



FCC Test Report

Equipment : WatchGuard® AP
Brand Name : WatchGuard®
Model No. : AP300
FCC ID : Q6G-AP300
Standard : 47 CFR FCC Part 15.407
Operating Band : 5250 MHz – 5350 MHz
5470 MHz – 5725 MHz
FCC Classification : NII
Applicant : WatchGuard® Technologies, Inc.
505 Fifth Avenue South, Suite 500 Seattle Washington
98104 United States
Manufacturer : Senao Networks, Inc.
No. 500 & 528, Fusing 3rd., Hwa-Ya Technical Park,
Kuei-Shan Dist., Taoyuan City, Taiwan, R.O.C.
Function : Outdoor AP; Indoor AP;
 Fixed P2P AP Portable Client

The product sample received on Oct. 16, 2015 and completely tested on Nov. 12, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:


Kevin Liang / Assistant Manager





Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Support Equipment.....	7
1.3	Testing Applied Standards	7
1.4	Testing Location Information	7
1.5	Measurement Uncertainty	8
2	TEST CONFIGURATION OF EUT	9
2.1	The Worst Case Modulation Configuration	9
2.2	The Worst Case Power Setting Parameter.....	9
2.3	The Worst Case Measurement Configuration.....	10
2.4	Test Setup Diagram	12
3	TRANSMITTER TEST RESULT	14
3.1	AC Power-line Conducted Emissions	14
3.2	Emission Bandwidth	17
3.3	RF Output Power.....	21
3.4	Peak Power Spectral Density.....	27
3.5	Transmitter Bandedge Emissions	31
3.6	Transmitter Unwanted Emissions.....	35
3.7	Frequency Stability	114
4	TEST EQUIPMENT AND CALIBRATION DATA	116

APPENDIX A. CO-LOCATION

APPENDIX B. TEST PHOTOS

APPENDIX C. PHOTOGRAPHS OF EUT



Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.2	15.203	Antenna Requirement	Complied
3.1	15.207	AC Power-line Conducted Emissions	Complied
3.2	15.407(a)	Emission Bandwidth	Complied
3.3	15.407(a)	RF Output Power (Maximum Conducted Output Power)	Complied
3.4	15.407(a)	Peak Power Spectral Density	Complied
3.5	15.407(b)	Transmitter Bandedge Emissions	Complied
3.6	15.407(b)	Transmitter Unwanted Emissions	Complied
3.7	15.407(g)	Frequency Stability	Complied



Revision History



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
a	5260-5320	52-64 [4]	3	18.55
	5500-5700	100-140 [11]	3	18.50
n (HT20) / ac (VHT20)	5260-5320	52-64 [4]	3 / 3	18.47 / 18.81
	5500-5700	100-140 [11]	3 / 3	18.95 / 18.85
n (HT40) / ac (VHT40)	5270-5310	54-62 [2]	3 / 3	21.62 / 21.84
	5510-5670	102-134 [3]	3 / 3	21.73 / 21.62
ac (VHT80)	5290	58 [1]	3	17.03
	5530	106 [2]	3	23.79

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

1.1.2 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input checked="" type="checkbox"/>	Temporary RF connector provided
<input type="checkbox"/>	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.

Antenna General Information			
Port No.	Ant. Cat.	Ant. Type	Gain (dBi)
1	Integral	PIFA	4.66
2	Integral	PIFA	5.00
3	Integral	PIFA	4.87

Remark: This EUT only supports 3TX and CDD function in modulation mode: 11a, 11n and 11ac.



1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	<input type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input checked="" type="checkbox"/> Prototype
Type of EUT	
<input checked="" type="checkbox"/> Stand-alone	
<input type="checkbox"/> Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...	
<input type="checkbox"/> Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ...	
<input type="checkbox"/> Other:	

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
<input type="checkbox"/> Operated normally mode for worst duty cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 98.62% - IEEE 802.11a	0.06
<input checked="" type="checkbox"/> 98.52% - IEEE 802.11n (HT20)	0.06
<input checked="" type="checkbox"/> 97.06% - IEEE 802.11n (HT40)	0.13
<input checked="" type="checkbox"/> 97.79% - IEEE 802.11ac (VHT20)	0.10
<input checked="" type="checkbox"/> 97.10% - IEEE 802.11ac (VHT40)	0.13
<input checked="" type="checkbox"/> 94.46% - IEEE 802.11ac (VHT80)	0.25

Note 1: RF Output Power Plots w/o Duty Factor Note 1: Power Density Plots w/o Duty Factor

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input type="checkbox"/> DC	
Type of DC Source	<input checked="" type="checkbox"/> From adapter	<input type="checkbox"/> From PoE	<input type="checkbox"/> From Battery
Test Voltage	<input checked="" type="checkbox"/> V _{nom} (120V)	<input checked="" type="checkbox"/> V _{max} (138 V)	<input checked="" type="checkbox"/> V _{min} (102 V)
Test Climatic	<input checked="" type="checkbox"/> T _{nom} (20°C)	<input checked="" type="checkbox"/> T _{max} (50°C)	<input checked="" type="checkbox"/> T _{min} (-20°C)



1.2 Support Equipment

Support Equipment - RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5540	DoC
2	Adapter for Notebook	DELL	HA65NM130	DoC

Support Equipment - AC Conduction and Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	AC Adapter (Client Provide)	Powertron Electronics Corp.	PA1015-120IB125	DoC

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v01
- FCC KDB 644545 D03 v01
- FCC KDB 662911 v02r01
- FCC-14-30A1-UNII

1.4 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	HWA YA	ADD	: No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.	
		TEL	: 886-3-327-3456 FAX : 886-3-327-0973	
Test Condition		Test Site No.	Test Engineer	Test Environment
AC Conduction		CO04-HY	Anthony	21°C / 60%
RF Conducted		TH01-HY	Howard	23.5°C / 64%
Radiated Emission		03CH03-HY	Joe	24.5°C / 52%



1.5 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		
Test Item	Uncertainty	
AC power-line conducted emissions	±2.3 dB	
Emission bandwidth, 26dB bandwidth	±0.5%	
RF output power, conducted	±0.1 dB	
Power density, conducted	±0.5 dB	
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
	1 – 18 GHz	±0.5 dB
	18 – 40 GHz	±0.5 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
	1 – 18 GHz	±3.6 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature	±0.8 °C	
Humidity	±5 %	
DC and low frequency voltages	±0.9%	
Time	±1.4 %	
Duty Cycle	±0.5 %	



2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing			
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS
11a	3	6-54Mbps	6 Mbps
HT20	3	MCS 0-23	MCS 0
HT40	3	MCS 0-23	MCS 0
VHT20	3	MCS 0-8	MCS 0
VHT40	3	MCS 0-9	MCS 0
VHT80	3	MCS 0-9	MCS 0

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (5250-5350MHz band)							
Test Software Version	Atheros Radio Test 2(ART2-GUI)_2.3						
Modulation Mode	N _{TX}	Test Frequency (MHz)					
		NCB: 20MHz		NCB: 40MHz		NCB: 80MHz	
		5260	5300	5320	5270	5310	5290
11a	3	13.0	13.0	13.0	-	-	-
HT20	3	13.0	13.0	13.0	-	-	-
HT40	3	-	-	-	16.5	16.5	-
VHT20	3	13.5	13.0	13.0	-	-	-
VHT40	3	-	-	-	13.0	13.0	-
VHT80	3	-	-	-	-	-	12.5

The Worst Case Power Setting Parameter (5470-5725MHz band)												
Test Software Version	Atheros Radio Test 2(ART2-GUI)_2.3											
Modulation Mode	N _{TX}	Test Frequency (MHz)										
		NCB: 20MHz				NCB: 40MHz				NCB: 80MHz		
		5500	5580	5700	5720	5510	5550	5670	5710	5530	5610	5690
11a,6-54Mbps	3	14.0	13.5	14.0	14.0	-	-	-	-	-	-	-
HT20	3	14.5	14.0	14.0	14.0	-	-	-	-	-	-	-
HT40	3	-	-	-	-	17.5	17.5	17.5	17.5	-	-	-
VHT20	3	14.5	14.0	14.0	14.0	-	-	-	-	-	-	-
VHT40	3	-	-	-	-	17.5	17.5	17.5	17.5	-	-	-
VHT80	3	-	-	-	-	-	-	-	-	14.0	20.0	20.0



2.3 The Worst Case Measurement Configuration

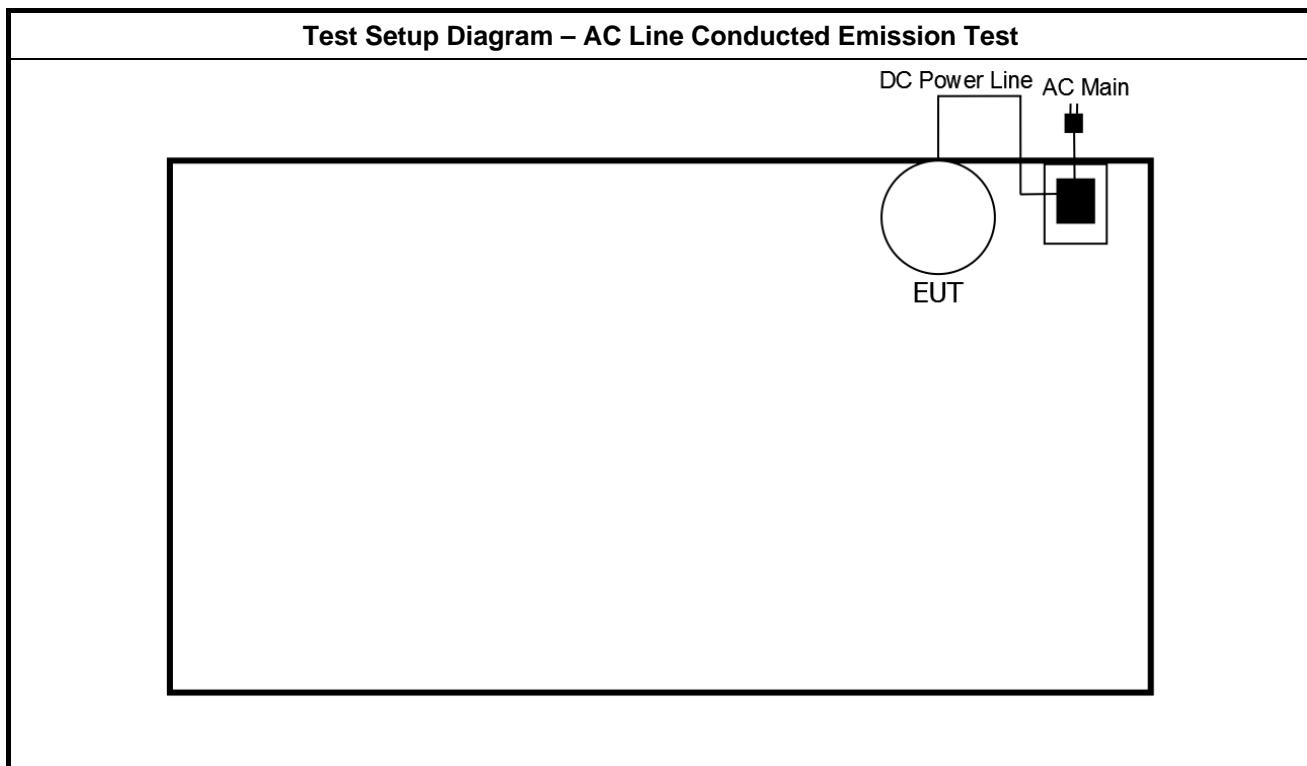
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	EUT with Adapter

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Peak Power Spectral Density, Emission Bandwidth, Transmitter Conducted Unwanted Emissions Transmitter Conducted Bandedge Emissions
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT20, HT40, VHT20, VHT40, VHT80

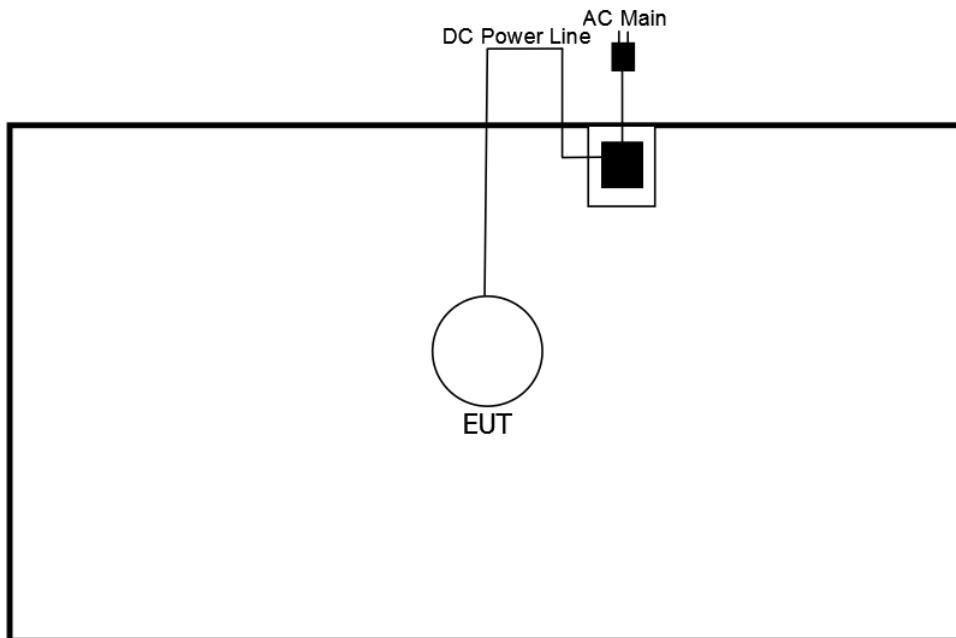


The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
User Position	<input type="checkbox"/> EUT will be placed in fixed position. <input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. <input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode	Operating Mode Description
1	EUT with Adapter
Modulation Mode	11a, HT20, HT40, VHT20, VHT40, VHT80
Orthogonal Planes of EUT	X Plane
Worst Planes of EUT	Y Plane
Worst Planes of EUT	Z Plane

2.4 Test Setup Diagram



Test Setup Diagram - Radiated Emission



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line 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.

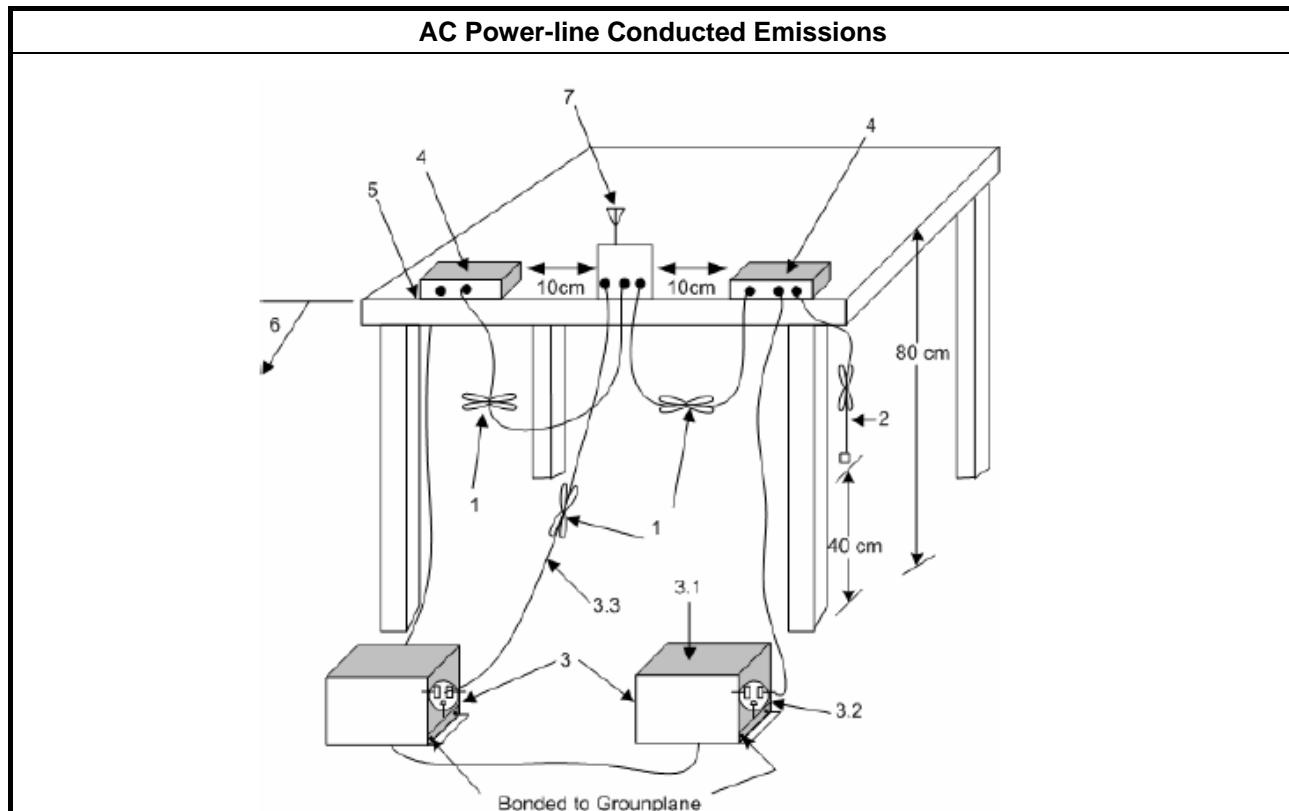
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

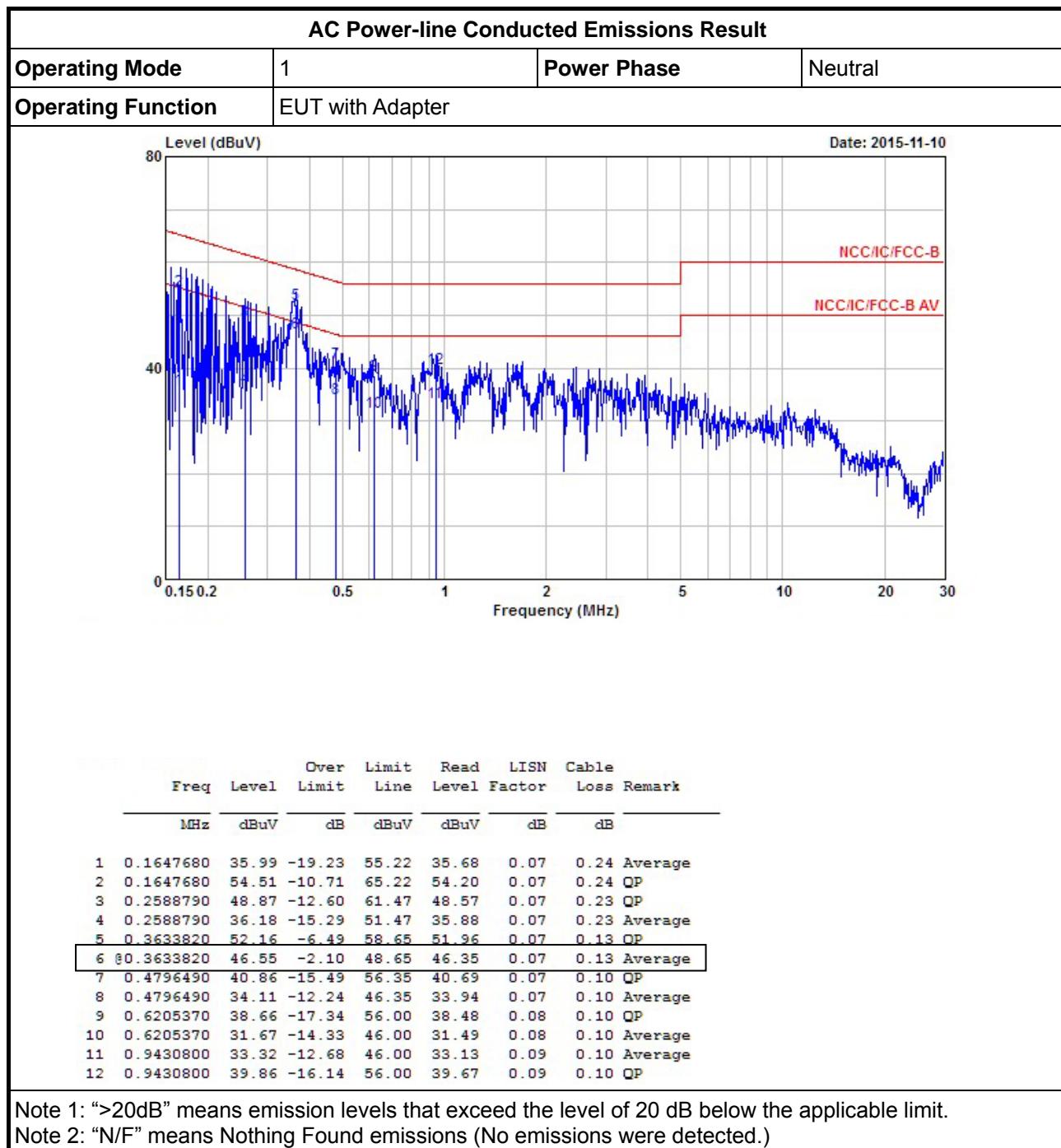
Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup





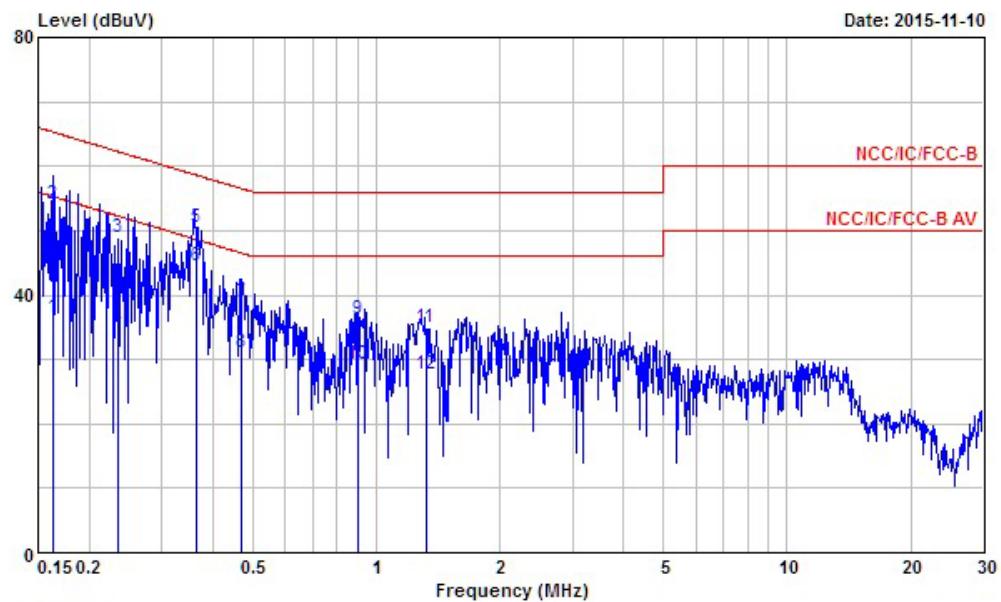
3.1.5 Test Result of AC Power-line Conducted Emissions





AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	EUT with Adapter		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1632710	36.45	-18.85	55.30	36.16	0.05	0.24	Average	
2	0.1632710	54.09	-11.21	65.30	53.80	0.05	0.24	QP	
3	0.2351940	49.00	-13.26	62.26	48.69	0.06	0.25	QP	
4	0.2351940	35.02	-17.24	52.26	34.71	0.06	0.25	Average	
5	0.3640520	50.48	-8.16	58.64	50.28	0.07	0.13	QP	
6	0.3640520	44.47	-4.17	48.64	44.27	0.07	0.13	Average	
7	0.4711010	38.75	-17.74	56.49	38.58	0.07	0.10	QP	
8	0.4711010	31.10	-15.39	46.49	30.93	0.07	0.10	Average	
9	0.8991650	36.19	-19.81	56.00	36.01	0.08	0.10	QP	
10	0.8991650	29.34	-16.66	46.00	29.16	0.08	0.10	Average	
11		1.320	34.85	-21.15	56.00	34.58	0.09	0.18	QP
12		1.320	27.60	-18.40	46.00	27.33	0.09	0.18	Average

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
<input type="checkbox"/>	For the 5.15-5.25 GHz band, N/A
<input checked="" type="checkbox"/>	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
<input checked="" type="checkbox"/>	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
<input type="checkbox"/>	For the 5.725-5.85 GHz band, 6 dB emission bandwidth \geq 500kHz.

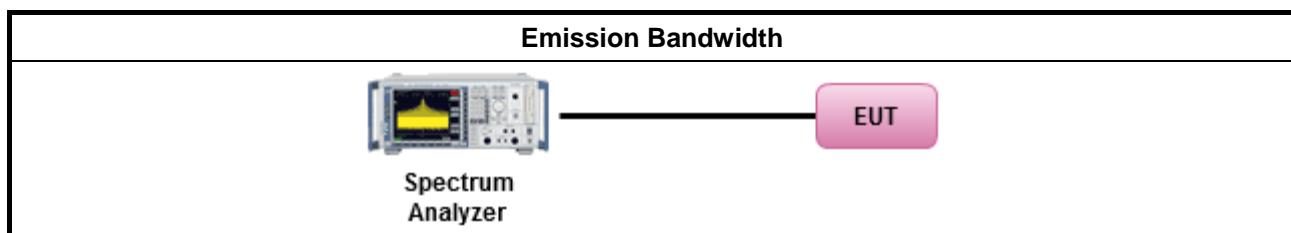
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	For the emission bandwidth shall be measured using one of the options below:
	<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
	<input type="checkbox"/> Refer as IC RSS-Gen, clause 6.6 for bandwidth testing.
<input checked="" type="checkbox"/>	For conducted measurement.
	<input type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain port 1.
	<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
	<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below:
	<input type="checkbox"/> Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.
	<input checked="" type="checkbox"/> Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

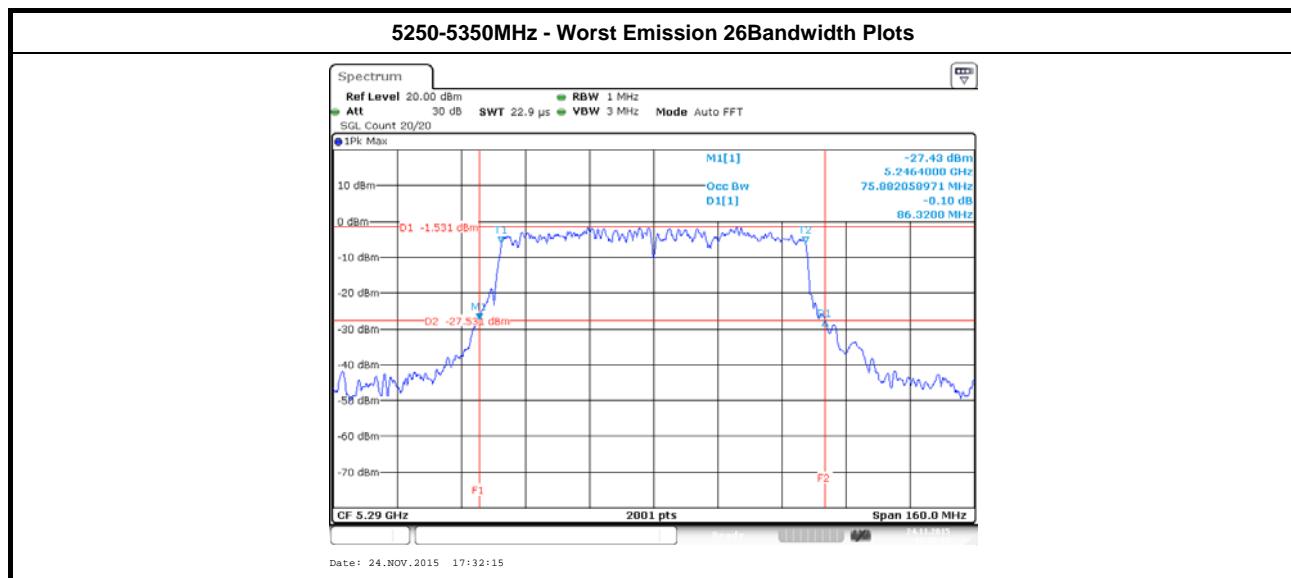
3.2.4 Test Setup





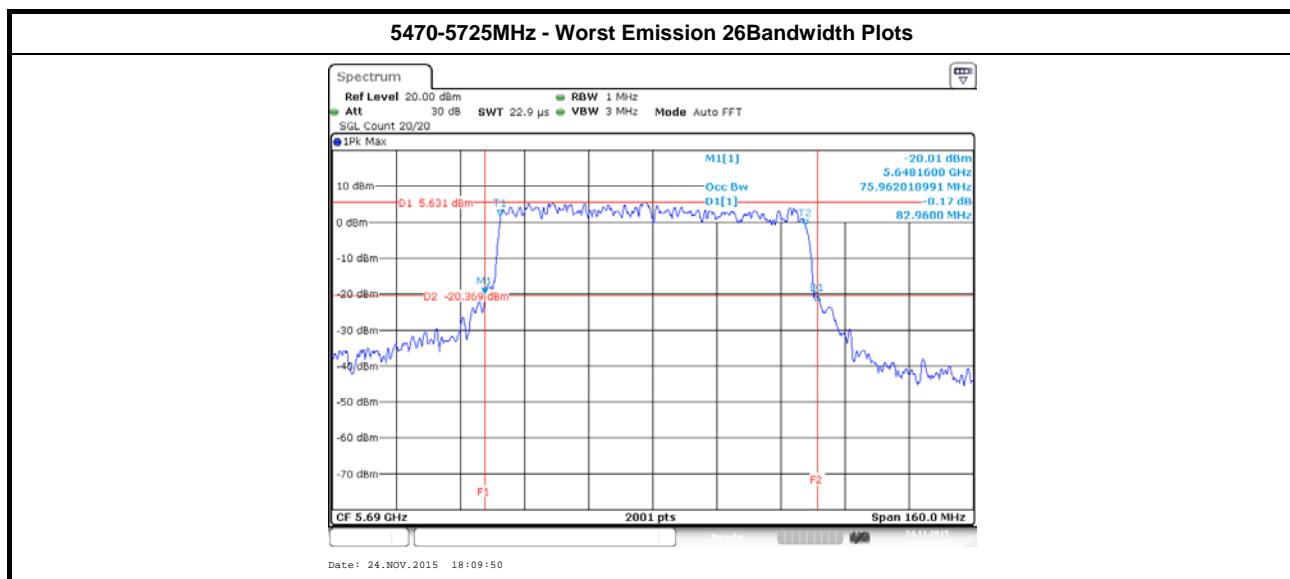
3.2.5 Test Result of Emission Bandwidth

UNII Emission Bandwidth Result (5250-5350MHz band)								
Condition			Emission Bandwidth (MHz)					
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth			26dB Bandwidth		
			Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 1	Chain Port 2	Chain Port 3
11a	3	5260	16.59	16.59	16.41	21.20	20.52	19.67
11a	3	5300	16.76	16.59	16.59	20.72	20.92	20.40
11a	3	5320	16.36	16.51	16.54	19.00	20.45	20.67
HT20	3	5260	17.76	17.64	17.89	22.15	21.57	22.12
HT20	3	5300	18.01	17.69	17.86	21.85	21.15	21.52
HT20	3	5320	17.76	17.79	17.84	21.20	21.37	22.00
HT40	3	5270	36.46	36.50	36.34	40.44	40.32	41.32
HT40	3	5310	36.50	36.78	36.82	42.40	41.08	40.72
VHT20	3	5260	18.09	17.69	17.81	22.25	21.70	21.52
VHT20	3	5300	17.81	17.91	17.79	20.82	22.15	21.95
VHT20	3	5320	18.24	17.66	17.89	22.92	21.12	22.52
VHT40	3	5270	36.74	36.54	36.10	41.88	41.52	39.36
VHT40	3	5310	36.26	36.74	36.58	39.24	41.52	43.80
VHT80	3	5290	75.48	75.96	75.88	81.04	83.04	86.32
Result			Complied					





UNII Emission Bandwidth Result (5470-5725MHz band)								
Condition			Emission Bandwidth (MHz)					
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth			26dB Bandwidth		
			Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 1	Chain Port 2	Chain Port 3
11a	3	5500	16.56	16.59	16.39	20.20	20.85	19.22
11a	3	5580	16.49	16.44	16.84	21.00	19.75	21.47
11a	3	5700	16.49	16.36	16.56	20.72	19.05	19.95
11a	3	5720	16.41	16.61	16.41	19.22	19.62	20.22
HT20	3	5500	17.89	17.79	17.84	21.12	21.30	21.97
HT20	3	5580	17.64	17.86	17.91	20.77	21.55	21.22
HT20	3	5700	17.79	17.54	17.61	22.00	21.07	20.30
HT20	3	5720	17.74	17.81	17.64	20.37	21.00	20.40
HT40	3	5510	36.26	36.38	36.14	40.40	41.84	40.32
HT40	3	5550	36.38	36.50	36.18	41.48	42.60	40.16
HT40	3	5670	36.54	36.90	36.58	41.24	43.00	42.12
HT40	3	5710	36.26	36.18	36.34	40.28	41.32	43.32
VHT20	3	5500	17.94	17.74	17.79	22.82	21.17	20.85
VHT20	3	5580	17.69	17.74	17.79	20.50	21.42	21.42
VHT20	3	5700	17.66	17.69	17.81	20.95	21.00	21.97
VHT20	3	5720	17.71	17.81	17.99	21.02	21.55	22.17
VHT40	3	5510	36.66	36.34	36.46	41.72	41.12	41.60
VHT40	3	5550	37.10	36.46	36.74	43.40	44.04	42.36
VHT40	3	5670	36.54	36.46	36.50	40.88	42.68	41.32
VHT40	3	5710	36.26	36.46	36.58	40.32	41.08	41.00
VHT80	3	5530	75.40	75.40	75.32	84.48	80.64	78.40
VHT80	3	5610	75.80	75.72	75.40	79.60	80.08	80.08
VHT80	3	5690	75.72	75.40	75.96	80.32	81.60	82.96
Result			Complied					





3.3 RF Output Power

3.3.1 RF Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
<input type="checkbox"/> For the 5.15-5.25 GHz band:	
<input type="checkbox"/> Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125 mW [21dBm]	
<input type="checkbox"/> Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$	
<input type="checkbox"/> Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$.	
<input type="checkbox"/> Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + $10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + $10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input type="checkbox"/> For the 5.725-5.85 GHz band:	
<input type="checkbox"/> Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.	
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

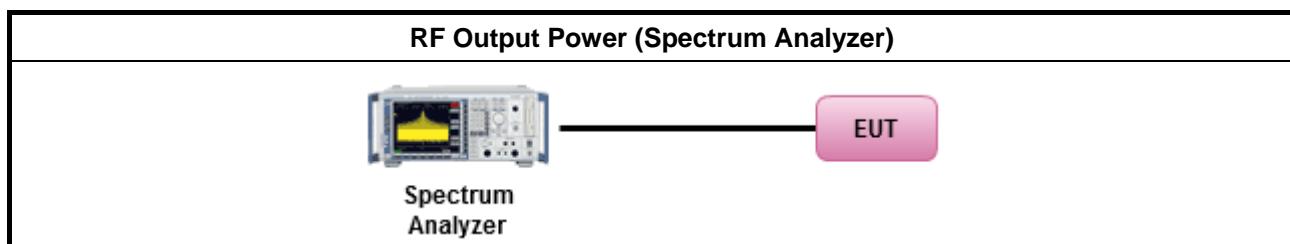
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/> Maximum Conducted Output Power	
	[duty cycle \geq 98% or external video / power trigger]
<input checked="" type="checkbox"/>	Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty cycle $<$ 98% and average over on/off periods with duty factor
<input checked="" type="checkbox"/>	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
<input type="checkbox"/>	Refer as FCC KDB 789033, clause E Method PM (using an RF average power meter).
<input checked="" type="checkbox"/> For conducted measurement.	
<input type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain port 1.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input checked="" type="checkbox"/>	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup





3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1	2	3	-
Maximum G_{ANT} (dBi)		4.66	5.00	4.87	-
Modulation Mode	DG (dBi) (See the Note 2)	N_{TX}	N_{SS} (Min.)	STBC	Array Gain (dB)
11a	4.85	3	1	-	0
HT20	4.85	3	1	-	0
HT40	4.85	3	1	-	0
VHT20	4.85	3	1	-	0
VHT40	4.85	3	1	-	0
VHT80	4.85	3	1	-	0

Note 1: For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain = $G_{ANT} + 10 \log(N_{TX})$
All transmit signals are completely uncorrelated, Directional Gain = G_{ANT}

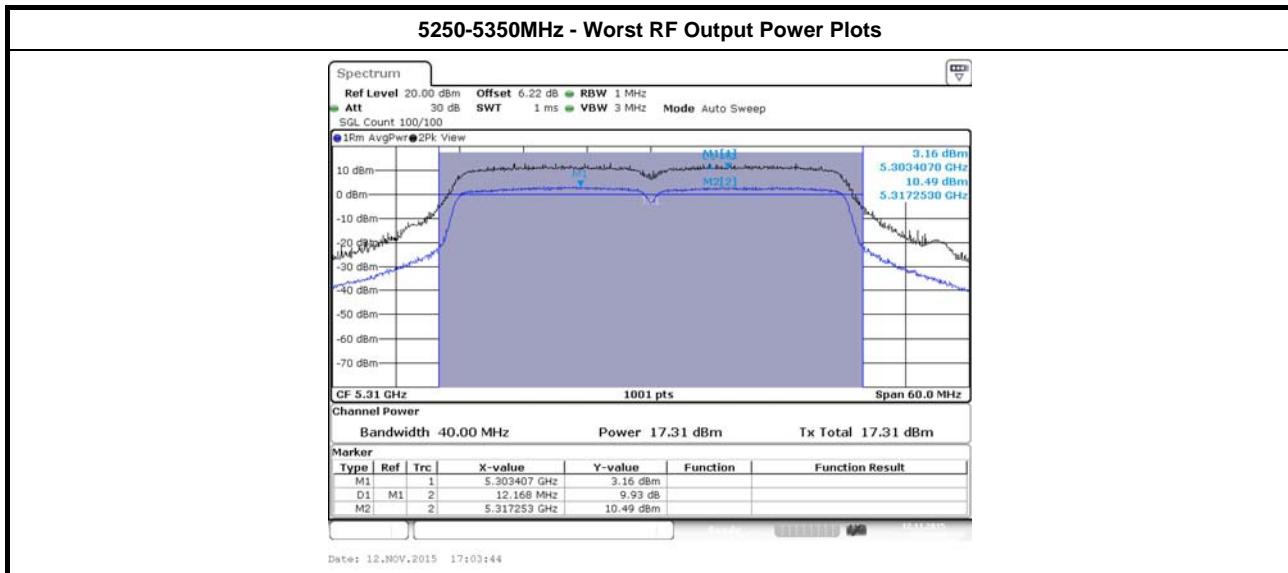
Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain = $10 \log[(10^{G_{1/20}} + \dots + 10^{G_{N/20}})^2 / N_{TX}]$
All transmit signals are completely uncorrelated, Directional Gain = $10 \log[(10^{G_{1/10}} + \dots + 10^{G_{N/10}}) / N_{TX}]$

Note 3: For Spatial Multiplexing, Directional Gain (DG) = $G_{ANT} + 10 \log(N_{TX}/N_{SS})$,
where N_{SS} = the number of independent spatial streams data.

Note 4: For CDD transmissions, directional gain is calculated as power measurements:
Directional Gain (DG) = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows:
Array Gain = 0 dB (i.e., no array gain) for $N_{TX} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{TX}

3.3.6 Test Result of Maximum Conducted Output Power

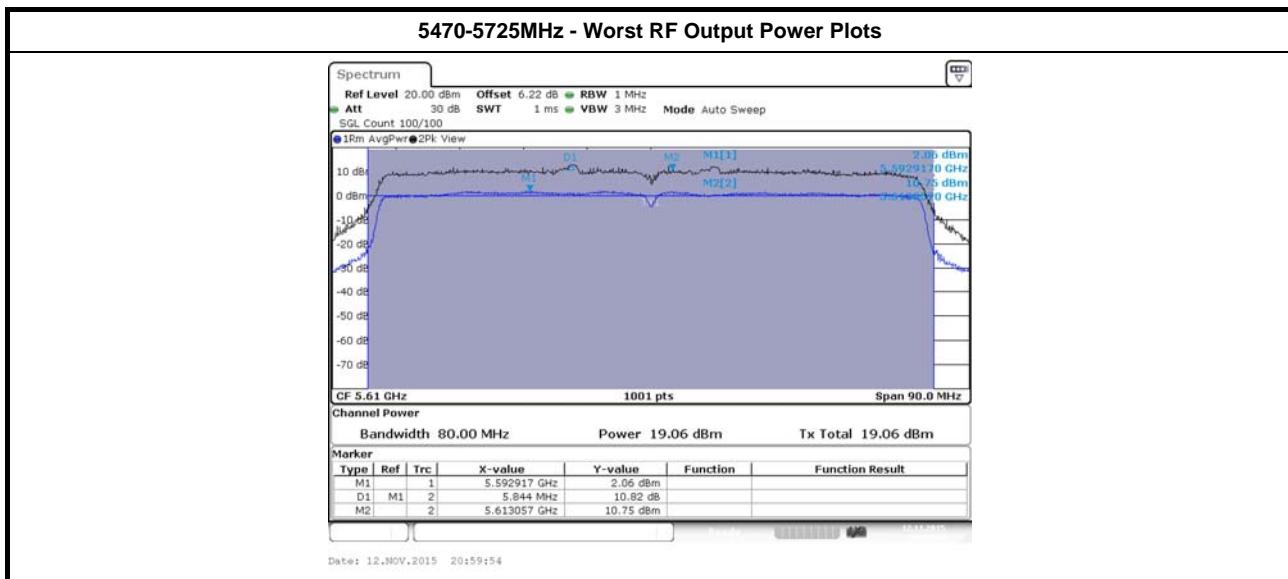
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power (dBm)				Antenna Gain (dBi)	Power Limit
			Chain Port 1	Chain Port 2	Chain Port 3	Sum Chain		
11a	3	5260	13.34	13.60	13.59	18.28	4.85	23.98
11a	3	5300	13.09	14.08	14.08	18.55	4.85	23.98
11a	3	5320	13.21	13.82	13.99	18.46	4.85	23.88
HT20	3	5260	13.32	13.55	13.56	18.25	4.85	24.00
HT20	3	5300	13.25	13.89	13.90	18.47	4.85	24.00
HT20	3	5320	13.15	13.86	14.00	18.46	4.85	24.00
HT40	3	5270	16.42	16.68	17.19	21.55	4.85	24.00
HT40	3	5310	16.28	16.80	17.40	21.62	4.85	24.00
VHT20	3	5260	13.85	14.47	14.19	18.95	4.85	24.00
VHT20	3	5300	13.17	13.96	13.98	18.49	4.85	24.00
VHT20	3	5320	13.26	14.05	14.16	18.61	4.85	23.99
VHT40	3	5270	16.65	16.69	17.21	21.63	4.85	24.00
VHT40	3	5310	16.49	16.89	17.44	21.73	4.85	24.00
VHT80	3	5290	11.83	12.32	12.60	17.03	4.85	24.00
Result			Complied					



Note 1: RF Output Power Plots w/o Duty Factor.



Maximum Conducted Output Power (5470-5725MHz band)								
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power (dBm)				Antenna Gain (dBi)	Power Limit
			Chain Port 1	Chain Port 2	Chain Port 3	Sum Chain		
11a	3	5500	13.48	13.22	13.59	18.20	4.85	23.93
11a	3	5580	13.21	13.24	13.59	18.12	4.85	24.00
11a	3	5700	13.62	13.72	13.83	18.50	4.85	23.84
11a	3	5720	12.64	12.57	12.96	17.50	4.85	23.82
HT20	3	5500	14.15	13.70	14.23	18.81	4.85	24.00
HT20	3	5580	13.78	13.81	14.06	18.66	4.85	24.00
HT20	3	5700	13.58	13.55	13.79	18.42	4.85	24.00
HT20	3	5720	12.67	12.24	12.75	17.34	4.85	24.00
HT40	3	5510	16.96	16.44	17.14	21.63	4.85	24.00
HT40	3	5550	17.03	16.85	17.32	21.84	4.85	24.00
HT40	3	5670	16.92	16.57	17.16	21.66	4.85	24.00
HT40	3	5710	16.80	16.27	16.88	21.43	4.85	24.00
VHT20	3	5500	14.22	13.75	14.26	18.85	4.85	24.00
VHT20	3	5580	13.80	13.83	14.23	18.73	4.85	24.00
VHT20	3	5700	13.70	13.55	13.78	18.45	4.85	24.00
VHT20	3	5720	12.46	12.48	12.88	17.38	4.85	24.00
VHT40	3	5510	16.95	16.43	17.06	21.59	4.85	24.00
VHT40	3	5550	16.80	16.57	17.17	21.62	4.85	24.00
VHT40,	3	5670	16.77	16.36	17.00	21.49	4.85	24.00
VHT40,	3	5710	16.60	16.27	16.73	21.31	4.85	24.00
VHT80	3	5530	12.99	12.72	12.96	17.66	4.85	24.00
VHT80	3	5610	18.92	18.81	19.31	23.79	4.85	24.00
VHT80	3	5690	19.11	18.44	19.19	23.69	4.85	24.00
Result			Complied					



Note 1: RF Output Power Plots w/o Duty Factor.



3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
<input type="checkbox"/> For the 5.15-5.25 GHz band:	
<input type="checkbox"/> Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.	
<input type="checkbox"/> Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$.	
<input type="checkbox"/> Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input type="checkbox"/> For the 5.725-5.85 GHz band:	
<input type="checkbox"/> Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.	
PPSD = peak power spectral density that the same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

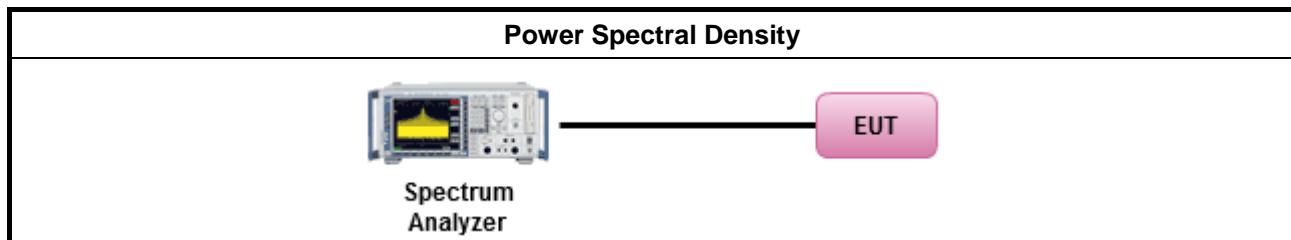
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

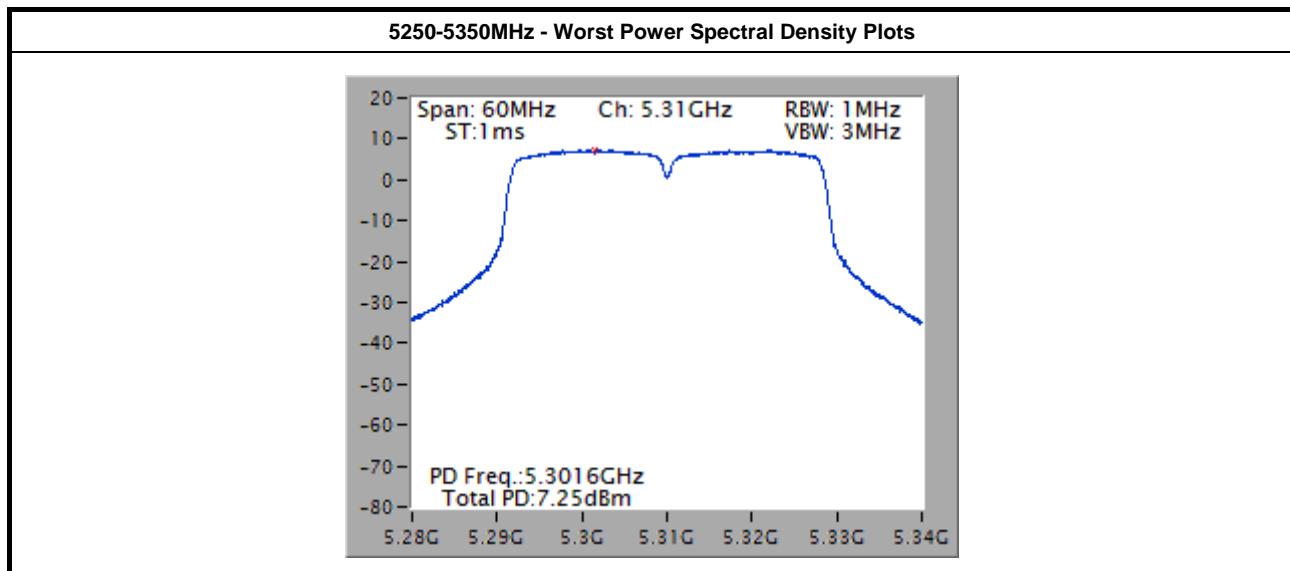
Test Method	
<input checked="" type="checkbox"/> Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
<input type="checkbox"/> Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth [duty cycle \geq 98% or external video / power trigger]	
<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
duty cycle $<$ 98% and average over on/off periods with duty factor	
<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)	
<input checked="" type="checkbox"/> For conducted measurement.	
<input type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain port 1.	
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.	
<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below:	
	<input checked="" type="checkbox"/> Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	<input type="checkbox"/> Option 2: Measure and add $10 \log(N)$ dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with $10 \log(N)$. Or each transmit chains shall be add $10 \log(N)$ to compared with the limit.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$
<input checked="" type="checkbox"/>	Each individually PPSD plots refer as test report clause 3.3.5 with each individually PPSD plots.

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

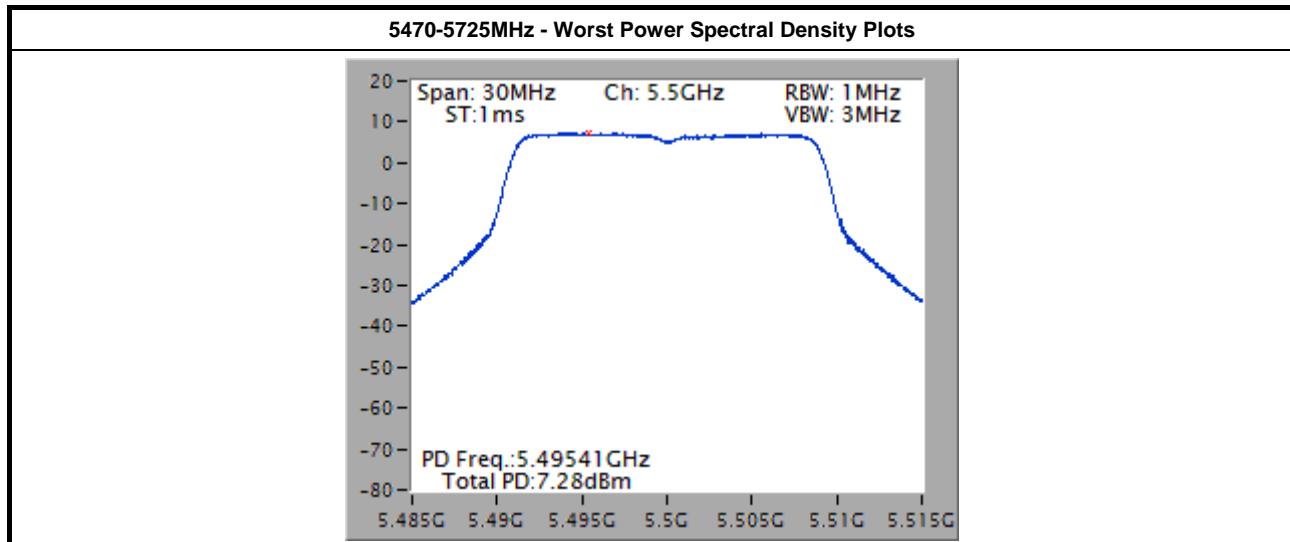
Peak Power Spectral Density Result (5250-5350MHz band)					
Modulation Mode	N _{TX}	Freq. (MHz)	Peak Power Spectral Density (dBm)	PSD Limit	PSD-DG (dBi)
11a	3	5260	7.16	7.38	9.62
11a	3	5300	7.20	7.38	9.62
11a	3	5320	7.17	7.38	9.62
HT20	3	5260	6.96	7.38	9.62
HT20	3	5300	6.82	7.38	9.62
HT20	3	5320	6.92	7.38	9.62
HT40	3	5270	7.16	7.38	9.62
HT40	3	5310	7.19	7.38	9.62
VHT20	3	5260	7.37	7.38	9.62
VHT20	3	5300	7.21	7.38	9.62
VHT20	3	5320	7.19	7.38	9.62
VHT40	3	5270	7.25	7.38	9.62
VHT40	3	5310	7.38	7.38	9.62
VHT80	3	5290	-0.77	7.38	9.62
Result		Complied			



Note 1: Power Density Plots w/o Duty Factor.

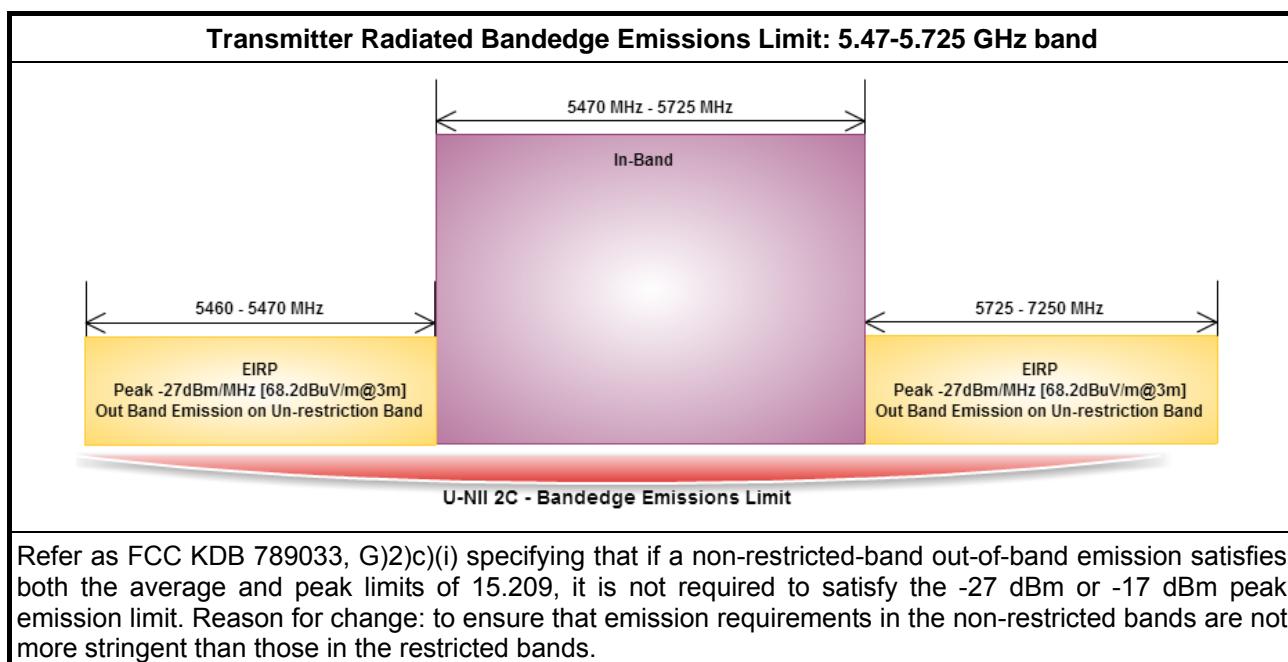
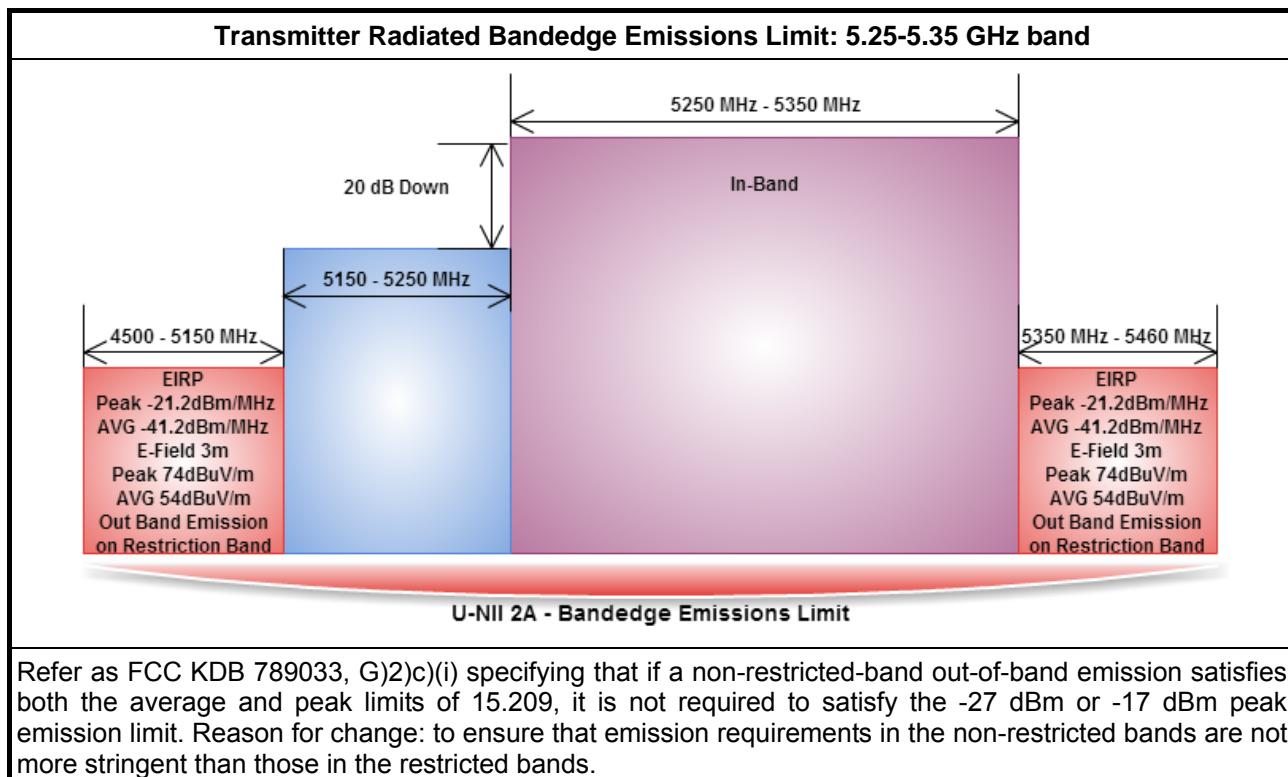


Peak Power Spectral Density Result (5470-5725MHz band)					
Modulation Mode	N _{TX}	Freq. (MHz)	Peak Power Spectral Density (dBm)	PSD Limit	PSD-DG (dBi)
11a	3	5500	6.99	7.38	9.62
11a	3	5580	6.88	7.38	9.62
11a	3	5700	7.17	7.38	9.62
11a	3	5720	7.21	7.38	9.62
HT20	3	5500	7.23	7.38	9.62
HT20	3	5580	7.15	7.38	9.62
HT20	3	5700	6.98	7.38	9.62
HT20	3	5720	6.84	7.38	9.62
HT40	3	5510	7.20	7.38	9.62
HT40	3	5550	7.33	7.38	9.62
HT40	3	5670	7.11	7.38	9.62
HT40	3	5710	7.25	7.38	9.62
VHT20	3	5500	7.38	7.38	9.62
VHT20	3	5580	7.30	7.38	9.62
VHT20	3	5700	6.84	7.38	9.62
VHT20	3	5720	6.97	7.38	9.62
VHT40	3	5510	7.20	7.38	9.62
VHT40	3	5550	7.18	7.38	9.62
VHT40	3	5670	7.10	7.38	9.62
VHT40	3	5710	7.21	7.38	9.62
VHT80	3	5530	0.21	7.38	9.62
VHT80	3	5610	6.45	7.38	9.62
VHT80	3	5690	6.32	7.38	9.62
Result		Complied			



3.5 Transmitter Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

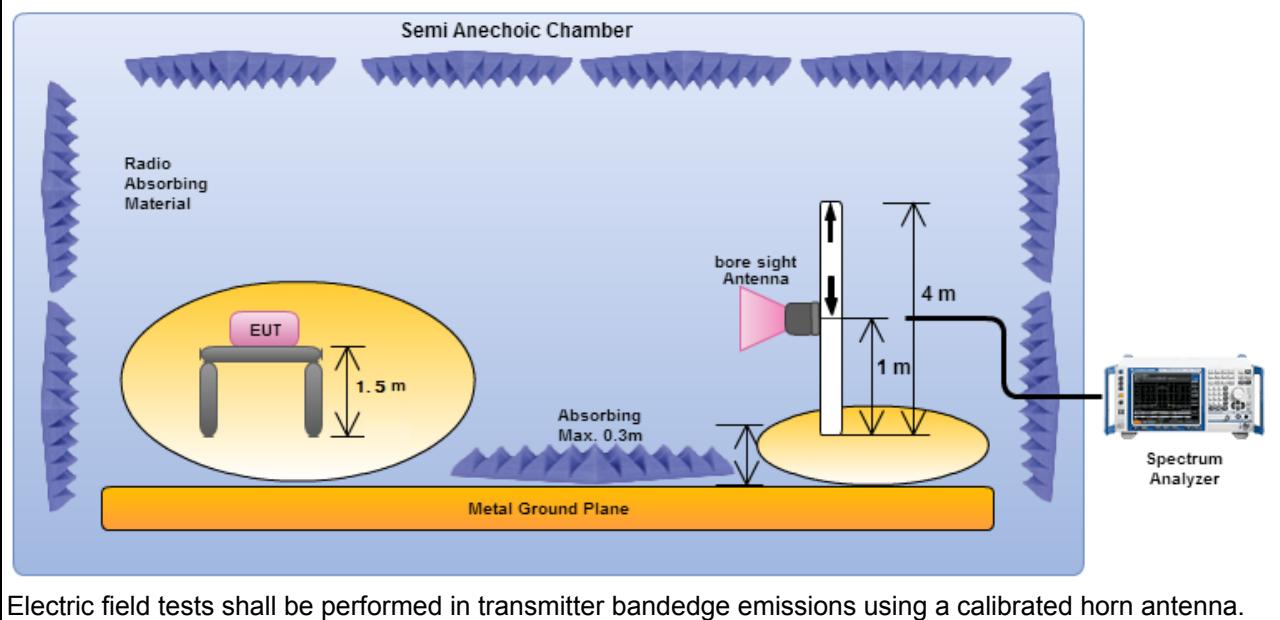


3.5.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.10 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input type="checkbox"/> If EUT operate in adjacent contiguous bands, bandedge testing performed at the lowest frequency channel at lower-band and highest frequency channel at higher-band. Transmitter in-band emissions will consist of adjacent contiguous bands (e.g., IEEE 802.11ac VHT160 The lowest frequency channel at lower-band and highest frequency channel at higher-band in-band emissions will consist of two adjacent contiguous bands.) <ul style="list-style-type: none"><input type="checkbox"/> Operating in 5.15-5.25 GHz band (lower-band) and 5.25-5.35 GHz band (higher-band).<input type="checkbox"/> Operating in 5.47-5.725 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
<input type="checkbox"/> If EUT operate in individual non-contiguous bands, bandedge testing performed at the lowest frequency channel and highest frequency channel within lower-band and higher-band. (e.g., (e.g., IEEE 802.11ac VHT160) <ul style="list-style-type: none"><input type="checkbox"/> Operating in 5.25-5.35 GHz band (lower-band) and 5.47-5.725 GHz band (higher-band).<input type="checkbox"/> Operating in 5.15-5.25 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
<input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below: <ul style="list-style-type: none"><input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause H)2) for unwanted emissions into non-restricted bands.<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands.<ul style="list-style-type: none"><input type="checkbox"/> Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging).<input type="checkbox"/> Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW).<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause H)5) measurement procedure peak limit.<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/> For the transmitter bandedge emissions shall be measured using following options below: <ul style="list-style-type: none"><input type="checkbox"/> Refer as FCC KDB 789033, clause H)3)d) for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.10 for band-edge testing.<input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.6.2 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/> For radiated measurement, refer as ANSI C63.10, clause 6.6. Test distance is 3m.
<input checked="" type="checkbox"/> 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). Measurements in the bandedge are typically made at a closer distance 3m, because the instrumentation noise floor is typically close to the radiated emission limit.

3.5.4 Test Setup

Transmitter Radiated Bandedge Emissions



Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.



3.5.5 Transmitter Radiated Bandedge Emissions (with Antenna)

U-NII 5250-5350MHz Transmitter Radiated Bandedge (with Antenna)										
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
11a	3	5260	3	5398.800	62.19	74	5104.200	49.22	54	V
11a	3	5320	3	5354.240	70.60	74	5354.380	52.92	54	V
HT20	3	5260	3	5105.400	61.93	74	5386.200	48.59	54	V
HT20	3	5320	3	5351.160	67.79	74	5352.000	52.59	54	V
HT40	3	5270	3	5352.600	68.47	74	5351.400	52.14	54	V
HT40	3	5310	3	5353.000	68.22	74	5351.380	52.43	54	V
VHT20	3	5260	3	5133.600	62.34	74	5368.800	48.59	54	V
VHT20	3	5320	3	5352.000	68.25	74	5351.720	52.75	54	V
VHT40	3	5270	3	5350.800	66.76	74	5351.400	52.22	54	V
VHT40	3	5310	3	5351.380	68.82	74	5352.100	52.01	54	V
VHT80	3	5290	3	5367.000	69.86	74	5366.400	52.78	54	V

Note 1: Measurement worst emissions of receive antenna polarization.

U-NII 5470-5725MHz Transmitter Radiated Bandedge (with Antenna)							
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Pol.
11a	1	5500	3	5464.880	67.10	68.2	V
11a	1	5700	3	5725.040	67.14	68.2	V
HT20	3	5500	3	5467.920	66.39	68.2	V
HT20	3	5700	3	5725.160	66.99	68.2	V
HT40	3	5510	3	5460.800	66.97	68.2	V
HT40	3	5670	3	5728.200	66.53	68.2	V
VHT20	3	5500	3	5466.160	66.35	68.2	V
VHT20	3	5700	3	5728.760	66.85	68.2	V
VHT40	3	5510	3	5460.600	67.13	68.2	V
VHT40	3	5670	3	5728.000	66.23	68.2	V
VHT80	3	5530	3	5468.720	67.12	68.2	V
VHT80	3	5610	3	5734.640	65.86	68.2	V

Note 1: Measurement worst emissions of receive antenna polarization.



3.6 Transmitter Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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: Test distance for frequencies at or above 30 MHz, 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).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

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 - 5.85 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.85 5.86 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 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

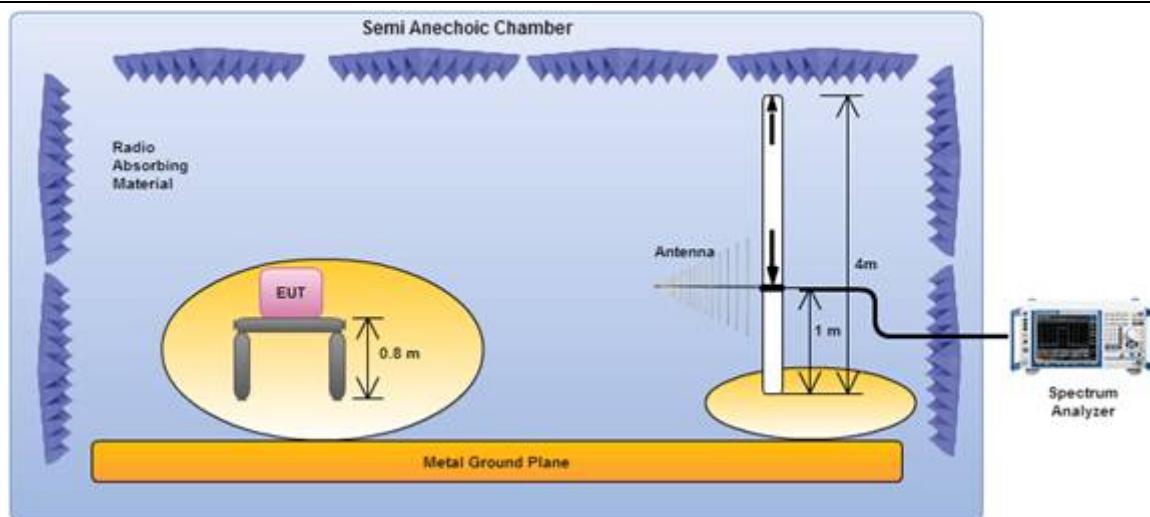


3.6.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> 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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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).
<input checked="" type="checkbox"/> The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
<input type="checkbox"/> Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
<input type="checkbox"/> Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/> Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/> For radiated measurement.
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz. For 1 GHz to 5 GHz, test distance is 3m; For 5 GHz to 40 GHz, test distance is 3m.
<input checked="" type="checkbox"/> The any unwanted emissions level shall not exceed the fundamental emission level.
<input checked="" type="checkbox"/> All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

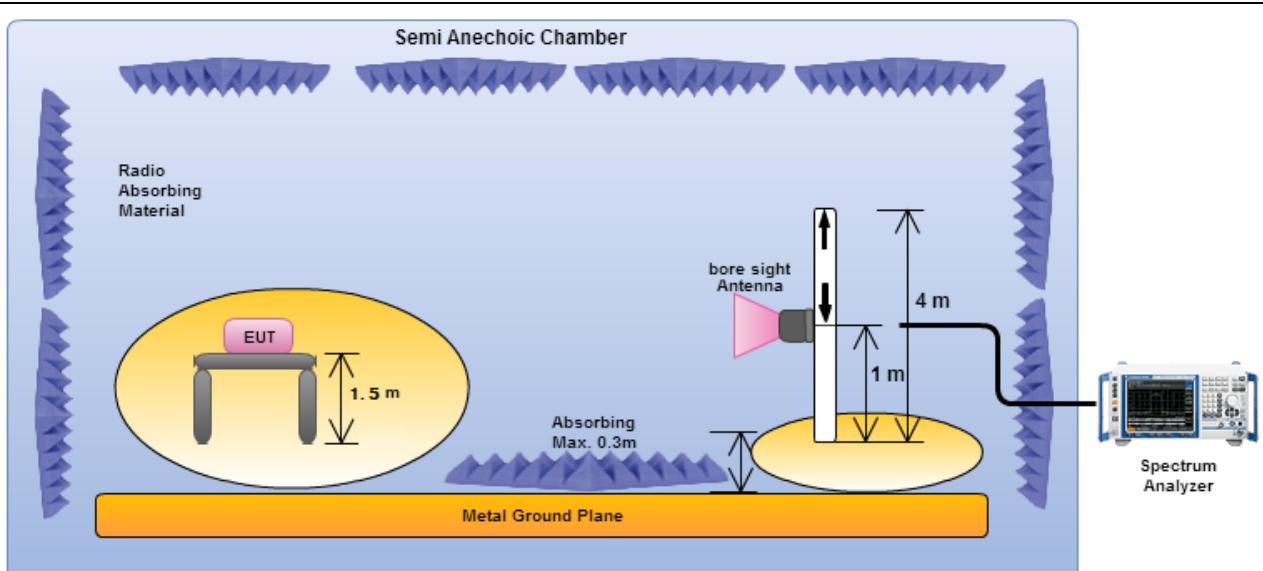
3.6.4 Test Setup

Transmitter Radiated Unwanted Emissions Below 1GHz



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

Transmitter Radiated Unwanted Emissions Above 1GHz



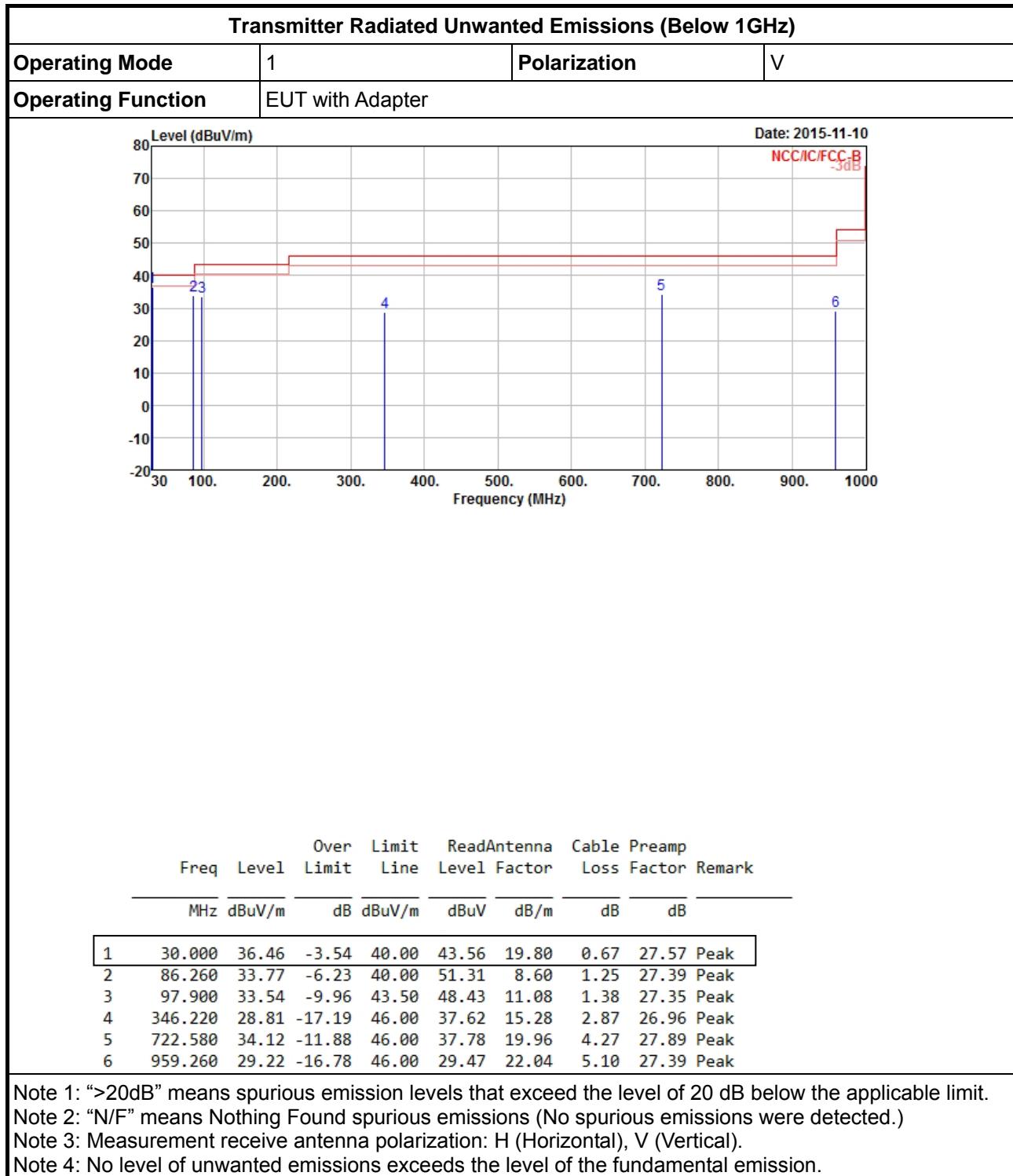
The frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

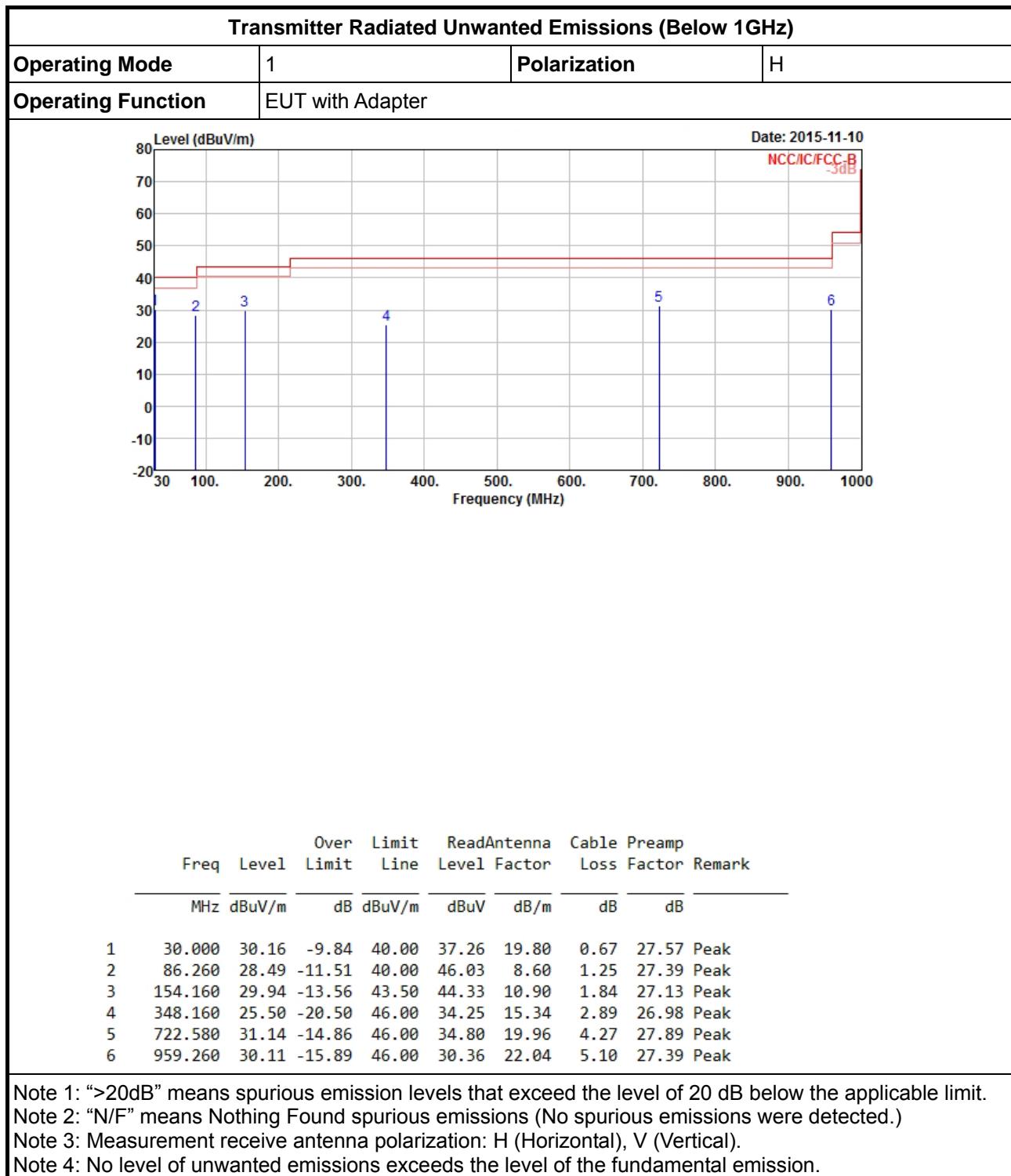
3.6.5 Transmitter Radiated Unwanted Emissions-with Antenna (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.



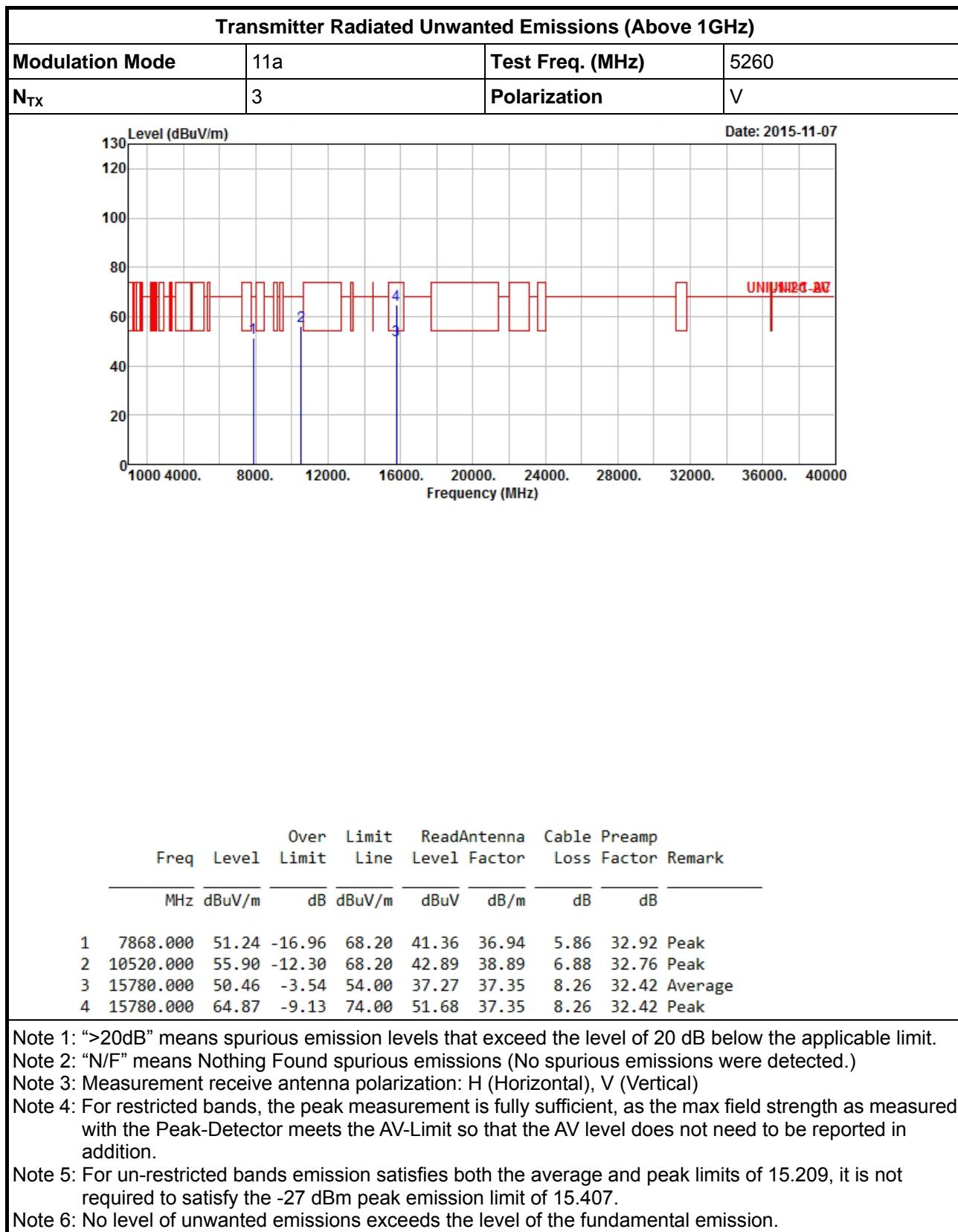
3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

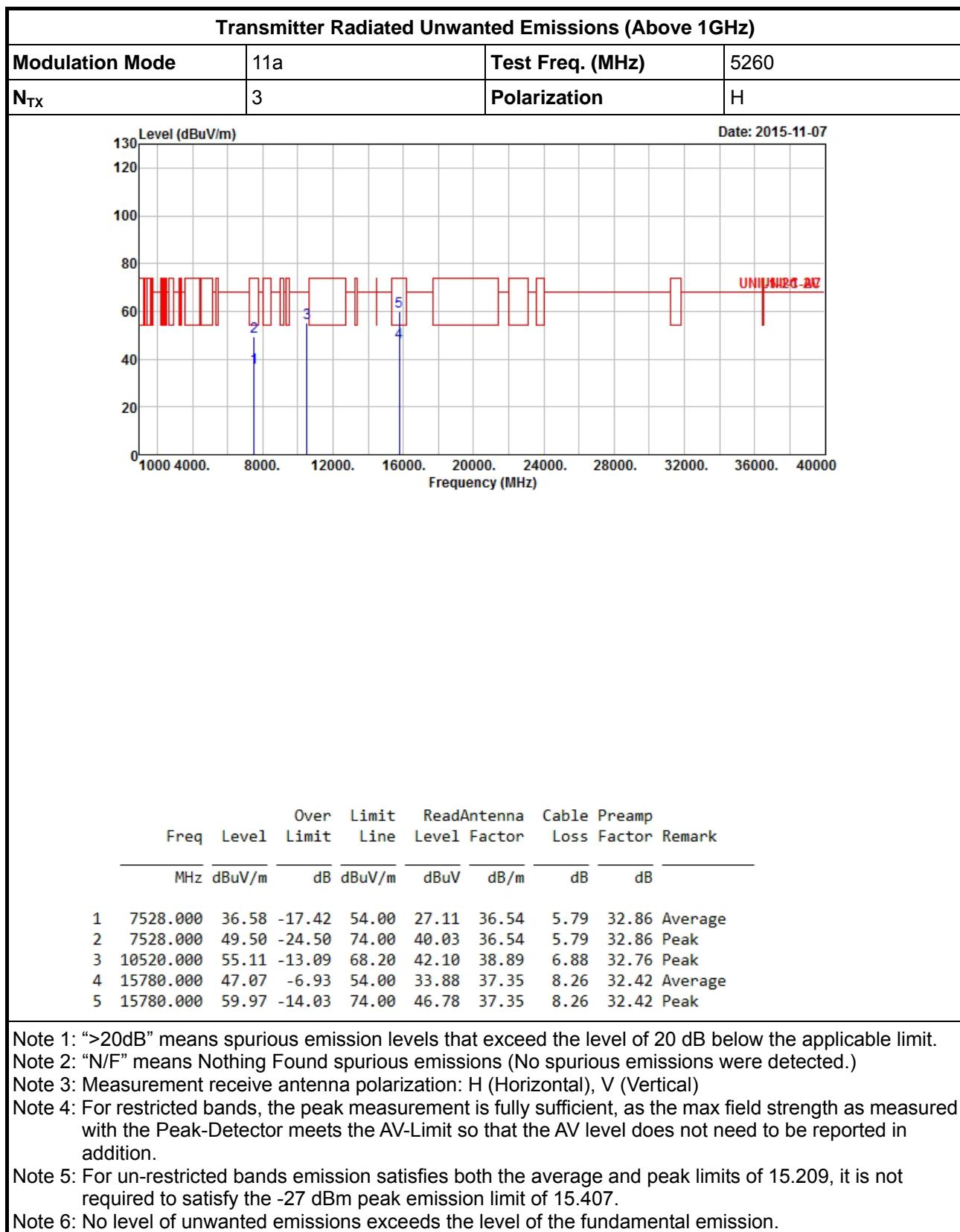


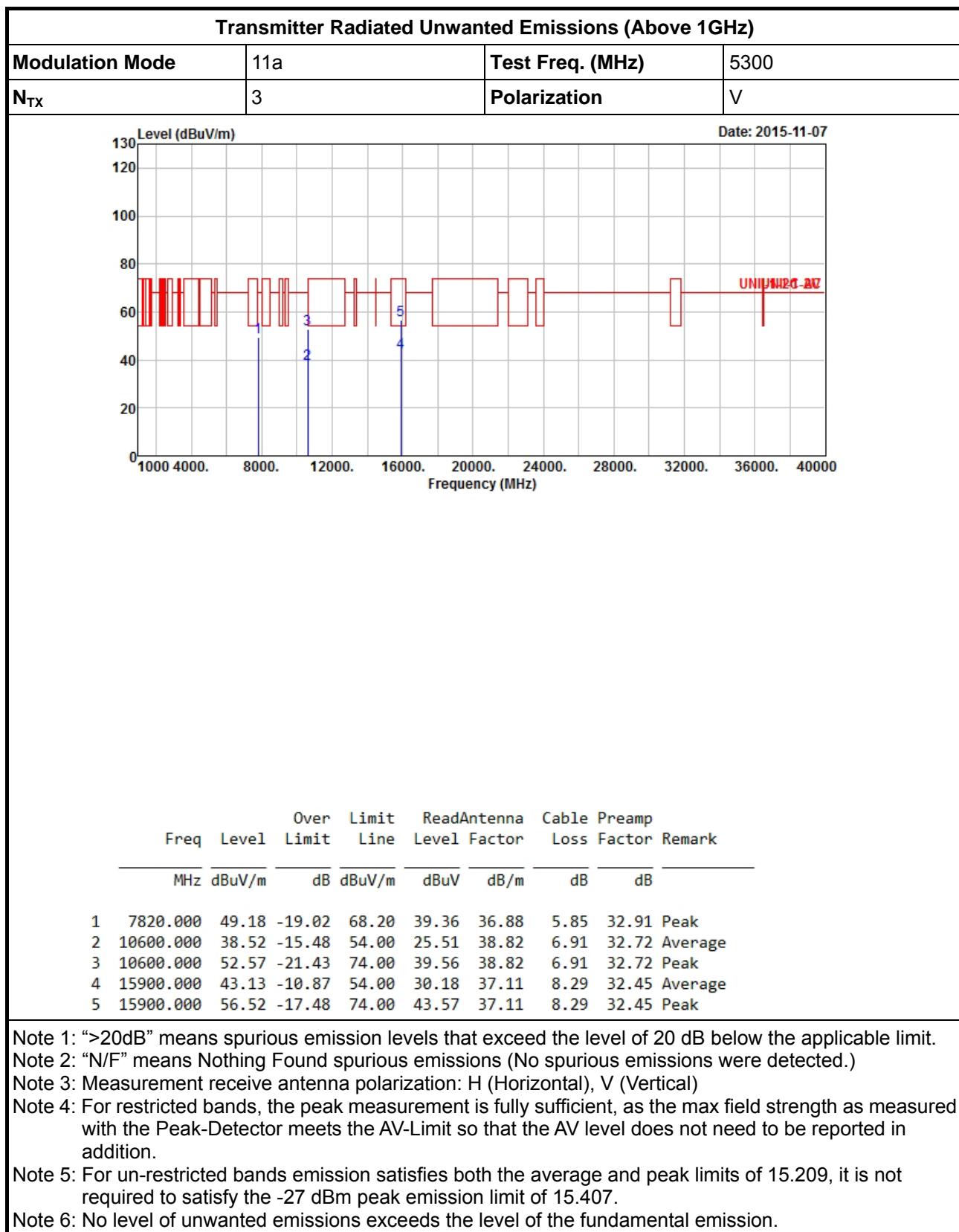


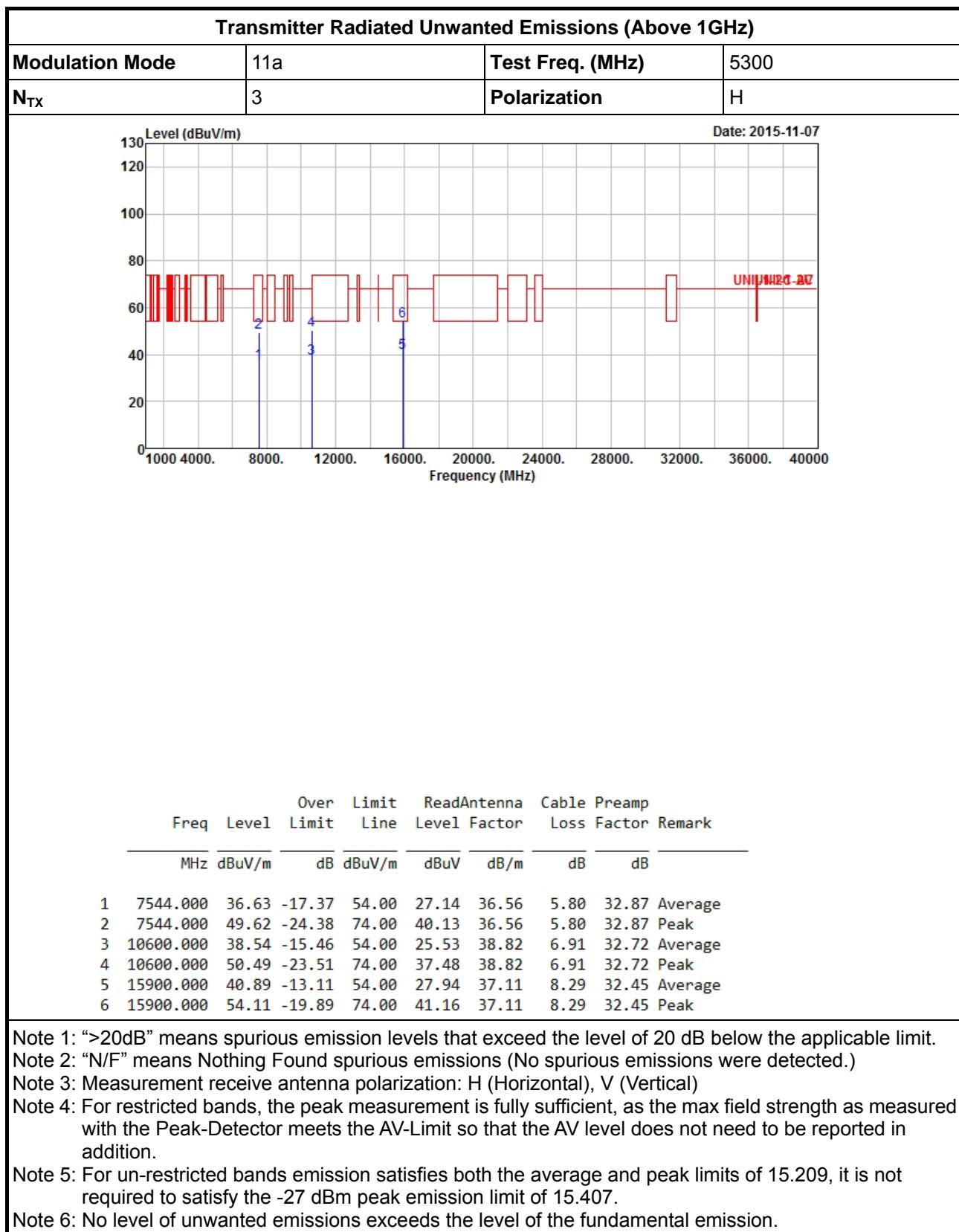


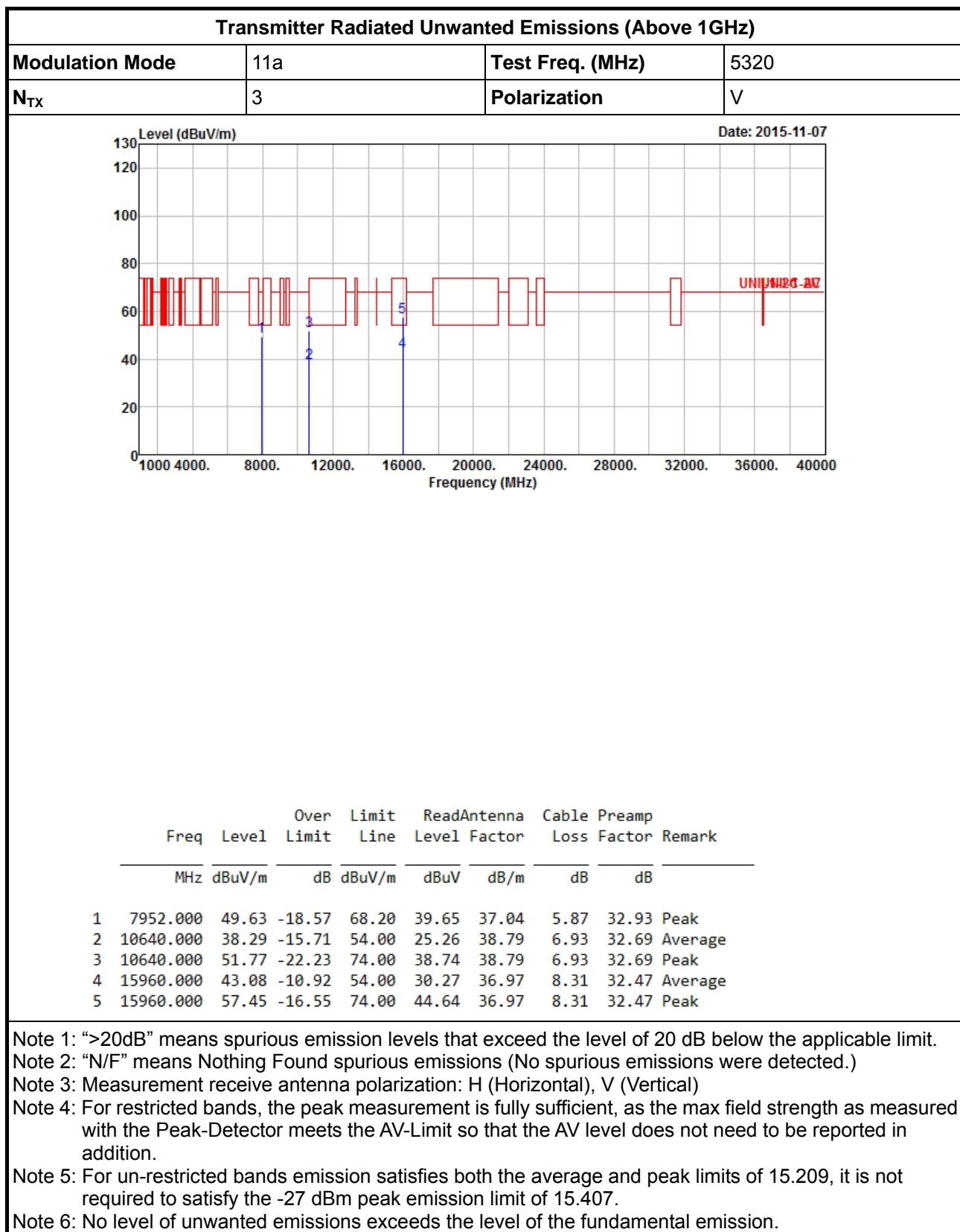
3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 5250-5350MHz

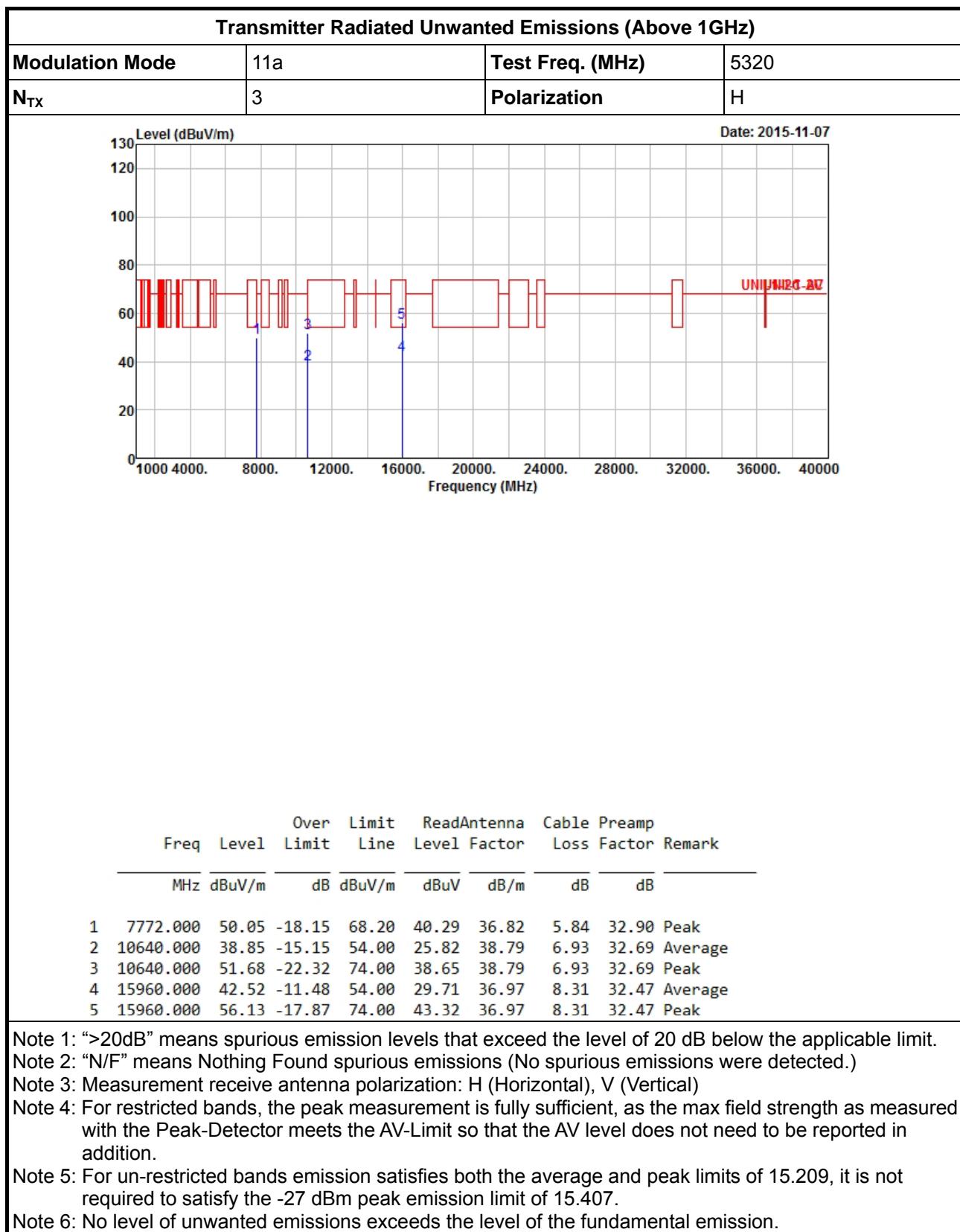












Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

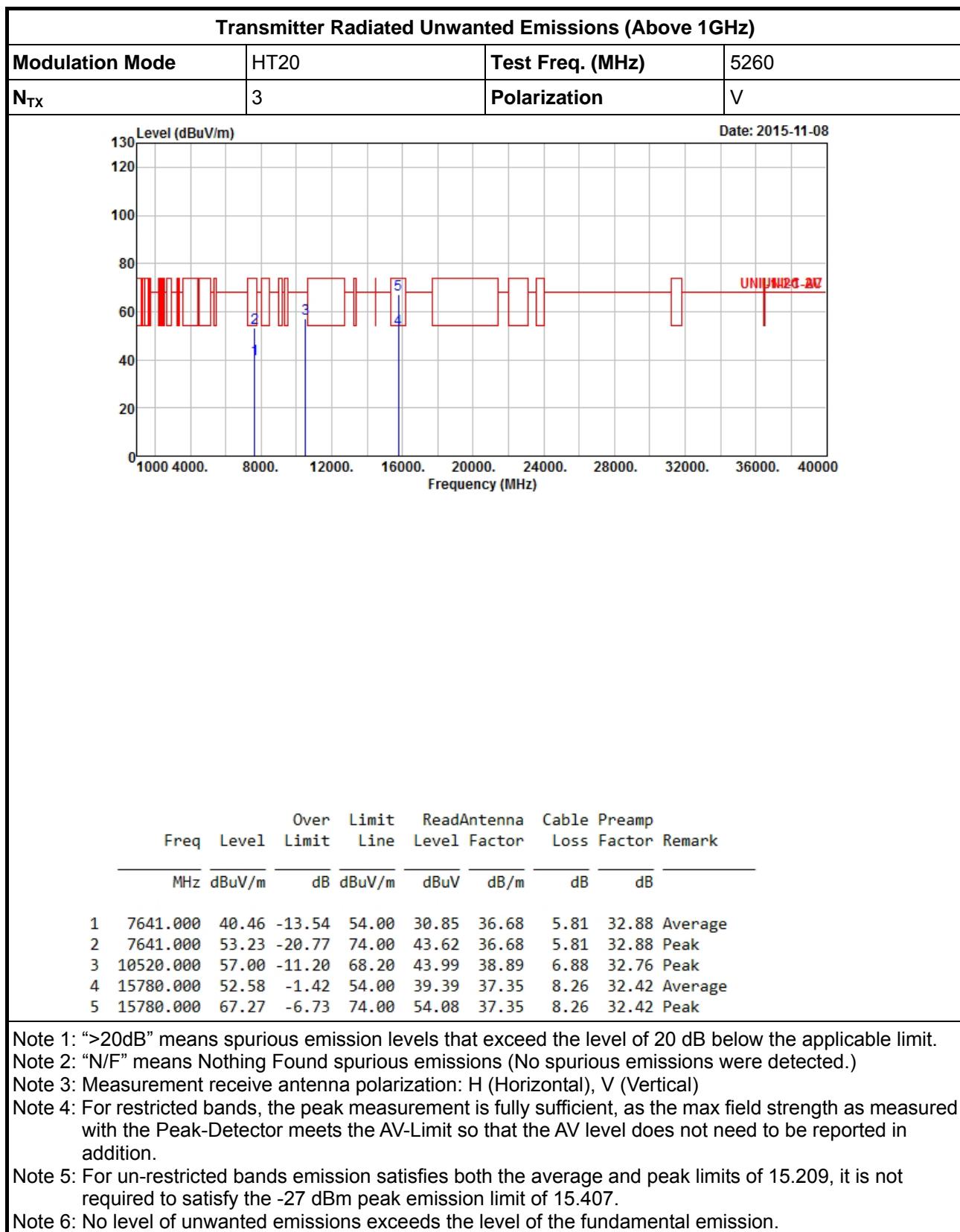
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

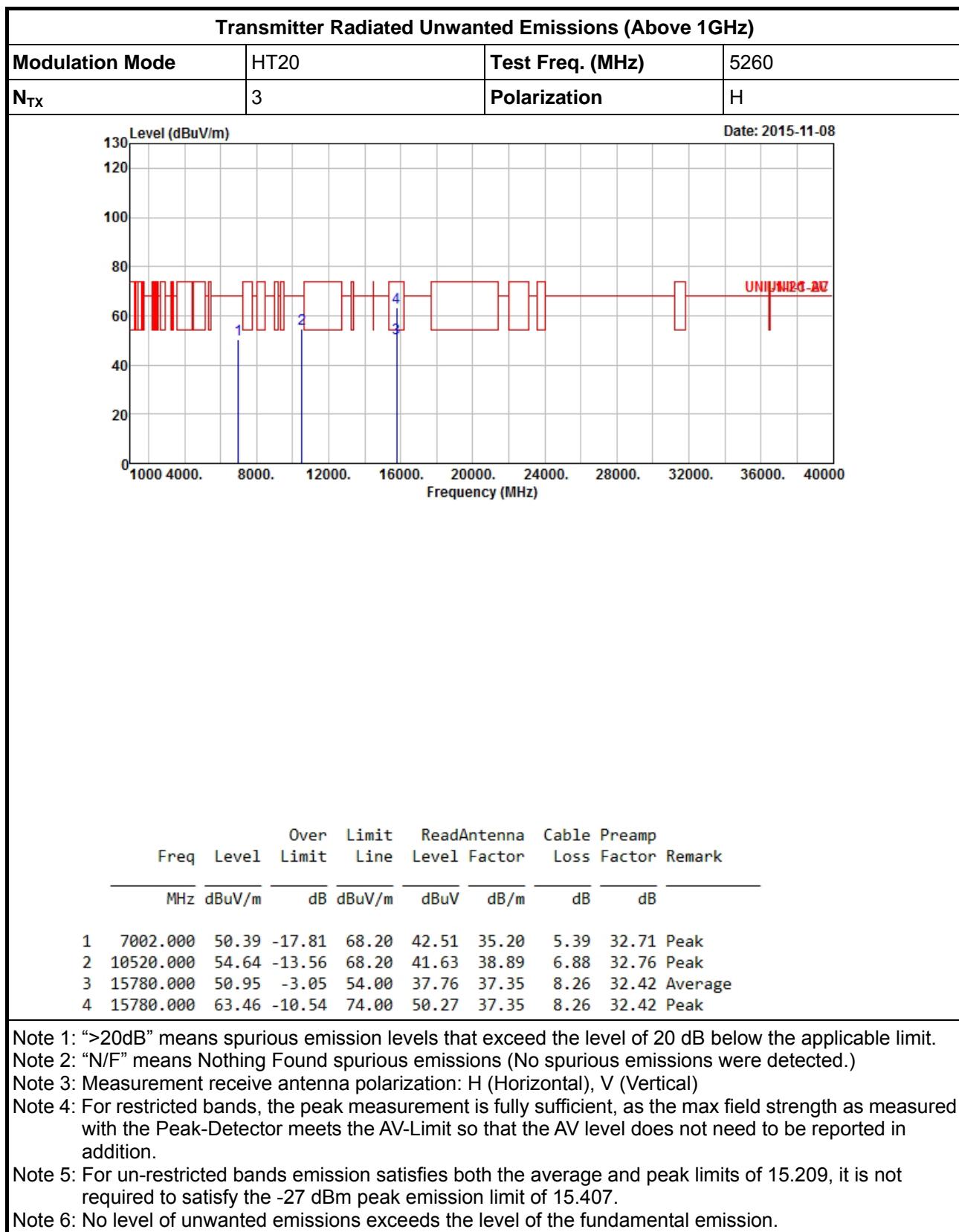
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

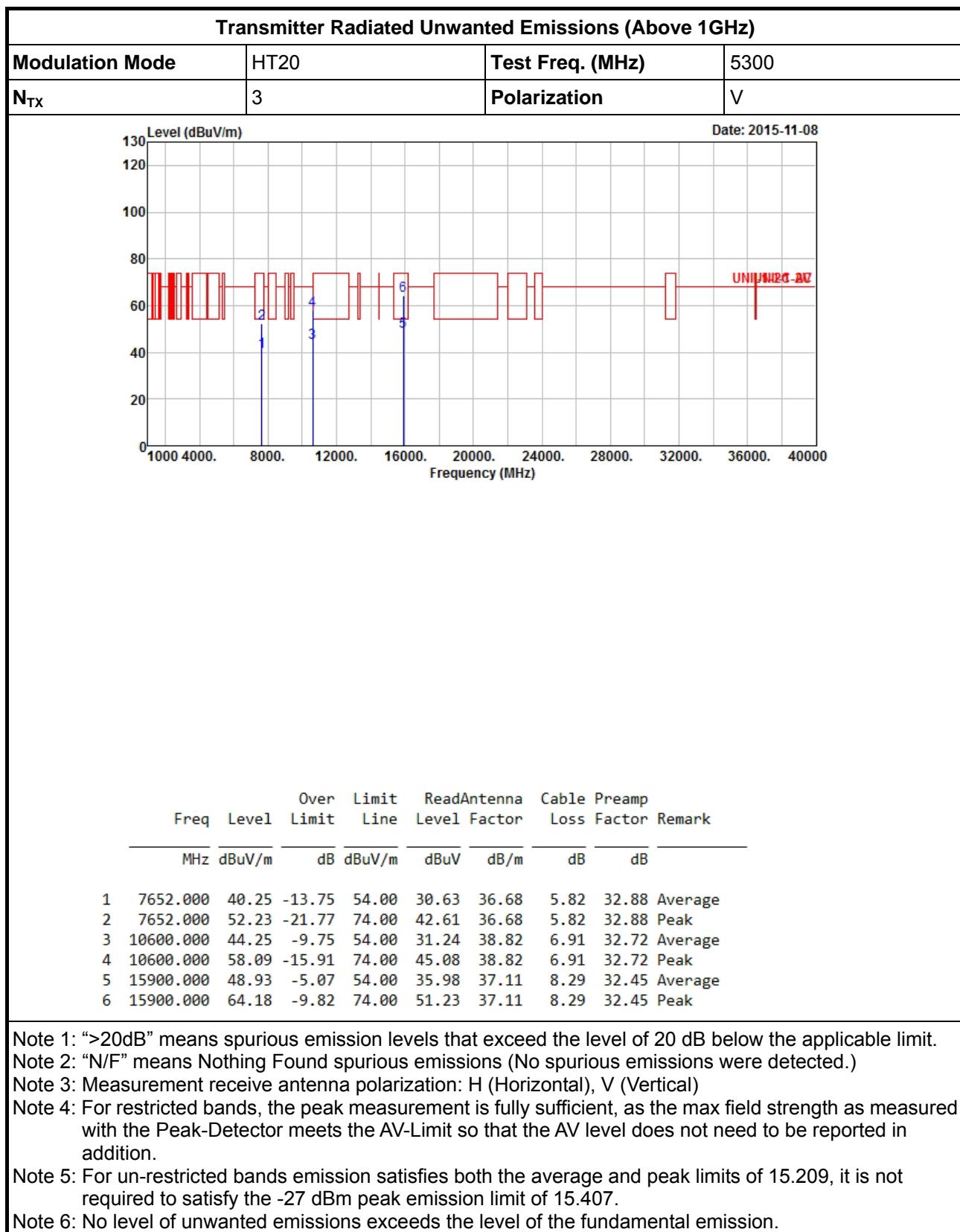
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

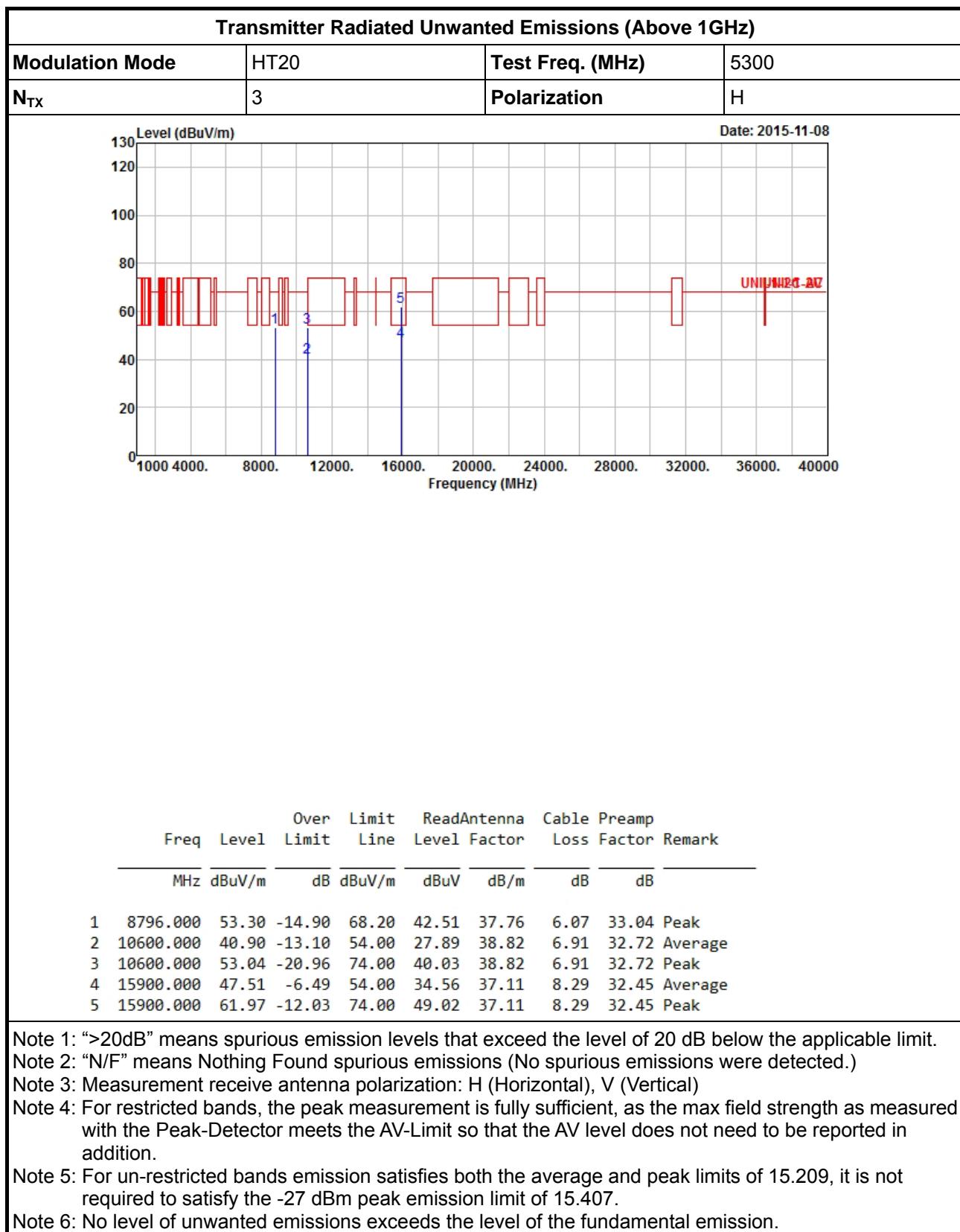
Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

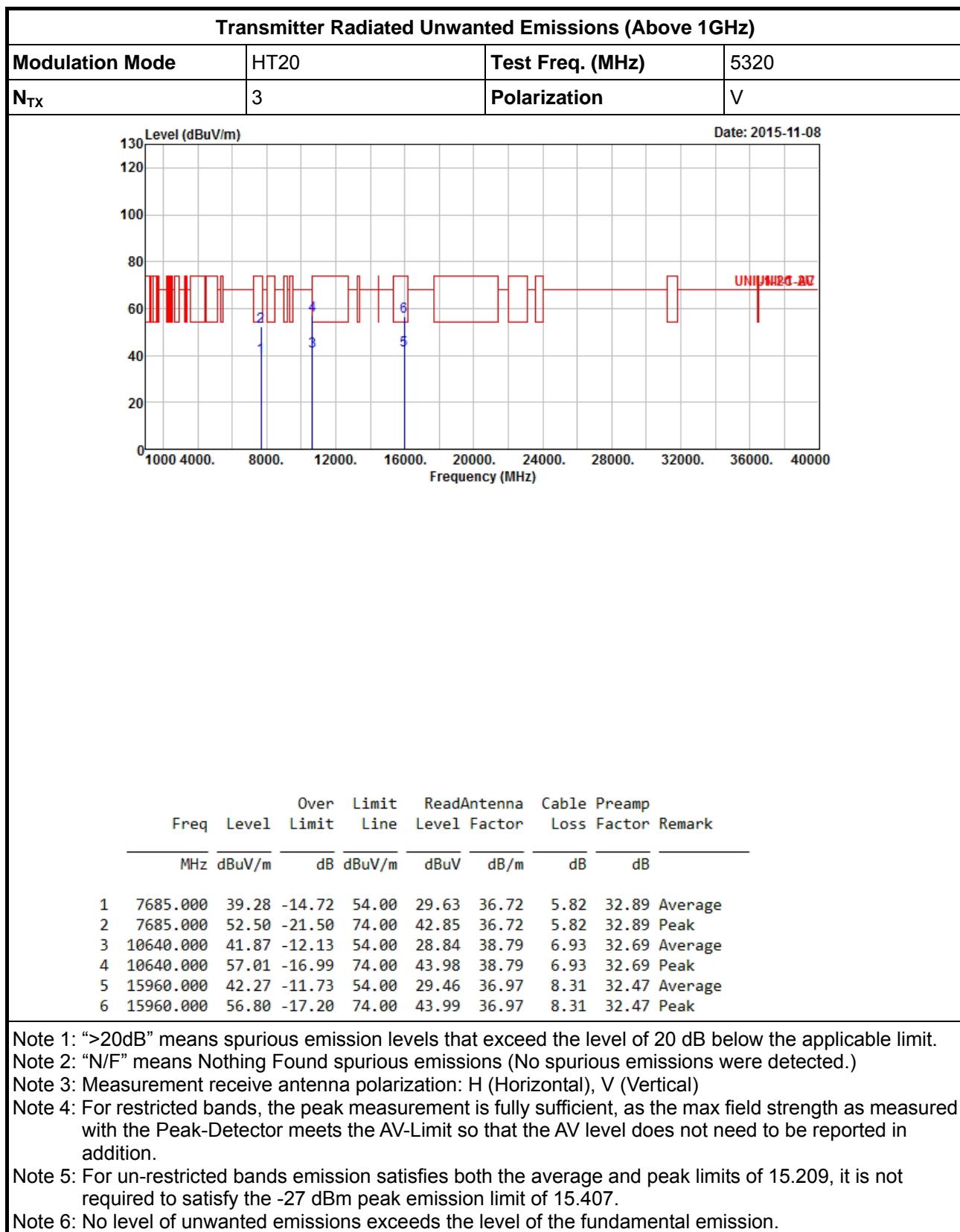
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

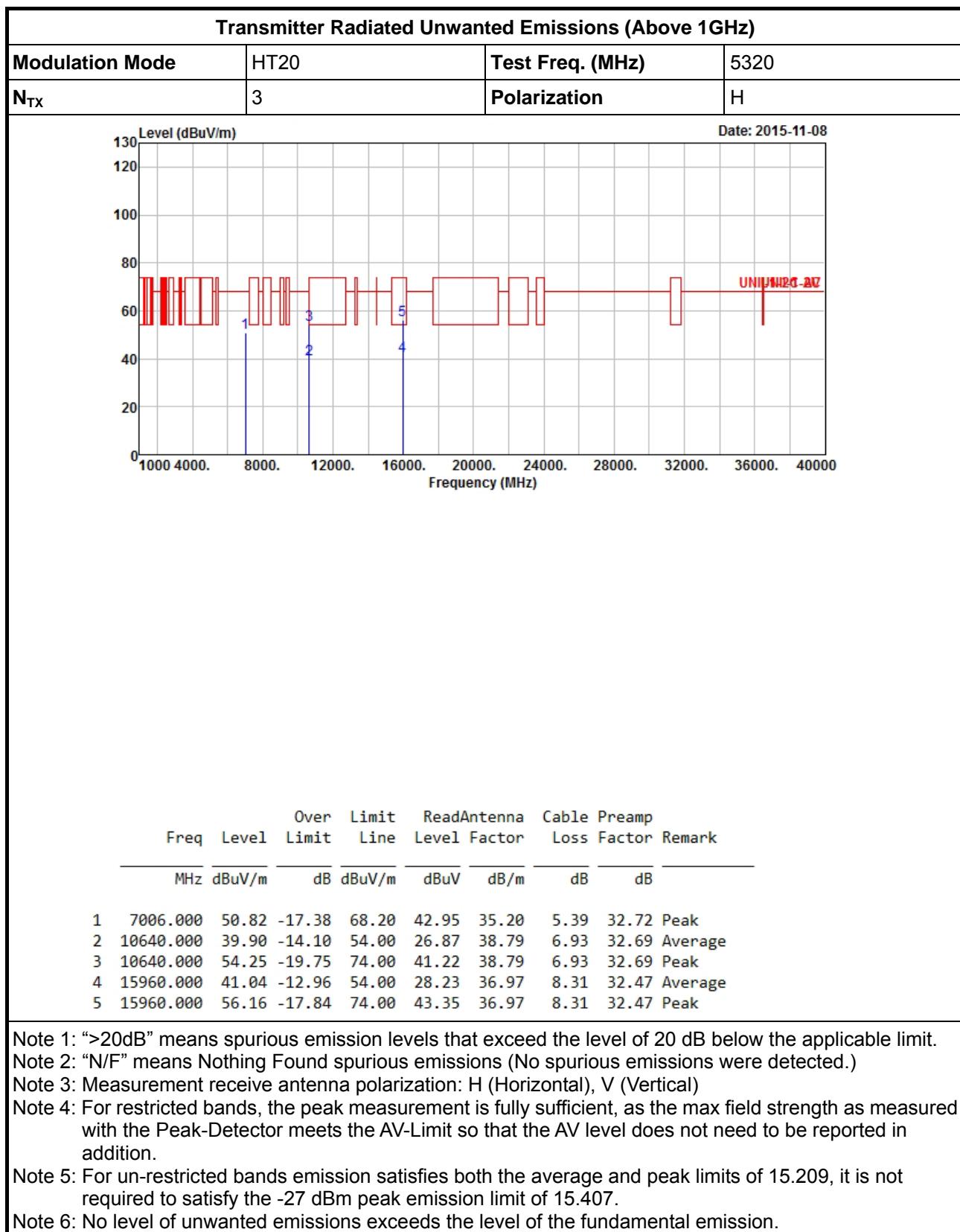


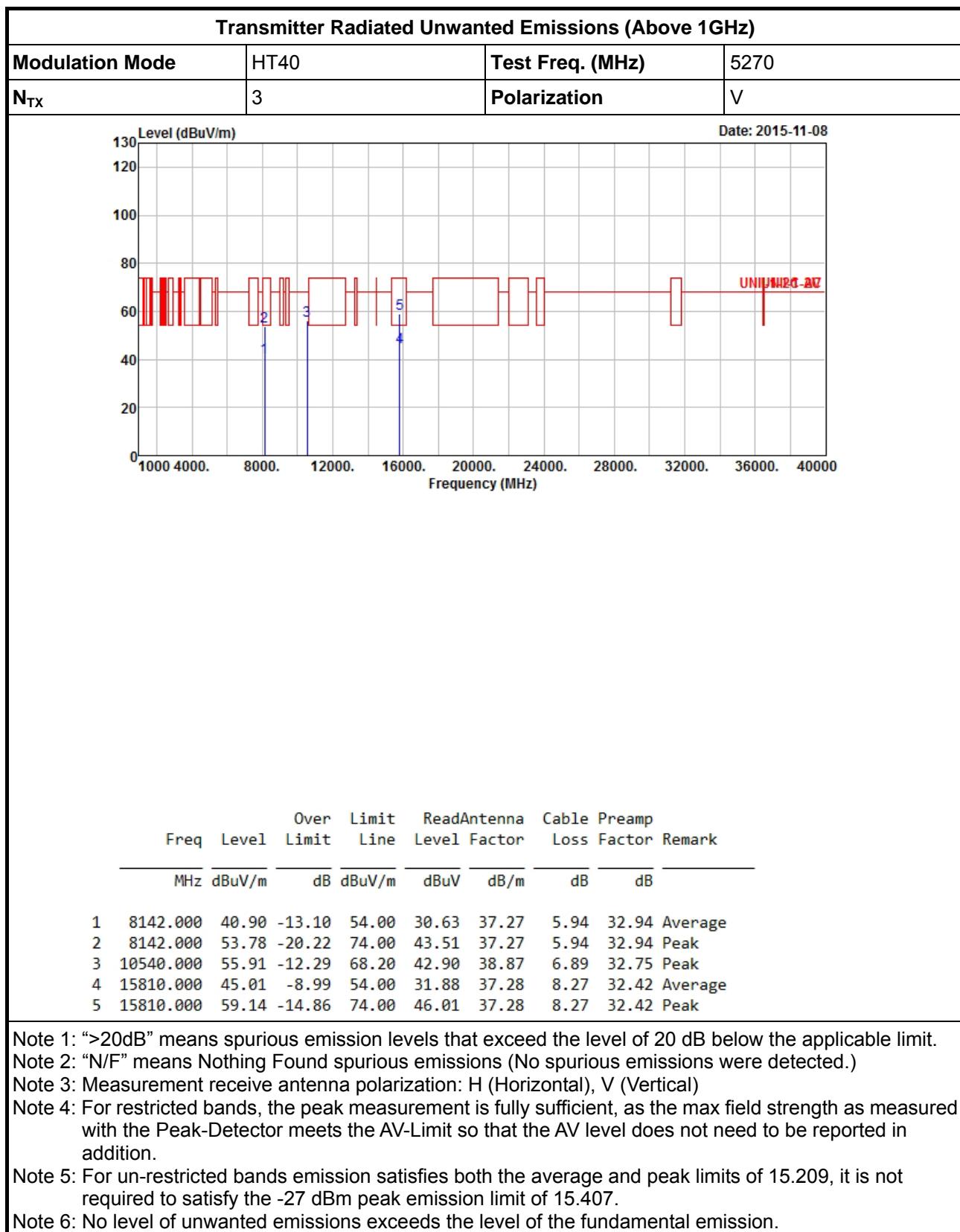


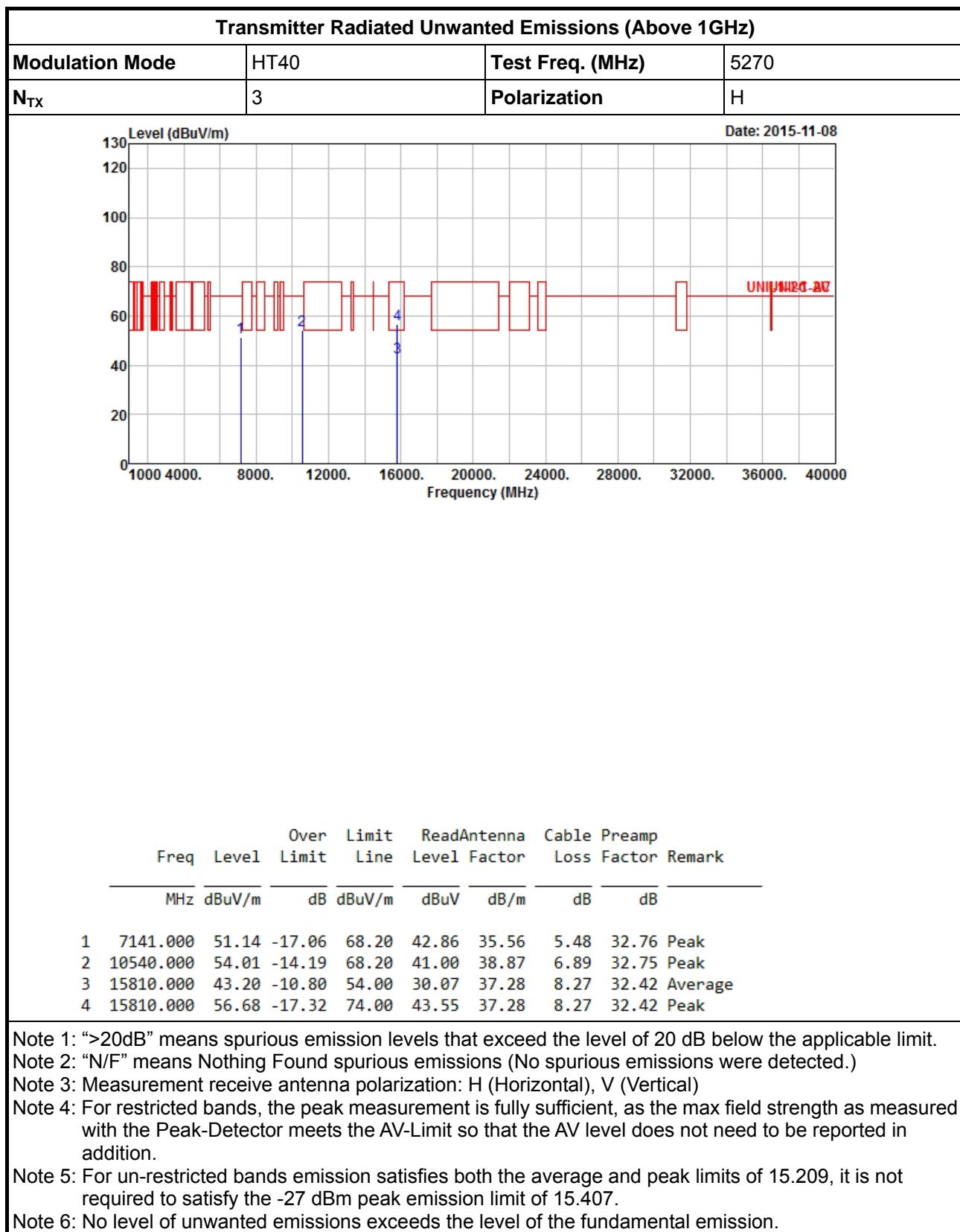


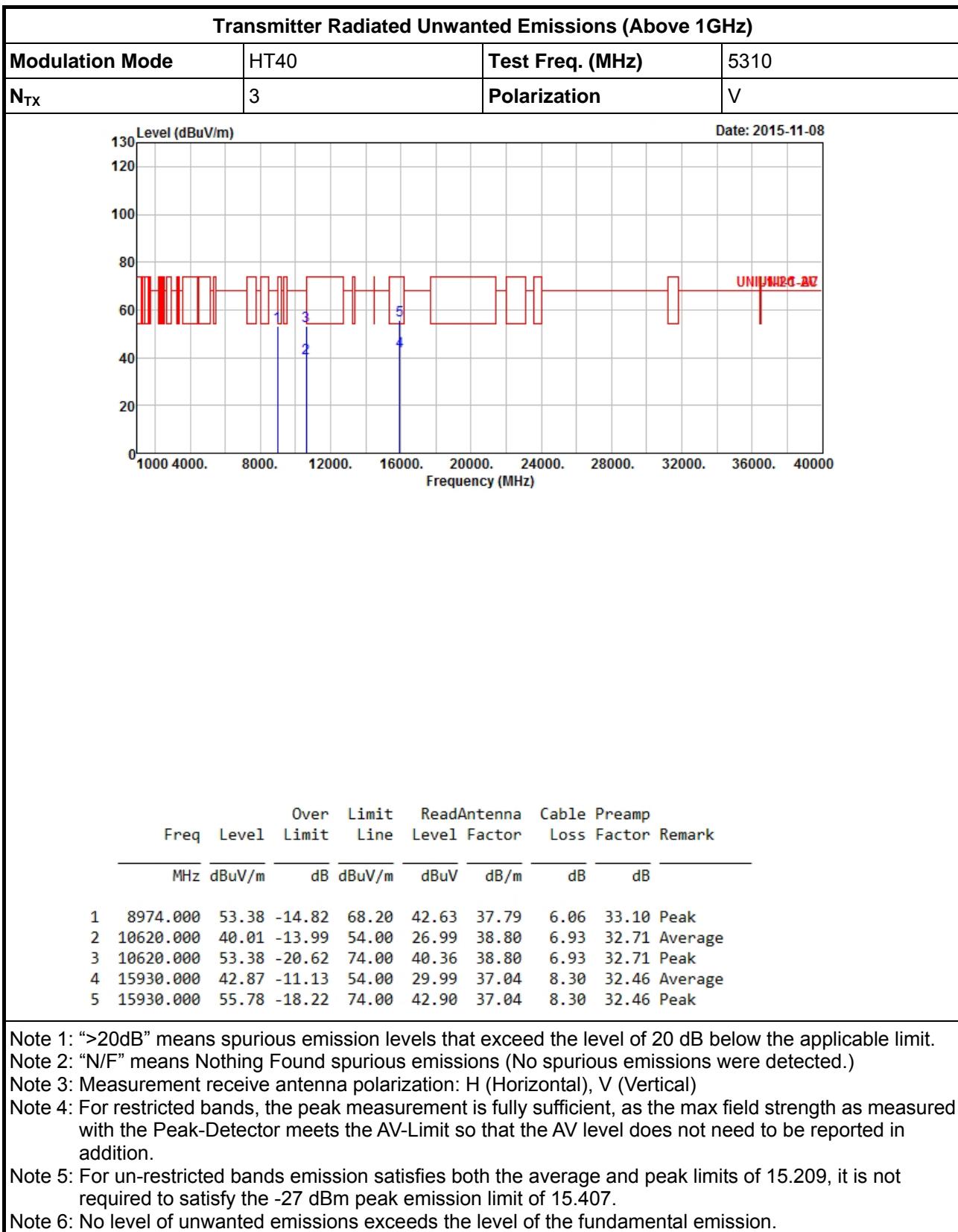


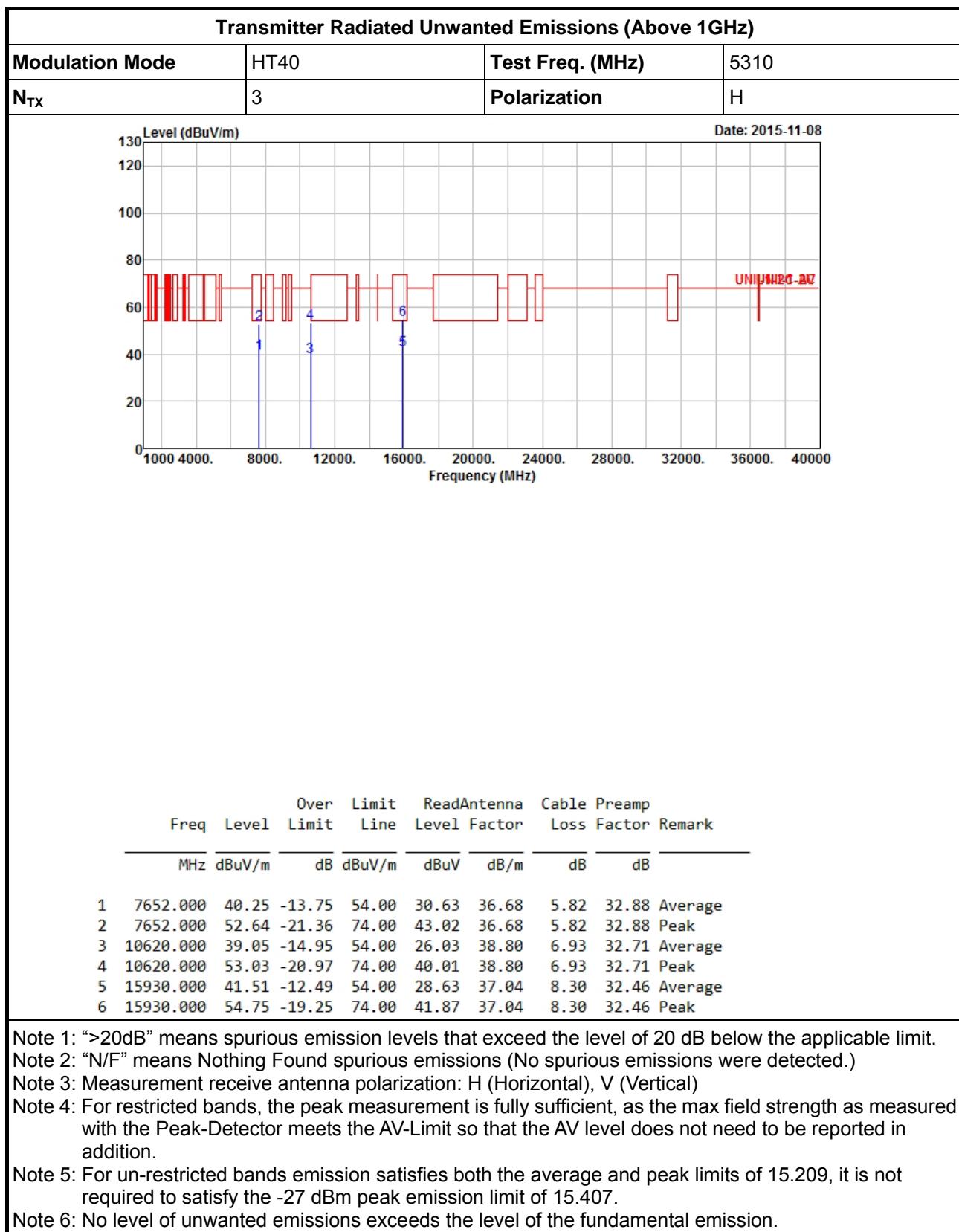


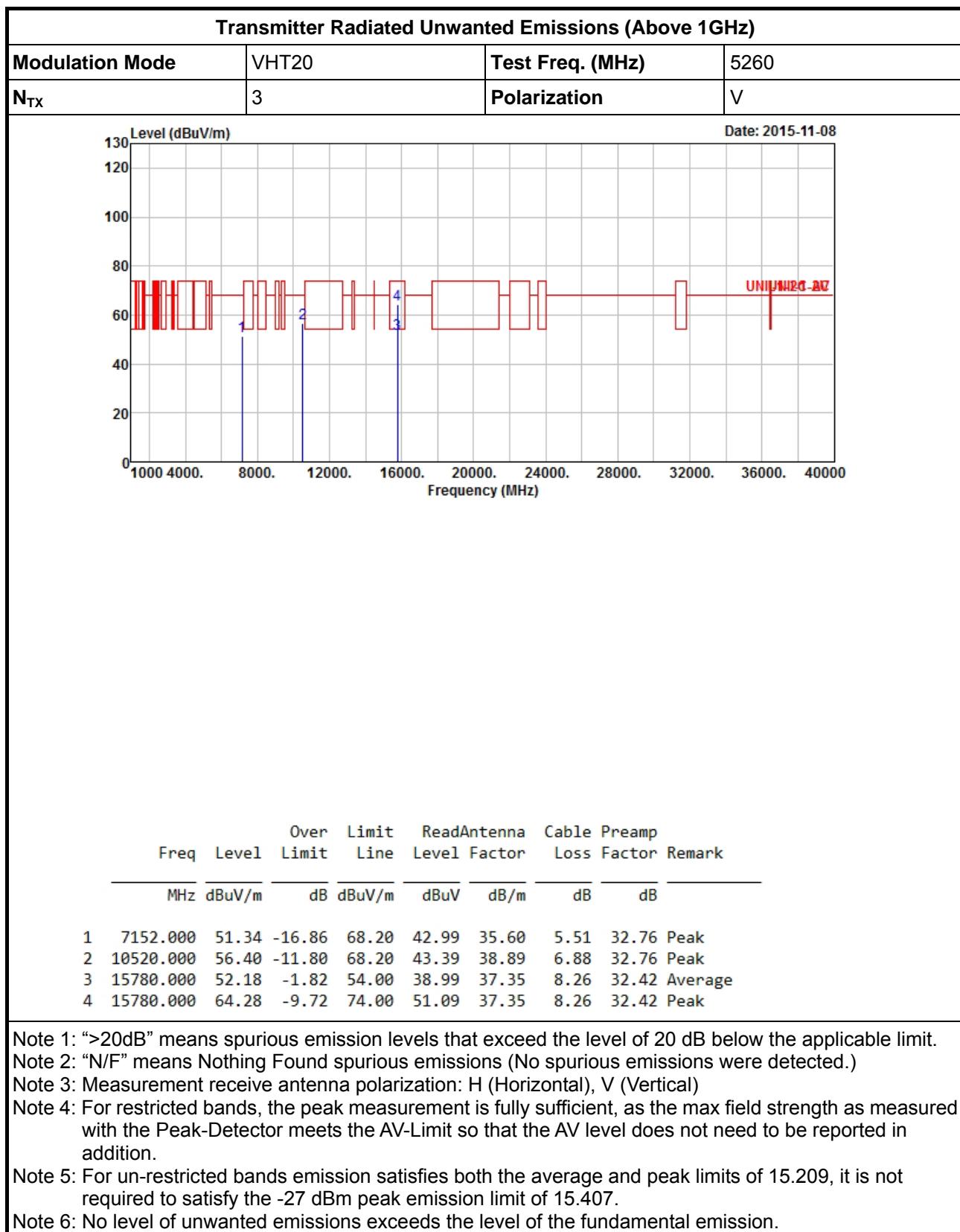


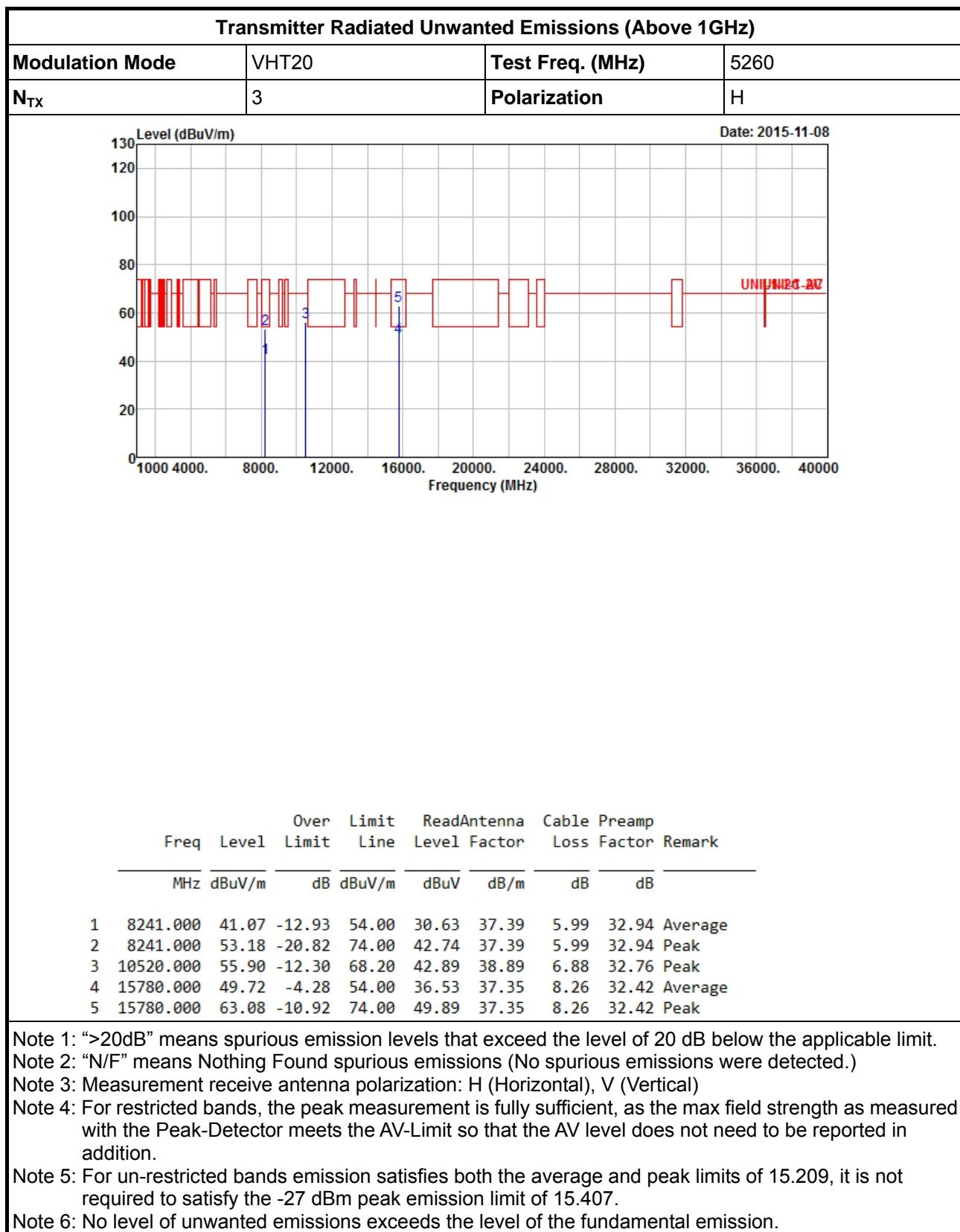


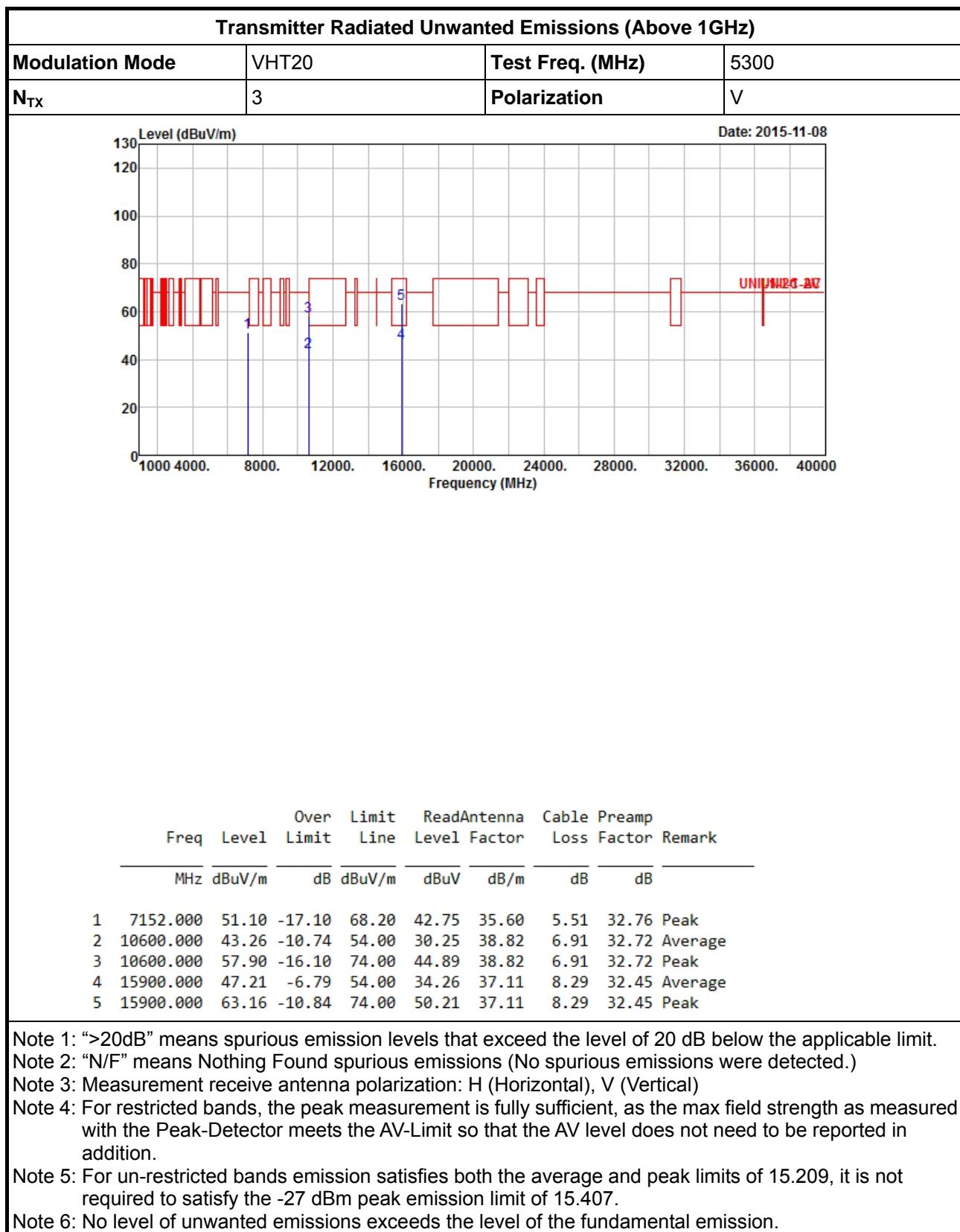


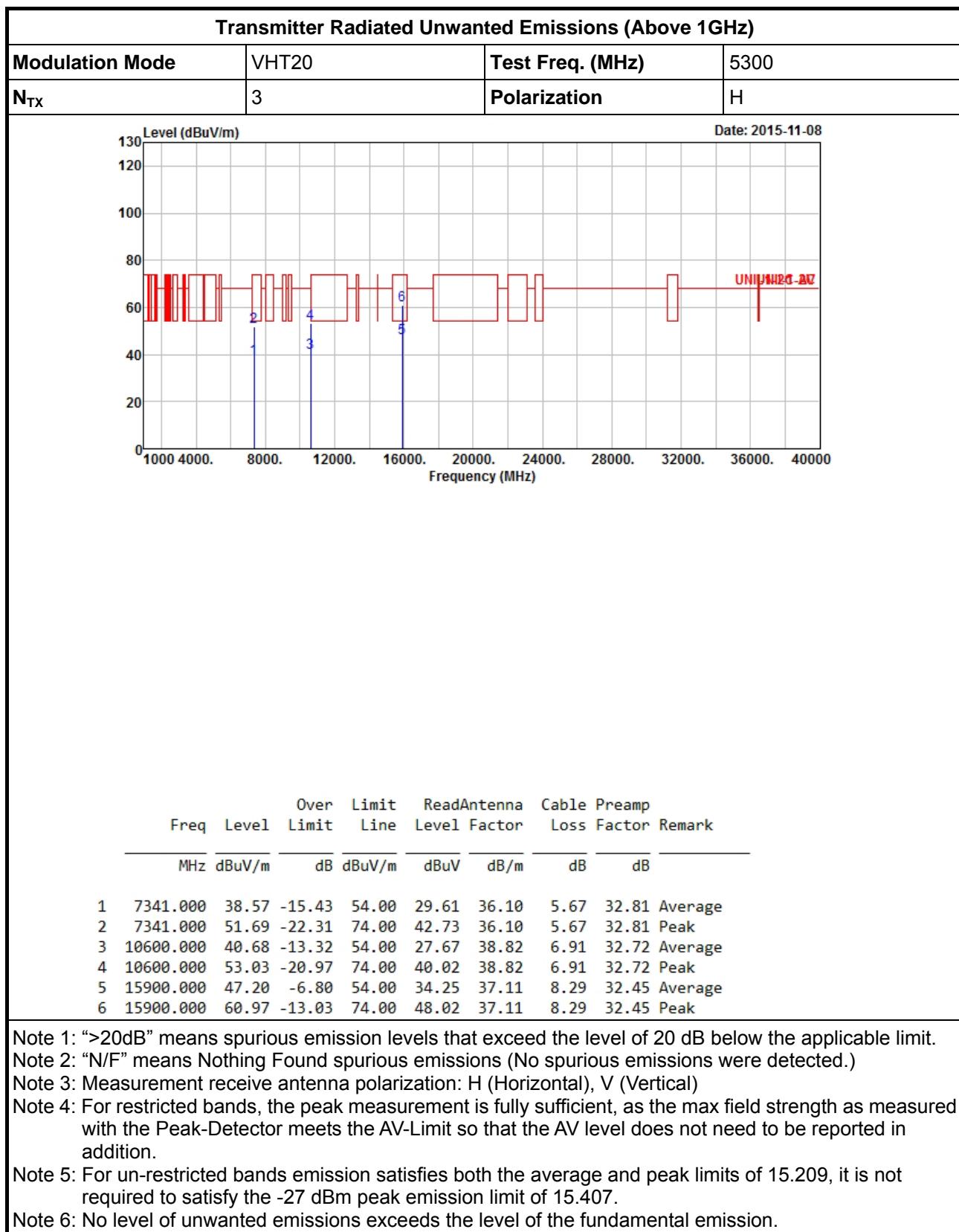


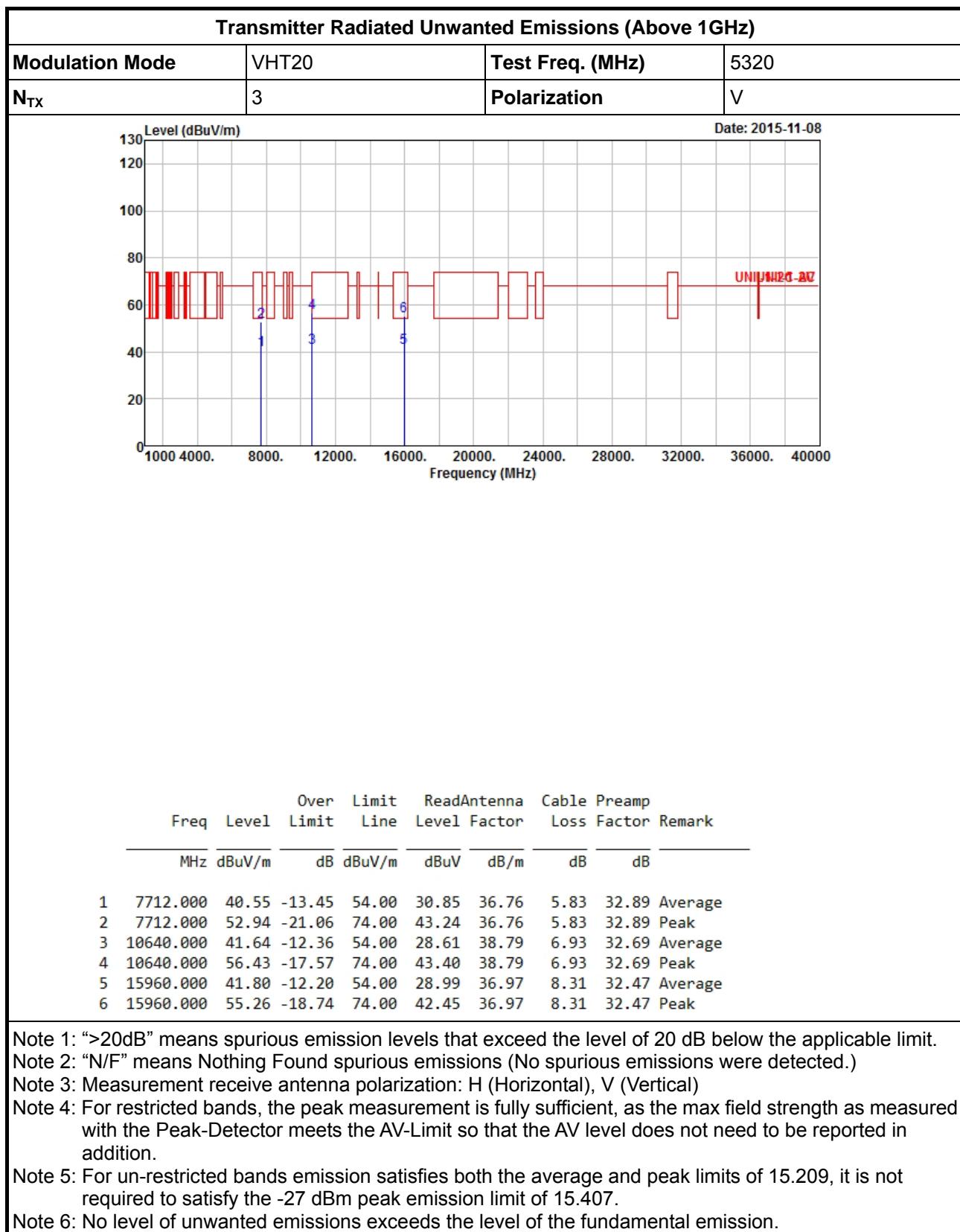












Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: 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.

Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

