

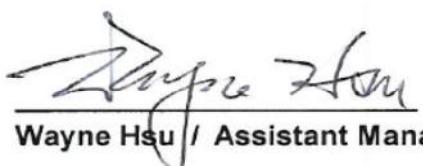
# FCC RADIO TEST REPORT

**Model Name** : Smart Badge  
**Brand Name** : Motorola Solutions, Inc  
**Model No.** : SB1  
**FCC ID** : UZ7SB1  
**Standard** : 47 CFR FCC Part 15 Subpart C § 15.247  
**Frequency Range** : 2400 MHz – 2483.5 MHz  
**Applicant** : Motorola Solutions, Inc.  
**Manufacturer** : One Motorola Plaza Holtsville NY 11742-1300 USA

The product sample received on Jul. 09, 2012 and completely tested on Aug. 01, 2012. 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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## Summary of Test Result

<b>Conformance Test Specifications</b>					
<b>Report Clause</b>	<b>Ref. Std. Clause</b>	<b>Description</b>	<b>Measured</b>	<b>Limit</b>	<b>Result</b>
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	0.652MHz: 33.79dBuV (12.21dB) - AV 37.51dBuV (18.49dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth Unit [MHz] 11B-20M: 9.66 11G-20M: 16.38 11N2.4G-20M: 17.58	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm] 11B-20M: 19.34 11G-20M: 24.57 11N2.4G-20M: 24.60	Power [dBm] 11B-20M: 30 11G-20M: 30 11N2.4G-20M: 30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/3kHz] 11B-20M: -8.50 11G-20M: -12.09 11N2.4G-20M: -11.15	PSD [dBm/3kHz] 8	Complied
3.5	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2538.20 MHz: 22.60dB Restricted Bands [dBuV/m at 3m]: 2390.00MHz: 72.08 (Margin 1.92dB) - PK 52.73 (Margin 1.27dB) - AV	Non-Restricted Bands: > 20 dB Restricted Bands: FCC 15.209	Complied
3.6	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 7386.00MHz: 50.94 (Margin 3.06dB) - PK	Non-Restricted Bands: > 20 dB 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 Protocol	Ch. Frequency (MHz)	Channel Number	RF Output Power (dBm)
2400-2483.5	b	2412-2472	1-13 [13]	19.34
2400-2483.5	g	2412-2472	1-13 [13]	24.57
2400-2483.5	n (HT20)	2412-2472	1-13 [13]	24.60

Note 1: IEEE Std. 802.11-2007 modulation consists of IEEE Std. 802.11g-2003 and IEEE Std. 802.11b-1999.

Note 2: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). The EUT supports HT20 only.

Note 3: RF output power specifies that Maximum Peak Conducted Output Power.

Transmitter Chains & Receiver Chains Information					
IEEE Std. 802.11 Protocol	Number of Transmit Chains ( $N_{TX}$ )	Number of Receive Chains ( $N_{RX}$ )	Correlation Signals with Multiple $N_{TX}$	99% Emission Bandwidth (MHz)	Co-location
b	1	1	Correlated	14.03	N/A
g	1	1	Correlated	16.49	N/A
n (HT20)	1	1	Uncorrelated	17.95	N/A

Note 1: 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 type="checkbox"/>	Equipment placed on the market without antennas
<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 Information for Single Transmit Chain (1 N <sub>Tx</sub> )					
<b>Worst Antenna Port (Total 1 Port)</b>		1			
<b>RF Output Power Level (PL)</b>		1			
<b>Transmit Chains Power Distribution</b>		<input checked="" type="checkbox"/> symmetrical distribution <input type="checkbox"/> asymmetrical distribution			
<b>Ant. No.</b>	<b>Ant. Port</b> [Ant No. X connect to Ant. Port Y]	<b>Ant. Cat.</b>	<b>Ant. Type</b>		<b>G<sub>ANT</sub> (dBi)</b>
1	1	Integral	PIFA		0.90

### 1.1.3 Type of EUT

Identify EUT	
Presentation of Equipment <input checked="" type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input 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:	

### 1.2 Accessories

Accessories Information				
AC Adapter	Brand Name	Motorola	Model Name	DCH4-050MV-0301
			Part No.	PWRS-14000-253R Rev B
	Power Rating	I/P: 100- 240Vac, 150mA ; O/P: 5Vdc, 850mA		
Battery	Brand Name	Motorola	Part No.	82-158057-01 Rev 01
	Power Rating	3.7Vdc, 910mAh	Type	Li-ion
Headset 1	Brand Name	Motorola	Part No.	21-SB1X-HDSET-10R
Headset 2	Brand Name	Motorola	Part No.	21-SB1X-HDSET2-10R
USB Cable	Brand Name	Motorola	Part No.	25-124330-01R
Holster (hip/belt w/ tether) SB1	Brand Name	Motorola	Part No.	SG-SB1X-HLSTR-02R
Lanyards: SB1 w/ J-Hook (std)	Brand Name	Motorola	Part No.	KT-SB1X-LANYD-10R
Speaker Nugget	Brand Name	Motorola	Part No.	21-SB1X-SKADP-01R
Headset Nugget	Brand Name	Motorola	Part No.	21-SB1X-HSADP-01R
1 Slot Cradle	Brand Name	Motorola	Part No.	CRDSB1X-1000CR
The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.				

### 1.2.1 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle		
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)	Voltage Duty Factor [dB] – (20 log 1/x)
<input type="checkbox"/> Operated normally mode for worst duty cycle		
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle		
100% - IEEE 802.11b	0	0
100% - IEEE 802.11g	0	0
100% - IEEE 802.11n (HT20)	0	0

### 1.2.2 EUT Operational Condition

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

## 1.3 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	Serial No.
1	Personal Computer	HP Compaq	DC7700	DoC
2	CRT Monitor	COMPAQ	S510	DoC
3	Keyboard	HP	KB-0133	DoC
4	Mouse	HP	M-S69	JNZ211488
5	Printer	HP	C2642A(DJ400)	B94C2642X
6	Modem	ACEEX	DM1414	IFAXDM1414
7	Speaker Nugget	Motorola	Part No. 21-SB1X-SKADP-01R	--
8	Headset Nugget	Motorola	Part No. 21-SB1X-HSADP-01R	--
9	1 Slot Cradle	Motorola	Part No. CRDSB1X-1000CR	--
10	Headset 1	Motorola	Part No. 21-SB1X-HDSET-10R	--
11	Headset 2	Motorola	Part No. 21-SB1X-HDSET2-10R	--

\*\*We chose the worst case test photos recorded in this report.

## 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 D01 - Guidance for Performing Compliance Measurements on DTS
- ◆ FCC KDB 662911 - Emissions Testing of Transmitters with Multiple Outputs
- ◆ FCC KDB 412172 - Guidelines for Determining the ERP and EIRP

## 1.5 Testing Location Information

Testing Location				
	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.	TEL : 886-3-327-3456	FAX : 886-3-318-0055
	LINKOU	ADD : No. 30-2, Dingfu Vil., Linkou Dist., New Taipei City 244, Taiwan, R.O.C.	TEL : 886-2-2601-1640	FAX : 886-2-2601-1695
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Ian Tu	25.9°C / 42%	09-Jul-12 ~ 16-Jul-12
AC Conduction	CO01-LK	Peter Lin	24°C / 48%	01-Aug-12
Radiated Emission	03CH02-HY	Hsiao	25.2°C / 54%	10-Jul-12 ~ 14-Jul-12

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

## 2 Test Configuration of EUT

### 2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing						
Power Level		1				
IEEE 802.11 Protocol	Number of Transmit Chains ( $N_{TX}$ )	Data Rate / MCS	Worst Data Rate / MCS	Worst Modulation Mode	RF Output Power (dBm)	Power Spectral Density (dBm/3kHz)
b	1	1-11 Mbps	1 Mbps	11B-20M	19.34	-8.50
g	1	6-54 Mbps	6 Mbps	11G-20M	24.57	-12.09
n (HT20)	1	MCS 0-7	MCS 0	11N2.4G-20M	24.60	-11.15

Note 1: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20. Worst modulation mode of Guard Interval (GI) is 400ns.

Note 2: Modulation modes consist of 11B-20M, 11G-20M, 11N2.4G-20M:  
 11B: IEEE 802.11b, 11G: IEEE 802.11g, 11N2.4G: IEEE 802.11n (2.4GHz Band)  
 20M: Channel Bandwidth 20MHz

Note 3: RF output power specifies that Maximum Peak Conducted Output Power.

## 2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration		
IEEE 802.11 Protocol	Worst Modulation Mode	Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)
b	11B-20M	2412-(F1), 2437-(F2), 2462-(F3) 2467-(F4), 2472-(F5)
g	11G-20M	2412-(F1), 2437-(F2), 2462-(F3) 2467-(F4), 2472-(F5)
n (HT20)	11N2.4G-20M	2412-(F1), 2437-(F2), 2462-(F3) 2467-(F4), 2472-(F5)

## 2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter					
Power Level		1			
Test Software		Ralink QA			
Worst Modulation Mode	Number of Transmit Chains ( $N_{Tx}$ )	Frequency (MHz)	Power Setting	Worst Data Rate / MCS	Maximum Peak Conducted Output Power (dBm)
11B-20M	1	2412	18.5	1 Mbps	19.06
11B-20M	1	2437	18.5	1 Mbps	19.34
11B-20M	1	2462	17.5	1 Mbps	18.87
11B-20M	1	2467	2.0	1 Mbps	3.39
11B-20M	1	2472	2.5	1 Mbps	3.63
11G-20M	1	2412	15.5	6 Mbps	20.84
11G-20M	1	2437	19.0	6 Mbps	24.57
11G-20M	1	2462	18.5	6 Mbps	24.22
11G-20M	1	2467	2.5	6 Mbps	7.99
11G-20M	1	2472	0.5	6 Mbps	6.28
11N2.4G-20M	1	2412	15.5	MCS 0	20.88
11N2.4G-20M	1	2437	19.0	MCS 0	24.60
11N2.4G-20M	1	2462	16.5	MCS 0	22.18
11N2.4G-20M	1	2467	2.5	MCS 0	8.29
11N2.4G-20M	1	2472	-2.0	MCS 0	4.29

## 2.4 The Worst Case Measurement Configuration

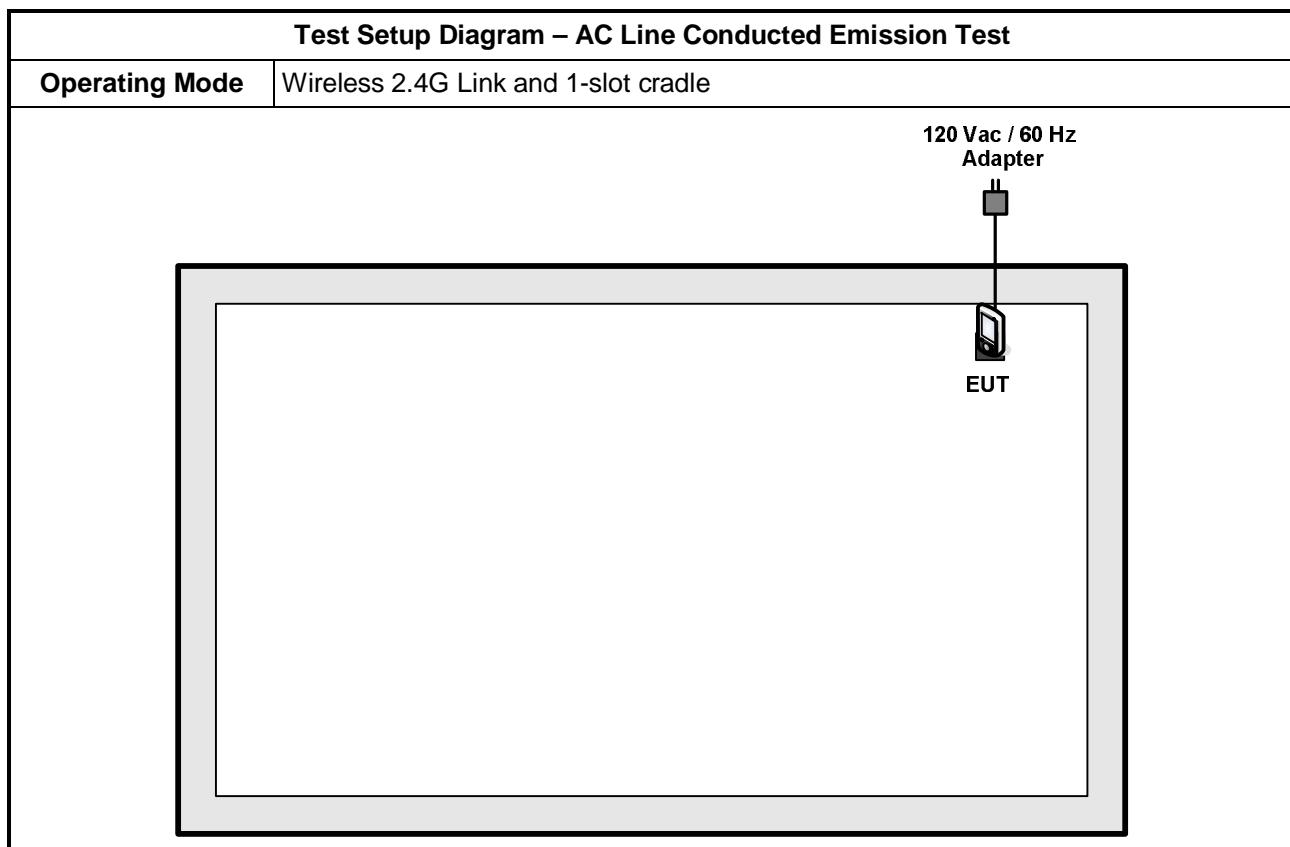
The Worst Case Mode for Following Conformance Tests				
Tests Item	AC power-line conducted emissions			
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120V/60 Hz			
Operating Mode	Operating Mode Description	Worst Modulation Mode	Test Freq.	Power Level
1	Wireless 2.4G Link and 1-slot cradle	11N2.4G-20M	F2	1
2	USB reads and writes (ActiveSync)、 Wireless 2.4G Link and 1-slot cradle	11N2.4G-20M	F2	1
3	Headset Nugget、 Headset 1、 Wireless 2.4G Link and 1-slot cradle	11N2.4G-20M	F2	1
4	Headset Nugget、 Headset 2、 Wireless 2.4G Link and 1-slot cradle	11N2.4G-20M	F2	1
5	Speaker Nugget、 Wireless 2.4G Link and 1-slot cradle	11N2.4G-20M	F2	1

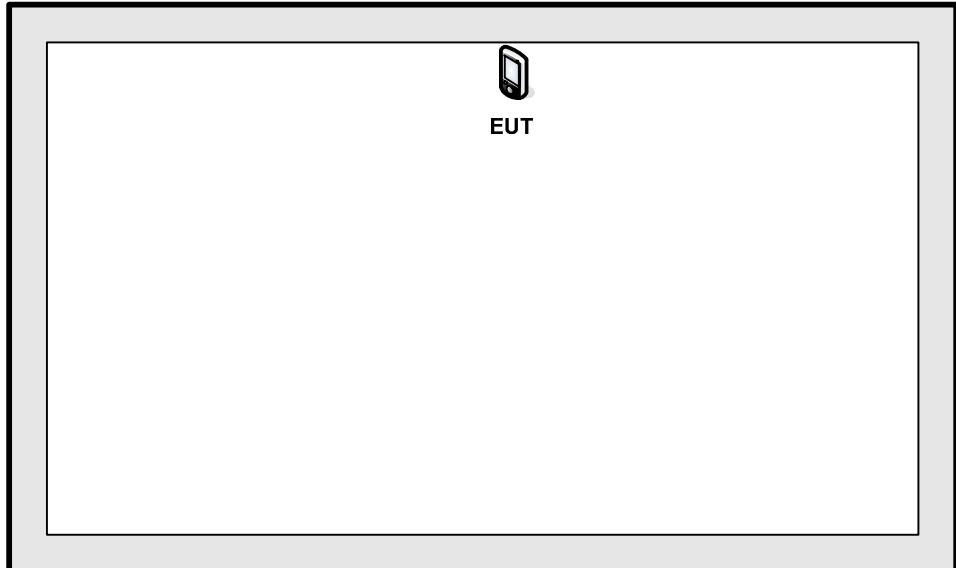
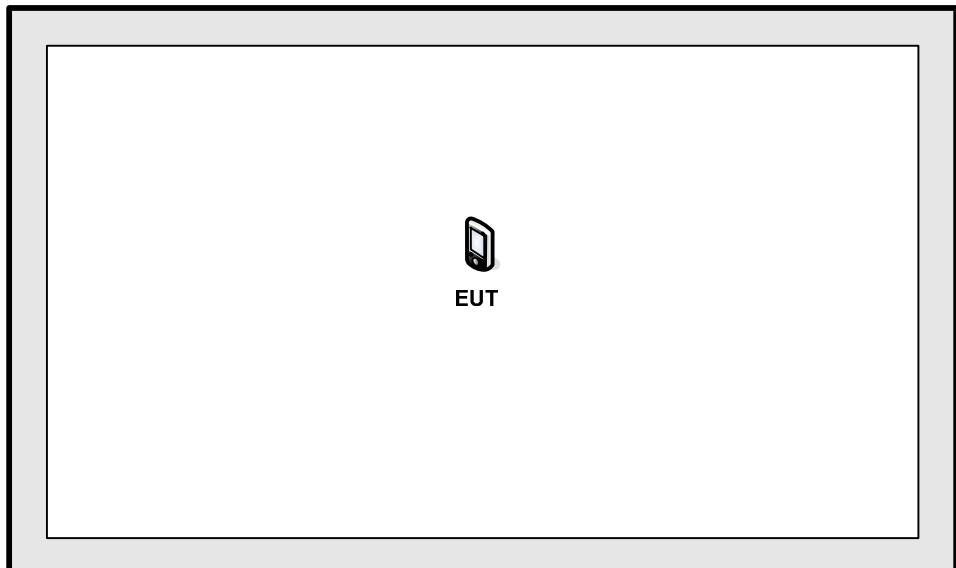
The Worst Case Mode for Following Conformance Tests				
Tests Item	RF Output Power Power Spectral Density 6 dB Bandwidth			
Test Condition	Conducted measurement at transmit chains			
Worst Modulation Mode	Number of Transmit Chains (N <sub>TX</sub> )	Worst Data Rate / MCS	Test Frequency	Power Level
11B-20M	1	1 Mbps	F1, F2, F3, F4, F5	1
11G-20M	1	6 Mbps	F1, F2, F3, F4, F5	1
11N2.4G-20M	1	MCS 0	F1, F2, F3, F4, F5	1

The Worst Case Mode for Following Conformance Tests				
Tests Item	Transmitter Radiated Bandedge Emissions			
Test Condition	Radiated measurement			
Worst Modulation Mode	Number of Transmit Chains (N <sub>TX</sub> )	Worst Data Rate / MCS	Test Frequency	Power Level
11B-20M	1	1 Mbps	F1, F5	1
11G-20M	1	6 Mbps	F1, F5	1
11N2.4G-20M	1	MCS 0	F1, F5	1

The Worst Case Mode for Following Conformance Tests						
Tests Item	Transmitter Radiated Unwanted Emissions					
Test Condition	Radiated measurement					
User Position	<input type="checkbox"/> EUT will be placed in fixed position.					
	<input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two or three orthogonal planes.					
	<input checked="" type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes.					
Operating Mode < 1GHz	<input checked="" type="checkbox"/> 1. 11G-20M, F2					
	<input checked="" type="checkbox"/> 2. 11N2.4G-20M, F2					
Worst Modulation Mode	Number of Transmit Chains ( $N_{TX}$ )	Worst Data Rate / MCS	Test Frequency	Power Level	Ant No.	Worst Orthogonal Planes of EUT
11B-20M	1	1 Mbps	F1, F2, F3, F4, F5	1	1	X
11G-20M	1	6 Mbps	F1, F2, F3, F4, F5	1	1	X
11N2.4G-20M	1	MCS 0	F1, F2, F3, F4, F5	1	1	X
11N2.4G-20M EUT with speaker nugget	1	MCS 0	F3	1	1	X
11N2.4G-20M EUT with headset nugget	1	MCS 0	F3	1	1	X
Orthogonal Planes of EUT	X Plane		Y Plane		Z Plane	
						
Note 1: For the transmitter radiated unwanted emissions test mode, the worst case was found in 802.11n (20MHz). We chose the worst case to test EUT with speaker nugget and headset nugget. And it was recorded in this report.						

## 2.5 Test Setup Diagram



**Test Setup Diagram - Radiated Test****Operating Mode      Transmit Mode (Below 1GHz)****Operating Mode      Transmit Mode (Above 1GHz)**

**Test Setup Diagram - Radiated Test**

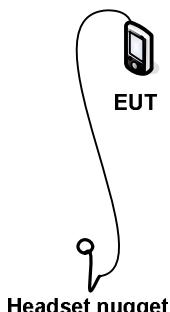
<b>Operating Mode</b>	<b>EUT with speaker nugget (Above 1GHz)</b>
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Speaker nugget in the  
back of the EUT.



EUT

<b>Operating Mode</b>	<b>EUT with headset nugget (Above 1GHz)</b>
-----------------------	---



### 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.

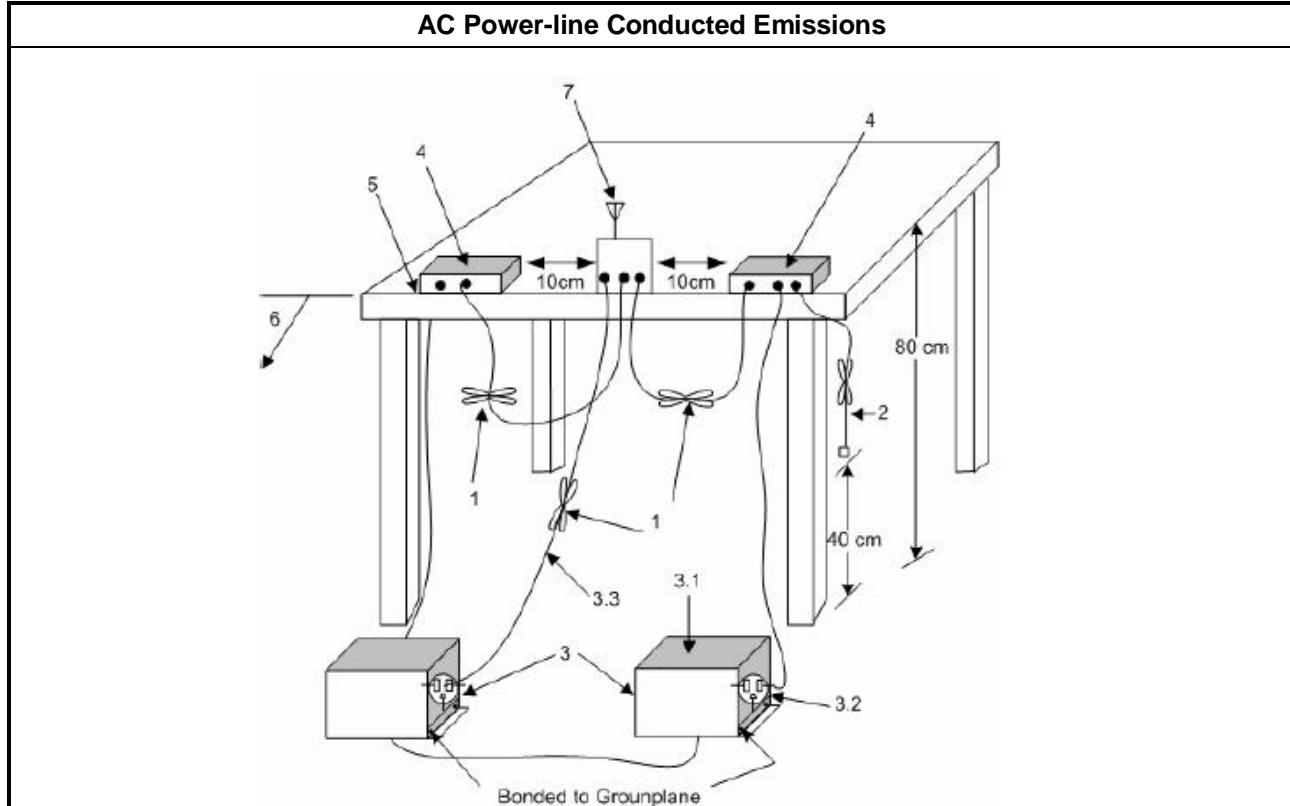
##### 3.1.2 Measuring Instruments

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

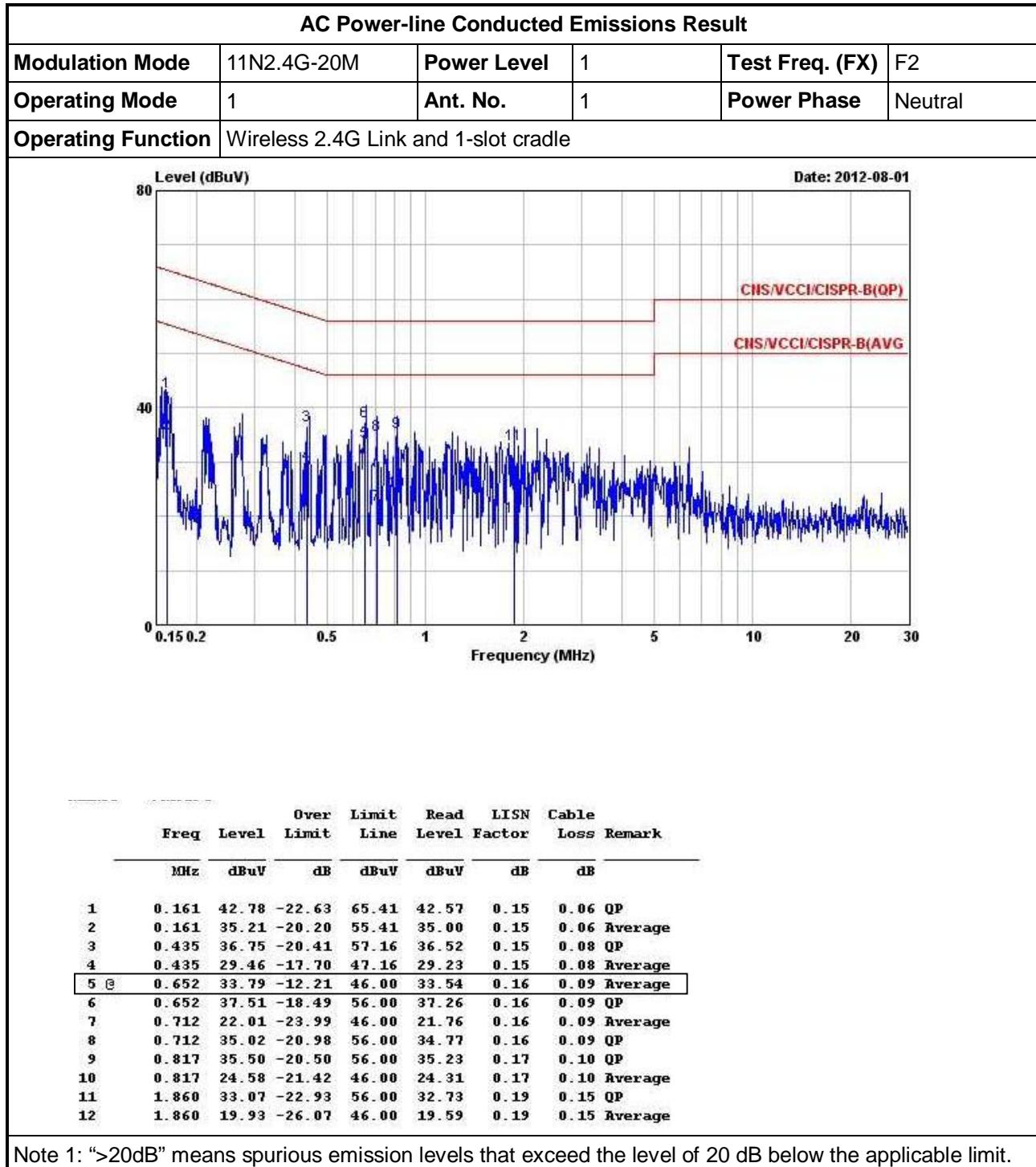
##### 3.1.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

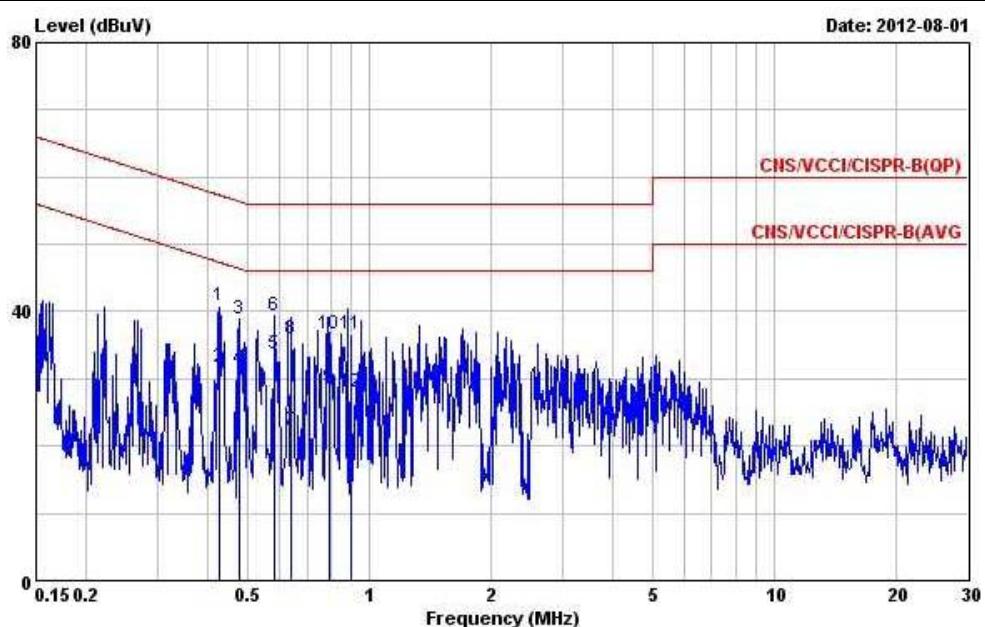
##### 3.1.4 Test Setup



### 3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	1	Ant. No.	1	Power Phase	Line
Operating Function	Wireless 2.4G Link and 1-slot cradle				

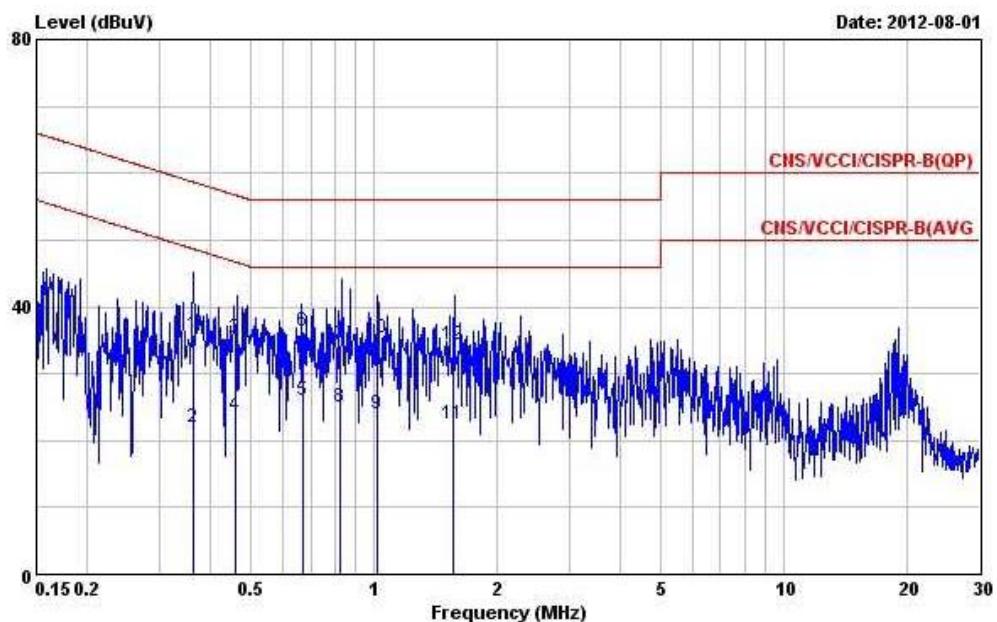


	Freq	Level	Over Limit	Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.424	40.75	-16.62	57.37	40.52	0.15	0.08	QP
2	0.424	31.80	-15.57	47.37	31.57	0.15	0.08	Average
3	0.477	38.86	-17.53	56.39	38.62	0.16	0.08	QP
4	0.477	31.48	-14.91	46.39	31.24	0.16	0.08	Average
5	0.579	33.75	-12.25	46.00	33.50	0.16	0.09	Average
6	0.579	39.38	-16.62	56.00	39.13	0.16	0.09	QP
7	0.640	22.35	-23.65	46.00	22.09	0.17	0.09	Average
8	0.640	35.84	-20.16	56.00	35.58	0.17	0.09	QP
9	0.796	28.81	-17.19	46.00	28.54	0.17	0.10	Average
10	0.796	36.75	-19.25	56.00	36.48	0.17	0.10	QP
11	0.902	36.62	-19.38	56.00	36.34	0.18	0.10	QP
12	0.902	28.10	-17.90	46.00	27.82	0.18	0.10	Average

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.)

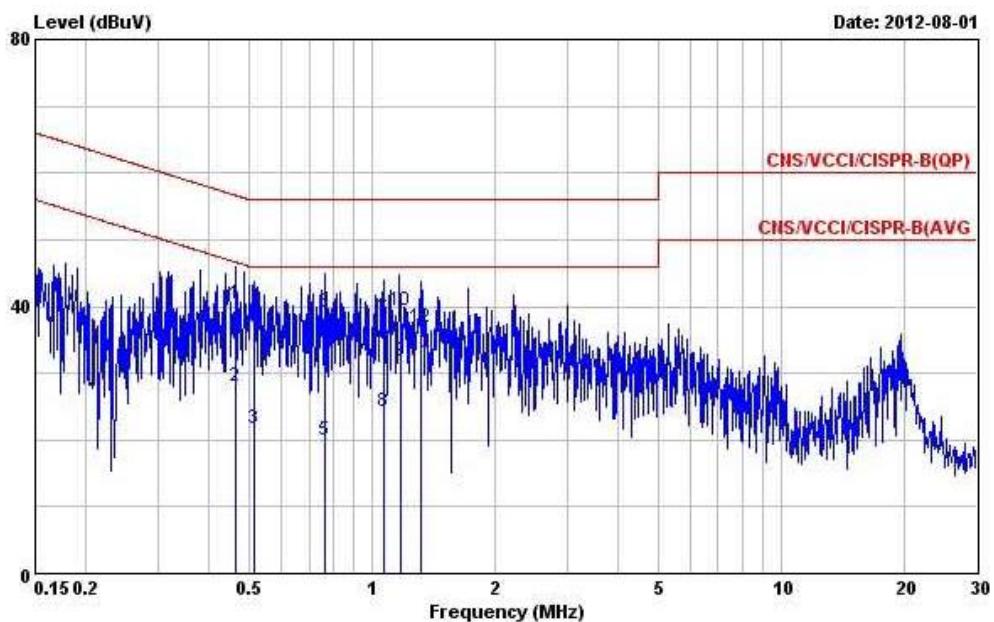
AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	2	Ant. No.	1	Power Phase	Neutral
Operating Function	USB reads and writes (ActiveSync )、Wireless 2.4G Link and 1-slot cradle				



	Freq	Level	Over Limit	Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.363	35.84	-22.82	58.66	35.61	0.15	0.08	QP
2	0.363	22.02	-26.64	48.66	21.79	0.15	0.08	Average
3	0.461	35.22	-21.45	56.67	34.99	0.15	0.08	QP
4	0.461	23.83	-22.84	46.67	23.60	0.15	0.08	Average
5	0.670	26.04	-19.96	46.00	25.79	0.16	0.09	Average
6	0.670	36.36	-19.64	56.00	36.11	0.16	0.09	QP
7	0.829	34.28	-21.72	56.00	34.01	0.17	0.10	QP
8	0.829	24.94	-21.06	46.00	24.67	0.17	0.10	Average
9	1.020	23.97	-22.03	46.00	23.70	0.17	0.10	Average
0	1.020	35.21	-20.79	56.00	34.94	0.17	0.10	QP
1	1.552	22.39	-23.61	46.00	22.07	0.18	0.14	Average
2	1.552	34.20	-21.80	56.00	33.88	0.18	0.14	QP

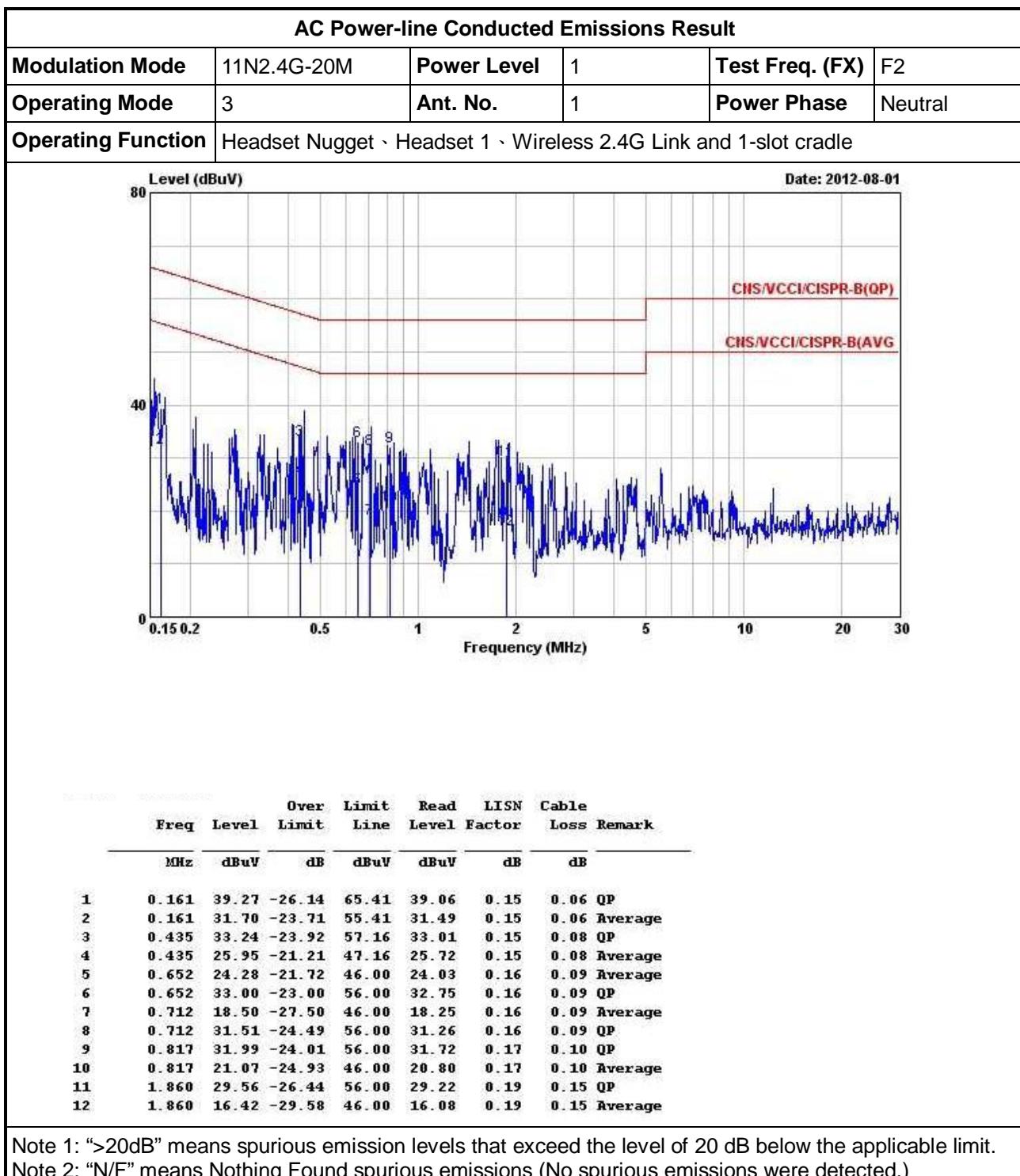
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.  
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

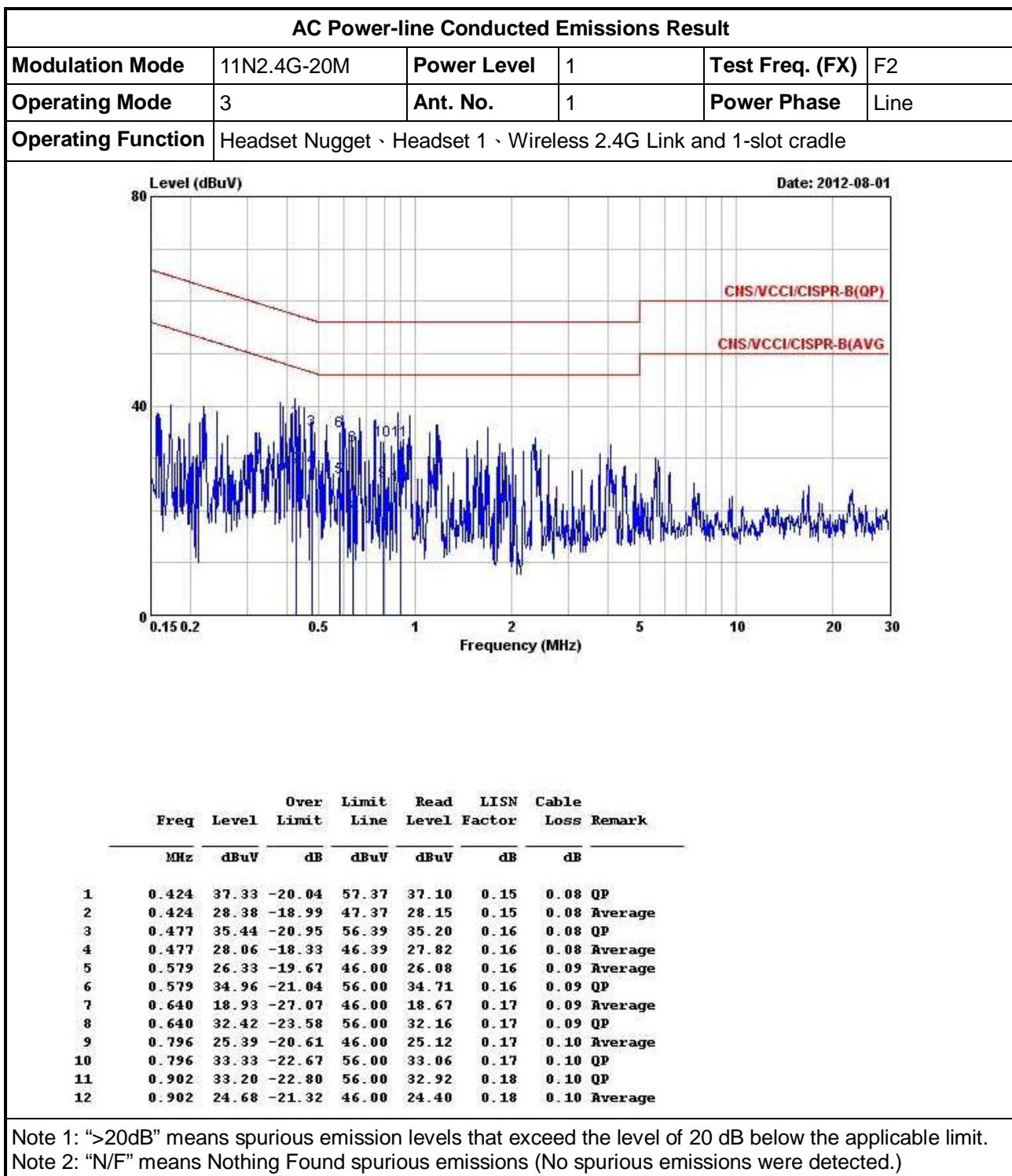
AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	2	Ant. No.	1	Power Phase	Line
Operating Function	USB reads and writes (ActiveSync )、Wireless 2.4G Link and 1-slot cradle				



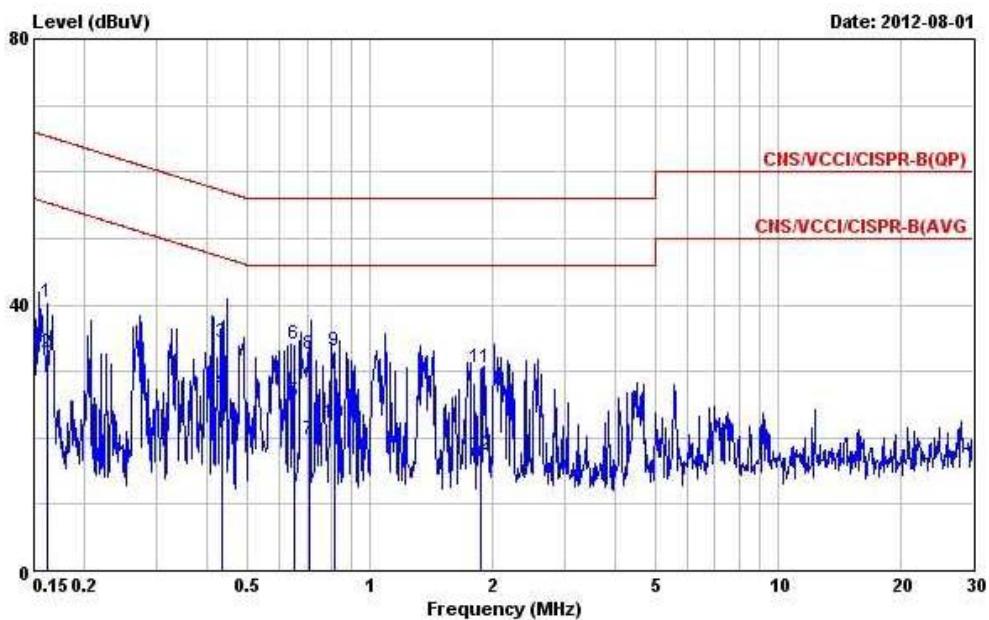
Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
0.464	40.47	-16.15	56.62	40.24	0.15	0.08	QP
0.464	27.93	-18.69	46.62	27.70	0.15	0.08	Average
0.516	21.67	-24.33	46.00	21.42	0.16	0.09	Average
0.516	37.48	-18.52	56.00	37.23	0.16	0.09	QP
0.763	19.95	-26.05	46.00	19.69	0.17	0.09	Average
0.763	39.17	-16.83	56.00	38.91	0.17	0.09	QP
1.070	38.10	-17.90	56.00	37.81	0.18	0.11	QP
1.070	24.29	-21.71	46.00	24.00	0.18	0.11	Average
1.175	31.92	-14.08	46.00	31.63	0.18	0.11	Average
1.175	39.25	-16.75	56.00	38.96	0.18	0.11	QP
1.310	31.63	-14.37	46.00	31.33	0.18	0.12	Average
1.310	36.80	-19.20	56.00	36.50	0.18	0.12	QP

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.)



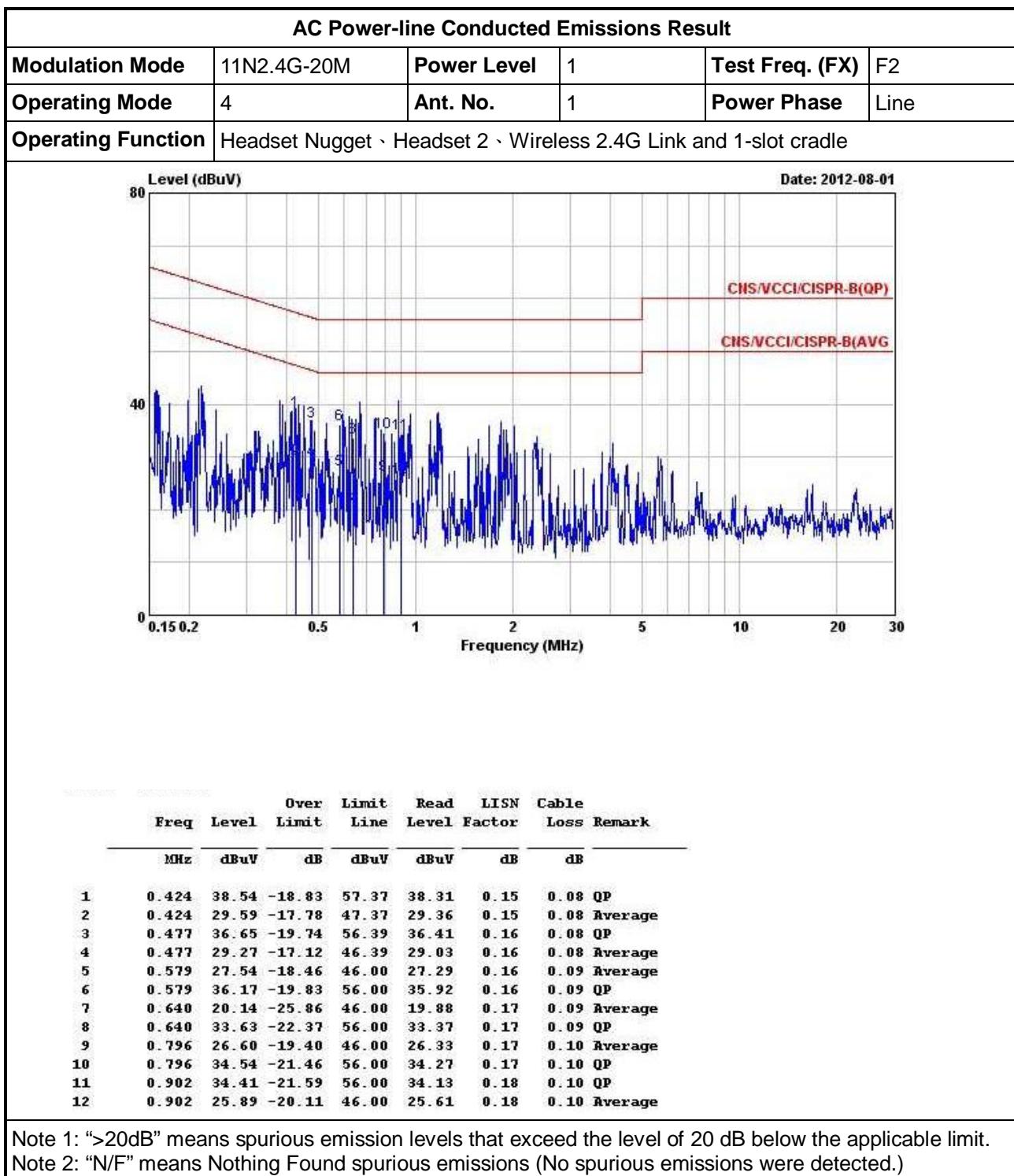


AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	4	Ant. No.	1	Power Phase	Neutral
Operating Function	Headset Nugget、Headset 2、Wireless 2.4G Link and 1-slot cradle				

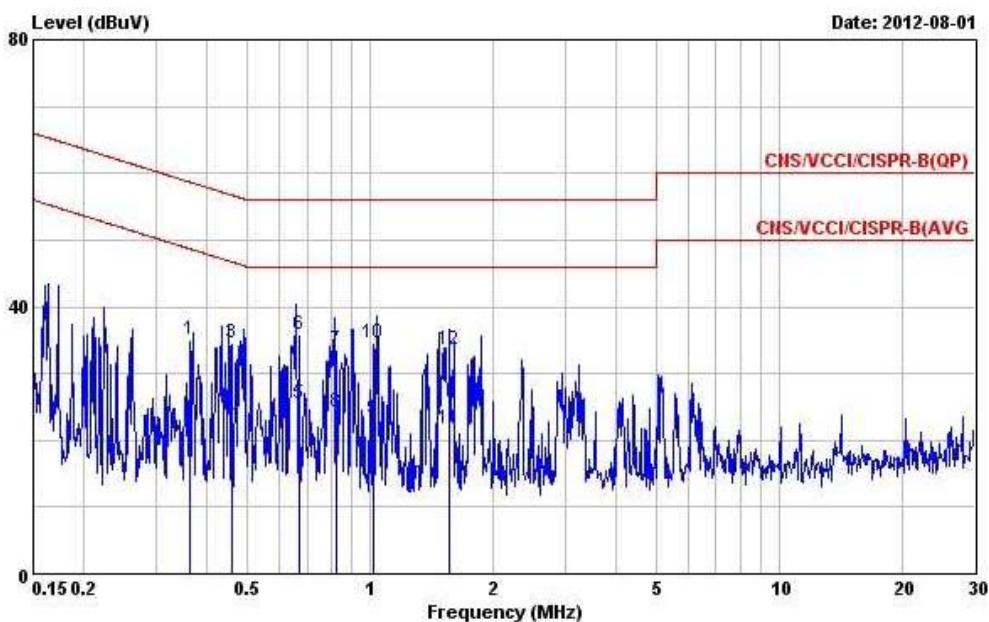


Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
0.161	40.37	-25.04	65.41	40.16	0.15	0.06	QP
0.161	32.80	-22.61	55.41	32.59	0.15	0.06	Average
0.435	34.34	-22.82	57.16	34.11	0.15	0.08	QP
0.435	27.05	-20.11	47.16	26.82	0.15	0.08	Average
0.652	25.38	-20.62	46.00	25.13	0.16	0.09	Average
0.652	34.10	-21.90	56.00	33.85	0.16	0.09	QP
0.712	19.60	-26.40	46.00	19.35	0.16	0.09	Average
0.712	32.61	-23.39	56.00	32.36	0.16	0.09	QP
0.817	33.09	-22.91	56.00	32.82	0.17	0.10	QP
0.817	22.17	-23.83	46.00	21.90	0.17	0.10	Average
1.860	30.66	-25.34	56.00	30.32	0.19	0.15	QP
1.860	17.52	-28.48	46.00	17.18	0.19	0.15	Average

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.)



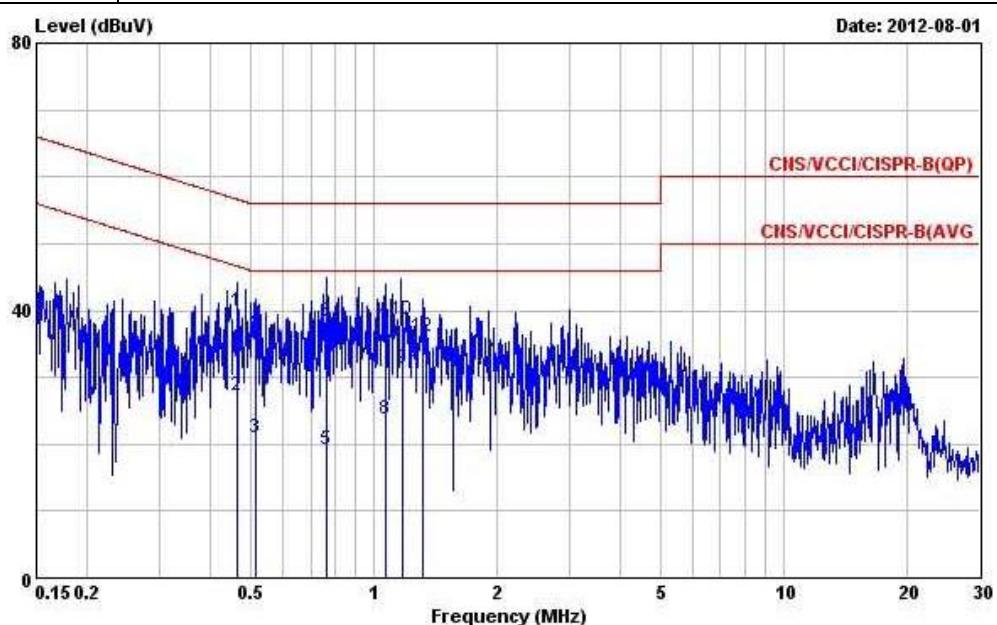
AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	5	Ant. No.	1	Power Phase	Neutral
Operating Function	Speaker Nugget、Wireless 2.4G Link and 1-slot cradle				



Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
0.363	35.19	-23.47	58.66	34.96	0.15	0.08	QP
0.363	21.37	-27.29	48.66	21.14	0.15	0.08	Average
0.461	34.57	-22.10	56.67	34.34	0.15	0.08	QP
0.461	23.18	-23.49	46.67	22.95	0.15	0.08	Average
0.670	25.39	-20.61	46.00	25.14	0.16	0.09	Average
0.670	35.71	-20.29	56.00	35.46	0.16	0.09	QP
0.829	33.63	-22.37	56.00	33.36	0.17	0.10	QP
0.829	24.29	-21.71	46.00	24.02	0.17	0.10	Average
1.020	23.32	-22.68	46.00	23.05	0.17	0.10	Average
1.020	34.56	-21.44	56.00	34.29	0.17	0.10	QP
1.552	21.74	-24.26	46.00	21.42	0.18	0.14	Average
1.552	33.55	-22.45	56.00	33.23	0.18	0.14	QP

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.)

AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F2
Operating Mode	5	Ant. No.	1	Power Phase	Line
Operating Function	Speaker Nugget、Wireless 2.4G Link and 1-slot cradle				



Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
0.464	39.79	-16.83	56.62	39.56	0.15	0.08	QP
0.464	27.25	-19.37	46.62	27.02	0.15	0.08	Average
0.516	20.99	-25.01	46.00	20.74	0.16	0.09	Average
0.516	36.80	-19.20	56.00	36.55	0.16	0.09	QP
0.763	19.27	-26.73	46.00	19.01	0.17	0.09	Average
0.763	38.49	-17.51	56.00	38.23	0.17	0.09	QP
1.070	37.42	-18.58	56.00	37.13	0.18	0.11	QP
1.070	23.61	-22.39	46.00	23.32	0.18	0.11	Average
1.175	31.24	-14.76	46.00	30.95	0.18	0.11	Average
1.175	38.57	-17.43	56.00	38.28	0.18	0.11	QP
1.310	30.95	-15.05	46.00	30.65	0.18	0.12	Average
1.310	36.12	-19.88	56.00	35.82	0.18	0.12	QP

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.)

## 3.2 6dB Bandwidth

### 3.2.1 6dB Bandwidth Limit

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

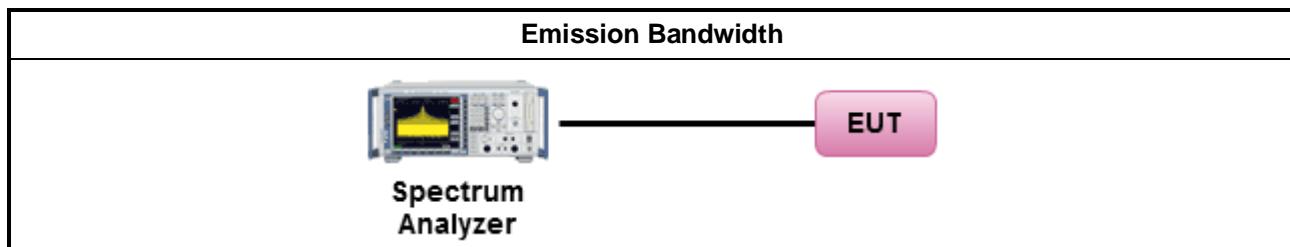
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

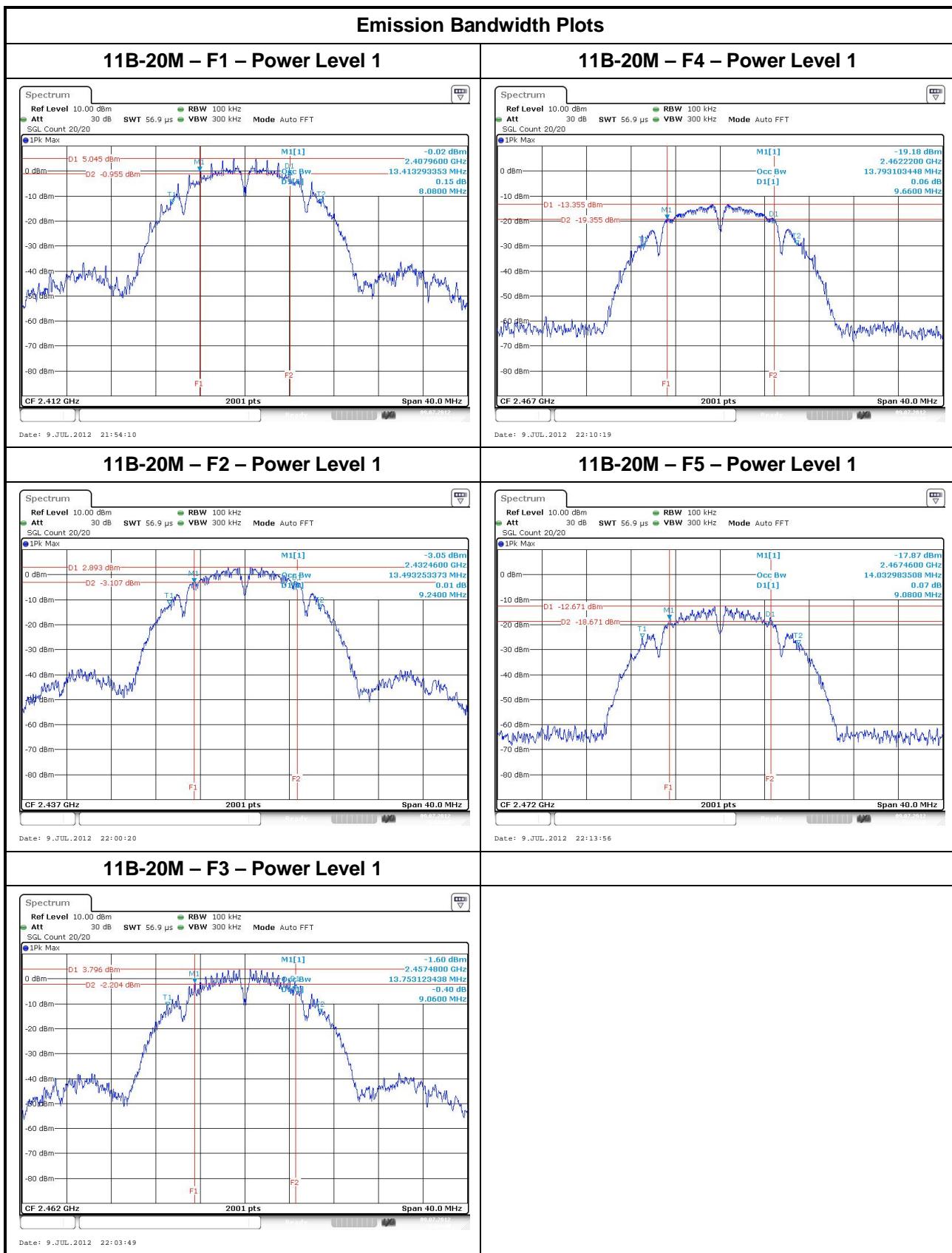
Test Method			
<input checked="" type="checkbox"/> For the emission bandwidth shall be measured using one of the options below:			
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 5.1.1 Option 1 for 6 dB bandwidth measurement. <input type="checkbox"/> Refer as FCC KDB 558074, clause 5.1.2 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"/> For conducted measurements on devices with multiple transmit chains using options given below: <table border="1" style="margin-left: 20px;"> <tr> <td><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 3.</td></tr> <tr> <td><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.</td></tr> <tr> <td><input checked="" type="checkbox"/> Option 3: A power splitter/combiner shall be used to combine all the transmit chains (antenna outputs) into a single test point and record a single test point EBW.</td></tr> </table>	<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 3.	<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.	<input checked="" type="checkbox"/> Option 3: A power splitter/combiner shall be used to combine all the transmit chains (antenna outputs) into a single test point and record a single test point EBW.
<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 3.			
<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.			
<input checked="" type="checkbox"/> Option 3: A power splitter/combiner shall be used to combine all the transmit chains (antenna outputs) into a single test point and record a single test point EBW.			
<input type="checkbox"/> For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.			

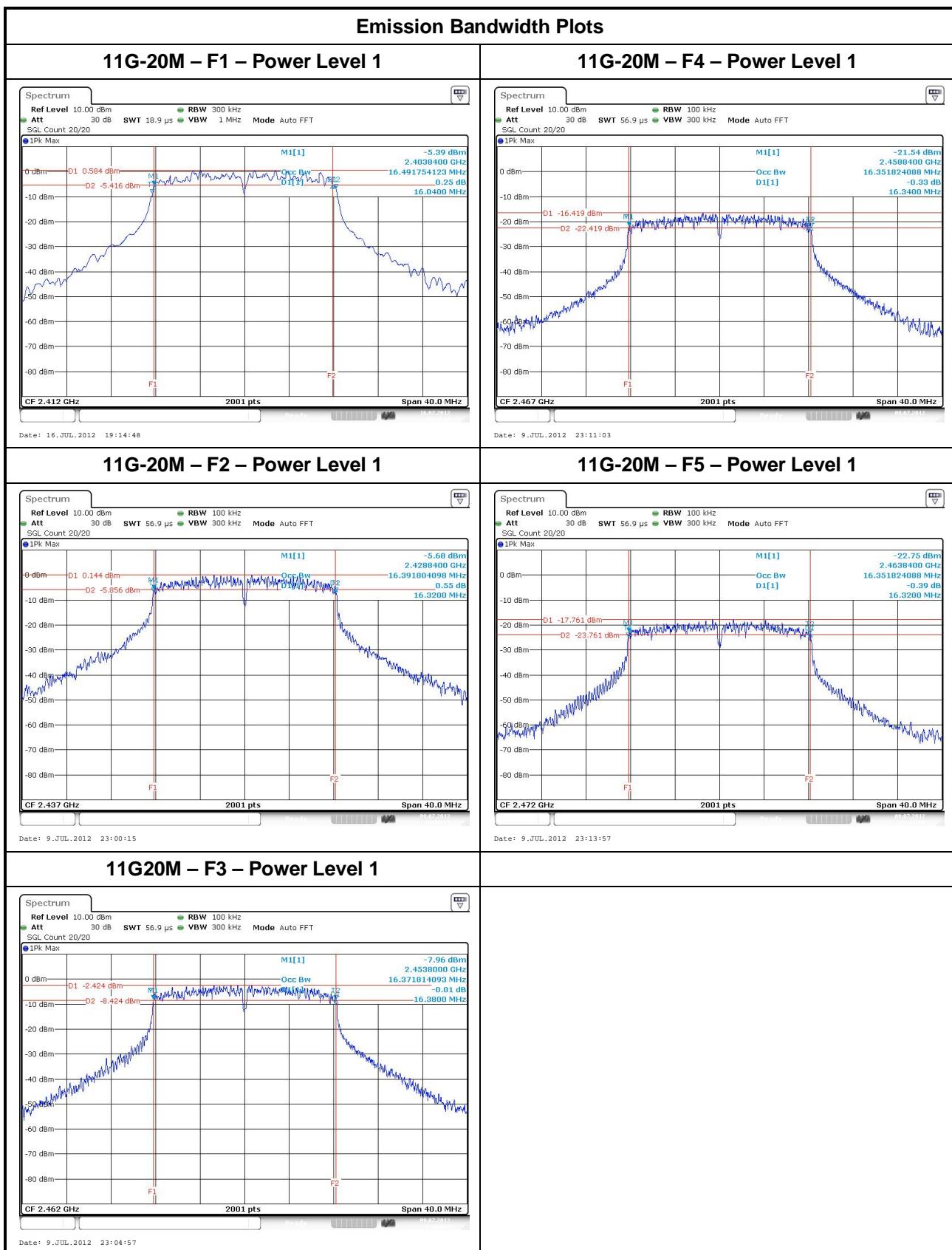
### 3.2.4 Test Setup

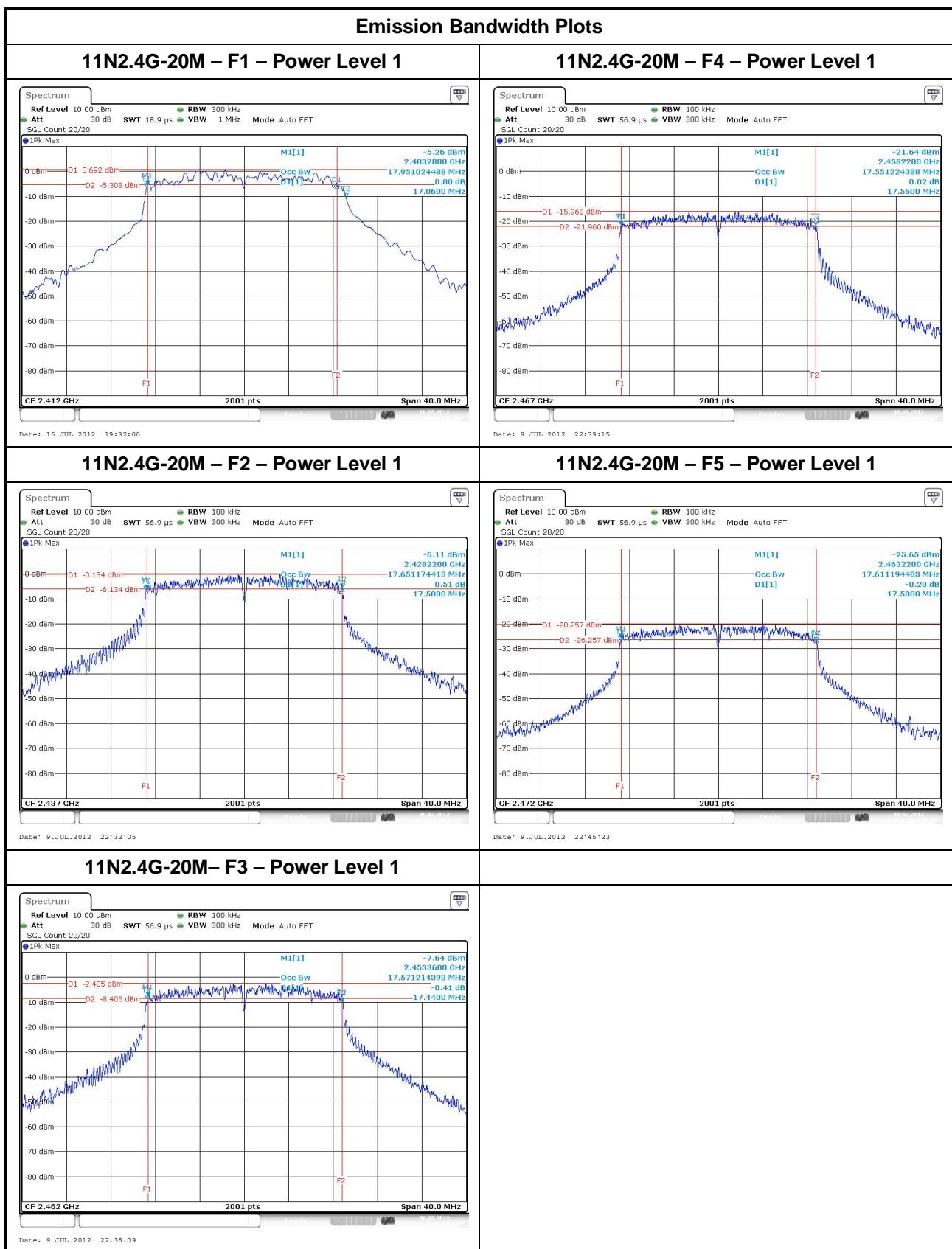


### 3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result				
Power Level	1		Emission Bandwidth (MHz)	
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	99% Bandwidth	6dB Bandwidth
11B-20M	1	2412	13.41	8.08
11B-20M	1	2437	13.49	9.24
11B-20M	1	2462	13.75	9.06
11B-20M	1	2467	13.79	9.66
11B-20M	1	2472	14.03	9.08
11G-20M	1	2412	16.49	16.04
11G-20M	1	2437	16.39	16.32
11G-20M	1	2462	16.37	16.38
11G-20M	1	2467	16.35	16.34
11G-20M	1	2472	16.35	16.32
11N2.4G-20M	1	2412	17.95	17.06
11N2.4G-20M	1	2437	17.65	17.58
11N2.4G-20M	1	2462	17.57	17.44
11N2.4G-20M	1	2467	17.55	17.56
11N2.4G-20M	1	2472	17.61	17.58
<b>Limit</b>			<b>N/A</b>	<b>≥500 kHz</b>
<b>Result</b>			<b>Complied</b>	
Note 1: N <sub>TX</sub> = 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 $P_{Out} = 30 - (G_{TX} - 6)/3 + 8dB$ dBm
<b>e.i.r.p. Power Limit:</b>	
<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><math>P_{Out}</math> = maximum peak conducted output power or maximum conducted output power in dBm,  <math>G_{TX}</math> = the maximum transmitting antenna directional gain in dBi.  <math>P_{eirp}</math> = e.i.r.p. Power in dBm.</p>	

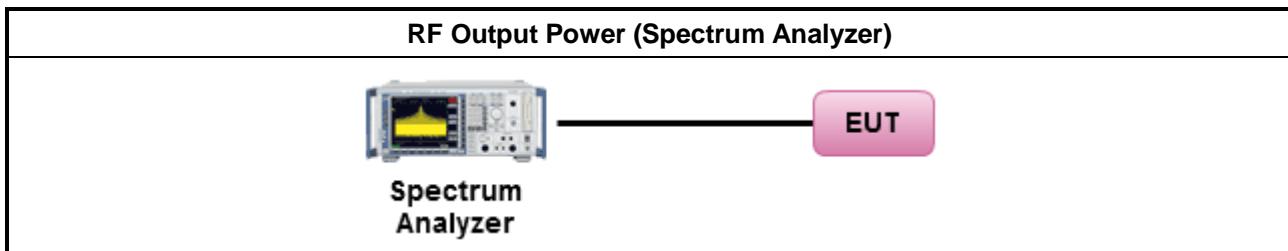
#### 3.3.2 Measuring Instruments

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

### 3.3.3 Test Procedures

Test Method
<input type="checkbox"/> Maximum Peak Conducted Output Power
<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.2.1.1 Option 1 (RBW > EBW method). <input type="checkbox"/> Refer as FCC KDB 558074, clause 5.2.1.2 Option 2 (integrated band power method). <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter. <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW $\geq$ EBW). <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.2.1 b) for spectrum analyzer - BW correction factor.
<input checked="" type="checkbox"/> Maximum Conducted Output Power
<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.2.2.1 Option 1 (RMS detection with slow sweep speed). <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 5.2.2.2 Option 2 (spectral trace averaging). <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.3.1 for spectrum analyzer - Method 1 (trace averaging). <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.3.2 for spectrum analyzer - Method 2 (zero-span averaging). <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.3.2 for spectrum analyzer - Method 3 (band power max-hold).
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement.
<input checked="" type="checkbox"/> For conducted measurements on devices with multiple transmit chains: 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:
<input type="checkbox"/> Method 1: $EIRP_1 = P_1 + G_{ANT1}$ ; $EIRP_2 = P_2 + G_{ANT2}$ ; ... $EIRP_n = P_n + G_{ANTn}$ $EIRP_{total} = EIRP_1 + EIRP_2 + \dots + EIRP_n$ (calculated in linear unit [mW] and transfer to log unit [dBm])
<input checked="" type="checkbox"/> Method 2: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$
<input type="checkbox"/> Refer as FCC KDB 558074, clause 2 for radiated measurement.

### 3.3.4 Test Setup



## 3.3.5 Test Result of Maximum Conducted Output Power

Maximum Conducted (Average) Output Power										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11B-20M	1	2412	16.03				16.03	30	16.93	36
11B-20M	1	2437	16.32				16.32	30	17.22	36
11B-20M	1	2462	15.86				15.86	30	16.76	36
11B-20M	1	2467	0.37				0.37	30	1.27	36
11B-20M	1	2472	0.62				0.62	30	1.52	36
Result			Complied							

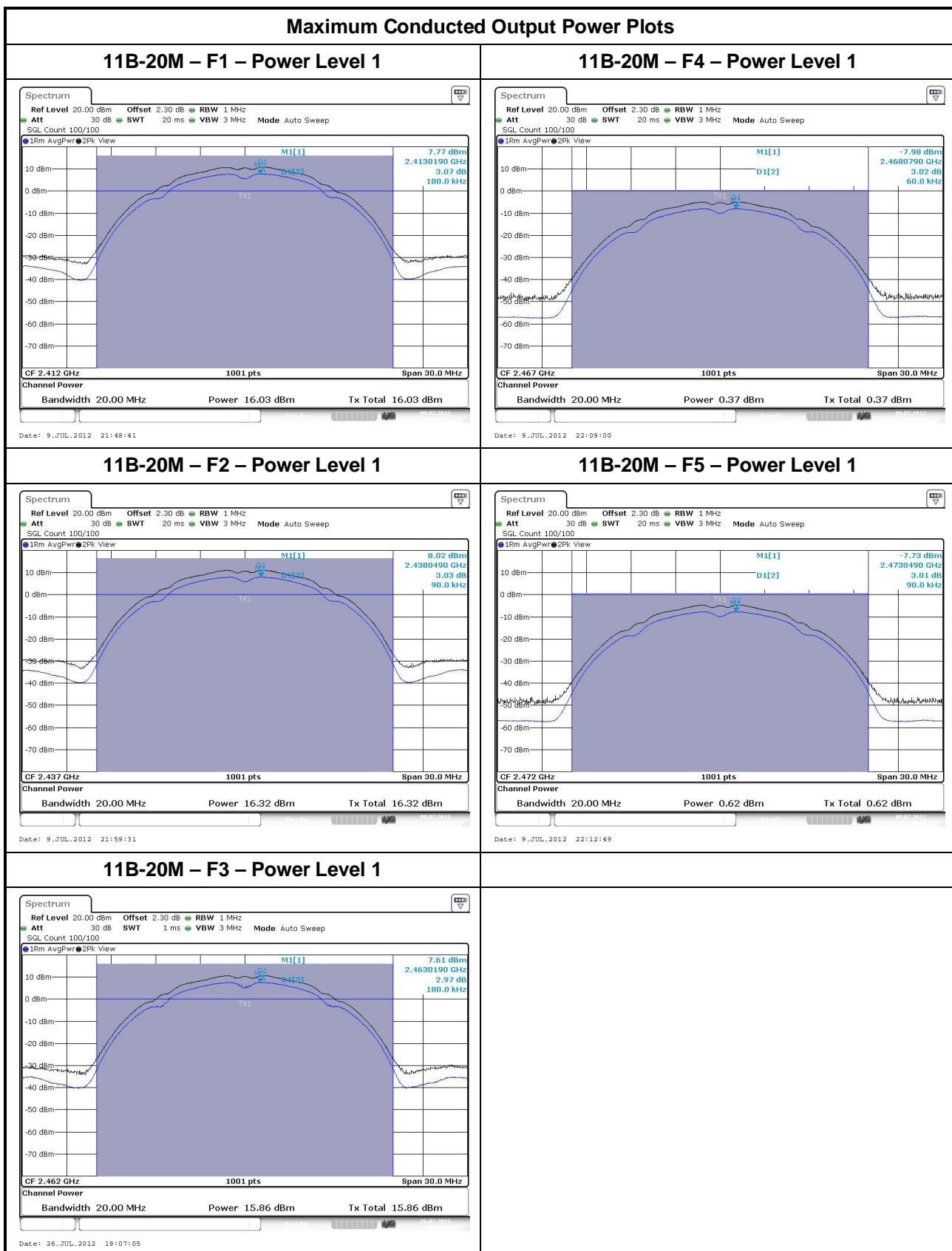
Maximum Conducted (Average) Output Power										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11G-20M	1	2412	12.92				12.92	30	13.82	36
11G-20M	1	2437	16.64				16.64	30	17.54	36
11G-20M	1	2462	14.63				14.63	30	18.10	36
11G-20M	1	2467	0.11				0.11	30	1.01	36
11G-20M	1	2472	-1.64				-1.64	30	-0.74	36
Result			Complied							

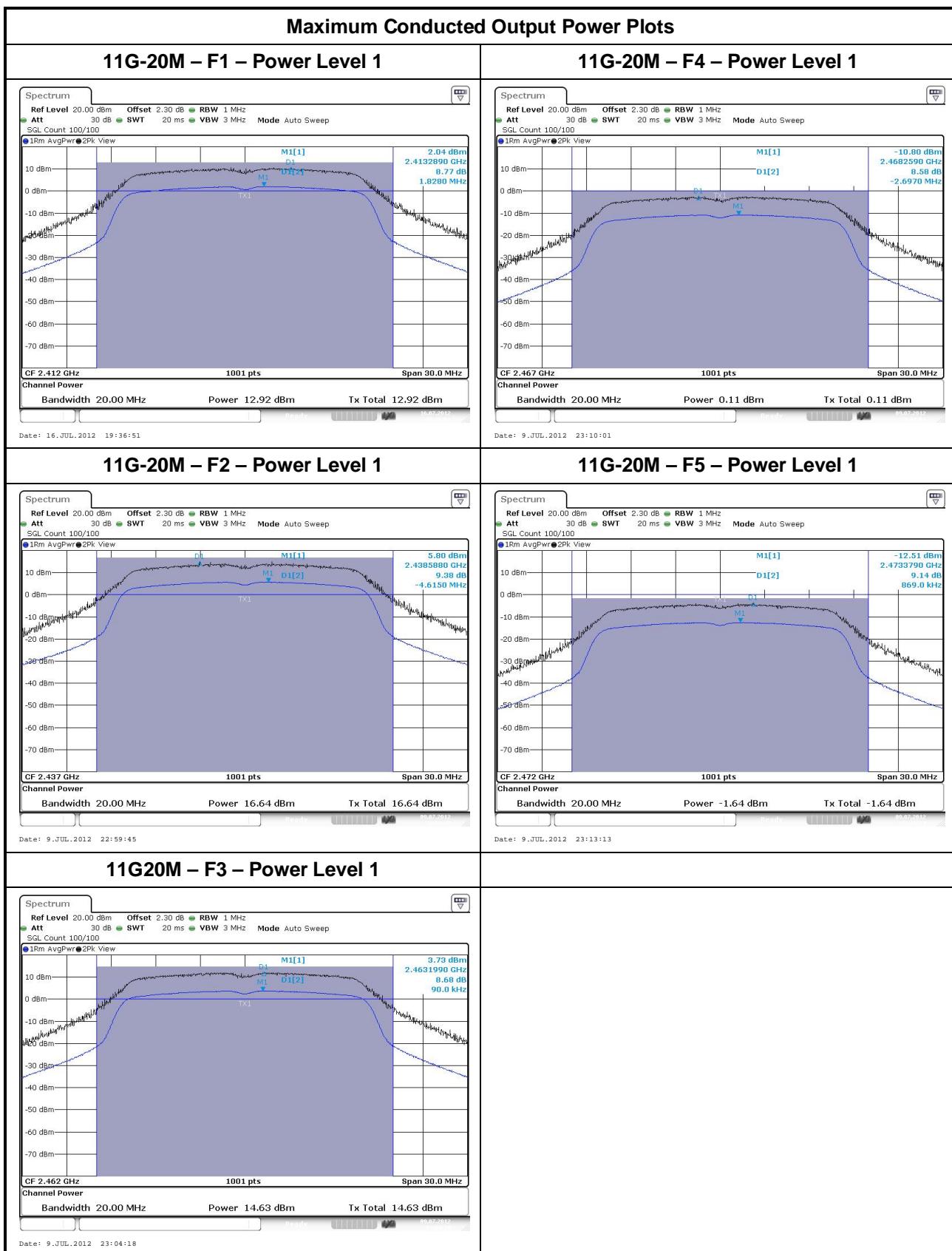
Maximum Conducted (Average) Output Power										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11N2.4G-20M	1	2412	12.76				12.76	30	13.66	36
11N2.4G-20M	1	2437	16.50				16.50	30	17.40	36
11N2.4G-20M	1	2462	14.04				14.04	30	14.94	36
11N2.4G-20M	1	2467	0.19				0.19	30	1.09	36
11N2.4G-20M	1	2472	-3.50				-3.50	30	-2.60	36
Result			Complied							

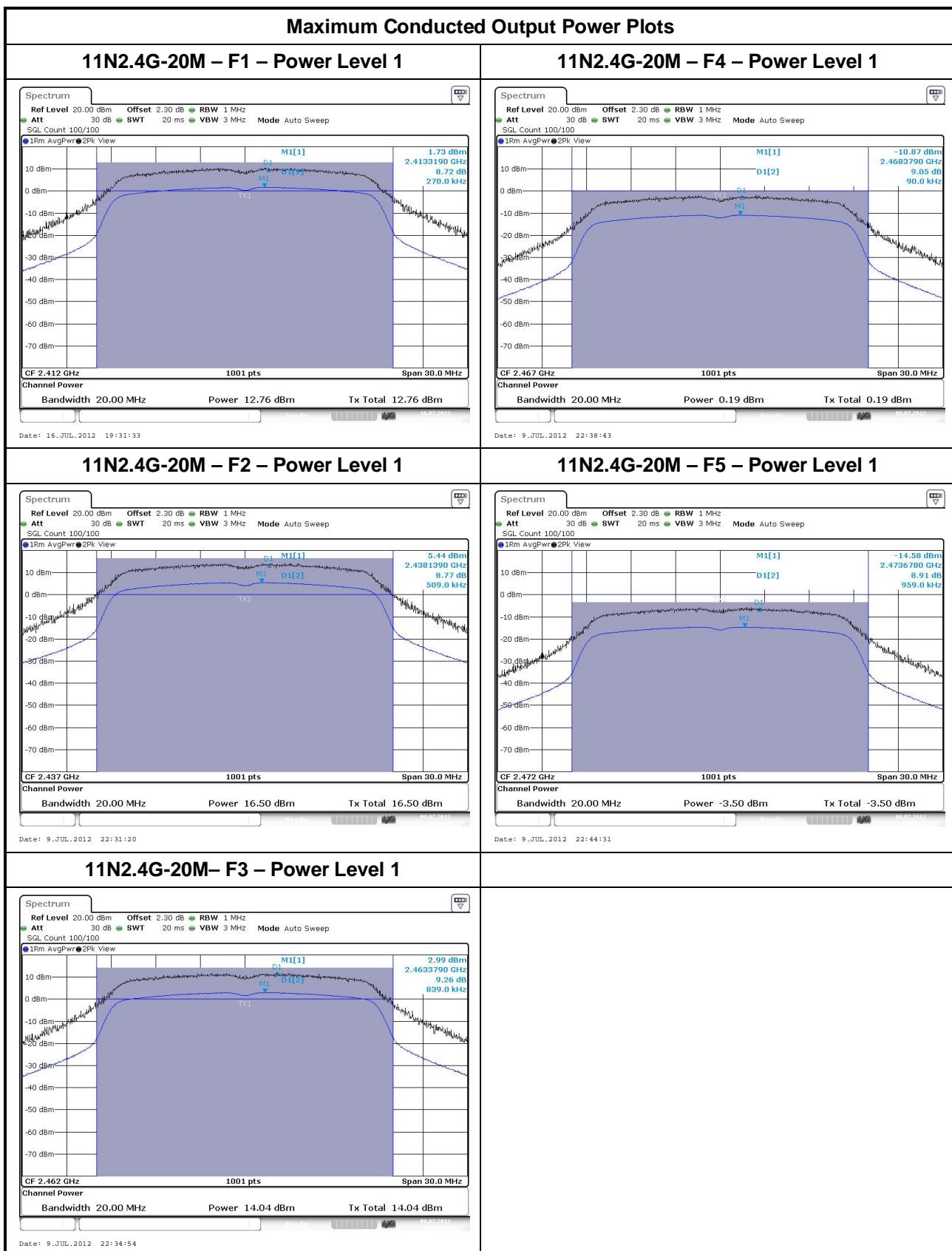
Maximum Peak Conducted Output Power Result										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90								
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11B-20M	1	2412	19.06				19.06	30	19.96	36
11B-20M	1	2437	19.34				19.34	30	20.24	36
11B-20M	1	2462	18.87				18.87	30	19.77	36
11B-20M	1	2467	3.39				3.39	30	4.29	36
11B-20M	1	2472	3.63				3.63	30	4.53	36
Result			Complied							

Maximum Peak Conducted Output Power Result										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90								
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11G-20M	1	2412	20.84				20.84	30	21.74	36
11G-20M	1	2437	24.57				24.57	30	25.47	36
11G-20M	1	2462	24.22				24.22	30	25.12	36
11G-20M	1	2467	7.99				7.99	30	8.89	36
11G-20M	1	2472	6.28				6.28	30	7.18	36
Result			Complied							

Maximum Peak Conducted Output Power Result										
Power Level		1	RF Output Power (dBm)							
G <sub>ANT</sub> (dBi)		0.90								
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain-Port 1	-	-	-	Sum Chain	Power Limit	EIRP Power	EIRP Limit
11N2.4G-20M	1	2412	20.88				20.88	30	21.78	36
11N2.4G-20M	1	2437	24.60				24.60	30	25.50	36
11N2.4G-20M	1	2462	22.18				22.18	30	23.08	36
11N2.4G-20M	1	2467	8.29				8.29	30	9.19	36
11N2.4G-20M	1	2472	4.29				4.29	30	5.19	36
Result			Complied							







## 3.4 Power Spectral Density

### 3.4.1 Power Spectral Density Limit

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

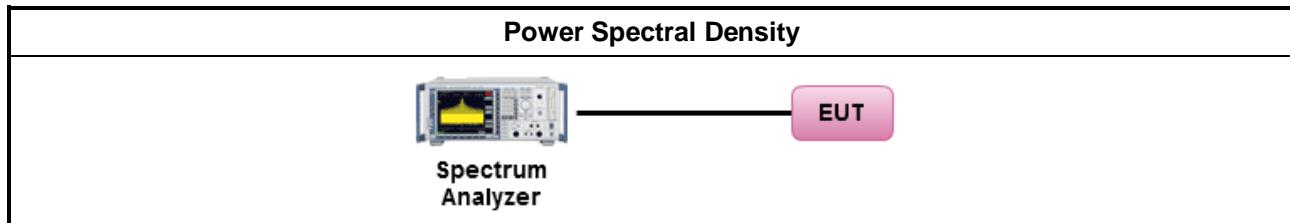
### 3.4.2 Measuring Instruments

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

### 3.4.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/> Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a "worst-case" measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options:	
<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.3.1 Option 1 (peak PSD; BWCF=-15.2dB).	
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 5.3.2 Option 2 (average PSD; BWCF=-15.2dB).	
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.11.2.3 for PSD for DTS - (RBW=3kHz; sweep=100s).	
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.11.2.4 for Alternative PSD for DTS - (RBW=3kHz; average=100)	
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement.	
<input checked="" type="checkbox"/> For conducted measurements on devices with 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. The new data trace samples added 100 kHz segment and found the highest value of each 100 kHz segments. Add the bandwidth correction factor (BWCF) [-15.2 dB] adjusting in power spectral density per 3kHz.
	<input checked="" 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 type="checkbox"/> Refer as FCC KDB 558074, clause 2 for radiated measurement.	

### 3.4.4 Test Setup



### 3.4.5 Test Result of Power Spectral Density

Power Spectral Density Result				
Power Level		1	Power Spectral Density (dBm/3kHz)	
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain- Port 1	PSD Limit
11B-20M	1	2412	-9.09	8
11B-20M	1	2437	-8.50	8
11B-20M	1	2462	-11.78	8
11B-20M	1	2467	-24.44	8
11B-20M	1	2472	-23.76	8
Result		Complied		

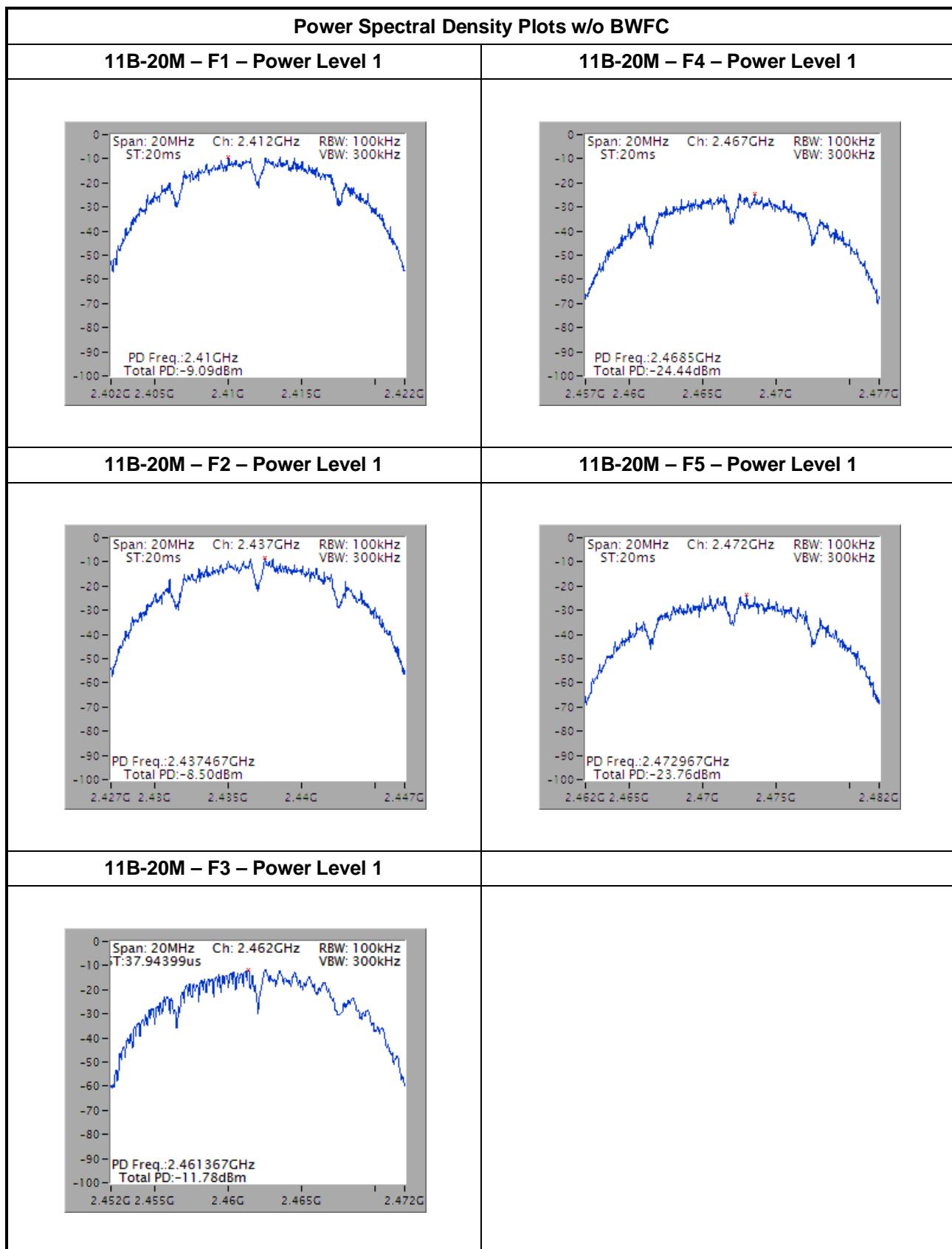
Note 1: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN<sub>TX</sub>

Power Spectral Density Result				
Power Level		1	Power Spectral Density (dBm/3kHz)	
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain- Port 1	PSD Limit
11G-20M	1	2412	-13.66	8
11G-20M	1	2437	-12.09	8
11G-20M	1	2462	-14.39	8
11G-20M	1	2467	-28.76	8
11G-20M	1	2472	-30.60	8
Result		Complied		

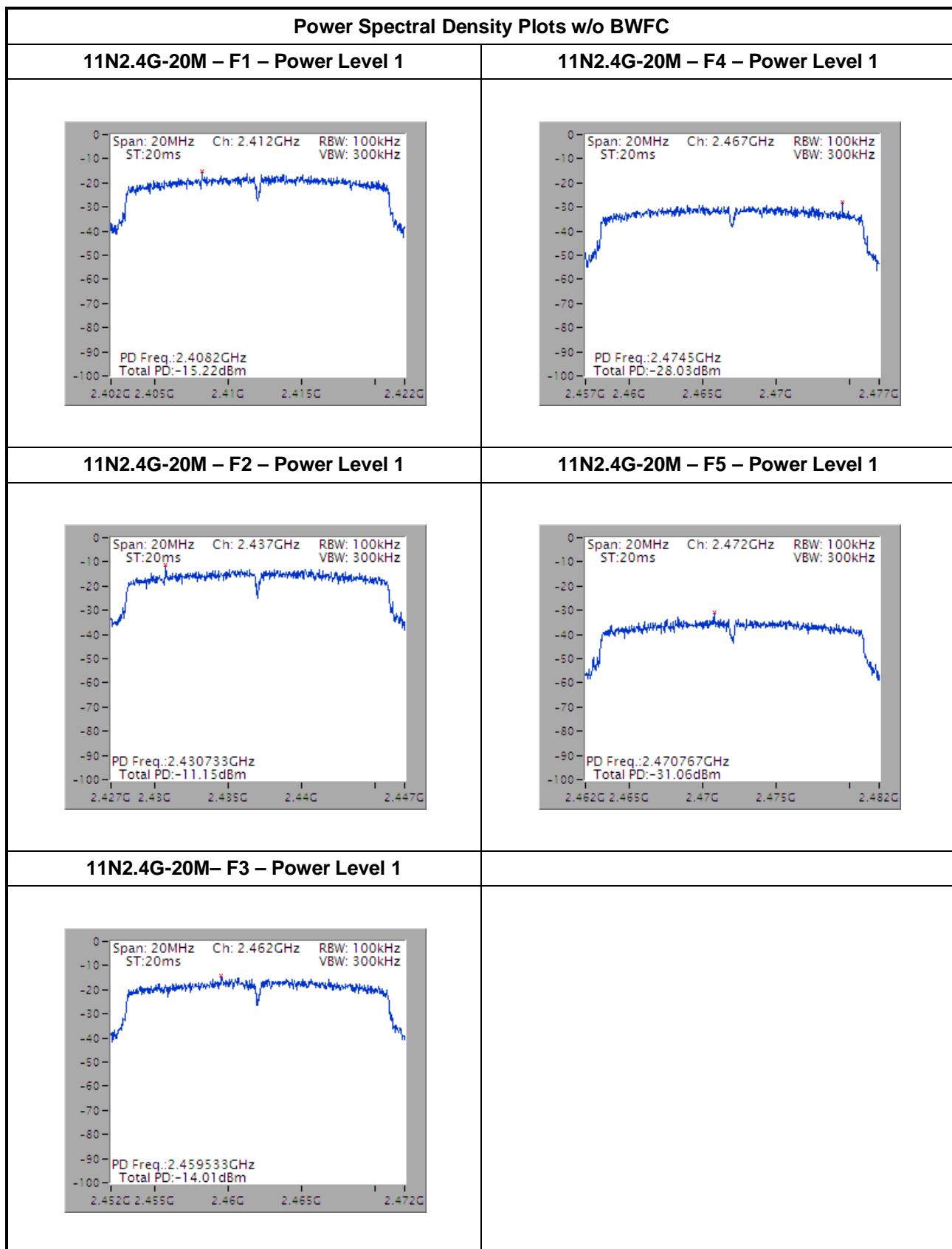
Note 1: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN<sub>TX</sub>

Power Spectral Density Result				
Power Level		1	Power Spectral Density (dBm/3kHz)	
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain- Port 1	PSD Limit
11N2.4G-20M	1	2412	-15.22	8
11N2.4G-20M	1	2437	-11.15	8
11N2.4G-20M	1	2462	-14.01	8
11N2.4G-20M	1	2467	-28.03	8
11N2.4G-20M	1	2472	-31.06	8
Result		Complied		

Note 1: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN<sub>TX</sub>

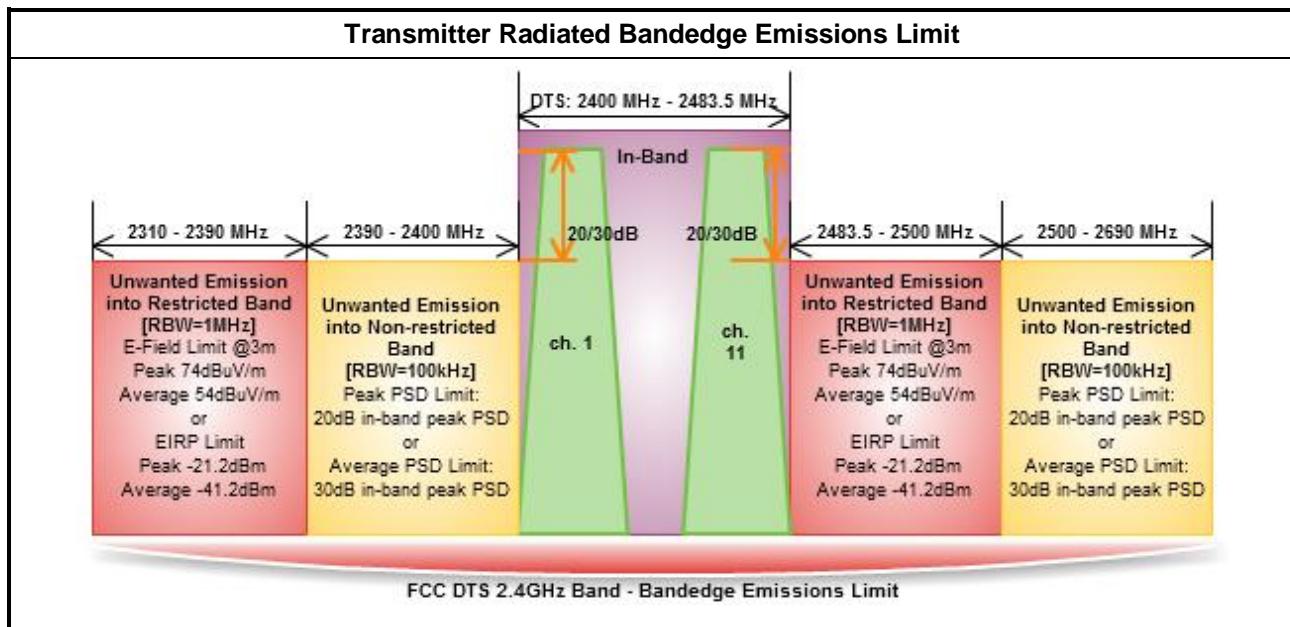






## 3.5 Transmitter Radiated Bandedge Emissions

### 3.5.1 Transmitter Radiated Bandedge Emissions Limit



### 3.5.2 Measuring Instruments

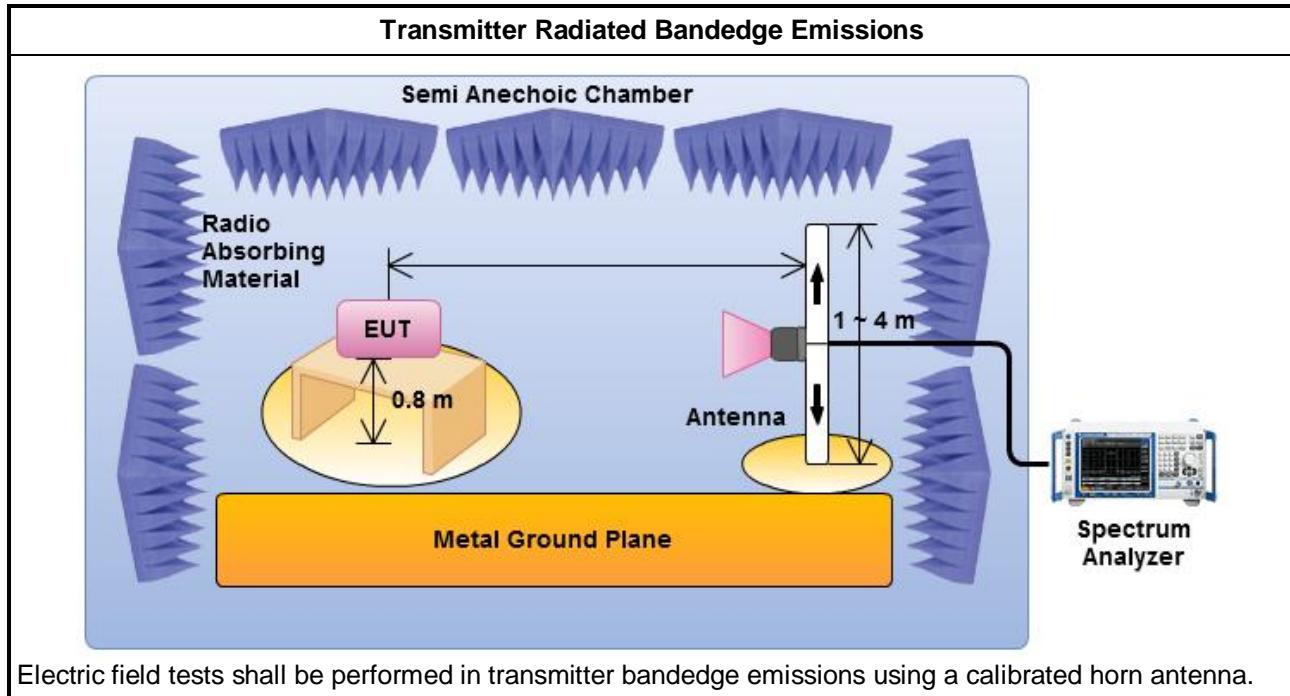
Refer a test equipment and calibration data table in this test report.

### 3.5.3 Test Procedures

<b>Test Method – General Information</b>	
<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 5.4.1 for unwanted emissions into non-restricted bands.	
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2 for unwanted emissions into restricted bands.	
<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.1 Option 1 (Power Averaging).	
<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.2 Option 2 (Trace Averaging).	
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). – Duty cycle $\geq$ 98%.	
<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 5.4.2.2.3 measurement procedure peak limit.	
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.	
<input checked="" type="checkbox"/>	For the transmitter bandedge emissions shall be measured using following options below:
<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.	

<b>Test Method</b>	
<input type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement.	
<input type="checkbox"/>	<input type="checkbox"/> For unwanted emissions into non-restricted bands (relative emission limits).
	<input type="checkbox"/> For conducted measurements on devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
<input type="checkbox"/>	For unwanted emissions into restricted bands. Test conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.1 unwanted emissions in restricted bands on frequencies $\leq$ 1000 MHz
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.2 unwanted emissions in restricted bands on frequencies $>$ 1000 MHz
	<input type="checkbox"/> For conducted measurements on devices with 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, out-of-band and spurious emission measurement. The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the limit.
	<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"/>	Refer as FCC KDB 558074, clause 2 for radiated measurement.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.

### 3.5.4 Test Setup



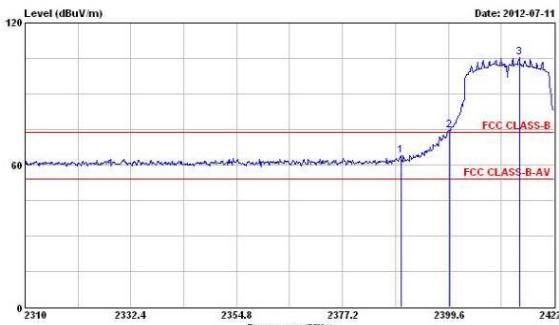
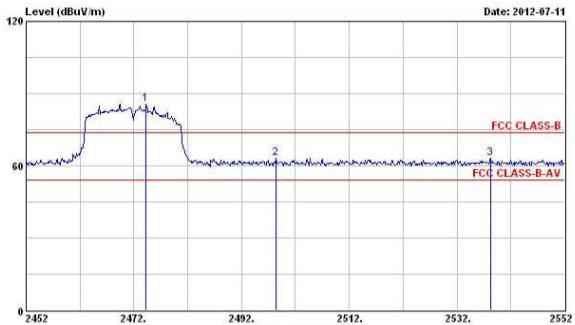
### 3.5.5 Test Result of Transmitter Radiated Bandedge Emissions

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Non-restricted Band Emissions					
Modulation	11B-20M								
Non-restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	NBE Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Level Type	Pol. note 1
2390-2400	1	2412	107.44	2397.58	67.09	40.35	20	PK	H
2500-2690	1	2472	94.47	2501.80	64.00	30.47	20	PK	H
Low Band				Up Band					
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)									

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Restricted Band Emissions					
Modulation	11B-20M								
Restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/1MHz)	RBE Freq. (MHz)	Measure Distance (m)	Out-Band Level (dBuV/m)	Limit (dBuV/m)	Level Type	Pol. note 1
2310-2390	1	2412	112.18	2388.29	3	61.72	74	PK	H
2310-2390	1	2412	107.85	2385.15	3	50.60	54	AV	H
2483.5-2500	1	2472	98.48	2483.50	3	61.56	74	PK	H
2483.5-2500	1	2472	94.12	2483.50	3	48.75	54	AV	H
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).									

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Non-restricted Band Emissions					
Modulation	11G-20M								
Non-restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	NBE Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Level Type	Pol. note 1
2390-2400	1	2412	104.65	2399.82	73.84	30.81	20	PK	H
2500-2690	1	2472	89.81	2500.70	63.57	26.24	20	PK	H
Low Band				Up Band					
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)									

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Restricted Band Emissions					
Modulation	11G-20M								
Restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/1MHz)	RBE Freq. (MHz)	Measure Distance (m)	Out-Band Level (dBuV/m)	Limit (dBuV/m)	Level Type	Pol. note 1
2310-2390	1	2412	112.17	2387.28	3	72.93	74	PK	H
2310-2390	1	2412	101.46	2390.00	3	52.07	54	AV	H
2483.5-2500	1	2472	96.76	2483.50	3	69.92	74	PK	H
2483.5-2500	1	2472	86.55	2483.50	3	50.67	54	AV	H
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).									

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Non-restricted Band Emissions					
Modulation	11N2.4G-20M								
Non-restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	NBE Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Level Type	Pol. note 1
2390-2400	1	2412	105.31	2399.82	74.67	30.64	20	PK	H
2500-2690	1	2472	85.79	2538.20	63.19	22.60	20	PK	H
Low Band				Up Band					
									
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)									

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	Ant. No.	1	Restricted Band Emissions					
Modulation	11N2.4G-20M								
Restricted Band (MHz)	N <sub>TX</sub>	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/1MHz)	RBE Freq. (MHz)	Measure Distance (m)	Out-Band Level (dBuV/m)	Limit (dBuV/m)	Level Type	Pol. note 1
2310-2390	1	2412	113.30	2390.00	3	72.08	74	PK	H
2310-2390	1	2412	101.80	2390.00	3	52.73	54	AV	H
2483.5-2500	1	2472	95.48	2483.50	3	68.47	74	PK	H
2483.5-2500	1	2472	83.21	2483.50	3	50.15	54	AV	H
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).									

### 3.6 Transmitter Radiated 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.

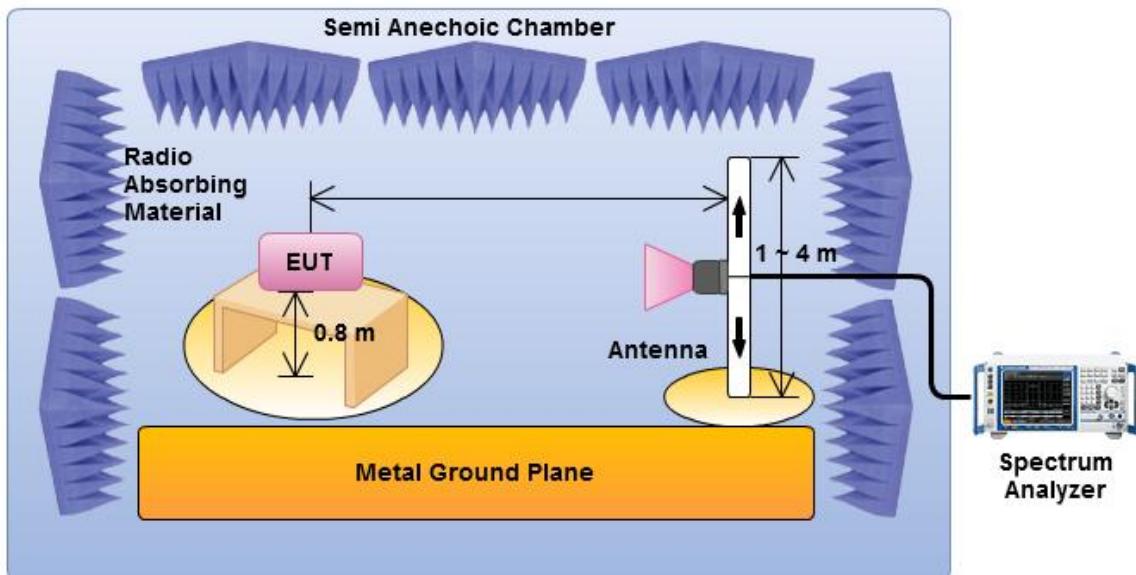
### 3.6.3 Test Procedures

Test Method – General Information	
<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 5.4.1 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 5.4.2 for unwanted emissions into restricted bands.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.1 Option 1 (Power Averaging).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.2 Option 2 (Trace Averaging).
	<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle $\geq$ 98%.
	<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 5.4.2.2.3 measurement procedure peak limit.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.

<b>Test Method</b>	
<input type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement.	
<input type="checkbox"/>	<input type="checkbox"/> For unwanted emissions into non-restricted bands (relative emission limits).
	<input type="checkbox"/> For conducted measurements on devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
<input type="checkbox"/>	For unwanted emissions into restricted bands. Test conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.1 unwanted emissions in restricted bands on frequencies $\leq$ 1000 MHz
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 5.4.2.2.2 unwanted emissions in restricted bands on frequencies $>$ 1000 MHz
	<input type="checkbox"/> For conducted measurements on devices with 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, out-of-band and spurious emission measurement. The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the limit.
	<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"/>	For radiated measurement.
	<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 6.5 for radiated emissions from above 1 GHz.

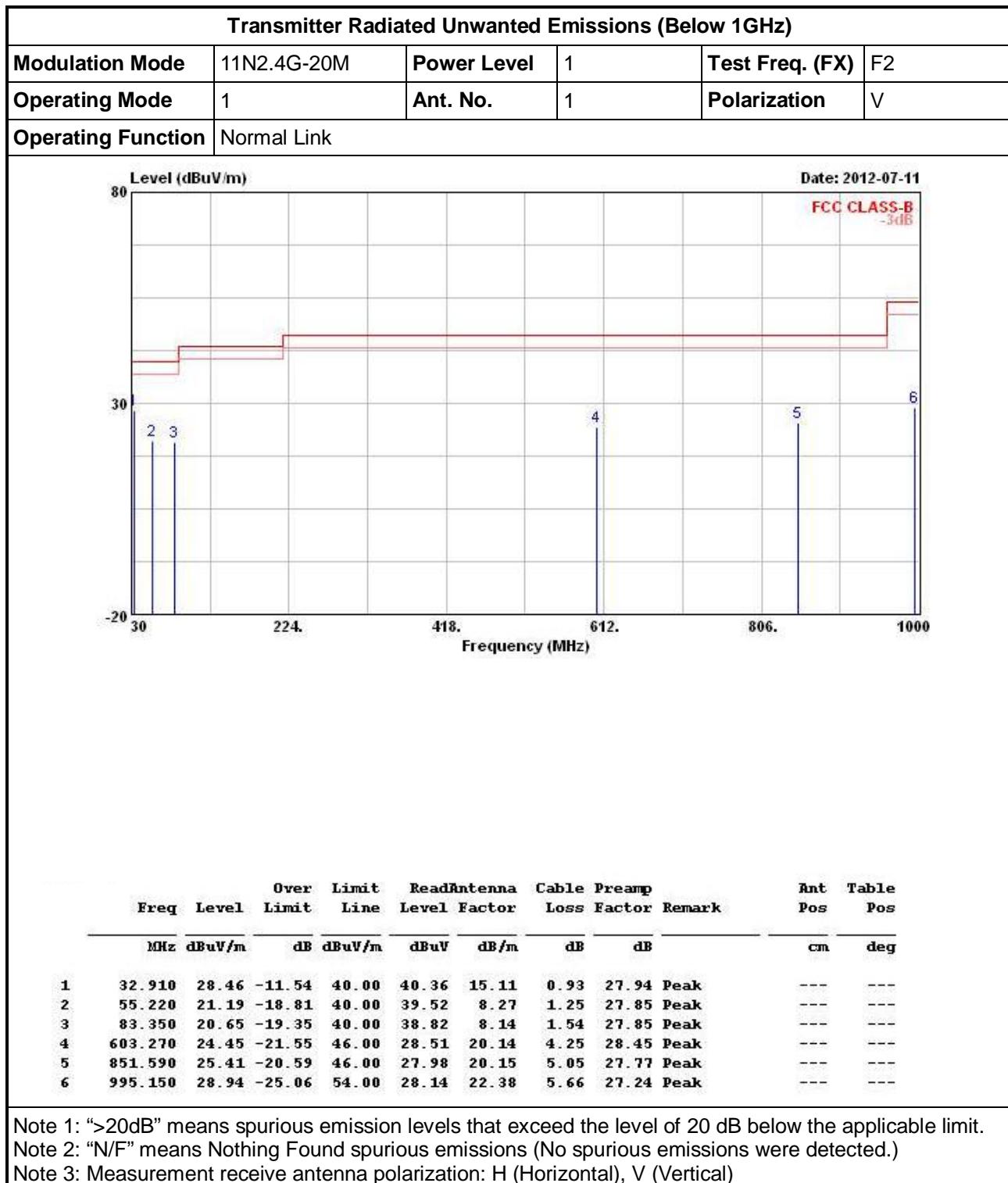
### 3.6.4 Test Setup

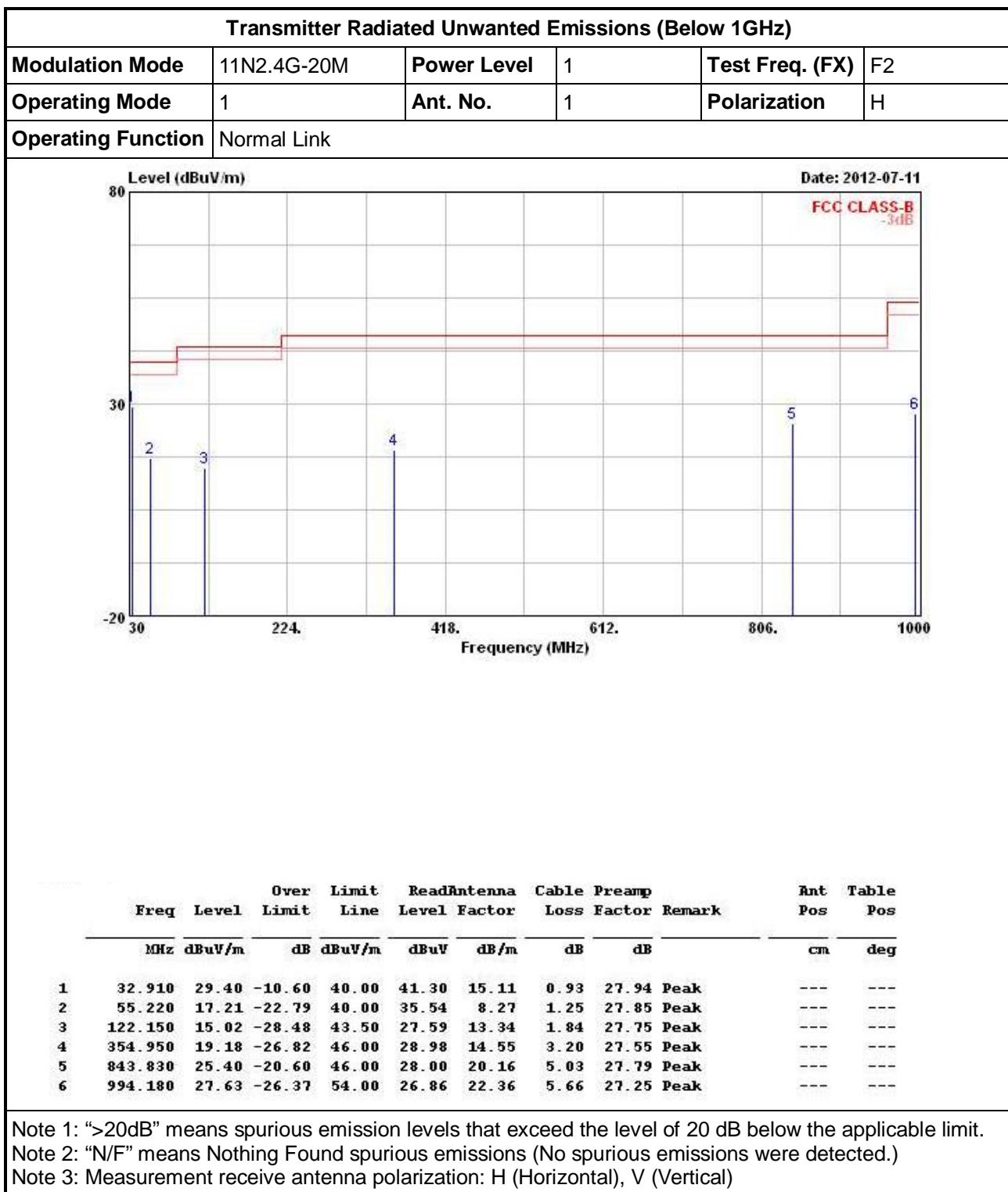
#### Transmitter Radiated Unwanted Emissions

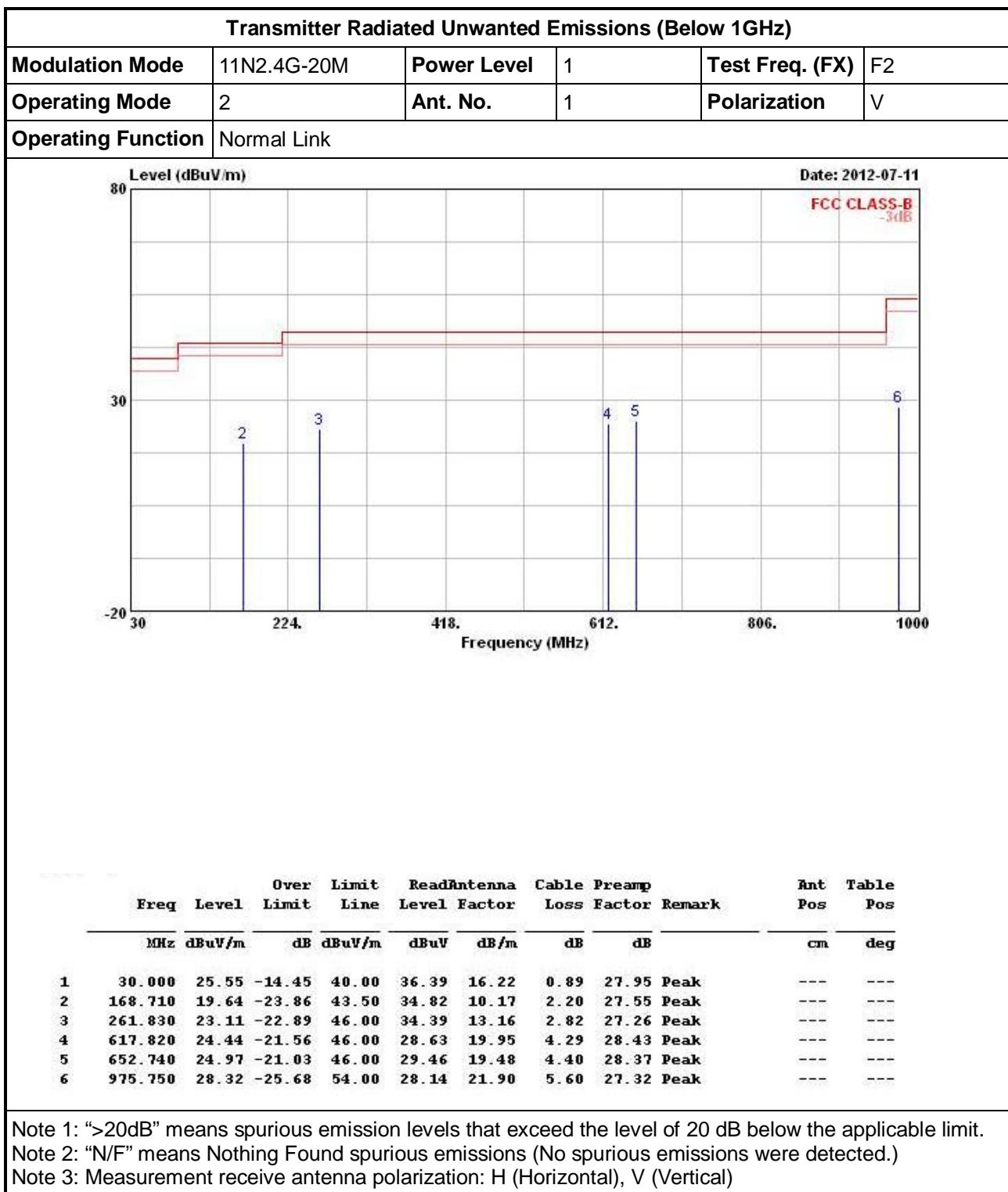


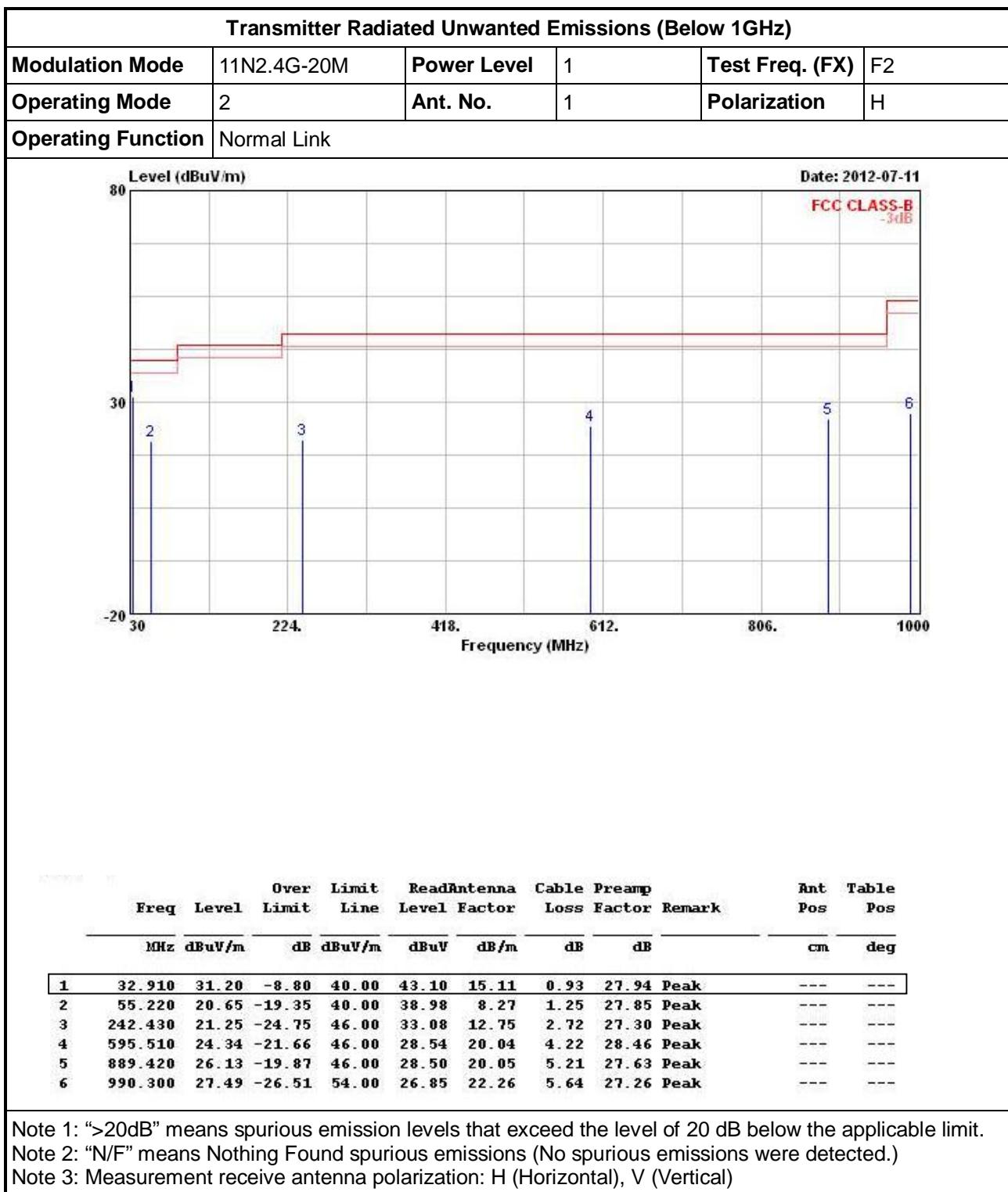
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

## 3.6.5 Test Result of Transmitter Radiated Unwanted Emissions (Below 1GHz)

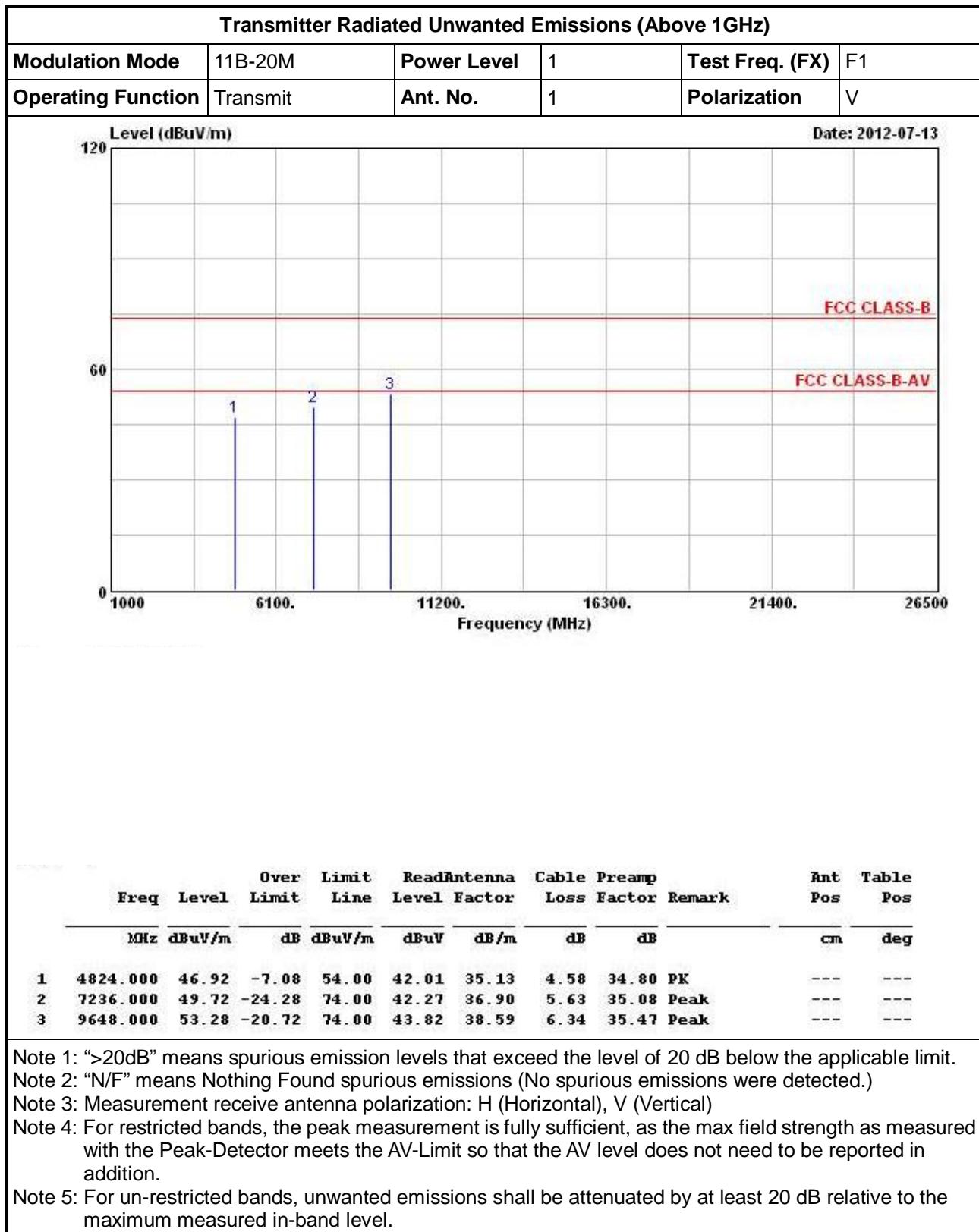


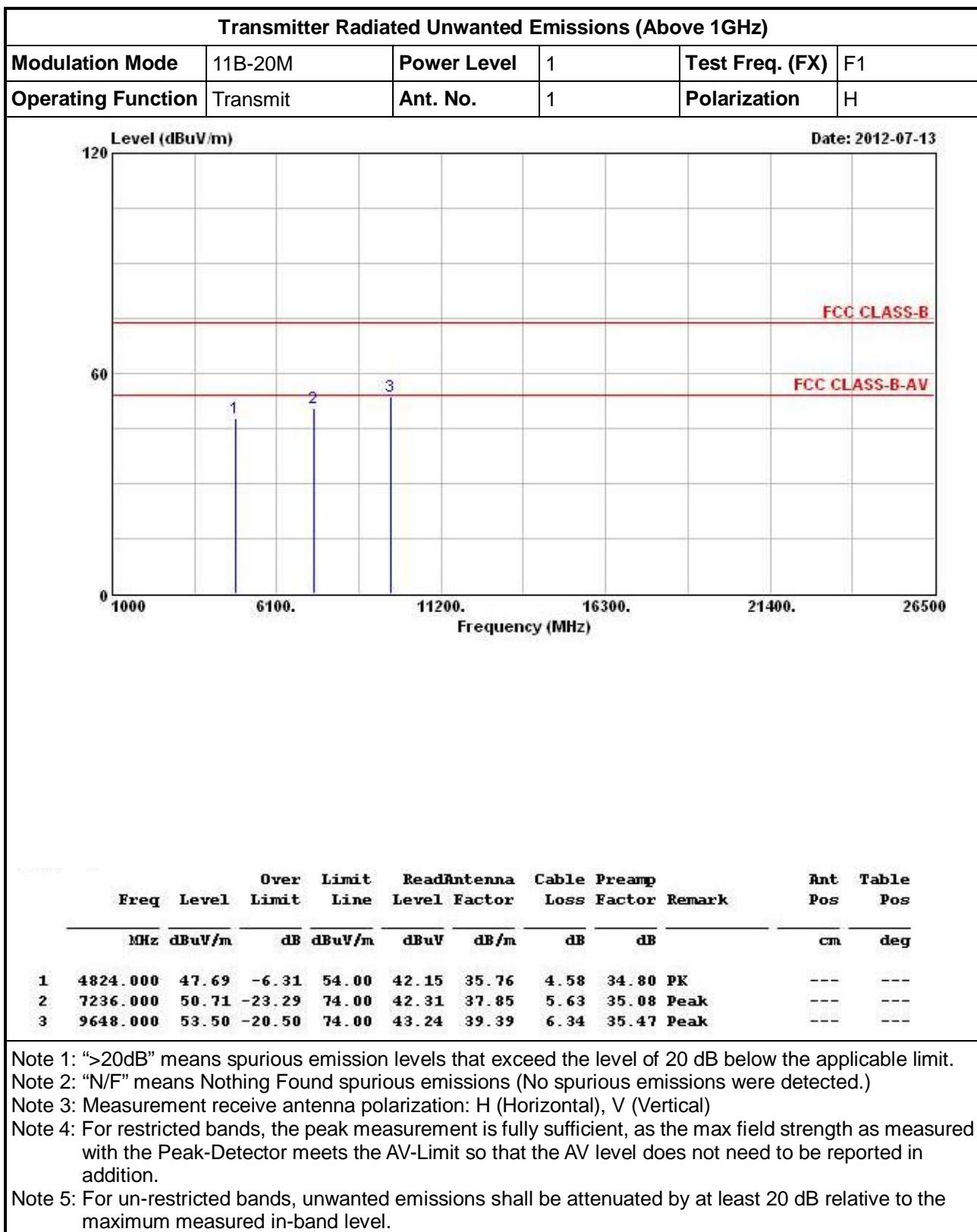


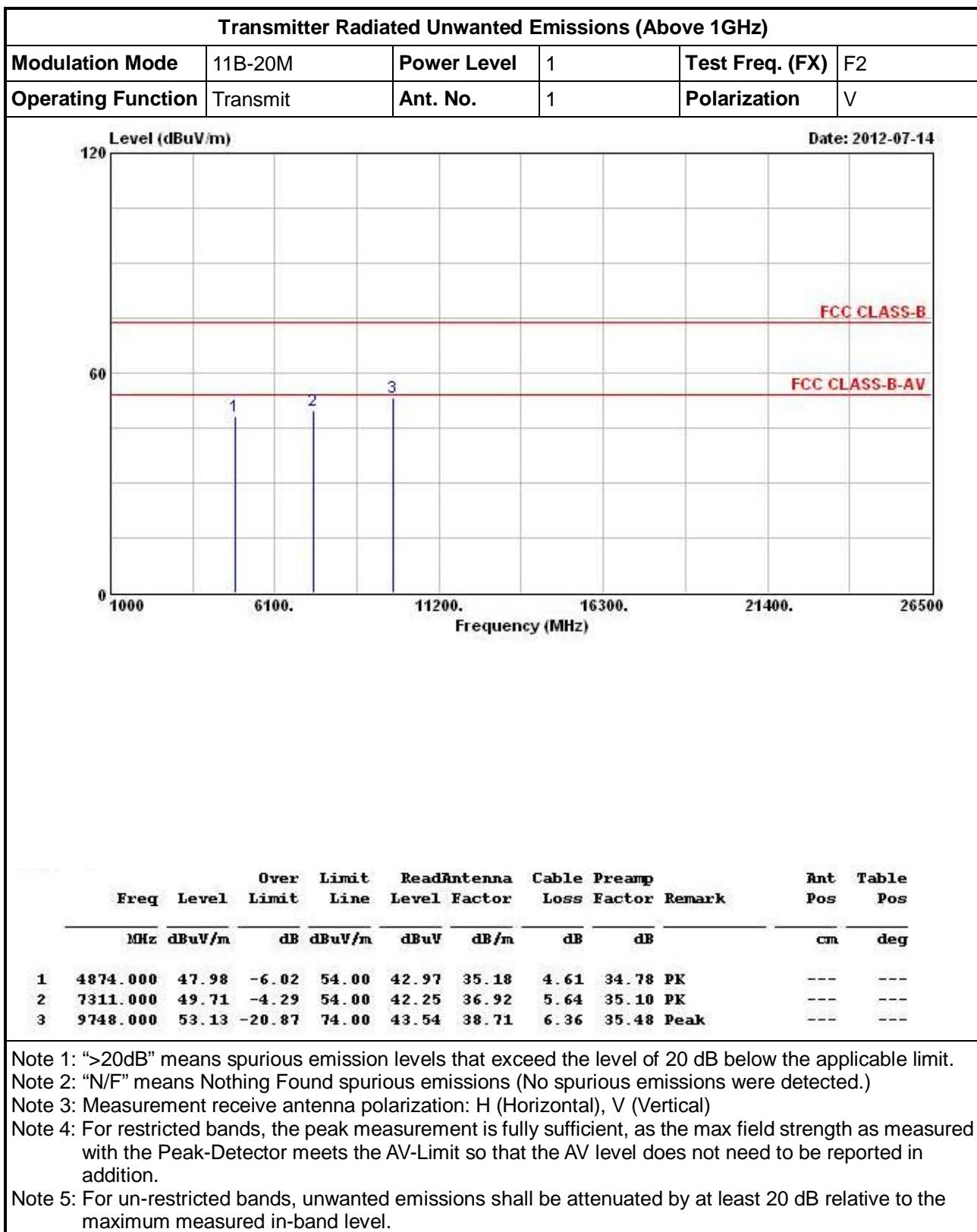




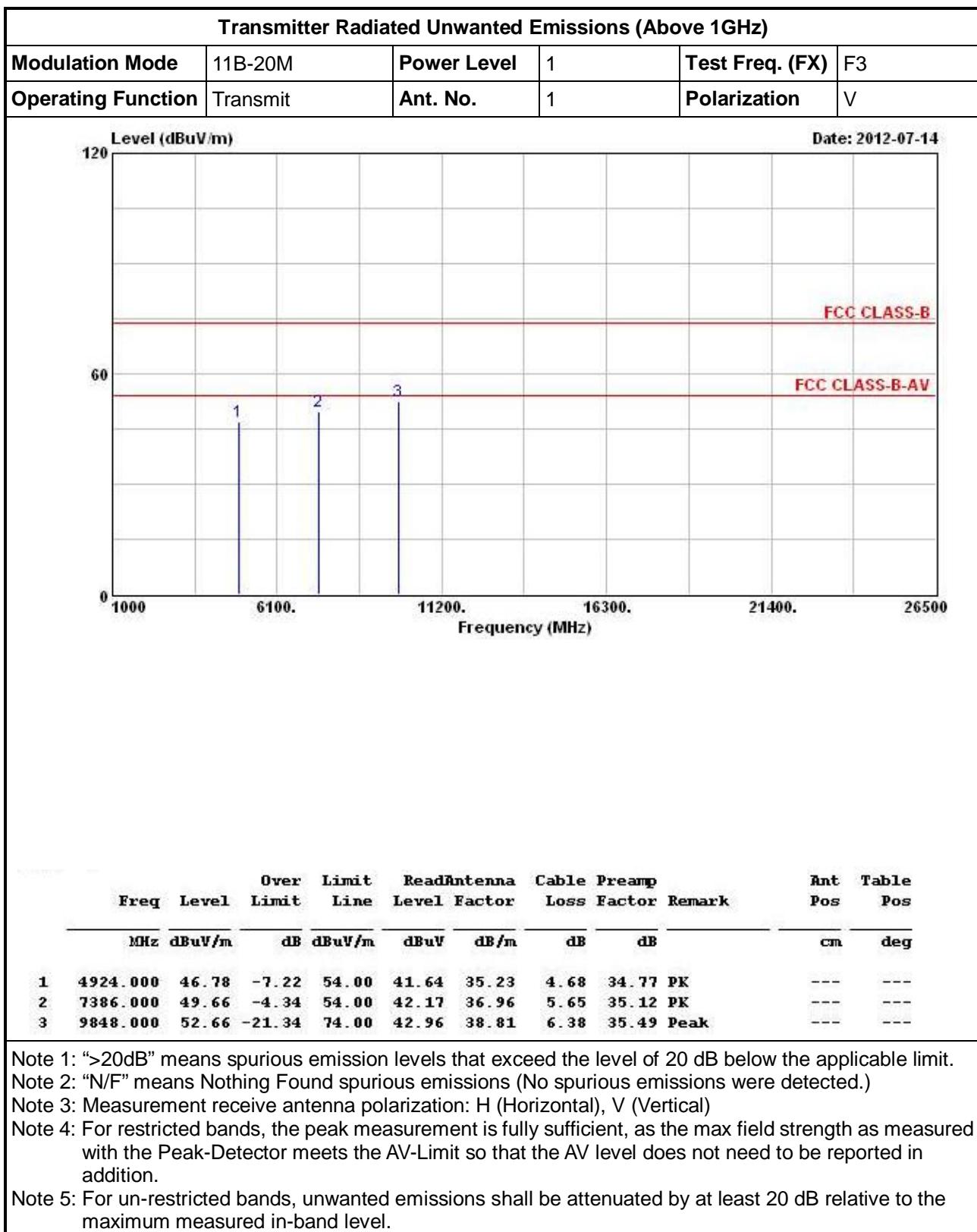
## 3.6.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11B-20M



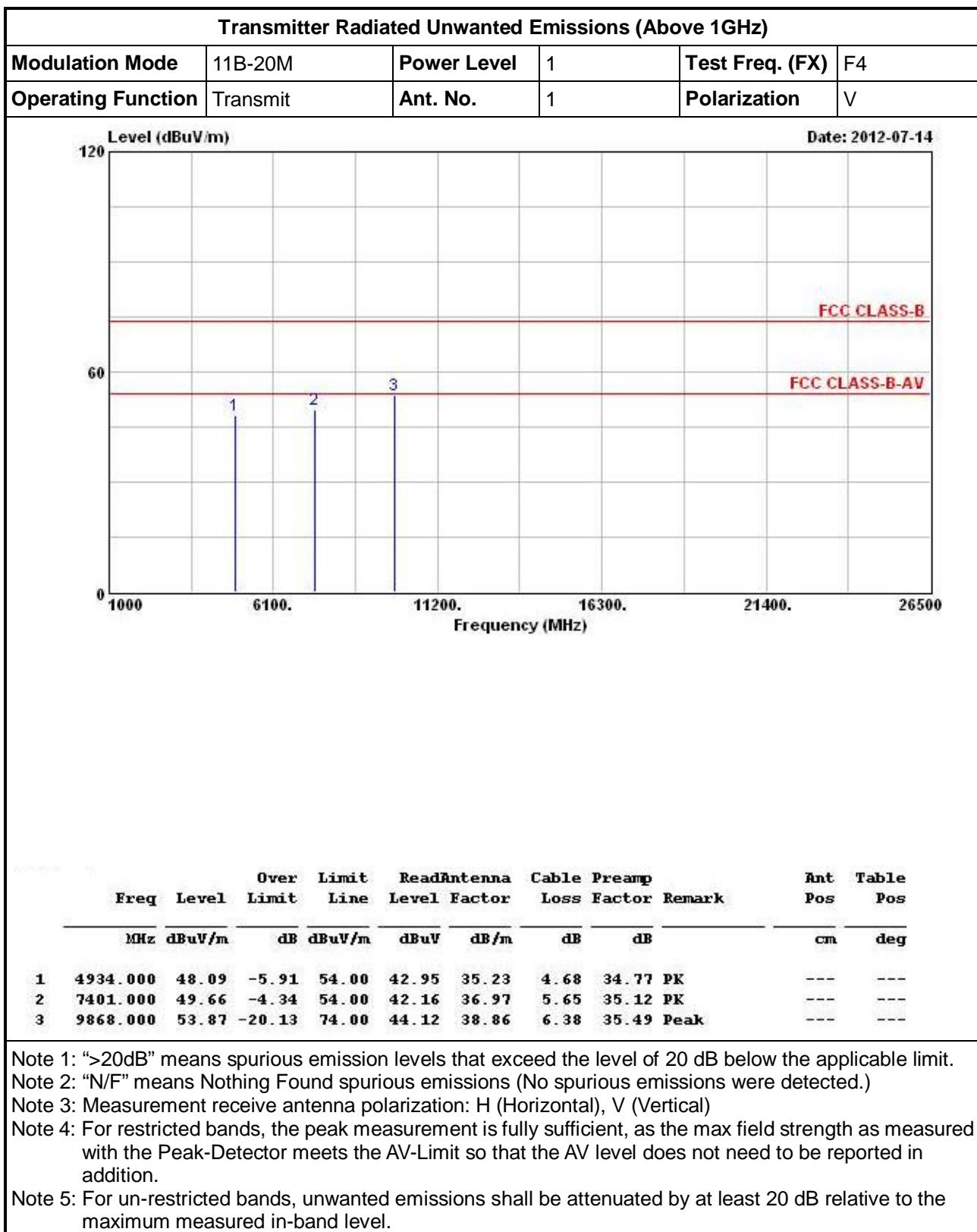


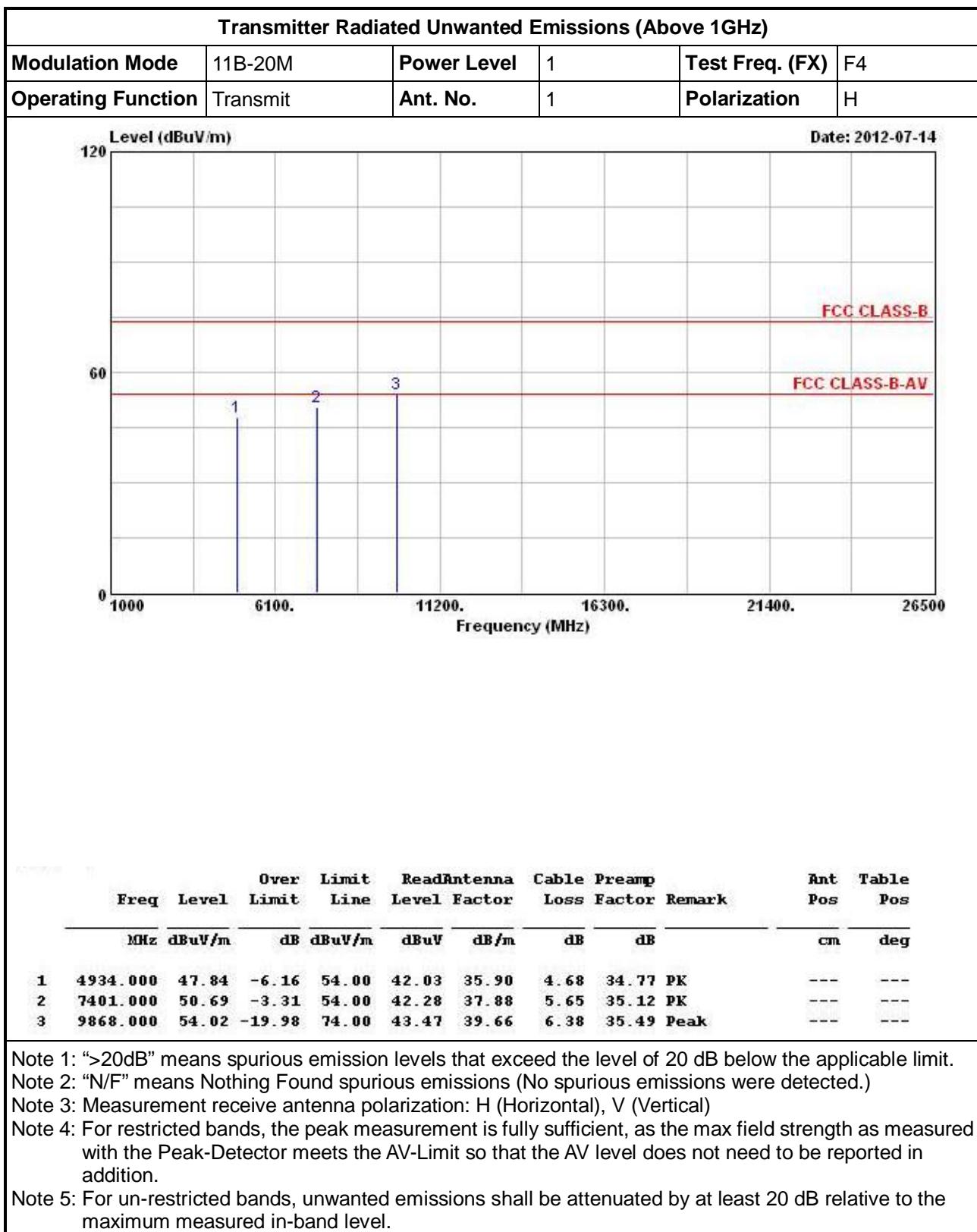


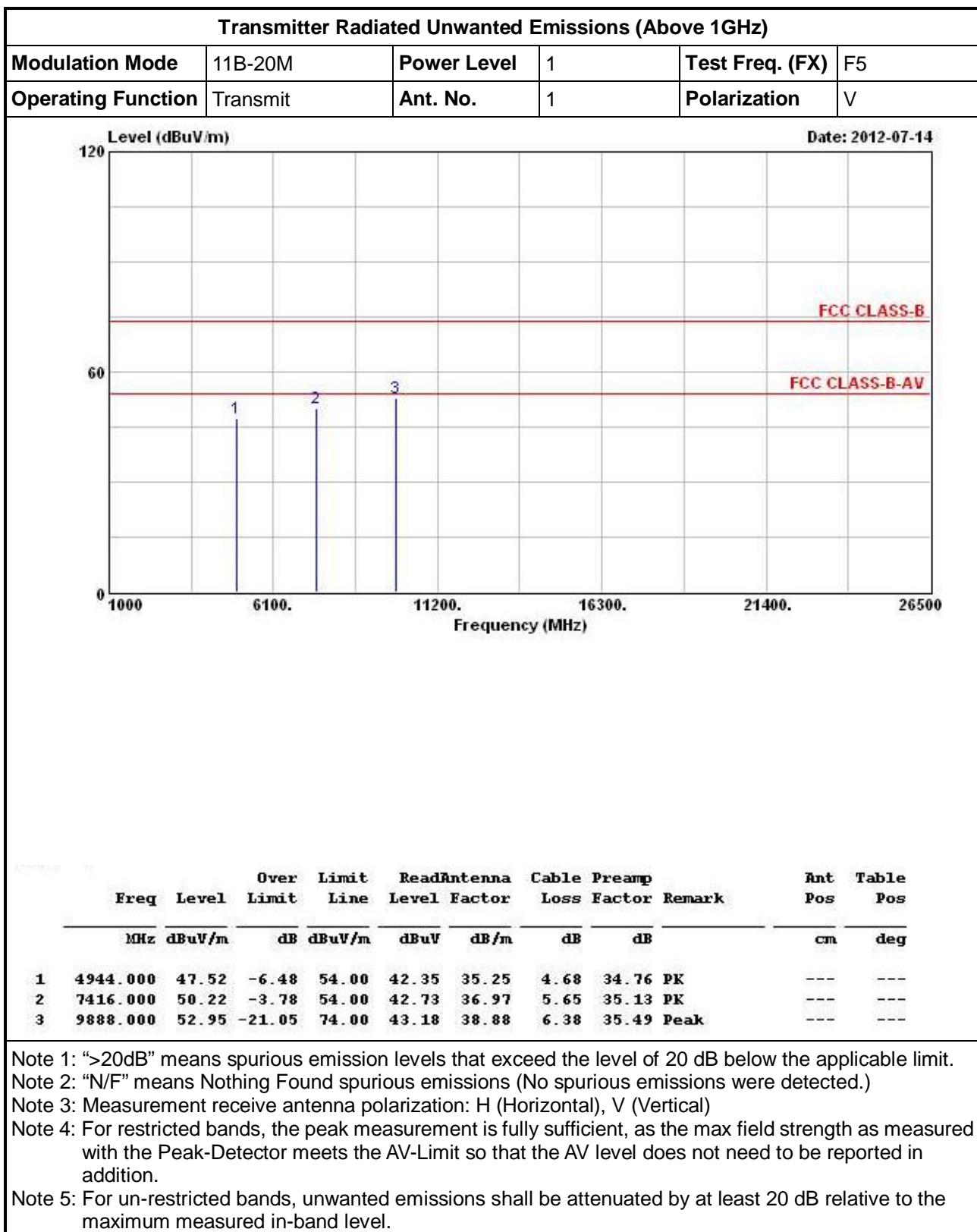


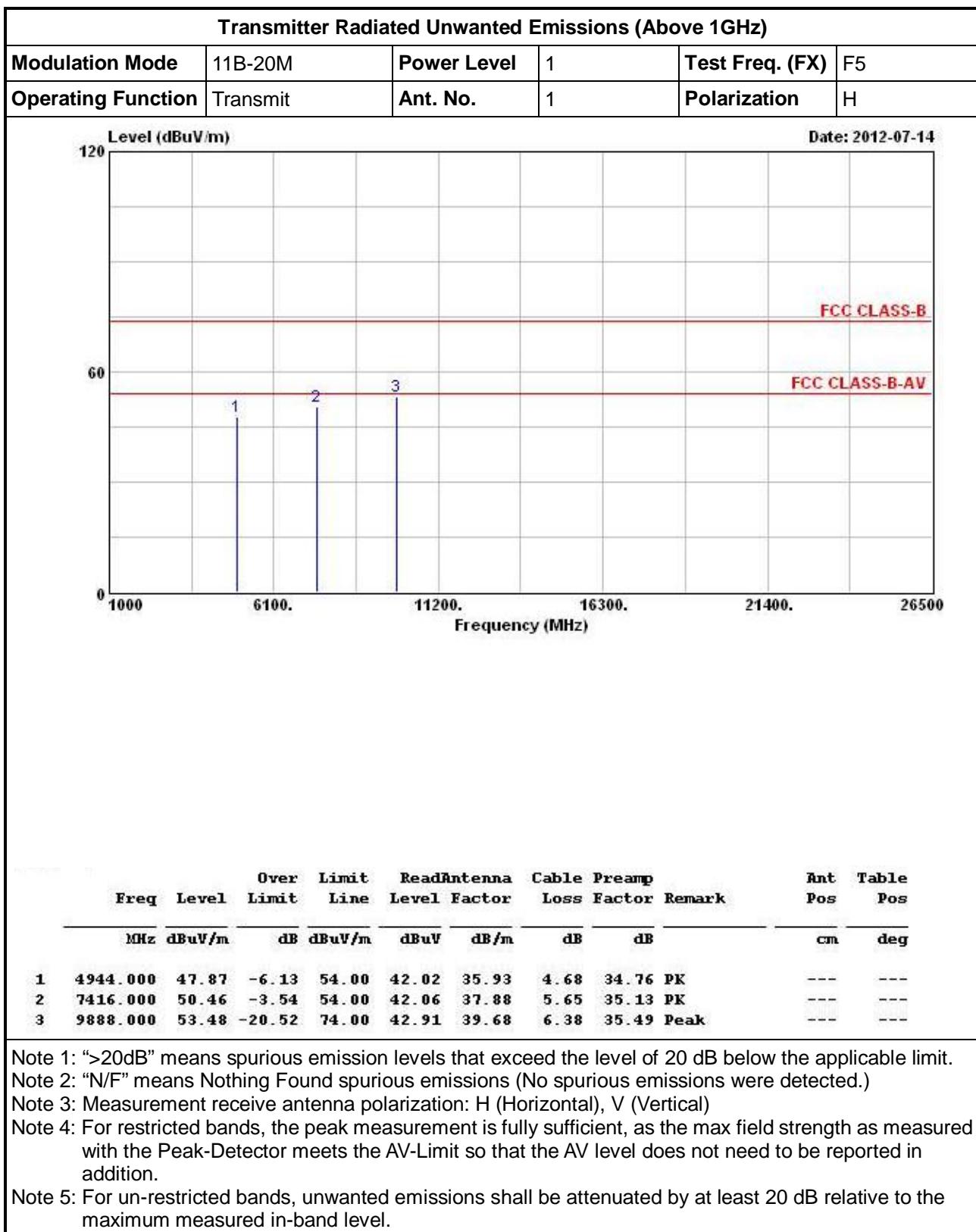




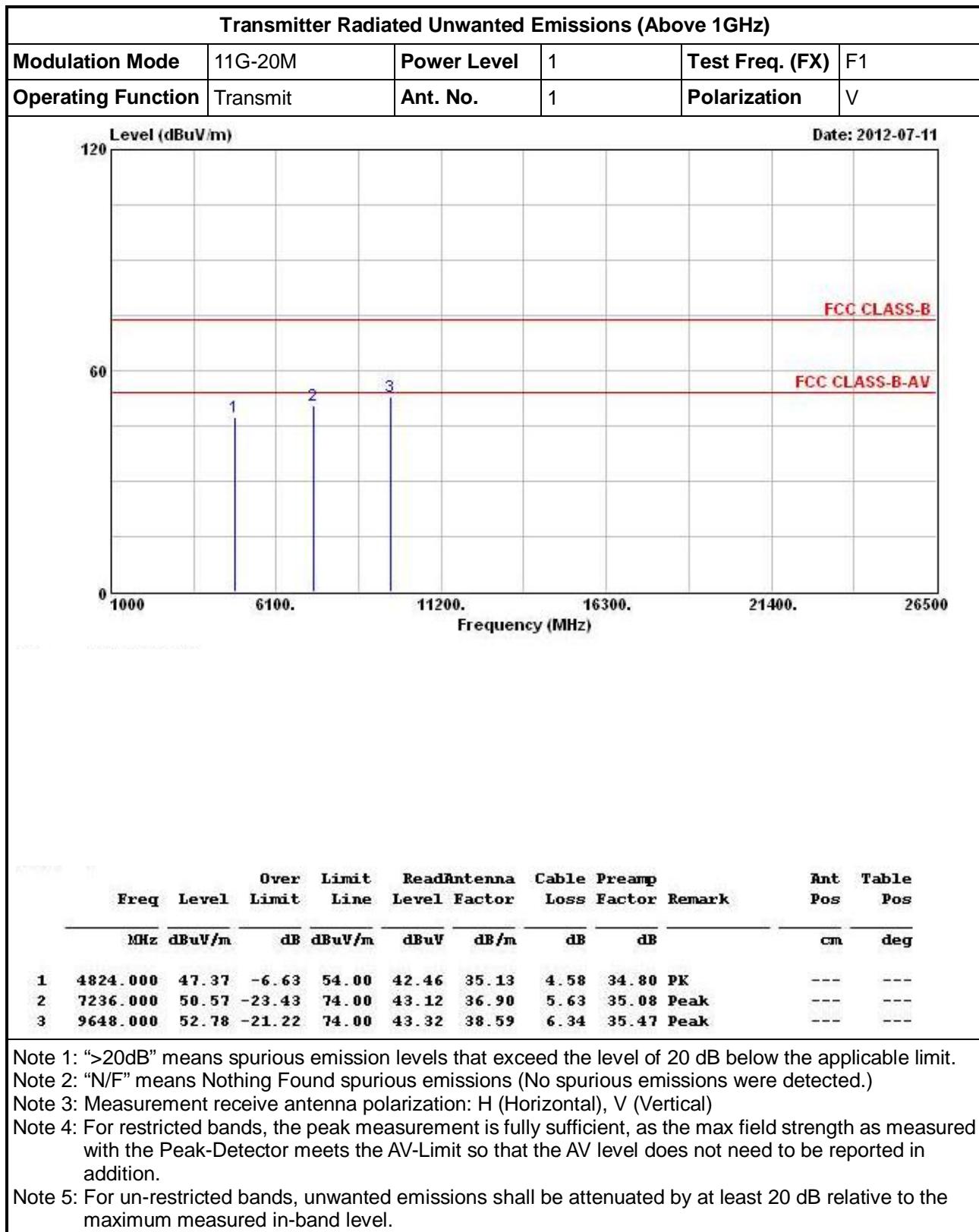


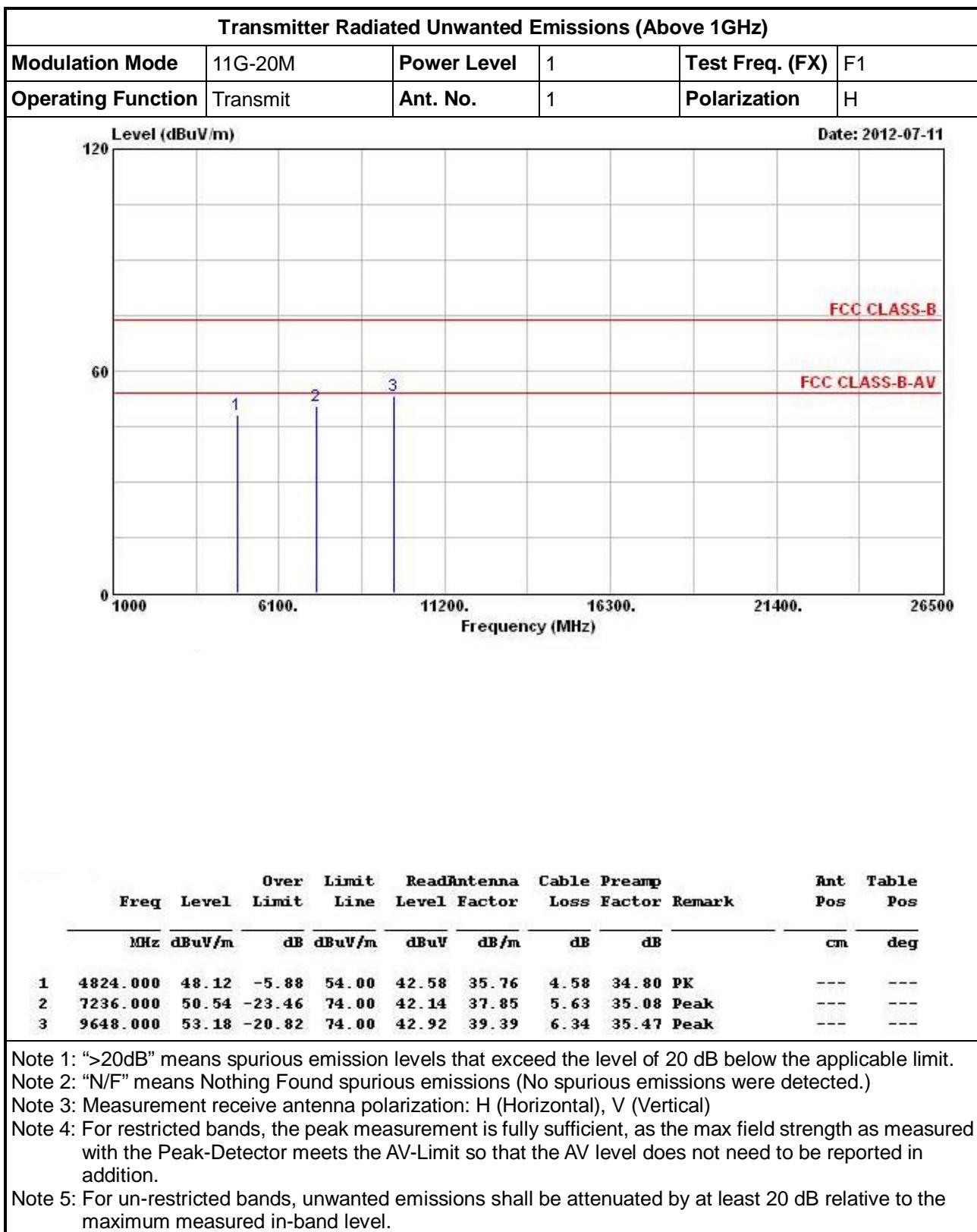


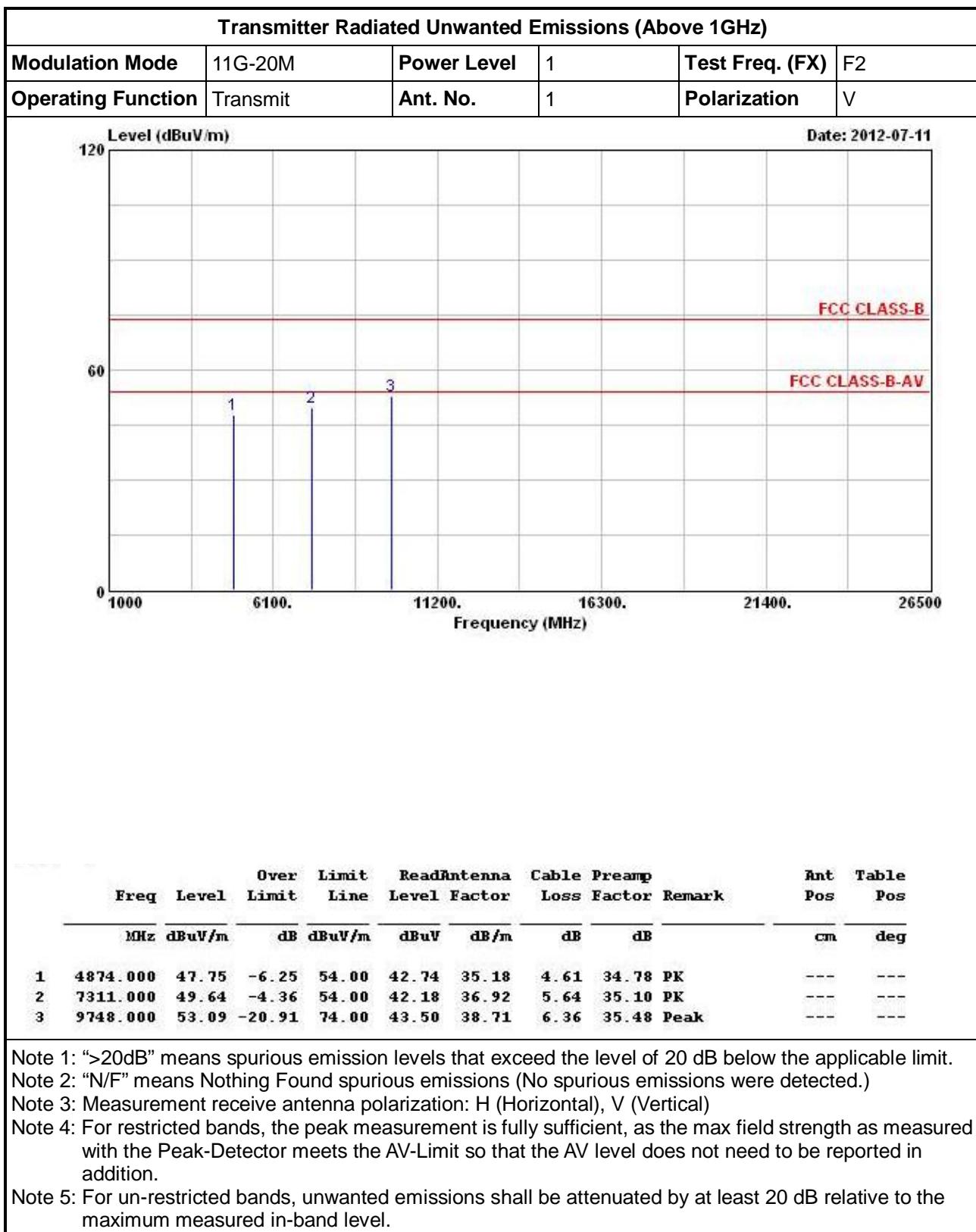


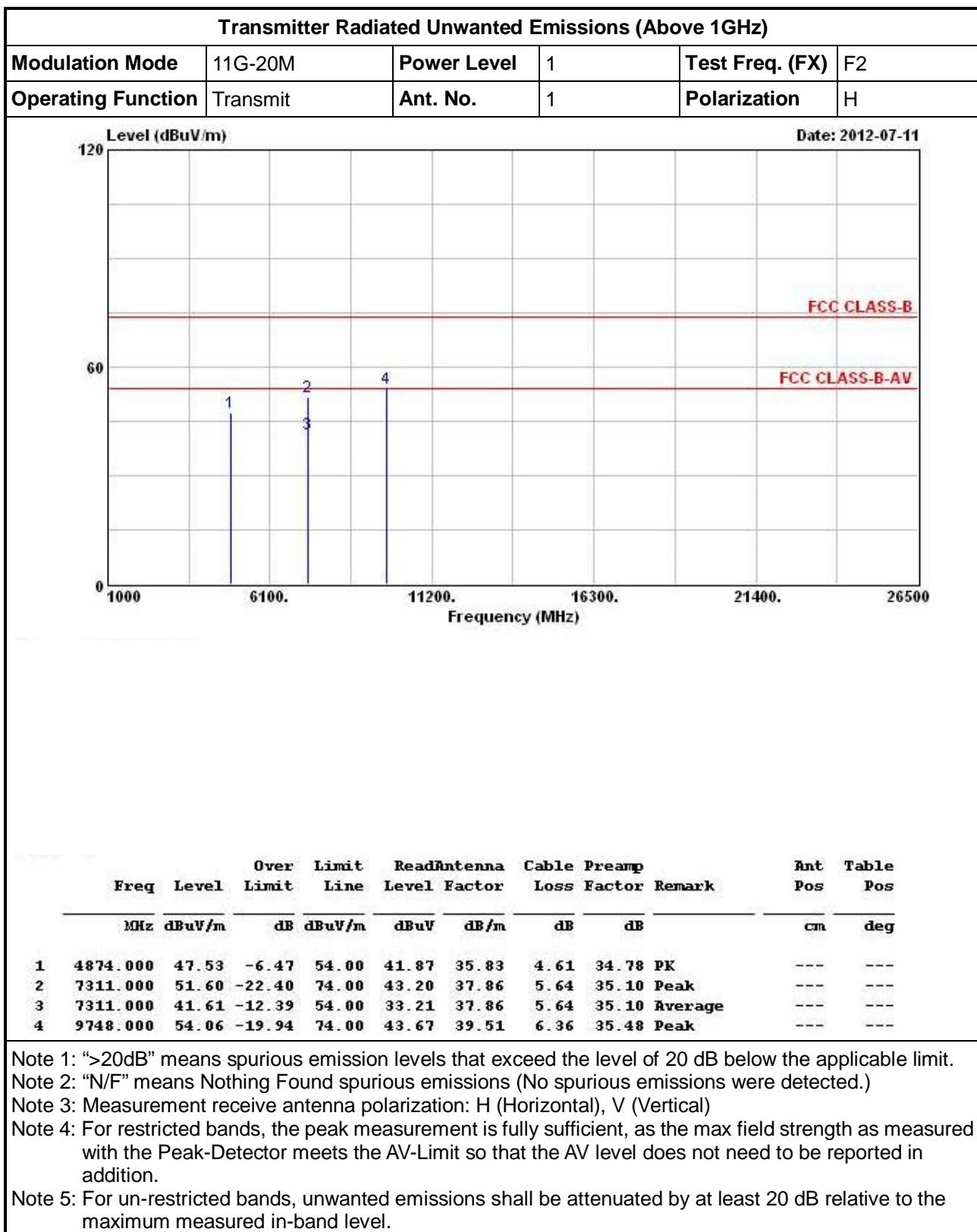


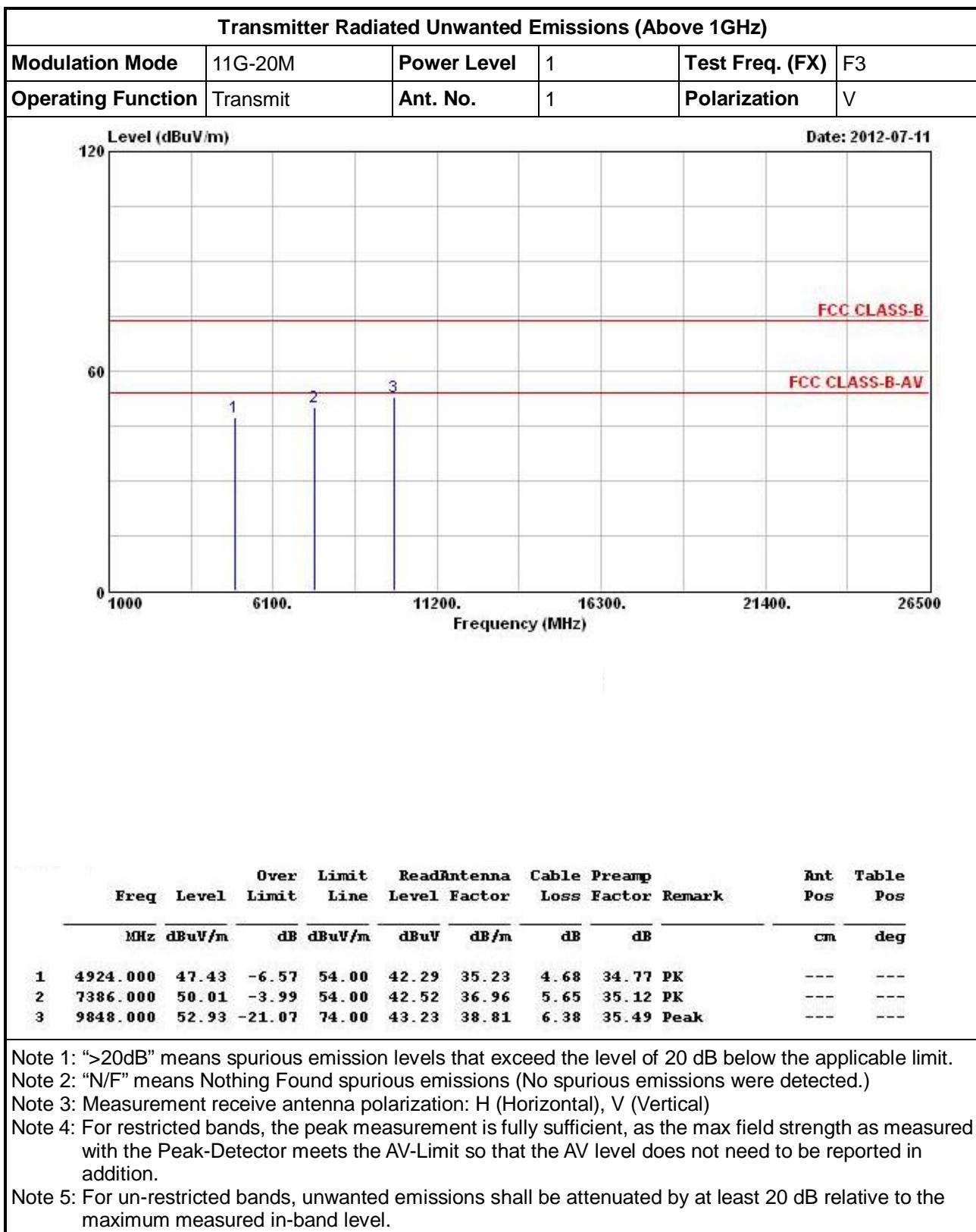
## 3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11G-20M

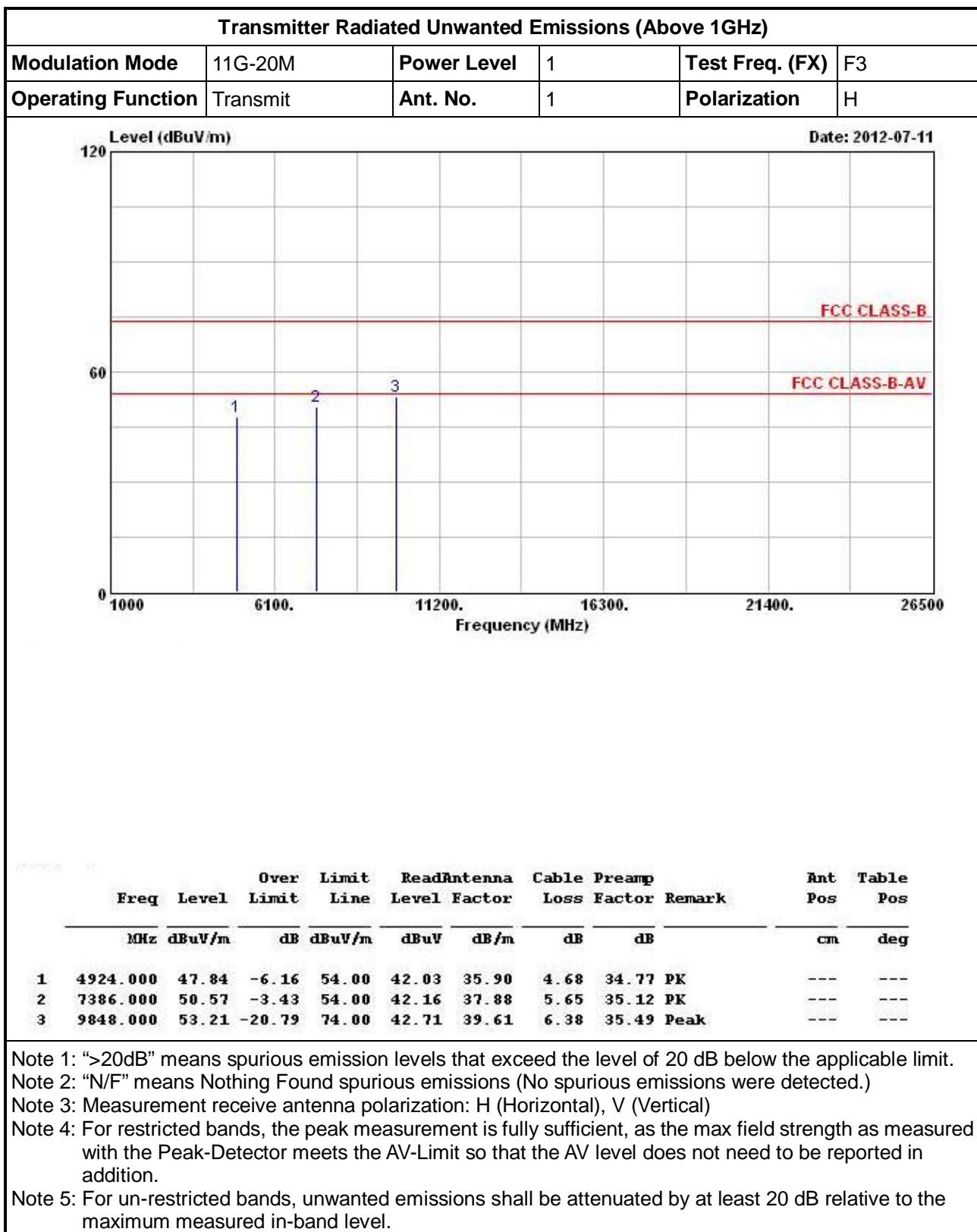


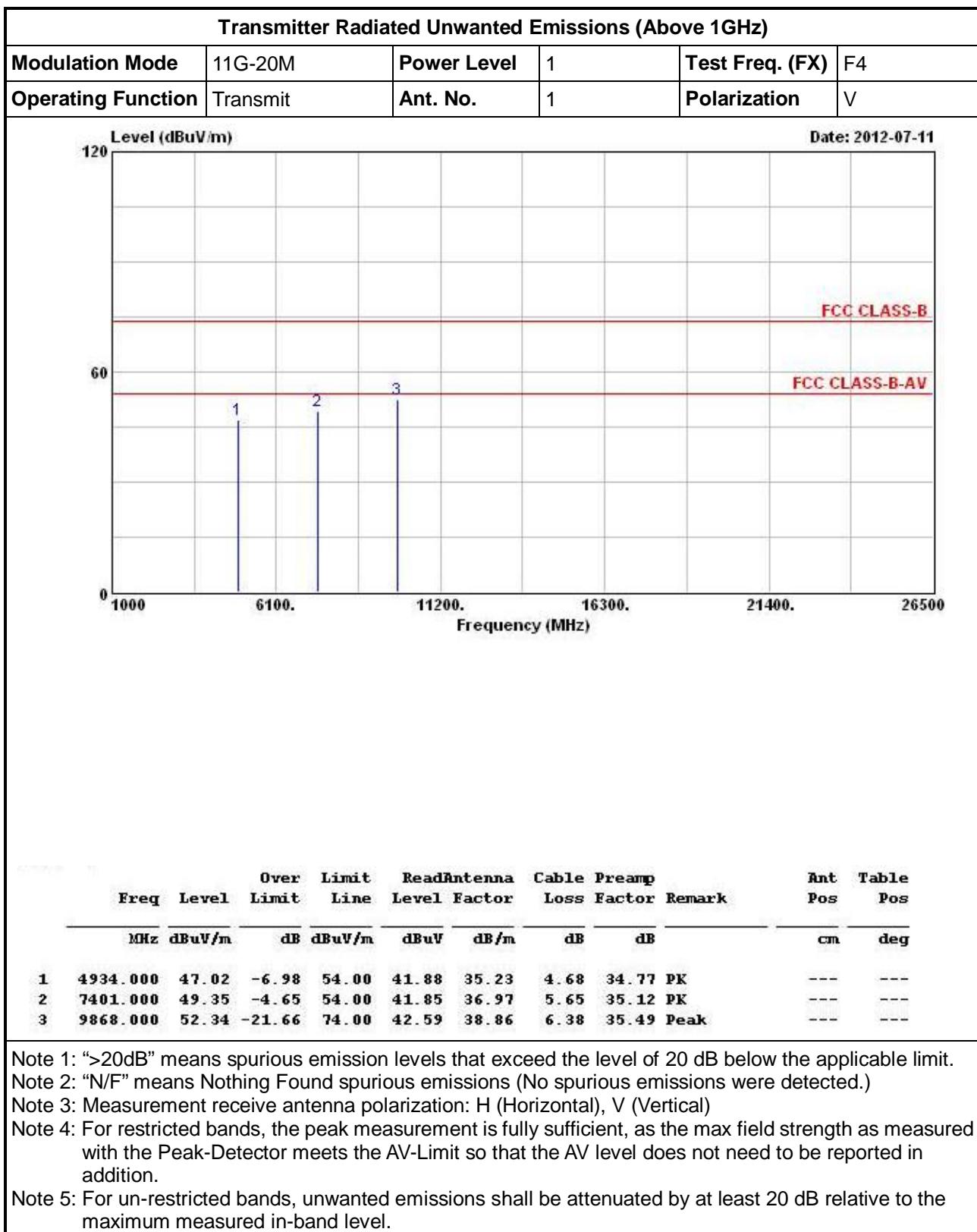


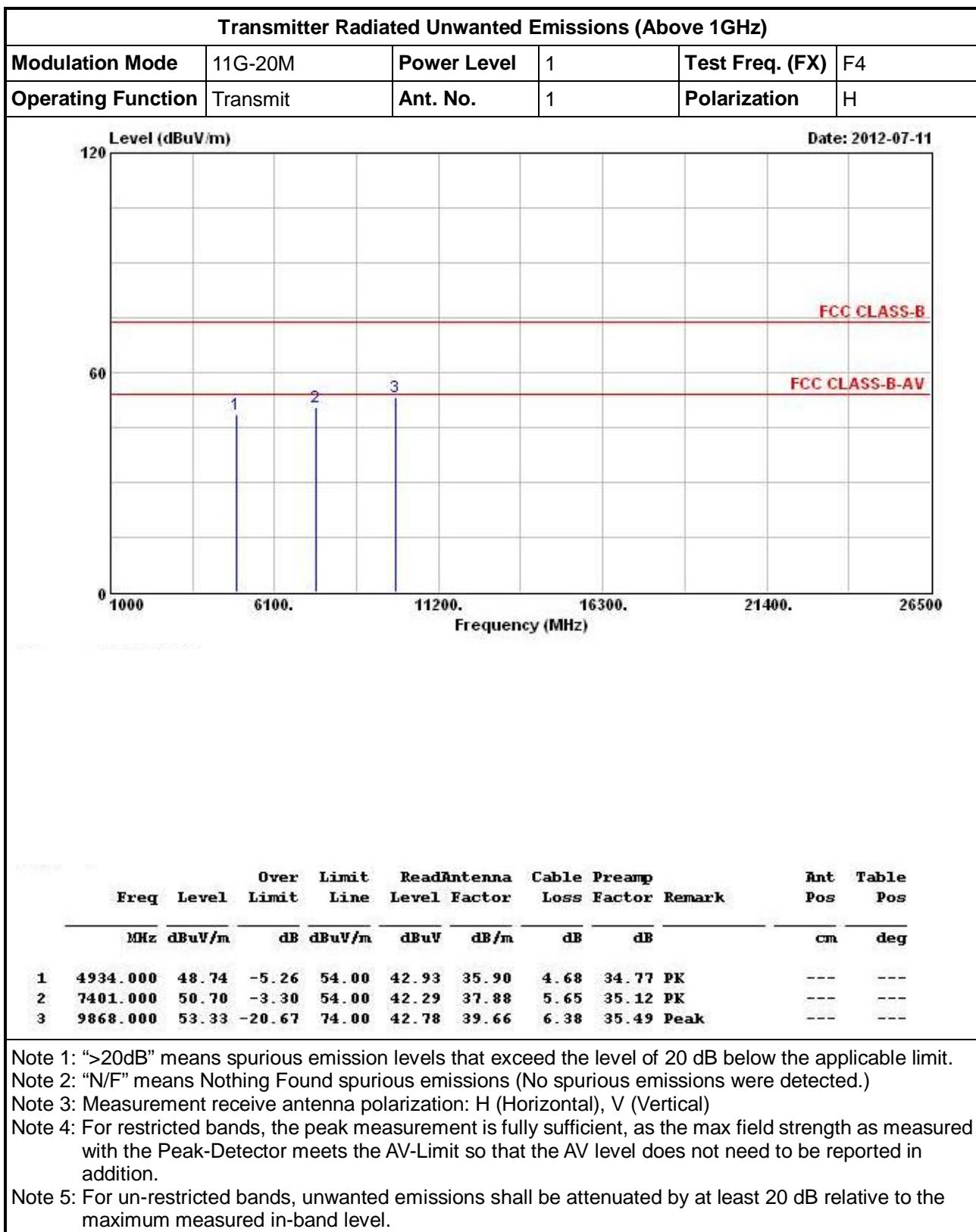








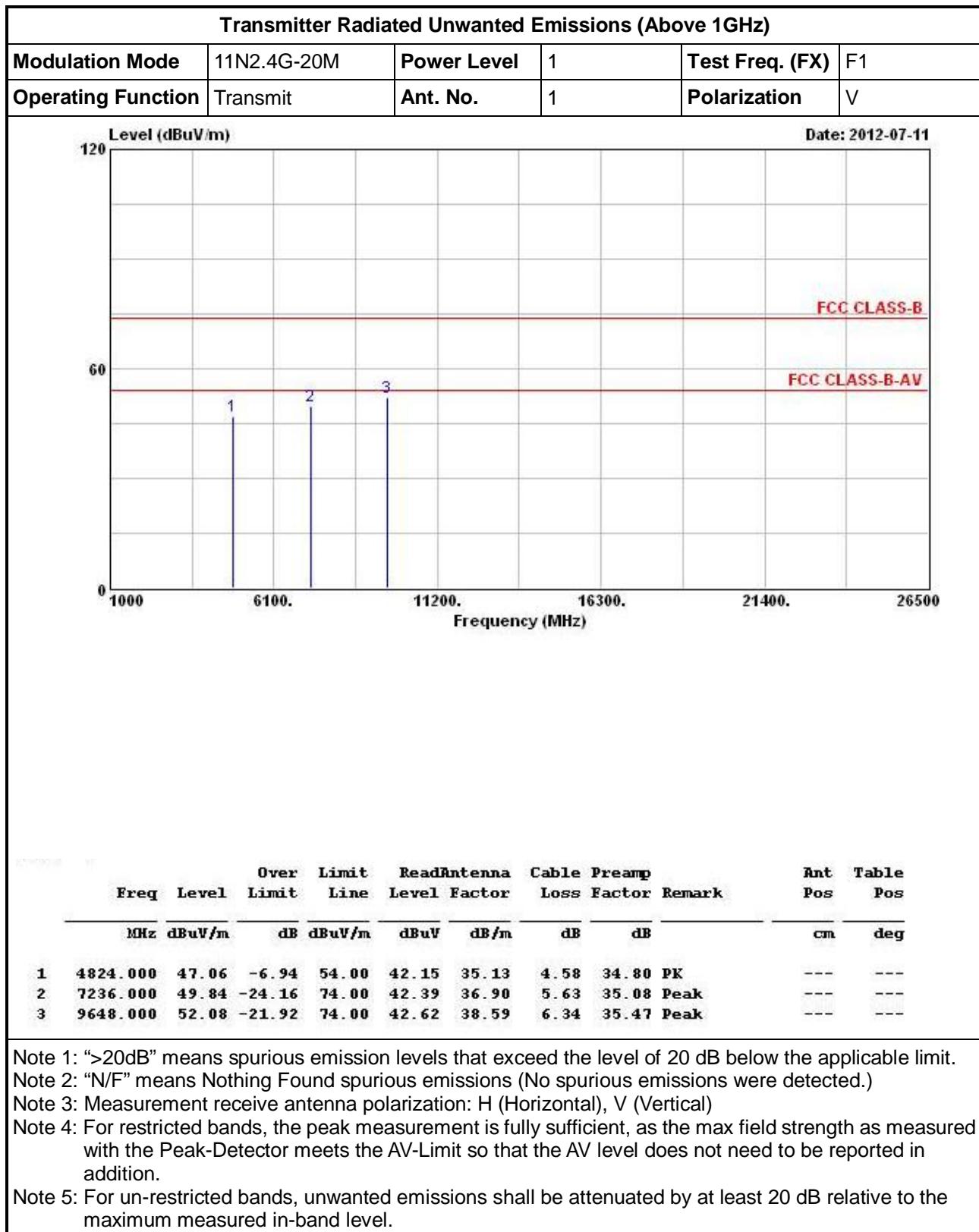


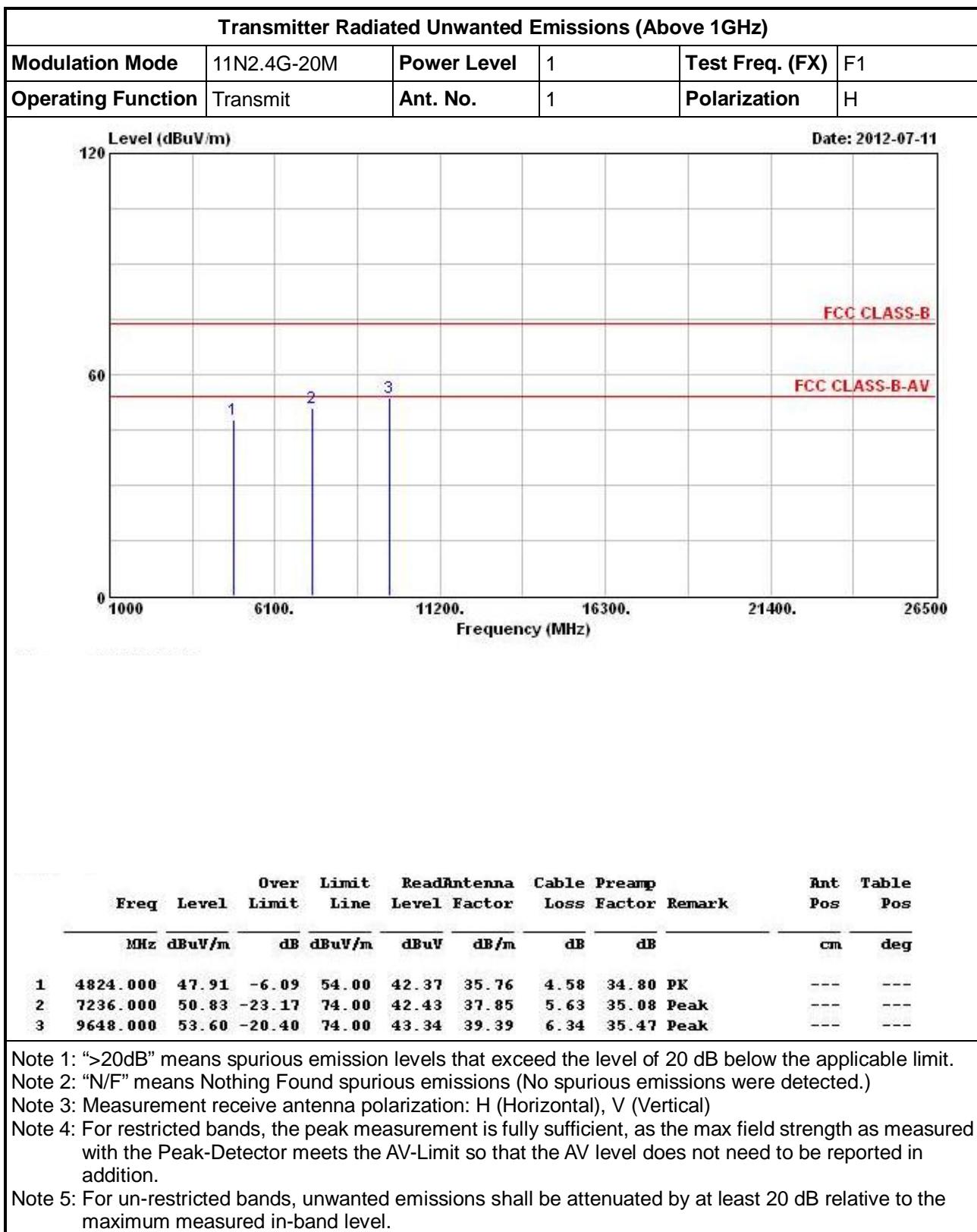




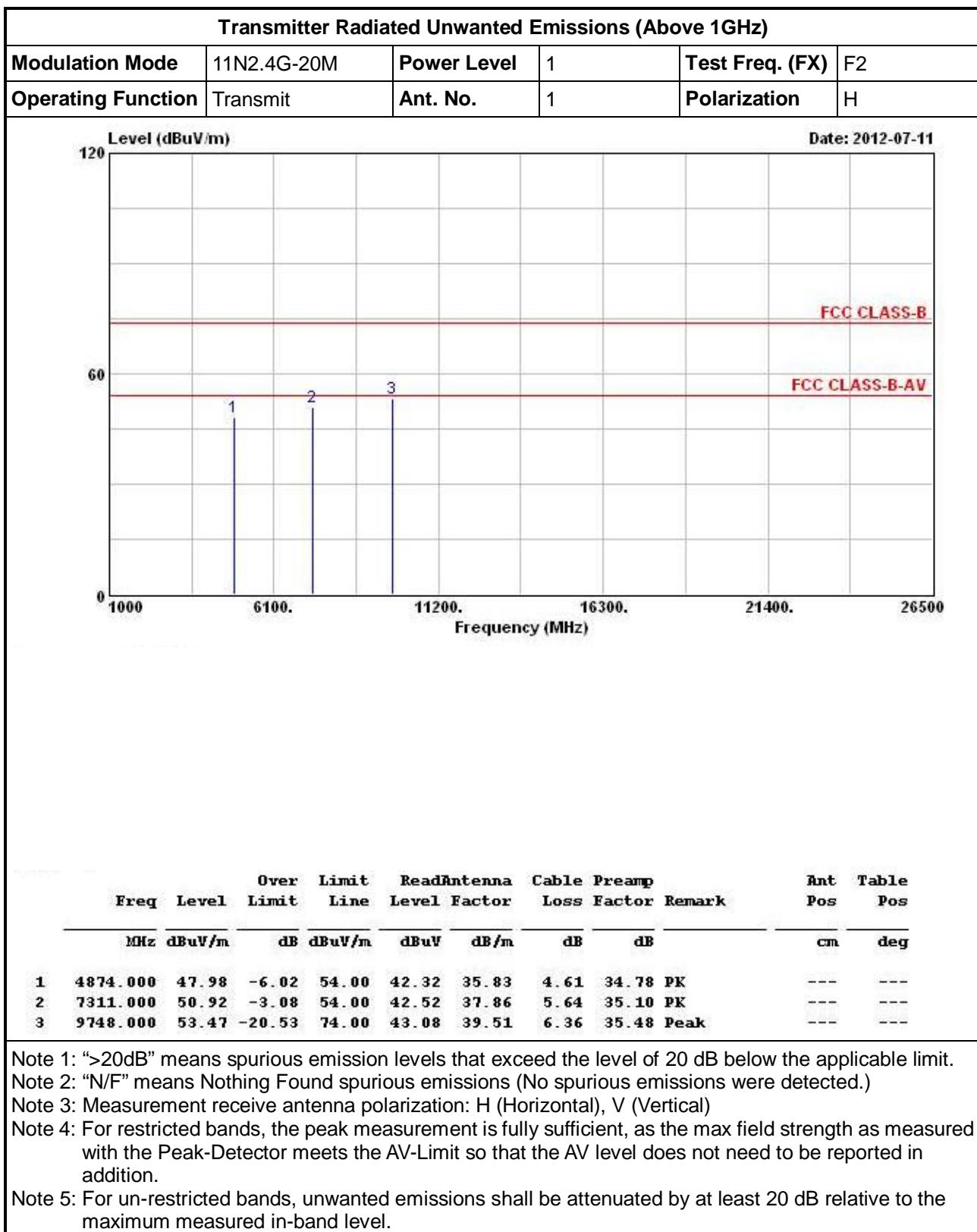


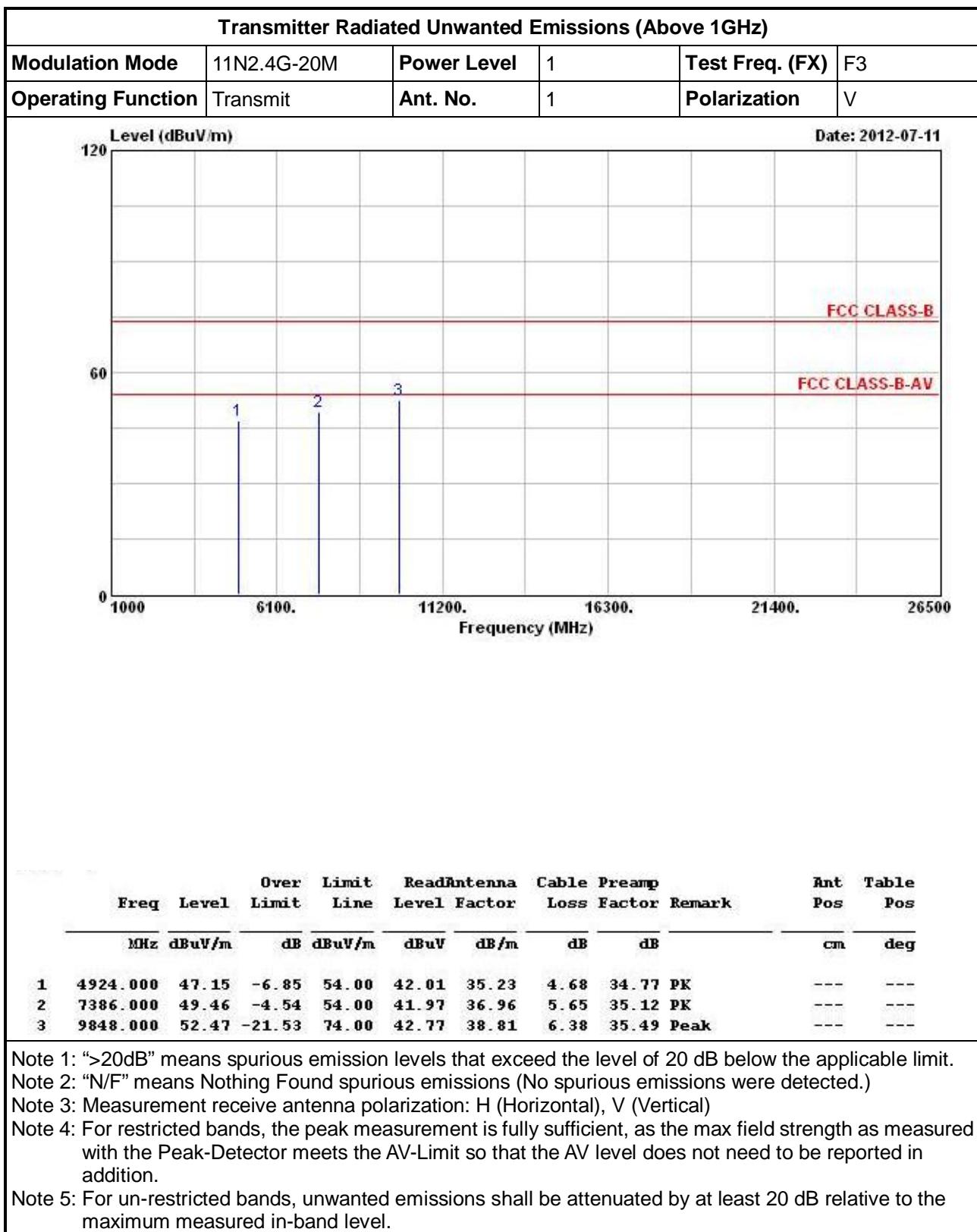
## 3.6.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11N2.4G-20M



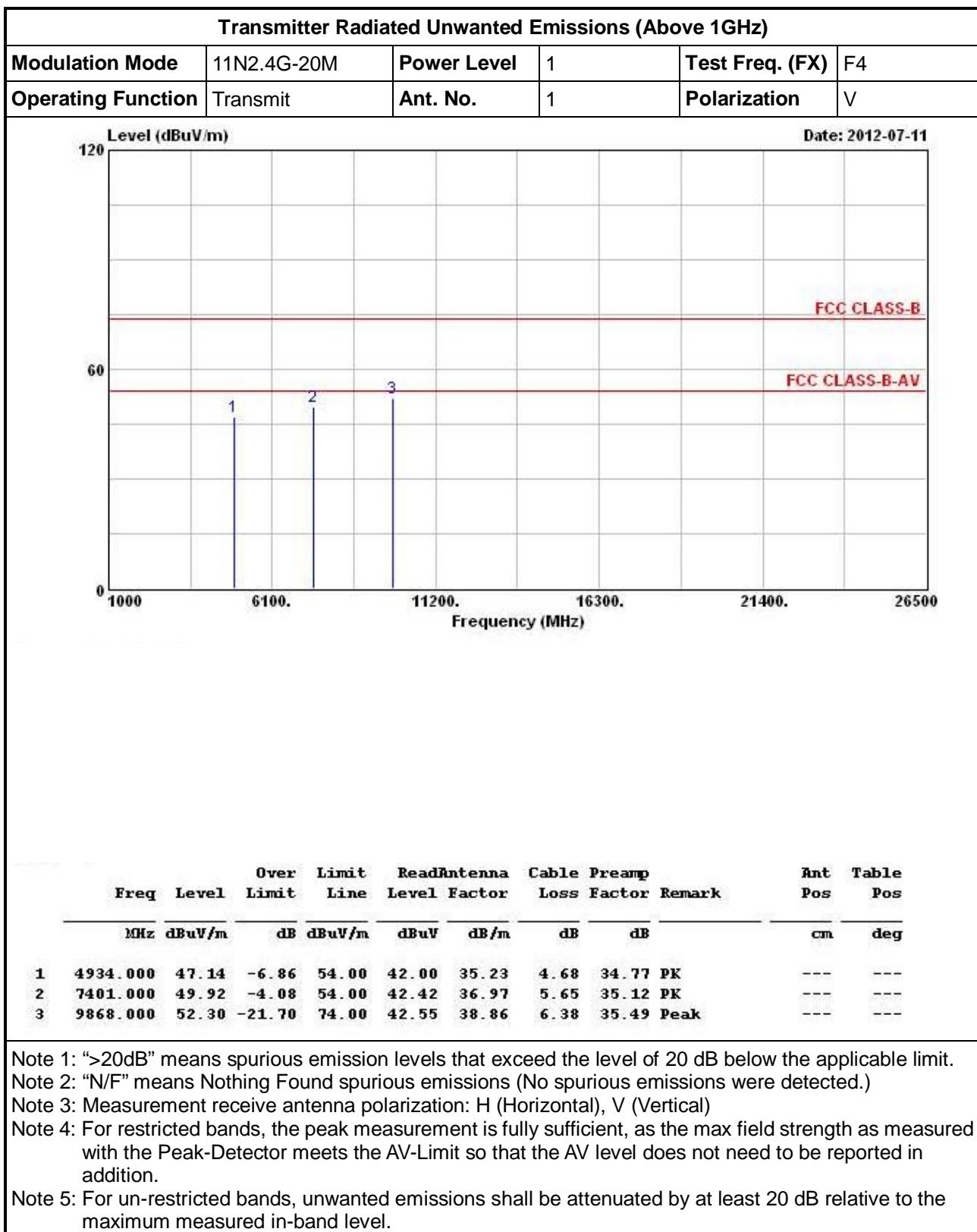


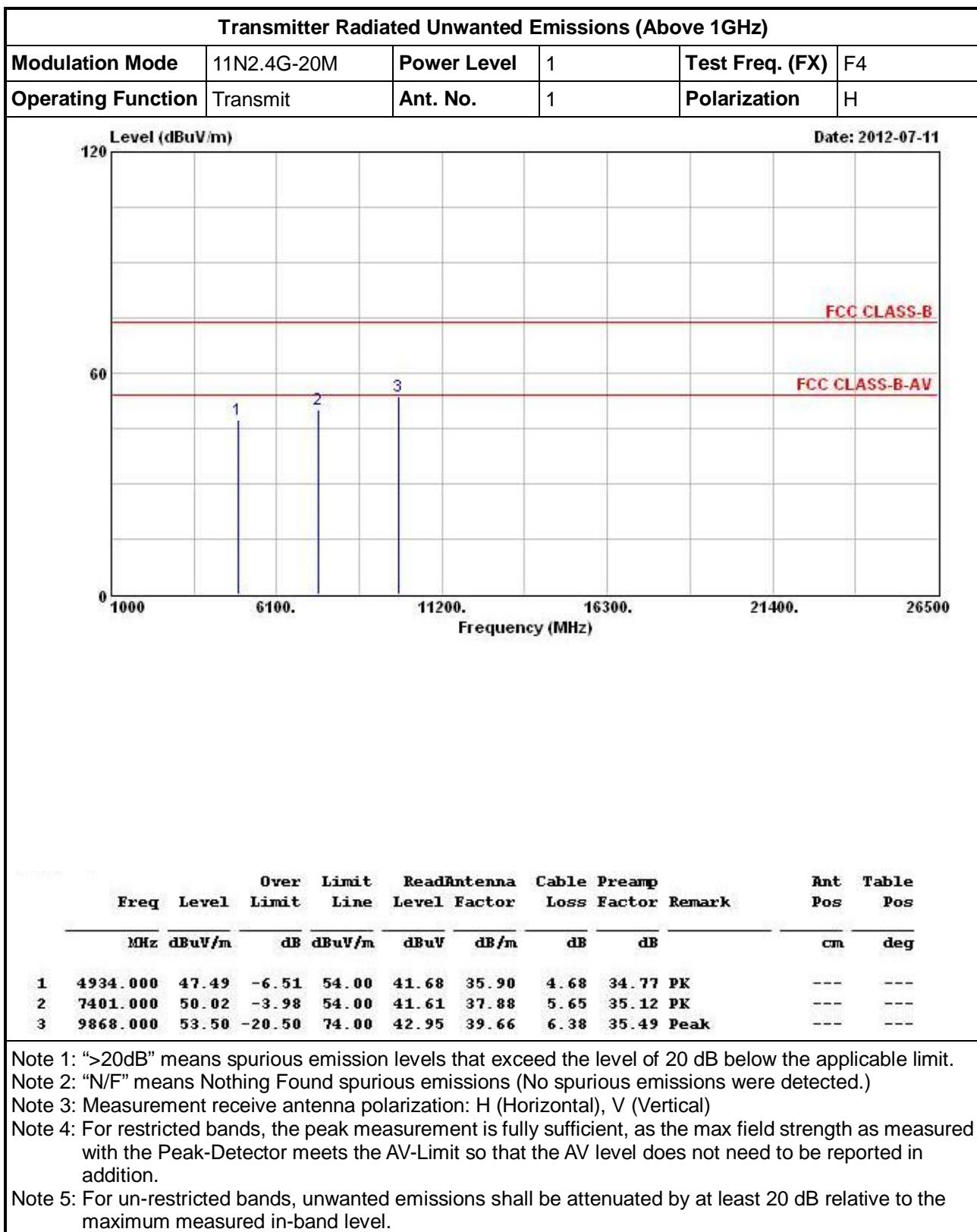




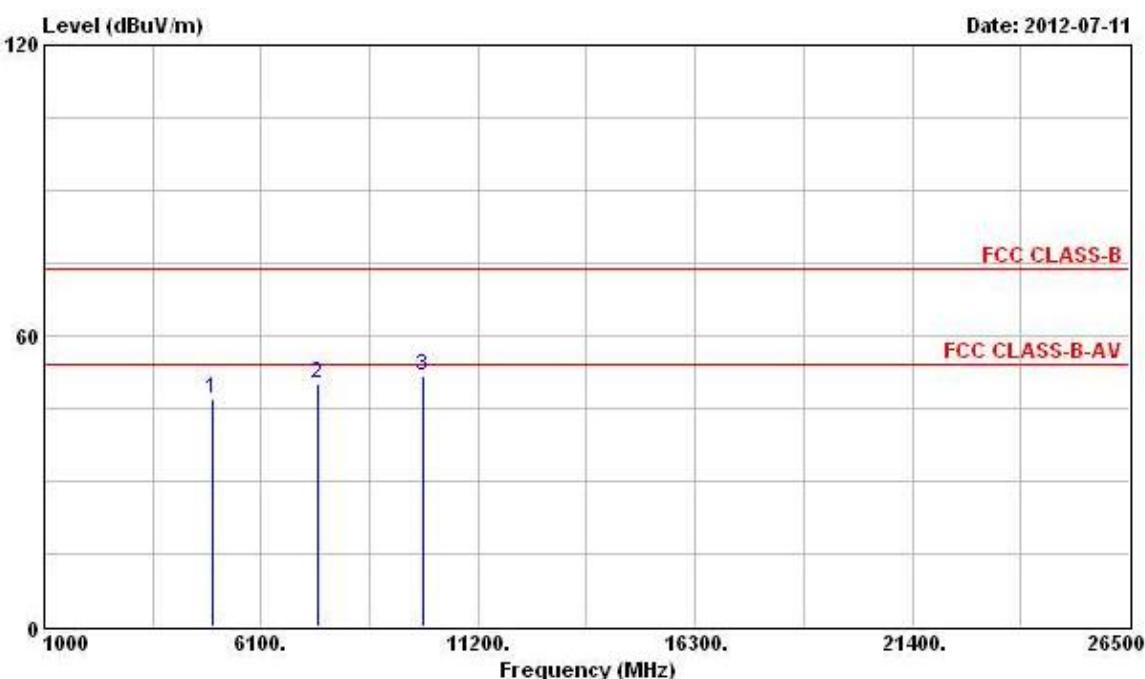








Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F5
Operating Function	Transmit	Ant. No.	1	Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4944.000	46.81	-7.19	54.00	41.64	35.25	4.68	34.76	PK	---
2	7416.000	50.02	-3.98	54.00	42.53	36.97	5.65	35.13	PK	---
3	9888.000	51.74	-22.26	74.00	41.97	38.88	6.38	35.49	Peak	---

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

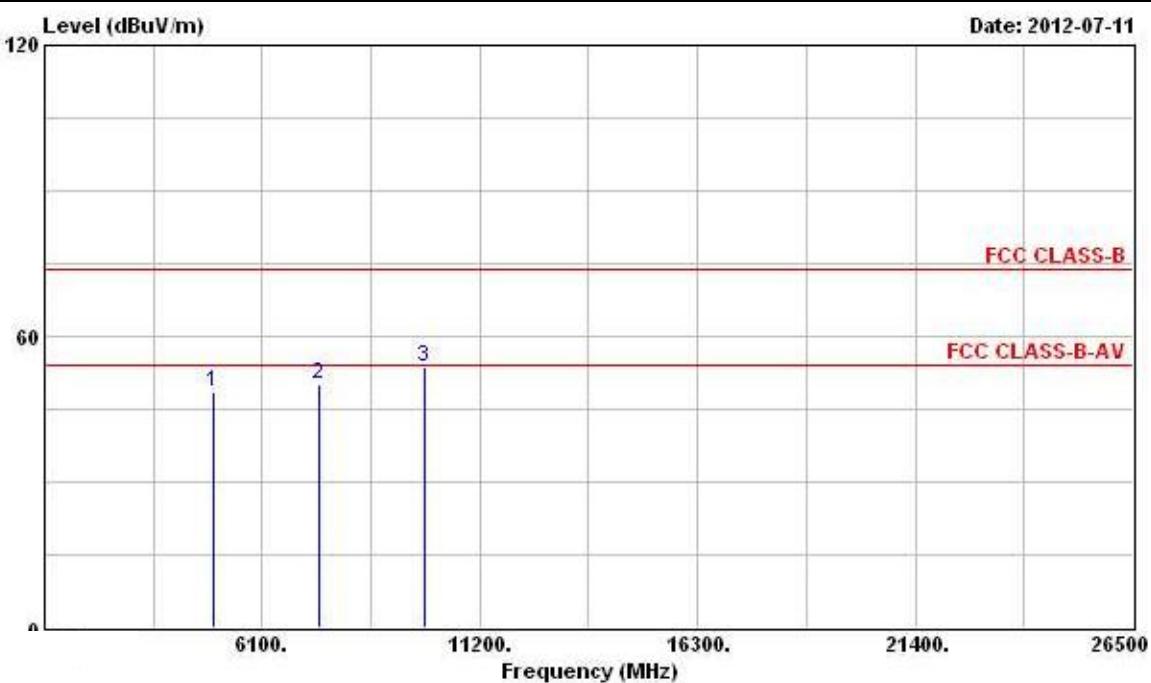
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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	11N2.4G-20M	Power Level	1	Test Freq. (FX)	F5
Operating Function	Transmit	Ant. No.	1	Polarization	H



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	4944.000	48.40	-5.60	54.00	42.55	35.93	4.68	34.76	PK	---
2	7416.000	49.98	-4.02	54.00	41.58	37.88	5.65	35.13	PK	---
3	9888.000	53.85	-20.15	74.00	43.28	39.68	6.38	35.49	Peak	---

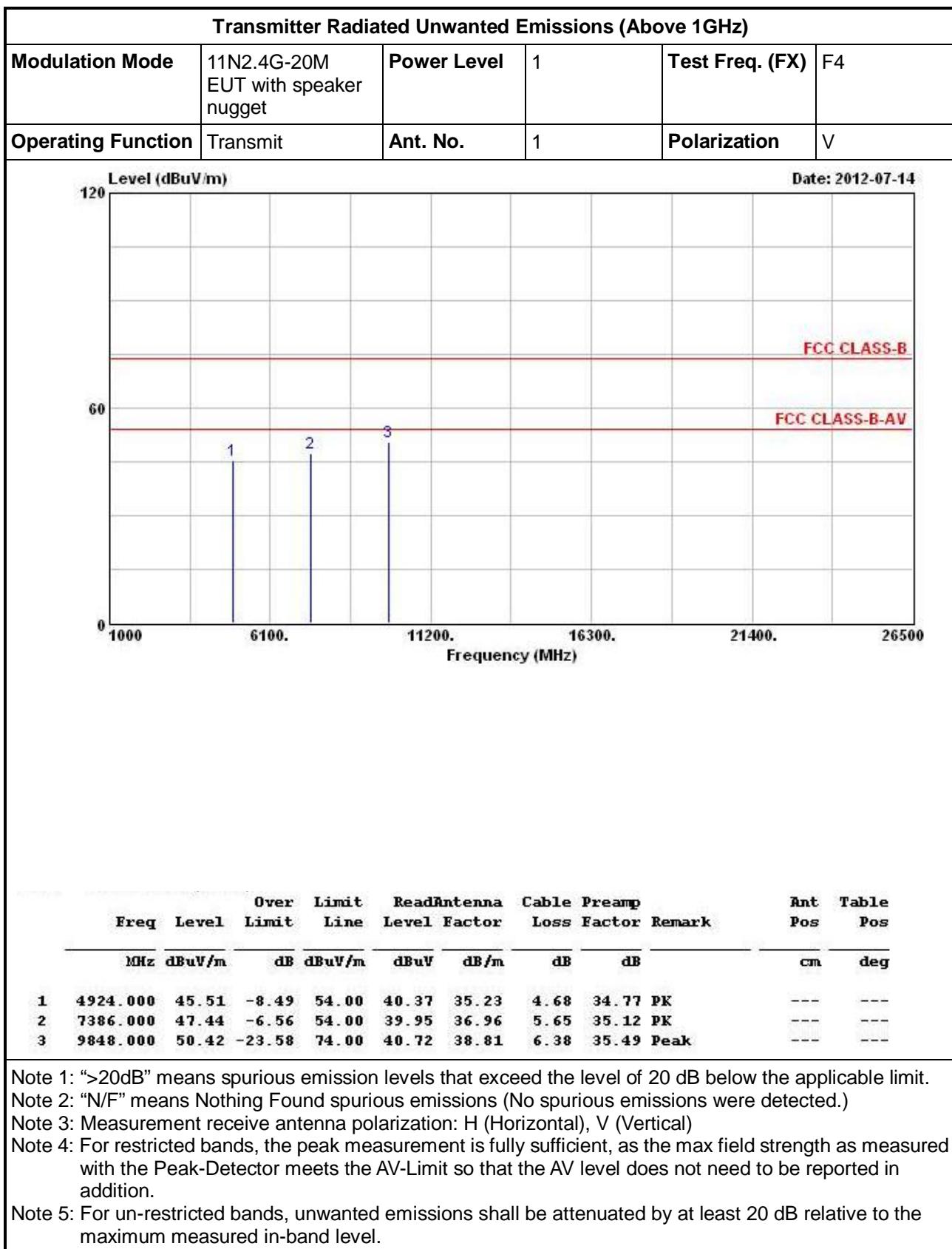
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.

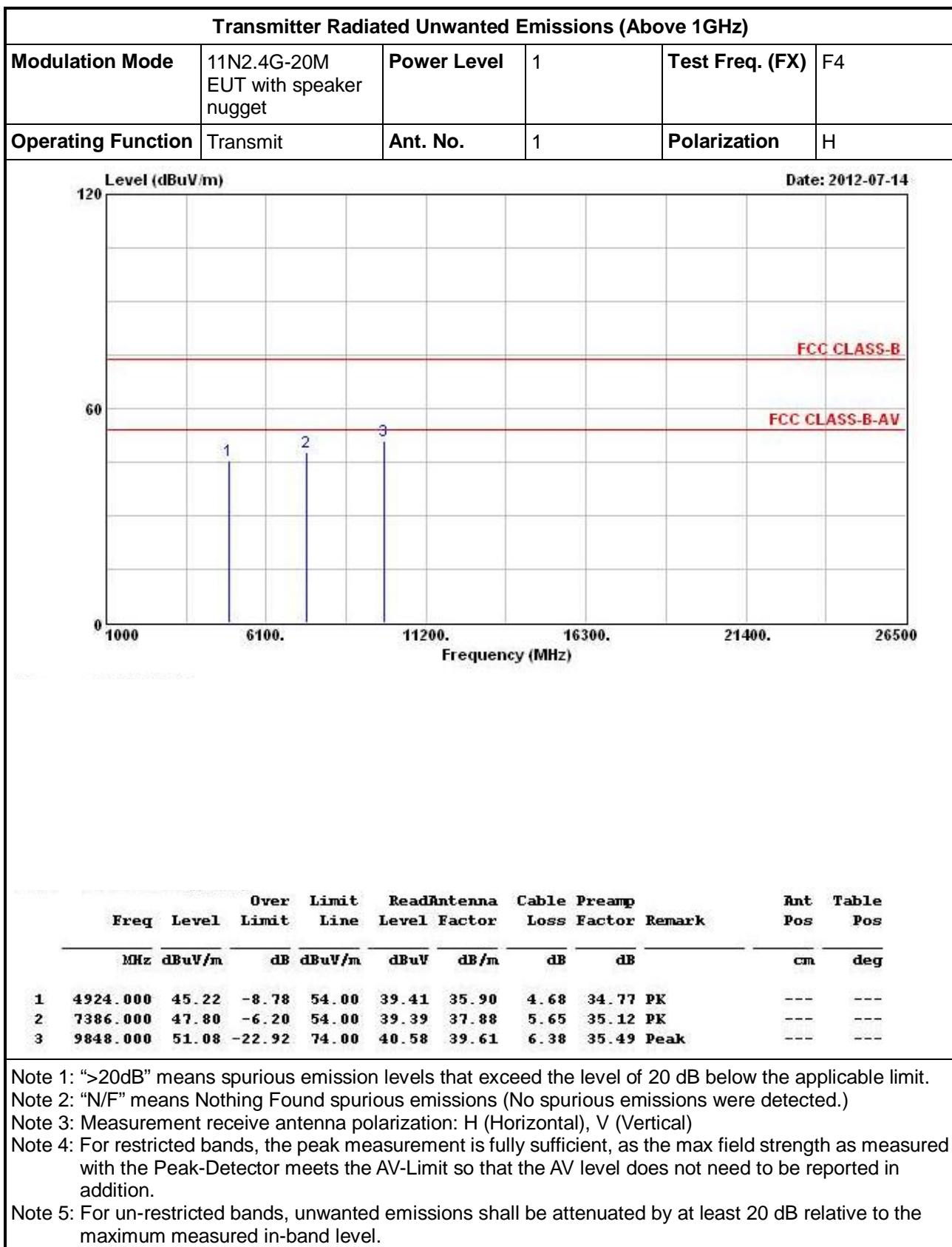
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

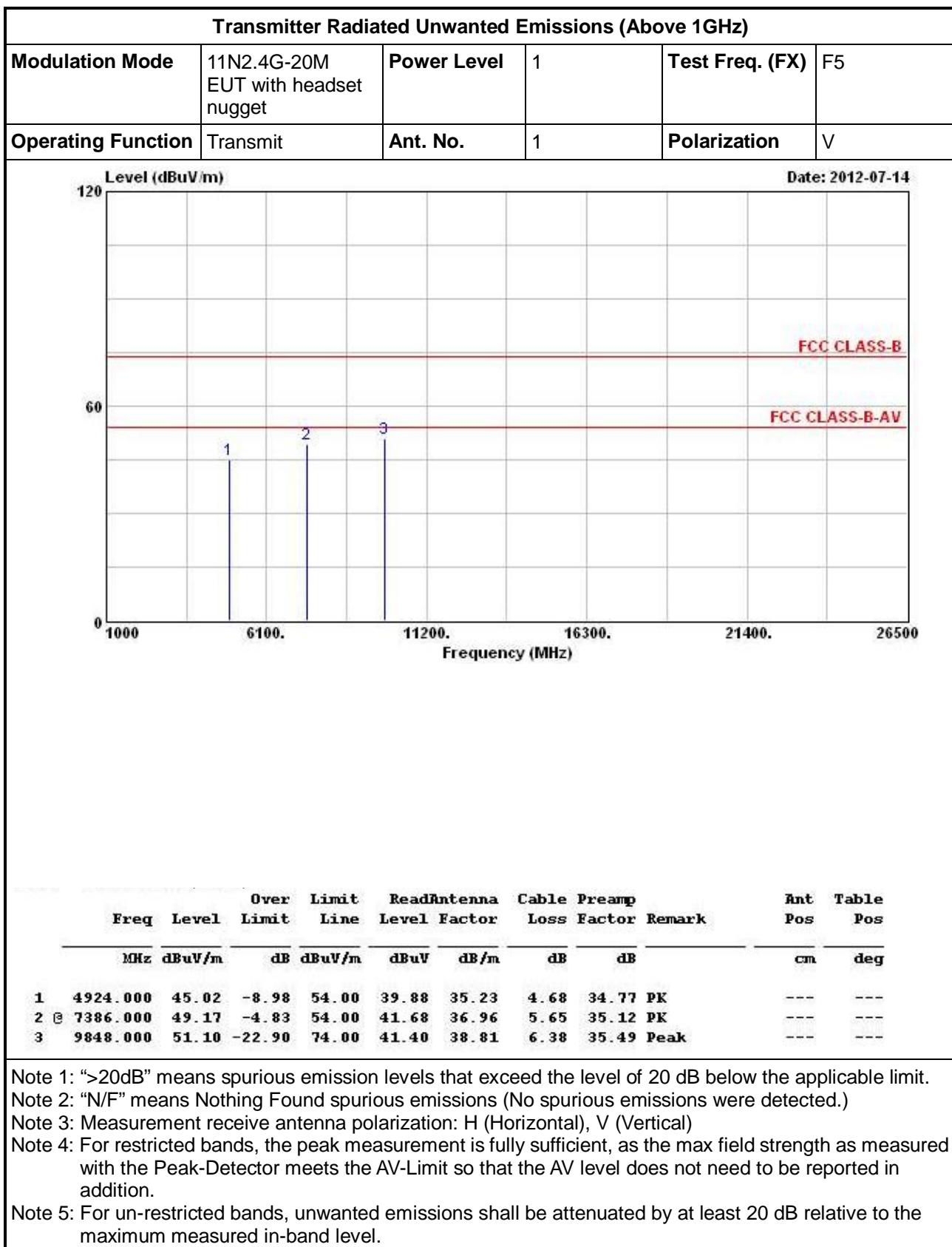
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

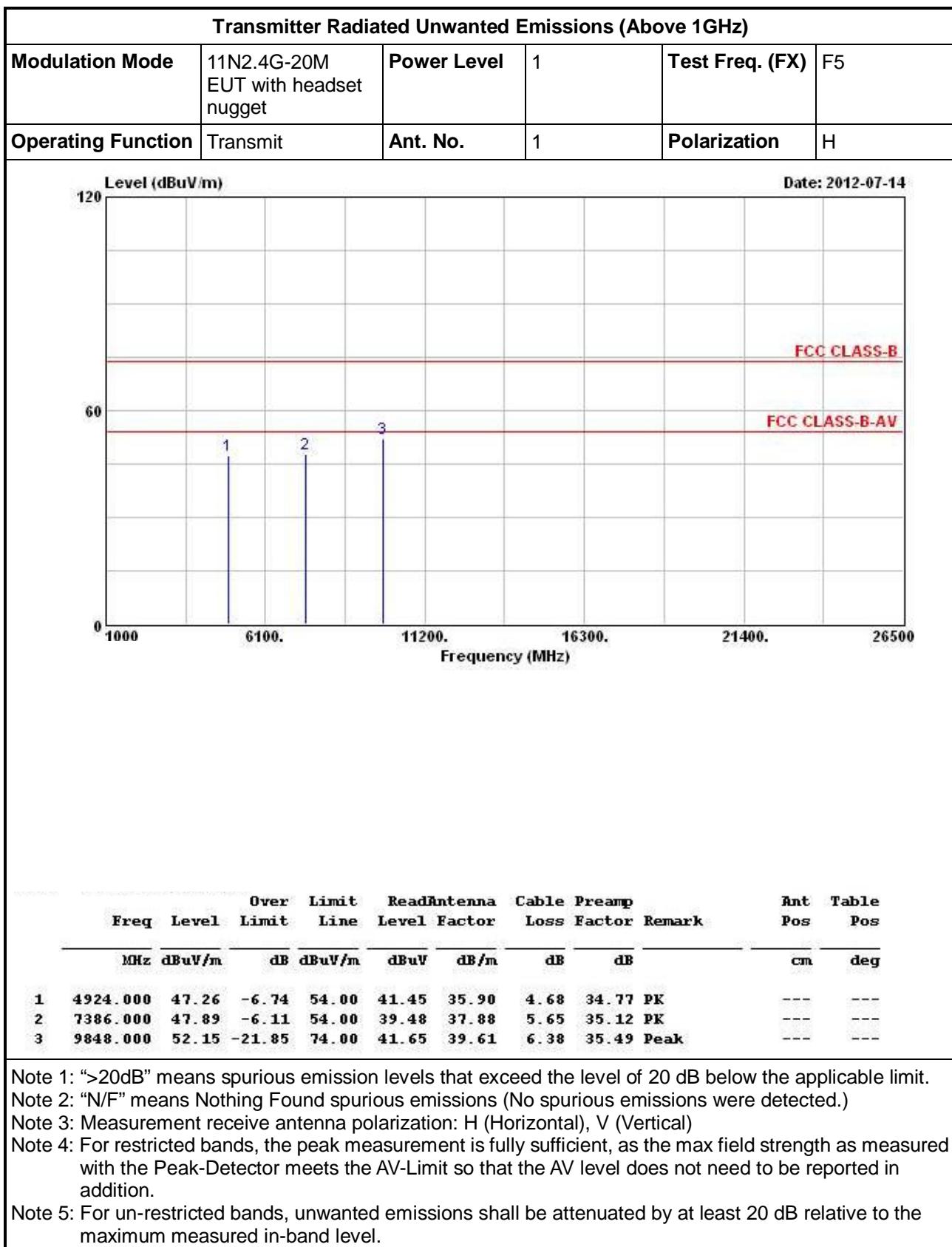
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

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









## 4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Test Receiver	R&S	ESCS 30	838251/004	9 kHz ~ 2.75 GHz	Feb. 02, 2012	Conduction (CO01-LK)
LISN	R&S	NNB-2/16Z	99081	9 kHz ~ 30 MHz	Apr. 11, 2012	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9 kHz ~ 30 MHz	Nov. 04, 2011	Conduction (CO01-LK)
PULSE LIMTER	R&S	ESH3-Z2	20-6120	9 kHz ~ 30 MHz	May 16. 2012	Conduction (CO01-LK)

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	9 KHz ~ 40 GHz	Feb. 21, 2012	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jun. 09, 2011*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 19, 2012	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20~100°C	Dec. 07, 2011	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100302	10MHz ~ 40GHz	Nov. 22, 2011	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
RF Cable-1m	Jye Bao	RG142	CB034-1m	20 MHz ~ 7 GHz	Dec. 03, 2011	Conducted (TH01-HY)
RF Cable-2m	Jye Bao	RG142	CB035-2m	20 MHz ~ 1 GHz	Dec. 03, 2011	Conducted (TH01-HY)

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

**FCC TEST REPORT****Report No. : FR270520**

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Characteristics</b>	<b>Calibration Date</b>	<b>Remark</b>
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Sep. 01, 2011	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 10, 2012	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100kHz ~ 1.3GHz	Jul. 25, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz ~ 26.5GHz	Aug. 08, 2011	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz ~ 18GHz	Nov. 15, 2011	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Nov. 11, 2011	Radiation (03CH02-HY)
RF Cable-high	SUHNER	SUCOFLEX106	03CH02-HY	1GHz ~ 40GHz	Mar. 06, 2012	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Oct. 22, 2011	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0~ 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 ~ 4 m	N/A	Radiation (03CH02-HY)

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

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Characteristics</b>	<b>Calibration Date</b>	<b>Remark</b>
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH02-HY)

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

## 5 Certification of TAF Accreditation



Certificate No. : L1190-120405

財團法人全國認證基金會  
Taiwan Accreditation Foundation

### Certificate of Accreditation

This is to certify that

**Sporton International Inc.**

**EMC & Wireless Communications Laboratory**

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,  
Taiwan, R.O.C.

**is accredited in respect of laboratory**

**Accreditation Criteria** : ISO/IEC 17025:2005

**Accreditation Number** : 1190

**Originally Accredited** : December 15, 2003

**Effective Period** : January 10, 2010 to January 09, 2013

**Accredited Scope** : Testing Field, see described in the Appendix

**Specific Accreditation Program** : Accreditation Program for Designated Testing Laboratory  
for Commodities Inspection  
Accreditation Program for Telecommunication Equipment  
Testing Laboratory  
Accreditation Program for BSMI Mutual Recognition  
Arrangement with Foreign Authorities

Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date: April 05, 2012

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