

FCC Test Report

Equipment : Industrial 2.4G 802.11n/ 5G 802.11ac Wave1 mPCIe module
Brand Name : Korenix
Model No. : Industrial 2.4G 802.11n/ 5G 802.11ac Wave1 mPCIe module
FCC ID : SSA-JW1223
Standard : 47 CFR FCC Part 15.247
Frequency : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Function : Point-to-multipoint; Point-to-point
Applicant : Korenix Technology Co., Ltd.
Manufacturer : 14F., No.213,Sec. 3,Beixin Rd., Xindian Dist., New Taipei City 23143, | Taiwan (R.O.C)

The product sample received on Apr. 18, 2016 and completely tested on Jun. 16, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Reviewed by:


Kevin Liang / Assistant Manager





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Appendix I. Test Result of AC Power-line Conducted Emissions

Appendix A. Test Result of Emission Bandwidth

Appendix B. Test Result of Maximum Conducted Output Power

Appendix C. Test Result of Power Spectral Density

Appendix D. Test Result of Transmitter Radiated Bandedge Emissions

Appendix E. Transmitter Radiated Unwanted Emissions

Appendix F. Test Photos

Appendix G. Photographs of EUT



Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.2231870MHz 48.19 (Margin 14.51dB) - QP 42.60 (Margin 10.10dB) - AV	FCC 15.207	Complied
3.2	15.247(a)	DTS Bandwidth	6dB Bandwidth Unit [MHz] 20M:5.56	≥500kHz	Complied
3.3	15.247(b)	Fundamental Emission Output Power	Power [dBm]: 28.98	Power [dBm]:30	Complied
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]: -2.10	PSD [dBm/3kHz]:8	Complied
3.5	15.247(d)	Test Result of Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2399.824 MHz: 35.57 dB Restricted Bands [dBuV/m at 3m]: 2389.968 MHz 67.09(Margin 6.91 dB) – PK 2483.60 MHz 52.67 (Margin 1.33 dB) - AV	Non-Restricted Bands:> 20 dBc Bands: FCC 15.209	Complied
3.6	15.247(d)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 4874 MHz 52.90 (Margin 1.10dB) - AV 55.60 (Margin 18.40dB) - PK	Non-Restricted Bands:> 20 dBc Restricted Bands: FCC 15.209	Complied



Revision History

Report No.	Version	Description	Issued Date
FR641512AC	Rev. 01	Initial issue of report	Jul. 14, 2016

1 General Description

1.1 Information

1.1.1 RF General Information

Band	Mode	BWch (MHz)	Nss-Min	Nant
2.4G	11b	20	1	3
2.4G	11g	20	1	3
2.4G	HT20	20	1,(M0-7)	3
2.4G	HT40	40	1,(M0-7)	3

Note:

- 2.4G is the 2.4GHz Band (2.4-2.4835GHz).
- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Antenna Category	
<input type="checkbox"/>	Integral antenna (antenna permanently attached)
<input 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.
<input checked="" type="checkbox"/>	External antenna (dedicated antennas)
<input type="checkbox"/>	Single power level with corresponding antenna(s).
<input checked="" type="checkbox"/>	Multiple power level and corresponding antenna(s).
<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.	Ant. Cat.	Ant. Type	Gain (dBi)
1	External	dipole	2
2	External	dipole	2
3	External	dipole	2



1.1.3 Type of EUT

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

1.1.4 Mode Test Duty Cycle

Operated Mode for Worst Duty Cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 100.00% - IEEE 802.11b	0.00
<input checked="" type="checkbox"/> 97.93%- IEEE 802.11g	0.09
<input checked="" type="checkbox"/> 98.52%- IEEE 802.11n (HT20)	0.06
<input checked="" type="checkbox"/> 97.10%- IEEE 802.11n (HT40)	0.13

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"/> External AC adapter	<input checked="" type="checkbox"/> From Host System	<input type="checkbox"/> Battery

1.2 Testing Applied Standards

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

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ FCC KDB 558074 D01 v03r05
- ◆ FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.	
		TEL :	886-3-327-3456	FAX : 886-3-327-0973
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Ryan	24°C / 57%	2016/06/16
RF Conducted	TH01-HY	Ryan	23.5°C / 66%	2016/06/14
Radiated	03CH09-HY	Thor	24°C / 56%	2016/06/14

Test site registered number [553509] with FCC.

1.4 Measurement Uncertainty

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

Measurement Uncertainty		
Test Item		Uncertainty
AC power-line conducted emissions		±2.3 dB
Emission bandwidth, 6dB bandwidth		±0.6 %
RF output power, conducted		±0.1 dB
Power density, conducted		±0.6 dB
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
	1 – 18 GHz	±0.5 dB
	18 – 40 GHz	±0.5 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
	1 – 18 GHz	±3.6 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±5 %
DC and low frequency voltages		±0.9%
Time		±1.4 %
Duty Cycle		±0.6 %

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing			
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS
11b	3	1-11 Mbps	1 Mbps
11g	3	6-54 Mbps	6 Mbps
HT20	3	MCS 16-23	MCS 16
HT40	3	MCS 16-23	MCS 16

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). The EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 800ns.
 Note 2: Modulation modes consist below configuration:
 11b: IEEE 802.11b, 11g: IEEE 802.11g, HT20/HT40: IEEE 802.11n
 Note 3: RF output power specifies that Maximum Peak Conducted Output Power.




2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (2400-2483.5MHz band)							
Test Software Version	KorenixArt_V0.7						
Modulation Mode	N _{TX}	Test Frequency (MHz)					
		NCB: 20MHz			NCB: 40MHz		
		2412	2437	2462	2422	2437	2452
11b,1-11Mbps	3	16.5	16	15.5	-	-	-
11g,6-54Mbps	3	13	21	13.5	-	-	-
HT20,M0-15	3	11	20	11.5	-	-	-
HT40,M0-15	3	-	-	-	8.5	13.5	6.5

2.3 The Worst Case Measurement Configuration

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth, Fundamental Emission Output Power, Power Spectral Density, Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

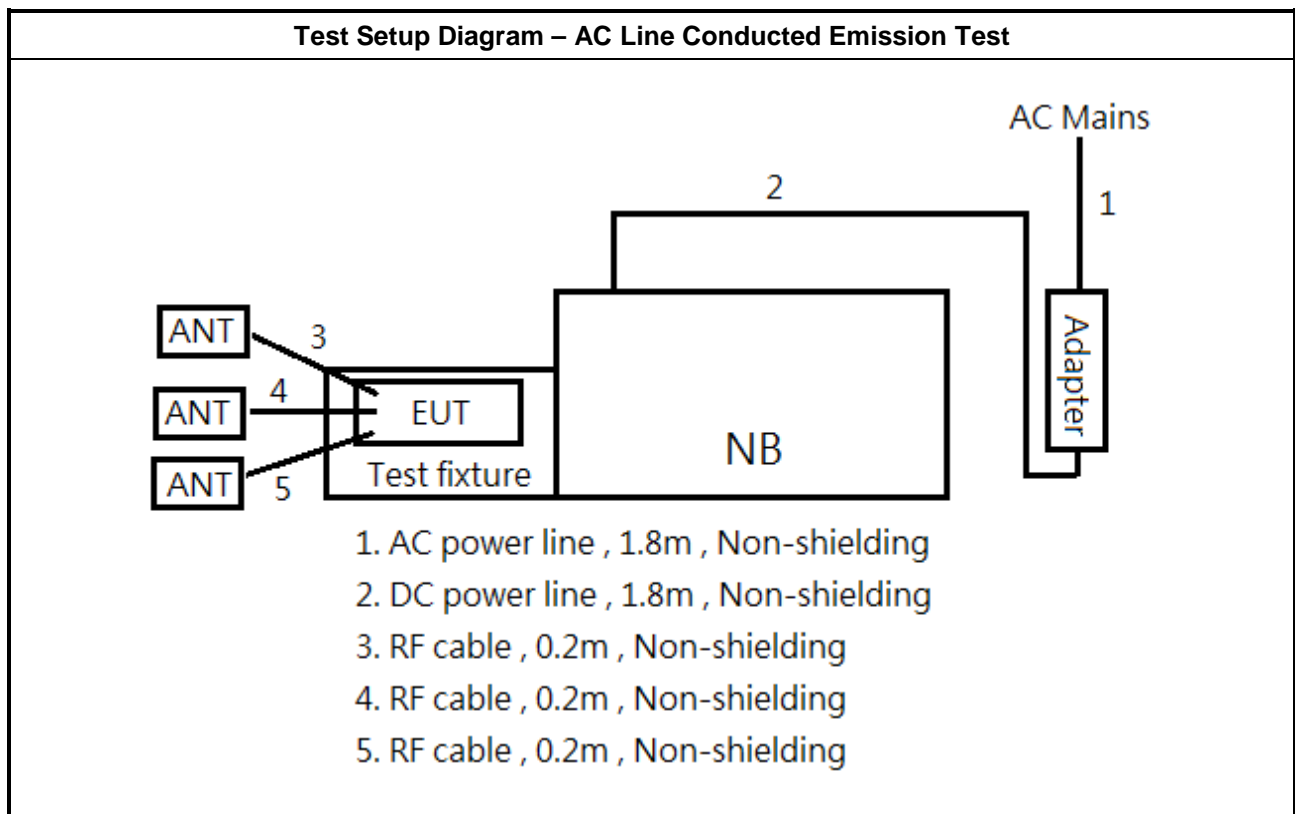
The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
User Position	<input checked="" type="checkbox"/> EUT will be placed in fixed position.		
	<input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions.		
	<input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode < 1GHz	<input checked="" type="checkbox"/> 1. Transmit Mode		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		
Worst Planes of Ant			V

2.4 Support Equipment

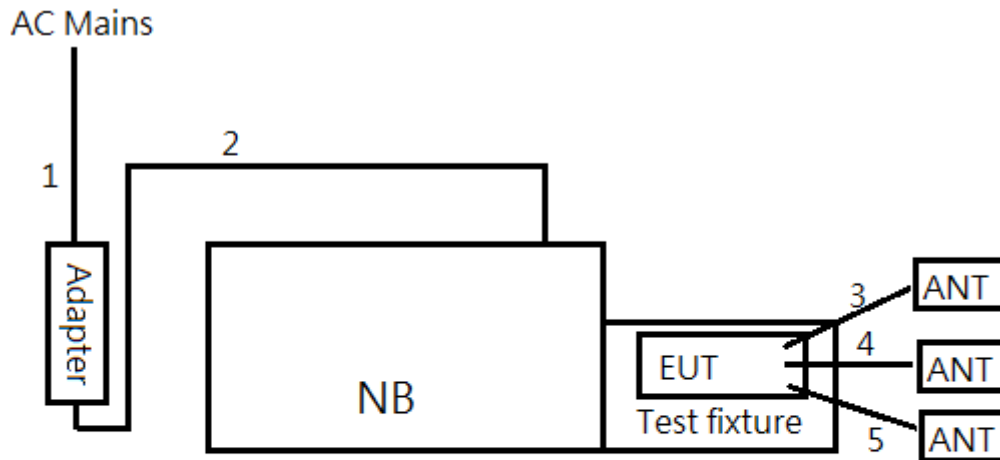
Support Equipment - AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5530	DoC
2	Adapter for NB	DELL	LA65NS2-0	DoC
3	Test fixture	-	-	-

Support Equipment - Conducted and Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E6400	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	Test fixture	-	-	-

2.5 Test Setup Diagram



Test Setup Diagram - Radiated Test



1. AC power line , 1.8m , Non-shielding
2. DC power line , 1.8m , Non-shielding
3. RF cable , 0.2m , Non-shielding
4. RF cable , 0.2m , Non-shielding
5. RF cable , 0.2m , Non-shielding

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.

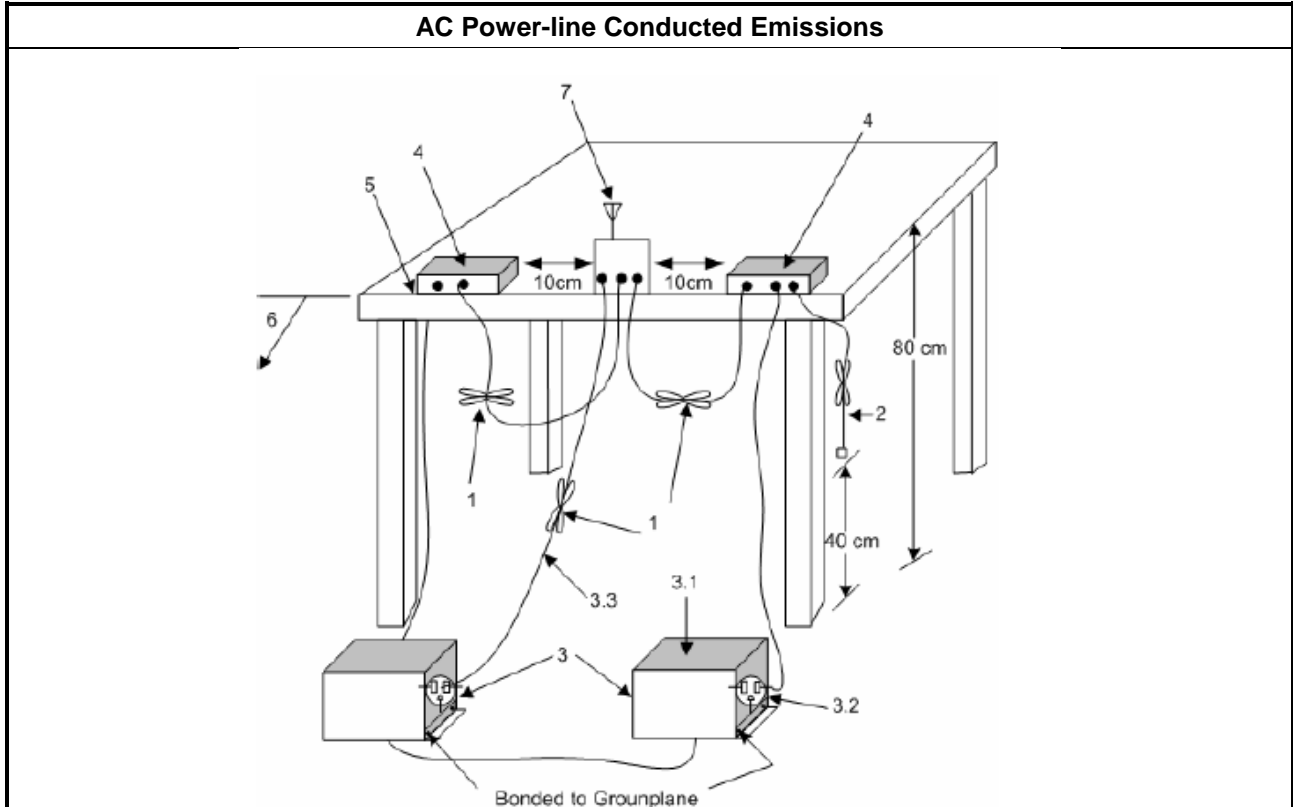
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
<ul style="list-style-type: none"> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup





3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix I

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth \geq 500 kHz.

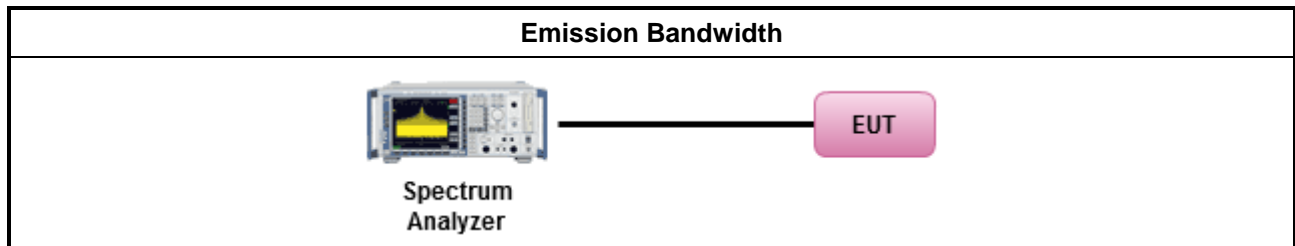
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪	For the emission bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.3 Fundamental Emission Output Power

3.3.1 Fundamental Emission Output Power Limit

Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
<ul style="list-style-type: none"> ▪ 2400-2483.5 MHz Band: 	
	<ul style="list-style-type: none"> ▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> ▪ Smart antenna system (SAS):
	<ul style="list-style-type: none"> - Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dBm
e.i.r.p. Power Limit:	
<ul style="list-style-type: none"> ▪ 2400-2483.5 MHz Band 	
	<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	<ul style="list-style-type: none"> ▪ Smart antenna system (SAS)
	<ul style="list-style-type: none"> - Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	<ul style="list-style-type: none"> - Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	<ul style="list-style-type: none"> - Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
<p>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.</p>	

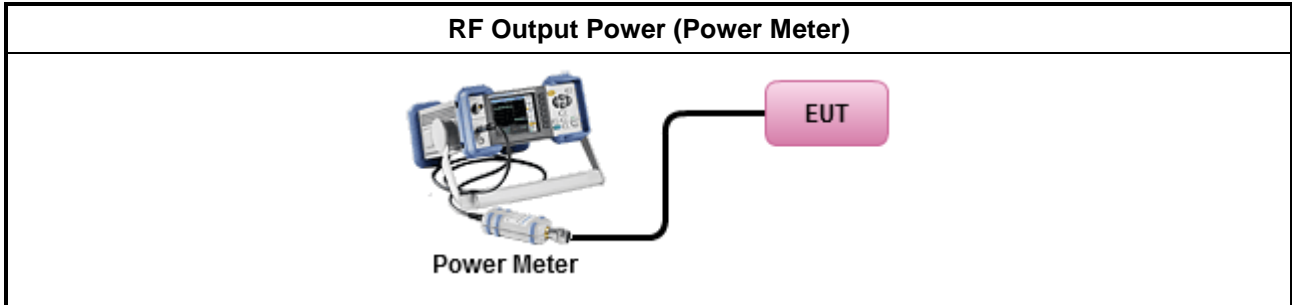
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ 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 (peak power meter for VBW ≥ DTS BW)
<ul style="list-style-type: none"> ▪ Maximum Conducted Output Power 	
[duty cycle ≥ 98% or external video / power trigger]	
	<input 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 checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM (using an RF average power meter).
<ul style="list-style-type: none"> ▪ For conducted measurement. 	
	<ul style="list-style-type: none"> ▪ If 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.
	<ul style="list-style-type: none"> ▪ 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 Test Result of Maximum Peak Conducted Output Power

Refer as Appendix B

3.3.6 Test Result of Maximum Average Conducted Output Power

Refer as Appendix B

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
<ul style="list-style-type: none"> ▪ Power Spectral Density (PSD) \leq 8 dBm/3kHz

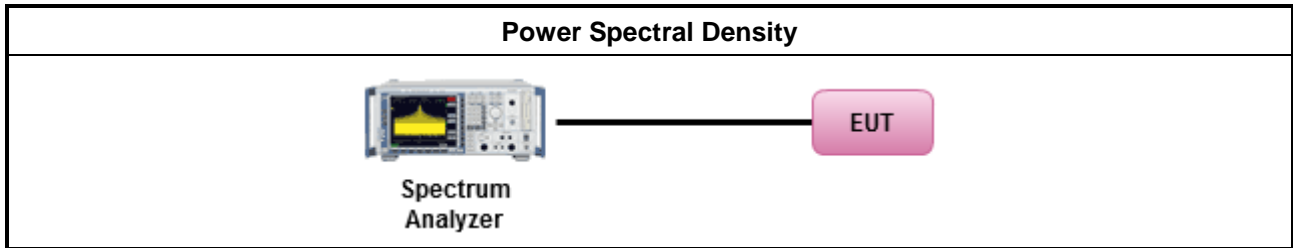
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method			
<ul style="list-style-type: none"> ▪ 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 AVGPSD-1 (spectral trace averaging).			
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.4 Method AVGPSD-2 (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 AVGPSD-1 Alt (spectral trace averaging).			
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)			
<ul style="list-style-type: none"> ▪ For conducted measurement. <ul style="list-style-type: none"> ▪ If The EUT supports multiple transmit chains using options given below: <table border="1" style="width: 100%;"> <tbody> <tr> <td> <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_{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. </td> </tr> <tr> <td> <input type="checkbox"/> Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits, </td> </tr> <tr> <td> <input type="checkbox"/> Option 3: 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. </td> </tr> </tbody> </table> 	<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 _{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 sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,	<input type="checkbox"/> Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
<input checked="" type="checkbox"/> 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 sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,			
<input type="checkbox"/> Option 3: 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

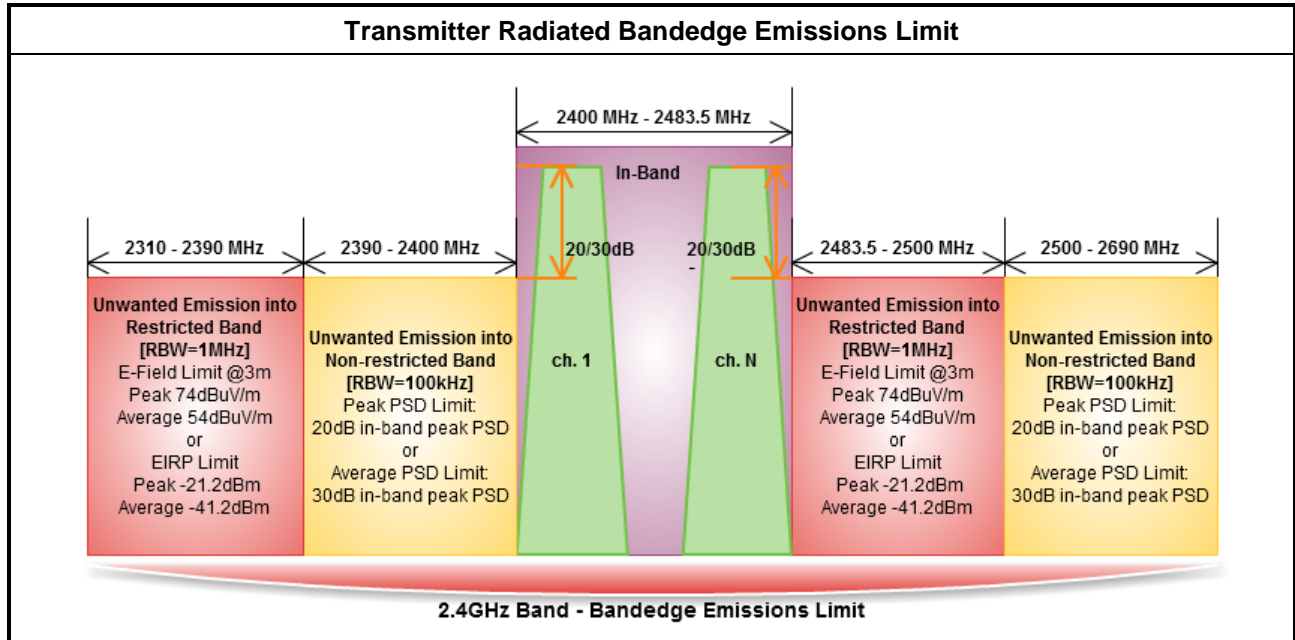


3.4.5 Test Result of Power Spectral Density

Refer as Appendix C

3.5 Transmitter Radiated Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



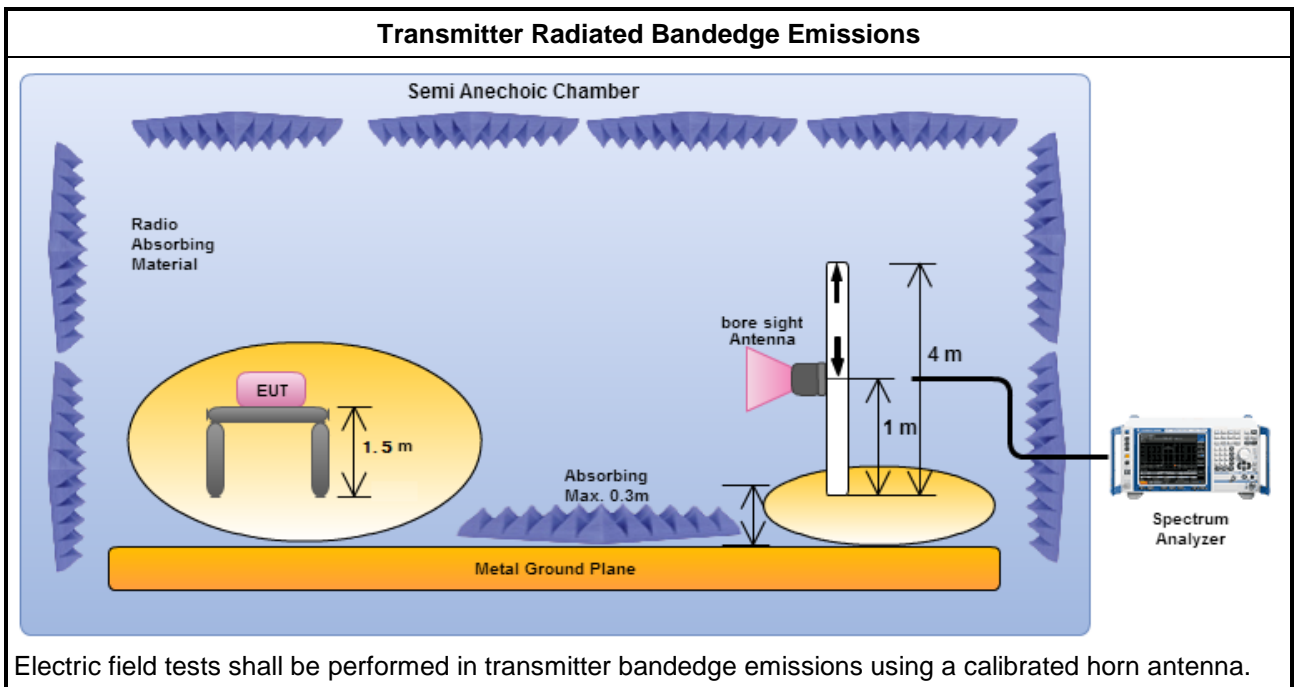
3.5.2 Measuring Instruments

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 ≥ 98 or duty factor].
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.10 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input 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 4.1.4.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
<input checked="" type="checkbox"/>	For the transmitter bandedge emissions shall be measured using following options below:
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.10 for band-edge testing.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.10.6.2 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7 and ANSI C63.10, clause 6.6. Test distance is 3m.

3.5.4 Test Setup





3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.6 Transmitter Radiated Unwanted Emissions

3.6.1 Transmitter in 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

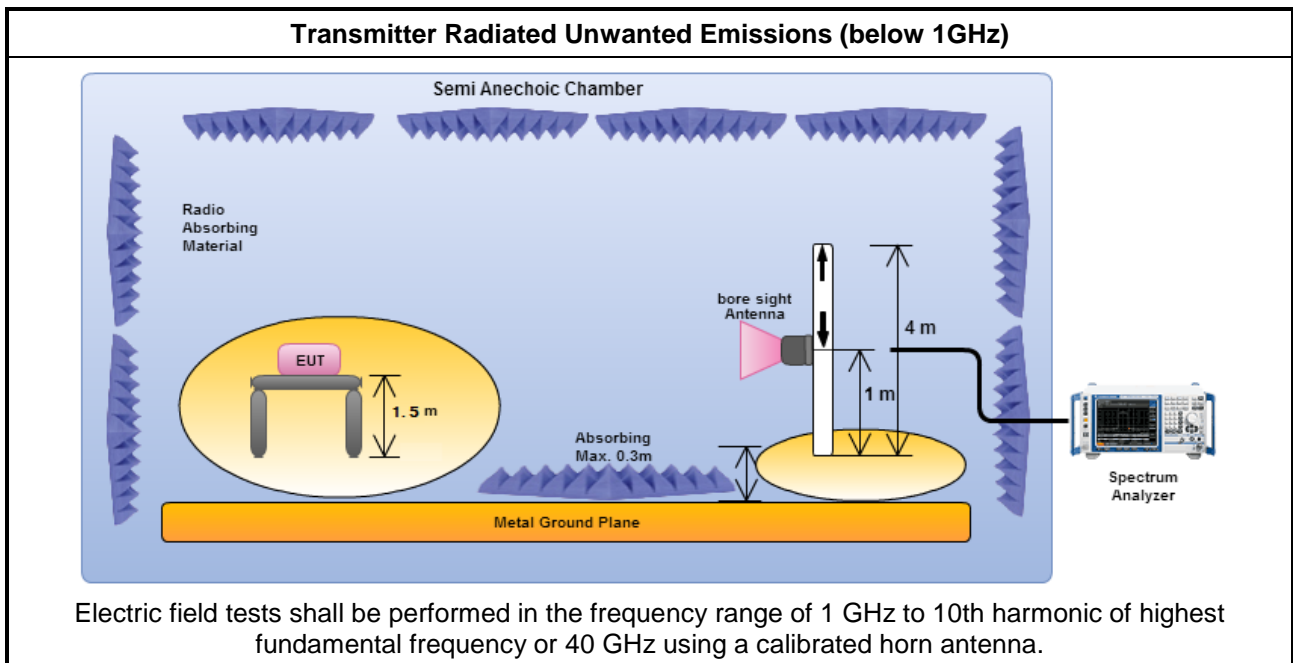
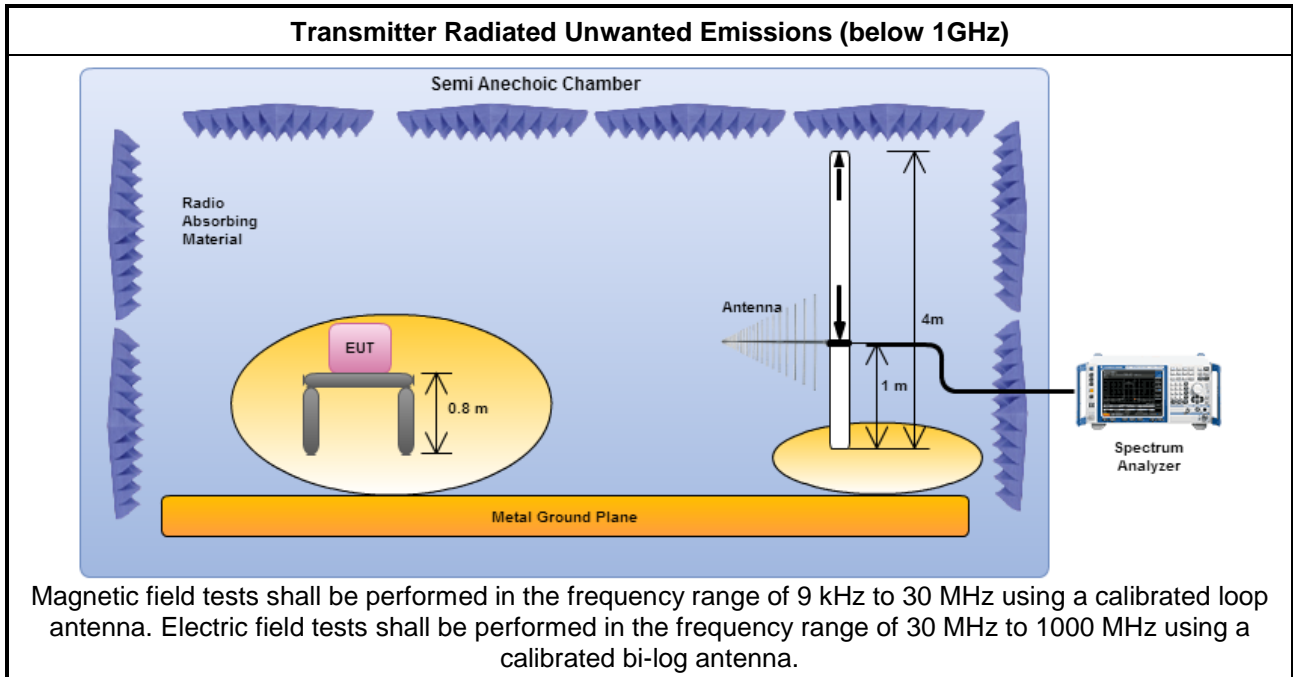
Refer a test equipment and calibration data table in this test report.



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"/>	The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle \geq 98%)
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
<input 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 4.1.4.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 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 below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	The any unwanted emissions level shall not exceed the fundamental emission level.
<input checked="" type="checkbox"/>	All amplitude of spurious emissions that are attenuated by more than 30 dB below the permissible value has no need to be reported.

3.6.4 Test Setup



3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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

3.6.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix E



4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
EMC Receiver	KETSIGHT	N9038A	MY54130031	20Hz ~ 8.4GHz	Apr. 14, 2016	Apr. 13, 2017
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 26, 2016	Jan. 25, 2017
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 30, 2015	Oct. 29, 2016
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	NCR	NCR

Instrument for Conducted Test

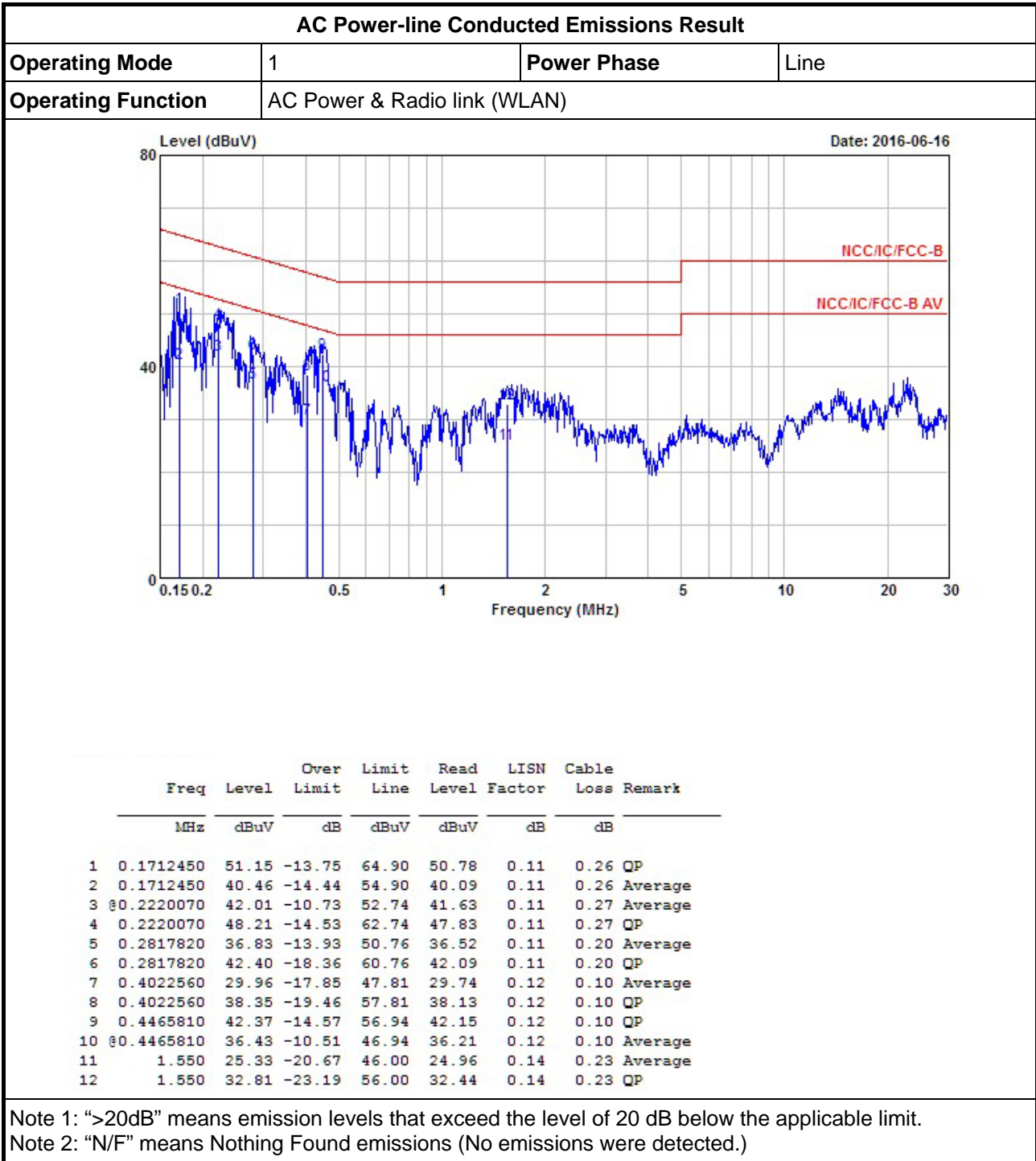
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9KHz~40GHz	Feb 16, 2016	Feb 15, 2017
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jul. 28, 2015	Jul. 27, 2016
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	Feb. 04 ,2016	Feb. 03 ,2017
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	Feb. 04, 2016	Feb. 03, 2017

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz 3m	Apr. 25, 2016	Apr. 24, 2017
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz 3m	Jul. 01, 2015	Jun. 30, 2016
Amplifier	EMC	EMC9135	980232	9kHz ~ 1.0GHz	Jan. 29, 2016	Jan. 28, 2017
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	Apr.11.2016	Apr.10.2017
Spectrum	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	Jul. 15, 2015	Jul. 14, 2016
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL 6111D & MTJ6102	35418	30MHz ~ 1GHz	Mar. 31, 2016	Mar. 30, 2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA 9120D 1534	1GHz ~ 18GHz	Apr. 22, 2016	Apr. 21, 2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	Jan. 04, 2016	Jan. 03, 2017
Amplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02.2015	Jun. 01.2017
Loop Antenna	ROHDE&SCHWARZ	HFH2-Z2	100330	9 kHz~30 MHz	Nov. 10, 2014	Nov. 09, 2016

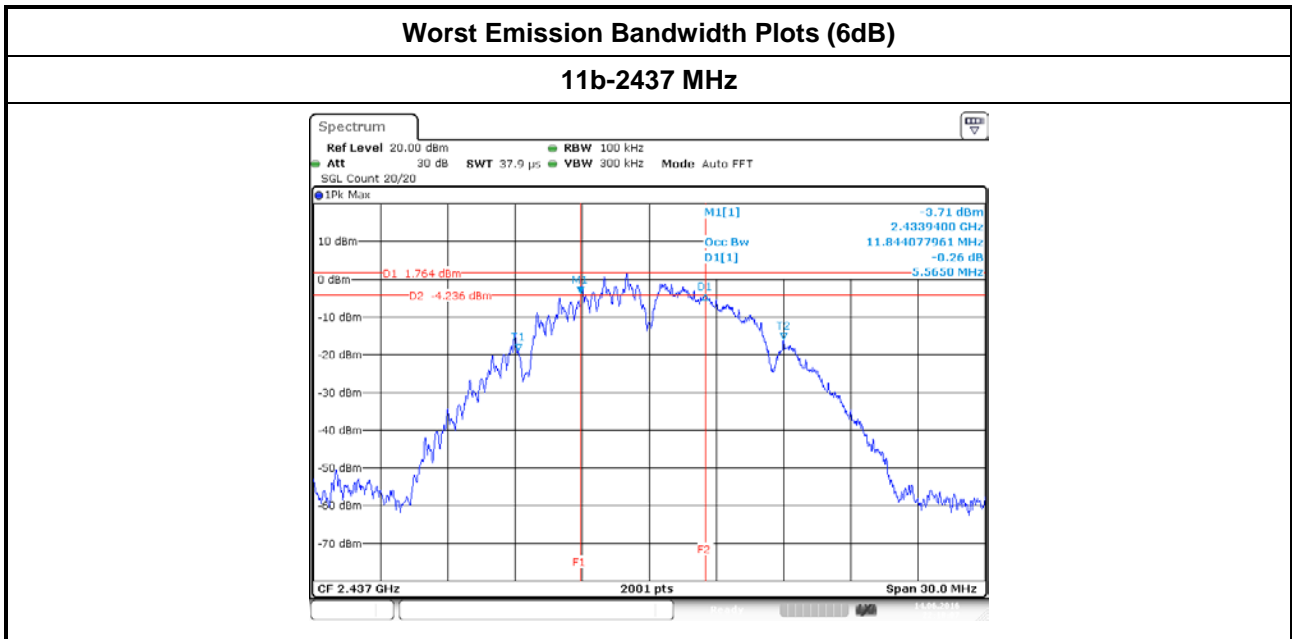


AC Power-line Conducted Emissions Result																																																																																																																																	
Operating Mode	1	Power Phase	Neutral																																																																																																																														
Operating Function	AC Power & Radio link (WLAN)																																																																																																																																
<div style="text-align: right;">Date: 2016-06-16</div>																																																																																																																																	
<table border="1"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over Limit</th> <th>Limit Line</th> <th>Read Level</th> <th>LISN Factor</th> <th>Cable Loss</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV</th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.1730690</td> <td>48.69</td> <td>-16.12</td> <td>64.81</td> <td>48.33</td> <td>0.10</td> <td>0.26</td> <td>QP</td> </tr> <tr> <td>2</td> <td>0.1730690</td> <td>39.08</td> <td>-15.73</td> <td>54.81</td> <td>38.72</td> <td>0.10</td> <td>0.26</td> <td>Average</td> </tr> <tr> <td>3</td> <td>0.2231870</td> <td>48.19</td> <td>-14.51</td> <td>62.70</td> <td>47.81</td> <td>0.11</td> <td>0.27</td> <td>QP</td> </tr> <tr> <td>4</td> <td>0.2231870</td> <td>42.60</td> <td>-10.10</td> <td>52.70</td> <td>42.22</td> <td>0.11</td> <td>0.27</td> <td>Average</td> </tr> <tr> <td>5</td> <td>0.2814930</td> <td>37.40</td> <td>-13.37</td> <td>50.77</td> <td>37.09</td> <td>0.11</td> <td>0.20</td> <td>Average</td> </tr> <tr> <td>6</td> <td>0.2814930</td> <td>43.90</td> <td>-16.87</td> <td>60.77</td> <td>43.59</td> <td>0.11</td> <td>0.20</td> <td>QP</td> </tr> <tr> <td>7</td> <td>0.4035060</td> <td>37.67</td> <td>-20.11</td> <td>57.78</td> <td>37.45</td> <td>0.12</td> <td>0.10</td> <td>QP</td> </tr> <tr> <td>8</td> <td>0.4035060</td> <td>27.00</td> <td>-20.78</td> <td>47.78</td> <td>26.78</td> <td>0.12</td> <td>0.10</td> <td>Average</td> </tr> <tr> <td>9</td> <td>0.4475500</td> <td>40.16</td> <td>-16.76</td> <td>56.92</td> <td>39.94</td> <td>0.12</td> <td>0.10</td> <td>QP</td> </tr> <tr> <td>10</td> <td>0.4475500</td> <td>34.14</td> <td>-12.78</td> <td>46.92</td> <td>33.92</td> <td>0.12</td> <td>0.10</td> <td>Average</td> </tr> <tr> <td>11</td> <td>1.590</td> <td>35.20</td> <td>-20.80</td> <td>56.00</td> <td>34.83</td> <td>0.14</td> <td>0.23</td> <td>QP</td> </tr> <tr> <td>12</td> <td>1.590</td> <td>27.91</td> <td>-18.09</td> <td>46.00</td> <td>27.54</td> <td>0.14</td> <td>0.23</td> <td>Average</td> </tr> </tbody> </table>					Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark		MHz	dBuV	dB	dBuV	dBuV	dB	dB		1	0.1730690	48.69	-16.12	64.81	48.33	0.10	0.26	QP	2	0.1730690	39.08	-15.73	54.81	38.72	0.10	0.26	Average	3	0.2231870	48.19	-14.51	62.70	47.81	0.11	0.27	QP	4	0.2231870	42.60	-10.10	52.70	42.22	0.11	0.27	Average	5	0.2814930	37.40	-13.37	50.77	37.09	0.11	0.20	Average	6	0.2814930	43.90	-16.87	60.77	43.59	0.11	0.20	QP	7	0.4035060	37.67	-20.11	57.78	37.45	0.12	0.10	QP	8	0.4035060	27.00	-20.78	47.78	26.78	0.12	0.10	Average	9	0.4475500	40.16	-16.76	56.92	39.94	0.12	0.10	QP	10	0.4475500	34.14	-12.78	46.92	33.92	0.12	0.10	Average	11	1.590	35.20	-20.80	56.00	34.83	0.14	0.23	QP	12	1.590	27.91	-18.09	46.00	27.54	0.14	0.23	Average
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark																																																																																																																									
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<p>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.)</p>																																																																																																																																	





Emission Bandwidth Result							
Modulation Mode	Freq. (MHz)	99% Bandwidth (MHz)			6dB Bandwidth (MHz)		
11b	2412	11.93	12.02	11.82	6.06	5.89	6.82
11b	2437	11.91	11.88	11.84	7.05	6.58	5.56
11b	2462	11.91	11.79	11.90	7.06	6.39	6.07
11g	2412	16.35	16.47	16.37	16.39	16.44	16.36
11g	2437	16.46	16.53	16.49	16.42	16.53	16.36
11g	2462	16.41	16.41	16.41	16.33	16.39	16.33
HT20	2412	17.60	17.64	17.63	17.65	17.67	17.61
HT20	2437	17.60	17.61	17.63	17.65	17.62	17.59
HT20	2462	17.66	17.58	17.61	17.64	16.69	17.67
HT40	2422	36.14	36.14	36.10	36.36	36.00	35.68
HT40	2437	36.10	36.18	36.14	36.32	35.08	35.76
HT40	2452	36.18	36.14	36.02	36.32	35.72	35.72
Limit		N/A			≥500 kHz		
Result		Complied					





Maximum Conducted Output Power

Appendix B

Maximum Peak Conducted Output Power Result										
Condition			RF Output Power (dBm)							
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	18.39	18.96	18.60	23.43	29.23	6.77	30.20	36.00
11b	1	2437	17.38	17.78	17.61	22.36	29.23	6.77	29.14	36.00
11b	1	2462	17.35	17.49	16.89	22.02	29.23	6.77	28.79	36.00
11g	1	2412	17.88	18.22	18.18	22.87	29.23	6.77	29.64	36.00
11g	1	2437	23.91	24.27	24.44	28.98	29.23	6.77	35.75	36.00
11g	1	2462	17.88	18.24	18.15	22.86	29.23	6.77	29.64	36.00
HT20	2	2412	15.85	16.40	16.10	20.89	29.23	6.77	27.66	36.00
HT20	2	2437	23.38	23.78	23.86	28.45	29.23	6.77	35.22	36.00
HT20	2	2462	15.80	16.37	16.07	20.86	29.23	6.77	27.63	36.00
HT40	2	2422	13.16	13.53	13.39	18.13	29.23	6.77	24.91	36.00
HT40	2	2437	17.48	18.18	18.24	22.75	29.23	6.77	29.52	36.00
HT40	2	2452	10.92	11.20	11.46	15.97	29.23	6.77	22.74	36.00
Result			Complied							

Test Result of Maximum Average Conducted Output Power

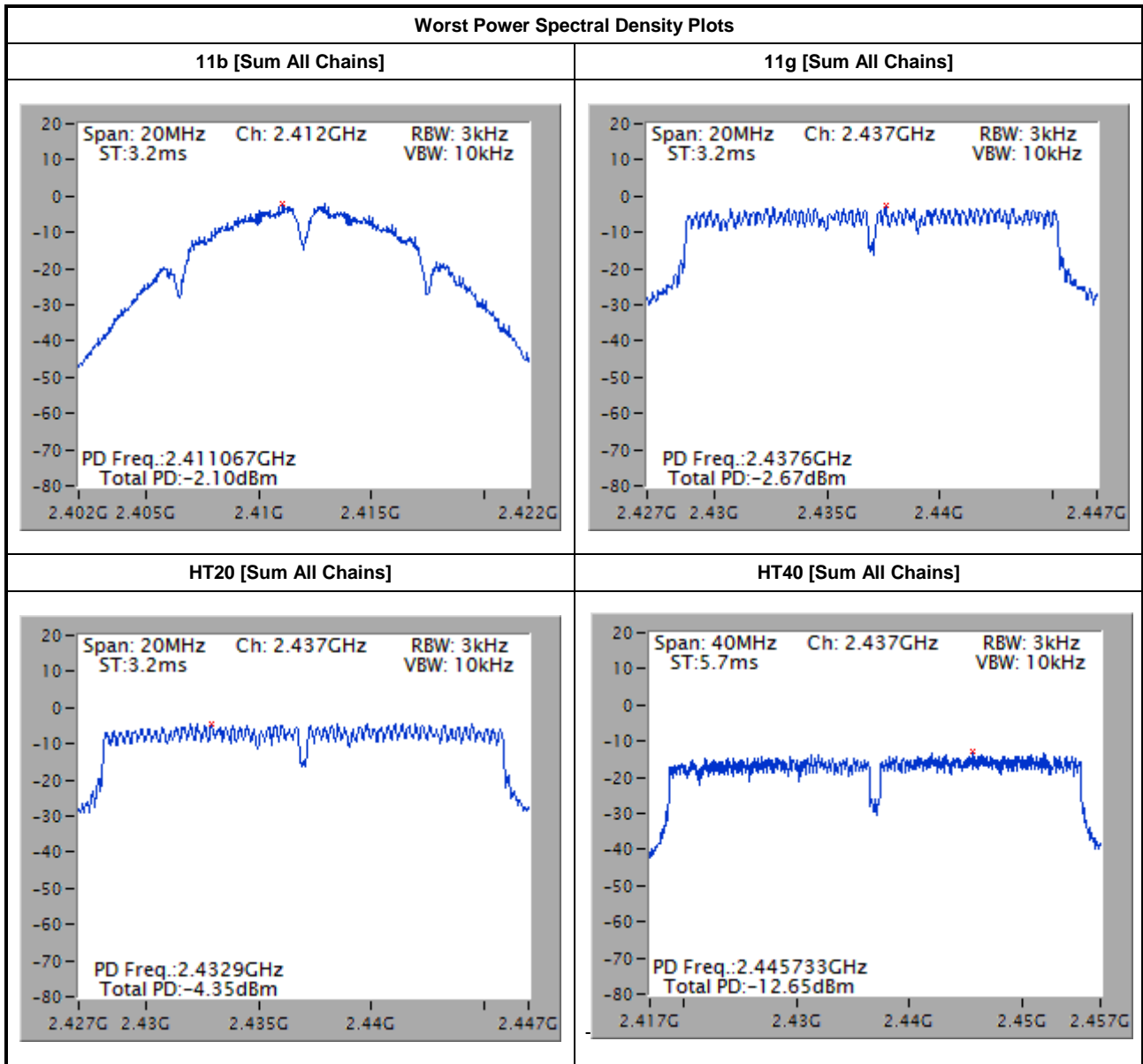
Maximum Conducted Average Output Power										
Condition			RF Output Power (dBm)							
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	15.16	15.77	15.51	20.26	29.23	6.77	27.03	36.00
11b	1	2437	14.16	14.81	14.68	19.33	29.23	6.77	26.10	36.00
11b	1	2462	14.14	14.24	13.68	18.80	29.23	6.77	25.57	36.00
11g	1	2412	11.38	11.94	11.70	16.45	29.23	6.77	23.22	36.00
11g	1	2437	18.53	19.16	19.10	23.71	29.23	6.77	30.48	36.00
11g	1	2462	11.50	11.94	11.61	16.46	29.23	6.77	23.23	36.00
HT20	2	2412	9.11	9.71	9.31	14.16	29.23	6.77	20.93	36.00
HT20	2	2437	17.37	18.05	18.01	22.60	29.23	6.77	29.37	36.00
HT20	2	2462	9.17	9.73	9.18	14.14	29.23	6.77	20.92	36.00
HT40	2	2422	5.74	6.45	6.16	10.90	29.23	6.77	17.67	36.00
HT40	2	2437	10.38	11.07	10.89	15.56	29.23	6.77	22.33	36.00
HT40	2	2452	3.67	4.05	4.06	8.70	29.23	6.77	15.47	36.00
Result			Complied							



Power Spectral Density

Appendix C

Power Spectral Density Result				
Condition			Power Spectral Density (dBm/3kHz)	
Modulation Mode	N _{TX}	Freq. (MHz)	Sum Chain	Power Limit
11b	3	2412	-2.10	8.00
11b	3	2437	-3.52	8.00
11b	3	2462	-3.89	8.00
11g	3	2412	-9.20	8.00
11g	3	2437	-2.67	8.00
11g	3	2462	-9.18	8.00
HT20	3	2412	-12.26	8.00
HT20	3	2437	-4.35	8.00
HT20	3	2462	-12.52	8.00
HT40	3	2422	-16.72	8.00
HT40	3	2437	-12.65	8.00
HT40	3	2452	-19.92	8.00
Result			Complied	
Note 1: PSD = sum each transmit chains by bin-to-bin PSD Note 1: PSD = each transmit chains PSD + 10logN _{TX}				





2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)								
Modulation	N _{TX}	Test Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Pol.
11b	3	2412	116.35	2398.928	60.81	55.54	20	V
11b	3	2462	112.670	2506.200	49.61	63.06	20	V
11g	3	2412	108.050	2399.900	71.32	36.73	20	V
11g	3	2462	104.270	2511.200	49.33	54.94	20	V
HT20	3	2412	104.630	2399.824	69.06	35.57	20	V
HT20	3	2462	106.340	2512.200	49.62	56.72	20	V
HT40	3	2422	101.480	2399.892	64.93	36.55	20	V
HT40	3	2452	99.680	2551.760	50.20	49.48	20	V

Note 1: Measurement worst emissions of receive antenna polarization

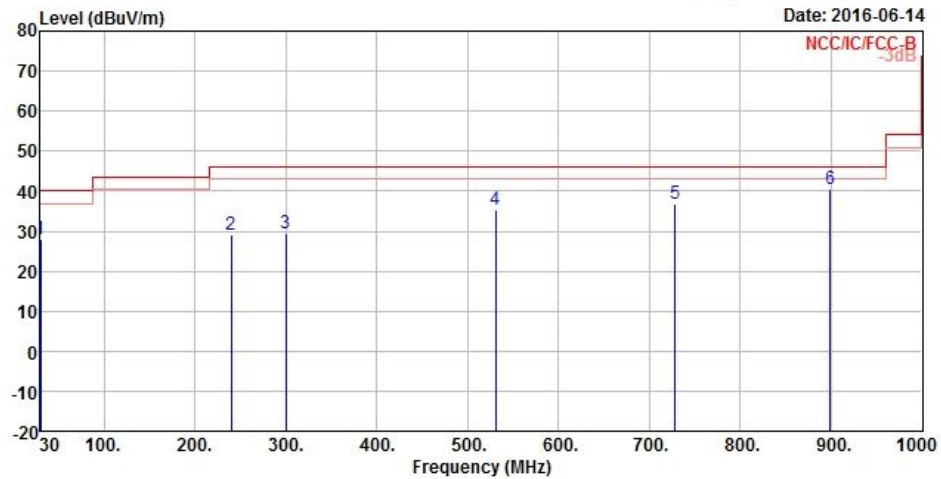
2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)										
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
11b	3	2412	3	2382.800	61.81	74	2389.740	48.610	54	V
11b	3	2462	3	2488.000	60.120	74	2485.000	48.530	54	V
11g	3	2412	3	2389.968	67.090	74	2389.968	52.520	54	V
11g	3	2462	3	2483.500	65.010	74	2483.500	52.670	54	V
HT20	3	2412	3	2385.040	65.360	74	2389.968	52.500	54	V
HT20	3	2462	3	2490.000	64.280	74	2483.600	52.670	54	V
HT40	3	2422	3	2387.880	64.600	74	2389.992	52.360	54	V
HT40	3	2452	3	2483.840	66.230	74	2483.720	52.600	54	V

Note 1: Measurement worst emissions of receive antenna polarization.



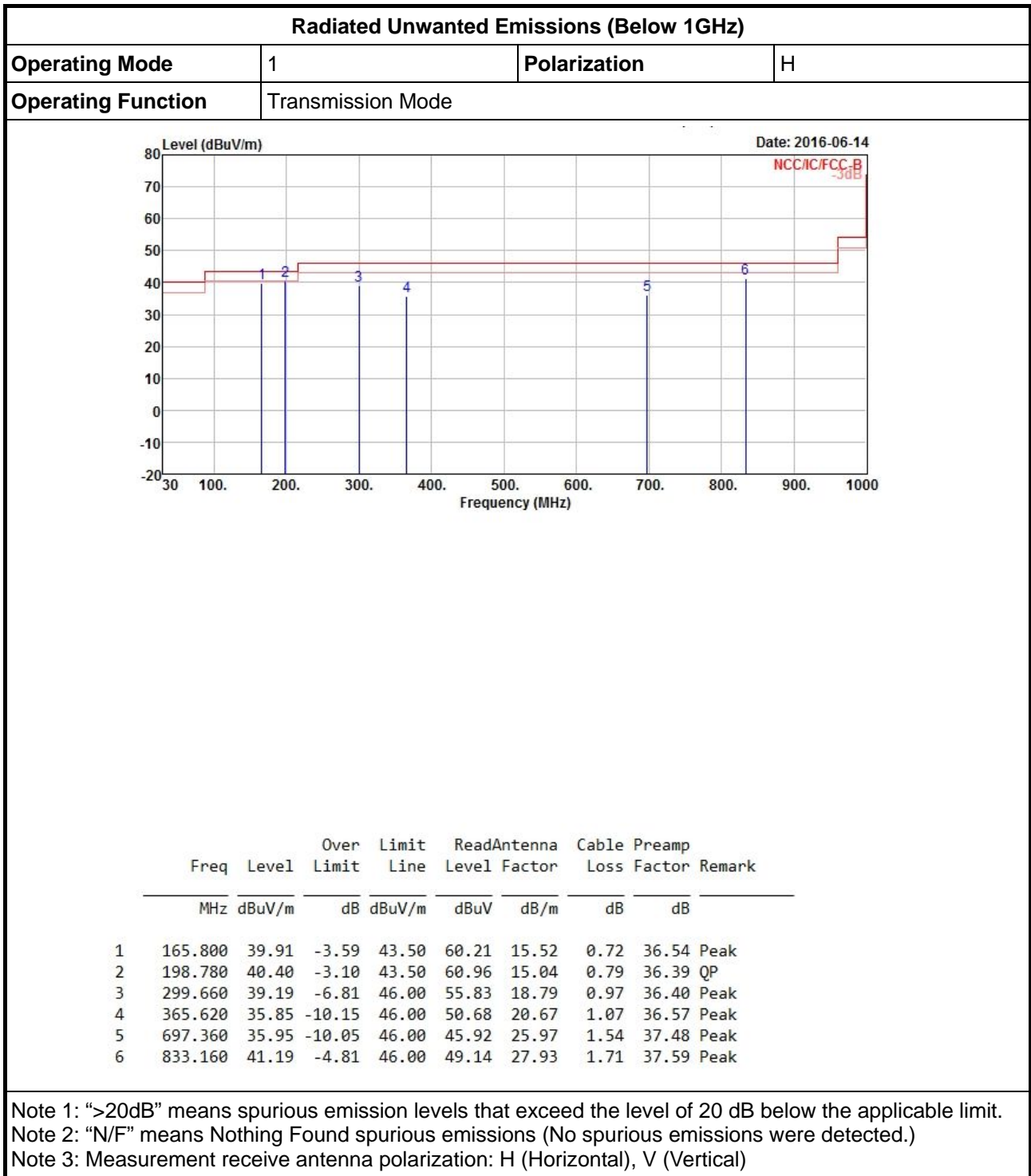
Transmitter Radiated Unwanted Emissions (Below 1GHz)

Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	Polarization	V
Operating Function	Transmission Mode		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	30.000	28.06	-11.94	40.00	40.26	24.90	0.32	37.42	Peak
2	239.520	29.16	-16.84	46.00	47.73	16.96	0.86	36.39	Peak
3	299.660	29.61	-16.39	46.00	46.25	18.79	0.97	36.40	Peak
4	530.520	35.36	-10.64	46.00	47.43	23.67	1.33	37.07	Peak
5	728.400	36.79	-9.21	46.00	46.20	26.51	1.58	37.50	Peak
6	899.120	40.47	-5.53	46.00	47.97	28.40	1.79	37.69	Peak

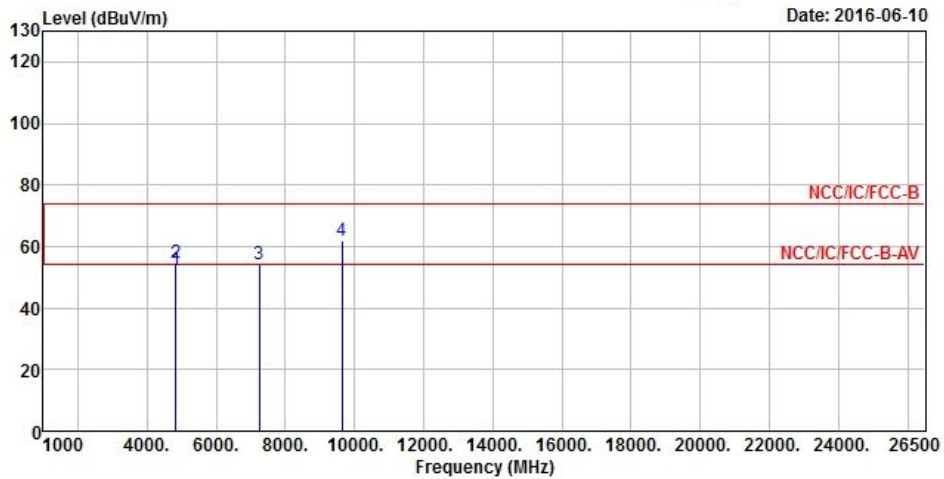
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)





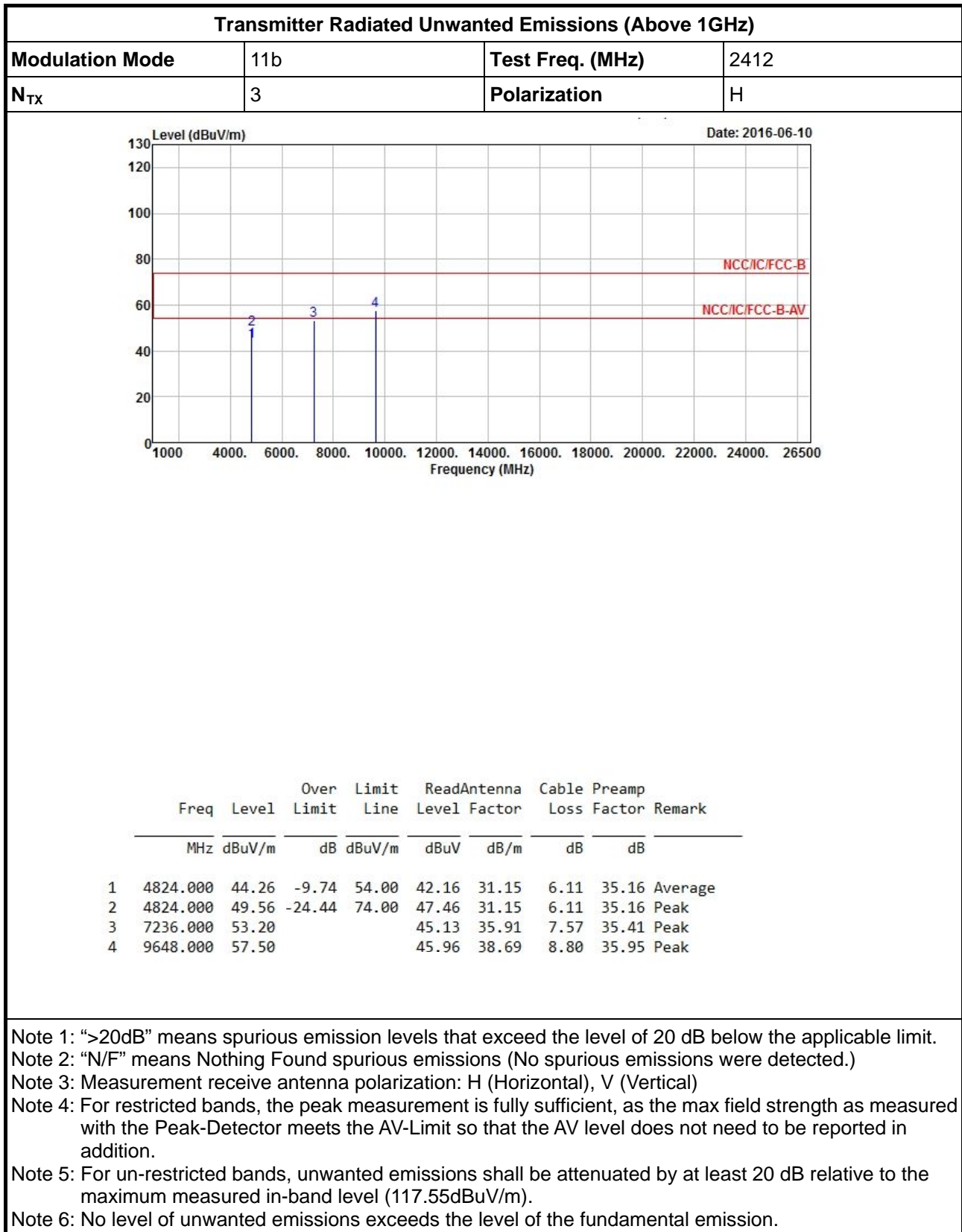
Transmitter Radiated Unwanted Emissions (Above 1GHz)

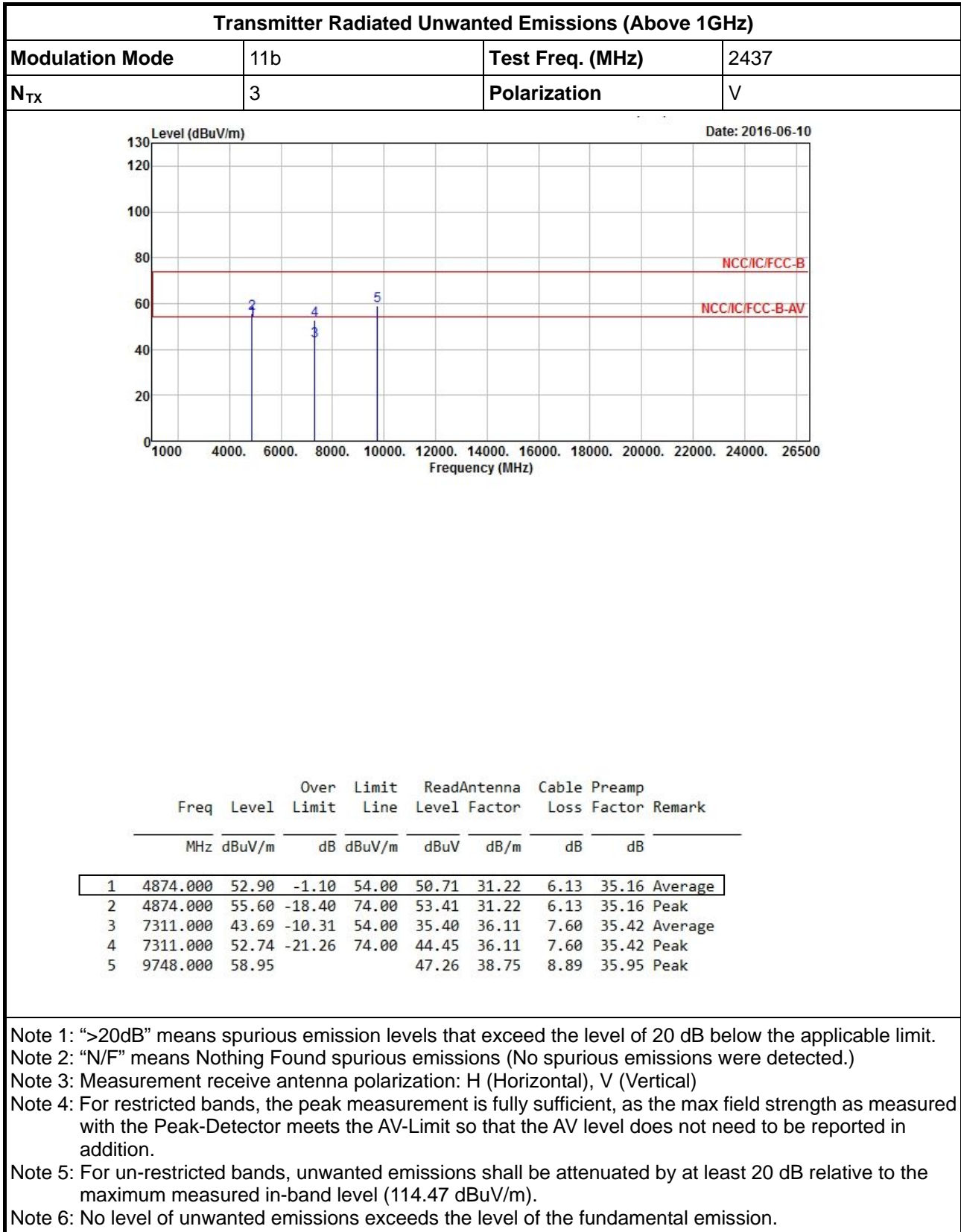
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11b	Test Freq. (MHz)	2412
N _{TX}	3	Polarization	V

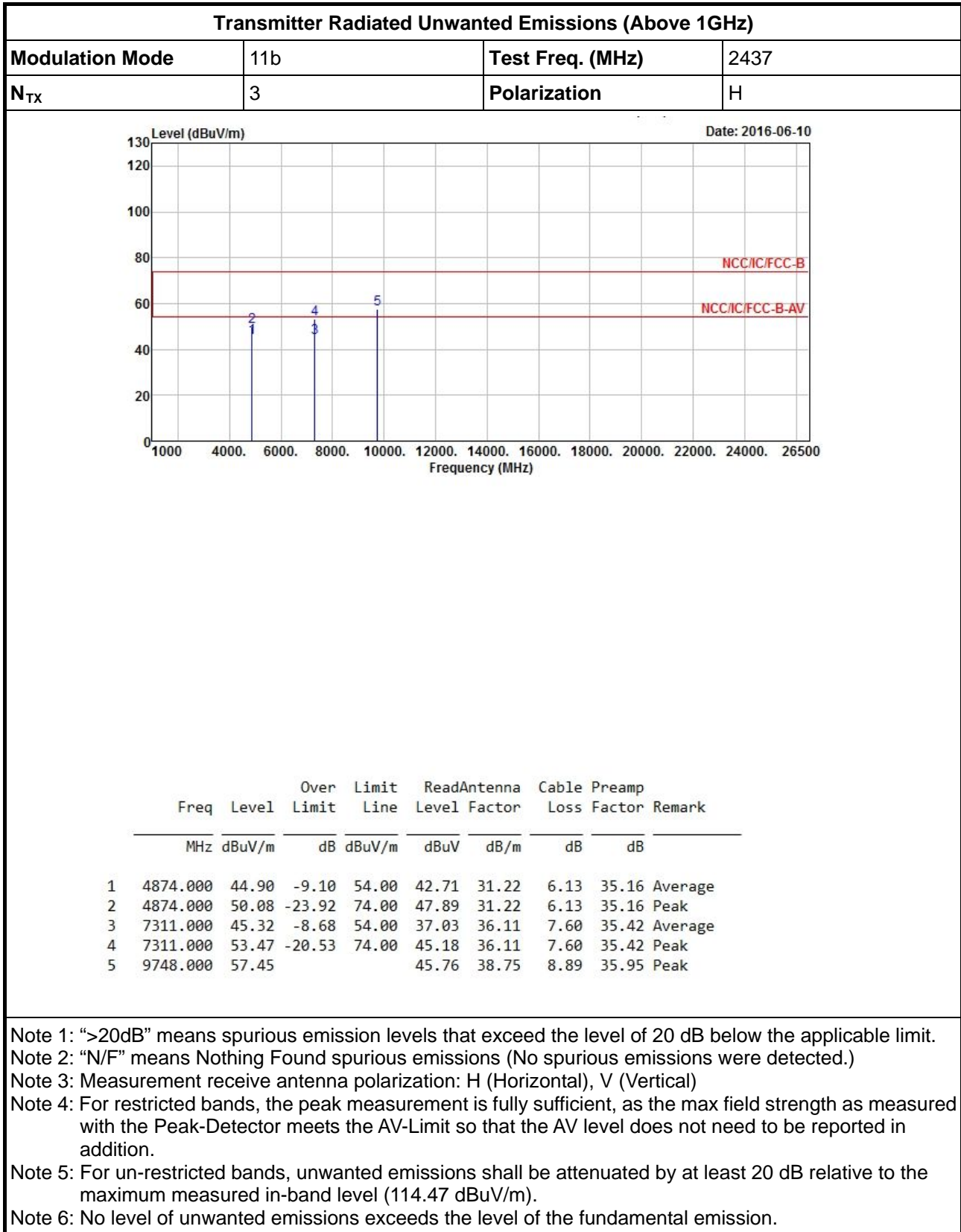


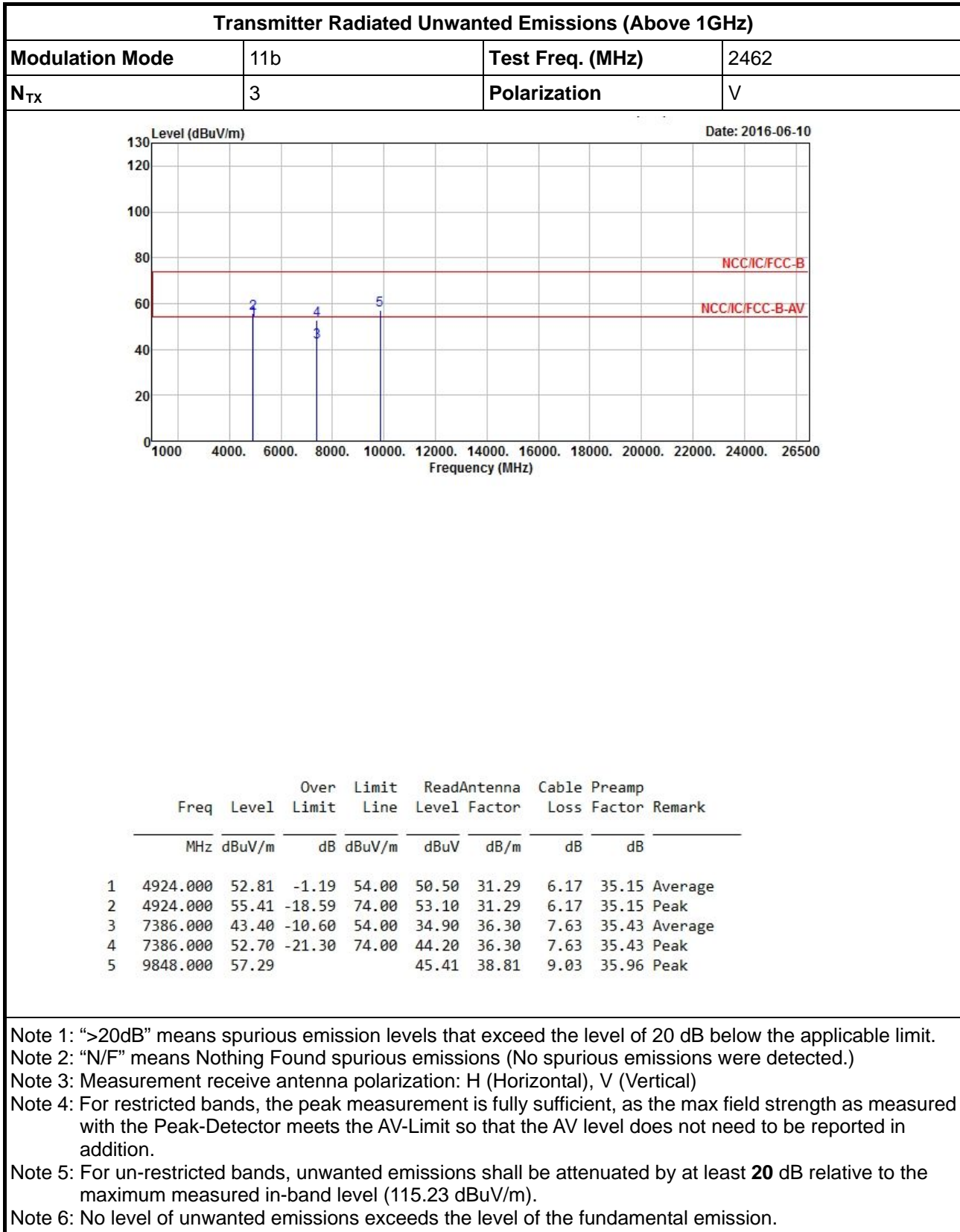
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4824.000	52.50	-1.50	54.00	50.40	31.15	6.11	35.16 Average
2	4824.000	54.90	-19.10	74.00	52.80	31.15	6.11	35.16 Peak
3	7236.000	53.97			45.90	35.91	7.57	35.41 Peak
4	9648.000	62.03			50.49	38.69	8.80	35.95 Peak

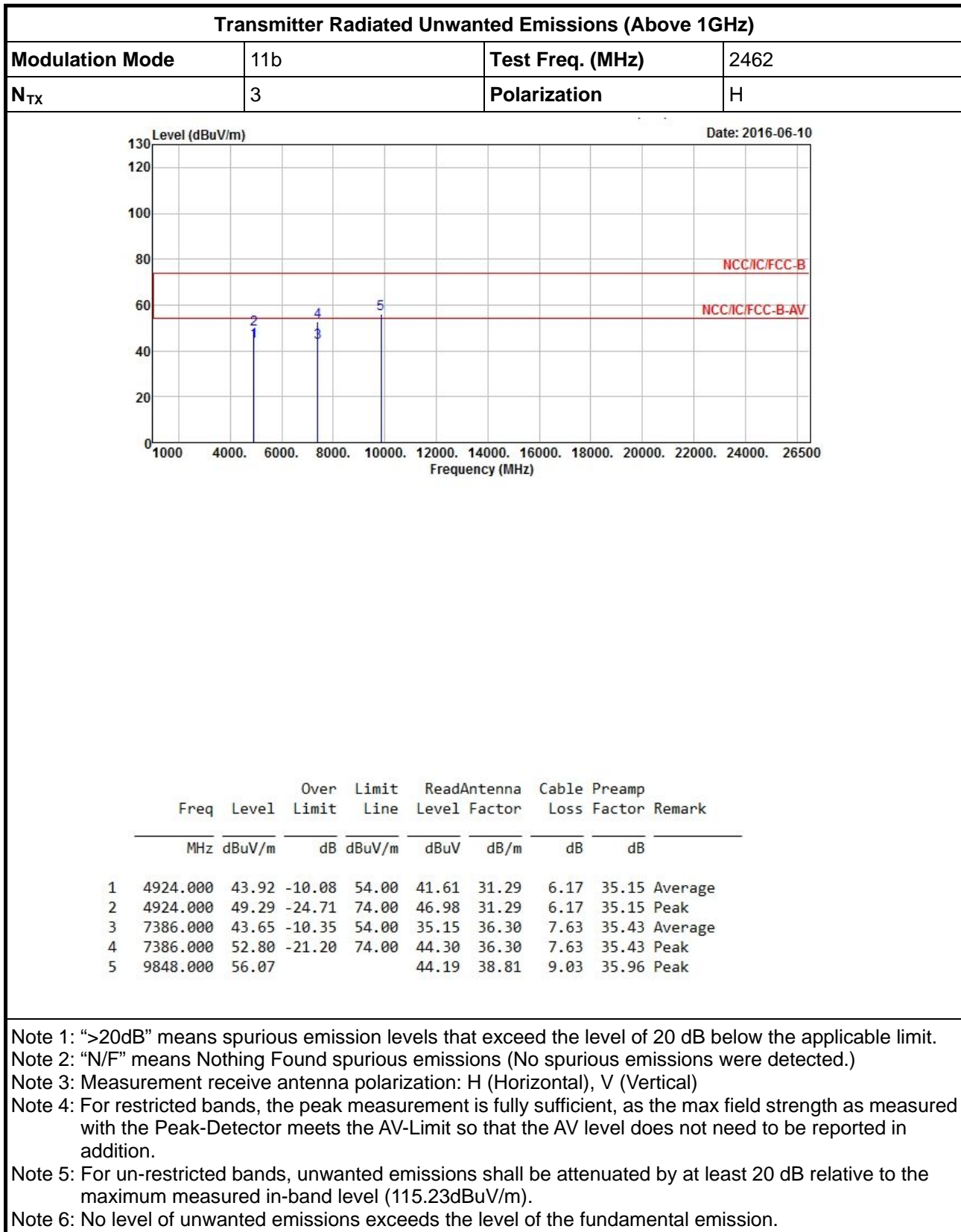
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- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV 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 (117.55 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.





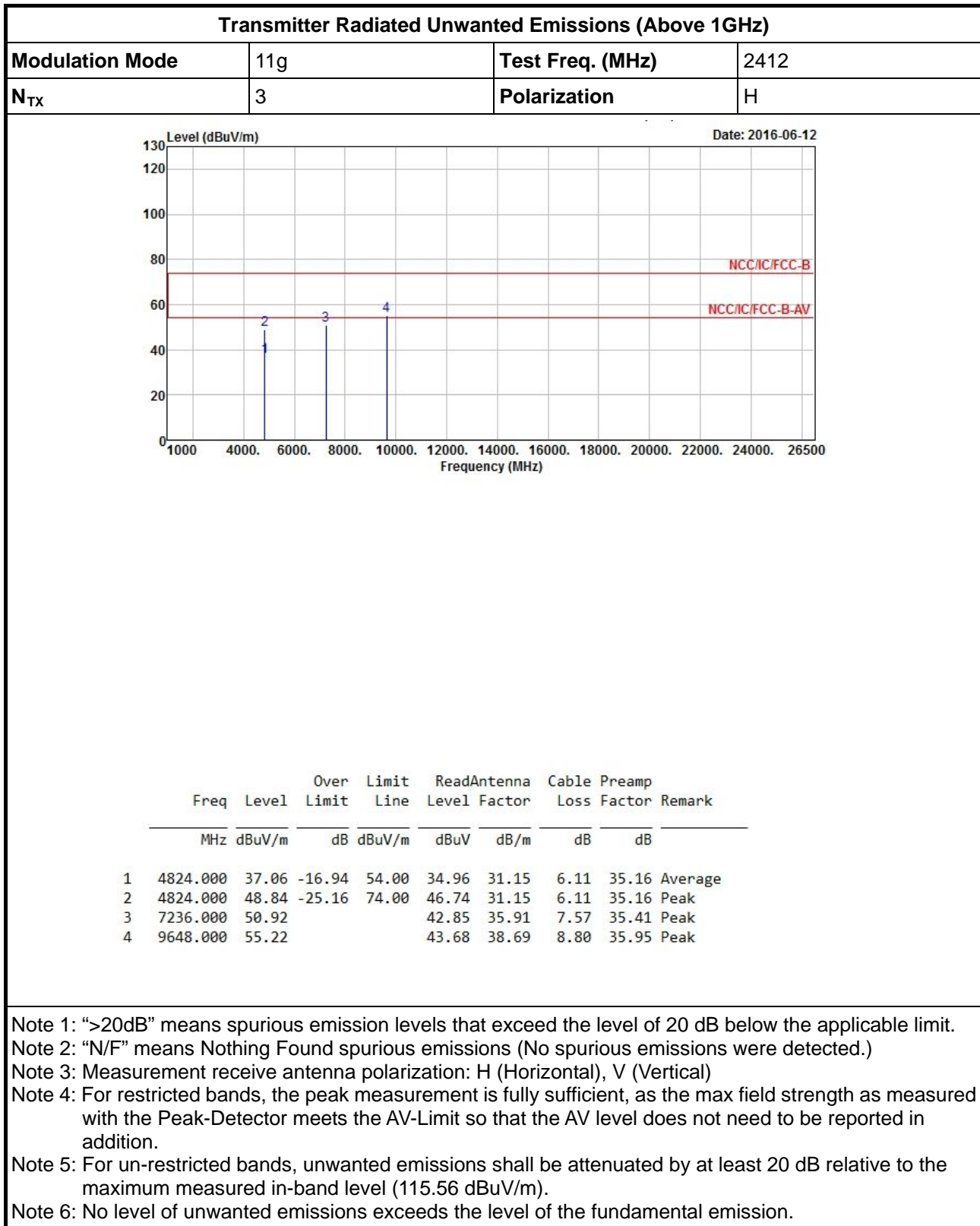






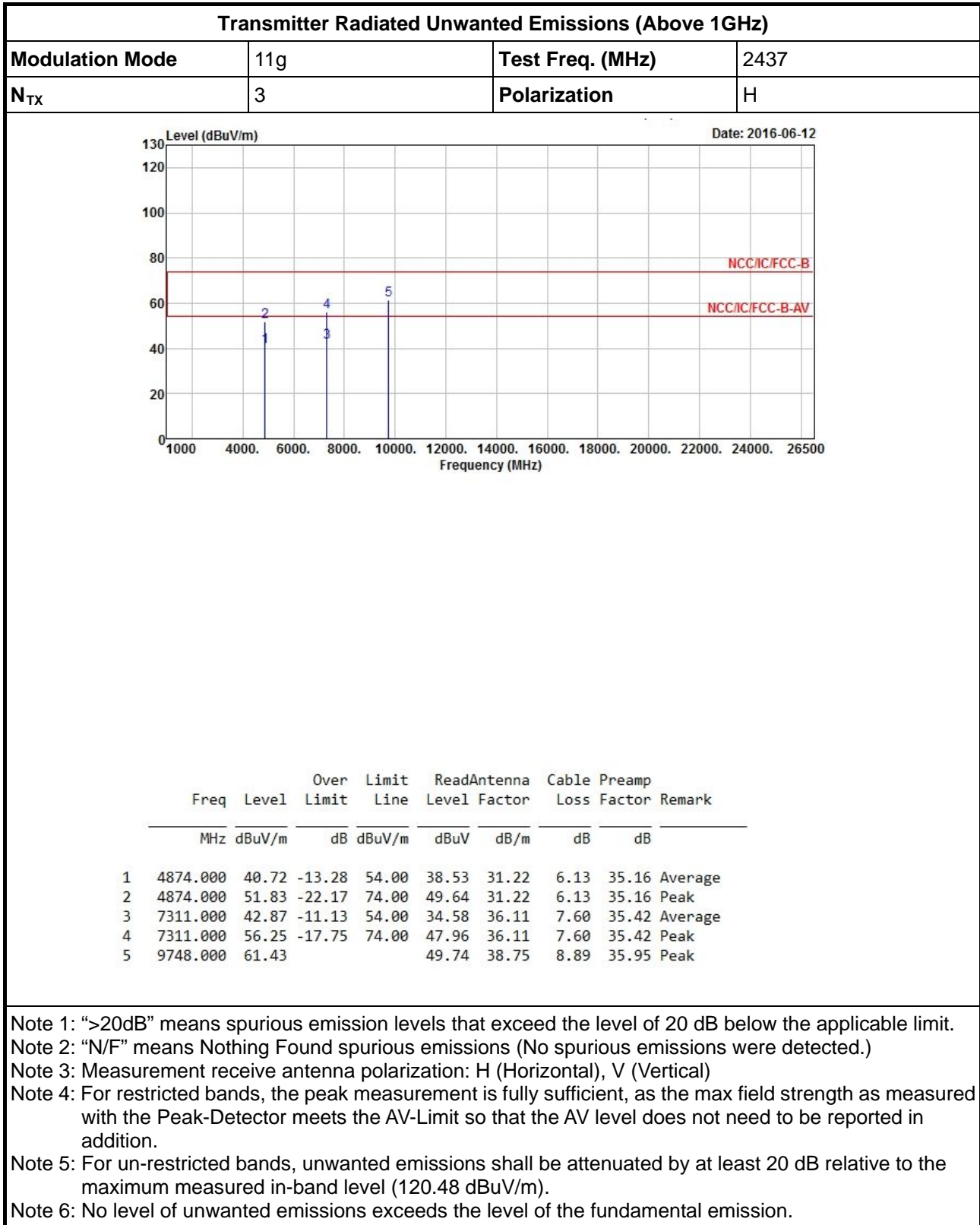


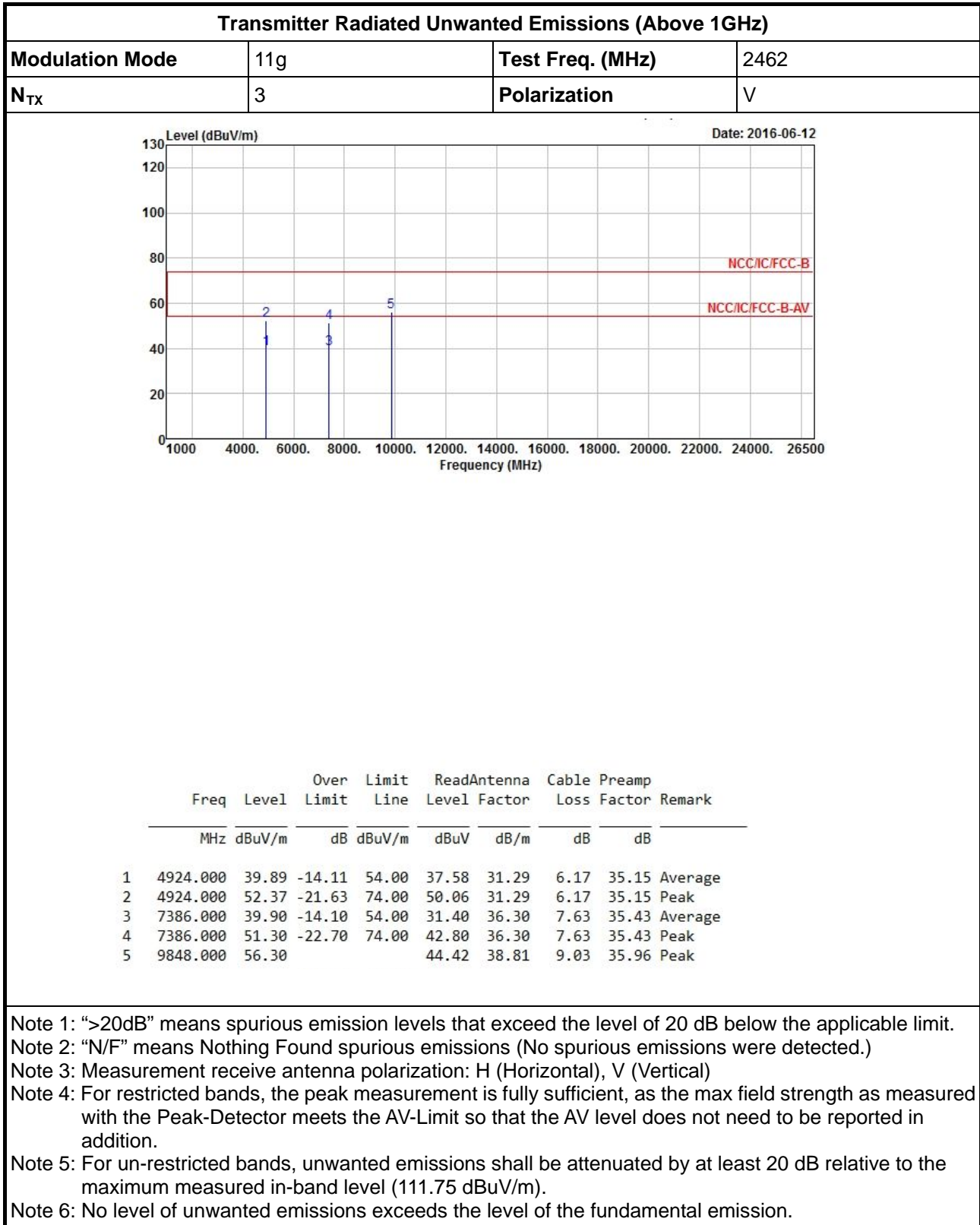
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																									
Modulation Mode	11g	Test Freq. (MHz)	2412																																																						
N _{TX}	3	Polarization	V																																																						
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Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																											
Modulation Mode	11g	Test Freq. (MHz)	2437																																																																								
N _{TX}	3	Polarization	V																																																																								
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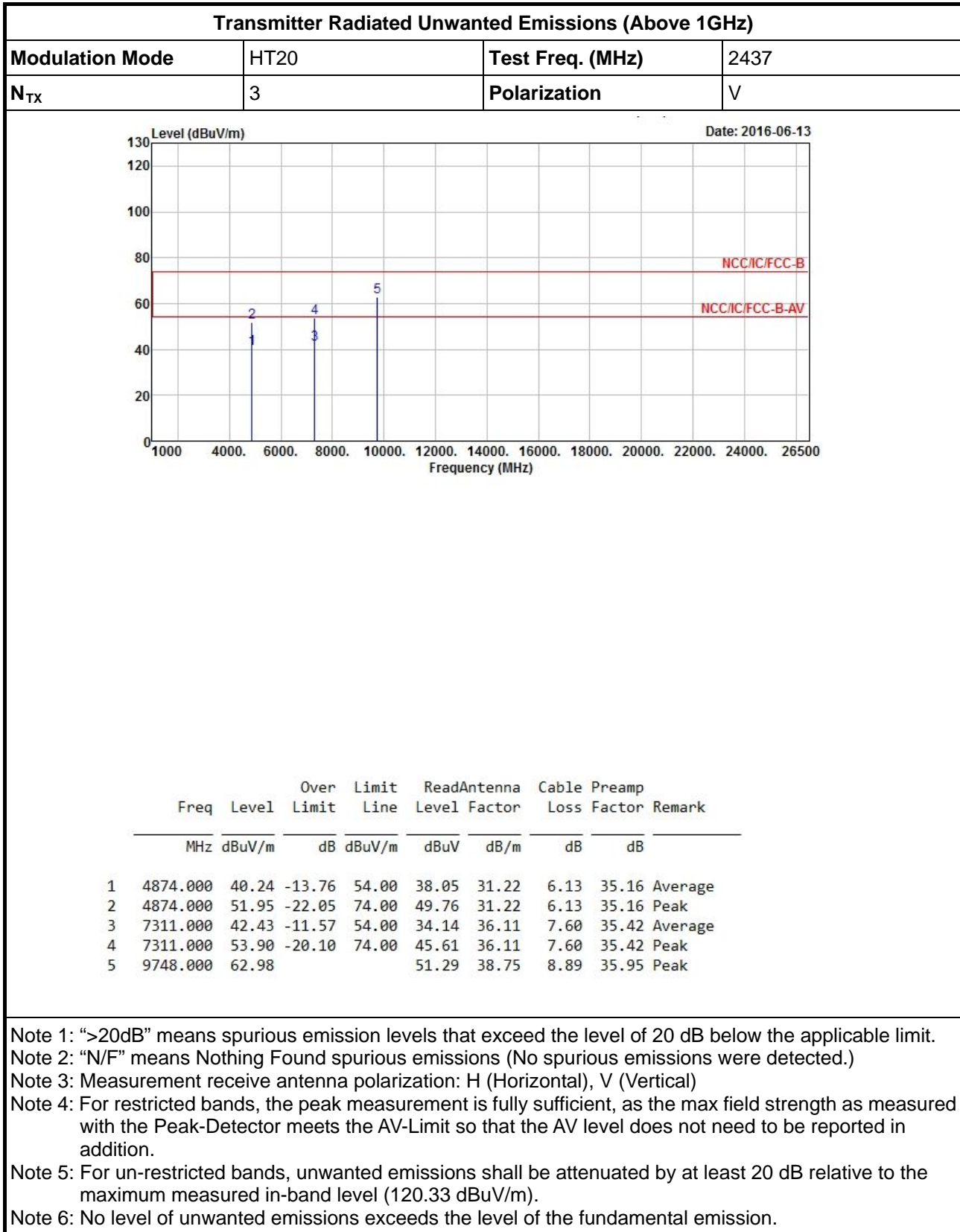
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																									
Modulation Mode	11g	Test Freq. (MHz)	2462																																																																						
N _{TX}	3	Polarization	H																																																																						
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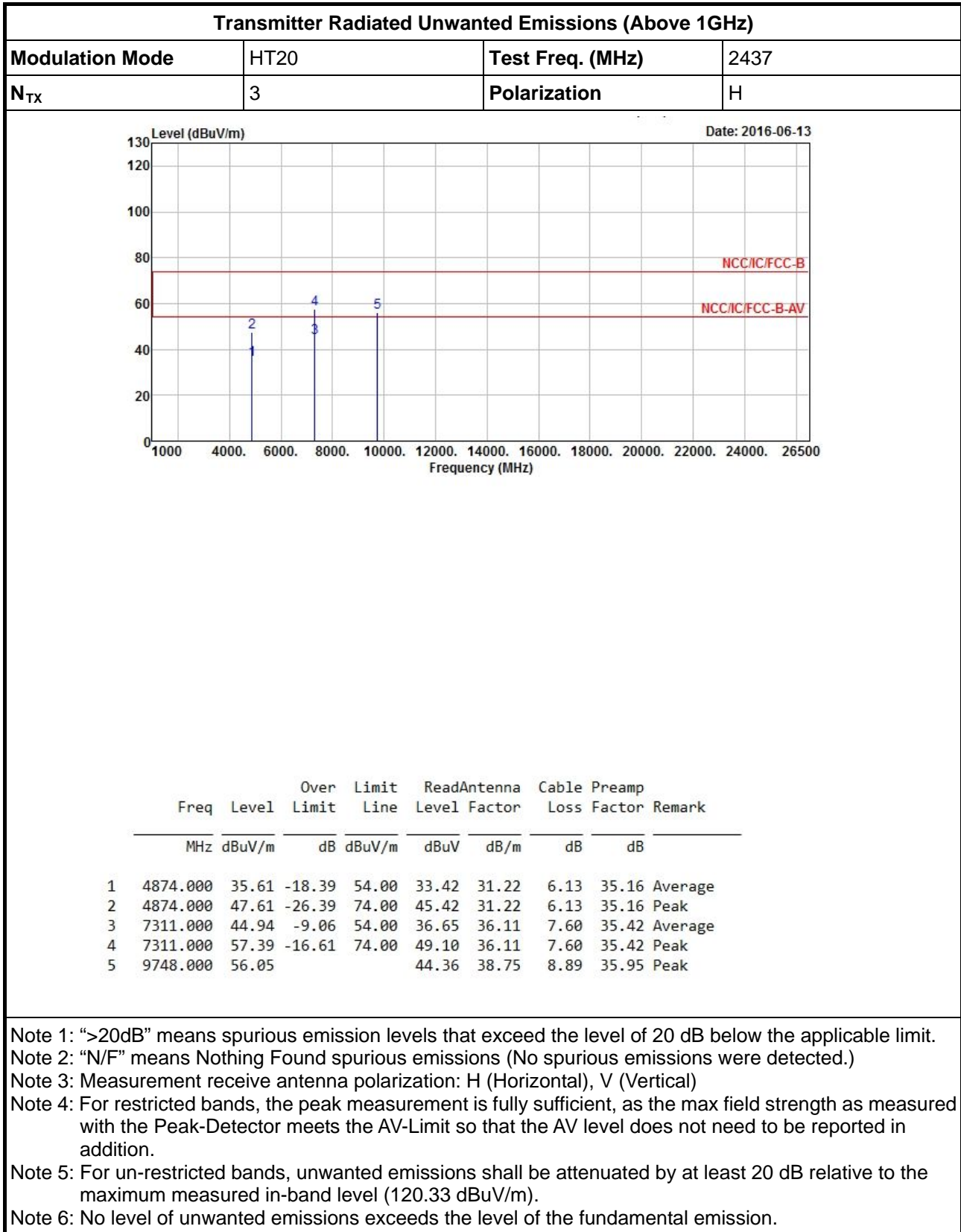


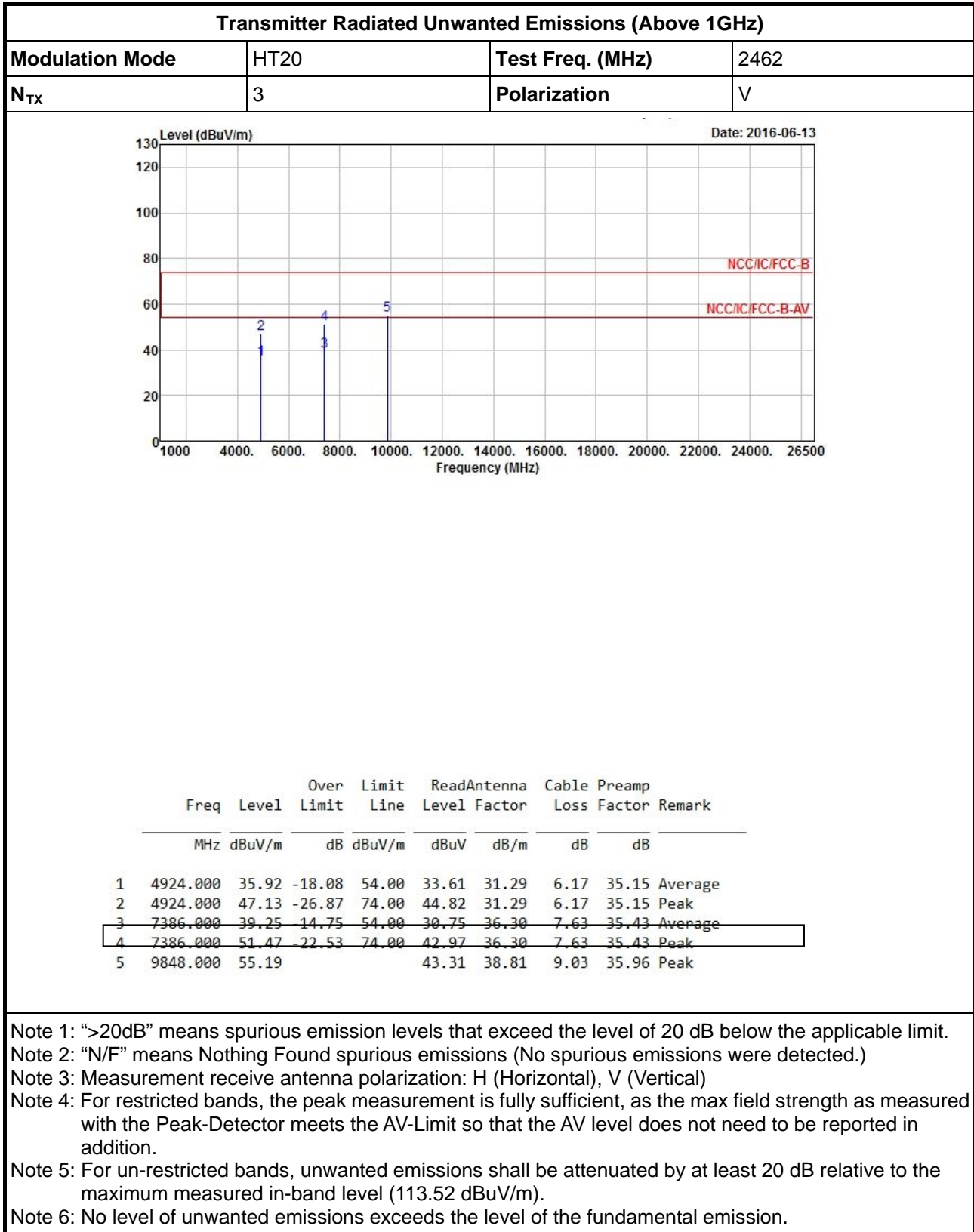
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																															
Modulation Mode	HT20	Test Freq. (MHz)	2412																																																												
N _{TX}	3	Polarization	V																																																												
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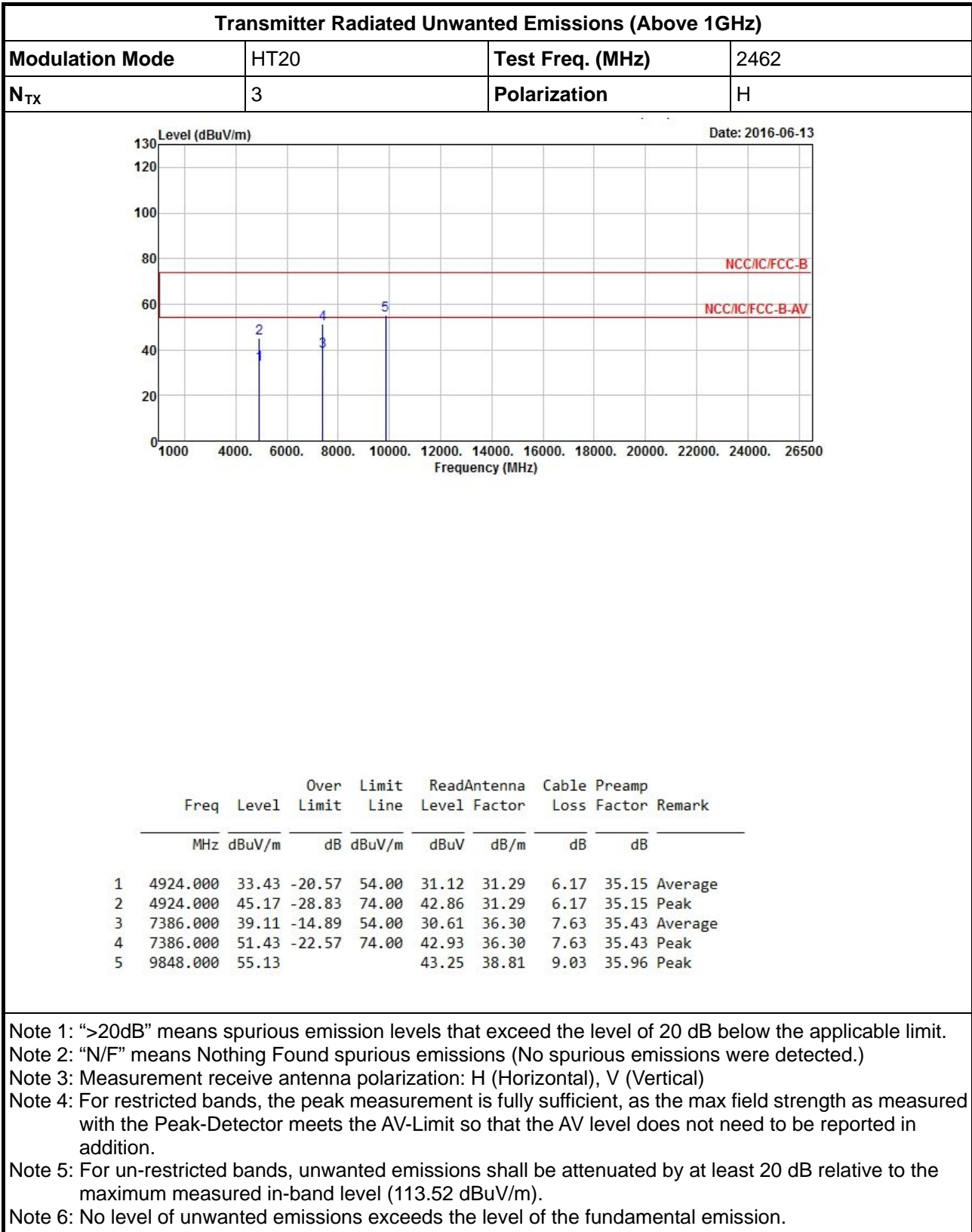


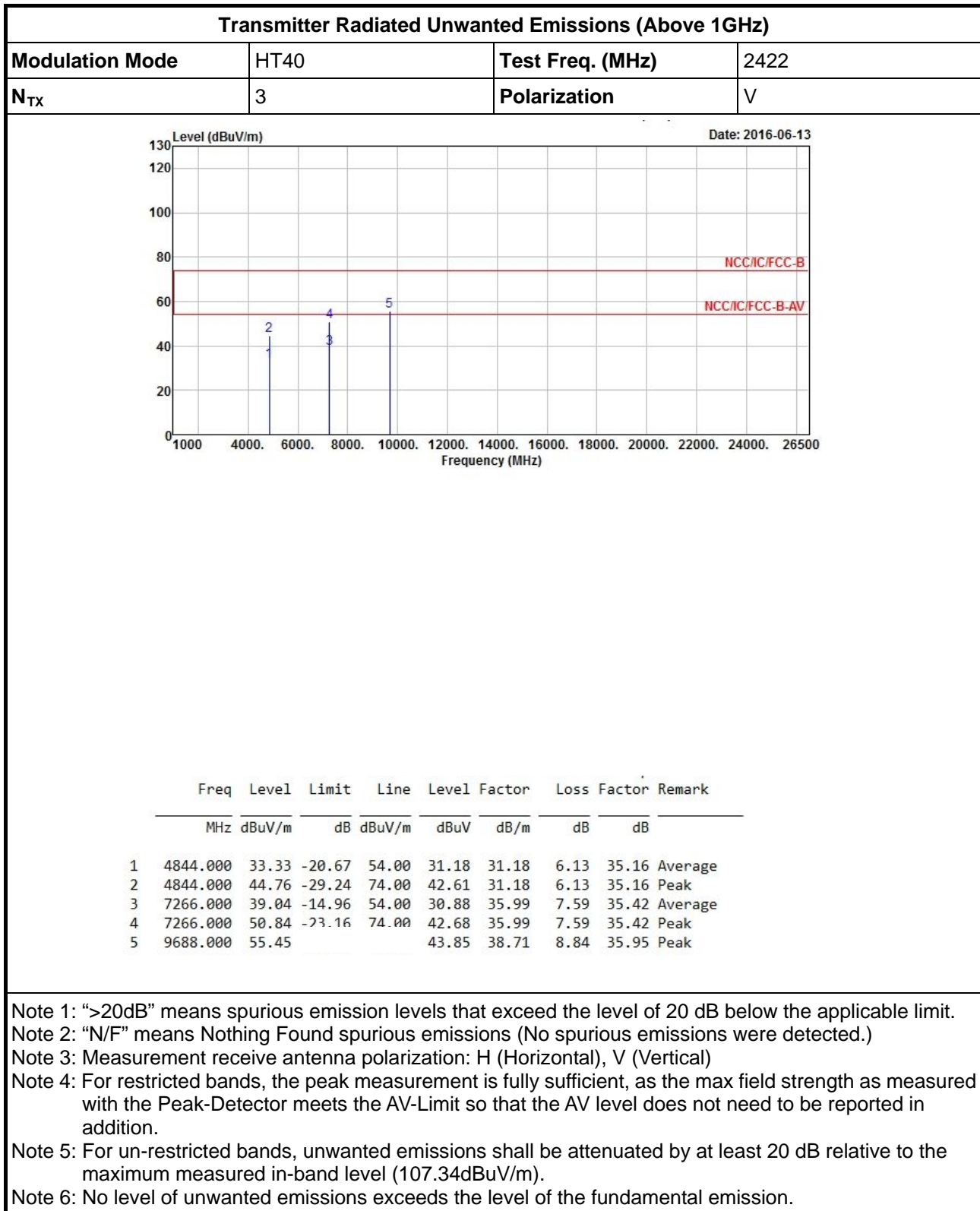
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																									
Modulation Mode	HT20	Test Freq. (MHz)	2412																																																						
N _{TX}	3	Polarization	H																																																						
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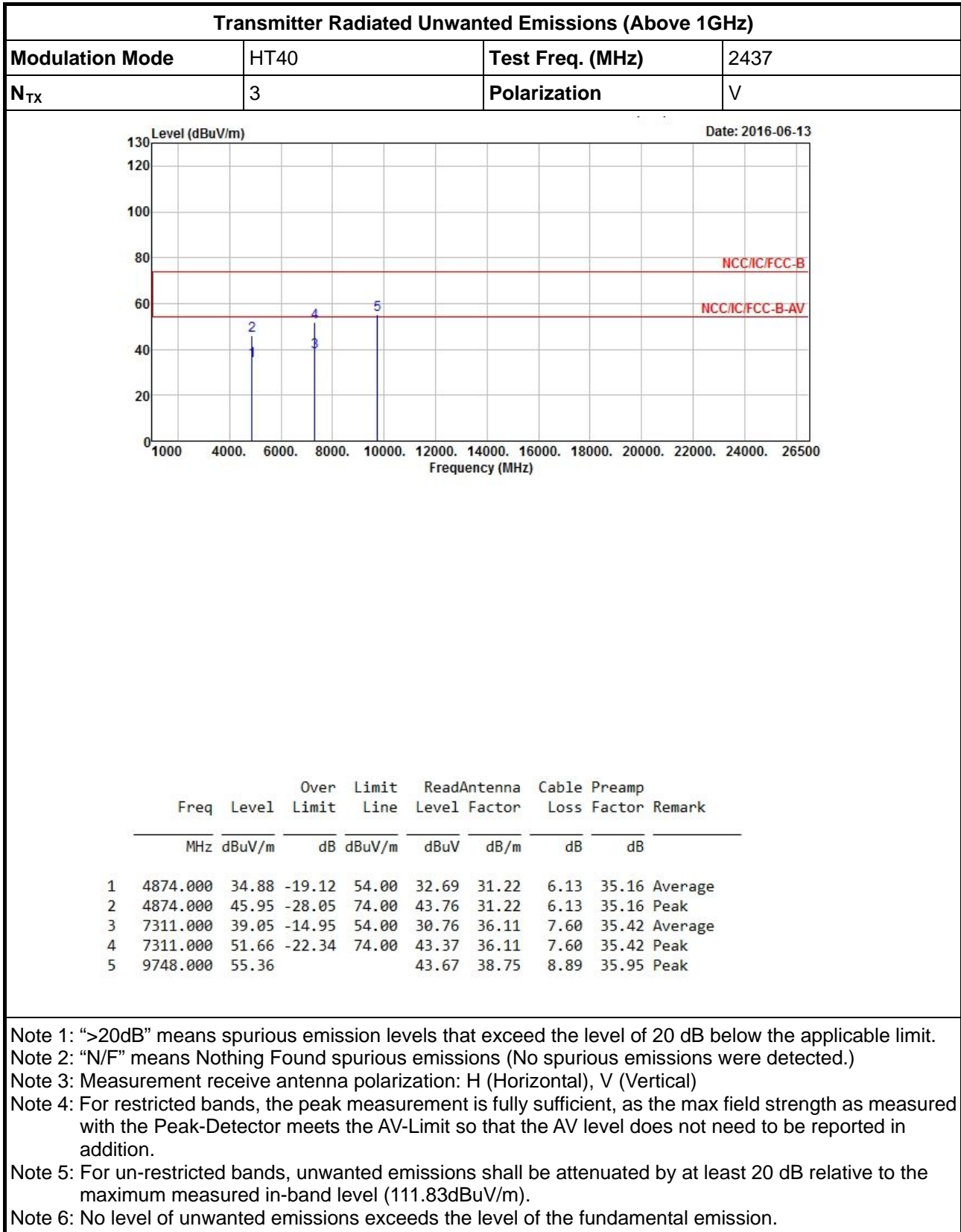


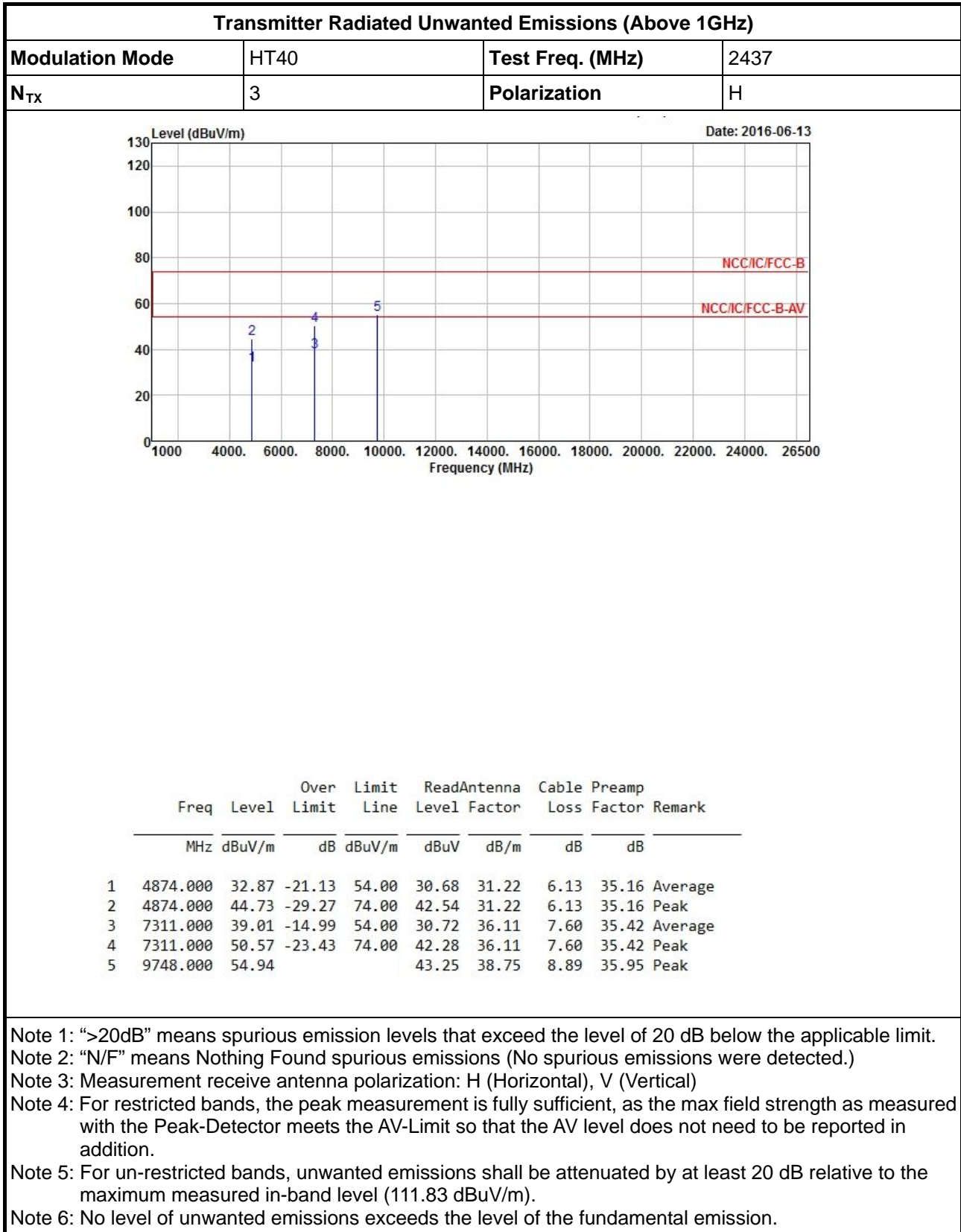






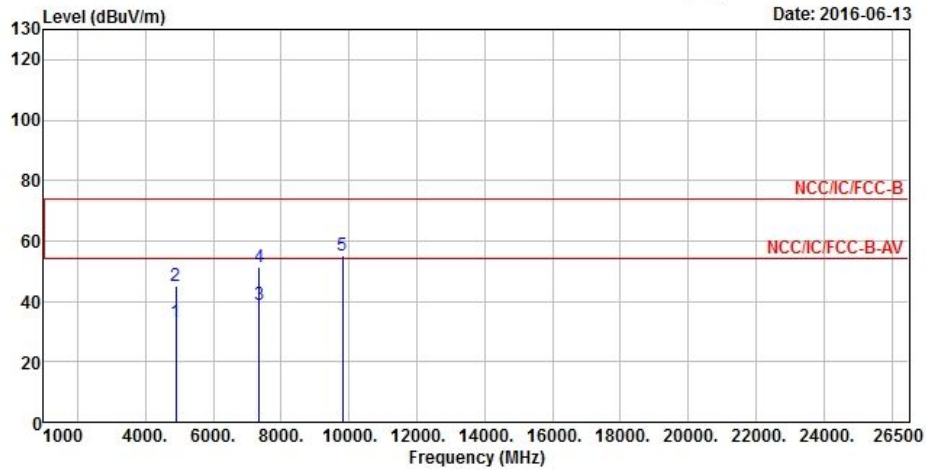
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Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	Test Freq. (MHz)	2452
N _{TX}	3	Polarization	V

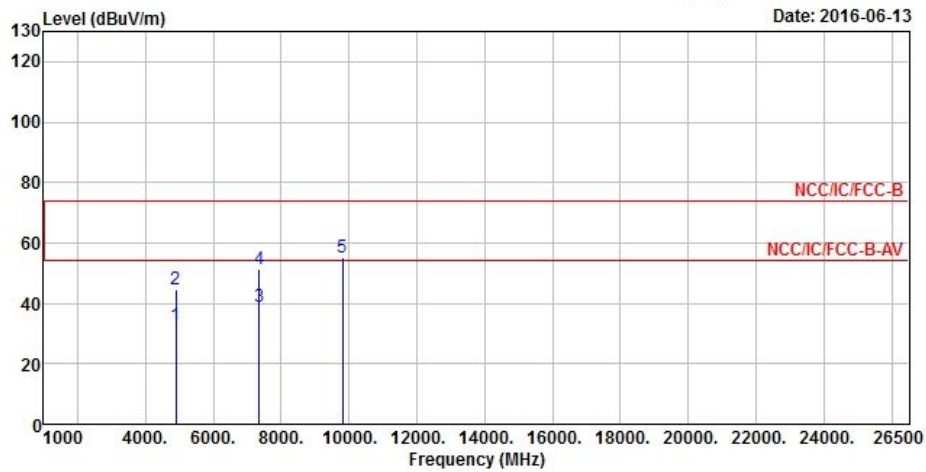


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4904.000	33.07	-20.93	54.00	30.80	31.27	6.15	35.15	Average
2	4904.000	45.05	-28.95	74.00	42.78	31.27	6.15	35.15	Peak
3	7356.000	39.02	-14.98	54.00	30.61	36.23	7.61	35.43	Average
4	7356.000	51.21	-22.79	74.00	42.80	36.23	7.61	35.43	Peak
5	9808.000	55.28			43.47	38.78	8.99	35.96	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 (106.09 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	Test Freq. (MHz)	2452
N _{TX}	3	Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4904.000	32.84	-21.16	54.00	30.57	31.27	6.15	35.15	Average
2	4904.000	44.51	-29.49	74.00	42.24	31.27	6.15	35.15	Peak
3	7356.000	39.00	-15.00	54.00	30.59	36.23	7.61	35.43	Average
4	7356.000	51.56	-22.44	74.00	43.15	36.23	7.61	35.43	Peak
5	9808.000	55.03			43.22	38.78	8.99	35.96	Peak

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
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- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.