000038
		116	5580	5,580.00665	-0.00000119
		140	5700	5,700.00007	-0.00000001
		36	5180	5,179.99682	0.00000061
		44	5220	5,220.00775	-0.00000149
		48	5240	5,240.00300	-0.00000057
25 °C		52	5260	5,260.00848	-0.00000161
		60	5300	5,300.00699	-0.00000132
	3.8V	64	5320	5,319.99640	0.0000068
		100	5500	5,500.00598	-0.00000109
		116	5580	5,579.99924	0.00000014
		140	5700	5,699.99401	0.00000105



		36	5180	5,179.99156	0.00000163
		44	5220	5,219.99380	0.00000119
		48	5240	5,239.99931	0.0000013
		52	5260	5,259.99130	0.00000165
		60	5300	5,300.00604	-0.00000114
		64	5320	5,319.99892	0.00000020
	4.29V	100	5500	5,499.99339	0.00000120
		116	5580	5,579.99533	0.0000084
		140	5700	5,700.00937	-0.00000164
55 °C		36	5180	5,180.00296	-0.00000057
		44	5220	5,219.99183	0.00000157
		48	5240	5,240.00934	-0.00000178
		52	5260	5,260.00297	-0.00000057
		60	5300	5,300.00543	-0.00000102
	3.51V	64	5320	5,319.99098	0.00000169
		100	5500	5,499.99884	0.00000021
		116	5580	5,580.00518	-0.00000093
		140	5700	5,699.99881	0.00000021

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	: 23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,189.99626	0.00000072
		46	5230	5,229.99048	0.00000182
		54	5270	5,269.99053	0.00000180
	4.29V	62	5310	5,309.99420	0.00000109
		102	5510	5,509.99166	0.00000151
		110	5550	5,549.99905	0.00000017
		134	5670	5,670.00937	-0.00000165
-10 ℃		38	5190	5,189.99092	0.00000175
	3.51V	46	5230	5,229.99257	0.00000142
		54	5270	5,270.00199	-0.00000038
		62	5310	5,309.99496	0.00000095
		102	5510	5,510.00054	-0.00000010
		110	5550	5,550.00511	-0.00000092
		134	5670	5,670.00470	-0.00000083



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		38	5190	5,190.00597	-0.00000115
		46	5230	5,230.00619	-0.00000118
		54	5270	5,270.00199	-0.00000038
		62	5310	5,309.99125	0.00000165
25 °C	3.8V	102	5510	5,510.00484	-0.00000088
		110	5550	5,549.99238	0.00000137
		134	5670	5,670.00560	-0.00000099
		38	5190	5,190.00412	-0.00000079
		46	5230	5,229.99774	0.00000043
		54	5270	5,269.99068	0.00000177
	4.29V	62	5310	5,310.00734	-0.00000138
		102	5510	5,510.00078	-0.00000014
		110	5550	5,549.99088	0.00000164
		134	5670	5,670.00690	-0.00000122
55 °C		38	5190	5,189.99340	0.00000127
		46	5230	5,230.00420	-0.00000080
		54	5270	5,270.00374	-0.00000071
		62	5310	5,309.99623	0.00000071
	3.51V	102	5510	5,509.99339	0.00000120
		110	5550	5,549.99742	0.00000047
		134	5670	5,670.00692	-0.00000122



Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	: 23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00938	-0.00000180
		58	5290	5,290.00362	-0.00000068
	4.29V	106	5530	5,529.99505	0.00000090
		122	5610	5,610.00101	-0.00000018
-10 °C		42	5210	5,210.00990	-0.00000190
		58	5290	5,290.00643	-0.00000122
	3.51V	106	5530	5,529.99882	0.00000021
		122	5610	5,609.99150	0.00000152
		42	5210	5,210.00469	-0.00000090
		58	5290	5,290.00973	-0.00000184
25 °C	3.8V	106	5530	5,530.00131	-0.00000024
		122	5610	5,609.99847	0.00000027
		42	5210	5,209.99682	0.00000061
		58	5290	5,289.99960	0.0000008
	4.29V	106	5530	5,530.00522	-0.00000094
55 °C		122	5610	5,610.00695	-0.00000124
		42	5210	5,210.00746	-0.00000143
		58	5290	5,289.99632	0.00000070
	3.51V	106	5530	5,529.99306	0.00000125
		122	5610	5,610.00757	-0.00000135



10 minutes:

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	: 23 °C	Test By	Gary
Humidity	:68 %		

			Measured	Spectrum	ΔFrequency
Test Temp.	Test Voltage	Channel	Frequency (MHz)	Frequency (MHz)	(MHz)
		36	5180	5,180.00885	-0.00000171
		44	5220	5,219.99417	0.00000112
		48	5240	5,239.99995	0.00000001
		52	5260	5,260.00092	-0.00000017
		60	5300	5,299.99813	0.0000035
	4.29V	64	5320	5,320.00922	-0.00000173
		100	5500	5,500.00381	-0.00000069
		116	5580	5,579.99048	0.00000171
		140	5700	5,700.00366	-0.00000064
-10 °C		36	5180	5,180.00075	-0.00000014
		44	5220	5,220.00890	-0.00000171
		48	5240	5,240.00613	-0.00000117
		52	5260	5,260.00305	-0.00000058
		60	5300	5,299.99112	0.00000168
	3.51V	64	5320	5,319.99257	0.00000140
		100	5500	5,499.99089	0.00000166
		116	5580	5,579.99016	0.00000176
		140	5700	5,700.00469	-0.00000082
		36	5180	5,179.99084	0.00000177
		44	5220	5,220.00857	-0.00000164
		48	5240	5,240.00227	-0.00000043
		52	5260	5,260.00465	-0.00000088
		60	5300	5,300.00586	-0.00000111
25 ℃	3.8V	64	5320	5,320.00483	-0.00000091
		100	5500	5,500.00686	-0.00000125
		116	5580	5,580.00109	-0.00000019
		140	5700	5,699.99203	0.00000140



		36	5180	5,180.00161	-0.00000031
		44	5220	5,220.00261	-0.00000050
				,	-
		48	5240	5,240.00407	-0.00000078
		52	5260	5,260.00493	-0.00000094
		60	5300	5,299.99758	0.00000046
		64	5320	5,319.99169	0.00000156
	4.29V	100	5500	5,499.99509	0.0000089
		116	5580	5,579.99564	0.00000078
		140	5700	5,699.99339	0.00000116
55 °C		36	5180	5,180.00595	-0.00000115
		44	5220	5,220.00289	-0.00000055
		48	5240	5,239.99094	0.00000173
		52	5260	5,260.00594	-0.00000113
		60	5300	5,300.00426	-0.00000080
	3.51V	64	5320	5,319.99822	0.0000034
		100	5500	5,500.00473	-0.00000086
		116	5580	5,579.99146	0.00000153
		140	5700	5,700.00814	-0.00000143

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,189.99211	0.00000152
		46	5230	5,229.99132	0.00000166
	4.29V	54	5270	5,270.00864	-0.00000164
		62	5310	5,310.00030	-0.00000006
-10 °C		102	5510	5,509.99446	0.00000100
		110	5550	5,550.00057	-0.00000010
		134	5670	5,669.99249	0.00000132
	3.51V	38	5190	5,190.00102	-0.00000020
		46	5230	5,230.00659	-0.00000126
		54	5270	5,270.00895	-0.00000170
		62	5310	5,309.99194	0.00000152
		102	5510	5,510.00433	-0.00000079
		110	5550	5,550.00387	-0.00000070
		134	5670	5,669.99995	0.00000001



		38	5190	5,189.99773	0.00000044
		46	5230	5,229.99572	0.0000082
		54	5270	5,269.99424	0.00000109
		62	5310	5,310.00158	-0.00000030
25 °C	3.8V	102	5510	5,509.99656	0.00000062
		110	5550	5,550.00585	-0.00000105
		134	5670	5,669.99791	0.0000037
		38	5190	5,189.99254	0.00000144
		46	5230	5,229.99613	0.00000074
		54	5270	5,270.00591	-0.00000112
		62	5310	5,309.99768	0.00000044
	4.29V	102	5510	5,510.00211	-0.00000038
		110	5550	5,549.99846	0.00000028
		134	5670	5,669.99240	0.00000134
55 °C		38	5190	5,189.99014	0.00000190
		46	5230	5,229.99083	0.00000175
		54	5270	5,270.00768	-0.00000146
		62	5310	5,310.00061	-0.00000012
	3.51V	102	5510	5,509.99509	0.0000089
		110	5550	5,550.00717	-0.00000129
		134	5670	5,670.00426	-0.00000075



Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00254	-0.00000049
		58	5290	5,289.99872	0.0000024
	4.29V	106	5530	5,530.00938	-0.00000170
-10 °C		122	5610	5,609.99031	0.00000173
		42	5210	5,209.99754	0.00000047
		58	5290	5,290.00512	-0.00000097
	3.51V	106	5530	5,529.99910	0.00000016
		122	5610	5,609.99460	0.00000096
		42	5210	5,210.00470	-0.00000090
		58	5290	5,289.99762	0.00000045
25 ℃	3.8V	106	5530	5,529.99489	0.00000092
		122	5610	5,610.00339	-0.00000060
		42	5210	5,210.00766	-0.00000147
		58	5290	5,290.00509	-0.00000096
	4.29V	106	5530	5,529.99669	0.00000060
55 °C		122	5610	5,609.99933	0.00000012
		42	5210	5,209.99638	0.00000070
		58	5290	5,290.00781	-0.00000148
	3.51V	106	5530	5,530.00108	-0.00000020
		122	5610	5,609.99333	0.00000119



14 ANTENNA REQUIREMENT

14.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

14.2 Antenna Connected Construction

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

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