International Certification Corp.
No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.
Tel: 886-3-271-8666 Fax: 886-3-318-0155

FCC Test Report

FCC ID	:	**MXF-WRTB283N**
Equipment	:	**Dual band Router**
Model No.	:	**WRTB-283N**
Brand Name	:	**Gemtek**
Applicant	:	**Gemtek Technology Co., Ltd.**
Address	:	**No. 15-1 Zhanghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.**
Standard	:	**47 CFR FCC Part 15.407**
Received Date	:	**Feb. 08, 2013**
Tested Date	:	**Feb. 20 ~ Apr. 02, 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

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FR320801AN	Rev. 01	Initial issue	Apr. 16, 2013

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.299MHz 46.34 (Margin 3.94dB) - AV	Pass
15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 220.12MHz 44.91 (Margin 1.09dB) - QP	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(a)	RF Output Power	Power [dBm]: 11a: 16.37 HT20: 16.80 HT40: 16.60	Pass
15.407(a)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(a)	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

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_{TX})**	**Data Rate / MCS**
5150-5250	a	5180-5240	36-48 [4]	1	6-54 Mbps
5150-5250	n (HT20)	5180-5240	36-48 [4]	3	MCS 0-23
5150-5250	n (HT40)	5190-5230	38-46 [2]	3	MCS 0-23
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.					

1.1.2 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	Embedded	2.58	UFL	---
2	Embedded	1.73	UFL	---
3	Printed	0.87	---	---

1.1.3 EUT Operational Condition

Supply Voltage	☒ AC mains	☐ DC	
Type of DC Source	☐ Internal DC supply	☐ External DC adapter	☐ Battery

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC Adapter 1	Brand Name: DVE Model Name: DSA-26PFA-15 FUS 120200 Power Rating: I/P: 100-240Vac, 50-60Hz, 0.8A O/P: 12Vdc, 2.0A Power Line: 1.5m non-shielded cable w/o core
2	AC Adapter 2	Brand Name: CWT Model Name: SAG024F 4 US Power Rating: I/P: 100-240Vac, 47-63Hz, 0.8A O/P: 12Vdc, 2.0A Power Line: 1m non-shielded cable w/o core
3	RJ45 cable	RJ45 2m shielded w/o core.

1.1.5 Channel List

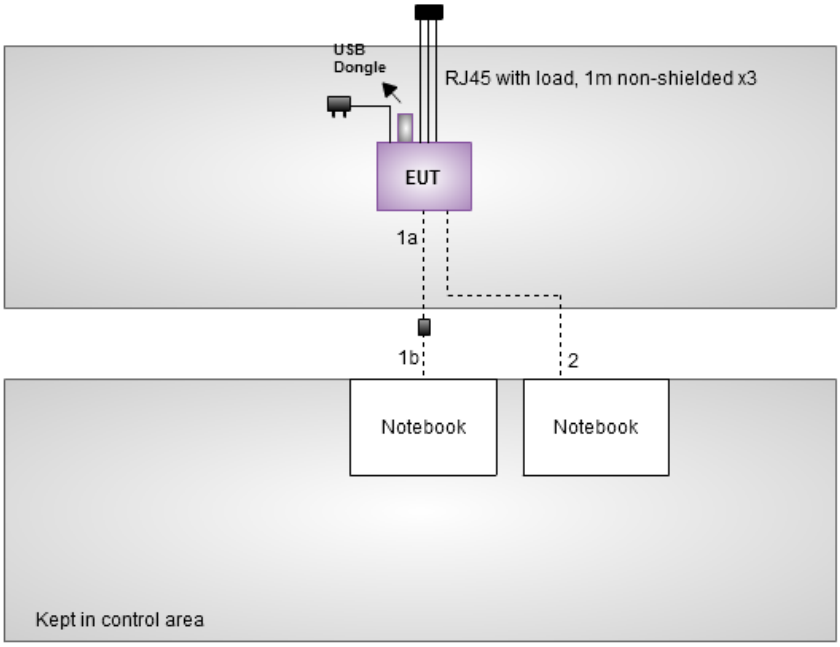
Frequency band (MHz)		**5150~5250**	
802.11 a / n HT20		**802.11n HT40**	
Channel	**Frequency(MHz)**	**Channel**	**Frequency(MHz)**
36	5180	38	5190
40	5200	46	5230
44	5220		
48	5240		

1.1.6 Test Tool and Duty Cycle

Test Tool	Hyperterminal 5.1
Duty Cycle Of Test Signal (%)	99.66% - IEEE 802.11a 98.43% - IEEE 802.11n (HT20) 96.48% - IEEE 802.11n (HT40)
Duty Factor	0 - IEEE 802.11a 0 - IEEE 802.11n (HT20) 0.16 - IEEE 802.11n (HT40)

1.2 Test Setup Chart

Test Setup Diagram



1.3 Local Support Equipment List

Support Equipment List						
No.	**Equipment**	**Brand**	**Model**	**S/N**	**FCC ID**	**Length (m)**
1	Notebook	DELL	E5420	---	DoC	a. RJ45 2m shielded w/o core. b. RJ45 10m non-shielded w/o core.
2	Notebook	DELL	E5420	---	DoC	RJ45 10m non-shielded w/o core.
3	USB Dongle	Transend	JetFlash V85	---	---	---

Note: Item 1a was provided by client.

1.4 The Equipment List

EMI	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	Dec. 12, 2012	Dec. 11, 2013
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	23342	Feb. 17, 2013	Feb. 16, 2014
ISN	TESEQ	ISN T400	21653	Jun. 22, 2012	Jun. 21, 2013
ISN	TESEQ	ISN T8-Cat6	27262	Sep. 17, 2012	Sep. 16, 2013
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
Note: Calibration Interval of instruments listed above is one year.					

EMI	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
3m semi-anechoic chamber	RIKEN	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
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
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
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	ROHDE&SCHWARZ	ESR3	101658	Jan. 30, 2013	Jan. 29, 2013
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

RF	RF Conducted				
Test Site	RF Conducted (TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV 40	101486	Nov. 14, 2012	Nov. 13, 2013
Spectrum Analyzer	R&S	FSP 40	100593	Aug. 14, 2012	Aug. 13, 2013
DC Power Source	G.W.	GPC-6030D	C671845	Jun. 19, 2012	Jun. 18, 2013
AC Power Source	G.W	APS-9102	EL920581	Jul. 02, 2012	Jul. 01, 2013
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	Nov. 21, 2012	Nov. 20, 2013
Signal Generator	R&S	SMR40	100116	Jun. 26, 2012	Jun. 25, 2013
Power Sensor	Anritsu	MA2411B	1027452	Sep. 08, 2012	Sep. 07, 2013
Power Meter	Anritsu	ML2495A	1124009	Sep. 08, 2012	Sep. 07, 2013
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	NA	NA
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345669/4	NA	NA

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 v01r02
FCC KDB 662911 D01 Multiple Transmitter Output v01r02

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 ^{o}C
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 53%	Skys Huang
Radiated Emissions	03CH01-WS	25°C / 65%	Aska Huang Haru Yang
RF Conducted	TH01-WS	24°C / 63%	Felix Sung

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

2.2 The Worst Test Modes and Channel Details

The Worst Test Modes and Channel Details	
Test Item(s)	**Conducted Emissions**
Modulation, Data rate	HT20/MCS 16
Test channel	5200
Test Mode	Operating Mode Description
A	DVE adapter
B	CWT adapter

The Worst Test Modes and Channel Details	
Test Item(s)	**Emission Bandwidth, RF Output Power, Peak Power Spectral Density Peak Excursion, Frequency Stability**
Modulation, Data rate	11a/6Mbps
Test channel (MHz)	5180, 5200, 5240
Test Mode	Operating Mode Description
-	DVE adapter, ANT1 (chain 0)
-	DVE adapter, ANT2 (chain 1)
-	DVE adapter, ANT3 (chain 2)
The EUT was pretested with ANT1, ANT2 and ANT3, and found that **ANT3** was the worst case for final test and only its data was record in this report.	
Modulation, Data rate	HT20/MCS 16, HT40/MCS 16
Test channel (MHz)	HT20: 5180, 5200, 5240 HT40: 5190, 5230
Test Mode	Operating Mode Description
-	DVE adapter, ANT1+ANT2+ANT3 (chain 0+chain 1+ chain 2)

The Worst Test Modes and Channel Details	
Test Item(s)	**Radiated emission (below 1GHz)**
Modulation, Data rate	HT20/MCS 16
Test channel (MHz)	5200
Test Mode	Operating Mode Description
A	DVE adapter
B	CWT adapter
Test Item(s)	**Radiated emission (above 1GHz)**
Modulation, Data rate	11a/6Mbps
Test channel (MHz)	11a: 5180, 5200, 5240
Test Mode	Operating Mode Description
A1	DVE adapter, ANT1 (chain 0)
A2	DVE adapter, ANT2 (chain 1)
A3	DVE adapter, ANT3 (chain 2)
The EUT was pretested with ANT1 and ANT2, and found that ANT1 was the worst case. Therefore, **ANT1 and ANT3** were for final test and only its data was record in this report.	
Modulation, Data rate	HT20/MCS 16, HT40/MCS 16
Test channel (MHz)	11a, HT20: 5180, 5200, 5240 HT40: 5190, 5230
Test Mode	Operating Mode Description
A1	DVE adapter, ANT1+ANT2+ANT3 (chain 0+chain 1+ chain 2)

3 Transmitter Test Results

3.1 Conducted Emissions

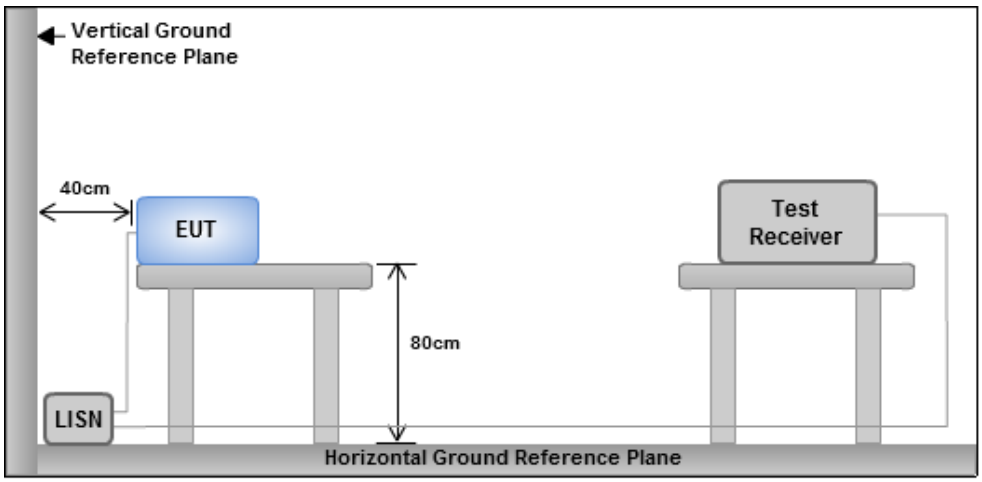
3.1.1 Limit of Conducted Emissions

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 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.

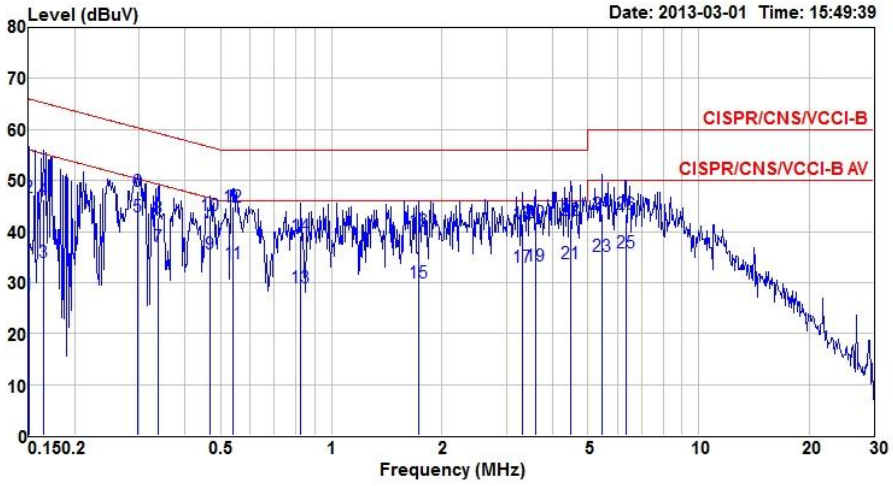
3.1.3 Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

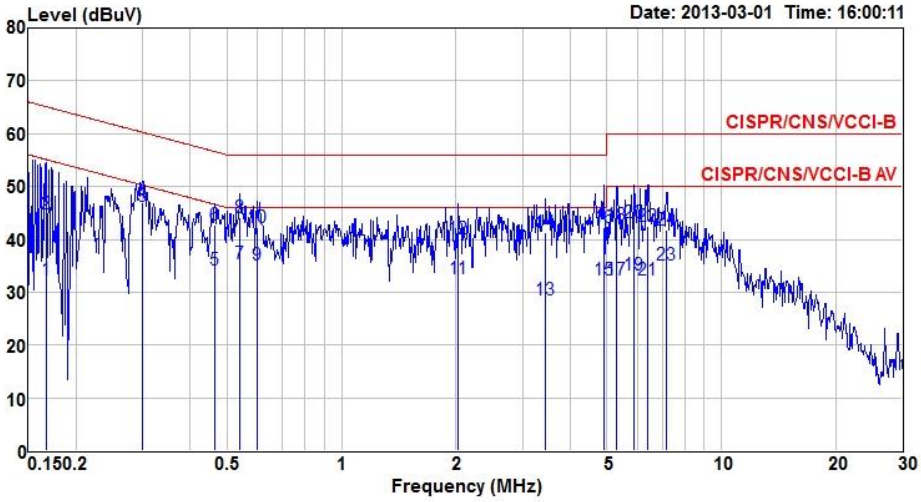
Power Phase	Line	**Test Freq. (MHz)**	5200
Test Mode	A		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	27.73	56.00	-28.27	27.66	0.03	0.06	Average
2	0.150	46.64	66.00	-19.36	46.57	0.03	0.06	QP
3	0.165	33.94	55.21	-21.27	33.83	0.03	0.10	Average
4	0.165	46.33	65.21	-18.88	46.22	0.03	0.10	QP
5	0.297	42.88	50.32	-7.44	42.77	0.03	0.11	Average
6	0.297	47.92	60.32	-12.40	47.81	0.03	0.11	QP
7	0.337	37.02	49.27	-12.25	36.95	0.03	0.08	Average
8	0.337	42.83	59.27	-16.44	42.76	0.03	0.08	QP
9	0.469	35.64	46.54	-10.90	35.61	0.03	0.05	Average
10	0.469	43.17	56.54	-13.37	43.14	0.03	0.05	QP
11	0.541	33.66	46.00	-12.34	33.64	0.03	0.05	Average
12	0.541	44.91	56.00	-11.09	44.89	0.03	0.05	QP
13	0.826	28.94	46.00	-17.06	28.97	0.03	0.04	Average
14	0.826	39.09	56.00	-16.91	39.12	0.03	0.04	QP
15	1.734	29.99	46.00	-16.01	29.97	0.04	0.14	Average
16	1.734	40.16	56.00	-15.84	40.14	0.04	0.14	QP
17	3.310	33.13	46.00	-12.87	32.97	0.06	0.22	Average
18	3.310	41.66	56.00	-14.34	41.50	0.06	0.22	QP
19	3.603	33.38	46.00	-12.62	33.20	0.06	0.23	Average
20	3.603	41.90	56.00	-14.10	41.72	0.06	0.23	QP
21	4.478	33.73	46.00	-12.27	33.58	0.06	0.22	Average
22	4.478	42.21	56.00	-13.79	42.06	0.06	0.22	QP
23	5.447	35.25	50.00	-14.75	35.17	0.07	0.20	Average
24	5.447	43.42	60.00	-16.58	43.34	0.07	0.20	QP
25	6.352	35.86	50.00	-14.14	35.86	0.07	0.17	Average
26	6.352	43.55	60.00	-16.45	43.55	0.07	0.17	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

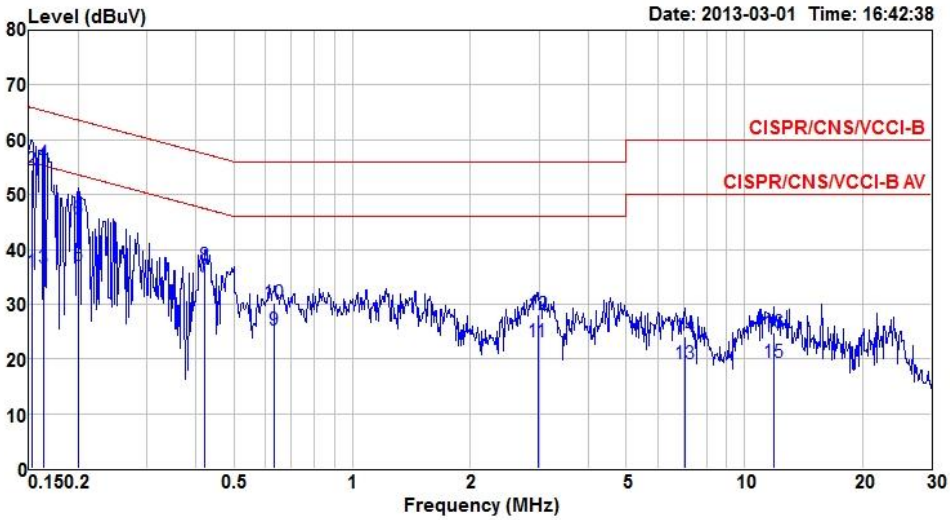
Power Phase	Neutral	**Test Freq. (MHz)**	5200
Test Mode	A		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.167	32.32	55.12	-22.80	32.22	0.02	0.10	Average
2	0.167	44.74	65.12	-20.38	44.64	0.02	0.10	QP
3	0.299	46.34	50.28	-3.94	46.26	0.02	0.10	Average
4	0.299	46.96	60.28	-13.32	46.88	0.02	0.10	QP
5	0.464	34.16	46.63	-12.47	34.15	0.02	0.05	Average
6	0.464	42.78	56.63	-13.85	42.77	0.02	0.05	QP
7	0.541	35.39	46.00	-10.61	35.39	0.02	0.05	Average
8	0.541	44.22	56.00	-11.78	44.22	0.02	0.05	QP
9	0.598	35.17	46.00	-10.83	35.18	0.02	0.05	Average
10	0.598	42.31	56.00	-13.69	42.32	0.02	0.05	QP
11	2.033	32.59	46.00	-13.41	32.56	0.03	0.16	Average
12	2.033	40.02	56.00	-15.98	39.99	0.03	0.16	QP
13	3.454	28.54	46.00	-17.46	28.37	0.05	0.22	Average
14	3.454	41.34	56.00	-14.66	41.17	0.05	0.22	QP
15	4.900	32.33	46.00	-13.67	32.21	0.06	0.21	Average
16	4.900	42.32	56.00	-13.68	42.20	0.06	0.21	QP
17	5.305	32.28	50.00	-17.72	32.20	0.06	0.20	Average
18	5.305	42.75	60.00	-17.25	42.67	0.06	0.20	QP
19	5.898	33.29	50.00	-16.71	33.25	0.06	0.19	Average
20	5.898	43.14	60.00	-16.86	43.10	0.06	0.19	QP
21	6.420	32.39	50.00	-17.61	32.38	0.07	0.17	Average
22	6.420	42.53	60.00	-17.47	42.52	0.07	0.17	QP
23	7.175	35.06	50.00	-14.94	35.10	0.07	0.16	Average
24	7.175	41.86	60.00	-18.14	41.90	0.07	0.16	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

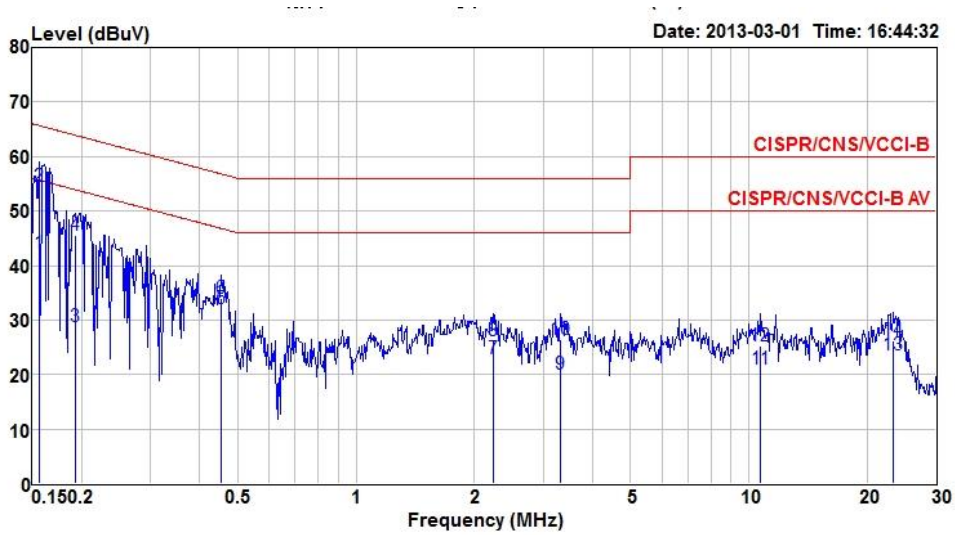
Power Phase	Line	**Test Freq. (MHz)**	5200
Test Mode	B		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.152	35.94	55.87	-19.93	35.86	0.03	0.07	Average
2	0.152	54.47	65.87	-11.40	54.39	0.03	0.07	QP
3	0.163	36.64	55.30	-18.66	36.53	0.03	0.10	Average
4	0.163	55.59	65.30	-9.71	55.48	0.03	0.10	QP
5	0.201	37.04	53.58	-16.54	36.85	0.03	0.18	Average
6	0.201	45.62	63.58	-17.96	45.43	0.03	0.18	QP
7	0.419	34.90	47.46	-12.56	34.86	0.03	0.05	Average
8	0.419	37.17	57.46	-20.29	37.13	0.03	0.05	QP
9	0.634	25.36	46.00	-20.64	25.37	0.03	0.04	Average
10	0.634	30.11	56.00	-25.89	30.12	0.03	0.04	QP
11	2.978	23.13	46.00	-22.87	23.00	0.05	0.21	Average
12	2.978	28.10	56.00	-27.90	27.97	0.05	0.21	QP
13	7.062	19.08	50.00	-30.92	19.11	0.08	0.16	Average
14	7.062	23.98	60.00	-36.02	24.01	0.08	0.16	QP
15	11.870	19.40	50.00	-30.60	19.69	0.17	0.12	Average
16	11.870	24.79	60.00	-35.21	25.08	0.17	0.12	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

Power Phase	Neutral	**Test Freq. (MHz)**	5200
Test Mode	B		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	42.30	55.69	-13.39	42.22	0.02	0.08	Average
2	0.156	54.58	65.69	-11.11	54.50	0.02	0.08	QP
3	0.193	28.77	53.89	-25.12	28.60	0.02	0.17	Average
4	0.193	45.55	63.89	-18.34	45.38	0.02	0.17	QP
5	0.454	32.14	46.80	-14.66	32.13	0.02	0.05	Average
6	0.454	33.97	56.80	-22.83	33.96	0.02	0.05	QP
7	2.237	22.87	46.00	-23.13	22.81	0.04	0.17	Average
8	2.237	26.27	56.00	-29.73	26.21	0.04	0.17	QP
9	3.310	20.00	46.00	-26.00	19.84	0.05	0.22	Average
10	3.310	26.37	56.00	-29.63	26.21	0.05	0.22	QP
11	10.733	21.05	50.00	-28.95	21.26	0.13	0.11	Average
12	10.733	25.19	60.00	-34.81	25.40	0.13	0.11	QP
13	23.387	23.66	50.00	-26.34	24.38	0.14	0.41	Average
14	23.387	26.12	60.00	-33.88	26.84	0.14	0.41	QP

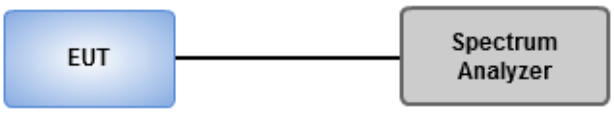
Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

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.

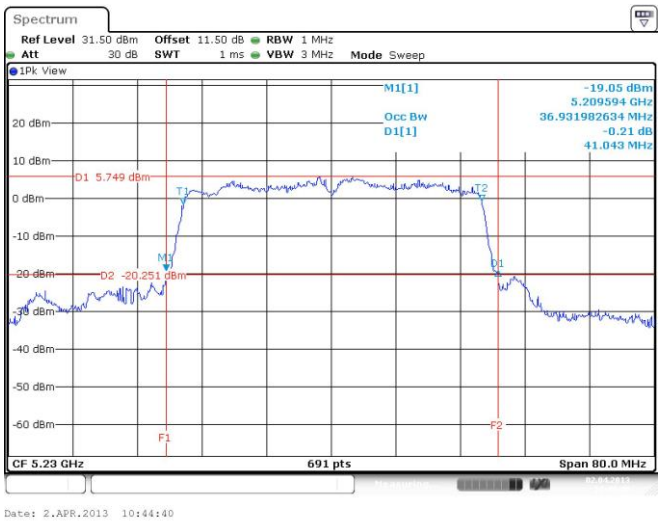
3.2.2 Test Setup



3.2.3 Test Result of Emission Bandwidth

Modulation Mode	N_{TX}	Freq. (MHz)	26dB Bandwidth (MHz)				99% Bandwidth (MHz)				Limit (dBm)	
			Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	99% BW	26dB BW
11a	1	5180	---	---	28.41	---	---	---	17.31	---	17.0	16.38
11a	1	5200	---	---	28.41	---	---	---	17.37	---	17.0	16.40
11a	1	5240	---	---	28.70	---	---	---	17.31	---	17.0	16.38
HT20	3	5180	26.78	27.25	27.13	---	18.00	18.06	18.00	---	17.0	16.55
HT20	3	5200	27.07	27.42	26.49	---	18.00	18.06	18.00	---	17.0	16.55
HT20	3	5240	26.55	27.65	26.96	---	18.00	18.00	18.00	---	17.0	16.55
HT40	3	5190	40.46	40.46	40.23	---	36.70	36.93	36.70	---	17.0	17.0
HT40	3	5230	40.81	41.04	40.58	---	36.58	36.93	36.82	---	17.0	17.0

Worst Plots



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: “B” is the 26dB emission bandwidth in MHz.		

3.3.2 Test Procedures

☐ **Spectrum analyzer**

☐ 1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.

2. Trace average 100 traces.

3. Compute power by integrating the spectrum across the 26 dB EBW of the signal using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

☐ 1. 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. Compute power by integrating the spectrum across the 26 dB EBW of the signal using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

☐ 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. Compute power by integrating the spectrum across the 26 dB EBW of the signal using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

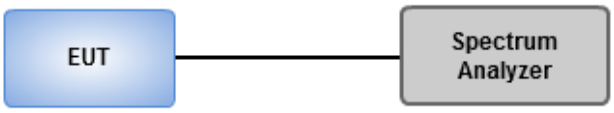
5. Add 10 log(1/x), where x is the duty cycle.

☒ **Power meter**

☒ A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than 6dB bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup

☐ RF Output Power (Spectrum Analyzer)



☒ RF Output Power (Power Meter)

3.3.4 Test Result of Maximum Conducted Output Power

Modulation Mode	N_{TX}	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11a	1	5180	---	---	16.34	---	43.053	16.34	17
11a	1	5200	---	---	16.37	---	43.351	16.37	17
11a	1	5240	---	---	16.31	---	42.756	16.31	17
HT20	3	5180	12.15	11.67	12.03	---	47.054	16.73	17
HT20	3	5200	12.37	11.61	12.08	---	47.890	16.80	17
HT20	3	5240	11.90	11.58	12.10	---	46.094	16.64	17
HT40	3	5190	8.12	7.79	8.63	---	19.793	12.97	17
HT40	3	5230	11.80	11.20	12.40	---	45.696	16.60	17

3.4 Peak Power Spectral Density

3.4.1 Limit of Peak Power Spectral Density

	Frequency Band (GHz)	Limit (dBm)
☒	5.15~5.25	4
☐	5.25~5.35	11
☐	5.47~5.725	11

3.4.2 Test Procedures

☒ Method SA-1

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

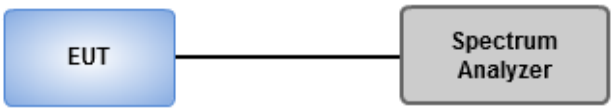
1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time ≥ 10 * (number of points in sweep) * (symbol period of the transmitted signal).
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.

☒ 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.

Note: 11a and HT20 uses Method SA-1, HT40 uses Method SA-2 Alternative.

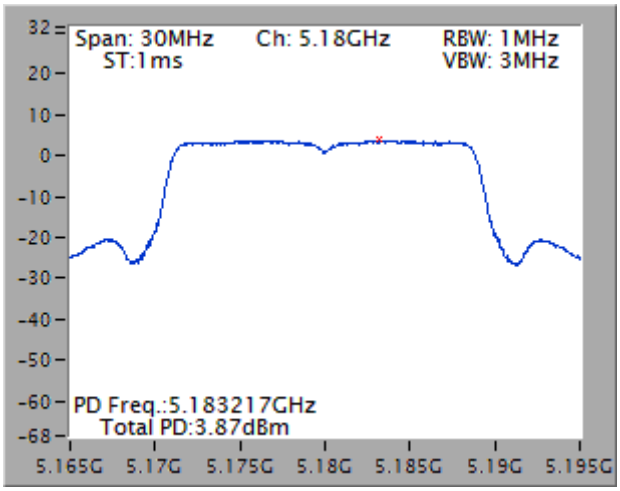
3.4.3 Test Setup



3.4.4 Test Result of Peak Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	PSD (dBm)	Duty Factor	Total PSD (dBm)	Limit (dBm)
11a	1	5180	3.86	0	3.86	4
11a	1	5200	3.80	0	3.80	4
11a	1	5240	3.77	0	3.77	4
HT20	3	5180	3.87	0	3.87	4
HT20	3	5200	3.84	0	3.84	4
HT20	3	5240	3.83	0	3.83	4
HT40	3	5190	-3.00	0.16	-2.84	4
HT40	3	5230	0.56	0.16	0.72	4

Worst Plots



3.5 Peak Excursion

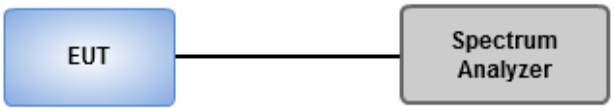
3.5.1 Peak Excursion Limit

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

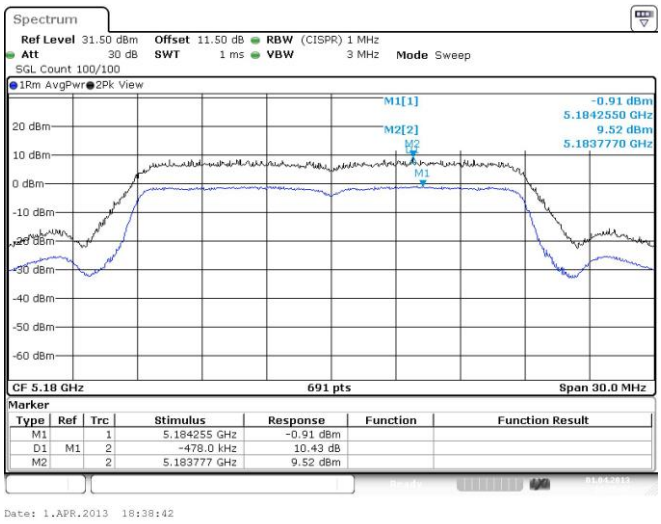
3.5.3 Test Setup



3.5.4 Test Result of Peak Excursion

Modulation Mode	N_{TX}	Freq. (MHz)	Peak Value (dBm)				PPSD (dBm)				Duty Factor	Peak Excursion (dB)				Limit (dB)
			Chains No.				Chains No.					Chains No.				
			0	1	2	3	0	1	2	3		0	1	2	3	
11a	1	5180	---	---	12.63	---	---	---	3.86	---	0	---	---	8.77	---	13
11a	1	5200	---	---	12.00	---	---	---	3.80	---	0	---	---	8.20	---	13
11a	1	5240	---	---	12.28	---	---	---	3.77	---	0	---	---	8.51	---	13
HT20	3	5180	9.33	8.24	9.52	---	-0.41	-1.08	-0.91	---	0	9.74	9.32	10.43	---	13
HT20	3	5200	9.09	9.29	9.29	---	-0.58	-0.9	-0.93	---	0	9.67	10.19	10.22	---	13
HT20	3	5240	8.80	8.38	9.30	---	-0.52	-1.07	-0.67	---	0	9.32	9.45	9.97	---	13
HT40	3	5190	1.59	1.49	2.73	---	-7.93	-8.03	-7.08	---	0.16	9.36	9.36	9.65	---	13
HT40	3	5230	5.45	5.21	5.81	---	-3.65	-4.85	-3.88	---	0.16	8.94	9.90	9.53	---	13

Worst Plots



Note1: Peak exclusion = Peak value –PPSD

Note2: If duty cycle of test signal is < 98%, duty factor is required to PPSD

Peak exclusion = Peak value – (PPSD + duty factor)

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.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.825 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.825 5.835 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 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).

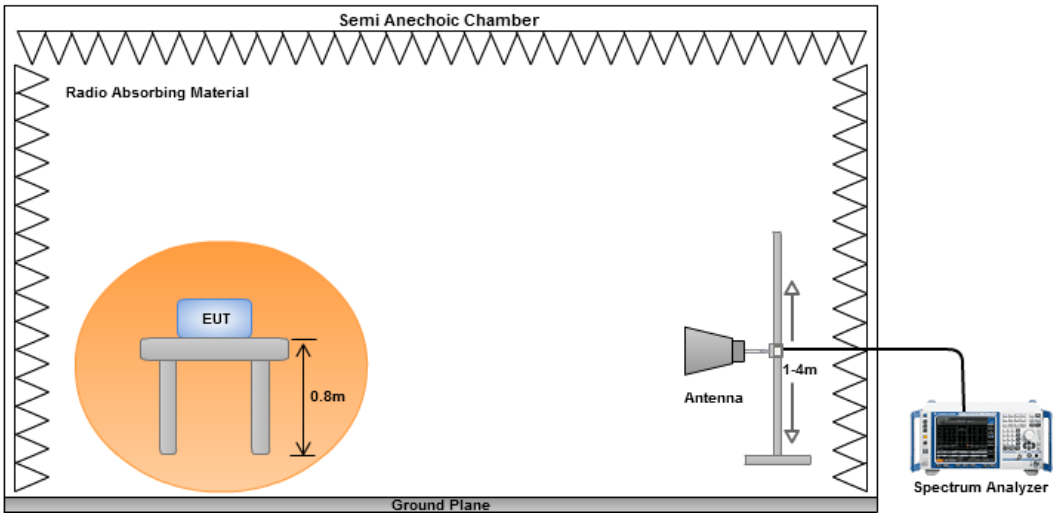
3.6.2 Test Procedures

1. 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.
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:

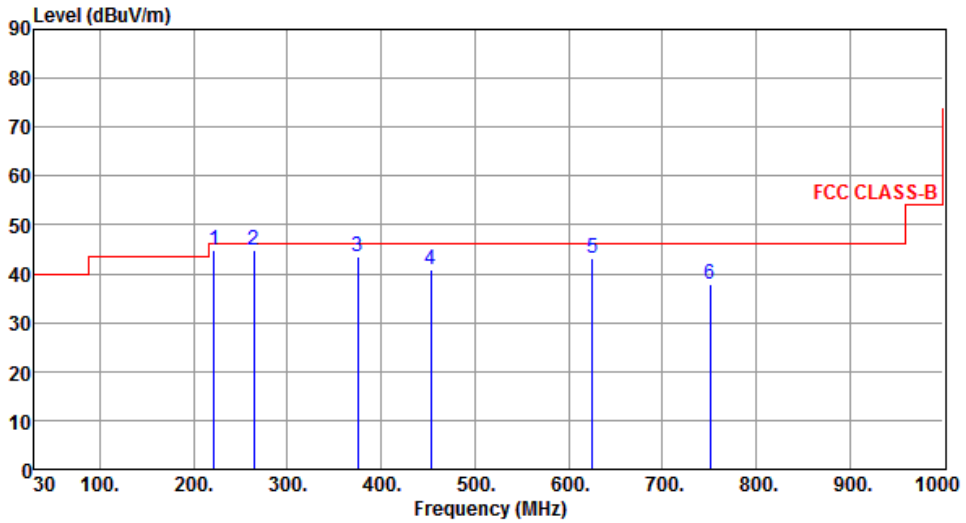
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=3MHz and RMS detector is for average measured value of radiated emission above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

3.6.3 Test Setup



3.6.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

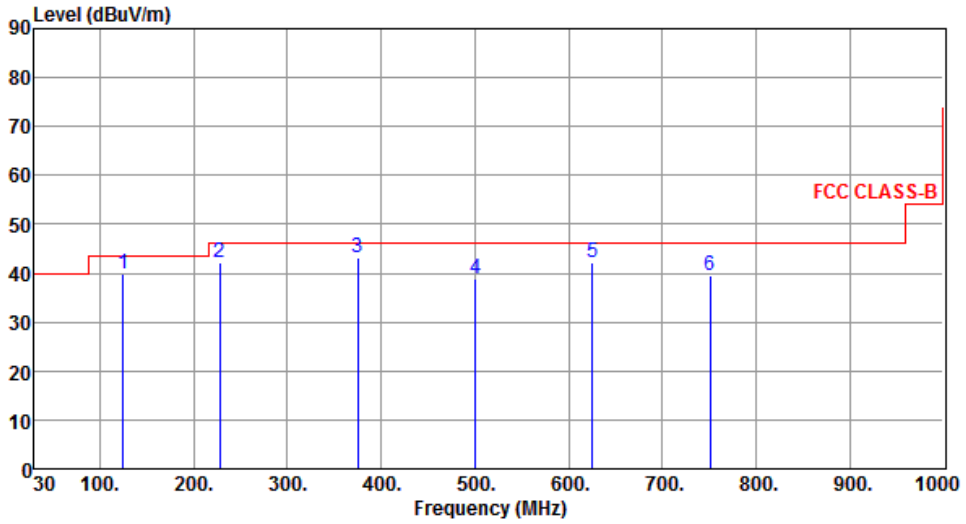
Polarization	Horizontal	**Test Freq. (MHz)**	5200
Test Mode	A		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	221.65	44.85	46.00	-1.15	64.15	-19.30	QP	----------	
2	264.27	44.68	46.00	-1.32	62.04	-17.36	QP	----------	
3	375.32	43.52	46.00	-2.48	57.79	-14.27	QP	----------	
4	452.92	40.82	46.00	-5.18	53.22	-12.40	Peak	----------	
5	625.58	43.04	46.00	-2.96	52.41	-9.37	QP	----------	
6	750.71	38.00	46.00	-8.00	45.21	-7.21	Peak	----------	

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

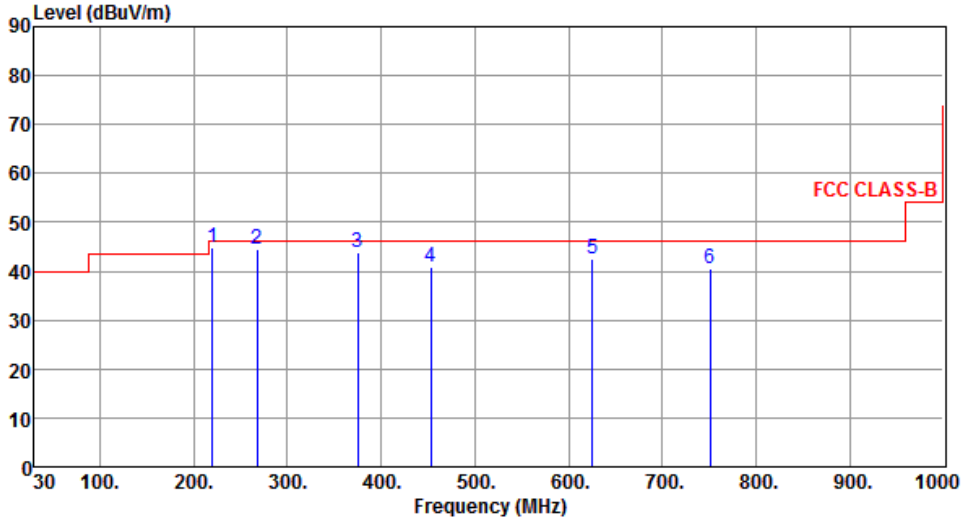
Polarization	Vertical	**Test Freq. (MHz)**	5200
Test Mode	A		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.06	39.99	43.50	-3.51	58.61	-18.62	Peak	----------	
2	227.88	42.26	46.00	-3.74	61.23	-18.97	Peak	----------	
3	375.32	43.25	46.00	-2.75	57.52	-14.27	QP	----------	
4	500.45	39.01	46.00	-6.99	50.57	-11.56	Peak	----------	
5	625.58	42.25	46.00	-3.75	51.62	-9.37	Peak	----------	
6	750.71	39.62	46.00	-6.38	46.83	-7.21	Peak	----------	

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

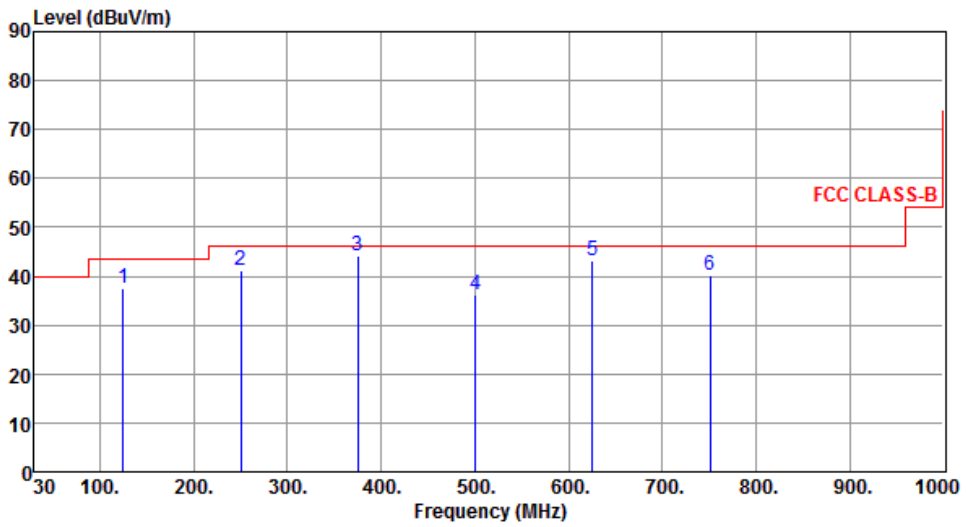
Polarization	Horizontal	**Test Freq. (MHz)**	5200
Test Mode	B		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	220.12	44.91	46.00	-1.09	64.28	-19.37	QP	----------	
2	267.65	44.65	46.00	-1.35	61.84	-17.19	QP	----------	
3	375.32	43.86	46.00	-2.14	58.13	-14.27	QP	----------	
4	452.92	40.84	46.00	-5.16	53.24	-12.40	Peak	----------	
5	625.58	42.40	46.00	-3.60	51.77	-9.37	Peak	----------	
6	750.71	40.67	46.00	-5.33	47.88	-7.21	Peak	----------	

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

Polarization	Vertical	**Test Freq. (MHz)**	5200
Test Mode	B		

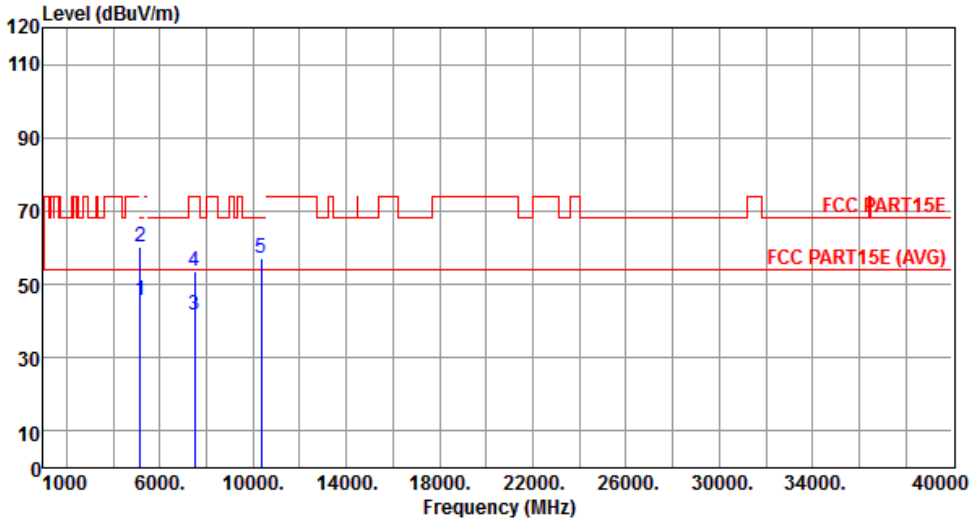


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.06	37.53	43.50	-5.97	56.15	-18.62	Peak	----------	
2	250.19	41.17	46.00	-4.83	59.04	-17.87	Peak	----------	
3	375.32	44.13	46.00	-1.87	58.40	-14.27	QP	----------	
4	500.45	36.10	46.00	-9.90	47.66	-11.56	Peak	----------	
5	625.58	43.06	46.00	-2.94	52.43	-9.37	QP	----------	
6	750.71	40.04	46.00	-5.96	47.25	-7.21	Peak	----------	

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

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

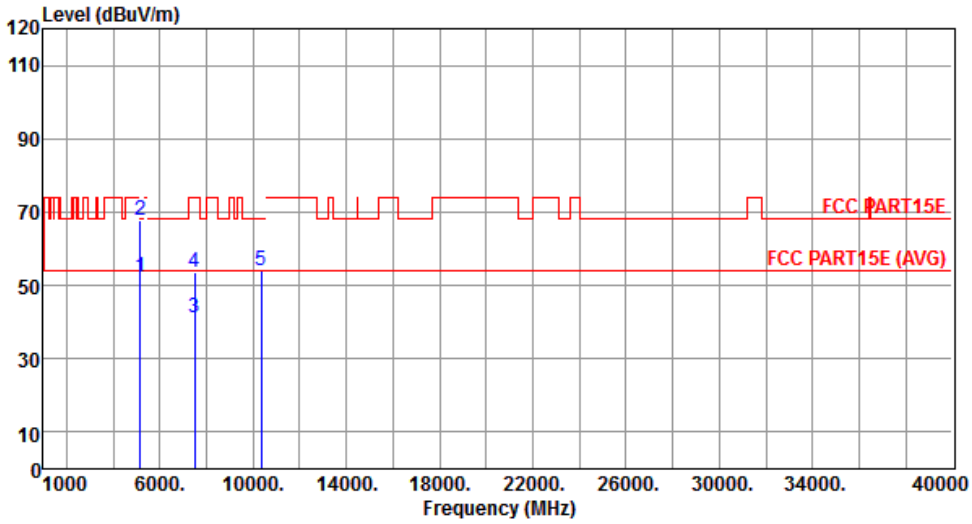
Polarization	Horizontal	**Test Freq. (MHz)**	5180
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.81	54.00	-8.19	40.87	4.94	Average	----------	
2	5150.00	60.01	74.00	-13.99	55.07	4.94	Peak	----------	
3	7500.00	41.46	54.00	-12.54	32.14	9.32	Average	----------	
4	7500.00	53.56	74.00	-20.44	44.24	9.32	Peak	----------	
5	10360.00	56.96	68.30	-11.34	42.25	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

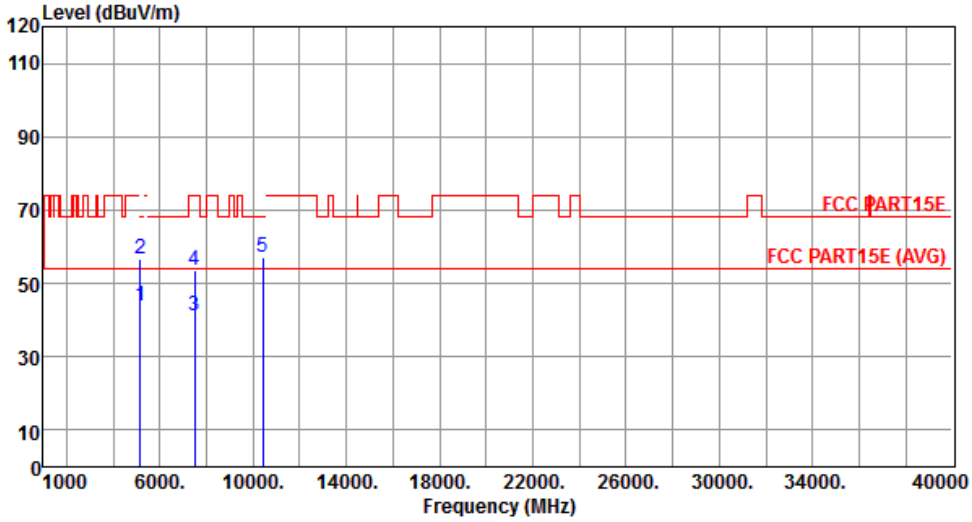
Polarization	Vertical	**Test Freq. (MHz)**	5180
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	52.40	54.00	-1.60	47.46	4.94	Average	----------	
2	5150.00	67.71	74.00	-6.29	62.77	4.94	Peak	----------	
3	7500.00	41.38	54.00	-12.62	32.06	9.32	Average	----------	
4	7500.00	53.44	74.00	-20.56	44.12	9.32	Peak	----------	
5	10360.00	54.00	68.30	-14.30	39.29	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

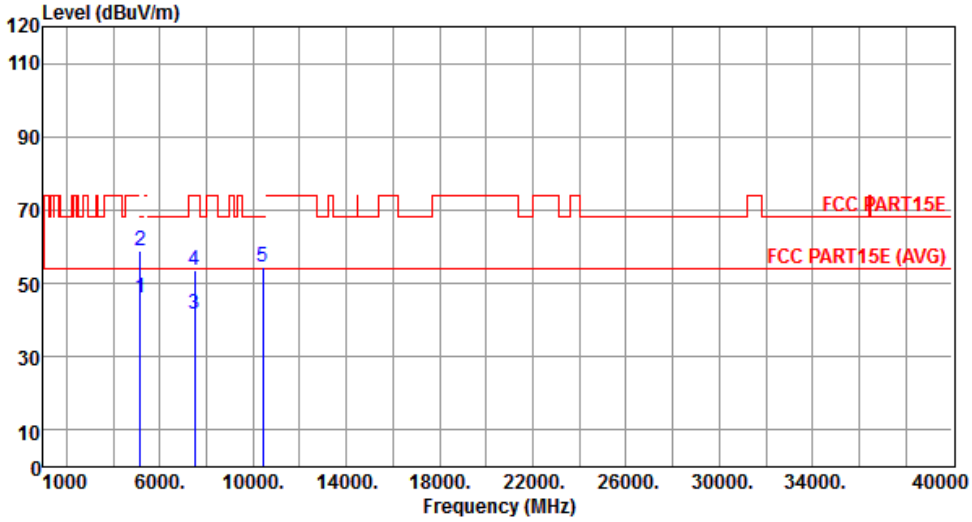
Polarization	Horizontal	**Test Freq. (MHz)**	5200
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.03	54.00	-9.97	39.09	4.94	Average	----------	
2	5150.00	56.84	74.00	-17.16	51.90	4.94	Peak	----------	
3	7500.00	41.38	54.00	-12.62	32.06	9.32	Average	----------	
4	7500.00	53.44	74.00	-20.56	44.12	9.32	Peak	----------	
5	10400.00	57.16	68.30	-11.14	42.41	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

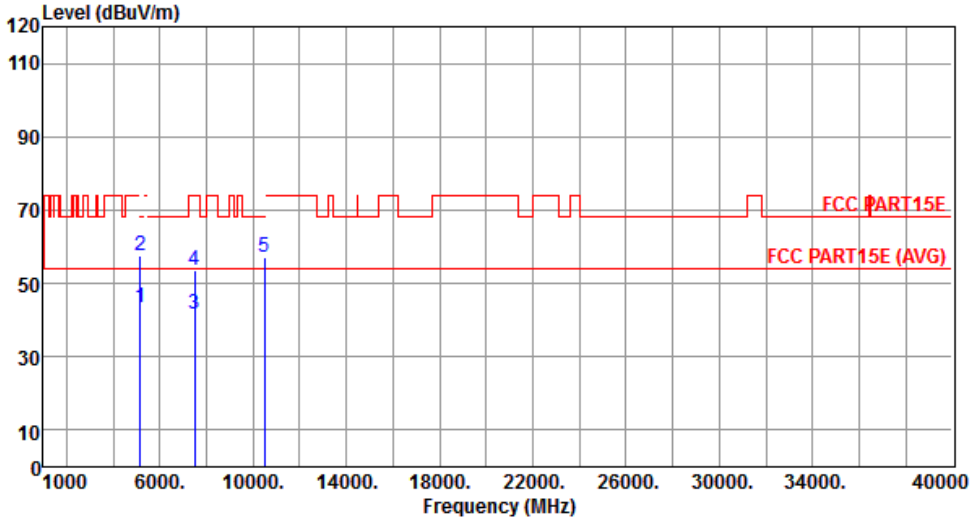
Polarization	Vertical	**Test Freq. (MHz)**	5200
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.22	54.00	-7.78	41.28	4.94	Average	----------	
2	5150.00	59.01	74.00	-14.99	54.07	4.94	Peak	----------	
3	7500.00	41.45	54.00	-12.55	32.13	9.32	Average	----------	
4	7500.00	53.54	74.00	-20.46	44.22	9.32	Peak	----------	
5	10400.00	54.60	68.30	-13.70	39.85	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

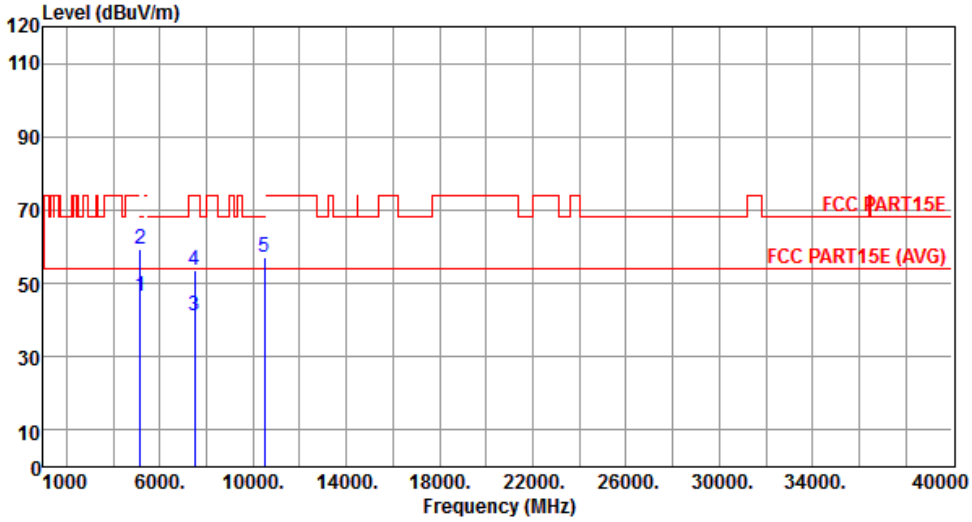
Polarization	Horizontal	**Test Freq. (MHz)**	5240
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.40	54.00	-10.60	38.46	4.94	Average	----------	
2	5150.00	57.40	74.00	-16.60	52.46	4.94	Peak	----------	
3	7500.00	41.56	54.00	-12.44	32.24	9.32	Average	----------	
4	7500.00	53.48	74.00	-20.52	44.16	9.32	Peak	----------	
5	10480.00	57.22	68.30	-11.08	42.38	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

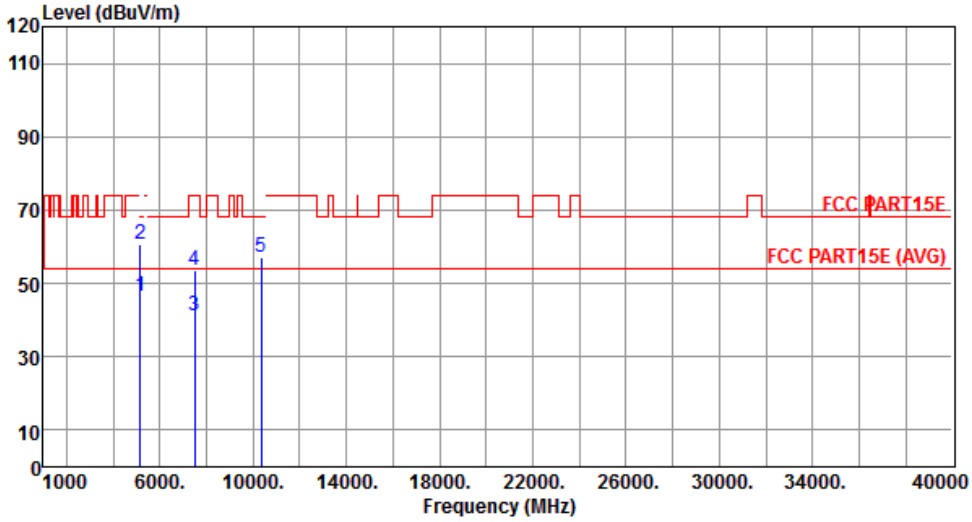
Polarization	Vertical	**Test Freq. (MHz)**	5240
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.60	54.00	-7.40	41.66	4.94	Average	----------	
2	5150.00	59.35	74.00	-14.65	54.41	4.94	Peak	----------	
3	7500.00	41.21	54.00	-12.79	31.89	9.32	Average	----------	
4	7500.00	53.46	74.00	-20.54	44.14	9.32	Peak	----------	
5	10480.00	57.19	68.30	-11.11	42.35	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

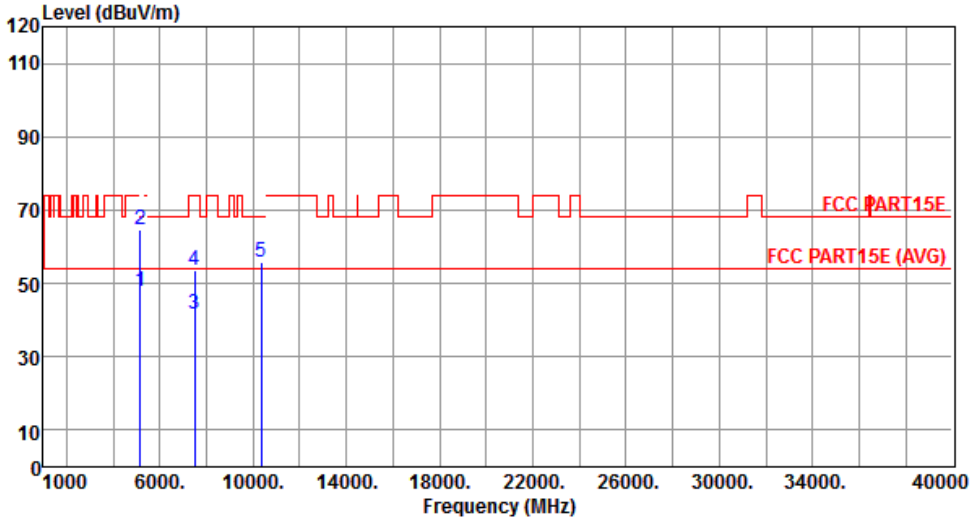
Polarization	Horizontal	**Test Freq. (MHz)**	5180
Test Mode	A3		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.56	54.00	-7.44	41.62	4.94	Average	----------	
2	5150.00	60.80	74.00	-13.20	55.86	4.94	Peak	----------	
3	7500.00	41.35	54.00	-12.65	32.03	9.32	Average	----------	
4	7500.00	53.58	74.00	-20.42	44.26	9.32	Peak	----------	
5	10360.00	57.06	68.30	-11.24	42.35	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

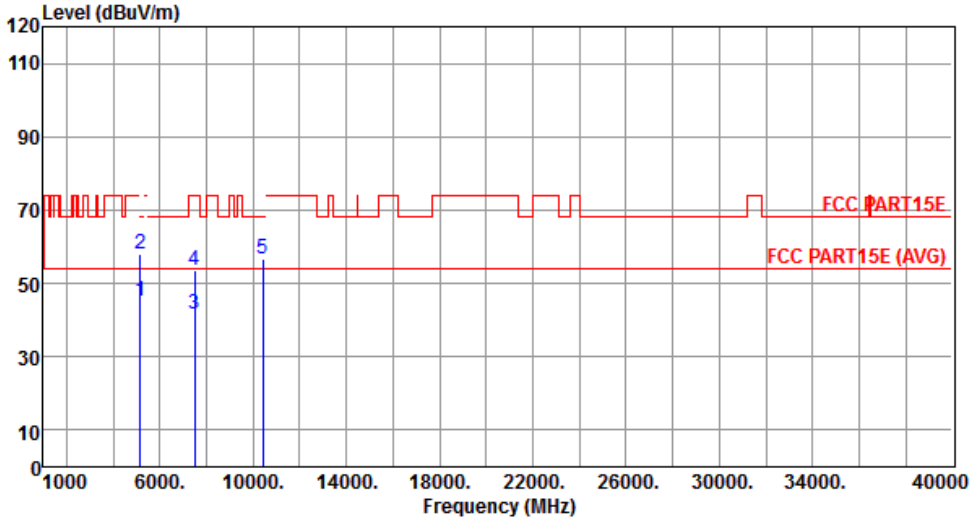
Polarization	Vertical	**Test Freq. (MHz)**	5180
Test Mode	A3		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.89	54.00	-6.11	42.95	4.94	Average	----------	
2	5150.00	64.70	74.00	-9.30	59.76	4.94	Peak	----------	
3	7500.00	41.54	54.00	-12.46	32.22	9.32	Average	----------	
4	7500.00	53.59	74.00	-20.41	44.27	9.32	Peak	----------	
5	10360.00	55.96	68.30	-12.34	41.25	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

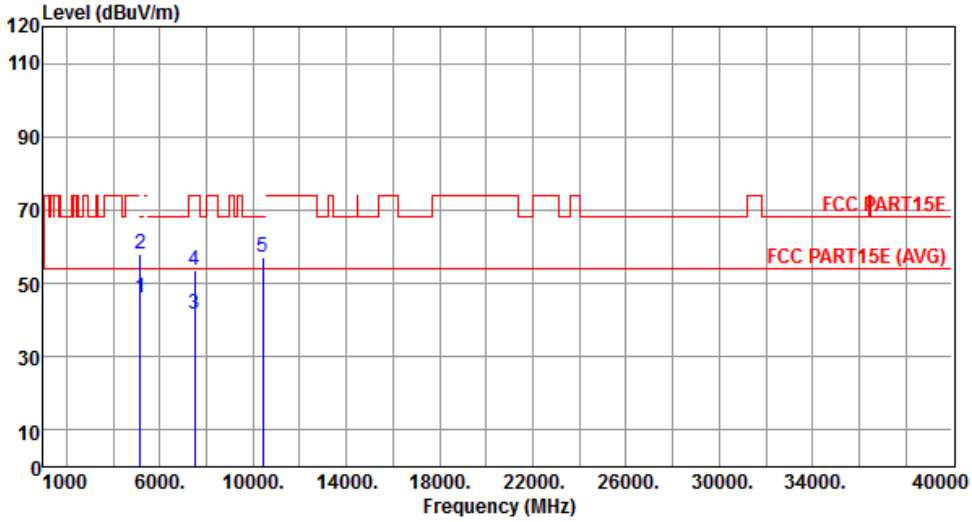
Polarization	Horizontal	**Test Freq. (MHz)**	5200
Test Mode	A3		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.19	54.00	-8.81	40.25	4.94	Average	----------	
2	5150.00	57.89	74.00	-16.11	52.95	4.94	Peak	----------	
3	7500.00	41.44	54.00	-12.56	32.12	9.32	Average	----------	
4	7500.00	53.57	74.00	-20.43	44.25	9.32	Peak	----------	
5	10400.00	56.86	68.30	-11.44	42.11	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

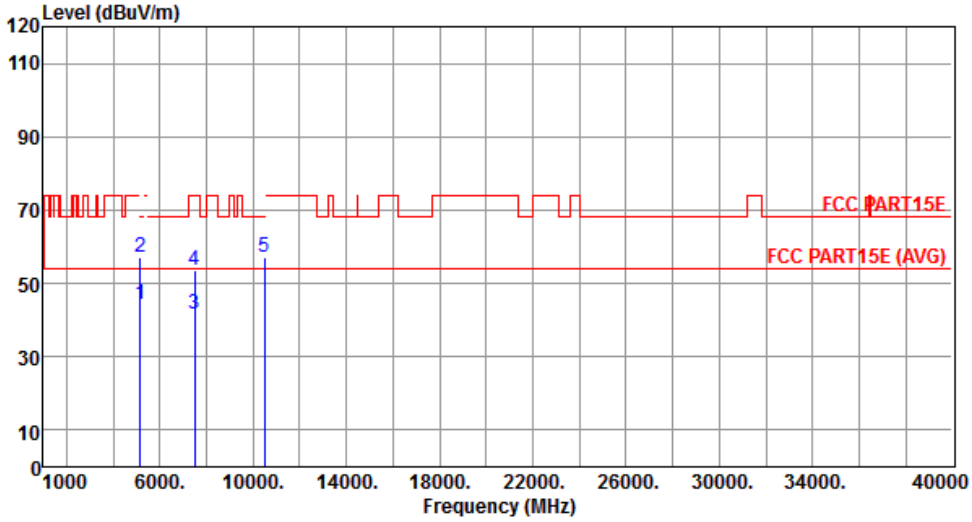
Polarization	Vertical	**Test Freq. (MHz)**	5200
Test Mode	A3		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.03	54.00	-7.97	41.09	4.94	Average	----------	
2	5150.00	57.97	74.00	-16.03	53.03	4.94	Peak	----------	
3	7500.00	41.74	54.00	-12.26	32.42	9.32	Average	----------	
4	7500.00	53.67	74.00	-20.33	44.35	9.32	Peak	----------	
5	10400.00	57.16	68.30	-11.14	42.41	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

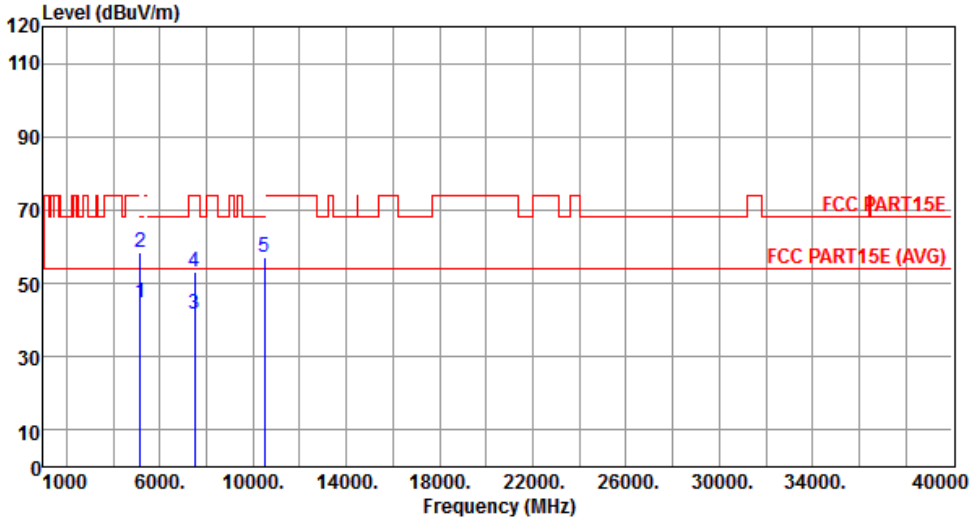
Polarization	Horizontal	**Test Freq. (MHz)**	5240
Test Mode	A3		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.50	54.00	-9.50	39.56	4.94	Average	----------	
2	5150.00	57.14	74.00	-16.86	52.20	4.94	Peak	----------	
3	7500.00	41.62	54.00	-12.38	32.30	9.32	Average	----------	
4	7500.00	53.47	74.00	-20.53	44.15	9.32	Peak	----------	
5	10480.00	57.20	68.30	-11.10	42.36	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Polarization	Vertical	**Test Freq. (MHz)**	5240
Test Mode	A3		

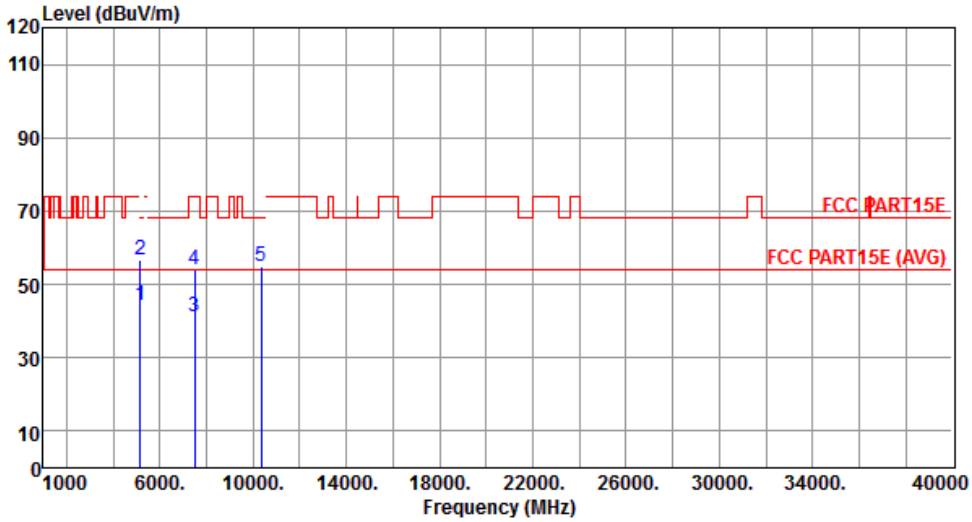


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.65	54.00	-9.35	39.71	4.94	Average	----------	
2	5150.00	58.25	74.00	-15.75	53.31	4.94	Peak	----------	
3	7500.00	41.47	54.00	-12.53	32.15	9.32	Average	----------	
4	7500.00	53.28	74.00	-20.72	43.96	9.32	Peak	----------	
5	10480.00	57.30	68.30	-11.00	42.46	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

3.6.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

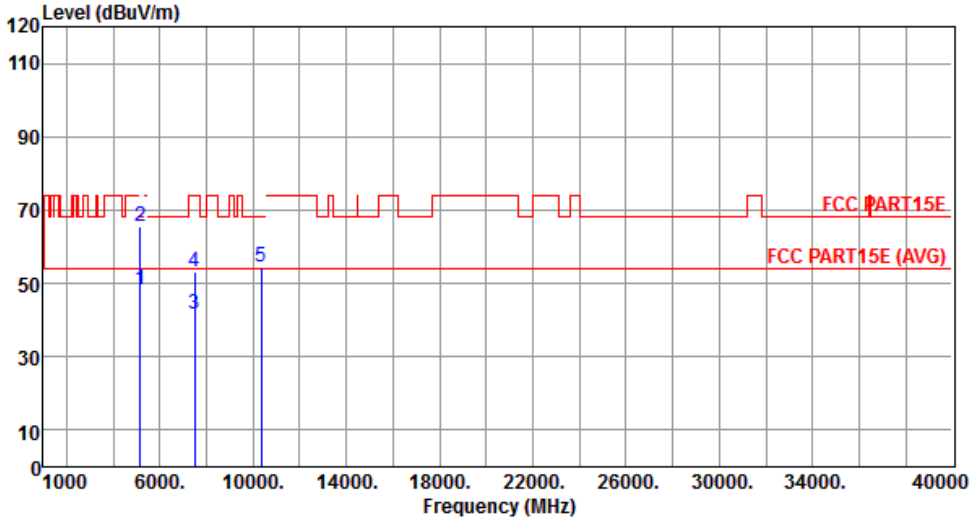
Polarization	Horizontal	**Test Freq. (MHz)**	5180
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.25	54.00	-9.75	39.31	4.94	Average	----------	
2	5150.00	56.89	74.00	-17.11	51.95	4.94	Peak	----------	
3	7500.00	41.38	54.00	-12.62	32.06	9.32	Average	----------	
4	7500.00	53.85	74.00	-20.15	44.53	9.32	Peak	----------	
5	10360.00	54.81	68.30	-13.49	40.10	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

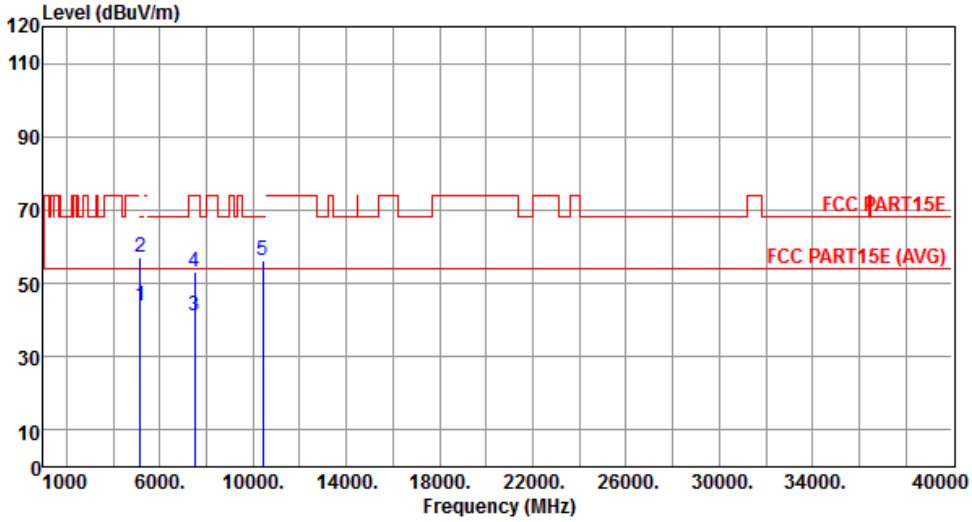
Polarization	Vertical	**Test Freq. (MHz)**	5180
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	48.47	54.00	-5.53	43.53	4.94	Average	----------	
2	5150.00	65.41	74.00	-8.59	60.47	4.94	Peak	----------	
3	7500.00	41.41	54.00	-12.59	32.09	9.32	Average	----------	
4	7500.00	53.31	74.00	-20.69	43.99	9.32	Peak	----------	
5	10360.00	54.68	68.30	-13.62	39.97	14.71	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

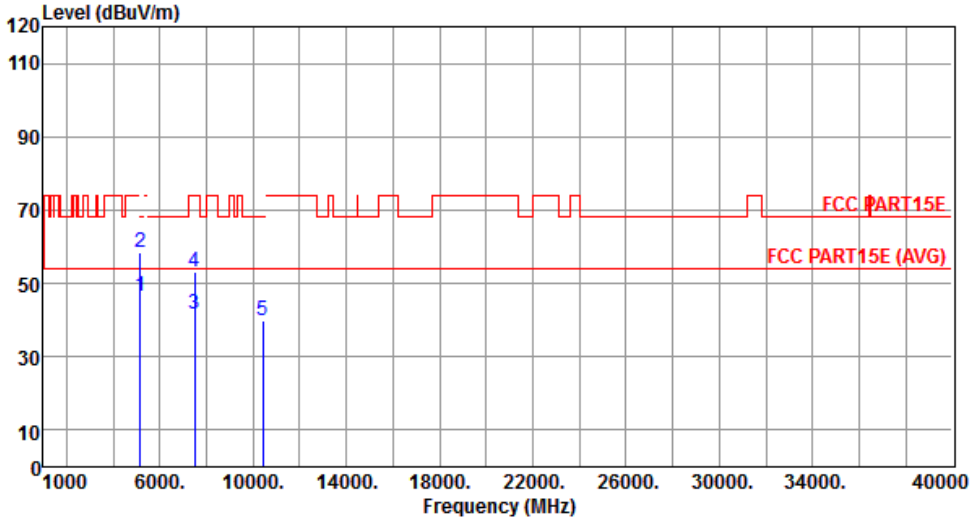
Polarization	Horizontal	**Test Freq. (MHz)**	5200
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.95	54.00	-10.05	39.01	4.94	Average	----------	
2	5150.00	57.30	74.00	-16.70	52.36	4.94	Peak	----------	
3	7500.00	41.35	54.00	-12.65	32.03	9.32	Average	----------	
4	7500.00	53.27	74.00	-20.73	43.95	9.32	Peak	----------	
5	10400.00	56.13	68.30	-12.17	41.38	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

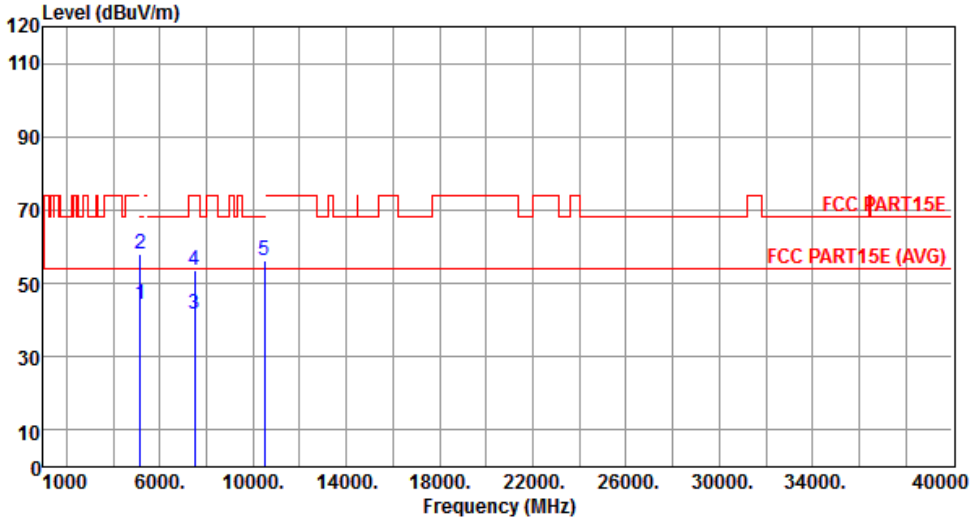
Polarization	Vertical	**Test Freq. (MHz)**	5200
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.56	54.00	-7.44	41.62	4.94	Average	----------	
2	5150.00	58.54	74.00	-15.46	53.60	4.94	Peak	----------	
3	7500.00	41.65	54.00	-12.35	32.33	9.32	Average	----------	
4	7500.00	53.24	74.00	-20.76	43.92	9.32	Peak	----------	
5	10400.00	39.86	68.30	-28.44	25.11	14.75	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

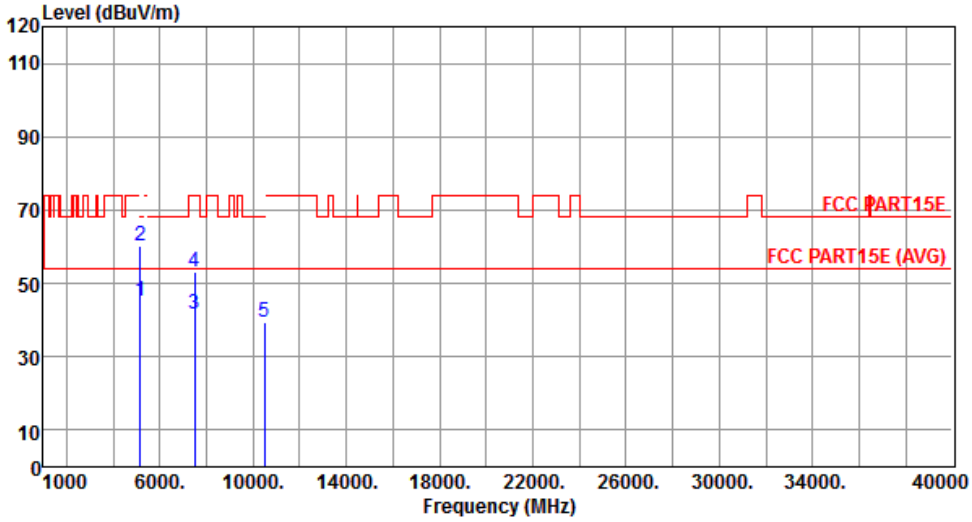
Polarization	Horizontal	**Test Freq. (MHz)**	5240
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.10	54.00	-9.90	39.16	4.94	Average	----------	
2	5150.00	57.97	74.00	-16.03	53.03	4.94	Peak	----------	
3	7500.00	41.65	54.00	-12.35	32.33	9.32	Average	----------	
4	7500.00	53.75	74.00	-20.25	44.43	9.32	Peak	----------	
5	10480.00	56.41	68.30	-11.89	41.57	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Polarization	Vertical	**Test Freq. (MHz)**	5240
Test Mode	A1		

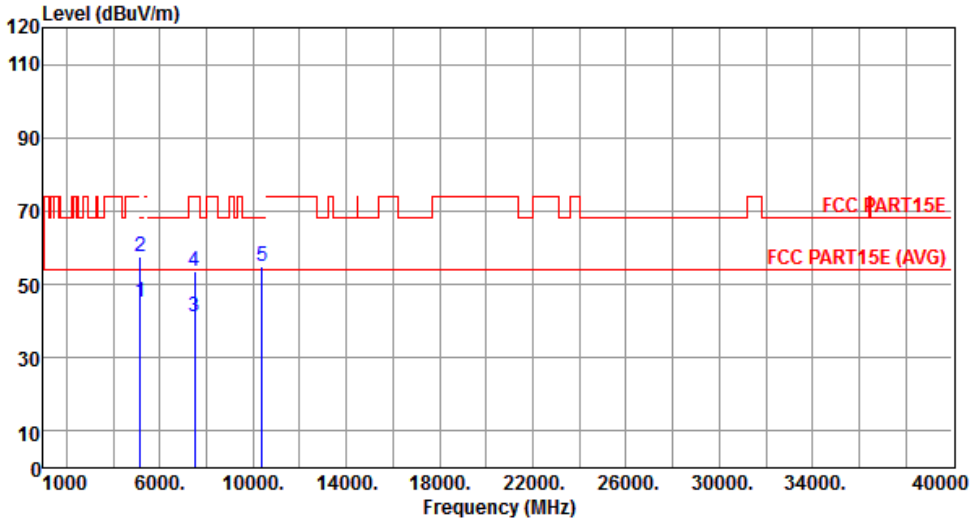


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.19	54.00	-8.81	40.25	4.94	Average	----------	
2	5150.00	60.17	74.00	-13.83	55.23	4.94	Peak	----------	
3	7500.00	41.44	54.00	-12.56	32.12	9.32	Average	----------	
4	7500.00	53.27	74.00	-20.73	43.95	9.32	Peak	----------	
5	10480.00	39.58	68.30	-28.72	24.74	14.84	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

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

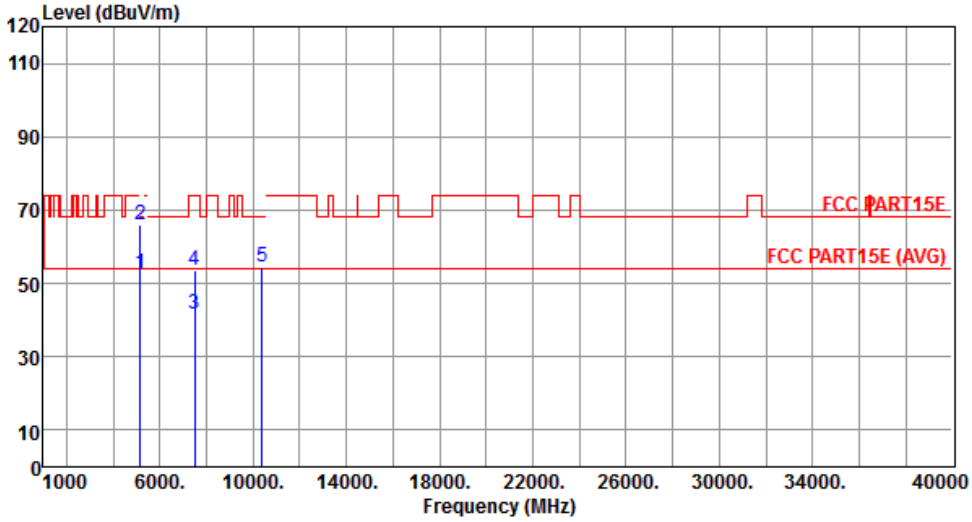
Polarization	Horizontal	**Test Freq. (MHz)**	5190
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.10	54.00	-8.90	40.16	4.94	Average	----------	
2	5150.00	57.63	74.00	-16.37	52.69	4.94	Peak	----------	
3	7500.00	41.38	54.00	-12.62	32.06	9.32	Average	----------	
4	7500.00	53.52	74.00	-20.48	44.20	9.32	Peak	----------	
5	10380.00	55.00	68.30	-13.30	40.27	14.73	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

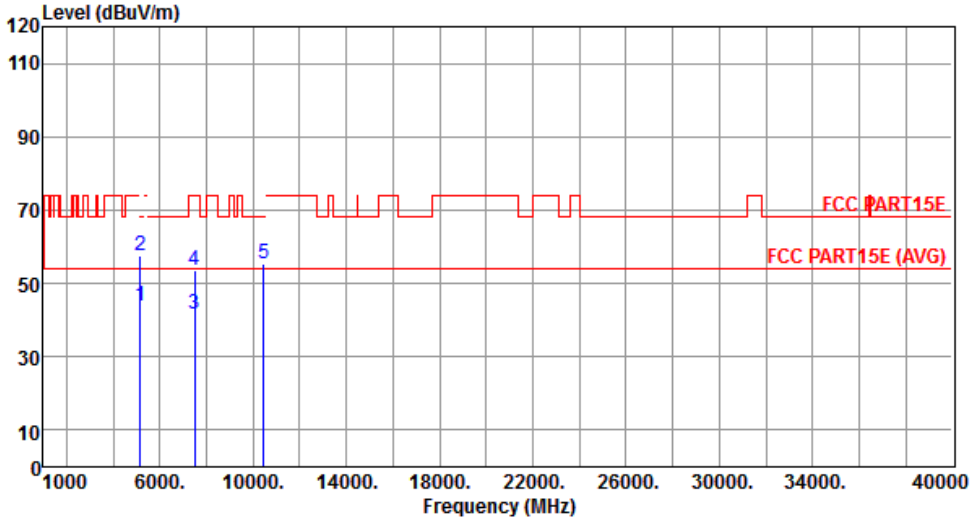
Polarization	Vertical	**Test Freq. (MHz)**	5190
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	52.77	54.00	-1.23	47.83	4.94	Average	----------	
2	5150.00	66.03	74.00	-7.97	61.09	4.94	Peak	----------	
3	7500.00	41.55	54.00	-12.45	32.23	9.32	Average	----------	
4	7500.00	53.47	74.00	-20.53	44.15	9.32	Peak	----------	
5	10380.00	54.28	68.30	-14.02	39.55	14.73	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

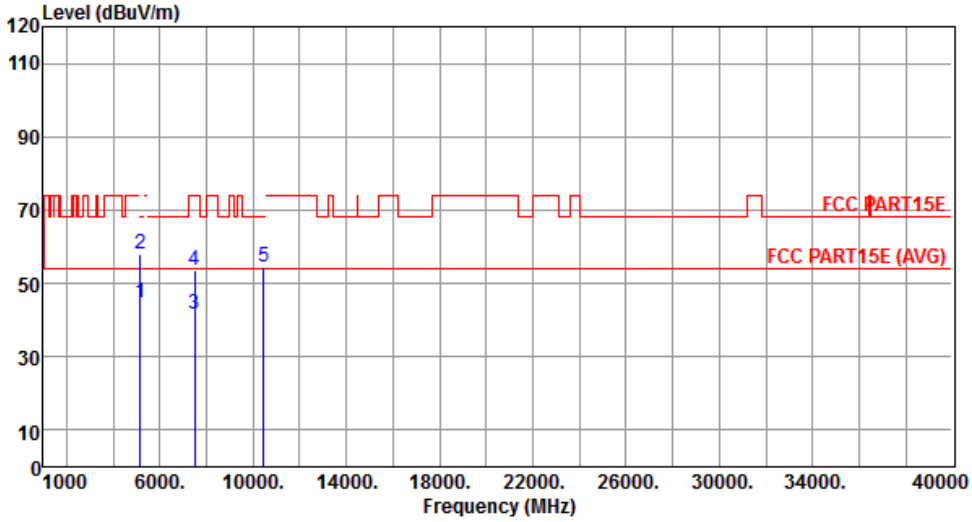
Polarization	Horizontal	**Test Freq. (MHz)**	5230
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.96	54.00	-10.04	39.02	4.94	Average	----------	
2	5150.00	57.43	74.00	-16.57	52.49	4.94	Peak	----------	
3	7500.00	41.51	54.00	-12.49	32.19	9.32	Average	----------	
4	7500.00	53.42	74.00	-20.58	44.10	9.32	Peak	----------	
5	10460.00	55.40	68.30	-12.90	40.58	14.82	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Polarization	Vertical	**Test Freq. (MHz)**	5230
Test Mode	A1		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.56	54.00	-9.44	39.62	4.94	Average	----------	
2	5150.00	57.83	74.00	-16.17	52.89	4.94	Peak	----------	
3	7500.00	41.57	54.00	-12.43	32.25	9.32	Average	----------	
4	7500.00	53.66	74.00	-20.34	44.34	9.32	Peak	----------	
5	10460.00	54.37	68.30	-13.93	39.55	14.82	Peak	----------	

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

3.7 Frequency Stability

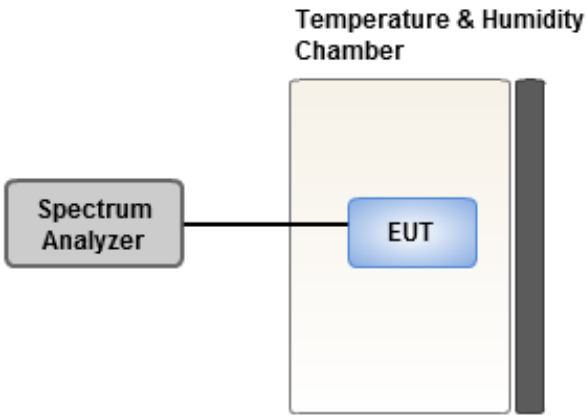
3.7.1 Limit of Frequency Stability

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.
2. 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.

3.7.3 Test Setup



3.7.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)			
Temperature (°C)	**0 minute**	**2 minutes**	**5 minutes**	**10 minutes**
T20°CVmax	-0.08	0.03	0.27	0.50
T20°CVmin	4.88	5.18	5.41	5.26
T50°CVnom	3.68	4.28	4.05	4.14
T40°CVnom	-1.55	-0.80	-2.03	-1.25
T30°CVnom	0.22	0.12	0.14	0.61
T20°CVnom	1.00	0.90	1.13	0.76
T10°CVnom	0.91	1.12	0.92	1.21
T0°CVnom	0.92	0.89	0.77	1.27
T-10°CVnom	0.77	0.55	1.42	0.95
T-20°CVnom	0.13	0.24	0.68	0.12
T-30°CVnom	-0.20	-0.50	0.09	0.30
Vnom [V]: 110	Vmax [V]: 126.5	Vmin [V]: 93.5		
Tnom [°C]: 20	Tmax [°C]: 50	Tmin [°C]: -30		

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