

FCC Test Report

FCC ID : VQK-F03F

Equipment: Mobile Phone

Model No. : F-03F

Brand Name : FUJITSU

Applicant : FUJITSU LIMITED

Address : 1-1, Kamikodanaka 4-chome, Nakahara-ku,

Kawasaki 211-8588, Japan

Standard : 47 CFR FCC Part 15.407

Received Date : Sep. 13, 2013

Tested Date : Oct. 04 ~ Oct. 16, 2013

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.

Approved & Reviewed by:

Gary Chang / Manager

IAC-MRA

TAF

Testing Laboratory

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Release Record

Report No.	Version	Description	Issued Date
FR391304AN	Rev. 01	Initial issue	Oct. 21, 2013

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Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 2.626MHz 33.87 (Margin -12.13dB) - AV	Pass
15.407(b)(1)(2)(3) 15.209	Radiated Emissions	[dBuV/m at 3m]: 11060.00MHz 48.46 (Margin -5.54dB) - AV	Pass
15.407(a)(1)(2)(3)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(a)(1)(2)(3)	RF Output Power	Power [dBm]: 5150~5250 MHz:11.54 5250~5350 MHz:11.45 5470~5725 MHz:12.54	Pass
15.407(a)(1)(2)(3)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(a)(6)	Peak Excursion	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

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1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	F-03F
IMEI Code	353704050015387, 353704050011303, 353704050015494
H/W Version	V2.1.0
S/W Version	R17.1e

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
IEEE Std. 802.11	Frequency Range (MHz)	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
а	5150-5250 5250-5350 5470-5725	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [8]	1	6-54 Mbps
n (HT20)	5150-5250 5250-5350 5470-5725	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [8]	1	MCS 0-7
n (HT40)	5150-5250 5250-5350 5470-5725	5190-5230 5270-5310 5510-5670	38-46 [2] 54-62 [2] 102-134 [3]	1	MCS 0-7
ac (VHT20)	5150-5250 5250-5350 5470-5725	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [8]	1	MCS 0-8
ac (VHT40)	5150-5250 5250-5350 5470-5725	5190-5230 5270-5310 5510-5670	38-46 [2] 54-62 [2] 102-134 [3]	1	MCS 0-8
ac (VHT80)	5150-5250 5250-5350 5470-5725	5210 5290 5530	42 [1] 58 [1] 106 [1]	1	MCS 0-9

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

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

Note 3: IEEE 802.11ac is draft version.

1.1.3 Antenna Details

Ant. No.	Туре	Gain (dBi)	Connector	Remark
1	λ/4 Monopole	-5.2		

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1.1.4 EUT Operational Condition

Supply Voltage		□ DC	
Type of DC Source	☐ Internal DC supply		□ Battery

1.1.5 Accessories

	Accessories				
No.	Equipment	Description			
		Brand Name: Fujitsu limited			
1	Battery	Model Name: CA54310-0045			
		Power Rating: O/P: 3.8Vdc, 2600mA			
	Cradle	Brand Name: Fujitsu limited			
2		Model Name: F44			
		Power Rating: O/P: 5.0Vdc, 1.5A			

1.1.6 Channel List

802.11 a / HT20 / VHT20		HT40/	VHT40
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	54	5270
48	5240	62	5310
52	5260	102	5510
56	5280	110	5550
60	5300	134	5670
64	5320	VHT	Γ 80
100	5500	42	5210
104	5520	58	5290
108	5540	106	5530
112	5560		
116	5580		
132	5660		
136	5680		
140	5700		

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1.1.7 Test Tool and Duty Cycle

Test Tool	QRCT, Ver 3.0.6.0				
	Mode	Duty cycle (%)	Duty factor (dB)		
	11a	88.37%	0.54		
	HT20	87.69%	0.57		
Duty Cycle and Duty Factor	HT40	78.28%	1.06		
	VHT20	85.01%	0.71		
	VHT40	72.39%	1.40		
	VHT80	57.14%	2.43		

1.1.8 Power Setting

Channel	Frequency(MHz)	11a	HT20	VHT20
CH 36	5180	11.5	10.5	10.5
CH 40	5200	11.5	10.5	10.5
CH 48	5240	11.5	10.5	10.5
CH 52	5260	11.5	10.5	10.5
CH 60	5300	11.5	10.5	10.5
CH 64	5320	11.5	10.5	10.5
CH 100	5500	12.5	11.5	11.5
CH 116	5580	12.5	11.5	11.5
CH 140	5700	12.5	11.5	11.5

Channel	Frequency(MHz)	HT40	VHT40	VHT80
CH 38	5190	10	9.5	-
CH 46	5230	10	9.5	-
CH 54	5270	10	9.5	-
CH 62	5310	10	9.5	-
CH 102	5510	10.5	9.5	-
CH 110	5550	10.5	9.5	-
CH 134	5670	10.5	9.5	-
CH 42	5210	-	-	9.5
CH 58	5290	-	-	9.5
CH 106	5530	-	-	9

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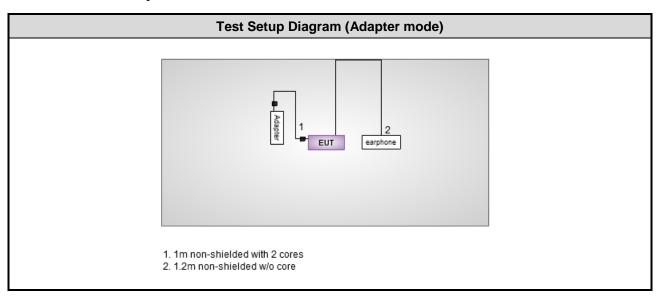


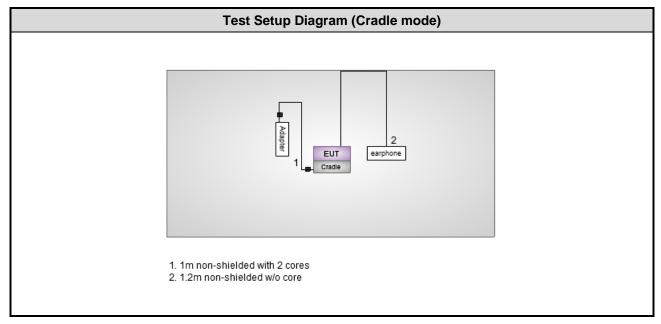
1.2 Local Support Equipment List

	Support Equipment List										
No.	Equipment	Brand	Model S/N FCC ID		Signal cable / Length (m)						
1	Adapter	NTT docomo	AC Adaptor 04			1m non-shielded with 2 cores					
2	Earphone	Apple	MD827FE/A			1.2m non-shielded w/o core					

Note: Item 1 was provided by client.

1.3 Test Setup Chart





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1.4 The Equipment List

Test Item	Conducted Emission									
Test Site	Conduction room 1 / (CO01-WS)									
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until					
EMC Receiver	R&S	ESCS 30	100169	Oct. 15, 2013	Oct. 14, 2014					
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013					
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013					
ISN	TESEQ	ISN T800	34406	Apr. 08, 2013	Apr. 07, 2014					
ISN	TESEQ	ISN T200A	30494	Apr. 09, 2013	Apr. 08, 2014					
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014					
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013					
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013					
ESH3-Z6 V-Network(+)	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013					
ESH3-Z6 V-Network(-)	R&S	ESH3-Z6	100951	Jan. 30, 2013	Jan. 29, 2014					
Two-Line V-Network	R&S	ENV216	101579	Jan. 07, 2013	Jan. 06, 2014					
50 ohm terminal	NA	50	03	Apr. 22, 2013	Apr. 21, 2014					
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014					

Test Item	RF Conducted	RF Conducted									
Test Site	(TH01-WS)	TH01-WS)									
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until						
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014						
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 29, 2012	Nov. 28, 2013						
Power Meter	Anritsu	ML2495A	1218007	Oct. 22, 2012	Oct. 21, 2013						
Power Sensor	Anritsu	MA2411B	1207367	Oct. 22, 2012	Oct. 21, 2013						
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 13, 2014						
Note: Calibration Inter	val of instruments listed	d above is one year.									

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Test Item	Radiated Emission above 1GHz										
Test Site	966 chamber1 / (03Ch	966 chamber1 / (03CH01-WS)									
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until						
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014						
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014						
Receiver	R&S	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014						
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014						
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014						
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014						
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013						
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013						
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013						
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013						
control	EM Electronics	EM1000	60612	N/A	N/A						

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014	
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015	
Note: Calibration Interv	val of instruments listed	d above is two year.				

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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 C63.10-2009

FCC KDB 412172

FCC KDB 789033 D01 General UNII Test procedures v01r03

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

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	±74.147 Hz						
Conducted power	±0.717 dB						
Power density	±2.687 dB						
Frequency error	±74.147 Hz						
Temperature	±0.3 °C						
AC conducted emission	±2.43 dB						
Radiated emission	±2.49 dB						

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2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By	Tested Date
AC Conduction	CO01-WS	21°C / 66%	Peter Lin	Oct. 16, 2013
Radiated Emissions	03CH01-WS	21°C / 66%	Peter Lin	Oct. 04~ Oct. 11, 2013
RF Conducted	TH01-WS	24°C / 61%	Brad Wu	Oct. 10, 2013

FCC site registration No.: 657002IC site registration No.: 10807A-1

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2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11a	5240	6 Mbps	1, 2
Radiated Emissions <1GHz	11a	5240	6 Mbps	1, 2
	11a	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	6 Mbps	
	HT20	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	MCS 0	
RF Output Power	HT40	5190 / 5230/ 5270 / 5310 / 5510 5550 / 5670	MCS 0	1
	VHT20	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	MCS 0	
	VHT40	5190 / 5230/ 5270 / 5310 / 5510 5550 / 5670	MCS 0	
	VHT80	5210 / 5290 / 5530	MCS 0	
	11a	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	6 Mbps	
Radiated Emissions >1GHz Emission Bandwidth	HT20	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	MCS 0	1
Peak Power Spectral Density	HT40	5190 / 5230/ 5270 / 5310 / 5510 5550 / 5670	MCS 0	
	VHT80	5210 / 5290 / 5530	MCS 0	
	11a	5240 / 5260 / 5700	6 Mbps	
	HT20	5240 / 5260 / 5700	MCS 0	
Deal Commission	HT40	5230 / 5310 / 5670	MCS 0	
Peak Excursion	VHT20	5240 / 5260 / 5700	MCS 0	1
	VHT40	5230 / 5310 / 5670	MCS 0	
	VHT80	5210 / 5290 / 5530	MCS 0	
Frequency Stability	Un-modulation	5320		1

NOTE:

- 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
- 2. The EUT had been tested by following test configurations for radiated emission below 1GHz.
 - 1) Configuration 1 : Adapter mode
 - 2) Configuration 2: Cradle mode
- Adapter and cradle mode had been pretested for radiated emission above 1GHz and found that the adapter mode was the worst case and was selected for final test.

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3 Transmitter Test Results

3.1 Conducted Emissions

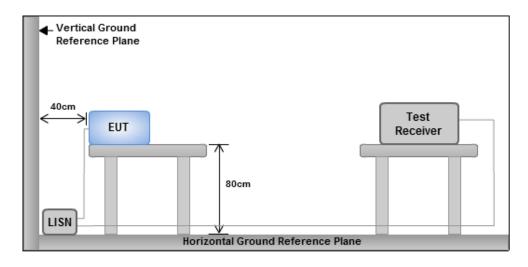
3.1.1 Limit of Conducted Emissions

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



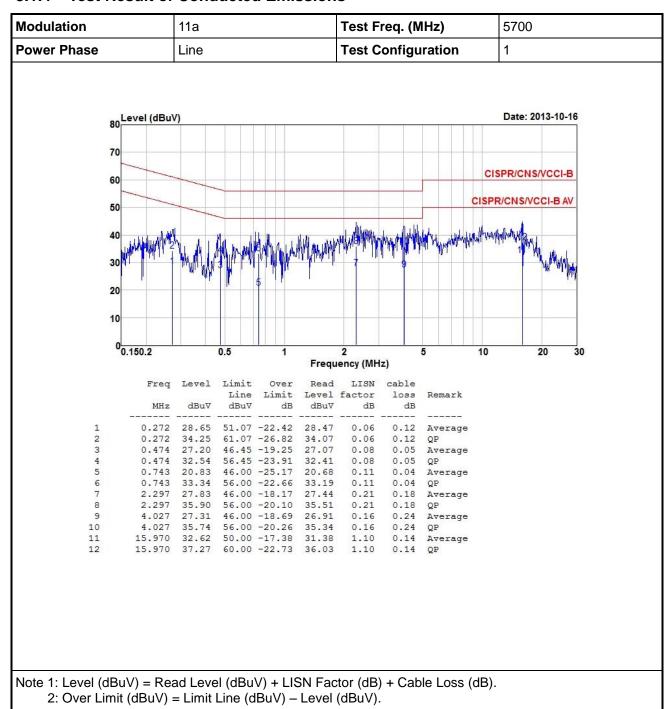
Note: 1. Support units were connected to second LISN.

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

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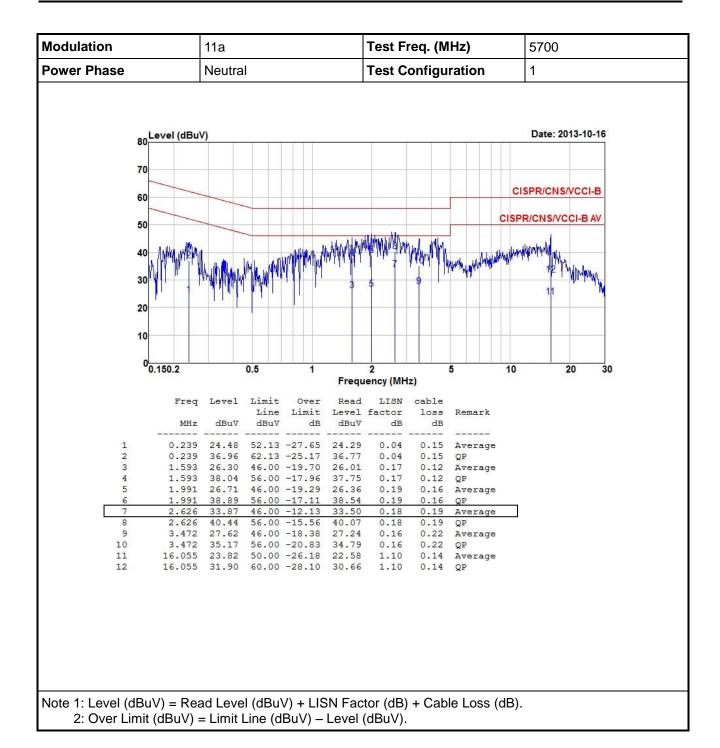


3.1.4 Test Result of Conducted Emissions



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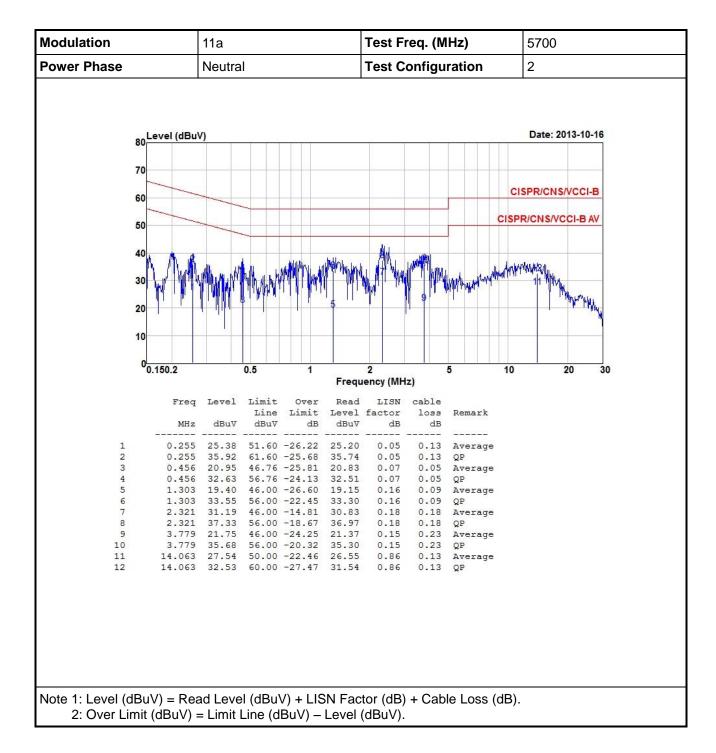
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Modulation		11a			Test Freq. (MHz)				5700			
Power Phase		Line				Test C	onfigu	ıration		2		
	80 Level (dBu	V)						T T T T		Date: 20	13-10-1	6
	200-000 200-000											
	70								CIE	PR/CNS/	VCCLE	
	60											
	50								CISPR/	CNS/VC	CI-B AV	
	40		ud.			olds.	and the late		Labore &	ald task. I		
	an Mul	M My		rd Johnson	h. John Mary J. J.	MANY L. SALVA		Mark Mark	11	ANALAM MANAL		
	30	M M		ANN,	halled . It sh	7					Janton	lat.
	20	19 4	3		5							
	10											
	10											
	0.150.2		0.5	1	95	2		5	10		20	30
					Frequ	iency (MH	lz)					
	Freq	Level	Limit Line	Over Limit	Read	LISN	cable	Remark				
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	TOMALA				
1	0.491	28.91	46.14	-17.23	28.78	0.08	0.05	Average				
2	0.491			-20.28	35.73	0.08	0.05	QP				
3	0.608				18.83		0.05	-				
4 5	0.608			-26.27	29.59	0.09	0.05	QP				
6	1.480	16.40 31.95				0.18	0.11					
7	2.500				24.89		0.19					
8		35.86					0.19					
9		28.87					0.24					
10		35.56										
10		30.03						Average				
11			60 00	-24.53	34 71	0.64	0.12					

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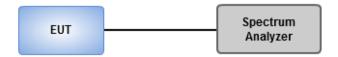


3.2 Emission Bandwidth

3.2.1 Test Procedures

- 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.

3.2.2 Test Setup



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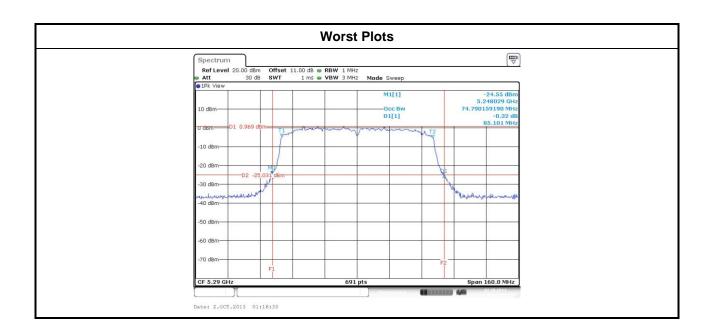


3.2.3 Test Result of Emission Bandwidth

	Emission Bandwidth									
		Freq.	26dB	Bandwidth	(MHz)	99% E	Bandwidth	(MHz)	26dB	99%
Mode	N _{TX}	(MHz)	Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2	Limit	Limit
11a	1	5180	22.43			17.19			17.00	16.35
11a	1	5200	22.67			17.25			17.00	16.37
11a	1	5240	22.43			17.13			17.00	16.34
11a	1	5260	22.61			17.19			24.00	23.35
11a	1	5300	22.20			17.19			24.00	23.35
11a	1	5320	22.38			17.19			24.00	23.35
11a	1	5500	22.49			17.13			24.00	23.34
11a	1	5580	22.32			17.19			24.00	23.35
11a	1	5700	22.43			17.19			24.00	23.35
HT40	1	5190	46.03			36.93			17.00	17.00
HT40	1	5230	45.45			36.70			17.00	17.00
HT40	1	5270	45.10			36.70			24.00	24.00
HT40	1	5310	45.22			36.82			24.00	24.00
HT40	1	5510	45.22			36.93			24.00	24.00
HT40	1	5550	45.80			36.93			24.00	24.00
HT40	1	5670	45.33			36.93			24.00	24.00
VHT20	1	5180	22.55			18.12			17.00	16.58
VHT20	1	5200	22.67			18.18			17.00	16.60
VHT20	1	5240	22.55			18.12			17.00	16.58
VHT20	1	5260	22.61			18.12			24.00	23.58
VHT20	1	5300	22.72			18.12			24.00	23.58
VHT20	1	5320	22.72			18.12			24.00	23.58
VHT20	1	5500	22.67			18.12			24.00	23.58
VHT20	1	5580	22.78			18.18			24.00	23.60
VHT20	1	5700	22.90			18.12			24.00	23.58
VHT80	1	5210	84.41			75.02			17.00	17.00
VHT80	1	5290	85.10			74.79			24.00	24.00
VHT80	1	5530	84.87			74.79			24.00	24.00

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3.3 RF Output Power

3.3.1 Limit of RF Output Power

	Frequency Band (GHz)	Limit
	5.15~5.25	50mW or 4dBm+10 log B
	5.25~5.35	250mW or 11dBm+10 log B
	5.47~5.725	250mW or 11dBm+10 log B
Note	e: "B" is the 26dB emission bandwidth in MHz.	

3.3.2 Test Procedures

Now 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



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3.3.4 Test Result of Maximum Conducted Output Power

			RF O	utput Power	(dBm)			
Mode	N _{TX}	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Total Power (mW)	Total Power (dBm)	Limit
11a	1	5180	11.54			14.256	11.54	17.00
11a	1	5200	11.38			13.740	11.38	17.00
11a	1	5240	11.47			14.028	11.47	17.00
11a	1	5260	11.32			13.552	11.32	24.00
11a	1	5300	11.10			12.882	11.10	24.00
11a	1	5320	11.45			13.964	11.45	24.00
11a	1	5500	12.24			16.749	12.24	24.00
11a	1	5580	12.46			17.620	12.46	24.00
11a	1	5700	12.54			17.947	12.54	24.00
HT20	1	5180	10.47			11.143	10.47	17.00
HT20	1	5200	10.26			10.617	10.26	17.00
HT20	1	5240	10.34			10.814	10.34	17.00
HT20	1	5260	10.36			10.864	10.36	24.00
HT20	1	5300	10.24			10.568	10.24	24.00
HT20	1	5320	10.39			10.940	10.39	24.00
HT20	1	5500	11.47			14.028	11.47	24.00
HT20	1	5580	11.28			13.428	11.28	24.00
HT20	1	5700	11.52			14.191	11.52	24.00
HT40	1	5190	9.98			9.954	9.98	17.00
HT40	1	5230	9.65			9.226	9.65	17.00
HT40	1	5270	9.62			9.162	9.62	24.00
HT40	1	5310	9.92			9.817	9.92	24.00
HT40	1	5510	10.42			11.015	10.42	24.00
HT40	1	5550	10.31			10.740	10.31	24.00
HT40	1	5670	10.18			10.423	10.18	24.00

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			RF Ou	utput Power	(dBm)			
Mode	N _{TX}	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Total Power (mW)	Total Power (dBm)	Limit
VHT20	1	5180	10.49			11.194	10.49	17.00
VHT20	1	5200	10.31			10.740	10.31	17.00
VHT20	1	5240	10.38			10.914	10.38	17.00
VHT20	1	5260	10.39			10.940	10.39	24.00
VHT20	1	5300	10.26			10.617	10.26	24.00
VHT20	1	5320	10.41			10.990	10.41	24.00
VHT20	1	5500	11.49			14.093	11.49	24.00
VHT20	1	5580	11.36			13.677	11.36	24.00
VHT20	1	5700	11.54			14.256	11.54	24.00
VHT40	1	5190	9.48			8.872	9.48	17.00
VHT40	1	5230	9.18			8.279	9.18	17.00
VHT40	1	5270	9.21			8.337	9.21	24.00
VHT40	1	5310	9.26			8.433	9.26	24.00
VHT40	1	5510	9.36			8.630	9.36	24.00
VHT40	1	5550	9.15			8.222	9.15	24.00
VHT40	1	5670	9.38			8.670	9.38	24.00
VHT80	1	5210	9.51			8.933	9.51	17.00
VHT80	1	5290	9.48			8.872	9.48	24.00
VHT80	1	5530	9.22			8.356	9.22	24.00

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3.4 Peak Power Spectral Density

3.4.1 Limit of Peak Power Spectral Density

	Frequency Band (GHz)	Limit (dBm)
\boxtimes	5.15~5.25	4
	5.25~5.35	11
	5.47~5.725	11

3.4.2 Test Procedures

	M	let	h	a	Ч	S	Α	
	 ıv	ıcı		v	u	_	\neg	

- 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

- Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
- 2. Set sweep time ≥ 10 * (number of points in sweep) * (symbol period of the transmitted signal).
- 3. Perform a single sweep.
- 4. Use the peak marker function to determine the maximum amplitude level.

Method SA-2 Alternative

- 1. 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.

3.4.3 Test Setup



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3.4.4 Test Result of Peak Power Spectral Density

Co	ondition		ı	Peak Power Spec	tral Density (dBm)
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm)	Duty factor (dB)	PPSD with D.F (dBm)	PPSD Limit (dBm)
11a	1	5180	-2.23	0.54	-1.69	4
11a	1	5200	-2.30	0.54	-1.76	4
11a	1	5240	-2.21	0.54	-1.67	4
11a	1	5260	-2.27	0.54	-1.73	11
11a	1	5300	-2.24	0.54	-1.70	11
11a	1	5320	-2.49	0.54	-1.95	11
11a	1	5500	-1.56	0.54	-1.02	11
11a	1	5580	-1.45	0.54	-0.91	11
11a	1	5700	-1.34	0.54	-0.80	11

Note: D.F is duty factor

Co	ondition		Peak Power Spectral Density (dBm)						
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD Duty factor (dBm)		PPSD with D.F (dBm)	PPSD Limit (dBm)			
HT40	1	5190	-7.38	1.06	-6.32	4			
HT40	1	5230	-7.87	1.06	-6.81	4			
HT40	1	5270	-7.83	1.06	-6.77	11			
HT40	1	5310	-7.87	1.06	-6.81	11			
HT40	1	5510	-7.39	1.06	-6.33	11			
HT40	1	5550	-7.39	1.06	-6.33	11			
HT40	1	5670	-7.62	1.06	-6.56	11			

Note: D.F is duty factor

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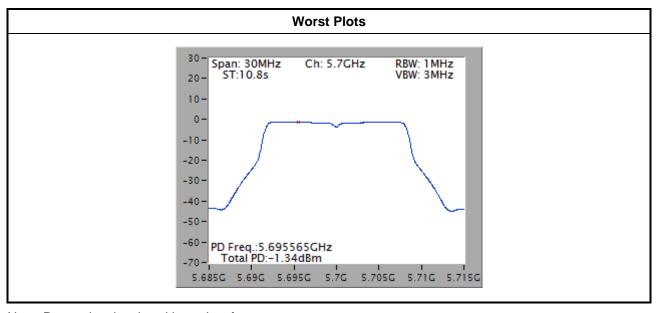


Co	ondition		ı	Peak Power Spec	tral Density (dBm)
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm)	Duty factor (dB)	PPSD with D.F (dBm)	PPSD Limit (dBm)
VHT20	1	5180	-3.63	0.71	-2.92	4
VHT20	1	5200	-3.71	0.71	-3.00	4
VHT20	1	5240	-3.75	0.71	-3.04	4
VHT20	1	5260	-3.66	0.71	-2.95	11
VHT20	1	5300	-3.67	0.71	-2.96	11
VHT20	1	5320	-3.92	0.71	-3.21	11
VHT20	1	5500	-2.85	0.71	-2.14	11
VHT20	1	5580	-3.21	0.71	-2.50	11
VHT20	1	5700	-2.69	0.71	-1.98	11

Note: D.F is duty factor

Co	ondition		Peak Power Spectral Density (dBm)					
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm)	Duty factor (dB)	PPSD with D.F (dBm)	PPSD Limit (dBm)		
VHT80	1	5210	-12.31	2.43	-9.88	4		
VHT80	1	5290	-12.07	2.43	-9.64	11		
VHT80	1	5530	-12.39	2.43	-9.96	11		

Note: D.F is duty factor



Note: Power density plot without duty factor

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3.5 Peak Excursion

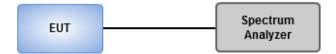
3.5.1 Peak Excursion Limit

Peak excursion of the modulation envelope shall not exceed 13 dB across any 1 MHz bandwidth.

3.5.2 Test Procedures

- 1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = peak.
- 2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
- 3. Use the peak search function to find the peak of the spectrum.
- 4. Use the procedure of section 3.4.2 to measure the PPSD.
- 5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD

3.5.3 Test Setup



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3.5.4 Test Result of Peak Excursion

Frequency	band(MHz)			5	i150~5250		
Mode	Modulation Mode	N _{TX}	Freq. (MHz)	Measured value(dB)	Duty factor (dB)	Peak Excursion (dB)	Limit
11a	BPSK	1	5180	8.87	0.54	8.33	13
11a	QPSK	1	5180	9.28	1.02	8.26	13
11a	16QAM	1	5180	10.46	1.79	8.67	13
11a	64QAM	1	5180	11.32	2.99	8.33	13
HT40	BPSK	1	5190	9.73	1.06	8.67	13
HT40	QPSK	1	5190	10.24	1.89	8.35	13
HT40	16QAM	1	5190	11.6	2.78	8.82	13
HT40	64QAM	1	5190	12.23	4.16	8.07	13
VHT20	BPSK	1	5180	8.95	0.71	8.24	13
VHT20	QPSK	1	5180	9.05	1.36	7.69	13
VHT20	16QAM	1	5180	10.18	2.25	7.93	13
VHT20	64QAM	1	5180	11.69	3.35	8.34	13
VHT20	256QAM	1	5180	11.35	4.09	7.26	13
VHT40	BPSK	1	5190	10.18	1.40	8.78	13
VHT40	QPSK	1	5190	12.35	2.32	10.03	13
VHT40	16QAM	1	5190	11.97	3.35	8.62	13
VHT40	64QAM	1	5190	12.39	4.47	7.92	13
VHT40	256QAM	1	5190	13.43	4.91	8.52	13
VHT80	BPSK	1	5210	11.62	2.43	9.19	13
VHT80	QPSK	1	5210	11.12	3.58	7.54	13
VHT80	16QAM	1	5210	12.32	4.73	7.59	13
VHT80	64QAM	1	5210	13.17	5.45	7.72	13
VHT80	256QAM	1	5210	14.03	5.85	8.18	13

Note: Measured value = Peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission. Since the duty cycle is < 98 %, duty factor is required to average spectrum Peak exclusion = Measured value – duty factor

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Frequency	band(MHz)			5	5250~5350		
Mode	Modulation Mode	N _{TX}	Freq. (MHz)	Measured value(dB)	Duty factor (dB)	Peak Excursion (dB)	Limit
11a	BPSK	1	5320	9.23	0.54	8.69	13
11a	QPSK	1	5320	9.73	1.02	8.71	13
11a	16QAM	1	5320	11.09	1.79	9.30	13
11a	64QAM	1	5320	11.74	2.99	8.75	13
HT40	BPSK	1	5310	9.06	1.06	8.00	13
HT40	QPSK	1	5310	10.19	1.89	8.30	13
HT40	16QAM	1	5310	11.69	2.78	8.91	13
HT40	64QAM	1	5310	12.9	4.16	8.74	13
VHT20	BPSK	1	5320	8.96	0.71	8.25	13
VHT20	QPSK	1	5320	9.65	1.36	8.29	13
VHT20	16QAM	1	5320	9.86	2.25	7.61	13
VHT20	64QAM	1	5320	11.97	3.35	8.62	13
VHT20	256QAM	1	5320	11.75	4.09	7.66	13
VHT40	BPSK	1	5310	9.6	1.40	8.20	13
VHT40	QPSK	1	5310	12.61	2.32	10.29	13
VHT40	16QAM	1	5310	11.96	3.35	8.61	13
VHT40	64QAM	1	5310	11.74	4.47	7.27	13
VHT40	256QAM	1	5310	13.56	4.91	8.65	13
VHT80	BPSK	1	5290	10.81	2.43	8.38	13
VHT80	QPSK	1	5290	11.81	3.58	8.23	13
VHT80	16QAM	1	5290	12.2	4.73	7.47	13
VHT80	64QAM	1	5290	13.07	5.45	7.62	13
VHT80	256QAM	1	5290	14.17	5.85	8.32	13

Note: Measured value = Peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission. Since the duty cycle is < 98 %, duty factor is required to average spectrum Peak exclusion = Measured value – duty factor

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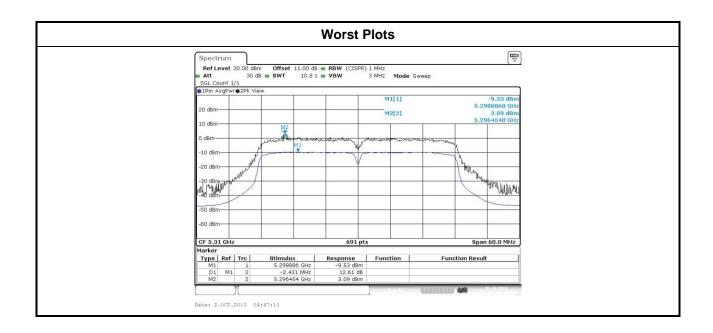


Frequency	band(MHz)			5	470~5725		
Mode	Modulation Mode	N _{TX}	Freq. (MHz)	Measured value(dB)	Duty factor (dB)	Peak Excursion (dB)	Limit
11a	BPSK	1	5700	9.21	0.54	8.67	13
11a	QPSK	1	5700	9.88	1.02	8.86	13
11a	16QAM	1	5700	11.27	1.79	9.48	13
11a	64QAM	1	5700	11.97	2.99	8.98	13
HT40	BPSK	1	5510	9.48	1.06	8.42	13
HT40	QPSK	1	5510	11.54	1.89	9.65	13
HT40	16QAM	1	5510	12.02	2.78	9.24	13
HT40	64QAM	1	5510	13.68	4.16	9.52	13
VHT20	BPSK	1	5700	8.87	0.71	8.16	13
VHT20	QPSK	1	5700	9.67	1.36	8.31	13
VHT20	16QAM	1	5700	10.09	2.25	7.84	13
VHT20	64QAM	1	5700	12.25	3.35	8.90	13
VHT20	256QAM	1	5700	11.34	4.09	7.25	13
VHT40	BPSK	1	5670	9.27	1.40	7.87	13
VHT40	QPSK	1	5670	12.59	2.32	10.27	13
VHT40	16QAM	1	5670	12.29	3.35	8.94	13
VHT40	64QAM	1	5670	12.17	4.47	7.70	13
VHT40	256QAM	1	5670	13.55	4.91	8.64	13
VHT80	BPSK	1	5530	11.26	2.43	8.83	13
VHT80	QPSK	1	5530	11.08	3.58	7.50	13
VHT80	16QAM	1	5530	12.35	4.73	7.62	13
VHT80	64QAM	1	5530	13.41	5.45	7.96	13
VHT80	256QAM	1	5530	14.46	5.85	8.61	13

Note: Measured value = Peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission. Since the duty cycle is < 98 %, duty factor is required to average spectrum Peak exclusion = Measured value – duty factor

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3.6 Transmitter Radiated and Band Edge Emissions

3.6.1 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]
5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
5.725 - 5.825 GHz	5.715 5.725 GHz: e.i.r.p17 dBm [78.2 dBuV/m@3m] 5.825 5.835 GHz: e.i.r.p17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p27 dBm [68.2 dBuV/m@3m]

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).

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3.6.2 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 a height of 0.8 m test table above the ground plane.
- 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.

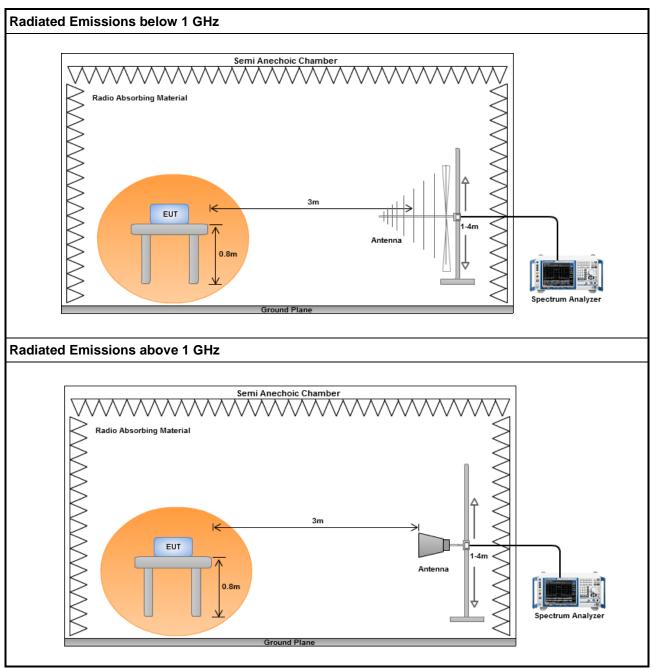
Note:

- 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.

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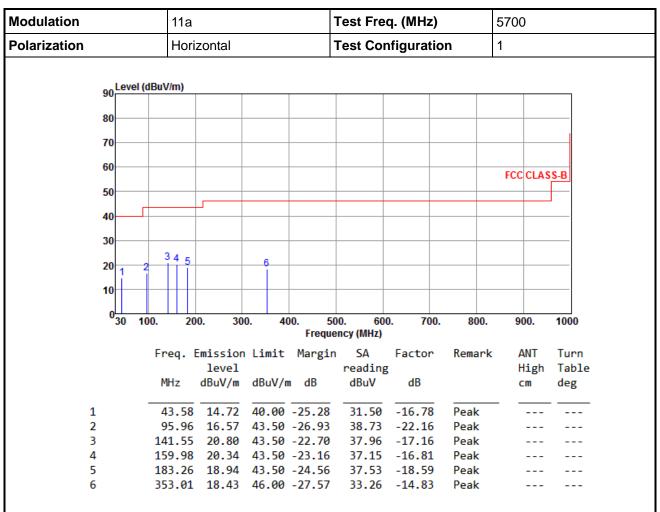
3.6.3 Test Setup



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3.6.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)



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

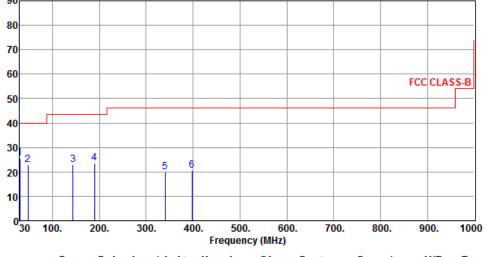
*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation		11a		Test Fre	q. (MH	<u>z</u>)	5700	5700			
Polarization		Vertical		Test Co	nfigura	tion	1				
90 ₀	evel (dBuV	//m)	ı						1		
80-											
70-											



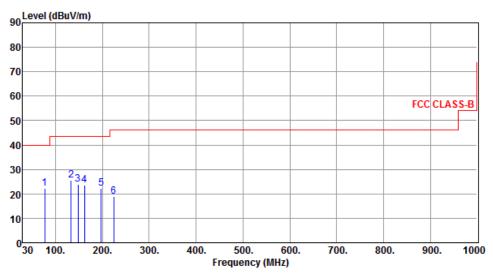
	Freq.	Emission level	Limit	Margin	SA reading		Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	30.00	25.45	40.00	-14.55	43.18	-17.73	Peak		
2	47.46	23.04	40.00	-16.96	39.67	-16.63	Peak		
3	143.49	22.77	43.50	-20.73	39.88	-17.11	Peak		
4	190.05	23.46	43.50	-20.04	42.55	-19.09	Peak		
5	340.40	19.97	46.00	-26.03	35.13	-15.16	Peak		
6	397.63	20.50	46.00	-25.50	34.22	-13.72	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).

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Modulation	11a	Test Freq. (MHz)	5700
Polarization	Horizontal	Test Configuration	2



	Freq.	Emission level	Limit	Margin	SA reading		Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	77.53	22.36	40.00	-17.64	43.54	-21.18	Peak		
2	133.79	25.44	43.50	-18.06	43.21	-17.77	Peak		
3	148.34	24.02	43.50	-19.48	41.01	-16.99	Peak		
4	161.92	23.74	43.50	-19.76	40.63	-16.89	Peak		
5	197.81	22.40	43.50	-21.10	41.62	-19.22	Peak		
6	224.00	18.84	46.00	-27.16	38.01	-19.17	Peak		

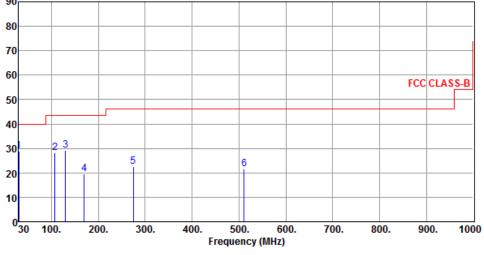
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain

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

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Modulation	11a	Test Freq. (MHz)	5700		
Polarization	Vertical	Test Configuration	2		
90 Level (dBu\	//m)				
70					



	Freq.	Emission level	Limit	Margin	SA reading		Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	30.00	28.89	40.00	-11.11	46.62	-17.73	Peak		
2	107.60	28.14	43.50	-15.36	48.51	-20.37	Peak		
3	129.91	29.34	43.50	-14.16	47.47	-18.13	Peak		
4	169.68	19.58	43.50	-23.92	36.75	-17.17	Peak		
5	274.44	22.59	46.00	-23.41	39.48	-16.89	Peak		
6	511.12	21.64	46.00	-24.36	33.02	-11.38	Peak		

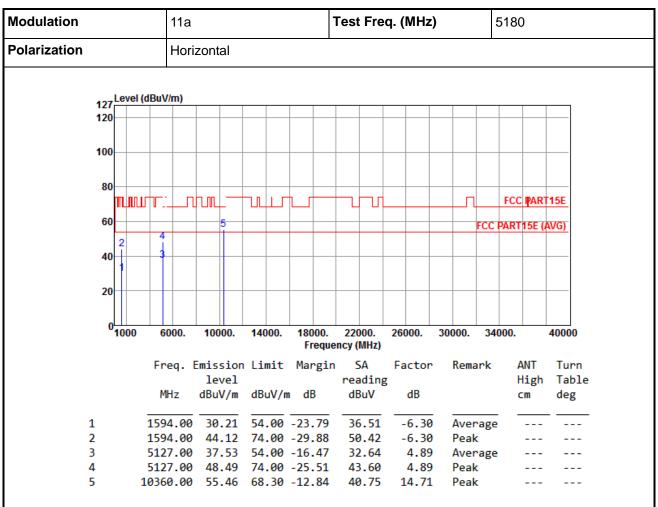
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain

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

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



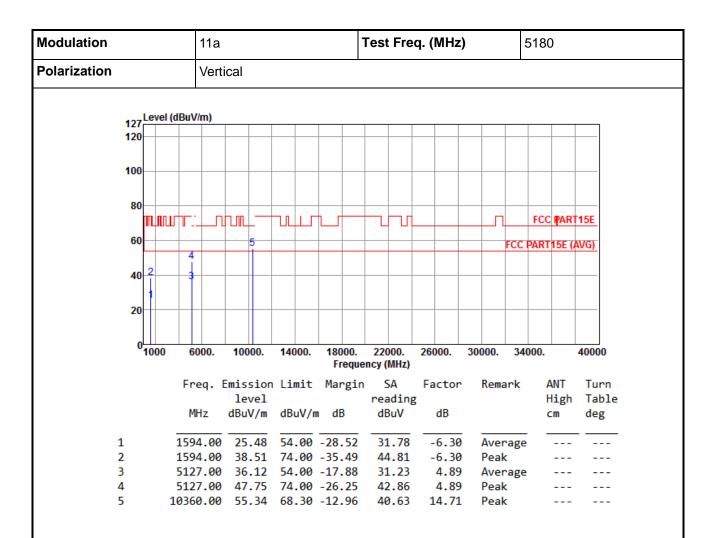
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

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^{*}Factor includes antenna factor, cable loss and amplifier gain

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



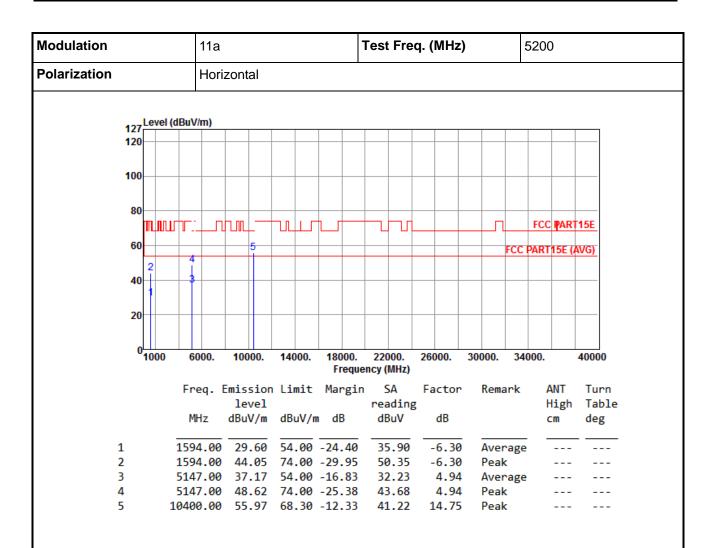


*Factor includes antenna factor, cable loss and amplifier gain

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

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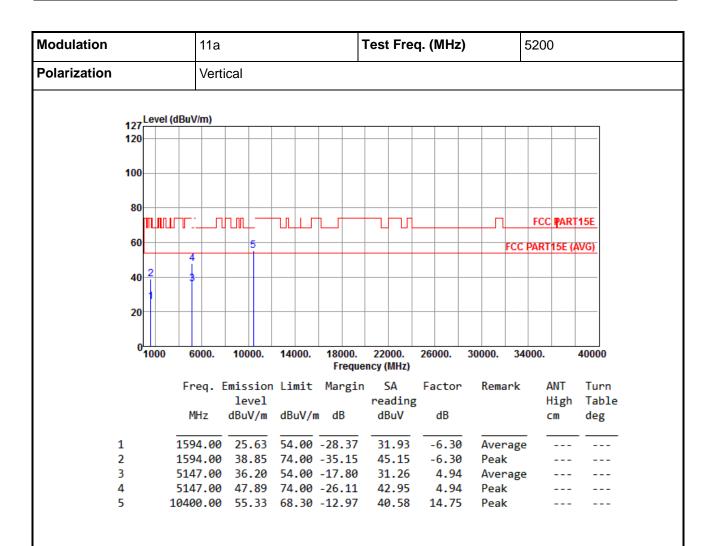


*Factor includes antenna factor, cable loss and amplifier gain

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

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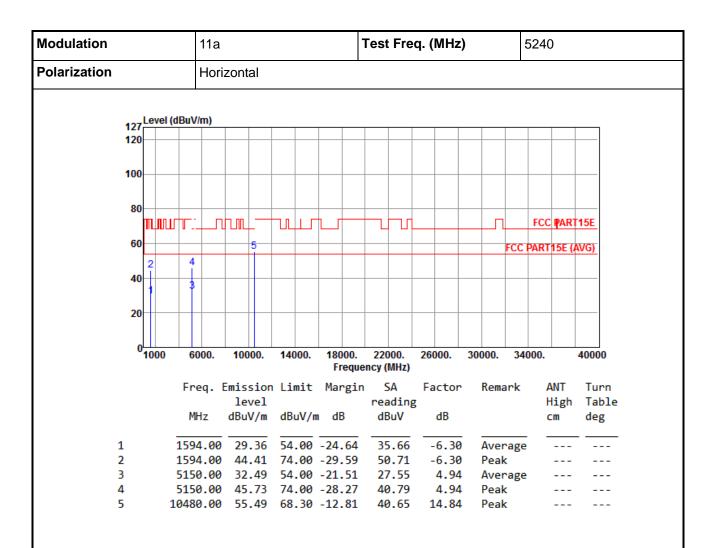


*Factor includes antenna factor, cable loss and amplifier gain

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

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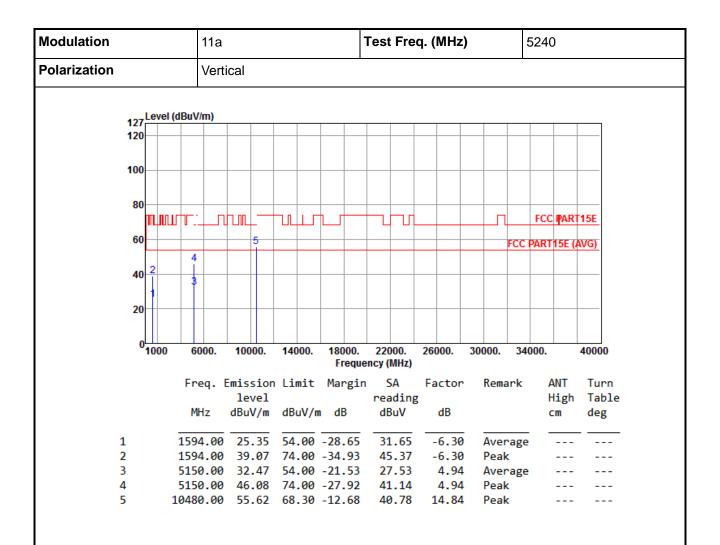


*Factor includes antenna factor, cable loss and amplifier gain

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

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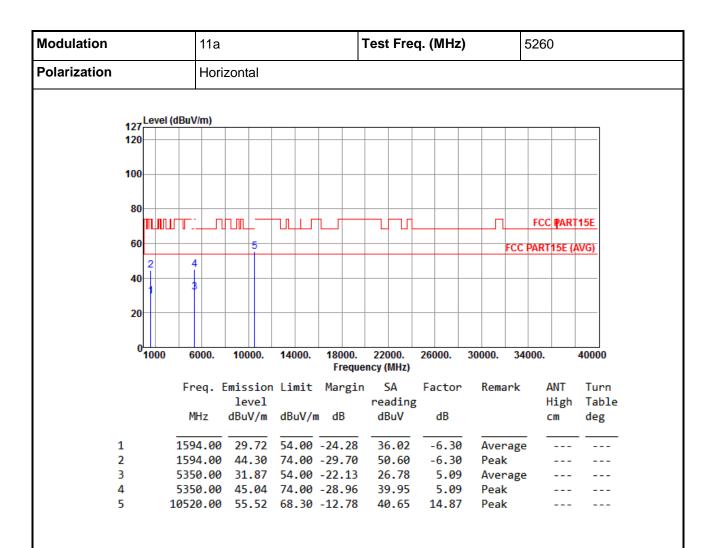


*Factor includes antenna factor, cable loss and amplifier gain

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

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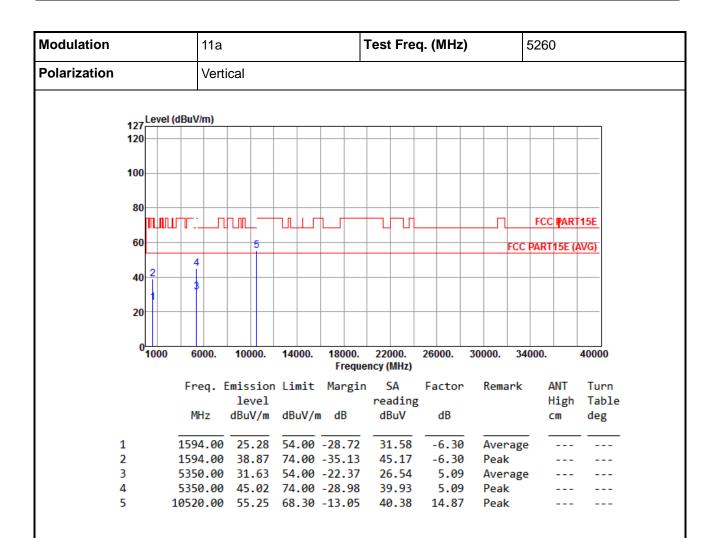


*Factor includes antenna factor, cable loss and amplifier gain

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

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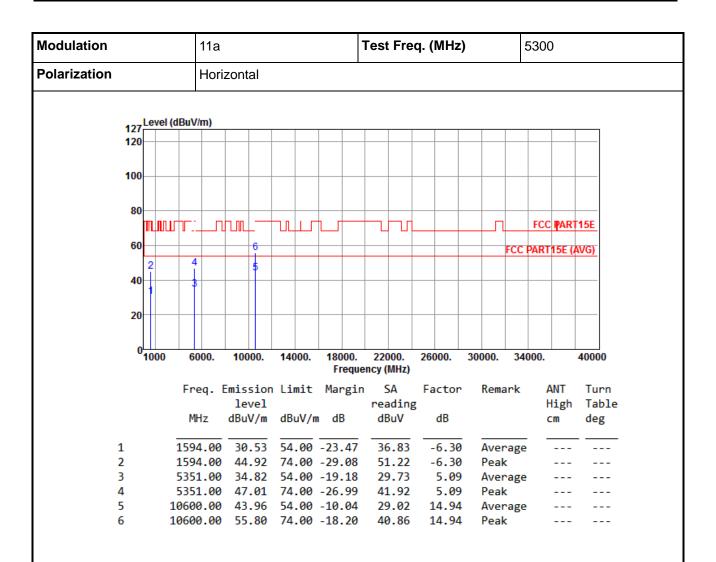


*Factor includes antenna factor, cable loss and amplifier gain

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

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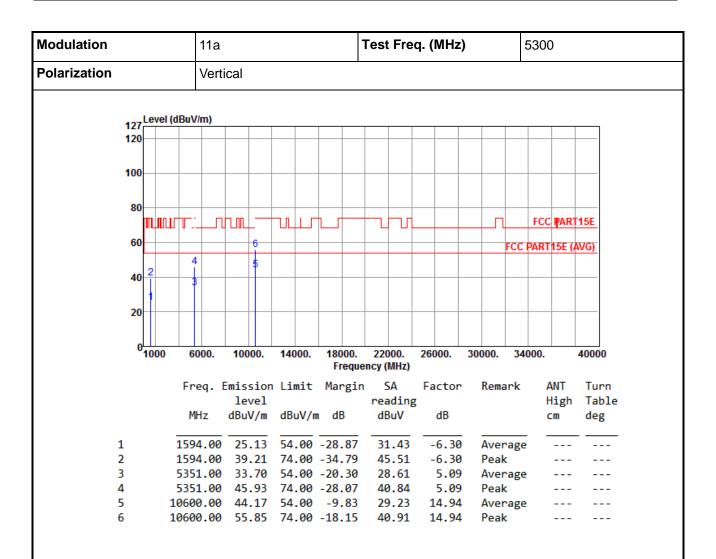


*Factor includes antenna factor, cable loss and amplifier gain

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

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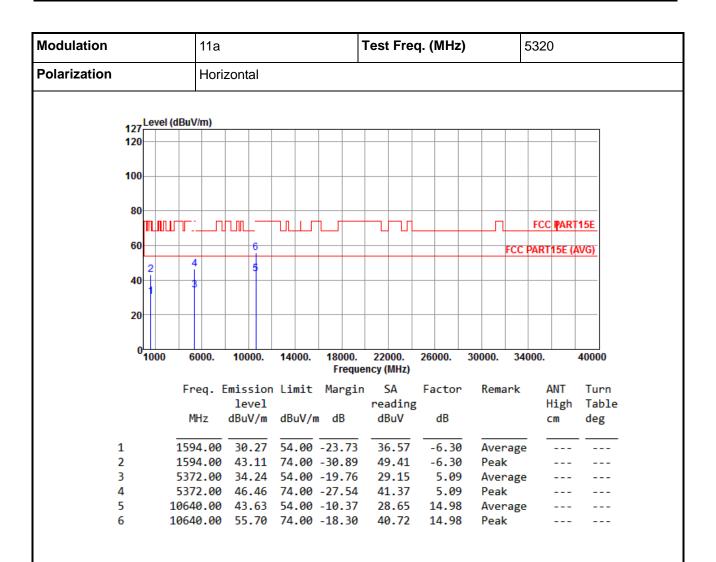


*Factor includes antenna factor, cable loss and amplifier gain

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

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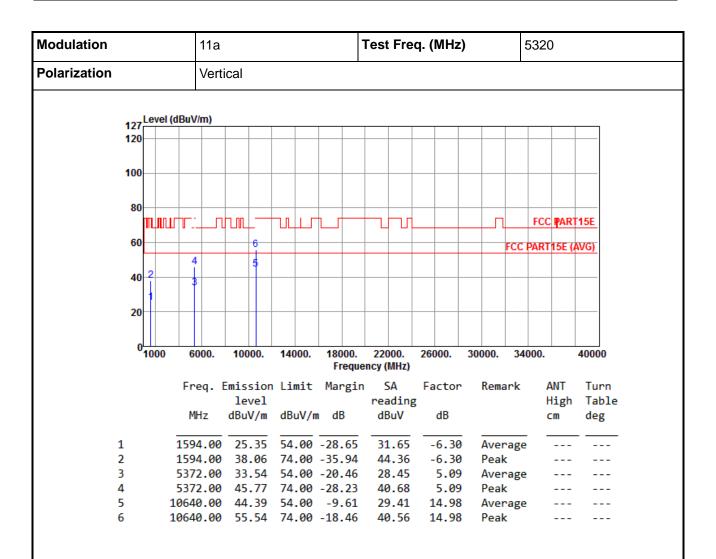


*Factor includes antenna factor, cable loss and amplifier gain

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

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*Factor includes antenna factor, cable loss and amplifier gain

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

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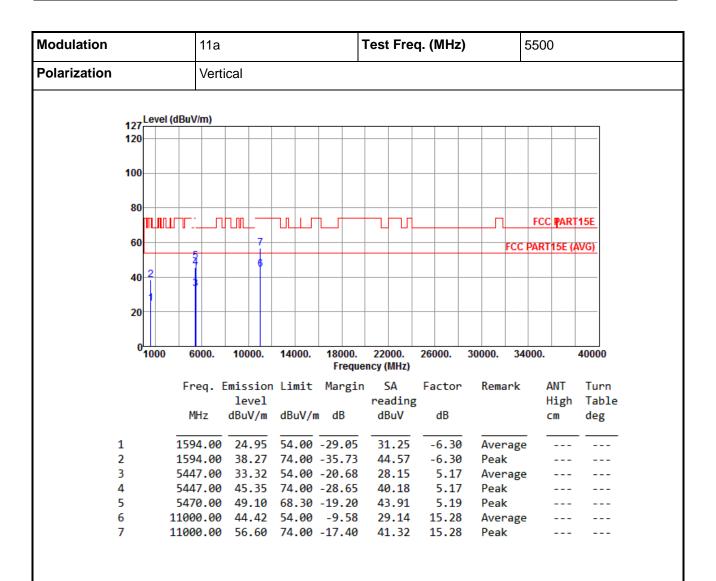
Modulation				11a							Test Freq. (MHz)							5500			
Polarization				Horizontal																	
		l evel	(dBuV	/m)																	
	127 120																				
	100																				
	80																				
	80		I	\perp		_						小				Л	FC	PAR	T15E		
	60		F			7										FC	C PAR	T15E (AVG)		
	40	2	2			6															
	40	1	'																		
	20																				
	0	1000	6	000.	100	00.	1400	0.	1800 Fre		220 ncy (I		260	000.	30000). 3	4000.		40000		
			Fr	eq. E			n Lim:	it	Marg			Α	Fa	ctor	Re	mark	:	ANT	Tur		
			м	Hz		/el	dBu\	/ /n	n dB		rea dB	ding		dB				High cm	Tab deg		
						_		_		_					_		_				
	1			4.00	30				-23.4			.82		6.30		erag	e				
	2			4.00 7.00		.16 .47			-29.8 -18.5			.46		6.30 5.17		ak					
	4			7.00		.47			-26.8			.01		5.17		erag ak	e				
	5			0.00		.79			-17.5			.60		5.19		ak					
	6		1100	0.00	43	.80	54.0	90	-10.2	20		.52	1	5.28	Av	erag	e				
	7		1100	0.00	55	.91	74.0	90	-18.6	99	40	.63	1	5.28	Pe	ak					

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).

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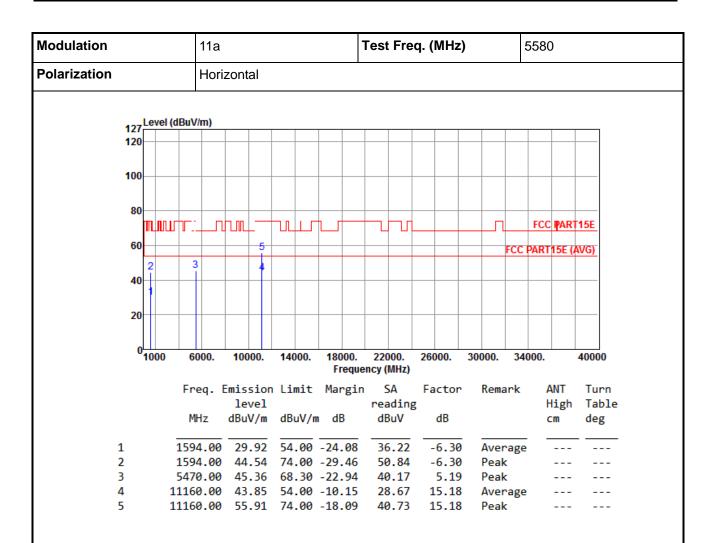


*Factor includes antenna factor, cable loss and amplifier gain

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

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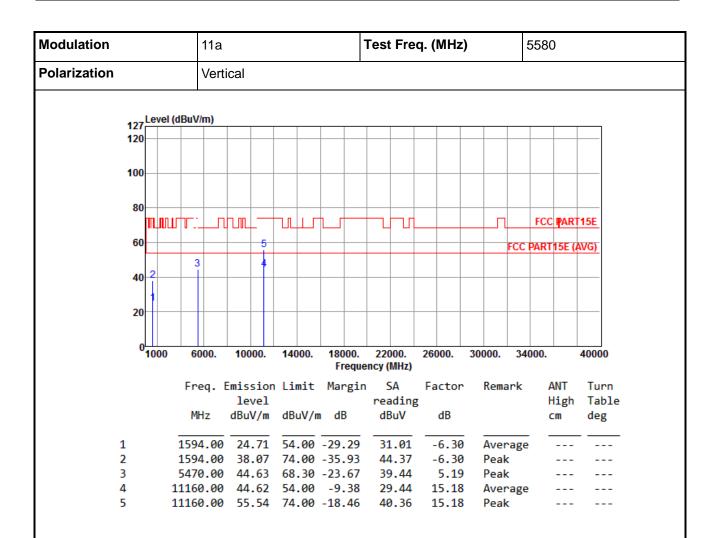


*Factor includes antenna factor, cable loss and amplifier gain

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

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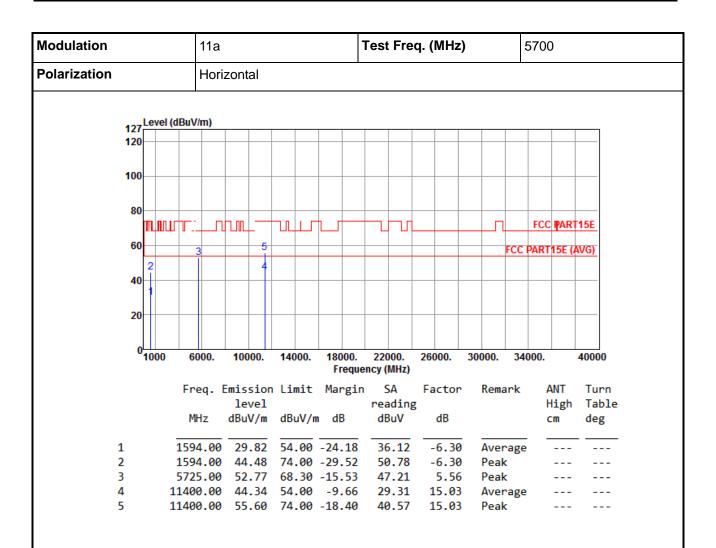


*Factor includes antenna factor, cable loss and amplifier gain

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

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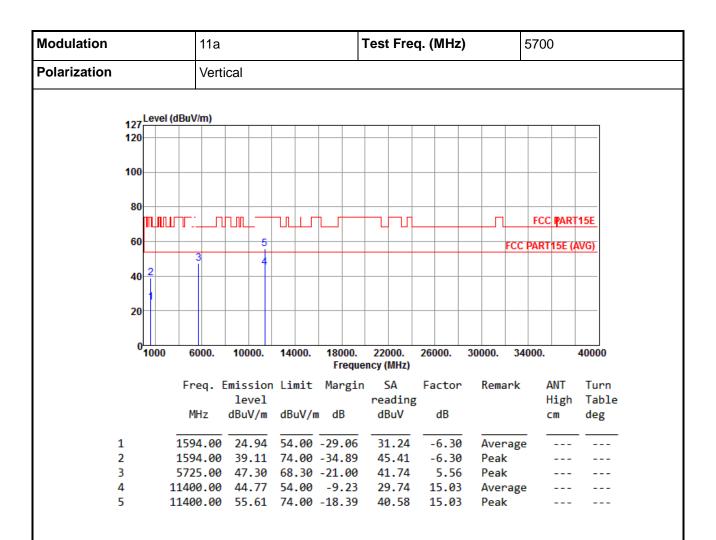


*Factor includes antenna factor, cable loss and amplifier gain

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

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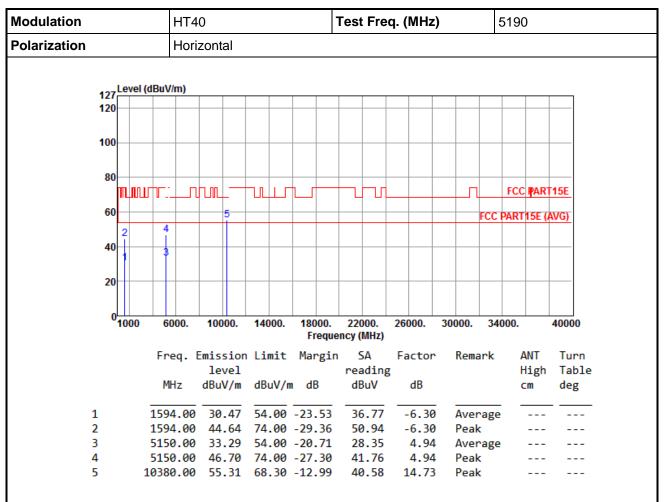
*Factor includes antenna factor, cable loss and amplifier gain

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

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3.6.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40



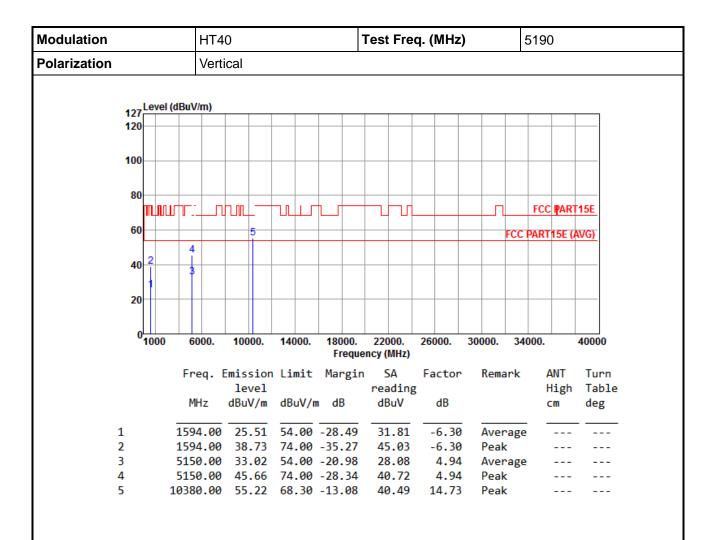
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

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

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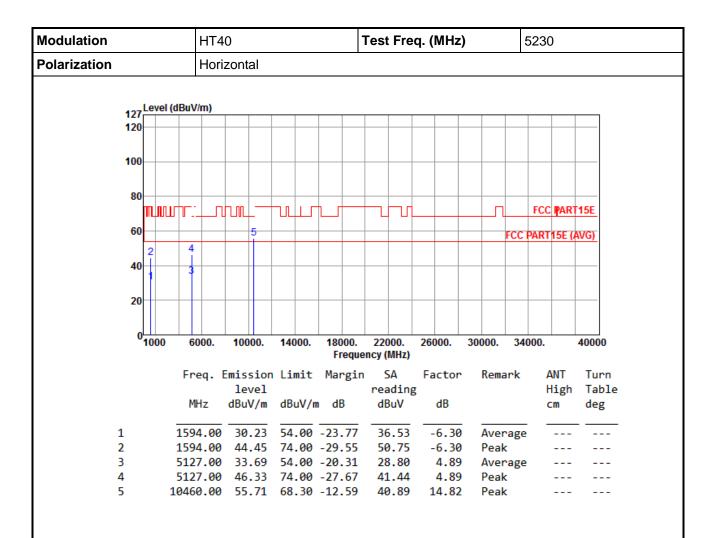


*Factor includes antenna factor, cable loss and amplifier gain

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

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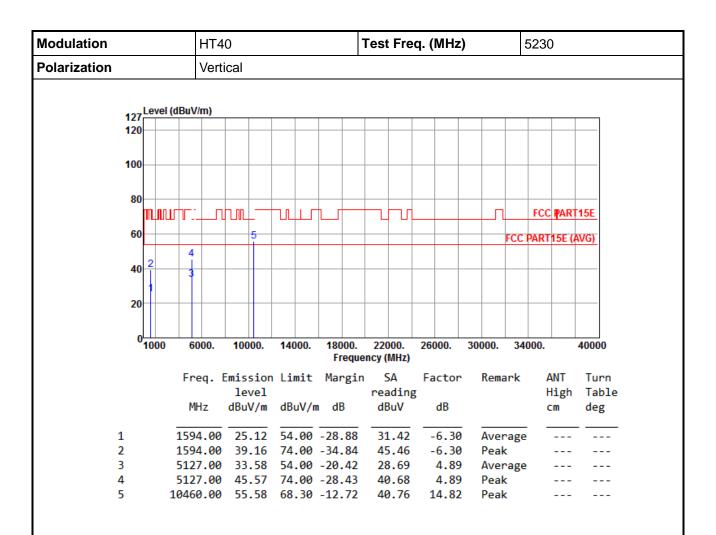


*Factor includes antenna factor, cable loss and amplifier gain

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

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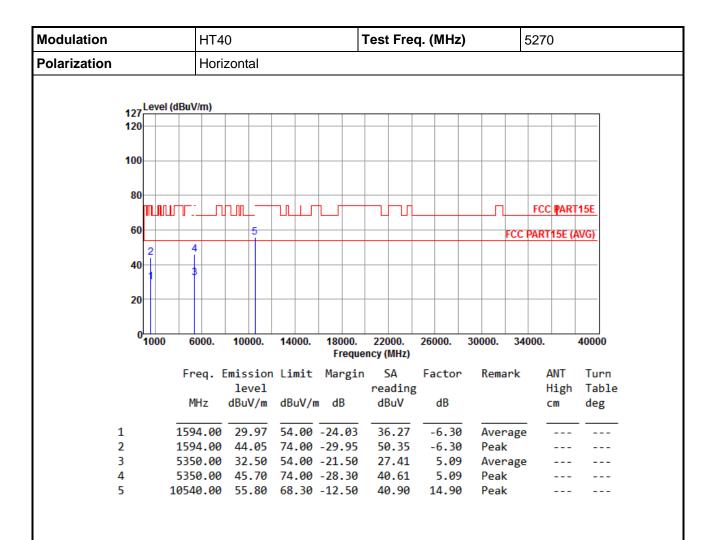


*Factor includes antenna factor, cable loss and amplifier gain

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

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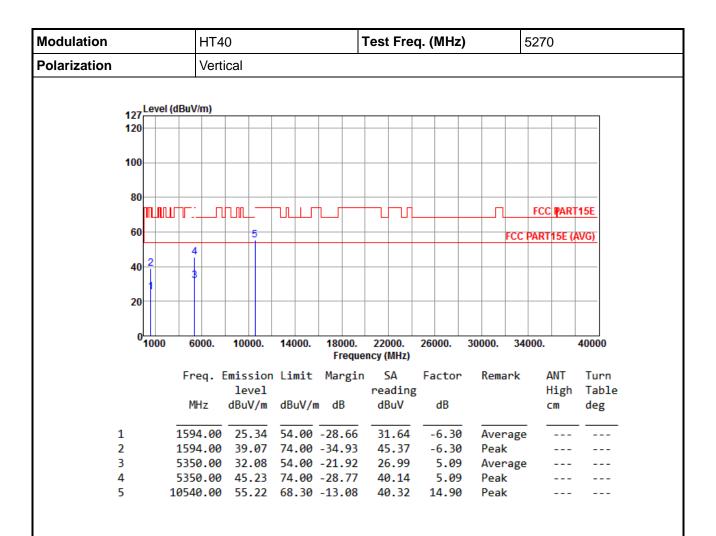


*Factor includes antenna factor, cable loss and amplifier gain

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

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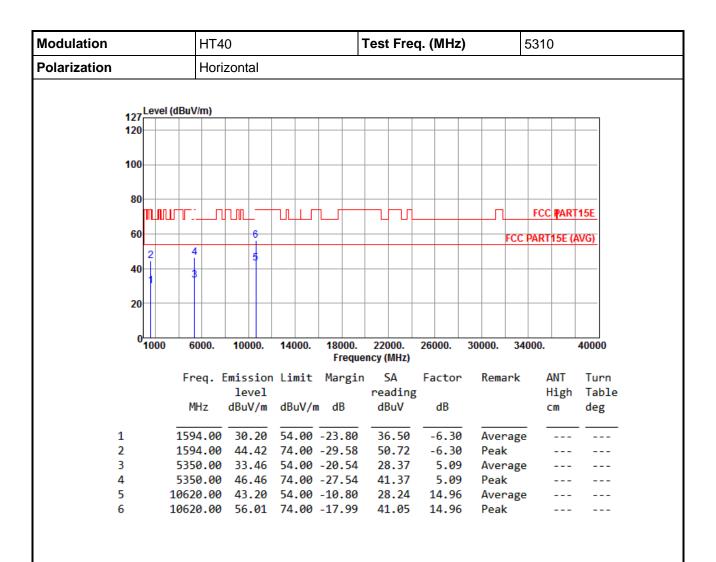


*Factor includes antenna factor, cable loss and amplifier gain

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

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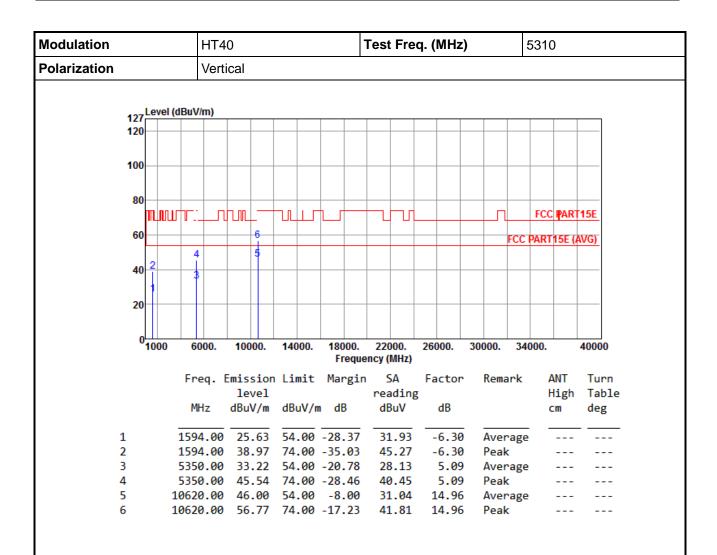


*Factor includes antenna factor, cable loss and amplifier gain

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

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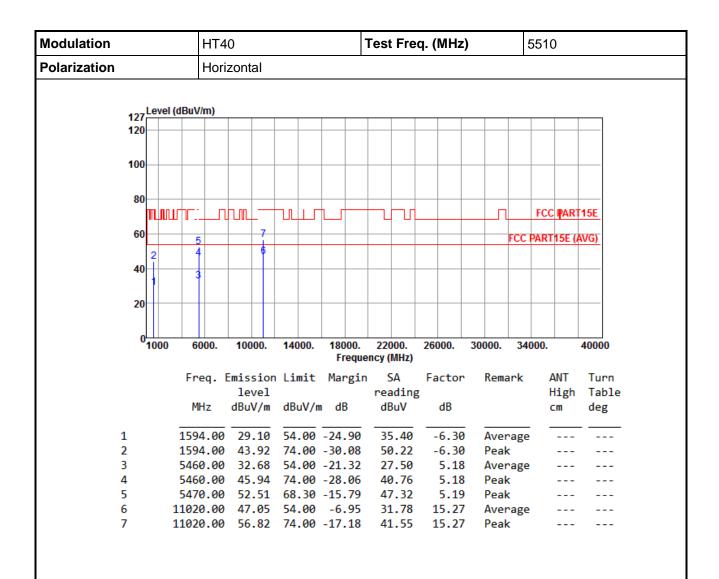


*Factor includes antenna factor, cable loss and amplifier gain

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

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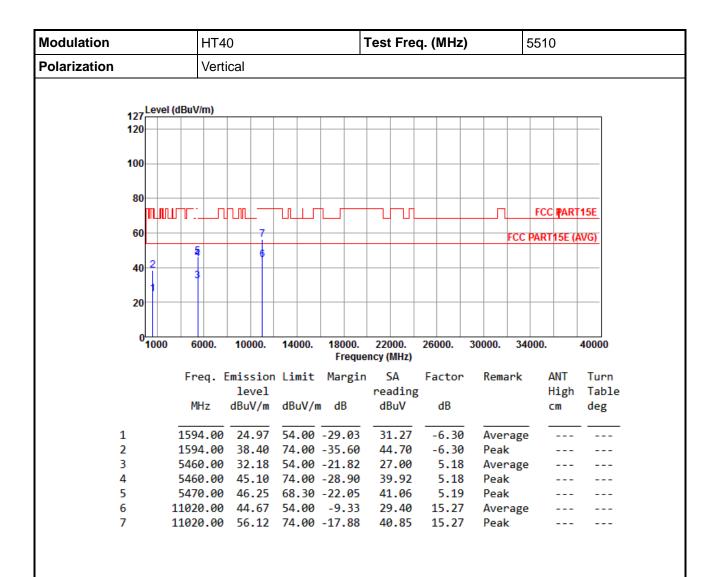


*Factor includes antenna factor, cable loss and amplifier gain

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

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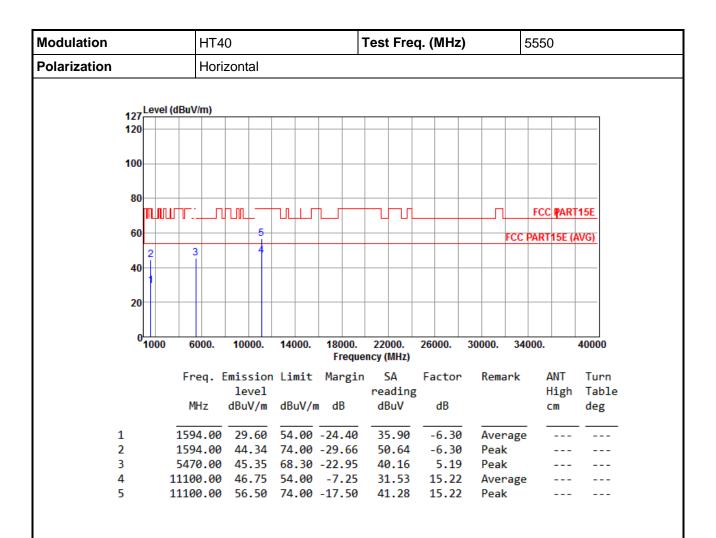


*Factor includes antenna factor, cable loss and amplifier gain

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

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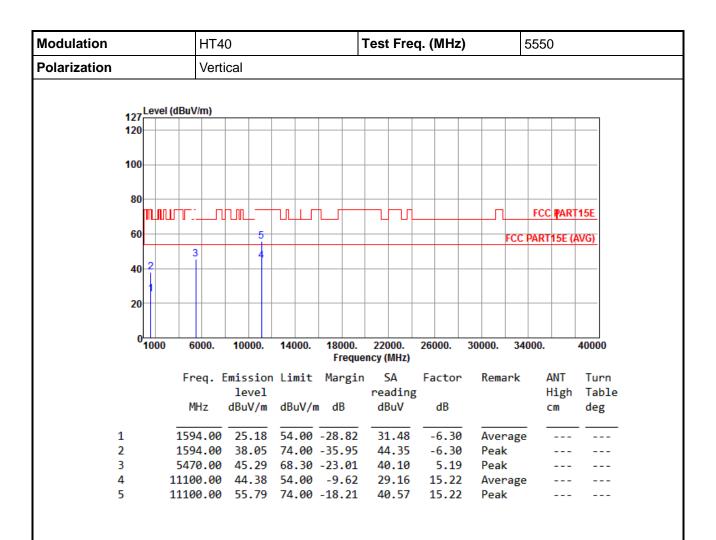


*Factor includes antenna factor, cable loss and amplifier gain

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

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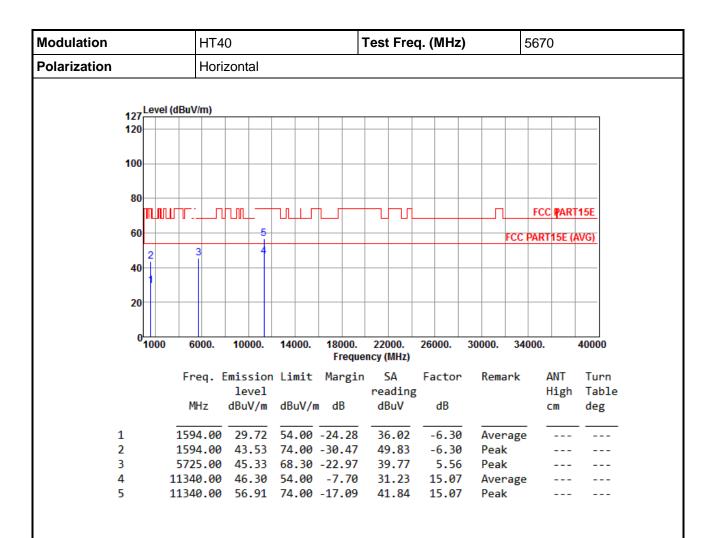


*Factor includes antenna factor, cable loss and amplifier gain

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

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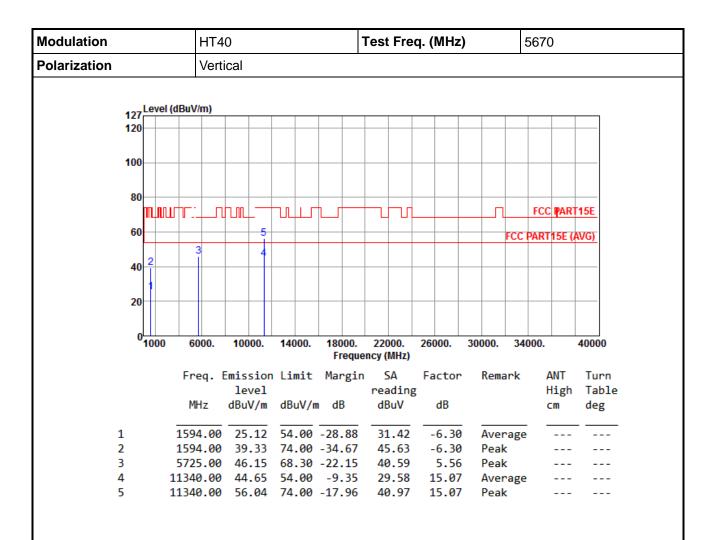


*Factor includes antenna factor, cable loss and amplifier gain

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

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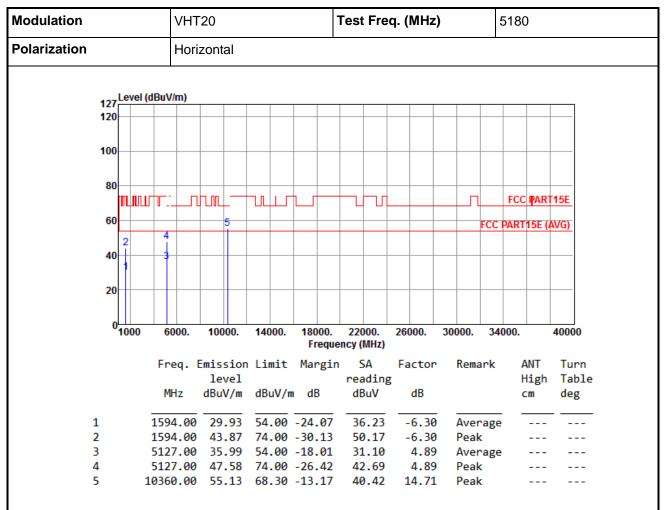
*Factor includes antenna factor, cable loss and amplifier gain

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

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3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20



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

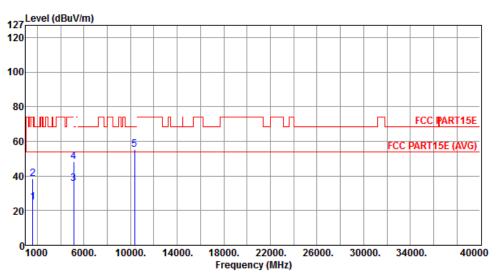
*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Vertical		



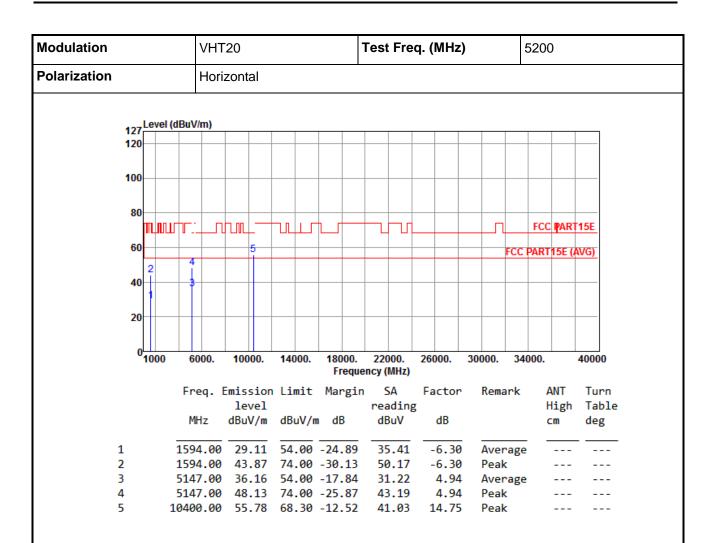
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	1594.00	25.04	54.00	-28.96	31.34	-6.30	Average		
2	1594.00	38.31	74.00	-35.69	44.61	-6.30	Peak		
3	5127.00	35.69	54.00	-18.31	30.80	4.89	Average		
4	5127.00	48.19	74.00	-25.81	43.30	4.89	Peak		
5	10360.00	55.49	68.30	-12.81	40.78	14.71	Peak		

*Factor includes antenna factor, cable loss and amplifier gain

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

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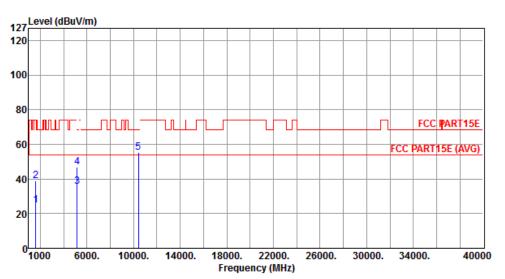
*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Vertical		



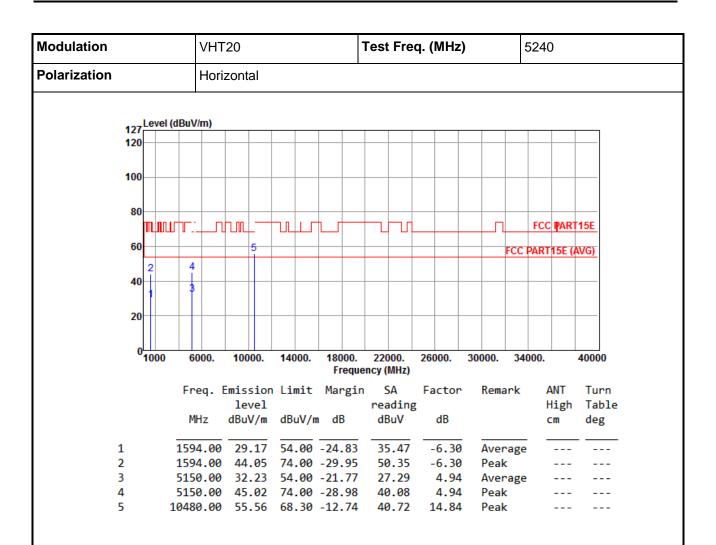
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	1594.00	24.95	54.00	-29.05	31.25	-6.30	Average		
2	1594.00	39.01	74.00	-34.99	45.31	-6.30	Peak		
3	5147.00	35.79	54.00	-18.21	30.85	4.94	Average		
4	5147.00	47.08	74.00	-26.92	42.14	4.94	Peak		
5	10400.00	55.24	68.30	-13.06	40.49	14.75	Peak		

*Factor includes antenna factor, cable loss and amplifier gain

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

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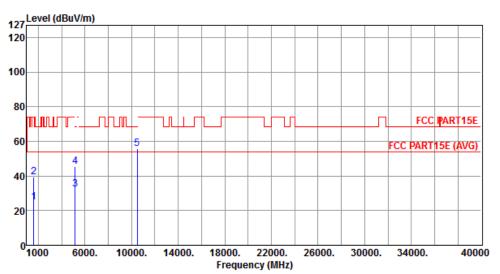
*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical		



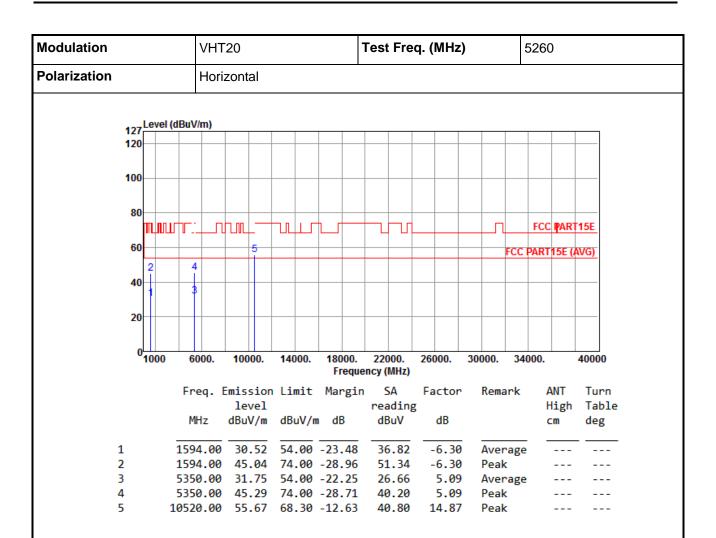
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	1594.00	24.96	54.00	-29.04	31.26	-6.30	Average		
2	1594.00	39.33	74.00	-34.67	45.63	-6.30	Peak		
3	5150.00	32.13	54.00	-21.87	27.19	4.94	Average		
4	5150.00	45.66	74.00	-28.34	40.72	4.94	Peak		
5	10480.00	55.78	68.30	-12.52	40.94	14.84	Peak		

*Factor includes antenna factor, cable loss and amplifier gain

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

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*Factor includes antenna factor, cable loss and amplifier gain

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

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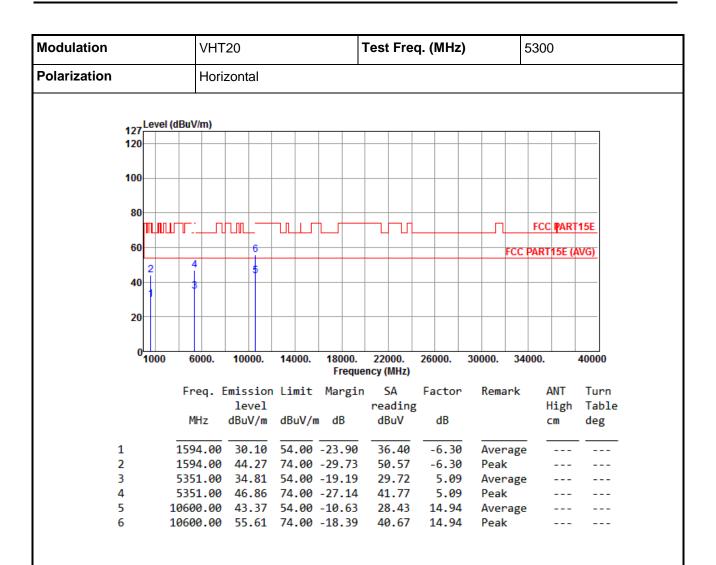


Modulation	VHT	20		Test Free	q. (MHz)		5260	
Polarization	Verti	cal						
127 Level	(dBuV/m)							
120								
100								
80							FCC PART	15E
60	U	5				FCC		
	4	Ĭ				FCC	PART15E (A	(VG)
40 2	3							
20								
0								
1000	6000.	10000.	14000. 18000 Free	0. 22000. quency (MHz)	26000.	30000. 34	000.	40000
	Freq. E	mission	Limit Marg		Factor	Remark	ANT	Turn
		level	ID 1// ID	reading			High	Table
	MHz	dBuV/m	dBuV/m dB	dBuV	dB		CM	deg
1	1594.00	24.71	54.00 -29.2	9 31.01	-6.30	Average		
2	1594.00	39.37	74.00 -34.6		-6.30	Peak		
3	5350.00	31.57	54.00 -22.4		5.09	Average		
4 5	5350.00	44.85	74.00 -29.1 68.30 -12.9		5.09 14.87	Peak 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).

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*Factor includes antenna factor, cable loss and amplifier gain

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

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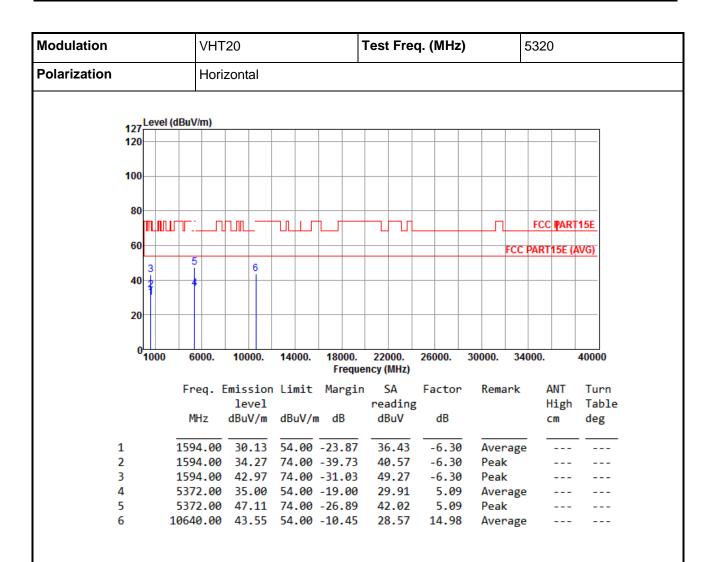


Modulation	VHT	20		7	est Free	q. (MHz)		5300	
Polarization	Vert	ical		l .					
127 Level	(dBuV/m)								
120									
100									
80									
								FCC IPAR	T15E
60	4	6					FC	C PART15E (AVG)
40 2	1	5							
20									
0 1000	6000.	10000.	14000.	18000. Freque	22000. ncy (MHz)	26000.	30000. 3	4000.	40000
	Freq. l	mission	Limit	Margin		Factor	Remark		Turn
	MHz	level dBuV/m	dBuV/m	dB	reading dBuV	dB		High cm	Table deg
1	1594.00	24.85	54.00	-29.15	31.15	-6.30	Averag	e	
2	1594.00		74.00		45.47	-6.30	Peak		
3 4	5351.00 5351.00		54.00 74.00		28.25 41.51	5.09 5.09	Averag Peak	e	
		44.11	54.00		29.17	14.94	Averag	е	
	10600.00		74.00		40.49	14.94	Peak	_	

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

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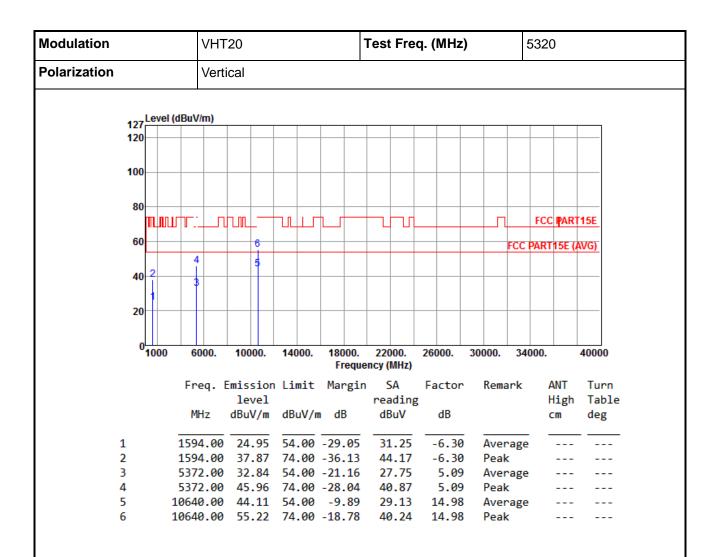


*Factor includes antenna factor, cable loss and amplifier gain

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

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*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation				VHT	20						Test	Fre	q. (MHz	:)		5	500)		
Polarization				Hori	zont	al				•											
	127	Level	(dBu\	//m)																	
	120																				
	400																				
	100																				
	80	-	_	+											-	-	-				
								Ш	╙			山				╌┖		FCC	PART	15E	
	60																				
	00		-	4		H											CC P	ART	15E (<i>l</i>	AVG)	
		2	1	í l		6															
	40		-																		
	20																				
	0																				
	U	1000	6	000.	100	000.	140	00.		000. reque	220 ncy (l		260	000.	3000	00.	340	00.		40000	D
			En	eq.	Emic	cior		ni+					Ea	ctor		lema	nk	۸	NT	Tur	un.
			FI	eq.		vel	LLL	IIIC	ridi	grii		A ding		ic cor	- N	ema	I K		ligh		
			M	Hz			dBı	M/s		R		uV uV		dB					.w itBu	deg	
			P	1112	ubu	v / III	ubt	4V/II	ıı ul	U	ub	uv		ub					.III	ueg	5
	1		150	4.00	20	21	54.	90	-24	19	36	.11	_	6.30		ver	200	-			_
	2			4.00								.37		6.30		eak					_
	_			00		.07	, 4.	.00	23	. ,,	36		_	0.50	' '	Cak					

30.53

42.02

41.87

28.68

5.17

5.17

5.19

15.28

15.28

Average

Average

Peak

Peak

Peak

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

*Factor includes antenna factor , cable loss and amplifier gain

5447.00 35.70 54.00 -18.30

5447.00 47.19 74.00 -26.81

5470.00 47.06 68.30 -21.24

11000.00 43.96 54.00 -10.04

11000.00 56.25 74.00 -17.75 40.97

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

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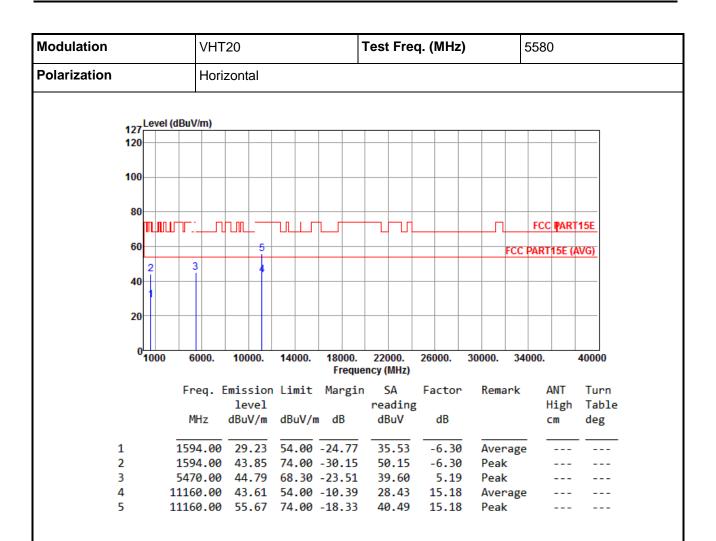


Modulation	VHT2	0			Test Fre	q. (MHz)		5500	
Polarization	Vertica	al		L					
127 Level (dBu\	//m)								
120									
100									
80									
			حىلىت					FCC PART	T15E
60		7							
00		- 					FCC	PART15E (AVG)
	5	6							
40 2	1								
1									
20									
01000 6	000.	10000.	14000.	18000.	22000.	26000.	30000. 34	4000.	40000
				Freque	ncy (MHz)				
Fr	eq. Em	ission	Limit	Margin	SA	Factor	Remark	ANT	Turn
		level		_	reading	5		High	Table
M	Mz d	BuV/m	dBuV/n	n dB	dBuV	dB		cm	deg
1 159	4.00	24.80	54.00	-29.20	31.10	-6.30	Averag		
				-35.93	44.37	-6.30	Peak	-	
				-20.51	28.32	5.17	Averag	e	
4 544	7.00			-28.29	40.54	5.17	Peak		
5 547	0.00	45.03	68.30	-23.27	39.84	5.19	Peak		
	0.00	43.90	54.00	-10.10	28.62	15.28	Averag	e	

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

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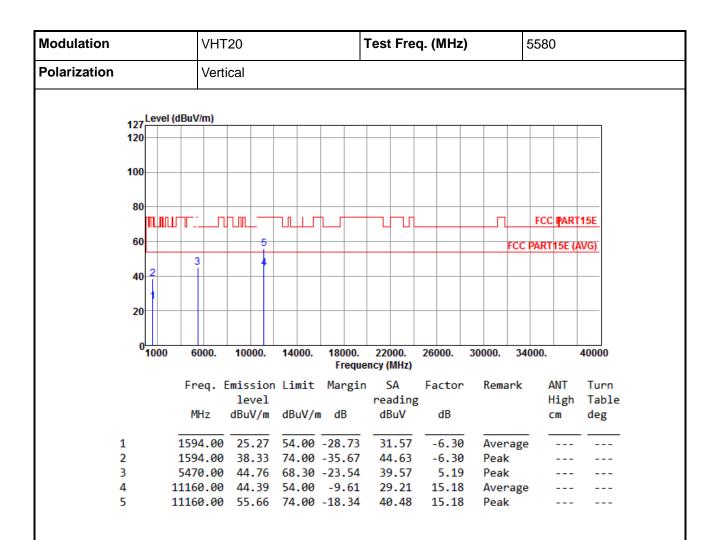


*Factor includes antenna factor, cable loss and amplifier gain

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

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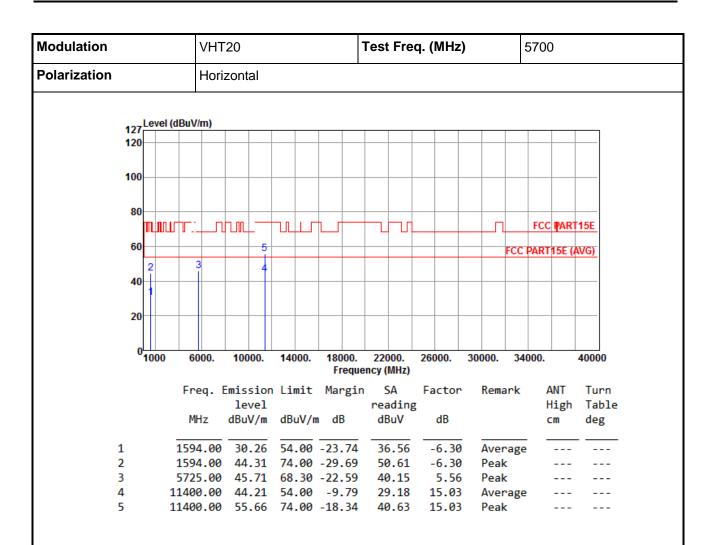


*Factor includes antenna factor, cable loss and amplifier gain

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

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*Factor includes antenna factor, cable loss and amplifier gain

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

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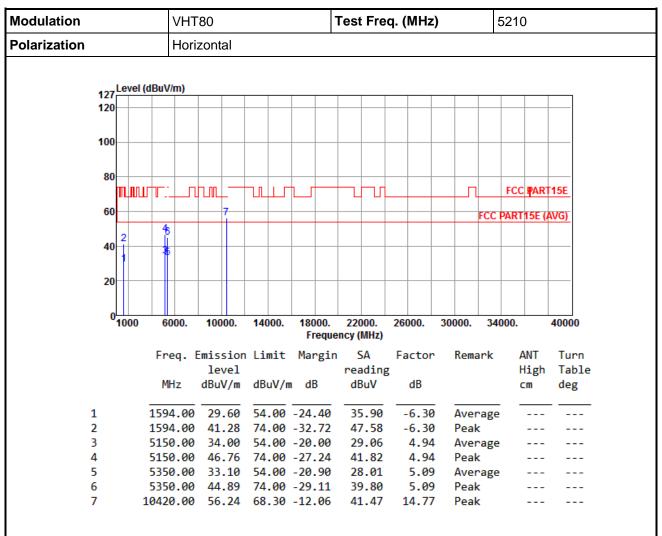
Modulation				VH	T20					Tes	st Fre	eq. (MHz)		5700)	
Polarization				Ve	rtical													
	127	Leve	el (dBu	ıV/m)														
	120	\parallel																
	100	\vdash		_		-				+								
	80	1				<u> </u>	<u></u>									FCC	ma D	7455
	60			-] [PAR'	
	00			3		5									FCC	PART	15E (AVG)
	40	2		+		+ 7												
	20	#								+								
	O	1000)	6000.	10	0000.	140	000.	18000 Fred		2000. (MHz)		000.	30000). 3	4000.		40000
			F	req.	Emi	ssio	n Li	mit	Marg		SA		actor	Re	mark		ANT	Turn
				MII-	_	evel		A17-			adin		JD.				ligh	
				MHz	аві	uv/m	ав	uv/r	n dB	(lBuV		dB			(zm	deg
	1			94.0		4.77			-29.2		31.07		6.30		erag	e		
	2			94.0		9.42			-34.5		15.72		6.30		ak			
	3 4			25.0 aa a		5.35 4 54			-22.9 -9.4		9.79 19.51		5.56 15.03		ak erag	Δ.		
	5								-18.5		10.44		L5.03		er ag ak	C		

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).

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3.6.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT80



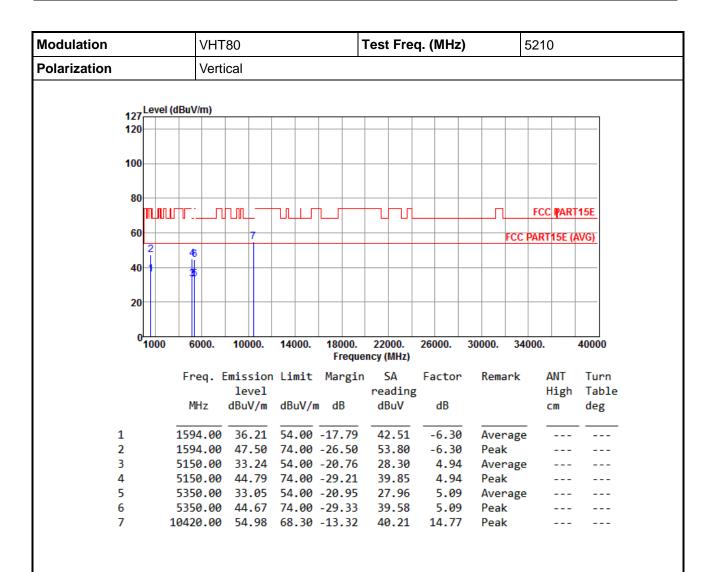
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

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

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^{*}Factor includes antenna factor, cable loss and amplifier gain



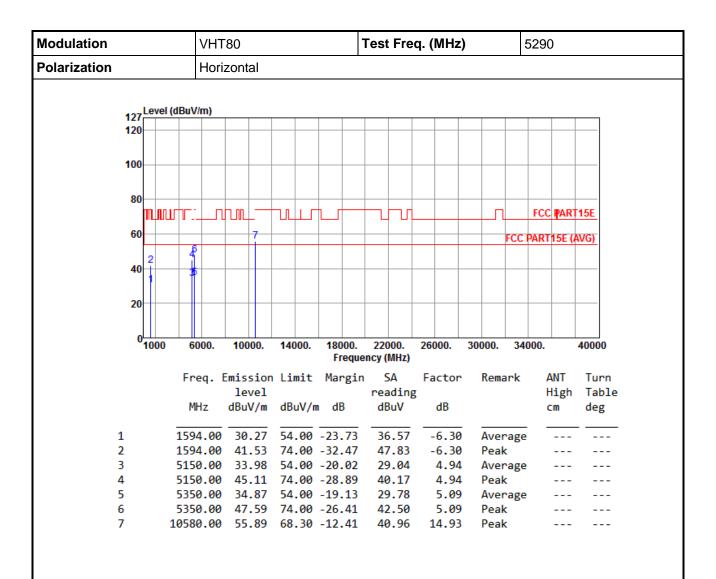


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor, cable loss and amplifier gain

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

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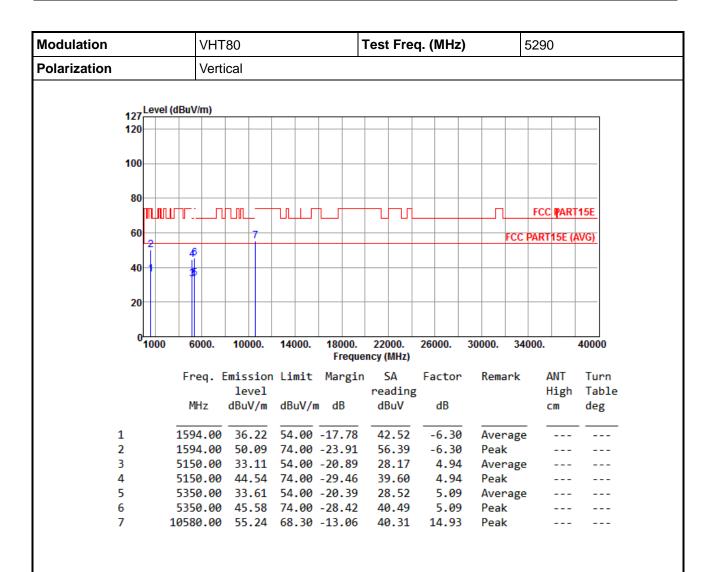


*Factor includes antenna factor, cable loss and amplifier gain

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

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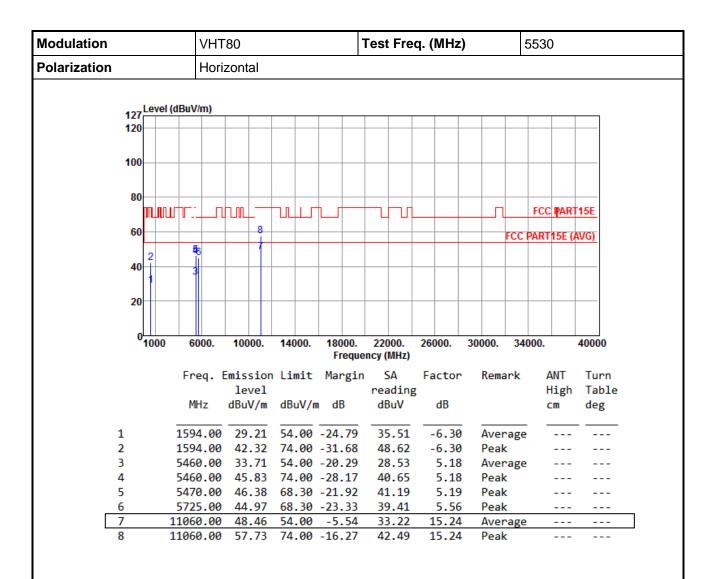


*Factor includes antenna factor, cable loss and amplifier gain

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

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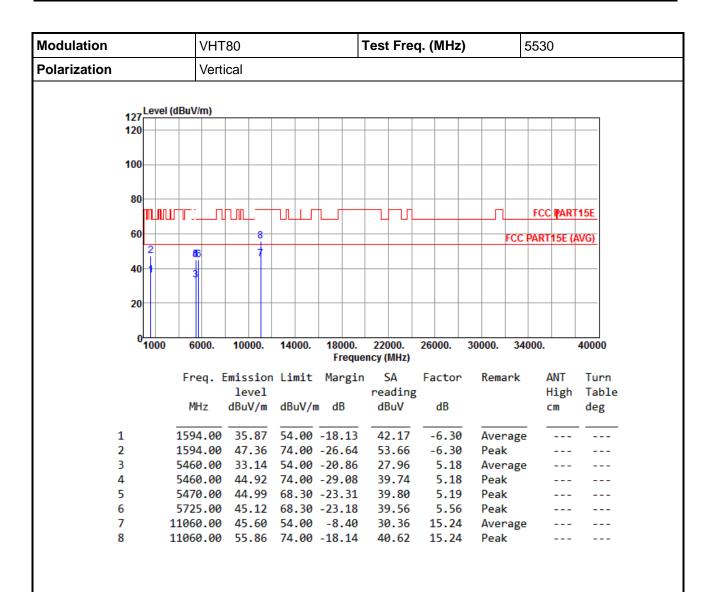


*Factor includes antenna factor, cable loss and amplifier gain

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

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*Factor includes antenna factor, cable loss and amplifier gain

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

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3.7 Frequency Stability

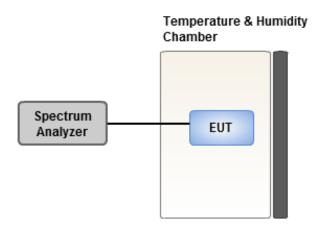
3.7.1 Limit of Frequency Stability

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.

3.7.2 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.
- 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.

3.7.3 Test Setup



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3.7.4 Test Result of Frequency Stability

Frequency: 5320 MHz		Frequency	Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes		
T20°CVmax	1.21	1.32	1.17	1.19		
T20°CVmin	5.90	5.75	6.47	6.26		
T55°CVnom	-0.47	-0.56	-0.84	0.13		
T50°CVnom	0.50	0.52	0.84	0.77		
T40°CVnom	1.72	2.33	1.64	1.58		
T30°CVnom	0.52	1.18	0.86	0.61		
T20°CVnom	1.37	2.05	1.35	1.90		
T10°CVnom	0.33	0.79	1.05	0.04		
T0°CVnom	2.49	2.92	2.81	2.80		
T-10°CVnom	1.99	2.08	1.94	1.88		
T-20°CVnom	2.19	2.59	2.20	2.74		
T-30°CVnom	3.96	4.47	4.50	4.07		
Vnom [Vdc]: 3.9		Vmax [Vdc]: 4.29	•	Vmin [Vdc]: 3.51		
Tnom [°C]: 20		Tmax [°C]: 55		Tmin [°C]: -30		

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Test laboratory information 4

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, 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 Hsiang. Location map can be found on our website http://www.icertifi.com.tw.

Kwei Shan Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei

City, Taiwan, R.O.C.

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 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

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