

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT OF

	OF		
Product Name:	Tablet PC		
Brand Name:	hp		
Model No.:	HSTNN-Q93C		
FCC ID:	B94HNQ93CSPNAC		
Report No.:	E2/2015/30022		
Issue Date:	Apr. 30, 2015		
FCC Rule Part:	<b>§15.407</b>		
Prepared for:	Hewlett-Packard Company 1501 Page Mill Road, M/S1419, Palo Alto, CA 94304, United States		
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333		
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Testing Laboratory

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FCC ID: B94HNQ93CSPNAC

**Report No.: E2/2015/30022** Issue Date: Apr. 30, 2015 Page 2 of 229

# VERIFICATION OF COMPLIANCE

Applicant:	Hewlett-Packard Company 1501 Page Mill Road, M/S1419, Palo Alto, CA, 94304, United States
Product Name:	Tablet PC
Brand Name:	hp
Model No.:	HSTNN-Q93C
FCC ID:	B94HNQ93CSPNAC
File Number:	E2/2015/30022
Date of test:	Mar. 16, 2015 ~ Apr. 29, 2015
Date of EUT Received:	Mar. 16, 2015

## We hereby certify that:

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

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

Test By:	Jazz Huang	Date:	Apr. 30, 2015
Prepared By:	Jazz Huang /Asst. Supervisor Vroletta Tang	Date:	Apr. 30, 2015
Approved By:	Violetta Tang / Clerk Tim Ch ang	Date:	Apr. 30, 2015

Jim Chang / Asst. Manager

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# **Revision History**

Report Number	Revision	Description	Issue Date
E2/2015/30021	Rev.00	Initial creation of document	Apr. 30, 2015

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#### FCC ID: B94HNQ93CSPNAC

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#### **GENERAL INFORMATION** 1.

#### **Product Description** 1.1

#### General:

Product Name:	Tablet PC			
Brand Name:	hp	hp		
Model No.:	HSTNN-Q93	3C		
Product SW/HW version	Win 8.1 / 1.0	)		
Radio SW/HW version	7.7.2.0 / 1.0	7.7.2.0 / 1.0		
	3.8Vdc form Rechargeable Li-ion Battery or 5.25V from AC/DC Adapter			
	Battery:	1. Model No.: HSTNH-C408M-SD, Supplier: Dynapack		
Power Supply:		2. Model No.: HSTNH-C408M-SS, Supplier: SDI (SQ)		
Tower Suppry.		1. Model No.: TPN-AA01, Supplier: AcBel		
	Adapter:	2. Model No.: TPN-DA01, Supplier: Delta		
		3. Model No.: TPN-LA01, Supplier: Lite-On		

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#### WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
	5150~5250	4	12.41dBm		
11a	5250~5350	4	12.41dBm	OEDM	
11a	5470~5725	11	12.39dBm	OFDM	
	5725-5850	5	12.45dBm		
	HT20 / VHT20 5150~5250	4	VHT: 12.37dBm (Worst Case)		
11n / ac	HT20 / VHT20 5250~5350	4	VHT: 12.41dBm (Worst Case)	OFDM	
11117 de	HT20 / VHT20 5470~5725	11	VHT: 12.39dBm (Worst Case)		
	HT20 / VHT20 5725-5850	5	VHT: 12.45dBm (Worst Case)		
	HT40 / VHT40 5150~5250	2	VHT: 12.44dBm (Worst Case)		
11n / ac	HT40 / VHT40 5250~5350	2	VHT: 12.36dBm (Worst Case)	OFDM	
11117 de	HT40 / VHT40 5470~5725	5	VHT: 12.46dBm (Worst Case)		
	HT40 / VHT40 5725-5850	2	VHT: 12.44dBm (Worst Case)		
	VHT80 5150~5250	1	12.22dBm		
11ac	VHT80 5250~5350	1	12.03dBm	OFDM	
	VHT80 5470~5725	3	12.11dBm		
	VHT80 5725-5850	1	12.34dBm		

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	PIFA Antenna Main: Part No.: DQ6R15GAV00, Supplier: Wistron Neweb Corp 5GHz Gain: -4.47dBi (5150MHz-5250MHz) 5GHz Gain: -4.48dBi (5250MHz-5350MHz)
Antenna Designation	5GHz Gain: -2.13dBi (5470MHz-5725MHz) 5GHz Gain: -3.57dBi (5725MHz-5850MHz) Aux: Part No.: DQ6R15GAW00, Supplier: Wistron Neweb Corp 5GHz Gain: -0.51dBi (5150MHz-5250MHz) 5GHz Gain: -0.64dBi (5250MHz-5350MHz) 5GHz Gain: -0.44dBi (5470MHz-5725MHz) 5GHz Gain: -2.09dBi (5725MHz-5850MHz)
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65Mbps 802.11 n_40MHz: 13.5 – 135Mbps 802.11 ac_20MHz: 6.5 – 65Mbps 802.11 ac_40MHz: 13.5 – 135Mbps 802.11 ac_80MHz: 29.3 – 292.5Mbps

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#### **Product Feature of Equipment Under Test** 1.2

The equipment under Test (Hereafter Called: EUT) is Tablet PC supporting, GSM / WCDMA / CDMA / LTE, Wi-Fi 802.11abgn & ac, Bluetooth with NFC and GPS features, and below is details of information.

Product Feature			
Product Name:	Tablet PC		
Brand Name:	hp		
Model No.:	HSTNN-Q93C		
FCC ID	B94HNQ93CSPNAC		
GSM Operating Band(s)	GSM 850/1900MHz		
GPRS / EGPRS Multi Slot Class	GPRS Class 12 / Class 12		
CDMA / EVDO	BC0 / BC1		
WCDMA Operating Band(s)	FDD Band II / IV / V		
WCDMA Rel. Version	Rel.8		
LTE Operating Band(s)	FCC Band 2 / 4 / 5 / 13 / 17 / 25		
LTE Rel. Version	Rel.9		
Wi-Fi Specification	802.11a/b/g/n/ac		
Bluetooth Version	V4.0 dual mode + HS		
NFC Specification	NFC		

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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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 v01

FCC KDB 662311 D01 Multiple Transmitter Output

FCC KDB 644545 D03 Guidance for IEEE 802.11ac v01

ANSI C63.10:2013

Note:

- 1. All test items have been performed and record as per the above standards.
- 2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.
- The EUT was placed 1.5m height for frequency above 1GHz in accordance with 3. ANSI C63.10:2013.

#### Test Facility 1.4

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan. (TAF code 0513)

FCC Registration Numbers are: 628985

Canada Registration Number: 4620A-5

#### 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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# 2. SYSTEM TEST CONFIGURATION

# 2.1 EUT Configuration

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

### 2.2 EUT Exercise

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

#### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to \$15.107. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. 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 hand-held 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.

# 2.4 Measurement Results Explanation Example

#### For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 802.11a: 2.25dB, 802.11ac\_VHT20/40: 2.32dB, 802.11ac\_VHT80: 2.54dB and 10dB attenuator.

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

### Fig. 2-1 Radiated Emission



### Fig. 2-2 Conducted (Antenna Port) 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	DRTU	N/A	N/A	N/A	N/A
2.	DC Power Supply	Agilent	E3634A	MY53180030	Shield	Un-shield

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FCC ID: B94HNQ93CSPNAC

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### Fig. 2-3 AC Power Line Conducted Emission



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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	<b>Power Cord</b>
1.	WLAN Test Software	DRTU	N/A	N/A	N/A	N/A

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#### SUMMARY OF TEST RESULT 3.

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
§15.407(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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#### 4. **DESCRIPTION OF TEST MODES**

#### 4.1 **Operated in U-NII Bands**

#### Operated band in 5150 MHz ~5250 MHz:

#### 4 channels are provided for 802.11a, 802.11n\_HT20, 802.11ac\_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n\_HT40, 802.11ac\_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac\_VHT80

CHANNEL	FREQUENCY
42	5210 MHz

#### Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n\_HT20, 802.11ac\_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

#### 2 channels are provided for 802.11n\_HT40, 802.11ac\_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

#### 1 channel is provided for 802.11ac\_VHT80

CHANNEL	FREQUENCY
58	5290 MHz

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# Operated band in 5470 MHz ~5725 MHz:

11 channels are provided for 802.11a, 802.11n\_HT20, 802.11ac\_VHT20

, _ ,		
FREQUENCY	CHANNEL	FREQUENCY
5500 MHz	124	5620 MHz
5520 MHz	128	5640 MHz
5540 MHz	132	5660 MHz
5560 MHz	136	5680 MHz
5580 MHz	140	5700 MHz
5600 MHz	144	5720 MHz
	5500 MHz 5520 MHz 5540 MHz 5560 MHz 5580 MHz	5500 MHz         124           5520 MHz         128           5540 MHz         132           5560 MHz         136           5580 MHz         140

## 5 channels are provided for 802.11n\_HT40, 802.11ac\_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	126	5630 MHz
110	5590 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

### 3 channels are provided for 802.11ac\_VHT80

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
106	5530 MHz	138	5690 MHz
122	5610 MHz		

# Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n\_HT20, 802.11ac\_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

# 2 channels are provided for 802.11n\_HT40, 802.11ac\_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755 MHz	159	5795 MHz

### 1 channel is provided for 802.11ac\_VHT80

CHANNEL	FREQUENCY		
155	5775 MHz		

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# 4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.
- 4. The given UE is pre-scanned among 802.11n and ac modes, and 802.11ac yields the highest reading that generates the highest emission. Therefore, 802.11ac as the mode of test configuration is chosen to carry out the relevantly mandatory test items.

				BELOW 1 GHz)		
MODE	FREQUENCYAVAILABLETESTEDBAND (MHz)CHANNELCHANNEL		MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5180~5240	36 to 48	44	OFDM	6	AUX
802.11ac_VHT80	5210	42	42	OFDM	MCS0	AUX
802.11a	5260~5320	52 to 64	60	OFDM	6	AUX
802.11ac_VHT80	5290	58	58	OFDM	MCS0	AUX
802.11a	5500~5700	100 to 140	116	OFDM	6	AUX
802.11ac_VHT80	5530~5690	106 to 138	122	OFDM	MCS0	AUX
802.11a	5745~5825	149 to 165	157	OFDM	6	AUX
802.11ac_VHT80	5775	155	155	OFDM	MCS0	AUX
	RAD	IATED EMIS	SION TEST (A	ABOVE 1 GHz)		
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5190 5240	264 49	26.44.40	OFDM	6	AUX
802.11ac_VHT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	AUX
802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS0	AUX
802.11ac_VHT80	5210	42	42	OFDM	MCS0	AUX
802.11a	5260 5220	52 40 64	52 (0) (4	OFDM	6	AUX
802.11ac_VHT20	5260~5320	52 to 64	52,60,64	OFDM	MCS0	AUX
802.11ac_VHT40	5270~5310	54 to 62	54,62	OFDM	MCS0	AUX
802.11ac_VHT80	5290	58	58	OFDM	MCS0	AUX

#### **RADIATED EMISSION TEST:**

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MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5500 5720	100 to 144	100 116 140 144	OFDM	6	AUX
802.11ac_VHT20	5500~5720	100 to 144	100,116,140,144	OFDM	MCS0	AUX
802.11ac_VHT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	AUX
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS0	AUX
802.11a	5745~5825	149 to 165	140 157 165	OFDM	6	AUX
802.11ac_VHT20		149 10 105	149,157,165	OFDM	MCS0	AUX
802.11ac_VHT40	5755~5795	151 to 159	151,159	OFDM	MCS0	AUX
802.11ac_VHT80	5775	155	155	OFDM	MCS0	AUX

#### Note:

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

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#### **ANTENNA PORT CONDUCTED MEASUREMENT:**

CONDUCTED TEST								
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
802.11a				OFDM	6	AUX		
802.11ac_HT20 802.11ac_VHT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	AUX		
802.11ac_HT40 802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS0	AUX		
802.11ac_VHT80	5210	42	42	OFDM	MCS0	AUX		
802.11a				OFDM	6	AUX		
802.11ac_HT20 802.11ac_VHT20	5260~5320	52 to 64	52,60,64	OFDM	MCS0	AUX		
802.11ac_HT40 802.11ac_VHT40	5270~5310	54 to 62	54,62	OFDM	MCS0	AUX		
802.11ac_VHT80	5290	58	58	OFDM	MCS0	AUX		
802.11a				OFDM	6	AUX		
802.11ac_HT20 802.11ac_VHT20	5500~5720	100 to 144	100,116,140,144	OFDM	MCS0	AUX		
802.11ac_HT40 802.11ac_VHT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	AUX		
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS0	AUX		
802.11a	5745 5925	140 4 - 165	140 157 165	OFDM	6	AUX		
802.11ac_HT20 802.11ac_VHT20	2.11ac_11120		149,157,165	OFDM	MCS0	AUX		
802.11ac_HT40 802.11ac_VHT40	5755~5795	151 to 159	151,159	OFDM	MCS0	AUX		
802.11ac_VHT80	5775	155	155	OFDM	MCS0	AUX		

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#### 5. **MEASUREMENT UNCERTAINTY**

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

**Radiated Spurious Emission:** 

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

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

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

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#### CONDUCTED EMISSION TEST 6.

# 6.1. Standard Applicable

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

	Limits						
Frequency range	di	3(uV)					
MHz	Quasi-peak	Average					
0.15 to 0.50	66 to 56	56 to 46					
0.50 to 5	56	46					
5 to 30	60	50					
Note							
1. The lower limit shall apply at the transition frequencies							
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.							

### 6.2. Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	SERIAL LAST				
ТҮРЕ		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI 3	101311	06/20/2014	06/19/2015			
Coaxial Cables	N/A	N30N30-1042-150c m	N/A	01/06/2015	01/07/2016			
LISN	Schwarzbeck	NSLK 8127	8127-648	06/10/2014	06/09/2015			
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015			
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.			

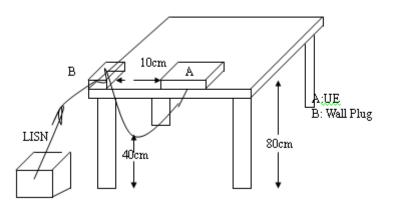
# 6.3. EUT Setup

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

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## 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 that closet to the limit

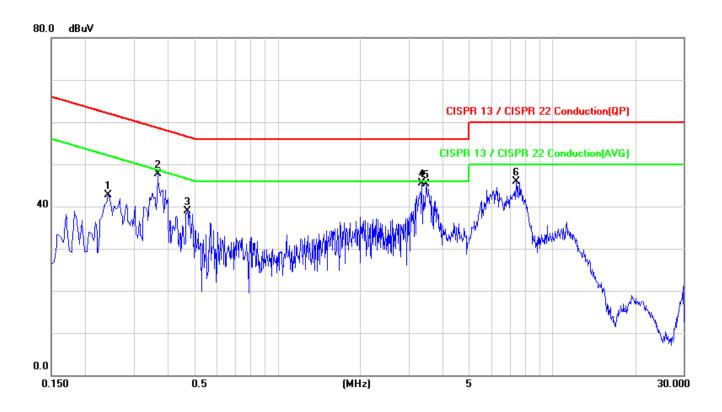
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# AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode	2	Test Date:	Apr. 10, 2015	
Temperature:	20 Humidity: 64 %		64 %	Test By:	Ashton
Adapter Model No.:	TPN-AA01				

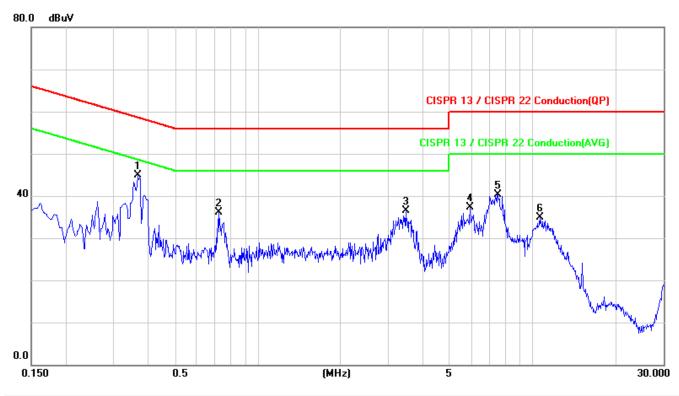


No.e	Mk.₽	Freq.₽	<b>Reading</b>	<b>Factor</b>	Measurement	Limit₽	<b>Over</b> ₊ <sup>2</sup>	<b>Detector</b> ₽	<b>Comment</b> e
¢.	¢	(MHz)↩	dBuV₽	(dB)⊷	(dBuV)∗ <sup>2</sup>	(dBuV)↩	(dB)⊷	¢	¢
1₽	ę	0.2420@	42.53₽	0.100	42.63	<b>6</b> 2.03₽	-19.40	peak₽	ę
2₽	ę	0.3660	47.52₽	0.150	<b>47.67</b> ₽	58.59₽	-10.92+	peak₽	ę
-3₽	ę	0.4700₽	38.63~	0.21@	38.84	<b>56.51</b> ₽	<b>-17.67</b> ₽	peak₽	ę
4₽	*0	3.3620+2	44.84	0.60₽	45.44~	56.00₽	-10.56e	peak₽	ę
-5₽	ę	3.4740	44.75₽	0.60₽	45.35₽	56.00₽	-10.650	peak₽	ę
6₽	¢,	7.4020₽	45.27₽	0.65+	45.92₽	60.00₽	-14.08	peak⊬	¢

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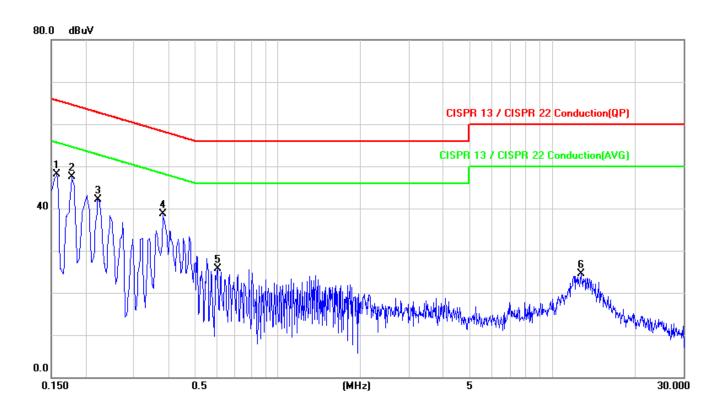
No.₽	Mk.¢	<b>Freq.</b> ₽	<b>Reading</b>	<b>Factor</b> ₽	Measurement	Limit₽	<b>Over</b>	<b>Detector</b> ₽	<b>Comment</b> ?
¢.	÷	(MHz)⊷	dBuV₽	(dB)⊷	(dBuV)⊷	(dBuV)⊷	(dB)⊷	¢	ę
1₽	*0	0.3660	44.81~	0.160	<b>44.97</b> ₽	58.59÷	-13.62¢	peak₽	ę
2₽	47	<b>0.7260</b> ₽	35.72₽	0.330	36.05+	56.00₽	-19.950	peak₽	¢.
3₽	÷	3.4620+2	35.82+	0.60₽	36.42*	<b>56.00</b> ₽	-19.58¢	peak₽	ę
4⊷	÷	5.9420₽	36.59₽	0.63	37.22+2	60.00₽	-22.78	peak₽	ę
5₽	÷	7.5140₽	39.71~	0.66₽	40.37+2	60.00₽	-19.63@	peak₽	с.
<mark>6</mark> ₽	ę	10.6620+2	34.14	<mark>0.68</mark> ₽	34.82+2	60.00₽	-25.180	peak₽	ę

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Operation Mode:	Operation mode			Test Date:	Apr. 10, 2015
Temperature:	20	20 Humidity: 64 %			Ashton
Adapter Model No.:	TPN-DA01		•		

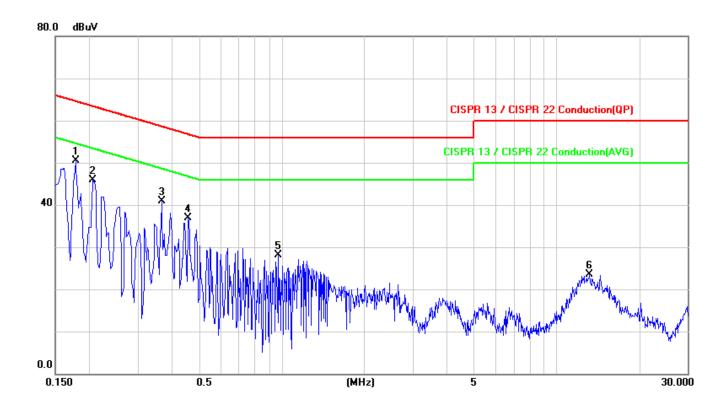


No.¢	Mk.₽	Freq.₽	<b>Reading</b>	<b>Factor</b>	Measurement	Limite	Over₽	<b>Detector</b> ₽	<b>Comment</b> ₽
÷	÷	(MHz)⊷	dBuV₽	(dB)⊷	(dBuV)⊷	(dBuV)⊷	(dB)⊷	¢	e.
1₽	÷	0.1580	48.00₽	0.09 <i>₽</i>	48.09	<b>6</b> 5.57₽	-17.480	peak∉	ę
2₽	<b>ب</b> *	0.1780 <i>₽</i>	<b>47.38</b> ₽	0.100	47.48₽	<b>64</b> .58₽	-17.100	peak₽	ę
3₽	÷	0.2220	42.02	0.100	42.12*	<b>6</b> 2.74₽	-20.62+2	peak⊬	ę
4₽	ę	0.3820	38.540	<mark>0.17</mark> ₽	38.71	58.24	-19.530	peak₽	ę
5₽	÷	<mark>0.6060</mark> ₽	25.40₽	0.2 <b>6</b> ₽	25. <b>66</b> ₽	56.00₽	-30.340	peak⊬	ę
<b>6</b> ₽	ę	12.7180@	23.82*	<mark>0.64</mark> ₽	2 <b>4.46</b> ₽	<b>60.00</b> ₽	-35.540	peak₽	ę

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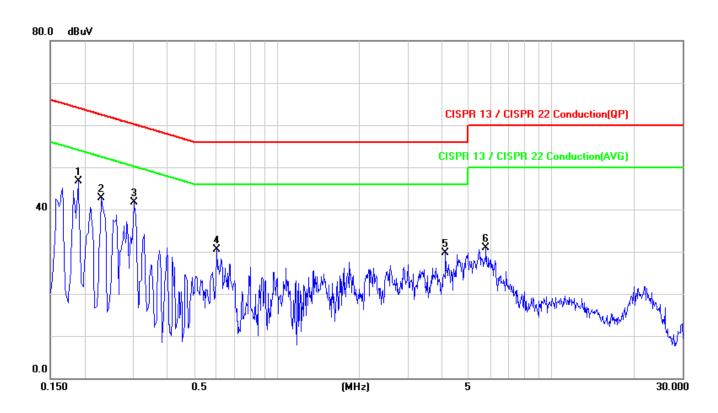
No.+	Mk.₽	<b>Freq.</b> ₽	Reading₽	<b>Factor</b> €	Measurement	Limit₽	<b>Over</b> $e$	<b>Detector</b> ₽	<b>Comment</b> *
¢,	÷	(MHz)⊷	dBuV₽	(dB)⊷	(dBuV)⊷	(dBuV)⊷	(dB)⊷	сь С	ę
1₽	<b>ب</b> *	0.1780₽	50.39¢	0.100	50. <b>49</b> ₽	<b>64</b> .58₽	-14.09	peak⊬	сь С
2₽	ę	0.2060	45.87₽	<mark>0.09</mark> ₽	<b>45.96</b> ₽	<b>6</b> 3.37₽	-17.41	peak₽	сь С
3₽	ę	0.3660~	<b>40</b> .72 <i>₽</i>	0.16	40.88	58.59÷	-17.71@	peak₽	с,
-4₽	ę	0.4580@	36.77₽	0.21	36.98₽	<b>56</b> .73₽	-19.75	peak₽	ę
5₽	ę	0.9780₽	27.75~	0.42*	28.17+	<b>56.00</b> ₽	-27.83+	peak₽	с,
<mark>6</mark> ₽	ę	13.2140@	22.81	<mark>0.64</mark> ₽	23.45+	<b>60.00</b> ₽	-36.550	peak₽	ą

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Operation Mode:	Operation mode			Test Date:	Apr. 10, 2015
Temperature:	20	20 Humidity: 64 %			Ashton
Adapter Model No.:	TPN-LA01		•	•	

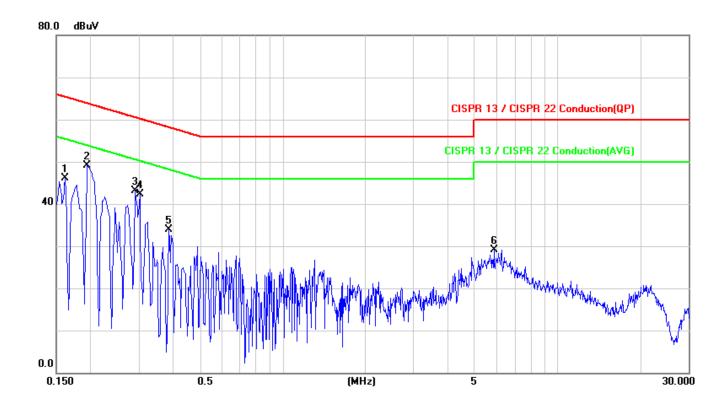


No.e	Mk.e	Freq.₽	<b>Reading</b>	<b>Factor</b> ₽	Measurement	Limit₽	<b>Over</b> + <sup>2</sup>	<b>Detector</b>	<b>Comment</b> ?
ę.	ę	(MHz)⊷	<u>dBuV</u> ₽	(dB)↩	(dBuV)⊷	(dBuV)⊷	(dB)⊷	ą	e.
1₽	<b>ب</b> *	0.1900@	<b>46</b> .71₽	0.09₽	46.80	64.04	-17.24	peak₽	e.
2₽	ę	0.2300@	42.63~	0.10	42.73	<b>6</b> 2.45₽	-19.72@	peak₽	¢.
3₽	ę	0.30200	41.61~	0.13+2	41.74	60.19	-18.450	peak₽	¢.
4₽	ę	0.6060₽	30.31	0.26+2	30.57+	56.00₽	-25.43+	peak₽	ф.
5₽	ę	4.1140	29.09	0.61+2	29.70	5 <b>6</b> .00₽	-26.30+	peak₽	÷
6₽	ę	5.8020	30.32+2	0.62*	30.94	<mark>60.00</mark> ₽	-29.06+2	peak₽	4

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No.@	Mk.₽	Freq.₽	<b>Reading</b>	<b>Factor</b> ₽	Measurement	Limit₽	<b>Over</b> ₽	<b>Detector</b>	<b>Comment</b> ?
÷	÷	(MHz)⊷	dBuV₽	(dB)↩	(dBuV)⊷	(dBuV)₽	(dB)⊷	¢	ę
<b>1</b> ₽	ę	0.1620¢ <sup>2</sup>	<b>46</b> .02₽	0.09↩	46.11	65.36₽	-19.25₽	peak₽	ę
2₽	**	0.1940₽	<b>49.05</b> ₽	0.09↩	49.14	<mark>63.86</mark> ₽	-14.72*	peak∉	ę
3₽	¢.	0.2900	<b>42.97</b> ₽	0.13	43.10+2	<b>60</b> .52₽	-17.42*	peak∉	ę
4₽	ę	0.3020	42.17	0.13	42.30	<b>60.19</b> ₽	-17.89₽	peak₽	ę
- 5₽	ę	0.3860	33.64~	0.17₽	33.81+	5 <b>8.1</b> 5₽	-24.34	peak∉	ę
<mark>6</mark> ₽	÷	5. <b>8860</b> ₽	28.45	0.62+2	29.07*	<mark>60.00</mark> ₽	-30.93+	peak∉	ę

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# 7. 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.

### Formula:

Duty Cycle = Ton / (Ton+Toff)

### **Measurement Procedure:**

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

### Duty Cycle:

	Duty Cycle	Duty Fator (dB)
802.11a	98.3%	0.08
802.11ac_20	98.2%	0.08
802.11ac_40	96.5%	0.15
802.11ac_80	91.8%	0.37

Duty Cycle Factor:  $10 * \log (1/0.983) = 0.08$ Duty Cycle Factor:  $10 * \log (1/0.982) = 0.08$ Duty Cycle Factor:  $10 * \log (1/0.965) = 0.15$ 

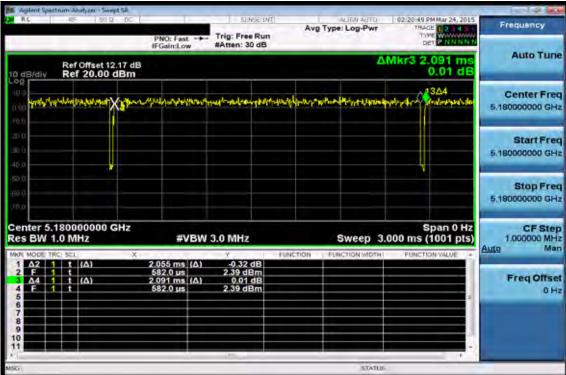
Duty Cycle Factor:  $10 * \log (1/0.918) = 0.37$ 

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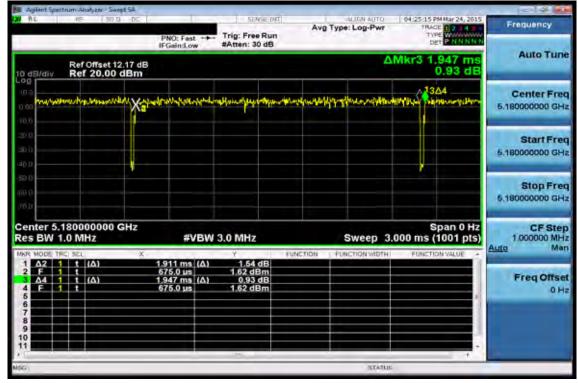
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# **DUTY CYCLE TEST SIGNAL Measurement Result** 802.11a



# 802.11ac VHT20

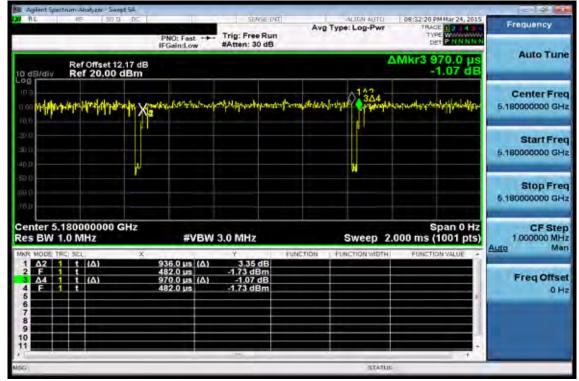


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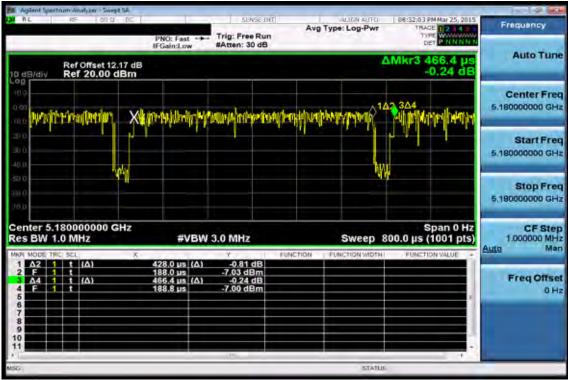
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## 802.11 ac VHT 40



#### 802.11 ac VHT 80



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# 8. 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 v01.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
  - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
  - b. Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
  - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto
  - b. Mark the peak frequency and -6dB (upper and lower) frequency.
- 6. Repeat above procedures until all test default channel measured were complete.

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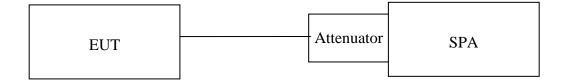
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### 8.3 Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
Spectrum Analyzer	Agilent	N9010A	MY53400256	10/15/2014	10/14/2015			
DC Block	PASTERNACK	PE8210	RF29	12/19/2014	12/18/2015			
Attenuator	WOKEN	218FS-10	RF23	12/19/2014	12/18/2015			
Splitter	Marvelous	MVE8576	RF37	12/19/2014	12/18/2015			
Splitter	Marvelous	MVE8576	RF38	12/19/2014	12/18/2015			
Attenuator	WOKEN	6SR1211	RF41	12/19/2014	12/18/2015			

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



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# 8.5 Measurement Result

## **26dB Bandwidth**

802.11a

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	22.740	13.57
5220	22.150	13.45
5240	22.060	13.44
5260	25.990	14.15
5300	23.190	13.65
5320	22.860	13.59
5500	22.700	13.56
5580	22.980	13.61
5700	20.130	13.04
5720 (UNII-2C)	15.600	11.93
5720 (UNII-3)	5.550	7.44

### 802.11ac\_VHT20

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	24.380	13.87
5220	23.730	13.75
5240	24.000	13.80
5260	24.250	13.85
5300	24.300	13.86
5320	24.810	13.95
5500	24.670	13.92
5580	24.720	13.93
5700	24.120	13.82
5720 (UNII-2C)	16.200	12.10
5720 (UNII-3)	5.600	7.48

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#### 802.11ac \_VHT40

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5190	43.170	16.35
5230	43.520	16.39
5270	43.530	16.39
5310	43.590	16.39
5510	43.590	16.39
5550	43.540	16.39
5670	43.750	16.41
5710 (UNII-2C)	35.700	15.53
5710 (UNII-3)	5.700	7.56

#### 802.11ac \_VHT80

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5210	80.500	19.06
5290	80.810	19.07
5530	80.870	19.08
5610	99.400	19.97
5690 (UNII-2C)	75.060	18.75
5690 (UNII-3)	5.460	7.37

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#### 6dB Bandwidth (5725 MHz~ 5850 MHz)

802.11a

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	15.150	11.80
5785	15.060	11.78
5825	15.150	11.80

#### 802.11ac\_VHT20

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	15.130	11.80
5785	15.090	11.79
5825	15.160	11.81

#### 802.11ac\_VHT40

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5755	35.140	15.46
5795	35.180	15.46

802.11ac\_VHT80

Frequency	6dB Bandwidth	10 Log (B)
(MHz)	(MHz)	(dB)
5775	75.280	18.77

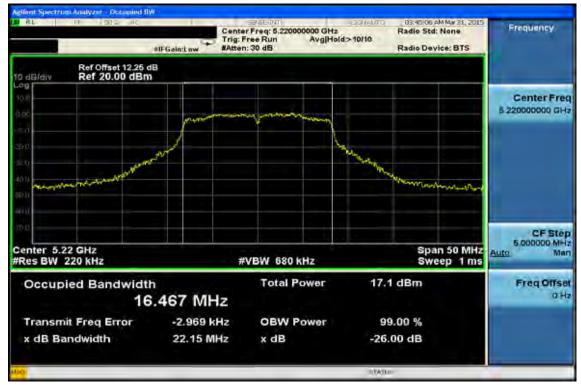
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# 802.11a, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180MHz)



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



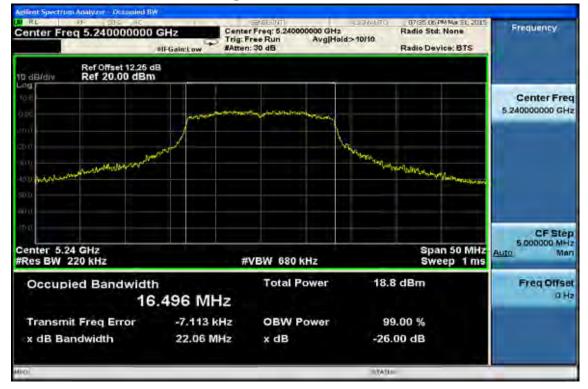
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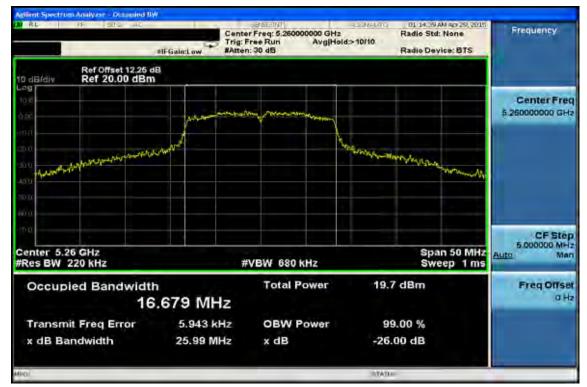
# 26dB Band Width Test Data CH-High (5240MHz)



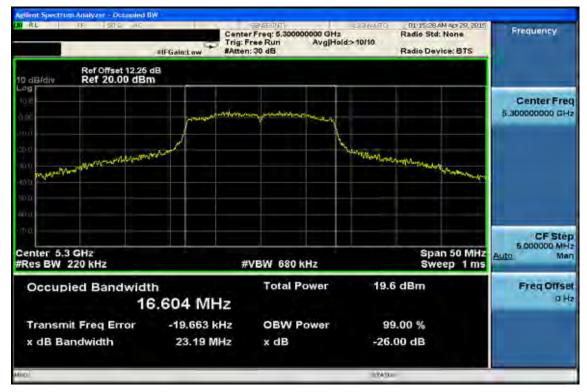
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## 802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



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

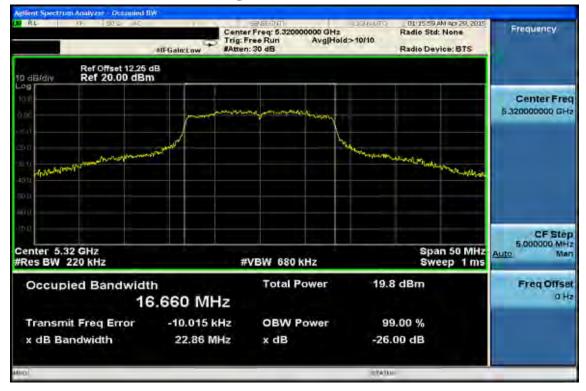


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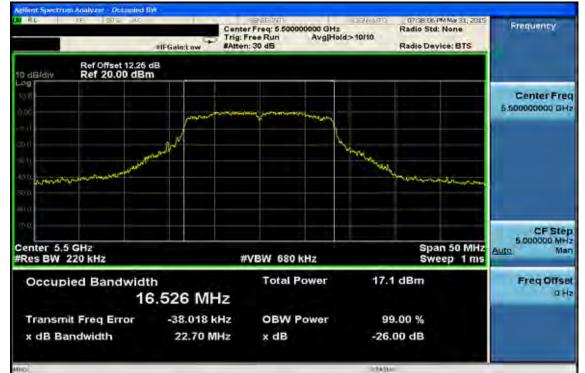
## 26dB Band Width Test Data CH-High (5320MHz)



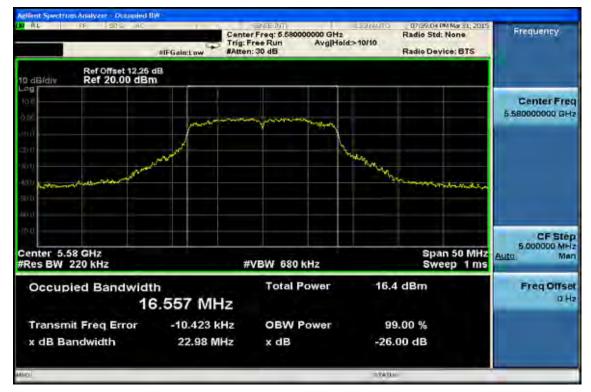
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## 802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



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



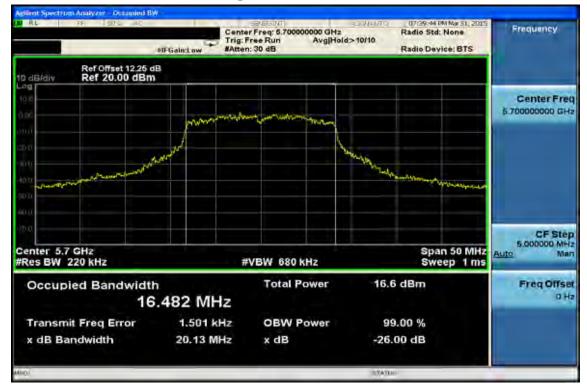
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## 26dB Band Width Test Data CH-High (5700MHz)



# 26dB Band Width Test Data CH-High (5720MHz)

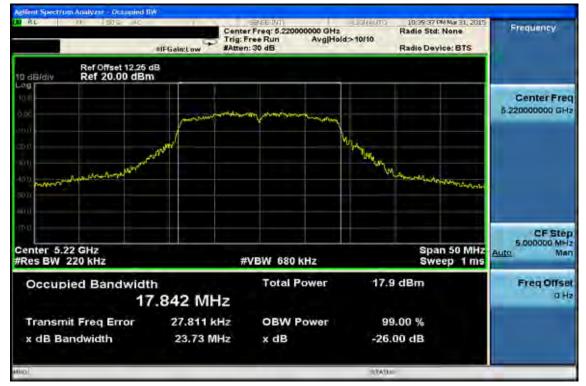


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# 802.11ac VHT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



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



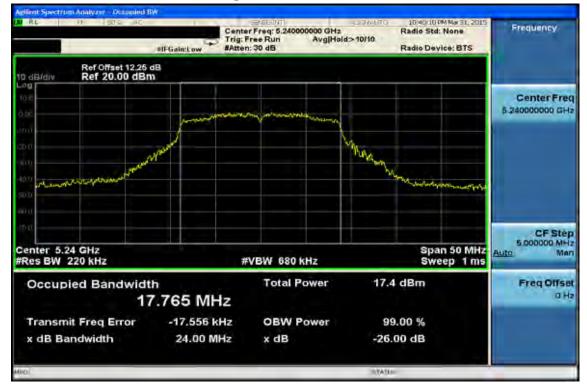
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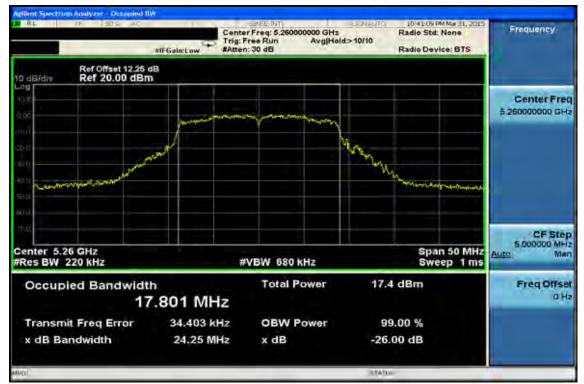


# 26dB Band Width Test Data CH-High (5240 MHz)

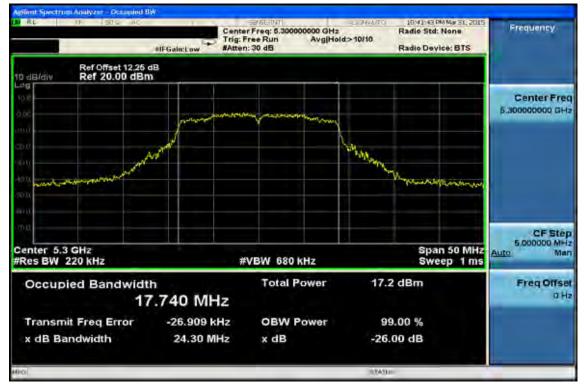


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# 802.11ac VHT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)



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



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



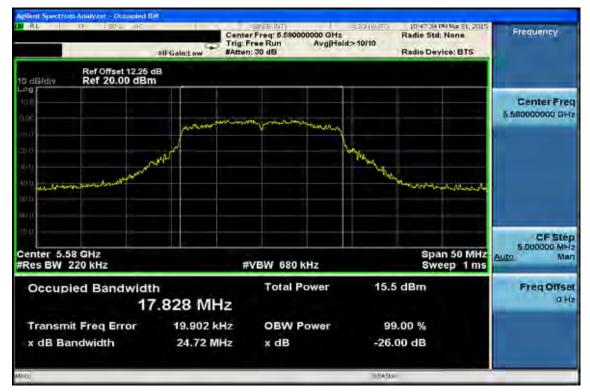
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## 802.11n VHT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



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



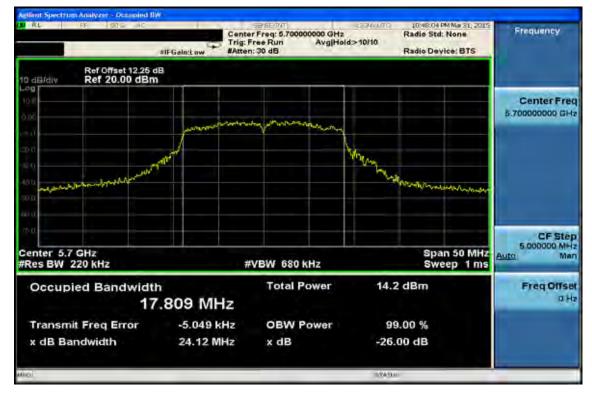
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## 26dB Band Width Test Data CH-High (5700 MHz)

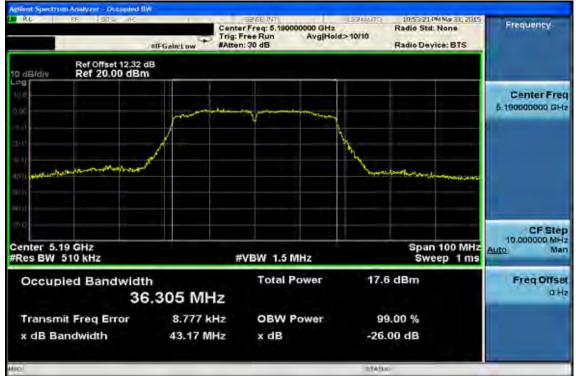


# 26dB Band Width Test Data CH-High (5720 MHz)

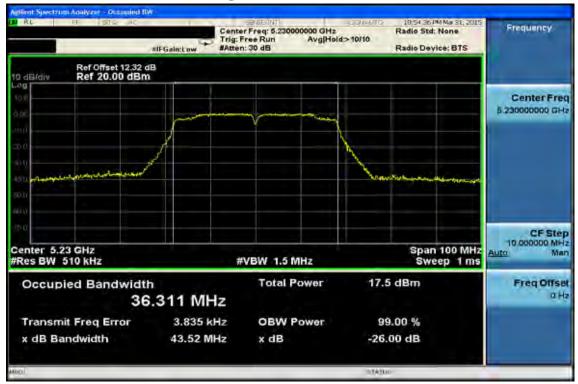


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# 802.11ac VHT40, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5190 MHz)



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

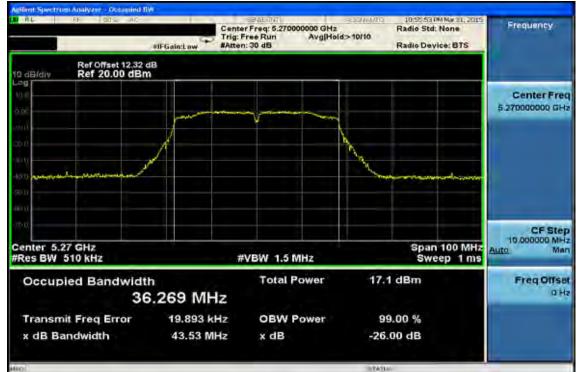


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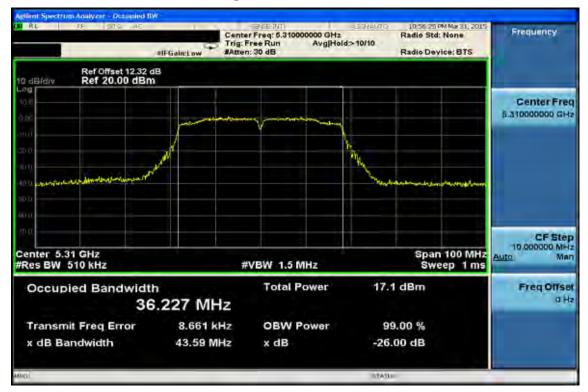
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# 802.11ac VHT40, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5270 MHz)



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

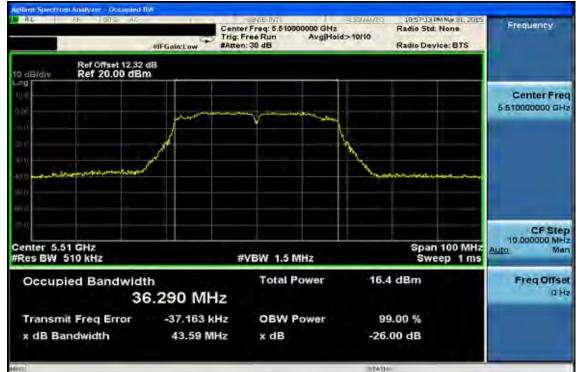


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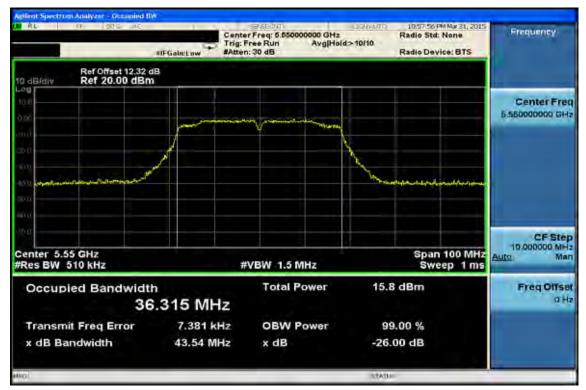
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# 802.11ac VHT40, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5510 MHz)



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



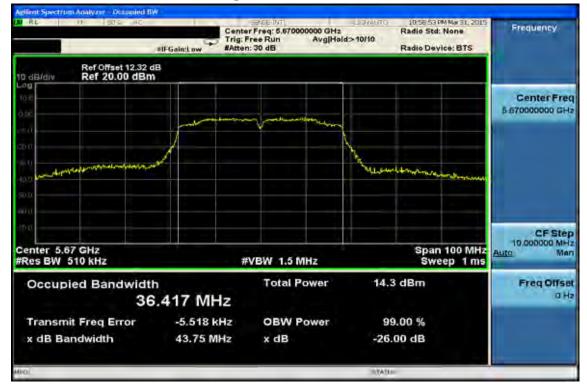
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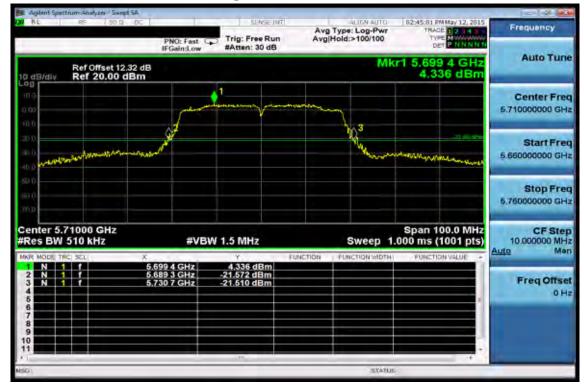
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# 26dB Band Width Test Data CH-High (5670 MHz)



## 26dB Band Width Test Data CH-High (5710 MHz)



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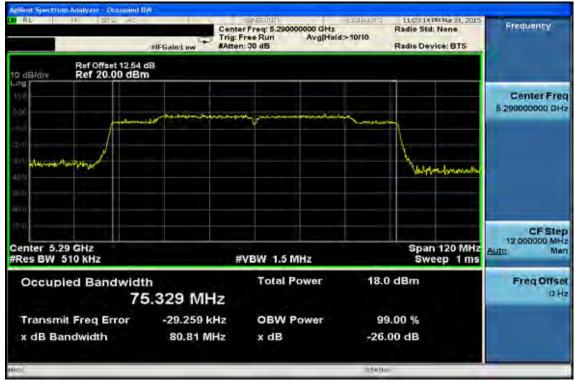
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## 802.11ac VHT80, 5150~5250 MHz 26dB Band Width Test Data CH-Mid (5210 MHz)

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10							BTATIN			

## 802.11ac VHT80, 5250~5350 MHz 26dB Band Width Test Data CH-Mid (5290 MHz)



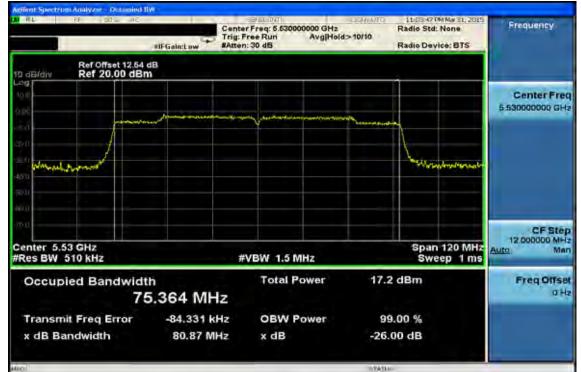
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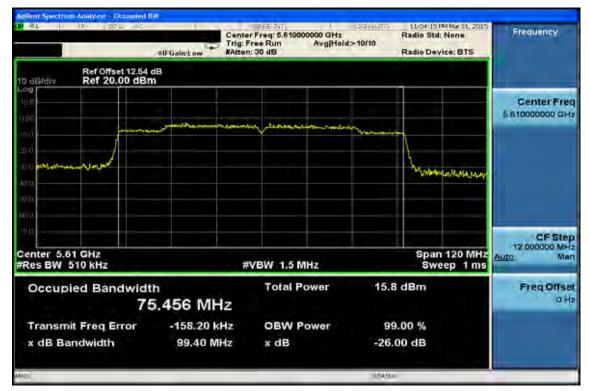
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# 802.11ac VHT80, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5530 MHz)



## 26dB Band Width Test Data CH-Mid (5610 MHz)



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# 26dB Band Width Test Data CH-High (5690 MHz)



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## 802.11a, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



## 6dB Band Width Test Data CH-Mid (5785 MHz)



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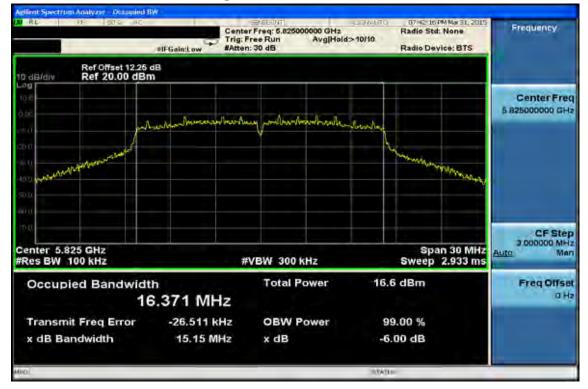
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# 6dB Band Width Test Data CH-High (5825 MHz)



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# 802.11ac VHT20, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



## 6dB Band Width Test Data CH-Mid (5785 MHz)



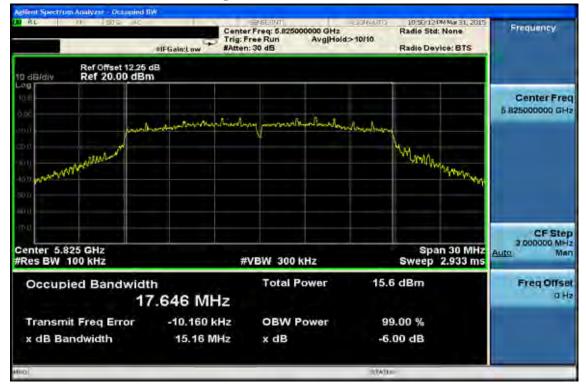
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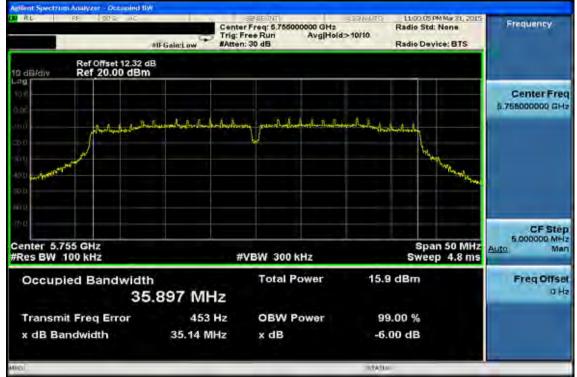


# 6dB Band Width Test Data CH-High (5825 MHz)



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# 802.11ac VHT40, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5755 MHz)



# 6dB Band Width Test Data CH-High (5795 MHz)



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# 802.11ac VHT80, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5775 MHz)

RL.	RF 190.5		ein:Low 🗭		req: 5.77500 e Run 0 dB	Avg Hol	d>10/10	10/10 11/06/19 PM My 31, 201 Radio Std: None 10/10 Radio Device: BTS		Frequency
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Res BW 1				#VE	SW 300 I	KHZ		Sweep	n 120 MHz 11.53 ms	Auto Mar
Occupi	ed Band		89 MH	z	Total P	ower	18.5	dBm		Freq Offset 0 Hz
Transmi x dB Ba	t Freq Er ndwidth		11.711 ki 75.28 Mi		OBW P x dB	ower		00 % 00 dB		
0							TATA TA			

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#### MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 9.

#### 9.1 **Standard Applicable**

OPERZTION Band	EUT CATEGORY		LIMIT	
U-NII-1		Access Point (Mater device)	1 Watt(30dBm)	
		Fixed point-to-point Acess Ponit	1 Watt(30dBm)	
	$\checkmark$	Mobile and portable clinet device	250mW(23.98dBm)	
U-NII-2A	$\checkmark$		250mW(23.98dBm) or 11dBm+10 log B	
U-NII-2C	$\checkmark$		250mW(23.98dBm) or 11dBm+10 log B	
U-NII-3	$\checkmark$		1 Watt(30dBm)	

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.

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#### FCC ID: B94HNQ93CSPNAC

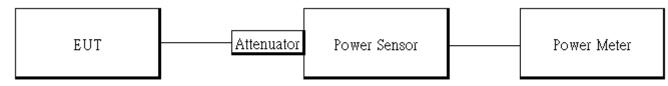
#### 9.2 Measurement Procedure

- 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 v01.
- 3. 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.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- 6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

#### 9.3 Measurement Equipment Used

Refer to section 8.3 for details.

#### 9.4 Test Set-up



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#### 9.5 **Measurement Result**

	E.	TOTAL	TOTAL	REQUIRED	
СН	Frequency	POWER	POWER	LIMIT	RESULT
	(MHz)	(dBm)	( <b>mW</b> )	(dBm)	
36	5180	12.33	17.100	23.98	PASS
44	5220	12.41	17.418	23.98	PASS
48	5240	12.36	17.219	23.98	PASS
52	5260	12.36	17.219	23.98 or 11+10log(B) =25.15	PASS
60	5300	12.41	17.418	23.98 or 11+10log(B) =24.65	PASS
64	5320	12.21	16.634	23.98 or 11+10log(B) =24.59	PASS
100	5500	12.29	16.943	23.98 or 11+10log(B) =24.56	PASS
116	5580	12.28	16.904	23.98 or 11+10log(B) =24.61	PASS
140	5700	12.39	17.338	23.98 or 11+10log(B) =24.04	PASS
144	5720 (UNII-2C)	9.21	8.337	23.98 or 11+10log(B) =22.93	PASS
144	5720 (UNII-3)	3.27	2.123	30	PASS
149	5745	12.39	17.338	30	PASS
157	5785	12.45	17.579	30	PASS
165	5825	12.42	17.458	30	PASS
802.1	1ac_VHT20	)			
	Б	TOTAL	TOTAL	REQUIRED	
СН	Frequency	POWER	POWER	LIMIT	RESULT
	(MHz)	(dBm)	( <b>mW</b> )	(dBm)	
36	5180	12.35	17.179	23.98	PASS
44	5220	12.37	17.258	23.98	PASS
48	5240	12.35	17.179	23.98	PASS
52	5260	12.34	17.140	23.98 or 11+10log(B) =24.85	PASS
60	5300	12.41	17.418	23.98 or 11+10log(B) =24.86	PASS
64		14.41	1/.410	23.760111+1002(D) = 24.60	
04	5320				PASS
100	5320 5500	12.22	16.672	23.98 or 11+10log(B) =24.95	PASS PASS
100	5500	12.22 12.31	16.672 17.022	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92	PASS
100 116	5500 5580	12.22 12.31 12.27	16.672 17.022 16.866	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92 23.98 or 11+10log(B) =24.93	PASS PASS
100	5500	12.22 12.31	16.672 17.022	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92	PASS
100 116 140	5500 5580 5700 5720	12.22 12.31 12.27 <b>12.39</b>	16.672 17.022 16.866 <b>17.338</b>	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92 23.98 or 11+10log(B) =24.93 23.98 or 11+10log(B) =24.82	PASS PASS PASS
100 116 140 144	5500 5580 5700 5720 (UNII-2C) 5720	12.22 12.31 12.27 <b>12.39</b> 9.10	16.672         17.022         16.866         17.338         8.128	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92 23.98 or 11+10log(B) =24.93 23.98 or 11+10log(B) =24.82 23.98 or 11+10log(B) =23.10	PASS PASS PASS PASS
100         116         140         144         144	5500 5580 5700 5720 (UNII-2C) 5720 (UNII-3)	12.22 12.31 12.27 <b>12.39</b> 9.10 3.14	16.672         17.022         16.866         17.338         8.128         2.061	23.98 or 11+10log(B) =24.95 23.98 or 11+10log(B) =24.92 23.98 or 11+10log(B) =24.93 23.98 or 11+10log(B) =24.82 23.98 or 11+10log(B) =23.10 30	PASS PASS PASS PASS PASS

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#### 802.11ac\_VHT40

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	12.44	17.539	23.98	PASS
46	5230	12.34	17.140	23.98	PASS
54	5270	12.36	17.219	23.98 or 11+10log(B) =27.39	PASS
62	5310	12.05	16.032	23.98 or 11+10log(B) =27.39	PASS
102	5510	12.33	17.100	23.98 or 11+10log(B) =27.39	PASS
110	5550	12.46	17.620	23.98 or 11+10log(B) =27.39	PASS
134	5670	12.45	17.579	23.98 or 11+10log(B) =27.41	PASS
142	5710 (UNII-2C)	4.37	2.735	23.98 or 11+10log(B) =26.53	PASS
142	5710 (UNII-3)	0.70	1.175	30	PASS
151	5755	12.44	17.539	30	PASS
159	5795	12.39	17.338	30	PASS

#### 802.11ac\_VHT80

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	12.22	16.672	23.98	PASS
58	5290	12.03	15.959	23.98 or 11+10log(B) =30.07	PASS
106	5530	12.19	16.558	23.98 or 11+10log(B) =30.08	PASS
122	5610	12.11	16.255	23.98 or 11+10log(B) =30.97	PASS
138	5690 (UNII-2C)	9.15	8.222	23.98 or 11+10log(B) =29.75	PASS
138	5690 (UNII-3)	0.67	1.167	30	PASS
155	5775	12.34	17.140	30	PASS

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#### **10. PEAK POWER SPECTRAL DENSITY**

#### **10.1 Standard Applicable**

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	17dBm/ MHz
	Fixed point-to-point Acess Ponit		
		Mobile and portable clinet device	11dBm/ MHz
U-NII-2A	$\checkmark$		11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3			30dBm/ 500kHz

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **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 v01.
- 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=500 kHz, VBW $\geq$  3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

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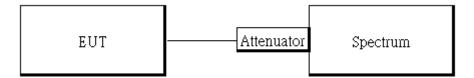
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#### **10.3 Measurement Equipment Used**

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
Spectrum Analyzer	Agilent	N9010A	MY53400256	10/15/2014	10/14/2015			
DC Block	PASTERNACK	PE8210	RF29	12/19/2014	12/18/2015			
Attenuator	WOKEN	218FS-10	RF23	12/19/2014	12/18/2015			
Attenuator	WOKEN	6SR1211	RF41	12/19/2014	12/18/2015			

#### 10.4 Test Set-up



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#### **10.5 Measurement Result**

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	( <b>dB</b> )
5180	-2.63	11.00	-13.63
5220	-2.48	11.00	-13.48
5240	-2.05	11.00	-13.05
5260	-3.03	11.00	-14.03
5300	-2.92	11.00	-13.92
5320	-2.49	11.00	-13.49
5500	-3.11	11.00	-14.11
5580	-3.95	11.00	-14.95
5700	-4.96	11.00	-15.96
5720 (UNII-2C)	-0.83	11.00	-11.83
5720 (UNII-3)	-1.49	30.00	-31.49
5745	-4.37	30.00	-34.37
5785	-4.08	30.00	-34.08
802.11ac VHT20			
Frequency	PPSD	Limit	Margin

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	( <b>dB</b> )
5180	-2.63	11.00	-13.63
5220	-2.39	11.00	-13.39
5240	-2.23	11.00	-13.23
5260	-3.16	11.00	-14.16
5300	-3.04	11.00	-14.04
5320	-2.93	11.00	-13.93
5500	-3.48	11.00	-14.48
5580	-4.32	11.00	-15.32
5700	-5.56	11.00	-16.56
5700 (UNII-2C)	-0.14	11.00	-11.14
5700 (UNII-3)	-1.46	30.00	-31.46
5745	-4.79	30.00	-34.79
5785	-3.87	30.00	-33.87

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#### 802.11ac VHT40

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	( <b>dB</b> )
5190	-5.61	11	-16.61
5230	-5.40	11	-16.40
5270	-5.91	11	-16.91
5310	-5.59	11	-16.59
5510	-6.61	11	-17.61
5550	-7.75	11	-18.75
5670	-8.27	11	-19.27
5690 (UNII-2C)	-3.28	11	-14.28
5690 (UNII-3)	-8.12	30	-38.12
5755	-7.25	30	-37.25
5795	-6.64	30	-36.64

#### 802.11ac VHT80

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5210	-8.07	11	-19.07
5290	-8.12	11	-19.12
5530	-8.91	11	-19.91
5610	-10.29	11	-21.29
5690 (UNII-2C)	-7.78	11	-18.78
5690 (UNII-3)	-12.50	30	-42.50
5775	-8.46	30	-38.46

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



# Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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## Peak Power Spectral Density Data Plot (CH High 5240 MHz)



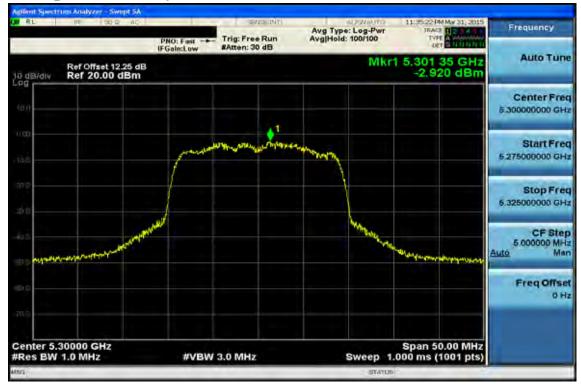
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# 802.11a, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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#### Peak Power Spectral Density Data Plot (CH High 5320 MHz)



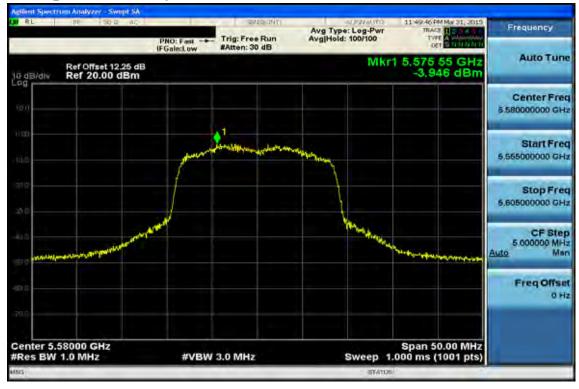
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# 802.11a, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



#### Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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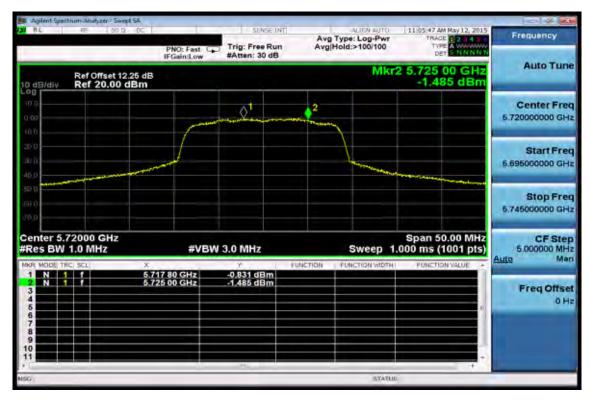
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#### Peak Power Spectral Density Data Plot (CH High 5700 MHz)

# Peak Power Spectral Density Data Plot (CH High 5720 MHz)



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### 802.11a, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



# Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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## Peak Power Spectral Density Data Plot (CH High 5825 MHz)



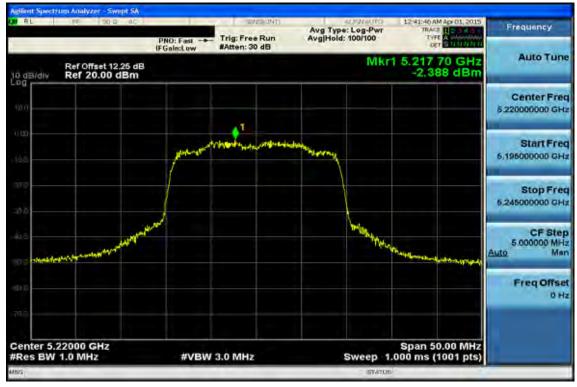
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# 802.11ac VHT20, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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### Peak Power Spectral Density Data Plot (CH High 5240 MHz)



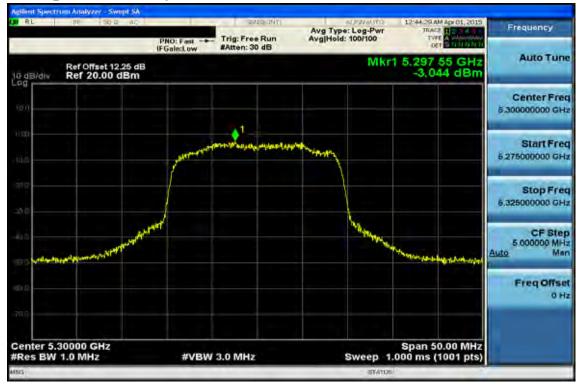
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# 802.11ac VHT20, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260MHz)



#### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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#### Peak Power Spectral Density Data Plot (CH High 5320 MHz)



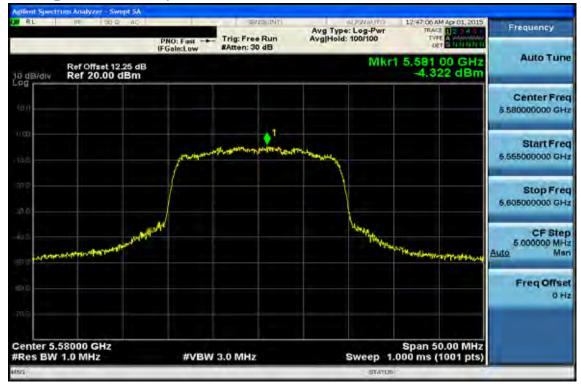
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# 802.11ac VHT20, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



#### Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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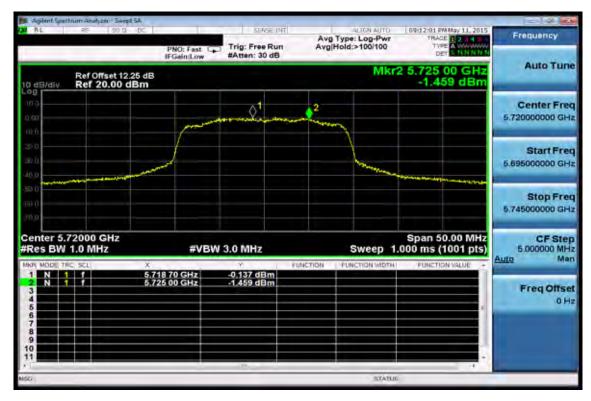
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Peak Power Spectral Density Data Plot (CH High 5720 MHz)



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## 802.11ac VHT20, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



# Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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## Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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# 802.11ac VHT40, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



#### Peak Power Spectral Density Data Plot (CH High 5230 MHz)



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# 802.11ac VHT40, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



#### Peak Power Spectral Density Data Plot (CH High 5310 MHz)



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# 802.11ac VHT40, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5510 MHz)



#### Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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## Peak Power Spectral Density Data Plot (CH High 5670 MHz)



#### Peak Power Spectral Density Data Plot (CH High 5710 MHz)



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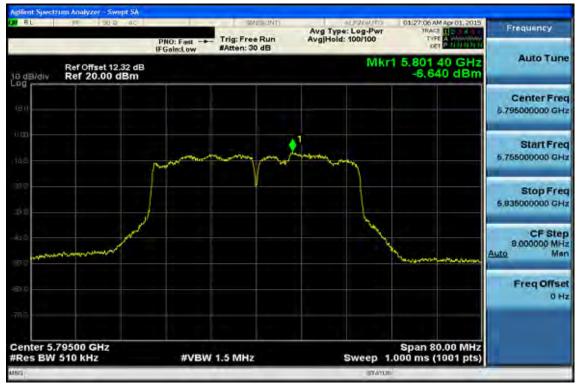
Chiefs 3 and but the state of the results shown in this test report relation of the only of the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有说明,此親告義是僅到測試之樣品負責,同時此樣品僅保留的天。本報告未遂年公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document is upwing the paragraphic to the function to the limit of the low: pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



# 802.11ac VHT40, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



Peak Power Spectral Density Data Plot (CH High 5795 MHz)



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



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



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



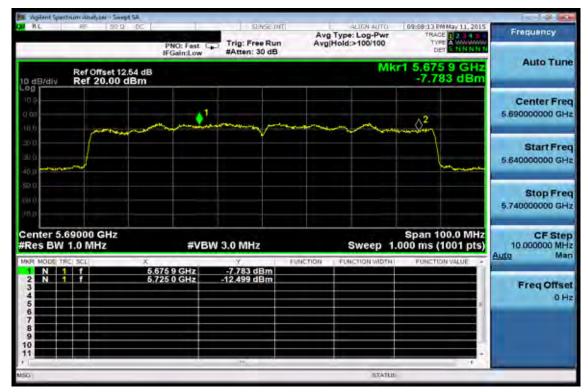
#### Peak Power Spectral Density Data Plot (CH Mid 5610 MHz)



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## Peak Power Spectral Density Data Plot (CH High 5690 MHz)



# 802.11ac VHT80, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Mid 5775 MHz)



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# 11. UNDESIRABLE RADIATED EMISSION MEASUREMENT111.1 Standard Applicable

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

- 1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 2. For transmitters operating in the 5.25-5.35 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.
- 3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

APPLICABLE TO	LI	MIT
FCC KDB 789033 D02 General UNII Test Procedures New Rules v01	FIELD STRE	NGTH AT 3m
	PK: 74 (dBµV/m)	AV 54 (dBµV/m)
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1)		
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)
15.407(b)(3)		
15.407(b)(4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)

 $EIRP = ((E*d)^2) / 30$ , 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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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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

#### Note:

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

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

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

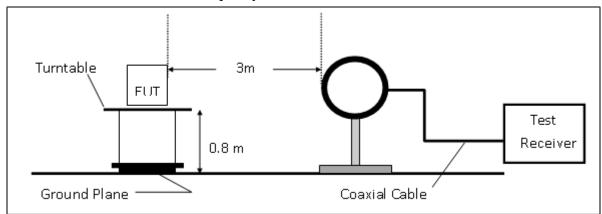
SGS 966 Chamber No.C									
Name of Equipment	Manufacturer	Model	Serial Number	Calibration	Calibration				
				Date	Due				
EMI Test Receiver	R&S	ESU 40	100363	04/09/2015	04/08/2016				
Loop Antenna	ETS-Lindgren	6502	00143303	12/09/2014	12/08/2015				
Broadband Antenna	TESEQ	CBL 6112D	35240	12/05/2014	12/04/2015				
Horn Antenna	ETS-Lindgren	3117	00143272	12/08/2014	12/07/2015				
Horn Antenna	ETS-Lindgren	3160-09	00117911	11/13/2014	11/12/2015				
Horn Antenna	ETS-Lindgren	3160-10	00117783	11/13/2014	11/12/2015				
Pre Amplifier	EMC Instruments	EMC330	980096	12/19/2014	12/18/2015				
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/19/2014	12/18/2015				
Pre Amplifier	R&S	SCU-18	10204	12/19/2014	12/18/2015				
Pre Amplifier	R&S	SCU-26	100780	12/19/2014	12/18/2015				
Pre Amplifier	R&S	SCU-40	100356	12/19/2014	12/18/2015				
Pre Amplifier	EMC Instruments	EMC184045B	980135	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/19/2014	12/18/2015				
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/19/2014	12/18/2015				
Attenuator	WOKEN	218FS-10	RF27	12/19/2014	12/18/2015				
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016				
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016				
DC Power Supply	HOLA	DP-3003	D7070035	05/31/2014	05/30/2015				
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.				
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.				
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.				
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.				

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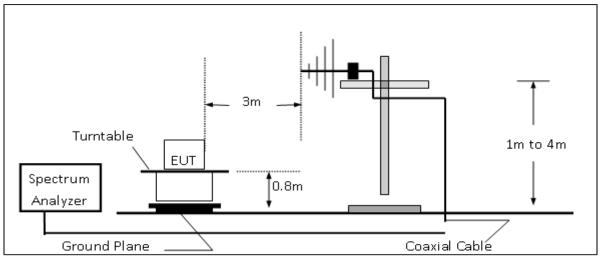


#### 11.3 Test SET-UP

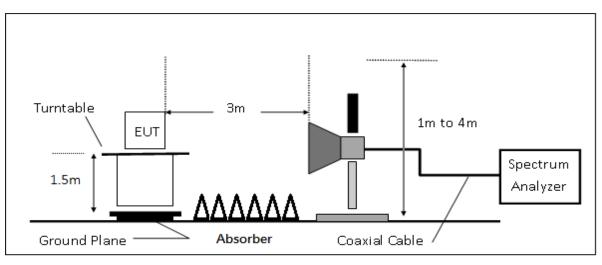
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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 v01.
- 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.
- 6. 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. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW  $\geq 1/T$  (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 11. Repeat above procedures until all frequency measured were complete.

#### 11.5 Field Strength Calculation

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

	$\mathbf{I}\mathbf{D} = \mathbf{K}\mathbf{A} + \mathbf{A}\mathbf{I} + \mathbf{C}\mathbf{L} - \mathbf{A}\mathbf{U}$	
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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

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

#### Note :

- "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.
- "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

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

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

#### 11.7 **Measurement Result**

Refer to attach tabular data sheets.

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#### **Radiated Spurious Emission Measurement Result**

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

#### 802.11a, 5150~5250 MHz

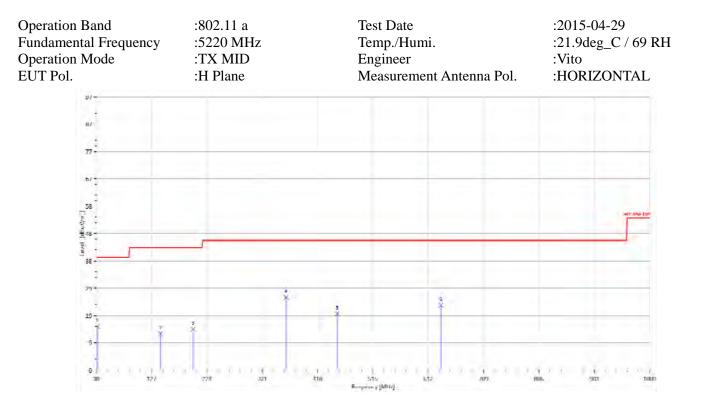
Operation E Fundament Operation E EUT Pol.	al Frequency	:802.11 a :5220 MHz :TX MID :H Plane	Test Date Temp./Humi. Engineer Measurement Antenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL
LUTTOI.	9/- n/			.vekricke
	77 h/ 58			
	38			ALCON-TOP
	- - - - - - - - - - - - - - - - - - -	ř	*	
	÷ 01 · · · · · · · · · · · · · · · · · · ·	778 331	1 116 - 574 - 677 - 677 Employee (Mills)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	51.23	-26.79	24.44	40.00	-15.56
81.41	Peak	S	40.15	-26.71	13.45	40.00	-26.55
96.93	Peak	S	40.90	-24.36	16.53	43.50	-26.97
142.52	Peak	S	38.46	-21.92	16.54	43.50	-26.96
199.75	Peak	S	36.17	-23.28	12.89	43.50	-30.61
600.36	Peak	S	40.28	-12.45	27.82	46.00	-18.18

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
31.94	Peak	S	29.75	-14.17	15.58	40.00	-24.42
142.52	Peak	S	34.84	-21.92	12.92	43.50	-30.58
199.75	Peak	S	37.81	-23.28	14.53	43.50	-28.97
362.71	Peak	S	42.94	-17.11	25.83	46.00	-20.17
452.92	Peak	S	34.83	-14.83	20.00	46.00	-26.00
634.31	Peak	S	34.62	-11.62	23.00	46.00	-23.00

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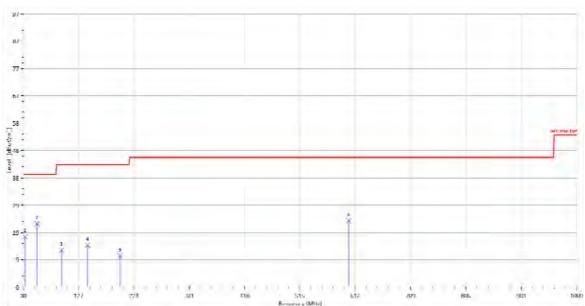


#### 802.11ac VHT80, 5150~5250 MHz

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

:802.11 ac 80M :5210 MHz :TX MID :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :VERTICAL

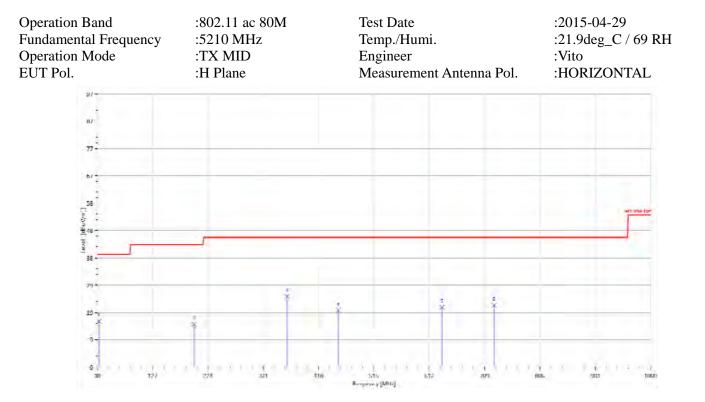


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	S	32.61	-14.69	17.91	40.00	-22.09
54.25	Peak	S	49.34	-26.79	22.54	40.00	-17.46
96.93	Peak	S	37.53	-24.36	13.16	43.50	-30.34
142.52	Peak	S	36.79	-21.92	14.88	43.50	-28.62
199.75	Peak	S	34.44	-23.28	11.16	43.50	-32.34
600.36	Peak	S	36.05	-12.45	23.59	46.00	-22.41

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	S	30.96	-14.69	16.26	40.00	-23.74
199.75	Peak	S	38.53	-23.28	15.26	43.50	-28.24
362.71	Peak	S	42.28	-17.11	25.17	46.00	-20.83
452.92	Peak	S	34.99	-14.83	20.16	46.00	-25.84
634.31	Peak	S	32.88	-11.62	21.25	46.00	-24.75
725.49	Peak	S	32.63	-10.71	21.92	46.00	-24.08

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#### 802.11a, 5250~5350 MHz

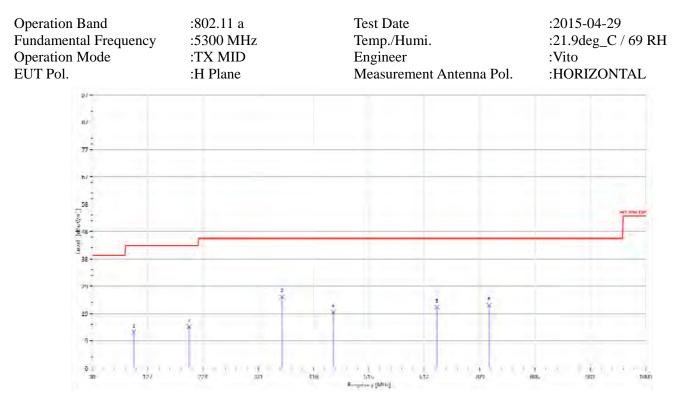
**Operation Band** :802.11 a Test Date :2015-04-29 **Fundamental Frequency** :5300 MHz Temp./Humi. :21.9deg\_C / 69 RH **Operation Mode** :TX MID Engineer :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 58 38 1 79 10 ò., 0 1 147 216 345 Forman a (Mile)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	49.05	-26.79	22.25	40.00	-17.75
96.93	Peak	S	39.52	-24.36	15.15	43.50	-28.35
142.52	Peak	S	37.73	-21.92	15.81	43.50	-27.69
199.75	Peak	S	36.46	-23.28	13.18	43.50	-30.32
600.36	Peak	S	35.49	-12.45	23.04	46.00	-22.96
961.20	Peak	S	31.44	-7.53	23.91	54.00	-30.09

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
102.75	Peak	S	36.17	-23.39	12.77	43.50	-30.73
199.75	Peak	S	37.99	-23.28	14.71	43.50	-28.79
362.71	Peak	S	42.40	-17.11	25.28	46.00	-20.72
452.92	Peak	S	34.66	-14.83	19.84	46.00	-26.16
634.31	Peak	S	33.27	-11.62	21.64	46.00	-24.36
725.49	Peak	S	33.03	-10.71	22.32	46.00	-23.68

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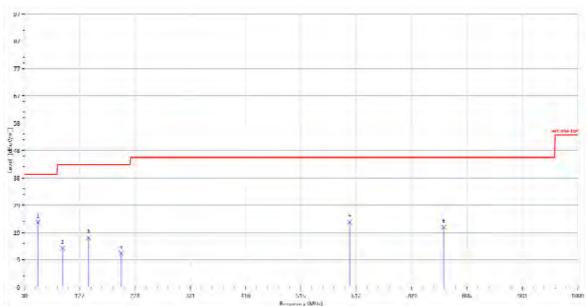


#### 802.11ac VHT80, 5250~5350 MHz

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

:802.11 ac80 :5290 MHz :TX MID :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :VERTICAL

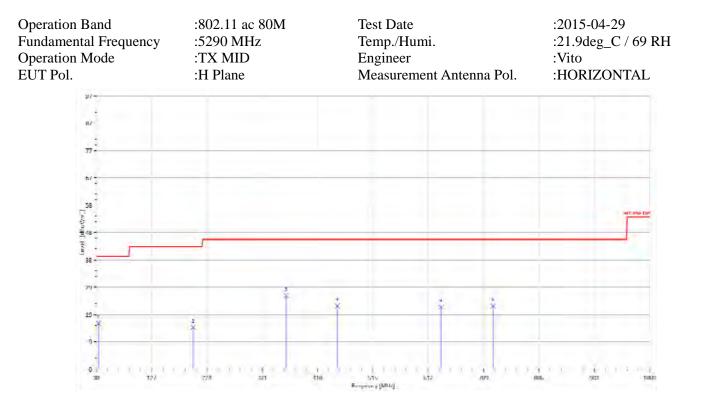


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	49.73	-26.79	22.94	40.00	-17.06
96.93	Peak	S	38.20	-24.36	13.83	43.50	-29.67
142.52	Peak	S	39.34	-21.92	17.42	43.50	-26.08
199.75	Peak	S	35.31	-23.28	12.03	43.50	-31.47
600.36	Peak	S	35.58	-12.45	23.13	46.00	-22.87
765.26	Peak	S	31.27	-9.98	21.29	46.00	-24.71

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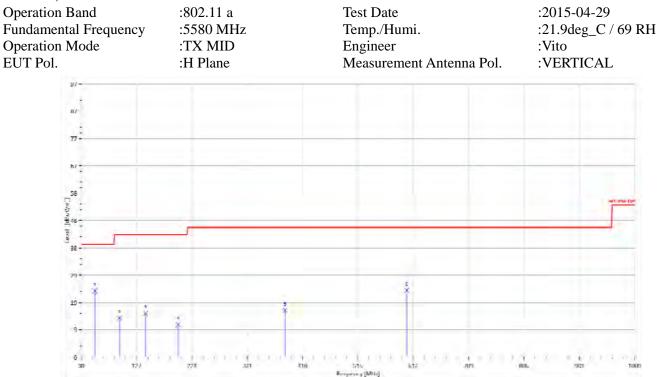
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
33.88	Peak	S	31.44	-15.22	16.22	40.00	-23.78
199.75	Peak	S	38.12	-23.28	14.85	43.50	-28.65
362.71	Peak	S	43.20	-17.11	26.09	46.00	-19.91
452.92	Peak	S	37.34	-14.83	22.51	46.00	-23.49
634.31	Peak	S	33.72	-11.62	22.09	46.00	-23.91
725.49	Peak	S	33.18	-10.71	22.47	46.00	-23.53

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#### 802.11a, 5470~5725 MHz

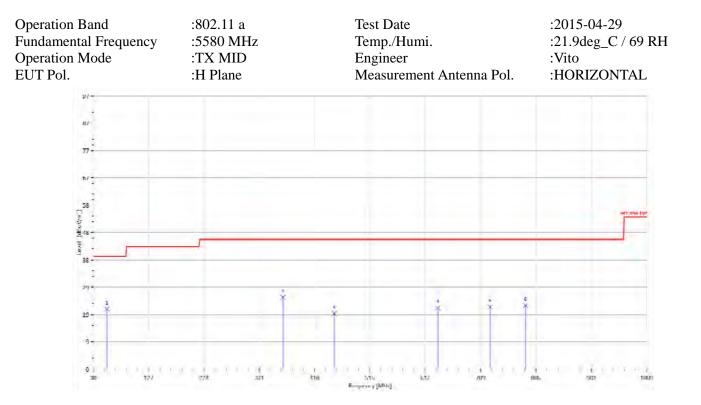


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	50.33	-26.79	23.53	40.00	-16.47
96.93	Peak	S	38.28	-24.36	13.91	43.50	-29.59
142.52	Peak	S	37.46	-21.92	15.54	43.50	-27.96
199.75	Peak	S	34.85	-23.28	11.57	43.50	-31.93
386.96	Peak	S	32.92	-16.32	16.61	46.00	-29.39
600.36	Peak	S	36.17	-12.45	23.71	46.00	-22.29

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	48.17	-26.79	21.38	40.00	-18.62
362.71	Peak	S	42.62	-17.11	25.51	46.00	-20.49
452.92	Peak	S	34.55	-14.83	19.72	46.00	-26.28
634.31	Peak	S	33.37	-11.62	21.74	46.00	-24.26
725.49	Peak	S	32.84	-10.71	22.13	46.00	-23.87
787.57	Peak	S	32.53	-9.93	22.60	46.00	-23.40

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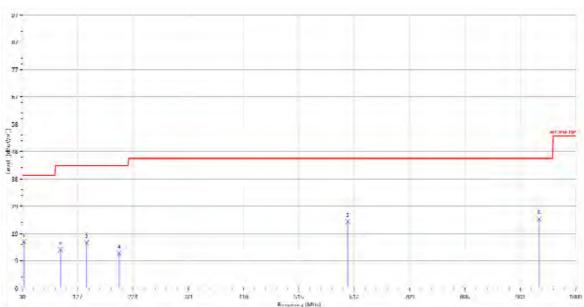


## 802.11ac VHT80, 5470~5725 MHz

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

:802.11 ac 80M :5610 MHz :TX MID :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :VERTICAL

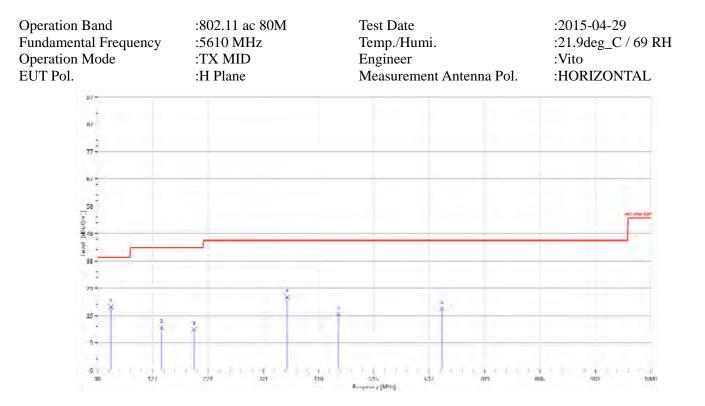


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	S	31.16	-14.69	16.46	40.00	-23.54
96.93	Peak	S	38.01	-24.36	13.65	43.50	-29.85
142.52	Peak	S	37.99	-21.92	16.07	43.50	-27.43
199.75	Peak	S	35.70	-23.28	12.43	43.50	-31.07
600.36	Peak	S	36.08	-12.45	23.63	46.00	-22.37
935.98	Peak	S	32.15	-7.60	24.55	46.00	-21.45

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	49.30	-26.79	22.51	40.00	-17.49
142.52	Peak	S	36.98	-21.92	15.06	43.50	-28.44
199.75	Peak	S	37.74	-23.28	14.46	43.50	-29.04
362.71	Peak	S	42.98	-17.11	25.87	46.00	-20.13
452.92	Peak	S	34.73	-14.83	19.90	46.00	-26.10
634.31	Peak	S	33.45	-11.62	21.82	46.00	-24.18

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### 802.11a, 5725~5850 MHz

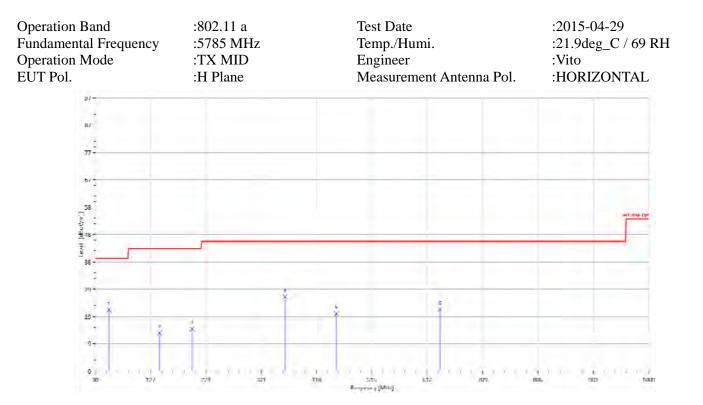
**Operation Band** :802.11 a Test Date :2015-04-29 **Fundamental Frequency** :5785 MHz Temp./Humi. :21.9deg\_C / 69 RH **Operation Mode** :TX MID Engineer :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 58 38 1 79 10-÷ċ. 0 1. 147 345 1/1 416 8n Frequence (Milit)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	S	31.29	-14.69	16.59	40.00	-23.41
142.52	Peak	S	37.19	-21.92	15.27	43.50	-28.23
600.36	Peak	S	35.81	-12.45	23.35	46.00	-22.65
634.31	Peak	S	33.54	-11.62	21.92	46.00	-24.08
709.00	Peak	S	31.64	-10.83	20.81	46.00	-25.19
778.84	Peak	S	32.67	-10.31	22.35	46.00	-23.65

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	48.62	-26.79	21.82	40.00	-18.18
142.52	Peak	S	35.51	-21.92	13.59	43.50	-29.91
199.75	Peak	S	38.25	-23.28	14.98	43.50	-28.53
362.71	Peak	S	43.49	-17.11	26.38	46.00	-19.62
452.92	Peak	S	35.19	-14.83	20.36	46.00	-25.64
634.31	Peak	S	33.52	-11.62	21.89	46.00	-24.11

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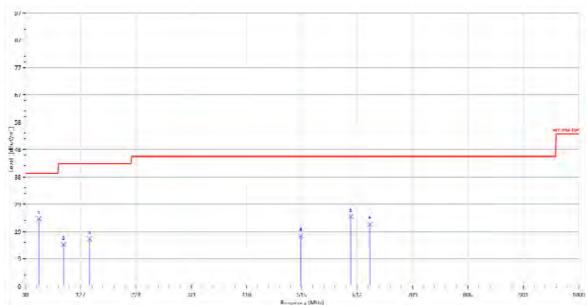


## 802.11ac VHT80, 5725~5850 MHz

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

:802.11 ac 80M :5775 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :VERTICAL

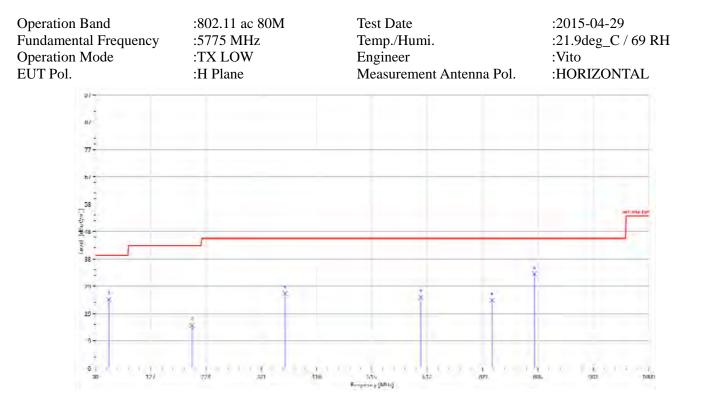


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	50.71	-26.79	23.91	40.00	-16.09
96.93	Peak	S	39.13	-24.36	14.76	43.50	-28.74
142.52	Peak	S	38.71	-21.92	16.79	43.50	-26.71
513.06	Peak	S	31.58	-13.71	17.87	46.00	-28.13
600.36	Peak	S	37.18	-12.45	24.72	46.00	-21.28
634.31	Peak	S	33.62	-11.62	21.99	46.00	-24.01

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54.25	Peak	S	51.03	-26.79	24.24	40.00	-15.76
199.75	Peak	S	38.54	-23.28	15.27	43.50	-28.23
362.71	Peak	S	43.61	-17.11	26.50	46.00	-19.50
600.36	Peak	S	37.61	-12.45	25.16	46.00	-20.84
725.49	Peak	S	34.84	-10.71	24.14	46.00	-21.86
800.18	Peak	S	42.96	-9.49	33.46	46.00	-12.54

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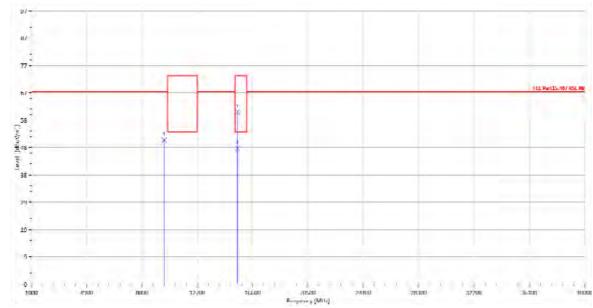
## **Above 1GHz Worst-Case Data:**

### 802.11a, 5150~5250 MHz

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

:802.11 a :5180 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :VERTICAL

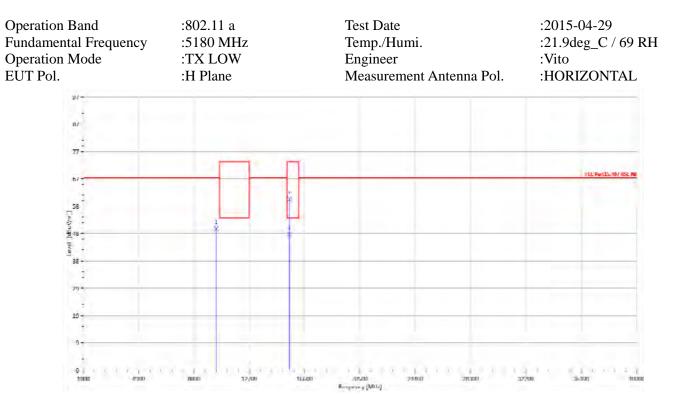


Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	Н	32.15	18.94	51.09	68.30	-17.21
15540.00	Peak	Н	35.27	25.80	61.07	74.00	-12.93
15540.00	Average	Н	22.31	25.80	48.11	54.00	-5.89

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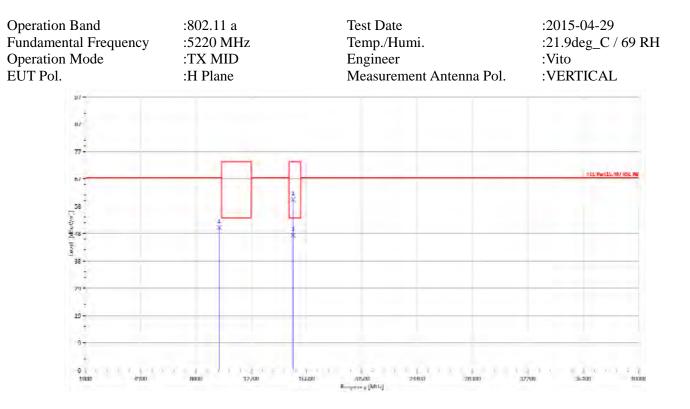
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	Н	31.26	18.94	50.20	68.30	-18.10
15540.00	Peak	Н	34.84	25.80	60.64	74.00	-13.37
15540.00	Average	Н	22.38	25.80	48.18	54.00	-5.82



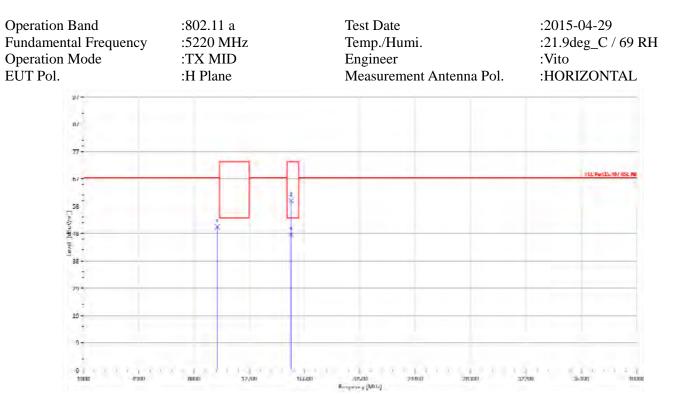
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	Н	31.61	19.03	50.63	68.30	-17.67
15660.00	Peak	Н	34.43	26.06	60.49	74.00	-13.51
15660.00	Average	Н	21.80	26.06	47.86	54.00	-6.14



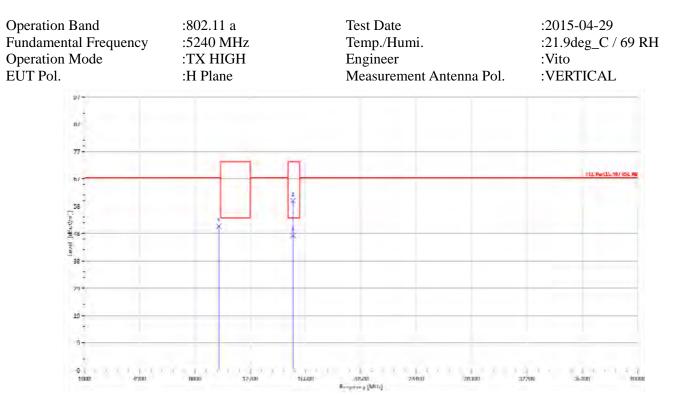
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	Н	31.71	19.03	50.74	68.30	-17.56
15660.00	Peak	Н	34.06	26.06	60.12	74.00	-13.88
15660.00	Average	Н	21.91	26.06	47.97	54.00	-6.03



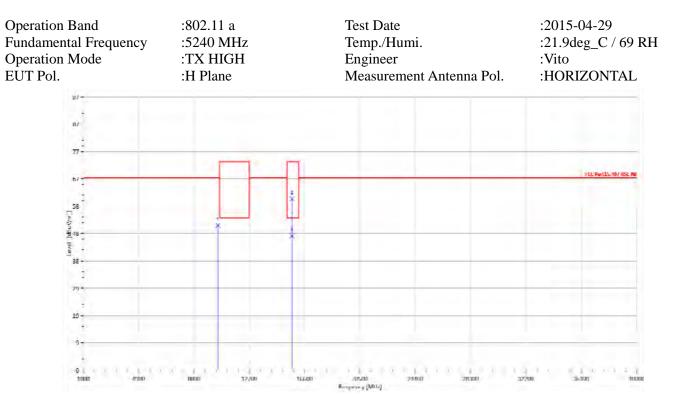
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	Н	31.92	19.13	51.05	68.30	-17.25
15720.00	Peak	Н	34.00	26.13	60.13	74.00	-13.87
15720.00	Average	Н	21.61	26.13	47.74	54.00	-6.26



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	Н	32.24	19.13	51.37	68.30	-16.93
15720.00	Peak	Н	34.68	26.13	60.81	74.00	-13.19
15720.00	Average	Н	21.52	26.13	47.65	54.00	-6.35



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## Band edge falling to restricted band

Operation Ba Fundamental Operation M EUT Pol.	Frequency	:802.11 a :5180 MHz :Band Edge I :H Plane	HzTemp./Humi.dge LOWEngineer		:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	Е	52.48	11.14	63.62	74.00	-10.38
5150.00	Average	Ε	41.24	11.14	52.38	54.00	-1.62
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5180 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / :Vito :HORIZONT	
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5142.88	Peak	S	55 20	11 18	66 38	74.00	-7.62

MITZ	FK/QF/AV	F/H/E/S	uDμv	uБ	ubμv/m	ubμv/m	uБ	
5142.88	Peak	S	55.20	11.18	66.38	74.00	-7.62	
5142.88	Average	S	41.17	11.18	52.35	54.00	-1.65	
5150.00	Peak	Е	54.19	11.14	65.33	74.00	-8.67	
5150.00	Average	Е	41.54	11.14	52.68	54.00	-1.32	

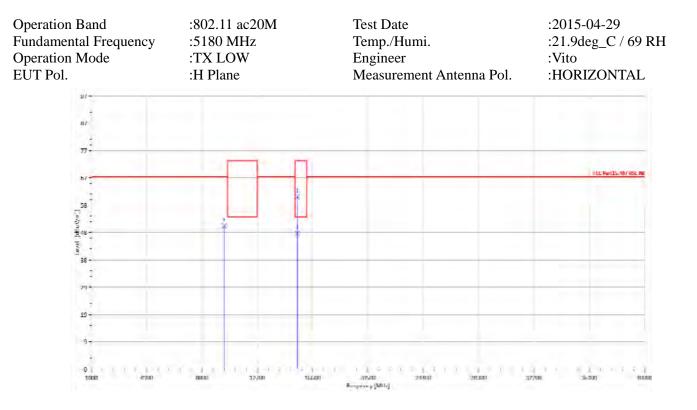


#### Radiated Spurious Emission Measurement Result 802.11ac VHT20, 5150~5250 MHz **Operation Band** :802.11 ac20M Test Date :2015-04-29 **Fundamental Frequency** :5180 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 EU Part15, 10/ 45 58 1 . 38 1 79 10-9-3.50 0 (12,01 24400 78.881 12/00 112.001 1000 ner 3778 Formation a (Mille)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	Н	32.03	18.94	50.96	68.30	-17.34
15540.00	Peak	Н	34.82	25.80	60.62	74.00	-13.38
15540.00	Average	Н	22.15	25.80	47.95	54.00	-6.05



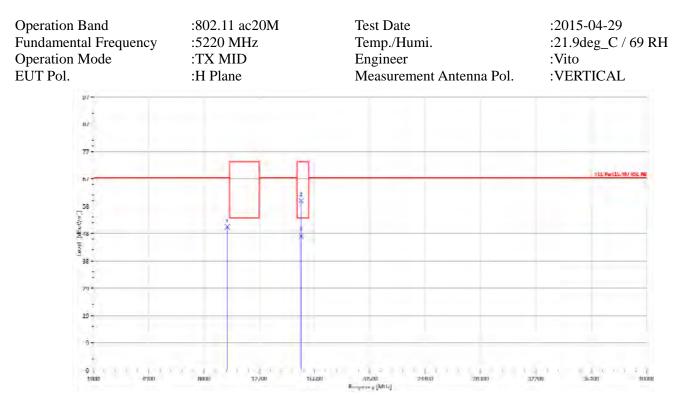
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	31.90	18.94	50.84	68.30	-17.46
Peak	Н	35.40	25.80	61.20	74.00	-12.80
Average	Н	22.35	25.80	48.15	54.00	-5.85
	Mode PK/QP/AV Peak Peak	Mode PK/QP/AV F/H/E/S Peak H Peak H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 31.90 Peak H 35.40	Mode Reading Level PK/QP/AV F/H/E/S dBµV dB Peak H 31.90 18.94 Peak H 35.40 25.80	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH31.9018.9450.84PeakH35.4025.8061.20	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBµV         dB         dBµV/m         dBµV/m           Peak         H         31.90         18.94         50.84         68.30           Peak         H         35.40         25.80         61.20         74.00



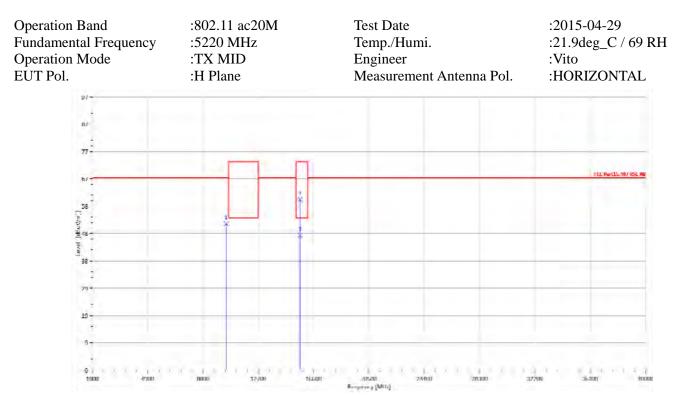
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	Н	31.78	19.03	50.81	68.30	-17.49
15660.00	Peak	Н	34.11	26.06	60.17	74.00	-13.83
15660.00	Average	Н	21.58	26.06	47.64	54.00	-6.36



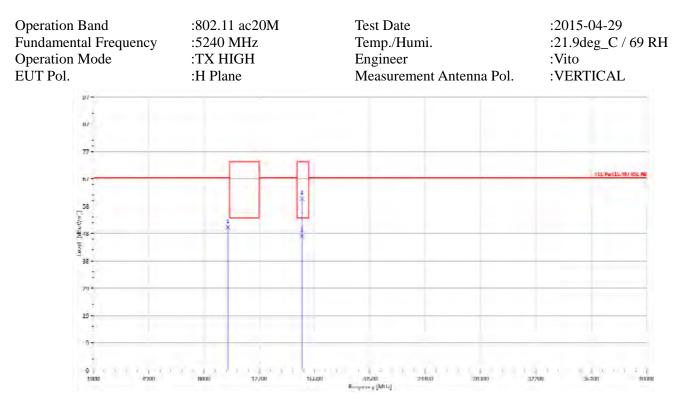
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	Н	32.89	19.03	51.91	68.30	-16.39
15660.00	Peak	Н	34.47	26.06	60.53	74.00	-13.47
15660.00	Average	Н	21.75	26.06	47.81	54.00	-6.19



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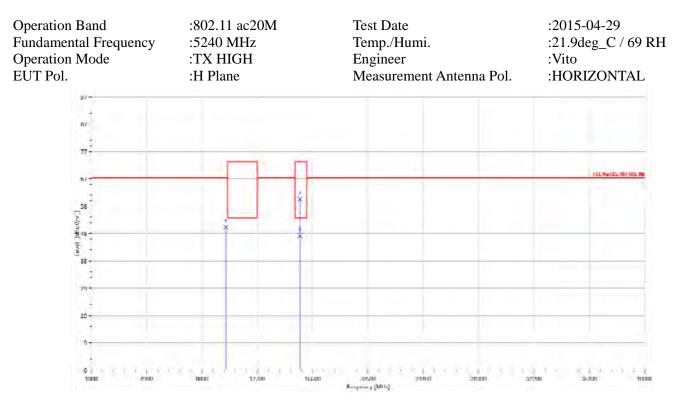


Margin
dB
-17.61
-13.16
-6.49
-

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	Н	31.60	19.13	50.73	68.30	-17.57
15720.00	Peak	Н	34.54	26.13	60.67	74.00	-13.33
15720.00	Average	Н	21.56	26.13	47.69	54.00	-6.31



## Band edge falling to restricted band

Fundamental Frequency Operation Mode		:802.11 ac20M :5180 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement And	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB	
5116.72	Peak	S	52.58	11.13	63.72	74.00	-10.28	
5116.72	Average	S	40.94	11.13	52.07	54.00	-1.93	
5150.00	Peak	E	50.89	11.14	62.03	74.00	-11.97	
5150.00	Average	E	41.22	11.14	52.36	54.00	-1.64	

Operation Band	:802.11 ac20M	Test Date	:2015-04-29
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21.9deg_C / 69 RH
Operation Mode	:Band Edge LOW	Engineer	:Vito
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

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)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	Е	53.14	11.14	64.28	74.00	-9.72
5150.00	Average	Е	41.48	11.14	52.62	54.00	-1.38

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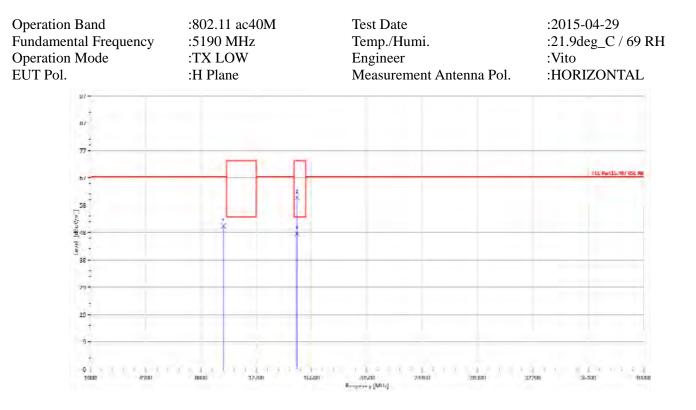


#### Radiated Spurious Emission Measurement Result 802.11ac VHT40, 5150~5250 MHz **Operation Band** :802.11 ac40M Test Date :2015-04-29 **Fundamental Frequency** :5190 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL -100 Perils, 10/ 458 58 38 -79 10-9-3.50 0 12.01 24400 78.881 12/08 1000 ner 112.00 37788 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Peak	Н	31.47	19.01	50.49	68.30	-17.81
15570.00	Peak	Н	35.94	25.80	61.74	74.00	-12.26
15570.00	Average	Н	22.51	25.80	48.31	54.00	-5.69



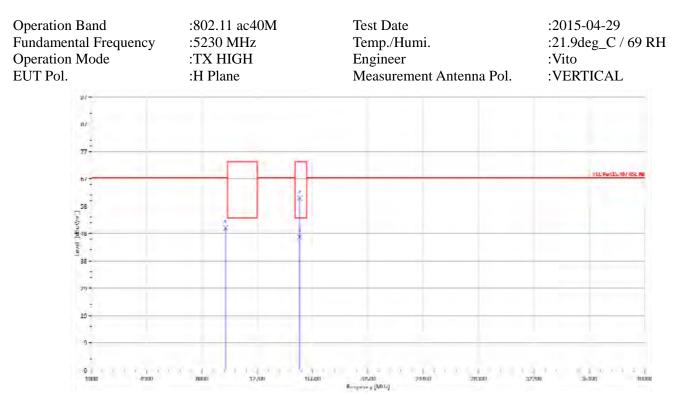
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Peak	Н	31.79	19.01	50.81	68.30	-17.49
15570.00	Peak	Н	35.10	25.80	60.90	74.00	-13.10
15570.00	Average	Н	22.23	25.80	48.03	54.00	-5.97



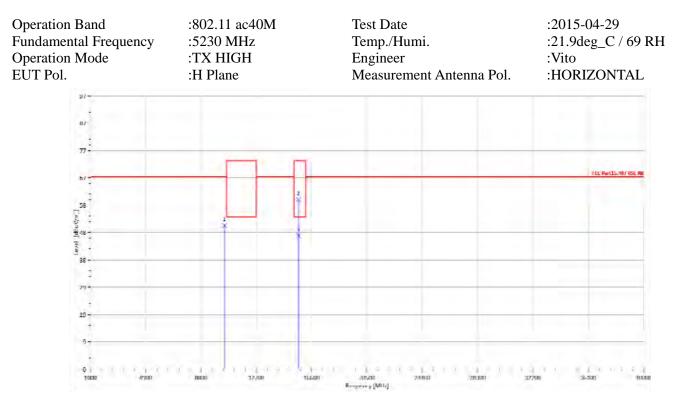
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	Н	31.29	19.11	50.41	68.30	-17.89
15690.00	Peak	Н	35.01	26.05	61.06	74.00	-12.94
15690.00	Average	Н	21.27	26.05	47.32	54.00	-6.68



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	Н	31.84	19.11	50.96	68.30	-17.34
15690.00	Peak	Н	34.12	26.05	60.17	74.00	-13.83
15690.00	Average	Н	21.32	26.05	47.37	54.00	-6.63



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## Band edge falling to restricted band

Operation Band		:802.11 ac40M		Test Date		:2015-04-29	
Fundamental	Frequency	:5190 MHz		Temp./Humi.		:21.9deg_C/	69 RH
Operation Mode		:Band Edge	LOW	Engineer		:Vito	
EUT Pol.		:H Plane		Measurement An	tenna Pol.	:VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Factor Actual		Margin
	Mode		Reading Lev	el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	E	54.20	11.14	65.34	74.00	-8.66
5150.00	Average	E	38.11	11.14	49.25	54.00	-4.75

Fundamental	Operation Band:802.11 ac40MFundamental Frequency:5190 MHzOperation Mode:Band Edge LOWEUT Pol.:H Plane			Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	E	53.01	11.14	64.15	74.00	-9.85
5150.00	Average	E	36.62	11.14	47.76	54.00	-6.24

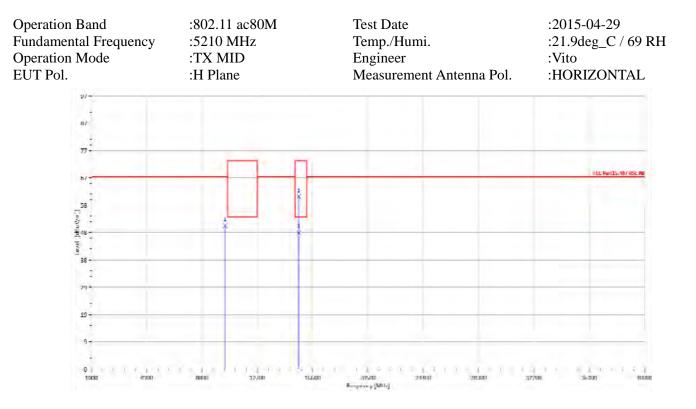


#### Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz **Operation Band** :802.11 ac80M Test Date :2015-04-29 **Fundamental Frequency** :5210 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX MID :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ -EU Part15, 10/ 45 58 1 5 . 38 1 79 10-9-3.50 0 (12,01 24400 78.881 12/00 1000 nexi TIJUT 3778 Forgerse a (Mile)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10420.00	Peak	Н	31.32	18.96	50.28	68.30	-18.02
15630.00	Peak	Н	34.96	25.97	60.93	74.00	-13.08
15630.00	Average	Н	22.39	25.97	48.36	54.00	-5.64



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10420.00	Peak	Н	31.95	18.96	50.91	68.30	-17.39
15630.00	Peak	Н	35.27	25.97	61.24	74.00	-12.76
15630.00	Average	Н	22.40	25.97	48.37	54.00	-5.63



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### Band edge falling to restricted band

Fundamental Frequency Operation Mode		:5210 MHz Te :Band Edge HIGH En		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector Mode	Note	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB	
5139.00	Peak	S	55.27	11.20	66.47	74.00	-7.53	
5139.00	Average	S	41.47	11.20	52.67	54.00	-1.33	

Fundamental	Operation Band:802.11 ac 80MSundamental Frequency:5320 MHzOperation Mode:Band Edge HIGHCUT Pol.:H Plane			Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	E	53.76	11.14	64.90	74.00	-9.10
5150.00	Average	E	41.59	11.14	52.73	54.00	-1.27

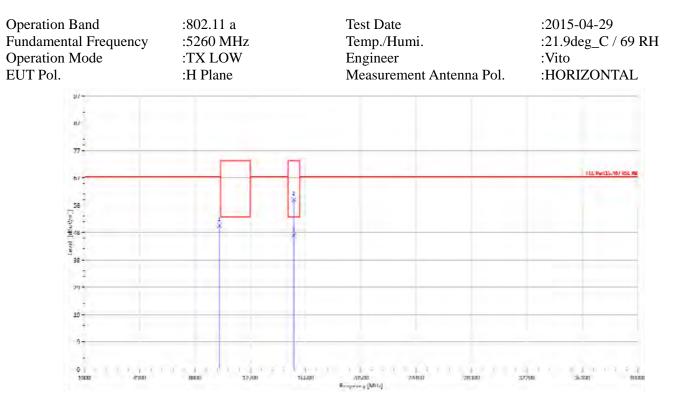


#### Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz **Operation Band** :802.11 a Test Date :2015-04-29 **Fundamental Frequency** :5260 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 100 Perils, 10/ 458 58 1 . 38 1 79 10-9-3.50 0 78.881 12/08 (12,01 28400 1000 ner TALE! 37788 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	Н	31.81	19.25	51.06	68.30	-17.24
15780.00	Peak	Н	34.10	26.25	60.35	74.00	-13.65
15780.00	Average	Н	21.31	26.25	47.56	54.00	-6.44



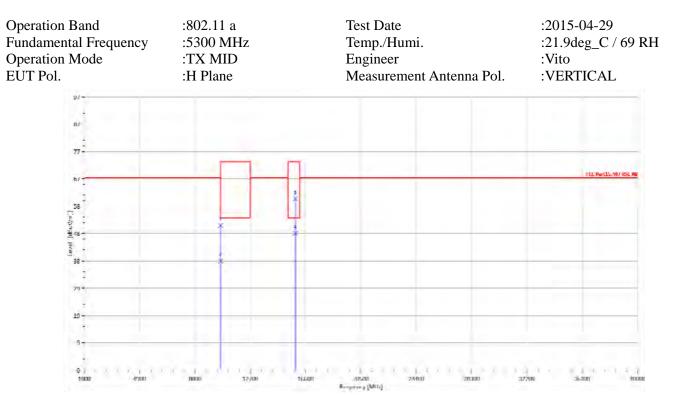
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	Н	31.75	19.25	51.00	68.30	-17.30
15780.00	Peak	Н	33.84	26.25	60.09	74.00	-13.91
15780.00	Average	Н	21.21	26.25	47.46	54.00	-6.54



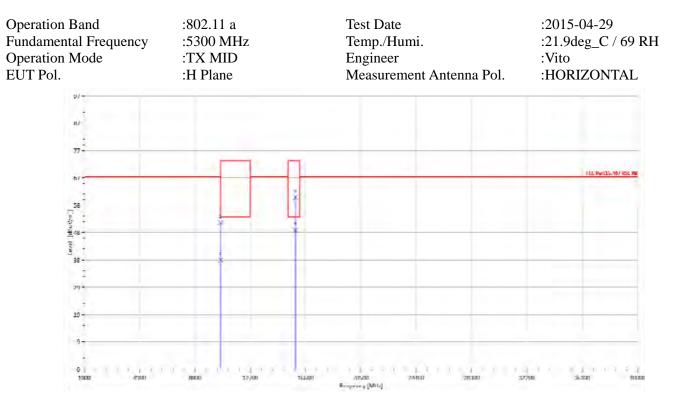
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Peak	Н	31.95	19.38	51.33	74.00	-22.67
10600.00	Average	Н	19.37	19.38	38.75	54.00	-15.25
15900.00	Peak	Н	34.48	26.39	60.87	74.00	-13.13
15900.00	Average	Н	22.17	26.39	48.56	54.00	-5.44



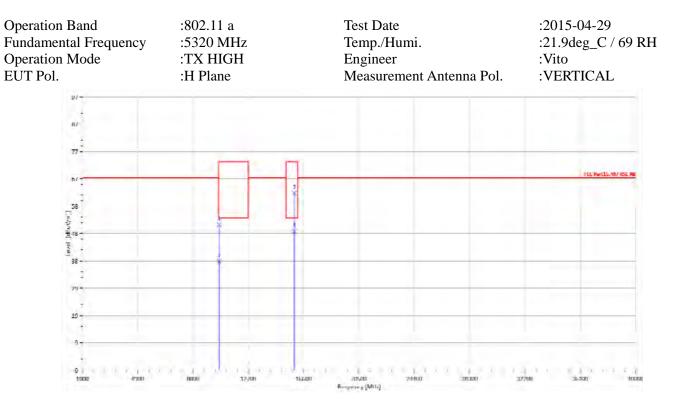
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Peak	Н	32.61	19.38	51.99	74.00	-22.01
10600.00	Average	Н	19.38	19.38	38.76	54.00	-15.24
15900.00	Peak	Н	34.55	26.39	60.94	74.00	-13.06
15900.00	Average	Н	22.93	26.39	49.32	54.00	-4.68



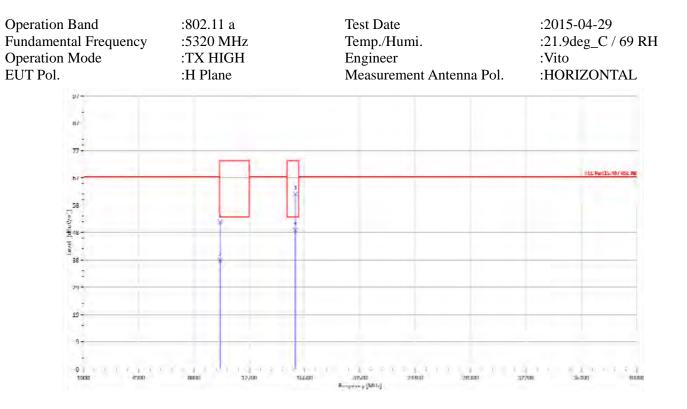
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Peak	Н	32.33	19.28	51.61	74.00	-22.39
10640.00	Average	Н	19.23	19.28	38.51	54.00	-15.49
15960.00	Peak	Н	36.34	26.48	62.82	74.00	-11.18
15960.00	Average	Н	22.83	26.48	49.31	54.00	-4.69



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Peak	Н	32.88	19.28	52.16	74.00	-21.84
10640.00	Average	Н	19.25	19.28	38.53	54.00	-15.47
15960.00	Peak	Н	35.64	26.48	62.12	74.00	-11.88
15960.00	Average	Н	22.91	26.48	49.39	54.00	-4.61



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## Band edge falling to restricted band

Operation Band		:802.11 a		Test Date		:2015-04-29		
Fundamental Frequency		:5320 MHz		Temp./Humi.		:21.9deg_C / 69 RH		
Operation Mode		:Band Edge HIGH		Engineer		:Vito		
EUT Pol.		:H Plane	ane Measur		surement Antenna Pol.		:VERTICAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB	
5350.00	Peak	E	51.73	11.30	63.03	74.00	-10.97	
5350.00	Average	E	41.22	11.30	52.52	54.00	-1.48	

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5320 MHz :Band Edge :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement And	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	E	52.43	11.30	63.73	74.00	-10.27
5350.00	Average	E	41.30	11.30	52.60	54.00	-1.40

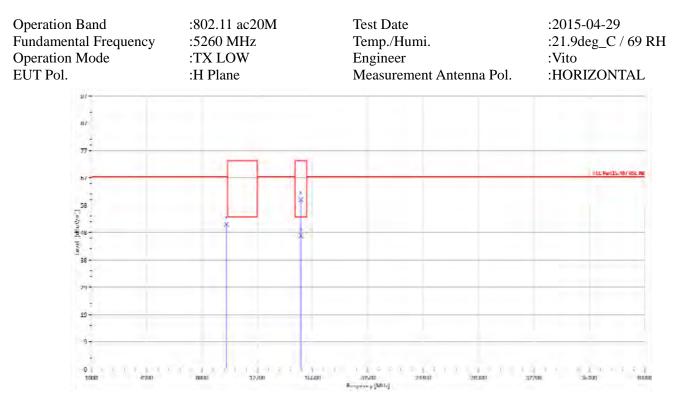


#### Radiated Spurious Emission Measurement Result 802.11ac VHT20, 5250~5350 MHz **Operation Band** :802.11 ac20M Test Date :2015-04-29 **Fundamental Frequency** :5260 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 100 Perils, 10/ 458 6/ 58 1 . 38 -79 10-9-3.50 0 24400 78.881 12/08 (12,01 1000 ner TALE! 37788 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	Н	31.27	19.25	50.52	68.30	-17.78
15780.00	Peak	Н	34.34	26.25	60.59	74.00	-13.41
15780.00	Average	Н	21.07	26.25	47.32	54.00	-6.68
15780.00	Average	Н	21.07	26.25	47.32	54.00	-6.68



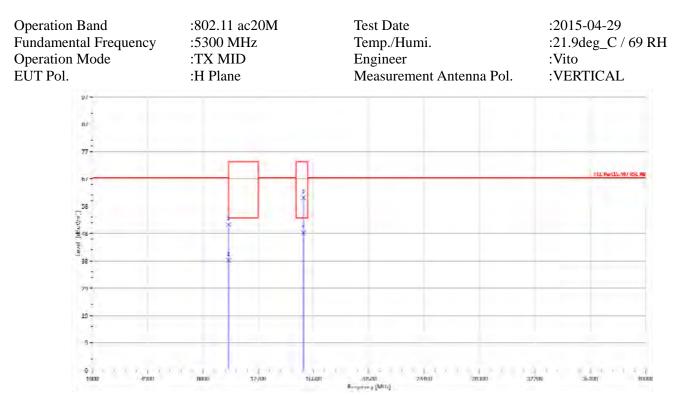
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Margin
dB
-16.91
-13.79
-6.59
-



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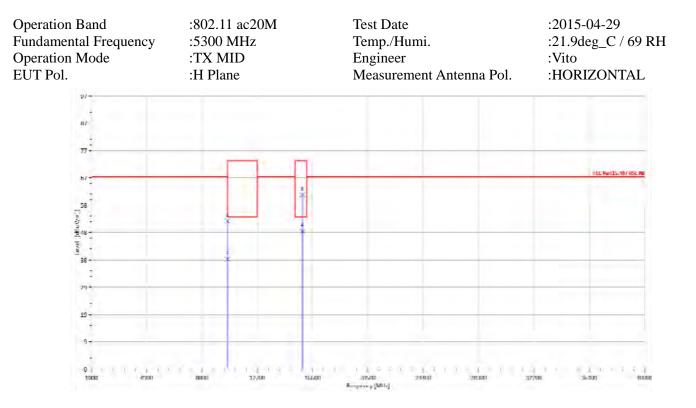
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Peak	Н	32.29	19.38	51.66	74.00	-22.34
10600.00	Average	Н	19.58	19.38	38.96	54.00	-15.04
15900.00	Peak	Н	34.81	26.39	61.20	74.00	-12.80
15900.00	Average	Н	22.30	26.39	48.69	54.00	-5.31

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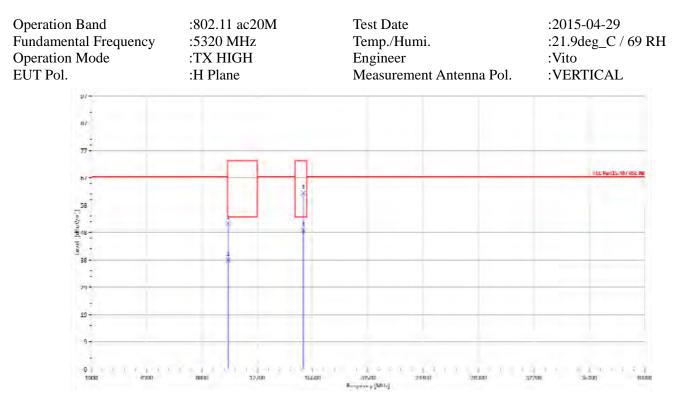
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Peak	Н	33.19	19.38	52.57	74.00	-21.43
10600.00	Average	Н	19.65	19.38	39.03	54.00	-14.97
15900.00	Peak	Н	35.48	26.39	61.87	74.00	-12.13
15900.00	Average	Н	22.43	26.39	48.82	54.00	-5.18



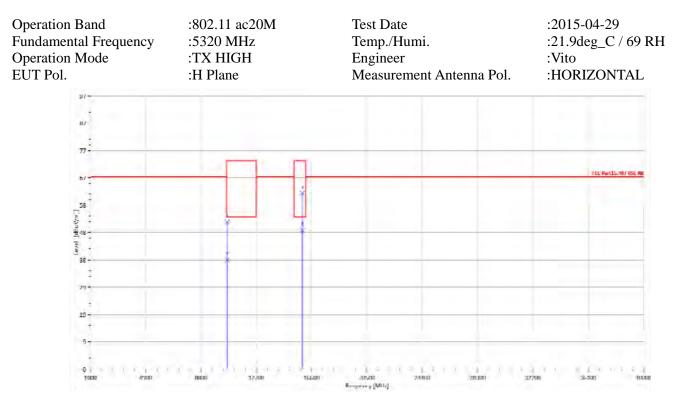
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Peak	Н	32.43	19.28	51.71	74.00	-22.29
10640.00	Average	Н	19.43	19.28	38.71	54.00	-15.29
15960.00	Peak	Н	36.00	26.48	62.48	74.00	-11.52
15960.00	Average	Н	22.88	26.48	49.36	54.00	-4.64



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Peak	Н	32.90	19.28	52.18	74.00	-21.82
10640.00	Average	Н	19.47	19.28	38.75	54.00	-15.25
15960.00	Peak	Н	35.93	26.48	62.41	74.00	-11.59
15960.00	Average	Н	22.85	26.48	49.33	54.00	-4.67



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#### Band edge falling to restricted band

Operation Band		:802.11 ac20M		Test Date		:2015-04-29	
Fundamental Frequency		:5320 MHz		Temp./Humi.		:21.9deg_C /	69 RH
Operation Mode		:Band Edge	HIGH	Engineer		:Vito	
EUT Pol.		:H Plane		Measurement An	tenna Pol.	:VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
_	Mode		Reading Lev	el	FS	@3m	-
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	E	52.92	11.30	64.22	74.00	-9.78
5350.00	Average	E	41.43	11.30	52.73	54.00	-1.27

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:5320 MHz	:Band Edge HIGH Engineer		tenna Pol.	:2015-04-29 :21.9deg_C / :Vito :HORIZONT.	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	52.76	11.30	64.07	74.00	-9.93
5350.00	Average	E	41.57	11.30	52.87	54.00	-1.13

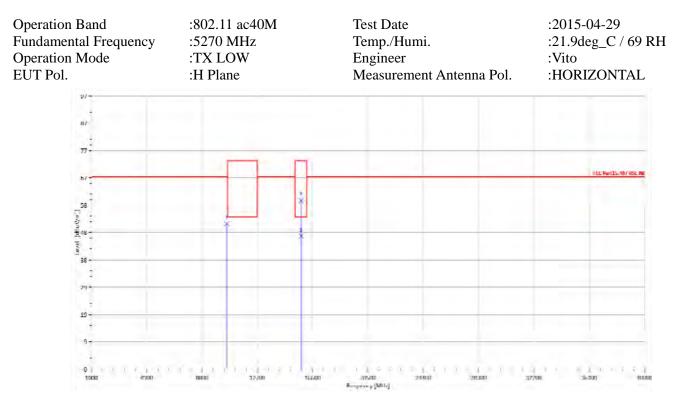


#### Radiated Spurious Emission Measurement Result 802.11ac VHT40, 5250~5350 MHz **Operation Band** :802.11 ac40M Test Date :2015-04-29 **Fundamental Frequency** :5270 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 EU Part15, 10/ 45 67 58 100 1 . 38 1 79 10-9-3.50 0 12.01 24400 78.881 12/08 1000 nex 112.00 3778 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Peak	Н	32.34	19.13	51.48	68.30	-16.82
15810.00	Peak	Н	34.19	26.30	60.49	74.00	-13.51
15810.00	Average	Н	20.95	26.30	47.25	54.00	-6.75



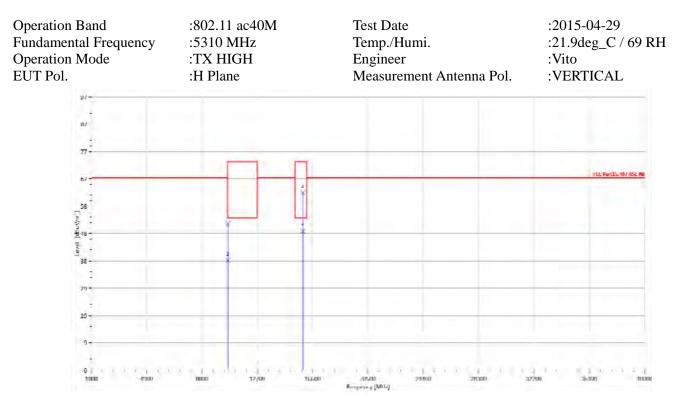
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Peak	Н	32.39	19.13	51.52	68.30	-16.78
15810.00	Peak	Н	33.58	26.30	59.88	74.00	-14.12
15810.00	Average	Н	20.98	26.30	47.28	54.00	-6.72



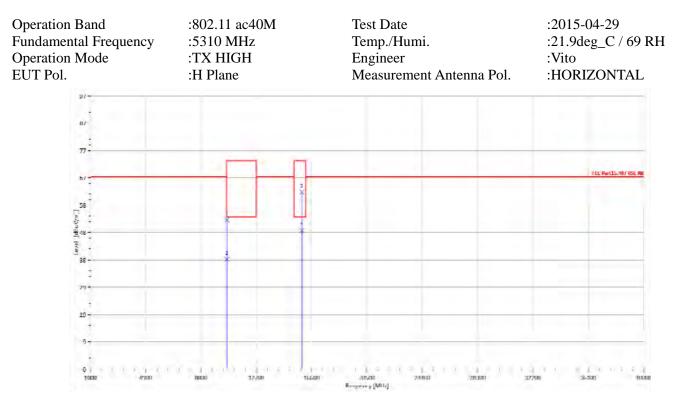
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Peak	Н	32.70	19.38	52.08	74.00	-21.92
10620.00	Average	Н	19.55	19.38	38.93	54.00	-15.07
15930.00	Peak	Н	36.55	26.50	63.05	74.00	-10.95
15930.00	Average	Н	22.80	26.50	49.30	54.00	-4.70



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Peak	Н	33.69	19.38	53.07	74.00	-20.93
10620.00	Average	Н	19.57	19.38	38.95	54.00	-15.05
15930.00	Peak	Н	36.33	26.50	62.83	74.00	-11.17
15930.00	Average	Н	22.79	26.50	49.29	54.00	-4.71



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#### Band edge falling to restricted band

Operation Band :802.11		:802.11 ac40	802.11 ac40M Test Date			:2015-04-29	
Fundamental	Frequency	:5310 MHz		Temp./Humi.		:21.9deg_C / 69 RH	
Operation Mo	ode	:Band Edge	HIGH	Engineer		:Vito	
EUT Pol.		:H Plane		Measurement And	tenna Pol.	:VERTICAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	55.87	11.30	67.17	74.00	-6.83
5350.00	Average	E	40.86	11.30	52.16	54.00	-1.84

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:Band Edge HIGH Engineer		Temp./Humi.	tenna Pol.	69 RH AL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	52.62	11.30	63.92	74.00	-10.08
5350.00	Average	E	39.11	11.30	50.41	54.00	-3.59

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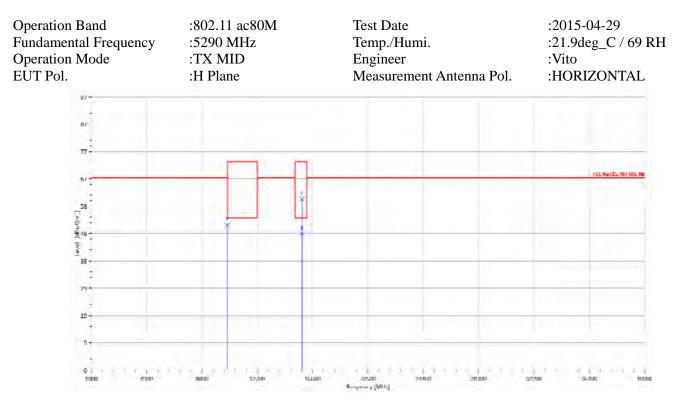


#### Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz **Operation Band** :802.11 ac80M Test Date :2015-04-29 **Fundamental Frequency** :5290 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX MID :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ 77 100 Perils, 10/ 458 58 1 . 38 ÷ 10-9-3.50 0 1 78.687 12/00 (12,01 28400 1000 ner 112.00 37788 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10580.00	Peak	Н	32.71	19.29	52.00	68.30	-16.30
15870.00	Peak	Н	34.86	26.42	61.27	74.00	-12.73
15870.00	Average	Н	21.81	26.42	48.23	54.00	-5.77



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
10580.00	Peak	Н	32.10	19.29	51.39	68.30	-16.91
15870.00	Peak	Н	34.27	26.42	60.68	74.00	-13.32
15870.00	Average	Н	21.93	26.42	48.35	54.00	-5.65



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#### Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode		:802.11 ac80M :5290 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer	Dal	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
EUT Pol.		.H Plane		Measurement Ant	lenna Pol.	VERTICAL	
Freq.	Detector	Note	Spectrum		Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	E	58.87	11.30	70.17	74.00	-3.83
5350.00	Average	E	41.52	11.30	52.82	54.00	-1.18
5358.40	Peak	S	60.74	11.30	72.04	74.00	-1.96
5358.40	Average	S	41.29	11.30	52.59	54.00	-1.41

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	ise		tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	E	54.74	11.30	66.05	74.00	-7.95
5350.00	Average	E	39.70	11.30	51.00	54.00	-3.00
5358.30	Peak	S	57.26	11.30	68.56	74.00	-5.44
5358.30	Average	S	39.64	11.30	50.94	54.00	-3.06



11000.00

11000.00

16500.00

Peak

Average

Peak

Η

Η

Η

## FCC ID: B94HNQ93CSPNAC

dB

-23.21

-15.66

-7.07

#### **Operation Band** :802.11 a Test Date :2015-04-29 **Fundamental Frequency** :5500 MHz Temp./Humi. :21.9deg\_C / 69 RH **Operation Mode** Engineer :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL -Distantia mark 58 10-÷.... 0 12,01 ene (Mild) Freq. Detector Note Spectrum Factor Actual Limit Margin Mode Reading Level FS @3m dBµV dBµV/m MHz PK/QP/AV F/H/E/S dB dBµV/m

30.78

18.32

34.07

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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

20.02

20.02

27.16

50.79

38.34

61.23

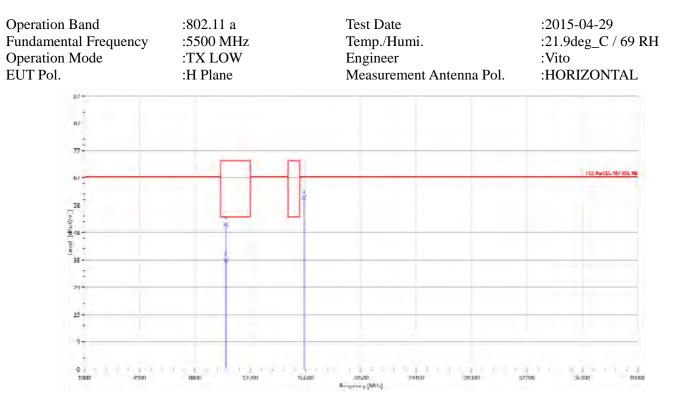
74.00

54.00

68.30



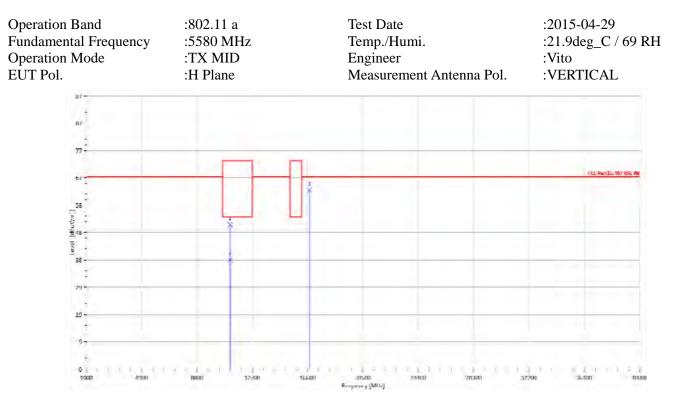
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Peak	Н	31.38	20.02	51.39	74.00	-22.61
11000.00	Average	Н	18.56	20.02	38.58	54.00	-15.42
16500.00	Peak	Н	33.58	27.16	60.75	68.30	-7.55



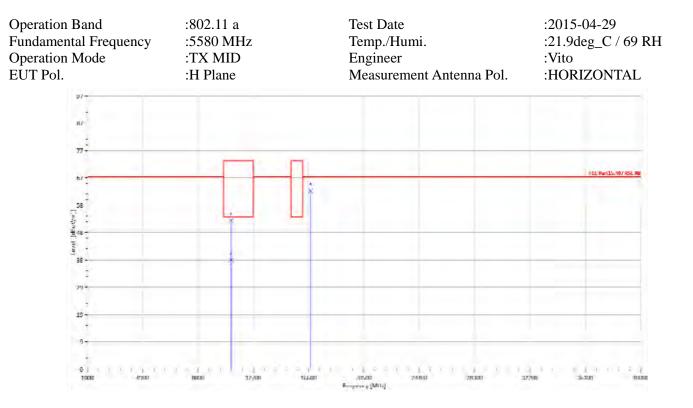
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Peak	Н	30.80	20.38	51.18	74.00	-22.82
11160.00	Average	Н	18.43	20.38	38.81	54.00	-15.19
16740.00	Peak	Н	35.80	27.79	63.59	68.30	-4.71



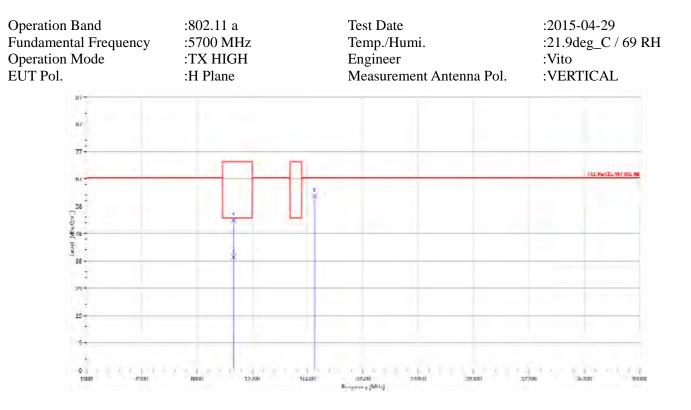
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV∕m	dBµV/m	dB
11160.00	Peak	Н	32.35	20.38	52.73	74.00	-21.27
11160.00	Average	Н	18.43	20.38	38.81	54.00	-15.19
16740.00	Peak	Н	35.50	27.79	63.29	68.30	-5.01



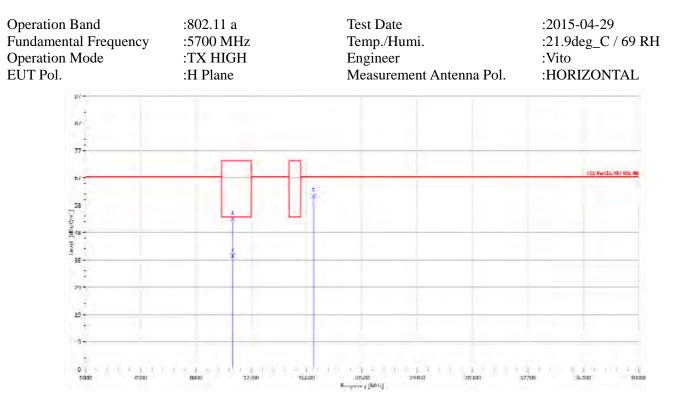
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	32.42	20.81	53.23	74.00	-20.77
Average	Н	19.35	20.81	40.16	54.00	-13.84
Peak	Н	33.62	28.26	61.88	68.30	-6.42
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 32.42 Average H 19.35	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH32.4220.81AverageH19.3520.81	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH32.4220.8153.23AverageH19.3520.8140.16	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBμV         dB         dBμV/m         dBμV/m           Peak         H         32.42         20.81         53.23         74.00           Average         H         19.35         20.81         40.16         54.00



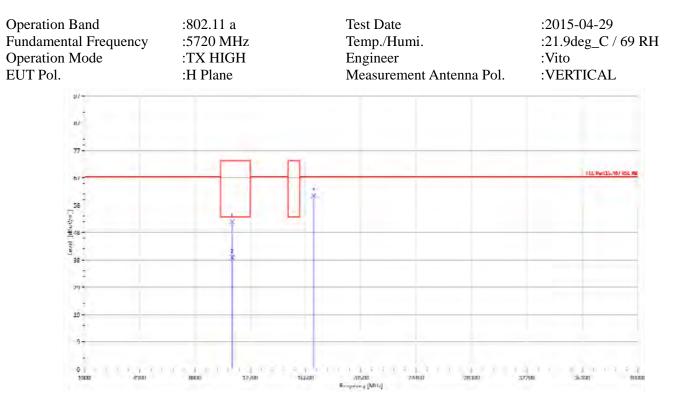
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	32.57	20.81	53.38	74.00	-20.62
Average	Н	19.42	20.81	40.23	54.00	-13.77
Peak	Н	33.18	28.26	61.44	68.30	-6.86
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level <u>PK/QP/AV F/H/E/S dBµV</u> Peak H 32.57 Average H 19.42	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH32.5720.81AverageH19.4220.81	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH32.5720.8153.38AverageH19.4220.8140.23	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBμV         dB         dBμV/m         dBμV/m           Peak         H         32.57         20.81         53.38         74.00           Average         H         19.42         20.81         40.23         54.00



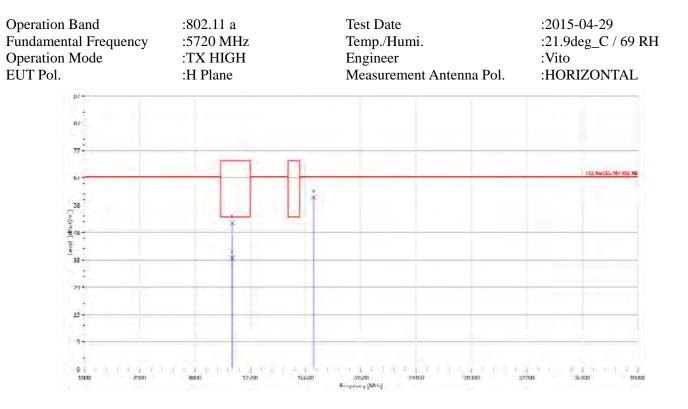
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11440.00	Peak	Н	31.48	20.87	52.35	74.00	-21.65
11440.00	Average	Н	18.79	20.87	39.66	54.00	-14.34
17160.00	Peak	Н	33.61	27.99	61.59	68.30	-6.71



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11440.00	Peak	Н	30.94	20.87	51.81	74.00	-22.19
11440.00	Average	Н	18.62	20.87	39.49	54.00	-14.51
17160.00	Peak	Н	32.97	27.99	60.95	68.30	-7.35



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## Band edge falling to restricted band

Operation Band		:802.11 a		Test Date		:2015-04-29			
Fundamental Operation Mo	· ·	:5500 MHz :Band Edge ]	IOW	Temp./Humi. Engineer		:21.9deg_C / ( :Vito	59 RH		
EUT Pol.	Jue	:H Plane		Measurement Ant	tenna Pol.	:VERTICAL			
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin		
	Mode		Reading Lev	vel	FS	@3m			
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB		
5460.00	Peak	E	52.19	11.46	63.65	74.00	-10.35		
5460.00	Average	E	41.24	11.46	52.70	54.00	-1.30		
5468.60	Peak	S	55.09	11.46	66.55	68.30	-1.75		
5470.00	Peak	E	52.50	11.46	63.96	68.30	-4.34		

Operation Band	:802.11 a	Test Date	:2015-04-29
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21.9deg_C / 69 RH
Operation Mode	:Band Edge LOW	Engineer	:Vito
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	52.83	11.46	64.30	74.00	-9.70
5460.00	Average	Е	41.29	11.46	52.75	54.00	-1.25
5468.60	Peak	S	55.22	11.46	66.67	68.30	-1.63
5470.00	Peak	Е	52.50	11.46	63.96	68.30	-4.34



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Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 a :5700 MHz :Band Edge :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	53.01	12.27	65.27	68.30	-3.03
5726.48	Peak	S	54.96	12.27	67.23	68.30	-1.07

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 a :5700 MHz :Band Edge :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	52.71	12.27	64.98	68.30	-3.32
5729.00	Peak	S	53.88	12.29	66.17	68.30	-2.13

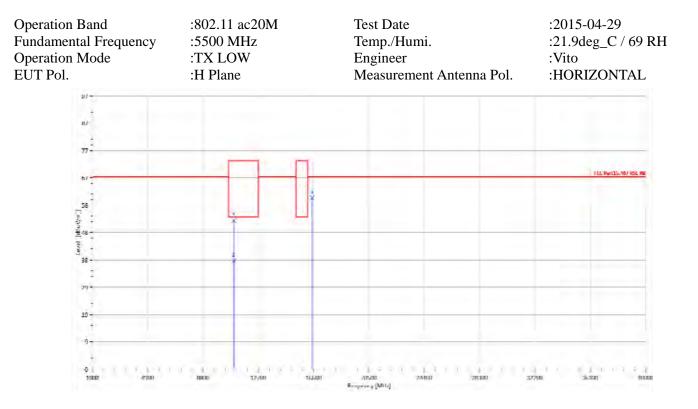


#### Radiated Spurious Emission Measurement Result 802.11ac VHT20, 5470~5725 MHz **Operation Band** :802.11 ac20M Test Date :2015-04-29 **Fundamental Frequency** :5500 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL -100 Perils, 10/ 458 58 38 -79 10-9-3-50 0 24400 78.881 12/00 113.00 (12,01 1000 THE R. 37788 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Peak	Н	31.98	20.02	52.00	74.00	-22.00
11000.00	Average	Н	18.40	20.02	38.42	54.00	-15.58
16500.00	Peak	Н	34.02	27.16	61.18	68.30	-7.12



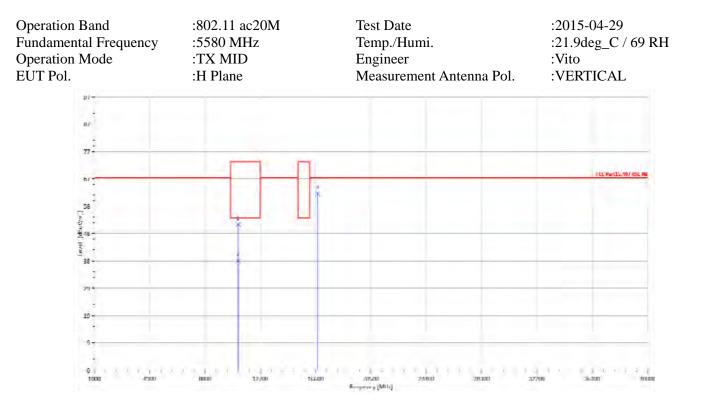
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	32.75	20.02	52.77	74.00	-21.23
Average	Н	18.41	20.02	38.43	54.00	-15.57
Peak	Н	33.54	27.16	60.71	68.30	-7.59
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 32.75 Average H 18.41	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH32.7520.02AverageH18.4120.02	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH32.7520.0252.77AverageH18.4120.0238.43	ModeReading LevelFS@3mPK/QP/AVF/H/E/SdBµVdBdBµV/mdBµV/mPeakH32.7520.0252.7774.00AverageH18.4120.0238.4354.00



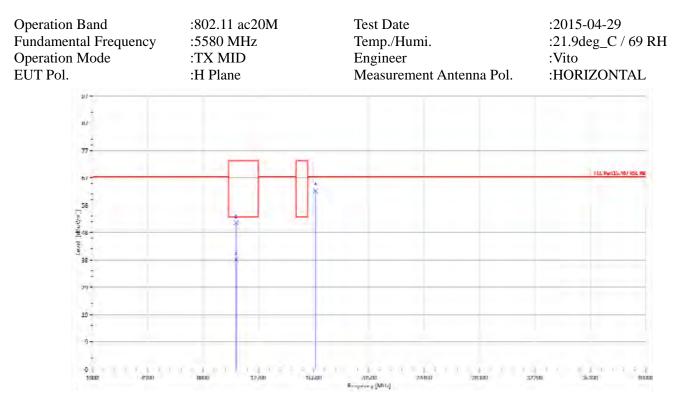
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	31.32	20.38	51.70	74.00	-22.30
Average	Н	18.45	20.38	38.83	54.00	-15.17
Peak	Н	34.90	27.79	62.69	68.30	-5.61
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 31.32 Average H 18.45	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH31.3220.38AverageH18.4520.38	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH31.3220.3851.70AverageH18.4520.3838.83	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBμV         dB         dBμV/m         dBμV/m           Peak         H         31.32         20.38         51.70         74.00           Average         H         18.45         20.38         38.83         54.00



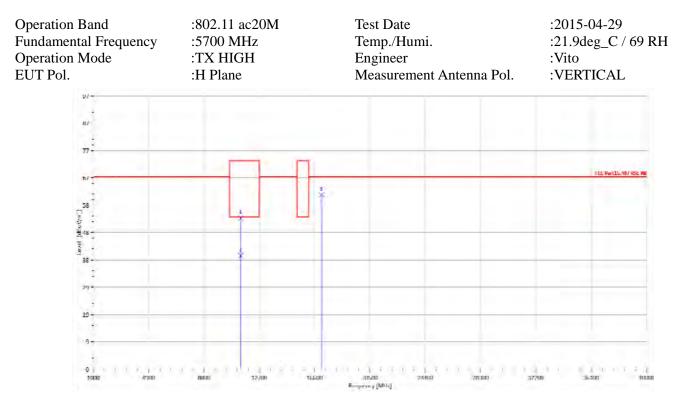
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Peak	Н	31.58	20.38	51.96	74.00	-22.04
11160.00	Average	Н	18.49	20.38	38.87	54.00	-15.13
16740.00	Peak	Н	35.47	27.79	63.26	68.30	-5.04



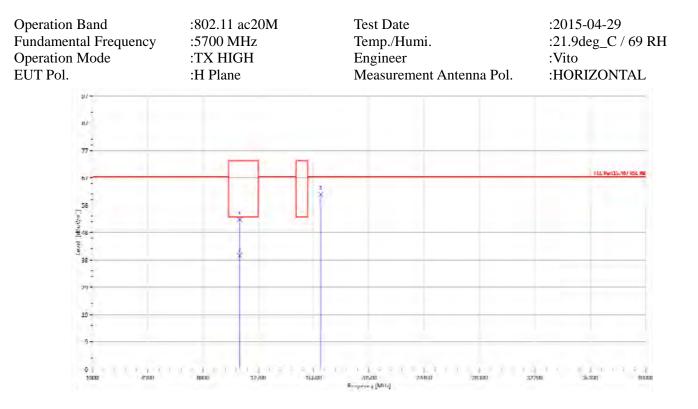
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ctual Limit Margin
FS @3m
µV/m dBµV/m dB
3.56 74.00 -20.44
0.24 54.00 -13.76
68.30 -6.45
5



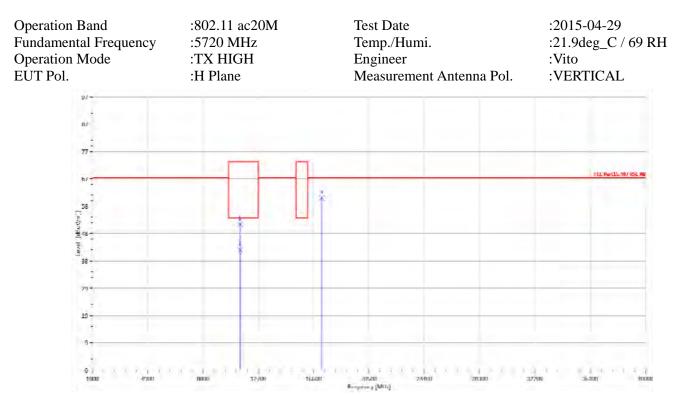
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	32.34	20.81	53.15	74.00	-20.85
Average	Н	19.42	20.81	40.23	54.00	-13.77
Peak	Н	33.72	28.26	61.98	68.30	-6.32
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 32.34 Average H 19.42	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH32.3420.81AverageH19.4220.81	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH32.3420.8153.15AverageH19.4220.8140.23	ModeReading LevelFS@3mPK/QP/AVF/H/E/SdBµVdBdBµV/mdBµV/mPeakH32.3420.8153.1574.00AverageH19.4220.8140.2354.00



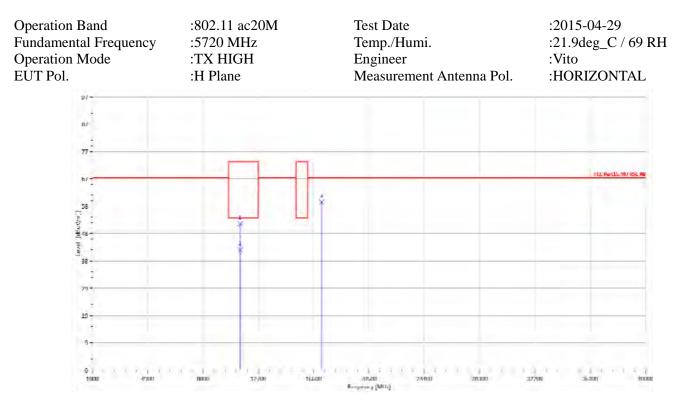
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11440.00	Peak	Н	30.87	20.87	51.73	74.00	-22.27
11440.00	Average	Н	21.87	20.87	42.74	54.00	-11.26
17160.00	Peak	Н	33.06	27.99	61.05	68.30	-7.25
11440.00	Average	Н	21.87	20.87	42.74	54.00	-11.26



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11440.00	Peak	Н	31.08	20.87	51.95	74.00	-22.05
11440.00	Average	Н	21.83	20.87	42.70	54.00	-11.30
17160.00	Peak	Н	31.66	27.99	59.64	68.30	-8.66
11440.00 11440.00	Peak Average	H H	31.08 21.83	20.87 20.87	51.95 42.70	74.00 54.00	-22.05 -11.30



5460.00

5460.00

5470.00

Peak

Average

Peak

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#### Band edge falling to restricted band

Operation Band Fundamental Frequency		:802.11 ac20M :5500 MHz		Test Date Temp./Humi.		:2015-04-29 :21.9deg_C / 69 RH	
Operation Mode EUT Pol.		:Band Edge LOW :H Plane		Engineer Measurement Ant	tenna Pol.	:Vito :VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	E	53.11	11.46	64.57	74.00	-9.43
5460.00	Average	E	41.24	11.46	52.70	54.00	-1.30
5468.60	Peak	S	54.81	11.46	66.27	68.30	-2.03
5470.00	Peak	E	54.67	11.46	66.13	68.30	-2.17

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 ac20M :5500 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB

11.46

11.46

11.46

63.55

52.73

65.75

74.00

54.00

68.30

-10.45

-1.27

-2.55

52.09

41.27

54.29

E

E

E



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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 ac20 :5700 MHz :Band Edge :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	rel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	53.62	12.27	65.89	68.30	-2.41

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 ac20M :5700 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	E	51.54	12.27	63.81	68.30	-4.49
5725.76	Peak	S	52.63	12.27	64.90	68.30	-3.40

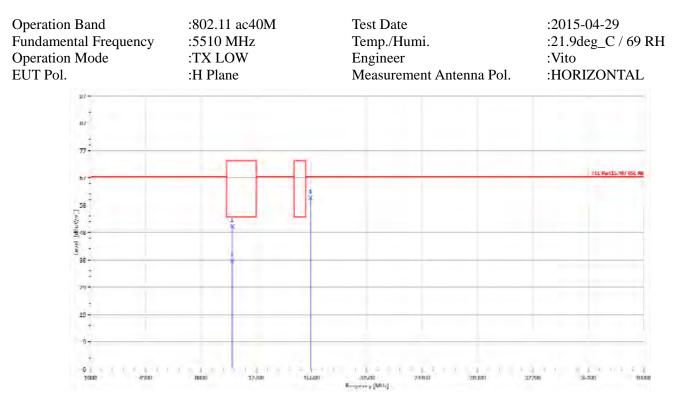


#### Radiated Spurious Emission Measurement Result 802.11ac VHT40, 5470~5725 MHz **Operation Band** :802.11 ac40M Test Date :2015-04-29 **Fundamental Frequency** :5510 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL -LU Part15, 10/ 10 58 38 -79 10-9-3.50 0 24400 78.881 12/58 (12,01 1000 1788 ner 112.00 3778 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Peak	Н	31.38	20.04	51.43	74.00	-22.57
11020.00	Average	Н	18.34	20.04	38.38	54.00	-15.62
16530.00	Peak	Н	33.47	27.29	60.76	68.30	-7.54



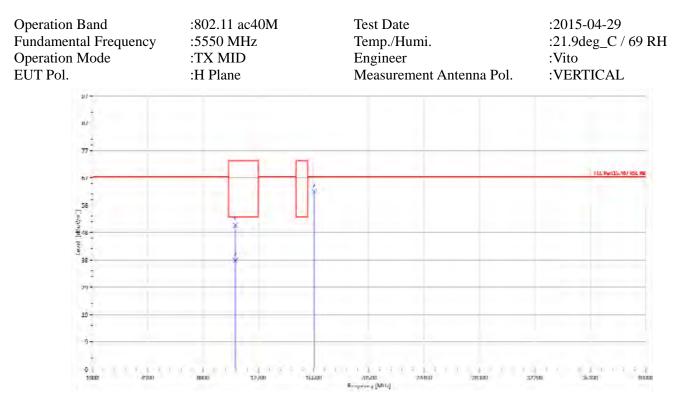
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Peak	Н	30.63	20.04	50.67	74.00	-23.33
11020.00	Average	Н	18.39	20.04	38.43	54.00	-15.57
16530.00	Peak	Н	33.54	27.29	60.84	68.30	-7.46



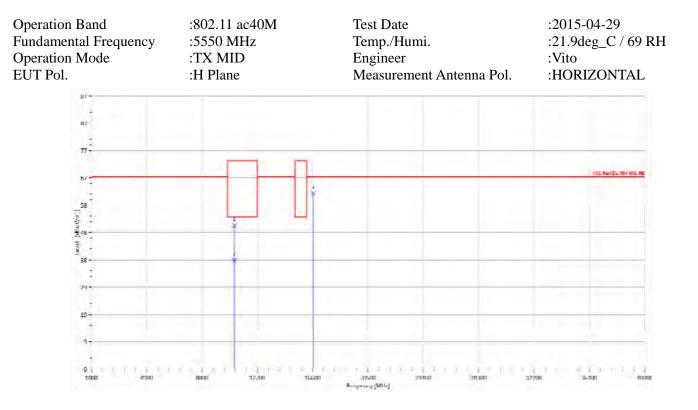
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00	Peak	Н	30.83	20.21	51.03	74.00	-22.97
11100.00	Average	Н	18.33	20.21	38.54	54.00	-15.46
16650.00	Peak	Н	35.54	27.54	63.08	68.30	-5.22



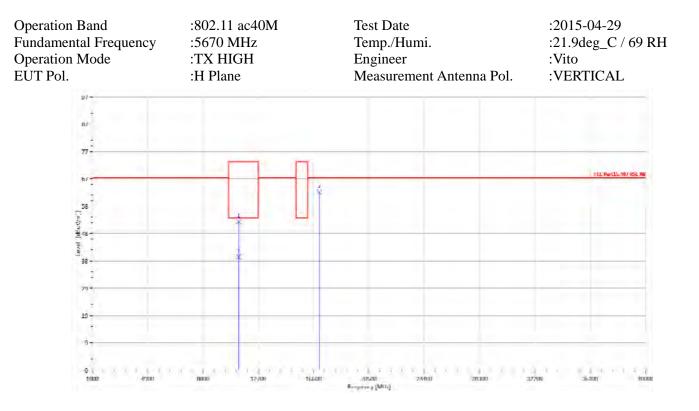
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00	Peak	Н	30.69	20.21	50.90	74.00	-23.10
11100.00	Average	Н	18.37	20.21	38.58	54.00	-15.42
16650.00	Peak	Н	34.77	27.54	62.31	68.30	-5.99



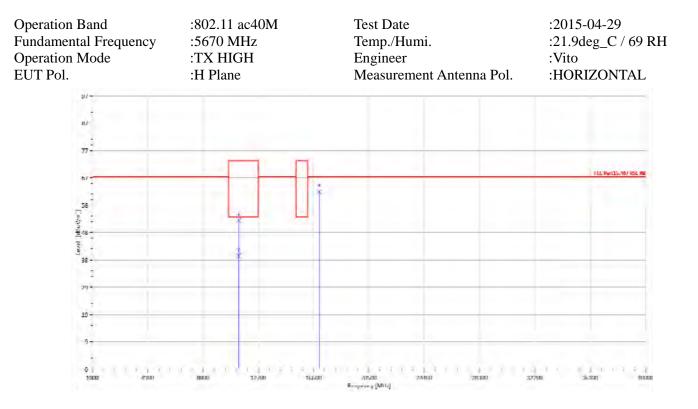
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Peak	Н	31.98	20.61	52.59	74.00	-21.41
11340.00	Average	Н	19.55	20.61	40.16	54.00	-13.84
17010.00	Peak	Н	34.85	28.28	63.13	68.30	-5.17



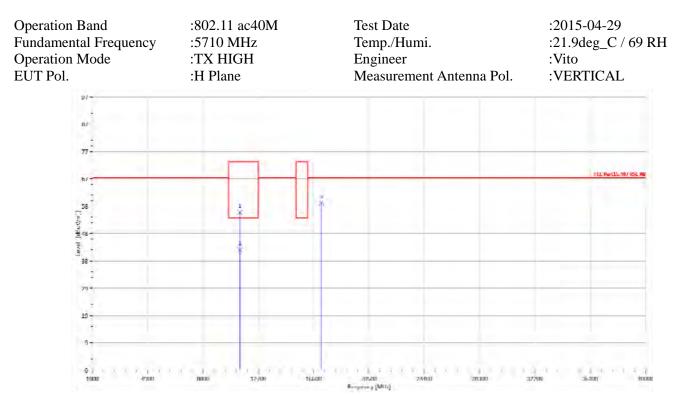
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	32.19	20.61	52.80	74.00	-21.20
Average	Н	19.56	20.61	40.17	54.00	-13.83
Peak	Н	34.70	28.28	62.98	68.30	-5.32
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 32.19 Average H 19.56	Mode Reading Level <u>PK/QP/AV F/H/E/S dBµV dB</u> Peak H 32.19 20.61 Average H 19.56 20.61	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH32.1920.6152.80AverageH19.5620.6140.17	ModeReading LevelFS@3mPK/QP/AVF/H/E/SdBµVdBdBµV/mdBµV/mPeakH32.1920.6152.8074.00AverageH19.5620.6140.1754.00



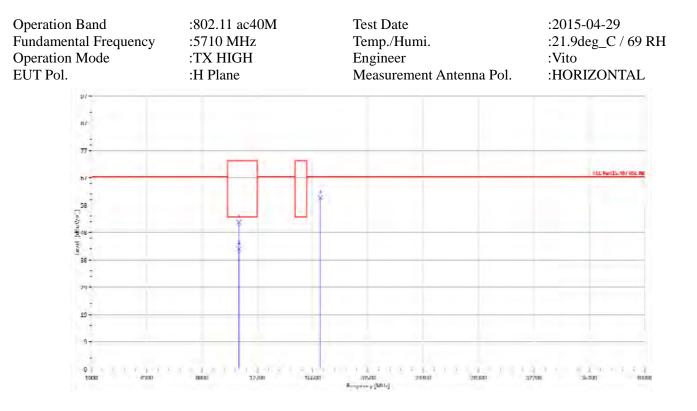
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11420.00	Peak	Н	35.25	20.73	55.98	74.00	-18.02
11420.00	Average	Н	21.92	20.73	42.65	54.00	-11.35
17130.00	Peak	Н	31.20	28.08	59.28	68.30	-9.02



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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	31.35	20.73	52.07	74.00	-21.93
Average	Н	21.86	20.73	42.59	54.00	-11.41
Peak	Н	32.65	28.08	60.73	68.30	-7.57
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level <u>PK/QP/AV F/H/E/S</u> dBµV Peak H 31.35 Average H 21.86	Mode Reading Level <u>PK/QP/AV F/H/E/S</u> dBµV dB Peak H 31.35 20.73 Average H 21.86 20.73	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH31.3520.7352.07AverageH21.8620.7342.59	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBμV         dB         dBμV/m         dBμV/m           Peak         H         31.35         20.73         52.07         74.00           Average         H         21.86         20.73         42.59         54.00



#### Band edge falling to restricted band

Operation Ba Fundamental Operation Mo EUT Pol.	tal Frequency :5510 MHz		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector Mode	Note	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	E	52.61	11.46	64.08	74.00	-9.92
5460.00	Average	E	34.85	11.46	46.31	54.00	-7.69
5470.00	Peak	E	54.99	11.46	66.44	68.30	-1.86

Operation Band	:802.11 ac40M	Test Date	:2015-04-29
Fundamental Frequency	:5510 MHz	Temp./Humi.	:21.9deg_C / 69 RH
Operation Mode	:Band Edge LOW	Engineer	:Vito
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

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)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	47.88	11.46	59.34	74.00	-14.66
5460.00	Average	E	31.22	11.46	42.68	54.00	-11.32
5468.40	Peak	S	55.55	11.46	67.00	68.30	-1.30
5470.00	Peak	Е	54.32	11.46	65.78	68.30	-2.52



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Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:5670 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector	Note	Spectrum		Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Н	51.98	12.27	64.25	68.30	-4.05
Fundamental	Operation Band:802.11 ac40MFundamental Frequency:5670 MHzOperation Mode:Band Edge HIGHEUT Pol.:H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-04-29 :21.9deg_C / 69 RH :Vito :HORIZONTAL		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin

	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	51.34	12.27	63.61	68.30	-4.69

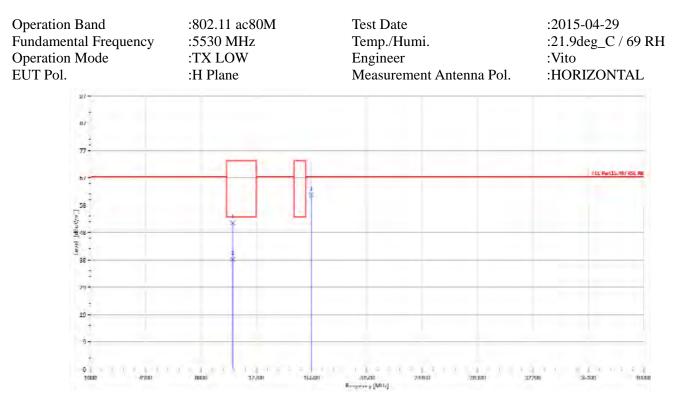


#### Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz **Operation Band** :802.11 ac80M Test Date :2015-04-29 **Fundamental Frequency** :5530 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ -100 Perils, 10/ 458 58 38 -10-9-3.50 0 1 24400 78.881 12/00 (12,01 1000 RED. 114.00 37788 Frequence (Mile)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11060.00	Peak	Н	31.62	20.14	51.76	74.00	-22.24
11060.00	Average	Н	18.79	20.14	38.93	54.00	-15.07
16590.00	Peak	Н	34.43	27.33	61.76	68.30	-6.54



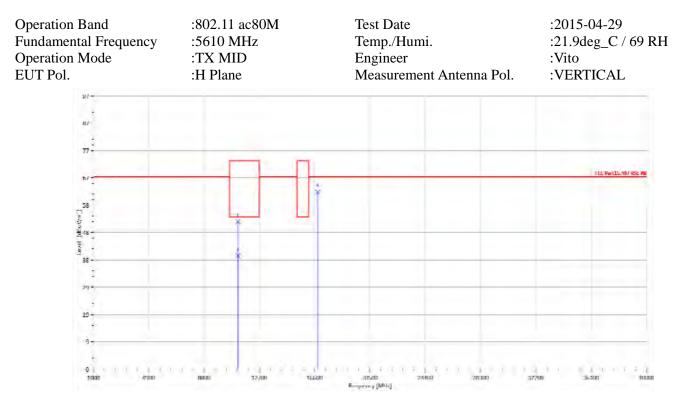
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11060.00	Peak	Н	31.71	20.14	51.85	74.00	-22.15
11060.00	Average	Н	18.81	20.14	38.95	54.00	-15.05
16590.00	Peak	Н	34.46	27.33	61.79	68.30	-6.51



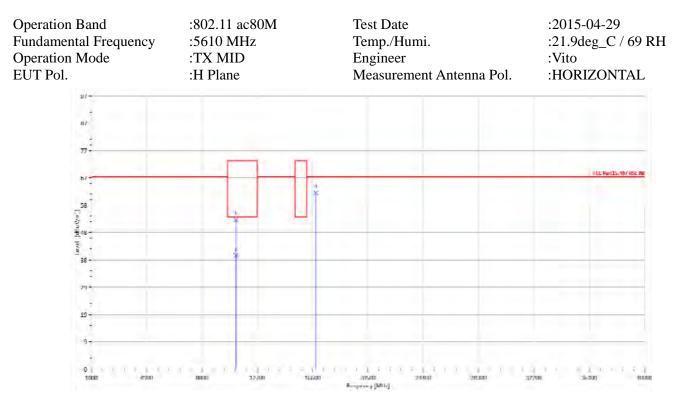
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00	Peak	Н	31.92	20.39	52.31	74.00	-21.69
11220.00	Average	Н	19.82	20.39	40.21	54.00	-13.79
16830.00	Peak	Н	35.05	27.86	62.91	68.30	-5.39



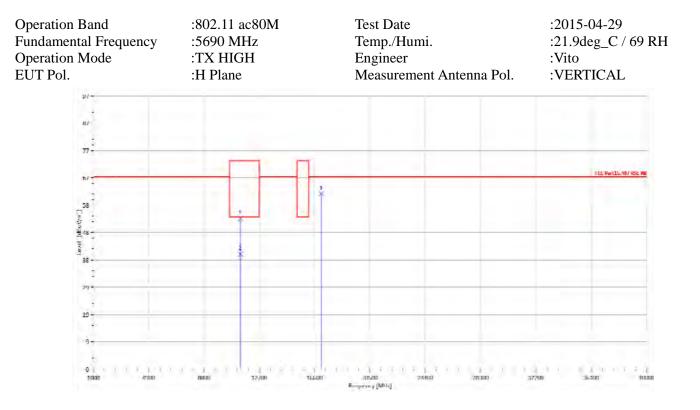
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00	Peak	Н	32.61	20.39	53.01	74.00	-20.99
11220.00	Average	Н	19.85	20.39	40.24	54.00	-13.76
16830.00	Peak	Н	34.75	27.86	62.62	68.30	-5.68



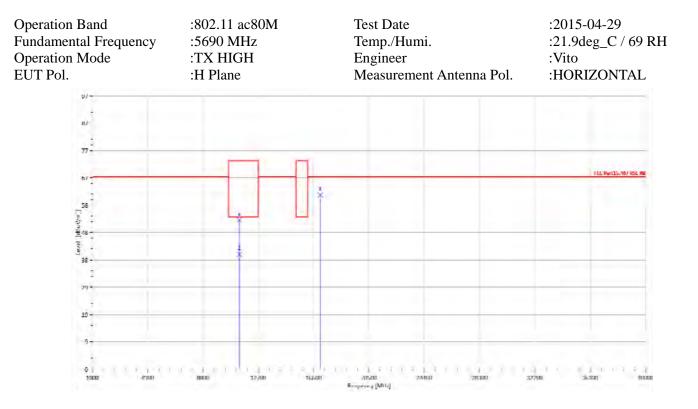
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11380.00	Peak	Н	32.57	20.84	53.41	74.00	-20.59
11380.00	Average	Н	19.92	20.84	40.76	54.00	-13.24
17070.00	Peak	Н	34.04	28.21	62.25	68.30	-6.05



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11380.00	Peak	Н	32.06	20.84	52.90	74.00	-21.10
11380.00	Average	Н	19.86	20.84	40.70	54.00	-13.30
17070.00	Peak	Н	33.61	28.21	61.83	68.30	-6.47



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#### Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 ac80M :5530 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector Mode	Note	Spectrum	Factor	Actual	Limit @3m	Margin
	Mode		Reading Lev	el	FS		
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	E	55.27	11.46	66.73	74.00	-7.27
5460.00	Average	E	35.66	11.46	47.12	54.00	-6.88
5464.50	Peak	S	55.35	11.46	66.81	68.30	-1.49
5470.00	Peak	E	52.34	11.46	63.80	68.30	-4.51

Operation Band	:802.11 ac80M	Test Date	:2015-04-29
Fundamental Frequency	:5530 MHz	Temp./Humi.	:21.9deg_C / 69 RH
Operation Mode	:Band Edge LOW	Engineer	:Vito
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

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

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

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	47.87	11.46	59.33	74.00	-14.67
5460.00	Average	Е	30.30	11.46	41.77	54.00	-12.23
5464.00	Peak	S	49.30	11.46	60.76	68.30	-7.54
5470.00	Peak	Е	46.81	11.46	58.26	68.30	-10.04



#### Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz **Operation Band** Test Date :802.11 a :2015-04-29 Fundamental Frequency :5745 MHz Temp./Humi. :21.9deg\_C / 69 RH **Operation Mode** :TX LOW Engineer :Vito :H Plane EUT Pol. Measurement Antenna Pol. :VERTICAL 11/ 77 LU Part15, 10/ 45 58 . 38 -79 10-9-3.50 0 24400 78.881 12/08 (12.01 100 1230 RED. 112.00 3778 Frequence (Mills)

Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	30.59	21.08	51.67	74.00	-22.33
Average	Н	17.95	21.08	39.03	54.00	-14.97
Peak	Н	34.55	28.06	62.61	68.30	-5.69
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 30.59 Average H 17.95	Mode Reading Level <u>PK/QP/AV F/H/E/S dBµV dB</u> Peak H 30.59 21.08 Average H 17.95 21.08	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH30.5921.0851.67AverageH17.9521.0839.03	Mode         Reading Level         FS         @3m           PK/QP/AV         F/H/E/S         dBμV         dB         dBμV/m         dBμV/m           Peak         H         30.59         21.08         51.67         74.00           Average         H         17.95         21.08         39.03         54.00

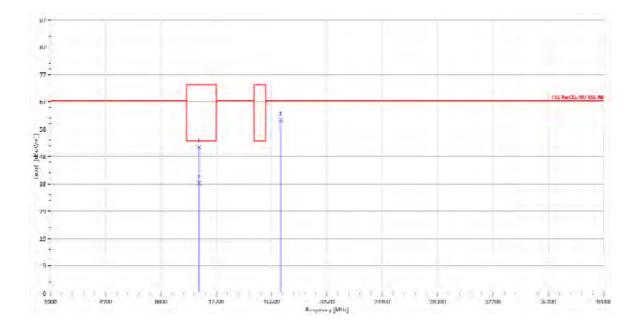


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**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 a :5745 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-04-29 :21.9deg\_C / 69 RH :Vito :HORIZONTAL



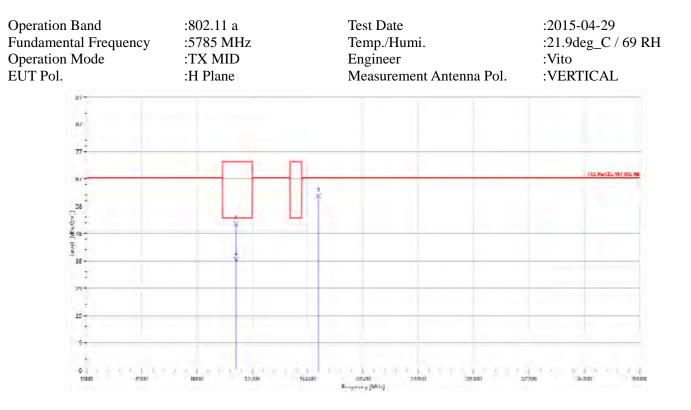
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Peak	Н	30.69	21.08	51.78	74.00	-22.22
11490.00	Average	Н	17.98	21.08	39.06	54.00	-14.94
17235.00	Peak	Н	33.35	28.06	61.41	68.30	-6.89

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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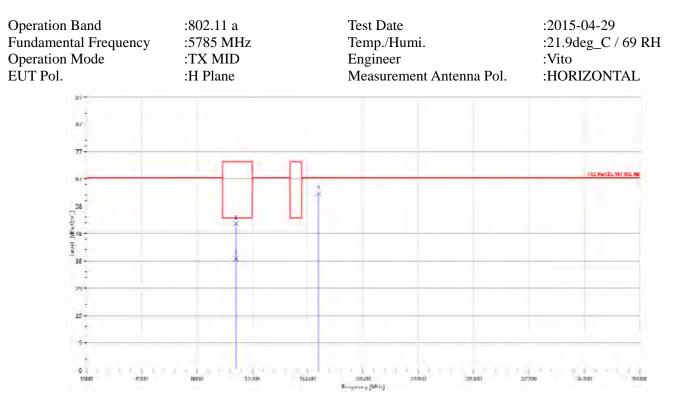
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Peak	Н	30.74	21.14	51.88	74.00	-22.12
11570.00	Average	Н	18.13	21.14	39.27	54.00	-14.73
17355.00	Peak	Н	33.93	27.87	61.80	68.30	-6.50



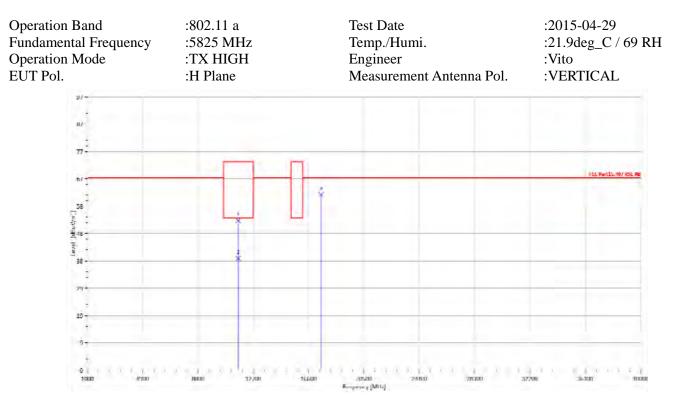
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Peak	Н	30.88	21.14	52.02	74.00	-21.98
11570.00	Average	Н	18.37	21.14	39.51	54.00	-14.49
17355.00	Peak	Н	34.75	27.87	62.63	68.30	-5.67



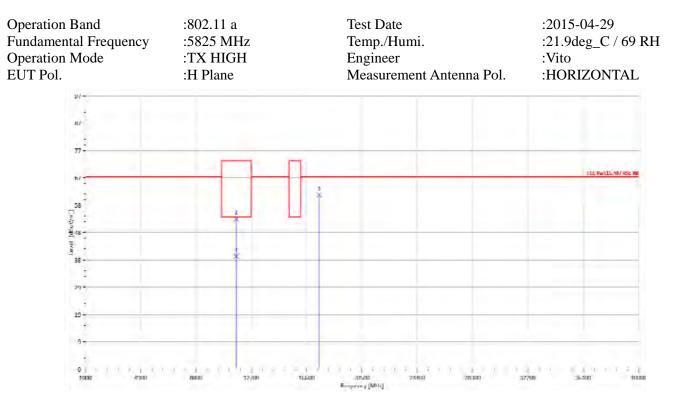
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Peak	Н	31.83	21.27	53.10	74.00	-20.90
11650.00	Average	Н	18.38	21.27	39.65	54.00	-14.35
17475.00	Peak	Н	34.67	27.65	62.32	68.30	-5.98



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Peak	Н	31.97	21.27	53.24	74.00	-20.76
11650.00	Average	Н	18.85	21.27	40.12	54.00	-13.88
17475.00	Peak	Н	34.15	27.65	61.80	68.30	-6.50



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#### Band edge falling to restricted band

Fundamental Frequency:5745Operation Mode:Band		:802.11 a :5745 MHz :Band Edge I :H Plane	5745 MHz T Band Edge LOW I		tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV∕m	dB
IVITIZ	rk/Qr/Av	Г/П/Е/З	ubμv	uБ	ασμν/ Π	ωμν/Π	uБ
5725.00	Peak	E	52.27	12.27	64.54	78.20	-13.66
Operation Pa	nd	.902.11 a		Test Data		2015 04 20	

Operation Band		:802.11 a		Test Date		:2015-04-29	
Fundamental Frequency :		:5745 MHz		Temp./Humi.		:21.9deg_C / 69 RH	
Operation Mode		:Band Edge I	LOW	Engineer		:Vito	
EUT Pol.		:H Plane		Measurement An	tenna Pol.	:HORIZONT	AL
. 1.	Detector Mode	Note	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz PK	C/QP/AV	F/H/E/S	dBµV	dB	dBµV∕m	dBµV/m	dB
5725.00	Peak	Е	53.05	12.27	65.32	78.20	-12.88



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Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 a :5825 MHz :Band Edge :H Plane	IHzTemp./Humi.Edge HIGHEngineer		itenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	/el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	Е	50.50	12.61	63.11	78.20	-15.09
Operation Ba Fundamental Operation Mo EUT Pol.	damental Frequency:5825 MHzeration Mode:Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-04-29 :21.9deg_C / :Vito :HORIZONTA		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	/el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	Е	50.20	12.61	62.81	78.20	-15.39

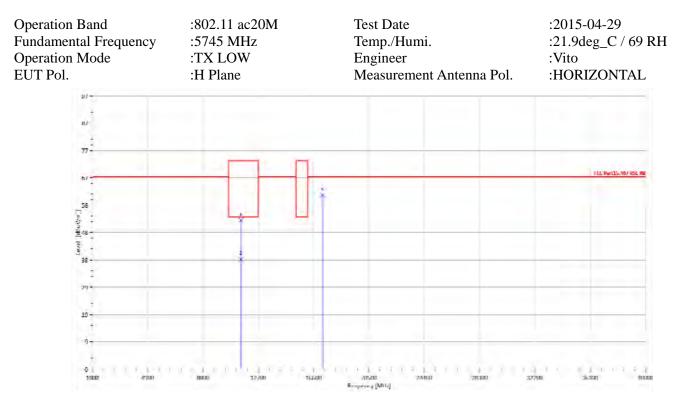


#### Radiated Spurious Emission Measurement Result 802.11ac VHT20, 5725~5850 MHz :802.11 ac20M **Operation Band** Test Date :2015-04-29 **Fundamental Frequency** :5745 MHz Temp./Humi. :21.9deg\_C / 69 RH **Operation Mode** :TX LOW Engineer :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 11/ -100 Perils, 10/ 458 58 3 38 -79 10-9-3.50 0 78.687 12/08 (12.01 28400 1000 12100 RED. 112.00 3778 Frequence (Mills)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Peak	Н	30.27	21.08	51.35	74.00	-22.65
11490.00	Average	Н	17.82	21.08	38.90	54.00	-15.10
17235.00	Peak	Н	33.54	28.06	61.59	68.30	-6.71



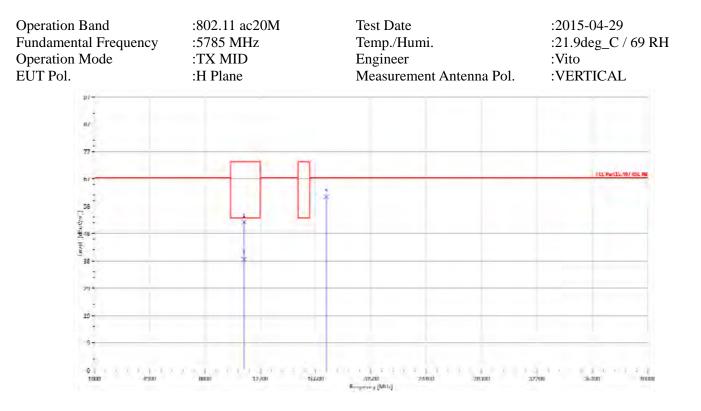
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Peak	Н	31.81	21.08	52.89	74.00	-21.11
11490.00	Average	Н	17.82	21.08	38.90	54.00	-15.10
17235.00	Peak	Н	33.61	28.06	61.66	68.30	-6.64



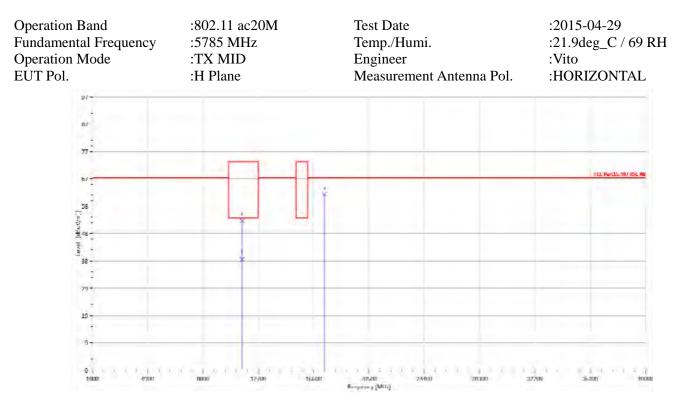
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Peak	Н	31.41	21.14	52.54	74.00	-21.46
11570.00	Average	Н	18.21	21.14	39.35	54.00	-14.65
17355.00	Peak	Н	33.67	27.87	61.55	68.30	-6.75



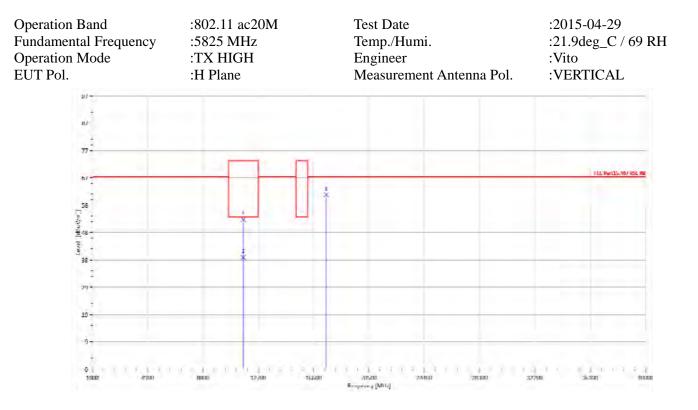
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS	@3m	
PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Peak	Н	31.88	21.14	53.02	74.00	-20.98
Average	Н	18.24	21.14	39.38	54.00	-14.62
Peak	Н	34.48	27.87	62.35	68.30	-5.95
	Mode PK/QP/AV Peak Average	Mode PK/QP/AV F/H/E/S Peak H Average H	Mode Reading Level PK/QP/AV F/H/E/S dBµV Peak H 31.88 Average H 18.24	ModeReading LevelPK/QP/AVF/H/E/SdBµVdBPeakH31.8821.14AverageH18.2421.14	ModeReading LevelFSPK/QP/AVF/H/E/SdBµVdBdBµV/mPeakH31.8821.1453.02AverageH18.2421.1439.38	ModeReading LevelFS@3mPK/QP/AVF/H/E/SdBµVdBdBµV/mdBµV/mPeakH31.8821.1453.0274.00AverageH18.2421.1439.3854.00



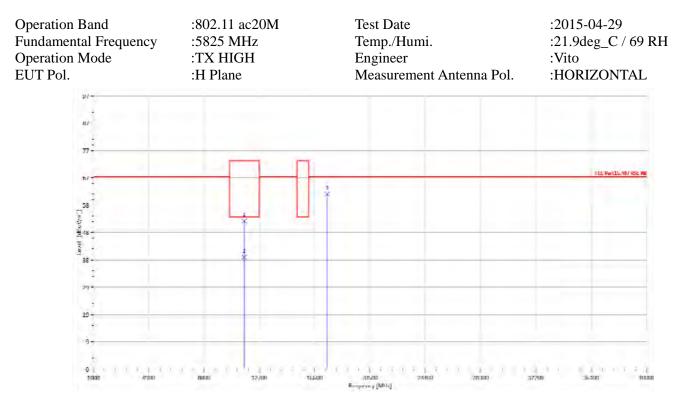
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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Peak	Н	31.86	21.27	53.13	74.00	-20.87
11650.00	Average	Н	18.37	21.27	39.64	54.00	-14.36
17475.00	Peak	Н	34.27	27.65	61.92	68.30	-6.38



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Peak	Н	31.26	21.27	52.54	74.00	-21.46
11650.00	Average	Н	18.43	21.27	39.70	54.00	-14.30
17475.00	Peak	Н	34.46	27.65	62.11	68.30	-6.19



5725.00

Peak

E

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#### Band edge falling to restricted band

Fundamental	Fundamental Frequency:5745 MHzOperation Mode:Band Edge LOW		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	56.03	12.27	68.30	78.20	-9.90
Fundamental	Operation Band:802.11 ac20MFundamental Frequency:5745 MHzOperation Mode:Band Edge LOWEUT Pol.:H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 0 :Vito :HORIZONTA		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel FS		@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV∕m	dBµV/m	dB

54.54

12.27

66.81

78.20

-11.39



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Operation Band:802.11 ac20MFundamental Frequency:5825 MHzOperation Mode:Band Edge HIGHEUT Pol.:H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL			
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	/el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	E	50.67	12.61	63.28	78.20	-14.92
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 ac20 :5825 MHz :Band Edge l :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / :Vito :HORIZONTA	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	E	50.41	12.61	63.02	78.20	-15.18

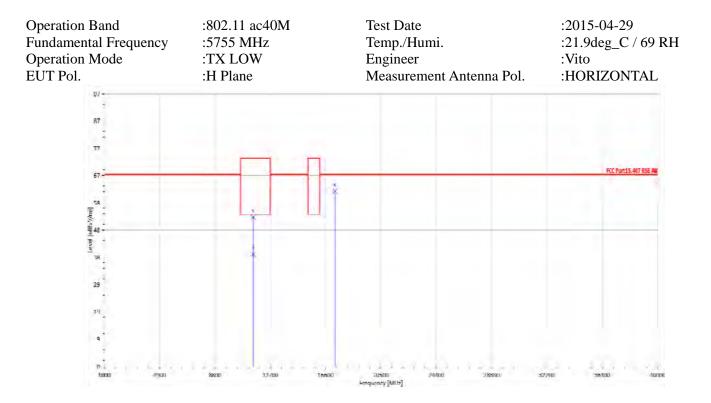


#### Radiated Spurious Emission Measurement Result 802.11ac VHT40, 5725~5850 MHz **Operation Band** :802.11 ac40M Test Date :2015-04-29 **Fundamental Frequency** :5755 MHz Temp./Humi. :21.9deg\_C / 69 RH Engineer **Operation Mode** :TX LOW :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 77 10 28300 1.1 1 12200 24400 Frequency (MHz)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11510.00	Peak	Н	31.41	21.17	52.58	74.00	-21.42
11510.00	Average	Н	18.57	21.17	39.74	54.00	-14.26
17265.00	Peak	Н	33.54	27.82	61.36	68.30	-6.94



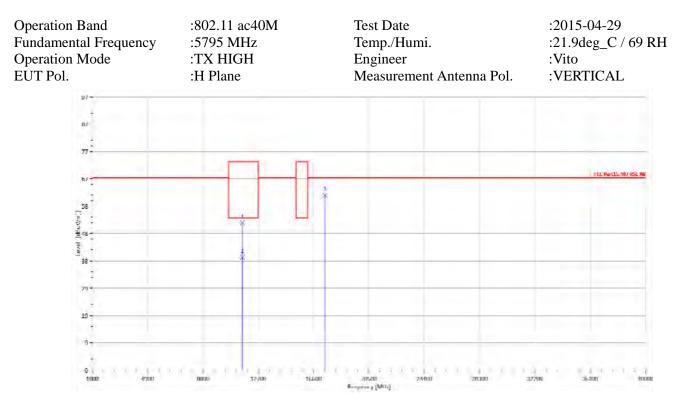
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or Note	Spectrum	Factor	Actual	Limit	Margin
2	Reading Level		FS	@3m	
AV F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
Н	31.79	21.17	52.96	74.00	-21.04
ge H	18.59	21.17	39.76	54.00	-14.24
ч	3/ /1	27.82	62.24	68 30	-6.06
	e <u>AV F/H/E/S</u> k H ge H	e Reading Level AV F/H/E/S dBµV AV H 31.79 ge H 18.59	e Reading Level $AV F/H/E/S dB\mu V dB$ K H 31.79 21.17 ge H 18.59 21.17	e Reading Level FS AV F/H/E/S dBμV dB dBμV/m κ H 31.79 21.17 52.96 ge H 18.59 21.17 39.76	eReading LevelFS@3m $AV$ $F/H/E/S$ $dB\mu V$ $dB$ $dB\mu V/m$ $dB\mu V/m$ KH31.7921.1752.9674.00



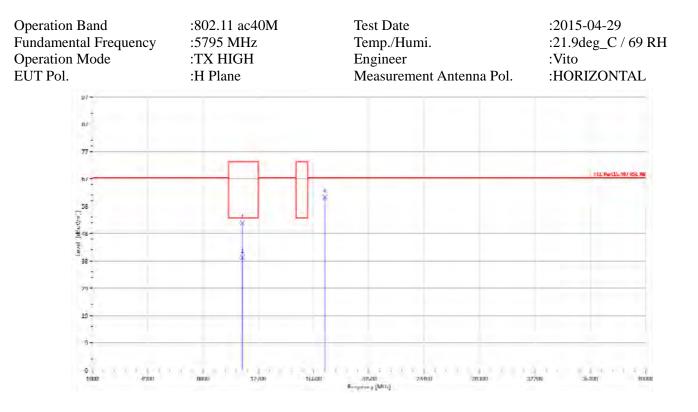
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Detector	Note	Spectrum	Factor	Actual	Limit	Margin
Mode	Re	ading Level		FS	@3m	
K/QP/AV F	/H/E/S	dBµV	dB	dBµV/m	dBµV∕m	dB
Peak	Н	31.00	21.28	52.28	74.00	-21.72
verage	Н	18.71	21.28	39.99	54.00	-14.01
Peak	Н	34.37	27.61	61.98	68.30	-6.32
	Mode K/QP/AV F/ Peak Average	Mode Re K/QP/AV F/H/E/S Peak H Average H	Mode Reading Level <u>K/QP/AV F/H/E/S dBµV</u> Peak H 31.00 Average H 18.71	Mode Reading Level <u>K/QP/AV F/H/E/S dBµV dB</u> Peak H 31.00 21.28 Average H 18.71 21.28	ModeReading LevelFS $K/QP/AV$ $F/H/E/S$ $dB\mu V$ $dB$ $dB\mu V/m$ PeakH31.0021.2852.28AverageH18.7121.2839.99	ModeReading LevelFS@3m $K/QP/AV$ $F/H/E/S$ $dB\mu V$ $dB$ $dB\mu V/m$ $dB\mu V/m$ PeakH31.0021.2852.2874.00AverageH18.7121.2839.9954.00



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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11590.00	Peak	Н	30.95	21.28	52.22	74.00	-21.78
11590.00	Average	Н	18.72	21.28	40.00	54.00	-14.00
17385.00	Peak	Н	33.75	27.61	61.36	68.30	-6.94



EUT Pol.

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:HORIZONTAL

#### Band edge falling to restricted band

:H Plane

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:Band Edge LOW Engineer		Temp./Humi.	:Vito		69 RH
Freq.	Detector Mode	Note	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	E	53.83	12.27	66.10	78.20	-12.10
Operation Band Fundamental Frequency Operation Mode		:802.11 ac401 :5755 MHz :Band Edge I		Test Date Temp./Humi. Engineer		:2015-04-29 :21.9deg_C / 0 :Vito	69 RH

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	E	52.74	12.27	65.01	78.20	-13.19

Measurement Antenna Pol.

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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5795 MHz	Band Edge HIGH Engineer		:2015-04-29 :21.9deg_C / 69 RH :Vito :VERTICAL		
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	E	50.92	12.61	63.53	78.20	-14.67
Fundamental	Operation Band:802.11 ac40MFundamental Frequency:5795 MHzOperation Mode:Band Edge HIGHEUT Pol.:H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / 0 :Vito :HORIZONTA		

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	Е	51.25	12.61	63.86	78.20	-14.34

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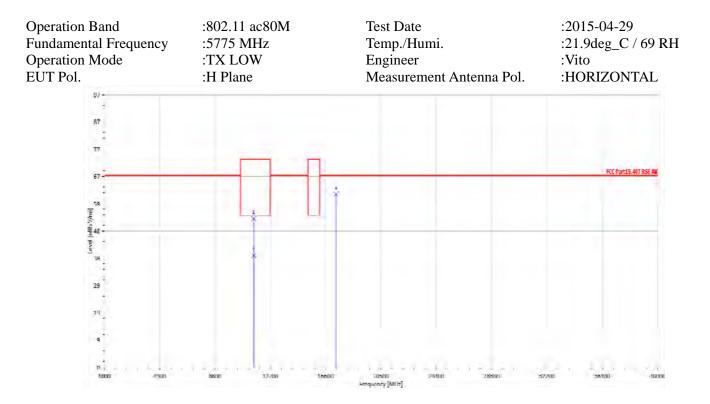
#### Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5725~5850 MHz **Operation Band** :802.11 ac80M Test Date :2015-04-29 **Fundamental Frequency** :5775 MHz Temp./Humi. :21.9deg\_C / 69 RH :TX LOW Engineer **Operation Mode** :Vito EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 77 10 1.1 28300 1 12200 24400 20500 Frequency (MHz)

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11550.00	Peak	Н	31.36	20.97	52.34	74.00	-21.66
11550.00	Average	Н	18.21	20.97	39.18	54.00	-14.82
17325.00	Peak	Н	34.03	28.00	62.03	68.30	-6.27

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Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
11550.00	Peak	Н	31.82	20.97	52.80	74.00	-21.21
11550.00	Average	Н	18.74	20.97	39.71	54.00	-14.29
17325.00	Peak	Н	33.61	28.00	61.61	68.30	-6.69

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#### Band edge falling to restricted band

PK/QP/AV

Peak

F/H/E/S

Е

MHz

5850.00

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 ac801 :5775 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / :Vito :VERTICAL	69 RH
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	Е	59.60	12.61	72.21	78.20	-5.99
Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 ac801 :5775 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-04-29 :21.9deg_C / :Vito :HORIZONT.	
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Lev	vel	FS	@3m	

dBµV

64.01

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dBµV/m

76.62

dB

12.61

dBµV/m

78.20

dB

-1.58



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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

No non-compliance noted: Refer to the theory of operation.

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# **13. FREQUENCY STABILITY**

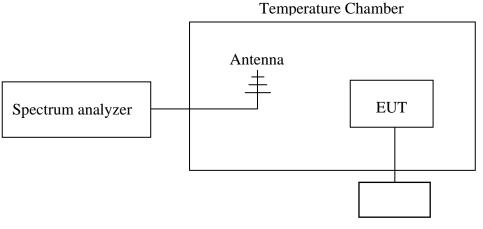
# 13.1 Standard Applicable

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

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

# 13.3 Test SET-UP



Variable AC Power Supply

## 13.4 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	MED	MODEL	SERIAL	LAST	CAL DUE		
ТҮРЕ	MFR	NUMBER	NUMBER	CAL.	CAL DUE.		
Spectrum Analyzer	Agilent	N9010A	MY53400256	10/15/2014	10/14/2015		
Temperature Chamber	TERCHY	MHK-120LK	1020582	06/18/2014	06/17/2015		
DC Power Supply	Agilent	E3640A	MY53140006	05/31/2014	05/30/2015		

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#### 13.5 **Measurement Result**

Operation Mode	802.11 a	Test Date	2015.04.01
Temperature	:24	Test By	Wayne
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180.0000	5,179.979320	0.0207
		44	5220.0000	5,219.978100	0.0219
		48	5240.0000	5,239.968020	0.0320
		52	5260.0000	5,259.977400	0.0226
		60	5300.0000	5,299.965100	0.0349
		64	5320.0000	5,319.980550	0.0194
	4.35V	100	5500.0000	5,499.978900	0.0211
		116	5580.0000	5,579.968960	0.0310
		140	5700.0000	5,699.976970	0.0230
		144	5720.0000	5,719.975140	0.0249
		149	5745.0000	5,744.974790	0.0252
		157	5785.0000	5,784.977750	0.0222
5		165	5825.0000	5,824.964720	0.0353
3		36	5180.0000	5,179.979680	0.0203
		44	5220.0000	5,219.976800	0.0232
		48	5240.0000	5,239.968100	0.0319
		52	5260.0000	5,259.973500	0.0265
		60	5300.0000	5,299.964900	0.0351
		64	5320.0000	5,319.980320	0.0197
	3.3V	100	5500.0000	5,499.978700	0.0213
		116	5580.0000	5,579.969160	0.0308
		140	5700.0000	5,699.977370	0.0226
		144	5720.0000	5,719.981240	0.0188
		149	5745.0000	5,744.955180	0.0448
		157	5785.0000	5,784.972580	0.0274
		165	5825.0000	5,824.964070	0.0359

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	1	7			
		36	5180.0000	5,179.977870	0.0221
		44	5220.0000	5,219.976690	0.0233
		48	5240.0000	5,239.977410	0.0226
		52	5260.0000	5,259.976110	0.0239
		60	5300.0000	5,299.977840	0.0222
		64	5320.0000	5,319.977390	0.0226
25	3.8V	100	5500.0000	5,499.976900	0.0231
		116	5580.0000	5,579.977950	0.0220
		140	5700.0000	5,699.975970	0.0240
		144	5720.0000	5,719.980540	0.0195
		149	5745.0000	5,744.976820	0.0232
		157	5785.0000	5,784.975530	0.0245
		165	5825.0000	5,824.977240	0.0228
		36	5180.0000	5,179.973830	0.0262
		44	5220.0000	5,219.978120	0.0219
		48	5240.0000	5,239.974910	0.0251
		52	5260.0000	5,259.971480	0.0285
		60	5300.0000	5,299.973700	0.0263
		64	5320.0000	5,319.976700	0.0233
	4.35V	100	5500.0000	5,499.975240	0.0248
		116	5580.0000	5,579.972330	0.0277
		140	5700.0000	5,699.974340	0.0257
		144	5720.0000	5,719.979850	0.0202
		149	5745.0000	5,744.973320	0.0267
		157	5785.0000	5,784.971710	0.0283
40		165	5825.0000	5,824.970120	0.0299
40		36	5180.0000	5,179.974230	0.0258
		44	5220.0000	5,219.974000	0.0260
		48	5240.0000	5,239.979450	0.0206
		52	5260.0000	5,259.978280	0.0217
		60	5300.0000	5,299.979070	0.0209
		64	5320.0000	5,319.976500	0.0235
	3.3V	100	5500.0000	5,499.975380	0.0246
		116	5580.0000	5,579.978910	0.0211
		140	5700.0000	5,699.974580	0.0254
		144	5720.0000	5,719.980150	0.0198
		149	5745.0000	5,744.978730	0.0213
		157	5785.0000	5,784.977670	0.0223
		165	5825.0000	5,824.972790	0.0272

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Operation Mode	802.11 ac_VHT40	Test Date	2015.04.01
Temperature	:24	Test By	Wayne
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190.0000	5,189.979920	0.0201
		46	5230.0000	5,229.978470	0.0215
		54	5270.0000	5,269.987010	0.0130
		62	5310.0000	5,309.980740	0.0193
		102	5510.0000	5,509.979900	0.0201
	4.35V	110	5550.0000	5,549.978750	0.0212
		134	5670.0000	5,669.976470	0.0235
		142	5710.0000	5,709.978450	0.0216
		151	5755.0000	5,754.974710	0.0253
~		159	5795.0000	5,794.975250	0.0247
5	3.3V	38	5190.0000	5,189.989650	0.0103
		46	5230.0000	5,229.987260	0.0127
		54	5270.0000	5,269.986140	0.0139
		62	5310.0000	5,309.990430	0.0096
		102	5510.0000	5,509.987900	0.0121
		110	5550.0000	5,549.990140	0.0099
		134	5670.0000	5,669.987410	0.0126
		142	5710.0000	5,709.977120	0.0229
		151	5755.0000	5,754.989780	0.0102
		159	5795.0000	5,794.982940	0.0171
25	3.8V	38	5190.0000	5,189.979490	0.0205
		46	5230.0000	5,229.975140	0.0249
		54	5270.0000	5,269.974910	0.0251
		62	5310.0000	5,309.979020	0.0210
		102	5510.0000	5,509.978300	0.0217
		110	5550.0000	5,549.973140	0.0269
		134	5670.0000	5,669.977660	0.0223
		142	5710.0000	5,709.978340	0.0217
		151	5755.0000	5,754.971720	0.0283
		159	5795.0000	5,794.971540	0.0285

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		_		_	
40		38	5190.0000	5,189.975120	0.0249
		46	5230.0000	5,229.976840	0.0232
		54	5270.0000	5,269.978810	0.0212
		62	5310.0000	5,309.978000	0.0220
		102	5510.0000	5,509.975120	0.0249
	4.35V	110	5550.0000	5,549.974100	0.0259
		134	5670.0000	5,669.975340	0.0247
		142	5710.0000	5,709.978150	0.0219
		151	5755.0000	5,754.975260	0.0247
		159	5795.0000	5,794.975140	0.0249
		38	5190.0000	5,189.978420	0.0216
		46	5230.0000	5,229.974790	0.0252
	3.3V	54	5270.0000	5,269.973410	0.0266
		62	5310.0000	5,309.977510	0.0225
		102	5510.0000	5,509.977580	0.0224
		110	5550.0000	5,549.974950	0.0251
		134	5670.0000	5,669.973690	0.0263
		142	5710.0000	5,709.978210	0.0218
		151	5755.0000	5,754.972400	0.0276
		159	5795.0000	5,794.972210	0.0278

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Operation Mode	802.11 ac_VHT80	Test Date	2015.04.01
Temperature	:24	Test By	Wayne
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
	4.35V	42	5210.0000	5,209.975790	0.0242
		58	5290.0000	5,289.975910	0.0241
		106	5530.0000	5,529.976280	0.0237
		122	5610.0000	5,609.975390	0.0246
		138	5690.0000	5,689.977270	0.0227
		155	5775.0000	5,774.970650	0.0293
5		42	5210.0000	5,209.975200	0.0248
		58	5290.0000	5,289.974500	0.0255
	2 21/	106	5530.0000	5,529.976841	0.0232
	3.3V	122	5610.0000	5,609.974180	0.0258
		138	5690.0000	5,689.979540	0.0205
		155	5775.0000	5,774.971770	0.0282
	3.8V	42	5210.0000	5,209.978100	0.0219
		58	5290.0000	5,289.978040	0.0220
		106	5530.0000	5,529.978350	0.0216
25		122	5610.0000	5,609.977510	0.0225
		138	5690.0000	5,689.972030	0.0280
		155	5775.0000	5,774.971520	0.0285
	4.35V	42	5210.0000	5,209.980180	0.0198
		58	5290.0000	5,289.980470	0.0195
		106	5530.0000	5,529.980841	0.0192
		122	5610.0000	5,609.979510	0.0205
		138	5690.0000	5,689.980310	0.0197
10		155	5775.0000	5,774.980240	0.0198
40	3.3V	42	5210.0000	5,209.980510	0.0195
		58	5290.0000	5,289.980940	0.0191
		106	5530.0000	5,529.980895	0.0191
		122	5610.0000	5,609.979440	0.0206
		138	5690.0000	5,689.978970	0.0210
		155	5775.0000	5,774.979820	0.0202

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# **14. ANTENNA REQUIREMENT**

# 14.1 Standard Applicable

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

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

# 14.2 Antenna Connected Construction

A PIFA antenna design is used.

The antenna is designed with permanent attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

~ End of Report ~

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