

# **FCC Test Report**

FCC ID : UIDTR4400

Equipment : 802.11ac Wireless Router

Model No. : TR4400-AC, RAC2V1A

(Two models are for marketing difference)

Brand Name : ARRIS

Applicant : Arris

Address : 3871 LAKEFIELD DRIVE SUITE 300 SUWANEE

**GAUSA** 

Standard : 47 CFR FCC Part 15.407

Received Date : Feb. 10, 2017

Tested Date : Mar. 03 ~ Jun. 27, 2017

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: Approved by:

Along Chen / Assistant Manager Gary Chang / Manager

A

Testing Laboratory 2732

Report No.: FR721001AN

Report Version: Rev. 01

Page: 1 of 113



# **Table of Contents**

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Local Support Equipment List	
1.3	Test Setup Chart	
1.4	The Equipment List	11
1.5	Testing Applied Standards	12
1.6	Measurement Uncertainty	13
2	TEST CONFIGURATION	14
2.1	Testing Condition	14
2.2	The Worst Test Modes and Channel Details	15
3	TRANSMITTER TEST RESULTS	17
3.1	Conducted Emissions	17
3.2	Emission Bandwidth	26
3.3	RF Output Power	31
3.4	Peak Power Spectral Density	34
3.5	Transmitter Radiated and Band Edge Emissions	40
3.6	Frequency Stability	111
4	TEST LABORATORY INFORMATION	113



# **Release Record**

Report No.	Version	Description	Issued Date
FR721001AN	Rev. 01	Initial issue	Aug. 07, 2017

Report No.: FR721001AN Page : 3 of 113



# **Summary of Test Results**

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.201MHz 51.99 (Margin -11.59dB) - QP	Pass
15.407(b)	Radiated Emissions	[dBuV/m at 3m]: 5150.00MHz	Pass
15.209		53.85 (Margin -0.15dB) - AV	
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	RF Output Power	Max Power [dBm]:  Non-beamforming mode  5150-5250MHz: 28.81  5725-5850MHz: 29.62  Beamforming mode  5150-5250MHz: 26.89  5725-5850MHz: 26.95	Pass
15.407(a)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Report No.: FR721001AN Page: 4 of 113



# 1 General Description

### 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information						
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS	
5150-5250	а	5180-5240	36-48 [4]	4	6-54 Mbps	
5150-5250	n (HT20)	5180-5240	36-48 [4]	4	MCS 0-31	
5150-5250	n (HT40)	5190-5230	38-46 [2]	4	MCS 0-31	
5150-5250	ac (VHT20)	5180-5240	36-48 [4]	4	MCS 0-9	
5150-5250	ac (VHT40)	5190-5230	38-46 [2]	4	MCS 0-9	
5150-5250	ac (VHT80)	5210	42 [1]	4	MCS 0-9	

Note 1: RF output power specifies that Maximum Conducted Output Power.

Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.

Note 3: 802.11n/ac supports beamforming function.

RF General Information						
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS	
5725-5850	а	5745-5825	149-165 [5]	4	6-54 Mbps	
5725-5850	n (HT20)	5745-5825	149-165 [5]	4	MCS 0-31	
5725-5850	n (HT40)	5755-5795	151-159 [2]	4	MCS 0-31	
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	4	MCS 0-9	
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	4	MCS 0-9	
5725-5850	ac (VHT80)	5775	155 [1]	4	MCS 0-9	

Note 1: RF output power specifies that Maximum Conducted Output Power.

Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.

Note 3: 802.11n/ac supports beamforming function.

#### 1.1.2 Antenna Details

Model	Туре	Connector	Gain (dBi)
5.0G ANT 1	Dipole	I-PEX	2.8
5.0G ANT 2	Dipole	I-PEX	2.5
5.0G ANT 3	Dipole	I-PEX	2.4
5.0G ANT 4	Dipole	I-PEX	3.9

Report No.: FR721001AN Page: 5 of 113



# 1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter
-------------------	-----------------------

#### 1.1.4 Accessories

	Accessories					
No.	Equipment	Description				
1	AC adapter	Brand: SERCOMM Model: PU30W120ULB18-CAU-00 Power Rating: I/P: 100-240Vac, 50-60Hz, 1.0A O/P: 12Vdc, 2.5A Power Line: 1.75m non-shielded without core				
2	AC adapter	Brand: ARRIS Model: NBS36E120250VU Power Rating: I/P: 100-240Vac, 50/60Hz, 0.8A O/P: 12Vdc, 2.5A Power Line: 1.8m non-shielded without core				
3	RJ45 cable	1.16m shielded without core				

### 1.1.5 Channel List

For Frequency band 5150-5250 MHz					
802.11 a /	HT20 / VHT20	HT40 / VHT40			
Channel	Frequency(MHz)	Channel	Frequency(MHz)		
36	5180	38	5190		
40	5200	46	5230		
44	5220	VH	T80		
48	5240	42	5210		

For Frequency band 5725~5850 MHz					
802.11 a / F	IT20 / VHT20	HT40 / VHT40			
Channel	Frequency(MHz)	Channel	Frequency(MHz)		
149	5745	151	5755		
153	5765	159	5795		
157	5785	VHT80			
161	5805	155	5775		
165	5825				

Report No.: FR721001AN Page: 6 of 113



# 1.1.6 Test Tool and Duty Cycle

Test Tool	Non-beamforming: QCART, V3.0.144.0 Beamforming: LanTest20, V2.0.0.2					
	Mode	Non-beamforming		Beamforming		
		Duty cycle (%)	Duty factor (dB)	Duty cycle (%)	Duty factor (dB)	
Duty Cycle and Duty Footor	11a	98.29%	0.07			
Duty Cycle and Duty Factor	VHT20	99.29%	0.03	93.24%	0.30	
	VHT40	98.37%	0.07	93.02%	0.31	
	VHT80	95.71%	0.19	91.88%	0.37	

Report No.: FR721001AN Page: 7 of 113



# 1.1.7 Power Setting

For Frequency band 5150-5250 MHz					
Modulation Mode	Tost Fraguency (MHz)	Powe	r Set		
Modulation Mode	Test Frequency (MHz)	Non-Beamforming	Beamforming		
11a	5180	19.5			
11a	5200	20			
11a	5240	20			
HT20	5180	19.5	25		
HT20	5200	20.5	27		
HT20	5240	20.5	27		
HT40	5190	16.5	22		
HT40	5230	22.5	27		
VHT20	5180	19.5	25		
VHT20	5200	20.5	27		
VHT20	5240	20.5	27		
VHT40	5190	16.5	22		
VHT40	5230	22.5	27		
VHT80	5210	15.5	22		

	For Frequency band 5725~5850 MHz						
Modulation Mode	Test Frequency (MHz)	Power Set					
	rest Frequency (MH2)	Non-Beamforming	Beamforming				
11a	5745	23					
11a	5785	23					
11a	5825	23					
HT20	5745	23	27				
HT20	5785	23	27				
HT20	5825	23	27				
HT40	5755	23	27				
HT40	5795	23	27				
VHT20	5745	23	27				
VHT20	5785	23	27				
VHT20	5825	23	27				
VHT40	5755	23	27				
VHT40	5795	23	27				
VHT80	5775	20	26				

Report No.: FR721001AN Page: 8 of 113



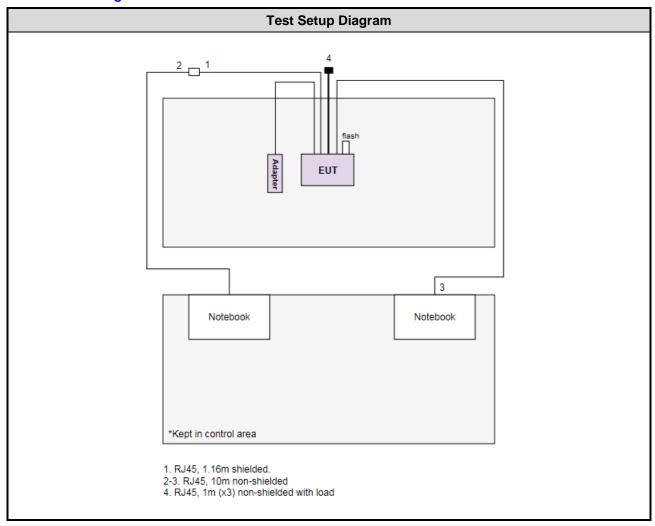
# 1.2 Local Support Equipment List

	Support Equipment List							
No.	No. Equipment Brand Model FCC ID Signal cable / Length (m							
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.			
2	Notebook	DELL	Latitude E5420	DoC	RJ45, 10m non-shielded.			
3	USB 3.0 flash	SONY	USM16GU					
4	BF Client device	ARRIS	TR4400-AC					

Note: No. 4 is provided by applicant.

# 1.3 Test Setup Chart

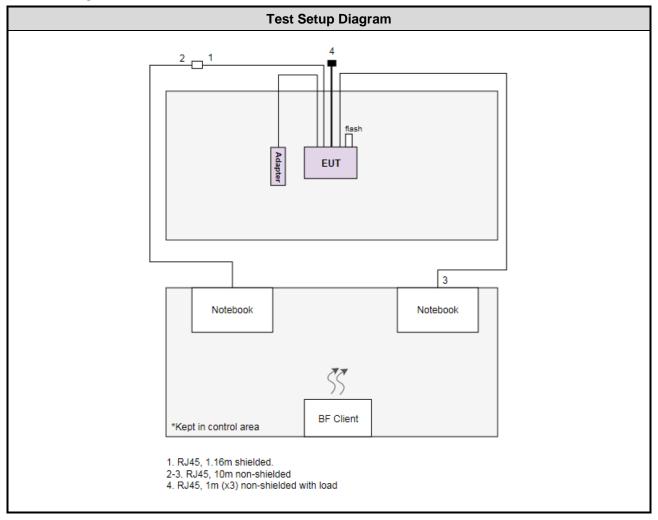
### Non-beamforming mode



Report No.: FR721001AN Page: 9 of 113



#### Beamforming mode



Report No.: FR721001AN Page: 10 of 113



# 1.4 The Equipment List

Conducted Emission						
Conduction room 1 /	(CO01-WS)					
Mar. 20, 2017						
Manufacturer	Manufacturer Model No. Serial No. Calibration Date Calibration Until					
R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017		
SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017		
EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017		
AUDIX e3 6.120210k NA NA						
	Conduction room 1 / Mar. 20, 2017  Manufacturer  R&S  SCHWARZBECK  EMC	Conduction room 1 / (CO01-WS)  Mar. 20, 2017  Manufacturer Model No.  R&S ESR3  SCHWARZBECK Schwarzbeck 8127  EMC EMCCFD300-BM-BM-6000	Conduction room 1 / (CO01-WS)           Mar. 20, 2017         Model No.         Serial No.           R&S         ESR3         101657           SCHWARZBECK         Schwarzbeck 8127         8127-667           EMC         EMCCFD300-BM-BM-6000         50821	Conduction room 1 / (CO01-WS)           Mar. 20, 2017         Manufacturer         Model No.         Serial No.         Calibration Date           R&S         ESR3         101657         Dec. 21, 2016           SCHWARZBECK         Schwarzbeck 8127         8127-667         Nov. 08, 2016           EMC         EMCCFD300-BM-BM-6000         50821         Dec. 20, 2016		

Test Item	Radiated Emission	Radiated Emission							
Test Site	966 chamber 3 / (03C	66 chamber 3 / (03CH03-WS)							
Tested Date	Mar. 03, 2017								
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until				
Receiver	Agilent	N9038A	MY53290044	Oct. 06, 2016	Oct. 05, 2017				
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 26, 2016	Apr. 25, 2017				
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017				
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017				
Preamplifier	EMC	EMC02325	980187	Sep. 08, 2016	Sep. 07, 2017				
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800 -001	Feb. 04, 2017	Feb. 03, 2018				
LF cable-3M	EMC	EMC8D-NM-NM-300 0	131103	Feb. 04, 2017	Feb. 03, 2018				
LF cable-13M	EMC	EMC8D-NM-NM-130 00	131104	Feb. 04, 2017	Feb. 03, 2018				
Measurement Software	AUDIX	e3	6.120210g	NA	NA				
Note: Calibration Inter	rval of instruments liste	d above is one year.							

Report No.: FR721001AN Page: 11 of 113



Test Item	Radiated Emission								
Test Site	966 chamber 3 / (03C	966 chamber 3 / (03CH03-WS)							
Tested Date	Jun. 05 ~ Jun. 14, 201	17							
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until				
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 09, 2016	Sep. 08, 2017				
Receiver	Agilent	N9038A	MY53290044	Oct. 06, 2016	Oct. 05, 2017				
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018				
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017				
Preamplifier	Agilent	83017A	MY53270014	Aug. 22, 2016	Aug. 21, 2017				
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017				
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 04, 2017	Feb. 03, 2018				
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 04, 2017	Feb. 03, 2018				
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 04, 2017	Feb. 03, 2018				
Measurement Software	AUDIX	e3	6.120210g	NA	NA				

Test Item	RF Conducted	RF Conducted						
Test Site	(TH01-WS)	TH01-WS)						
Tested Date	Jun. 10 ~ Jun. 27, 20	17						
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until			
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018			
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 21, 2016	Nov. 20, 2017			
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017			
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017			
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017			
Measurement Software	Shorton   Shorton   1 330   NA   NA							
Note: Calibration Inter	val of instruments liste	d above is one year.						

# 1.5 Testing Applied Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.407

ANSI C63.10-2013

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04

FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Report No.: FR721001AN Page: 12 of 113



# 1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty					
Parameters	Uncertainty				
Bandwidth	±34.134 Hz				
Conducted power	±0.808 dB				
Frequency error	±34.134 Hz				
Power density	±0.463 dB				
Conducted emission	±2.670 dB				
AC conducted emission	±2.90 dB				
Radiated emission ≤ 1GHz	±3.66 dB				
Radiated emission > 1GHz	±5.37 dB				
Time	±0.1%				
Temperature	±0.6 °C				

Report No.: FR721001AN Page: 13 of 113



# 2 Test Configuration

# 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 57%	Howard Huang
Radiated Emissions	03CH03-WS	23-24°C / 62-67%	Aska Huang
RF Conducted	TH01-WS	22°C / 60%	Brad Wu

FCC Designation No.: TW0009
 FCC site registration No.: 207696
 IC site registration No.: 10807C-2

Report No.: FR721001AN Page: 14 of 113



### 2.2 The Worst Test Modes and Channel Details

#### Non-beamforming mode

For Frequency band 5150-5250 MHz					
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration	
Conducted Emissions	VHT40	5230	MCS 0		
Radiated Emissions ≤1GHz	VHT40	5230	MCS 0		
RF Output Power	11a HT20 HT40 VHT20 VHT40 VHT80	5180 / 5200 / 5240 5180 / 5200 / 5240 5190 / 5230 5180 / 5200 / 5240 5190 / 5230 5210	6 Mbps MCS 0 MCS 0 MCS 0 MCS 0 MCS 0		
Radiated Emissions >1GHz Emission Bandwidth Peak Power Spectral Density	11a VHT20 VHT40 VHT80	5180 / 5200 / 5240 5180 / 5200 / 5240 5190 / 5230 5210	6 Mbps MCS 0 MCS 0 MCS 0		
Frequency Stability	Un-modulation	5200			

#### NOTE:

<sup>1)</sup> Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)

For Frequency band 5725-5850 MHz					
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration	
Conducted Emissions	VHT40	5755	6 Mbps		
Radiated Emissions ≤1GHz	VHT40	5755	6 Mbps		
RF Output Power	11a HT20 HT40 VHT20 VHT40 VHT80	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795 5745 / 5785 / 5825 5755 / 5795 5775	6 Mbps MCS 0 MCS 0 MCS 0 MCS 0 MCS 0		
Radiated Emissions >1GHz Emission Bandwidth 6dB bandwidth Peak Power Spectral Density	11a VHT20 VHT40 VHT80	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795 5775	6 Mbps MCS 0 MCS 0 MCS 0		
Frequency Stability	Un-modulation	5785			

#### NOTE:

Report No.: FR721001AN Page: 15 of 113

<sup>1)</sup> Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)



#### Beamforming mode

For Frequency band 5150-5250 MHz					
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration	
Conducted Emissions	VHT20	5240	MCS 0		
Radiated Emissions ≤1GHz	VHT20	5240	MCS 0		
RF Output Power	HT20 HT40 VHT20 VHT40 VHT80	5180 / 5200 / 5240 5190 / 5230 5180 / 5200 / 5240 5190 / 5230 5210	MCS 0 MCS 0 MCS 0 MCS 0 MCS 0		
Radiated Emissions >1GHz Emission Bandwidth Peak Power Spectral Density	VHT20 VHT40 VHT80	5180 / 5200 / 5240 5190 / 5230 5210	MCS 0 MCS 0 MCS 0		

#### NOTE:

1) Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)

For Frequency band 5725-5850 MHz					
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration	
Conducted Emissions	VHT20	5825	MCS 0		
Radiated Emissions ≤1GHz	VHT20	5825	MCS 0		
RF Output Power	HT20 HT40 VHT20 VHT40 VHT80	5745 / 5785 / 5825 5755 / 5795 5745 / 5785 / 5825 5755 / 5795 5775	MCS 0 MCS 0 MCS 0 MCS 0 MCS 0		
Radiated Emissions >1GHz Emission Bandwidth 6dB bandwidth Peak Power Spectral Density	VHT20 VHT40 VHT80	5745 / 5785 / 5825 5755 / 5795 5775	MCS 0 MCS 0 MCS 0		

#### NOTE:

1) Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)

Report No.: FR721001AN Page: 16 of 113



### 3 Transmitter Test Results

#### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit							
Frequency Emission (MHz) Quasi-Peak Average							
0.15-0.5 66 - 56 * 56 - 46 *							
0.5-5	56	46					
5-30	60	50					
Note 1: * Decreases with the logarithm of the frequency.							

#### 3.1.2 Test Procedures

- 1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
- 2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  LISN port.
- 3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
- 4. This measurement was performed with AC 120V / 60Hz.

#### 3.1.3 Test Setup



Note: 1. Support units were connected to second LISN.

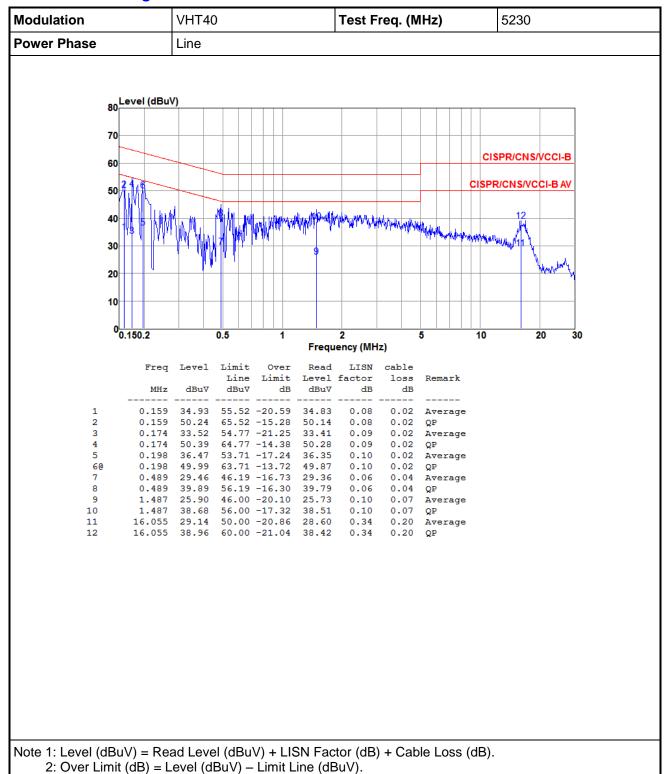
Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

Report No.: FR721001AN Page: 17 of 113



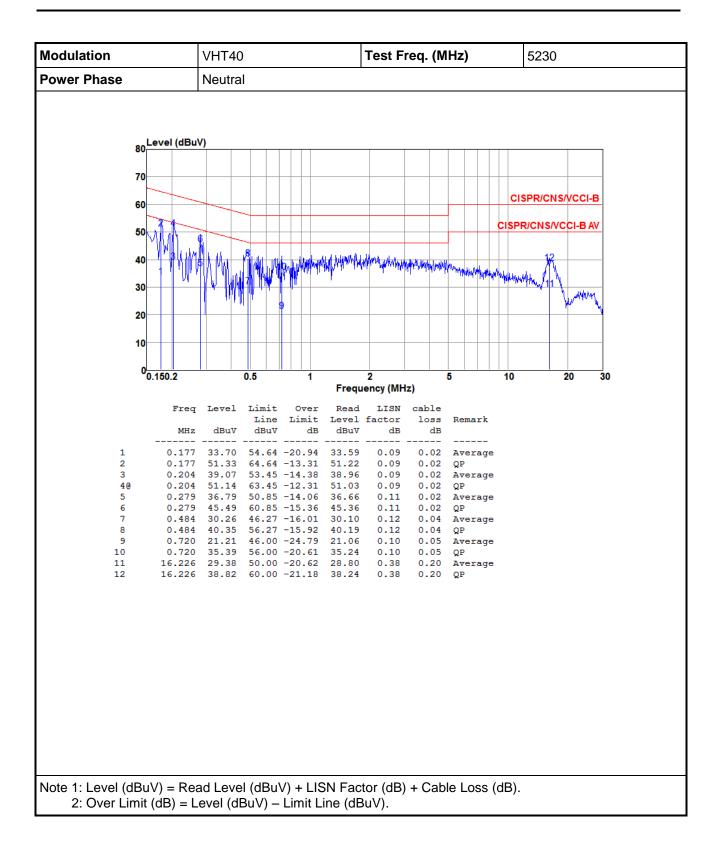
#### 3.1.4 Test Result of Conducted Emissions

#### Non-beamforming mode



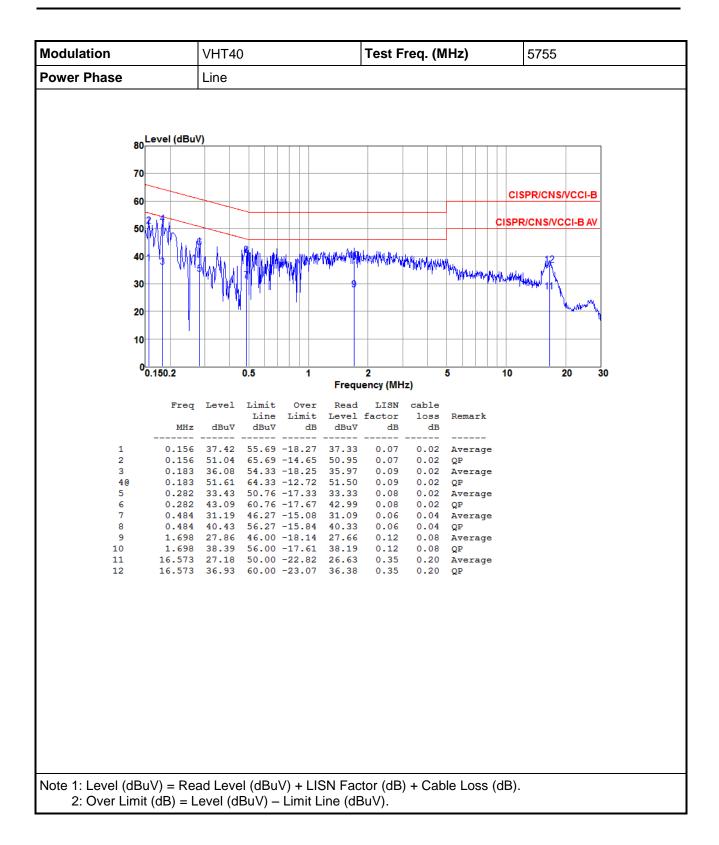
Report No.: FR721001AN Page: 18 of 113





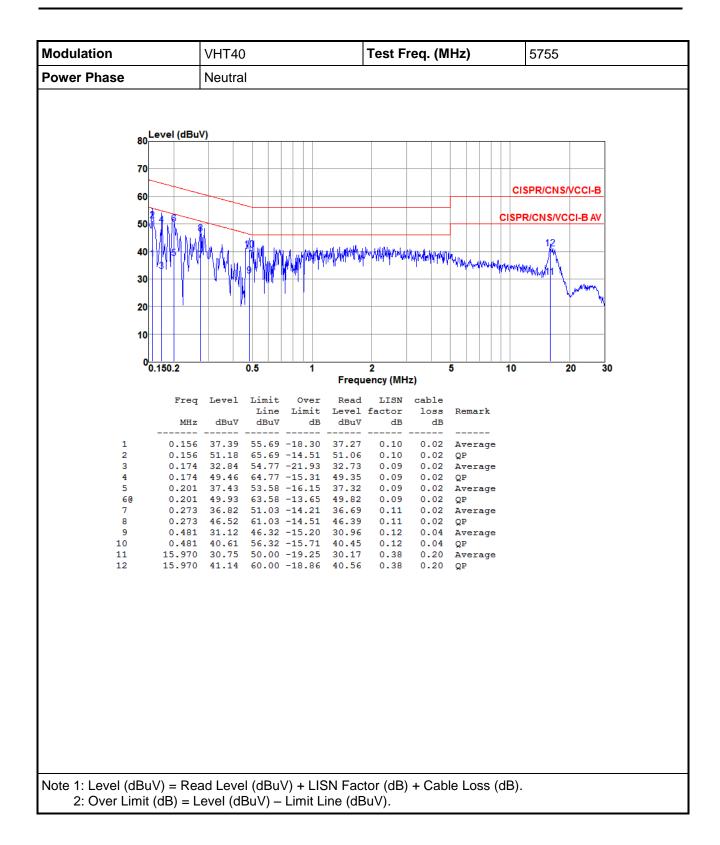
Report No.: FR721001AN Page: 19 of 113





Report No.: FR721001AN Page: 20 of 113

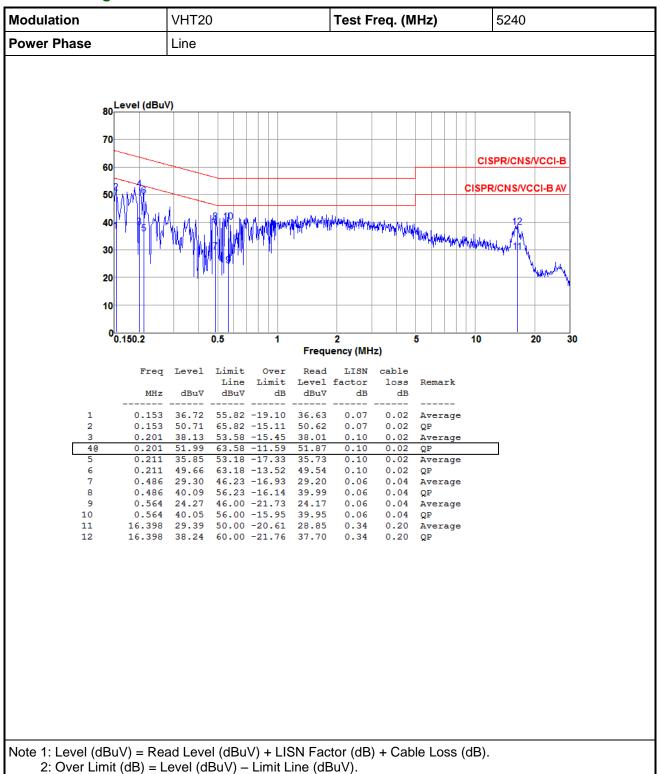




Report No.: FR721001AN Page: 21 of 113

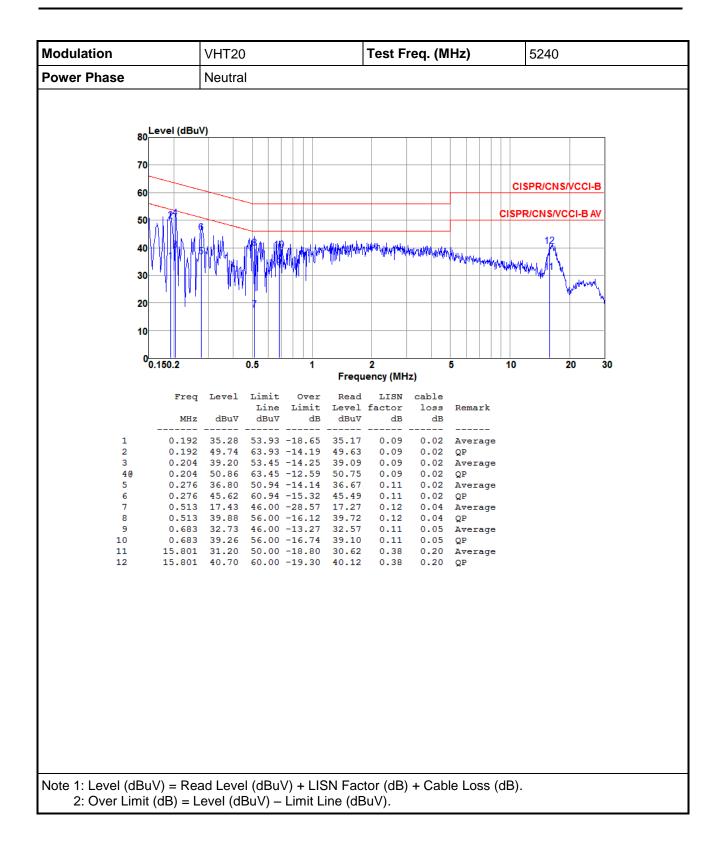


#### Beamforming mode



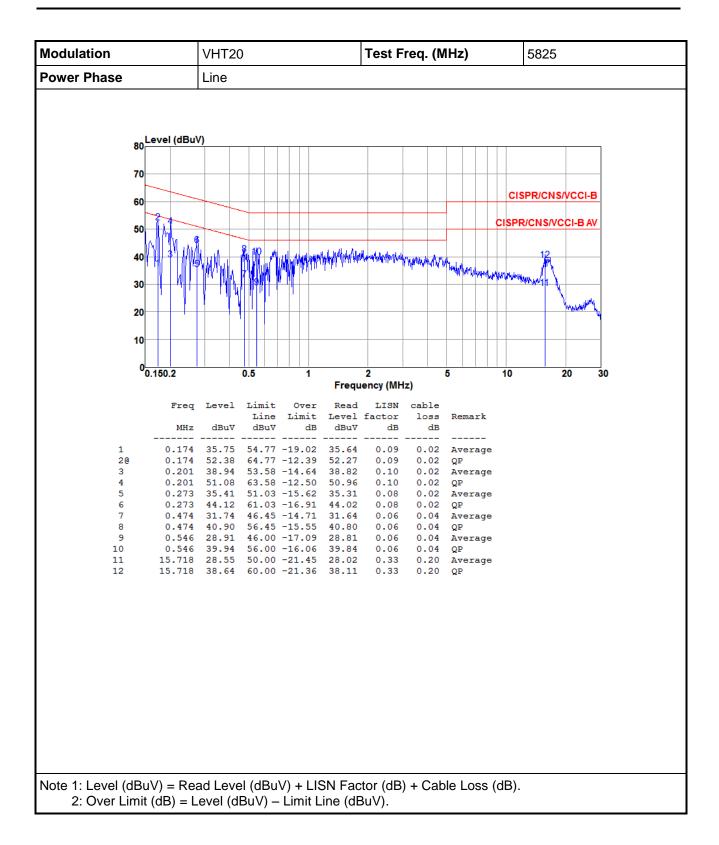
Report No.: FR721001AN Page: 22 of 113





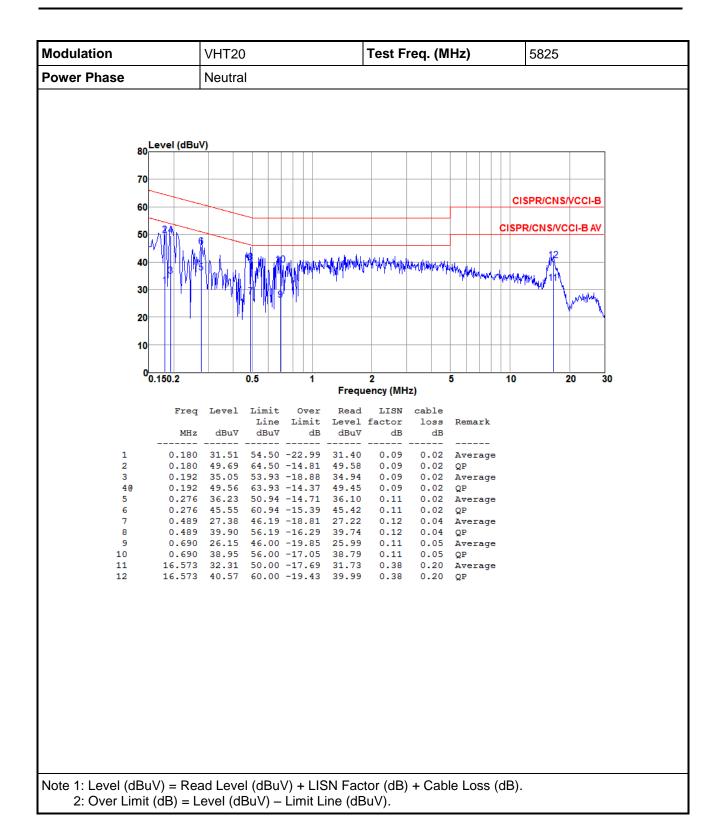
Report No.: FR721001AN Page: 23 of 113





Report No.: FR721001AN Page: 24 of 113





Report No.: FR721001AN Page: 25 of 113



#### 3.2 Emission Bandwidth

#### 3.2.1 Limit of Emission bandwidth

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

#### 3.2.2 Test Procedures

#### 26dB Bandwidth

- 1. Set RBW = approximately 1% of the emission bandwidth.
- 2. Set the VBW > RBW, Detector = Peak.
- 3. Trace mode = max hold.
- 4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

#### **Occupied Bandwidth**

- 1. Set RBW = 1 % to 5 % of the OBW
- 2. Set VBW ≥ 3 RBW
- 3. Sample detection and single sweep mode shall be used
- 4. Use the 99 % power bandwidth function of the instrument

#### 6dB Bandwidth

- 1. Set RBW = 100kHz, VBW = 300kHz
- 2. Detector = Peak, Trace mode = max hold.
- 3. Allow the trace to stabilize.
- 4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### 3.2.3 Test Setup



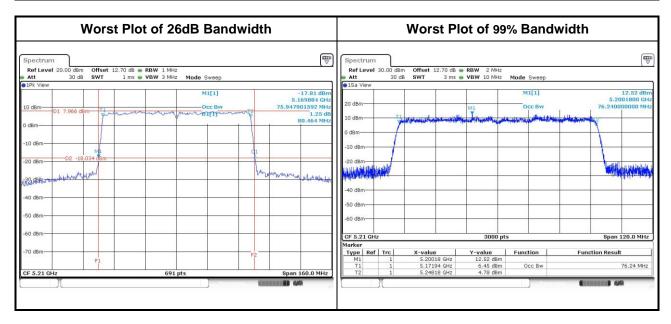
Report No.: FR721001AN Page: 26 of 113



#### 3.2.4 Test Result of Emission Bandwidth

### Non-beamforming mode

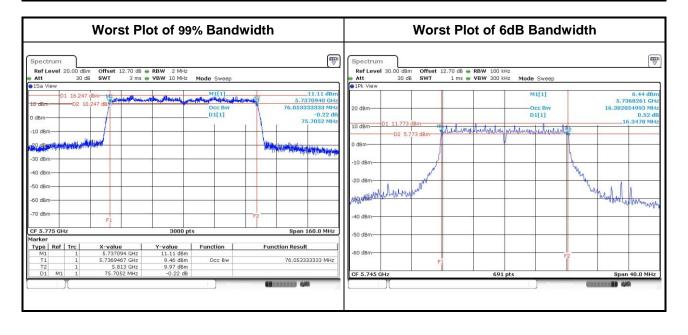
				For Frequ	ency band	5150-5250	MHz			
				Er	nission Ba	ndwidth				
Mada		Freq.	2	26dB Band	width (MHz	)		99% Bandv	vidth (MHz)	1
Mode	N <sub>TX</sub>	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3
11a	4	5180	19.54	19.42	19.42	19.71	16.42	16.45	16.45	16.46
11a	4	5200	19.59	19.65	19.94	20.12	16.43	16.45	16.46	16.47
11a	4	5240	19.65	20.29	20.41	20.58	16.43	16.46	16.50	16.50
VHT20	4	5180	20.23	20.58	20.35	20.41	17.60	17.62	17.63	17.63
VHT20	4	5200	20.35	20.58	20.70	20.70	17.59	17.63	17.63	17.63
VHT20	4	5240	20.41	20.81	20.99	21.10	17.61	17.64	17.66	17.66
VHT40	4	5190	40.46	40.58	40.70	40.58	36.30	36.34	36.32	36.32
VHT40	4	5230	40.58	40.81	41.04	55.30	36.38	36.40	36.38	36.54
VHT80	4	5210	80.46	80.46	80.46	80.46	76.24	76.08	76.12	76.08



Report No.: FR721001AN Page: 27 of 113



	For Frequency band 5725-5850 MHz										
					Emission	Bandwid	th				
			О	BW Band	width (MH	z)		6dB B	andwidth	(MHz)	
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	6dB BW Limit (MHz)
11a	4	5745	16.47	16.45	16.53	16.49	16.35	16.35	16.35	16.35	0.5
11a	4	5785	16.47	16.45	16.53	16.51	16.35	16.35	16.35	16.35	0.5
11a	4	5825	16.48	16.45	16.53	16.55	16.35	16.35	16.35	16.35	0.5
VHT20	4	5745	17.64	17.61	17.68	17.61	17.57	16.93	17.57	17.57	0.5
VHT20	4	5785	17.64	17.61	17.68	17.63	17.62	17.57	17.62	17.62	0.5
VHT20	4	5825	17.65	17.64	17.67	17.65	17.57	17.51	17.62	17.28	0.5
VHT40	4	5755	36.27	36.32	36.24	36.32	35.25	35.36	35.94	35.94	0.5
VHT40	4	5795	36.21	36.27	36.27	36.35	35.25	35.36	35.59	36.41	0.5
VHT80	4	5775	75.95	76.05	75.84	75.89	75.83	75.83	75.83	75.83	0.5

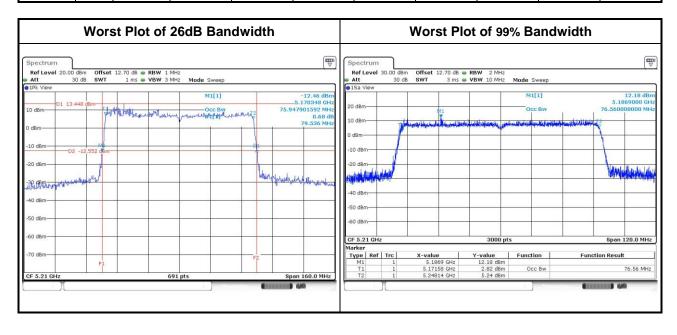


Report No.: FR721001AN Page: 28 of 113



### Beamforming mode

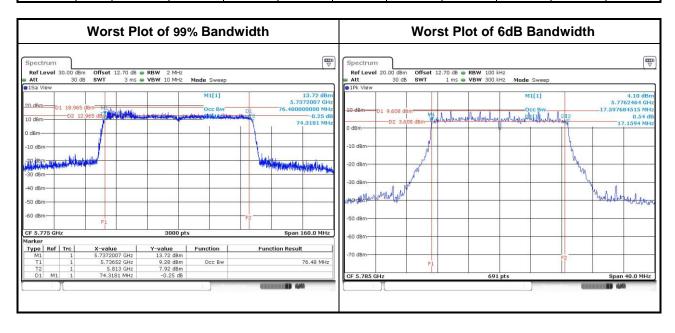
	For Frequency band 5150-5250 MHz									
				Er	nission Ba	ndwidth				
Mode		Freq.	2	26dB Band	width (MHz	)		99% Bandv	vidth (MHz)	
Mode	N <sub>TX</sub>	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3
VHT20	4	5180	20.41	20.29	20.46	20.64	17.61	17.63	17.61	17.61
VHT20	4	5200	20.23	20.64	20.58	20.52	17.61	17.63	17.64	17.65
VHT20	4	5240	20.35	20.46	20.93	21.28	17.62	17.66	17.66	17.66
VHT40	4	5190	40.12	40.35	40.12	40.12	36.38	36.28	36.18	36.30
VHT40	4	5230	61.22	66.20	40.35	75.36	36.40	36.68	36.36	36.62
VHT80	4	5210	79.54	79.30	79.30	79.54	76.28	76.12	76.24	76.56



Report No.: FR721001AN Page: 29 of 113



	For Frequency band 5725-5850 MHz										
					Emission	Bandwid	th				
			O	BW Band	width (MH	z)		6dB B	andwidth	(MHz)	
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	6dB BW Limit (MHz)
VHT20	4	5745	17.65	17.63	17.69	17.64	17.51	17.22	17.57	17.16	0.5
VHT20	4	5785	17.65	17.63	17.71	17.64	17.57	17.16	17.62	17.57	0.5
VHT20	4	5825	17.65	17.63	17.67	17.64	17.57	17.51	17.51	17.57	0.5
VHT40	4	5755	36.43	36.24	36.40	36.32	35.71	35.71	35.01	35.25	0.5
VHT40	4	5795	36.40	36.37	36.45	36.35	34.55	34.78	35.71	35.83	0.5
VHT80	4	5775	76.21	76.37	76.48	76.48	75.83	75.83	75.83	75.83	0.5



Report No.: FR721001AN Page: 30 of 113



### 3.3 RF Output Power

### 3.3.1 Limit of RF Output Power

	Frequency band 5150-5250 MHz							
Ope	erating Mode	Limit						
	Outdoor access point	Conducted Power: 1 W The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)						
$\boxtimes$	Indoor access point	Conducted Power: 1 W						
	Fixed point-to-point access points	Conducted Power: 1 W						
	Client devices	Conducted Power: 250 mW						

Fred	quency Band (MHz)	Limit					
	5250 ~ 5350	250mW or 11dBm+10 log B					
	5470 ~ 5725	250mW or 11dBm+10 log B					
	5725 ~ 5850	1 W					
Note	Note: "B" is the 26dB emission bandwidth in MHz.						

#### 3.3.2 Test Procedures

#### Method PM-G (Measurement using a gated RF average power meter)

Measurements is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### 3.3.3 Test Setup



Report No.: FR721001AN Page: 31 of 113



# 3.3.4 Test Result of Maximum Conducted Output Power

# Non-beamforming mode

			For Freq	uency band	5150-5250	) MHz			
			С	onducted l	Power (dBn	Total	Total	Limit	
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)
11a	4	5180	19.61	19.50	19.94	20.24	384.846	25.85	30.00
11a	4	5200	20.10	20.12	20.12	20.53	420.912	26.24	30.00
11a	4	5240	20.25	20.22	20.23	20.62	431.906	26.35	30.00
HT20	4	5180	19.38	19.41	19.84	20.16	374.129	25.73	30.00
HT20	4	5200	20.31	20.25	20.33	20.52	433.939	26.37	30.00
HT20	4	5240	20.61	20.35	20.64	20.53	452.330	26.55	30.00
HT40	4	5190	16.91	17.02	17.11	17.13	202.487	23.06	30.00
HT40	4	5230	22.45	22.69	22.81	22.64	736.212	28.67	30.00
VHT20	4	5180	19.49	19.50	19.92	20.3	383.372	25.84	30.00
VHT20	4	5200	20.48	20.39	20.44	20.69	448.964	26.52	30.00
VHT20	4	5240	20.77	20.49	20.78	20.68	467.967	26.70	30.00
VHT40	4	5190	17.02	17.15	17.23	17.25	208.163	23.18	30.00
VHT40	4	5230	22.61	22.83	22.93	22.79	760.700	28.81	30.00
VHT80	4	5210	16.24	16.13	16.21	16.38	168.327	22.26	30.00

	For Frequency band 5725-5850 MHz									
		- ()	С	onducted I	Power (dBn	Total	Total	Limit		
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)	
11a	4	5745	23.21	23.41	23.62	23.73	894.884	29.52	30.00	
11a	4	5785	23.16	23.35	23.89	23.71	903.156	29.56	30.00	
11a	4	5825	23.11	23.21	23.93	23.62	891.372	29.50	30.00	
HT20	4	5745	23.10	23.22	23.65	23.48	868.651	29.39	30.00	
HT20	4	5785	23.14	23.19	23.62	23.45	865.966	29.38	30.00	
HT20	4	5825	23.19	23.04	23.81	23.26	862.094	29.36	30.00	
HT40	4	5755	23.04	23.85	23.16	23.74	887.640	29.48	30.00	
HT40	4	5795	22.95	23.52	23.53	23.68	880.917	29.45	30.00	
VHT20	4	5745	23.22	23.35	23.81	23.6	895.689	29.52	30.00	
VHT20	4	5785	23.28	23.31	23.77	23.56	892.321	29.51	30.00	
VHT20	4	5825	23.31	23.16	23.92	23.51	892.295	29.51	30.00	
VHT40	4	5755	23.15	24.01	23.31	23.88	916.938	29.62	30.00	
VHT40	4	5795	23.03	23.68	23.67	23.83	908.610	29.58	30.00	
VHT80	4	5775	20.18	20.87	20.62	21.01	467.940	26.70	30.00	

Report No.: FR721001AN Page: 32 of 113



### Beamforming mode

	For Frequency band 5150-5250 MHz								
			C	onducted I	Power (dBn	n)	Total	Total	Limit
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)
HT20	4	5180	19.08	19.31	19.52	20.06	357.147	25.53	27.06
HT20	4	5200	20.41	20.53	20.32	21.06	458.171	26.61	27.06
HT20	4	5240	20.61	20.75	20.53	21.06	474.554	26.76	27.06
HT40	4	5190	15.53	16.35	16.41	16.35	165.783	22.20	27.06
HT40	4	5230	19.92	20.21	20.29	20.16	413.787	26.17	27.06
VHT20	4	5180	19.21	19.45	19.64	20.14	366.794	25.64	27.06
VHT20	4	5200	20.55	20.67	20.43	21.18	471.810	26.74	27.06
VHT20	4	5240	20.74	20.86	20.66	21.2	488.714	26.89	27.06
VHT40	4	5190	15.68	16.45	16.54	16.48	170.685	22.32	27.06
VHT40	4	5230	20.05	20.32	20.41	20.32	426.352	26.30	27.06
VHT80	4	5210	15.93	15.71	15.56	15.25	145.885	21.64	27.06

#### Note:

1. Directional gain =  $10 * \log((10^{2.8/20} + 10^{2.5/20} + 10^{2.4/20} + 10^{3.9/20})^2/4) = 8.94 \text{ dBi } > 6 \text{ dBi}$ Limit shall be reduced to 30 dBm - (8.94 dBi - 6 dBi) = 27.06 dBm

	For Frequency band 5725-5850 MHz								
	Made N From (MILE)		С	onducted I	Power (dBn	1)	Total	Total	Limit
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)
HT20	4	5745	20.15	21.24	20.68	21.04	480.567	26.82	27.06
HT20	4	5785	19.95	20.83	20.81	21.32	475.938	26.78	27.06
HT20	4	5825	20.06	20.61	21.39	21.08	482.425	26.83	27.06
HT40	4	5755	19.82	20.51	19.86	20.24	410.910	26.14	27.06
HT40	4	5795	19.71	20.26	20.13	20.24	408.430	26.11	27.06
VHT20	4	5745	20.26	21.39	20.81	21.15	494.711	26.94	27.06
VHT20	4	5785	20.09	20.94	20.95	21.43	489.706	26.90	27.06
VHT20	4	5825	20.14	20.73	21.51	21.21	495.289	26.95	27.06
VHT40	4	5755	19.90	20.65	20.01	20.35	422.492	26.26	27.06
VHT40	4	5795	19.84	20.38	20.22	20.36	419.366	26.23	27.06
VHT80	4	5775	18.45	19.26	19.13	19.22	319.724	25.05	27.06

Note: 1. Directional gain = 10 \*  $log((10^{2.8/20}+10^{2.5/20}+10^{2.4/20}+10^{3.9/20})^2/4) = 8.94 dBi > 6 dBi$ Limit shall be reduced to 30 dBm - (8.94 dBi - 6 dBi) = 27.06 dBm

Report No.: FR721001AN Page: 33 of 113



# 3.4 Peak Power Spectral Density

### 3.4.1 Limit of Peak Power Spectral Density

	Frequency band 5150-5250 MHz						
Оре	Operating Mode Limit						
	Outdoor access point	17 dBm / MHz					
$\boxtimes$	Indoor access point	17 dBm / MHz					
	Fixed point-to-point access points 17 dBm / MHz						
	Client devices	11 dBm / MHz					

Frequency Band (MHz)		Limit
	5250 ~ 5350	11 dBm / MHz
	5470 ~ 5725	11 dBm / MHz
	5725 ~ 5850	30 dBm /500 kHz

Report No.: FR721001AN Page: 34 of 113



#### 3.4.2 Test Procedures

#### For 5150 ~ 5250 MHz

- Method SA-1 (Non- Beamforming: 11a/VHT20/VHT40)
  - 1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
  - 2. Trace average 100 traces.
  - 3. Use the peak marker function to determine the maximum amplitude level.
- Method SA-2 Alternative (Non- Beamforming: VHT80 / Beamforming: all modes)
  - Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
  - 2. Set sweep time ≥ 10 \* (number of points in sweep) \* (total on/off period of the transmitted signal).
  - 3. Perform a single sweep.
  - 4. Use the peak marker function to determine the maximum amplitude level.
  - 5. Add  $10 \log(1/x)$ , where x is the duty cycle.

#### For 5725 ~ 5850 MHz

- Method SA-1 (Non- Beamforming: 11a/VHT20/VHT40)
  - 1. Set RBW = 500 kHz, VBW = 2 MHz, Sweep time = auto, Detector = RMS.
  - 2. Trace average 100 traces.
  - 3. Use the peak marker function to determine the maximum amplitude level.
- Method SA-2 Alternative (Non- Beamforming: VHT80 / Beamforming: all modes)
  - 1. Set RBW = 500 kHz, VBW = 2 MHz, Detector = RMS.
  - 2. Set sweep time ≥ 10 \* (number of points in sweep) \* (total on/off period of the transmitted signal).
  - 3. Perform a single sweep.
  - 4. Use the peak marker function to determine the maximum amplitude level.
  - 5. Add 10 log(1/x), where x is the duty cycle.

#### 3.4.3 Test Setup



Report No.: FR721001AN Page: 35 of 113



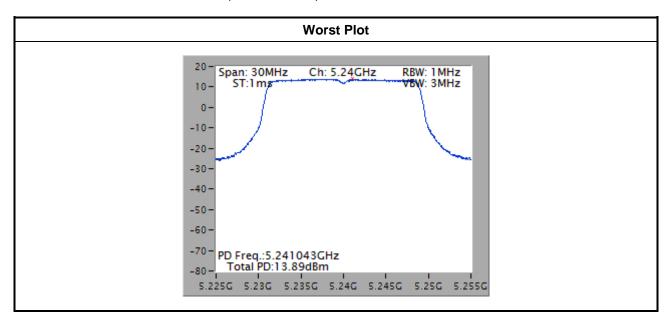
### 3.4.4 Test Result of Peak Power Spectral Density

### Non-beamforming mode

For Frequency band 5150-5250 MHz								
Condition			Peak Power Spectral Density (dBm/MHz)					
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	PPSD w/o D.F (dBm/MHz)	Duty Factor (dB)	PPSD with D.F (dBm/MHz)	PPSD Limit (dBm/MHz)		
11a	4	5180	12.77	0.00	12.77	14.06		
11a	4	5200	13.48	0.00	13.48	14.06		
11a	4	5240	13.82	0.00	13.82	14.06		
VHT20	4	5180	12.30	0.00	12.30	14.06		
VHT20	4	5200	13.64	0.00	13.64	14.06		
VHT20	4	5240	13.89	0.00	13.89	14.06		
VHT40	4	5190	6.87	0.00	6.87	14.06		
VHT40	4	5230	12.85	0.00	12.85	14.06		
VHT80	4	5210	3.22	0.19	3.41	14.06		

#### Note:

- 1. D.F is duty factor.
- 2. Test result is bin-by-bin summing measured value of each TX port. 3. Directional gain =  $10 * log((10^{2.8/20}+10^{2.5/20}+10^{2.4/20}+10^{3.9/20})^2/4) = 8.94 dBi > 6 dBi$ Limit shall be reduced to 17 dBm - (8.94 dBi - 6 dBi) = 14.06 dBm.



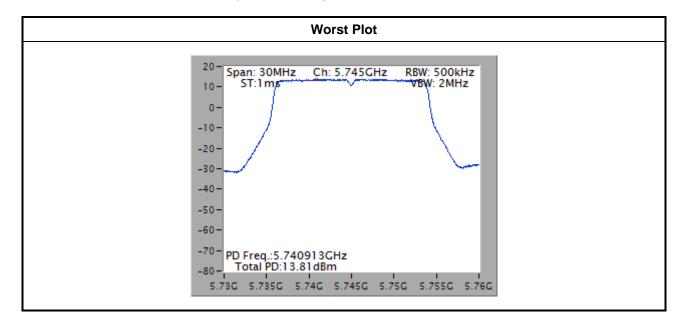
Report No.: FR721001AN Page: 36 of 113



			For Frequency	band 5725-5850 MF	łz	
Co	ondition		P	Peak Power Spectral	Density (dBm/500kl	Hz)
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	PPSD w/o D.F (dBm/500kHz)	Duty Factor (dB)	PPSD with D.F (dBm/500kHz)	PPSD Limit (dBm/500kHz)
11a	4	5745	13.42	0.00	13.42	27.06
11a	4	5785	13.51	0.00	13.51	27.06
11a	4	5825	13.54	0.00	13.54	27.06
VHT20	4	5745	13.81	0.00	13.81	27.06
VHT20	4	5785	13.06	0.00	13.06	27.06
VHT20	4	5825	12.95	0.00	12.95	27.06
VHT40	4	5755	11.70	0.00	11.70	27.06
VHT40	4	5795	11.71	0.00	11.71	27.06
VHT80	4	5775	4.53	0.19	4.72	27.06

#### Note:

- 1. D.F is duty factor.
- Test result is bin-by-bin summing measured value of each TX port. Directional gain =  $10 * log((10^{2.8/20}+10^{2.5/20}+10^{2.4/20}+10^{3.9/20})^2/4) = 8.94 dBi > 6 dBi Limit shall be reduced to 30 dBm (8.94 dBi 6 dBi) = 27.06 dBm.$



Report No.: FR721001AN Page: 37 of 113

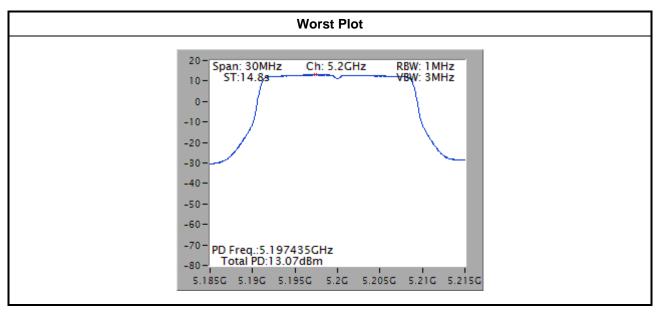


## Beamforming mode

			For Frequency	band 5150-5250 MH	lz	
Co	ondition	1		Peak Power Spectra	al Density (dBm/MH	z)
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	PPSD w/o D.F (dBm/MHz)	Duty Factor (dB)	PPSD with D.F (dBm/MHz)	PPSD Limit (dBm/MHz)
VHT20	4	5180	12.13	0.30	12.43	14.06
VHT20	4	5200	13.07	0.30	13.37	14.06
VHT20	4	5240	13.05	0.30	13.35	14.06
VHT40	4	5190	4.21	0.31	4.52	14.06
VHT40	4	5230	9.90	0.31	10.21	14.06
VHT80	4	5210	1.33	0.37	1.70	14.06

### Note:

- 1. D.F is duty factor.
- 2.
- Test result is bin-by-bin summing measured value of each TX port. Directional gain =  $10 * log((10^{2.8/20} + 10^{2.5/20} + 10^{2.4/20} + 10^{3.9/20})^2/4) = 8.94 dBi > 6 dBi$  Limit shall be reduced to 17 dBm (8.94 dBi 6 dBi) = 14.06 dBm.



Note: The worst plot is w/o duty factor.

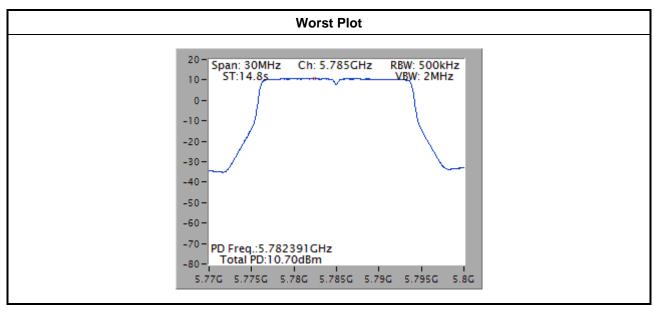
Report No.: FR721001AN Page: 38 of 113



			For Frequency	band 5725-5850 MH	łz	
Co	ondition	1	F	Peak Power Spectral	Density (dBm/500kl	Hz)
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	PPSD w/o D.F (dBm/500kHz)	Duty Factor (dB)	PPSD with D.F (dBm/500kHz)	PPSD Limit (dBm/500kHz)
VHT20	4	5745	10.63	0.30	10.93	27.06
VHT20	4	5785	10.70	0.30	11.00	27.06
VHT20	4	5825	10.65	0.30	10.95	27.06
VHT40	4	5755	7.22	0.31	7.53	27.06
VHT40	4	5795	7.96	0.31	8.27	27.06
VHT80	4	5775	3.29	0.37	3.66	27.06

### Note:

- 1. D.F is duty factor.
- Test result is bin-by-bin summing measured value of each TX port. Directional gain =  $10 * log((10^{2.8/20}+10^{2.5/20}+10^{2.4/20}+10^{3.9/20})^2/4) = 8.94 dBi > 6 dBi$  Limit shall be reduced to 30 dBm (8.94 dBi 6 dBi) = 27.06 dBm.



Note: The worst plot is w/o duty factor.

Report No.: FR721001AN Page: 39 of 113



# 3.5 Transmitter Radiated and Band Edge Emissions

### 3.5.1 Limit of Transmitter Radiated and Band Edge Emissions

	Restricted Band	Emissions Limit	
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

#### Note 1:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2**:

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

	Un-restricted band emissions above 1GHz Limit
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
5.725 - 5.850 GHz	15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
	15.407(b)(4)(ii) ,compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in §15.209(a) is not required. In addition,radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see § 15.205(c))

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Report No.: FR721001AN Page: 40 of 113



### 3.5.2 Test Procedures

- Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

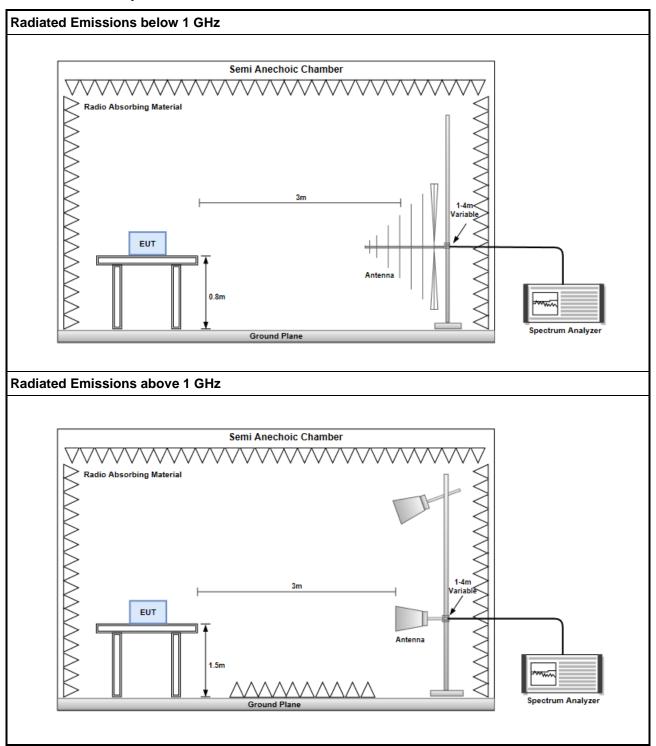
#### Note:

- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
- 2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
- 3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

Report No.: FR721001AN Page: 41 of 113



# 3.5.3 Test Setup

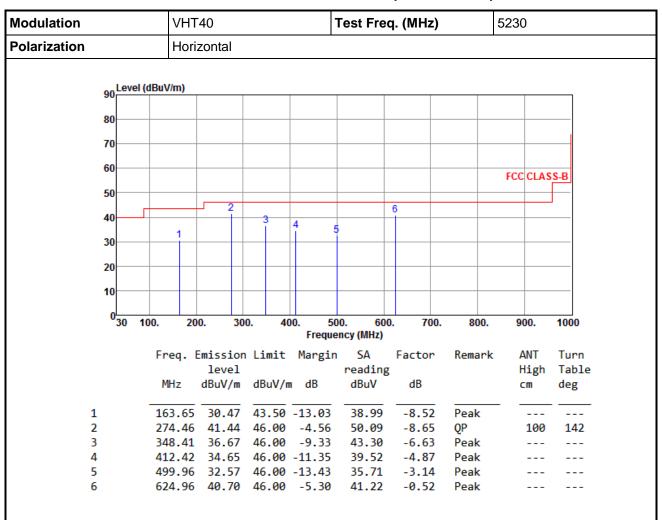


Report No.: FR721001AN Page: 42 of 113



### Non- beamforming mode

## 3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 43 of 113



Modulation	VHT40	Τ	est Freq.	(MHz)	5230	)
Polarization	Vertical	•				
90 Level (dBu	V/m)					
80						
70						
60					ECC	CLASS-B
50					rcc	, CLASS-B
	3 4	<u> </u>	6			
40 1 2		5				
30						
20						
20						
10						
0 <mark>30 100.</mark>	200. 300.	400. 500	0. 600. ncy (MHz)	700.	800. 9	00. 100
г.	noa Emission li			astan Da	emark /	ANT Tur
F	req. Emission Li level	mit margin	reading	actor Re		awi lur High Tab
1	MHz dBuV/m dB	uV/m dB	dBuV	dB		cm deg
1	46.52 35.46 40	.00 -4.54	43.68	-8.22 QF	<del></del> -	100 2
_		.00 -5.32		_	ak	
		.00 -4.39			ak	
	49.55 41.05 46 09.28 37.68 46	.00 -4.95 .00 -8.32			ak	
	09.28 37.68 46		42.64	-4.96 Pe	eak	

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 44 of 113



Modulation			VHT	40				Test Fre	q. (MHz	z)	5755	
Polarization			Hori	zonta	l							
	90Le	vel (dBu	ıV/m)									
	80—											
	70				_							
	60											
											FCC C	LASS-B
	50				2				_			
	40					3	4		6			
	30-		1				į į	5				
	20											
	10											
	0											
	0 30	100.	20	00.	300.	40		00. 60 ency (MHz)	0. 70	00. 800.	900	. 1000
		_	noa	Emico	ion	limi+	Margir		Factor	r Remar	k AN	T Tur
		-	req.	lev		LIMITC	mar.gri	reading		Nelliari	K AN Hi	
			MHz			dBuV/r	n dB	dBuV	dB		cm	_
		_								<del></del>		
	1		63.53				-12.95	39.06				
	2 3		73.68 48.55				-4.04 -9.47	50.64 43.15		•	10	00 14
	4		12.35				-11.28	39.60			_	
	5	4	99.86	32.			-13.35	35.79			-	
	6	6	24.97	40.	53	46.00	-5.47	41.05	-0.5	2 Peak	-	

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 45 of 113



Polarization Vertical  90 Level (dBuV/m)  70 60 40 1 2 30 40 1 2 30 20  FCC	CLASS-B
80 70 60 50 40 1 2 30 4 5 6	CLASS-B
80 70 60 50 40 1 2 30 4 5 6	CLASS-B
70 60 50 40 1 2 30	CLASS-B
60 50 40 1 2 30	CLASS-B
60 50 40 1 2 30	CLASS-B
3 4 5 6 40 1 2 30 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	CLASS-B
30 3 4 5 6 30 5 6	
30 5	
30	
20	
10	
0 30 100. 200. 300. 400. 500. 600. 700. 800. 9 Frequency (MHz)	00. 100
	ANT Tu
	digh Ta
	m de
1 46.62 35.36 40.00 -4.64 43.58 -8.22 QP	100
2 82.41 34.53 40.00 -5.47 48.06 -13.53 Peak	
3 273.62 41.45 46.00 -4.55 50.14 -8.69 Peak	
4 349.62 41.21 46.00 -4.79 47.81 -6.60 Peak	
5 409.48 37.55 46.00 -8.45 42.50 -4.95 Peak 6 624.67 40.47 46.00 -5.53 40.99 -0.52 Peak	

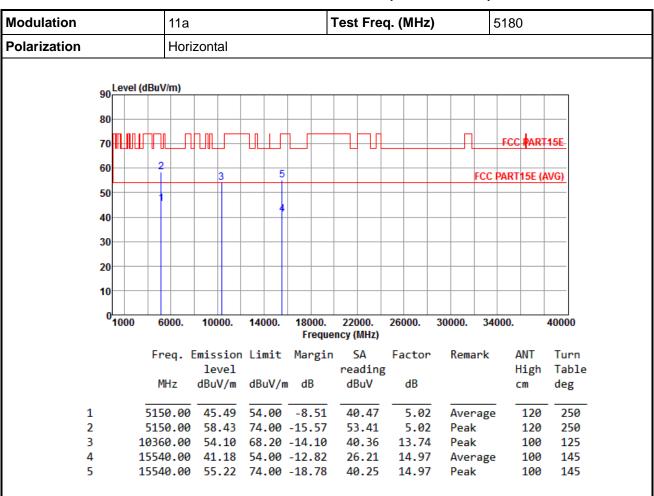
\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 46 of 113



# 3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a



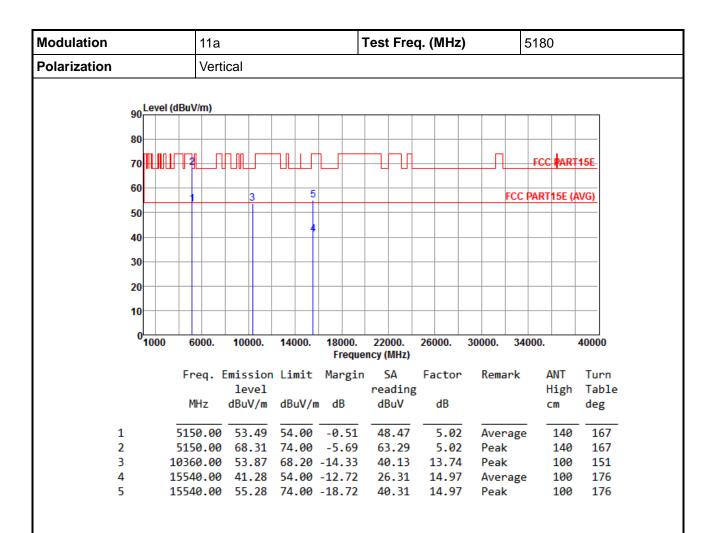
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 47 of 113



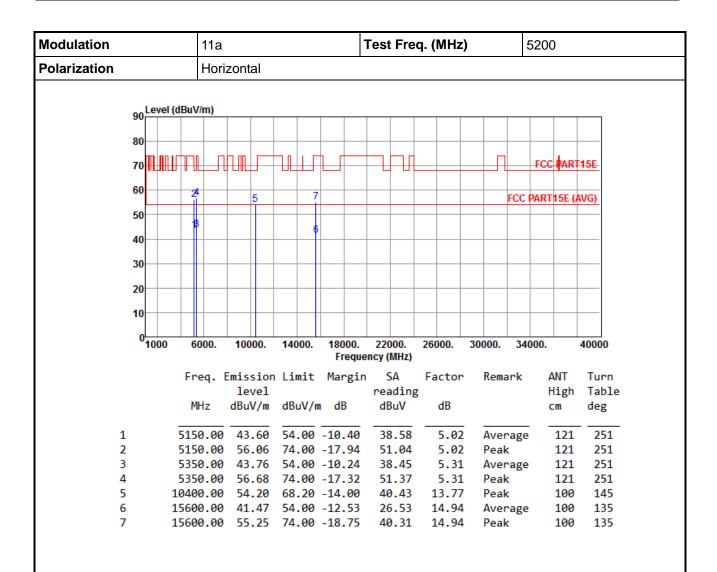


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 48 of 113



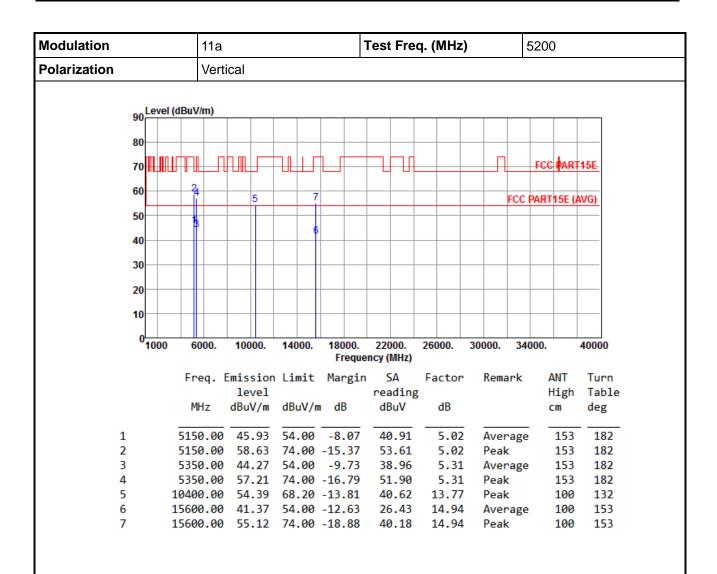


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 49 of 113



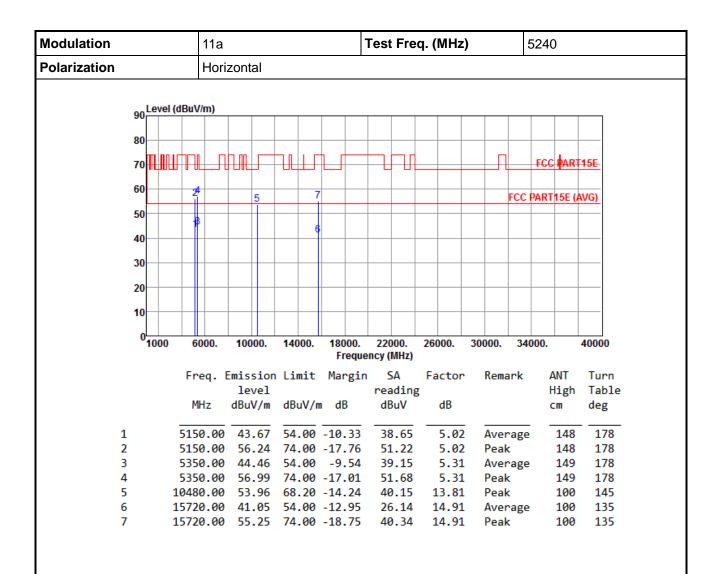


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 50 of 113



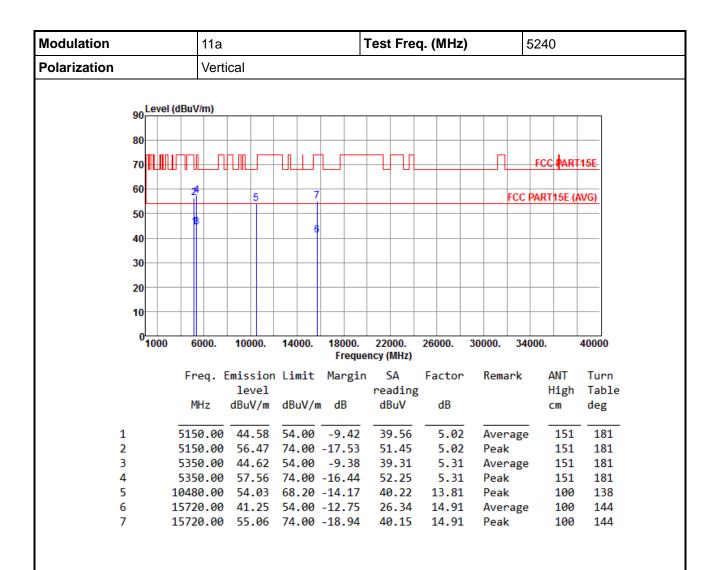


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 51 of 113



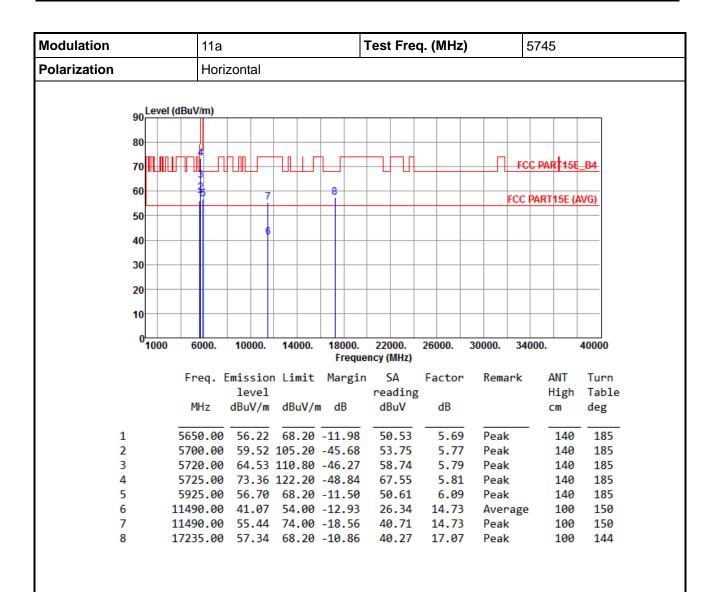


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 52 of 113



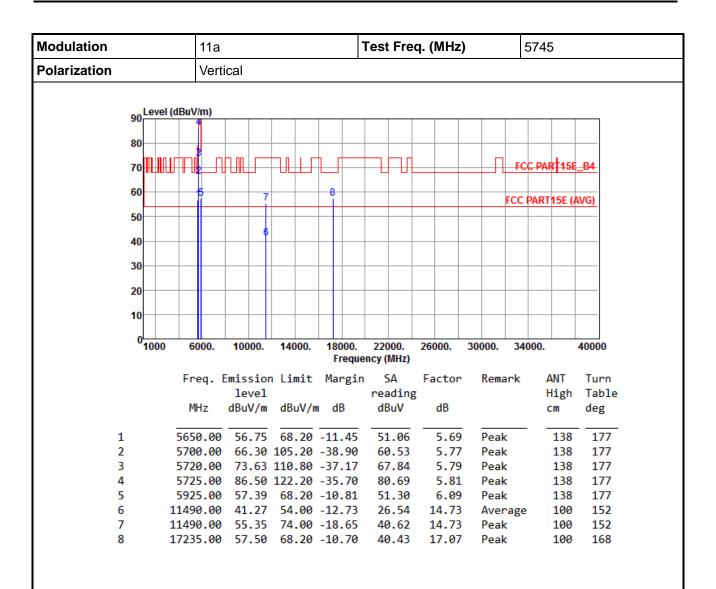


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 53 of 113



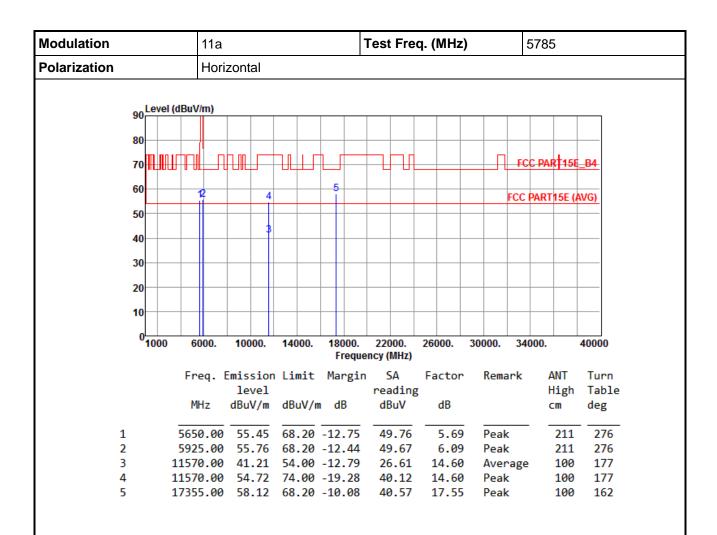


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 54 of 113



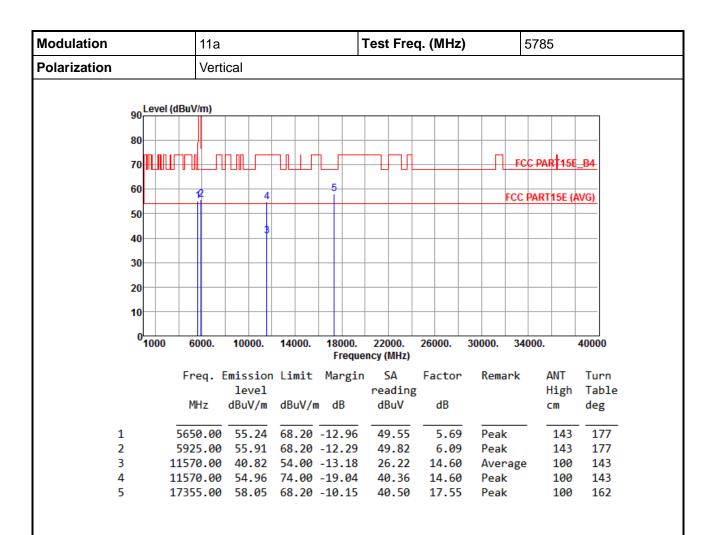


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 55 of 113



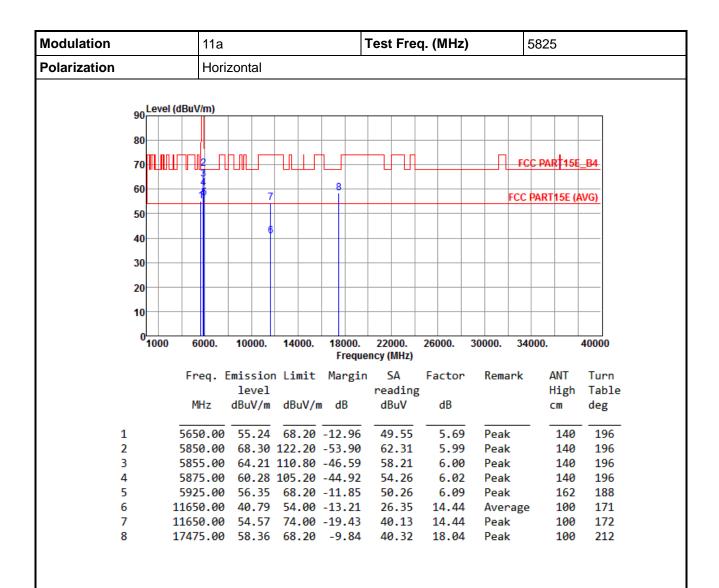


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 56 of 113



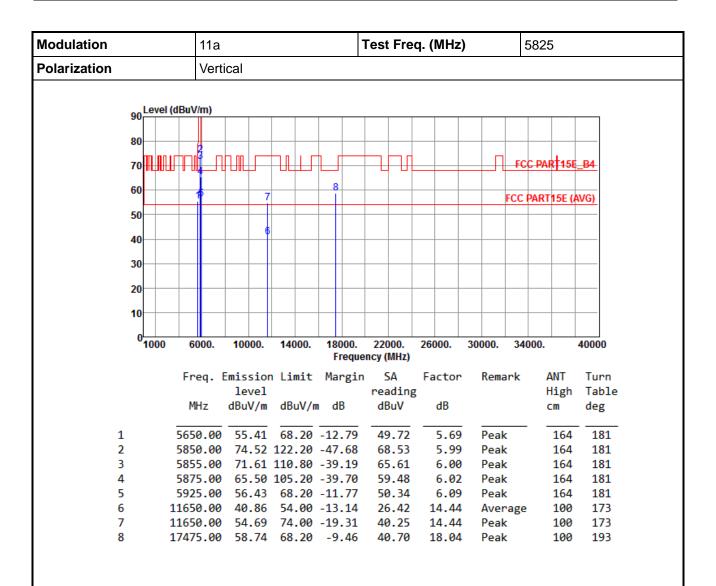


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 57 of 113





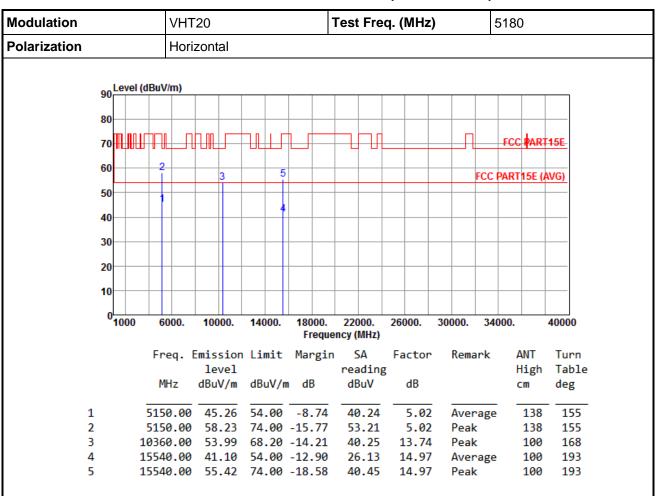
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 58 of 113



### 3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20



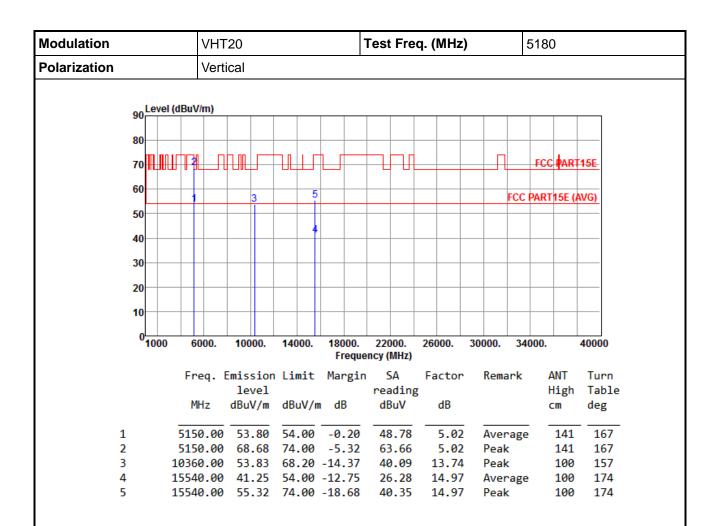
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 59 of 113



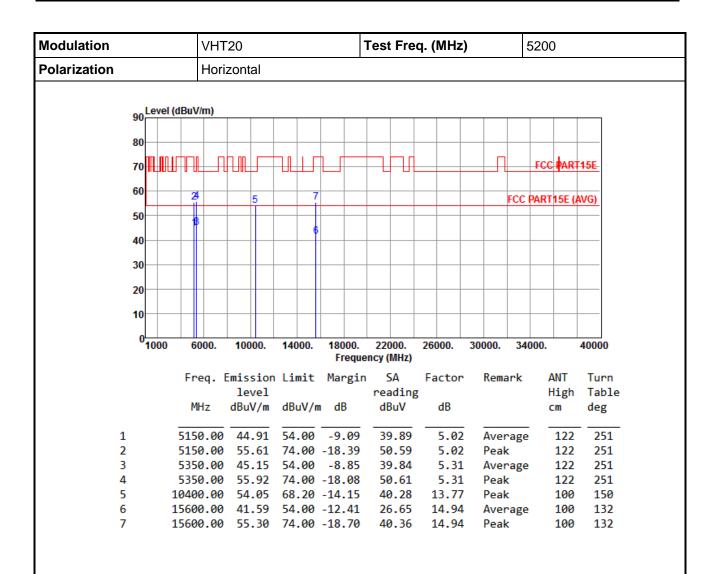


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 60 of 113



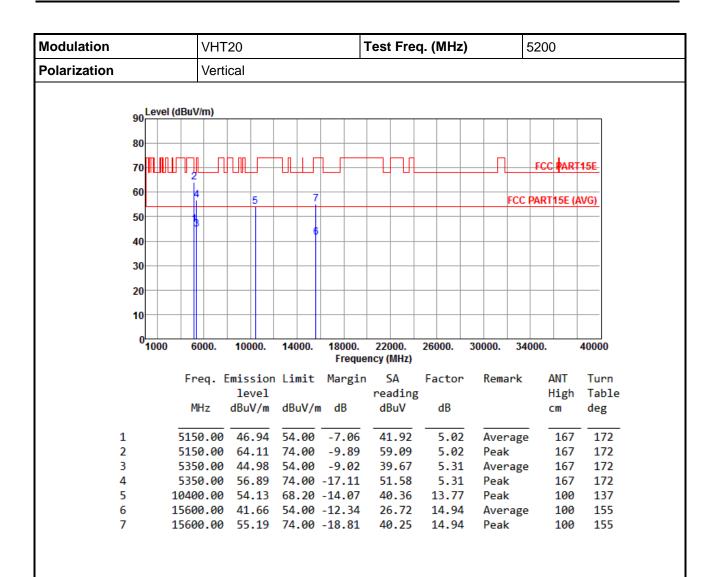


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 61 of 113



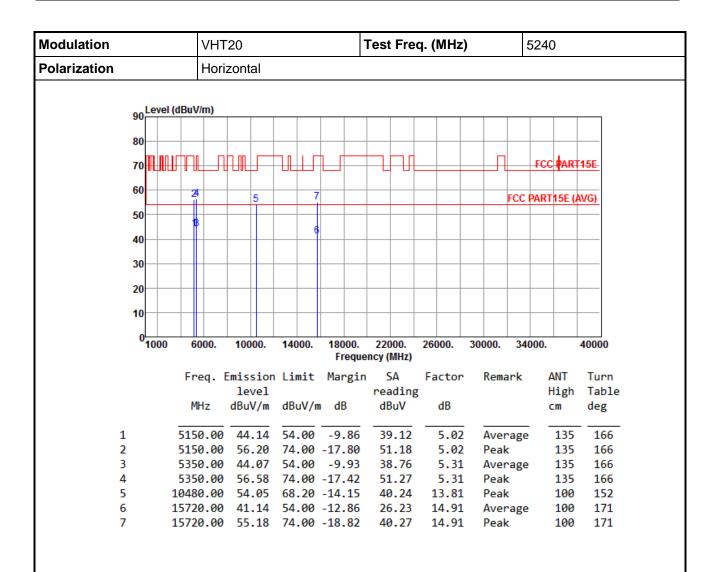


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 62 of 113



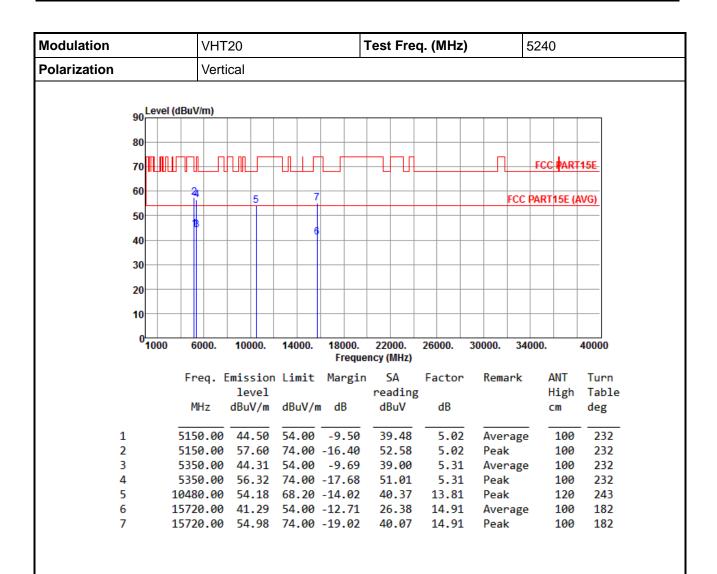


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 63 of 113



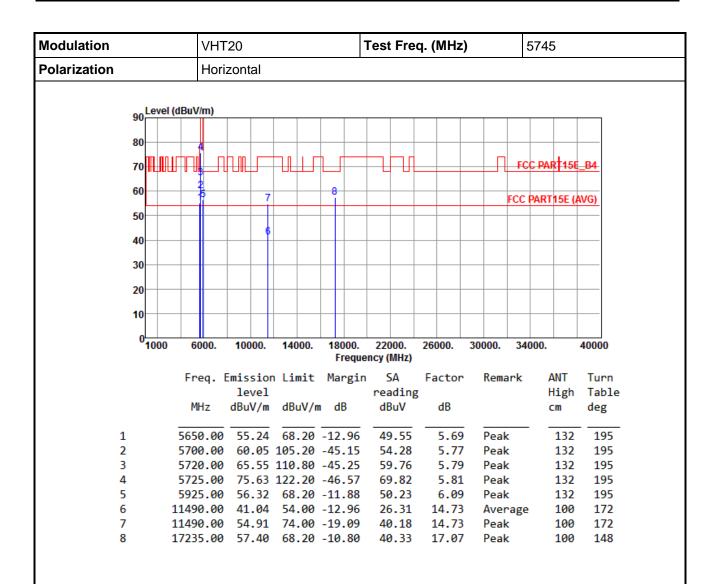


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 64 of 113



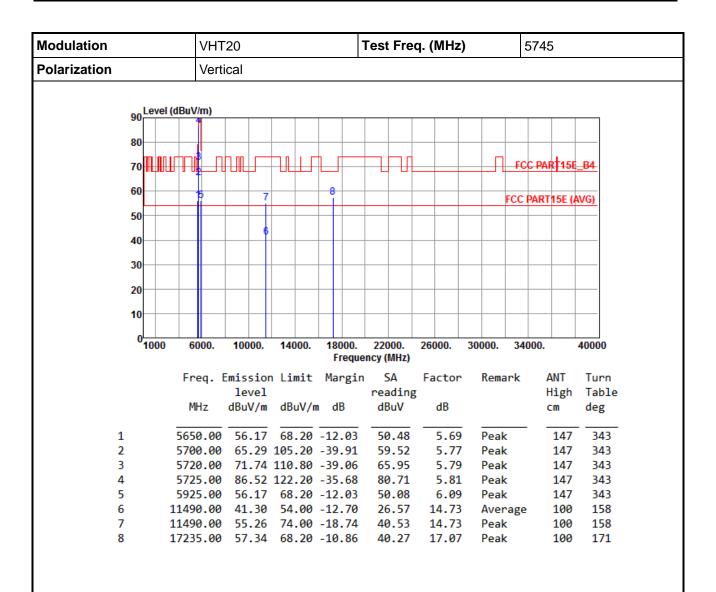


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 65 of 113



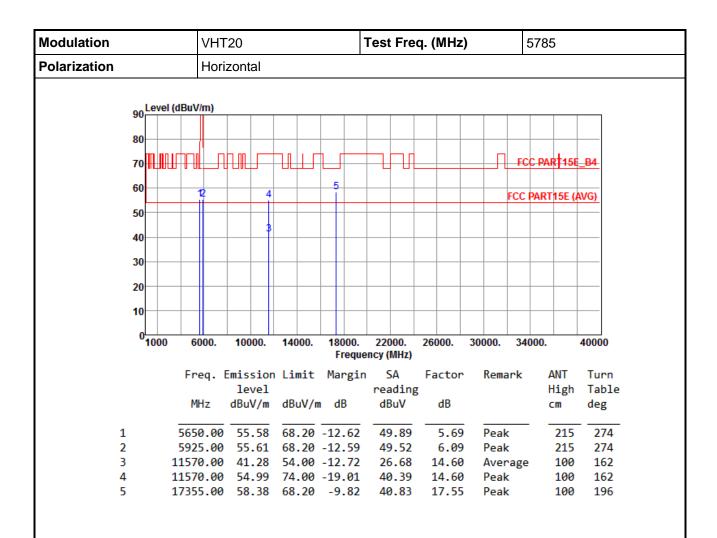


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 66 of 113



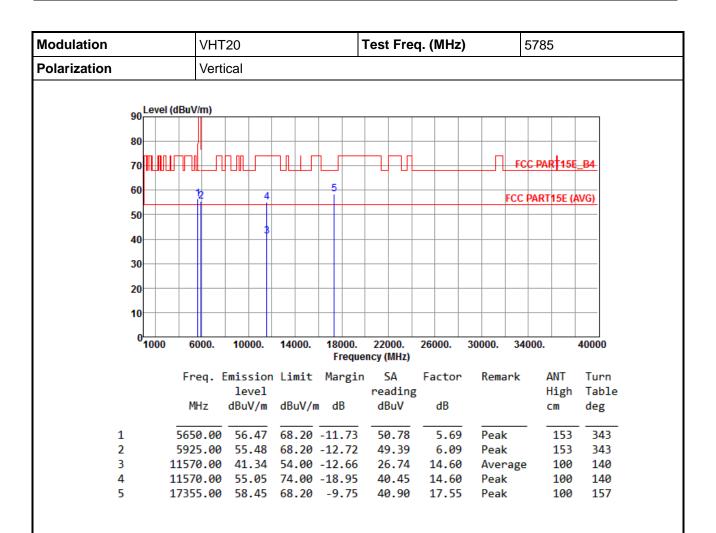


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 67 of 113



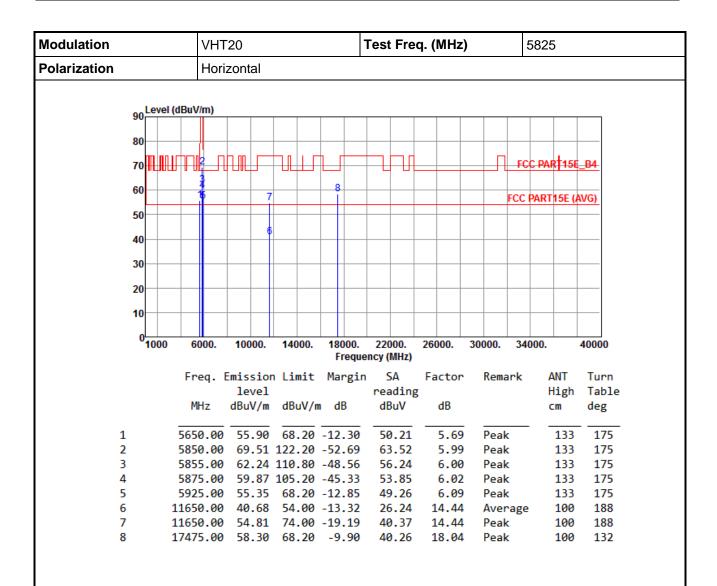


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 68 of 113



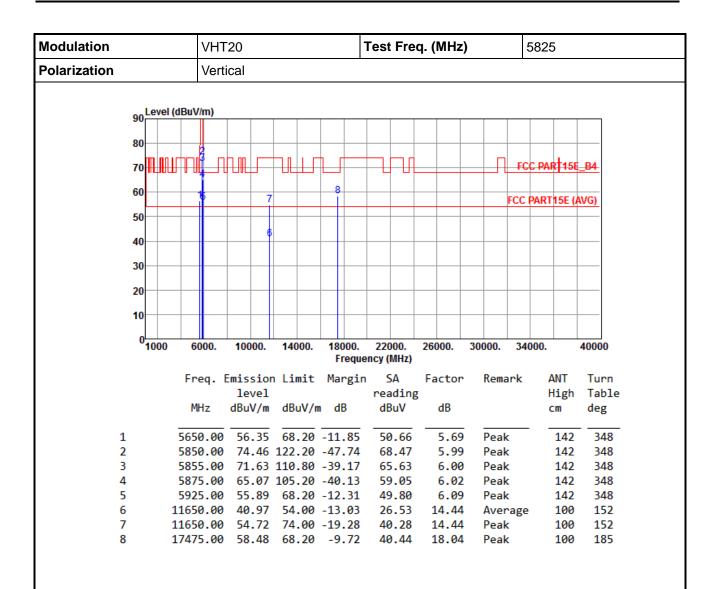


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 69 of 113





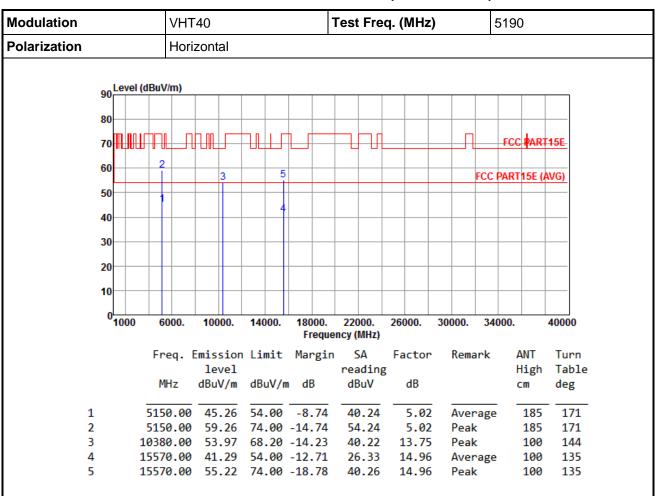
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 70 of 113



### 3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT40



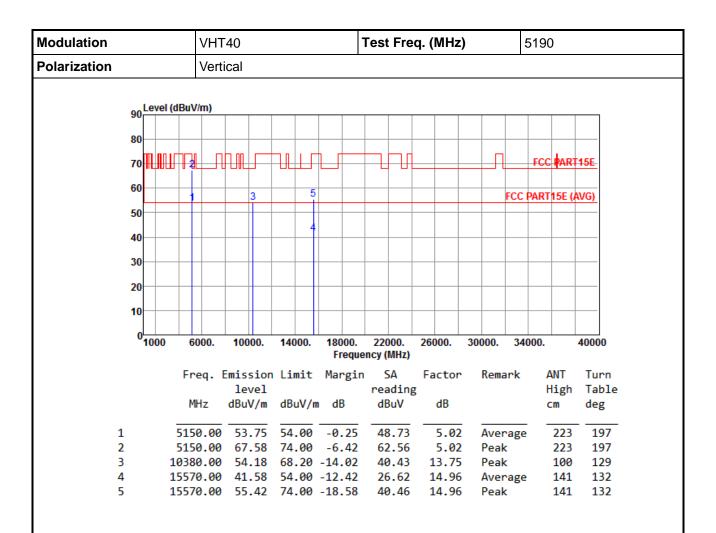
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 71 of 113



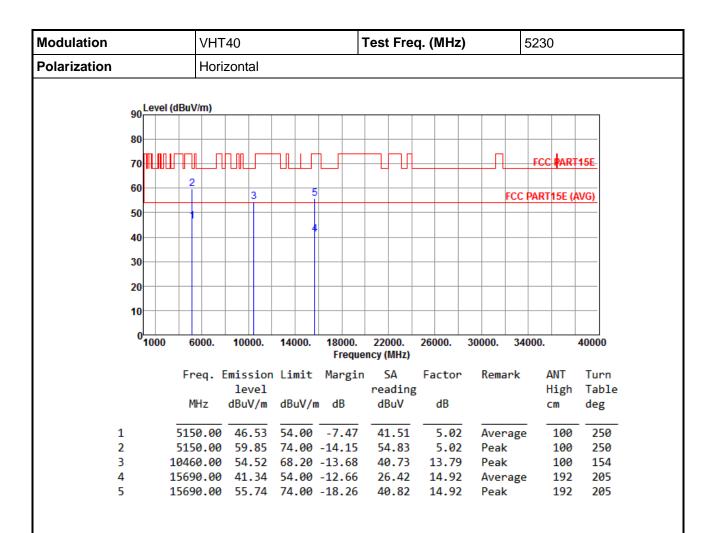


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 72 of 113



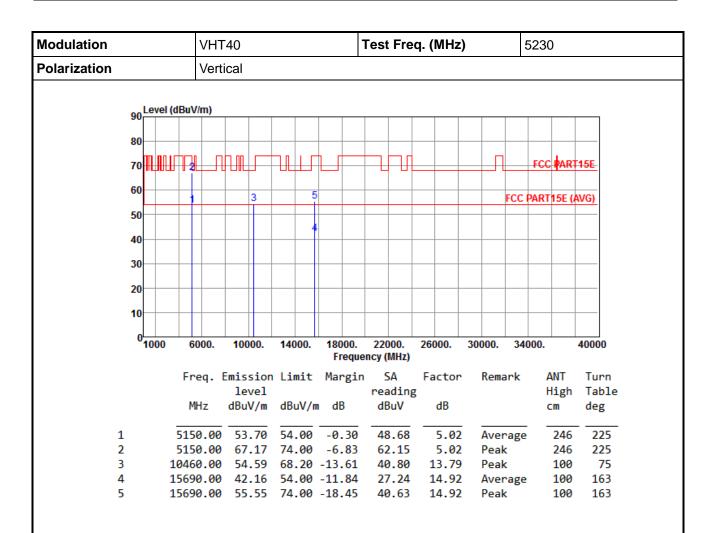


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 73 of 113



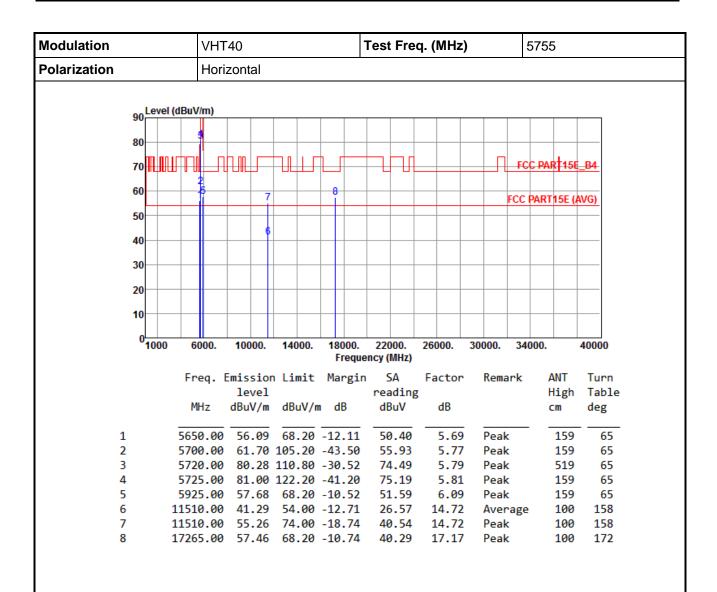


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 74 of 113



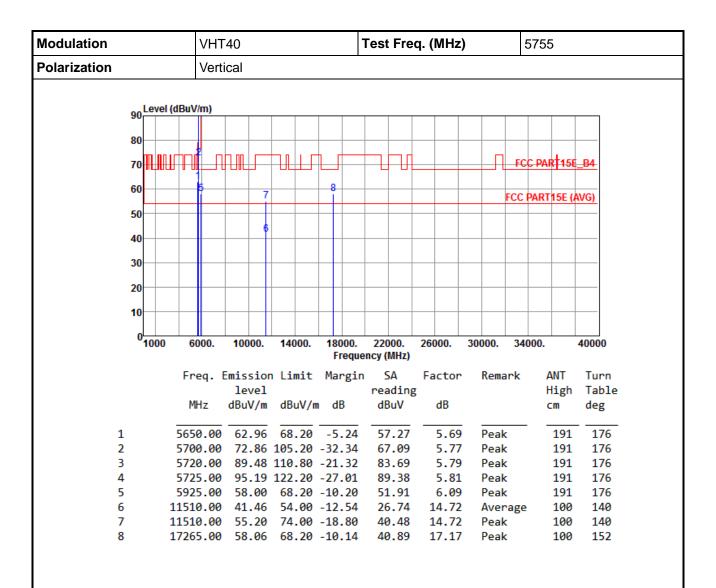


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 75 of 113



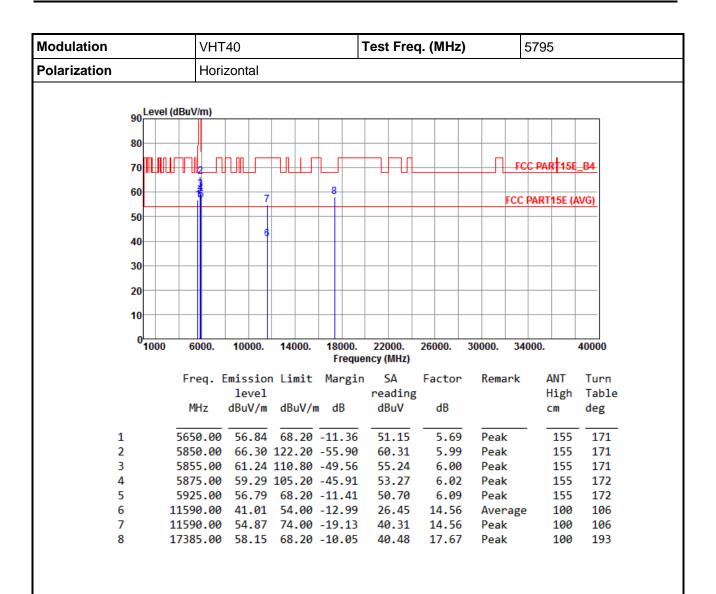


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 76 of 113



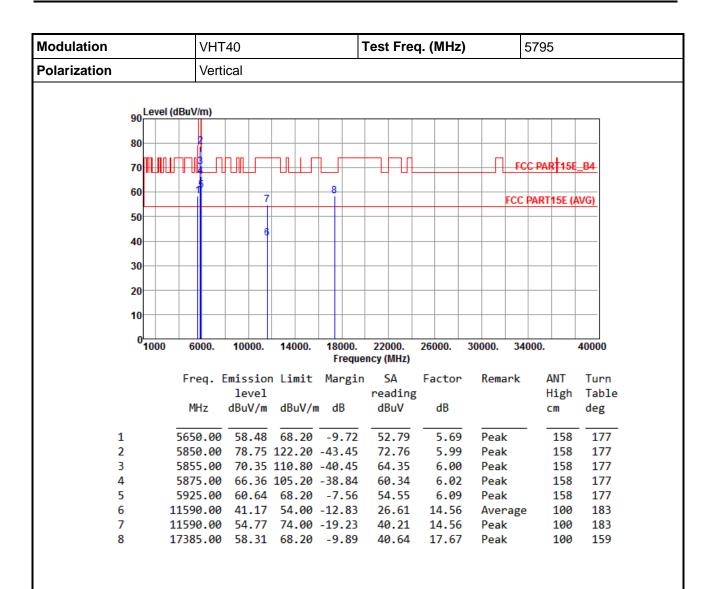


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 77 of 113





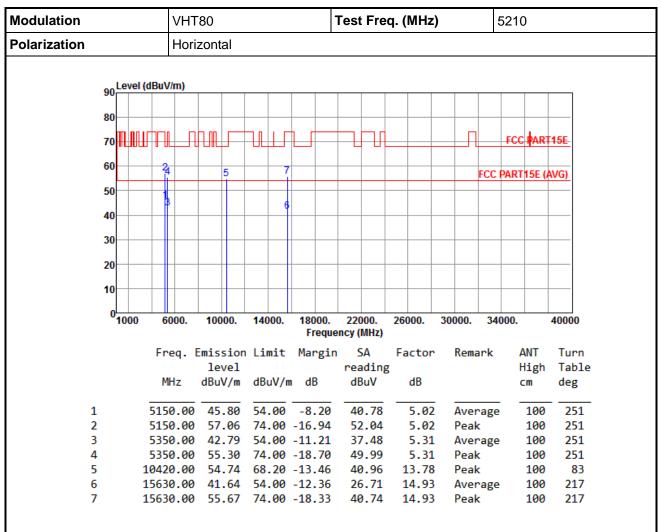
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 78 of 113



## 3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT80



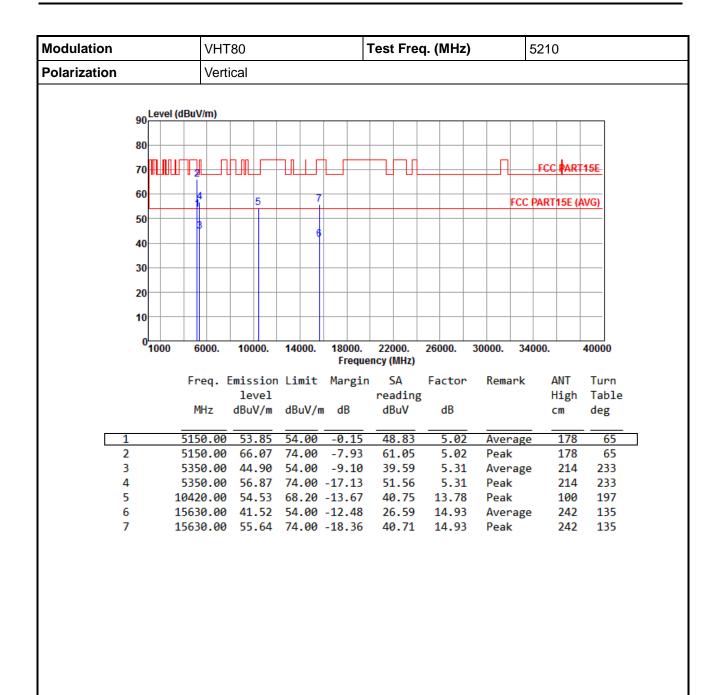
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR721001AN Page: 79 of 113

<sup>\*</sup>Factor includes antenna factor, cable loss and amplifier gain



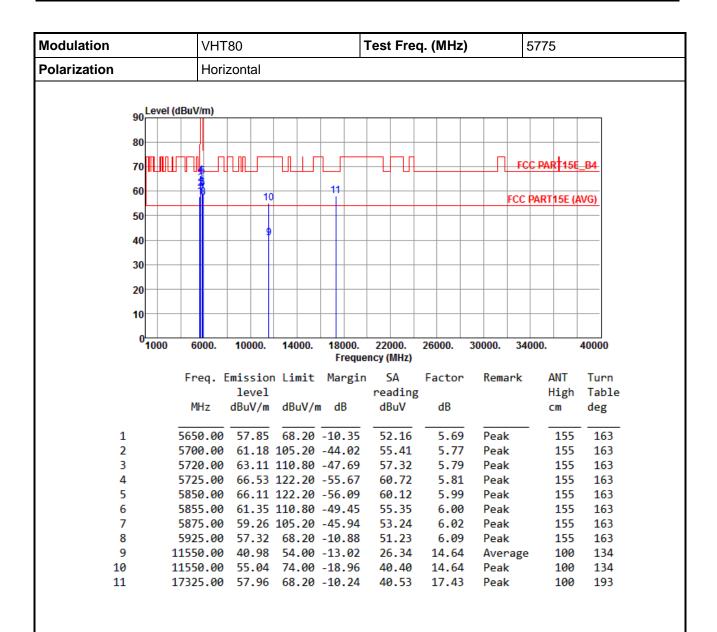


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 80 of 113



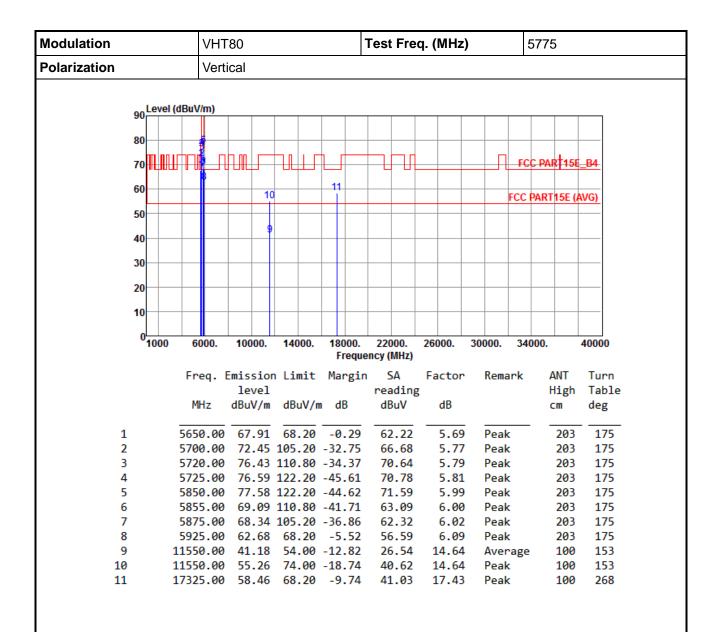


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 81 of 113





\*Factor includes antenna factor, cable loss and amplifier gain

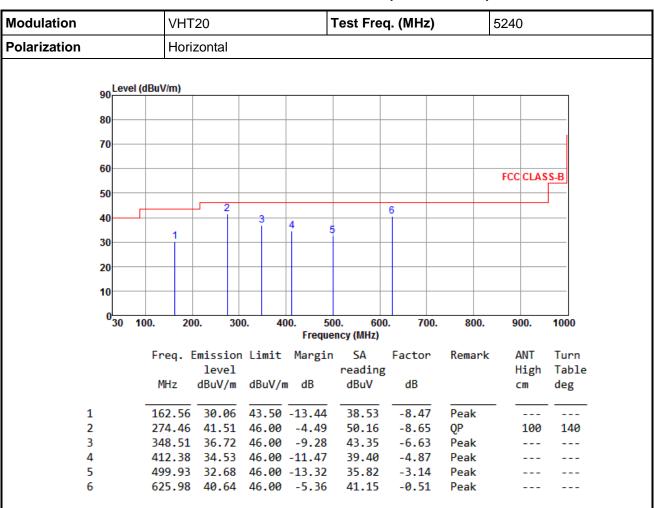
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 82 of 113



## Beamforming mode

## 3.5.9 Transmitter Radiated Unwanted Emissions (Below 1GHz)



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 83 of 113



Modulation				VHT	20				-	Test Fro	eq	. (MHz)		5240	)	
Polarization				Verti	cal				•					•		
	90 <sup>L</sup>	_evel	(dBuV	//m)							_					
	80															
	70															
	60					+					+			FCC	CLAS	S-B
	50					_					-					
	40					3	4		5		6	6				
		1 2	2						Ĭ							
	30					$\Box$										
	20					$\vdash$					$\vdash$					
	10															
	U,	30	100.	20	0.	300	0.	40		0. 6 ncy (MHz)	00.	700.	. 800	. 9	00.	1000
			En	oa F	micc	ion	lim	.i+	Margin			Factor	Remar	uk /	ANT	Turn
				cq. ı	leve		LIII	11.0	nai gin	readin		ractor	itelliai		ligh	Table
			М	Hz	dBuV,	/m	dBu	ıV/m	dB	dBuV	_	dB			zm _	deg
1				6.48	35.4	11	40.	90	-4.56	43.66		-8.22	QP		100	18
2				2.45			40.		-4.69	48.85		-13.54	Peak			
3			27	3.63	41.4		46.		-4.56	50.12		-8.68	Peak			
4				9.68					-4.76	47.84		-6.60	Peak			
5 6				0.38 4.96	37.		46.		-8.47 -5.36	42.46 41.16		-4.93 -0.52	Peak Peak			

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 84 of 113



Modulation			VHT20	)			-	Test Fre	q.	(MHz)		5825	5	
Polarization			Horizo	ntal										
9	90 Lev	el (dBuV	//m)											
	80													
•	80													
1	70													
	60													
	50											FCC	CLAS	2-B
	30			2					6					
4	40				3		4 ,		Ť					
:	30		1				,		_					
	20													
•	10													
	030	100.	200.	30	00.	40		00. 60		700.	800.	90	00.	1000
		<b>-</b>	F					ncy (MHz)			DI-		NIT.	т
		Fr		lssior Level	1 L1I	nıt	Margin	reading		actor	Remark		NNT High	Turn Table
		М		BuV/m	dBı	uV/m	dB	dBuV	ь	dB			:m	deg
1		16	3.28	18	/13	50	-13.02	38.98	-	-8.50	Peak			
2							-4.32	50.37		-8.69	QP		100	138
3							-9.56	43.06		-6.62	Peak			
4							-11.09	39.78		-4.87	Peak			
5 6				32.48			-13.52 -5.59	35.62 40.93		-3.14 -0.52	Peak Peak			

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR721001AN Page: 85 of 113



Modulation				VHT	VHT20					Test Freq. (MHz) 5				5825		
Polarization				Vertical												
	90	Lev	el (d	BuV/m)		1								$\neg$		
	80															
	00															
	70					+										
	60															
												FCC (	CLAS	S-B		
	50				3		4			_						
	40	1	2			-	-	5		6						
	30	Ιi	ا أ													
	30															
	20	$\vdash$	+			+										
	10															
	0	30	10	0. 20	0. 3	00.	40		00. 60	0. 700.	800.	90	0.	1000		
								Freque	ency (MHz)							
				Freq. E			imit	Margin		Factor	Remark		NT	Turn		
				MILL	leve		2.377	JD.	reading				igh	Table		
				MHz	dBuV/r	ı aı	suv/m	i ab	dBuV	dB		Cr	m	deg		
1			-	46.52	35.22	40	0.00	-4.78	43.44	-8.22	QP		100	18		
2				82.35	34.62		0.00	-5.38	48.14	-13.52	Peak					
3	}			273.55	41.28	3 46	5.00	-4.72	49.97	-8.69	Peak					
4				349.69			5.00	-4.57	48.03	-6.60	Peak					
5	•			409.53	37.6	46	5.00	-8.39	42.56	-4.95	Peak					

40.80

-0.52

Peak

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

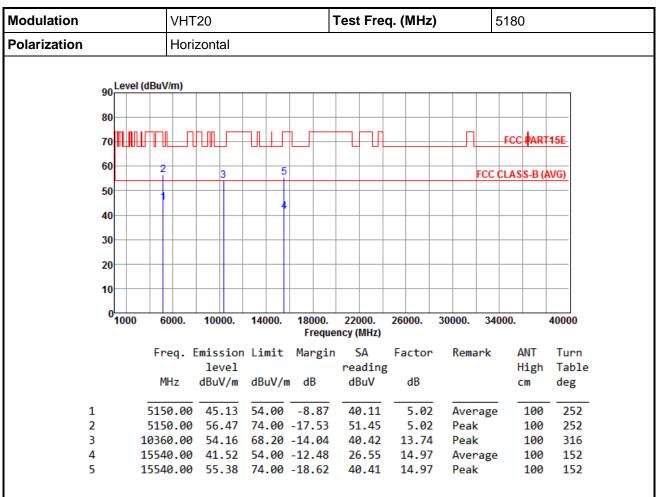
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

624.86 40.28 46.00 -5.72

Report No.: FR721001AN Page: 86 of 113



## 3.5.10 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20



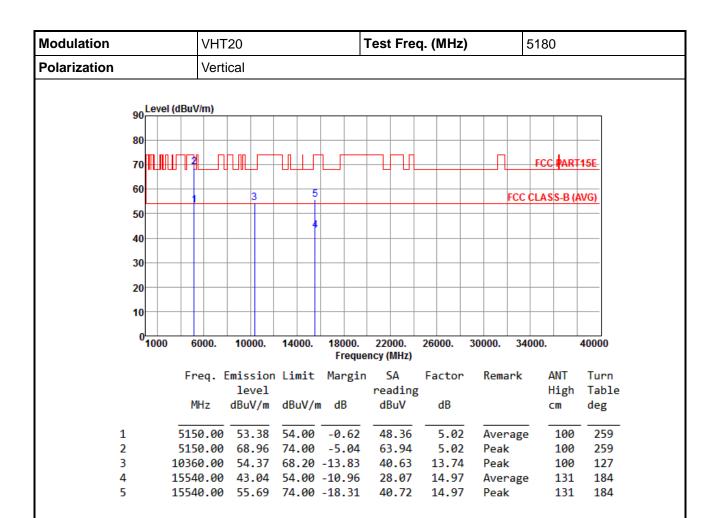
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 87 of 113



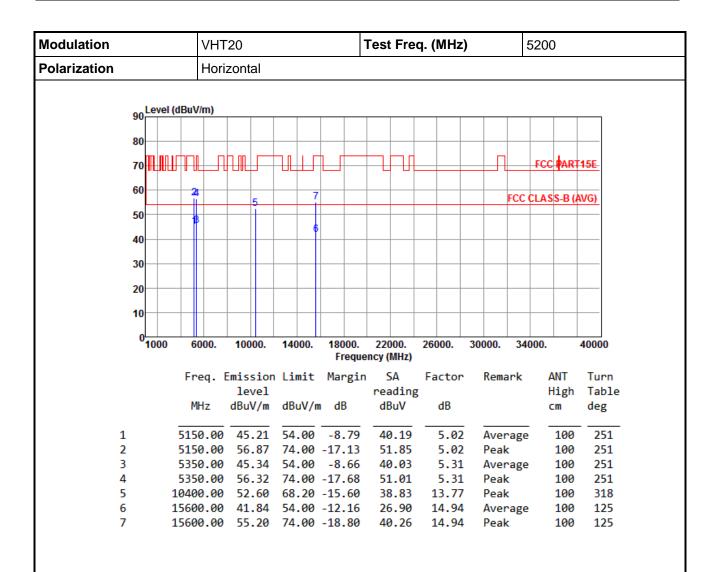


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 88 of 113



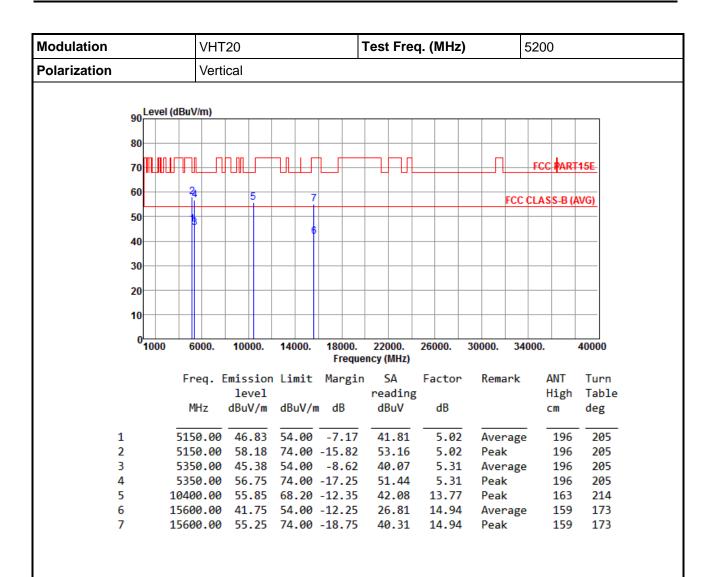


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 89 of 113



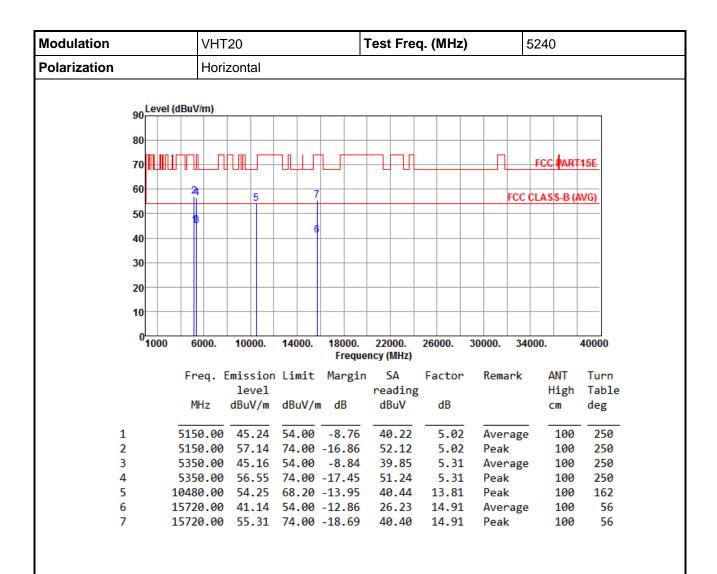


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 90 of 113



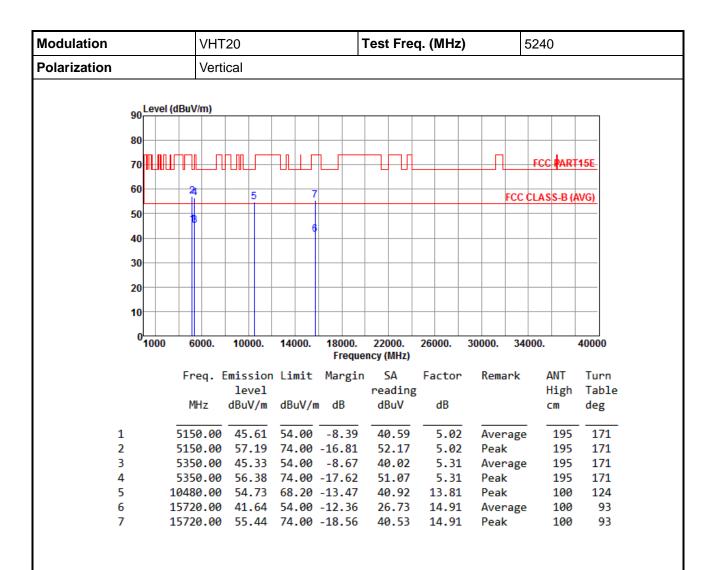


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 91 of 113



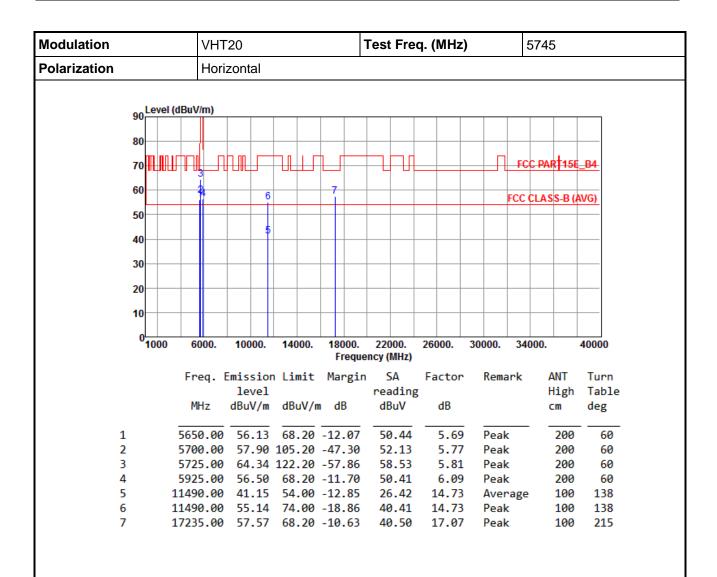


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 92 of 113



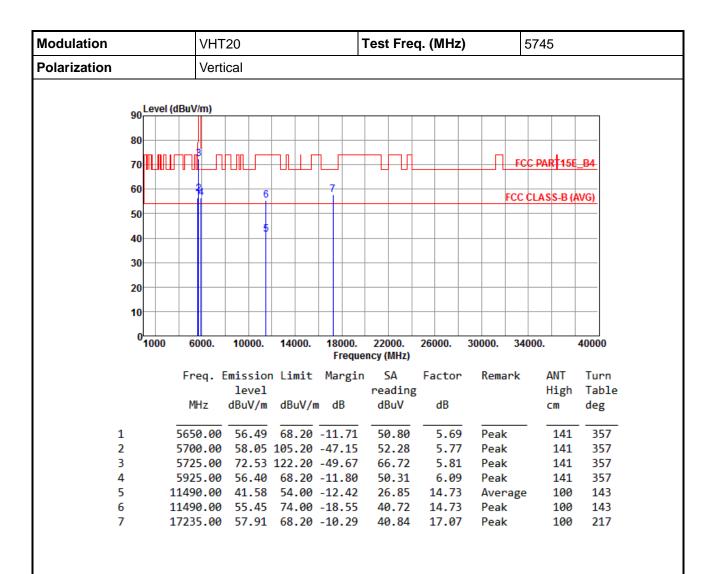


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 93 of 113



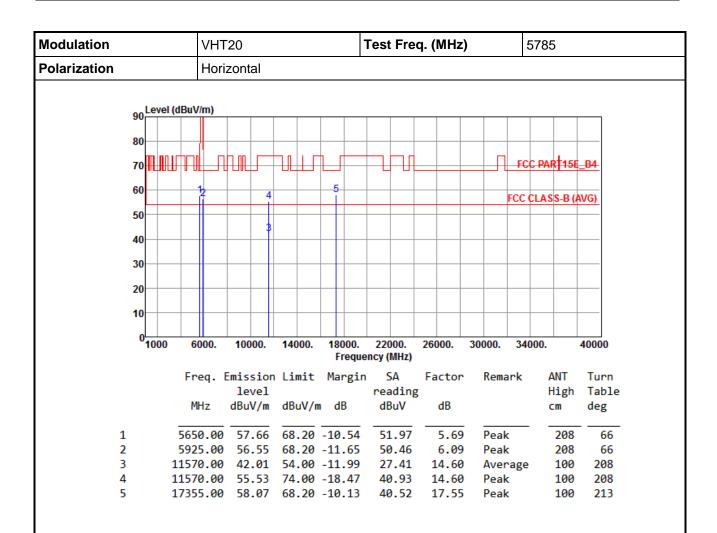


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 94 of 113



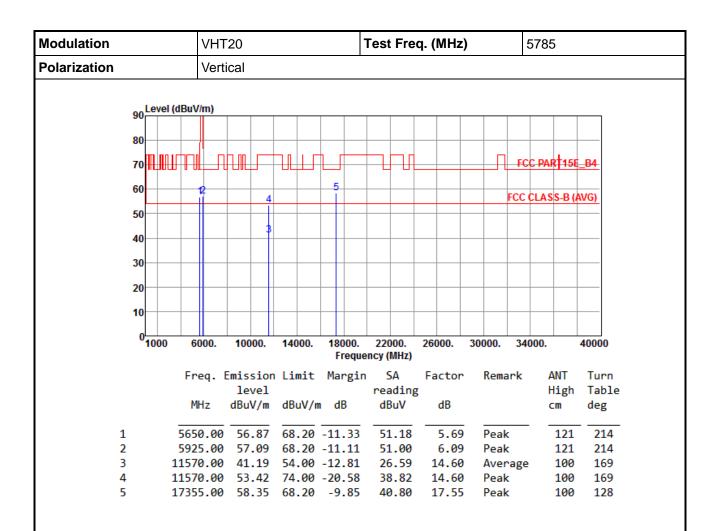


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 95 of 113



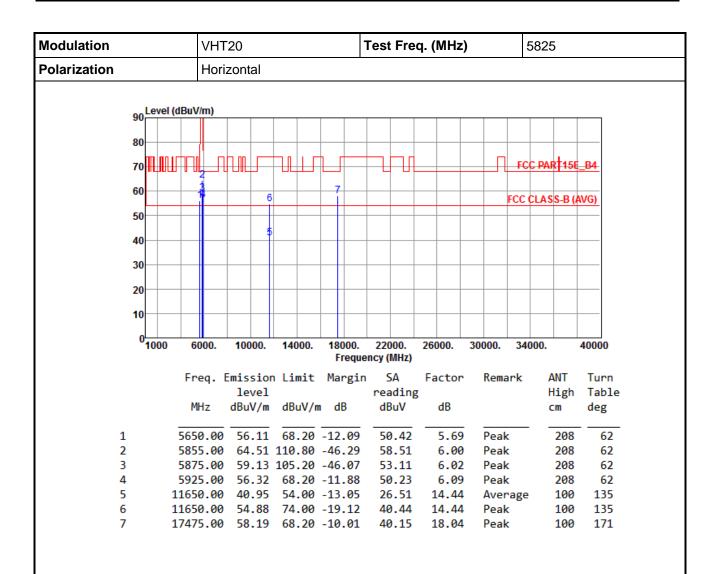


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 96 of 113



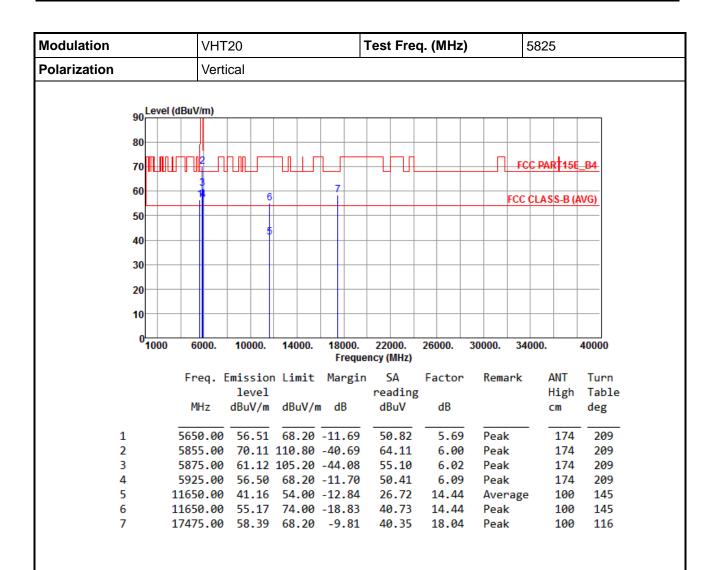


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 97 of 113





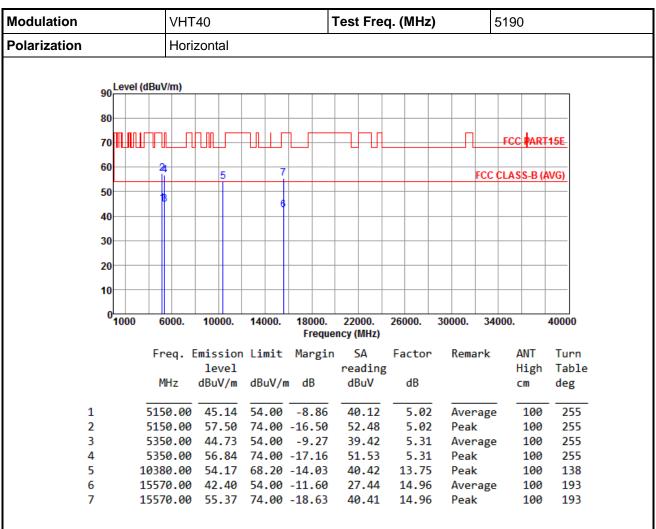
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 98 of 113



## 3.5.11 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT40



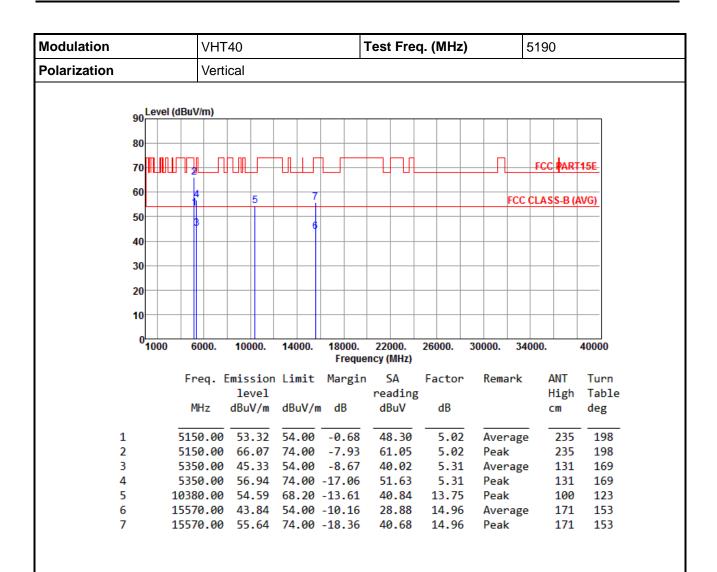
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 99 of 113



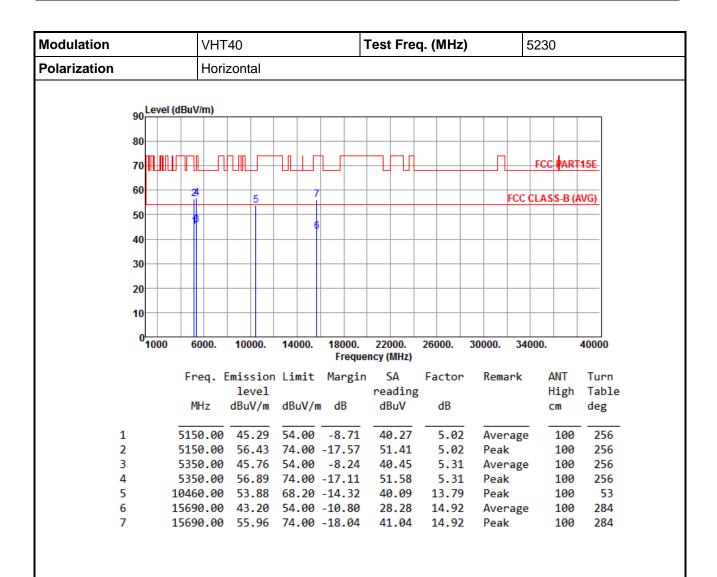


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 100 of 113



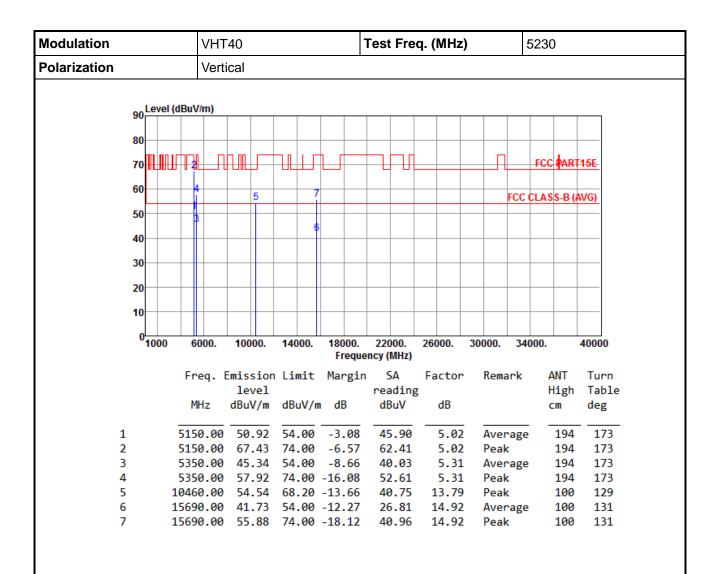


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 101 of 113



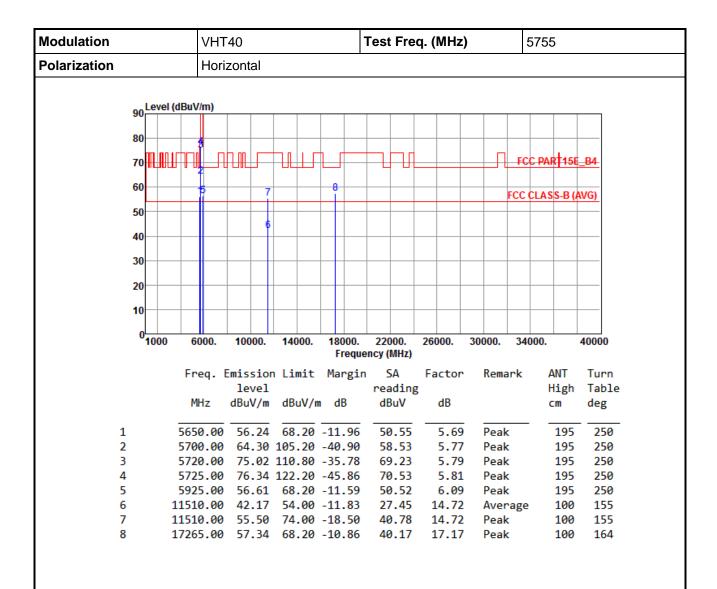


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 102 of 113



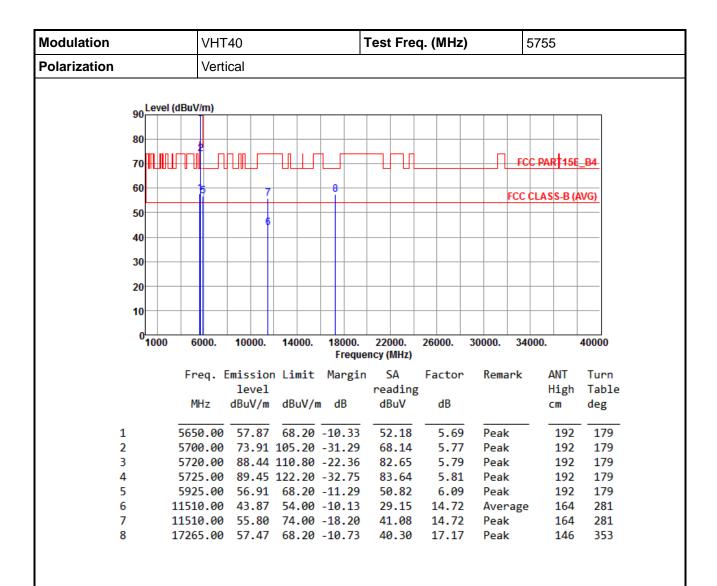


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 103 of 113



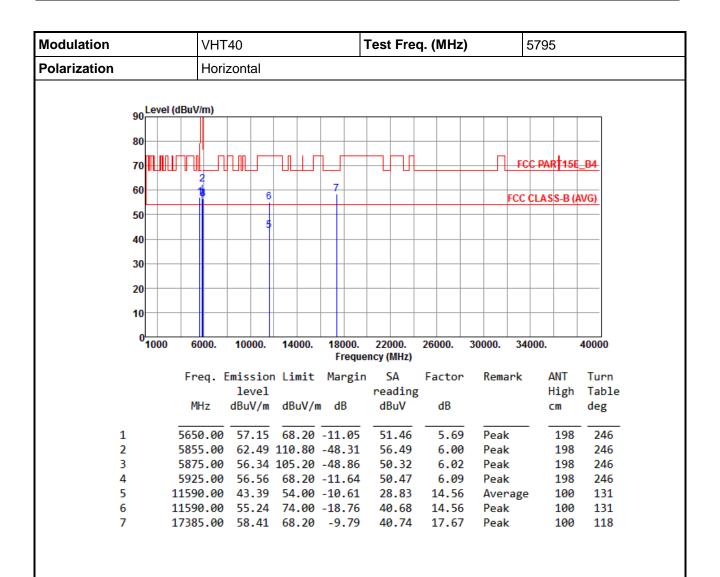


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 104 of 113



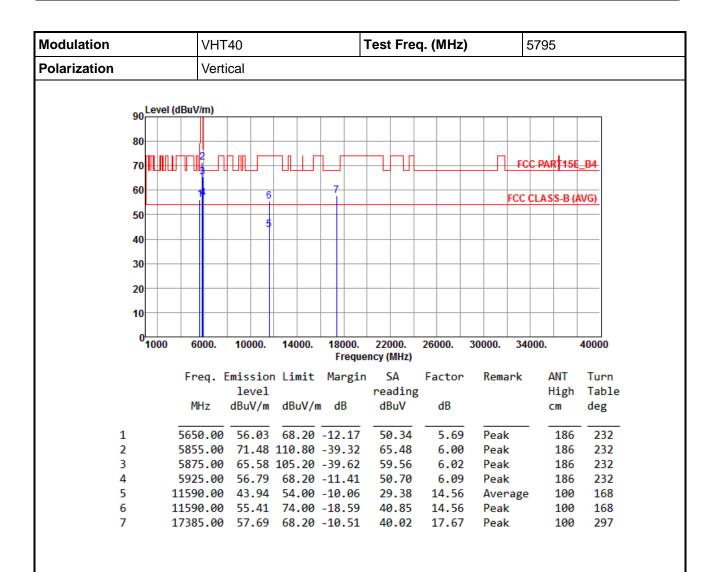


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 105 of 113





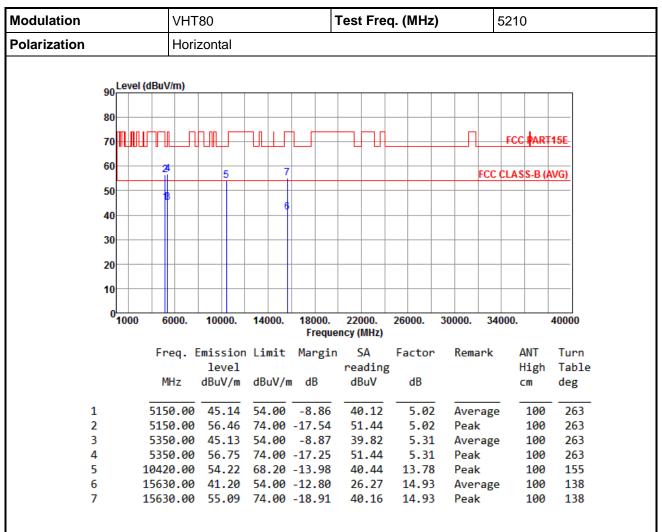
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 106 of 113



## 3.5.12 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT80



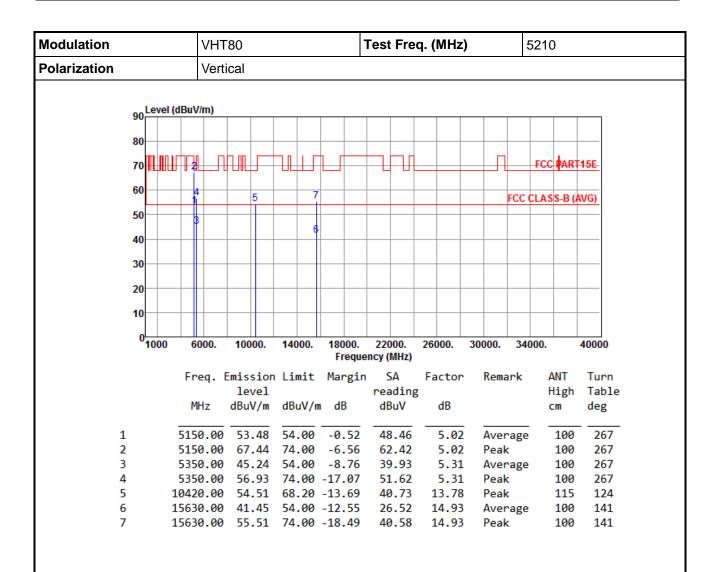
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR721001AN Page: 107 of 113

<sup>\*</sup>Factor includes antenna factor, cable loss and amplifier gain



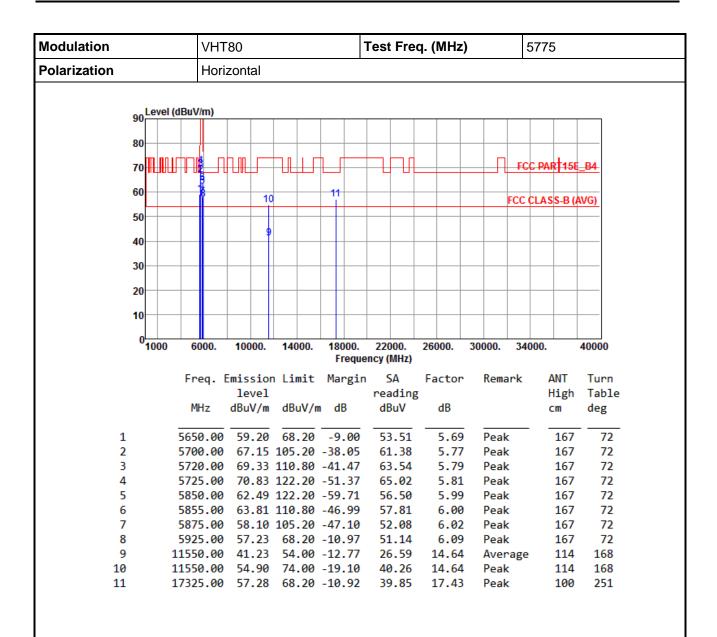


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 108 of 113



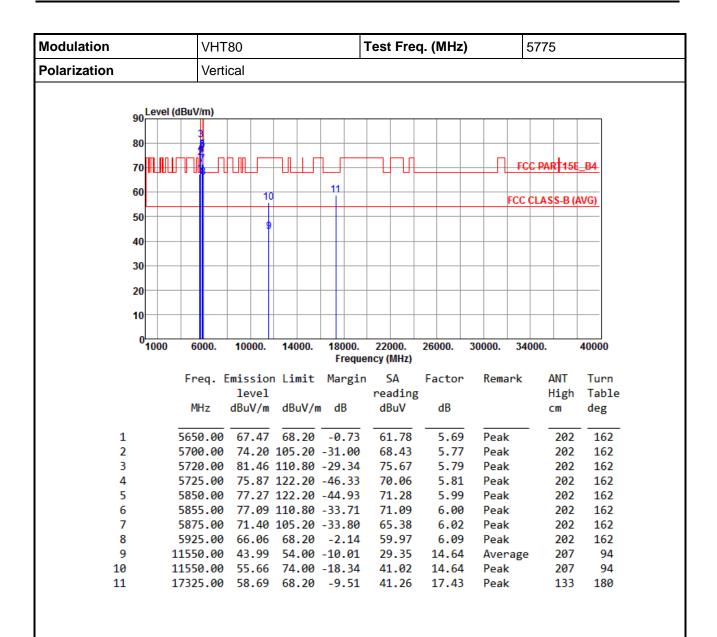


\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 109 of 113





\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR721001AN Page: 110 of 113



## 3.6 Frequency Stability

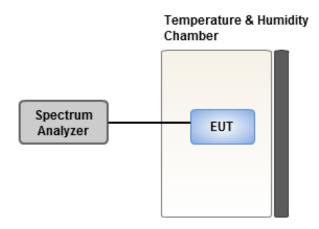
### 3.6.1 Limit of Frequency Stability

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.

#### 3.6.2 Test Procedures

- 1. The EUT is installed in an environment test chamber with external power source.
- Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT.
- 3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
- 4. When temperature is stabled, measure the frequency stability.
- 5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.

## 3.6.3 Test Setup



Report No.: FR721001AN Page: 111 of 113



# 3.6.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)									
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes						
T20°CVmax	6.59	7.08	6.90	6.24						
T20°CVmin	5.14	5.05	5.38	5.13						
T50°CVnom	4.42	5.03	4.48	4.66						
T40°CVnom	4.56	4.69	4.09	5.26						
T30°CVnom	3.27	3.54	3.03	3.23						
T20°CVnom	2.91	3.22	3.15	2.81						
T10°CVnom	2.60	2.69	2.29	2.47						
T0°CVnom	3.61	4.13	3.52	3.77						
T-10°CVnom	2.95	2.71	2.90	3.00						
T-20°CVnom	0.69	0.69	1.17	0.94						
T-30°CVnom	1.95	2.15	2.49	1.72						
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102							
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30							

Frequency: 5785 MHz		Frequency Drift (ppm)									
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes							
T20°CVmax	6.39	6.56	6.68	7.00							
T20°CVmin	5.06	4.99	5.25	5.60							
T50°CVnom	4.58	4.64	5.13	4.48							
T40°CVnom	4.07	3.99	3.96	4.72							
T30°CVnom	2.80	3.17	3.04	3.33							
T20°CVnom	3.10	3.32	3.18	3.71							
T10°CVnom	3.34	3.85	3.97	3.17							
T0°CVnom	4.03	4.58	3.95	4.18							
T-10°CVnom	3.16	2.90	3.47	2.97							
T-20°CVnom	0.94	1.48	1.49	1.07							
T-30°CVnom	1.70	1.52	2.04	1.92							
Vnom [Vac]: 120	Vı	max [Vac]: 138	Vmin [Va	Vmin [Vac]: 102							
Tnom [°C]: 20	Tr	max [°C]: 50	Tmin [°C]	Tmin [°C]: -30							

Report No.: FR721001AN Page: 112 of 113



# 4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <a href="http://www.icertifi.com.tw">http://www.icertifi.com.tw</a>.

#### Linkou

Tel: 886-2-2601-1640 No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City,

Taiwan, R.O.C.

#### Kwei Shan

Tel: 886-3-271-8666 No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

#### Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666 Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

==END==

Report No.: FR721001AN Page: 113 of 113