

FCC / IC Radio Test Report

Applicant : Qualcomm Atheros, Inc.
Manufacturer : 1700 Technology Drive, San Jose, CA95110
Equipment : 1X1 802.11b/g/n-BT4.0 PCIe/USB M.2 Combo Module
Brand Name : Qualcomm Atheros
Model No. : QCNFA335
FCC ID : PPD-QCNFA335
IC ID : 4104A-QCNFA335
Standard : 47 CFR FCC Part 15.247
RSS-210 Issue 8
Operating Band : 2400 MHz – 2483.5 MHz

The product sample received on Aug. 27, 2013 and completely tested on Sep. 30, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

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

Reviewed by:

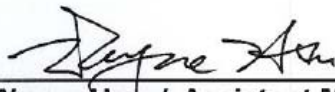

Wayne Hsu / Assistant Manager

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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Typical Data	Limit	Result
1.1.3	15.203	Antenna Requirement	Antenna connector mechanism complied	According to FCC 15.203	Complied
3.1	15.247(a) / RSS-210 A8.2 / /RSS-Gen 4.6.1	6dB Bandwidth	20M: 10.12 MHz 40M: 35.12 MHz	≥500kHz	Complied
		99% Bandwidth	20M: 17.69 MHz 40M: 36.06 MHz		
3.2	15.247(b) / RSS-210 A8.4	RF Output Power (Maximum Peak Conducted Output Power)	11 b: 22.43 dBm 11 g: 22.95 dBm 11 n HT20: 21.13 dBm 11 n HT40: 21.09 dBm	≤ 30 dBm	Complied
3.3	15.247(e) / RSS-210 A8.2	Power Spectral Density	11 b: -6.99 dBm/100kHz 11 g: -11.33 dBm/100kHz 11 n HT20: -13.37 dBm/100kHz 11 n HT40: -14.46 dBm/100kHz	≤ 8 dBm/3kHz	Complied
3.4	15.247(d) / RSS-210 A8.5	Emission in Non-Restricted Frequency Bands	Non-Restricted Bands	Non-Restricted Bands: > 20 dBc	Complied
3.5	15.247(d) / RSS-210 A8.5	Emission in Restricted Frequency Bands	Restricted Bands 2483.62 MHz -27.65 dBm - PK -41.50 dBm - AV	Restricted Bands: According to FCC 15.209 / RSS-Gen 6.1	Complied
3.6	15.207 / RSS-Gen 7.2.4	AC Power-line Conducted Emissions	0.1954980 MHz 43.77 dBuV - AV 56.14 dBuV - QP	According to FCC 15.207 / RSS-Gen 7.2.4	Complied

Revision History

[illegible]

1 General Description

1.1 Information

1.1.1 RF General Information (WLAN)

RF General Information						
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)	Co-location
2400~2483.5	b	2412, 2417, 2422, 2427, 2432, 2437, 2442, 2447, 2452, 2457, 2462	11	1	22.43	No
	g	2412, 2417, 2422, 2427, 2432, 2437, 2442, 2447, 2452, 2457, 2462	11	1	22.95	No
	n (HT20)	2412, 2417, 2422, 2427, 2432, 2437, 2442, 2447, 2452, 2457, 2462	11	1	21.13	No
	n (HT40)	2422, 2427, 2432, 2437, 2442, 2447, 2452	7	1	21.09	No
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 WLAN/ BT coexistence mode

- ♦ There are two HW variants for this module. The pretesting is conducted and test data from worst case is recorded in test report.

HW version 032: Dual Antenna	1X1 WLAN + BT: WLAN/BT concurrent at different antenna port and 18MHz separation between WLAN and BT fundamental. The WLAN is transmitted by the Chain 0 and the BT is transmitted by the Chain 1.
HW version 232: Single antenna	1X1 WLAN + BT: WLAN/BT 18MHz separation between WLAN and BT fundamental.
Note : Verified two HW versions and version 032 is the worst case. Record the worst case results in this report.	

1.1.3 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	External antenna (dedicated antennas)
<input checked="" type="checkbox"/>	RF connector provided
<input checked="" type="checkbox"/>	Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...)
<input type="checkbox"/>	Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...)

Antenna General Information		
No.	Frequency Band	Maximum Gain (dBi)
1	2400~2483.5MHz	3.62
2	2400~2483.5MHz	3.20

1.1.4 Type of EUT

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

1.1.5 Test Signal Duty Cycle

Operated Mode for Duty Cycle	
<input type="checkbox"/>	Operated normally mode for duty cycle
<input checked="" type="checkbox"/>	Operated test mode for duty cycle
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 100% - IEEE 802.11b	0
<input checked="" type="checkbox"/> 100% - IEEE 802.11g	0
<input checked="" type="checkbox"/> 98.97% - IEEE 802.11n (HT20)	0.05
<input checked="" type="checkbox"/> 100% - IEEE 802.11n (HT40)	0

1.1.6 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	E5530	DoC
2	(USB) Mouse	Microsoft	1113	DoC
3	(USB) Printer	EPSON	C61	DoC
4	Bluetooth Earphone	Sony Ericsson	Z354	PY7DDA-1-2
5	Test Fixture	--	--	--
6	Wireless AP (Remote Workstation)	ASUS	RT-AC66U	MSQ-RTAC66U

Support Equipment - Radiated Emissions				
No.	Equipment	Brand Name	Model Name	Serial No.
1	Notebook	DELL	E5520	DoC
2	Test Fixture	--	--	--
3	50Ω Terminal	--	--	--

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 Subpart C 15.247
- ♦ RSS-210 Issue 8
- ♦ RSS-GEN Issue 3
- ♦ 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 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test Condition	Test Site No.	Test Engineer	Test Environment
AC Conduction	CO04-HY	Zeus	23°C / 52%
RF Conducted	TH06-HY	Cain	20.4°C / 67.0%
Radiated Emission	03CH03-HY	Eddie	21.9°C / 51.2%

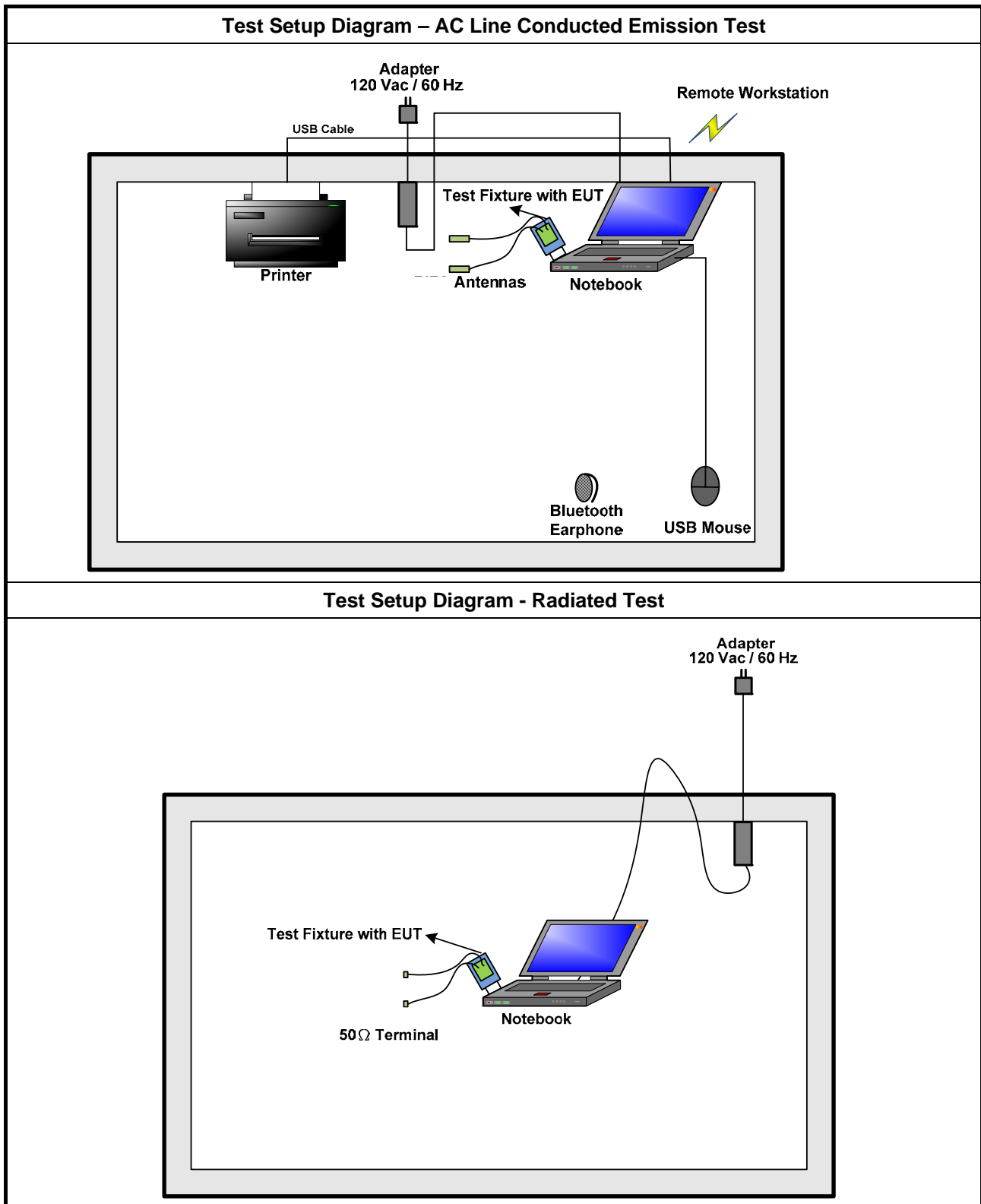
1.5 Measurement Uncertainty

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 Test Setup Diagram



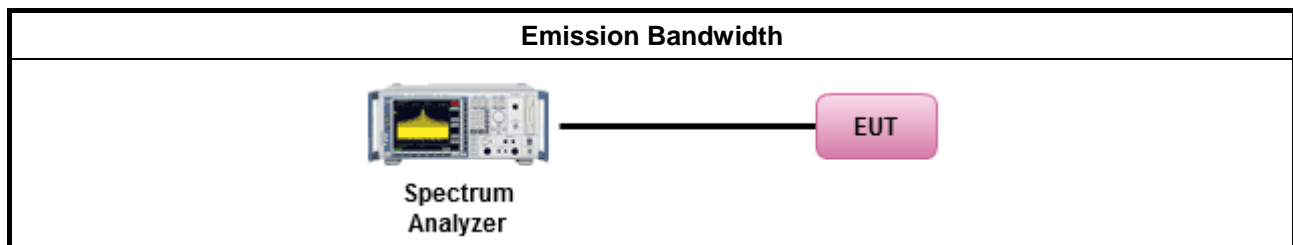
3 Transmitter Test Result

3.1 6dB Bandwidth

3.1.1 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	For the emission bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.
<input checked="" type="checkbox"/>	Refer as RSS-210 A8.2 for 6 dB bandwidth and RSS-Gen section 4.6.1 for 99% dB bandwidth measurement.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
<input checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input type="checkbox"/>	The EUT supports multiple transmit chains using options given below:
<input type="checkbox"/>	Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1
<input type="checkbox"/>	Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

3.1.2 Test Setup

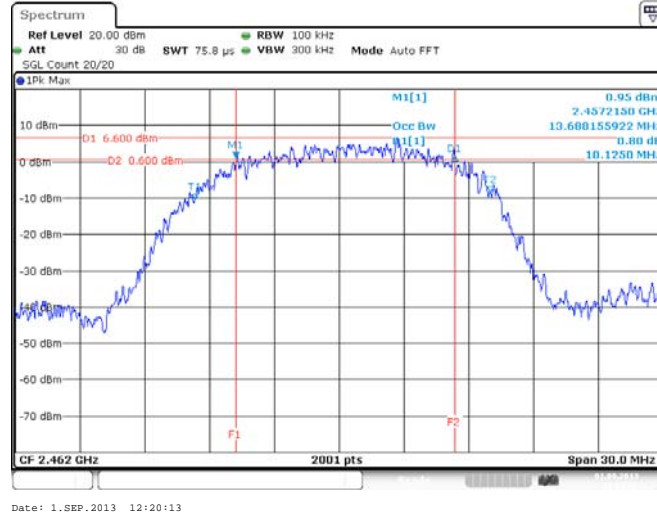


3.1.3 Test Result of Emission Bandwidth

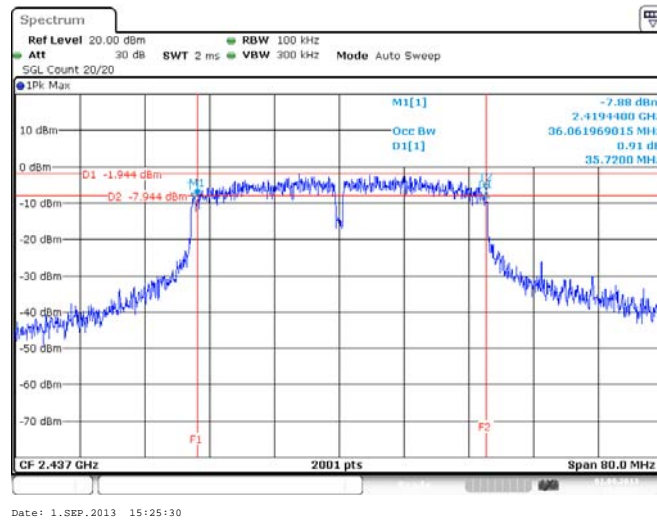
Emission Bandwidth Result				
Condition			Emission Bandwidth (MHz)	
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth	6dB Bandwidth
11b_11Mbps	1	2412	13.71	10.30
11b_11Mbps	1	2437	13.61	10.23
11b_11Mbps	1	2462	13.68	10.12
11g_6Mbps	1	2412	16.44	16.45
11g_6Mbps	1	2437	16.74	16.36
11g_6Mbps	1	2462	16.34	16.35
HT-20_MCS0	1	2412	17.63	17.64
HT-20_MCS0	1	2437	17.64	17.61
HT-20_MCS0	1	2462	17.54	17.52
HT-40_MCS0	1	2422	35.86	35.12
HT-40_MCS0	1	2437	36.06	35.72
HT-40_MCS0	1	2452	35.86	35.76
Limit			N/A	≥500 kHz
Result			Complied	
Note 1: N _{TX} = Number of Transmit Chains				

Worst Emission Bandwidth Plots

6dB bandwidth



99% bandwidth

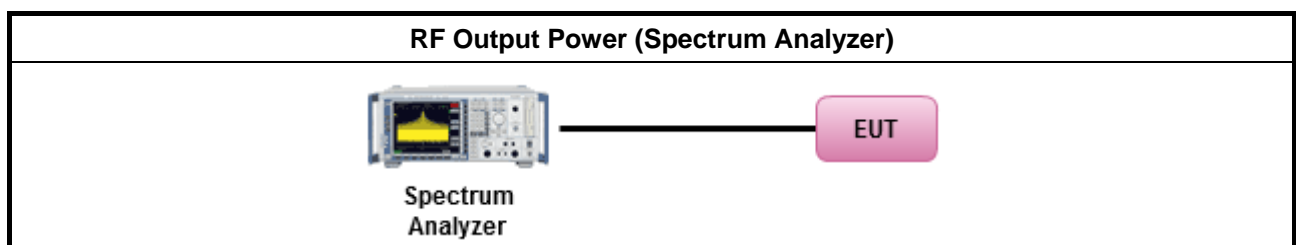


3.2 RF Output Power

3.2.1 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Maximum Peak Conducted Output Power
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.2 Option 2 (integrated band power method).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.3 Option 2 (peak power meter for VBW ≥ DTS BW)
<input checked="" type="checkbox"/>	Maximum Conducted Output Power
	[duty cycle ≥ 98% or external video / power trigger]
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM (using an RF average power meter).
<input checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input type="checkbox"/>	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
<input type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.2.2 Test Setup



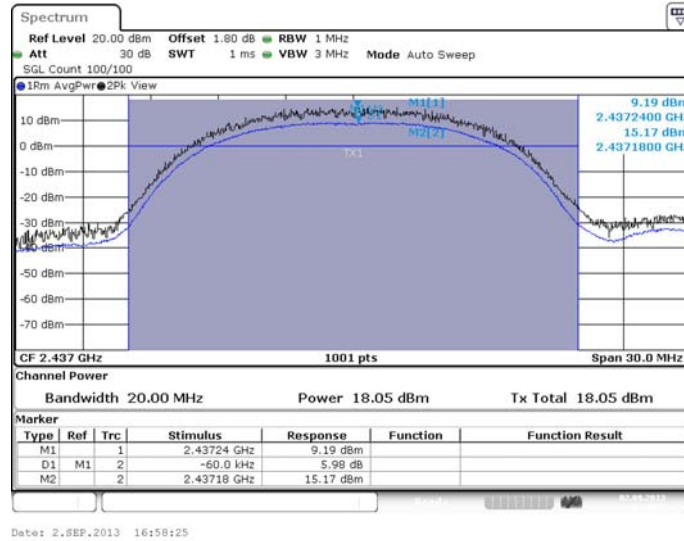
3.2.3 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result							
Condition			RF Output Power (dBm)				
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b_11Mbps	1	2412	21.72	30.00	3.62	25.34	36.00
11b_11Mbps	1	2437	22.43	30.00	3.62	26.05	36.00
11b_11Mbps	1	2462	21.68	30.00	3.62	25.30	36.00
11g_6Mbps	1	2412	19.02	30.00	3.62	22.64	36.00
11g_6Mbps	1	2437	22.95	30.00	3.62	26.57	36.00
11g_6Mbps	1	2462	19.02	30.00	3.62	22.64	36.00
HT-20_MCS0	1	2412	17.96	30.00	3.62	21.58	36.00
HT-20_MCS0	1	2437	21.13	30.00	3.62	24.75	36.00
HT-20_MCS0	1	2462	18.47	30.00	3.62	22.09	36.00
HT-40_MCS0	1	2422	16.78	30.00	3.62	20.40	36.00
HT-40_MCS0	1	2437	21.09	30.00	3.62	24.71	36.00
HT-40_MCS0	1	2452	16.43	30.00	3.62	20.05	36.00
Result			Complied				
Note : The above modulation modes have the worst test results and record in the report.							

3.2.4 Test Result of Maximum Average Conducted Output Power

Maximum Average Conducted Output Power Result							
Condition			RF Output Power (dBm)				
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b_11Mbps	1	2412	17.28	30.00	3.62	20.90	36.00
11b_11Mbps	1	2437	18.05	30.00	3.62	21.67	36.00
11b_11Mbps	1	2462	17.39	30.00	3.62	21.01	36.00
11g_6Mbps	1	2412	14.06	30.00	3.62	17.68	36.00
11g_6Mbps	1	2437	18.00	30.00	3.62	21.62	36.00
11g_6Mbps	1	2462	14.14	30.00	3.62	17.76	36.00
HT-20_MCS0	1	2412	13.06	30.00	3.62	16.68	36.00
HT-20_MCS0	1	2437	16.12	30.00	3.62	19.74	36.00
HT-20_MCS0	1	2462	13.47	30.00	3.62	17.09	36.00
HT-40_MCS0	1	2422	11.62	30.00	3.62	15.24	36.00
HT-40_MCS0	1	2437	16.03	30.00	3.62	19.65	36.00
HT-40_MCS0	1	2452	11.42	30.00	3.62	15.04	36.00
Result			Complied				
Note : The above modulation modes have the worst test results and record in the report.							

Worst AV Conducted Output Power Plots

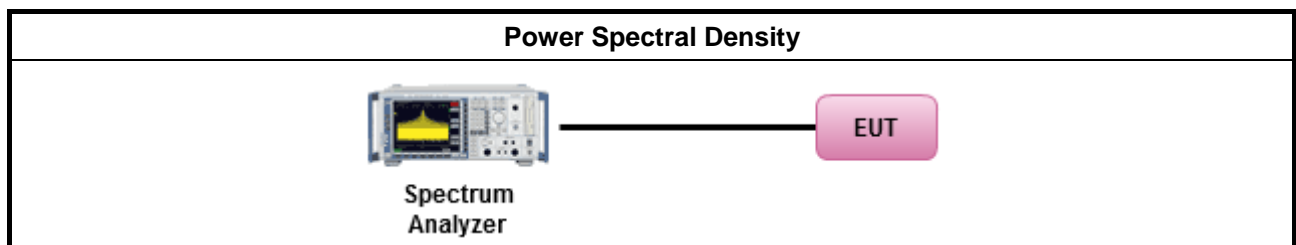


3.3 Power Spectral Density

3.3.1 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz;detector=peak).. [duty cycle \geq 98% or external video / power trigger]
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.3 Method AVGPS-1 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.4 Method AVGPS-1 Alt. (slow sweep speed) duty cycle < 98% and average over on/off periods with duty factor
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.5 Method AVGPS-2 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.6 Method AVGPS-2 Alt. (slow sweep speed)
<input checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input type="checkbox"/>	The EUT supports multiple transmit chains using options given below:
<input type="checkbox"/>	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
<input type="checkbox"/>	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

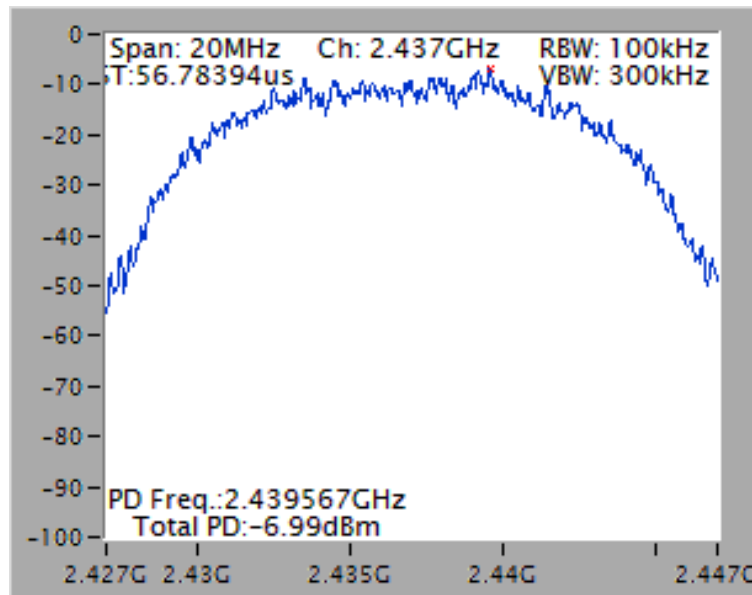
3.3.2 Test Setup



3.3.3 Test Result of Power Spectral Density

Power Spectral Density Result				
Condition			Power Spectral Density	
Modulation Mode	N _{TX}	Freq. (MHz)	Sum Chain dBm/100kHz	Power Limit dBm/3kHz
11b_11Mbps	1	2412	-8.35	8
11b_11Mbps	1	2437	-6.99	8
11b_11Mbps	1	2462	-7.79	8
11g_6Mbps	1	2412	-15.46	8
11g_6Mbps	1	2437	-11.33	8
11g_6Mbps	1	2462	-15.59	8
HT-20_MCS0	1	2412	-16.78	8
HT-20_MCS0	1	2437	-13.37	8
HT-20_MCS0	1	2462	-16.07	8
HT-40_MCS0	1	2422	-18.10	8
HT-40_MCS0	1	2437	-14.46	8
HT-40_MCS0	1	2452	-16.57	8
Result			Complied	
Note : The above modulation modes have the worst test results and record in the report.				

Worst Power Spectral Density Plots

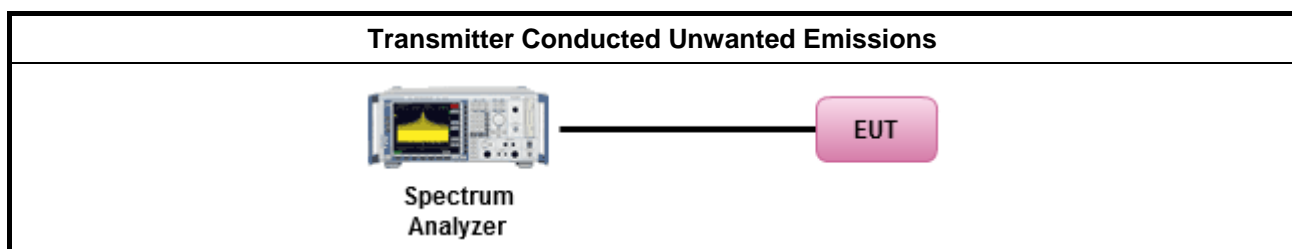


3.4 Emission in Non-Restricted Frequency Bands

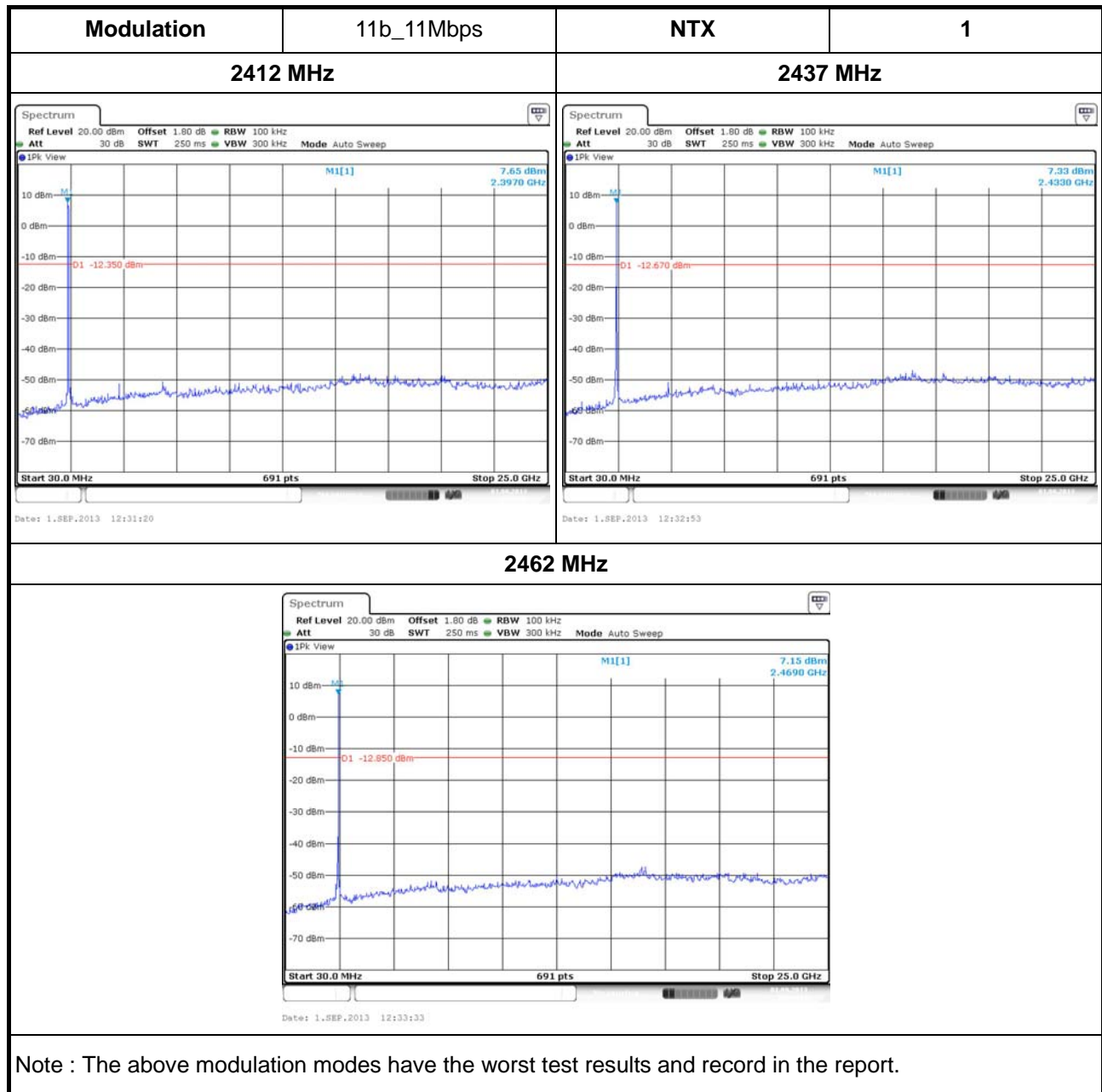
3.4.1 Test Procedures

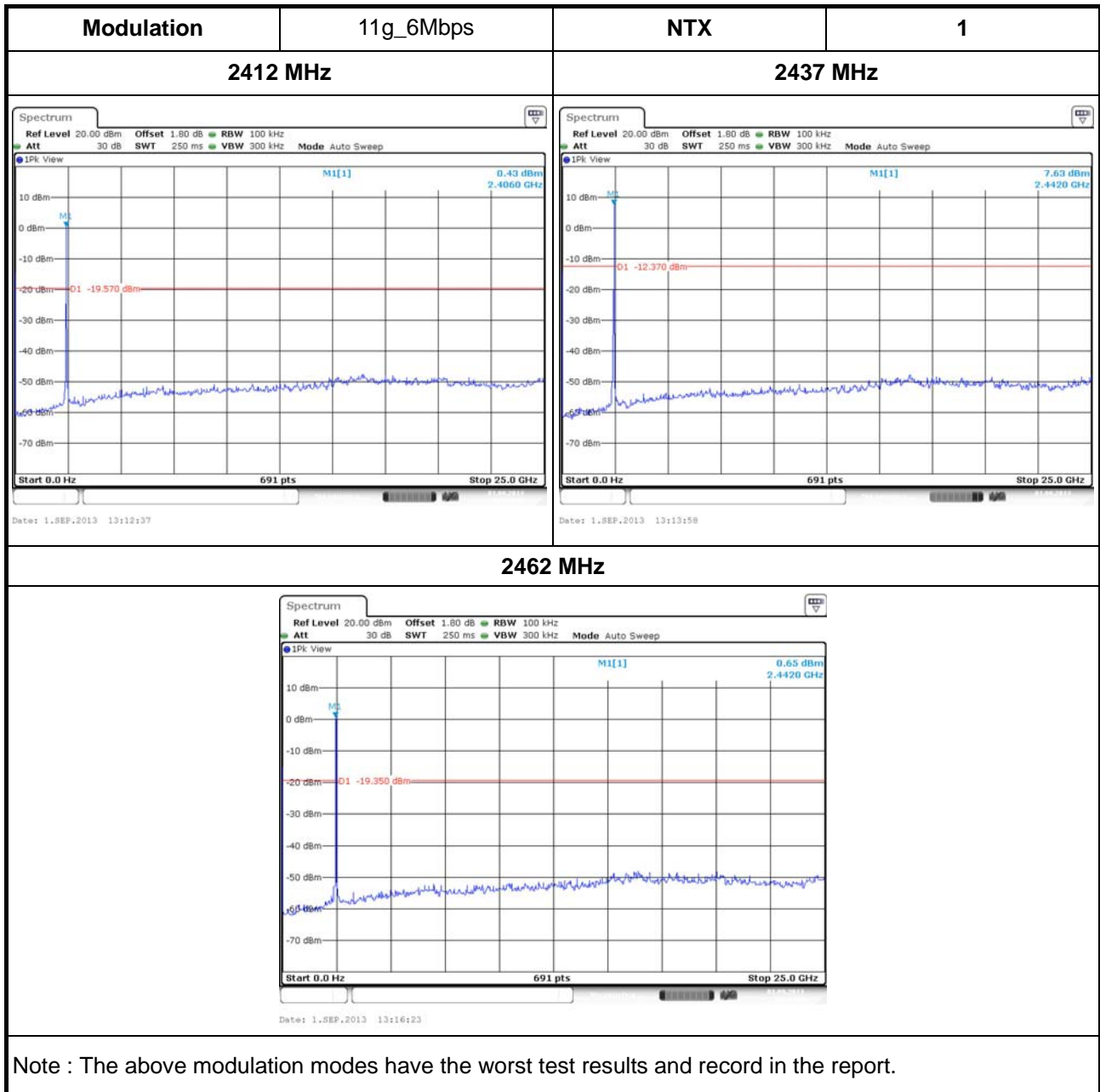
Test Method	
<input checked="" type="checkbox"/>	The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	For the transmitter bandedge emissions shall be measured using following options below:
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/>	For conducted measurement, refer as FCC KDB 558074, clause 12.2.2.
<input type="checkbox"/>	For conducted unwanted emissions into non-restricted bands (relative emission limits). 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 conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
<input type="checkbox"/>	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

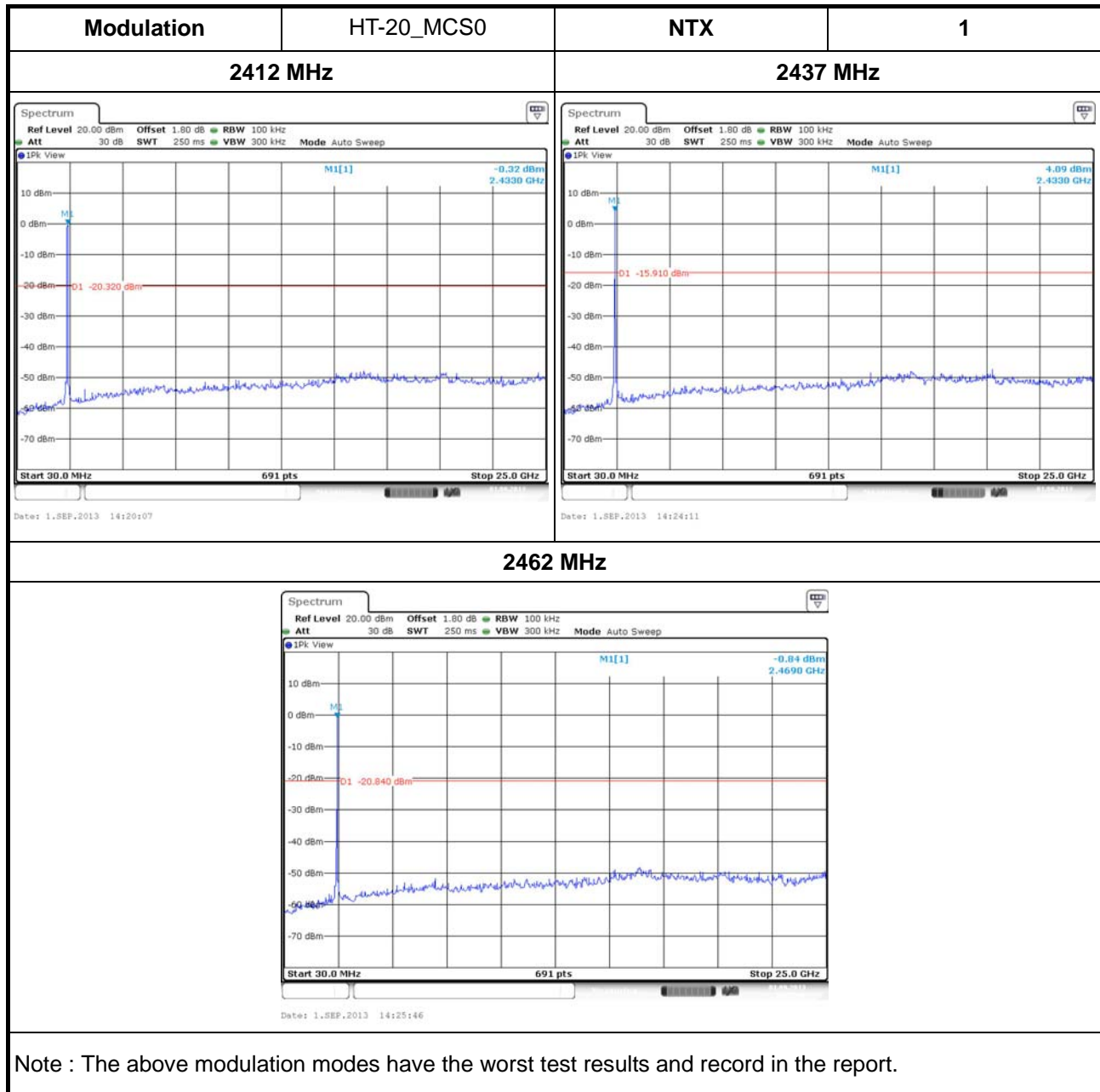
3.4.2 Test Setup

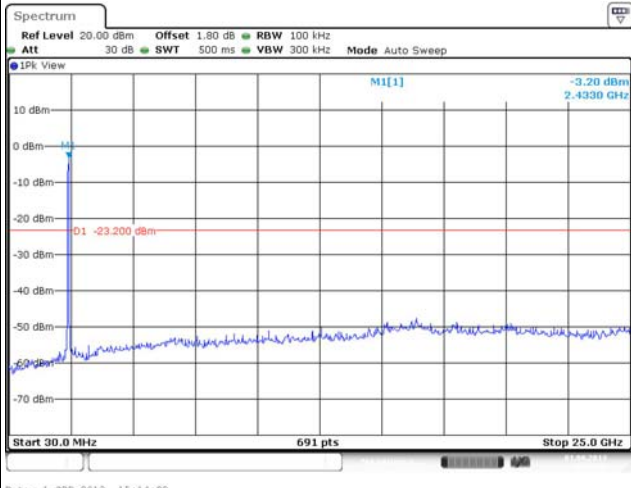
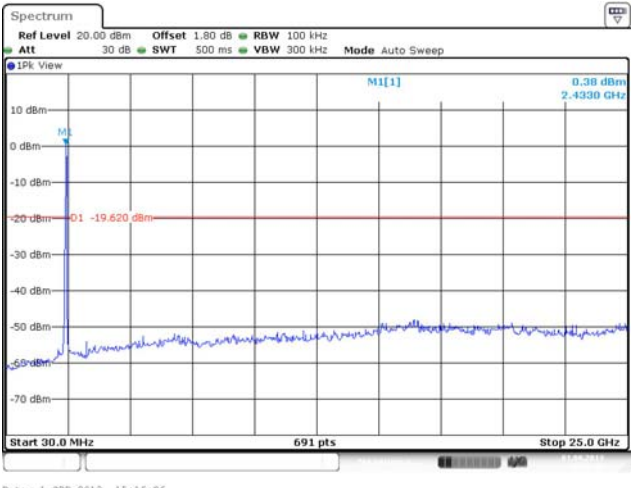
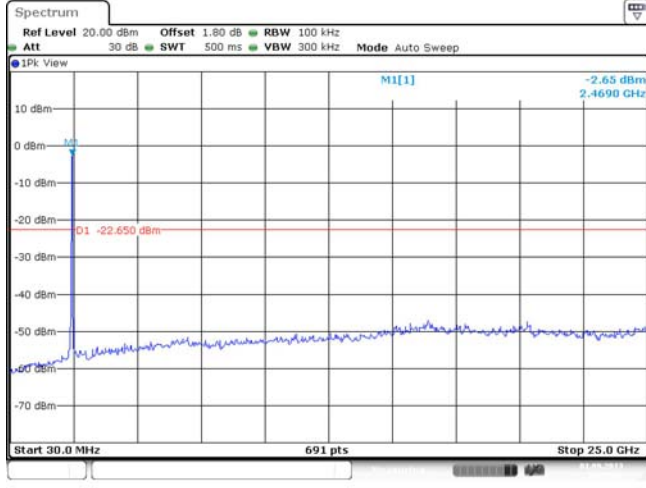


3.4.3 Test Result of Emission in Non-Restricted Frequency Bands







Modulation	HT-40_MCS0	NTX	1
2422 MHz		2437 MHz	
			
2452 MHz			
			
Note : The above modulation modes have the worst test results and record in the report.			

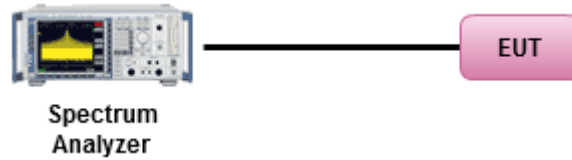
3.5 Emission in Restricted Frequency Bands

3.5.1 Test Procedures

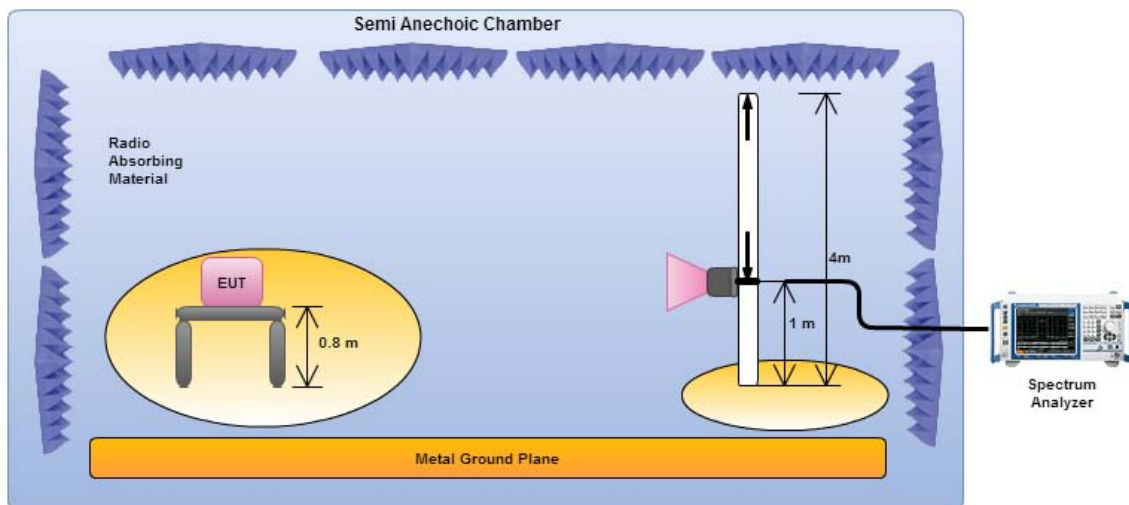
Test Method	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other 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 ≥ 98 or duty factor].
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$)
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$).
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.
<input checked="" type="checkbox"/>	For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2.
<input type="checkbox"/>	For conducted unwanted emissions into non-restricted bands (relative emission limits). 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 conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
<input type="checkbox"/>	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.5.2 Test Setup

Transmitter Conducted Emissions in restricted frequency bands (with Antenna Gain)



Transmitter Radiated Emissions in restricted frequency bands (with 50 Ω Terminated)

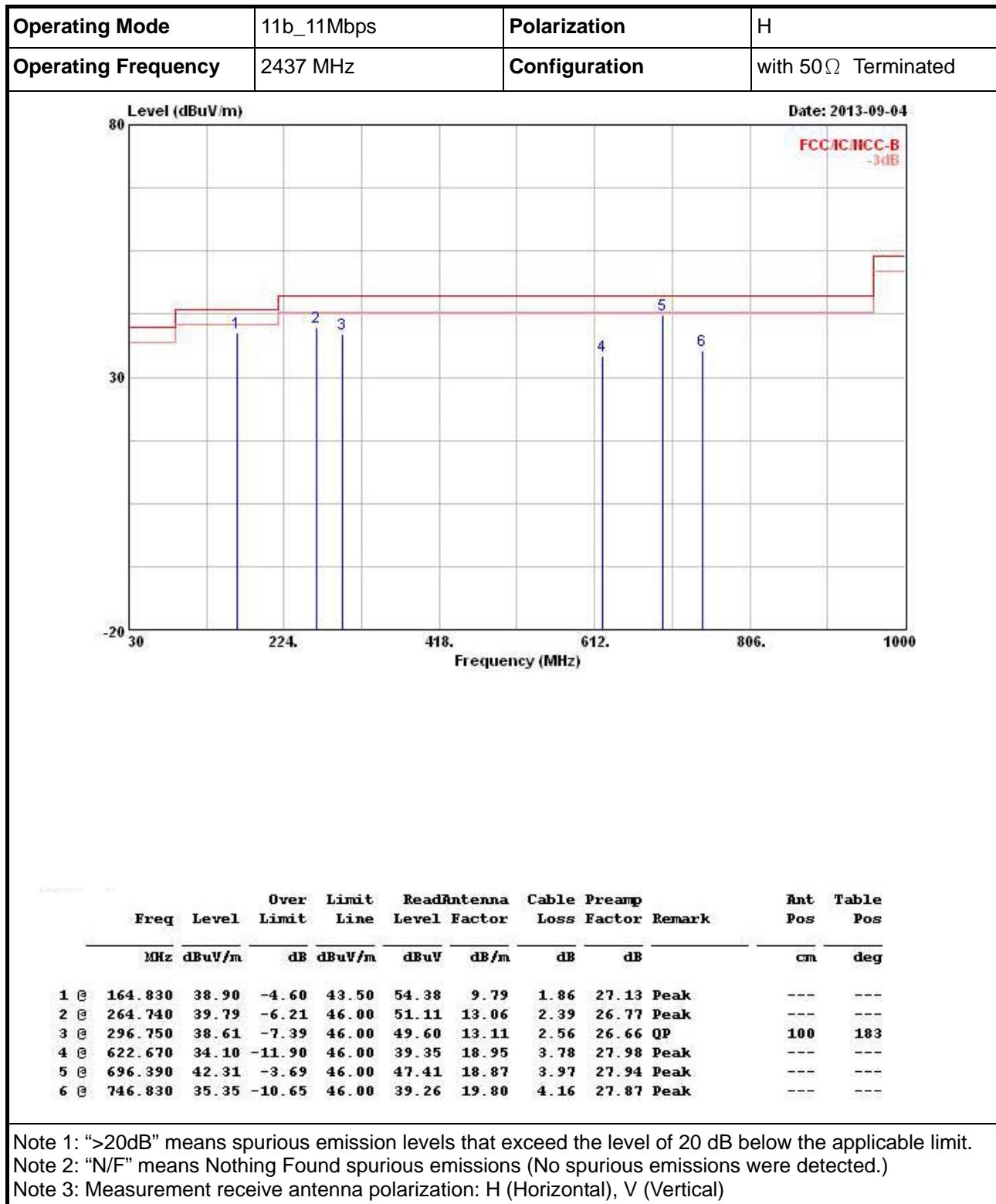


Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn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

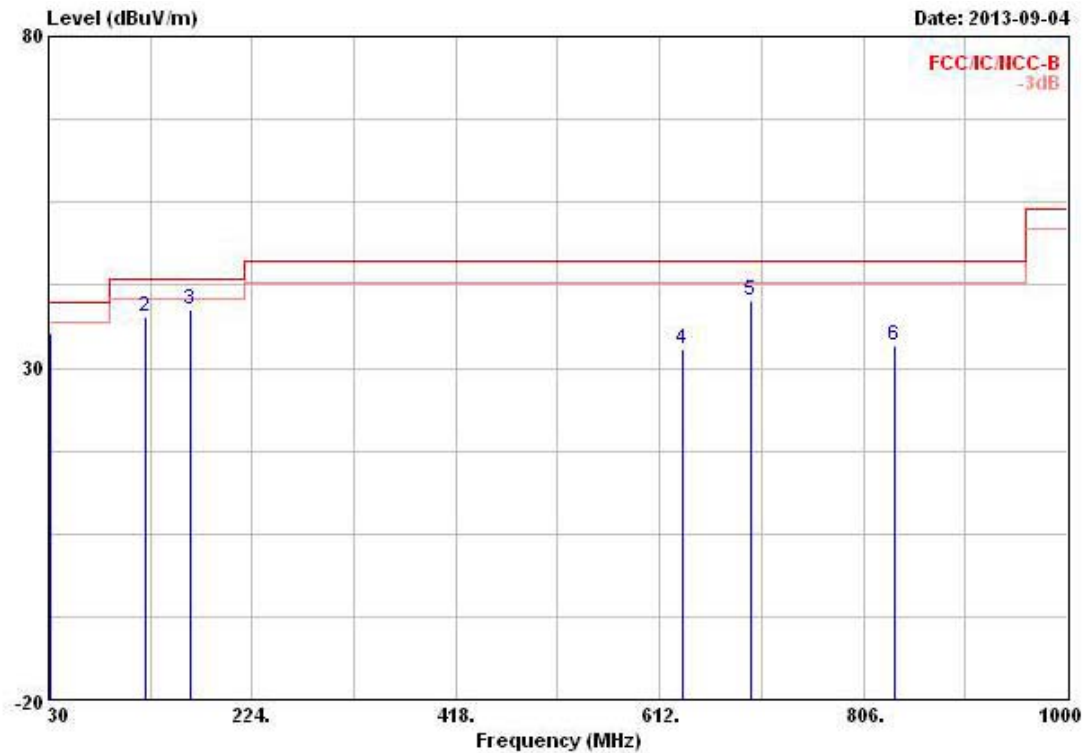
3.5.3 Emission in Restricted Frequency Bands- (Below 30MHz)

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

3.5.4 Emission in Restricted Frequency Bands- (Below 1GHz)



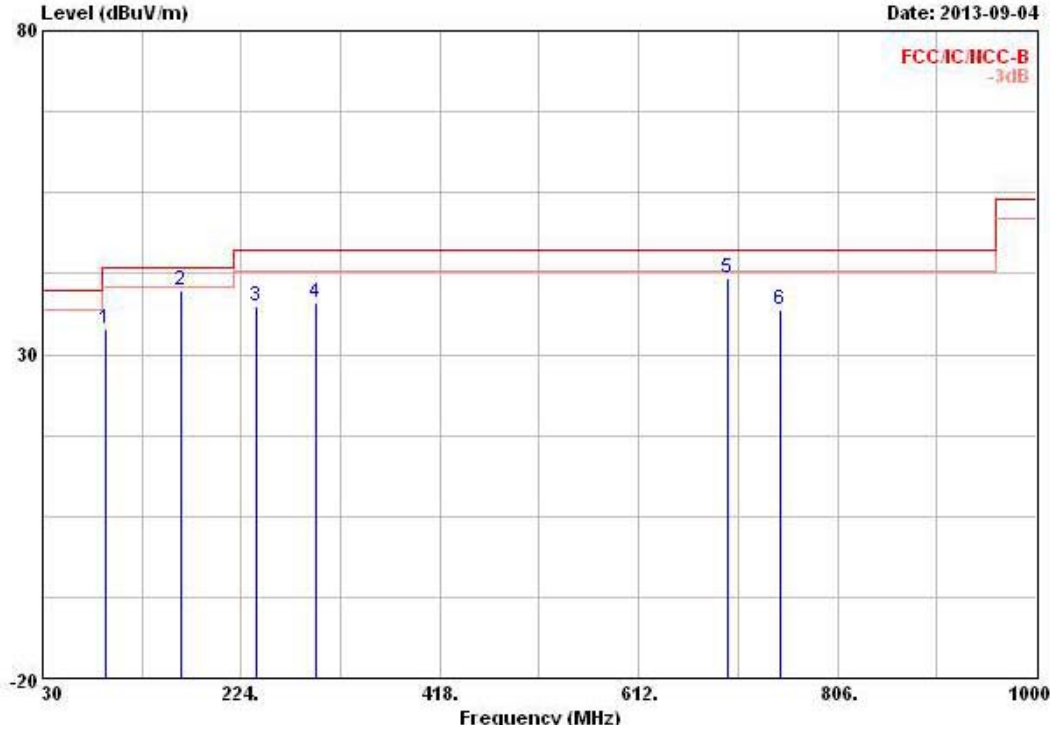
Operating Mode	11b_11Mbps	Polarization	V
Operating Frequency	2437 MHz	Configuration	with 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	31.940	35.27	-4.73	40.00	44.38	17.70	0.80	27.61	QP	100	86
2 @	122.150	37.70	-5.80	43.50	50.72	12.64	1.64	27.30	Peak	---	---
3 @	164.830	38.90	-4.60	43.50	54.38	9.79	1.86	27.13	Peak	---	---
4 @	633.340	32.84	-13.16	46.00	38.04	18.96	3.81	27.97	Peak	---	---
5 @	699.300	40.06	-5.94	46.00	45.12	18.90	3.98	27.94	Peak	---	---
6 @	836.070	33.30	-12.70	46.00	36.38	20.22	4.41	27.71	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)

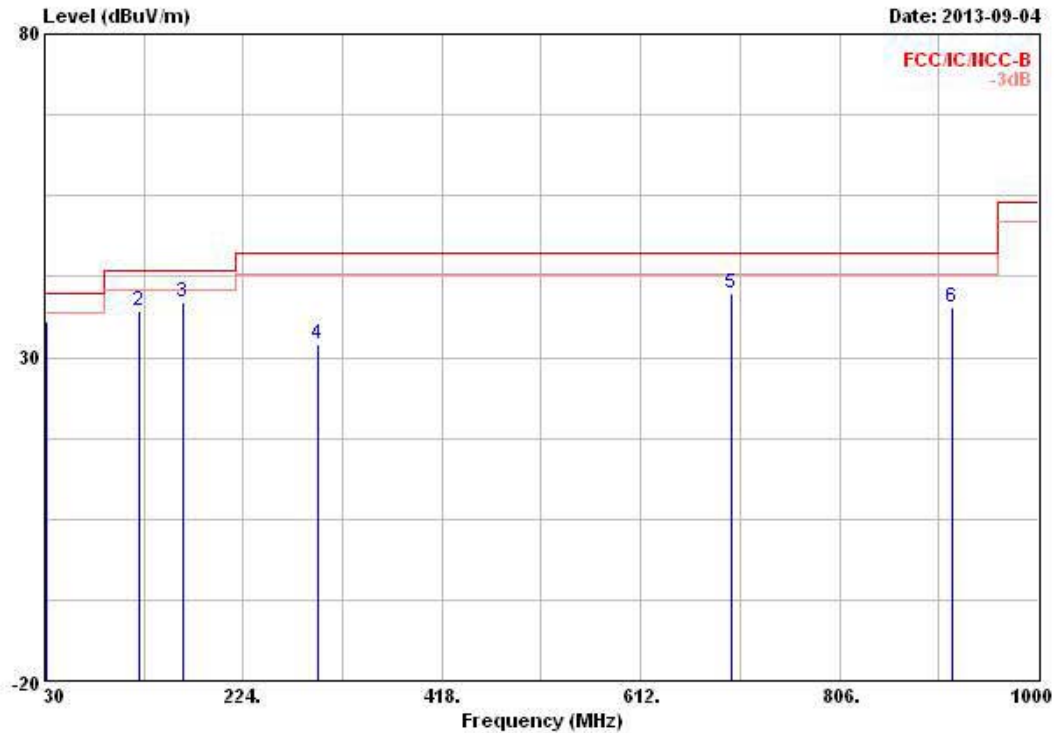
Operating Mode	11g_6Mbps	Polarization	H
Operating Frequency	2437 MHz	Configuration	with 50Ω Terminated



	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	91.110	33.88	-9.62	43.50	50.57	9.35	1.38	27.42 Peak	---	---
2	164.830	39.84	-3.66	43.50	55.32	9.79	1.86	27.13 Peak	---	---
3	238.550	37.42	-8.58	46.00	50.79	11.24	2.26	26.87 Peak	---	---
4	296.750	38.01	-7.99	46.00	49.00	13.11	2.56	26.66 QP	100	188
5	699.300	41.73	-4.27	46.00	46.79	18.90	3.98	27.94 Peak	---	---
6	749.740	36.84	-9.16	46.00	40.74	19.80	4.17	27.87 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)

Operating Mode	11g_6Mbps	Polarization	V
Operating Frequency	2437 MHz	Configuration	with 50Ω Terminated



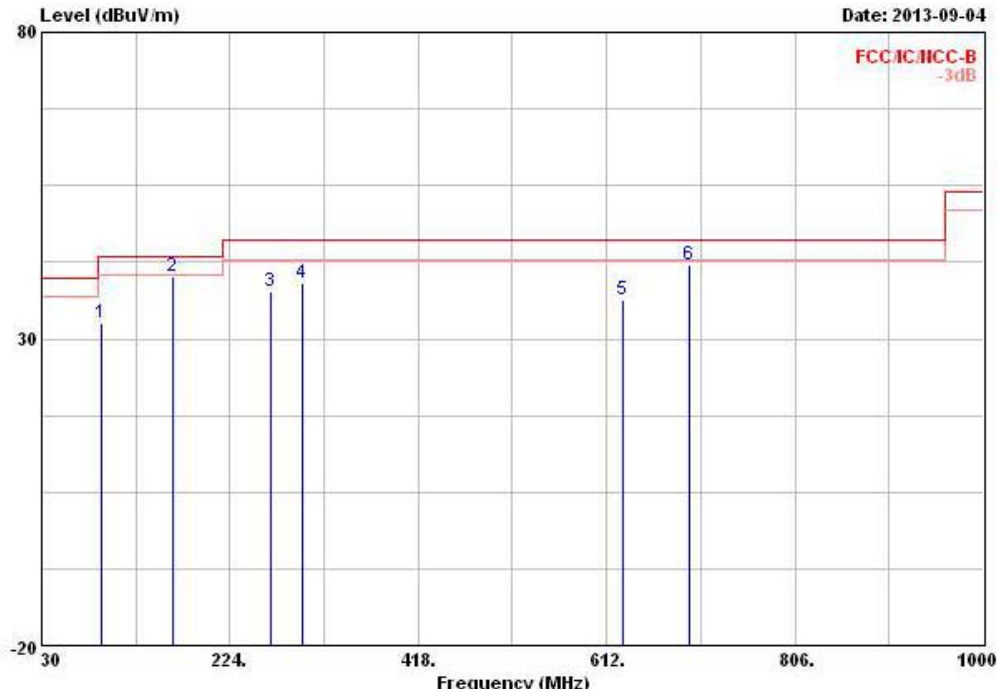
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	31.940	35.68	-4.32	40.00	44.79	17.70	0.80	27.61 QP	100	76
2	122.150	37.05	-6.45	43.50	50.07	12.64	1.64	27.30 Peak	---	---
3 @	164.830	38.61	-4.89	43.50	54.09	9.79	1.86	27.13 Peak	---	---
4	296.750	31.99	-14.01	46.00	42.98	13.11	2.56	26.66 Peak	---	---
5	700.270	39.77	-6.23	46.00	44.82	18.91	3.98	27.94 Peak	---	---
6	916.580	37.64	-8.36	46.00	40.01	20.50	4.63	27.50 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)

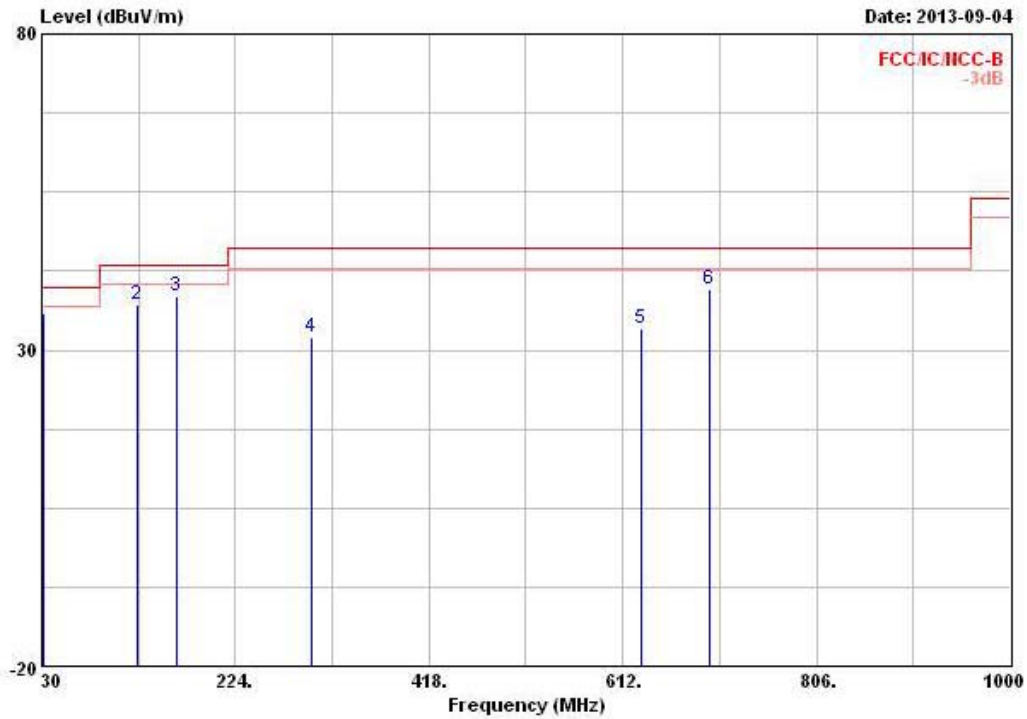
Operating Mode	HT-20_MCS0	Polarization	H
Operating Frequency	2437 MHz	Configuration	with 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	91.110	32.66	-10.84	43.50	49.35	9.35	1.38	27.42	Peak	---	---
2	164.830	40.16	-3.34	43.50	55.64	9.79	1.86	27.13	Peak	---	---
3	265.710	37.79	-8.21	46.00	49.21	12.96	2.39	26.77	Peak	---	---
4	298.690	39.04	-6.96	46.00	49.99	13.13	2.57	26.65	QP	100	184
5	629.460	36.32	-9.68	46.00	41.53	18.97	3.80	27.98	Peak	---	---
6	696.390	42.05	-3.95	46.00	47.15	18.87	3.97	27.94	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)

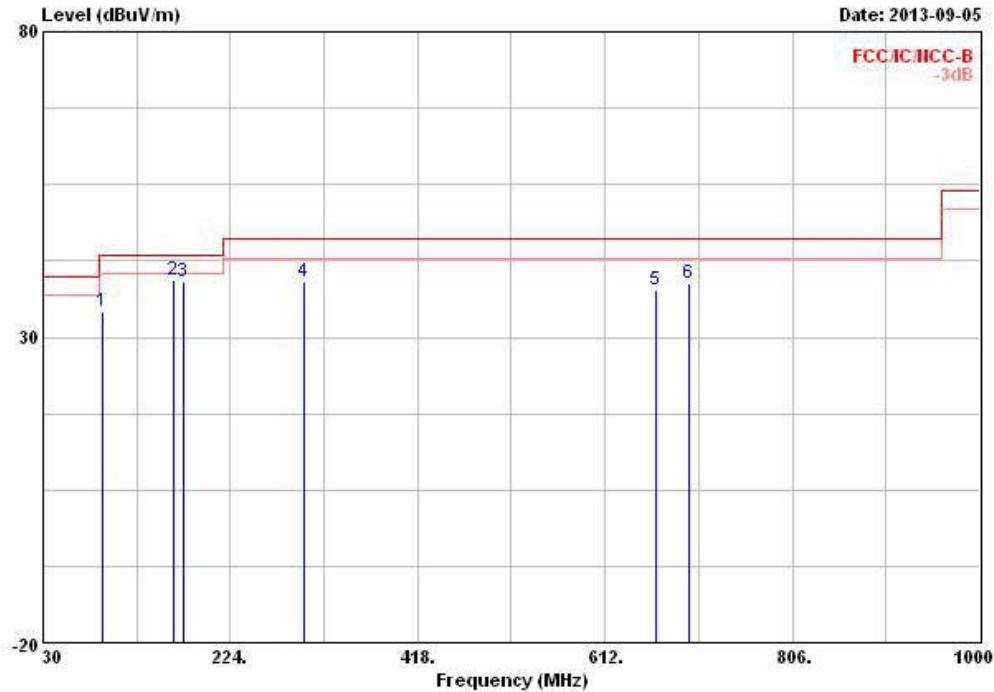
Operating Mode	HT-20_MCS0	Polarization	V
Operating Frequency	2437 MHz	Configuration	with 50Ω Terminated



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB	dB		cm	deg
1	31.940	35.88	-4.12	40.00	44.99	17.70	0.80	27.61 QP	100	84
2	126.030	37.23	-6.27	43.50	50.44	12.40	1.67	27.28 Peak	---	---
3	164.830	38.53	-4.97	43.50	54.01	9.79	1.86	27.13 Peak	---	---
4	299.660	31.97	-14.03	46.00	42.91	13.14	2.57	26.65 Peak	---	---
5	630.430	33.35	-12.65	46.00	38.55	18.97	3.80	27.97 Peak	---	---
6	699.300	39.55	-6.45	46.00	44.61	18.90	3.98	27.94 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)

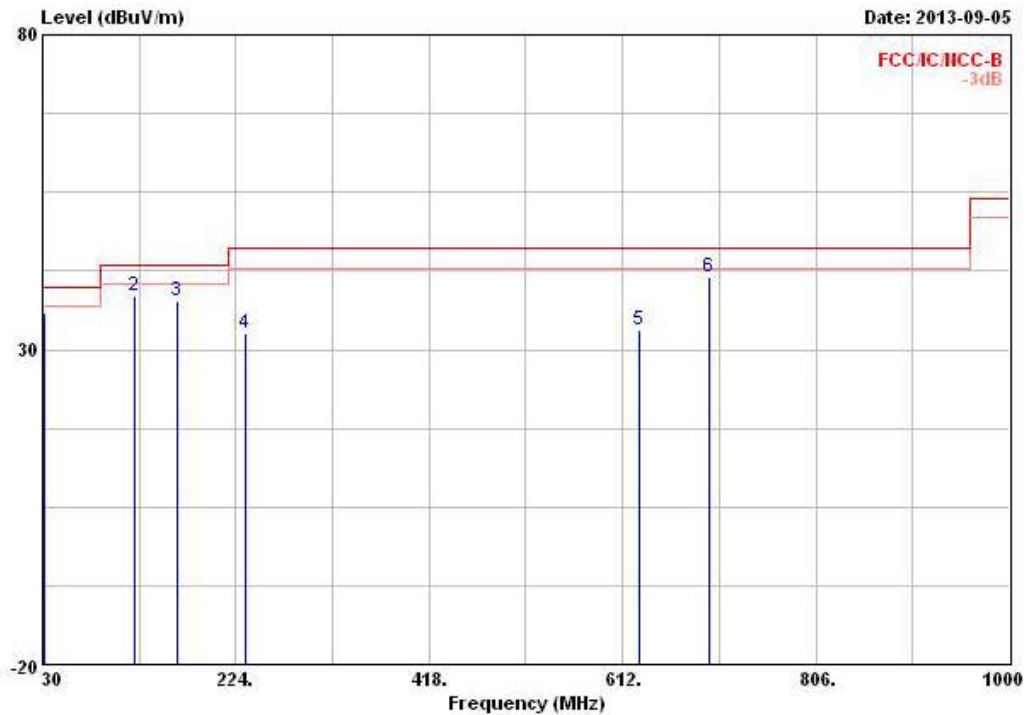
Operating Mode	HT-40_MCS0	Polarization	H
Operating Frequency	2437 MHz	Configuration	with 50 Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	91.110	34.29	-9.21	43.50	50.98	9.35	1.38	27.42	Peak	---	---
2	164.830	39.46	-4.04	43.50	54.94	9.79	1.86	27.13	Peak	---	---
3	175.500	39.02	-4.48	43.50	54.72	9.48	1.91	27.09	Peak	---	---
4	299.660	39.06	-6.94	46.00	50.00	13.14	2.57	26.65	QP	100	180
5	664.380	37.76	-8.24	46.00	42.96	18.87	3.89	27.96	Peak	---	---
6	699.300	38.94	-7.06	46.00	44.00	18.90	3.98	27.94	QP	100	76

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)

Operating Mode	HT-40_MCS0	Polarization	V
Operating Frequency	2437 MHz	Configuration	with 50 Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	31.940	35.88	-4.12	40.00	44.99	17.70	0.80	27.61	QP	100	142
2	122.150	38.62	-4.88	43.50	51.64	12.64	1.64	27.30	Peak	---	---
3	164.830	37.70	-5.80	43.50	53.18	9.79	1.86	27.13	Peak	---	---
4	233.700	32.50	-13.50	46.00	46.47	10.67	2.24	26.88	Peak	---	---
5	629.460	33.07	-12.93	46.00	38.28	18.97	3.80	27.98	Peak	---	---
6	699.300	41.43	-4.57	46.00	46.49	18.90	3.98	27.94	Peak	---	---

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

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

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

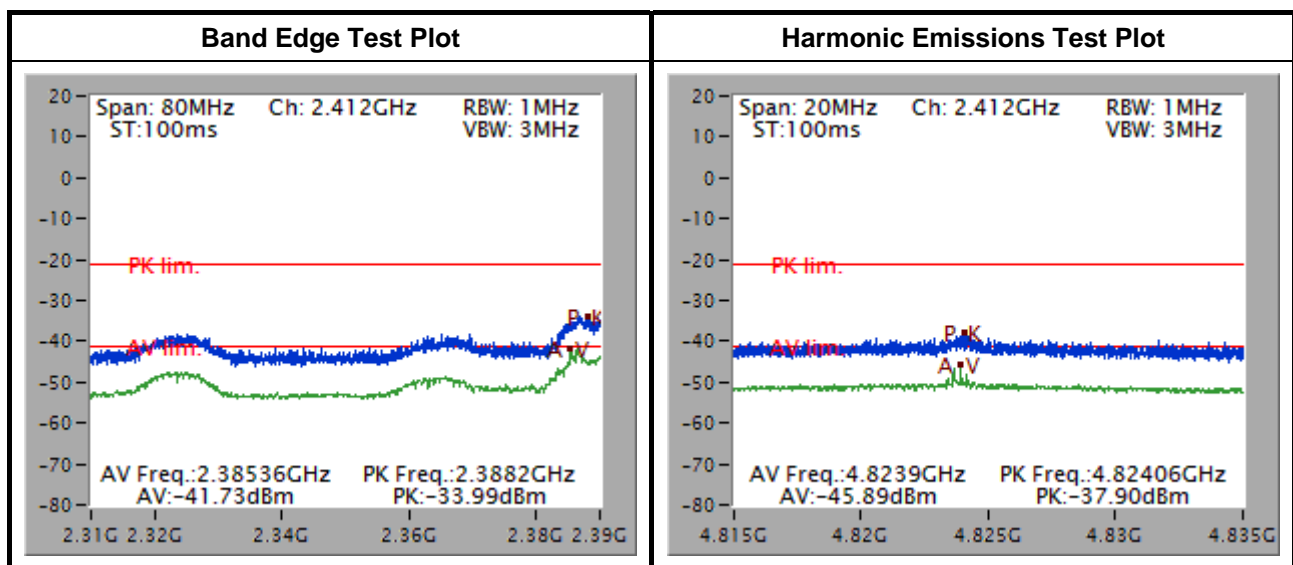
3.5.5 Emission in Restricted Frequency Bands- (Above 1GHz)

Antenna-ports conducted measurements are used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands; in the meanwhile, an additional radiated test with 50ohm terminator for cabinet spurious emission is also performed.

Modulation: 11b_11Mbps; Test Frequency: 2412 MHz; number of TX Chain: 1

Transmitter Conducted Unwanted Emissions Result in Restricted Bands						
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2388.20	-37.61	3.62	-33.99	-12.79	-21.2	Peak
2385.36	-45.35	3.62	-41.73	-0.53	-41.2	Average
4824.06	-41.52	3.62	-37.90	-16.70	-21.2	Peak
4823.90	-49.51	3.62	-45.89	-4.69	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.
 Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported



Modulation: 11b_11Mbps; Test Frequency: 2437 MHz; number of TX Chain: 1

Transmitter Conducted Unwanted Emissions Result in Restricted Bands						
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
4874.08	-41.17	3.62	-37.55	-16.35	-21.2	Peak
4873.76	-48.53	3.62	-44.91	-3.71	-41.2	Average

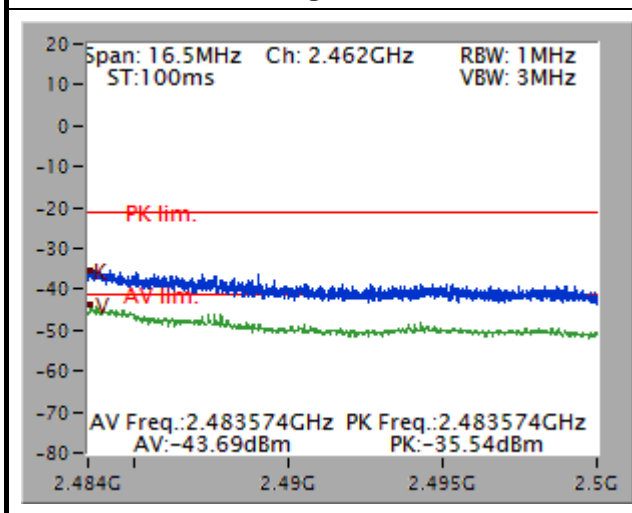
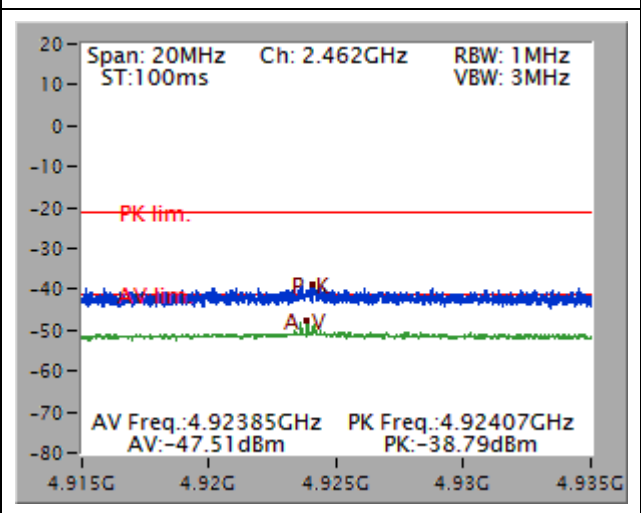
Note 1 : The above modulation modes have the worst test results and record in the report.
 Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Modulation: 11b_11Mbps; Test Frequency: 2462 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

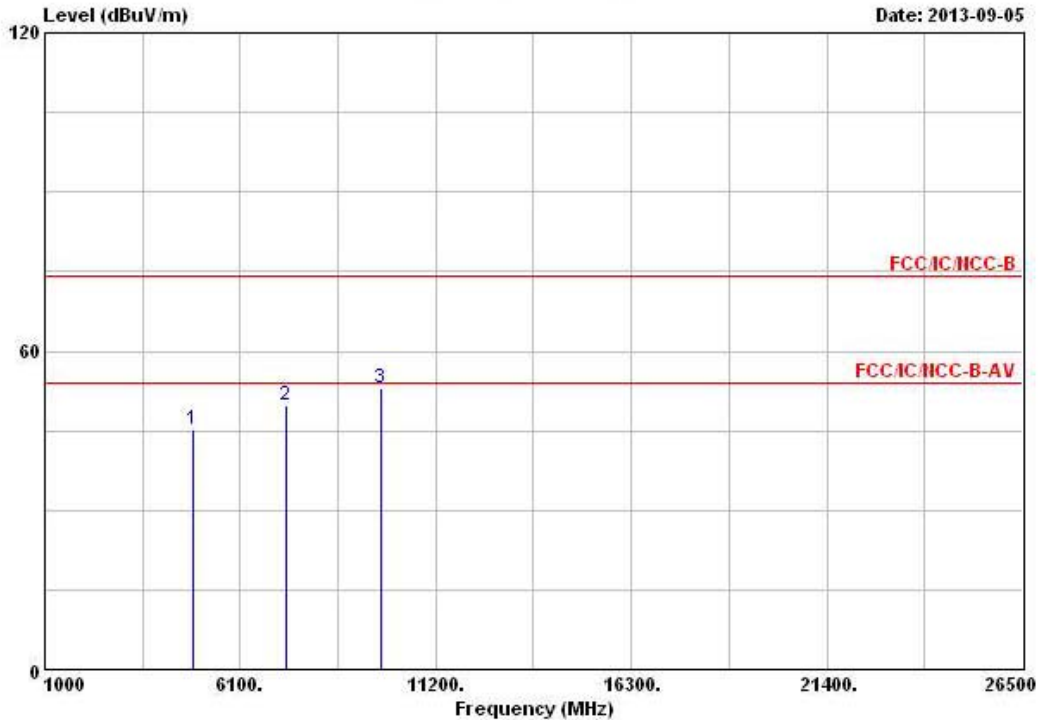
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2483.57	-39.16	3.62	-35.54	-14.34	-21.2	Peak
2483.57	-47.31	3.62	-43.69	-2.49	-41.2	Average
4924.07	-42.41	3.62	-38.79	-17.59	-21.2	Peak
4923.85	-52.13	3.62	-47.51	-6.31	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot


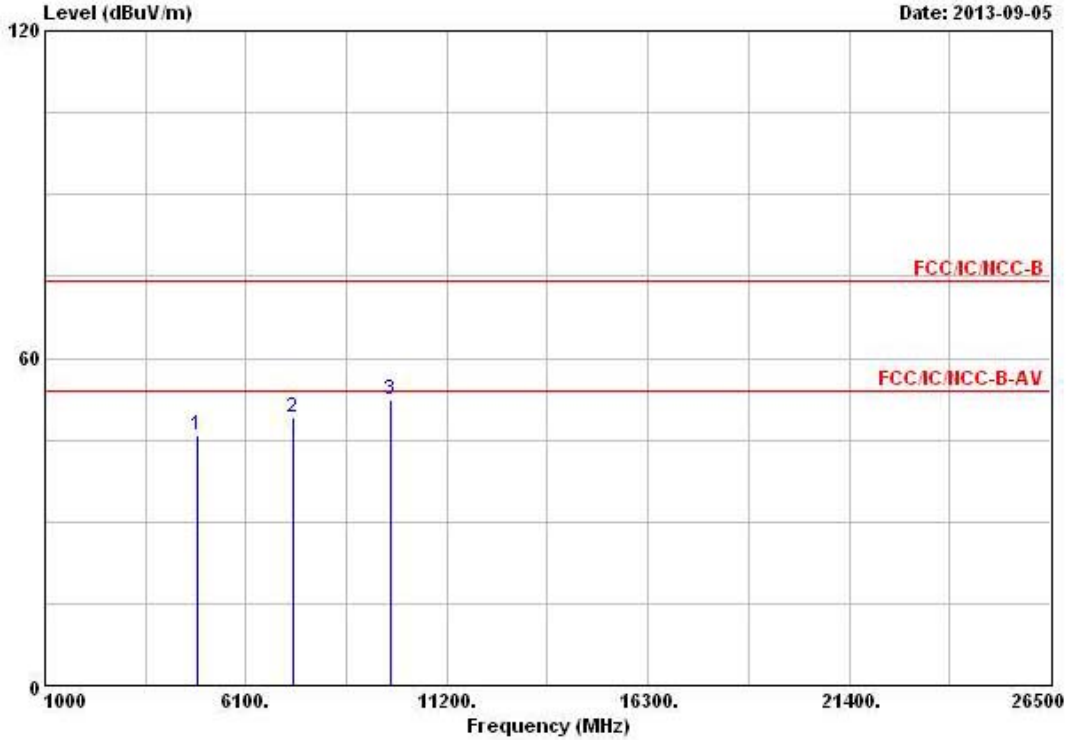
Operating Mode	11b_11Mbps	Polarization	H
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.210	45.11	-28.89	74.00	40.41	33.18	3.94	32.42	Peak	---	---
2	7311.000	49.68	-24.32	74.00	42.07	36.04	4.23	32.66	Peak	---	---
3	9747.620	52.89			41.91	38.57	5.49	33.08	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.

Operating Mode	11b_11Mbps	Polarization	V
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	45.81	-28.19	74.00	41.11	33.18	3.94	32.42	Peak	---	---
2	7311.000	49.25	-24.75	74.00	41.64	36.04	4.23	32.66	Peak	---	---
3	9748.000	52.34	---	---	41.36	38.57	5.49	33.08	Peak	---	---

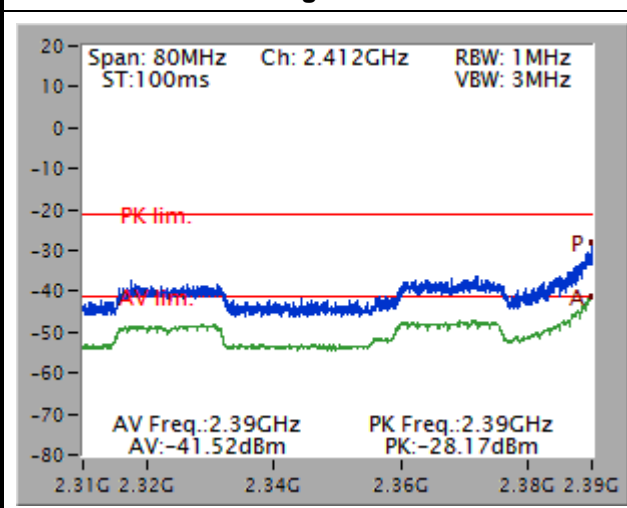
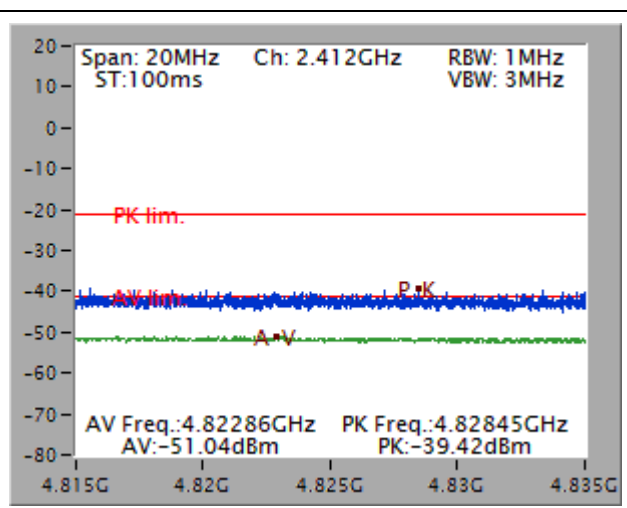
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted 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.

Modulation: 11g_6Mbps; Test Frequency: 2412 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2390.00	-31.79	3.62	-28.17	-6.97	-21.2	Peak
2390.00	-45.14	3.62	-41.52	-0.32	-41.2	Average
4828.45	-43.04	3.62	-39.42	-18.22	-21.2	Peak
4822.86	-54.66	3.62	-51.04	-9.84	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot

Modulation: 11g_6Mbps; Test Frequency: 2437 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
4873.95	-41.90	3.62	-38.28	-17.08	-21.2	Peak
4878.44	-53.42	3.62	-49.80	-8.60	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

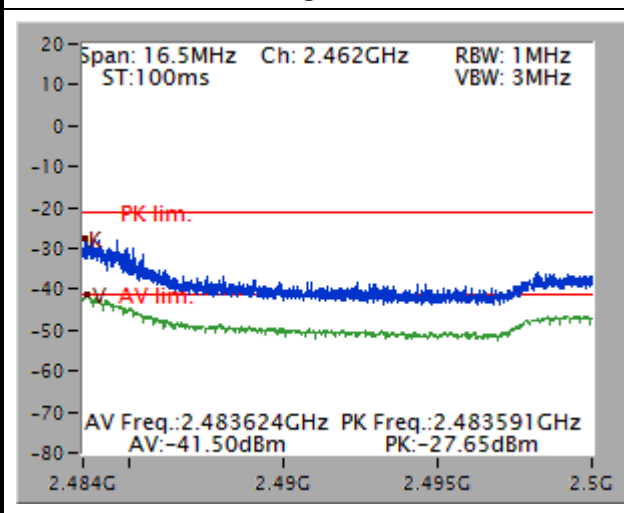
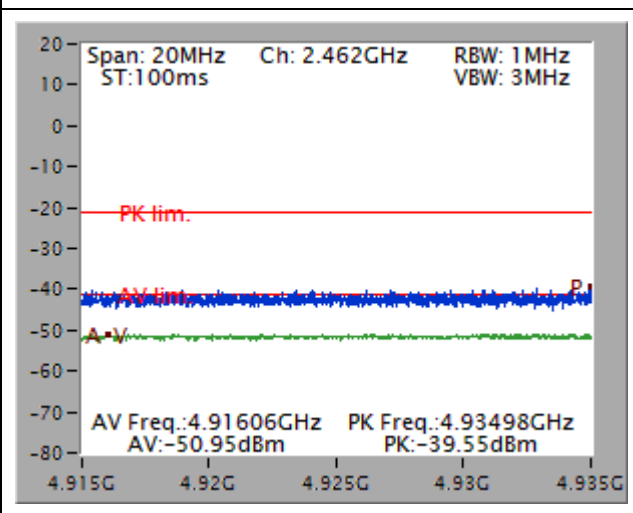
Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Modulation: 11g_6Mbps; Test Frequency: 2462 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

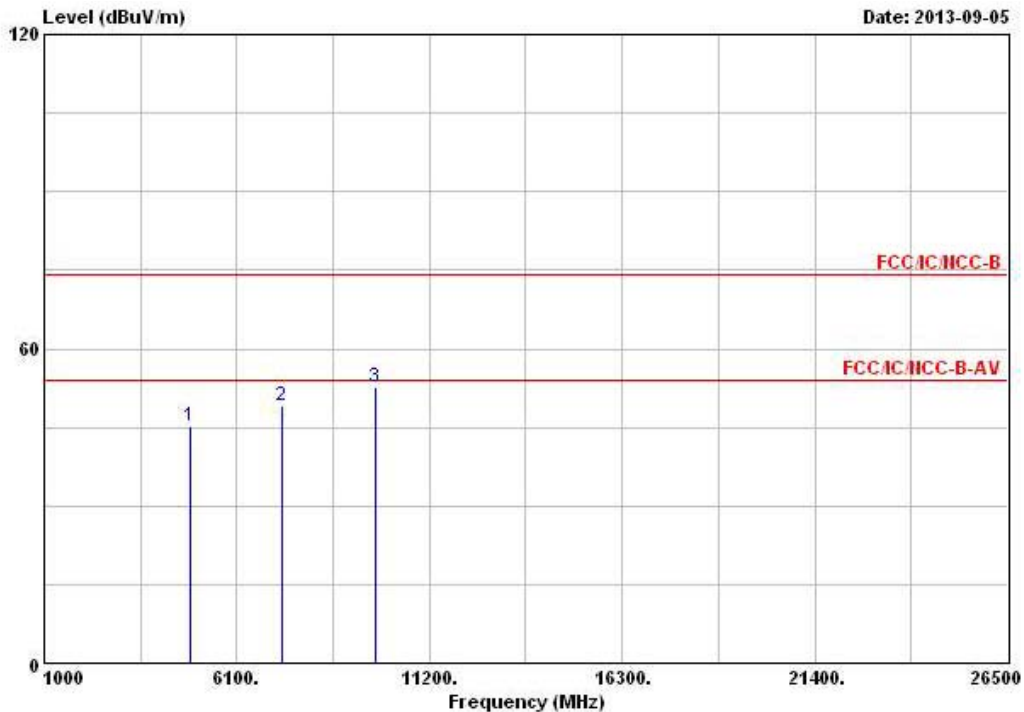
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2483.59	-31.27	3.62	-27.65	-6.45	-21.2	Peak
2483.62	-45.12	3.62	-41.50	-0.30	-41.2	Average
4934.98	-43.17	3.62	-39.55	-18.35	-21.2	Peak
4916.06	-54.57	3.62	-50.95	-9.75	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot


Operating Mode	11g_6Mbps	Polarization	H
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	45.30	-28.70	74.00	40.60	33.18	3.94	32.42	Peak	---	---
2	7311.000	49.00	-25.00	74.00	41.39	36.04	4.23	32.66	Peak	---	---
3	9747.620	52.76	-21.24	74.00	41.78	38.57	5.49	33.08	Peak	---	---

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

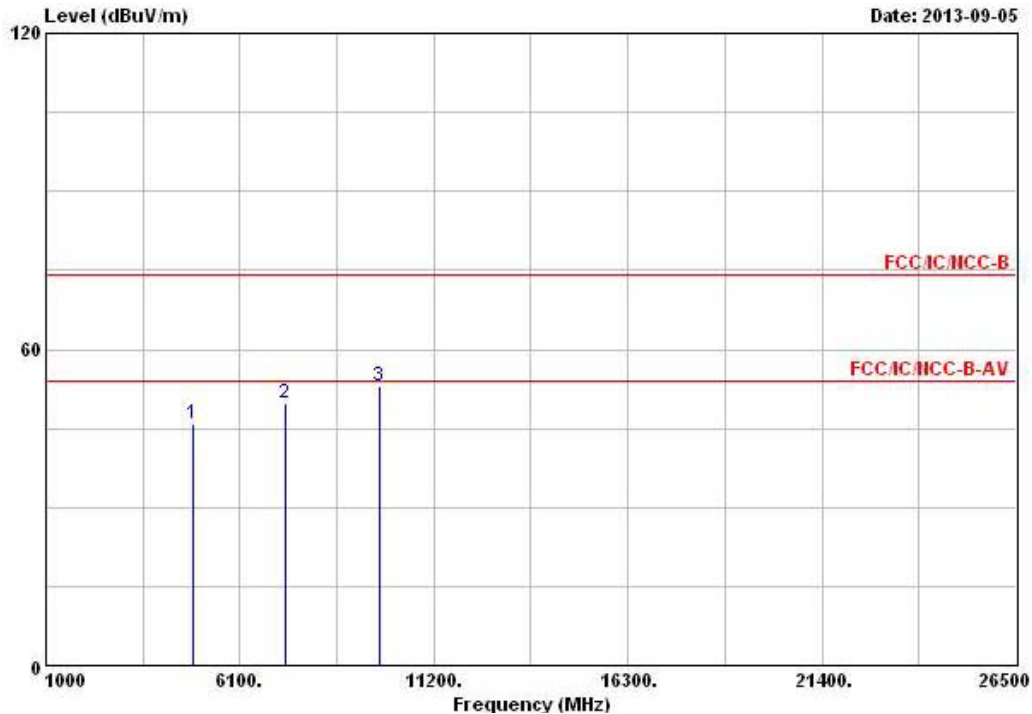
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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.

Operating Mode	11g_6Mbps	Polarization	V
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.620	45.85	-28.15	74.00	41.15	33.18	3.94	32.42	Peak	---	---
2	7311.390	49.83	-24.17	74.00	42.23	36.04	4.23	32.67	Peak	---	---
3	9748.000	52.93	-21.07	74.00	41.95	38.57	5.49	33.08	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.

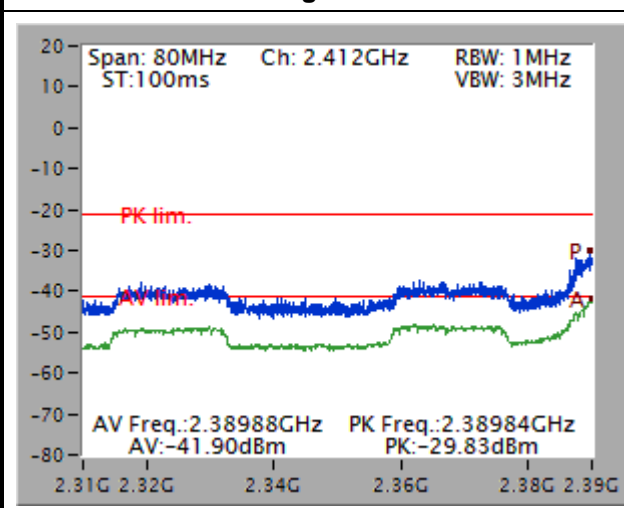
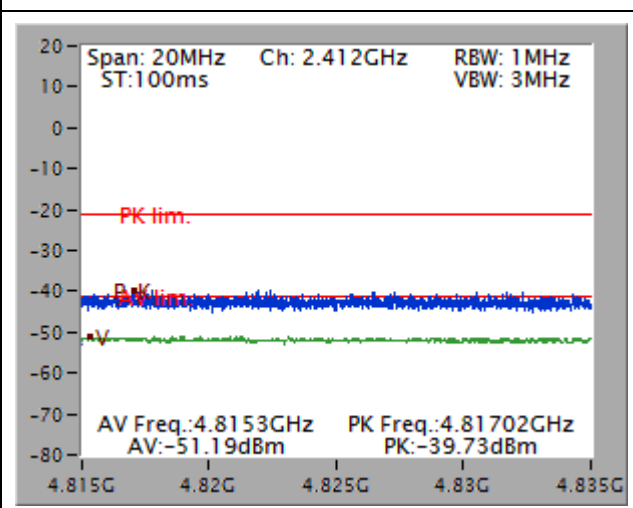
Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Modulation: HT-20_MCS0; Test Frequency: 2412 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2389.84	-33.45	3.62	-29.83	-8.63	-21.2	Peak
2389.88	-45.52	3.62	-41.90	-0.70	-41.2	Average
4817.02	-43.35	3.62	-39.73	-18.53	-21.2	Peak
4815.30	-54.81	3.62	-51.19	-9.99	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot

Modulation: HT-20_MCS0; Test Frequency: 2437 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
4865.06	-42.70	3.62	-39.08	-17.88	-21.2	Peak
4877.07	-54.66	3.62	-51.04	-9.84	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

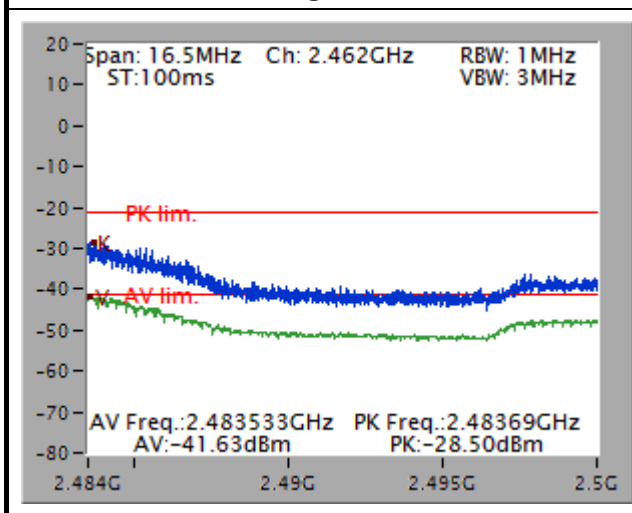
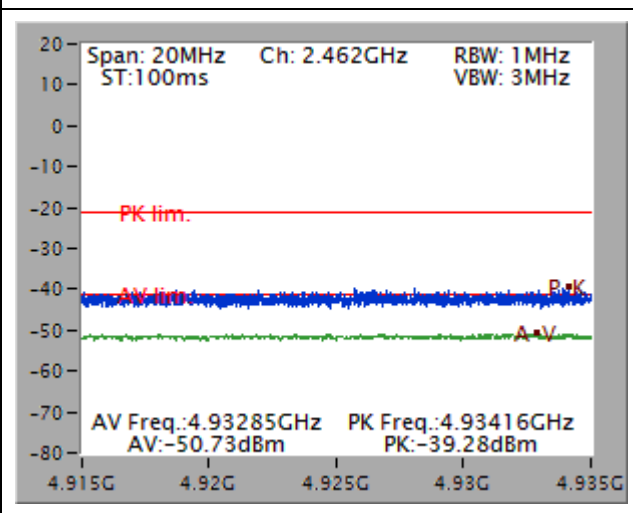
Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Modulation: HT-20_MCS0; Test Frequency: 2462 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

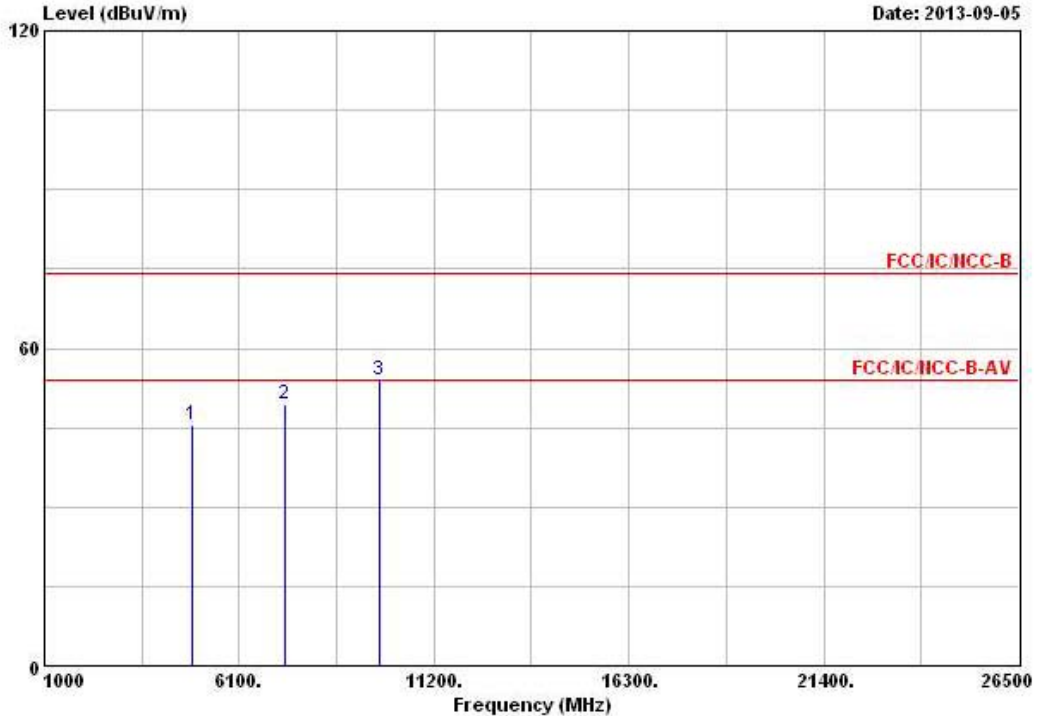
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2483.69	-32.12	3.62	-28.50	-7.30	-21.2	Peak
2483.53	-45.25	3.62	-41.63	-0.43	-41.2	Average
4934.16	-42.90	3.62	-39.28	-18.08	-21.2	Peak
4932.85	-54.35	3.62	-50.73	-9.53	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

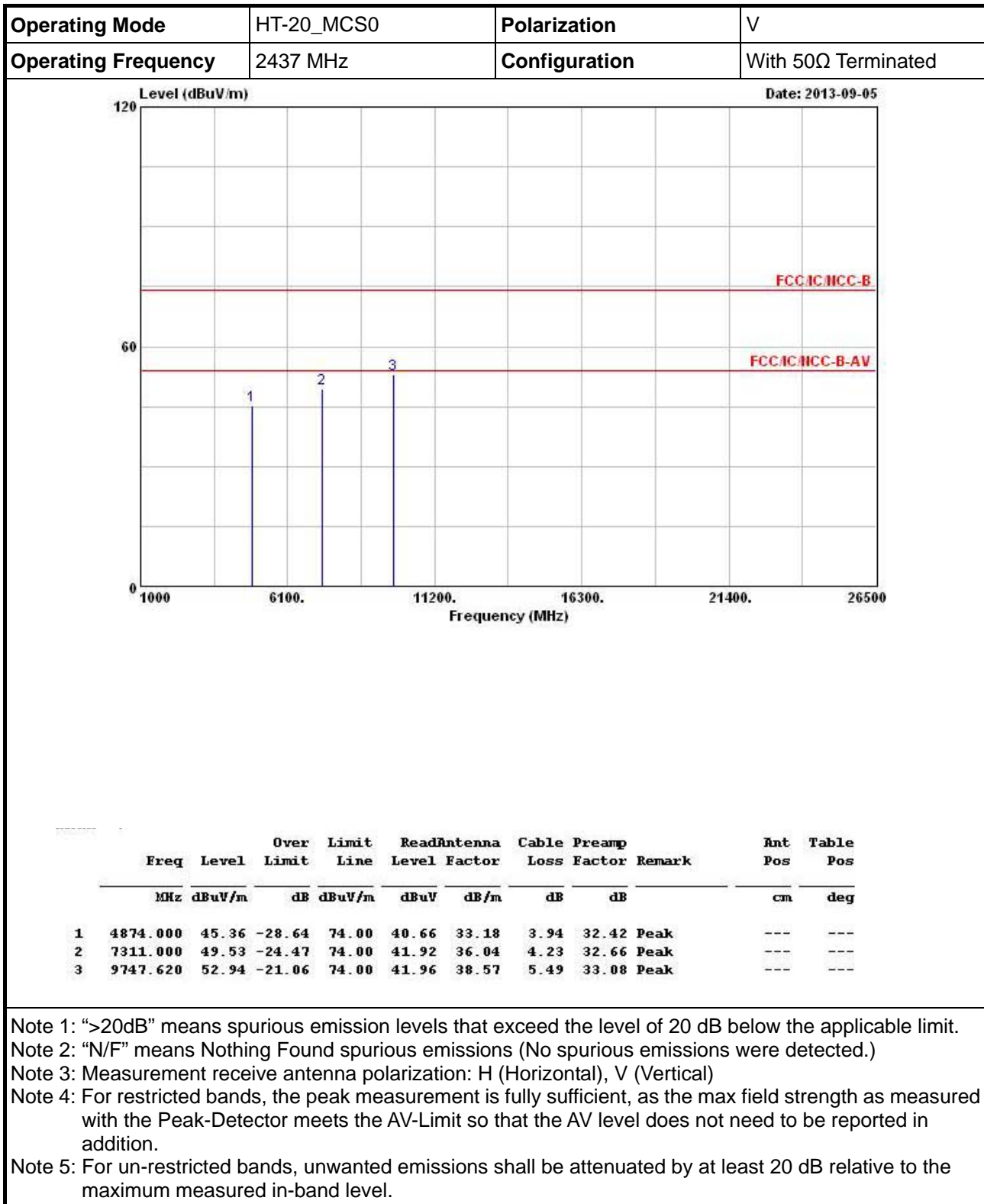
Band Edge Test Plot

Harmonic Emissions Test Plot


Operating Mode	HT-20_MCS0	Polarization	H
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.390	45.65	-28.35	74.00	40.95	33.18	3.94	32.42	Peak	---	---
2	7312.620	49.50	-24.50	74.00	41.90	36.04	4.23	32.67	Peak	---	---
3	9748.390	53.89	-20.11	74.00	42.91	38.57	5.49	33.08	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.

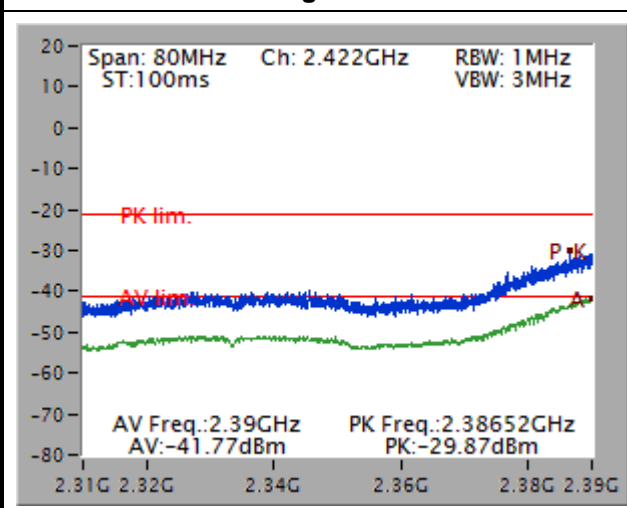
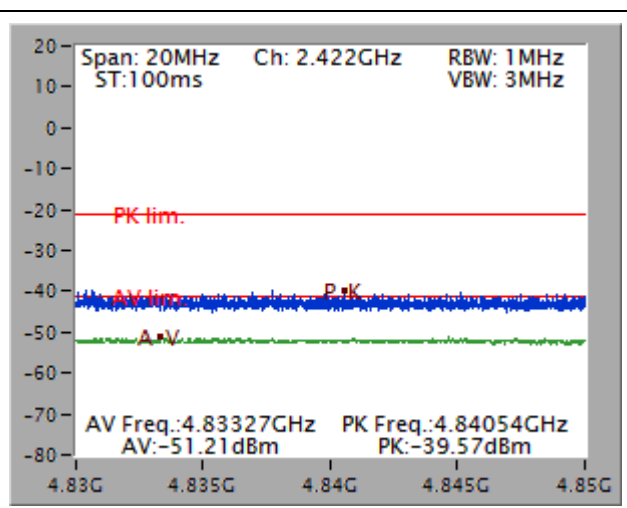


Modulation: HT-40_MCS0; Test Frequency: 2422 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2386.52	-33.49	3.62	-29.87	-8.67	-21.2	Peak
2390.00	-45.39	3.62	-41.77	-0.57	-41.2	Average
4840.54	-43.19	3.62	-39.57	-18.37	-21.2	Peak
4833.27	-54.83	3.62	-51.21	-10.01	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot

Modulation: HT-40_MCS0; Test Frequency: 2437 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
4865.25	-43.09	3.62	-39.47	-18.27	-21.2	Peak
4879.22	-54.64	3.62	-51.02	-9.82	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

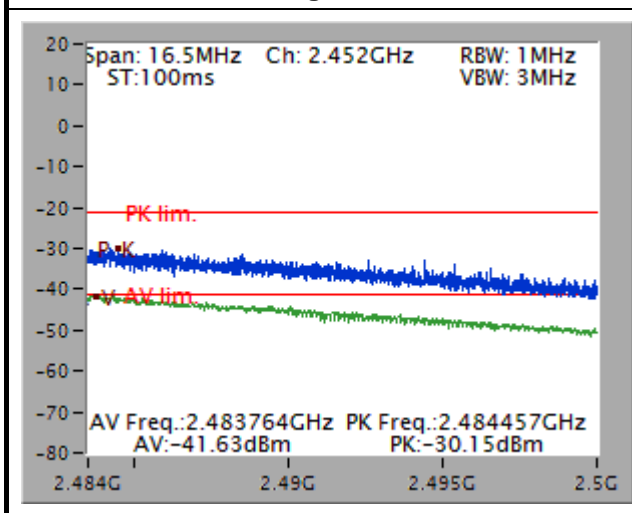
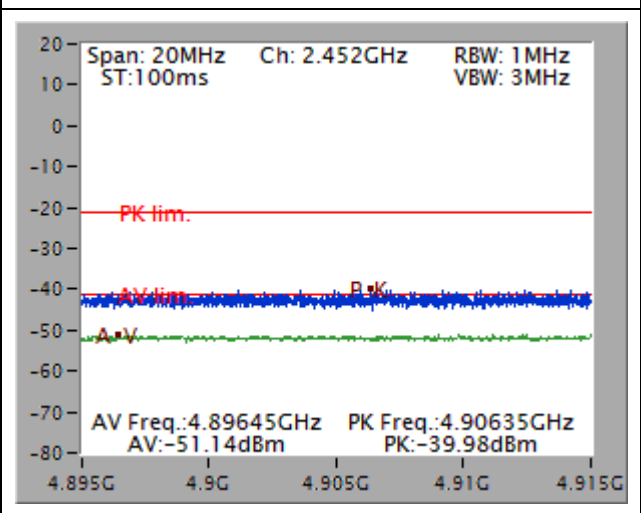
Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Modulation: HT-40_MCS0; Test Frequency: 2452 MHz; number of TX Chain: 1
Transmitter Conducted Unwanted Emissions Result in Restricted Bands

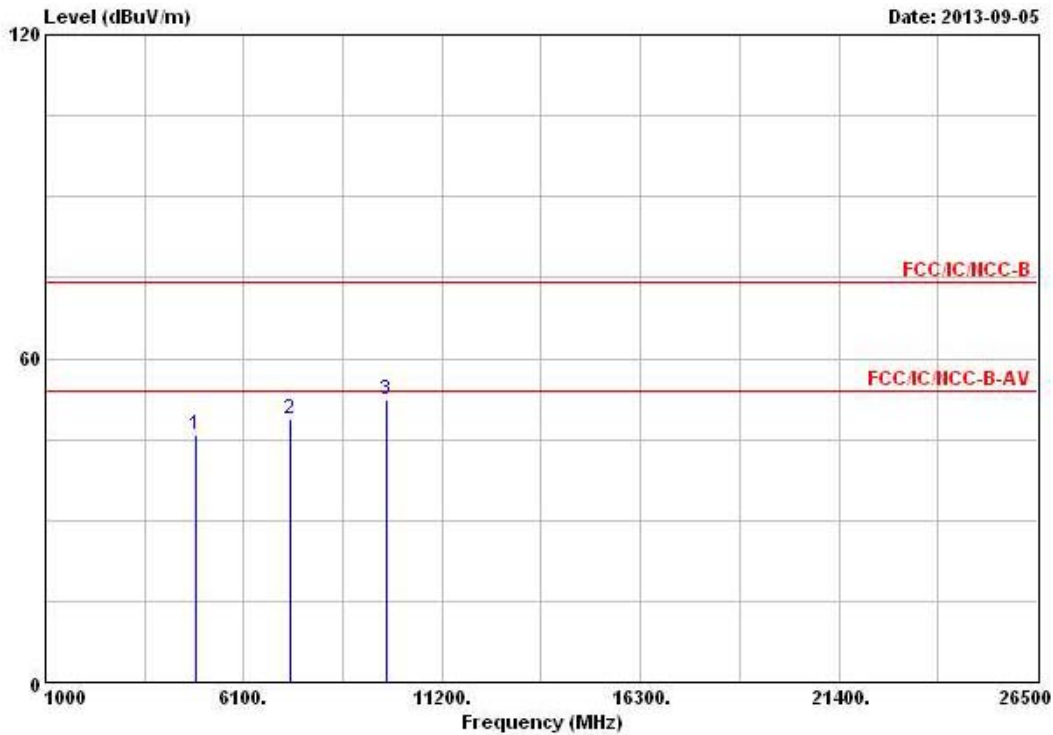
Frequency (MHz)	Test Level (dBm)	Antenna Gain (dBi)	EIRP Level (dBm)	Margin (dB)	Limit (dBm)	Level Type
2484.45	-33.77	3.62	-30.15	-8.95	-21.2	Peak
2483.76	-45.25	3.62	-41.63	-0.43	-41.2	Average
4906.35	-43.90	3.62	-39.98	-18.78	-21.2	Peak
4896.45	-54.76	3.62	-51.14	-9.94	-41.2	Average

Note 1 : The above modulation modes have the worst test results and record in the report.

Note 2 : All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported

Band Edge Test Plot

Harmonic Emissions Test Plot


Operating Mode	HT-40_MCS0	Polarization	H
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.230	45.87	-28.13	74.00	41.17	33.18	3.94	32.42	Peak	---	---
2	7311.300	48.70	-25.30	74.00	41.10	36.04	4.23	32.67	Peak	---	---
3	9748.000	52.36	-21.64	74.00	41.38	38.57	5.49	33.08	Peak	---	---

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

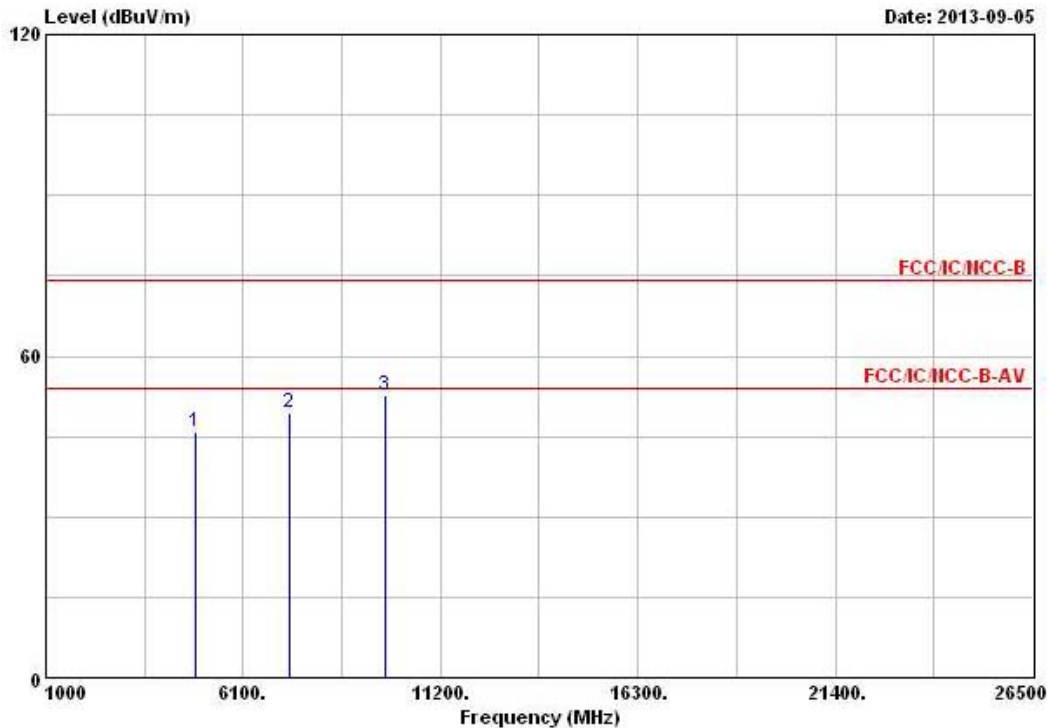
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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.

Operating Mode	HT-40_MCS0	Polarization	V
Operating Frequency	2437 MHz	Configuration	With 50Ω Terminated



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	45.86	-28.14	74.00	41.16	33.18	3.94	32.42	Peak	---	---
2	7311.620	49.36	-24.64	74.00	41.76	36.04	4.23	32.67	Peak	---	---
3	9747.620	52.72	-21.28	74.00	41.74	38.57	5.49	33.08	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.

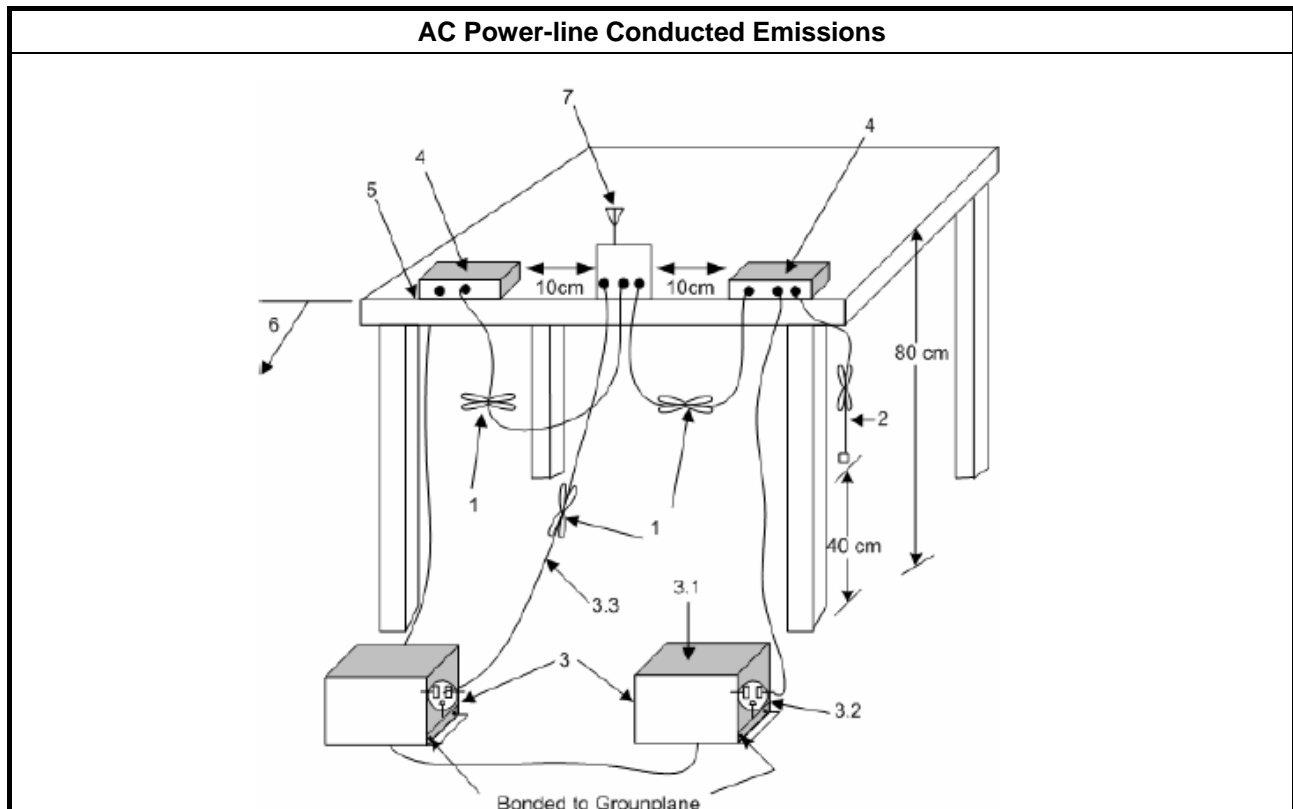
Note 5: For un-restricted bands, unwanted emissions (item 3) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

3.6 AC Power-line Conducted Emissions

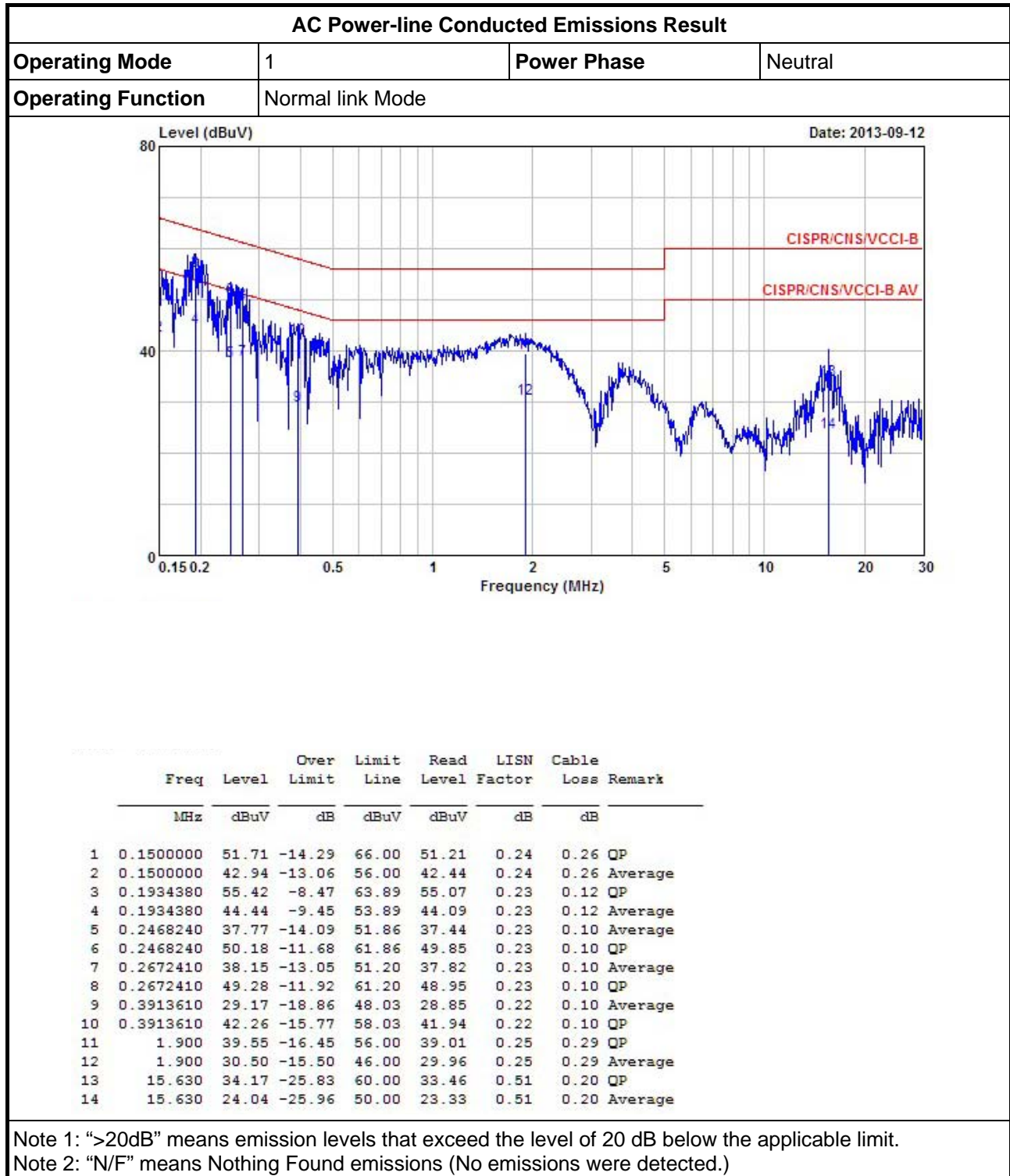
3.6.1 Test Procedures

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

3.6.2 Test Setup

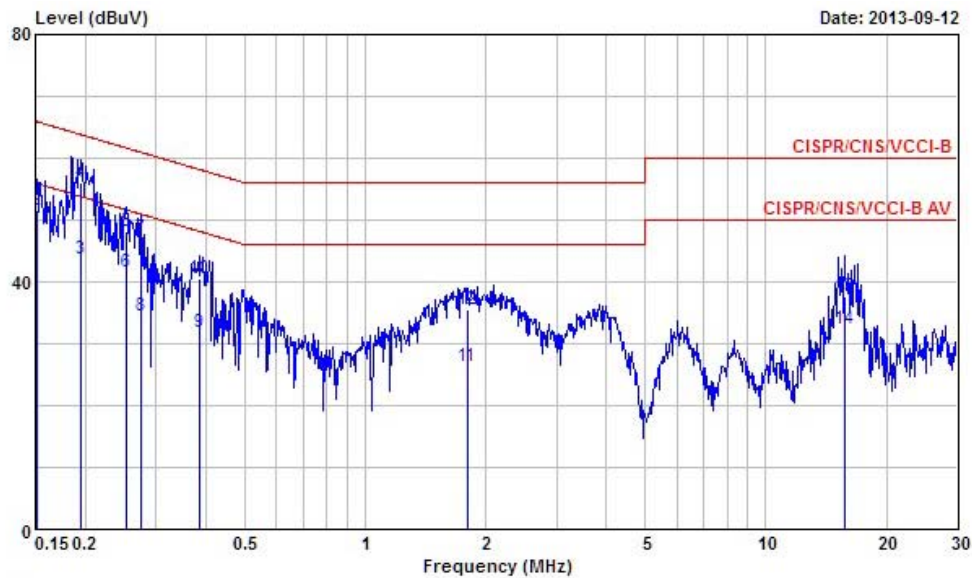


3.6.3 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Normal link Mode		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.1515980	44.97	-10.94	55.91	44.60	0.11	0.26	Average
2	0.1515980	51.56	-14.35	65.91	51.19	0.11	0.26	QP
3	0.1954980	43.77	-10.03	53.80	43.55	0.11	0.11	Average
4	0.1954980	56.14	-7.66	63.80	55.92	0.11	0.11	QP
5	0.2534510	48.28	-13.36	61.64	48.07	0.11	0.10	QP
6	0.2534510	41.60	-10.04	51.64	41.39	0.11	0.10	Average
7	0.2744160	47.03	-13.95	60.98	46.82	0.11	0.10	QP
8	0.2744160	34.38	-16.60	50.98	34.17	0.11	0.10	Average
9	0.3851900	31.96	-16.21	48.17	31.76	0.10	0.10	Average
10	0.3851900	40.45	-17.72	58.17	40.25	0.10	0.10	QP
11	1.800	26.41	-19.59	46.00	26.00	0.13	0.28	Average
12	1.800	35.40	-20.60	56.00	34.99	0.13	0.28	QP
13	15.720	37.75	-22.25	60.00	37.26	0.29	0.20	QP
14	15.720	32.25	-17.75	50.00	31.76	0.29	0.20	Average

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

4 Test Equipment and Calibration Data

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

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101013	9KHz~40GHz	Jan. 29, 2013	Conducted (TH06-HY)
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 16, 2013	Conducted (TH06-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Nov. 21, 2012	Conducted (TH06-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 27, 2013	Conducted (TH06-HY)
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345673/4	30MHz ~ 26.5GHz	Dec. 04, 2012	Conducted (TH06-HY)
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345668/4	30MHz ~ 26.5GHz	Dec. 04, 2012	Conducted (TH06-HY)

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

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

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz - 30 MHz	Dec. 02, 2012	Radiation (03CH03-HY)

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