

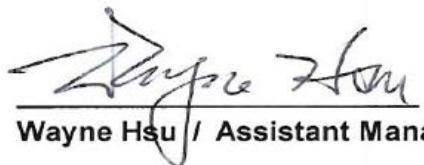
# FCC Test Report

Equipment : Wireless module  
Brand Name : PEGATRON  
Model No. : UPWL6017  
FCC ID : VUIUPWL6017  
Standard : 47 CFR FCC Part 15.247  
Frequency Range : 2400 MHz – 2483.5 MHz  
Equipment Class : DTS  
Applicant : PEGATRON CORPORATION  
Manufacturer : 5F., NO. 76, LIGONG ST., BEITOU DISTRICT,  
TAIPEI CITY 112 Taiwan

The product sample received on Aug. 27, 2012 and completely tested on Oct. 06, 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

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]: 16.75MHz 37.40 (Margin 12.60dB) - AV 43.15 (Margin 16.85dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth Unit [MHz] 11B-20M: 8.21 11G-20M: 15.44 11N2.4G-20M: 16.95 11N2.4G-40M: 35.56	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm] 11B-20M: 20.45 11G-20M: 23.47 11N2.4G-20M: 26.69 11N2.4G-40M: 26.03	Power [dBm]:30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/3kHz] 11B-20M: -7.85 11G-20M: -13.35 11N2.4G-20M: -10.91 11N2.4G-40M: -15.26	PSD [dBm/3kHz]:8	Complied
3.5	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2400.00MHz: 29.06dB Restricted Bands [dBuV/m at 3m]: 2390.00MHz 69.49 (Margin 4.51dB) - PK 53.00 (Margin 1.00dB) - 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]: 4874MHz 50.99 (Margin 3.01dB) - PK	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

## Revision History

[illegible]

# 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 <sub>TX</sub> )	RF Output Power (dBm)	Co-location
2400-2483.5	b	2412-2462	1-11 [11]	1	20.45	N/A
2400-2483.5	g	2412-2462	1-11 [11]	1	23.47	N/A
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	23.36	N/A
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	1	22.26	N/A
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	26.69	N/A
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	26.03	N/A
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 checked="" type="checkbox"/>	Temporary RF connector provided
<input type="checkbox"/>	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.

Antenna General Information					
No.	Ant. Cat.	Ant. Type	Brand	Part No.	G <sub>ANT</sub> (dBi)
1	Integral	PCB	Wanshih	UC3WFI0063	2.04
2	Integral	PCB	Wanshih	UC3WFI0064	3.90
3	Integral	PCB	Wanshih	UC3WFI0072	2.04
4	Integral	PCB	Wanshih	UC3WFI0073	5.72
5	Integral	PCB	Wanshih	UC3WFI0080	4.73
6	Integral	PCB	Wanshih	UC3WFI0081	5.65
7	Integral	PCB	Hong-lin	260-23396	2.32
8	Integral	PCB	Hong-lin	260-23397	4.64
9	Integral	PCB	Hong-lin	260-23042	4.36
10	Integral	PCB	Hong-lin	260-23403	4.40
11	Integral	PCB	Hong-lin	260-23432	2.58
12	Integral	PCB	Hong-lin	260-23434	4.36
13	Integral	PCB	Airgain	N2420DS (10cm)	3.1
14	Integral	PCB	Airgain	N2420DS (27cm)	3.1
15	Integral	PCB	Airgain	N2420 (10cm)	3.3
16	Integral	PCB	Airgain	N2420 (40cm)	3.3

EUT is consist of multiple antenna models assembly (multiple antenna models are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. Then Ant. No. 4 shall be performed the radiated test.

**1.1.3 Type of EUT**

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	<input type="checkbox"/> Production ; <input checked="" 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:

**1.1.4 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)	Voltage Duty Factor [dB] – (20 log 1/x)
<input checked="" type="checkbox"/> 97.75% - IEEE 802.11b	0.10	0.20
<input checked="" type="checkbox"/> 97.33% - IEEE 802.11g	0.12	0.23
<input checked="" type="checkbox"/> 97.81% - IEEE 802.11n (HT20) - N <sub>TX</sub> 1	0.10	0.19
<input checked="" type="checkbox"/> 95.65% - IEEE 802.11n (HT40) - N <sub>TX</sub> 1	0.19	0.39
<input checked="" type="checkbox"/> 100% - IEEE 802.11n (HT20) - N <sub>TX</sub> 2	0	0
<input checked="" type="checkbox"/> 100% - IEEE 802.11n (HT40) - N <sub>TX</sub> 2	0	0

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

**1.1.5 EUT Operational Condition**

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

## 1.2 Support Equipment

Support Equipment - Conducted Emissions				
No.	Equipment	Brand Name	Model Name	Serial No.
1	Notebook	DELL	XPS M1330	DoC
2	iPod	Apple	A1199	N/A
3	(USB) Mouse	Microsoft	1113	N/A
4	Wireless AP (Remote Workstation)	ASUS	RT-AC66U	DoC

Support Equipment - Radiated Emissions				
No.	Equipment	Brand Name	Model Name	Serial No.
1	Notebook	DELL	E5500	DoC
2	(USB) Mouse	Microsoft	1113	DoC
3	iPod	APPLE	A1199	DoC
4	Wireless AP (Remote Workstation)	ASUS	RT-AC66U	DoC

## 1.3 Testing Applied Standards

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

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2009
- ◆ FCC KDB 558074
- ◆ FCC KDB 662911
- ◆ FCC KDB 412172



## 1.4 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan 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	Test Date
RF Conducted	TH01-HY	Shiming	25.9°C / 42%	06-Oct-12
AC Conduction	CO04-HY	Bill	25.2°C / 49.3%	04-Sep-12
Radiated Emission	03CH03-HY	Daniel	25.4°C / 56%	20-Sep-12 ~ 29-Sep-12

## 1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty			
Test Item		Uncertainty	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					
IEEE Std. 802.11	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS	Worst Data Rate / MCS	Modulation Mode	RF Output Power (dBm)
b	1	1-11 Mbps	1 Mbps	11B-20M	<b>20.45</b>
g	1	6-54 Mbps	6 Mbps	11G-20M	<b>23.47</b>
n (HT20)	1	MCS 0-7	MCS 0	11N2.4G-20M	<b>23.36</b>
n (HT40)	1	MCS 0-7	MCS 0	11N2.4G-40M	<b>22.26</b>
n (HT20)	2	MCS 7-15	MCS 8	11N2.4G-20M	<b>26.69</b>
n (HT40)	2	MCS 7-15	MCS 8	11N2.4G-40M	<b>26.03</b>
<p>Note 1: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 800ns.</p> <p>Note 2: Modulation modes consist below configuration::            11B: IEEE 802.11b, 11G: IEEE 802.11g, 11N: IEEE 802.11n            2.4G: 2.4-2.4835GHz band            20M/40M: Channel Bandwidth 20MHz/40MHz</p> <p>Note 3: RF output power specifies that Maximum Peak Conducted Output Power.</p>					

### 2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std. 802.11	Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)
b, g, n (HT20)	2412-(F1), 2437-(F2), 2462-(F3)
n (HT40)	2422-(F4), 2437-(F5), 2452-(F6)

## 2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter					
Test Software Version		Mtool_1.0.0.9			
Modulation Mode	Transmit Chains (N <sub>TX</sub> )	Frequency (MHz)	Power Setting	Data Rate / MCS	RF Output Power (dBm)
11B-20M	1	2412	66	1 Mbps	19.67
11B-20M	1	2437	72	1 Mbps	20.45
11B-20M	1	2462	66	1 Mbps	19.78
11G-20M	1	2412	37	6 Mbps	17.37
11G-20M	1	2437	65	6 Mbps	23.47
11G-20M	1	2462	40	6 Mbps	17.84
11N2.4G-20M	1	2412	36	MCS 0	16.81
11N2.4G-20M	1	2437	65	MCS 0	23.36
11N2.4G-20M	1	2462	36	MCS 0	16.57
11N2.4G-40M	1	2422	32	MCS 0	14.57
11N2.4G-40M	1	2437	60	MCS 0	22.26
11N2.4G-40M	1	2452	33	MCS 0	15.59
11N2.4G-20M	2	2412	33	MCS 8	17.93
11N2.4G-20M	2	2437	65	MCS 8	26.69
11N2.4G-20M	2	2462	35	MCS 8	18.66
11N2.4G-40M	2	2422	32	MCS 8	17.51
11N2.4G-40M	2	2437	62	MCS 8	26.03
11N2.4G-40M	2	2452	33	MCS 8	18.04
Note 1: RF output power specifies that Maximum Peak Conducted Output Power.					

## 2.4 The Worst Case Measurement Configuration

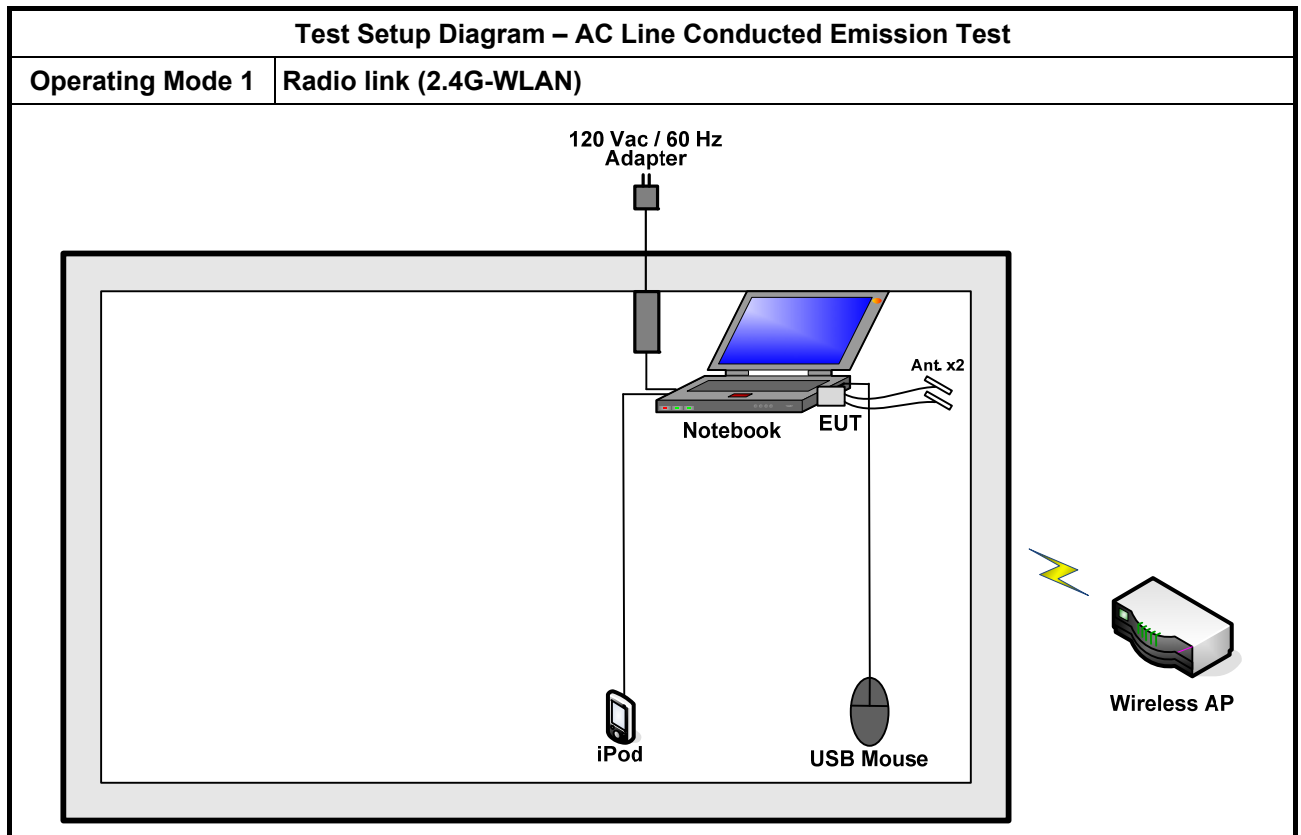
The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	AC power-line conducted emissions
<b>Condition</b>	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
<b>Operating Mode</b>	Operating Mode Description
1	Radio link (2.4G-WLAN)

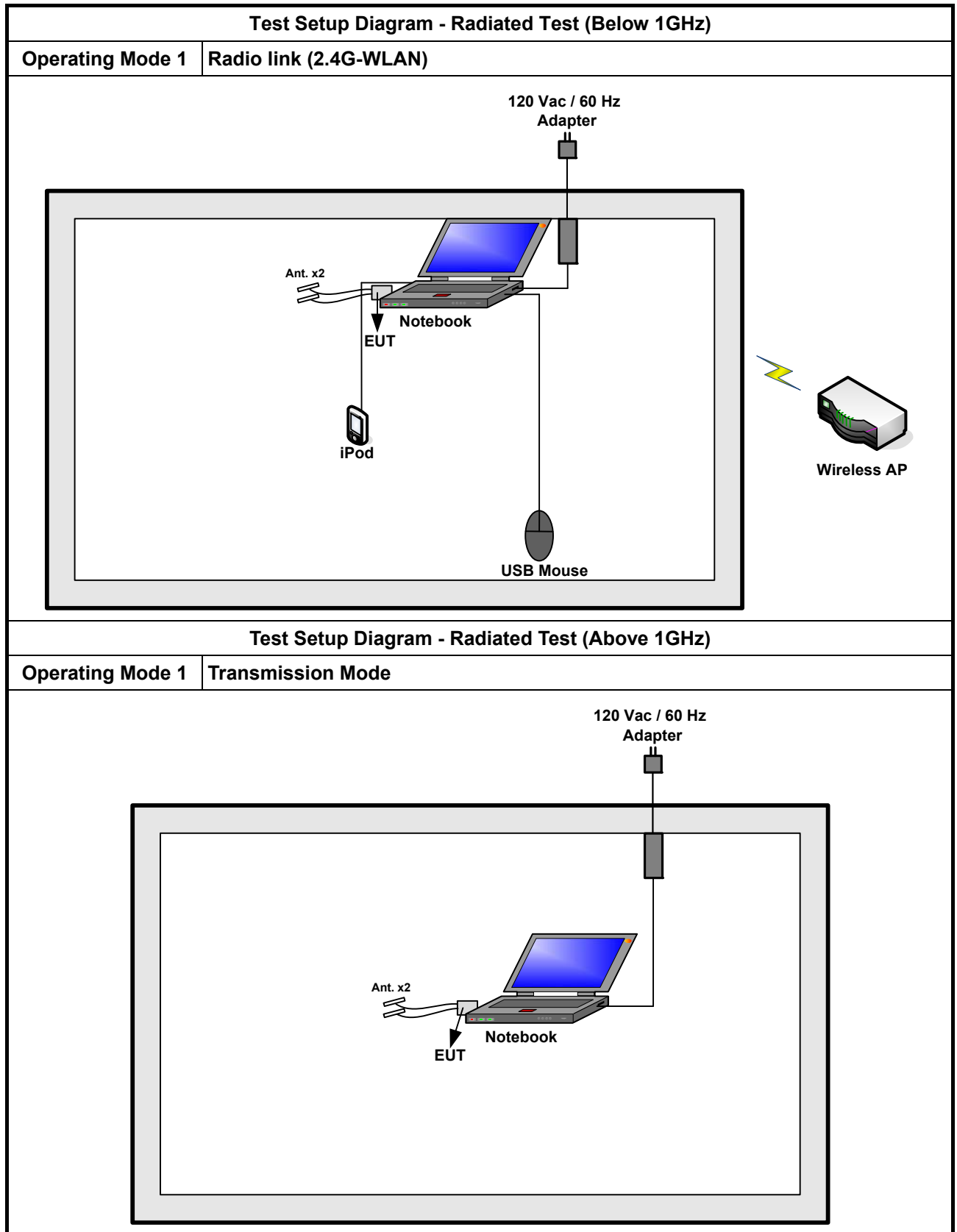
The Worst Case Mode for Following Conformance Tests			
<b>Tests Item</b>	RF Output Power, Power Spectral Density, 6 dB Bandwidth		
<b>Test Condition</b>	Conducted measurement at transmit chains		
<b>Modulation Mode</b>	<b>Transmit Chains (N<sub>TX</sub>)</b>	<b>Data Rate / MCS</b>	<b>Test Frequency</b>
11B-20M	1	1 Mbps	F1, F2, F3
11G-20M	1	6 Mbps	F1, F2, F3
11N2.4G-20M	1	MCS 0	F1, F2, F3
11N2.4G-40M	1	MCS 0	F4, F5, F6
11N2.4G-20M	2	MCS 8	F1, F2, F3
11N2.4G-40M	2	MCS 8	F4, F5, F6

The Worst Case Mode for Following Conformance Tests			
<b>Tests Item</b>	Transmitter Radiated Bandedge Emissions		
<b>Test Condition</b>	Radiated measurement		
<b>Modulation Mode</b>	<b>Transmit Chains (N<sub>TX</sub>)</b>	<b>Data Rate / MCS</b>	<b>Test Frequency</b>
11B-20M	1	1 Mbps	F1, F3
11G-20M	1	6 Mbps	F1, F3
11N2.4G-20M	1	MCS 0	F1, F3
11N2.4G-40M	1	MCS 0	F4, F6
11N2.4G-20M	2	MCS 8	F1, F3
11N2.4G-40M	2	MCS 8	F4, F6

The Worst Case Mode for Following Conformance Tests		
<b>Tests Item</b>	Transmitter Radiated Unwanted Emissions	
<b>Test Condition</b>	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.	
<b>User Position</b>	<input checked="" 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 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.	
<b>Operating Mode &lt; 1GHz</b>	<input checked="" type="checkbox"/> 1. Radio link (2.4G-WLAN)	
<b>Modulation Mode</b>	<b>Data Rate / MCS</b>	<b>Test Frequency</b>
11B-20M	1 Mbps	F1, F2, F3
11G-20M	6 Mbps	F1, F2, F3
11N2.4G-20M	MCS 0	F1, F2, F3
11N2.4G-40M	MCS 0	F4, F5, F6
11N2.4G-20M	MCS 8	F1, F2, F3
11N2.4G-40M	MCS 8	F4, F5, F6

## 2.5 Test Setup Diagram





### 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.

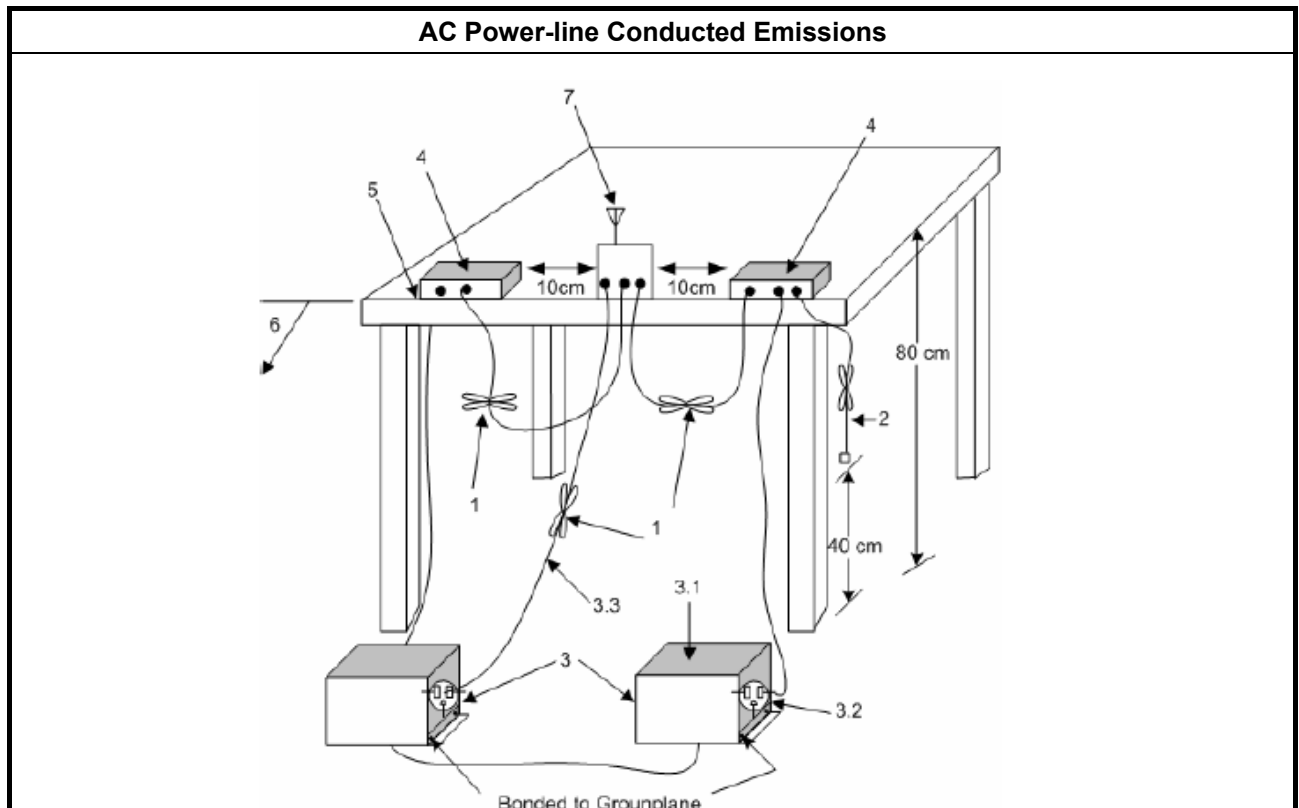
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

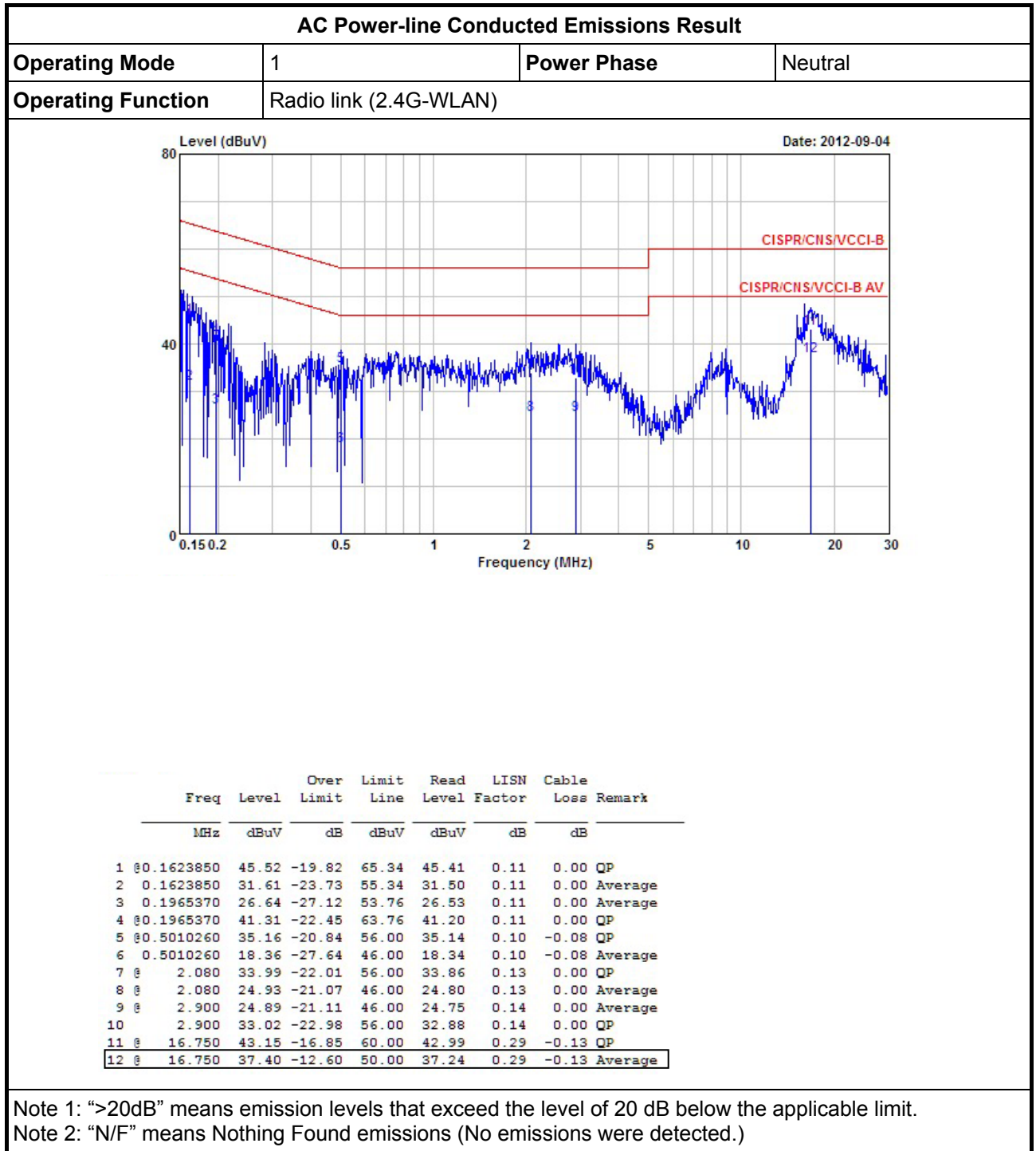
Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

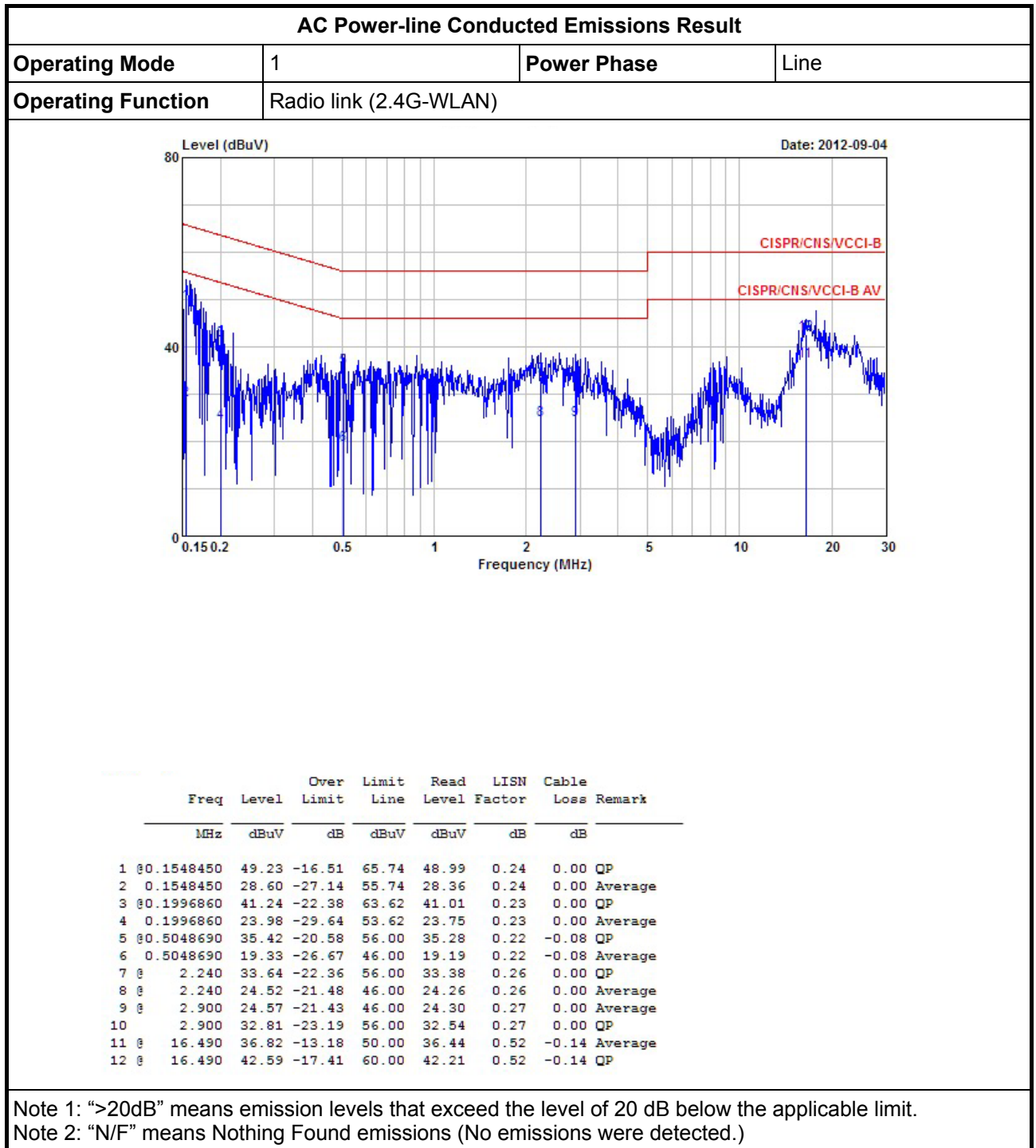
##### 3.1.4 Test Setup





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





## 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.

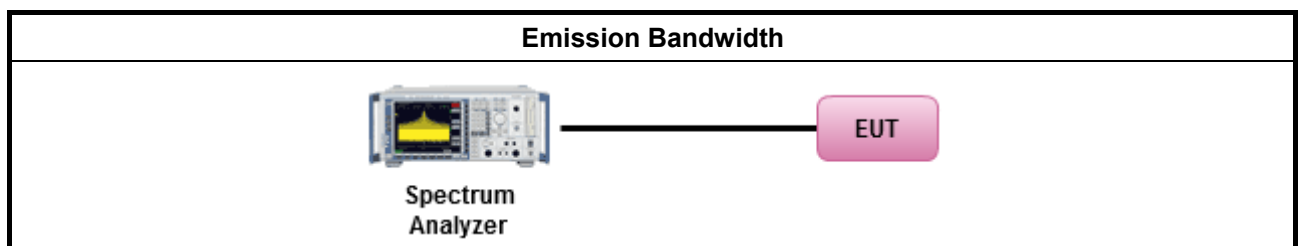
### 3.2.2 Measuring Instruments

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 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"/> The EUT supports single transmit chain and measurements performed on this transmit chain.
<input checked="" type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below:
<input type="checkbox"/> Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.
<input checked="" type="checkbox"/> Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

### 3.2.4 Test Setup



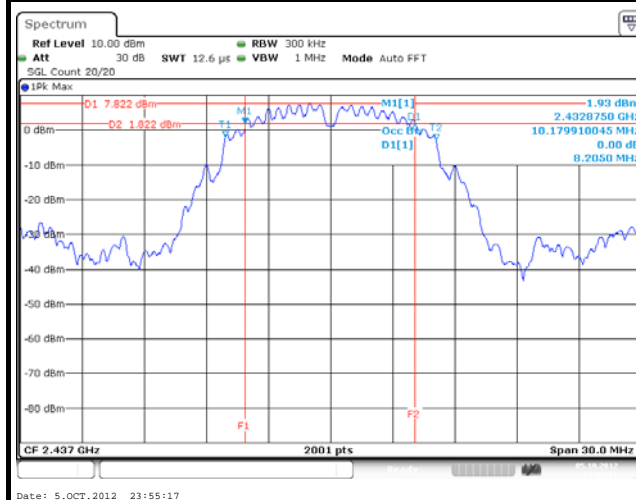
**3.2.5 Test Result of Emission Bandwidth**

Emission Bandwidth Result										
Condition			Emission Bandwidth (MHz)							
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	99% Bandwidth				6dB Bandwidth			
			Chain-Port 1	Chain-Port 2	-	-	Chain-Port 1	Chain-Port 2	-	-
11B-20M	1	2412	10.18	-	-	-	8.19	-	-	-
11B-20M	1	2437	10.18	-	-	-	8.21	-	-	-
11B-20M	1	2462	10.18	-	-	-	8.18	-	-	-
11G-20M	1	2412	16.28	-	-	-	14.07	-	-	-
11G-20M	1	2437	16.39	-	-	-	15.44	-	-	-
11G-20M	1	2462	16.52	-	-	-	15.08	-	-	-
11N2.4G-20M	1	2412	17.45	-	-	-	16.38	-	-	-
11N2.4G-20M	1	2437	17.42	-	-	-	16.92	-	-	-
11N2.4G-20M	1	2462	17.45	-	-	-	16.70	-	-	-
11N2.4G-40M	1	2422	36.54	-	-	-	36.36	-	-	-
11N2.4G-40M	1	2437	36.30	-	-	-	33.28	-	-	-
11N2.4G-40M	1	2452	36.06	-	-	-	35.04	-	-	-
11N2.4G-20M	2	2412	17.44	17.45	-	-	16.16	15.57	-	-
11N2.4G-20M	2	2437	17.44	17.44	-	-	14.49	15.89	-	-
11N2.4G-20M	2	2462	17.38	17.50	-	-	15.14	16.95	-	-
11N2.4G-40M	2	2422	36.34	36.42	-	-	33.56	31.68	-	-
11N2.4G-40M	2	2437	36.54	36.22	-	-	35.44	35.56	-	-
11N2.4G-40M	2	2452	36.02	36.30	-	-	29.92	33.60	-	-
Limit			N/A				≥500 kHz			
Result			Complied							
Note 1: N <sub>TX</sub> = Number of Transmit Chains										

**N<sub>TX</sub> 1**

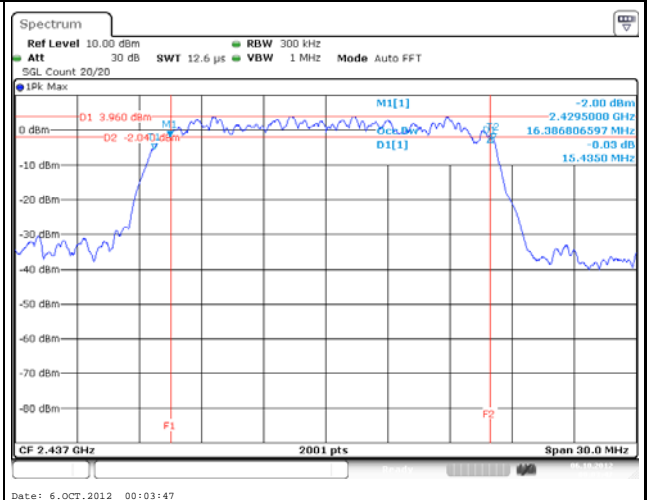
### Worst Emission Bandwidth Plots

## 11B-20M – F2 [Port 1]



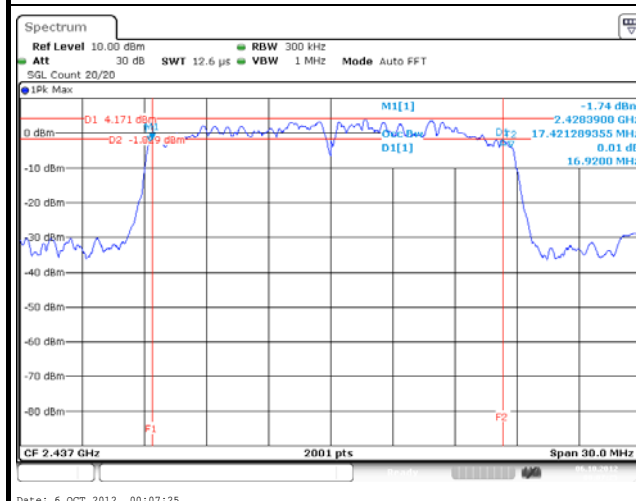
Date: 5.OCT.2012 23:55:17

### 11G-20M – F2 [Port 1]



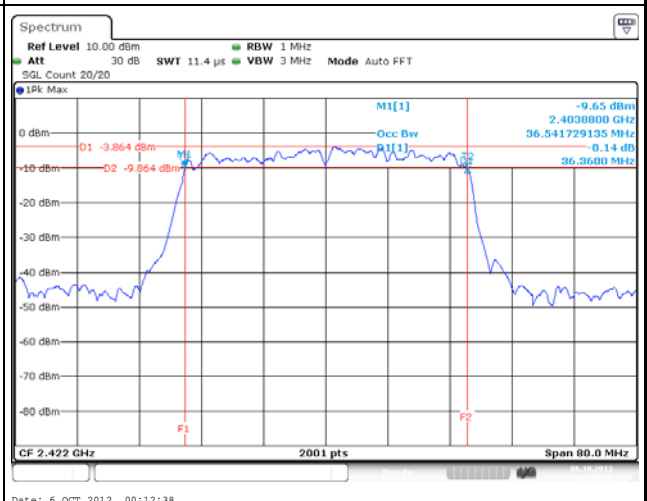
Date: 6.OCT.2012 00:03:47

### 11N2.4G-20M – F2 [Port 1]



Date: 6.OCT.2012 00:07:25

### 11N2.4G-40M – F4 [Port 1]

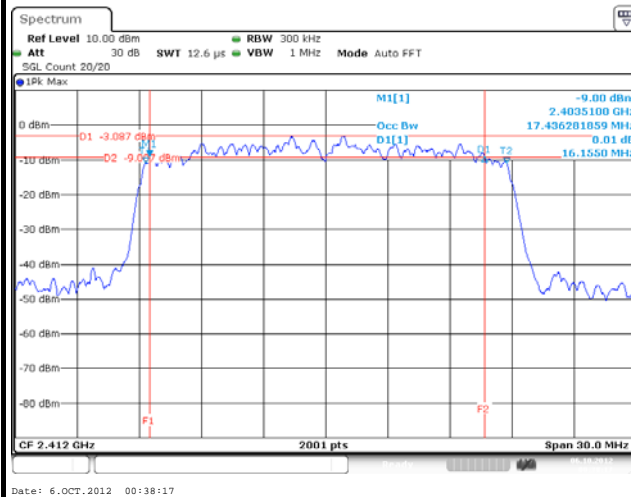


Date: 6.OCT.2012 00:12:38

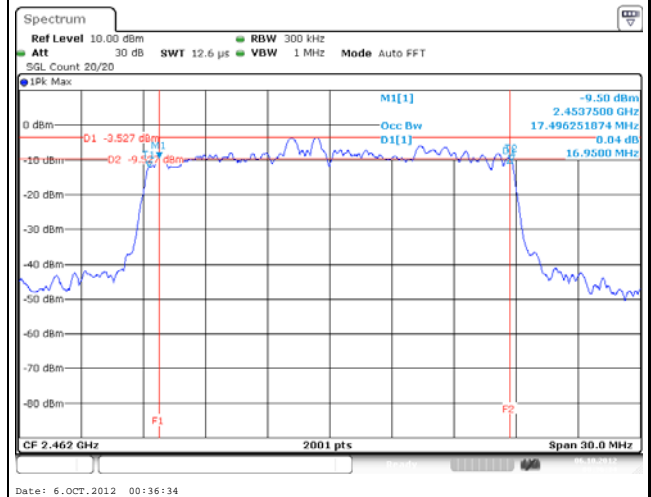
N<sub>TX</sub> 2

## Worst Emission Bandwidth Plots

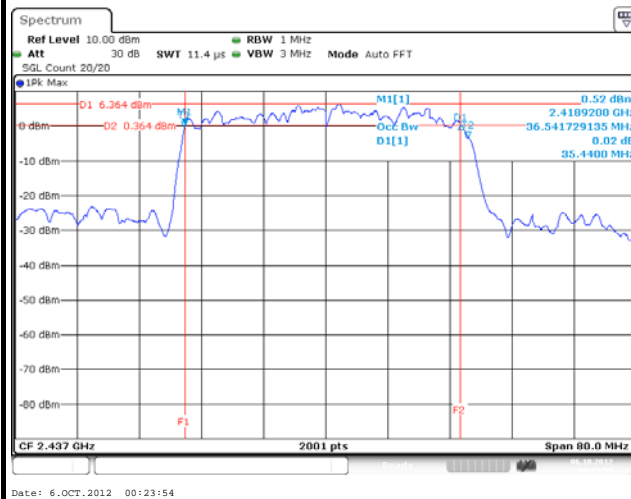
11N2.4G-20M – F1 [Port 1]



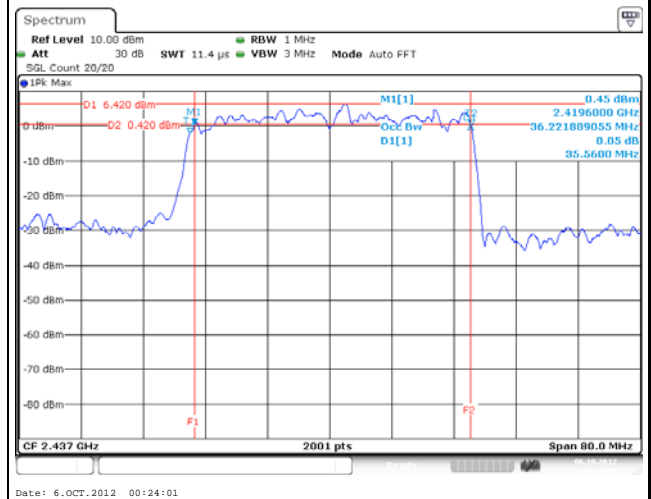
11N2.4G-20M – F3 [Port 2]



11N2.4G-40M – F5 [Port 1]



11N2.4G-40M – F5 [Port 2]



### 3.3 RF Output Power

#### 3.3.1 RF Output Power Limit

RF Output Power Limit	
<b>Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit</b>	
<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 $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ 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
$P_{Out}$ = 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.	

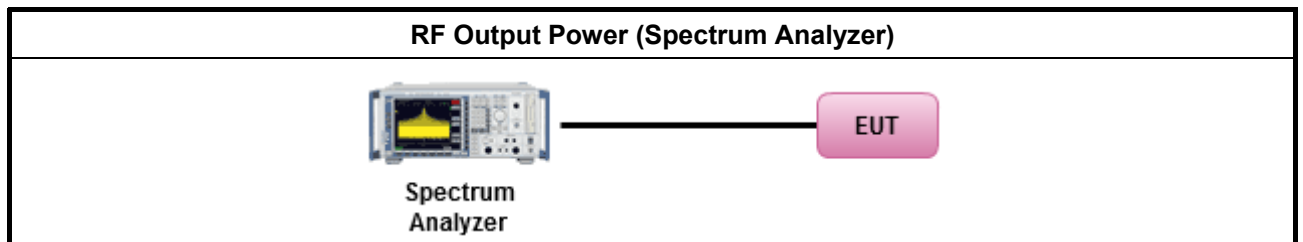
#### 3.3.2 Measuring Instruments

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 5.2.1.1 Option 1 (RBW ≥ EBW method).
<input checked="" 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 checked="" type="checkbox"/>	Maximum Conducted (Average) 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 checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input checked="" type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input checked="" type="checkbox"/>	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

### 3.3.4 Test Setup





### 3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1	2	-	-
Maximum $G_{ANT}$ (dBi)		5.72	5.72	-	-
Modulation Mode	DG (dBi)	$N_{TX}$	$N_{SS}$	STBC	Array Gain (dB)
Legacy CCK, 1-11Mbps (11b)	5.72	1	1	-	-
Non HT20, 6-54Mbps (11g)	5.72	1	1	-	-
HT20, M0-M7	5.72	1	1	-	-
HT20, M8-15	5.72	2	2	-	-
HT40, M0-M7	5.72	1	1	-	-
HT40, M8-M15	5.72	2	2	-	-
<p>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 = <math>G_{ANT} + 10 \log(N_{TX})</math>  All transmit signals are completely uncorrelated, Directional Gain = <math>G_{ANT}</math></p> <p>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 = <math>10 \log[(10^{G_{1/20}} + \dots + 10^{G_{N/20}})^2 / N_{TX}]</math>  All transmit signals are completely uncorrelated, Directional Gain = <math>10 \log[(10^{G_{1/10}} + \dots + 10^{G_{N/10}}) / N_{TX}]</math></p> <p>Note 3: For Spatial Multiplexing, Directional Gain (DG) = <math>G_{ANT} + 10 \log(N_{TX}/N_{SS})</math>,  where <math>N_{SS}</math> = the number of independent spatial streams data.</p> <p>Note 4: For CDD transmissions, directional gain is calculated as power measurements:  Directional Gain (DG) = <math>G_{ANT} + \text{Array Gain}</math>, where Array Gain is as follows:  Array Gain = 0 dB (i.e., no array gain) for <math>N_{TX} \leq 4</math>;  Array Gain = 0 dB (i.e., no array gain) for channel widths <math>\geq 40</math> MHz for any <math>N_{TX}</math>;</p>					

**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 <sub>TX</sub>	Freq. (MHz)	Chain Port 1	Chain Port 2	-	-	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11B-20M	1	2412	19.67	-	-	-	19.67	30	5.72	25.39	36.0
11B-20M	1	2437	20.45	-	-	-	20.45	30	5.72	26.17	36.0
11B-20M	1	2462	19.78	-	-	-	19.78	30	5.72	25.50	36.0
11G-20M	1	2412	17.37	-	-	-	17.37	30	5.72	23.09	36.0
11G-20M	1	2437	23.47	-	-	-	23.47	30	5.72	29.19	36.0
11G-20M	1	2462	17.84	-	-	-	17.84	30	5.72	23.56	36.0
11N2.4G-20M	1	2412	16.81	-	-	-	16.81	30	5.72	22.53	36.0
11N2.4G-20M	1	2437	23.36	-	-	-	23.36	30	5.72	29.08	36.0
11N2.4G-20M	1	2462	16.57	-	-	-	16.57	30	5.72	22.29	36.0
11N2.4G-40M	1	2422	14.57	-	-	-	14.57	30	5.72	20.29	36.0
11N2.4G-40M	1	2437	22.26	-	-	-	22.26	30	5.72	27.98	36.0
11N2.4G-40M	1	2452	15.59	-	-	-	15.59	30	5.72	21.31	36.0
11N2.4G-20M	2	2412	15.53	14.20	-	-	17.93	30	5.72	23.65	36.0
11N2.4G-20M	2	2437	23.82	23.53	-	-	26.69	30	5.72	32.41	36.0
11N2.4G-20M	2	2462	15.82	15.47	-	-	18.66	30	5.72	24.38	36.0
11N2.4G-40M	2	2422	14.92	14.03	-	-	17.51	30	5.72	23.23	36.0
11N2.4G-40M	2	2437	22.87	23.16	-	-	26.03	30	5.72	31.75	36.0
11N2.4G-40M	2	2452	15.50	14.51	-	-	18.04	30	5.72	23.76	36.0
<b>Result</b>			<b>Complied</b>								

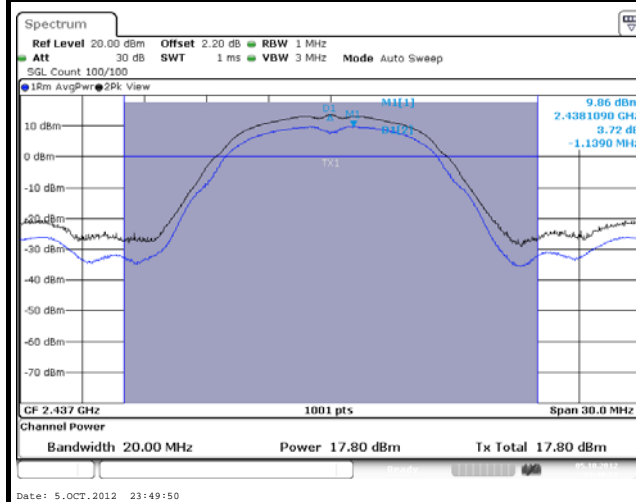
**3.3.7 Test Result of Maximum Conducted (Average) Output Power**

Maximum Conducted (Average) Output Power											
Condition			RF Output Power (dBm)								
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Chain Port 1	Chain Port 2	-	-	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11B-20M	1	2412	16.32	-	-	-	16.32	30	5.72	22.04	36.0
11B-20M	1	2437	17.90	-	-	-	17.90	30	5.72	23.62	36.0
11B-20M	1	2462	16.13	-	-	-	16.13	30	5.72	21.85	36.0
11G-20M	1	2412	9.82	-	-	-	9.82	30	5.72	15.54	36.0
11G-20M	1	2437	16.02	-	-	-	16.02	30	5.72	21.74	36.0
11G-20M	1	2462	10.38	-	-	-	10.38	30	5.72	16.10	36.0
11N2.4G-20M	1	2412	9.38	-	-	-	9.38	30	5.72	15.10	36.0
11N2.4G-20M	1	2437	15.97	-	-	-	15.97	30	5.72	21.69	36.0
11N2.4G-20M	1	2462	9.19	-	-	-	9.19	30	5.72	14.91	36.0
11N2.4G-40M	1	2422	7.09	-	-	-	7.09	30	5.72	12.81	36.0
11N2.4G-40M	1	2437	14.71	-	-	-	14.71	30	5.72	20.43	36.0
11N2.4G-40M	1	2452	8.01	-	-	-	8.01	30	5.72	13.73	36.0
11N2.4G-20M	2	2412	7.79	6.31	-	-	10.12	30	5.72	15.84	36.0
11N2.4G-20M	2	2437	16.10	15.51	-	-	18.83	30	5.72	24.55	36.0
11N2.4G-20M	2	2462	8.13	7.04	-	-	10.63	30	5.72	16.35	36.0
11N2.4G-40M	2	2422	6.84	5.55	-	-	9.25	30	5.72	14.97	36.0
11N2.4G-40M	2	2437	14.82	14.71	-	-	17.78	30	5.72	23.50	36.0
11N2.4G-40M	2	2452	7.41	6.08	-	-	9.81	30	5.72	15.53	36.0
<b>Result</b>			<b>Complied</b>								

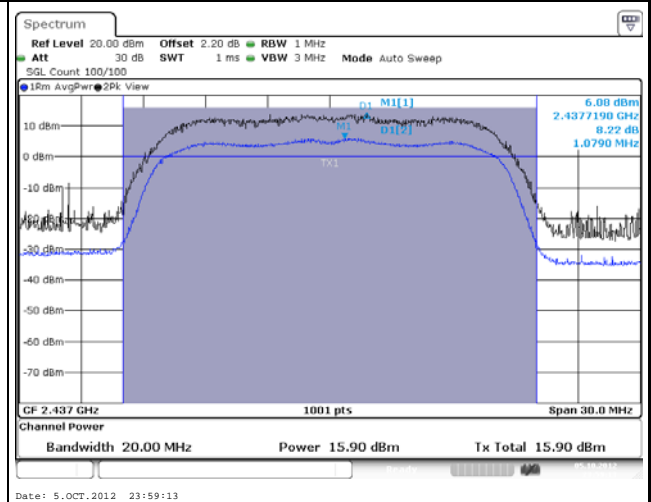
N<sub>Tx</sub> 1

## Worst Maximum Peak Conducted Output Power and Maximum Conducted Output Power Plots

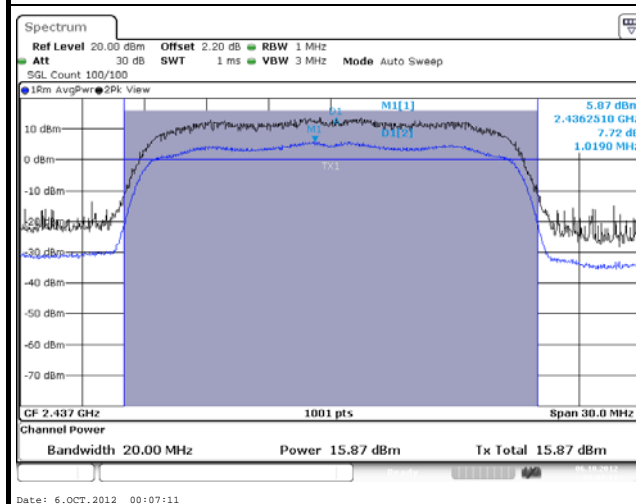
11B-20M – F2 [Port 1]



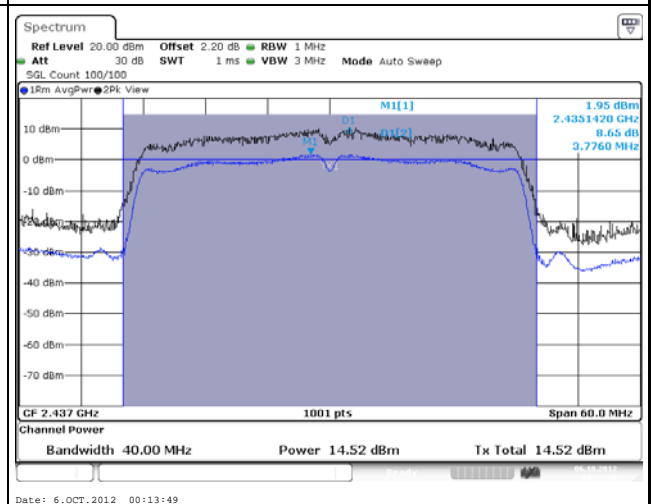
11G-20M – F2 [Port 1]



11N2.4G-20M – F2 [Port 1]



11N2.4G-40M – F5 [Port 1]



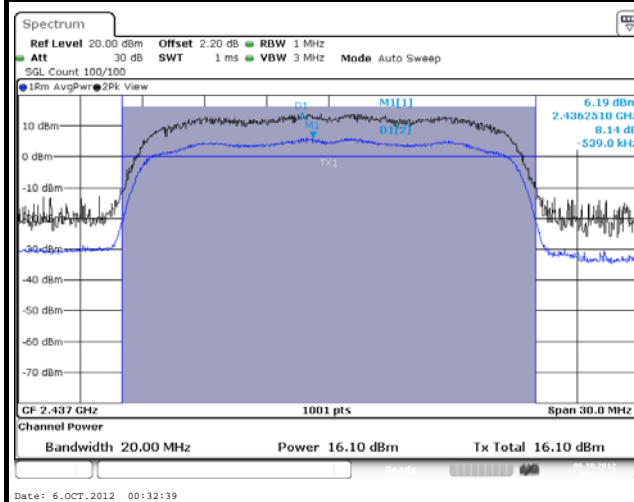
Note 1: Average Output Power Plots w/o Duty Factor



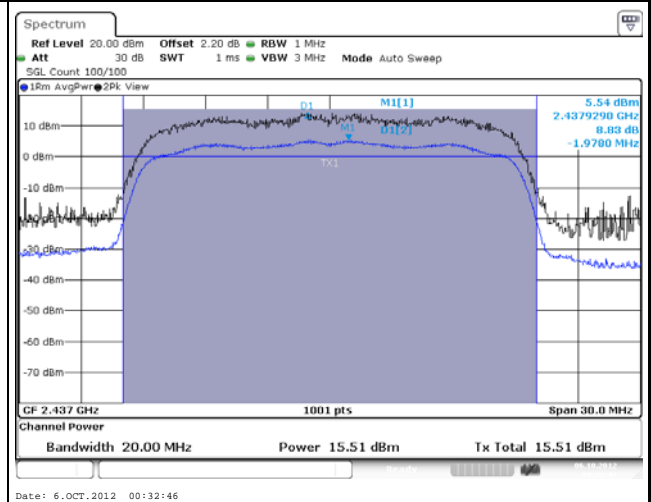
N<sub>Tx</sub> 2

Worst Maximum Peak Conducted Output Power and Maximum Conducted Output Power Plots

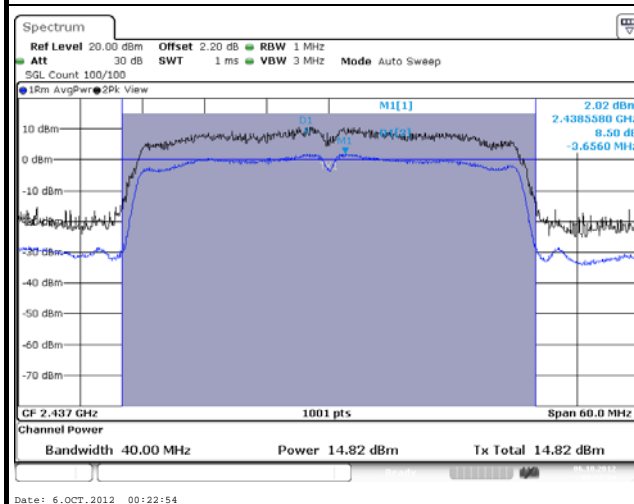
11N2.4G-20M – F2 [Port 1]



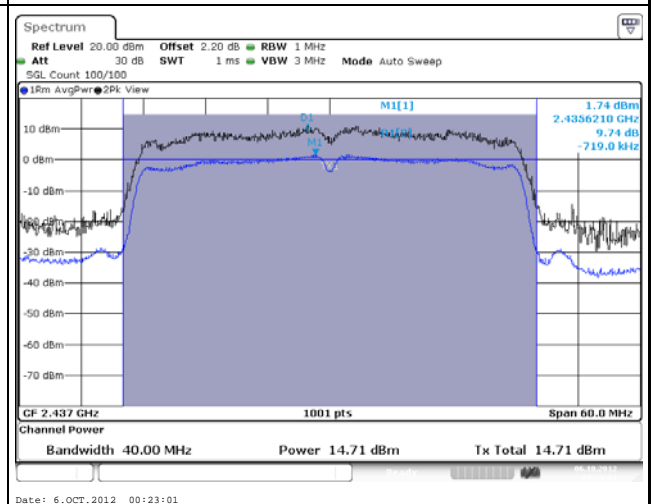
11N2.4G-20M – F2 [Port 2]



11N2.4G-40M – F5 [Port 1]



11N2.4G-40M – F5 [Port 2]



### 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 dBm/3kHz

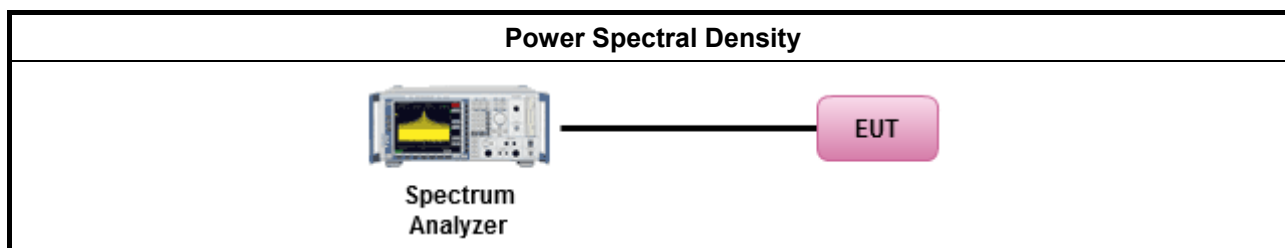
#### 3.4.2 Measuring Instruments

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

#### 3.4.3 Test Procedures

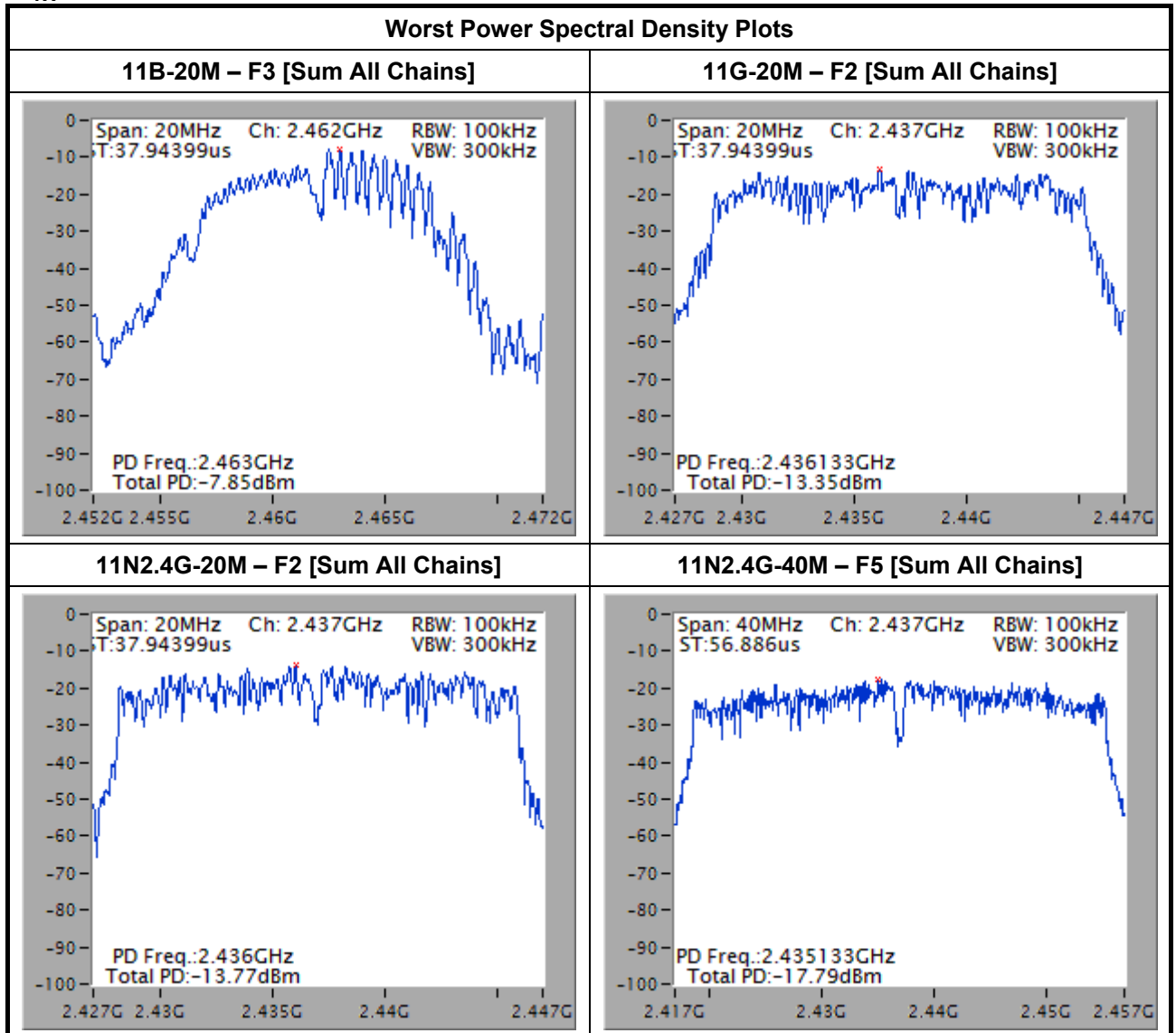
Test Method	
<input checked="" type="checkbox"/>	Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a "worst-case" measured level 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 checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 5.3.1 Option 1 (peak PSD; BWCF=-15.2dB).
<input 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"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input checked="" type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input checked="" type="checkbox"/>	The EUT supports multiple transmit chains using options given below:
<input checked="" type="checkbox"/>	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power 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 <sub>TX</sub> 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 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



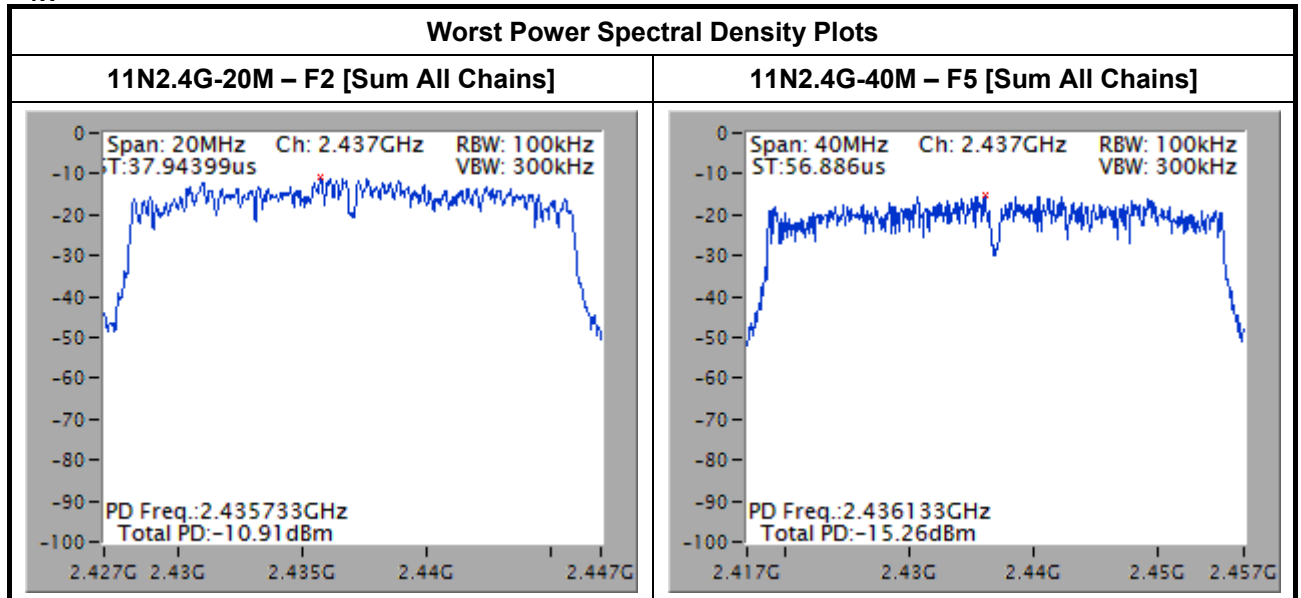
### 3.4.5 Test Result of Power Spectral Density

Power Spectral Density Result								
Condition			Power Spectral Density (dBm/3kHz)					
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Sum Chain	-	-	-	-	Power Limit
11B-20M	1	2412	-9.33	-	-	-	-	8
11B-20M	1	2437	-9.16	-	-	-	-	8
11B-20M	1	2462	-7.85	-	-	-	-	8
11G-20M	1	2412	-19.56	-	-	-	-	8
11G-20M	1	2437	-13.35	-	-	-	-	8
11G-20M	1	2462	-20.19	-	-	-	-	8
11N2.4G-20M	1	2412	-20.52	-	-	-	-	8
11N2.4G-20M	1	2437	-13.77	-	-	-	-	8
11N2.4G-20M	1	2462	-20.75	-	-	-	-	8
11N2.4G-40M	1	2422	-25.22	-	-	-	-	8
11N2.4G-40M	1	2437	-17.79	-	-	-	-	8
11N2.4G-40M	1	2452	-23.35	-	-	-	-	8
11N2.4G-20M	2	2412	-19.67	-	-	-	-	8
11N2.4G-20M	2	2437	-10.91	-	-	-	-	8
11N2.4G-20M	2	2462	-18.42	-	-	-	-	8
11N2.4G-40M	2	2422	-21.25	-	-	-	-	8
11N2.4G-40M	2	2437	-15.26	-	-	-	-	8
11N2.4G-40M	2	2452	-21.59	-	-	-	-	8
Result			Complied					
Note 1: PSD [dBm/3kHz] = sum each transmit chains by bin-to-bin PSD [dBm/100kHz] + BWFC [-15.2 dB]								

**N<sub>TX</sub> 1**


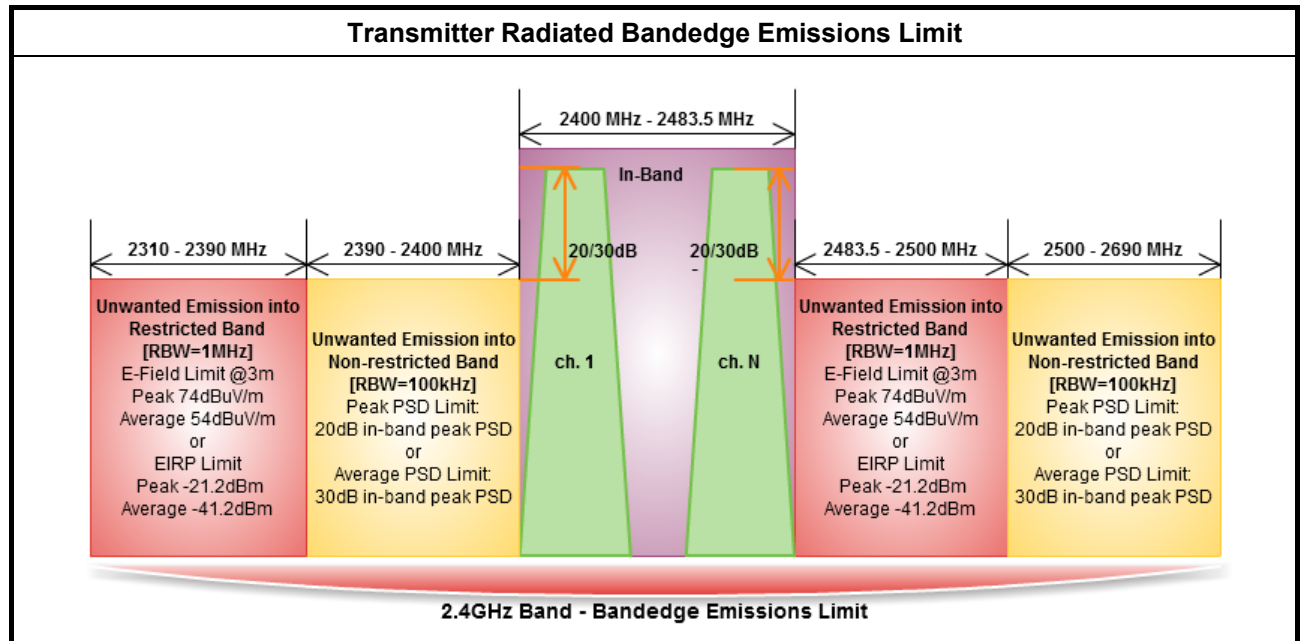


N<sub>TX</sub> 2



### 3.5 Transmitter Radiated Bandedge Emissions

#### 3.5.1 Transmitter Radiated Bandedge Emissions Limit



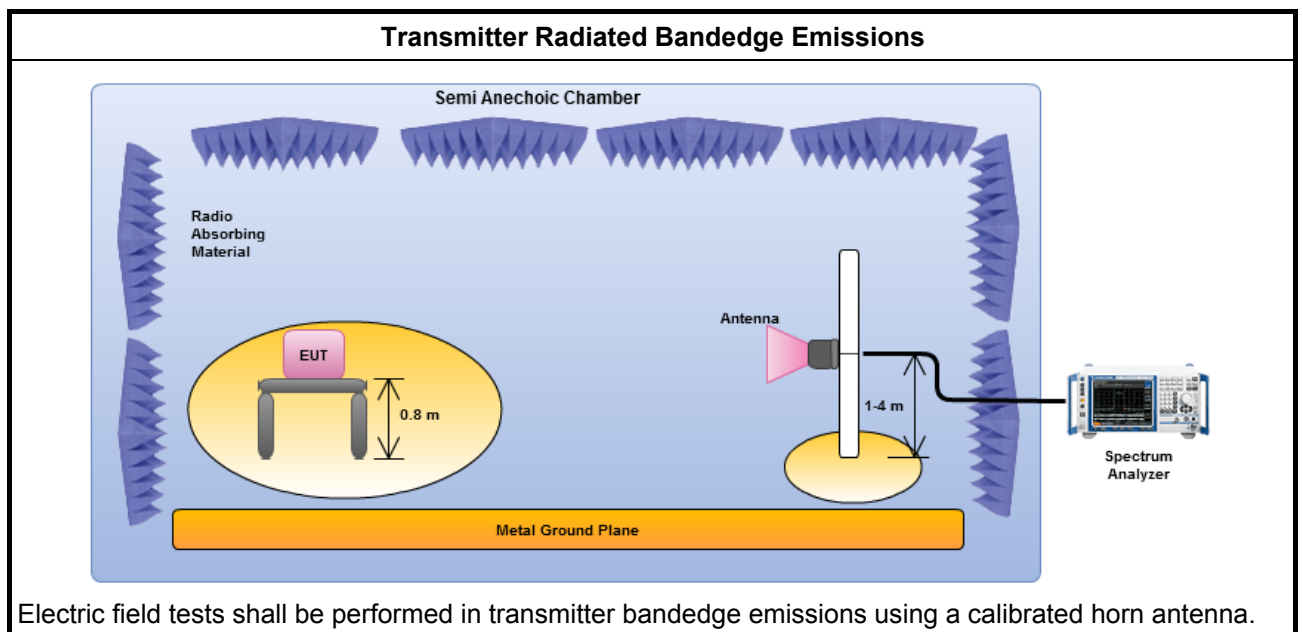
#### 3.5.2 Measuring Instruments

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

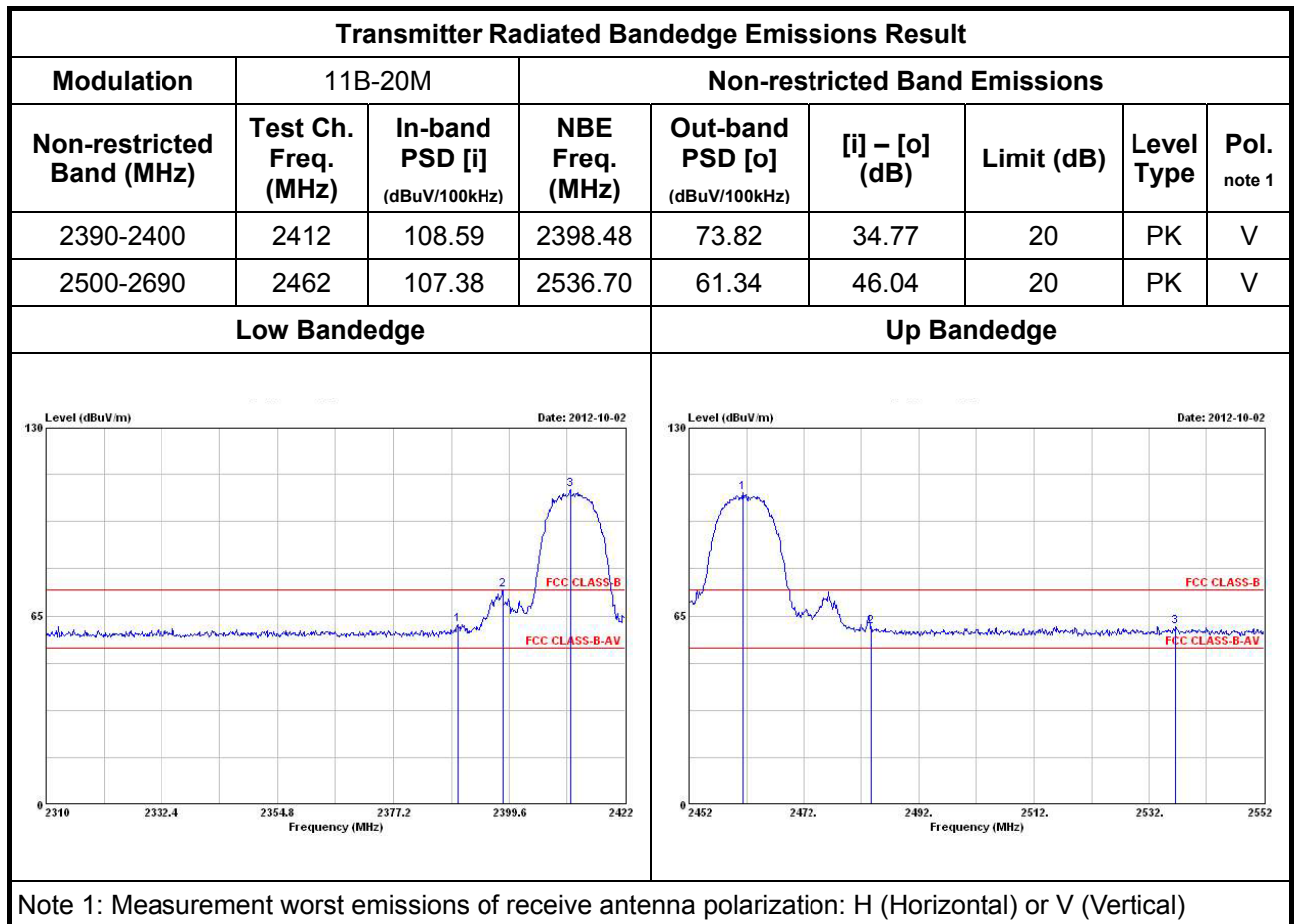
### 3.5.3 Test Procedures

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 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 checked="" 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 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 5.4.2.2.1.1 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 type="checkbox"/>	Refer as FCC KDB 558074, clause 5.4.2.2.4 for narrower resolution bandwidth using the band power and summing the spectral levels (i.e., 100 kHz or 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 ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.

### 3.5.4 Test Setup

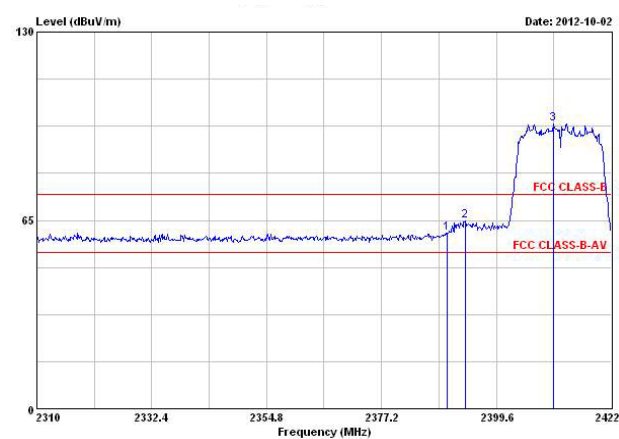
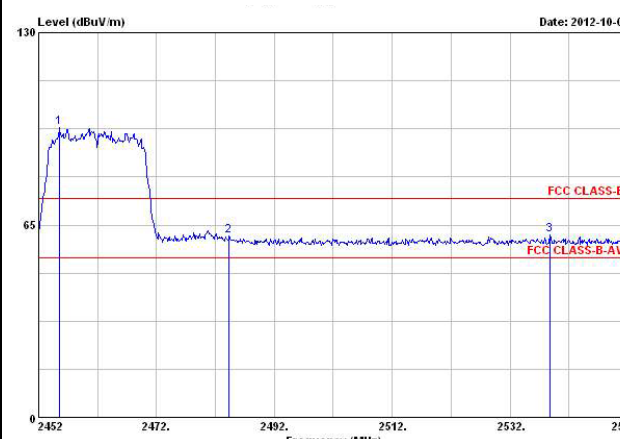


### 3.5.5 Test Result of Transmitter Radiated Bandedge Emissions-N<sub>TX</sub> 1

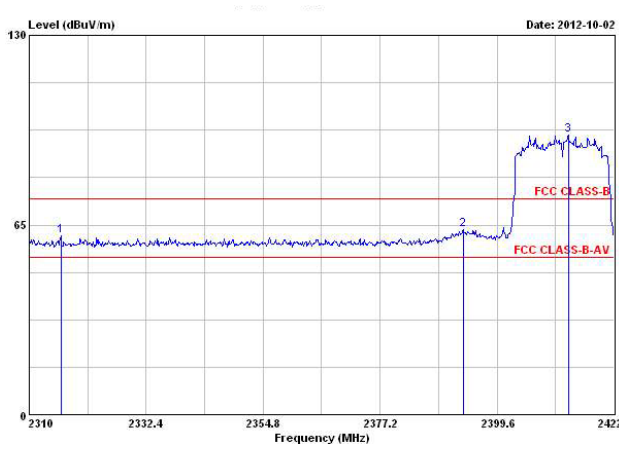
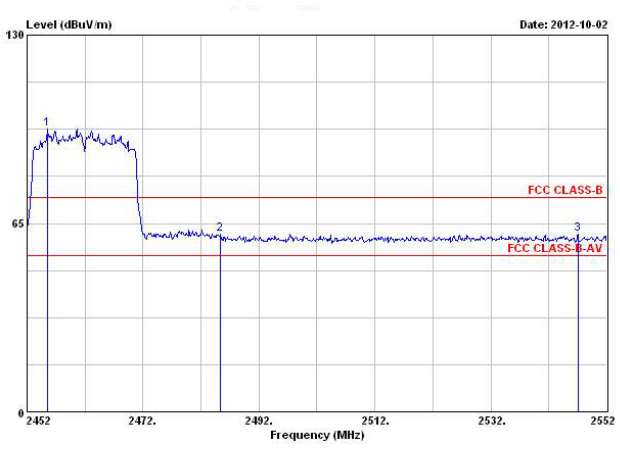


Transmitter Radiated Bandedge Emissions Result								
Modulation	11B-20M		Restricted Band Emissions					
Restricted Band (MHz)	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/1MHz)	RBE Freq. (MHz)	Measure Distance (m)	Out-Band Level (dBuV/m)	Limit (dBuV/m)	Level Type	Pol. note 1
2310-2390	2412	114.13	2390.00	3	66.13	74	PK	V
2310-2390	2412	104.37	2390.00	3	52.31	54	AV	V
2483.5-2500	2462	113.07	2483.90	3	67.29	74	PK	V
2483.5-2500	2462	103.19	2483.50	3	52.38	54	AV	V

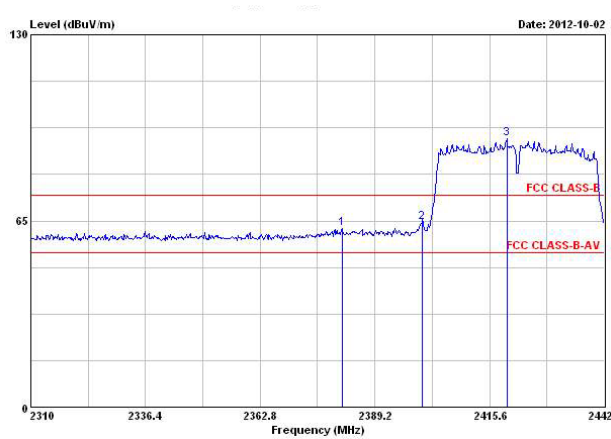
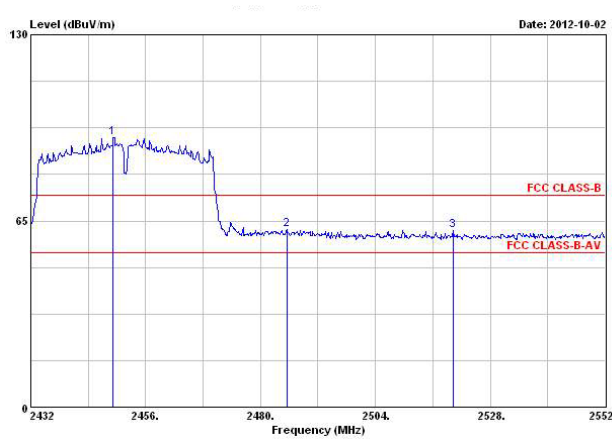
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

Transmitter Radiated Bandedge Emissions Result								
Modulation	11G-20M		Non-restricted Band Emissions					
Non-restricted Band (MHz)	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	2412	98.44	2393.55	64.72	33.72	20	PK	V
2500-2690	2462	98.05	2538.70	61.49	36.56	20	PK	V
Low Bandedge				Up Bandedge				
								
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)								

Transmitter Radiated Bandedge Emissions Result								
Modulation	11G-20M		Restricted Band Emissions					
Restricted Band (MHz)	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	2412	106.89	2390.00	3	69.49	74	PK	V
2310-2390	2412	95.55	2390.00	3	53.00	54	AV	V
2483.5-2500	2462	106.81	2483.50	3	69.39	74	PK	V
2483.5-2500	2462	94.78	2483.50	3	52.22	54	AV	V
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).								

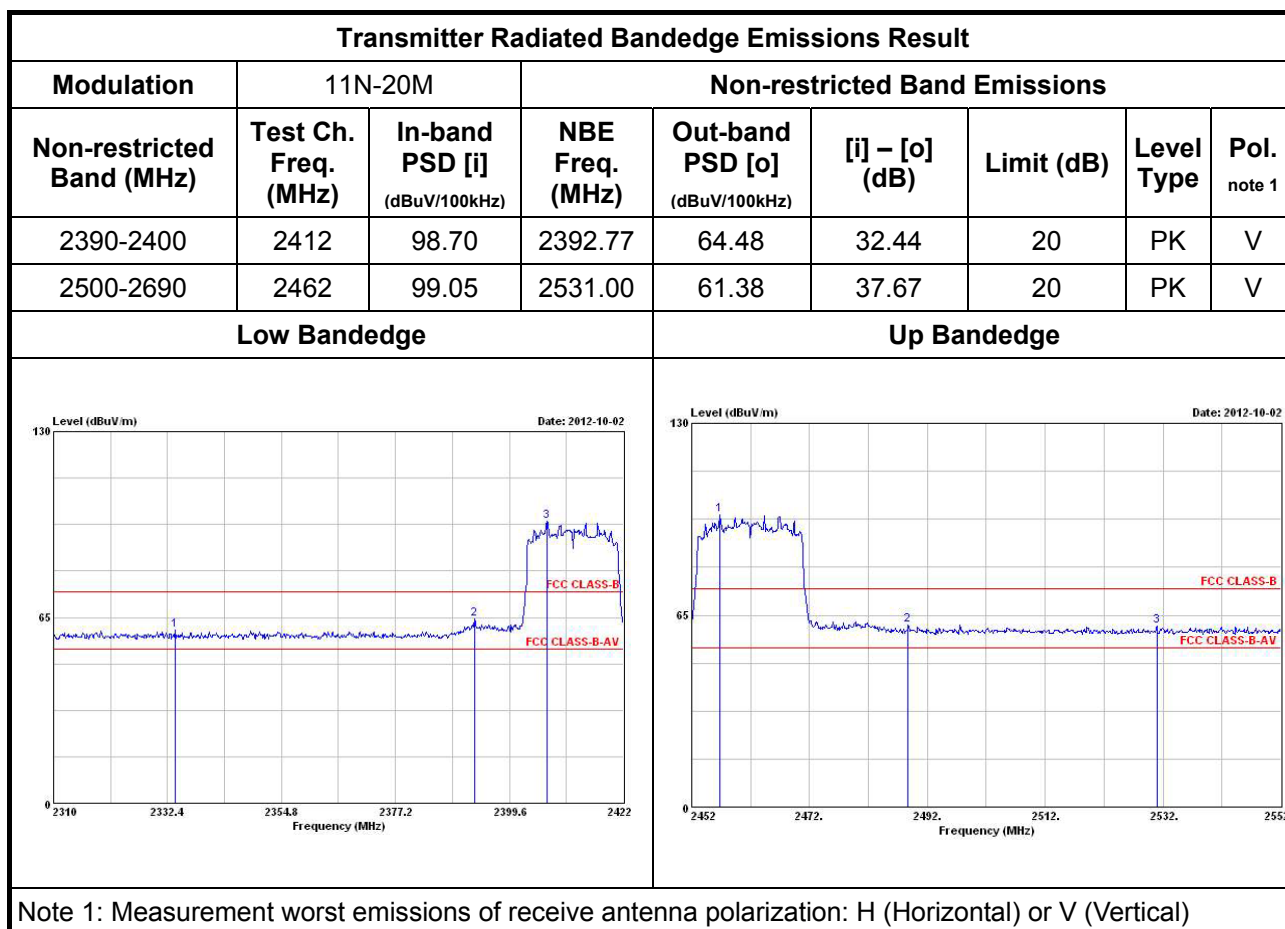
Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-20M		Non-restricted Band Emissions					
Non-restricted Band (MHz)	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	NBE Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Level Type	Pol. note 1
2390-2400	2412	95.75	2393.10	63.35	32.40	20	PK	V
2500-2690	2462	97.51	2547.00	61.33	36.18	20	PK	V
Low Bandedge				Up Bandedge				
								
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)								

Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-20M		Restricted Band Emissions					
Restricted Band (MHz)	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	2412	103.82	2390.00	3	71.21	74	PK	V
2310-2390	2412	92.63	2390.00	3	52.78	54	AV	V
2483.5-2500	2462	105.69	2485.00	3	68.99	74	PK	V
2483.5-2500	2462	94.05	2483.50	3	52.42	54	AV	V
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).								

Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-40M		Non-restricted Band Emissions					
Non-restricted Band (MHz)	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	2422	93.54	2400.00	64.48	29.06	20	PK	V
2500-2690	2452	94.12	2520.20	61.53	32.59	20	PK	V
Low Bandedge				Up Bandedge				
								
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)								

Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-40M		Restricted Band Emissions					
Restricted Band (MHz)	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	2422	100.70	2388.54	3	69.32	74	PK	V
2310-2390	2422	88.83	2384.18	3	52.95	54	AV	V
2483.5-2500	2452	101.61	2490.92	3	68.31	74	PK	V
2483.5-2500	2452	89.22	2483.60	3	52.76	54	AV	V
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).								

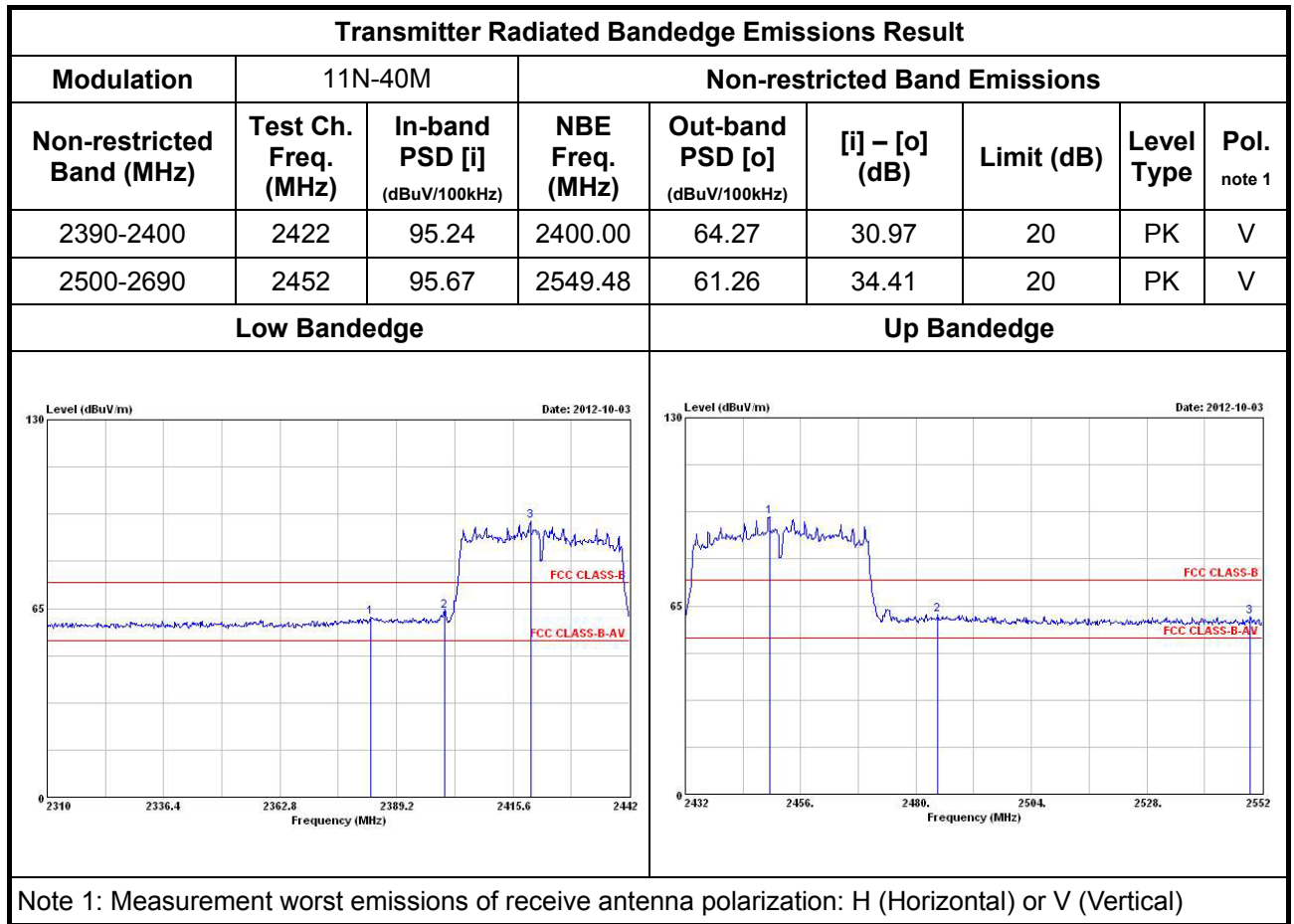
### 3.5.6 Test Result of Transmitter Radiated Bandedge Emissions-N<sub>TX</sub> 2



Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-20M		Restricted Band Emissions					
Restricted Band (MHz)	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	2412	106.15	2390.00	3	68.59	74	PK	V
2310-2390	2412	92.85	2390.00	3	52.41	54	AV	V
2483.5-2500	2462	106.92	2484.60	3	70.31	74	PK	V
2483.5-2500	2462	93.45	2483.50	3	52.89	54	AV	V

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).





Transmitter Radiated Bandedge Emissions Result								
Modulation	11N-40M		Restricted Band Emissions					
Restricted Band (MHz)	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	2422	101.00	2381.68	3	69.25	74	PK	V
2310-2390	2422	85.10	2383.79	3	52.98	54	AV	V
2483.5-2500	2452	101.16	2486.48	3	69.08	74	PK	V
2483.5-2500	2452	85.43	2484.20	3	52.65	54	AV	V

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.

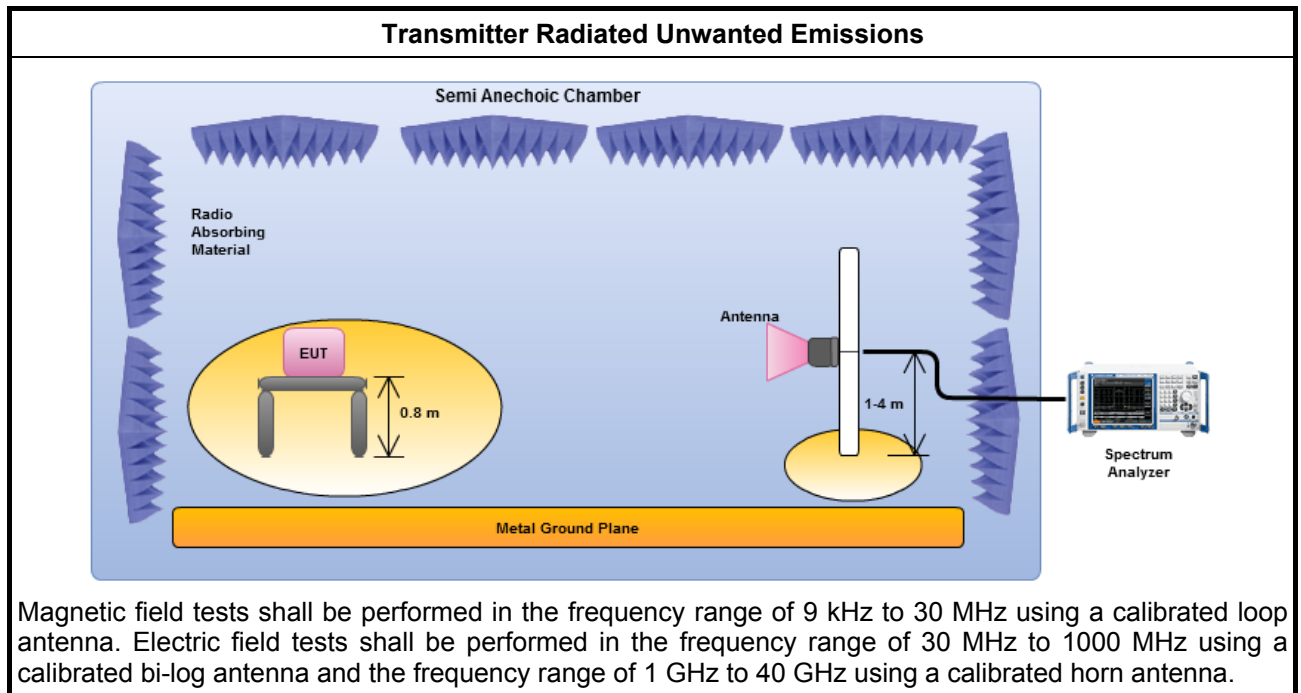
#### 3.6.2 Measuring Instruments

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

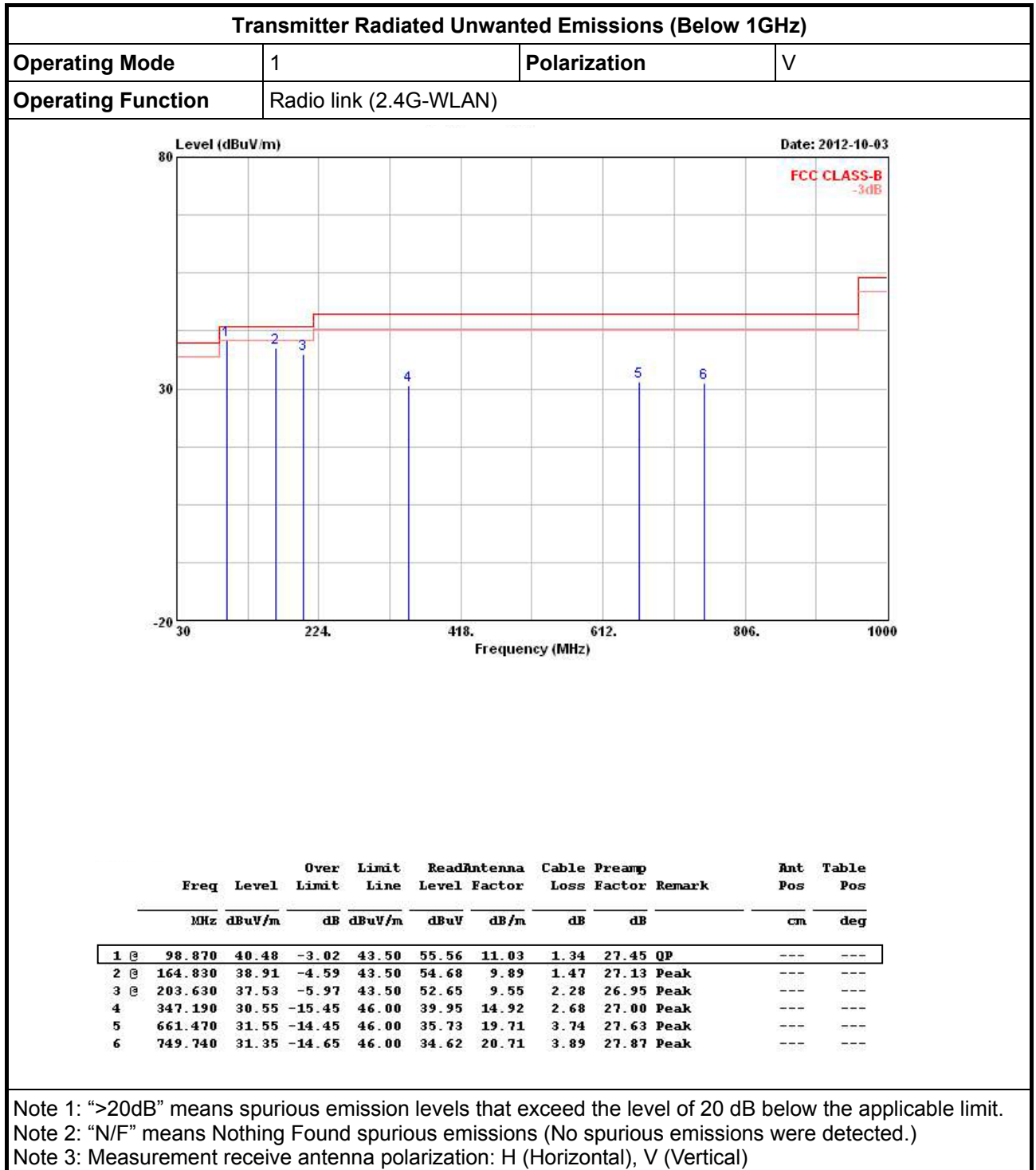
### 3.6.3 Test Procedures

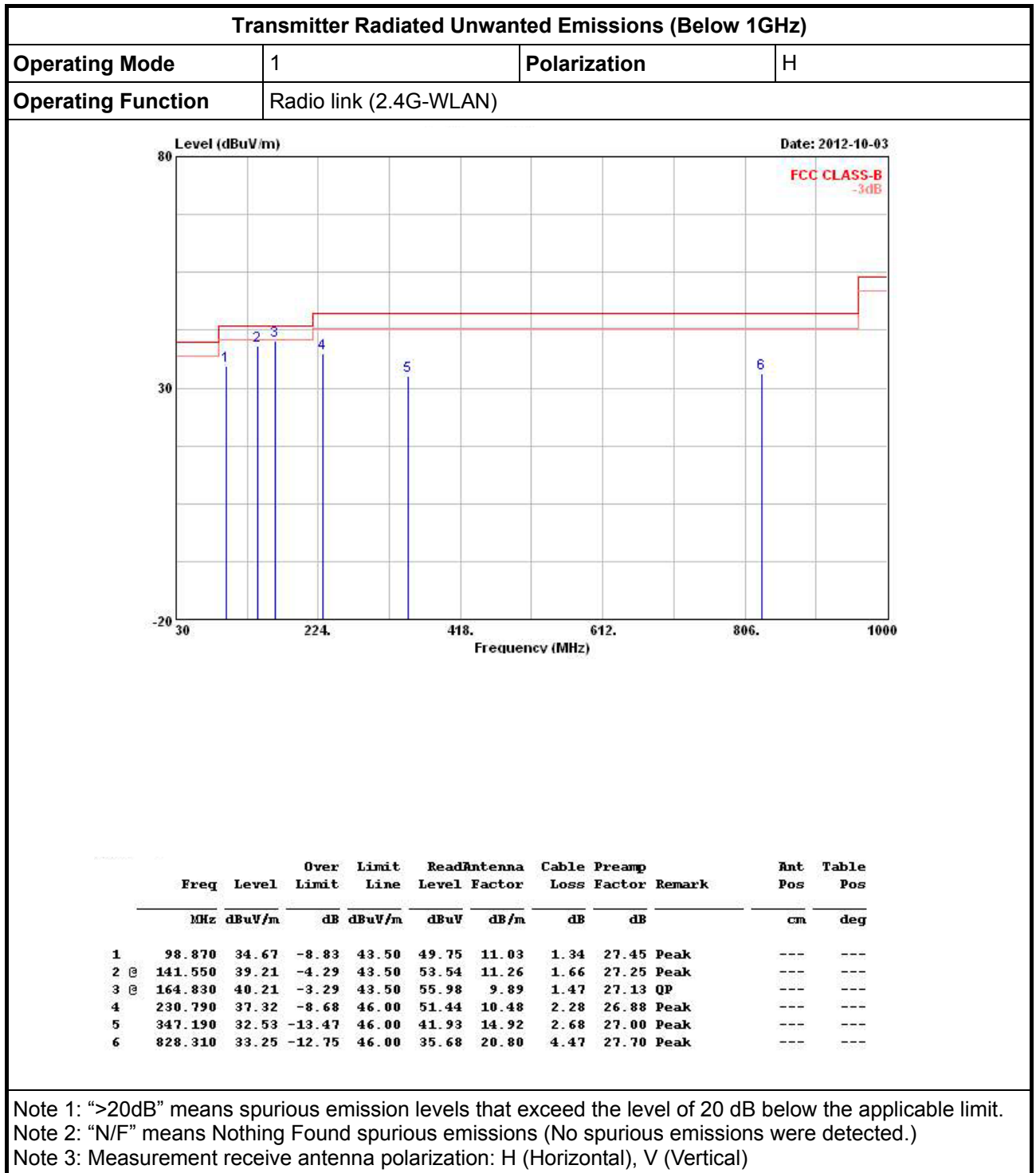
Test Method	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other 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 checked="" 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 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 5.4.2.2.1.1 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 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



### 3.6.5 Transmitter Radiated Unwanted Emissions (Below 1GHz)





### 3.6.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11B-20M-N<sub>Tx</sub>1

