



FCC Test Report

Equipment : 7" Tablet PC
Brand Name : Verizion
Model No. : QMV7A
FCC ID : HFS-QMV7A
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Applicant : Quanta Computer Inc.
Manufacturer : 211, Wen Hwa 2nd Rd., Kuei Shan,
Tao Yuan 33377, Taiwan

The product sample received on Aug. 06, 2013 and completely tested on Aug. 29, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 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:



Wayne Hsu / Assistant Manager





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APPENDIX A. TEST PHOTOS

APPENDIX B. PHOTOGRAPHS OF EUT



Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.1965370MHz 44.23 (Margin 9.53dB) - AV 52.72 (Margin 11.04dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	Bandwidth	6dB Bandwidth Unit [MHz] 20M:9.58 / 40M:35.40	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm]:21.48	Power [dBm]:30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/100kHz]:-7.97	PSD [dBm/3kHz]:8	Complied
3.5	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2431.700MHz: 35.66dB Restricted Bands [dBuV/m at 3m]: 2387.390MHz 66.28 (Margin 7.72dB) - PK 53.15 (Margin 0.85dB) - AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.6	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 97.900MHz 39.05 (Margin 4.45dB) - PK	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied



Revision History



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
2400-2483.5	b	2412-2462	1-11 [11]	1	21.48
2400-2483.5	g	2412-2462	1-11 [11]	1	20.44
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	18.59
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	1	18.73

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
Note 4: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)

1.1.2 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input type="checkbox"/>	Temporary RF connector provided
<input checked="" 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			
No.	Ant. Cat.	Ant. Type	Gain (dBi)
1	Integral	PIFA	-0.01



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"/> 99.32% - IEEE 802.11b	0.03
<input checked="" type="checkbox"/> 95.20% - IEEE 802.11g	0.21
<input checked="" type="checkbox"/> 94.84% - IEEE 802.11n (HT20)	0.23
<input checked="" type="checkbox"/> 88.47% - IEEE 802.11n (HT40)	0.53

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

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input checked="" type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> Li-on Battery



1.2 Accessories

Accessories Information				
AC Adapter	Brand Name	PI	Model Name	AD83531
	Power Rating	I/P: 100-240V ~ 50/60Hz 0.3A	;	O/P: 5V --- 2A
Li-ion Battery	Brand Name	McNair	Model Name	MLP3970125
	Power Rating	3.7V / 4000 mAh / 14.8 Wh		

Reminder: Regarding to more detail and other information, please refer to user manual.

1.3 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	Serial No.
1	Notebook	DELL	E552	DoC

1.4 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 C63.10-2009
- FCC KDB 558074
- FCC KDB 662911
- FCC KDB 412172

1.5 Testing Location Information

Testing Location				
	HWA YA	ADD	: No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, 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	Zeus	23°C / 52%
	RF Conducted	TH01-HY	Wei	22.2°C / 61%
	Radiated Emission	03CH03-HY	Eddie	24.1°C / 56.2%



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			
Test Item	Uncertainty	Limit	
AC power-line conducted emissions	±2.26 dB	N/A	
Emission bandwidth, 6dB bandwidth	±1.42 %	N/A	
RF output power, conducted	±0.63 dB	N/A	
Power density, conducted	±0.81 dB	N/A	
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A
	1 – 18 GHz	±0.67 dB	N/A
	18 – 40 GHz	±0.83 dB	N/A
	40 – 200 GHz	N/A	N/A
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	N/A
Temperature	±0.8 °C	N/A	
Humidity	±3 %	N/A	
DC and low frequency voltages	±3 %	N/A	
Time	±1.42 %	N/A	
Duty Cycle	±1.42 %	N/A	



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
11b,1-11Mbps	1	1-11 Mbps	11 Mbps
11g,6-54Mbps	1	6-54 Mbps	6 Mbps
HT20,M0-7	1	M0-7	MCS 0
HT40, M0-7	1	M0-7	MCS 0

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (2400-2483.5MHz band)							
Test Software Version	Continuous Transmitting						
Modulation Mode	N _{TX}	Test Frequency (MHz)					
		NCB: 20MHz			NCB: 40MHz		
		2412	2437	2462	2422	2437	2452
11b,1-11Mbps	1	19.5	19.5	19	-	-	-
11g,6-54Mbps	1	17.5	17.5	17	-	-	-
HT20, M0-7	1	16	15.5	15.5	-	-	-
HT40, M0-7	1	-	-	-	16.5	16	16



2.3 The Worst Case Measurement Configuration

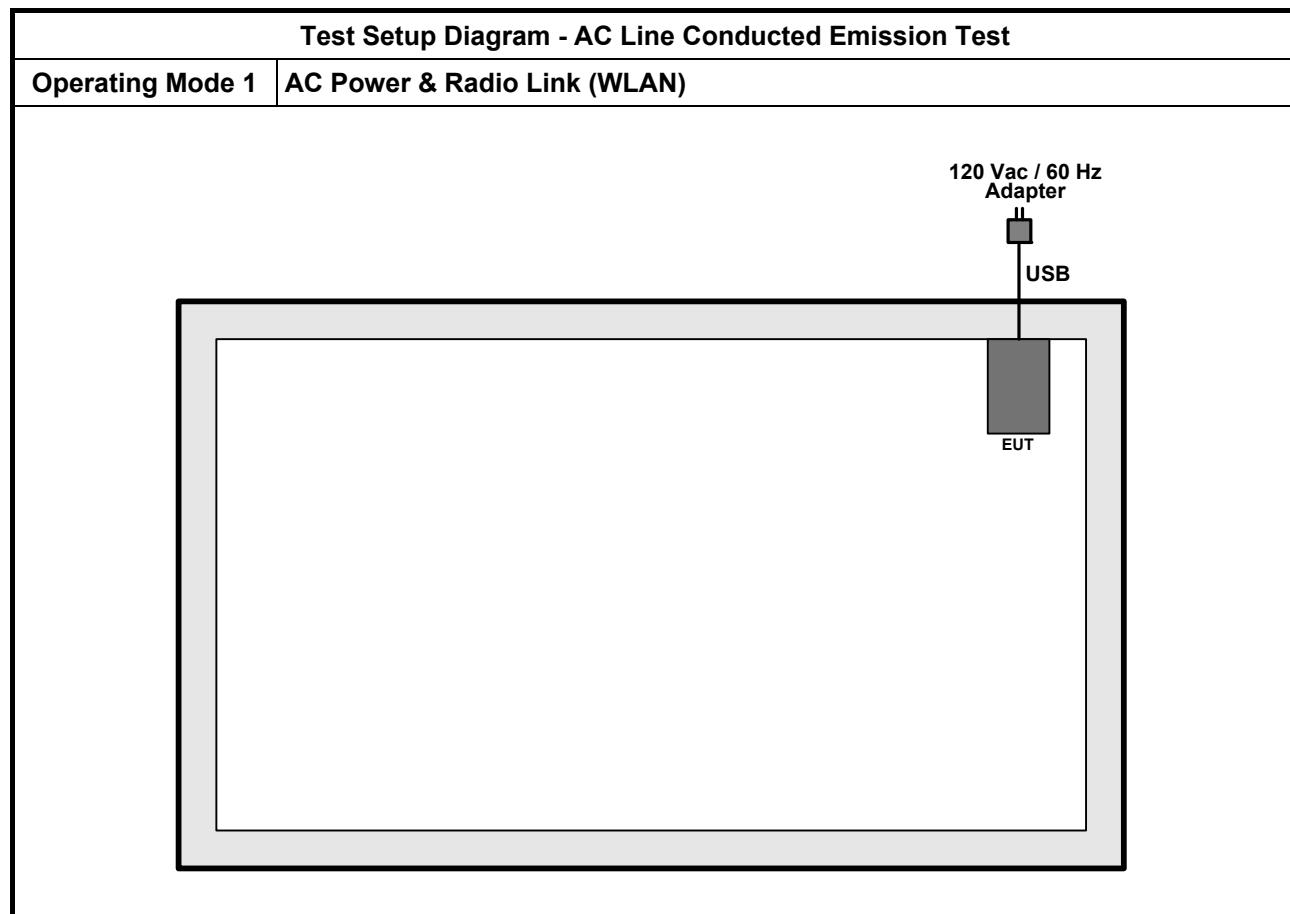
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	AC Power & Radio link (WLAN)
2	USB Power & Radio link (WLAN)

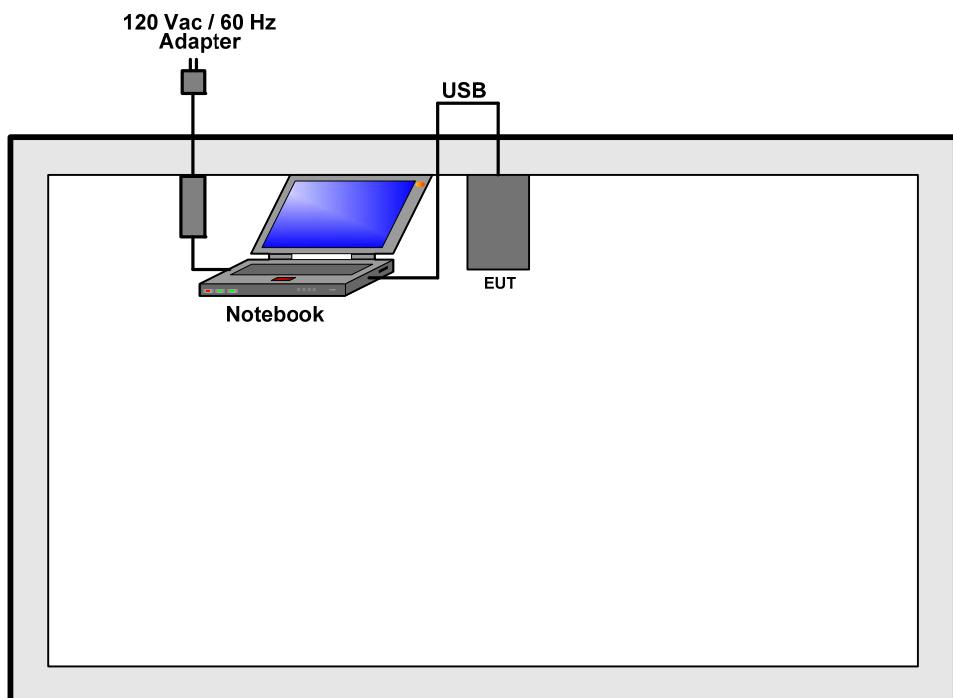
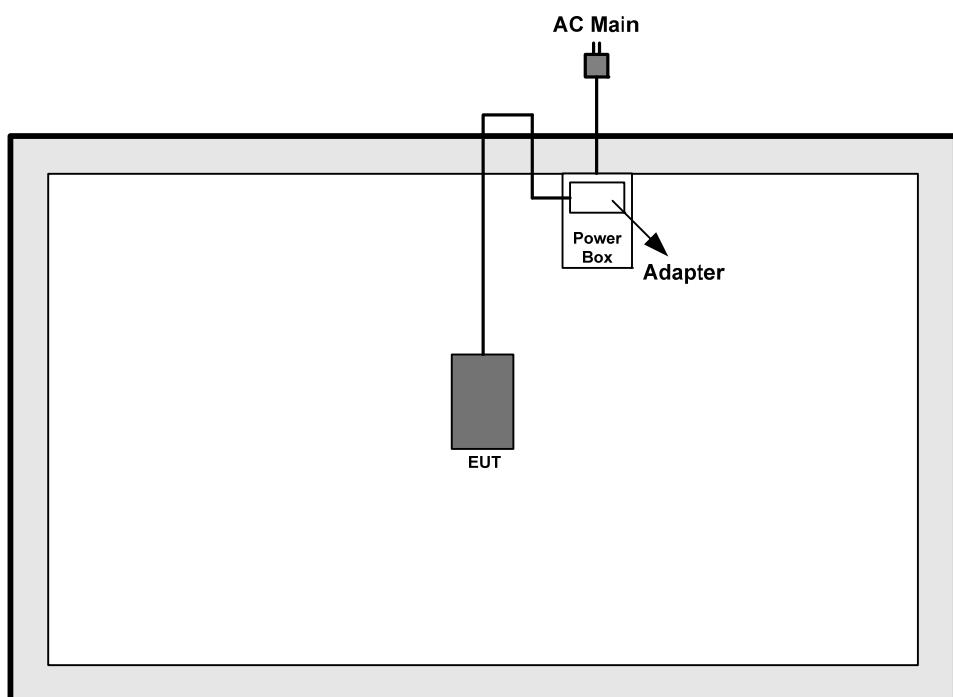
For operating mode 1 is the worst case and it was record in this test report.

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Power Spectral Density, 6 dB Bandwidth
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11b, 11g, HT20, HT40

The Worst Case Mode for Following Conformance Tests							
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions						
Test Condition	Radiated measurement						
User Position	<input checked="" type="checkbox"/> EUT will be placed in fixed position. The worst planes is X. <input 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. EUT shall be performed two or three orthogonal planes.						
Operating Mode < 1GHz	<input checked="" type="checkbox"/> 1. AC Power & Radio Link (WLAN) <input checked="" type="checkbox"/> 2. USB Power & Radio link (WLAN)						
	For operating mode 2 is the worst case and it was record in this test report.						
Modulation Mode	11b, 11g, HT20, HT40						
Orthogonal Planes of EUT	<table border="1"><thead><tr><th>X Plane</th><th>Y Plane</th><th>Z Plane</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table>	X Plane	Y Plane	Z Plane			
X Plane	Y Plane	Z Plane					

2.4 Test Setup Diagram



Test Setup Diagram - Radiated Below 1GHz Test**Operating Mode 2 | USB Power & Radio link (WLAN)****Test Setup Diagram - Radiated Above 1GHz Test****Operating Mode 1 | AC Power & Continuous Transmitting**

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.

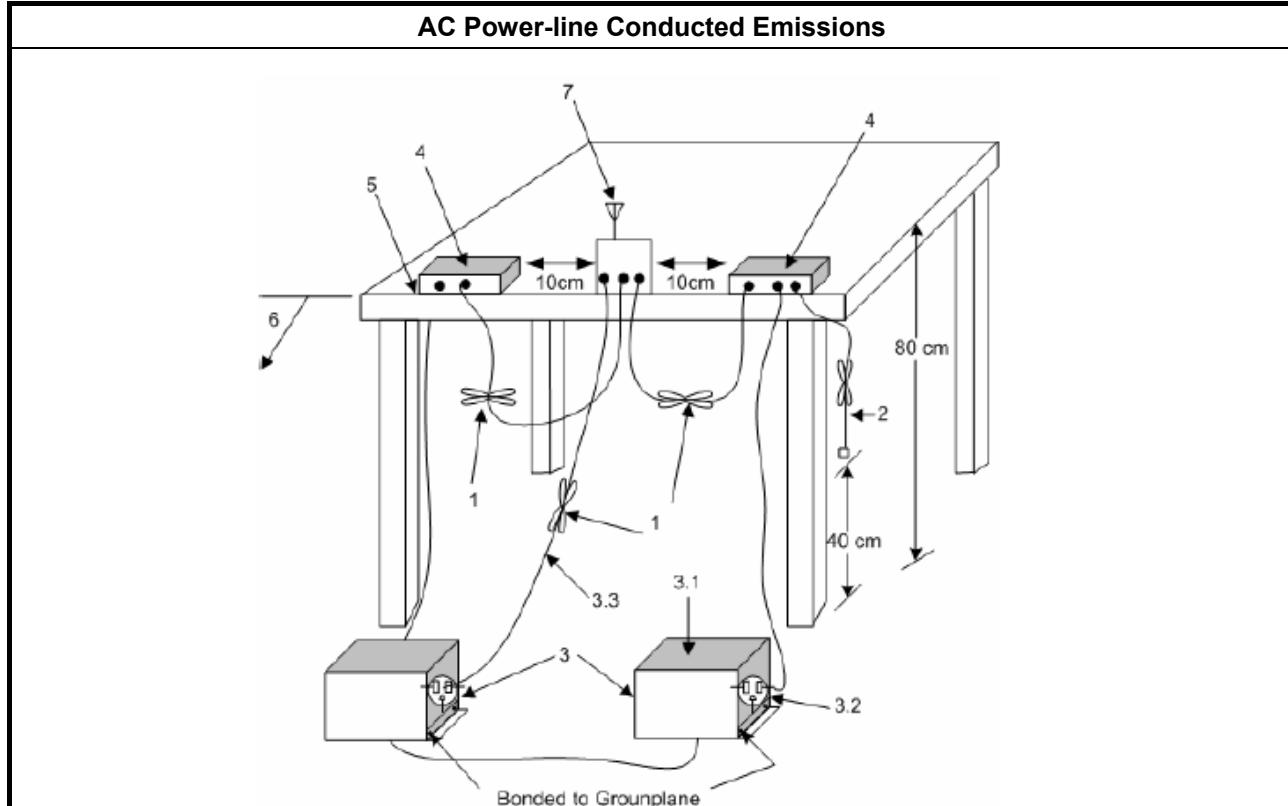
3.1.2 Measuring Instruments

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 C63.10-2009, clause 6.2 for AC power-line conducted emissions.

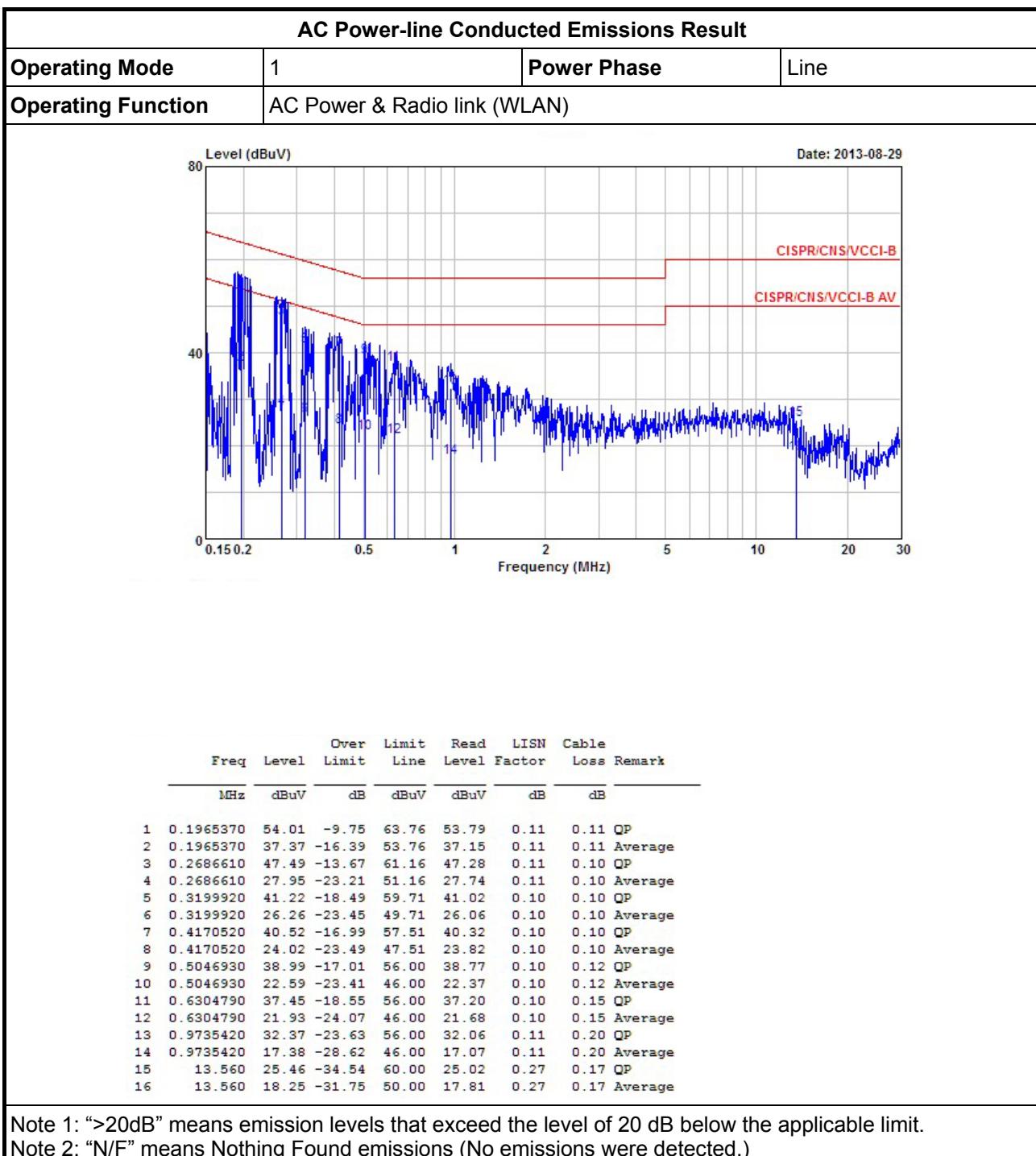
3.1.4 Test Setup





3.1.5 Test Result of AC Power-line Conducted Emissions

AC Power-line Conducted Emissions Result																																																																																																																																																						
Operating Mode	1	Power Phase	Neutral																																																																																																																																																			
Operating Function	AC Power & Radio link (WLAN)																																																																																																																																																					
<table border="1"> <thead> <tr> <th>Freq</th> <th>Level</th> <th>Over Limit</th> <th>Line</th> <th>Read</th> <th>LISN</th> <th>Cable</th> <th>Remark</th> </tr> <tr> <th>MHz</th> <th>dBuV</th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>0.1965370</td><td>52.72</td><td>-11.04</td><td>63.76</td><td>52.38</td><td>0.23</td><td>0.11 QP</td></tr> <tr><td>2</td><td>0.1965370</td><td>44.23</td><td>-9.53</td><td>53.76</td><td>43.89</td><td>0.23</td><td>0.11 Average</td></tr> <tr><td>3</td><td>0.2588790</td><td>46.81</td><td>-14.66</td><td>61.47</td><td>46.48</td><td>0.23</td><td>0.10 QP</td></tr> <tr><td>4</td><td>0.2588790</td><td>34.08</td><td>-17.39</td><td>51.47</td><td>33.75</td><td>0.23</td><td>0.10 Average</td></tr> <tr><td>5</td><td>0.3356200</td><td>44.52</td><td>-14.79</td><td>59.31</td><td>44.20</td><td>0.22</td><td>0.10 QP</td></tr> <tr><td>6</td><td>0.3356200</td><td>29.95</td><td>-19.36</td><td>49.31</td><td>29.63</td><td>0.22</td><td>0.10 Average</td></tr> <tr><td>7</td><td>0.3892930</td><td>39.66</td><td>-18.42</td><td>58.08</td><td>39.34</td><td>0.22</td><td>0.10 QP</td></tr> <tr><td>8</td><td>0.3892930</td><td>14.15</td><td>-33.93</td><td>48.08</td><td>13.83</td><td>0.22</td><td>0.10 Average</td></tr> <tr><td>9</td><td>0.5265450</td><td>38.80</td><td>-17.20</td><td>56.00</td><td>38.45</td><td>0.22</td><td>0.13 QP</td></tr> <tr><td>10</td><td>0.5265450</td><td>28.81</td><td>-17.19</td><td>46.00</td><td>28.46</td><td>0.22</td><td>0.13 Average</td></tr> <tr><td>11</td><td>0.6371950</td><td>36.36</td><td>-19.64</td><td>56.00</td><td>35.98</td><td>0.23</td><td>0.15 QP</td></tr> <tr><td>12</td><td>0.6371950</td><td>21.30</td><td>-24.70</td><td>46.00</td><td>20.92</td><td>0.23</td><td>0.15 Average</td></tr> <tr><td>13</td><td>0.9996780</td><td>33.45</td><td>-22.55</td><td>56.00</td><td>33.02</td><td>0.23</td><td>0.20 QP</td></tr> <tr><td>14</td><td>0.9996780</td><td>21.03</td><td>-24.97</td><td>46.00</td><td>20.60</td><td>0.23</td><td>0.20 Average</td></tr> <tr><td>15</td><td>13.560</td><td>22.95</td><td>-37.05</td><td>60.00</td><td>22.30</td><td>0.48</td><td>0.17 QP</td></tr> <tr><td>16</td><td>13.560</td><td>16.65</td><td>-33.35</td><td>50.00</td><td>16.00</td><td>0.48</td><td>0.17 Average</td></tr> </tbody> </table>							Freq	Level	Over Limit	Line	Read	LISN	Cable	Remark	MHz	dBuV	dB	dBuV	dBuV	dB	dB		1	0.1965370	52.72	-11.04	63.76	52.38	0.23	0.11 QP	2	0.1965370	44.23	-9.53	53.76	43.89	0.23	0.11 Average	3	0.2588790	46.81	-14.66	61.47	46.48	0.23	0.10 QP	4	0.2588790	34.08	-17.39	51.47	33.75	0.23	0.10 Average	5	0.3356200	44.52	-14.79	59.31	44.20	0.22	0.10 QP	6	0.3356200	29.95	-19.36	49.31	29.63	0.22	0.10 Average	7	0.3892930	39.66	-18.42	58.08	39.34	0.22	0.10 QP	8	0.3892930	14.15	-33.93	48.08	13.83	0.22	0.10 Average	9	0.5265450	38.80	-17.20	56.00	38.45	0.22	0.13 QP	10	0.5265450	28.81	-17.19	46.00	28.46	0.22	0.13 Average	11	0.6371950	36.36	-19.64	56.00	35.98	0.23	0.15 QP	12	0.6371950	21.30	-24.70	46.00	20.92	0.23	0.15 Average	13	0.9996780	33.45	-22.55	56.00	33.02	0.23	0.20 QP	14	0.9996780	21.03	-24.97	46.00	20.60	0.23	0.20 Average	15	13.560	22.95	-37.05	60.00	22.30	0.48	0.17 QP	16	13.560	16.65	-33.35	50.00	16.00	0.48	0.17 Average
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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 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
<input checked="" type="checkbox"/> 6 dB bandwidth \geq 500 kHz.

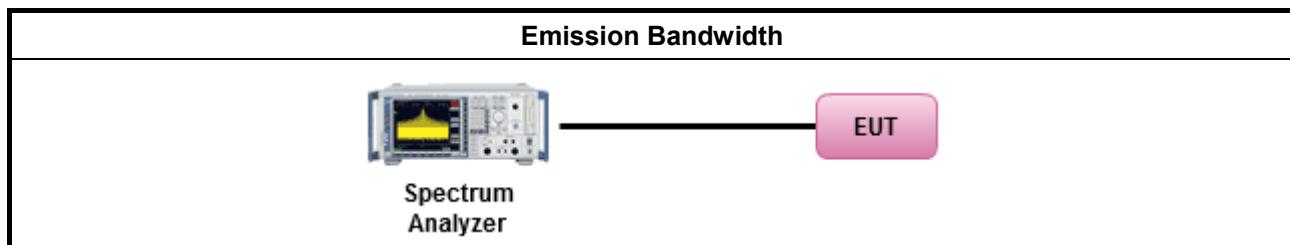
3.2.2 Measuring Instruments

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 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
<input checked="" type="checkbox"/> For conducted measurement.
<input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input 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 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.

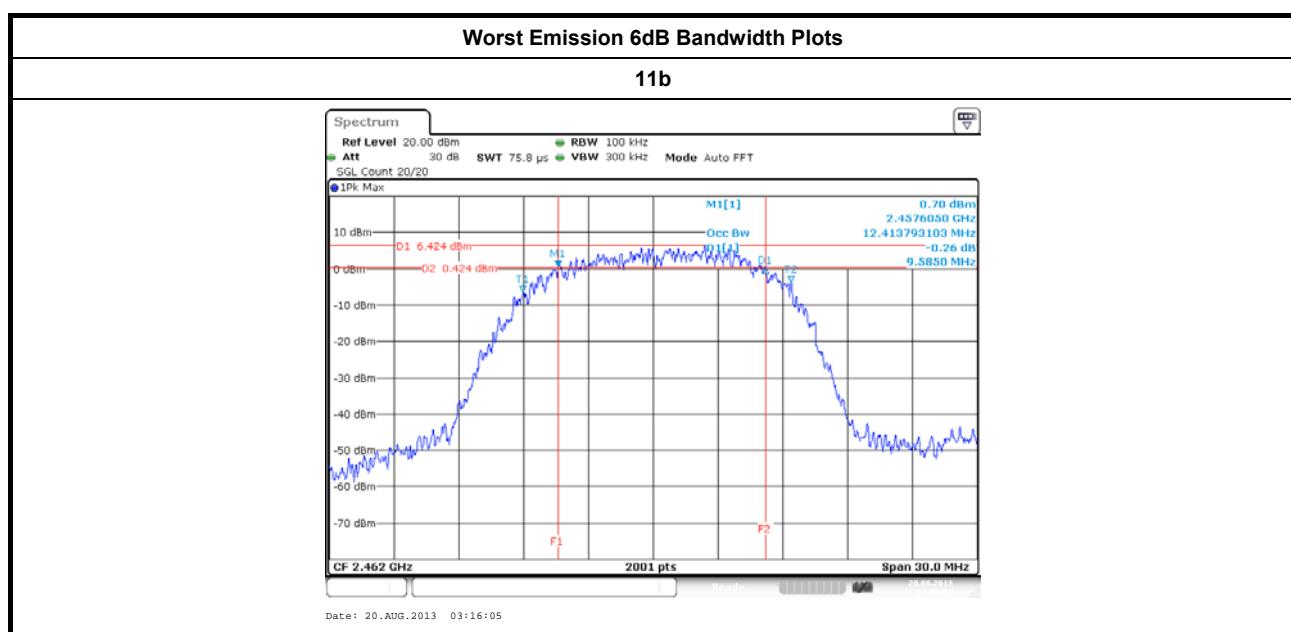
3.2.4 Test Setup





3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result					
Condition			Emission Bandwidth (MHz)		
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth		6dB Bandwidth
			Chain Port 1	Chain Port 1	
11b	1	2412	12.50		10.00
11b	1	2437	12.39		9.75
11b	1	2462	12.41		9.58
11g	1	2412	16.37		15.75
11g	1	2437	16.35		16.32
11g	1	2462	16.32		16.05
HT20	1	2412	17.66		17.61
HT20	1	2437	17.63		17.71
HT20	1	2462	17.60		17.61
HT40	1	2422	36.02		36.32
HT40	1	2437	35.94		36.16
HT40	1	2452	35.94		35.40
Limit			N/A	≥500 kHz	
Result			Complied		

Note 1: N_{TX} = Number of Transmit Chains



3.3 RF Output Power

3.3.1 RF Output Power Limit

RF Output Power Limit	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
<input checked="" type="checkbox"/> 2400-2483.5 MHz Band:	
<input checked="" type="checkbox"/> If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
<input checked="" type="checkbox"/> Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm	
<input type="checkbox"/> Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm	
<input type="checkbox"/> Smart antenna system (SAS):	
	<input type="checkbox"/> Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<input type="checkbox"/> Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<input type="checkbox"/> Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
e.i.r.p. Power Limit:	
<input checked="" type="checkbox"/> 2400-2483.5 MHz Band	
<input checked="" type="checkbox"/> Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)	
<input type="checkbox"/> Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm	
<input type="checkbox"/> Smart antenna system (SAS)	
	<input type="checkbox"/> Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	<input type="checkbox"/> Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	<input type="checkbox"/> Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm.	

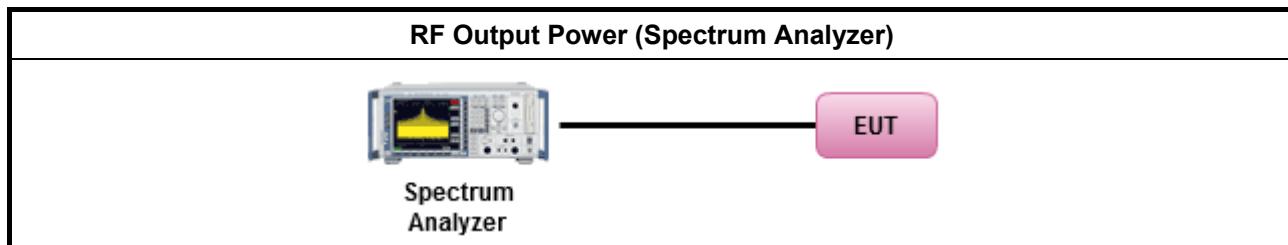
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/> Maximum Peak Conducted Output Power	<input type="checkbox"/> Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW \geq EBW method). <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 9.1.2 Option 2 (integrated band power method). <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.1.3 Option 2 (peak power meter for VBW \geq DTS BW)
<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 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging). <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed) duty cycle < 98% and average over on/off periods with duty factor <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging). <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed) RF power meter and average over on/off periods with duty factor or gated trigger <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM (using an RF average power meter).
<input checked="" type="checkbox"/> For conducted measurement.	<input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain. <input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. <input 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 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	-	-	-
Maximum G_{ANT} (dBi)	-0.01	-	-	-
Modulation Mode	N_{TX}	N_{SS} (Min.)	Array Gain (dB)	Power DG (dBi) Note ³
11b,1-11Mbps	1	1	-	-0.01
11g,6-54Mbps	1	1	-	-0.01
HT20,M0-M7	1	1	0	-0.01
HT40, M0-M7	1	1	0	-0.01

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 = $10 \log[(10^{G1/20} + \dots + 10^{GN/20})^2 / N_{TX}]$
 All transmit signals are completely uncorrelated, Directional Gain = $10 \log[(10^{G1/10} + \dots + 10^{GN/10}) / N_{TX}]$

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} ;

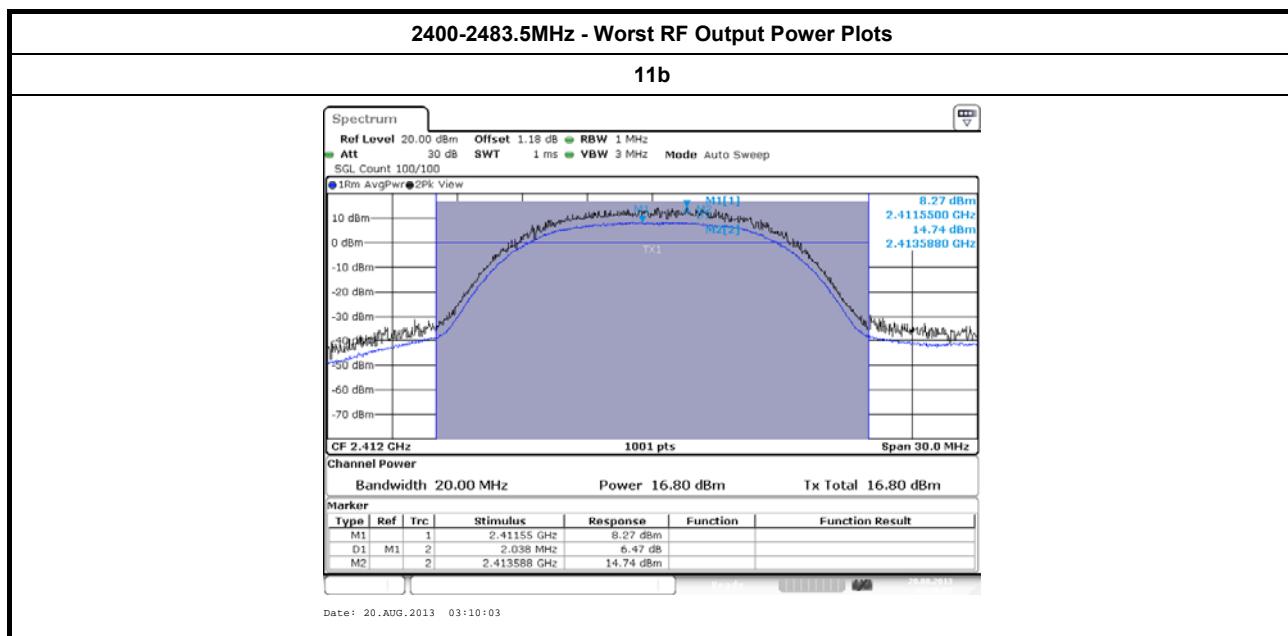


3.3.6 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result								
Condition			RF Output Power (dBm)					
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	21.01	21.01	30	-0.01	21.00	36.00
11b	1	2437	20.74	20.74	30	-0.01	20.73	36.00
11b	1	2462	21.48	21.48	30	-0.01	21.47	36.00
11g	1	2412	20.16	20.16	30	-0.01	20.15	36.00
11g	1	2437	20.44	20.44	30	-0.01	20.43	36.00
11g	1	2462	20.12	20.12	30	-0.01	20.11	36.00
HT20	1	2412	18.54	18.54	30	-0.01	18.53	36.00
HT20	1	2437	18.40	18.40	30	-0.01	18.39	36.00
HT20	1	2462	18.59	18.59	30	-0.01	18.58	36.00
HT40	1	2422	18.73	18.73	30	-0.01	18.72	36.00
HT40	1	2437	18.44	18.44	30	-0.01	18.43	36.00
HT40	1	2452	18.61	18.61	30	-0.01	18.60	36.00
Result			Complied					

3.3.7 Test Result of Maximum Conducted Output Power

Maximum Conducted Output Power								
Condition			RF Output Power (dBm)					
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	16.83	16.83	30	-0.01	16.82	36.00
11b	1	2437	16.68	16.68	30	-0.01	16.67	36.00
11b	1	2462	16.73	16.73	30	-0.01	16.72	36.00
11g	1	2412	15.22	15.22	30	-0.01	15.21	36.00
11g	1	2437	15.55	15.55	30	-0.01	15.54	36.00
11g	1	2462	15.14	15.14	30	-0.01	15.13	36.00
HT20	1	2412	13.53	13.53	30	-0.01	13.52	36.00
HT20	1	2437	13.57	13.57	30	-0.01	13.56	36.00
HT20	1	2462	13.63	13.63	30	-0.01	13.62	36.00
HT40	1	2422	13.86	13.86	30	-0.01	13.85	36.00
HT40	1	2437	13.63	13.63	30	-0.01	13.62	36.00
HT40	1	2452	13.66	13.66	30	-0.01	13.65	36.00
Result			Complied					



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



3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
<input checked="" type="checkbox"/> Power Spectral Density (PSD) $\leq 8 \text{ dBm/3kHz}$

3.4.2 Measuring Instruments

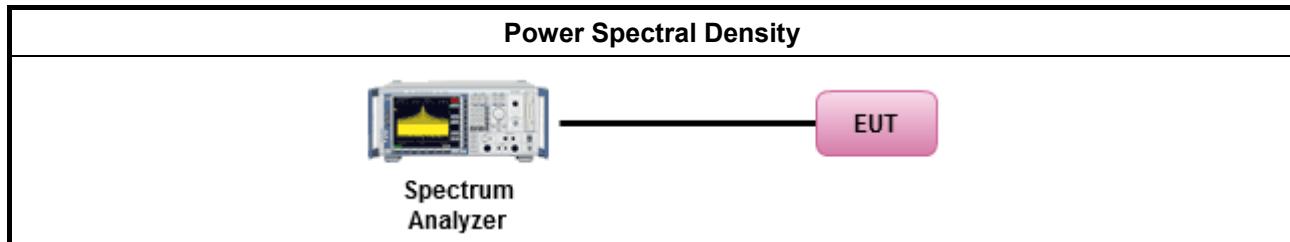
Refer a test equipment and calibration data table in this test report.

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. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz;detector=peak).. [duty cycle $\geq 98\%$ or external video / power trigger]
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 10.3 Method AVGPSD-1 (spectral trace averaging).
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.4 Method AVGPSD-1 Alt. (slow sweep speed) duty cycle $< 98\%$ and average over on/off periods with duty factor
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 10.5 Method AVGPSD-2 (spectral trace averaging).
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)
<input checked="" type="checkbox"/> For conducted measurement.
<input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input type="checkbox"/> The EUT supports multiple transmit chains using options given below:
<input type="checkbox"/> Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
<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.



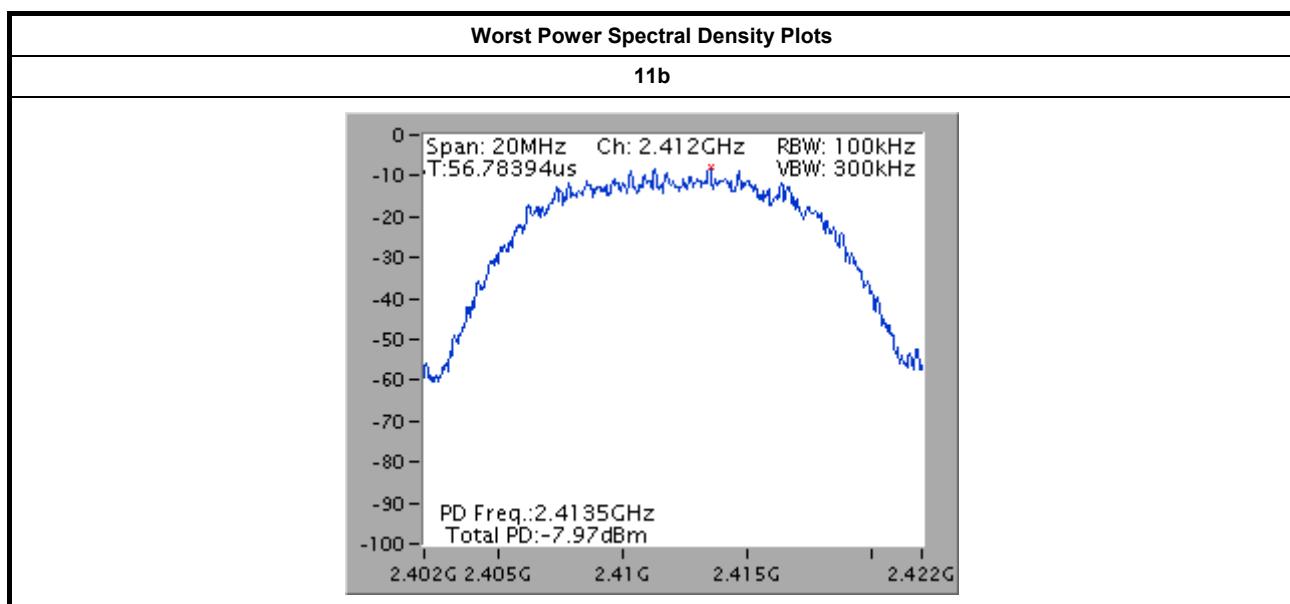
3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

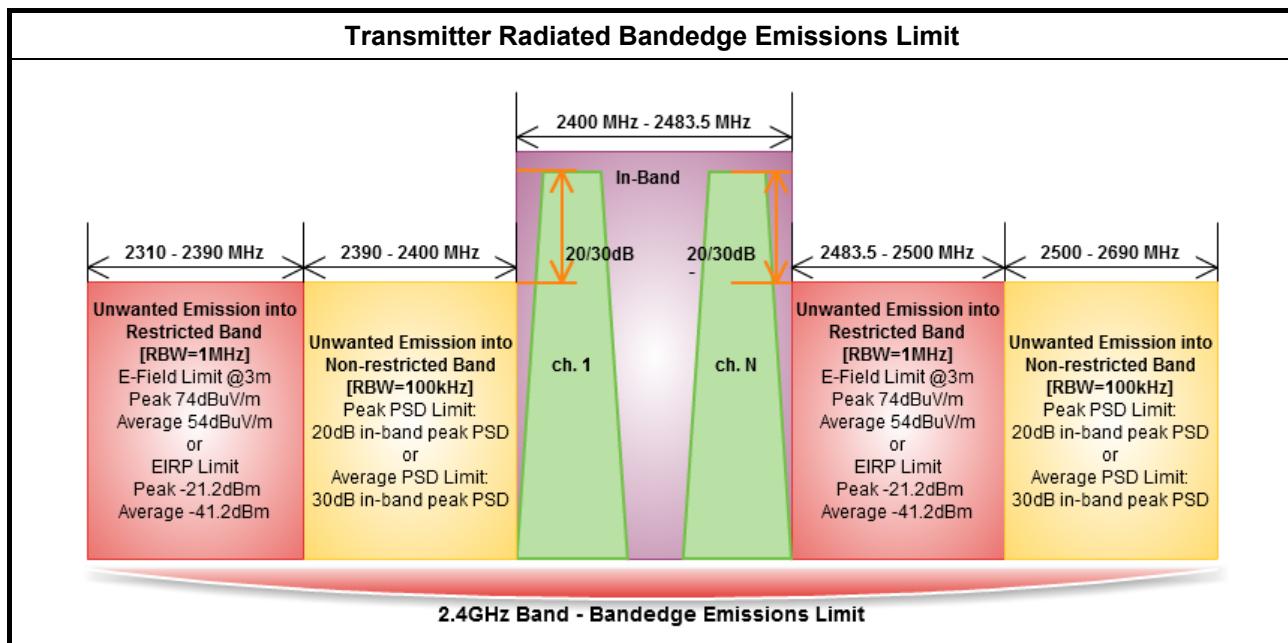
Condition			Power Spectral Density	
Modulation Mode	N _{TX}	Freq. (MHz)	Sum Chain (dBm/100kHz)	PSD Limit (dBm/3kHz)
11b	1	2412	-7.97	8
11b	1	2437	-8.81	8
11b	1	2462	-8.23	8
11g	1	2412	-13.46	8
11g	1	2437	-11.28	8
11g	1	2462	-13.63	8
HT20	1	2412	-14.99	8
HT20	1	2437	-15.35	8
HT20	1	2462	-15.67	8
HT40	1	2422	-16.59	8
HT40	1	2437	-17.31	8
HT40	1	2452	-16.61	8
Result		Complied		

Note 1: PSD = sum each transmit chains by bin-to-bin PSD



3.5 Transmitter Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



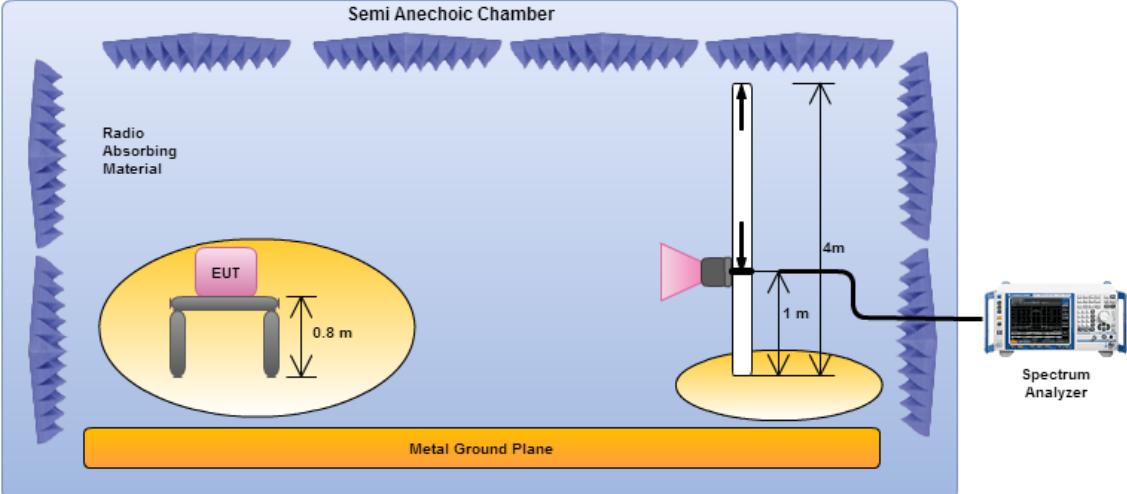
3.5.2 Measuring Instruments

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 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$)
<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$).
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
<input checked="" type="checkbox"/> For the transmitter bandedge emissions shall be measured using following options below:
<input type="checkbox"/> Refer as FCC KDB 558074, clause 13.3 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 6.9.2 for band-edge testing.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/> For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.

3.5.4 Test Setup

Transmitter Radiated Bandedge Emissions
 <p>Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.</p>



3.5.5 Transmitter Radiated Bandedge Emissions

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)								
Modulation	N _{TX}	Test Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Pol.
11b	1	2412	109.77	2411.920	69.41	40.36	20	H
11b	1	2462	107.42	2461.500	52.62	54.80	20	H
11g	1	2412	98.88	2409.230	62.97	35.91	20	H
11g	1	2462	97.45	2549.100	52.86	44.59	20	H
HT20,M0-7	1	2412	99.86	2409.230	62.42	37.44	20	H
HT20,M0-7	1	2462	98.43	2459.000	52.10	46.33	20	H
HT40,M0-7	1	2422	94.26	2431.700	58.60	35.66	20	H
HT40,M0-7	1	2452	94.11	2455.400	53.63	40.48	20	H

Note 1: Measurement worst emissions of receive antenna polarization

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)										
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.
11b	1	2412	3	2386.940	66.28	74	2387.390	53.15	54	H
11b	1	2462	3	2486.300	66.01	74	2483.500	52.90	54	H
11g	1	2412	3	2390.000	71.76	74	2390.000	51.41	54	H
11g	1	2462	3	2485.400	72.66	74	2483.500	50.60	54	H
HT20,M0-7	1	2412	3	2389.630	72.83	74	2390.000	52.54	54	H
HT20,M0-7	1	2462	3	2483.500	71.40	74	2483.500	51.69	54	H
HT40,M0-7	1	2422	3	2390.000	69.37	74	2390.000	52.67	54	H
HT40,M0-7	1	2452	3	2483.500	68.16	74	2484.680	52.71	54	H

Note 1: Measurement worst emissions of receive antenna polarization.



3.6 Transmitter Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

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: 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 Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

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

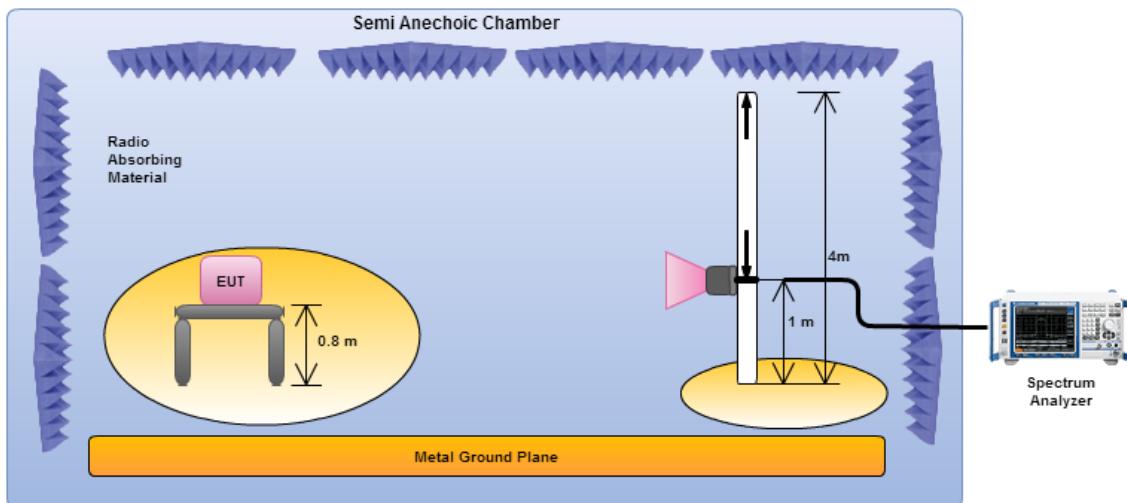


3.6.3 Test Procedures

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. 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"/>	Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.
<input checked="" type="checkbox"/>	Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.
<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 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle \geq 98%)
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW \geq 1/T).
	<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.

3.6.4 Test Setup

Transmitter Radiated Unwanted Emissions



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

3.6.5 Transmitter Radiated Unwanted Emissions (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.



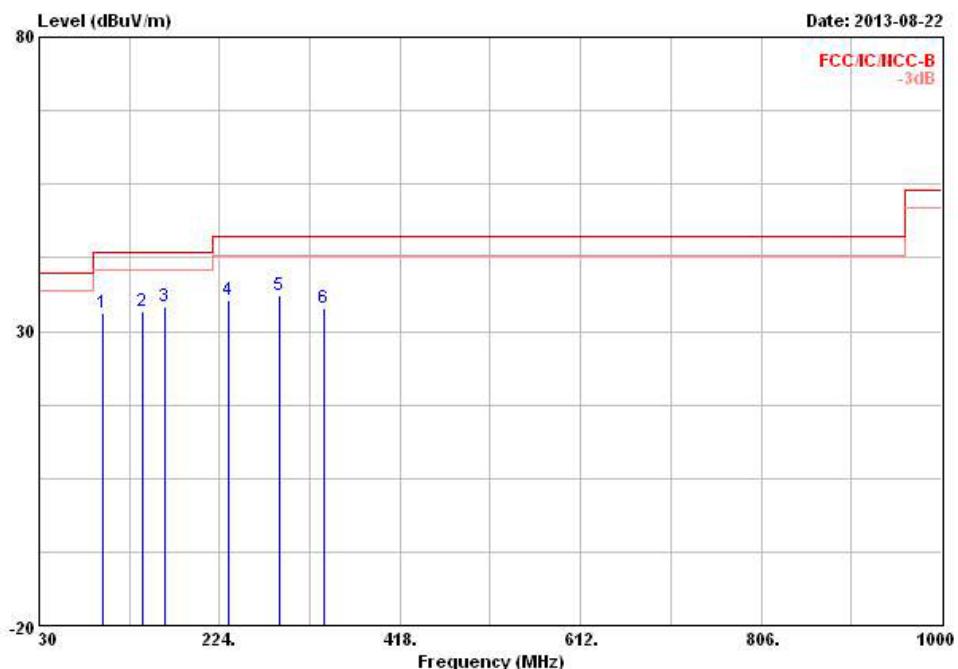
3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Transmitter Radiated Unwanted Emissions (Below 1GHz)																																																																																																							
Operating Mode		2		Polarization		V																																																																																																	
Operating Function		USB Power & Radio link (WLAN)																																																																																																					
Level (dBuV/m)											Date: 2013-08-22																																																																																												
<table border="1"> <thead> <tr> <th rowspan="2">Freq</th> <th rowspan="2">Level</th> <th rowspan="2">Over Limit</th> <th rowspan="2">Line</th> <th colspan="2">Read Antenna</th> <th colspan="2">Cable Preamp</th> <th rowspan="2">Ant Pos</th> <th rowspan="2">Table Pos</th> </tr> <tr> <th>dB</th> <th>dBuV/m</th> <th>dBuV</th> <th>dB/m</th> <th>dB</th> <th>dB</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1 @ 47.460</td> <td>34.26</td> <td>-5.74</td> <td>40.00</td> <td>51.60</td> <td>9.27</td> <td>0.97</td> <td>27.58</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2 @ 97.900</td> <td>39.05</td> <td>-4.45</td> <td>43.50</td> <td>54.14</td> <td>10.86</td> <td>1.44</td> <td>27.39</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3 126.030</td> <td>34.37</td> <td>-9.13</td> <td>43.50</td> <td>47.51</td> <td>12.47</td> <td>1.67</td> <td>27.28</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4 164.830</td> <td>34.37</td> <td>-9.13</td> <td>43.50</td> <td>49.75</td> <td>9.89</td> <td>1.86</td> <td>27.13</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5 299.660</td> <td>29.86</td> <td>-16.14</td> <td>46.00</td> <td>40.36</td> <td>13.58</td> <td>2.57</td> <td>26.65</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6 847.710</td> <td>33.11</td> <td>-12.89</td> <td>46.00</td> <td>35.50</td> <td>20.84</td> <td>4.45</td> <td>27.68</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>												Freq	Level	Over Limit	Line	Read Antenna		Cable Preamp		Ant Pos	Table Pos	dB	dBuV/m	dBuV	dB/m	dB	dB	MHz	dBuV/m							cm	deg	1 @ 47.460	34.26	-5.74	40.00	51.60	9.27	0.97	27.58	Peak	---	---	2 @ 97.900	39.05	-4.45	43.50	54.14	10.86	1.44	27.39	Peak	---	---	3 126.030	34.37	-9.13	43.50	47.51	12.47	1.67	27.28	Peak	---	---	4 164.830	34.37	-9.13	43.50	49.75	9.89	1.86	27.13	Peak	---	---	5 299.660	29.86	-16.14	46.00	40.36	13.58	2.57	26.65	Peak	---	---	6 847.710	33.11	-12.89	46.00	35.50	20.84	4.45	27.68	Peak	---	---
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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)																																																																																																							



Transmitter Radiated Unwanted Emissions (Below 1GHz)

Operating Mode	2	Polarization	H
Operating Function	USB Power & Radio link (WLAN)		



Freq	Level	Over Limit		Read Antenna		Cable Preamp		Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	
98.870	33.03	-10.47	43.50	47.94	11.03	1.45	27.39	Peak	---	---
141.550	33.40	-10.10	43.50	47.60	11.26	1.76	27.22	Peak	---	---
164.830	34.26	-9.24	43.50	49.64	9.89	1.86	27.13	Peak	---	---
233.700	35.35	-10.65	46.00	49.15	10.84	2.24	26.88	Peak	---	---
288.020	36.11	-9.89	46.00	46.93	13.37	2.51	26.70	Peak	---	---
335.550	34.00	-12.00	46.00	43.49	14.67	2.73	26.89	Peak	---	---

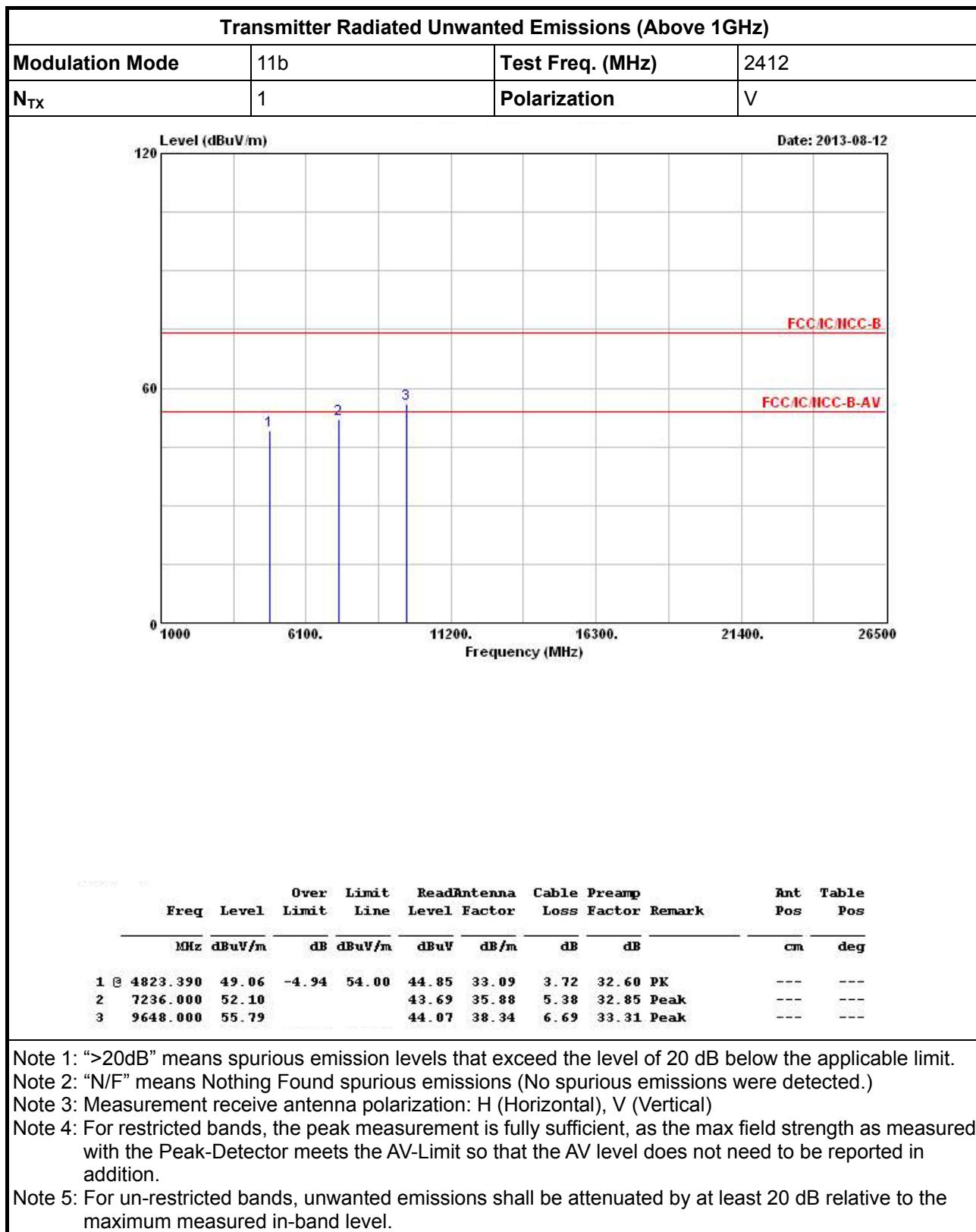
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.

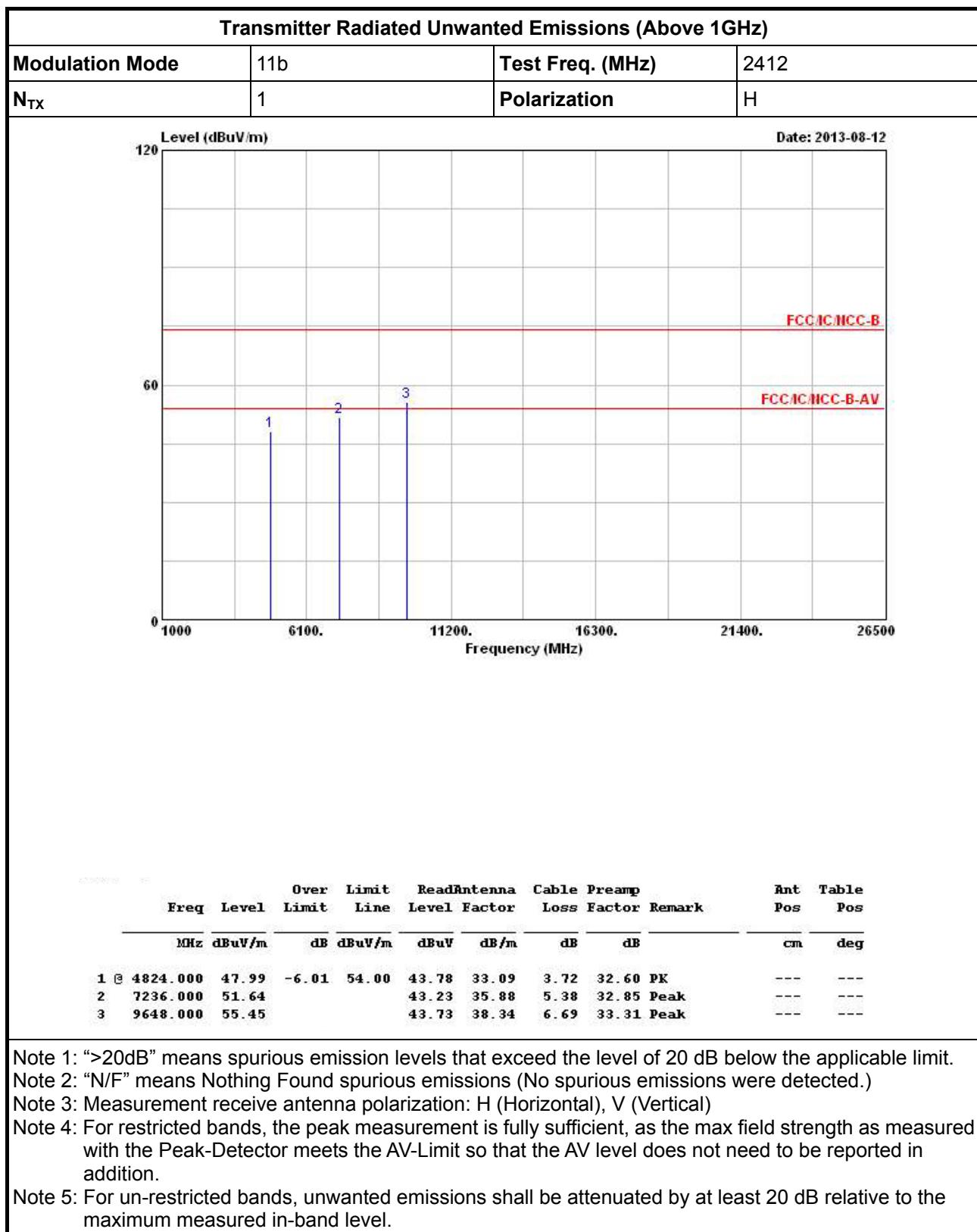
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected)

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



3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

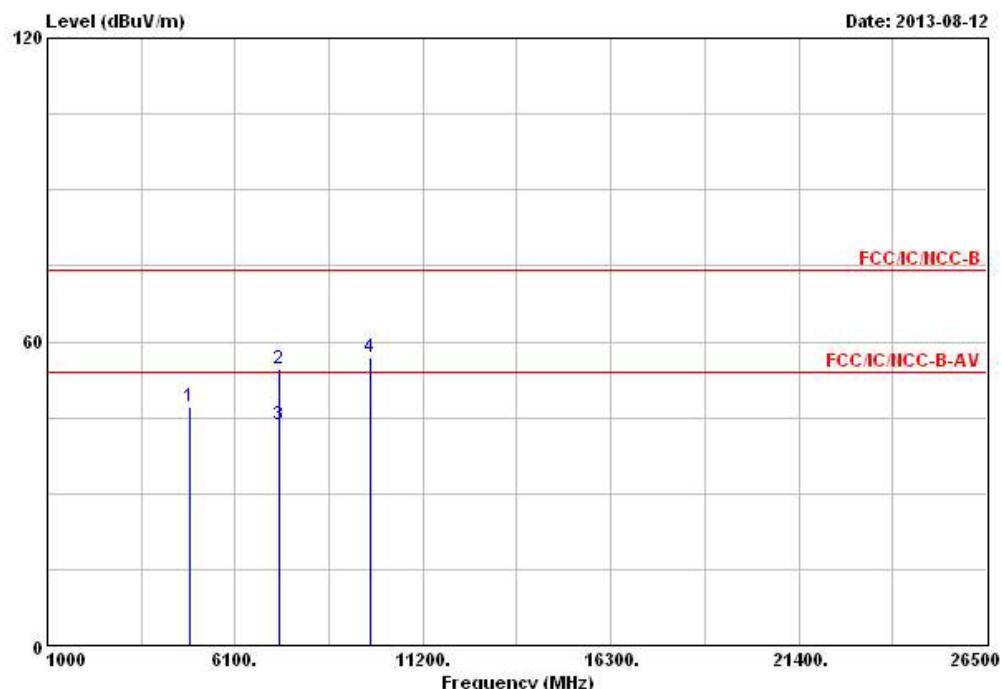






Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2437
N _{TX}	1	Polarization	V



Freq	Level	Over Limit	Line	Read	Antenna Level	Cable Factor	Preamp Factor	Remark	Ant	Table
									Pos	Pos
MHz	dBuV/m		dB	dBuV/m		dBuV	dB/m		dB	dB
1	4873.620	47.10	-6.90	54.00	42.80	33.18	3.72	32.60 PK	---	---
2	7311.000	54.70	-19.30	74.00	46.04	36.04	5.48	32.86 Peak	---	---
3	7311.000	43.72	-10.28	54.00	35.06	36.04	5.48	32.86 Average	---	---
4	9748.620	56.87			44.88	38.57	6.73	33.31 Peak	---	---

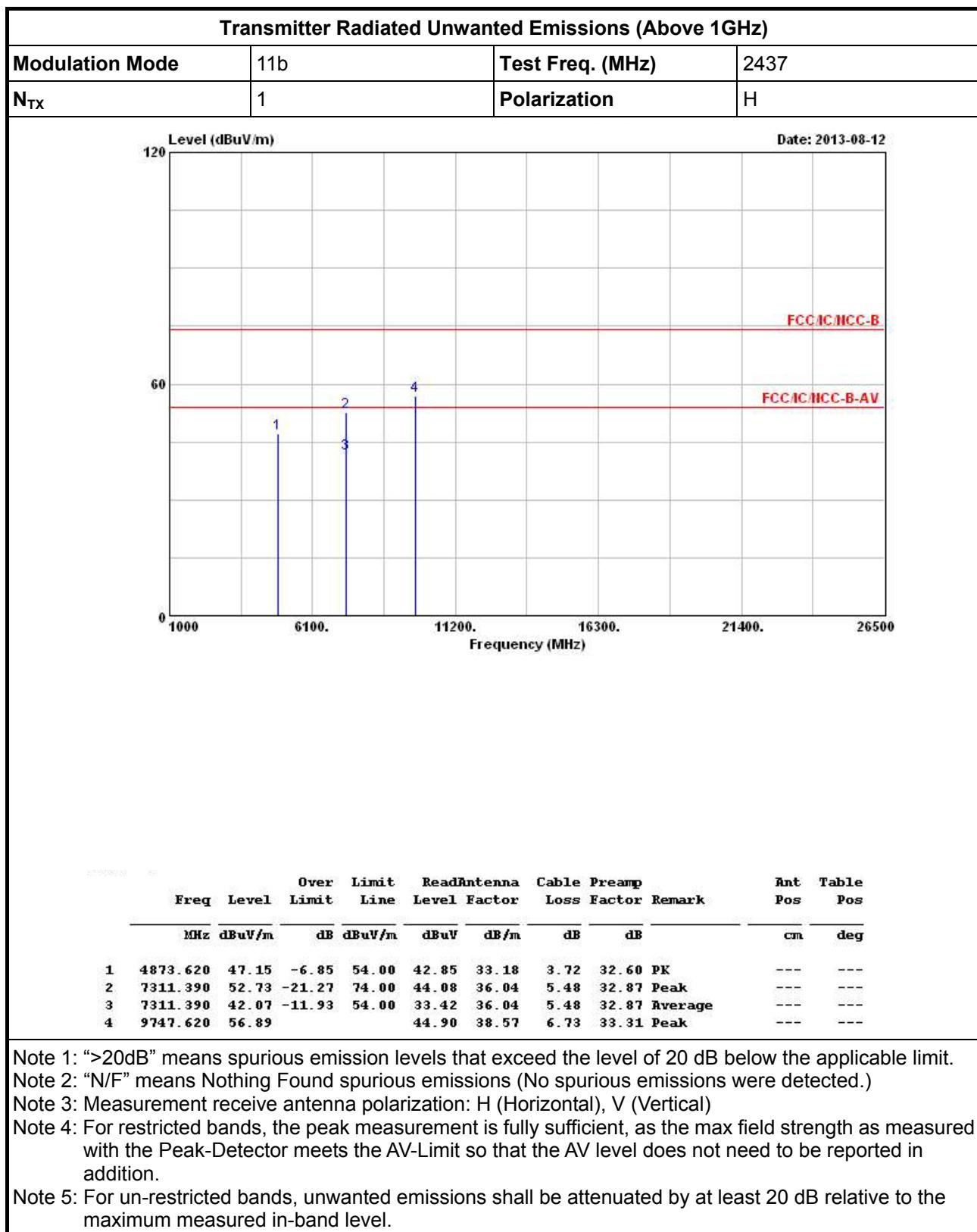
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

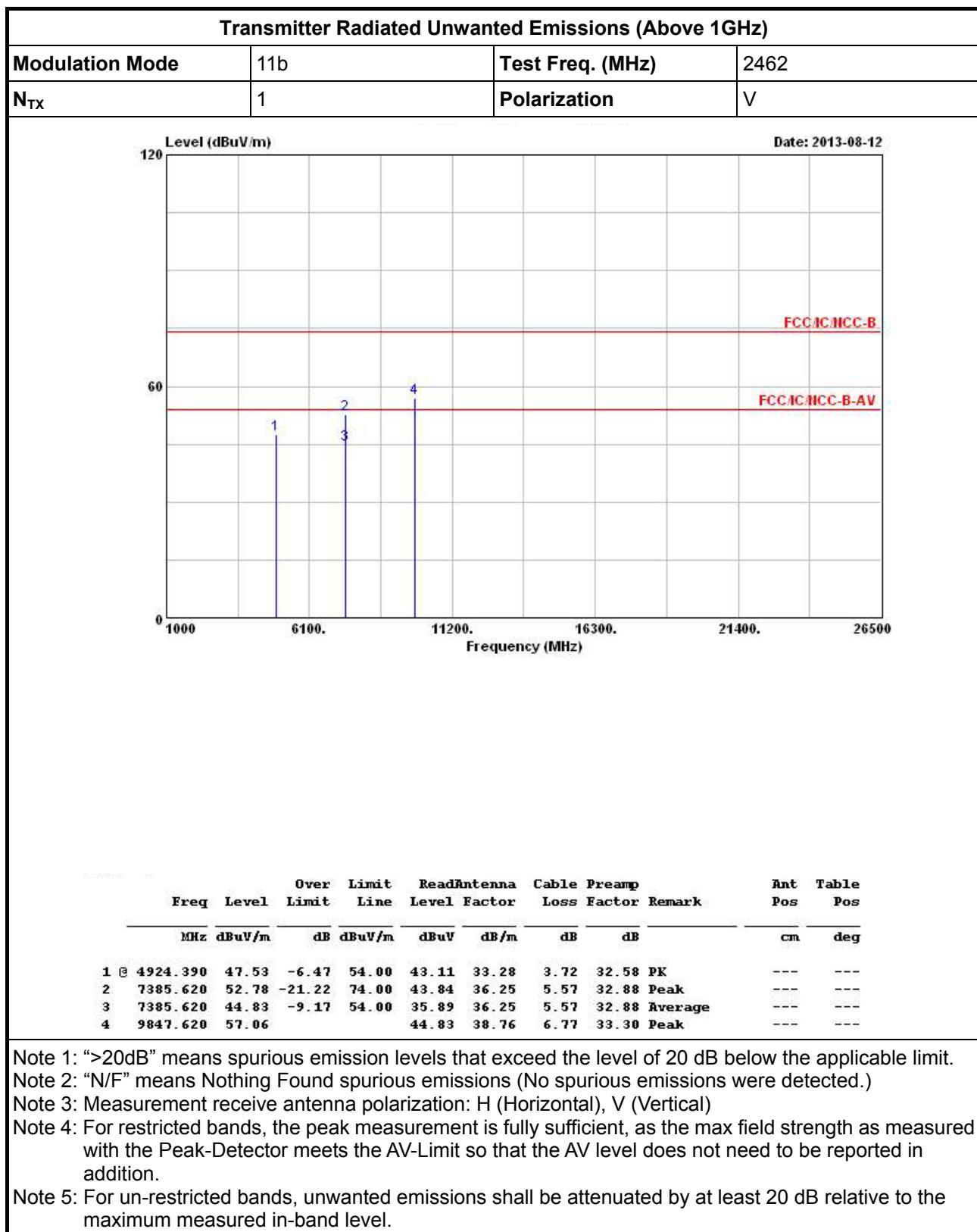
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

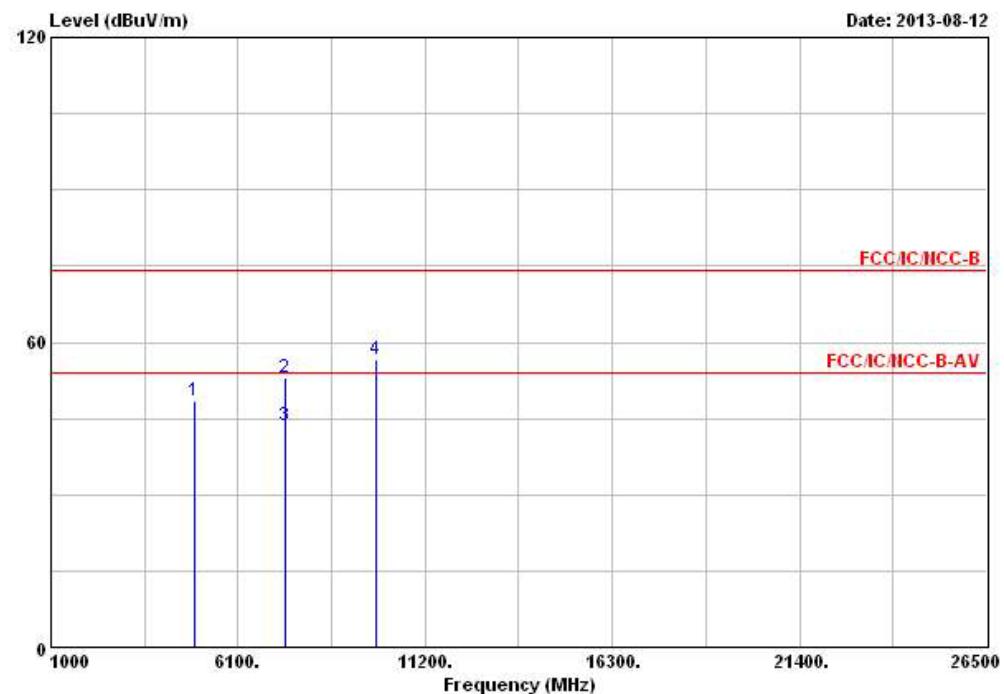






Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2462
N_{TX}	1	Polarization	H



Freq	Level	Over	Limit	ReadAntenna		Cable		Preamp	Ant	Table	
		Limit	Line	Level	Factor	Loss	Factor	Remark			
MHz	dBuV/m	dB		dBuV/m	dBuV	dB		dB	cm		deg
4924.390	48.40	-5.60	54.00	43.98	33.28	3.72	32.58	PK	---	---	
7385.620	53.08	-20.92	74.00	44.14	36.25	5.57	32.88	Peak	---	---	
7385.620	43.59	-10.41	54.00	34.65	36.25	5.57	32.88	Average	---	---	
9848.000	56.64			44.41	38.76	6.77	33.30	Peak	---	---	

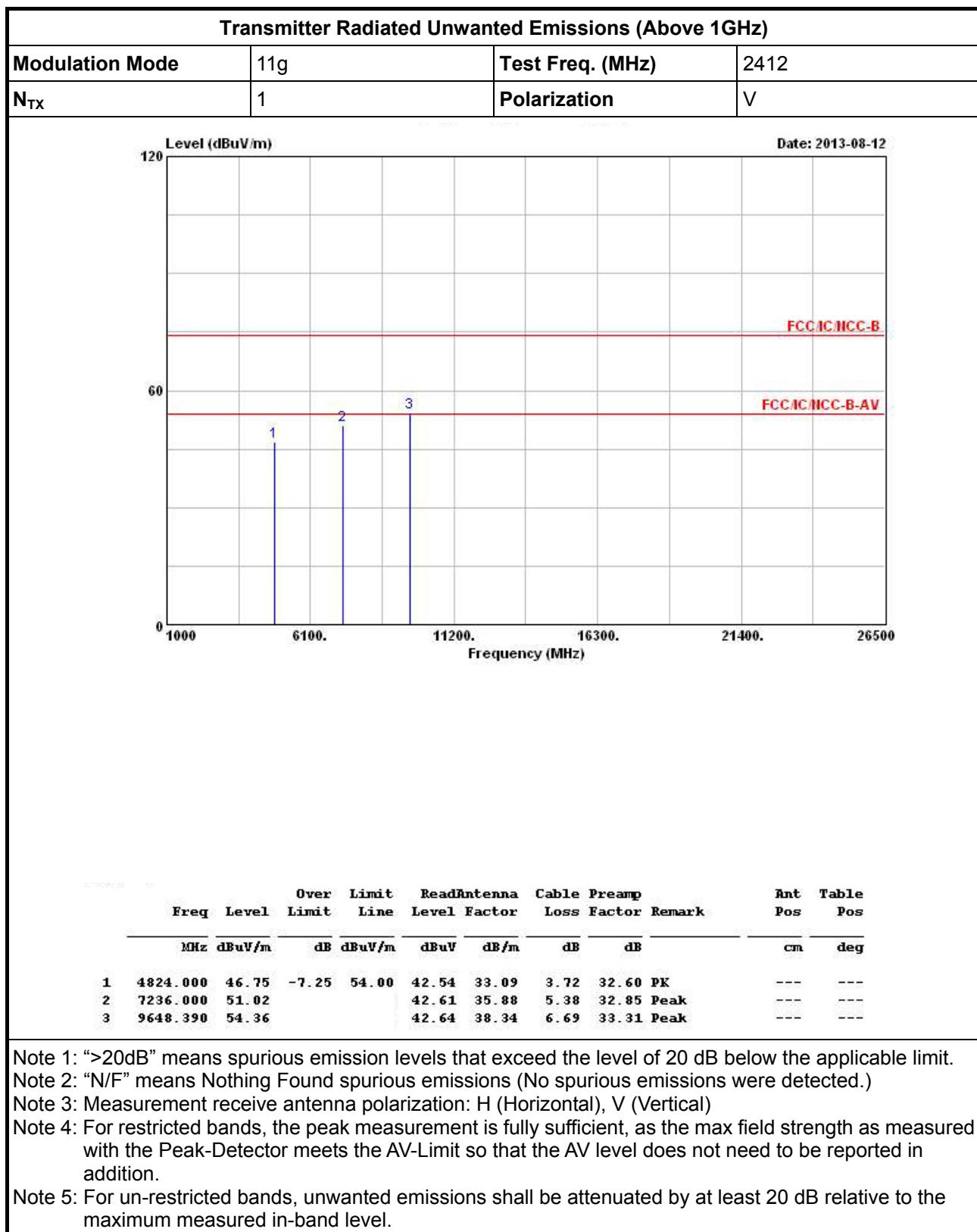
Note 1: >20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

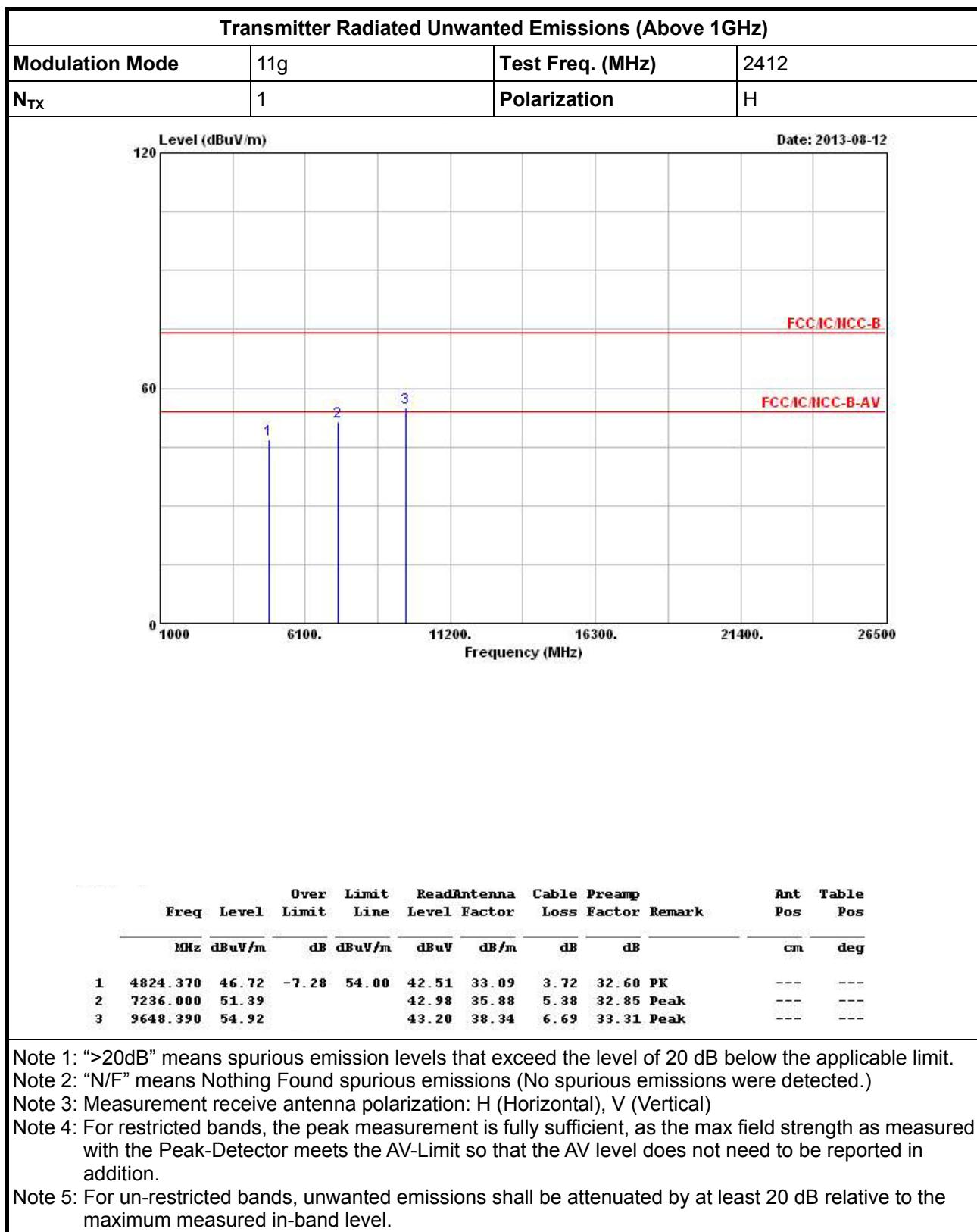
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected)

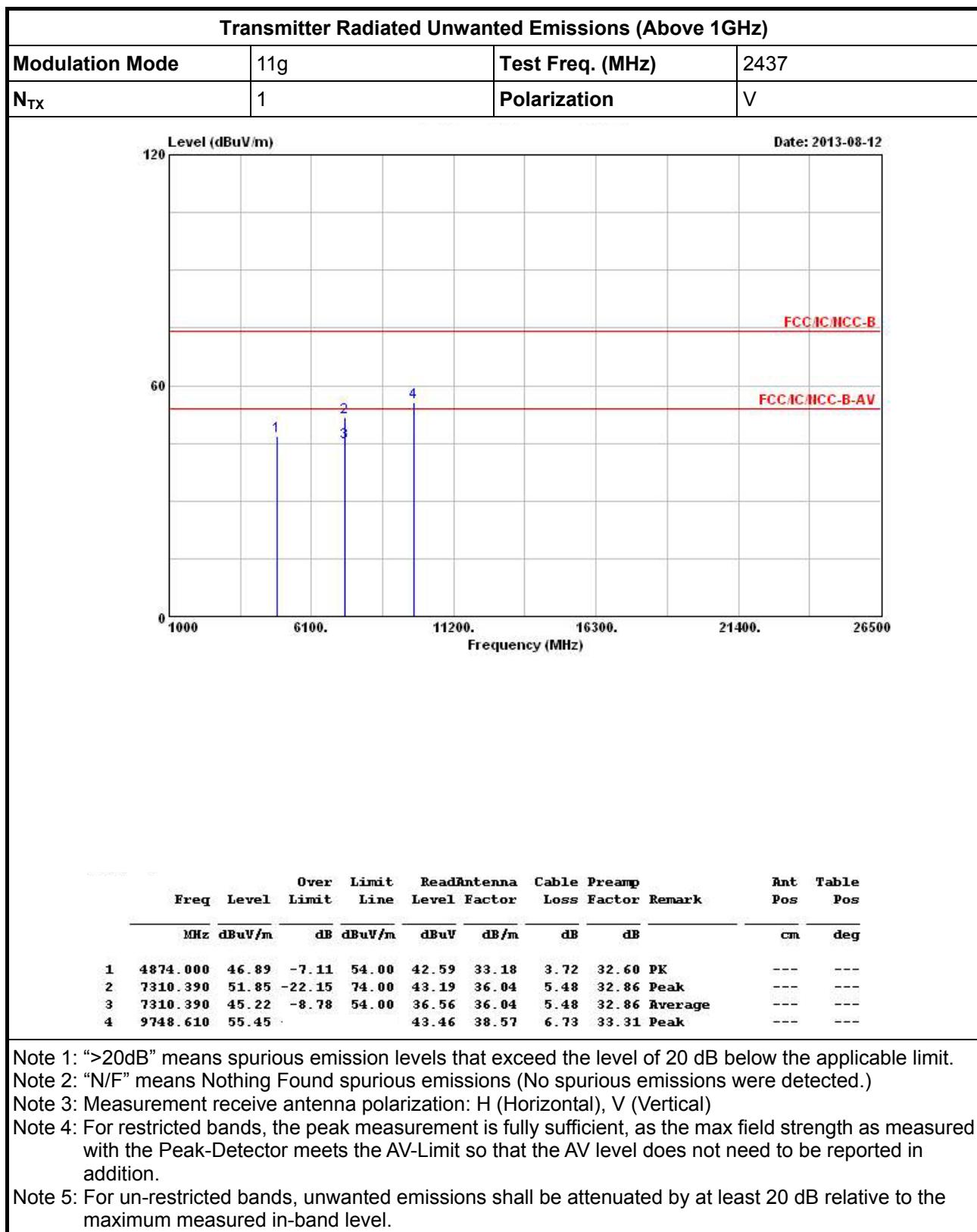
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

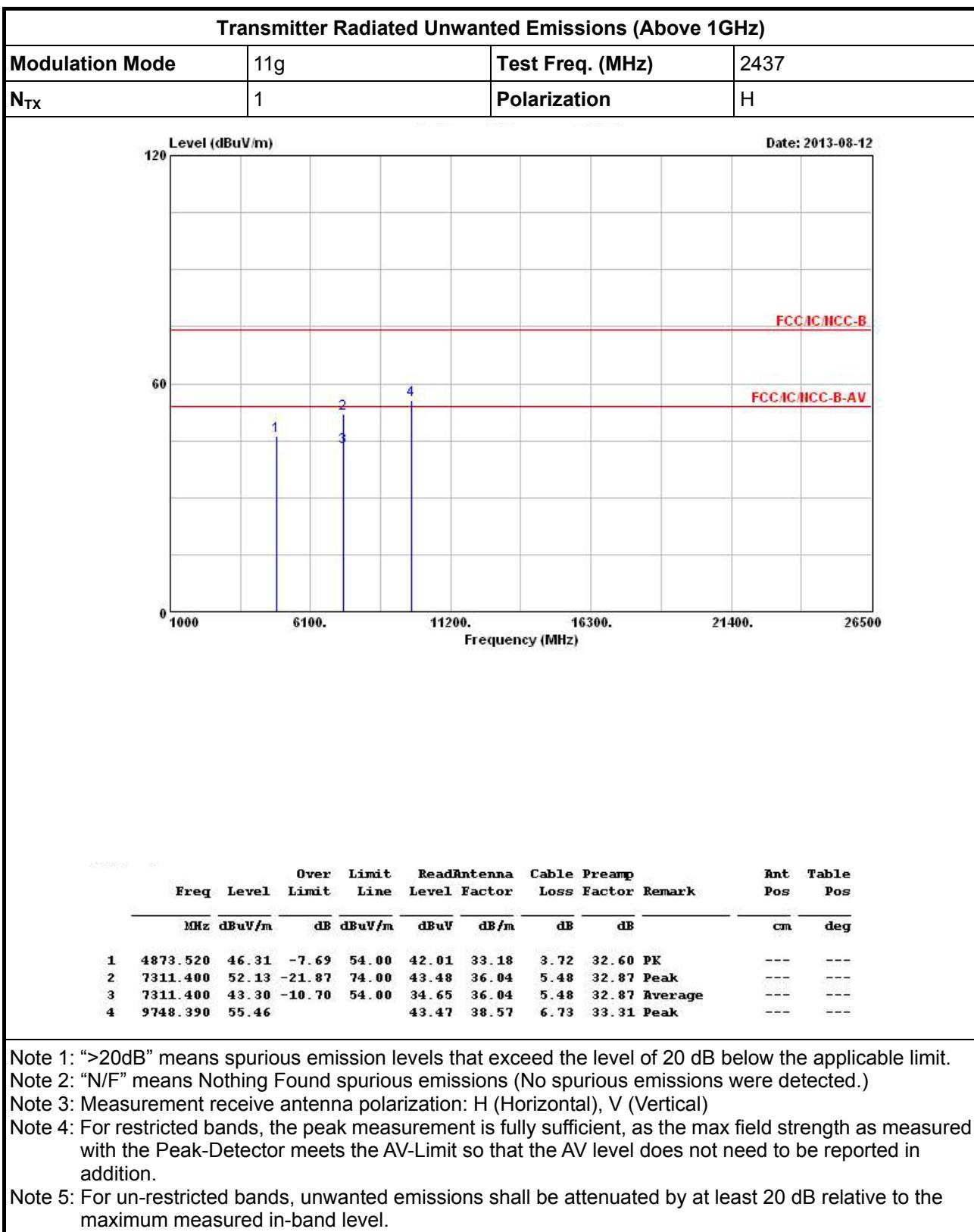
Note 3: Measurements receive antenna polarization: H (horizontal), V (vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

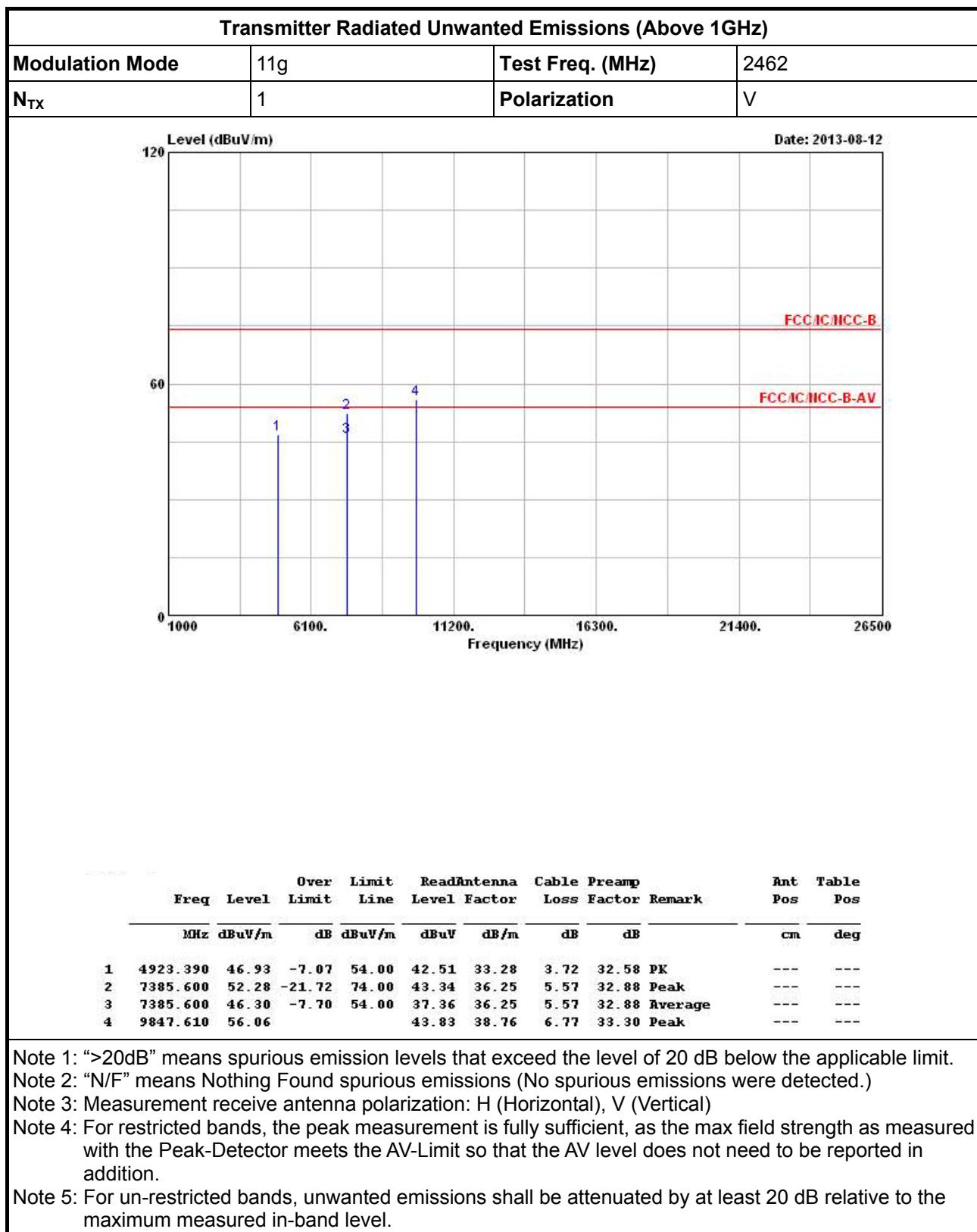
Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

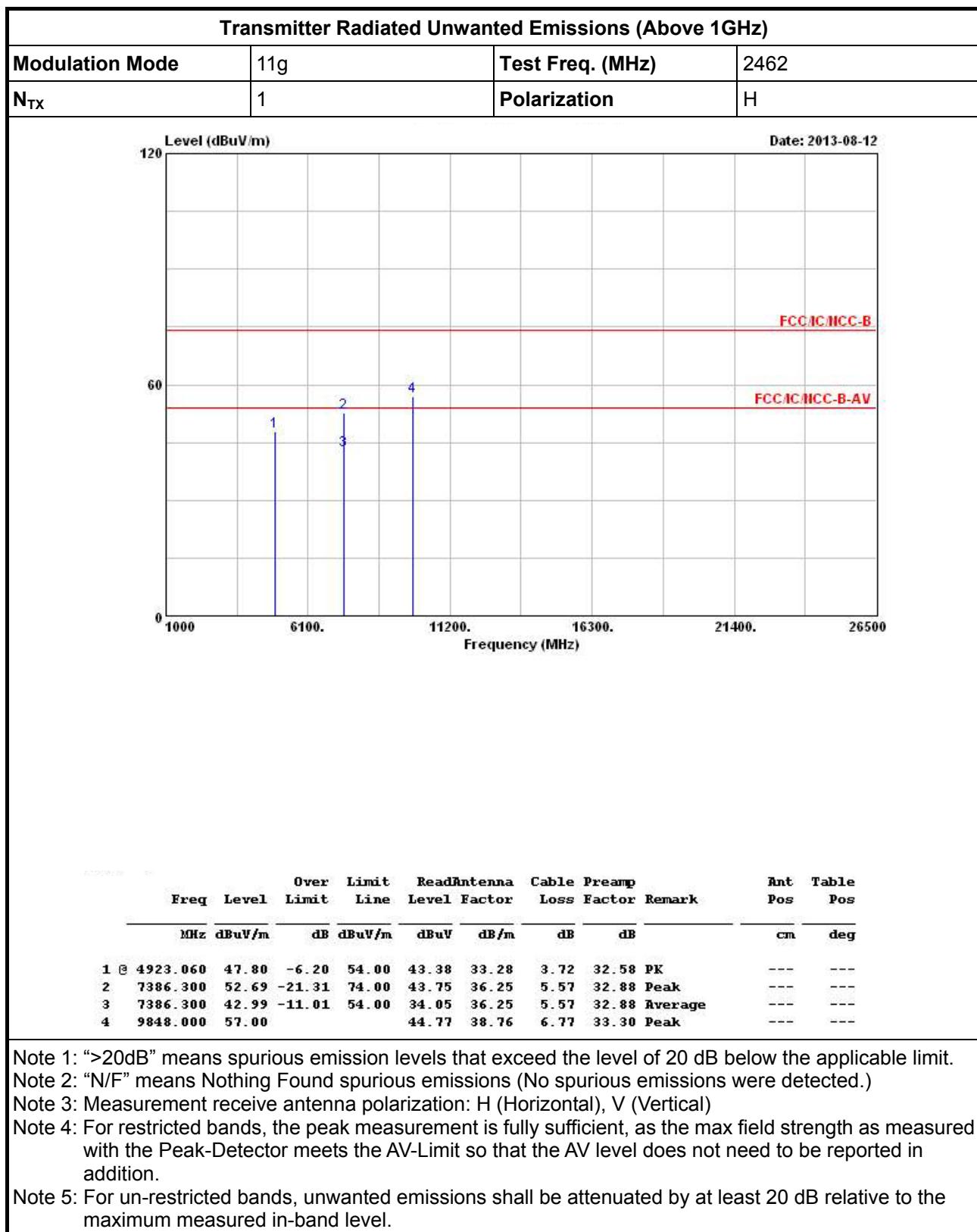


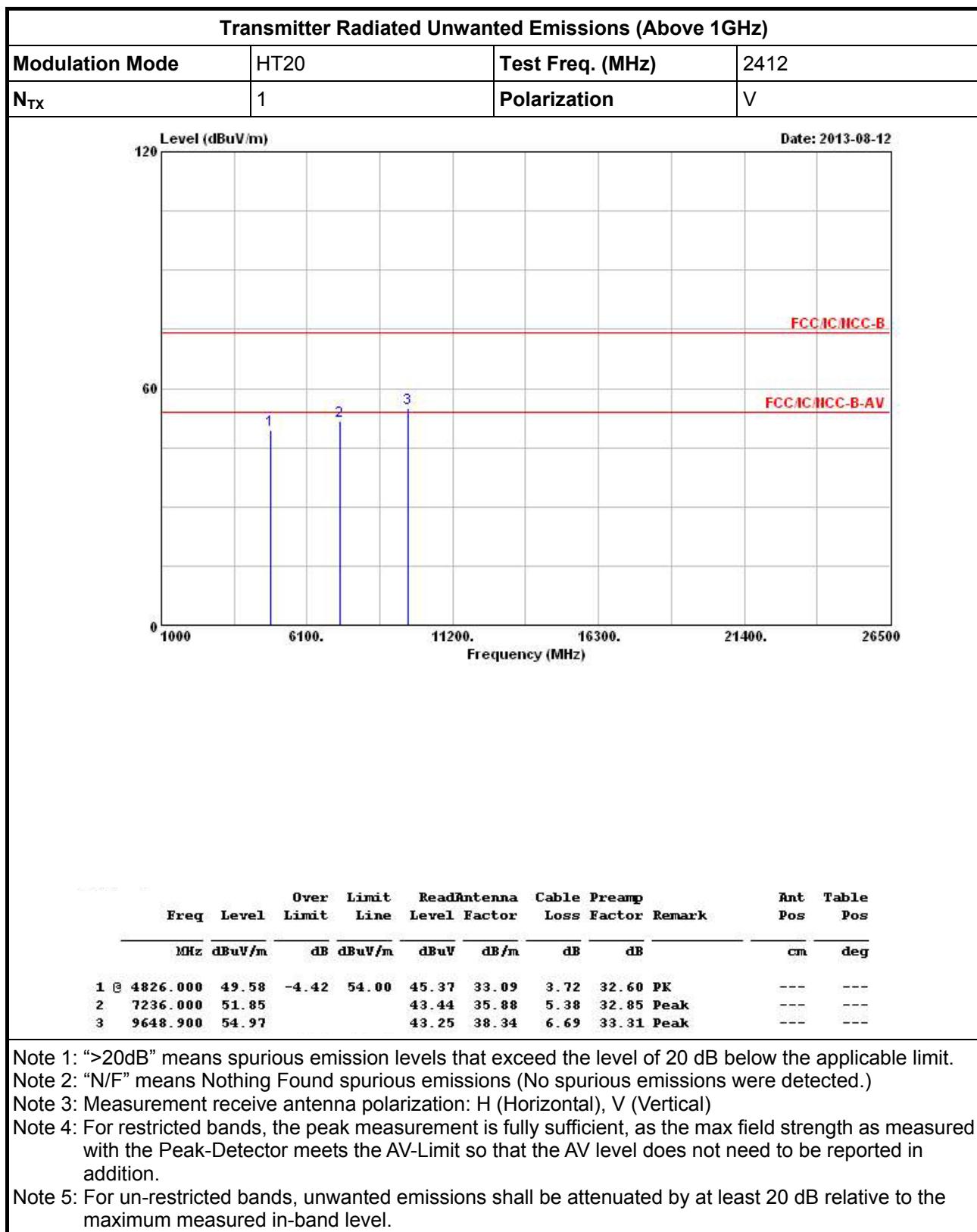


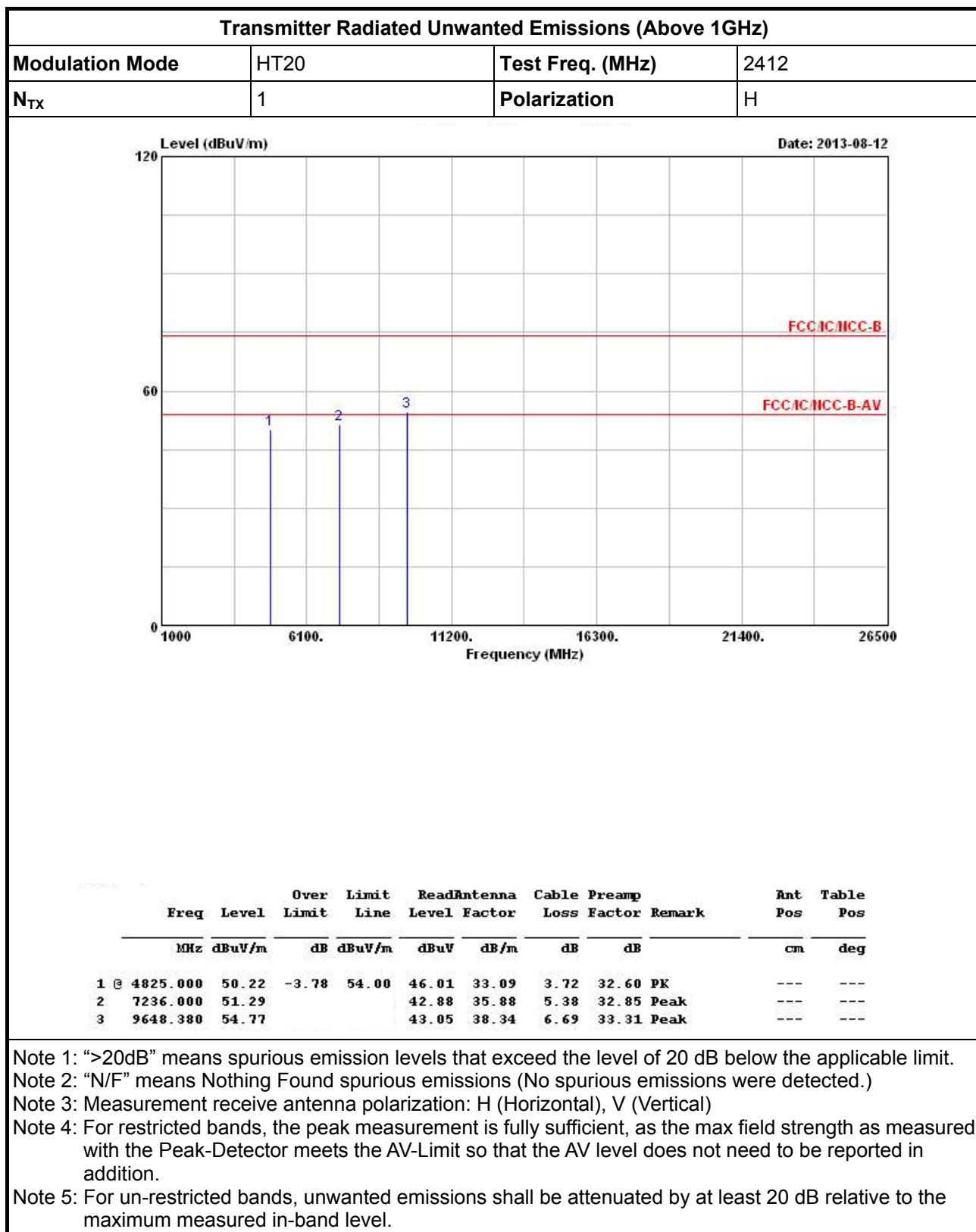


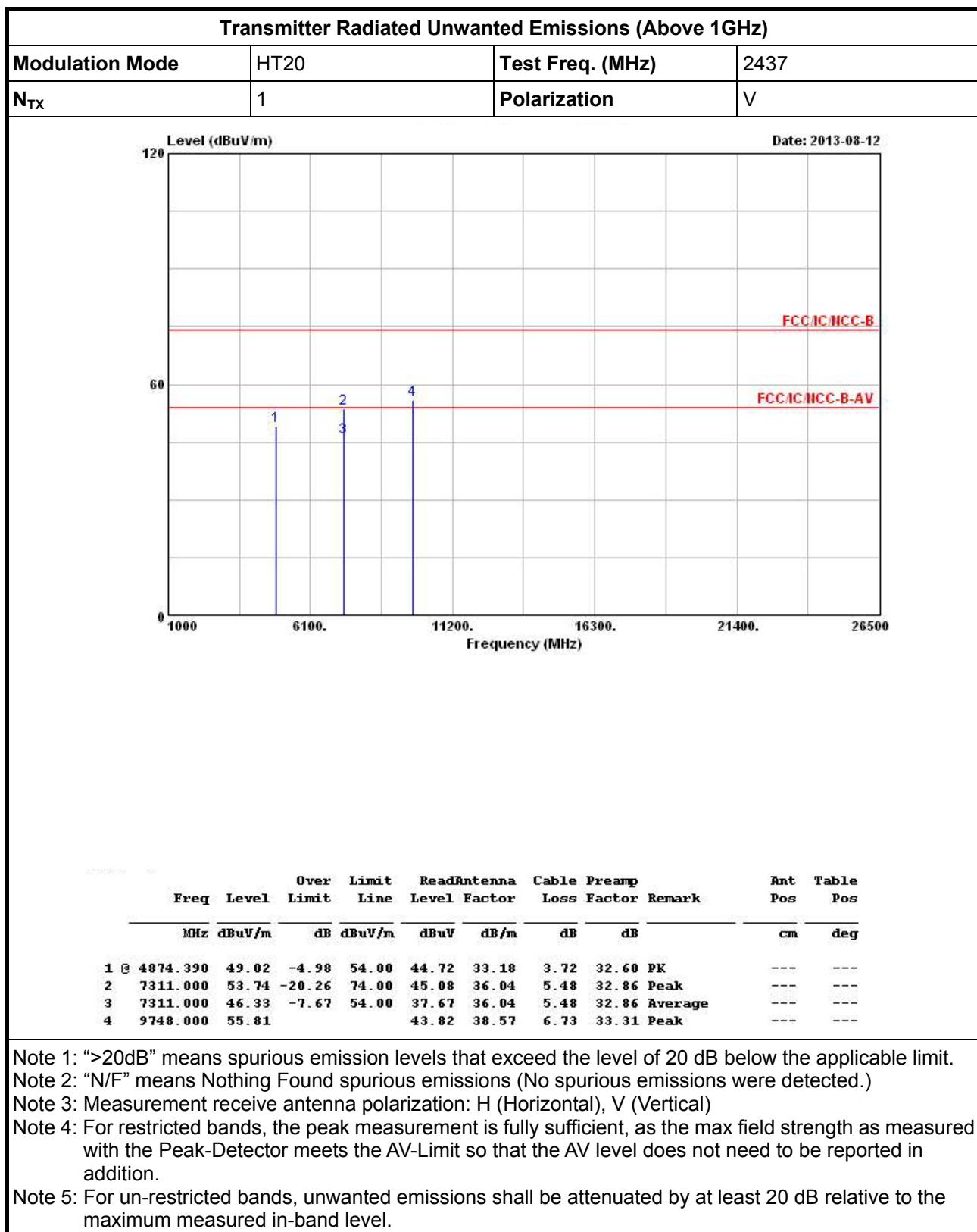


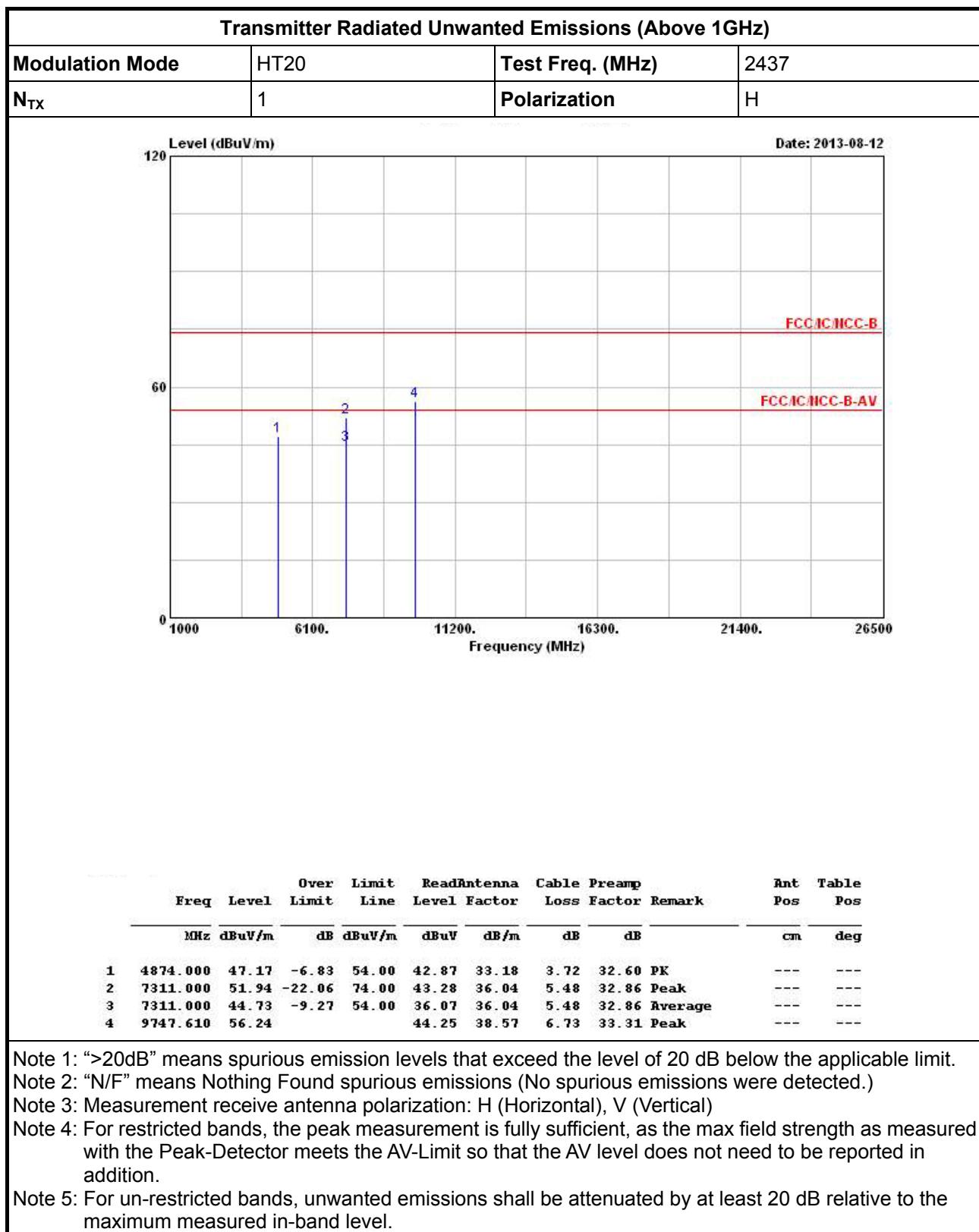


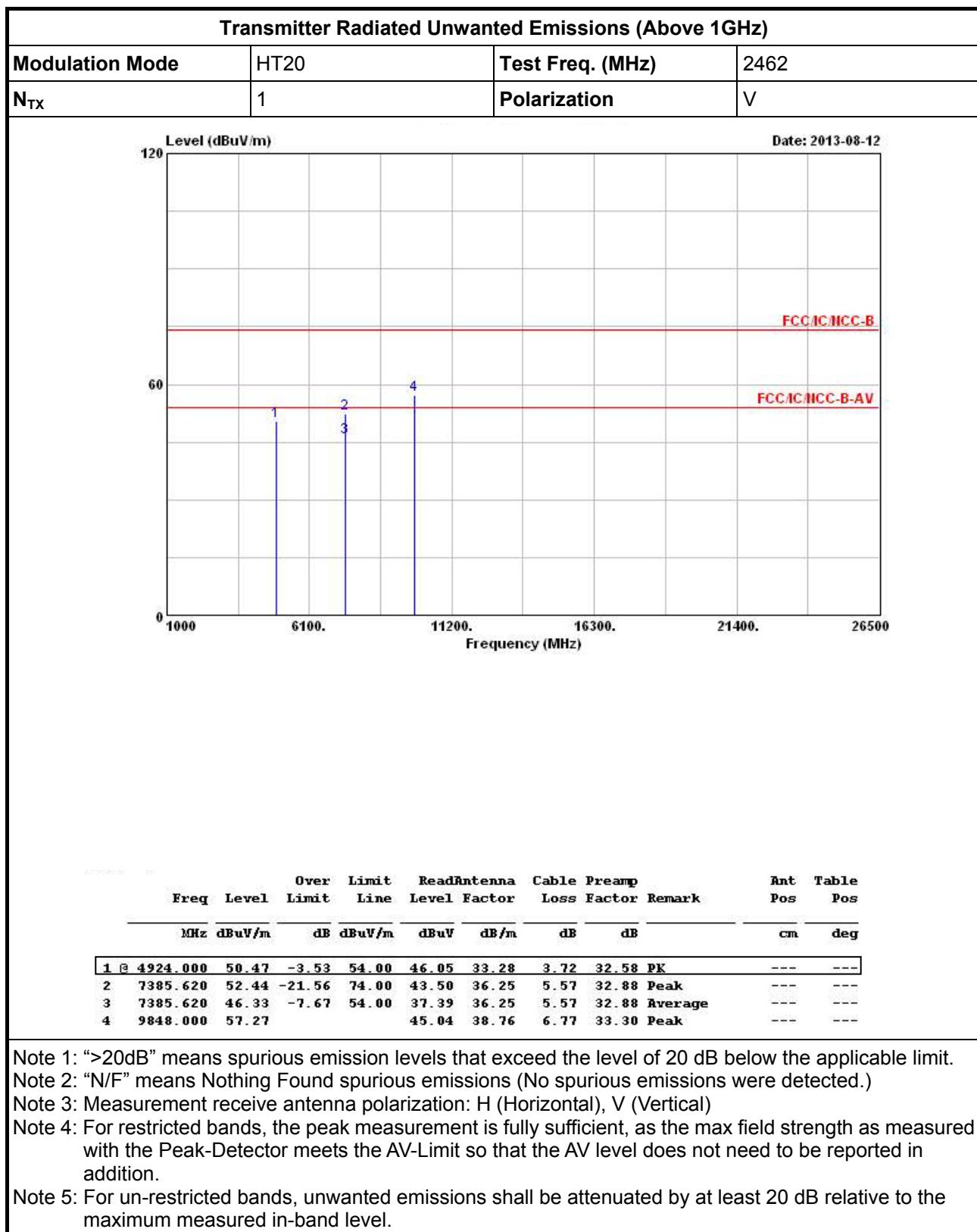






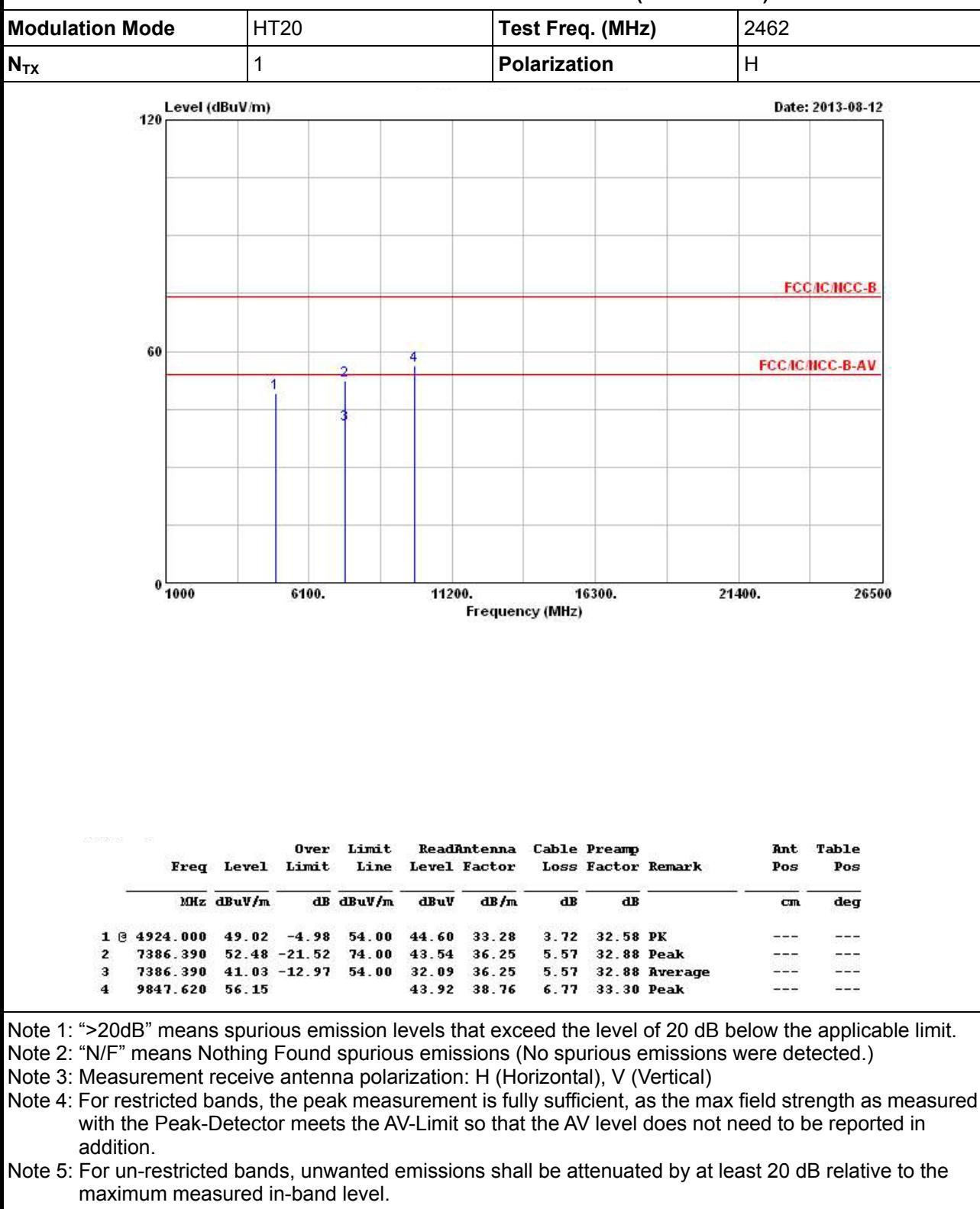


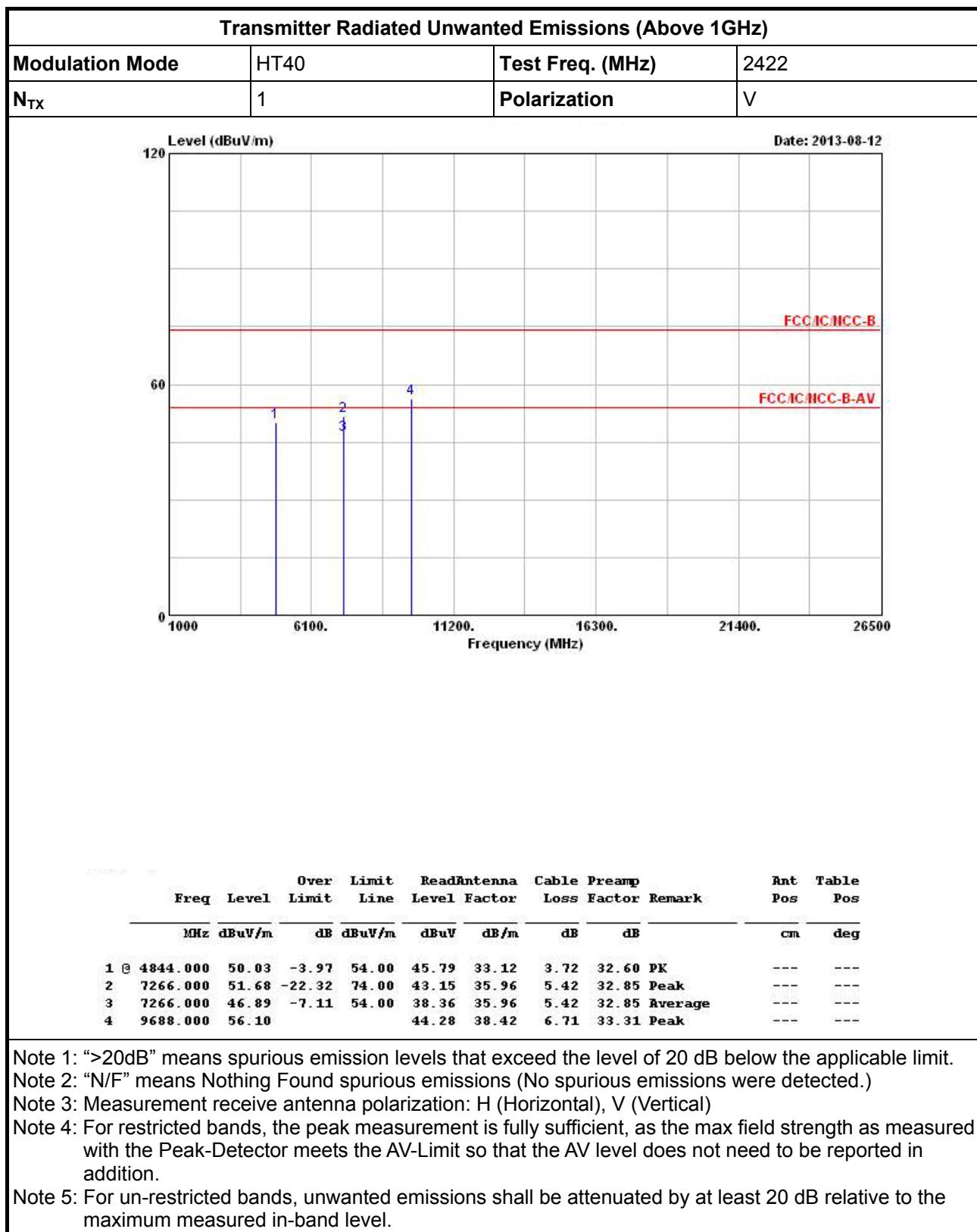


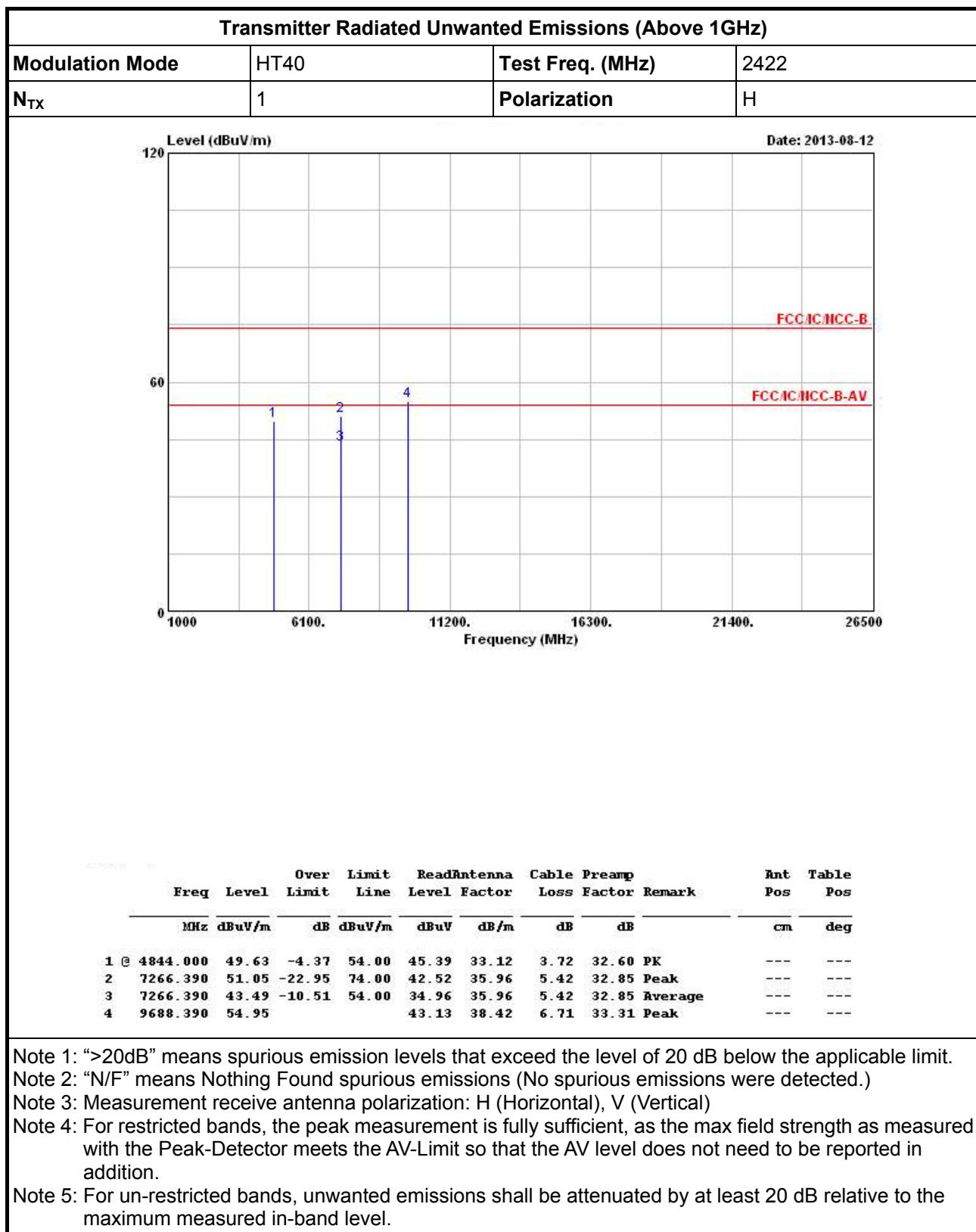


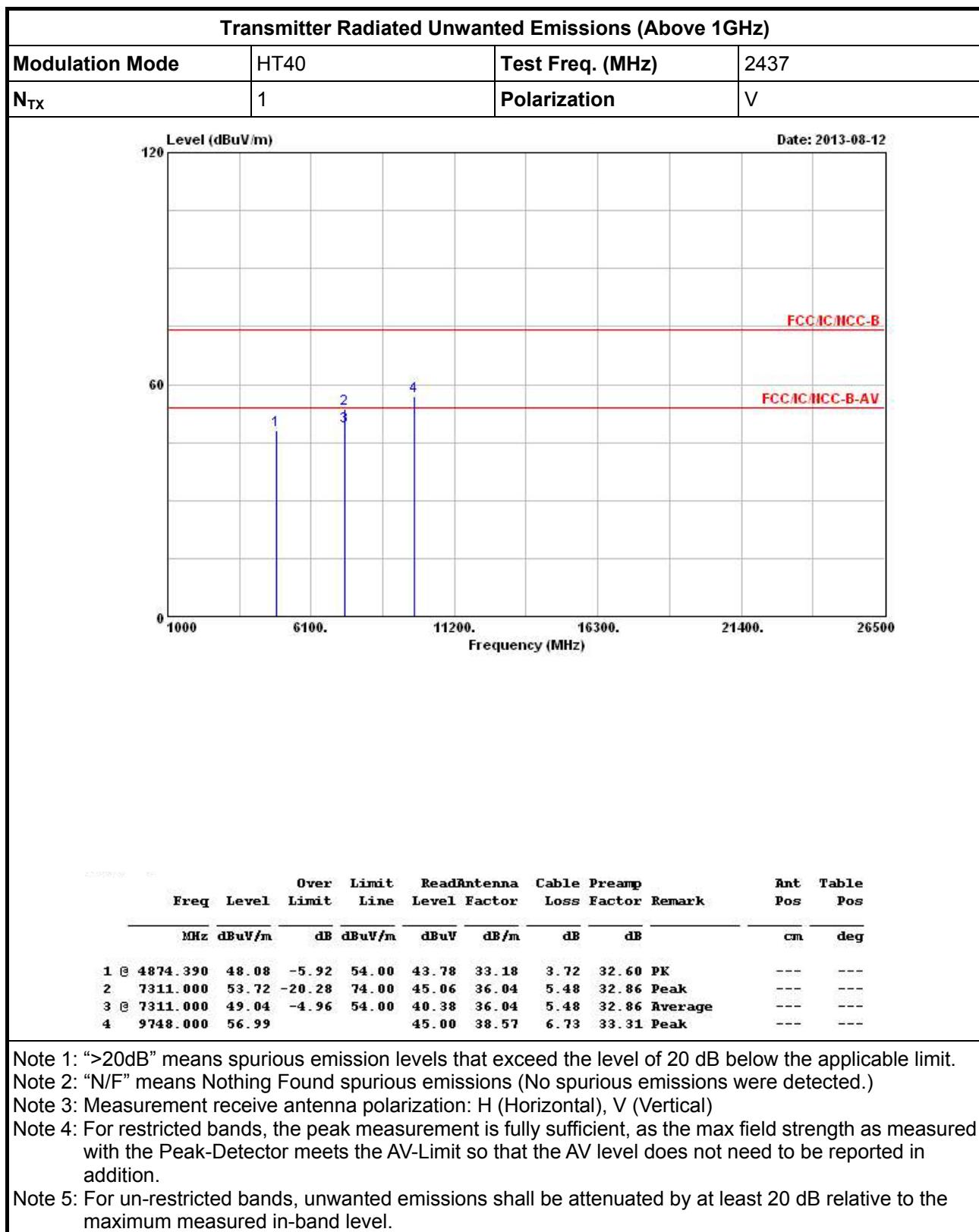


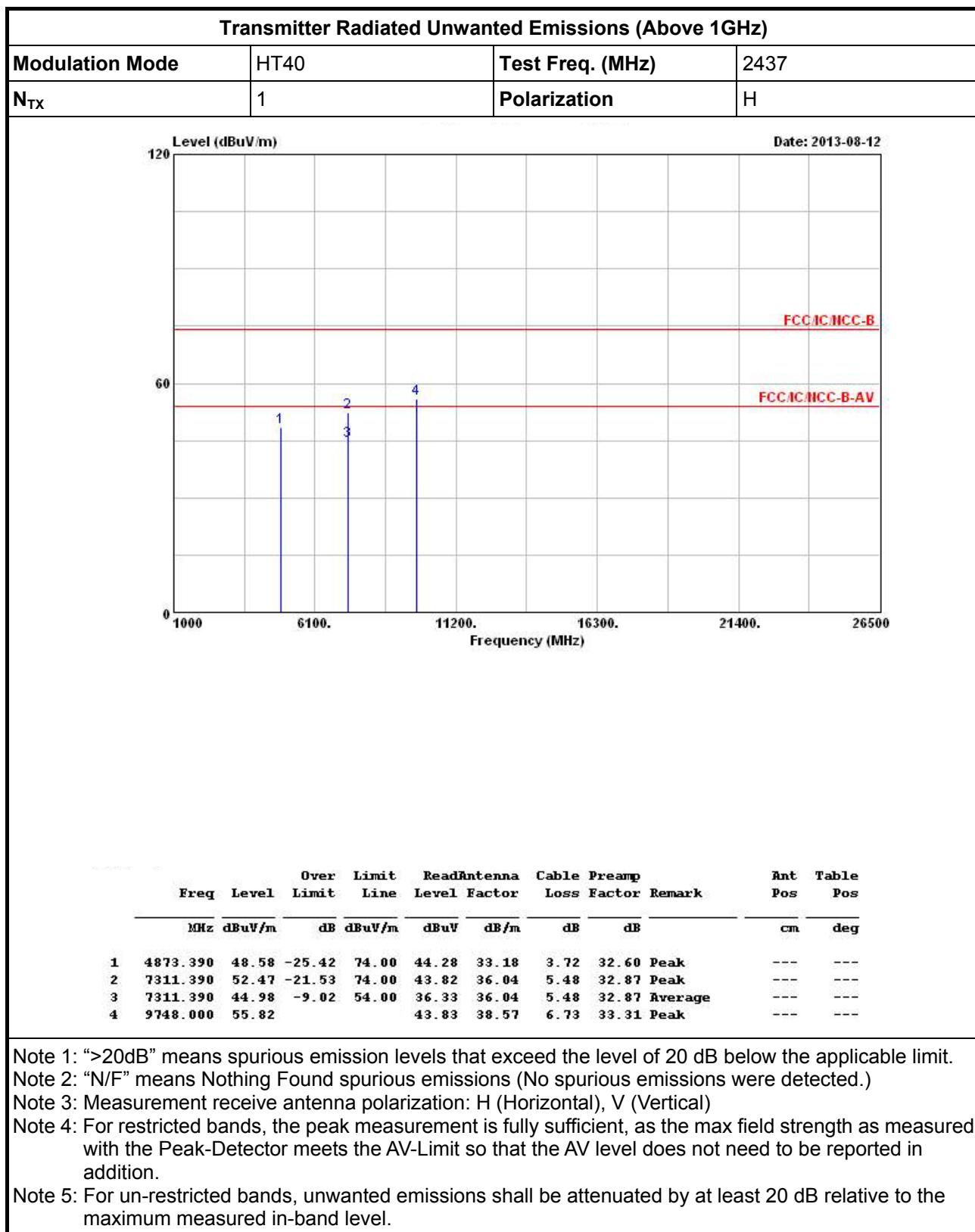
Transmitter Radiated Unwanted Emissions (Above 1GHz)





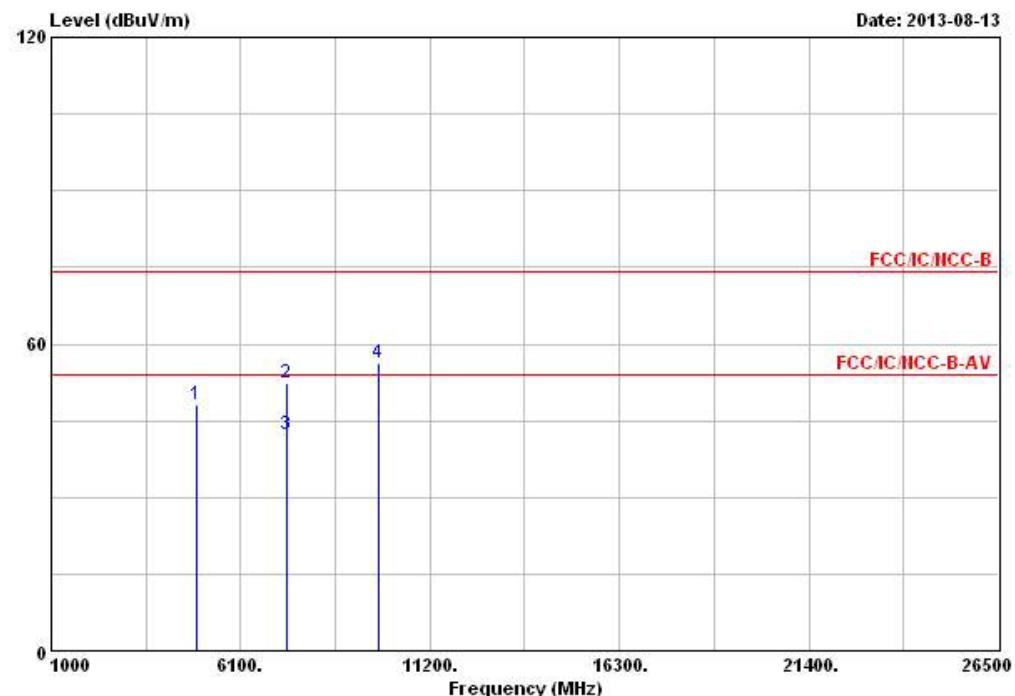








Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	Test Freq. (MHz)	2452
N _{TX}	1	Polarization	V



Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Remark	Ant	Table
		Limit	Line	Level	Factor	Loss	Factor			
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @ 4904.000	48.06	-5.94	54.00	43.69	33.24	3.72	32.59	PK	---	---
2 7356.000	52.48	-21.52	74.00	43.65	36.17	5.54	32.88	Peak	---	---
3 7356.000	42.29	-11.71	54.00	33.46	36.17	5.54	32.88	Average	---	---
4 9908.000	56.25			44.11	38.68	6.76	33.30	Peak	---	---

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)

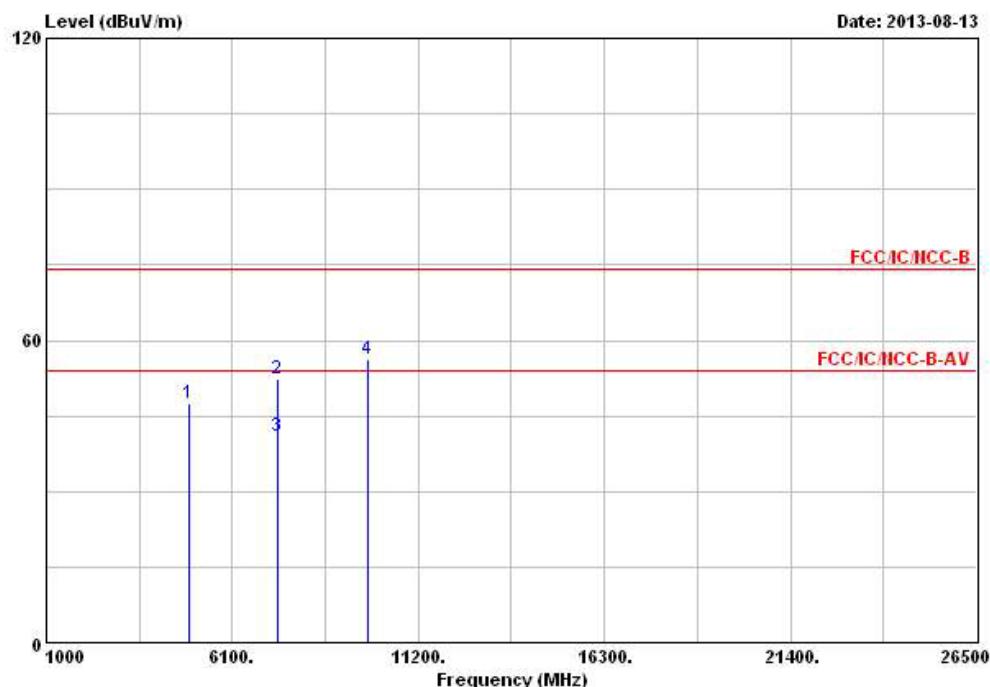
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2452
N_{TX}	1	Polarization	H



Freq	Level	Over Limit		ReadAntenna		Cable Preamp		Ant Pos	Table Pos
		Line	Level	Factor	Loss	Factor	Remark		
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @ 4904.000	47.53	-6.47	54.00	43.16	33.24	3.72	32.59	PK	---
2 7356.000	52.42	-21.58	74.00	43.59	36.17	5.54	32.88	Peak	---
3 7356.000	41.08	-12.92	54.00	32.25	36.17	5.54	32.88	Average	---
4 9807.620	56.17			44.03	38.68	6.76	33.30	Peak	---

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 3: Measured field 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, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Mar. 26, 2013	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 21, 2013	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz ~ 30MHz	Apr. 18, 2013	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	7.61183201e+012	9kHz ~ 30MHz	Nov. 09, 2012	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 40	100305	9KHz~40GHz	Mar. 20, 2013	Conducted (TH01-HY)
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 16, 2013	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100°C	Nov. 21, 2012	Conducted (TH01-HY)
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	1GHz ~ 26.5GHz	Dec. 04, 2012	Conducted (TH01-HY)
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_103	10712/4	1GHz ~ 33GHz	Dec. 04, 2012	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Dec. 01, 2012	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May. 03, 2013	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Aug. 16, 2012	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100793	9kHz ~ 30GHz	Sep. 26, 2012	Radiation (03CH03-HY)
Receiver	R&S	ESU26	1302.6005.26	20Hz ~ 26.5GHz	Apr. 02, 2013	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 22, 2012	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 31, 2013	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 08, 2013	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	9MHz ~ 1GHz	Jan. 17, 2013	Radiation (03CH03-HY)
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Jan. 17, 2013	Radiation (03CH03-HY)
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	Jul. 03, 2012	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is two year.