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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

**FCC Applicant:** Sharp Corporation, Mobile Communication B.U.

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739-0192, Japan

**FCC Manufacturer: Sharp Corporation** 

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**Product Name:** Smart phone **Report Number:** ER/2020/B0093 **FCC ID** APYHRO00291

**FCC Rule Part:** §15.407, Cat: U-NII **Issue Date:** December 23, 2020

Date of Test: November 17, 2020 - December 16, 2020

Date of EUT Re-

November 17, 2020 ceived:

# We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT 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.

Approved By:

Blue Yang / Asst. Manager





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Revision History				
Report Number	Revision	Description	Issue Date	Remark
ER/2020/B0093	Rev.00	Original.	December 23, 2020	Revised By: Elle Chang

#### Note:

### 1 · Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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### **GENERAL INFORMATION**

#### **Product Description** 1.1

Product Nan	ne:	Smart phone	
Hardware Version: DVT			
Software Version: N/A			
Power Supply: 3.85 Vdc from Rechargeable Li-polymer Battery		ble Li-polymer Battery	
Modulation type  64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Antenna Des	Inverted-F Antenna, 5150~5250MHz Gain: -2.20dBi enna Designation: 5250~5350MHz Gain: -2.20dBi 5470~5725MHz Gain: -2.40dBi 5725~5850MHz Gain: -5.10dBi		20dBi 40dBi
Transition Rate:	802.11 n_2	6/9/12/18/24/36/48/54 Mbps 20MHz: 6.5 – 72.2Mbps 40MHz: 13.5 - 150.0Mbps	802.11 ac_20MHz: 6.5 -86.7Mbps 802.11 ac_40MHz: 13.5 -200.0Mbps 802.11 ac_80MHz: 29.3 - 433.3Mbps

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#### 1.2 **FCC** worst power

oo worst p		1		
Wi-Fi 802.11	Frequency Range(MHz)	Channels	Rated Power (Avg.) (dBm) (Worst case)	Modulation Technology
	5150~5250	4	11.85	
0	5250~5350	4	11.84	OFDM
а	5470~5725	12	11.91	OFDIVI
	5725-5850	5	11.81	
	5150~5250	4	HT: 11.92 (Worst Case)	
n_HT	5250~5350	4	HT: 11.82 (Worst Case)	OFDM
ac_VHT 20M	5470~5725	12	HT: 11.91 (Worst Case)	OFDIVI
	5725-5850	5	HT: 11.74 (Worst Case)	
	5150~5250	2	HT: 11.77 (Worst Case)	
n_HT	5250~5350	2	HT: 11.72 (Worst Case)	OFDM
ac_VHT 40M	5470~5725	5	HT: 11.82 (Worst Case)	OFDIVI
	5725-5850	2	HT: 10.56 (Worst Case)	
ac_VHT 80M	5150~5250	1	11.92	
	5250~5350	1	11.96	OFDM
	5470~5725	2	11.98	OFDIVI
	5725-5850	1	11.65	

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#### 1.3 **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

#### 1.4 **Test Facility**

SGS Taiwan Ltd. Central RF Lab (TAF code 3702) No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

FCC Designation number: TW0027

#### 1.5 **Special Accessories**

There are no special accessories used while test was conducted.

#### 1.6 **Equipment Modifications**

There was no modification incorporated into the EUT.

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### SYSTEM TEST CONFIGURATION

#### **EUT Configuration** 2.1

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

#### 2.2 **EUT Exercise**

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

#### 2.3 **Test Procedure**

#### 2.3.1 **Conducted Emissions**

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

#### 2.3.2 Conducted Test (RF)

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

#### 2.3.3 **Radiated Emissions**

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

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#### **Measurement Results Explanation Example** 2.4

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

Radiated emission below 30MHz is measured in a 9m\*9m\*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

#### 2.4.2 For all conducted test items:

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

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#### **Configuration of Tested System** 2.5

### Fig. 2-1 Radiated Emission Configuration



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

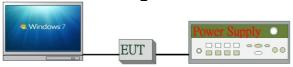


Fig. 2-3 Conducted (AC powerline) **Emission Configuration** 



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L430	PK-126TN	N/A	N/A
3.	Notebook	Lenovo	X250	PC-06A4E7	N/A	N/A
4.	Adapter	Sharp	XN-2QC25	NA	N/A	N/A
5.	Headphone	Panasonic	RP-HJS150-K	NA	N/A	N/A
6.	DC Power Sup- ply	Agilent	E3640A	MY40000811	N/A	N/A

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# **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 Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.205 §15.209 §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**

#### 4.1 802.11a/n/ac operated in U-NII Bands

# Operated band in 5150 MHz ~5250

20 M		
СН	Freq (MHz)	
36	5180	
40	5200	
44	5220	
48	5240	

1911 12.		
40 M		
СН	Freq (MHz)	
38	5190	
46	5230	
	<b>4</b> CH 38	

80	M
СН	Freq (MHz)
42	5210

# Operated band in 5250 MHz ~5350 MHz:

	•	
20 M		
СН	Freq (MHz)	
52	5260	
56	5280	
60	5300	
64	5320	

40 M		
CH	Freq (MHz)	
54	5270	
62	5310	

80 M		
СН	Freq (MHz)	
58	5290	

# Operated band in 5470 MHz ~5725 MHz:

20 M					
СН	Freq (MHz)				
100	5500				
104	5520				
108	5540				
112	5560				
116	5580				
120	5600				
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				
144	5720				

4	0 M
СН	Freq (MHz)
102	5510
110	5550
118	5590
126	5630
134	5670
142	5710

80 M					
СН	Freq (MHz)				
106	5530				
122	5610				
138	5690				

# Operated band in 5745 MHz ~5850 мн.

20 M				
СН	Freq (MHz)			
149	5745			
153	5765			
157	5785			
161	5805			
165	5825			

1711 12.				
40 M				
CH Freq (MHz)				
151	5755			
159 5795				

80 M				
СН	Freq (MHz)			
155	5775			

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#### 4.2 The Worst Test Modes and Channel Details

- 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. The gevin UE is pre-scanned among below modes.

Modulation	Tı	ansmiss	sion Chair	า	Single Transmission Spatial	Multiple Transmission Spatial
⊠ 802.11 a	⊠ Ch0	□ Ch1 □ Ch2 □ Ch3		⊠ 1TX	□ 2TX	
⊠ 802.11 n	⊠ Ch0	☐ Ch1	☐ Ch2	□ Ch3	⊠ SISO	☐ MIMO
⊠ 802.11 ac	⊠ Ch0	☐ Ch1	☐ Ch2	□ Ch3	⊠ SISO	☐ MIMO

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

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### **RADIATED EMISSION TEST:**

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
WIODE	BAND (MHz)	CHANNEL	CHANNEL	INIODOLATION	(Mbps)	PORT
	5180~5240	36 to 48	44			
802.11a	5260~5320	52 to 64	60	OFDM	6	ch0
002.11a	5500~5720	100 to 144	116	OFDIVI	0	CHO
	5745~5825	149 to 165	157			

#### 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 E2 position was reported.

RADIATED EMISSION TEST (ABOVE 1 GHz)							
MODE	FREQUENCY	AVAILABLE	TESTED	MODUL ATION	DATA RATE	ANTENNA	
MODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	(Mbps)	PORT	
	5180~5240	36 to 48	36,44,48				
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	ch0	
002.11a	5500~5720	100 to 144	100,116,140,144	OI DIVI	O	CHO	
	5745~5825	149 to 165	149,157,165				
	5180~5240	36 to 48	36,44,48		MCS0	ch0	
802.11n_HT20	5260~5320	52 to 64	52,60,64	OFDM			
002.1111_11120	5500~5720	100 to 144	100,116,140,144				
	5745~5825	149 to 165	149,157,165				
	5190~5230	38 to 46	38,46		DM MCS0	ch0	
802.11n HT40	5270~5310	54 to 62	54,62	OFDM			
002.1111_11140	5510~5670	102 to 142	102,110,134,142	OI DIVI			
	5755~5795	151 to 159	151,159				
	5210	42	42	OFDM			
802.11ac_VHT80	5290	58	58		OFDM MCS0	MCSO	ahn
002.11ac_v11100	5530~5610	106 to 138	106,122,138			IVICOU	ch0
	5775	155	155				

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#### 4.2.2 ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST						
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA	
IVIODE	BAND (MHz)	CHANNEL	CHANNEL	IVIODOLATION	(Mbps)	PORT	
	5180~5240	36 to 48	36,44,48				
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	ch0	
002.11a	5500~5720	100 to 144	100,116,140,144	OFDIVI	0	CHO	
	5745~5825	149 to 165	149,157,165				
	5180~5240	36 to 48	36,44,48	OFDM	MCS0		
802.11n_HT20	5260~5320	52 to 64	52,60,64			ch0	
002.1111_F1120	5500~5720	100 to 144	100,116,140,144				
	5745~5825	149 to 165	149,157,165				
	5190~5230	38 to 46	38,46			ch0	
802.11n HT40	5270~5310	54 to 62	54,62	OFDM	DM MCS0		
002.1111_11140	5510~5670	102 to 142	102,110,134,142	OFDIVI	IVICOU		
	5755~5795	151 to 159	151,159				
	5210	42	42	OFDM			
802.11ac_VHT80	5290	58	58		OFDM MCS0	MCCO	ch0
002.11aC_VT100	5530~5610	106 to 138	106,122,138			IVICOU	CIIU
	5775	155	155				

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# **MEASUREMENT UNCERTAINTY**

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Meas- urement	+/- 0.96 dB
Peak Power Spectral Density Meas- urement	+/- 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					
	9kHz~30MHz: +-2.3dB				
	30MHz - 180MHz: +/- 3.37dB				
Polarization: Vertical	180MHz -417MHz: +/- 3.19dB				
Polarization. Vertical	0.417GHz-1GHz: +/- 3.19dB				
	1GHz - 18GHz: +/- 4.04dB				
	18GHz - 40GHz: +/- 4.04dB				
	9kHz~30MHz: +-2.3dB				
	30MHz - 167MHz: +/- 4.22dB				
Polarization: Horizontal	167MHz -500MHz: +/- 3.44dB				
Polarization: Horizontal	0.5GHz-1GHz: +/- 3.39dB				
	1GHz - 18GHz: +/- 4.08dB				
	18GHz - 40GHz: +/- 4.08dB				

#### Note:

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

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### CONDUCTED EMISSION TEST

### 6.1 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

#### 6.2 **Measurement Equipment Used**

Conducted Emission Test Site										
EQUIPMENT Type	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.					
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021					
LISN	SCHWARZBECK	NSLK 8127	8127-465	04/09/2020	04/08/2021					
Coaxial Cables	N/A	Coaxial Cable	161207	12/07/2019	12/06/2020					
Test Software	audix	e3	Ver. 6.11- 20180413	N.C.R	N.C.R					

#### **EUT Setup** 6.3

- 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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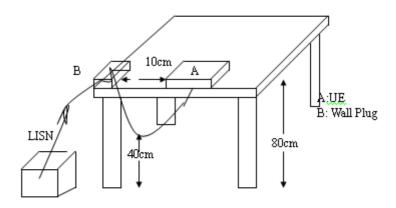
<sup>1.</sup> The lower limit shall apply at the transition frequencies

<sup>2.</sup> The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50



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#### 6.4 **Test SET-UP**



#### 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

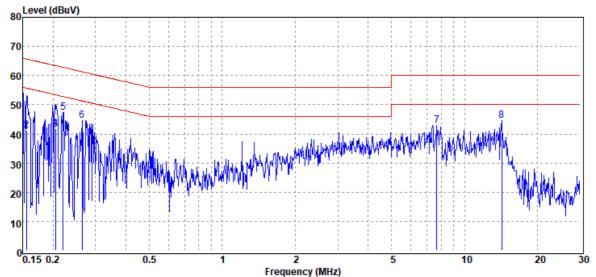
Report Number :ER-2020-B0093 Test Site :Conduction 6F

**Test Mode** :2020-12-05 :WLAN 5G **Test Date** 

Power :AC 120V/60Hz Temp./Humi. :23.7/56

Probe :L Engineer :Neo

Note:



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.16	Average	38.47	2.14	40.61	55.69	-15.08
0.16	QP	39.14	2.14	41.28	65.69	-24.41
0.21	Average	39.27	2.14	41.41	53.40	-11.99
0.21	QP	39.68	2.14	41.82	63.40	-21.58
0.22	Peak	45.20	2.14	47.34	62.79	-15.45
0.26	Peak	42.44	2.14	44.58	61.29	-16.71
7.69	Peak	40.27	2.72	42.99	60.00	-17.01
14.21	Peak	41.49	2.96	44.45	60.00	-15.55

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Report Number :ER-2020-B0093

Test Mode :WLAN 5G

Power :AC 120V/60Hz

Probe :N

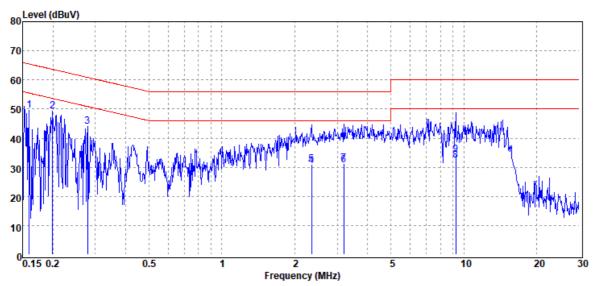
Note:

**Test Site** :Conduction 6F

**Test Date** :2020-12-05

Temp./Humi. :23.7/56

Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμ̈V	dB	dΒμV	dΒμV	dB
0.40	5 .	47.40	0.04	40.04	05.45	45.00
0.16	Peak	47.40	2.21	49.61	65.47	-15.86
0.20	Peak	47.06	2.21	49.27	63.62	-14.35
0.28	Peak	41.77	2.21	43.98	60.85	-16.87
2.35	Average	28.02	2.32	30.34	46.00	-15.66
2.35	QP	28.67	2.32	30.99	56.00	-25.01
3.19	Average	28.40	2.37	30.77	46.00	-15.23
3.19	QP	29.03	2.37	31.40	56.00	-24.60
9.25	Average	29.85	2.67	32.52	50.00	-17.48
9.25	QP	31.77	2.67	34.44	60.00	-25.56

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### **DUTY CYCLE TEST SIGNAL**

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

#### 7.1 **Measurement Procedure:**

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

**Duty Cycle:** 

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log ( 1/Duty Cycle )	1/T (kHz)	VBW setting (kHz)
802.11a	98.00	0.09	0.49	0.01
802.11n_20	98.00	0.09	0.53	0.01
802.11n_40	96.00	0.18	1.08	2.00
802.11ac_80	93.00	0.32	2.19	3.00

Duty Cycle Factor:  $10 * \log(1/0.98) = 0.09$ Duty Cycle Factor:  $10 * \log(1/0.98) = 0.09$ Duty Cycle Factor:  $10 * \log(1/0.96) = 0.18$ Duty Cycle Factor:  $10 * \log(1/0.93) = 0.32$ 

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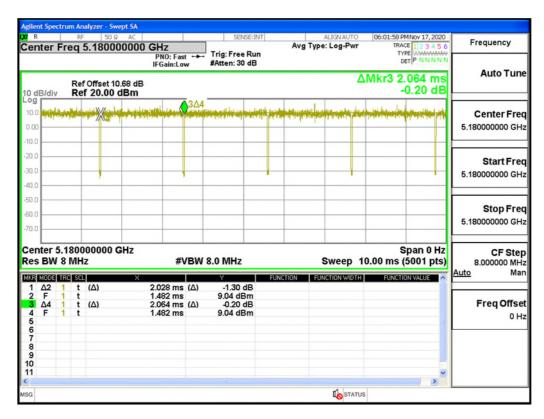
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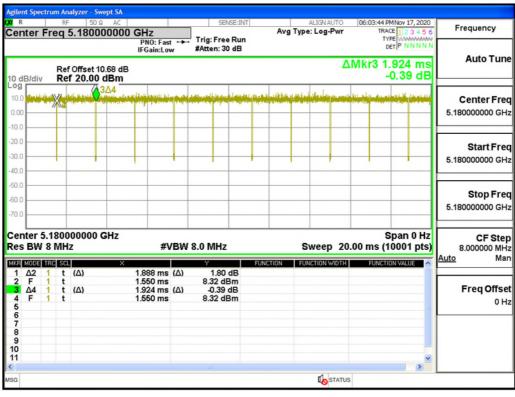
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### 7.2 DUTY CYCLE TEST SIGNAL MEASUREMENT RESULT

#### 802.11a



#### 802.11n HT20



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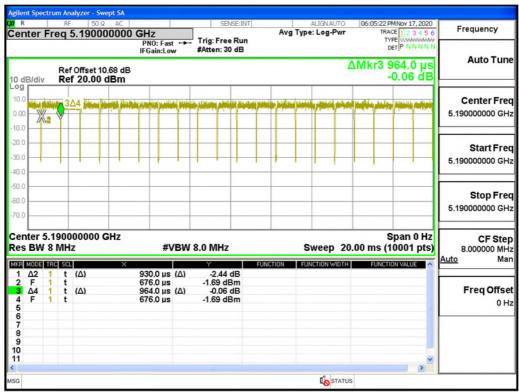
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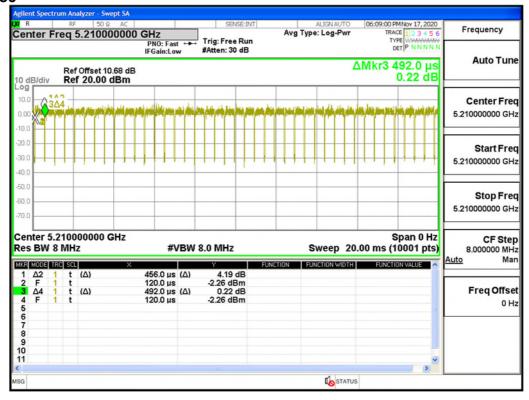


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#### 802.11n HT 40



#### 802.11 ac VHT 80



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### 26DB &6DB EMISSION BANDWIDTH MEASUREMENT

#### 8.1 Standard Applicable

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

#### 8.2 **Measurement Procedure**

- 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.
  - 3.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.

- 3.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.
- Repeat above procedures until all frequency of interest measured was complete.

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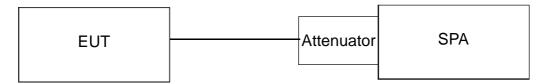


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#### 8.3 **Measurement Equipment Used**

SGS Conducted Room										
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due					
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020					
EXM Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/27/2020	06/26/2021					
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021					
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021					

#### 8.4 **Test Set-up**



#### 8.5 **Measurement Result**

#### 8.5.1 FCC 26dB Bandwidth

802.11a\_Ch0

802.11n\_HT20\_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.52	13.530	5180	22.98	13.610
5220	21.81	13.390	5220	22.74	13.570
5240	21.91	13.410	5240	23.00	13.620
5260	21.78	13.380	5260	23.09	13.630
5300	21.97	13.420	5300	22.89	13.600
5320	21.72	13.370	5320	22.67	13.550
5500	21.87	13.400	5500	22.94	13.610
5580	21.89	13.400	5580	22.85	13.590
5700	22.25	13.470	5700	22.58	13.540
5720	21.99	13.420	5720	22.73	13.570

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### 802.11n \_HT40\_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	802.11ac _VHT80_C	h0	
5190	42.40	16.270	Evo e	26dB	40 L (D)
5230	42.74	16.310	Freq. (MHz)	BW	10 Log (B) (dB)
5270	42.40	16.270	()	(MHz)	(ab)
5310	41.99	16.230	5210	85.40	19.310
5510	41.91	16.220	5290	84.46	19.270
5550	42.43	16.280	5530	85.74	19.330
5670	42.15	16.250	5610	85.21	19.300
5710	42.44	16.280	5690	85.11	19.300

#### 8.5.2 6dB Bandwidth (5725 MHz~ 5850 MHz) measure with Peak detector for FCC

802.11a\_Ch0 802.11n\_HT20\_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.39	12.150	5745	17.62	12.460
5785	16.40	12.150	5785	17.63	12.460
5825	16.39	12.150	5825	17.64	12.460

#### 802.11n\_HT40\_Ch0

F	6dB		802.11ac _VHT80_C	h0	
Freq. (MHz)	BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	DVV	10 Log (B) (dB)
5755	36.39	15.610	,	(MHz)	(42)
5795	36.40	15.610	5775	76.34	18.830

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#### 8.5.1 26dB BW Verification for DFS Function

802.11a\_Ch0

802.11n\_HT20\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.35	< 5250	5240	5248.94	< 5250
5745	5736.74	> 5725	5745	5736.13	> 5725

802.11n \_HT40\_Ch0

802.11ac \_VHT80\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.24	< 5250	5210	5248.06	< 5250
5755	5736.86	> 5725	5775	5737.15	> 5725

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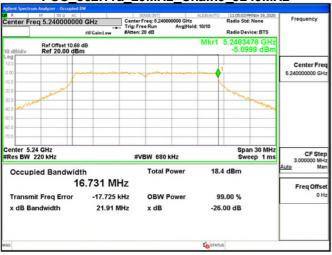
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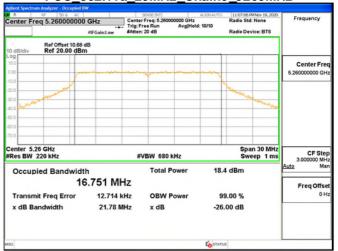
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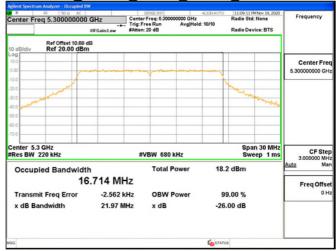
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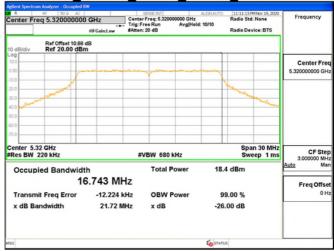
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### FCC 802.11a 20MHz Chain0 5300MHz



### FCC 802.11a 20MHz Chain0 5320MHz



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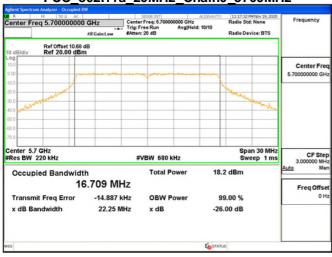
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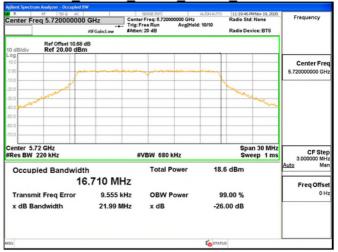
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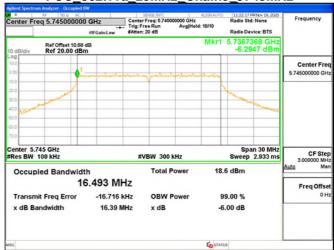
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#### FCC\_802.11a\_20MHz\_Chain0\_5720MHz



### FCC 802.11a 20MHz Chain0 5745MHz



### FCC 802.11a 20MHz Chain0 5785MHz

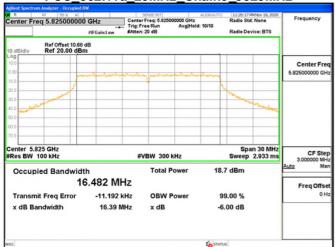


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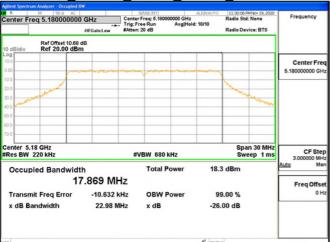


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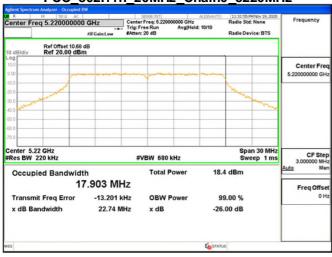
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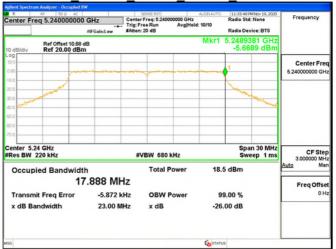
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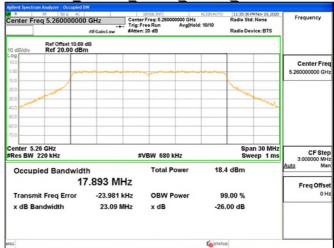
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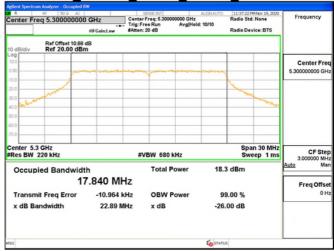
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### FCC 802.11n 20MHz Chain0 5260MHz



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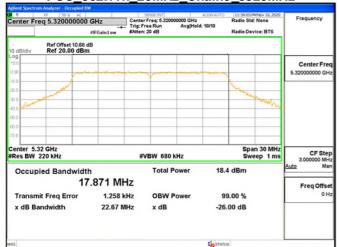


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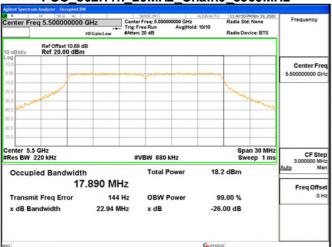


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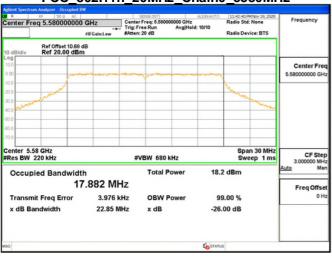
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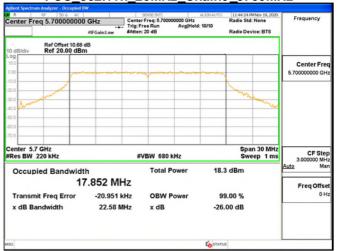
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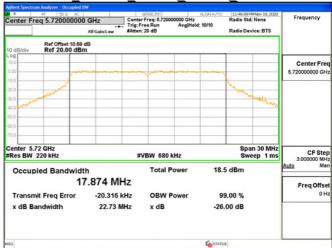
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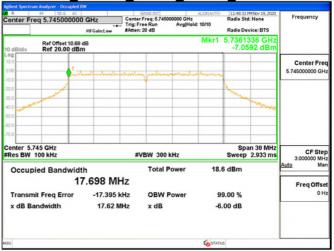
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### FCC 802.11n 20MHz Chain0 5745MHz

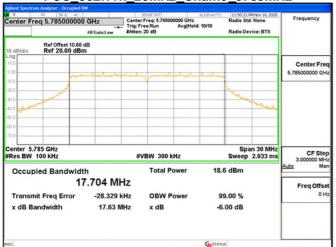


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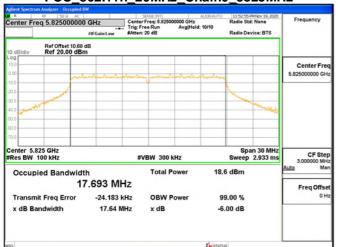


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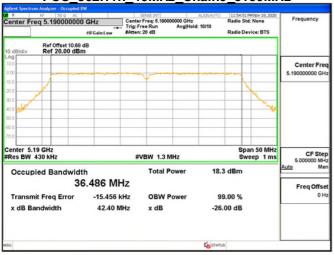
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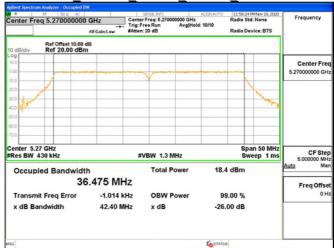
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#### FCC\_802.11n\_40MHz\_Chain0\_5230MHz



### FCC 802.11n 40MHz Chain0 5270MHz



### FCC 802.11n 40MHz Chain0 5310MHz

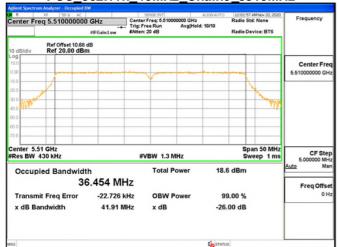


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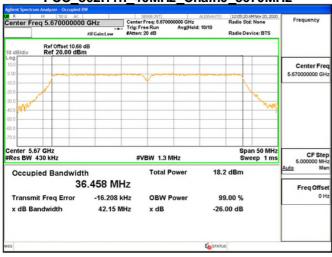
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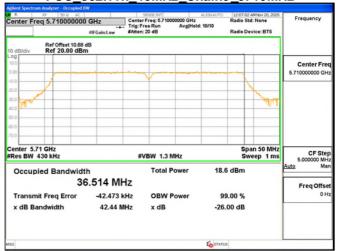
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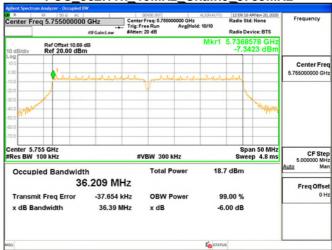
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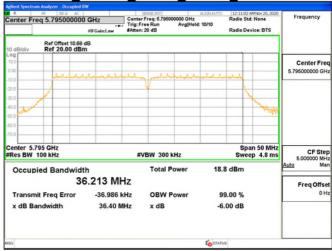
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### FCC 802.11n 40MHz Chain0 5755MHz



### FCC 802.11n 40MHz Chain0 5795MHz



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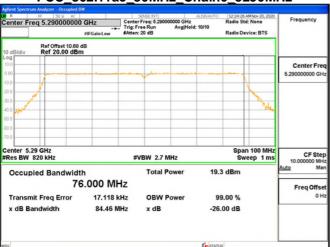


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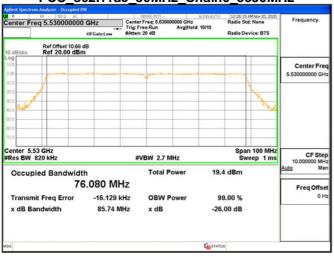
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### FCC 802.11ac 80MHz Chain0 5290MHz



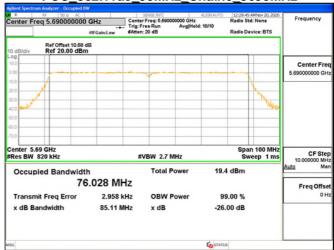
### FCC 802.11ac 80MHz Chain0 5530MHz



#### FCC\_802.11ac\_80MHz\_Chain0\_5610MHz



### FCC 802.11ac 80MHz Chain0 5690MHz



### FCC 802.11ac 80MHz Chain0 5775MHz



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### MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

#### 9.1 Standard Applicable

#### **FCC**

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 dBi.

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

#### 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 antenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- Record the max. reading and add 10 log(1/duty cycle). 5.
- Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

#### **Measurement Equipment Used** 9.3

SGS Conducted Room										
Name of Equipment	Manufacturer	Model	Serial Num-	Calibration	Calibration					
Name of Equipment	Manulaciulei	Model	ber	Date	Due					
Power Meter	Anritsu	ML2496A	1804001	02/20/2020	02/19/2021					
Power Sensor	Anritsu	MA2411B	1726104	02/20/2020	02/19/2021					
Power Sensor	Anritsu	MA2411B	1726107	02/20/2020	02/19/2021					
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020					
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021					

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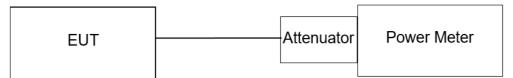
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#### **Test Set-up** 9.4



#### 9.5 **Measurement Result**

#### Conducted output power (FCC) 9.5.1

#### 802 11a Ch0

802.11a_	CIIO							
СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT	
36	5180	6	10.71	11.770		23.98		PASS
44	5220	6	11.85	15.303		23.98		PASS
48	5240	6	11.80	15.128		23.98		PASS
52	5260	6	11.84	15.268	23.98	or 11+10log(B) =	24.38	PASS
60	5300	6	11.61	14.480	23.98	or 11+10log(B) =	24.42	PASS
64	5320	6	10.60	11.476	23.98	or 11+10log(B) =	24.37	PASS
100	5500	6	10.67	11.662	23.98	or 11+10log(B) =	24.40	PASS
116	5580	6	11.91	15.516	23.98	or 11+10log(B) =	24.40	PASS
140	5700	6	10.98	12.525	23.98	or 11+10log(B) =	24.47	PASS
144	5720(U-NII 2C)	6	11.81	15.16	23.98	or 11+10log(B) =	24.42	PASS
144	5720 (U-NII 3)	6	11.81	15.16		30		PASS
149	5745	6	10.72	11.797		30		PASS
157	5785	6	11.81	15.163		30		PASS
165	5825	6	10.80	12.016		30		PASS

#### 802.11n HT20 Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	MCS0	10.67	11.662		23.98		PASS
44	5220	MCS0	11.92	15.552		23.98		PASS
48	5240	MCS0	11.86	15.338		23.98		PASS
52	5260	MCS0	11.82	15.198	23.98	or $11+10\log(B) =$	24.63	PASS
60	5300	MCS0	11.55	14.282	23.98	or 11+10log(B) =	24.60	PASS
64	5320	MCS0	10.96	12.467	23.98	or 11+10log(B) =	24.55	PASS
100	5500	MCS0	10.65	11.608	23.98	or $11+10\log(B) =$	24.61	PASS
116	5580	MCS0	11.91	15.516	23.98	or 11+10log(B) =	24.59	PASS
140	5700	MCS0	10.90	12.296	23.98	or $11+10\log(B) =$	24.54	PASS
144	5720(U-NII 2C)	MCS0	11.80	15.13	23.98	or 11+10log(B) =	24.57	PASS
144	5720 (U-NII 3)	MCS0	11.80	15.13		30		PASS
149	5745	MCS0	10.76	11.906		30		PASS
157	5785	MCS0	11.74	14.920		30		PASS
165	5825	MCS0	10.66	11.635		30		PASS

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#### 802.11n\_HT40\_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	10.97	12.495		23.98		PASS
46	5230	MCS0	11.77	15.022		23.98		PASS
54	5270	MCS0	11.72	14.850	23.98	or 11+10log(B) =	27.27	PASS
62	5310	MCS0	10.80	12.015	23.98	or 11+10log(B) =	27.23	PASS
102	5510	MCS0	10.81	12.043	23.98	or 11+10log(B) =	27.22	PASS
110	5550	MCS0	11.60	14.445	23.98	or 11+10log(B) =	27.28	PASS
134	5670	MCS0	10.56	11.369	23.98	or 11+10log(B) =	27.25	PASS
142	5710(U-NII 2C)	MCS0	11.82	15.20	23.98	or 11+10log(B) =	27.28	PASS
142	5710 (U-NII 3)	MCS0	11.82	15.20		30		PASS
151	5755	MCS0	10.51	11.239		30		PASS
159	5795	MCS0	10.56	11.369		30		PASS

#### 802.11ac VHT80 Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
42	5210	MCS0	11.92	15.542		23.98		PASS
58	5290	MCS0	11.69	14.741	23.98	or 11+10log(B) =	30.27	PASS
106	5530	MCS0	11.91	15.507	23.98	or 11+10log(B) =	30.33	PASS
122	5610	MCS0	11.59	14.405	23.98	or 11+10log(B) =	30.30	PASS
138	5690(U-NII 2C)	MCS0	11.98	15.76	23.98	or 11+10log(B) =	30.30	PASS
138	5690 (U-NII 3)	MCS0	11.98	15.76		30		PASS
155	5775	MCS0	11.65	14.606		30		PASS

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# 10 MAXIMUM POWER SPECTRAL DENSITY

#### 10.1 Standard Applicable

#### **FCC**

OPERZTION Band	EUT CATEGORY		LIMIT
		Access Point (Master device )	17dBm/ MHz
U-NII-1		Fixed point-to-point Access Ponit	TAUDITI/ IVII IZ
	<b>√</b>	Mobile and portable client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C	<b>√</b>		11dBm/ MHz
U-NII-3	<b>√</b>		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 greater than 6 dBi. Therefore, reduction of power is not required.

#### 10.2 **Measurement Procedure**

- 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 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=300kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto, detector = RMS or sample, traces 100 sweeps of video averaging.

Set RBW=500kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto, detector = RMS or sample, traces 100 sweeps of video averaging.

- 5. 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.

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#### 10.3 **Measurement Equipment Used**

SGS Conducted Room							
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
DC Power Sup- ply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020		
EXM Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/27/2020	06/26/2021		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021		

#### 10.4 **Test Set-up**



#### 10.5 **Measurement Result**

#### 10.5.1 **Power spectral density**

POWER DENSITY 802.11a MODE							
Frequency (MHz)	ch0 meas PSD	Maxmum Corr'd PSD	Limit	Margin (dB)			
5180.00	-2.17	-2.17	11.00 dBm/MHz	-13.17			
5220.00	-1.79	-1.79	11.00 dBm/MHz	-12.79			
5240.00	-1.57	-1.57	11.00 dBm/MHz	-12.57			
5260.00	-1.83	-1.83	11.00 dBm/MHz	-12.83			
5300.00	-1.87	-1.87	11.00 dBm/MHz	-12.87			
5320.00	-1.96	-1.96	11.00 dBm/MHz	-12.96			
5500.00	-2.15	-2.15	11.00 dBm/MHz	-13.15			
5580.00	-1.88	-1.88	11.00 dBm/MHz	-12.88			
5700.00	-1.90	-1.90	11.00 dBm/MHz	-12.90			
5720 (U-NII 2C)	-1.99	-1.99	11.00 dBm/MHz	-12.99			
5720 (U-NII 3)	-5.23	-5.23	30.00 dBm/500kHz	-35.23			
5745.00	-4.52	-4.52	30.00 dBm/500kHz	-34.52			
5785.00	-4.80	-4.80	30.00 dBm/500kHz	-34.80			
5825.00	-4.69	-4.69	30.00 dBm/500kHz	-34.69			

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POWER DENSITY 802.11n HT20 MODE							
Frequency (MHz)	ch0 meas PSD	Maxmum Corr'd PSD	Limit	Margin (dB)			
5180.00	-1.98	-1.98	11.00 dBm/MHz	-12.98			
5220.00	-2.30	-2.30	11.00 dBm/MHz	-13.30			
5240.00	-1.93	-1.93	11.00 dBm/MHz	-12.93			
5260.00	-2.19	-2.19	11.00 dBm/MHz	-13.19			
5300.00	-2.16	-2.16	11.00 dBm/MHz	-13.16			
5320.00	-2.14	-2.14	11.00 dBm/MHz	-13.14			
5500.00	-2.14	-2.14	11.00 dBm/MHz	-13.14			
5580.00	-2.43	-2.43	11.00 dBm/MHz	-13.43			
5700.00	-2.09	-2.09	11.00 dBm/MHz	-13.09			
5720 (U-NII 2C)	-1.61	-1.61	11.00 dBm/MHz	-12.61			
5720 (U-NII 3)	-5.43	-5.43	30.00 dBm/500kHz	-35.43			
5745.00	-5.56	-5.56	30.00 dBm/500kHz	-35.56			
5785.00	-5.03	-5.03	30.00 dBm/500kHz	-35.03			
5825.00	-5.13	-5.13	30.00 dBm/500kHz	-35.13			

POWER DENSITY 802.11n HT40 MODE							
Frequency (MHz)	ch0 meas PSD	Maxmum Corr'd PSD	Limit	Margin (dB)			
5190.00	-6.37	-6.19	11.00 dBm/MHz	-17.19			
5230.00	-5.99	-5.81	11.00 dBm/MHz	-16.81			
5270.00	-6.02	-5.84	11.00 dBm/MHz	-16.84			
5310.00	-5.18	-5.00	11.00 dBm/MHz	-16.00			
5510.00	-5.80	-5.62	11.00 dBm/MHz	-16.62			
5550.00	-6.03	-5.85	11.00 dBm/MHz	-16.85			
5670.00	-6.24	-6.06	11.00 dBm/MHz	-17.06			
5710 (U-NII 2C)	-5.83	-5.65	11.00 dBm/MHz	-16.65			
5710 (U-NII 3)	-10.08	-9.90	30.00 dBm/500kHz	-39.90			
5755.00	-8.81	-8.63	30.00 dBm/500kHz	-38.63			
5795.00	-8.21	-8.03	30.00 dBm/500kHz	-38.03			

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POWER DENSITY 802.11ac VHT80 MODE							
Frequency (MHz)	ch0 meas PSD	Maxmum Corr'd PSD	Limit	Margin (dB)			
5210.00	-10.38	-10.06	11.00 dBm/MHz	-21.06			
5290.00	-10.06	-9.74	11.00 dBm/MHz	-20.74			
5530.00	-9.71	-9.39	11.00 dBm/MHz	-20.39			
5610.00	-10.12	-9.80	11.00 dBm/MHz	-20.80			
5690 (U-NII 2C)	-9.99	-9.67	11.00 dBm/MHz	-20.67			
5690 (U-NII 3)	-14.39	-14.07	30.00 dBm/500kHz	-44.07			
5775.00	-12.97	-12.65	30.00 dBm/500kHz	-42.65			

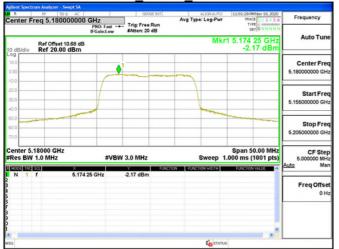
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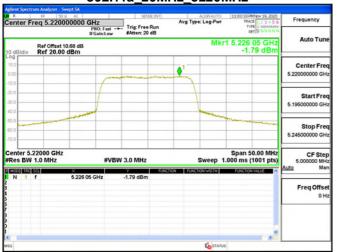


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## 802.11a\_20MHz\_5180MHz



## 802.11a 20MHz 5220MHz



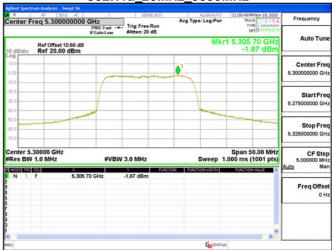
# 802.11a 20MHz 5240MHz



## 802.11a\_20MHz\_5260MHz



## 802.11a 20MHz 5300MHz



# 802.11a 20MHz 5320MHz

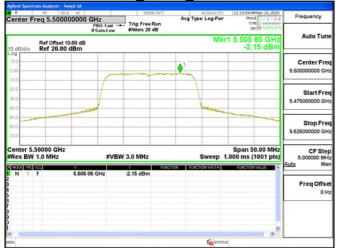


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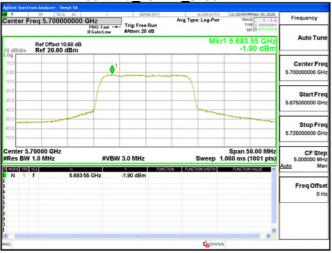
## 802.11a\_20MHz\_5500MHz



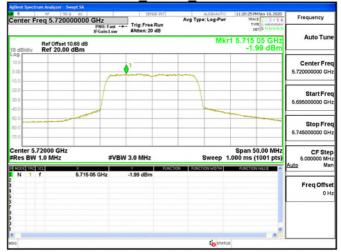
## 802.11a 20MHz 5580MHz



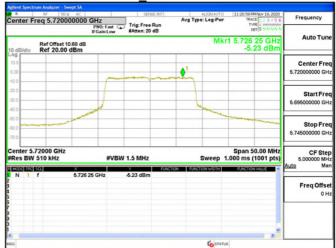
# 802.11a 20MHz 5700MHz



# 802.11a\_20MHz\_5720MHz



## 802.11a 20MHz\5720MHz



# 802.11a 20MHz 5745MHz



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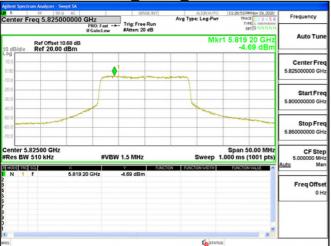


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## 802.11a\_20MHz\_5785MHz



## 802.11a 20MHz 5825MHz



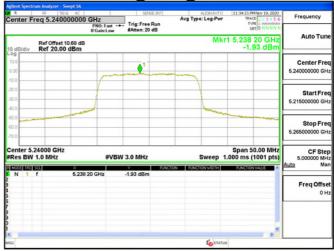
# 802.11n 20MHz 5180MHz



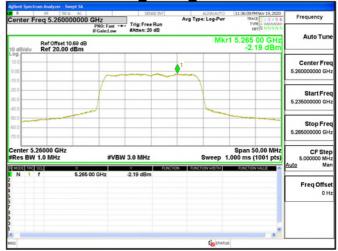
# 802.11n\_20MHz\_5220MHz



## 802.11n 20MHz 5240MHz



# 802.11n 20MHz 5260MHz



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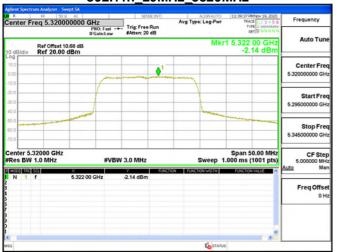


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## 802.11n\_20MHz\_5300MHz



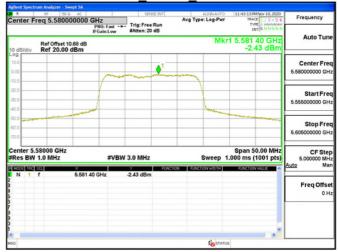
## 802.11n 20MHz 5320MHz



# 802.11n 20MHz 5500MHz



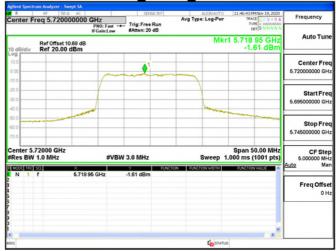
# 802.11n\_20MHz\_5580MHz



## 802.11n 20MHz 5700MHz



# 802.11n 20MHz 5720MHz



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## 802.11n\_20MHz\_5720MHz



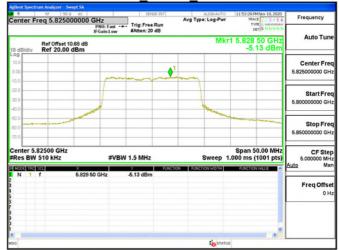
## 802.11n 20MHz 5745MHz



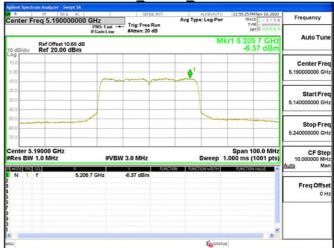
# 802.11n 20MHz 5785MHz



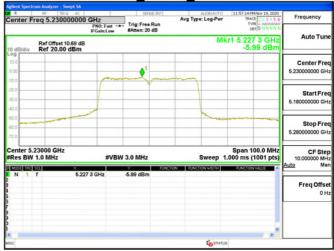
# 802.11n\_20MHz\_5825MHz



## 802.11n 40MHz 5190MHz



# 802.11n 40MHz 5230MHz

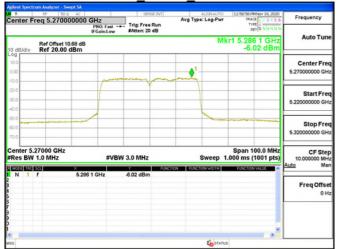


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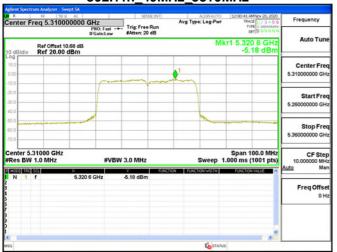


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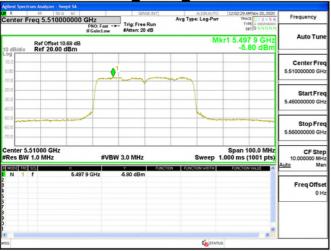
## 802.11n\_40MHz\_5270MHz



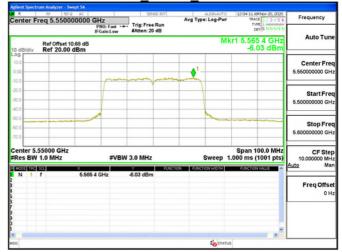
## 802.11n 40MHz 5310MHz



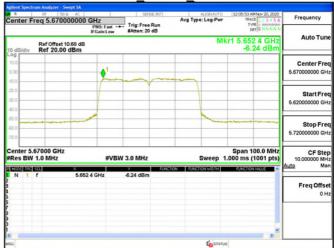
# 802.11n 40MHz 5510MHz



# 802.11n\_40MHz\_5550MHz



## 802.11n 40MHz 5670MHz



# 802.11n 40MHz 5710MHz

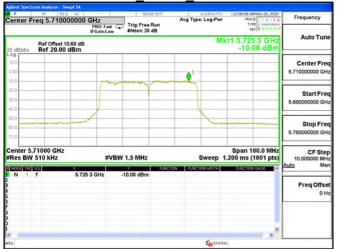


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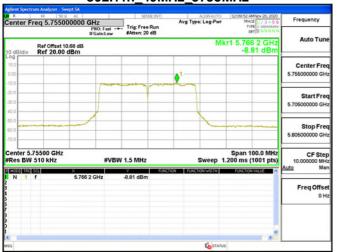


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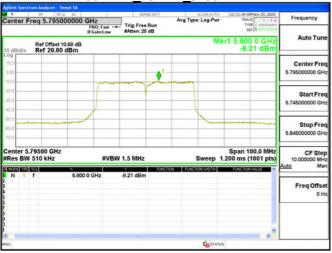
## 802.11n\_40MHz\_5710MHz



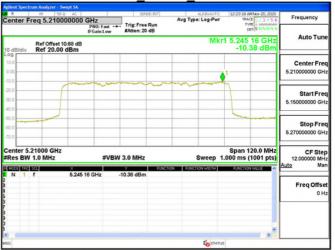
## 802.11n 40MHz 5755MHz



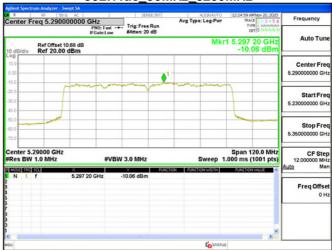
# 802.11n 40MHz 5795MHz



## 802.11ac\_80MHz\_5210MHz



## 802.11ac 80MHz 5290MHz



# 802.11ac 80MHz 5530MHz

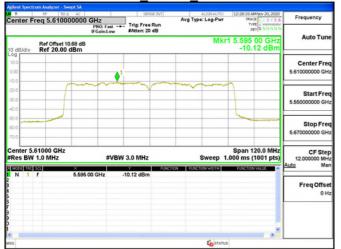


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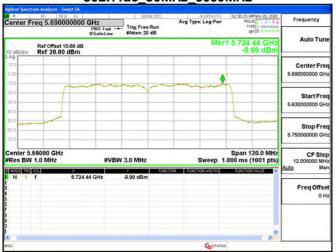


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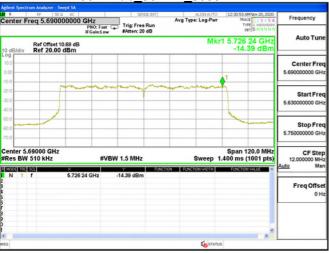
## 802.11ac\_80MHz\_5610MHz



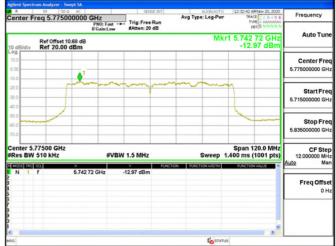
## 802.11ac 80MHz 5690MHz



# 802.11ac 80MHz 5690MHz



## 802.11ac 80MHz 5775MHz



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# 11 UNDESIRABLE RADIATED EMISSION MEASUREMENT

#### 11.1 Standard Applicable

# 11.1.1 Band Edge

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.

APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1) RSS-247 §6.2.1.2		
15.407(b)(2) RSS-247 §6.2.2.2	PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)
15.407(b)(3) RSS-247 §6.2.3.2		
	PK:-27 (dBm/MHz) *1	PK: 68.2(dBµV/m) *1
15.407(b)(4)(i)	PK:10 (dBm/MHz) *2	PK:105.2 (dBµV/m) *2
RSS-247 §6.2.4.2	PK:15.6 (dBm/MHz) *3	PK: 110.8(dBµV/m) *3
	PK:27 (dBm/MHz) *4	PK:122.2 (dBµV/m) *4

<sup>\*1</sup> beyond 75 MHz or more above of the bandedge.

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

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

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

<sup>\*4</sup> from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



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# 11.1.2 Spurious Emission

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 ( $\mu$ V/m)



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

SGS SAC-III						
Name of Equip- ment	Manufacturer	Model	Serial Num- ber	Calibration Date	Calibration Due	
Horn Antenna	Schwarzbeck	BBHA9120D	1441	10/16/2020	10/15/2021	
Horn Antenna	Schwarzbeck	BBHA9170	184	12/25/2019	12/24/2020	
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT- N0555	01/13/2020	01/12/2021	
Loop Antenna	ETS.LINDGREN	6502	148045	10/19/2020	10/18/2021	
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/29/2020	10/28/2021	
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021	
Pre-Amplifier	EMC Instruments	EMC051825	980152	01/02/2020	01/01/2021	
Pre-Amplifier	HP	8447D	2944A09469	01/02/2020	01/01/2021	
Attenuator	Mini-Circuit	BW-S10W2+	4	01/02/2020	01/01/2021	
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	01/02/2020	01/01/2021	
Filter 5470-5725 MHz	Micro-Tronics	BRM50704	1	01/02/2020	01/01/2021	
Filter 5725-5875 MHz	Micro-Tronics	BRM50705	1	01/02/2020	01/01/2021	
High Pass Filter	WI	WHKX7.0/18G- 8SS	45	01/02/2020	01/01/2021	
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	01/02/2020	01/01/2021	
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	01/02/2020	01/01/2021	
Coaxial Cable	Huber Suhner	EMC 104-SM- SM-2000	160123	01/02/2020	01/01/2021	

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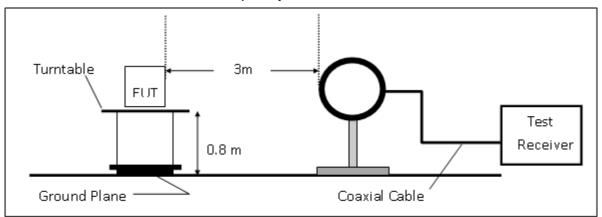
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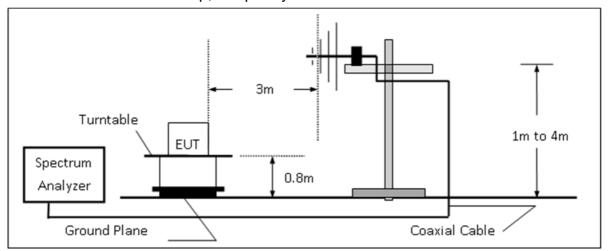
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#### 11.3 **Test SET-UP**

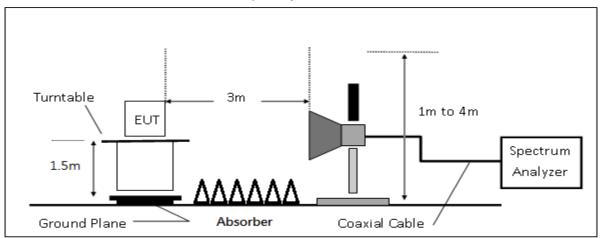
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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



# (C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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#### 11.4 **Measurement Procedure**

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

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#### 11.5 **Field Strength Calculation**

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

# FS = RA + AF + CL - AG

**Where** FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

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

Actual  $FS(dB\mu V/m) = SPA$ . Reading level $(dB\mu V) + Factor(dB)$ 

 $Factor(dB) = Antenna\ Factor(dB\mu V/m) + Cable\ Loss(dB) - Pre\_Amplifier\ Gain(dB)$ 

# 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.

Pre-scanned was done at frequency 5.47 GHz and 5.85 GHz for bandedge measurement of straddle channels 138, 142 and 144 which was 20dB lower than the limit per 15.31(o) & RSS-GEN §6.13.2 was not reported.

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# **Radiated Spurious Emission Measurement Result**

#### 11.7.1 **Below 1GHz Worst-Case Data:**

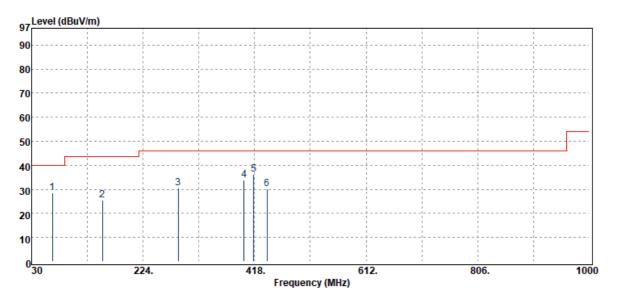
Report Number :ER/2020/B0093 **Test Site** :SAC I Chamber

**Test Date Operation Mode** :802.11a :2020-12-05

**Test Frequency** :5220 MHz Temp./Humi. :23.3/61

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.86	-17.37	28.49	40.00	-11.51
153.19	Peak	37.67	-12.13	25.54	43.50	-17.96
285.11	Peak	39.21	-8.73	30.48	46.00	-15.52
399.57	Peak	39.95	-6.08	33.87	46.00	-12.13
416.06	Peak	41.37	-5.19	36.18	46.00	-9.82
439.34	Peak	36.54	-6.19	30.35	46.00	-15.65

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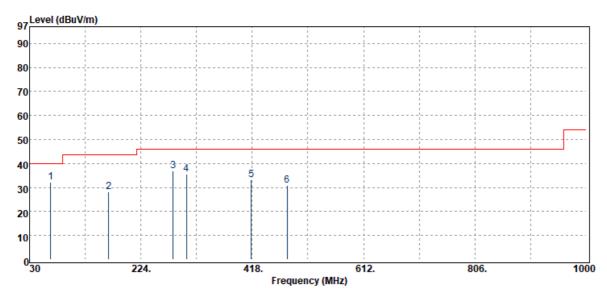
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5220 MHz Temp./Humi. :23.3/61

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
66.86	Peak	49.80	-17.45	32.35	40.00	-7.65
167.74	Peak	41.12	-12.79	28.33	43.50	-15.17
280.26	Peak	45.72	-8.81	36.91	46.00	-9.09
303.54	Peak	44.11	-8.43	35.68	46.00	-10.32
416.06	Peak	38.26	-5.19	33.07	46.00	-12.93
479.11	Peak	36.09	-5.37	30.72	46.00	-15.28

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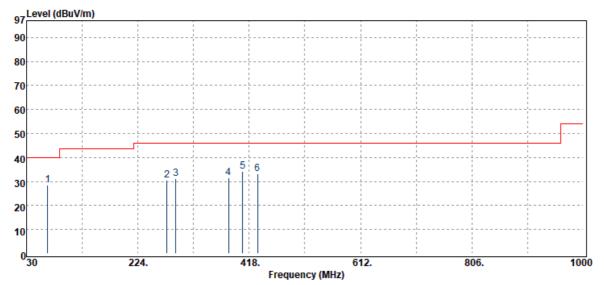
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5300 MHz Temp./Humi. :23.3/61

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
66.86	Peak	45.87	-17.45	28.42	40.00	-11.58
274.44	Peak	39.35	-8.85	30.50	46.00	-15.50
289.96	Peak	39.91	-8.62	31.29	46.00	-14.71
382.11	Peak	38.33	-6.83	31.50	46.00	-14.50
406.36	Peak	39.84	-5.67	34.17	46.00	-11.83
432.55	Peak	39.27	-6.02	33.25	46.00	-12.75

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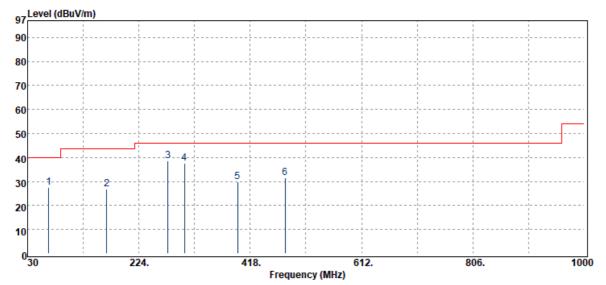
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5300 MHz Temp./Humi. :23.3/61

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
66.86	Peak	45.05	-17.45	27.60	40.00	-12.40
167.74	Peak	39.67	-12.79	26.88	43.50	-16.62
274.44	Peak	47.45	-8.85	38.60	46.00	-7.40
303.54	Peak	45.96	-8.43	37.53	46.00	-8.47
395.69	Peak	36.20	-6.25	29.95	46.00	-16.05
479.11	Peak	36.91	-5.37	31.54	46.00	-14.46

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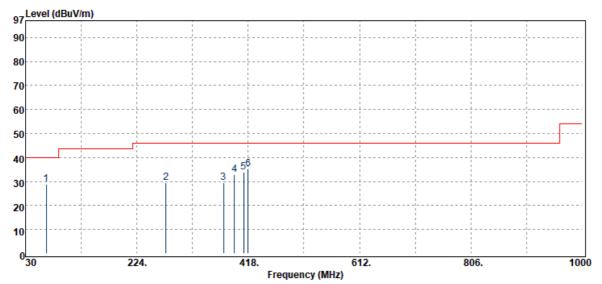
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5580 MHz Temp./Humi. :23.3/61

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
65.89	Peak	46.20	-17.37	28.83	40.00	-11.17
274.44	Peak	38.44	-8.85	29.59	46.00	-16.41
375.32	Peak	36.42	-6.91	29.51	46.00	-16.49
393.75	Peak	39.29	-6.36	32.93	46.00	-13.07
410.24	Peak	39.20	-5.33	33.87	46.00	-12.13
418.00	Peak	40.51	-5.21	35.30	46.00	-10.70

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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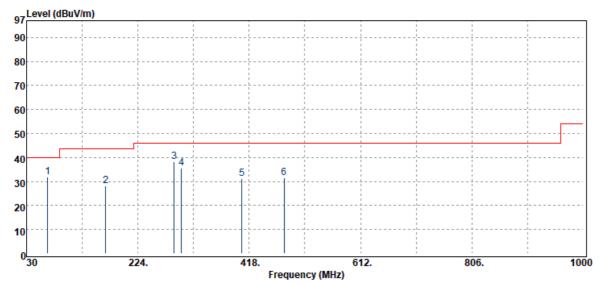
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5580 MHz Temp./Humi. :23.3/61

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
66.86	Peak	49.49	-17.45	32.04	40.00	-7.96
167.74	Peak	41.12	-12.79	28.33	43.50	-15.17
287.05	Peak	46.88	-8.69	38.19	46.00	-7.81
299.66	Peak	44.06	-8.55	35.51	46.00	-10.49
405.39	Peak	36.95	-5.76	31.19	46.00	-14.81
479.11	Peak	36.99	-5.37	31.62	46.00	-14.38

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.



:Tx CH Mid

Test Mode

Report No.:ER/2020/B0093

:VERTICAL

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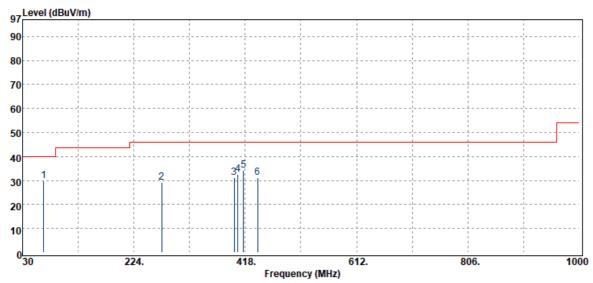
Antenna Pol.

:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5785 MHz Temp./Humi. :23.3/61

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
66.86	Peak	47.38	-17.45	29.93	40.00	-10.07
272.50	Peak	38.08	-8.82	29.26	46.00	-16.74
398.60	Peak	37.27	-6.12	31.15	46.00	-14.85
405.39	Peak	38.28	-5.76	32.52	46.00	-13.48
415.09	Peak	39.42	-5.18	34.24	46.00	-11.76
439.34	Peak	37.55	-6.19	31.36	46.00	-14.64

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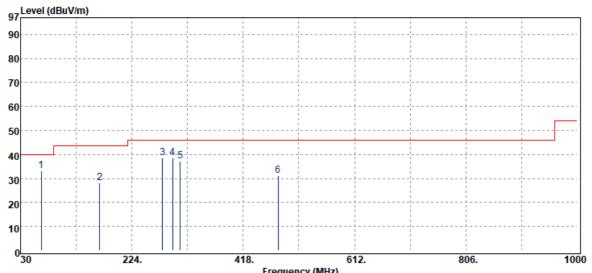
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-05

**Test Frequency** :5785 MHz Temp./Humi. :23.3/61

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



		rrequency (wir	12)			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
65.89	Peak	50.49	-17.37	33.12	40.00	-6.88
167.74	Peak	40.98	-12.79	28.19	43.50	-15.31
277.35	Peak	47.30	-8.84	38.46	46.00	-7.54
294.81	Peak	47.35	-8.59	38.76	46.00	-7.24
308.39	Peak	45.40	-8.28	37.12	46.00	-8.88
479.11	Peak	36.74	-5.37	31.37	46.00	-14.63

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#### **Above 1GHz Worst-Case Data:** 11.7.2

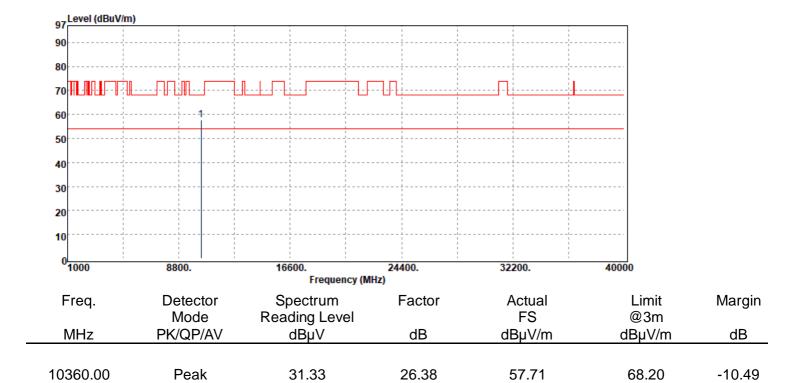
Report Number :ER/2020/B0093 **Test Site** :SAC I Chamber

**Operation Mode Test Date** :2020-12-09 :802.11a

**Test Frequency** :5180 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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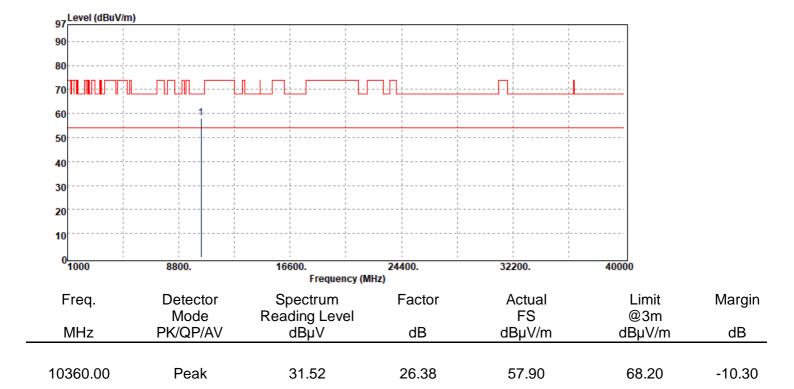
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5180 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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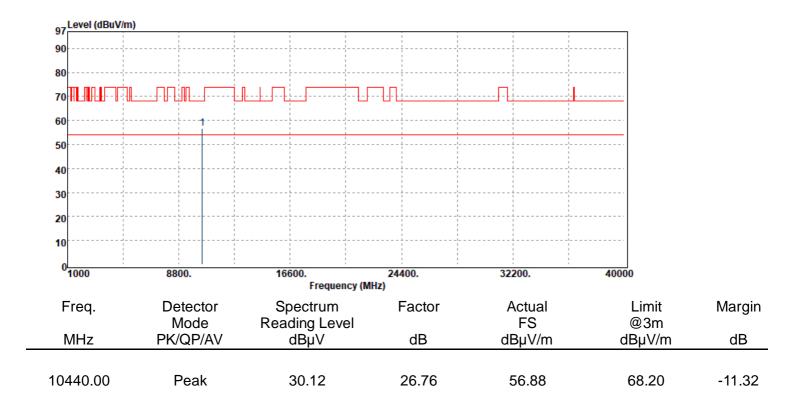
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5220 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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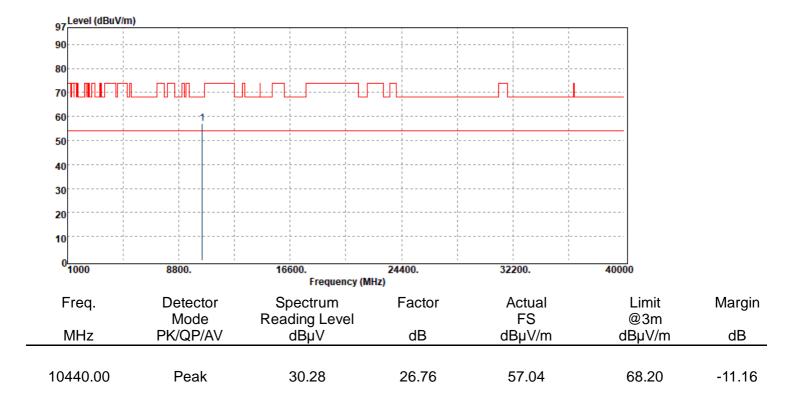
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5220 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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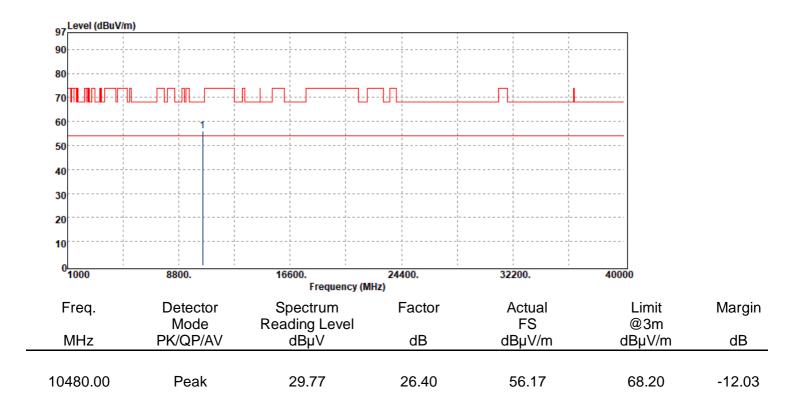
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5240 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



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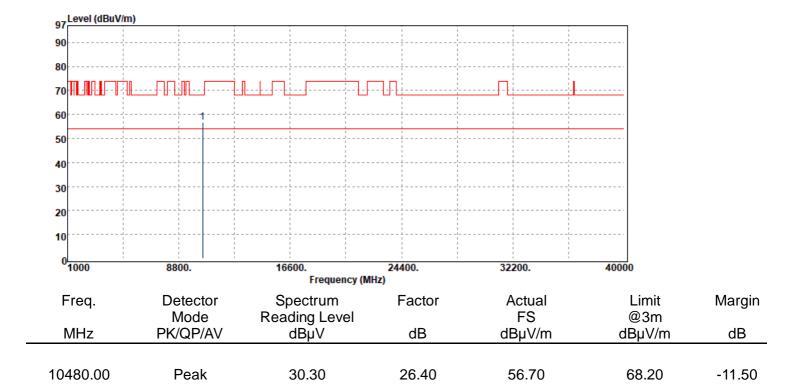
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5240 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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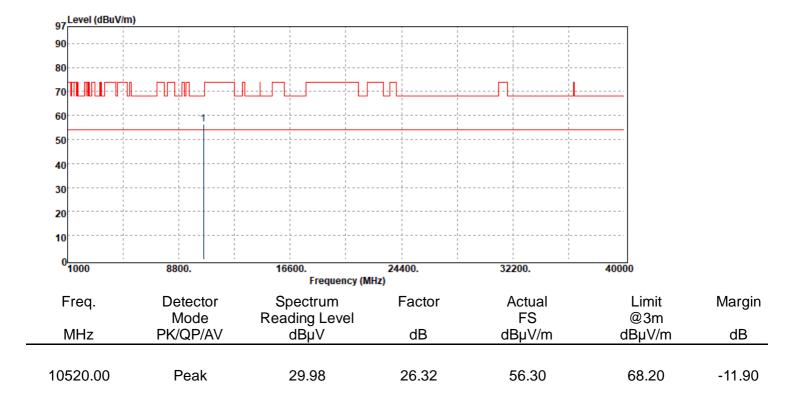
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5260 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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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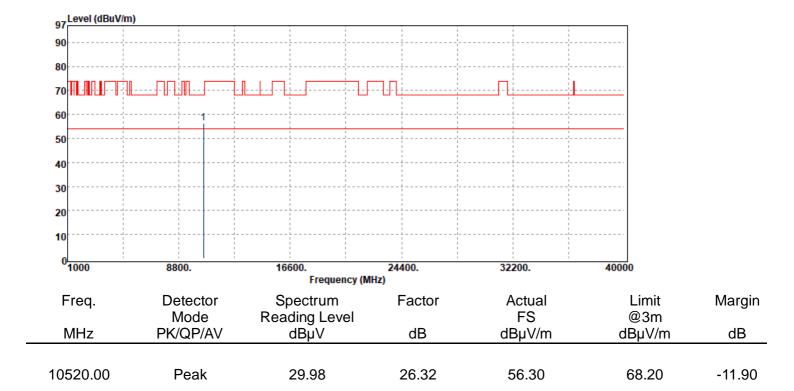
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**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5260 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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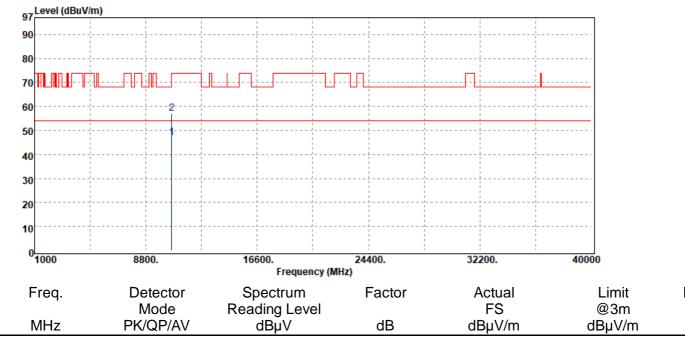
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5300 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	20.36	26.78	47.14	54.00	-6.86
10600.00	Peak	30.36	26.78	57.14	74.00	-16.86

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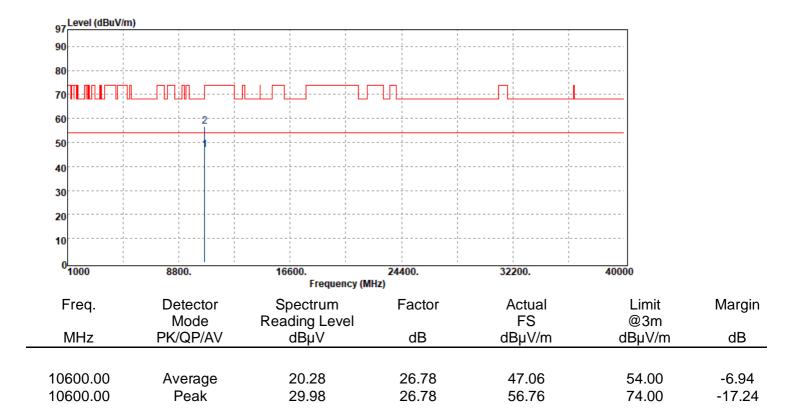
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5300 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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:E2 Plane

**EUT Pol** 

Report No.:ER/2020/B0093

:Neo

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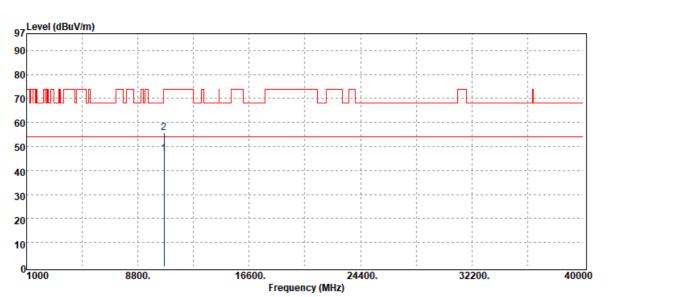
Engineer

:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5320 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH High Antenna Pol.



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	20.49	26.51	47.00	54.00	-7.00
10640.00	Peak	29.26	26.51	55.77	74.00	-18.23

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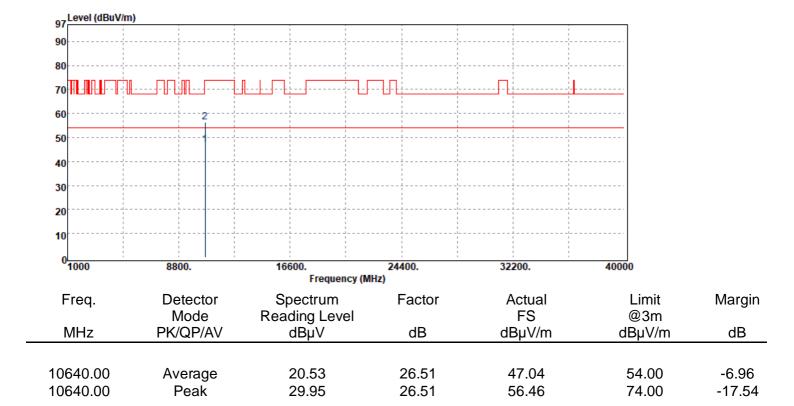
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5320 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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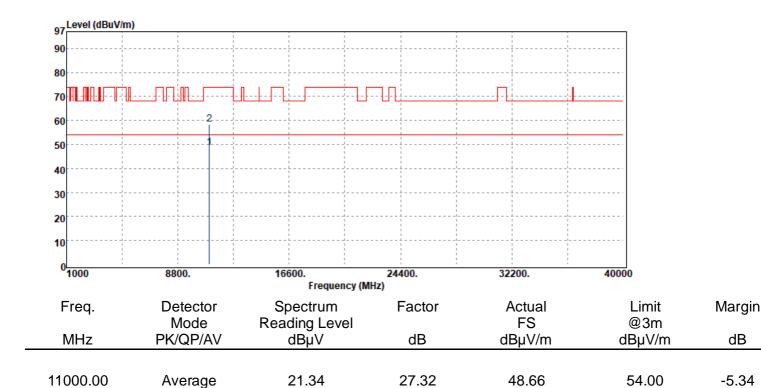
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5500 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



27.32

58.36

74.00

-15.64

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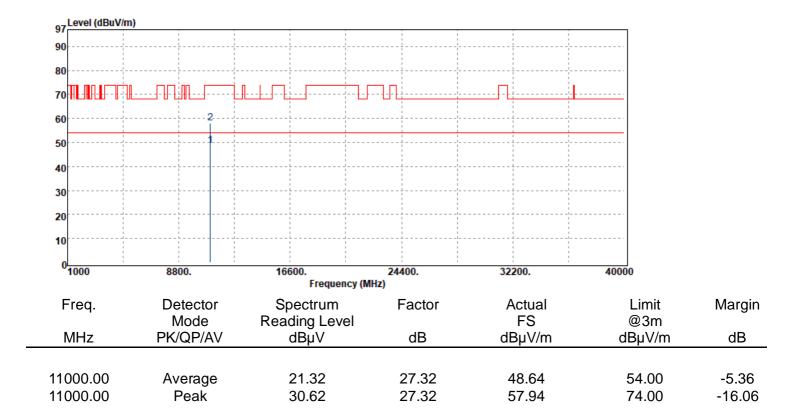
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5500 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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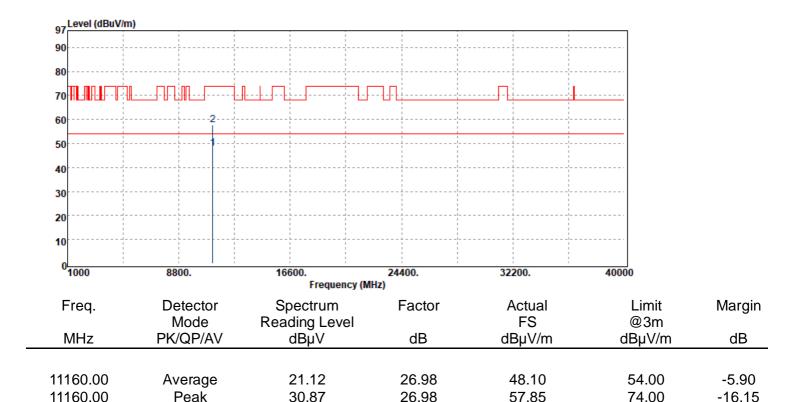
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5580 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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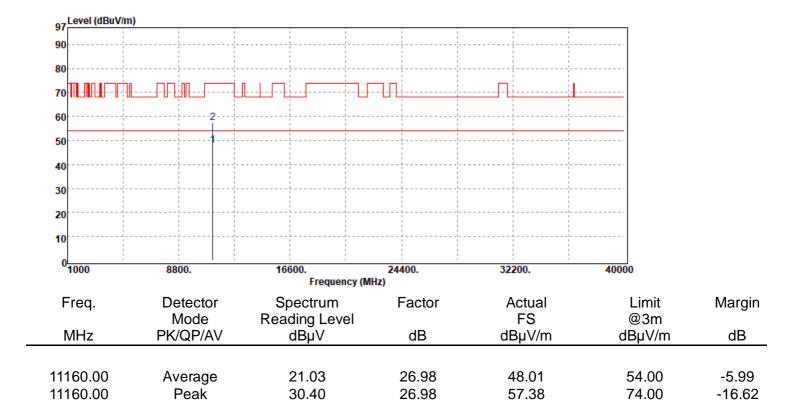
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5580 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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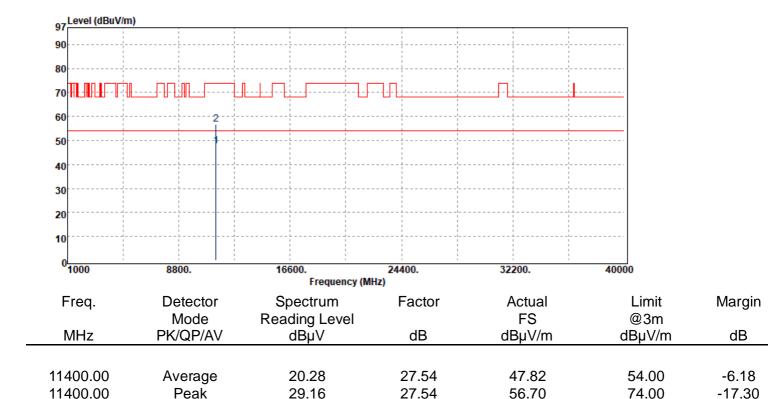
Report Number :ER/2020/B0093 Test Site :SAC I Chamber

Operation Mode :802.11a Test Date :2020-12-09

Test Frequency :5700 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

EUT Pol :E2 Plane Engineer :Neo



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:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5700 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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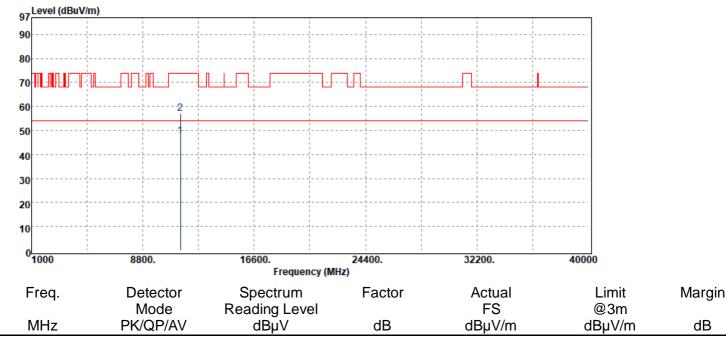
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5720 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



11440.00	Average	20.03	27.76	47.79	54.00	-6.21
11440.00	Peak	29.26	27.76	57.02	74.00	-16.98

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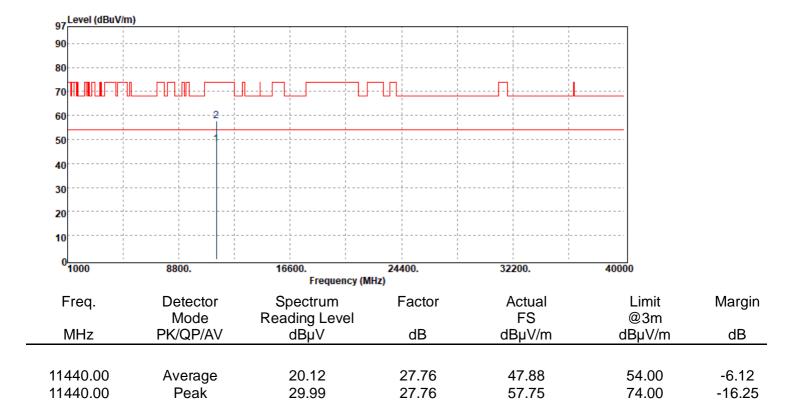
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5720 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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Report Number :ER/2020/B0093 Test Site :SAC I Chamber

Operation Mode :802.11a Test Date :2020-12-09

Test Frequency :5745 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

EUT Pol :E2 Plane Engineer :Neo



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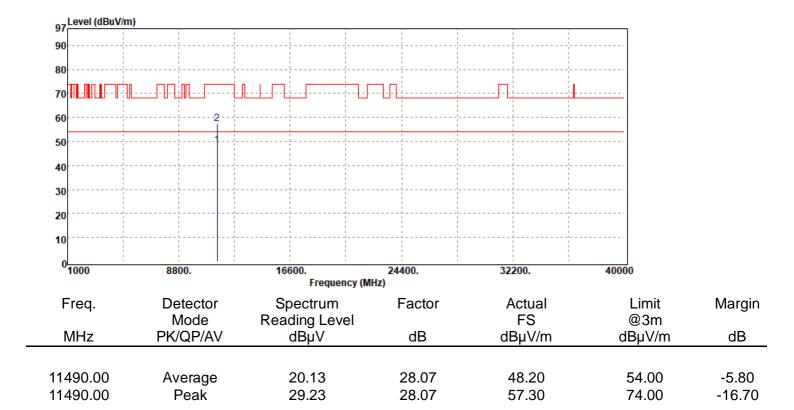
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5745 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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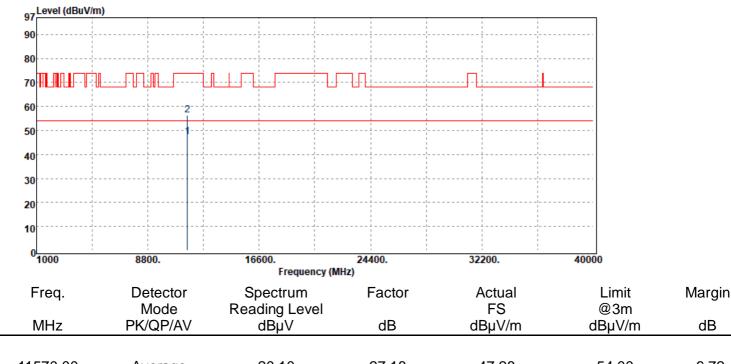
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Test Date Operation Mode** :802.11a :2020-12-09

**Test Frequency** :5785 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBuV/m	@3m dBµV/m	dB
		'		•		
11570.00 11570.00	Average Peak	20.10 29.10	27.18 27.18	47.28 56.28	54.00 74.00	-6.72 -17.72

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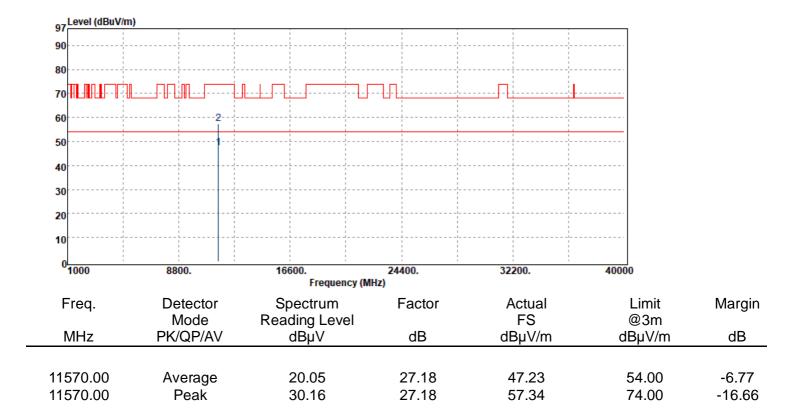
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5785 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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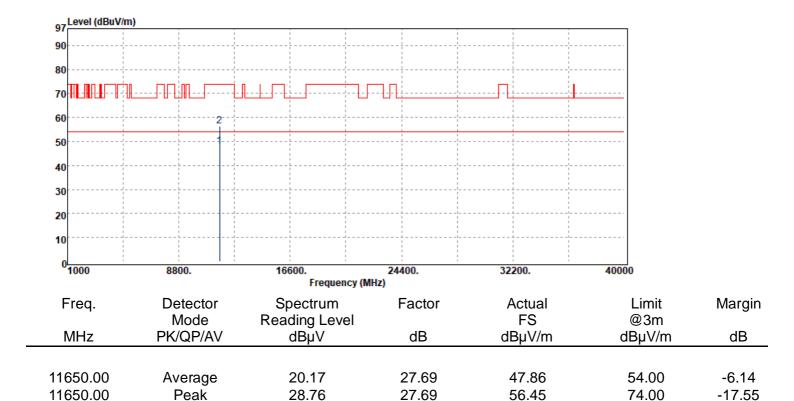
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5825 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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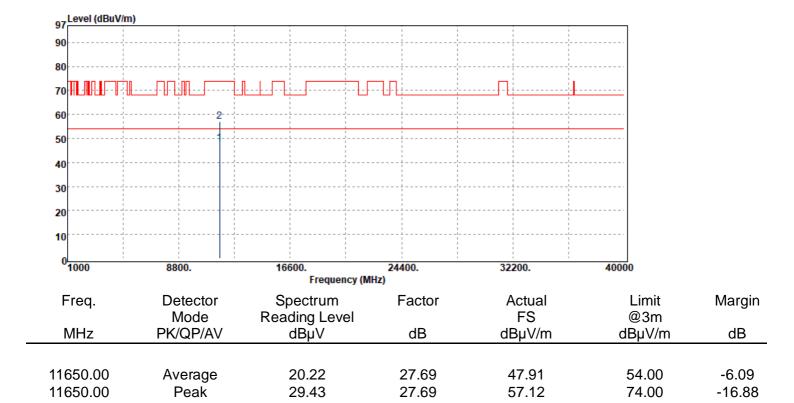
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-09

**Test Frequency** :5825 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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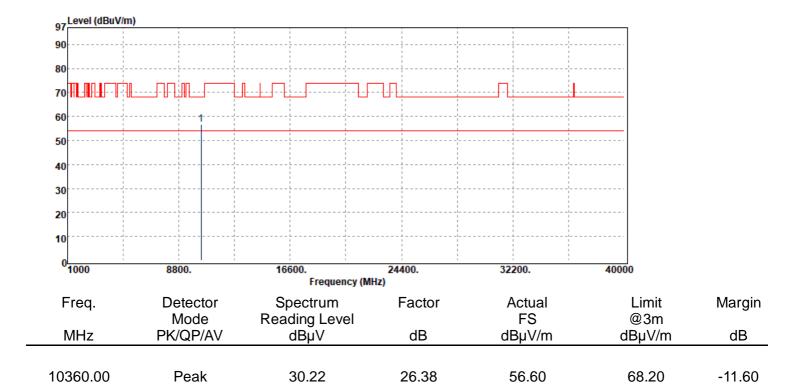
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5180 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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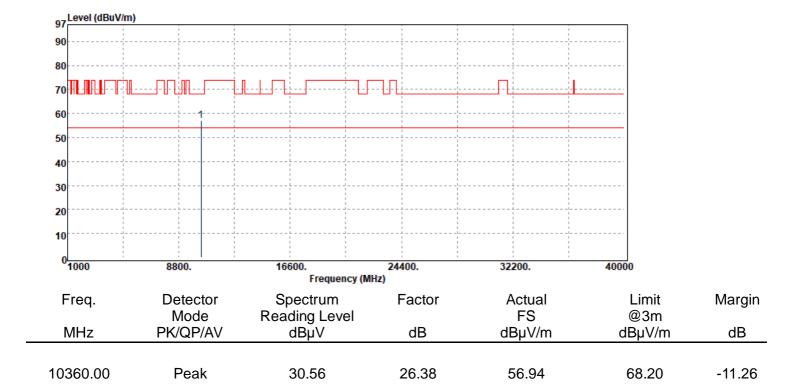
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5180 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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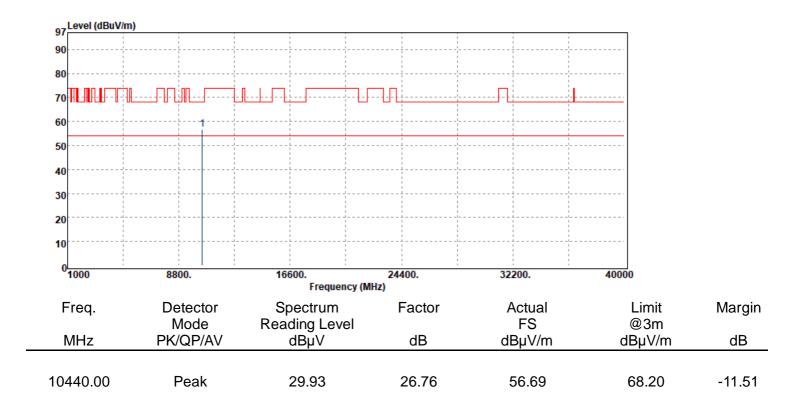
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5220 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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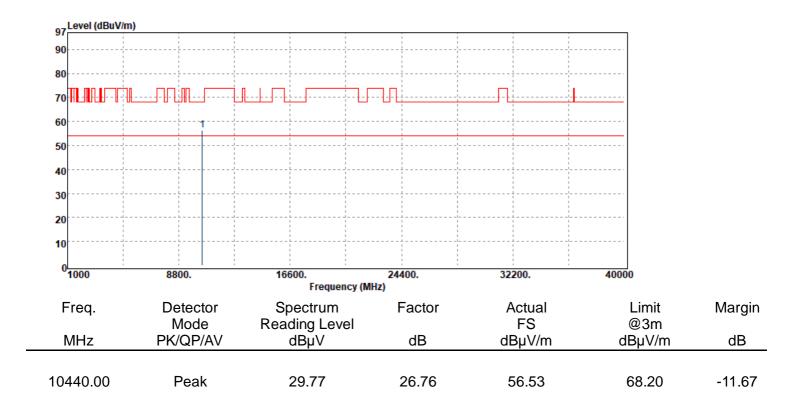
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5220 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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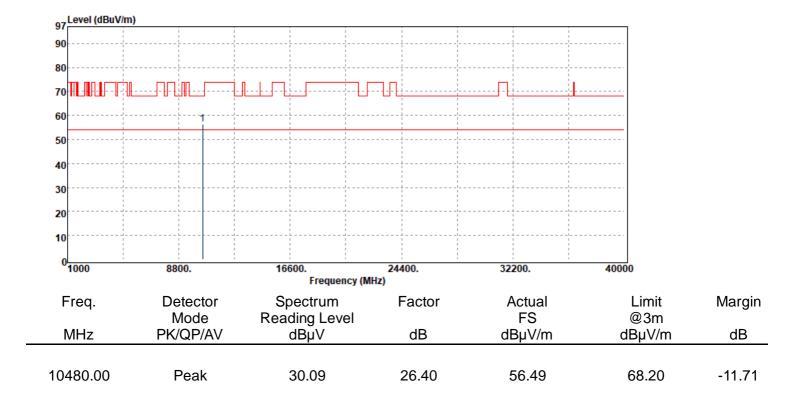
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5240 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



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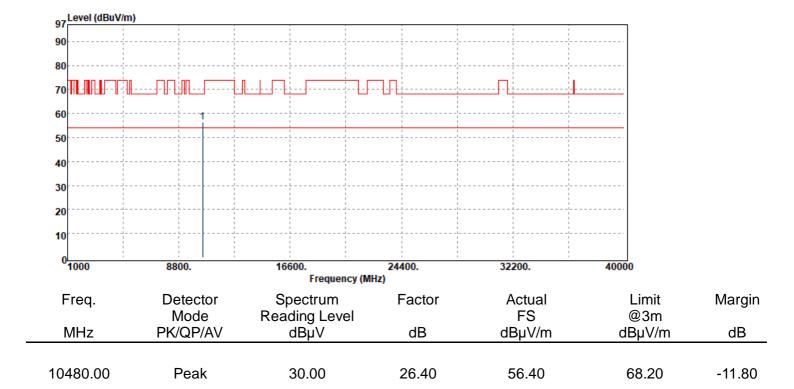
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5240 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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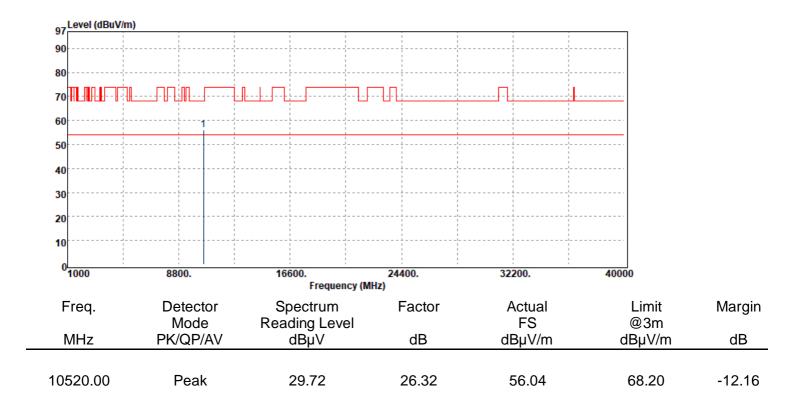
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5260 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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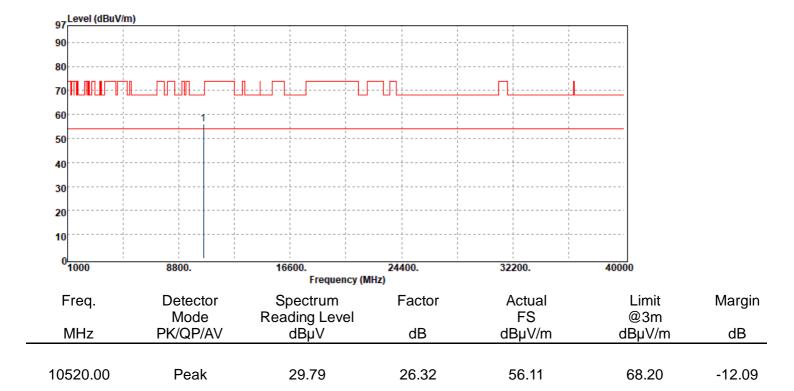
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5260 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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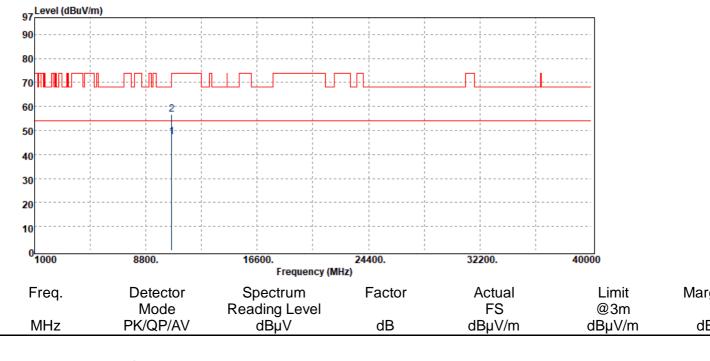
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5300 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
10600.00	Average	20.39	26.78	47.17	54.00	-6.83
10600.00	Peak	29.84	26.78	56.62	74.00	-17.38

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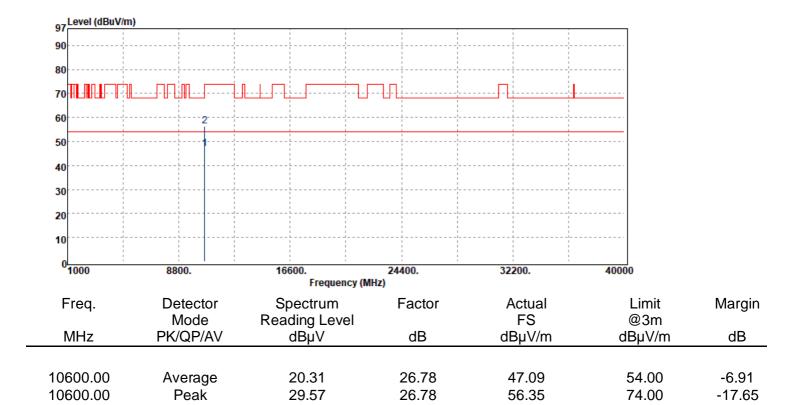
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5300 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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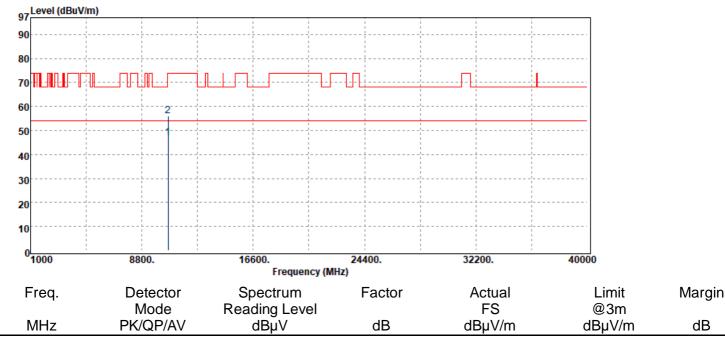
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5320 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



10640.00	Average	20.45	26.51	46.96	54.00	-7.04
10640.00	Peak	29.40	26.51	55.91	74.00	-18.09

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dB



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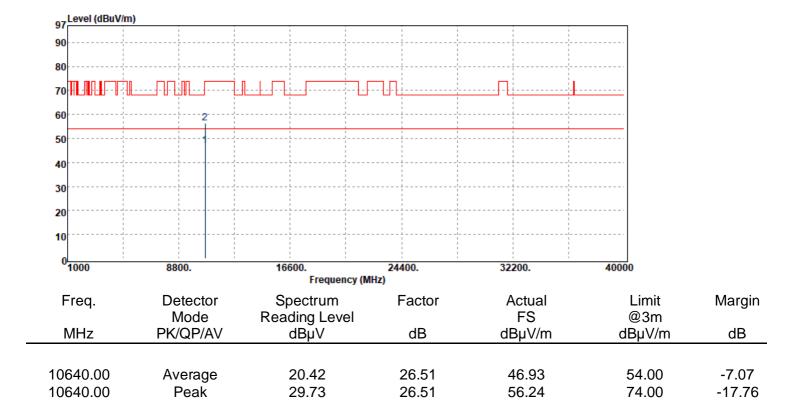
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5320 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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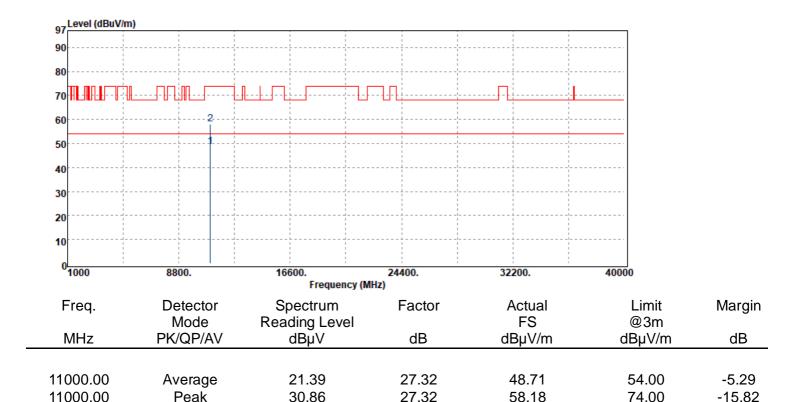
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5500 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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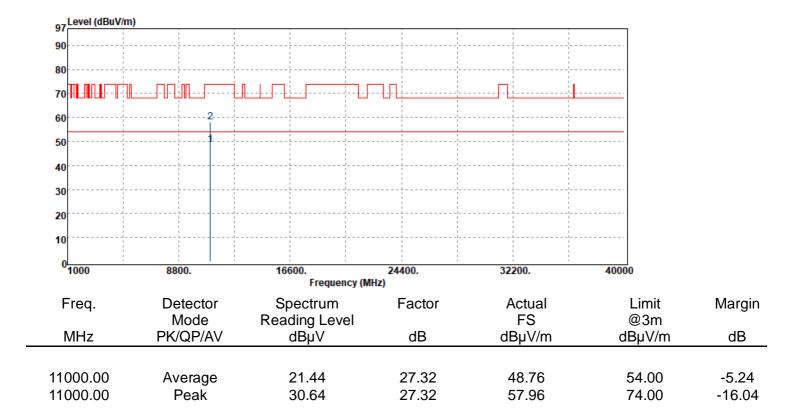
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5500 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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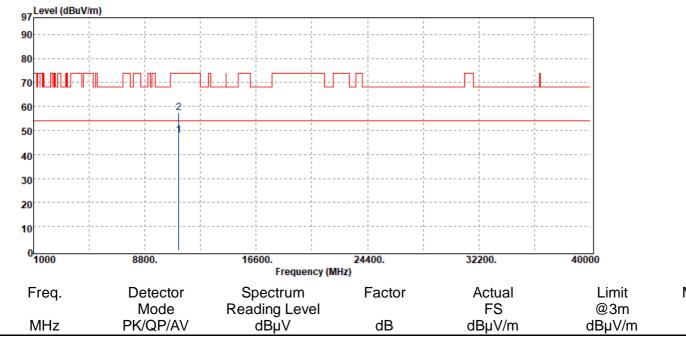
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5580 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	20.91	26.98	47.89	54.00	-6.11
11160.00	Peak	30.47	26.98	57.45	74.00	-16.55

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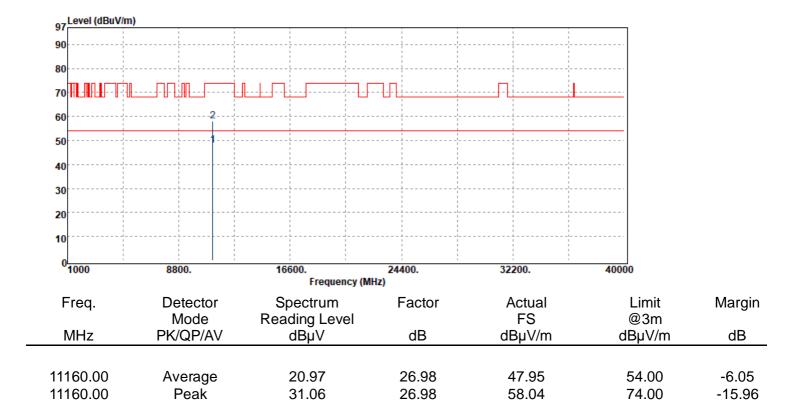
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5580 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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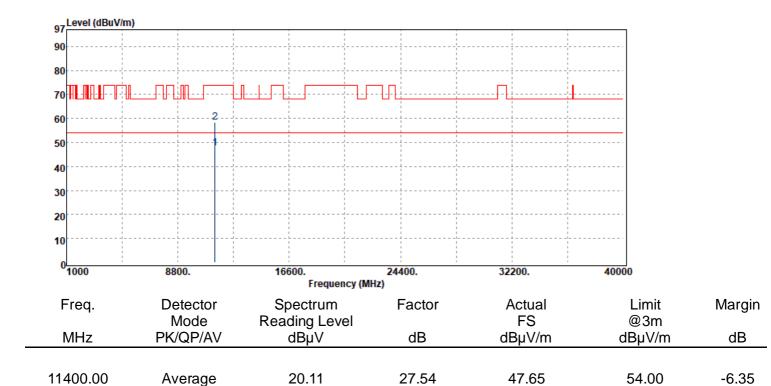
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5700 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



27.54

58.26

74.00

-15.74

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30.72

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11400.00

Peak



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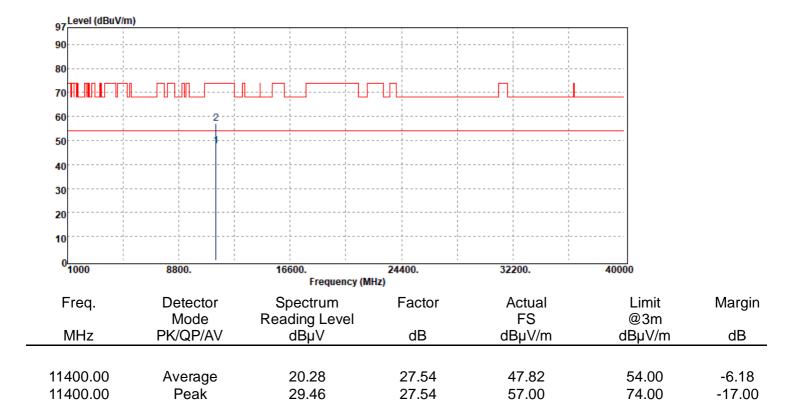
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**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5700 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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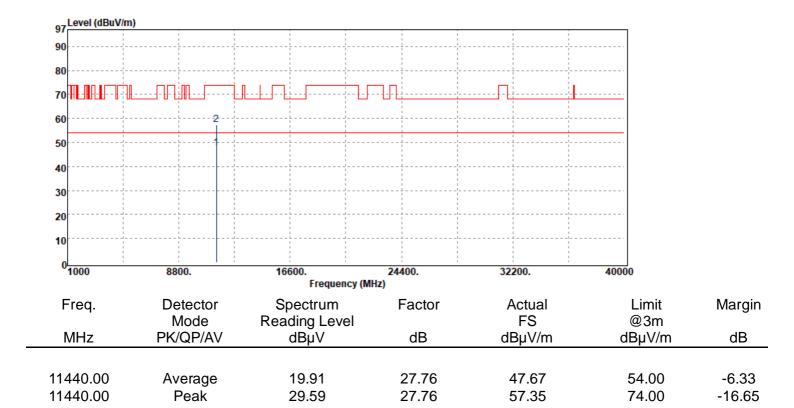
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5720 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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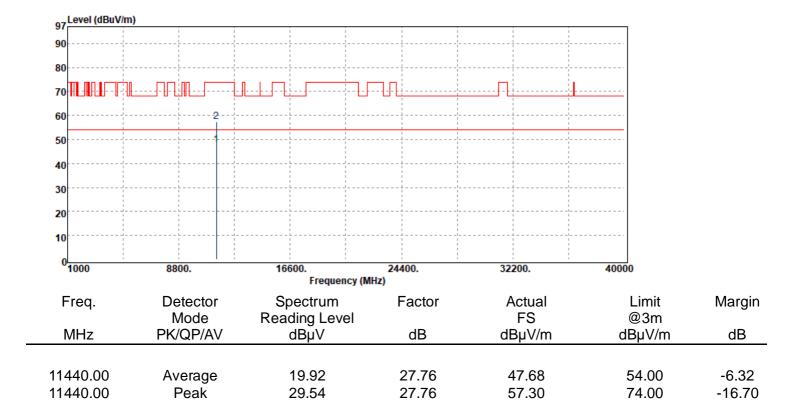
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**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5720 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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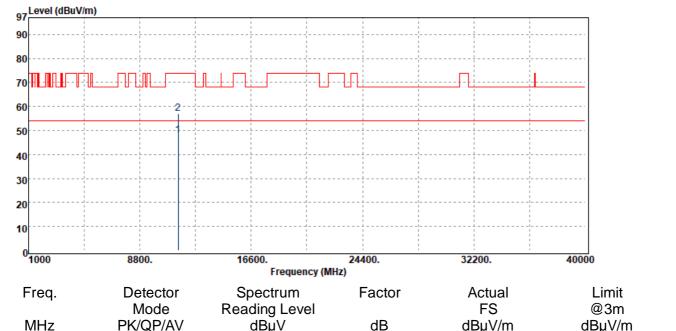
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** :5745 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11490.00	Average	19.93	28.07	48.00	54.00	-6.00
11490.00	Peak	29.14	28.07	57.21	74.00	-16.79

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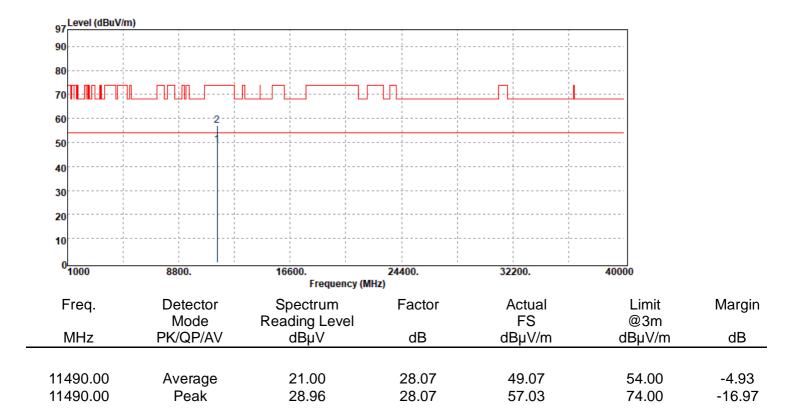
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5745 MHz

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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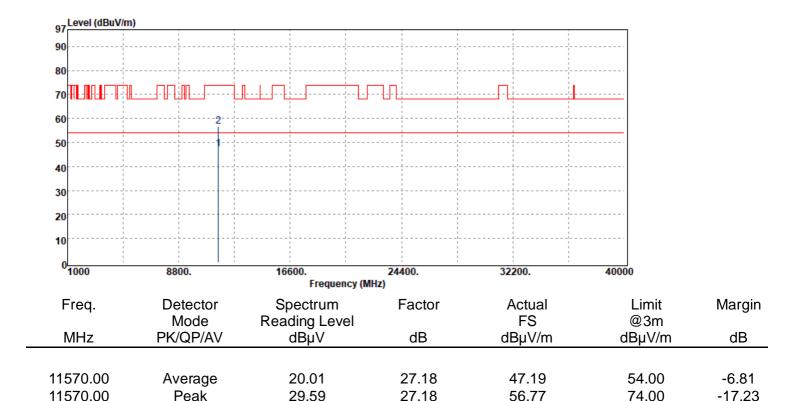
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5785 MHz

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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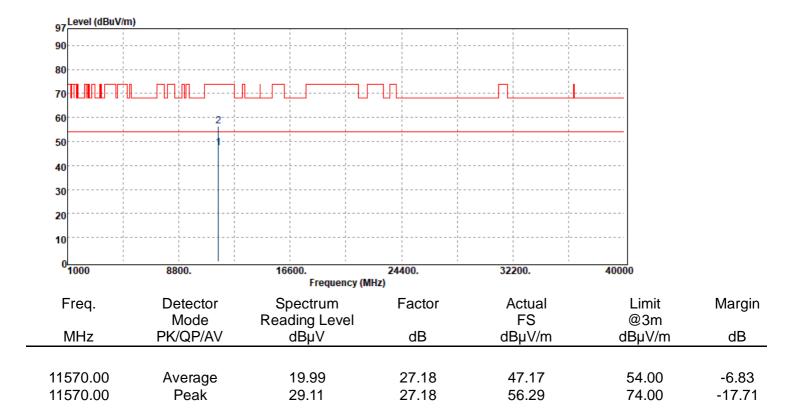
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**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5785 MHz

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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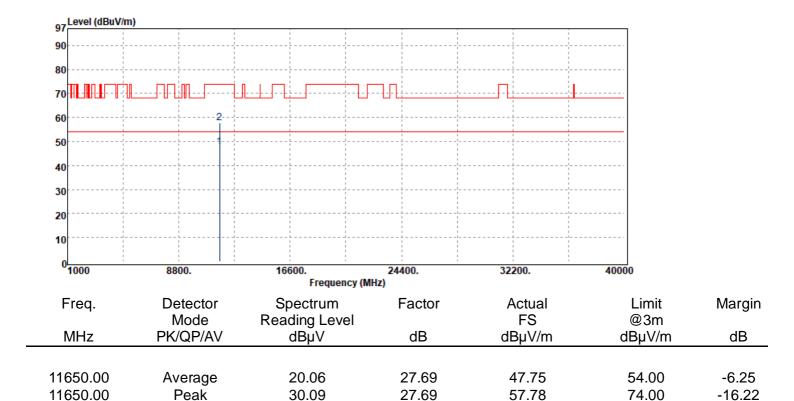
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5825 MHz

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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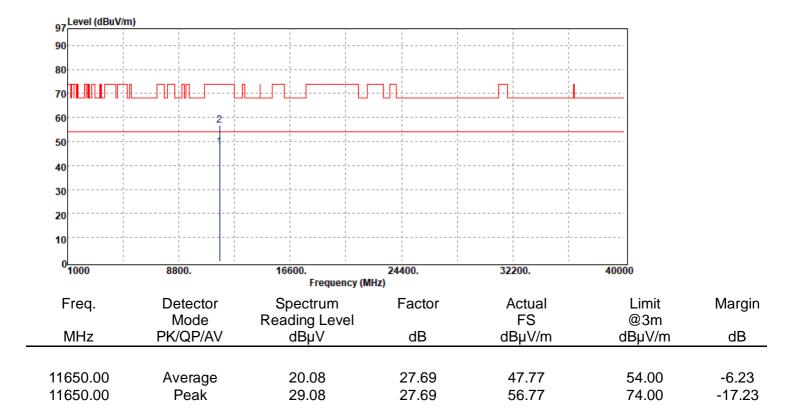
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5825 MHz

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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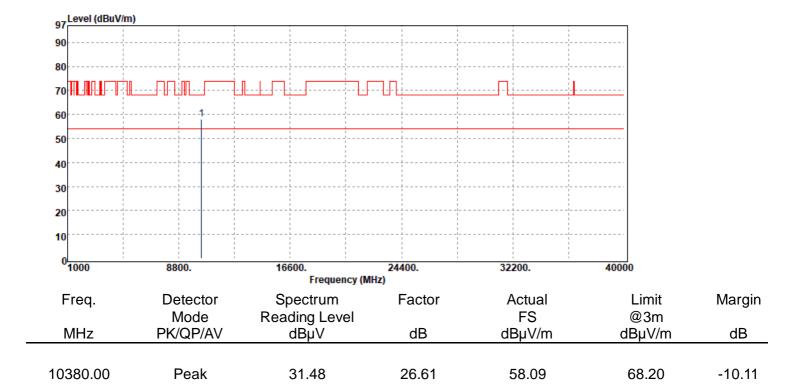
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5190 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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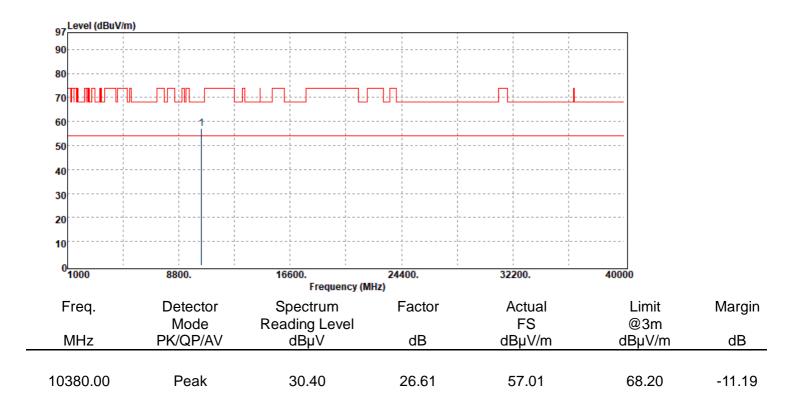
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5190 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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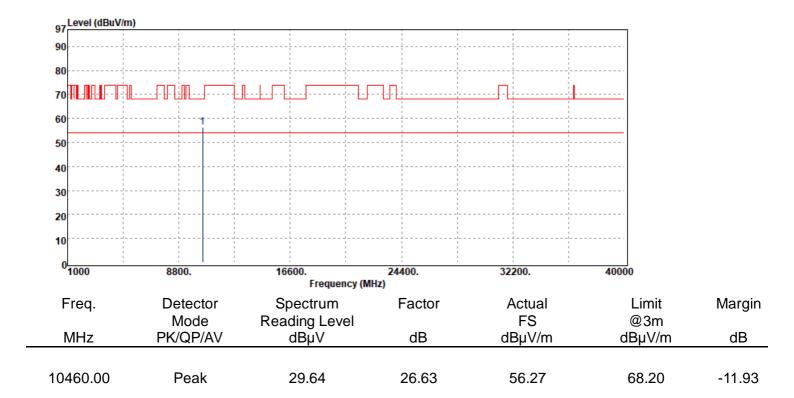
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5230 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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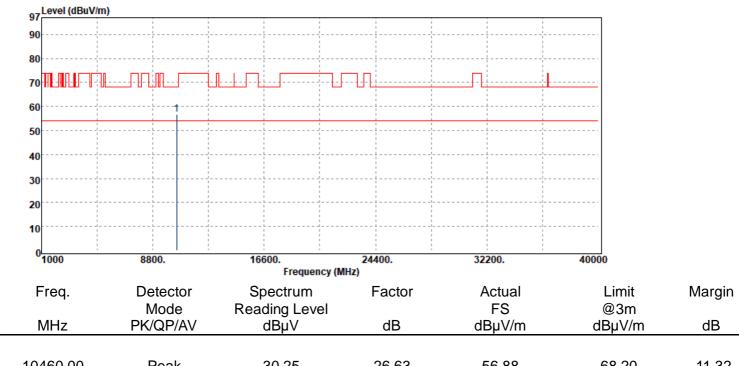
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**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5230 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	30.25	26.63	56.88	68.20	-11.32

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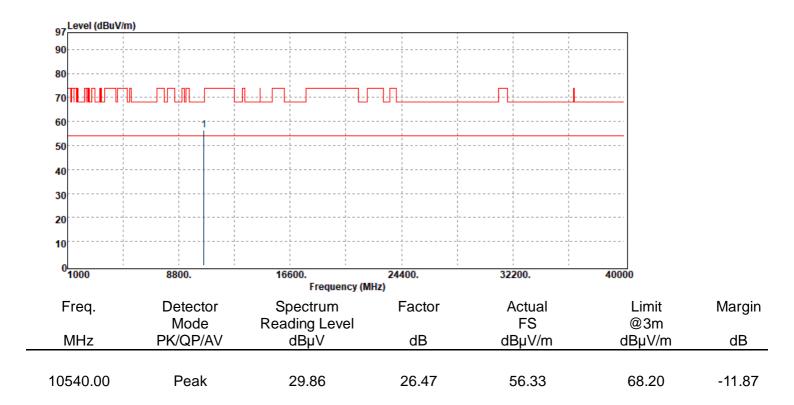
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5270 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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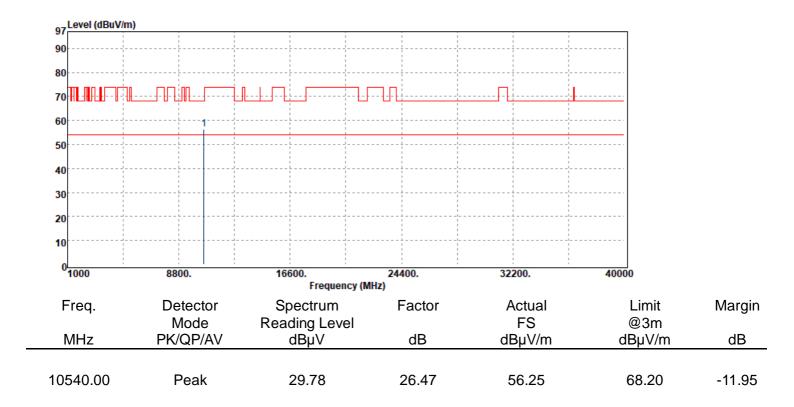
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**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5270 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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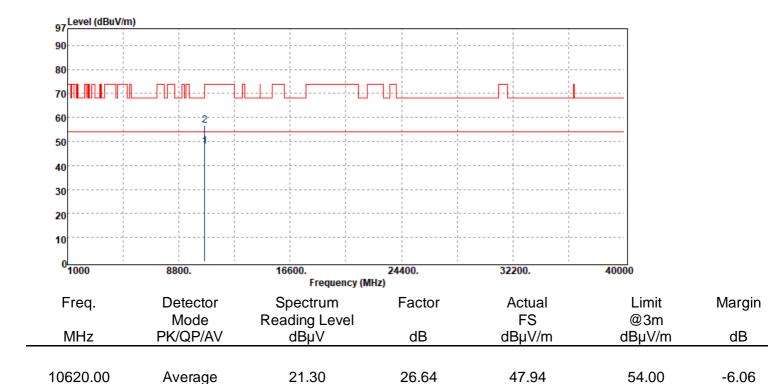
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5310 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



26.64

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30.04

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10620.00

Peak

56.68

74.00

-17.32



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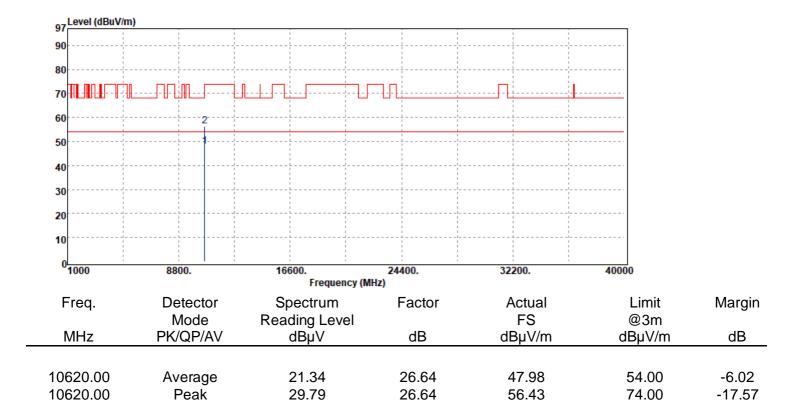
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5310 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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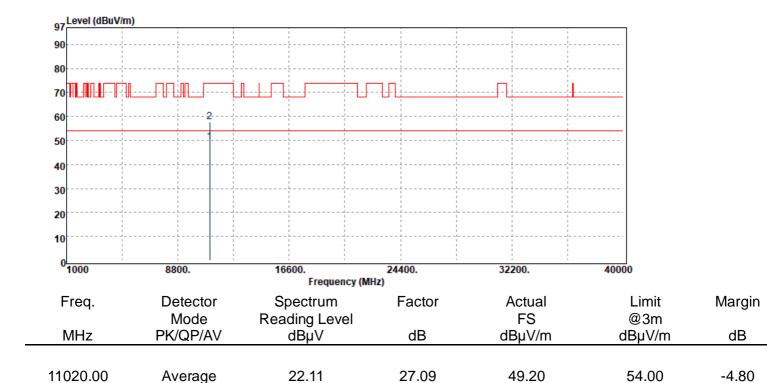
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5510 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



27.09

57.81

74.00

-16.19

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於北只有治明,此起生社用煤料消除之一样。	,同时此样只从P.2000平。未起生土领木八司隶高达司,不可如心海制。

30.72

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11020.00

Peak



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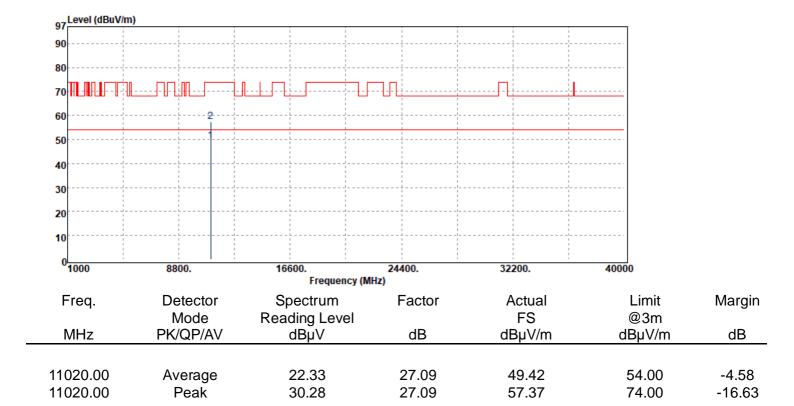
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**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5510 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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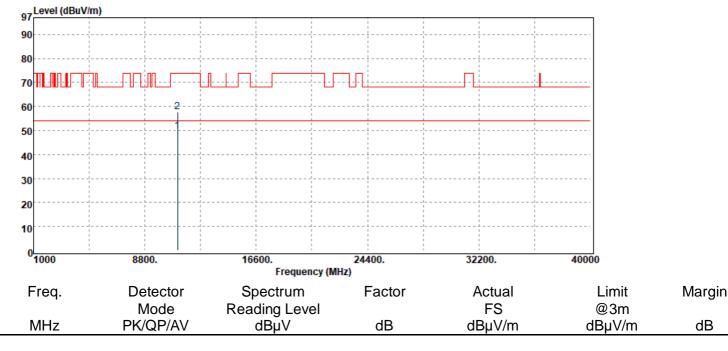
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5550 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
11100.00	Average	22.47	27.23	49.70	54.00	-4.30
11100.00	Peak	30.40	27.23	57.63	74.00	-16.37

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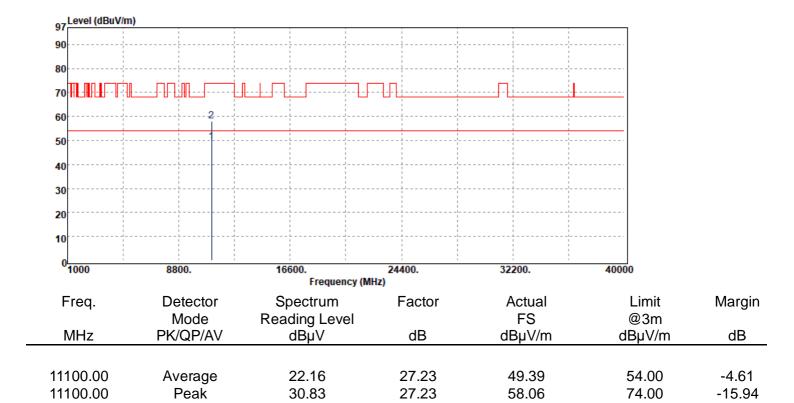
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5550 MHz

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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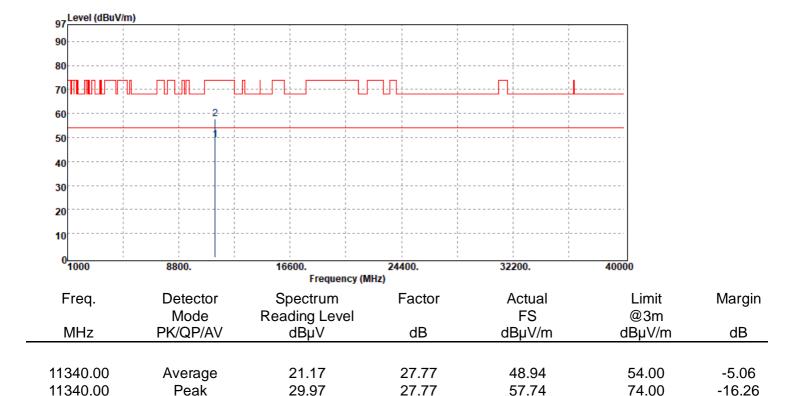
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5670 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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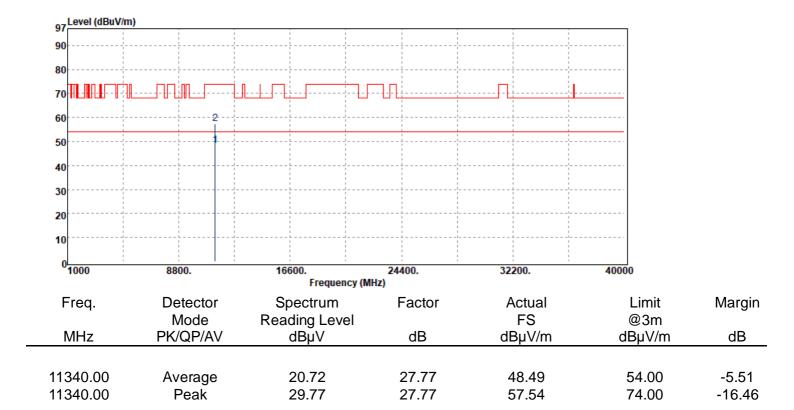
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5670 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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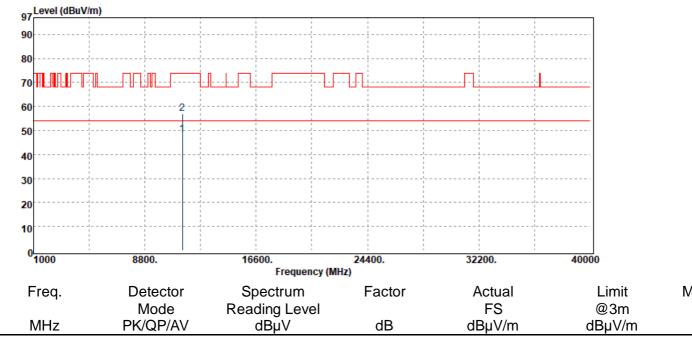
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5710 MHz Temp./Humi. :23.2/64

Test Mode :VERTICAL :Tx CH Mid Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμ̈V	dB	dBµV/m	dBμV/m	dB
11420.00	Average	20.69	27.66	48.35	54.00	-5.65
11420.00	Peak	29.26	27.66	56.92	74.00	-17.08

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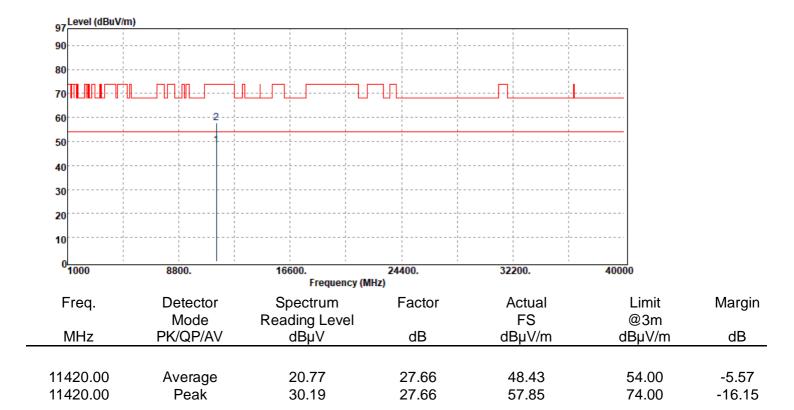
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** :5710 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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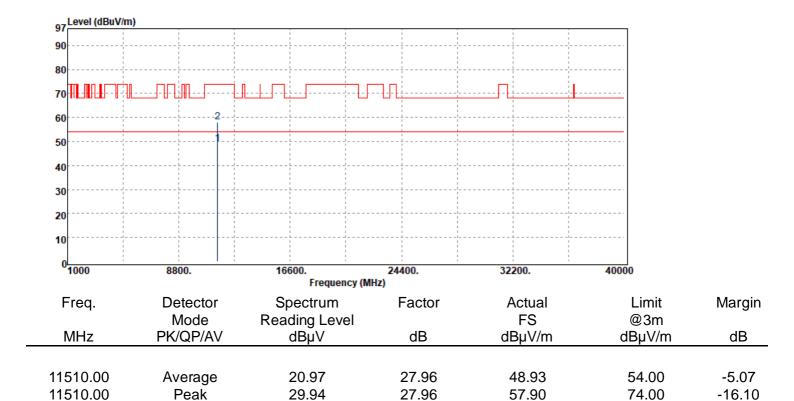
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5755 MHz

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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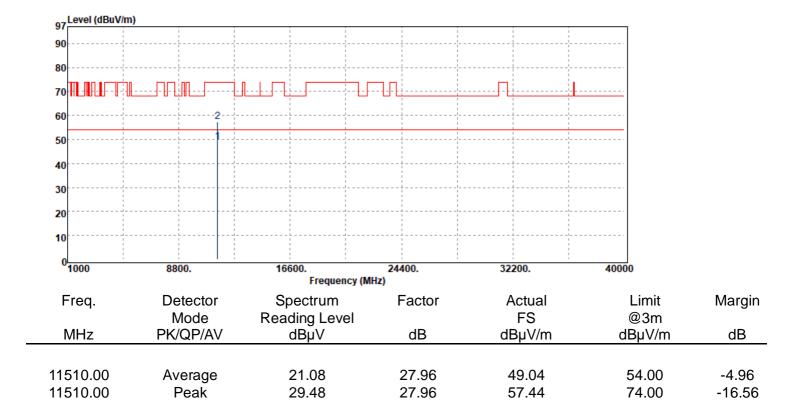
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5755 MHz

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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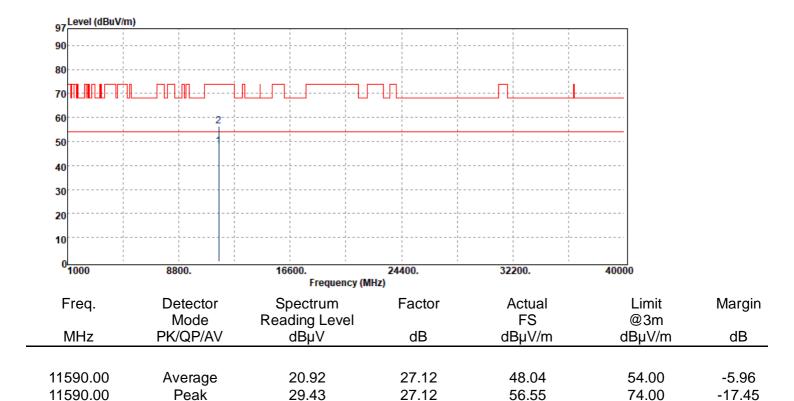
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5795 MHz

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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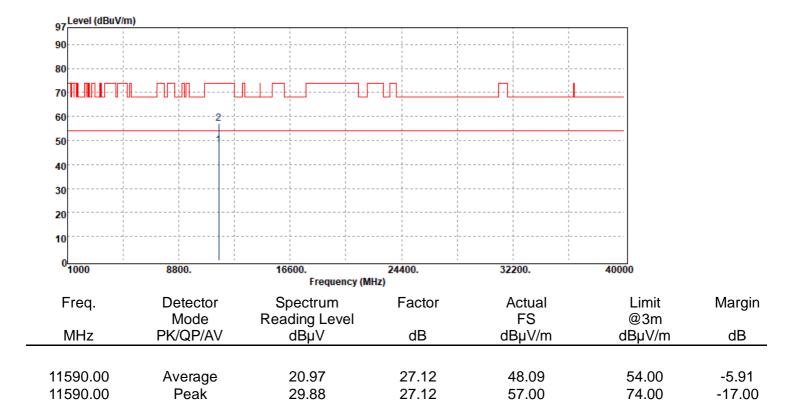
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**Operation Mode Test Date** :802.11n40 :2020-12-09

**Test Frequency** Temp./Humi. :23.2/64 :5795 MHz

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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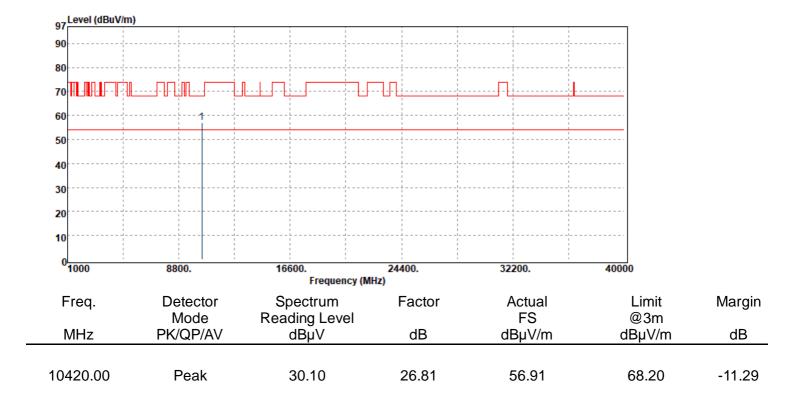
Report Number :ER/2020/B0093 Test Site :SAC I Chamber

Operation Mode :802.11ac80 Test Date :2020-12-09

Test Frequency :5210 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

EUT Pol :E2 Plane Engineer :Neo



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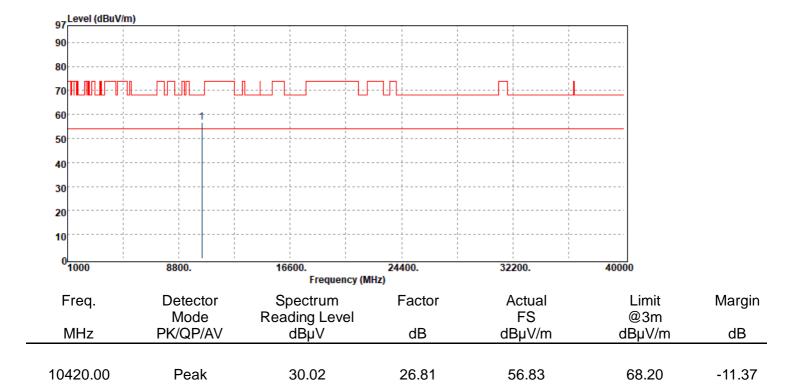
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11ac80 :2020-12-09

**Test Frequency** :5210 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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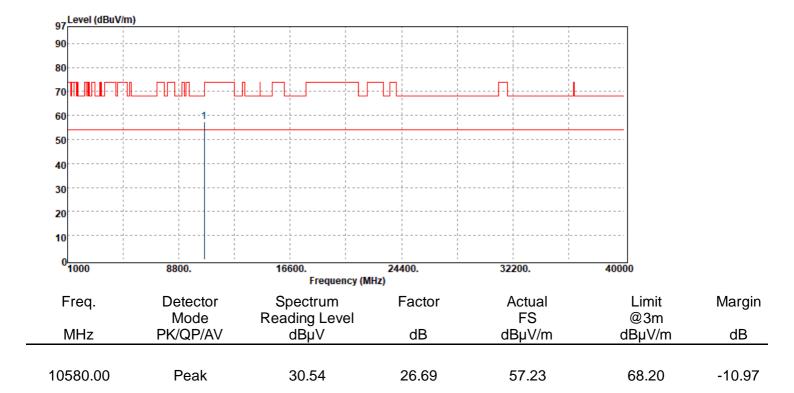
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11ac80 :2020-12-09

**Test Frequency** :5290 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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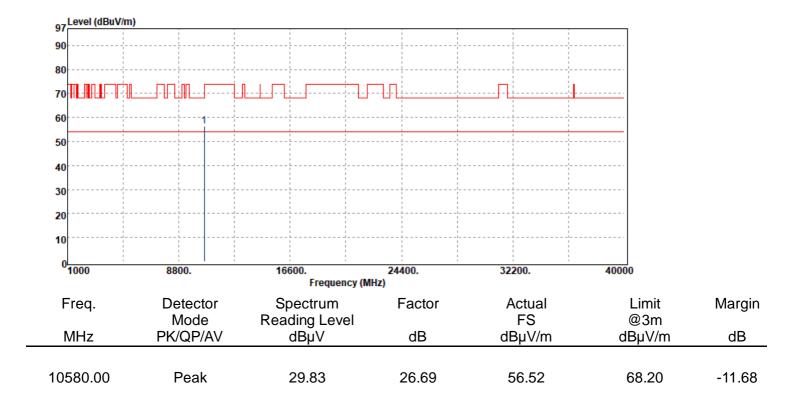
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**Operation Mode Test Date** :802.11ac80 :2020-12-09

**Test Frequency** :5290 MHz Temp./Humi. :23.2/64

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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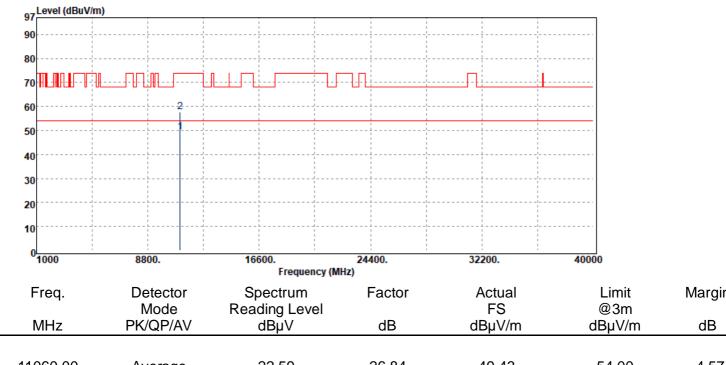
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** :5530 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11060.00	Average	22.59	26.84	49.43	54.00	-4.57
11060.00	Peak	30.92	26.84	57.76	74.00	-16.24

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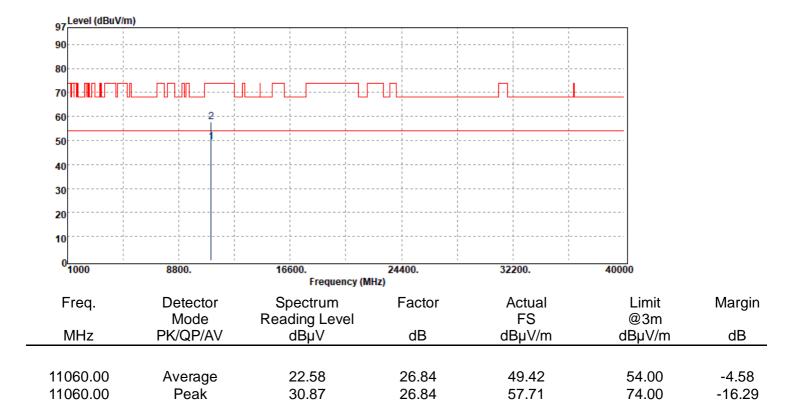
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**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** :5530 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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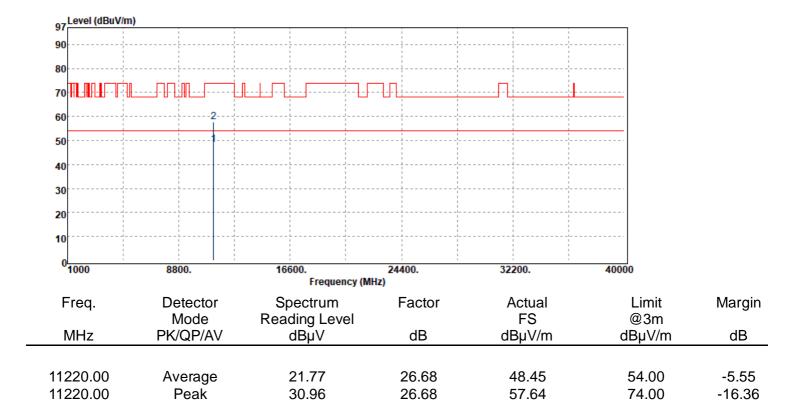
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** :5610 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH Mid Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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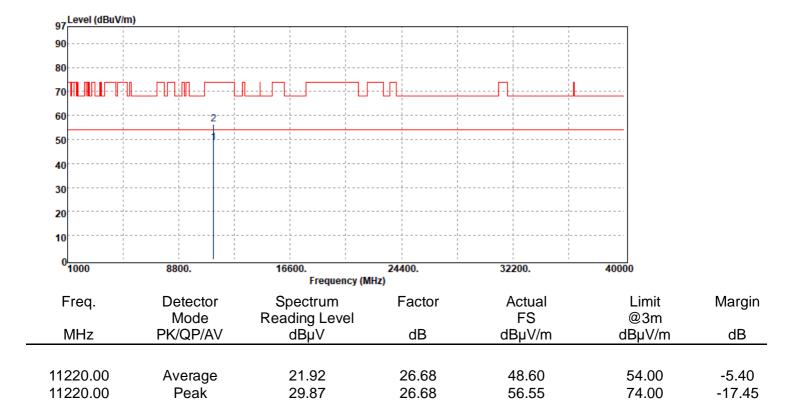
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11ac80 :2020-12-10

:5610 MHz **Test Frequency** Temp./Humi. :23.4/69

Test Mode :Tx CH Mid Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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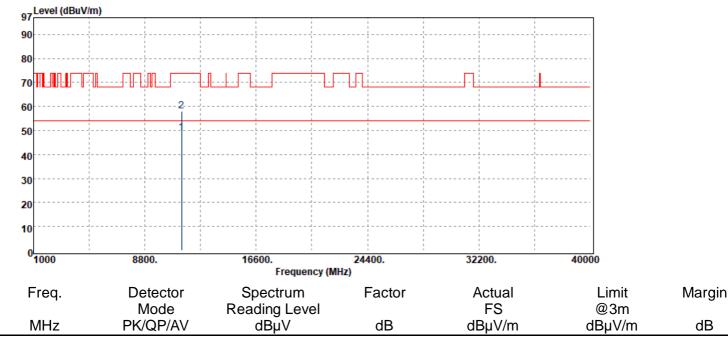
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Test Date Operation Mode** :802.11ac80 :2020-12-10

**Test Frequency** :5690 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



MHz	Mode PK/QP/AV	Reading Level dBuV	dB	FS dBuV/m	@3m dBµV/m	dB
IVII 1Z	I IVQI /AV	αυμν	ub_	αυμν/π	αυμνπι	<u> </u>
11380.00 11380.00	Average Peak	21.27 30.33	27.63 27.63	48.90 57.96	54.00 74.00	-5.10 -16.04

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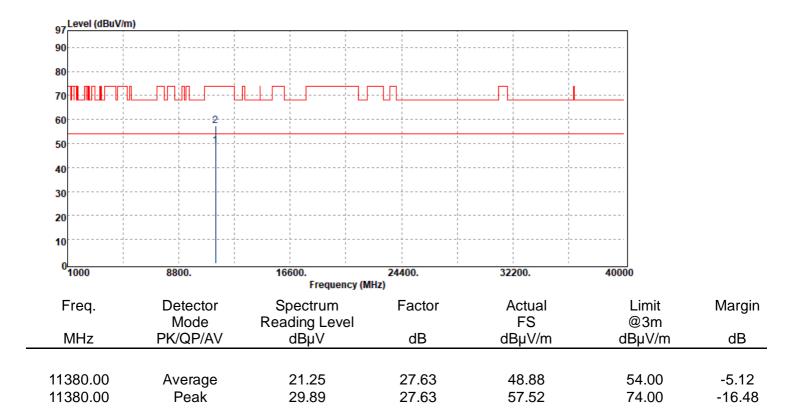
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** :5690 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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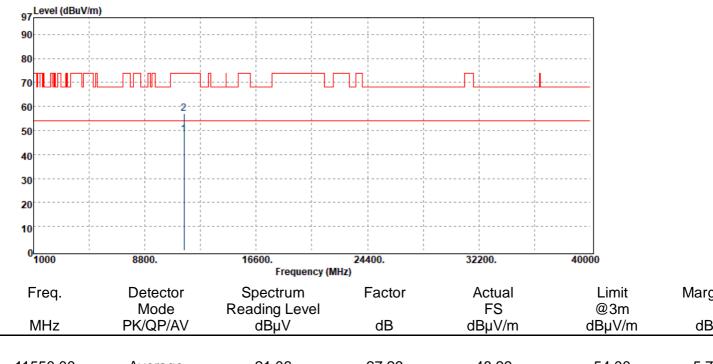
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** :5775 MHz Temp./Humi. :23.4/69

Test Mode :Tx CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11550.00	Average	21.06	27.23	48.29	54.00	-5.71
11550.00	Peak	29.91	27.23	57.14	74.00	-16.86

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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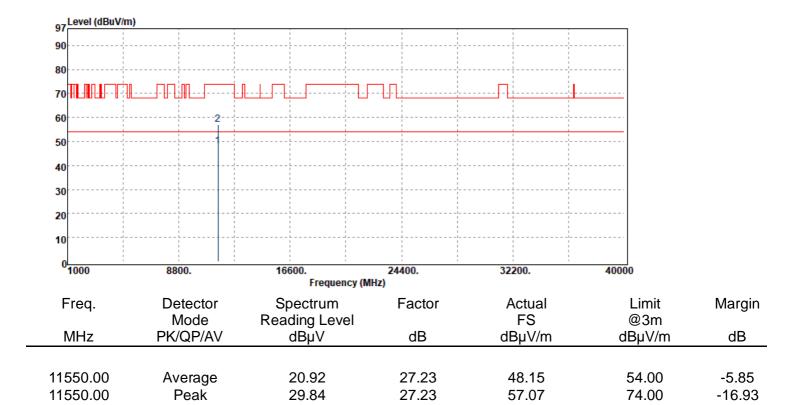
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11ac80 :2020-12-10

**Test Frequency** Temp./Humi. :23.4/69 :5775 MHz

Test Mode :Tx CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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## 11.7.3 Band edge falling to restricted band

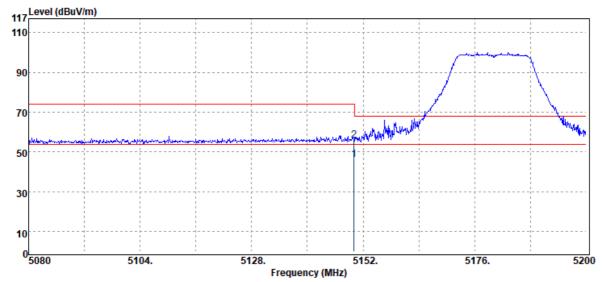
Report Number :ER/2020/B0093 **Test Site** :SAC I Chamber

**Operation Mode Test Date** :2020-12-04 :802.11a

**Test Frequency** :5180 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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	31.38	14.83	46.21	54.00	-7.79
5150.00	Peak	41.22	14.83	56.05	74.00	-17.95

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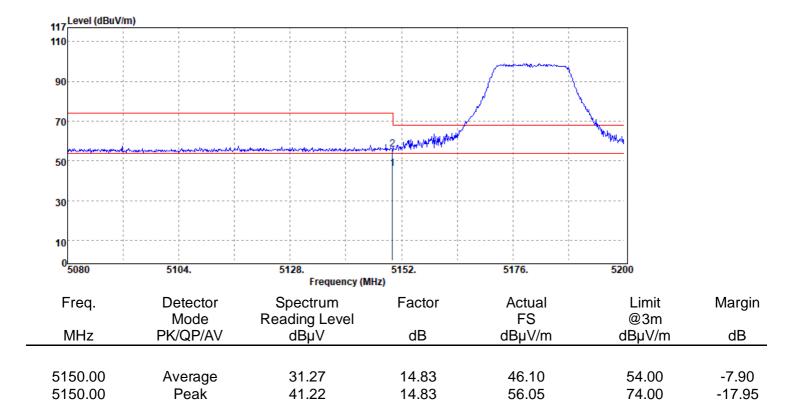
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5180 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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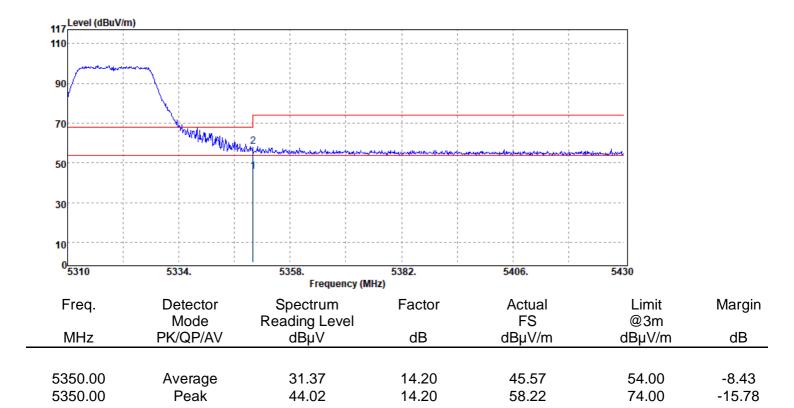
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Test Date Operation Mode** :802.11a :2020-12-04

**Test Frequency** :5320 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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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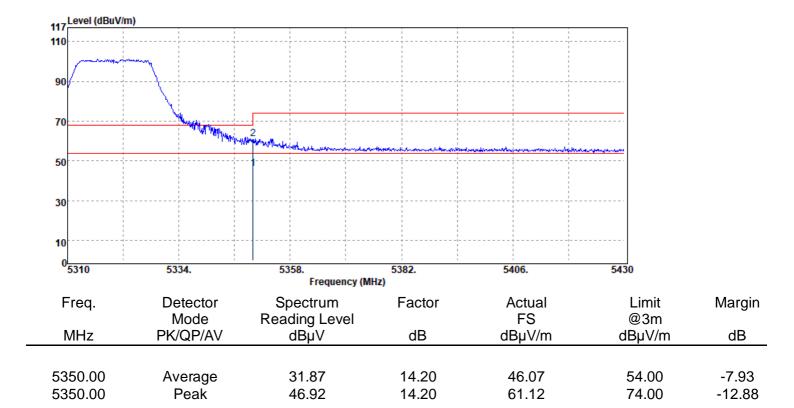
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5320 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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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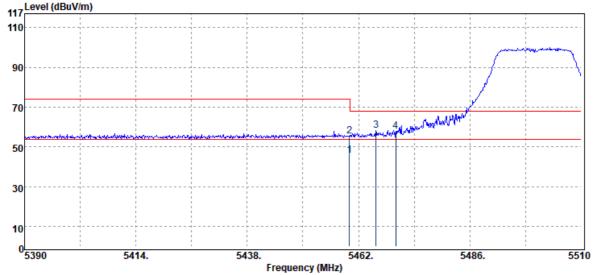
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5500 MHz Temp./Humi. :23.8/60

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5460.00	Average	31.27	14.57	45.84	54.00	-8.16
5460.00	Peak	40.79	14.57	55.36	74.00	-18.64
5465.72	Peak	43.69	14.60	58.29	68.20	-9.91
5470.00	Peak	43.44	14.61	58.05	68.20	-10.15

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.



Margin

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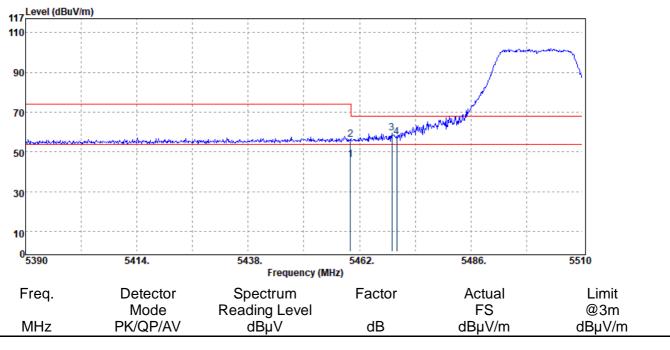
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5500 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
5460.00	Avorago	31.78	14.57	46.35	54.00	-7.65
5460.00	Average Peak	41.88	14.57	56.45	74.00	-7.65 -17.55
5468.96 5470.00	Peak Peak	44.75 43.00	14.61 14.61	59.36 57.61	68.20 68.20	-8.84 -10.59
0 17 0.00	i oak	10.00	1-1.01	07.01	55.20	10.00

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



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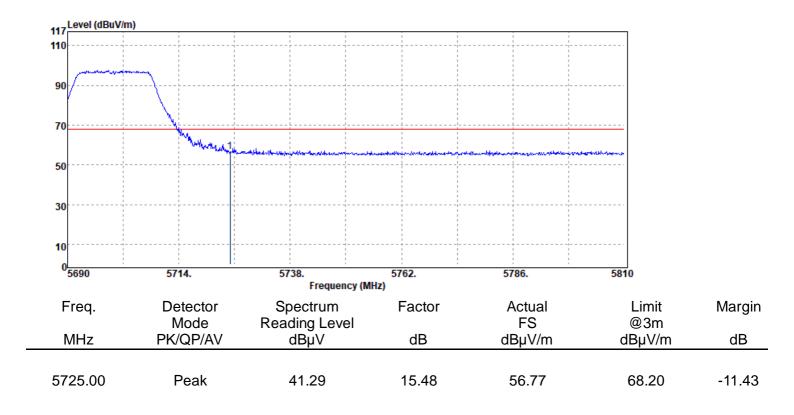
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5700 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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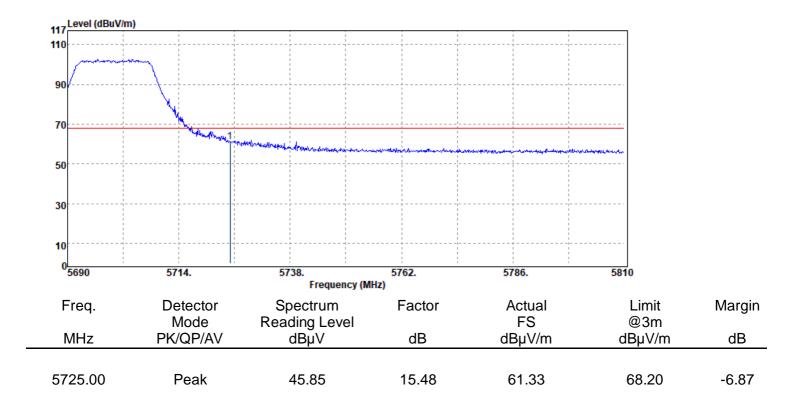
:ER/2020/B0093 **Test Site** :SAC I Chamber Report Number

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5700 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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:ER/2020/B0093 Report Number

**Operation Mode** :802.11a

**Test Frequency** :5745 MHz

Test Mode :Bandedge CH Low

Peak

Peak

Peak

5700.00

5720.00

5725.00

**EUT Pol** :E2 Plane **Test Site** :SAC I Chamber

**Test Date** :2020-12-04

Temp./Humi. :23.8/60

Antenna Pol. :VERTICAL

105.20

110.80

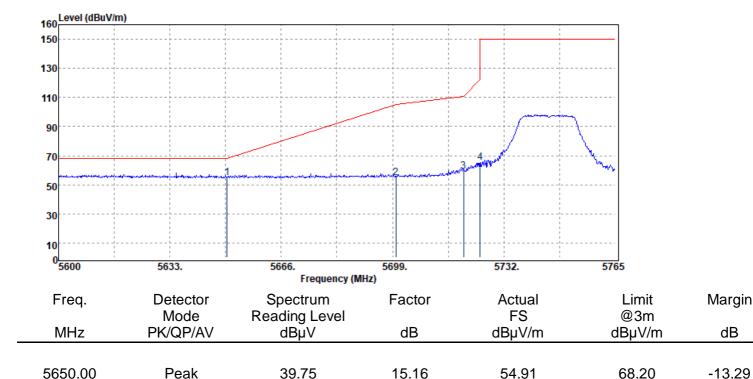
122.20

-50.19

-51.42

-57.14

Engineer :Neo



15.42

15.47

15.48

55.01

59.38

65.06

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.

39.59

43.91

49.58

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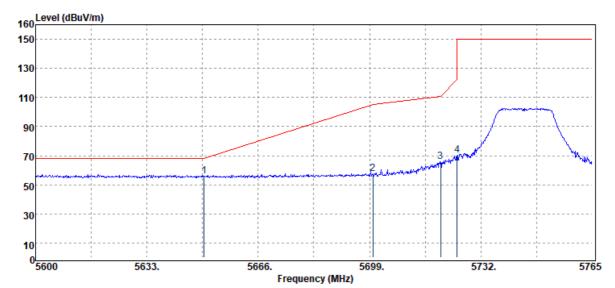
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5745 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5650.00	Peak	40.87	15.16	56.03	68.20	-12.17
5700.00	Peak	41.96	15.42	57.38	105.20	-47.82
5720.00	Peak	50.15	15.47	65.62	110.80	-45.18
5725.00	Peak	55.01	15.48	70.49	122.20	-51.71

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:ER/2020/B0093 Report Number

**Operation Mode** :802.11a

**Test Frequency** :5825 MHz

Test Mode :Bandedge CH High

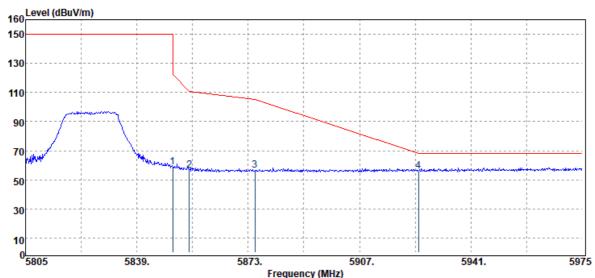
**EUT Pol** :E2 Plane Test Site :SAC I Chamber

**Test Date** :2020-12-04

Temp./Humi. :23.8/60

:VERTICAL Antenna Pol.

Engineer :Neo



			/			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5850.00	Peak	42.99	15.75	58.74	122.20	-63.46
5855.00	Peak	40.49	15.75	56.24	110.80	-54.56
5875.00	Peak	40.50	15.75	56.25	105.20	-48.95
5925.00	Peak	39.87	16.06	55.93	68.20	-12.27

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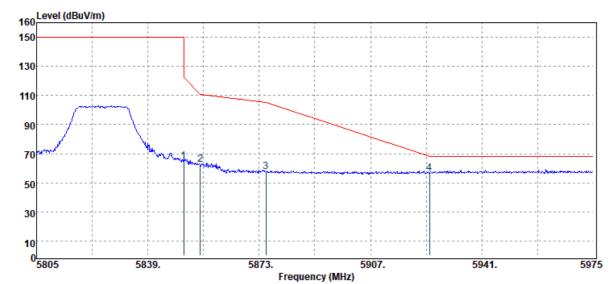
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11a :2020-12-04

**Test Frequency** :5825 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5850.00	Peak	49.25	15.75	65.00	122.20	-57.20
5855.00	Peak	47.03	15.75	62.78	110.80	-48.02
5875.00	Peak	41.85	15.75	57.60	105.20	-47.60
5925.00	Peak	40.52	16.06	56.58	68.20	-11.62

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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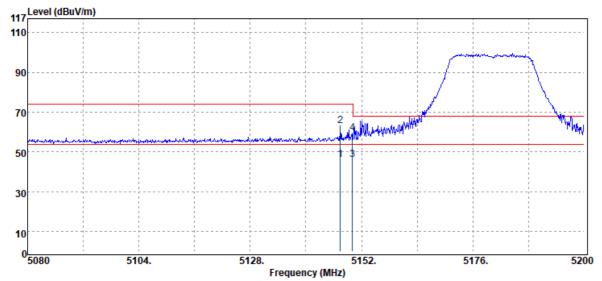
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-04

**Test Frequency** :5180 MHz Temp./Humi. :23.8/60

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5147.44	Average	31.40	14.83	46.23	54.00	-7.77
5147.44	Peak	48.22	14.83	63.05	74.00	-10.95
5150.00	Average	31.25	14.83	46.08	54.00	-7.92
5150.00	Peak	44.87	14.83	59.70	74.00	-14.30

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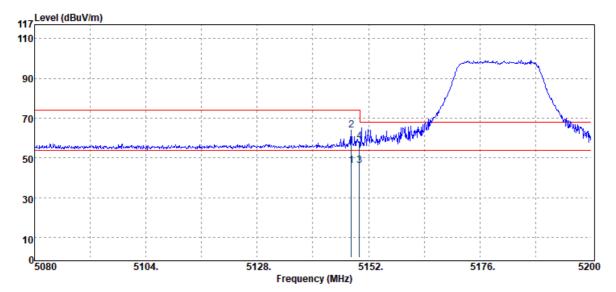
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :2020-12-04 :802.11n20

**Test Frequency** :5180 MHz Temp./Humi. :23.8/60

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
						_
5148.28	Average	31.22	14.83	46.05	54.00	-7.95
5148.28	Peak	49.19	14.83	64.02	74.00	-9.98
5150.00	Average	31.33	14.83	46.16	54.00	-7.84
5150.00	Peak	43.43	14.83	58.26	74.00	-15.74

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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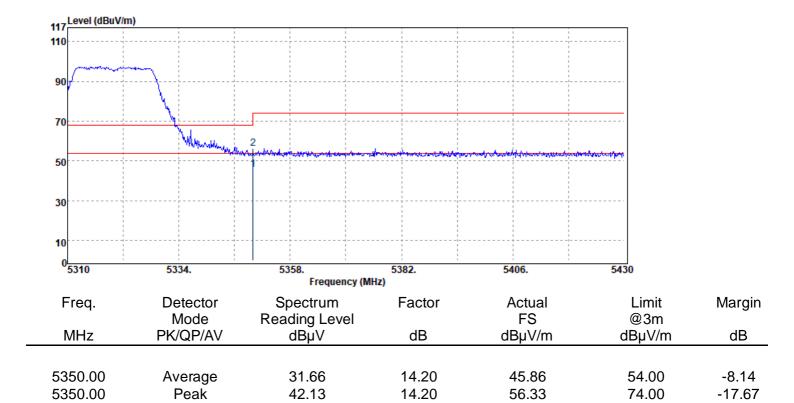
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5320 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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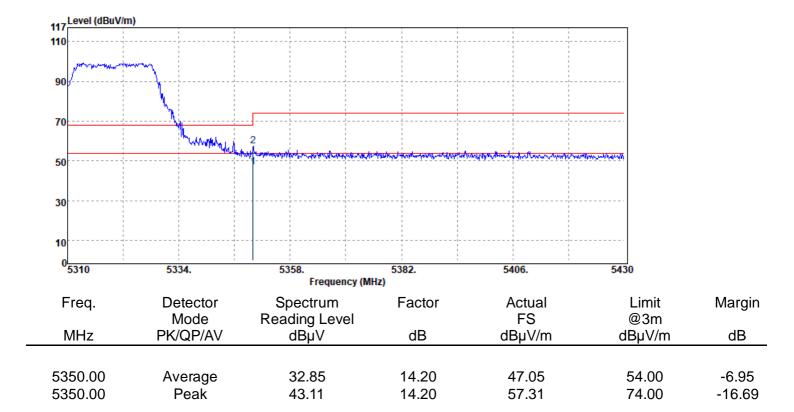
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5320 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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.



:SAC I Chamber

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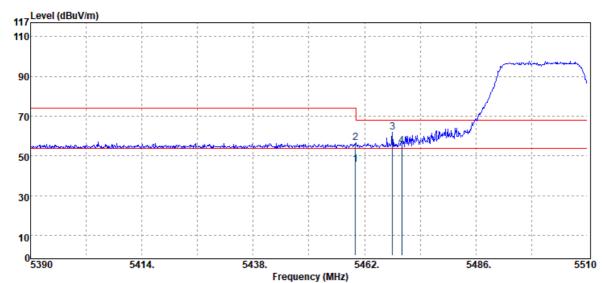
:ER/2020/B0093 Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-10

**Test Frequency** :5500 MHz Temp./Humi. :23.4/69

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5460.00	Average	31.06	14.57	45.63	54.00	-8.37
5460.00	Peak	42.10	14.57	56.67	74.00	-17.33
5468.00	Peak	47.48	14.60	62.08	68.20	-6.12
5470.00	Peak	40.61	14.61	55.22	68.20	-12.98

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.



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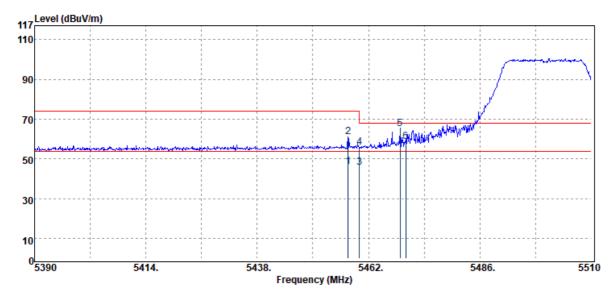
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-10

**Test Frequency** :5500 MHz Temp./Humi. :23.4/69

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5457.56	Average	31.52	14.56	46.08	54.00	-7.92
5457.56	Peak	46.58	14.56	61.14	74.00	-12.86
5460.00	Average	31.36	14.57	45.93	54.00	-8.07
5460.00	Peak	41.10	14.57	55.67	68.20	-12.53
5468.84	Peak	50.42	14.61	65.03	68.20	-3.17
5470.00	Peak	44.00	14.61	58.61	68.20	-9.59

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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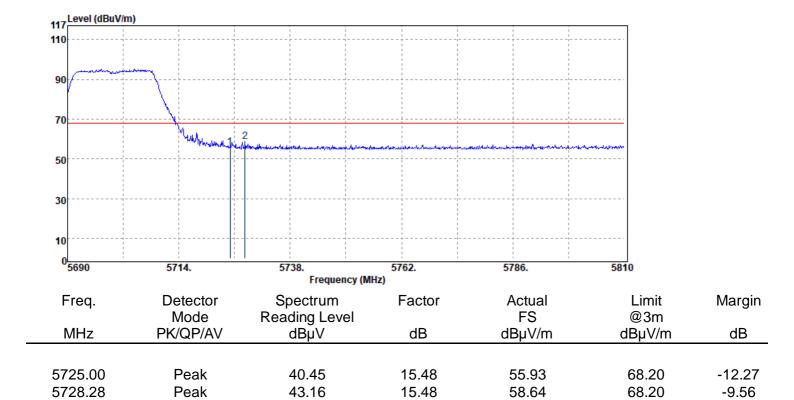
:ER/2020/B0093 :SAC I Chamber Report Number **Test Site** 

**Operation Mode Test Date** :802.11n20 :2020-12-10

**Test Frequency** :5700 MHz Temp./Humi. :23.4/69

Test Mode :Bandedge CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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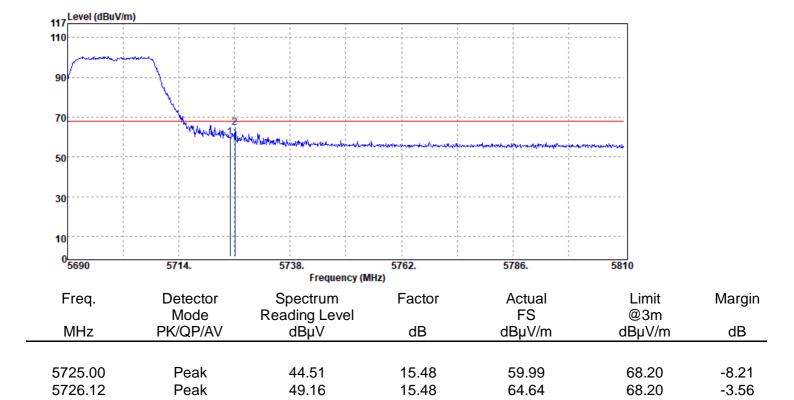
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n20 :2020-12-10

**Test Frequency** :5700 MHz Temp./Humi. :23.4/69

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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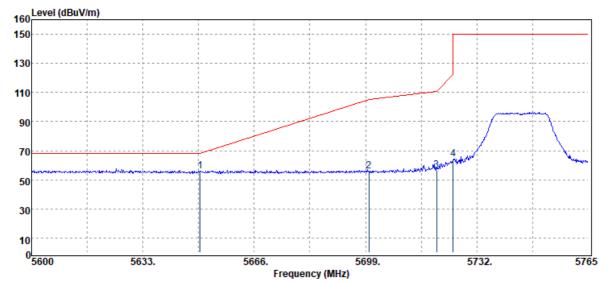
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5745 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5650.00	Peak	40.60	15.16	55.76	68.20	-12.44
5700.00	Peak	40.47	15.42	55.89	105.20	-49.31
5720.00	Peak	41.07	15.47	56.54	110.80	-54.26
5725.00	Peak	48.78	15.48	64.26	122.20	-57.94

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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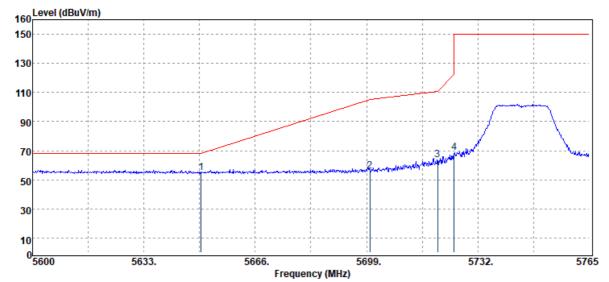
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5745 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5650.00	Peak	39.43	15.16	54.59	68.20	-13.61
5700.00	Peak	40.53	15.42	55.95	105.20	-49.25
5720.00	Peak	48.41	15.47	63.88	110.80	-46.92
5725.00	Peak	53.28	15.48	68.76	122.20	-53.44

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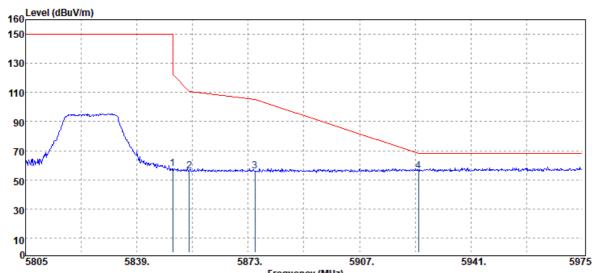
:ER/2020/B0093 Report Number Test Site :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5825 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



		Frequency (MF	łz)			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
						_
5850.00	Peak	41.85	15.75	57.60	122.20	-64.60
5855.00	Peak	40.37	15.75	56.12	110.80	-54.68
5875.00	Peak	40.15	15.75	55.90	105.20	-49.30
5925.00	Peak	39.83	16.06	55.89	68.20	-12.31
5925.00	Peak	39.83	16.06	55.89	68.20	-12.31

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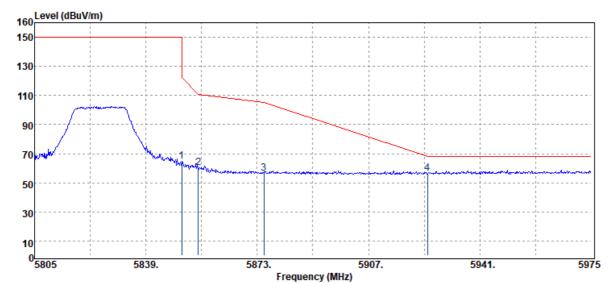
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n20 :2020-12-08

**Test Frequency** :5825 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5850.00	Peak	48.85	15.75	64.60	122.20	-57.60
5855.00	Peak	44.40	15.75	60.15	110.80	-50.65
5875.00	Peak	40.52	15.75	56.27	105.20	-48.93
5925.00	Peak	40.50	16.06	56.56	68.20	-11.64

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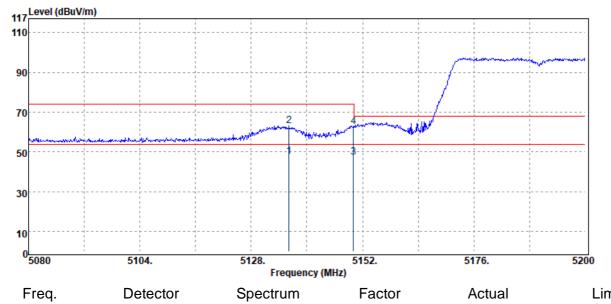
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5190 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5136.16	Average	32.82	14.86	47.68	54.00	-6.32
5136.16	Peak	48.44	14.86	63.30	74.00	-10.70
5150.00	Average	32.59	14.83	47.42	54.00	-6.58
5150.00	Peak	47.84	14.83	62.67	74.00	-11.33

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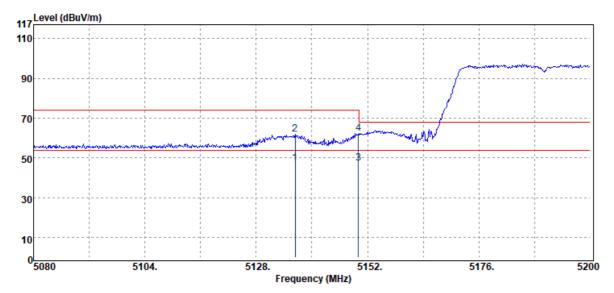
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**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5190 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5136.40	Average	32.38	14.85	47.23	54.00	-6.77
5136.40	Peak	46.90	14.85	61.75	74.00	-12.25
5150.00	Average	32.43	14.83	47.26	54.00	-6.74
5150.00	Peak	47.39	14.83	62.22	74.00	-11.78

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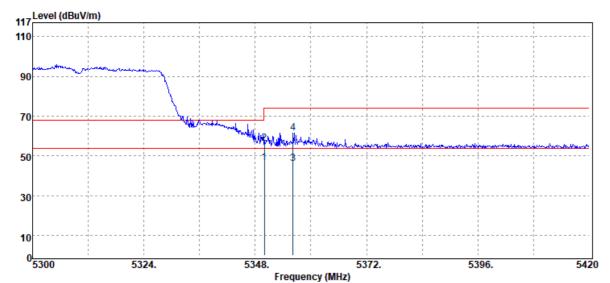
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5310 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5350.00	Average	32.17	14.20	46.37	54.00	-7.63
5350.00	Peak	41.90	14.20	56.10	74.00	-17.90
5356.16	Average	32.06	14.27	46.33	54.00	-7.67
5356.16	Peak	47.47	14.27	61.74	74.00	-12.26

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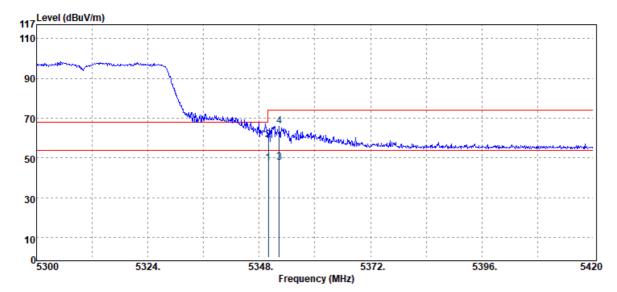
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5310 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
						_
5350.00	Average	33.22	14.20	47.42	54.00	-6.58
5350.00	Peak	45.05	14.20	59.25	74.00	-14.75
5352.32	Average	33.41	14.23	47.64	54.00	-6.36
5352.32	Peak	51.81	14.23	66.04	74.00	-7.96

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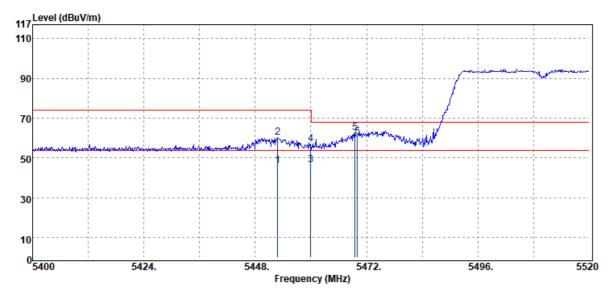
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-10

**Test Frequency** :5510 MHz Temp./Humi. :23.4/69

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5452.80	Average	31.55	14.53	46.08	54.00	-7.92
5452.80	Peak	45.61	14.53	60.14	74.00	-13.86
5460.00	Average	31.86	14.57	46.43	54.00	-7.57
5460.00	Peak	42.58	14.57	57.15	74.00	-16.85
5469.48	Peak	48.20	14.62	62.82	68.20	-5.38
5470.00	Peak	45.95	14.61	60.56	68.20	-7.64

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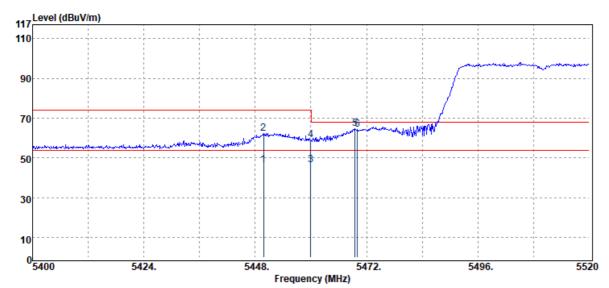
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-10

**Test Frequency** :5510 MHz Temp./Humi. :23.4/69

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5449.80	Average	32.11	14.52	46.63	54.00	-7.37
5449.80	Peak	48.03	14.52	62.55	74.00	-11.45
5460.00	Average	32.18	14.57	46.75	54.00	-7.25
5460.00	Peak	44.59	14.57	59.16	74.00	-14.84
5469.48	Peak	50.19	14.62	64.81	68.20	-3.39
5470.00	Peak	49.90	14.61	64.51	68.20	-3.69

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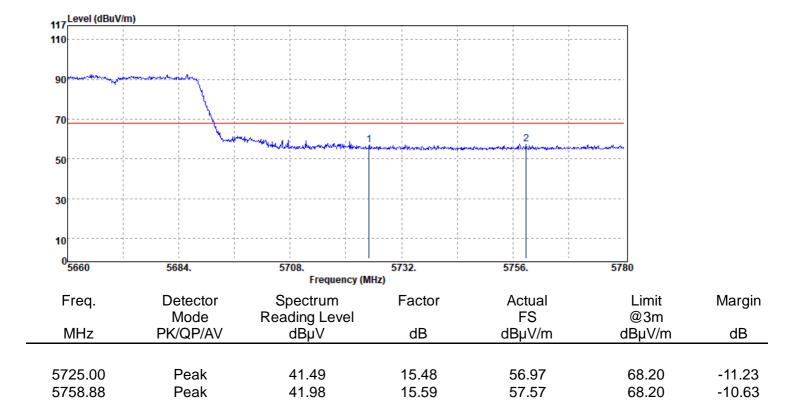
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5670 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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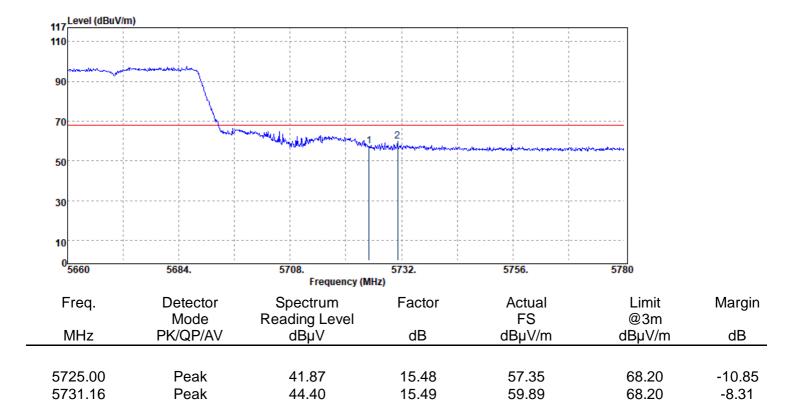
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5670 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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:SAC I Chamber

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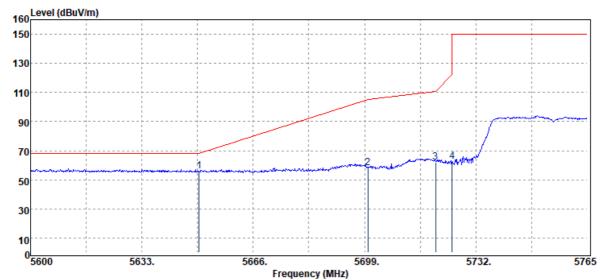
:ER/2020/B0093 Report Number **Test Site** 

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5755 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμ̈V	dB	dBµV/m	dBµV/m	dB
5650.00	Peak	40.89	15.16	56.05	68.20	-12.15
5700.00	Peak	42.63	15.42	58.05	105.20	-47.15
5720.00	Peak	46.56	15.47	62.03	110.80	-48.77
5725.00	Peak	47.02	15.48	62.50	122.20	-59.70

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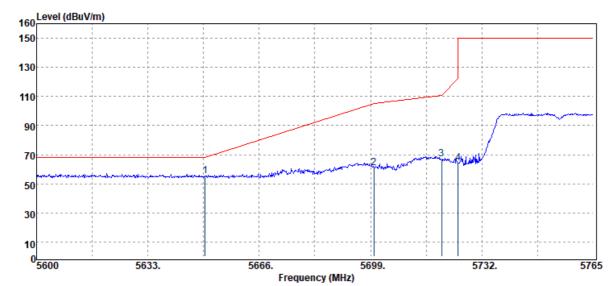
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5755 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5650.00	Peak	40.31	15.16	55.47	68.20	-12.73
5700.00	Peak	45.55	15.42	60.97	105.20	-44.23
5720.00	Peak	51.47	15.47	66.94	110.80	-43.86
5725.00	Peak	48.72	15.48	64.20	122.20	-58.00

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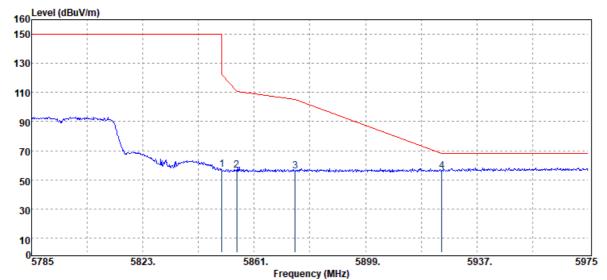
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5795 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5850.00	Peak	41.22	15.75	56.97	122.20	-65.23
5855.00	Peak	40.91	15.75	56.66	110.80	-54.14
5875.00	Peak	40.44	15.75	56.19	105.20	-49.01
5925.00	Peak	39.76	16.06	55.82	68.20	-12.38

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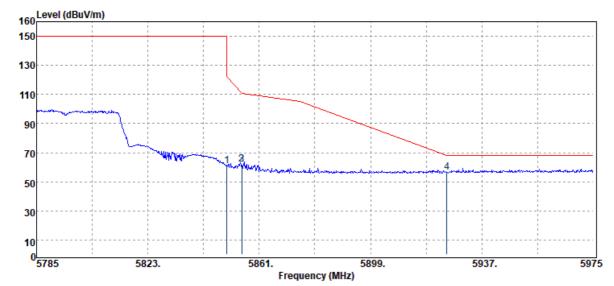
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**Operation Mode Test Date** :802.11n40 :2020-12-08

**Test Frequency** :5795 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	45.13	15.75	60.88	122.20	-61.32
5855.00	Peak	46.35	15.75	62.10	110.80	-48.70
5855.00	Peak	46.35	15.75	62.10	110.80	-48.70
5925.00	Peak	40.48	16.06	56.54	68.20	-11.66

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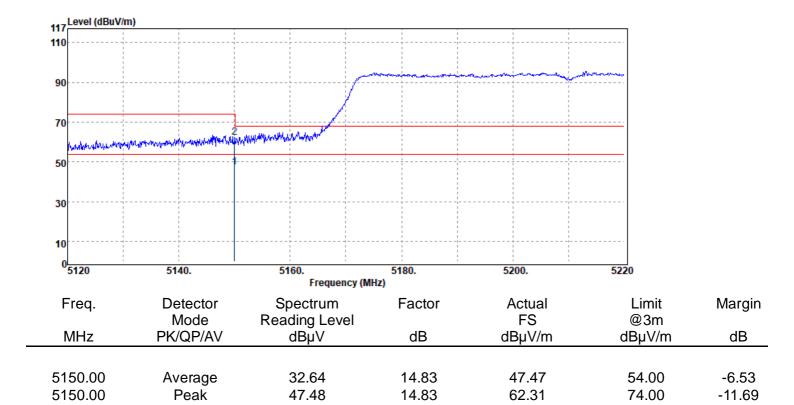
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5210 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :VERTICAL

**EUT Pol** :E2 Plane Engineer :Neo



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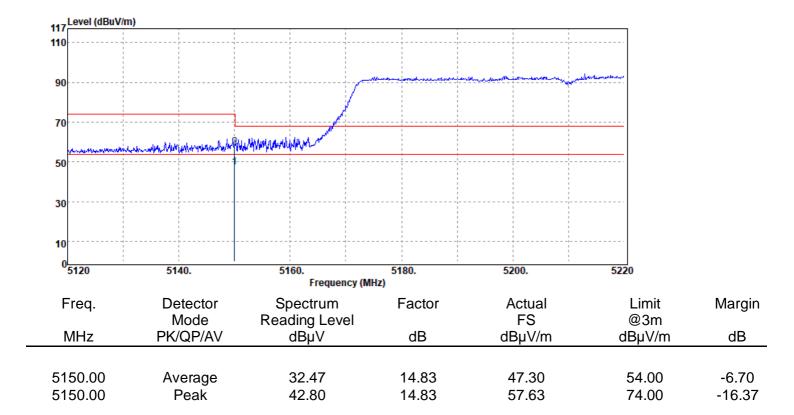
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5210 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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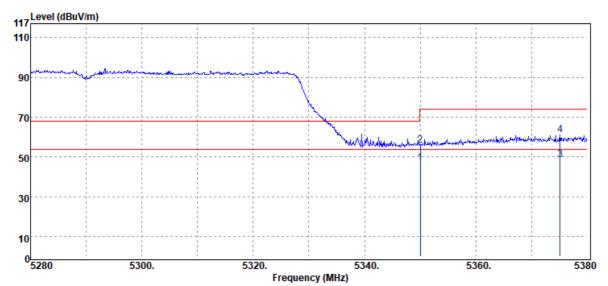
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5290 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5350.00	Average	32.90	14.20	47.10	54.00	-6.90
5350.00	Peak	41.75	14.20	55.95	74.00	-18.05
5375.10	Average	34.13	14.44	48.57	54.00	-5.43
5375.10	Peak	46.60	14.44	61.04	74.00	-12.96

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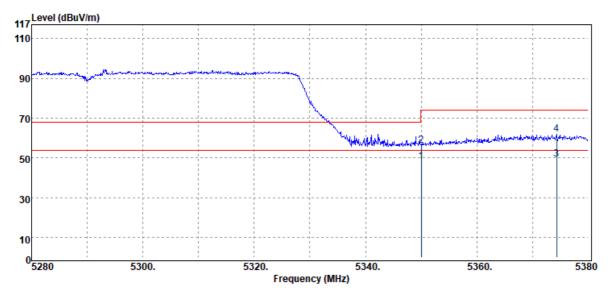
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5290 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
						_
5350.00	Average	33.84	14.20	48.04	54.00	-5.96
5350.00	Peak	41.99	14.20	56.19	74.00	-17.81
5374.30	Average	35.14	14.44	49.58	54.00	-4.42
5374.30	Peak	47.44	14.44	61.88	74.00	-12.12

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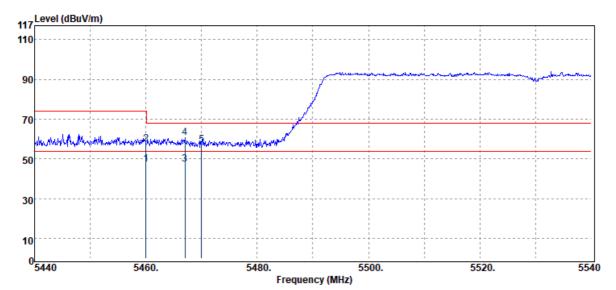
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5530 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	32.96	14.57	47.53	54.00	-6.47
5460.00	Peak	43.07	14.57	57.64	74.00	-16.36
5467.00	Average	32.91	14.61	47.52	54.00	-6.48
5467.00	Peak	46.06	14.61	60.67	68.20	-7.53
5470.00	Peak	42.32	14.61	56.93	68.20	-11.27

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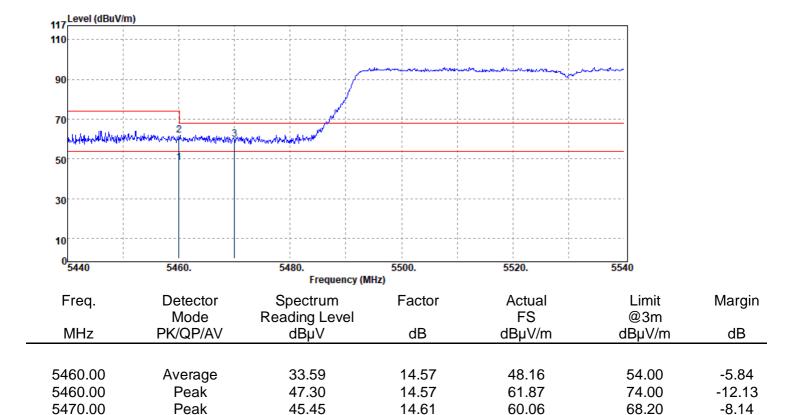
:ER/2020/B0093 :SAC I Chamber Report Number Test Site

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5530 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



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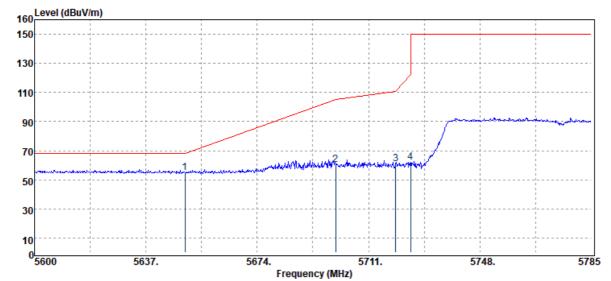
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5775 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH Low Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5650.00	Peak	39.85	15.16	55.01	68.20	-13.19
5700.00	Peak	44.84	15.42	60.26	105.20	-44.94
5720.00	Peak	45.33	15.47	60.80	110.80	-50.00
5725.00	Peak	46.55	15.48	62.03	122.20	-60.17

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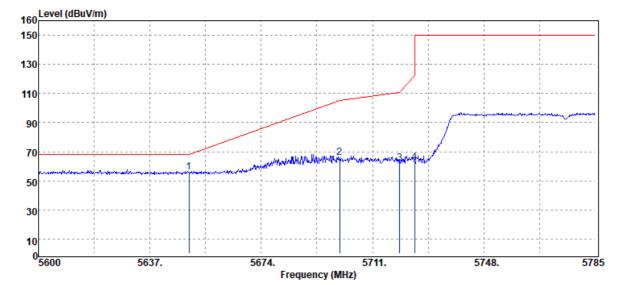
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5775 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH Low Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
		•		·	•	
5650.00	Peak	40.79	15.16	55.95	68.20	-12.25
5700.00	Peak	50.58	15.42	66.00	105.20	-39.20
5720.00	Peak	46.64	15.47	62.11	110.80	-48.69
5725.00	Peak	47.01	15.48	62.49	122.20	-59.71

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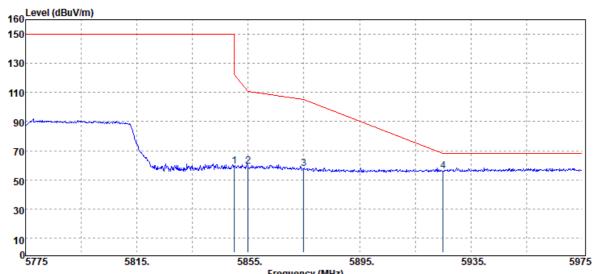
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5775 MHz Temp./Humi. :24.1/67

Test Mode :VERTICAL :Bandedge CH High Antenna Pol.

**EUT Pol** :E2 Plane Engineer :Neo



		Frequency (Wif	1 <b>Z)</b>			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5850.00	Peak	43.65	15.75	59.40	122.20	-62.80
5855.00	Peak	43.56	15.75	59.31	110.80	-51.49
5875.00	Peak	41.62	15.75	57.37	105.20	-47.83
5925.00	Peak	39.98	16.06	56.04	68.20	-12.16

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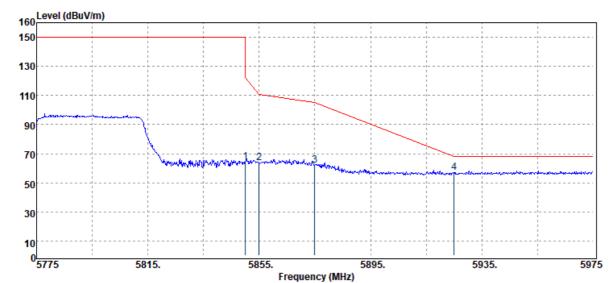
:ER/2020/B0093 Report Number **Test Site** :SAC I Chamber

**Operation Mode Test Date** :802.11ac80 :2020-12-08

**Test Frequency** :5775 MHz Temp./Humi. :24.1/67

Test Mode :Bandedge CH High Antenna Pol. :HORIZONTAL

**EUT Pol** :E2 Plane Engineer :Neo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5850.00	Peak	48.24	15.75	63.99	122.20	-58.21
5855.00	Peak	47.67	15.75	63.42	110.80	-47.38
5875.00	Peak	46.25	15.75	62.00	105.20	-43.20
5925.00	Peak	40.70	16.06	56.76	68.20	-11.44

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# 12 TRANSMISSION IN THE ABSENCE OF DATA

#### 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.

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# 13 FREQUENCY STABILITY

#### 13.1 **Standard Applicable**

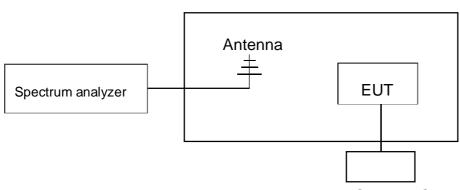
Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

#### 13.2 **Measurement Procedure**

- 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



Variable AC Power Supply

#### 13.4 **Measurement Equipment Used:**

	SGS Conducted Room						
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020		
EXM Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/27/2020	06/26/2021		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021		

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### 13.5 **Measurement Result** Start up

Operation Mode	802.11 a	Test Date	2020.11.20
Temperature	23.6	Test By	Bob
Humidity			64

Test Temp.(°C)	Test Voltage(V)	Channel	Frequency (MHz)	Measured Frequency (MHz)	ΔFrequency (ppm)
35	4	36	5180	5,180.09700	18.73
30	3.7	36	5180	5,180.08900	17.18
25	3.85	36	5180	5,180.05000	9.65
5	4	36	5180	5,179.97800	-4.25
3	3.7	36	5180	5,179.93300	-12.93

# 2 minutes

Operation Mode	802.11 a	Test Date	2020.11.20
Temperature	23.6	Test By	Bob
Humidity			64

Test Temp.(°C)	Test Voltage(V)	Channel	Frequency (MHz)	Measured Frequency (MHz)	ΔFrequency (ppm)
35	4	36	5180	5,180.08700	16.80
	3.7	36	5180	5,180.08400	16.22
25	3.85	36	5180	5,180.07100	13.71
5	4	36	5180	5,179.96600	-6.56
]	3.7	36	5180	5,179.94800	-10.04

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# 5 minutes

Operation Mode	802.11 a	Test Date	2020.11.20
Temperature	23.6	Test By	Bob
Humidity			64

Test Temp.(°C)	Test Voltage(V)	Channel	Frequency (MHz)	Measured Frequency (MHz)	ΔFrequency (ppm)
35	4	36	5180	5,180.10000	19.31
	3.7	36	5180	5,180.08600	16.60
25	3.85	36	5180	5,180.07000	13.51
5	4	36	5180	5,179.94900	-9.85
3	3.7	36	5180	5,179.99200	-1.54

# 10 minutes

Operation Mode	802.11 a	Test Date	2020.11.20
Temperature	23.6	Test By	Bob
Humidity			64

Test Temp.(°C)	Test Voltage(V)	Channel	Frequency (MHz)	Measured Frequency (MHz)	ΔFrequency (ppm)
35	4	36	5180	5,180.09700	18.73
	3.7	36	5180	5,180.06500	12.55
25	3.85	36	5180	5,180.03300	6.37
5	4	36	5180	5,179.94100	-11.39
	3.7	36	5180	5,179.90600	-18.15

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# **14 ANTENNA REQUIREMENT**

# **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 ~

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