



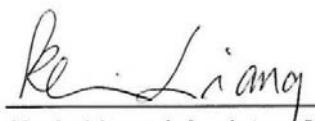
FCC Test Report

Equipment : AC1200 Dual Band Concurrent Ceiling-Mount AP
Brand Name : EDIMAX
Model No. : EW-7476HPC, GAP-476HPC, CAP1200
FCC ID : NDD9574761413
Standard : 47 CFR FCC Part 15.407
Operating Band : 5250 MHz – 5350 MHz
5470 MHz – 5725 MHz
FCC Classification : UNII
Applicant/ Manufacturer : EDIMAX TECHNOLOGY CO., LTD.
No.3, Wu-Chuan 3rd Road, Wu-Ku Industrial Park,
New Taipei City, Taiwan
Function : Outdoor AP Indoor AP Fixed P2P AP
 Portable Client

The product sample received on Jul. 15, 2014 and completely tested on Oct. 15, 2015. 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 A. TEST PHOTOS

APPENDIX B. PHOTOGRAPHS OF EUT



Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.2	15.203	Antenna Requirement	Complied
3.1	15.207	AC Power-line Conducted Emissions	Complied
3.2	15.407(a)	Emission Bandwidth	Complied
3.3	15.407(a)	RF Output Power (Maximum Conducted Output Power)	Complied
3.4	15.407(a)	Peak Power Spectral Density	Complied
3.5	15.407(b)	Transmitter Bandedge Emissions	Complied
3.6	15.407(b)	Transmitter Unwanted Emissions	Complied
3.7	15.407(g)	Frequency Stability	Complied



Revision History



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information (5250-5350MHz band)					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
5250-5350	a	5260-5320	52-64 [4]	1	21.76
5250-5350	n (HT20)	5260-5320	52-64 [4]	2	21.06
5250-5350	n (HT40)	5270-5310	54-62 [2]	2	22.17
5250-5350	ac (VHT20)	5260-5320	52-64 [4]	2	21.25
5250-5350	ac (VHT40)	5270-5310	54-62 [2]	2	22.12
5250-5350	ac (VHT80)	5290	58 [1]	2	16.27

Note 1: RF output power specifies that Maximum Conducted Output Power.
Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
Note 3: 802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.

RF General Information (5470-5725MHz band)					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
5470-5725	a	5500-5700	100-140 [11]	1	21.68
5470-5725	n (HT20)	5500-5700	100-140 [11]	2	21.14
5470-5725	n (HT40)	5510-5670	102-134 [3]	2	23.63
5470-5725	ac (VHT20)	5500-5700	100-140 [11]	2	21.05
5470-5725	ac (VHT40)	5510-5670	102-134 [3]	2	23.68
5470-5725	ac (VHT80)	5530	106 [2]	2	21.81

Note 1: RF output power specifies that Maximum Conducted Output Power.
Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
Note 3: 802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.



1.1.2 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Temporary RF connector provided
<input type="checkbox"/>	<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 type="checkbox"/>	External antenna (dedicated antennas)
<input type="checkbox"/>	<input type="checkbox"/> Single power level with corresponding antenna(s).
<input type="checkbox"/>	<input type="checkbox"/> Multiple power level and corresponding antenna(s).

Antenna General Information			
Ant. Port	Ant. Cat.	Ant. Type	Gain (dBi)
1	Integral	PIFA	4.00
2	Integral	PIFA	3.45
Remark:			
1. This EUT supports 1TX and Port 1 for emission in modulation mode 11a. 2. This EUT only supports 2TX in modulation mode HT20, HT40, VHT20, VHT40 and VHT80.			

1.1.3 Type of EUT

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



1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
<input type="checkbox"/> Operated normally mode for worst duty cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 87.49% - IEEE 802.11a	0.58
<input checked="" type="checkbox"/> 87.49% - IEEE 802.11n (HT20)	0.58
<input checked="" type="checkbox"/> 81.81% - IEEE 802.11n (HT40)	0.87
<input checked="" type="checkbox"/> 87.49% - IEEE 802.11ac (VHT20)	0.58
<input checked="" type="checkbox"/> 83.32% - IEEE 802.11ac (VHT40)	0.79
<input checked="" type="checkbox"/> 81.81% - IEEE 802.11ac (VHT80)	0.87

Note 1 : RF Output power/PSD plots w/o duty factor , but added in test table.

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	<input type="checkbox"/> System
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input checked="" type="checkbox"/> From PoE	<input checked="" type="checkbox"/> External adapter
Test Voltage	<input checked="" type="checkbox"/> V _{nom} (120 V)	<input checked="" type="checkbox"/> V _{max} (138 V)	<input checked="" type="checkbox"/> V _{min} (102 V)
Test Climatic	<input checked="" type="checkbox"/> T _{nom} (20°C)	<input checked="" type="checkbox"/> T _{max} (50°C)	<input checked="" type="checkbox"/> T _{min} (-20°C)

1.1.6 DFS and TPC Information

The DFS Related Operating Mode(s) of the Equipment			
<input checked="" type="checkbox"/> Master			
<input type="checkbox"/> Slave with radar detection			
<input type="checkbox"/> Slave without radar detection			
Software / Firmware Version	1.99.8		
Power-on Cycle. (Master VHT80)	88.875 sec		
Communication Mode	<input checked="" type="checkbox"/> IP Based	<input type="checkbox"/> Frame Based	
IEEE Std. 802.11	Frequency Range (MHz)	TPC (Transmit Power Control)	Active Scan
a / n (HT20) / ac (VHT20)	<input checked="" type="checkbox"/> 5250-5350	Yes	Yes
n (HT40) / ac (VHT40)	<input checked="" type="checkbox"/> 5470-5725	Yes	Yes
ac (VHT80)	<input checked="" type="checkbox"/> 5600-5650	Yes	Yes



1.2 Accessories and Support Equipment

Accessories Information				
AC Adapter 1	Brand Name	APD	Model Name	WA-12M12R
	Power Rating	I/P: 100-240Vac , 0.5A ; O/P: 12Vdc,1A		
	Power Cord	1.5 meter, non-shielded cable, with one ferrite core		
AC Adapter 2 (Level 6)	Brand Name	APD	Model Name	WA-12M12R
	Power Rating	I/P: 100-240Vac , 0.5A ; O/P: 12Vdc,1A		
	Power Cord	1.5 meter, non-shielded cable, without ferrite		

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

Support Equipment - AC Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5530	DoC
2	PoE	D-Link	DWL-P200	-
3	Notebook (Remote)	DELL	E5530	DoC

Support Equipment - Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	PoE	Acelink	PI-1000PT	-
2	Notebook (Remote)	DELL	E5530	DoC

Support Equipment - RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5540	DoC
2	Adapter	DELL	HA65NM130	DoC

1.3 Testing Applied Standards

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

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ FCC KDB 789033 D02 v01
- ◆ FCC KDB 644545 D03 v01
- ◆ FCC KDB 662911 v02r01
- ◆ FCC-14-30A1-UNII



1.4 Testing Location Information

Testing Location				
Test Condition		Test Site No.	Test Engineer	Test Environment
AC Conduction		CO04-HY (Adapter 1)	Zeus	25°C / 43%
		CO04-HY (Adapter 2)	Anthony	21°C / 61%
RF Conducted		TH01-HY	Howard	23°C / 63%
Radiated Emission		03CH02-HY (Adapter 1)	Spirit	23.2°C / 55%
		03CH02-HY (Below 1GHz) (Adapter 2)	Joe	23.2°C / 55%



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	
AC power-line conducted emissions	±2.3 dB	
Emission bandwidth, 26dB bandwidth	±0.5%	
RF output power, conducted	±0.1 dB	
Power density, conducted	±0.5 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	±0.5 %	



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
11a	1	6-54Mbps	6 Mbps
HT20	2	MCS 0-15	MCS 0
HT40	2	MCS 0-15	MCS 0
VHT20	2	MCS 0-8	MCS 0
VHT40	2	MCS 0-9	MCS 0
VHT80	2	MCS 0-9	MCS 0

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (5250-5350MHz band)							
Test Software Version	CART						
Modulation Mode	N _{TX}	Test Frequency (MHz)					
		NCB: 20MHz		NCB: 40MHz		NCB: 80MHz	
		5260	5300	5320	5270	5310	5290
11a	1	23.5	23.5	21.0	-	-	-
HT20	2	19.5	19.5	18.5	-	-	-
HT40	2	-	-	-	21.5	14.0	-
VHT20	2	19.5	19.5	18.5	-	-	-
VHT40	2	-	-	-	21.5	14.0	-
VHT80	2	-	-	-	-	-	17

The Worst Case Power Setting Parameter (5470-5725MHz band)								
Test Software Version	CART							
Modulation Mode	N _{TX}	Test Frequency (MHz)						
		NCB: 20MHz			NCB: 40MHz		NCB: 80MHz	
		5500	5580	5700	5510	5550	5670	5530
11a	1	22.0	23.5	20.5	-	-	-	-
HT20	2	19.0	19.5	15.5	-	-	-	-
HT40	2	-	-	-	17.5	23.0	20.0	-
VHT20	2	19.0	19.5	15.5	-	-	-	-
VHT40	2	-	-	-	17.5	23.0	20.0	-
VHT80	2	-	-	-	-	-	-	17.5
								21.5



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	Flash 8M: Adapter 1 mode
2	Flash 8M: PoE mode
3	Flash 16M: Adapter 1 mode
4	Flash 16M: PoE mode
5	Flash 8M: Adapter 2 mode
6	Flash 16M: Adapter 2 mode

For operating **mode 4** is the worst case and it was record in this test report.

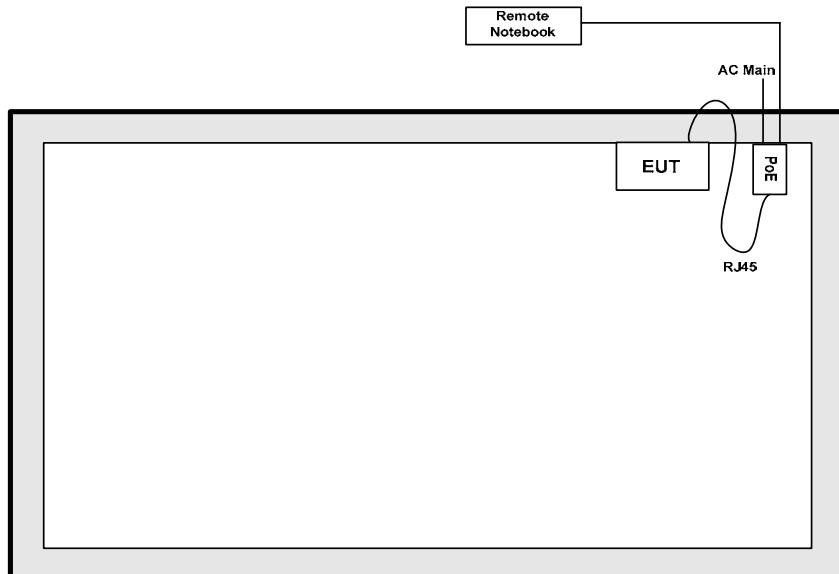
The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Peak Power Spectral Density, Emission Bandwidth, Transmitter Conducted Unwanted Emissions Transmitter Conducted Bandedge Emissions
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT20, HT40, VHT20, VHT40, VHT80



The Worst Case Mode for Following Conformance Tests					
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions				
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 type="checkbox"/> EUT will be placed in fixed position. <input checked="" 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. EUT shall be performed three orthogonal planes.				
Operating Mode < 1GHz	Operating Mode Description				
1	Flash 8M: Adapter mode				
2	Flash 8M: PoE mode				
3	Flash 16M: Adapter mode				
4	Flash 16M: PoE mode				
5	Flash 8M: Adapter 2 mode				
6	Flash 16M: Adapter 2 mode				
For operating mode 2 is the worst case and it was record in this test report.					
Operating Mode > 1GHz	Adapter mode and transmit				
Modulation Mode	11a, HT20, HT40, VHT20, VHT40, VHT80				
Orthogonal Planes of EUT	<table><thead><tr><th>X Plane</th><th>Z Plane</th></tr></thead><tbody><tr><td></td><td></td></tr></tbody></table>	X Plane	Z Plane		
X Plane	Z Plane				
Worst Planes of EUT	V				

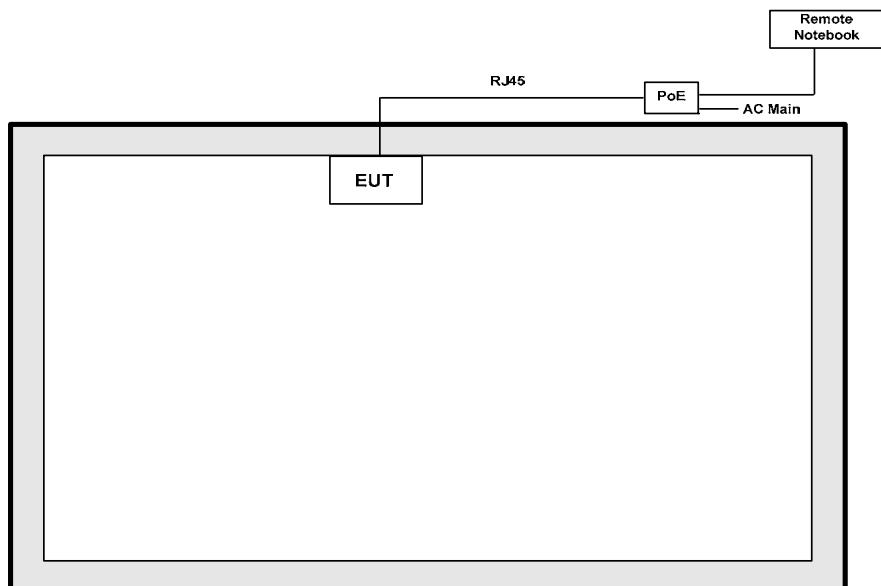
2.4 Test Setup Diagram

Test Setup Diagram - AC Line Conducted Emission Test – Mode 4

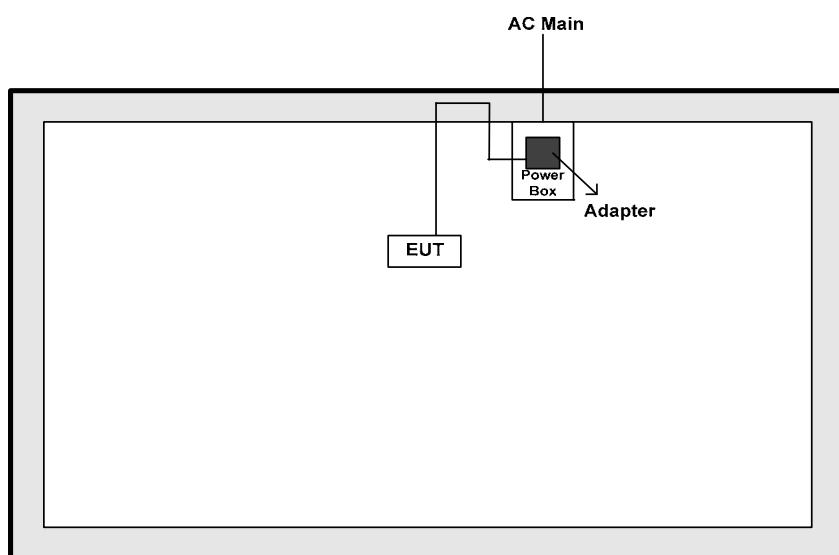




Test Setup Diagram - Radiated Test (Below 1GHz) – Mode 2



Test Setup Diagram - Radiated Test (Above 1GHz)- Mode 1



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

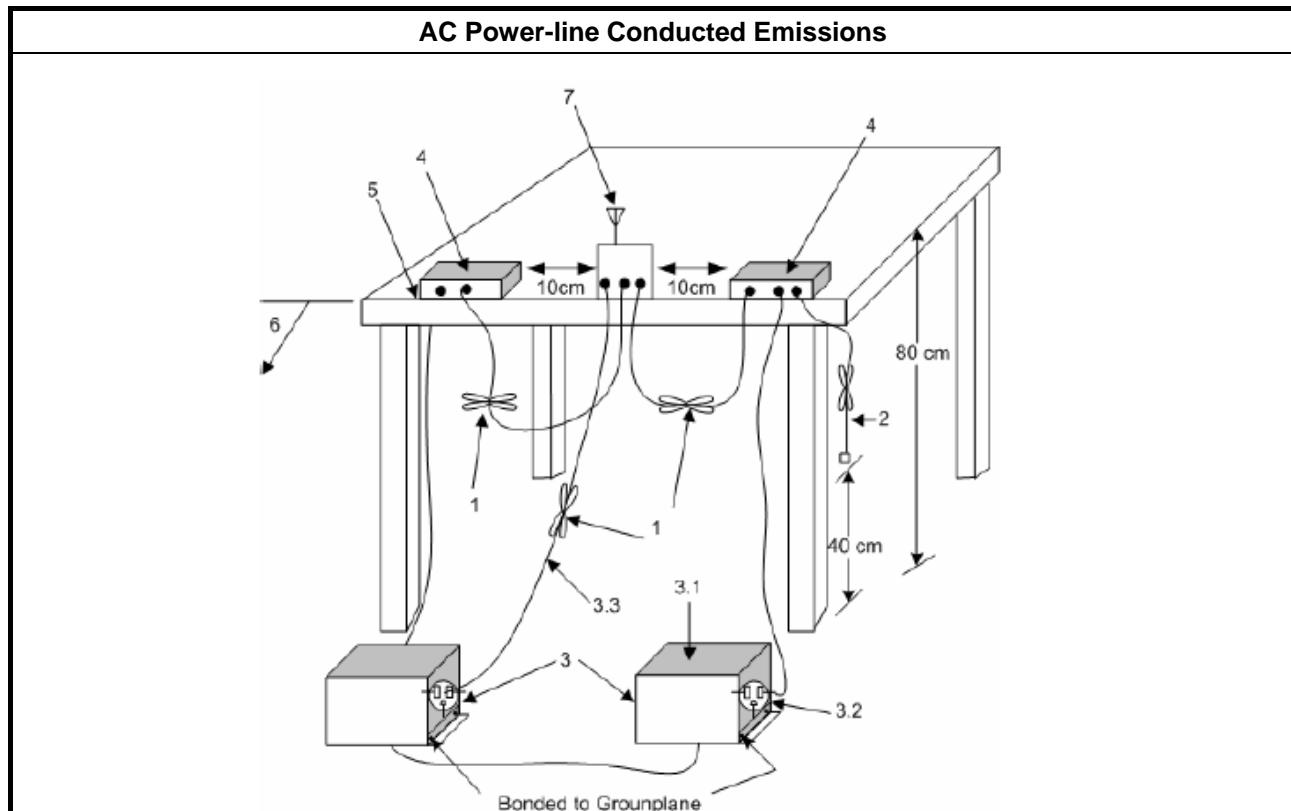
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

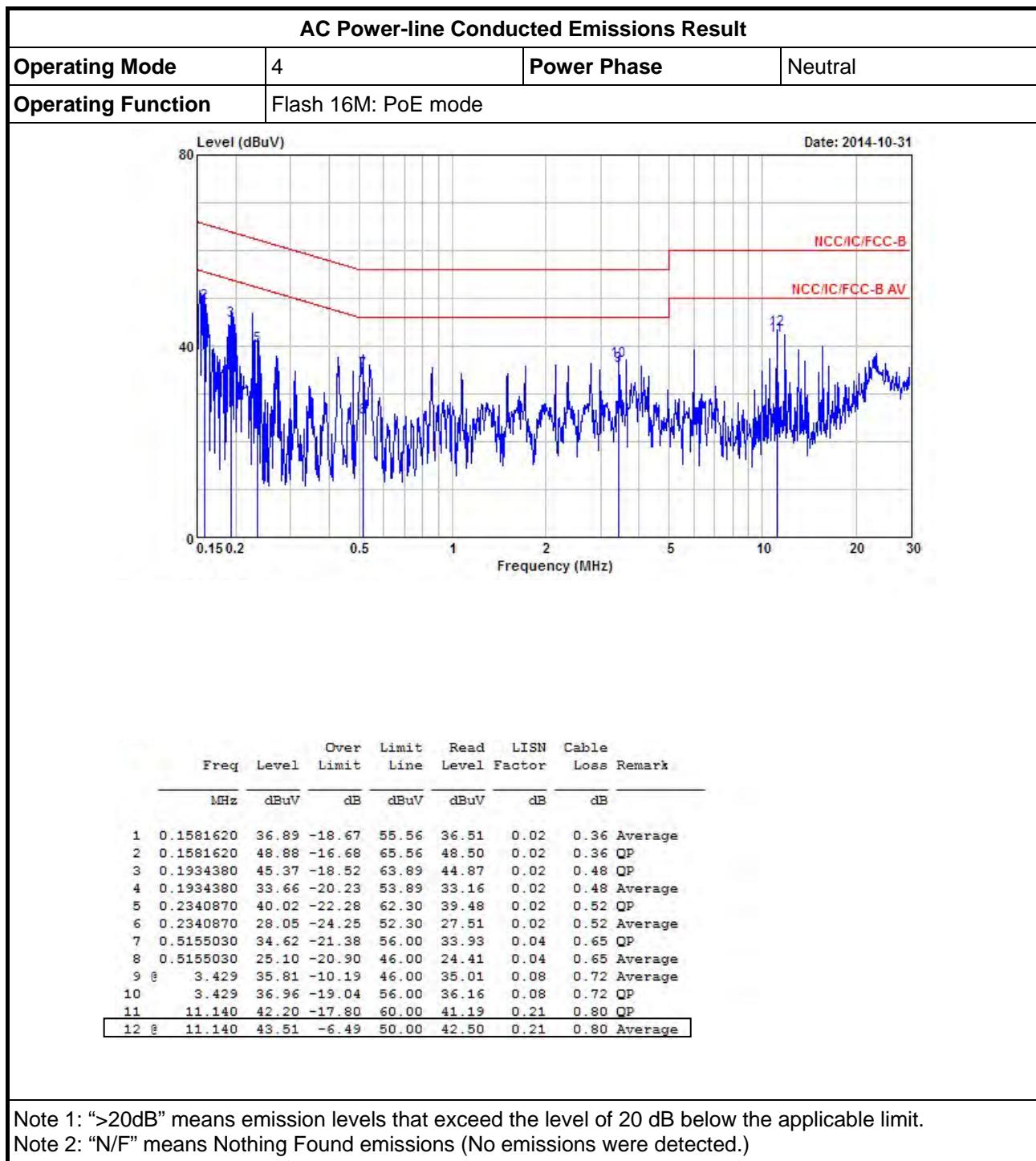
Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup





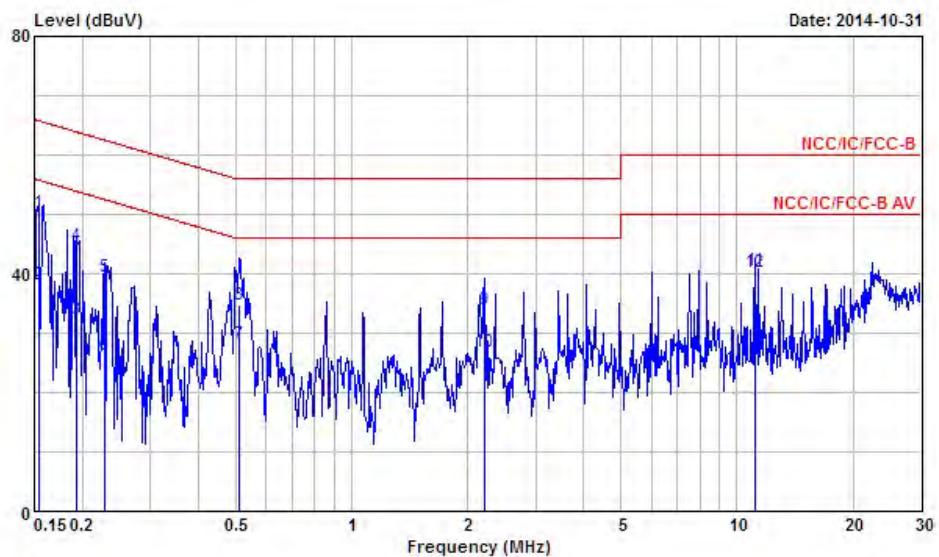
3.1.5 Test Result of AC Power-line Conducted Emissions





AC Power-line Conducted Emissions Result

Operating Mode	4	Power Phase	Line
Operating Function	Flash 16M: PoE mode		



Freq	Level	Over	Limit	Read	LISN	Cable
		Limit	Line	Level	Factor	Loss Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB
0.1540270	50.29	-15.49	65.78	49.91	0.03	0.35 QP
0.1540270	38.25	-17.53	55.78	37.87	0.03	0.35 Average
0.1924150	32.36	-21.57	53.93	31.85	0.03	0.48 Average
0.1924150	44.85	-19.08	63.93	44.34	0.03	0.48 QP
0.2291780	39.46	-23.02	62.48	38.91	0.03	0.52 QP
0.2291780	26.37	-26.11	52.48	25.82	0.03	0.52 Average
0.5100690	28.05	-17.95	46.00	27.36	0.04	0.65 Average
0.5100690	34.72	-21.28	56.00	34.03	0.04	0.65 QP
2.210	33.98	-22.02	56.00	33.12	0.07	0.79 QP
2.210	26.85	-19.15	46.00	25.99	0.07	0.79 Average
11.147	40.44	-19.56	60.00	39.43	0.21	0.80 QP
11.147	40.37	-9.63	50.00	39.36	0.21	0.80 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.)

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
<input type="checkbox"/>	For the 5.15-5.25 GHz band, N/A
<input checked="" type="checkbox"/>	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
<input checked="" type="checkbox"/>	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
<input type="checkbox"/>	For the 5.725-5.85 GHz band, 6 dB emission bandwidth \geq 500kHz.

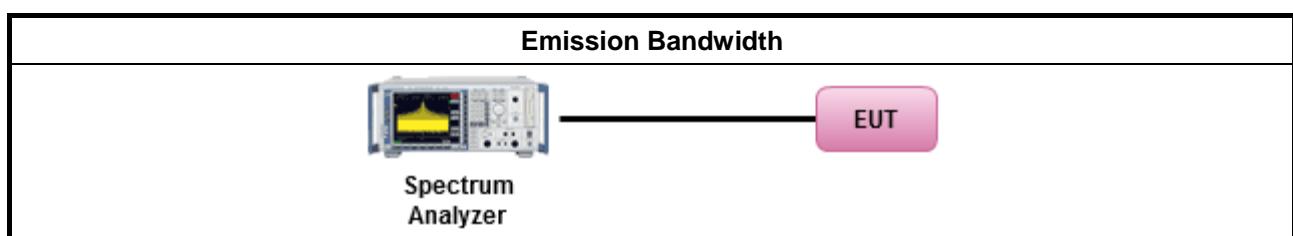
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	For the emission bandwidth shall be measured using one of the options below:
	<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause C for EBW and clause D for OBW measurement.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
	<input type="checkbox"/> Refer as IC RSS-Gen, clause 6.6 for 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 port 1.
	<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
	<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below:
	<input checked="" type="checkbox"/> Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.
	<input type="checkbox"/> Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

3.2.4 Test Setup

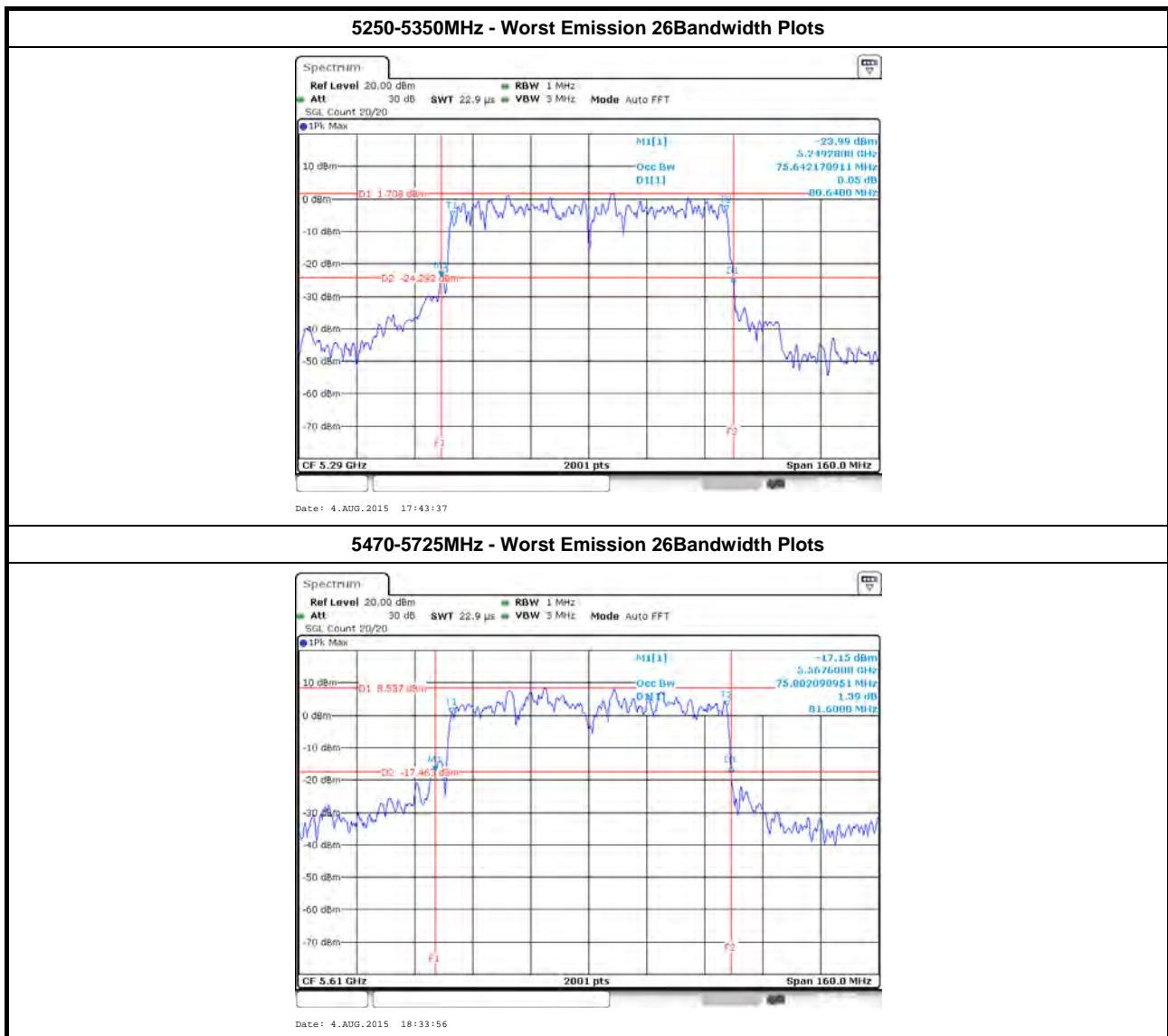




3.2.5 Test Result of Emission Bandwidth

UNII Emission Bandwidth Result (5250-5350MHz band)						
Condition			Emission Bandwidth (MHz)			
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth		26dB Bandwidth	
			Chain- Port 1	Chain- Port 2	Chain- Port 1	Chain- Port 2
11a	1	5260	16.56	-	21.82	-
11a	1	5300	16.36	-	21.25	-
11a	1	5320	16.99	-	21.72	-
HT20	2	5260	17.64	17.49	20.95	19.57
HT20	2	5300	17.56	17.71	20.50	21.27
HT20	2	5320	17.99	17.94	21.10	21.65
HT40	2	5270	36.50	36.30	40.32	39.52
HT40	2	5310	36.46	36.86	39.20	42.12
VHT20	2	5260	17.59	17.69	19.95	20.15
VHT20	2	5300	17.71	17.99	20.75	21.17
VHT20	2	5320	17.61	17.56	20.82	19.50
VHT40	2	5270	36.70	36.34	42.08	40.32
VHT40	2	5310	36.18	36.34	39.64	39.08
VHT80	2	5290	75.64	75.56	80.64	78.24
Result			Complied			

UNII Emission Bandwidth Result (5470-5725MHz band)						
Condition			Emission Bandwidth (MHz)			
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth		26dB Bandwidth	
			Chain- Port 1	Chain- Port 2	Chain- Port 1	Chain- Port 2
11a	1	5500	16.49	-	20.30	-
11a	1	5580	16.54	-	21.07	-
11a	1	5700	16.51	-	20.17	-
HT20	2	5500	17.89	17.66	21.45	20.35
HT20	2	5580	17.79	17.76	21.30	20.35
HT20	2	5700	17.69	17.84	20.10	20.90
HT40	2	5510	36.50	36.46	41.40	40.88
HT40	2	5550	36.58	36.50	41.40	41.04
HT40	2	5670	36.42	36.46	40.16	42.16
VHT20	2	5500	17.84	17.66	21.57	20.50
VHT20	2	5580	17.66	17.84	20.32	21.50
VHT20	2	5700	17.84	17.86	21.10	21.17
VHT40	2	5510	36.70	36.30	40.76	40.76
VHT40	2	5550	36.62	36.54	41.24	41.40
VHT40	2	5670	36.38	36.66	40.80	41.56
VHT80	2	5530	75.64	75.72	79.04	80.08
VHT80	2	5610	75.80	75.80	81.60	80.56
Result			Complied			





3.3 RF Output Power

3.3.1 RF Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
<input type="checkbox"/> For the 5.15-5.25 GHz band:	
<input type="checkbox"/> Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125 mW [21 dBm]	
<input type="checkbox"/> Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$	
<input type="checkbox"/> Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$.	
<input type="checkbox"/> Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + $10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + $10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input type="checkbox"/> For the 5.725-5.85 GHz band:	
<input type="checkbox"/> Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.	
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

3.3.2 Measuring Instruments

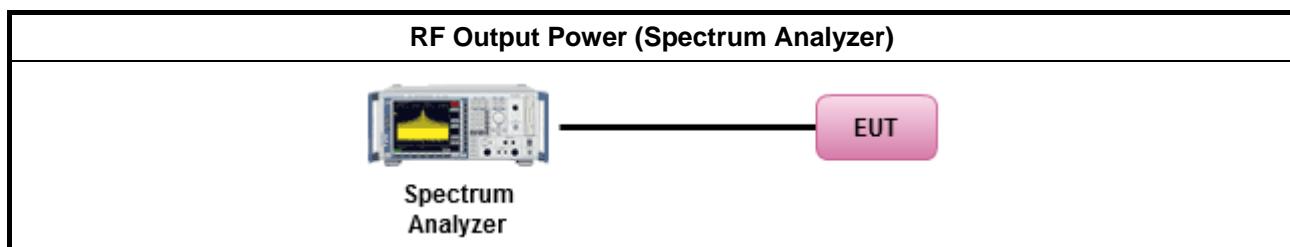
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/> Maximum Conducted Output Power	
[duty cycle \geq 98% or external video / power trigger]	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
duty cycle $<$ 98% and average over on/off periods with duty factor	
<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)	
Wideband RF power meter and average over on/off periods with duty factor	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method PM (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 port 1.	
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.	
<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
<input checked="" type="checkbox"/> If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

Note: The value have added the factor of clause 1.1.4 table.

3.3.4 Test Setup





3.3.5 Test Result of Maximum Conducted Output Power

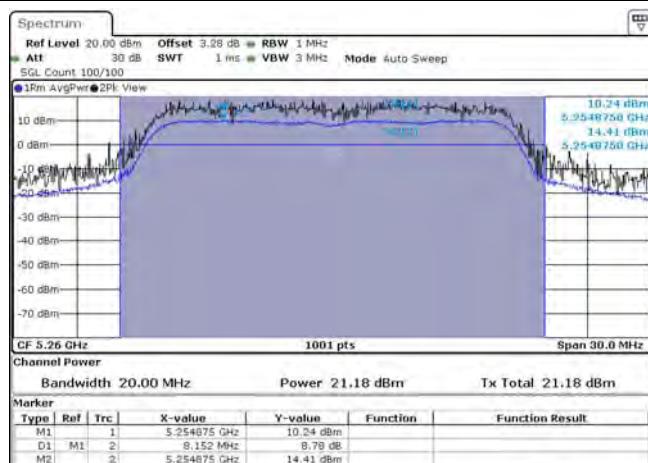
Maximum Conducted Output Power (5250-5350MHz band)							
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power (dBm)			Antenna Gain (dBi)	Power Limit
			Chain Port 1	Chain Port 2	Sum Chain		
11a	1	5260	21.76	-	21.76	4.00	24.00
11a	1	5300	21.73	-	21.73	4.00	24.00
11a	1	5320	19.15	-	19.15	4.00	24.00
HT20	2	5260	17.16	18.79	21.06	3.73	23.92
HT20	2	5300	17.13	18.49	20.87	3.73	24.00
HT20	2	5320	16.11	17.03	19.60	3.73	24.00
HT40	2	5270	18.39	19.81	22.17	3.73	24.00
HT40	2	5310	10.16	11.21	13.73	3.73	24.00
VHT20	2	5260	17.37	18.96	21.25	3.73	24.00
VHT20	2	5300	17.28	18.50	20.94	3.73	24.00
VHT20	2	5320	16.12	17.03	19.61	3.73	23.90
VHT40	2	5270	18.35	19.75	22.12	3.73	24.00
VHT40	2	5310	10.23	11.14	13.72	3.73	24.00
VHT80	2	5290	12.60	13.83	16.27	3.73	24.00
Result			Complied				



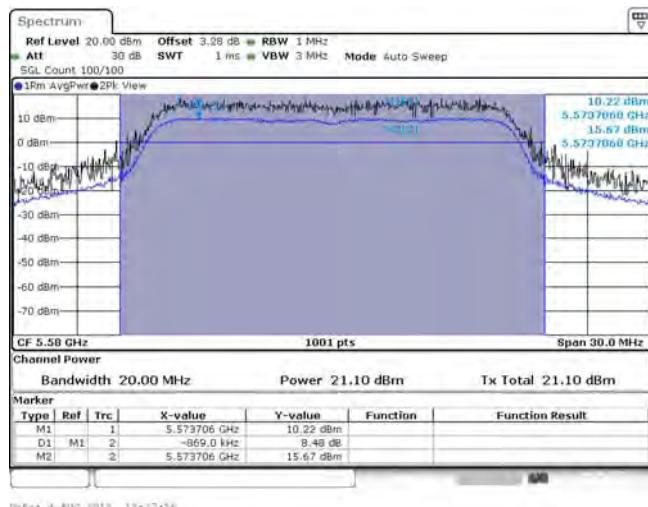
Maximum Conducted Output Power (5470-5725MHz band)							
Modulation Mode	N _{TX}	Freq. (MHz)	Output Power (dBm)			Antenna Gain (dBi)	Power Limit
			Chain Port 1	Chain Port 2	Sum Chain		
11a	1	5500	19.97	-	19.97	4.00	24.00
11a	1	5580	21.68	-	21.68	4.00	24.00
11a	1	5700	18.78	-	18.78	4.00	24.00
HT20	2	5500	16.81	17.59	20.23	3.73	24.00
HT20	2	5580	17.62	18.58	21.14	3.73	24.00
HT20	2	5700	13.07	14.17	16.67	3.73	24.00
HT40	2	5510	14.15	14.95	17.58	3.73	24.00
HT40	2	5550	20.34	20.87	23.63	3.73	24.00
HT40	2	5670	17.38	17.86	20.64	3.73	24.00
VHT20	2	5500	16.72	17.56	20.17	3.73	24.00
VHT20	2	5580	17.56	18.48	21.05	3.73	24.00
VHT20	2	5700	12.98	14.12	16.60	3.73	24.00
VHT40	2	5510	14.03	14.84	17.47	3.73	24.00
VHT40	2	5550	20.38	20.93	23.68	3.73	24.00
VHT40	2	5670	17.45	17.79	20.64	3.73	24.00
VHT80	2	5530	13.47	14.56	17.06	3.73	24.00
VHT80	2	5610	18.64	18.95	21.81	3.73	24.00
Result			Complied				



5250-5350MHz - Worst RF Output Power Plots



5470-5725MHz - Worst RF Output Power Plots



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



3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
<input type="checkbox"/> For the 5.15-5.25 GHz band:	
<input type="checkbox"/> Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.	
<input type="checkbox"/> Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$.	
<input type="checkbox"/> Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input type="checkbox"/> For the 5.725-5.85 GHz band:	
<input type="checkbox"/> Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$.	
<input type="checkbox"/> Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.	
PPSD = peak power spectral density that the same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

Note: The value have added the factor of clause 1.1.4 table.

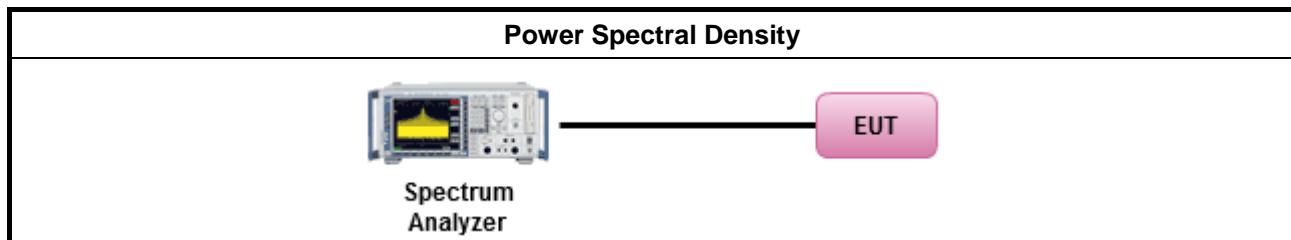
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/> Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, F5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth [duty cycle \geq 98% or external video / power trigger]	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
duty cycle $<$ 98% and average over on/off periods with duty factor	
<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging).	
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with 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 port 1.	
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.	
<input checked="" type="checkbox"/> The EUT supports multiple transmit chains using options given below:	
<input type="checkbox"/> Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
<input checked="" type="checkbox"/> Option 2: Measure and add $10 \log(N)$ dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with $10 \log(N)$. Or each transmit chains shall be add $10 \log(N)$ to compared with the limit.	
<input type="checkbox"/> If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$	
<input type="checkbox"/> Each individually PPSD plots refer as test report clause 3.3.5 with each individually PPSD plots.	

3.4.4 Test Setup





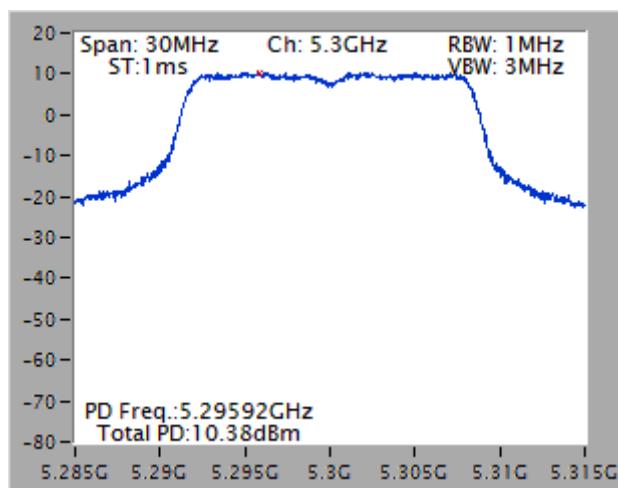
3.4.5 Test Result of Peak Power Spectral Density

Peak Power Spectral Density Result (5250-5350MHz band)					
Modulation Mode	N _{TX}	Freq. (MHz)	Peak Power Spectral Density (dBm)	PSD Limit	Antenna Gain (dBi)
11a	1	5260	10.82	11.00	4.00
11a	1	5300	10.96	11.00	4.00
11a	1	5320	8.52	11.00	4.00
HT20	2	5260	10.01	10.26	6.74
HT20	2	5300	9.61	10.26	6.74
HT20	2	5320	8.53	10.26	6.74
HT40	2	5270	8.20	10.26	6.74
HT40	2	5310	-0.38	10.26	6.74
VHT20	2	5260	10.16	10.26	6.74
VHT20	2	5300	9.81	10.26	6.74
VHT20	2	5320	8.52	10.26	6.74
VHT40	2	5270	8.07	10.26	6.74
VHT40	2	5310	-0.41	10.26	6.74
VHT80	2	5290	0.01	10.26	6.74
Result		Complied			

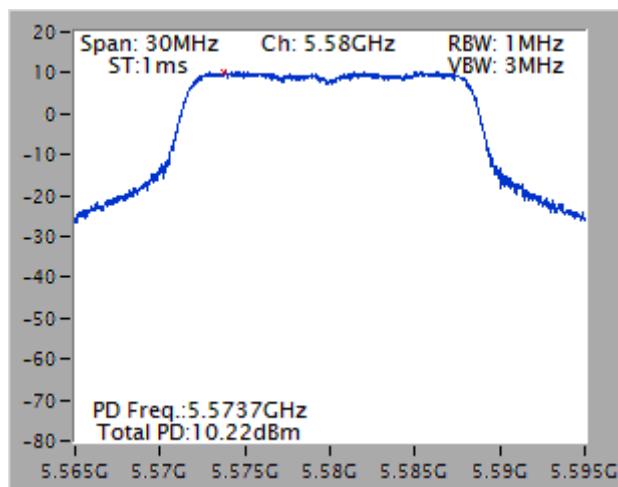


Peak Power Spectral Density Result (5470-5725MHz band)					
Modulation Mode	N _{TX}	Freq. (MHz)	Peak Power Spectral Density (dBm)	PSD Limit	Antenna Gain (dBi)
11a	1	5500	9.20	11.00	4.00
11a	1	5580	10.80	11.00	4.00
11a	1	5700	8.04	11.00	4.00
HT20	2	5500	8.95	10.26	6.74
HT20	2	5580	10.02	10.26	6.74
HT20	2	5700	5.27	10.26	6.74
HT40	2	5510	3.54	10.26	6.74
HT40	2	5550	9.50	10.26	6.74
HT40	2	5670	6.61	10.26	6.74
VHT20	2	5500	8.99	10.26	6.74
VHT20	2	5580	10.02	10.26	6.74
VHT20	2	5700	5.38	10.26	6.74
VHT40	2	5510	3.63	10.26	6.74
VHT40	2	5550	9.89	10.26	6.74
VHT40	2	5670	6.57	10.26	6.74
VHT80	2	5530	1.11	10.26	6.74
VHT80	2	5610	5.87	10.26	6.74
Result		Complied			

5250-5350MHz - Worst Power Spectral Density Plots



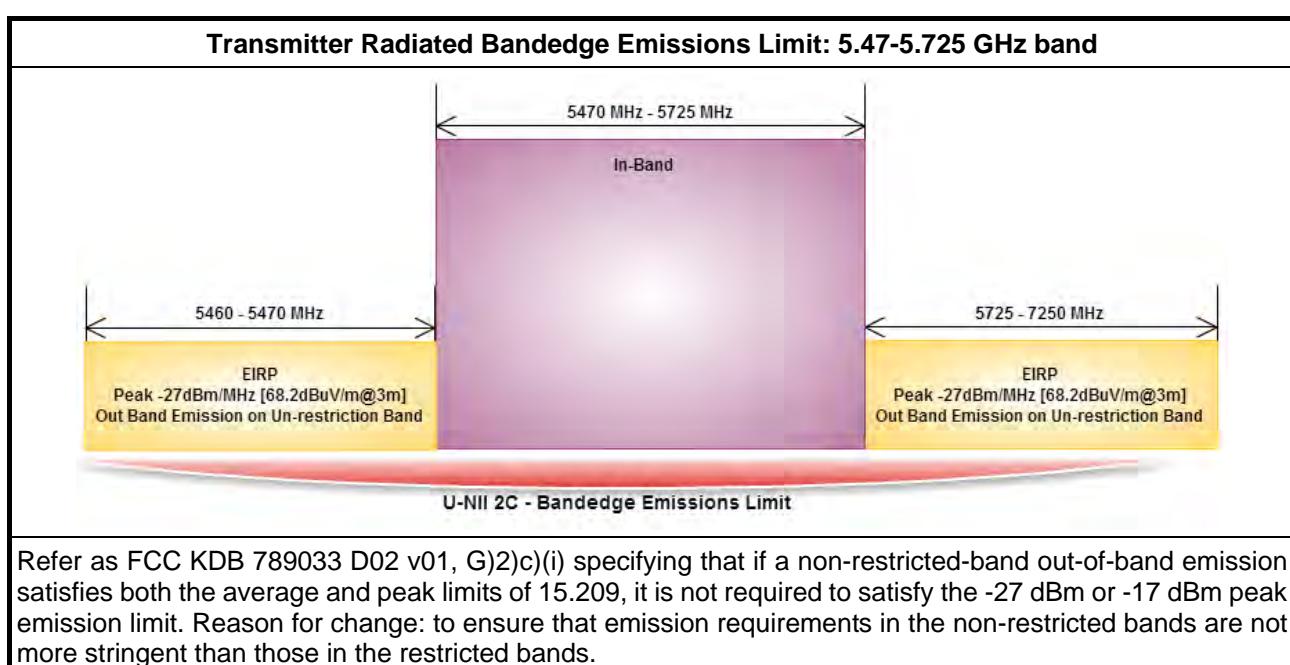
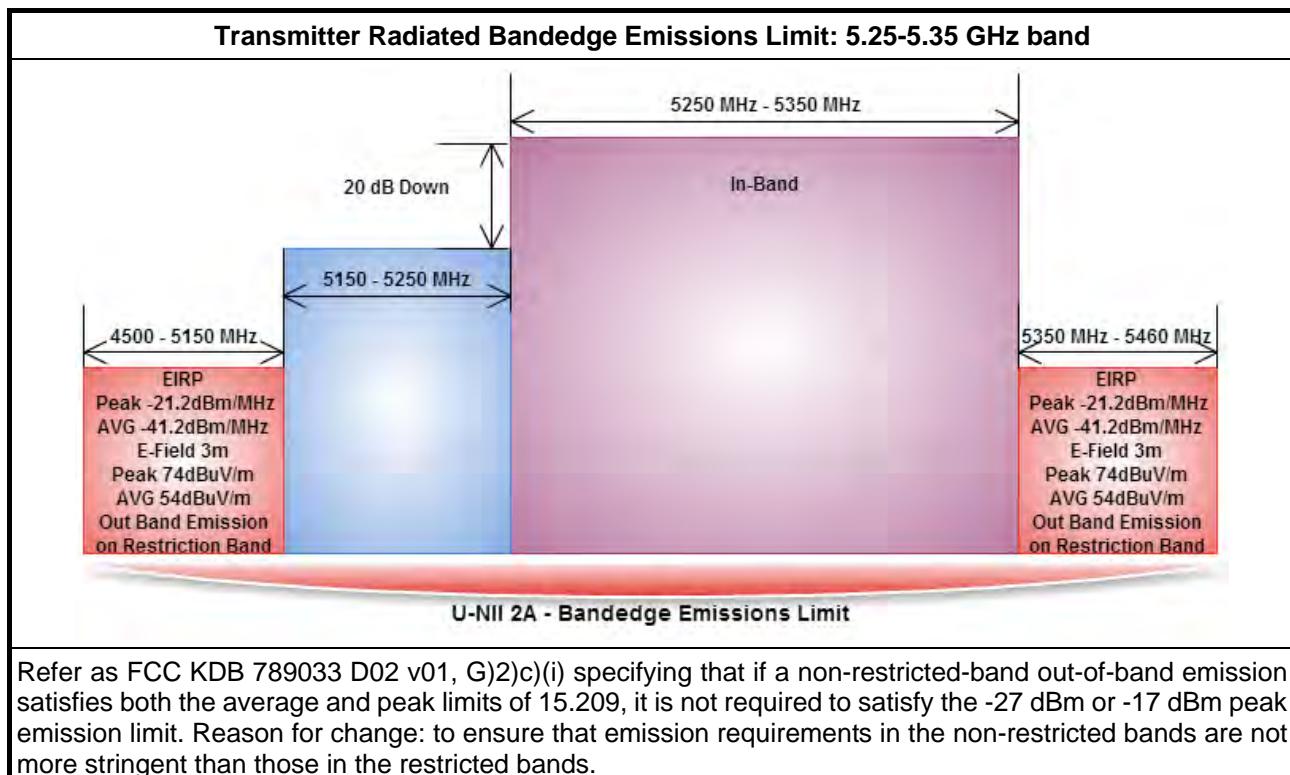
5470-5725MHz - Worst Power Spectral Density Plots



Note 1: RF Power Spectral Density Plots w/o Duty Factor

3.5 Transmitter Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



3.5.2 Measuring Instruments

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

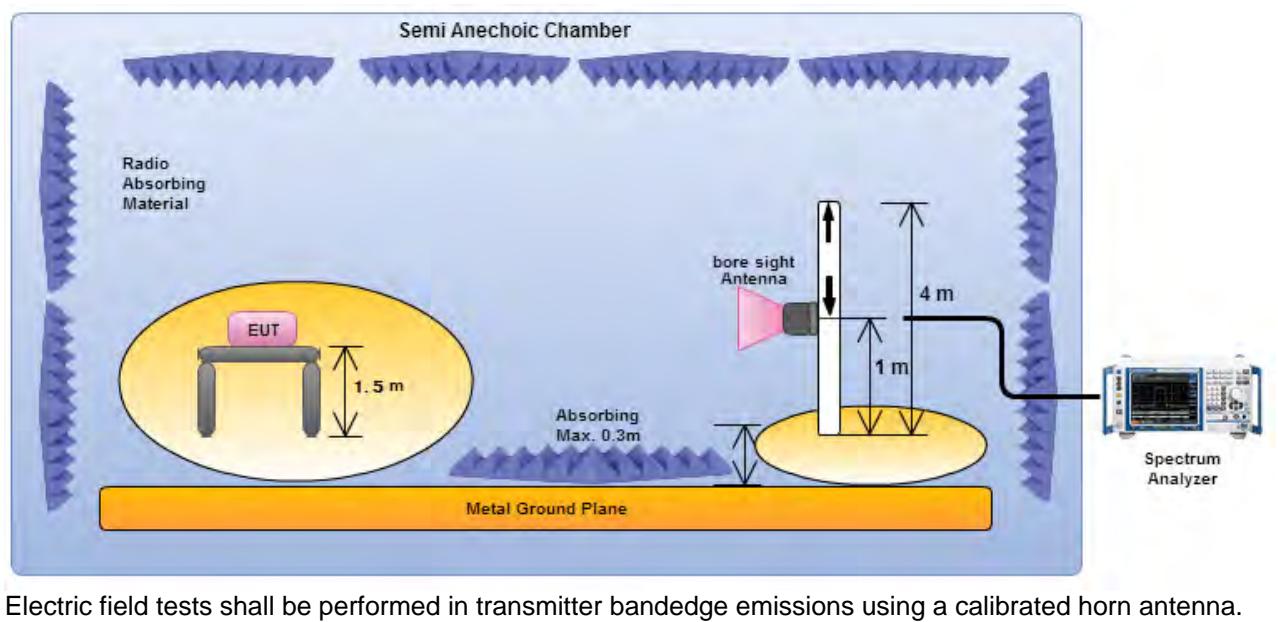


3.5.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.10 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input type="checkbox"/> If EUT operate in adjacent contiguous bands, bandedge testing performed at the lowest frequency channel at lower-band and highest frequency channel at higher-band. Transmitter in-band emissions will consist of adjacent contiguous bands (e.g., IEEE 802.11ac VHT160 The lowest frequency channel at lower-band and highest frequency channel at higher-band in-band emissions will consist of two adjacent contiguous bands.) <ul style="list-style-type: none"><input type="checkbox"/> Operating in 5.15-5.25 GHz band (lower-band) and 5.25-5.35 GHz band (higher-band).<input type="checkbox"/> Operating in 5.47-5.725 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
<input type="checkbox"/> If EUT operate in individual non-contiguous bands, bandedge testing performed at the lowest frequency channel and highest frequency channel within lower-band and higher-band. (e.g., (e.g., IEEE 802.11ac VHT160) <ul style="list-style-type: none"><input type="checkbox"/> Operating in 5.25-5.35 GHz band (lower-band) and 5.47-5.725 GHz band (higher-band).<input type="checkbox"/> Operating in 5.15-5.25 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
<input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below: <ul style="list-style-type: none"><input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause H)2) for unwanted emissions into non-restricted bands.<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause H)1) for unwanted emissions into restricted bands.<ul style="list-style-type: none"><input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, H)6) Method AD (Trace Averaging).<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, H)6) Method VB (Reduced VBW).<input checked="" 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 789033 D02 v01, clause H)5) measurement procedure peak limit.<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/> For the transmitter bandedge emissions shall be measured using following options below: <ul style="list-style-type: none"><input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause H)3)d) 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 6.10 for band-edge testing.<input 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 ANSI C63.10, clause 6.6. Test distance is 3m.
<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). Measurements in the bandedge are typically made at a closer distance 3m, because the instrumentation noise floor is typically close to the radiated emission limit.

3.5.4 Test Setup

Transmitter Radiated Bandedge Emissions



Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.



3.5.5 Transmitter Radiated Bandedge Emissions (with Antenna)

U-NII 5250-5350MHz Transmitter Radiated Bandedge (with Antenna)										
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.
11a	1	5260	3	5350.80	59.59	74	5131.80	48.90	54	V
11a	1	5320	3	5350.04	64.73	74	5350.46	52.94	54	V
HT20	2	5260	3	5359.20	60.26	74	5352.00	49.23	54	V
HT20	2	5320	3	5352.56	64.31	74	5350.60	52.37	54	V
HT40	2	5270	3	5351.40	63.67	74	5350.80	52.75	54	V
HT40	2	5310	3	5350.30	65.02	74	5350.12	52.52	54	V
VHT20	2	5260	3	5354.40	60.13	74	5367.60	49.12	54	V
VHT20	2	5320	3	5350.46	62.70	74	5350.18	52.14	54	V
VHT40	2	5270	3	5355.60	63.33	74	5350.20	52.48	54	V
VHT40	2	5310	3	5350.30	63.80	74	5350.30	52.43	54	V
VHT80	2	5290	3	5358.60	63.11	74	5358.00	52.75	54	V

Note 1: Measurement worst emissions of receive antenna polarization.

U-NII 5470-5725MHz Transmitter Radiated Bandedge (with Antenna)							
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Pol.
11a	1	5500	3	5459.92	65.76	74.0	V
11a	1	5700	3	5727.08	67.13	68.2	V
HT20	2	5500	3	5458.80	60.20	74.0	V
HT20	2	5700	3	5725.04	66.42	68.2	V
HT40	2	5510	3	5454.60	60.07	74.0	V
HT40	2	5670	3	5728.60	67.05	68.2	V
VHT20	2	5500	3	5454.64	60.01	74.0	V
VHT20	2	5700	3	5725.52	66.50	68.2	V
VHT40	2	5510	3	5458.40	59.38	74.0	V
VHT40	2	5670	3	5731.20	66.95	68.2	V
VHT80	2	5530	3	5431.28	63.72	74.0	V
VHT80	2	5610	3	5726.32	67.17	68.2	V

Note 1: Measurement worst emissions of receive antenna polarization.



3.6 Transmitter Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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 above 1GHz Limit	
Operating Band	Limit
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

Note 1: 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).

3.6.2 Measuring Instruments

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

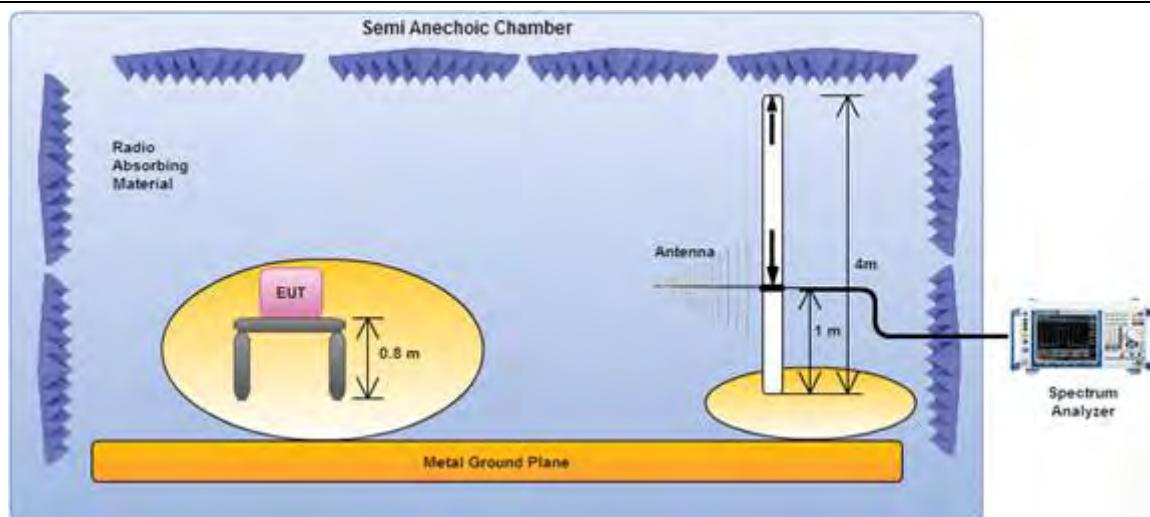


3.6.3 Test Procedures

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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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 789033 D02 v01, clause G2) for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause G1) for unwanted emissions into restricted bands.
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, G6) Method AD (Trace Averaging).
<input type="checkbox"/> Refer as FCC KDB 789033 D02 v01, G6) Method VB (Reduced VBW).
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/> Refer as FCC KDB 789033 D02 v01, clause G5) measurement procedure peak limit.
<input type="checkbox"/> Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/> For radiated measurement.
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.4 for radiated emissions 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 1GHz. For 1 GHz to 5 GHz, test distance is 3m; For 5 GHz to 40 GHz, 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 20 dB below the permissible value has no need to be reported.

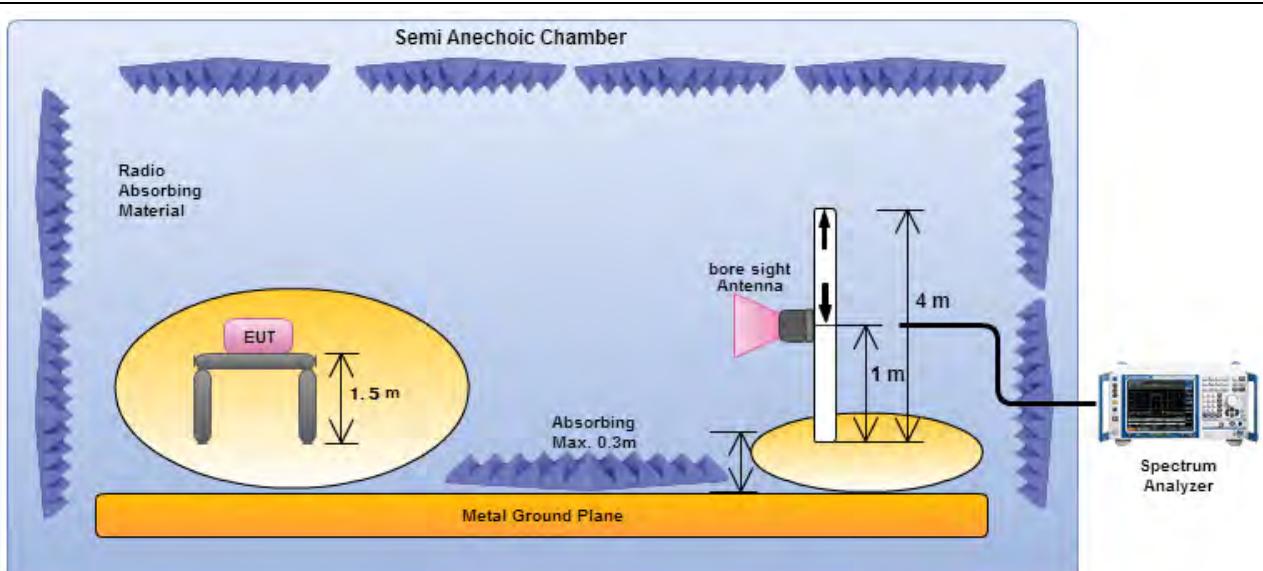
3.6.4 Test Setup

Transmitter Radiated Unwanted Emissions Below 1GHz



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.

Transmitter Radiated Unwanted Emissions Above 1GHz



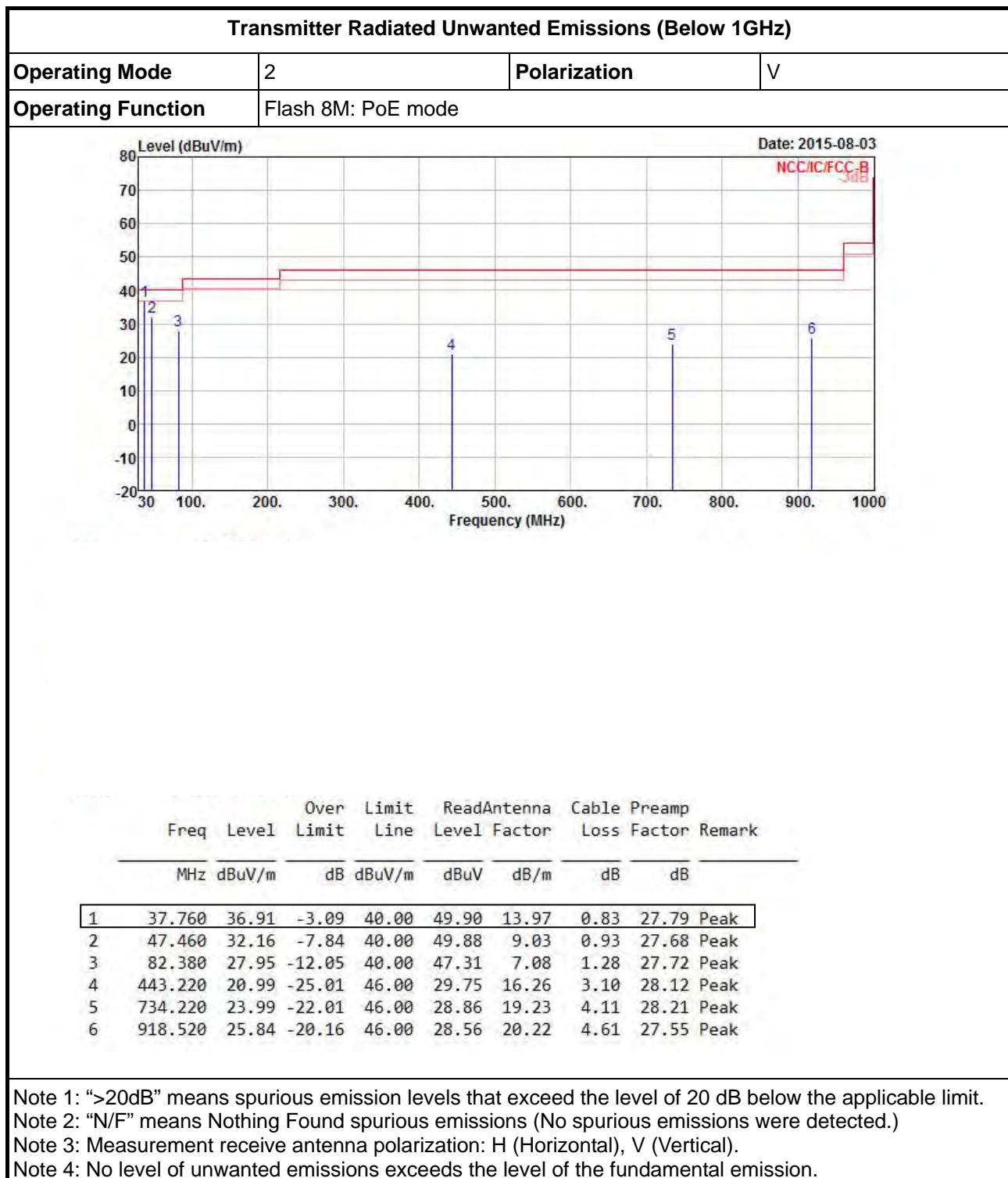
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

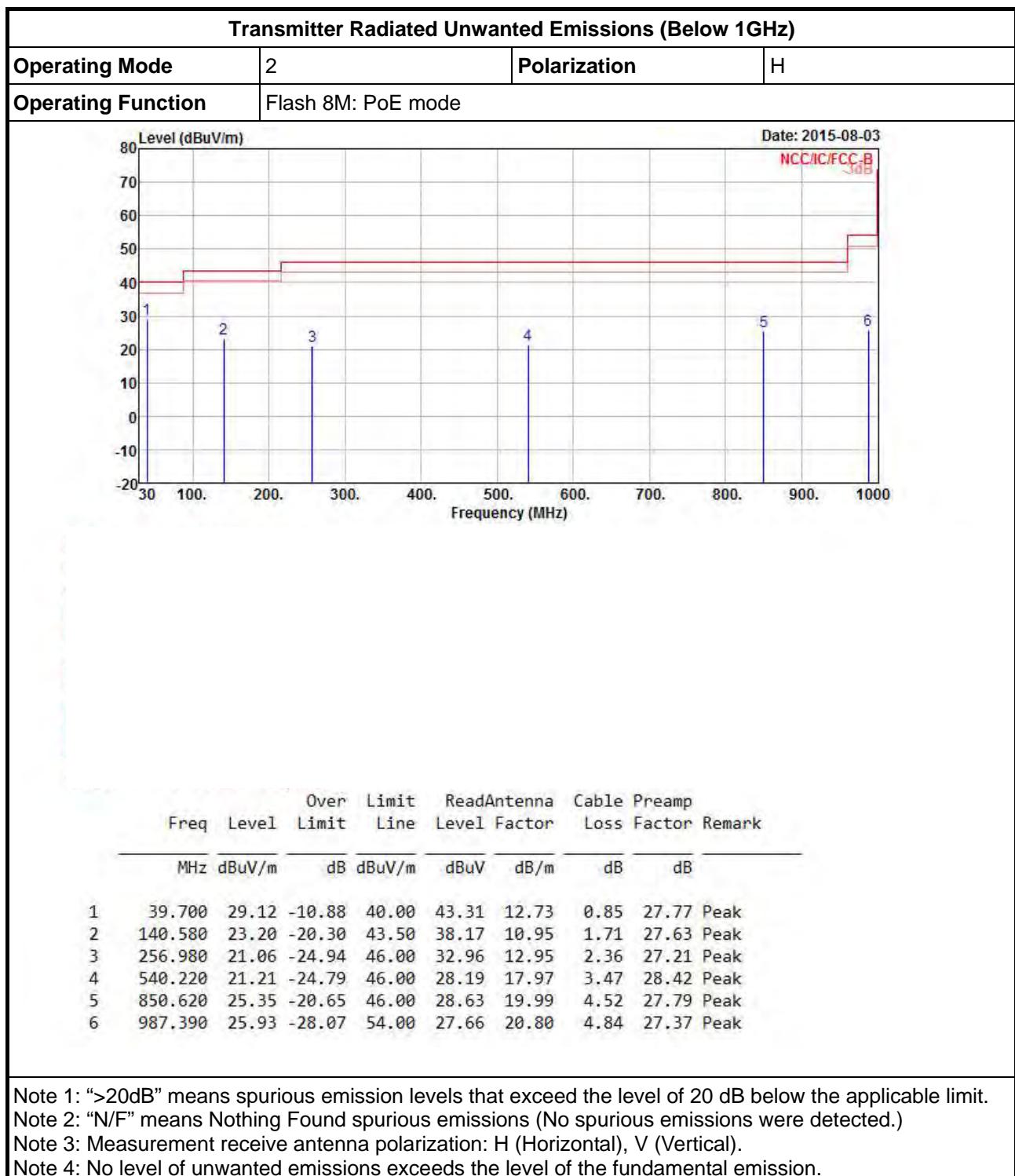
3.6.5 Transmitter Radiated Unwanted Emissions-with Antenna (Below 30MHz)

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



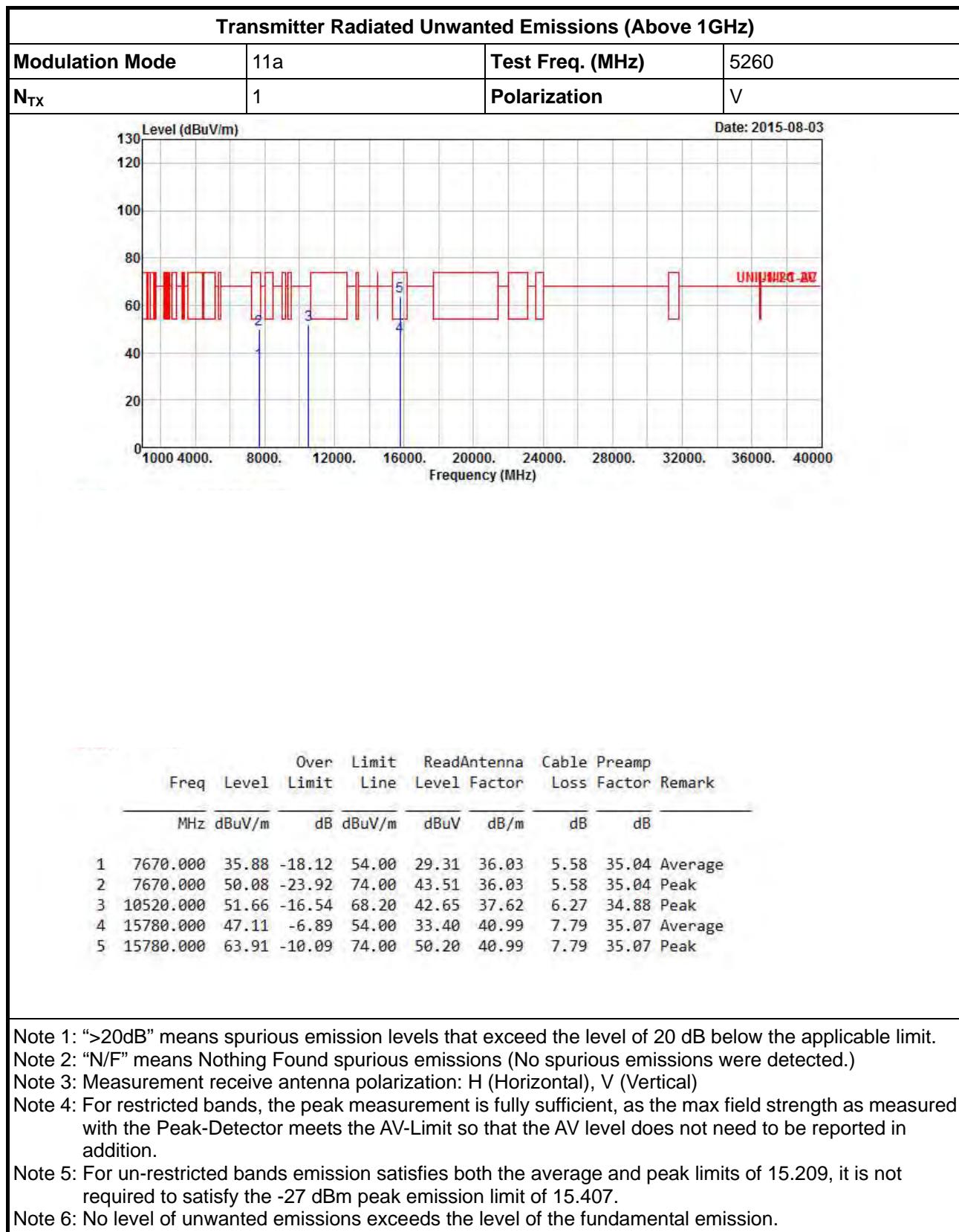
3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

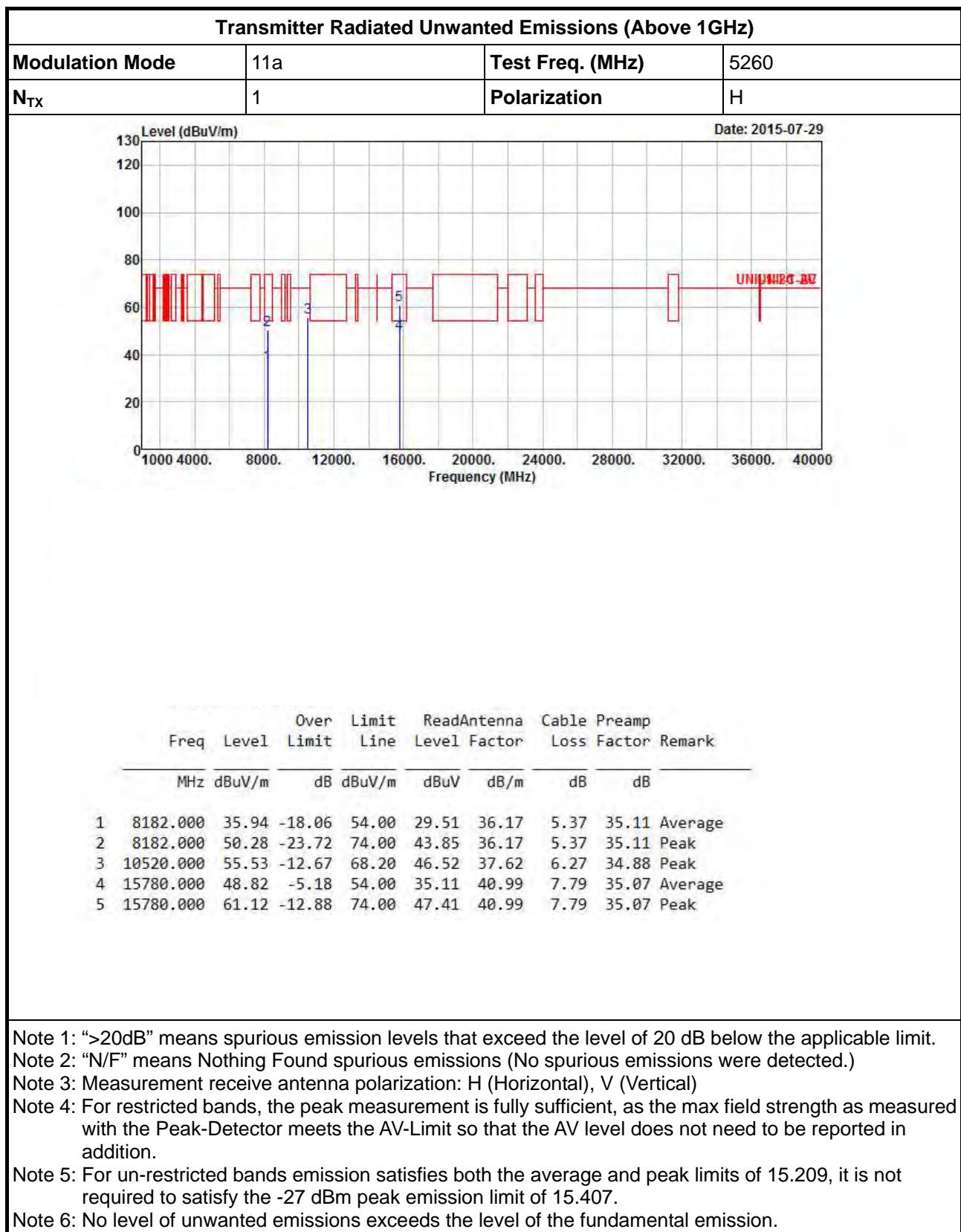


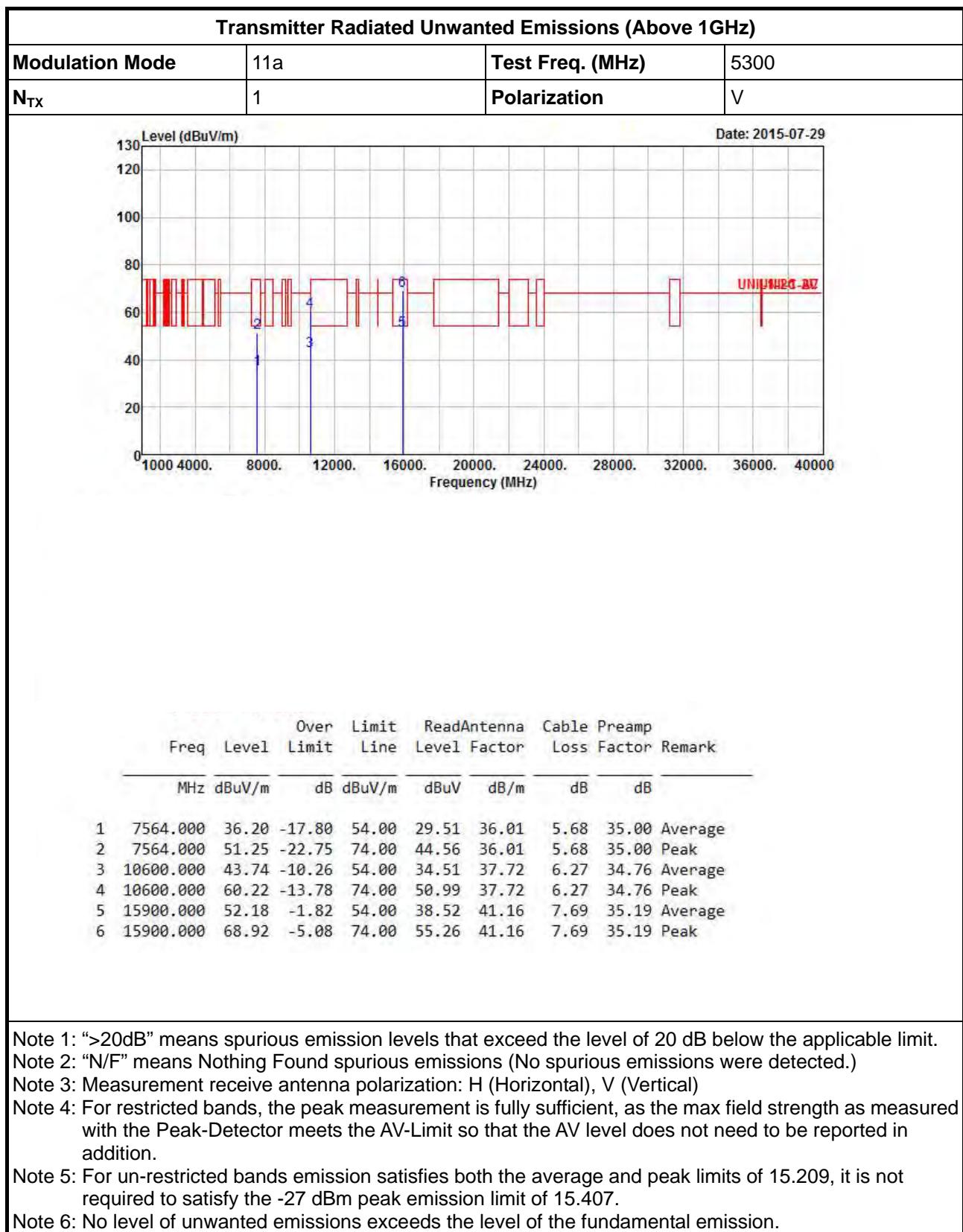


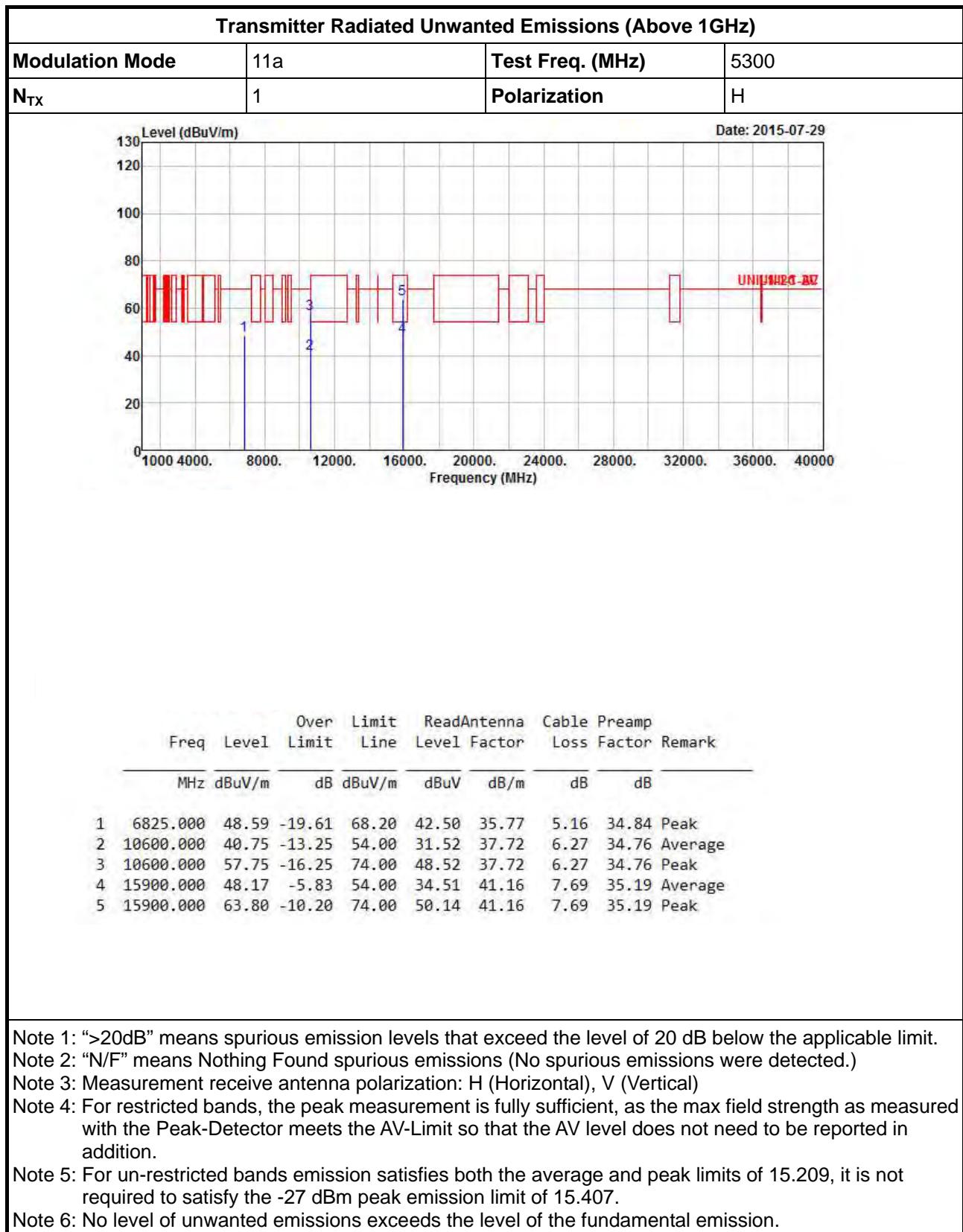


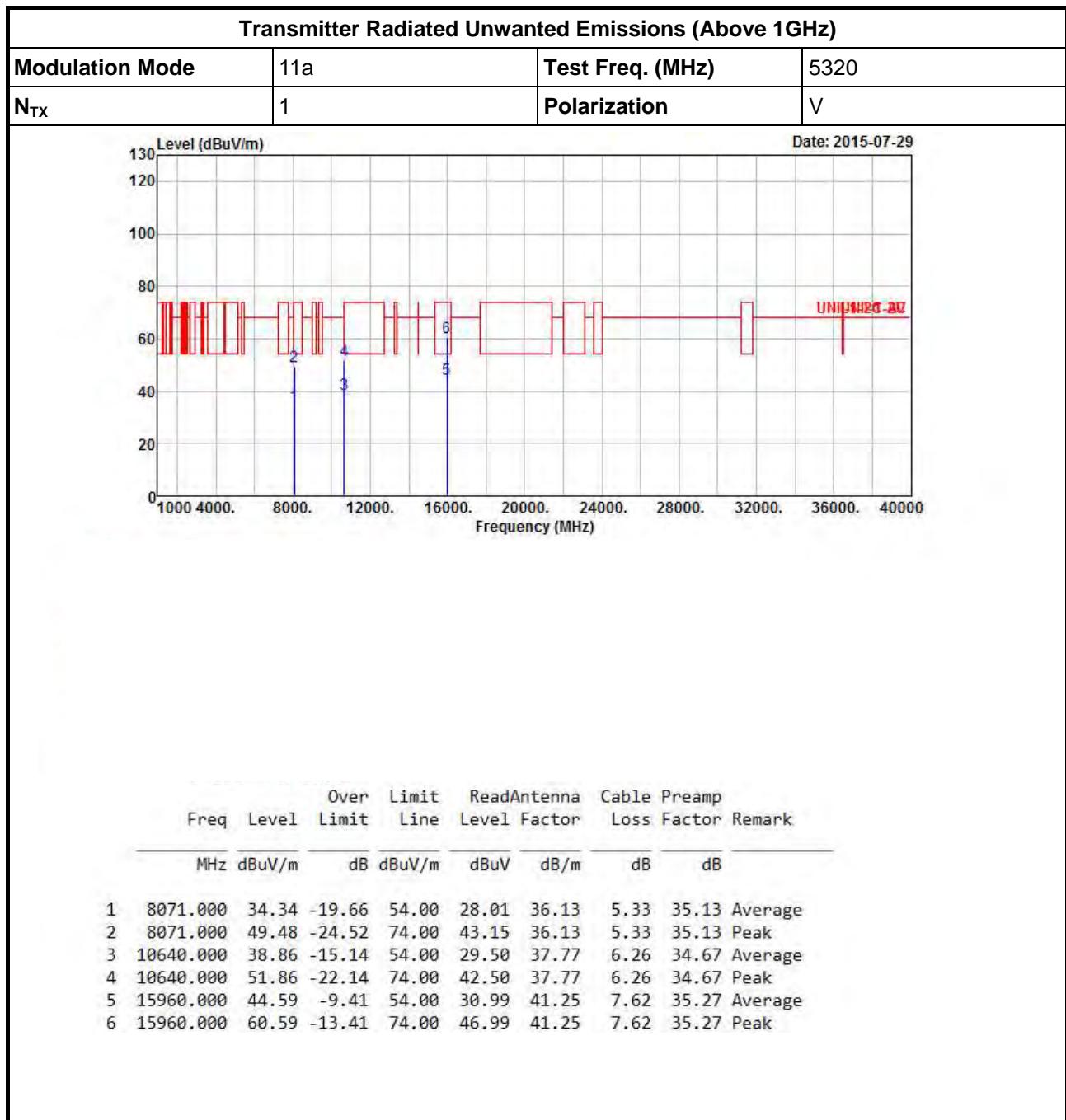
3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 5250-5350MHz











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

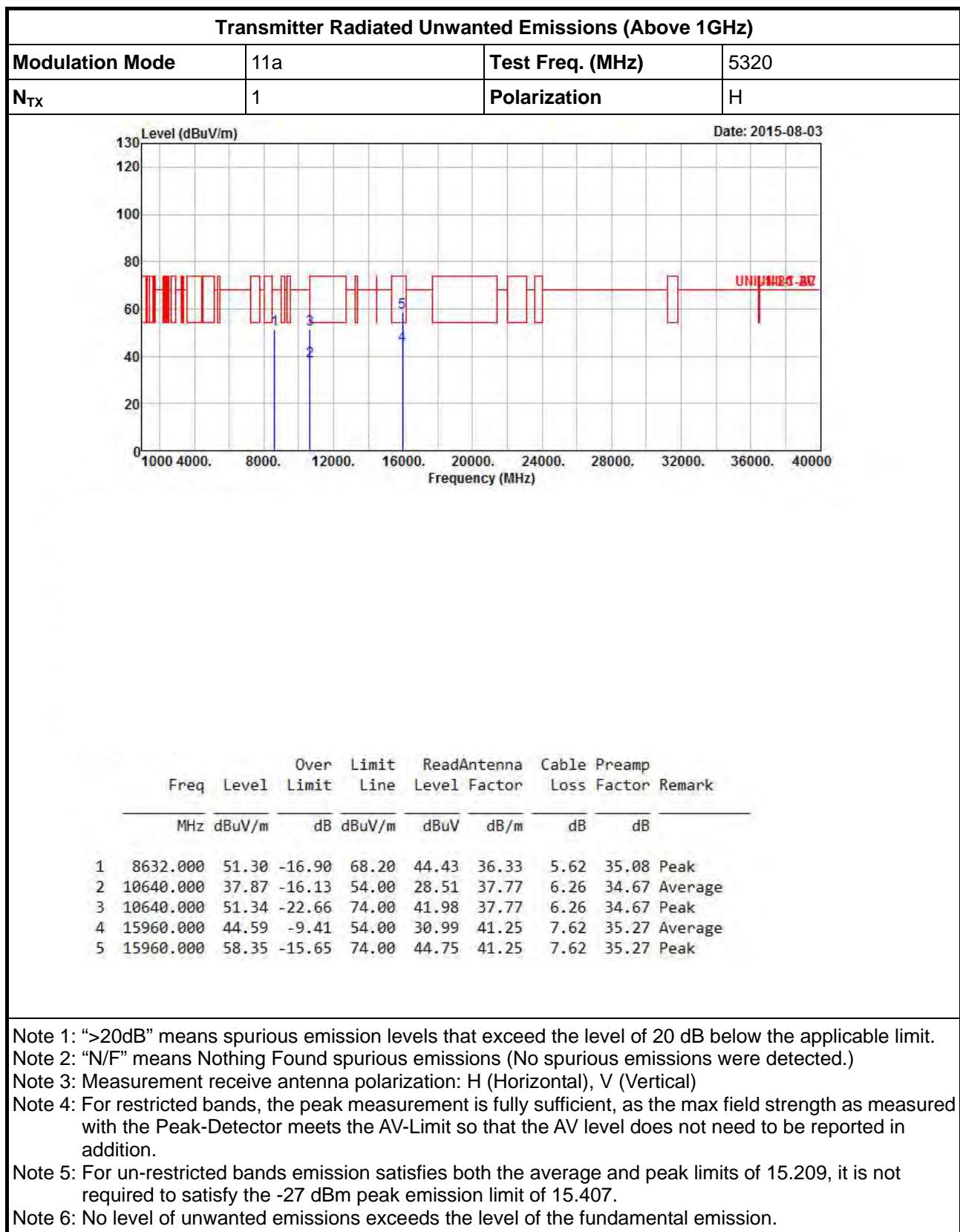
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

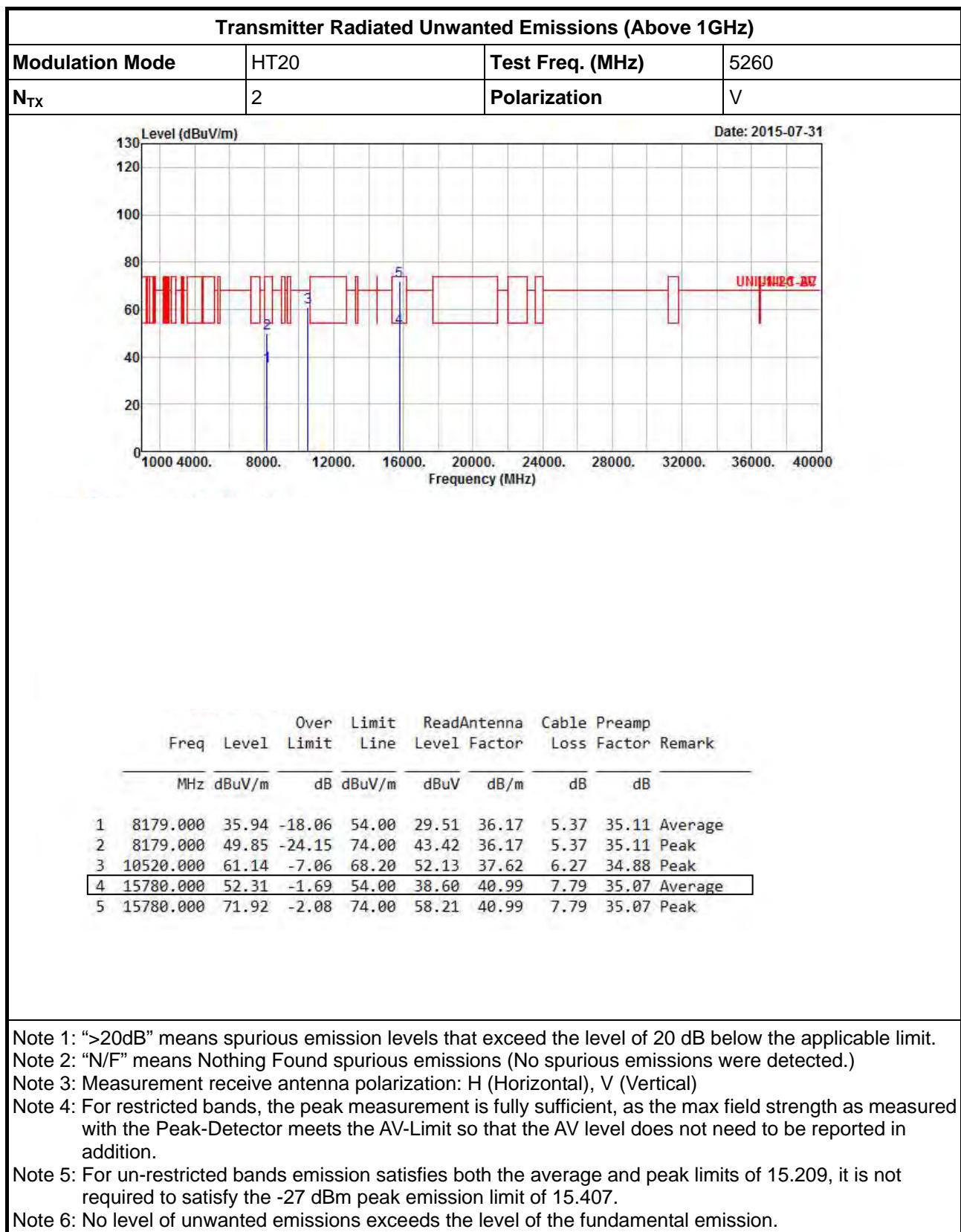
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

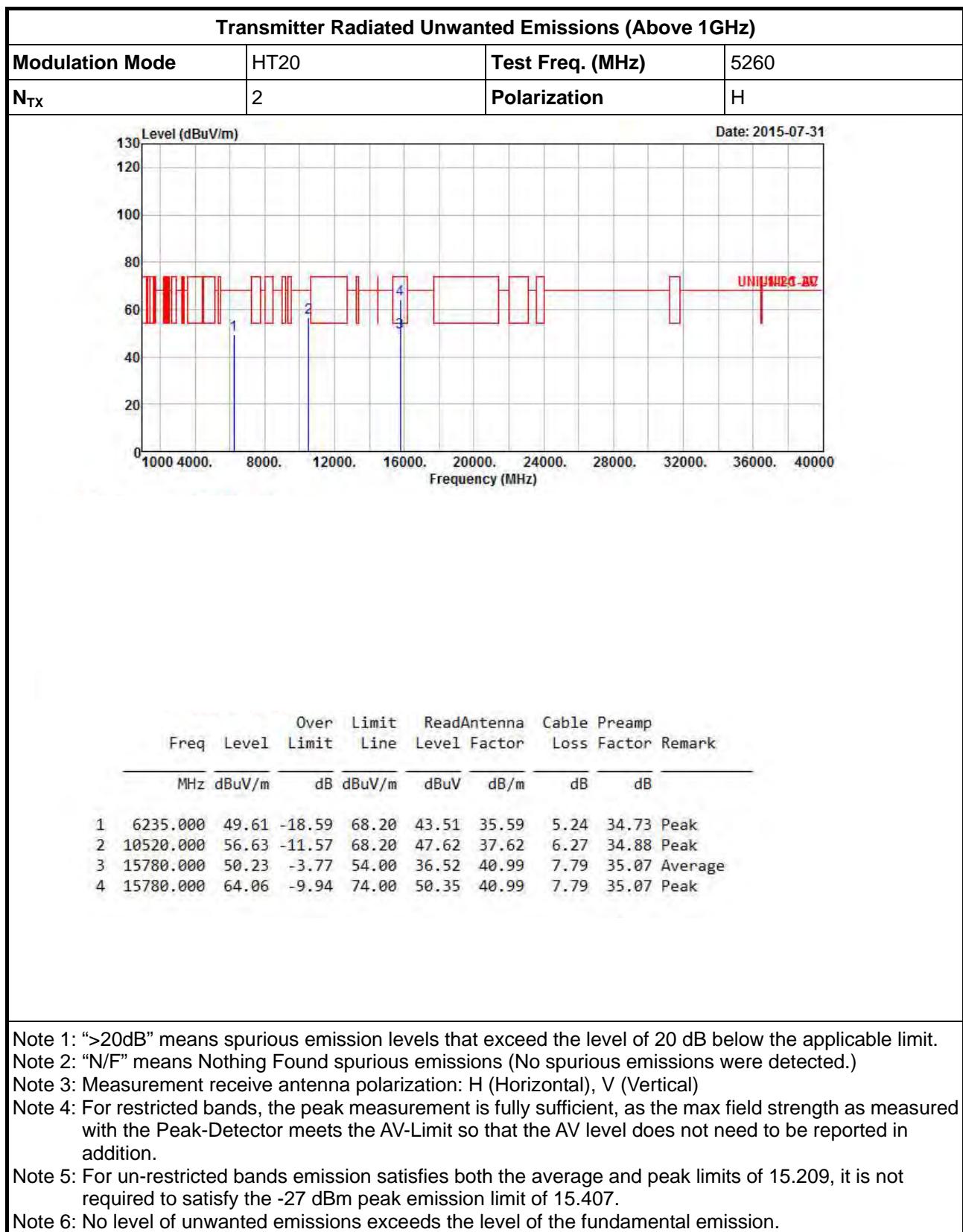
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

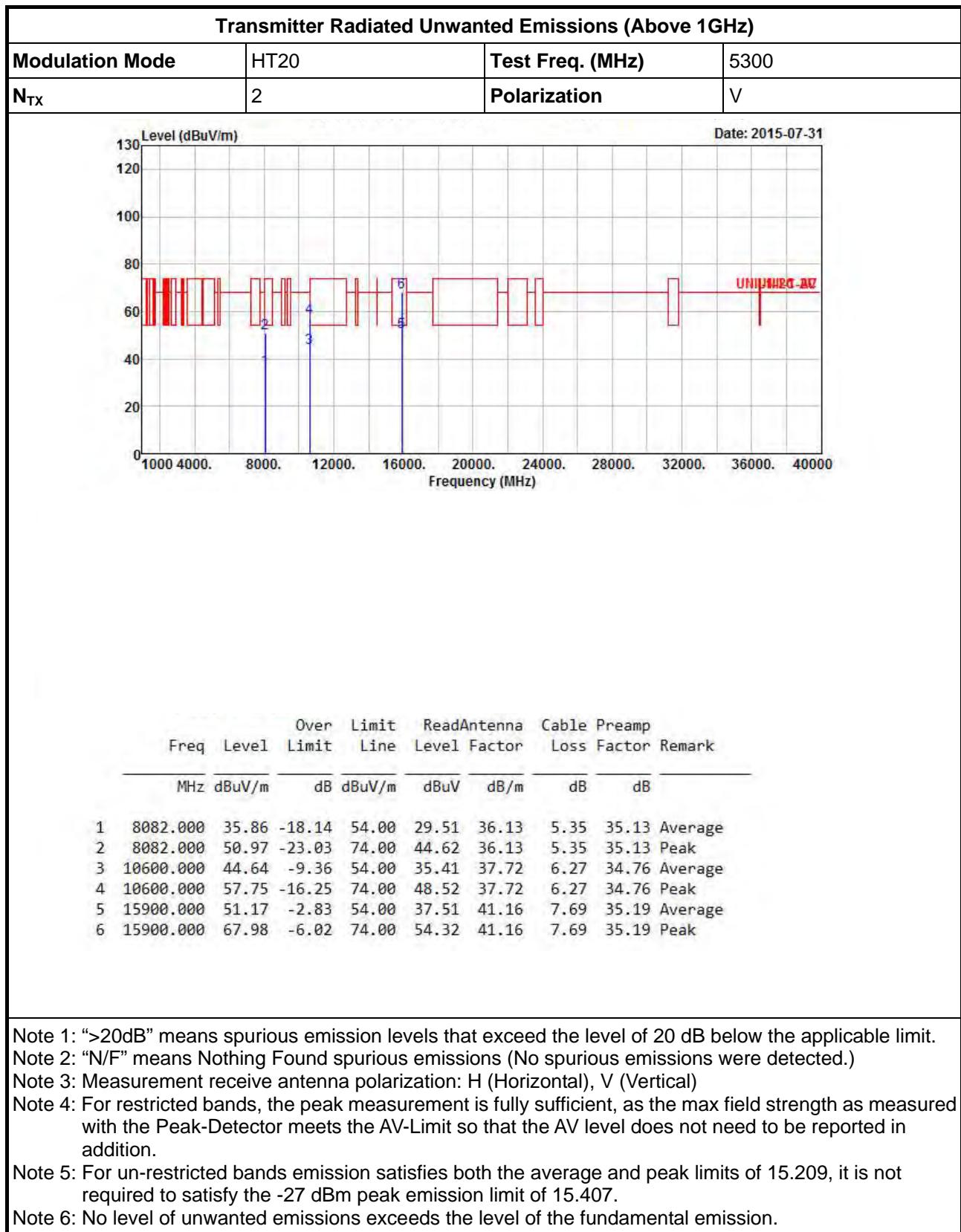
Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

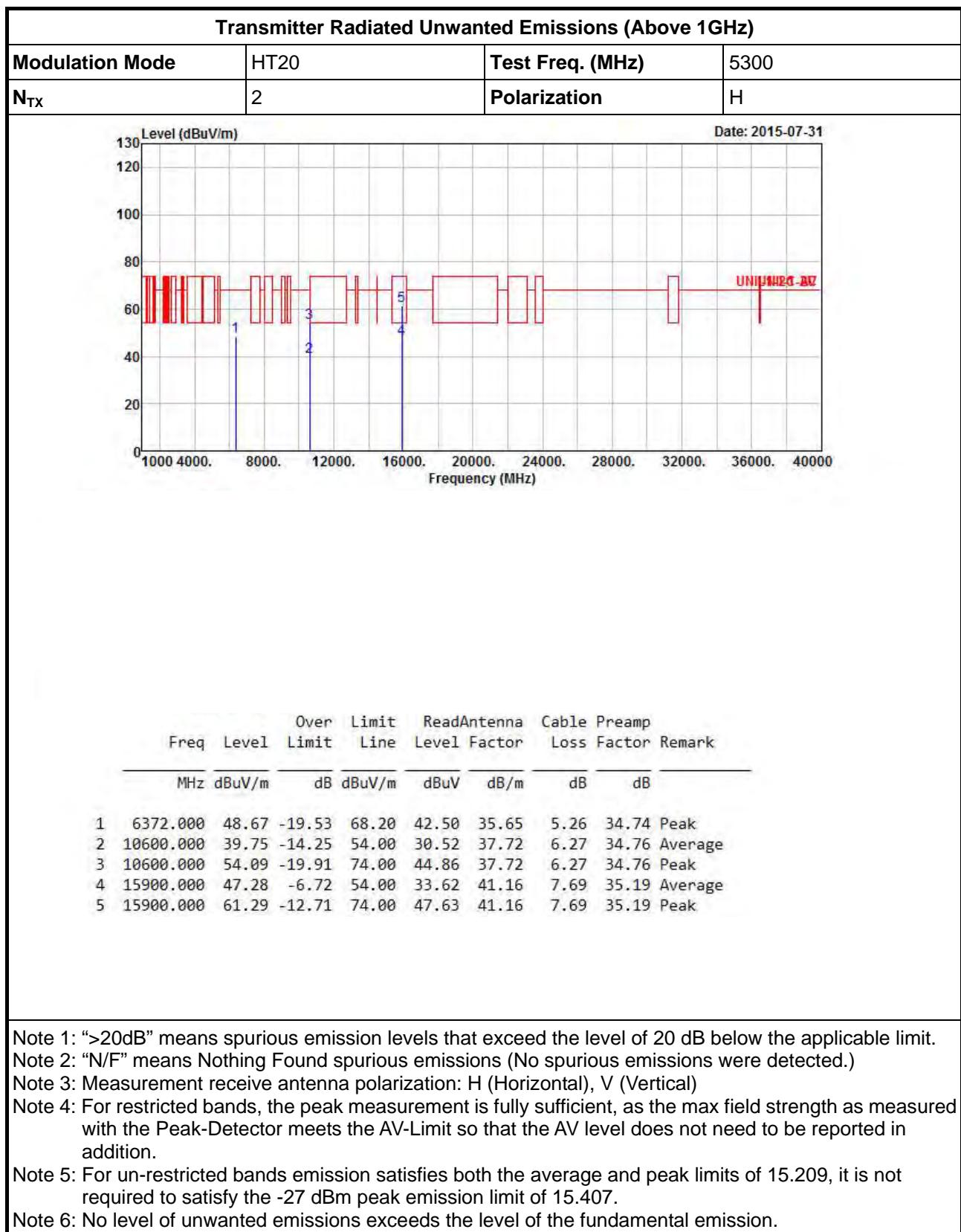
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

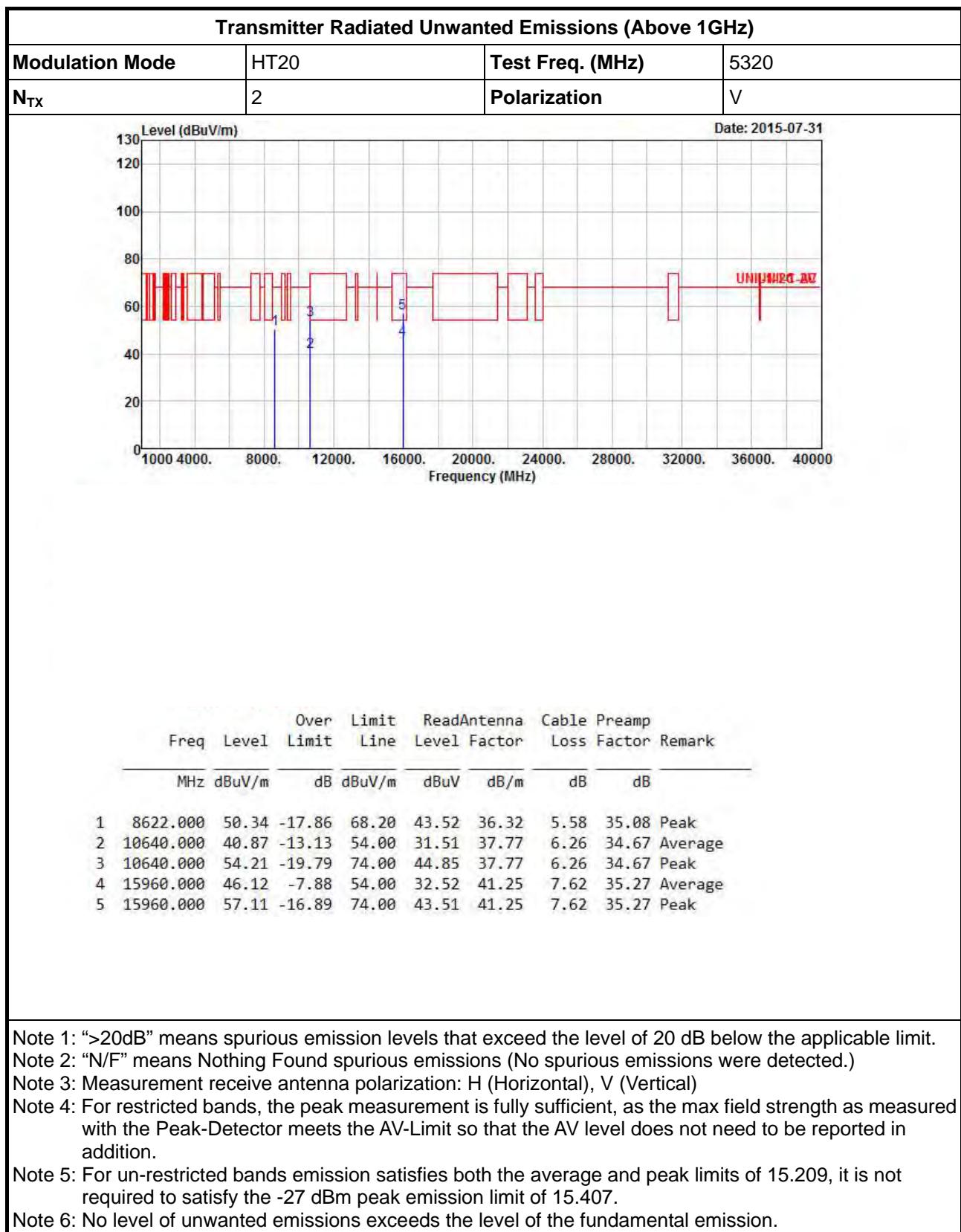


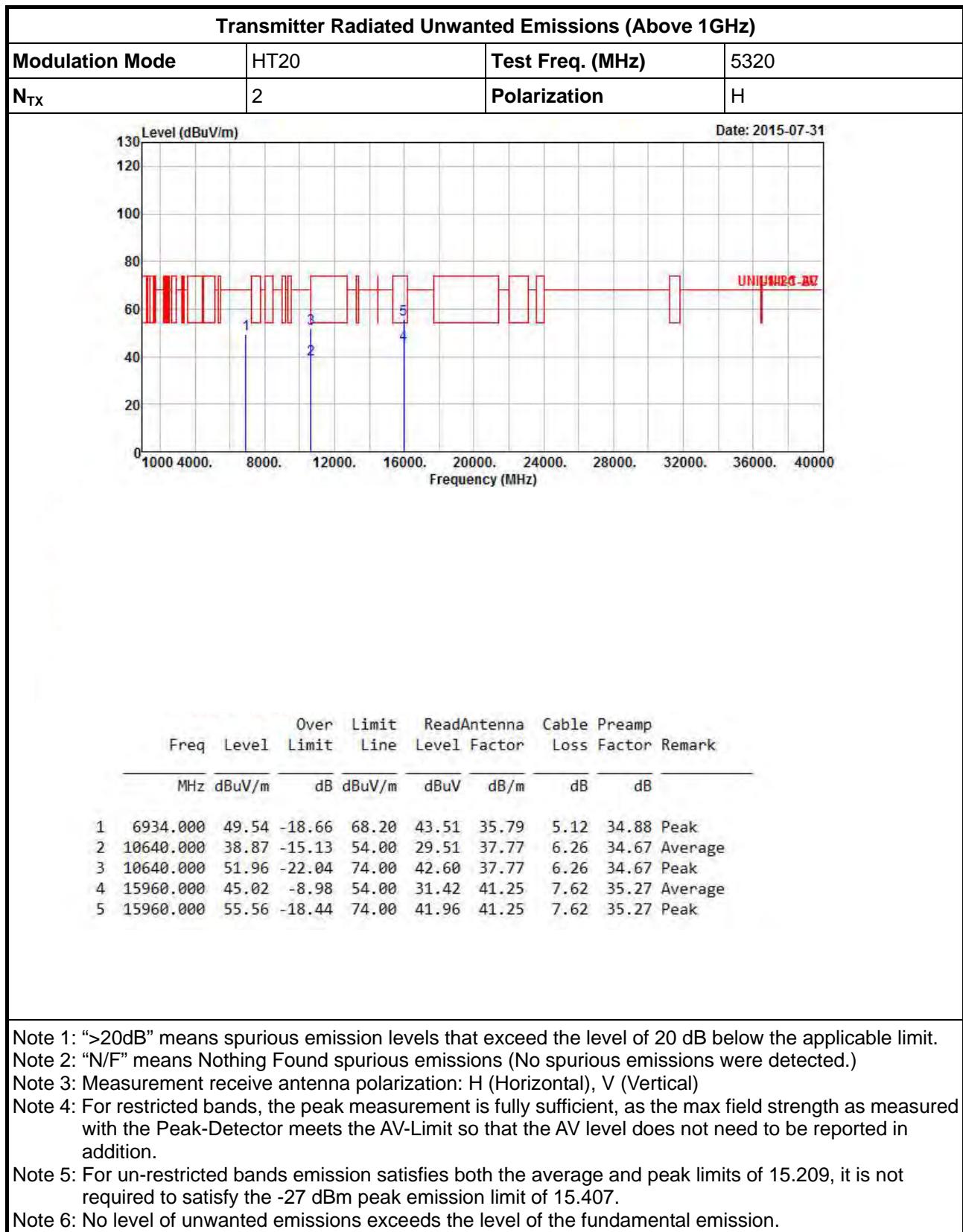


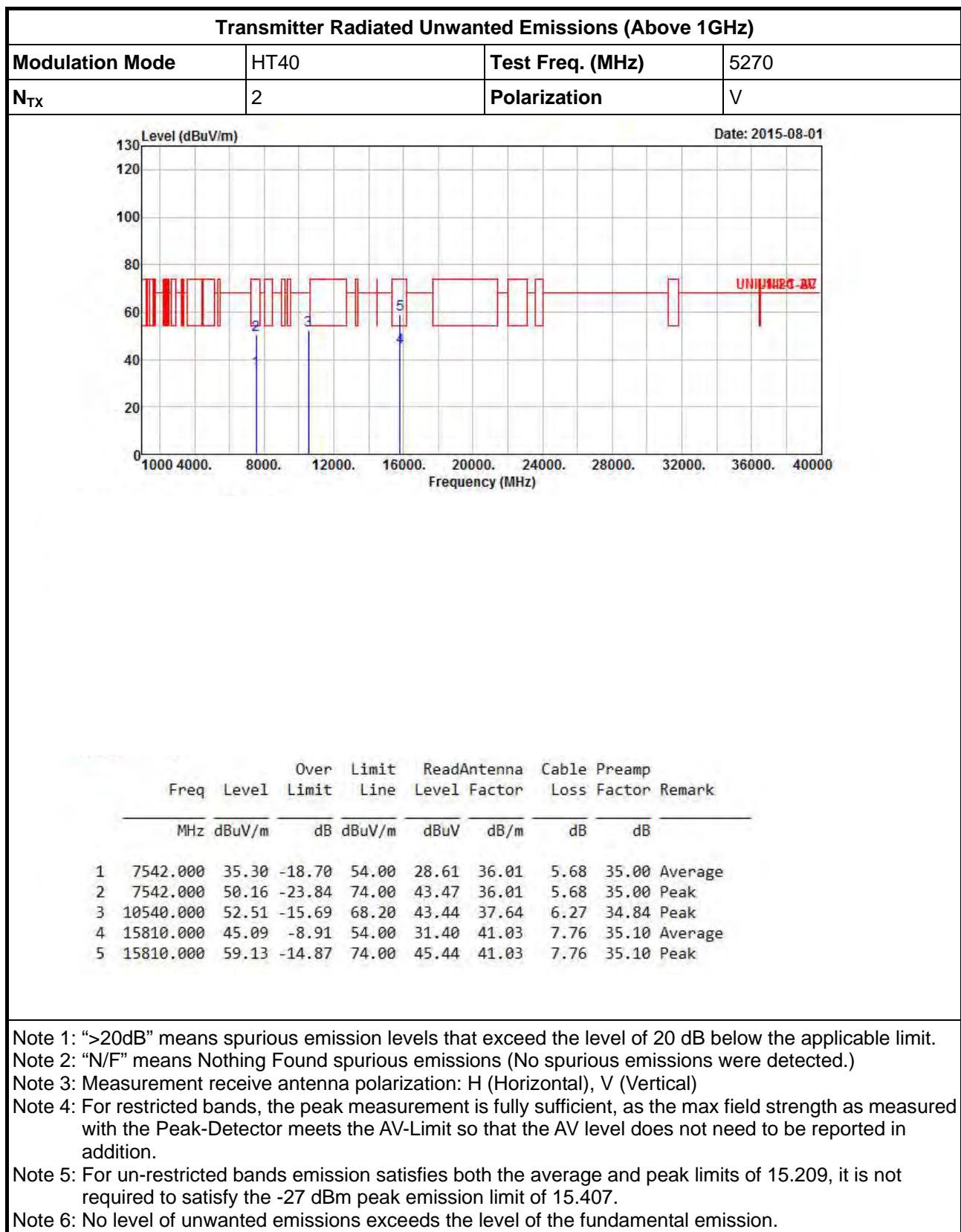


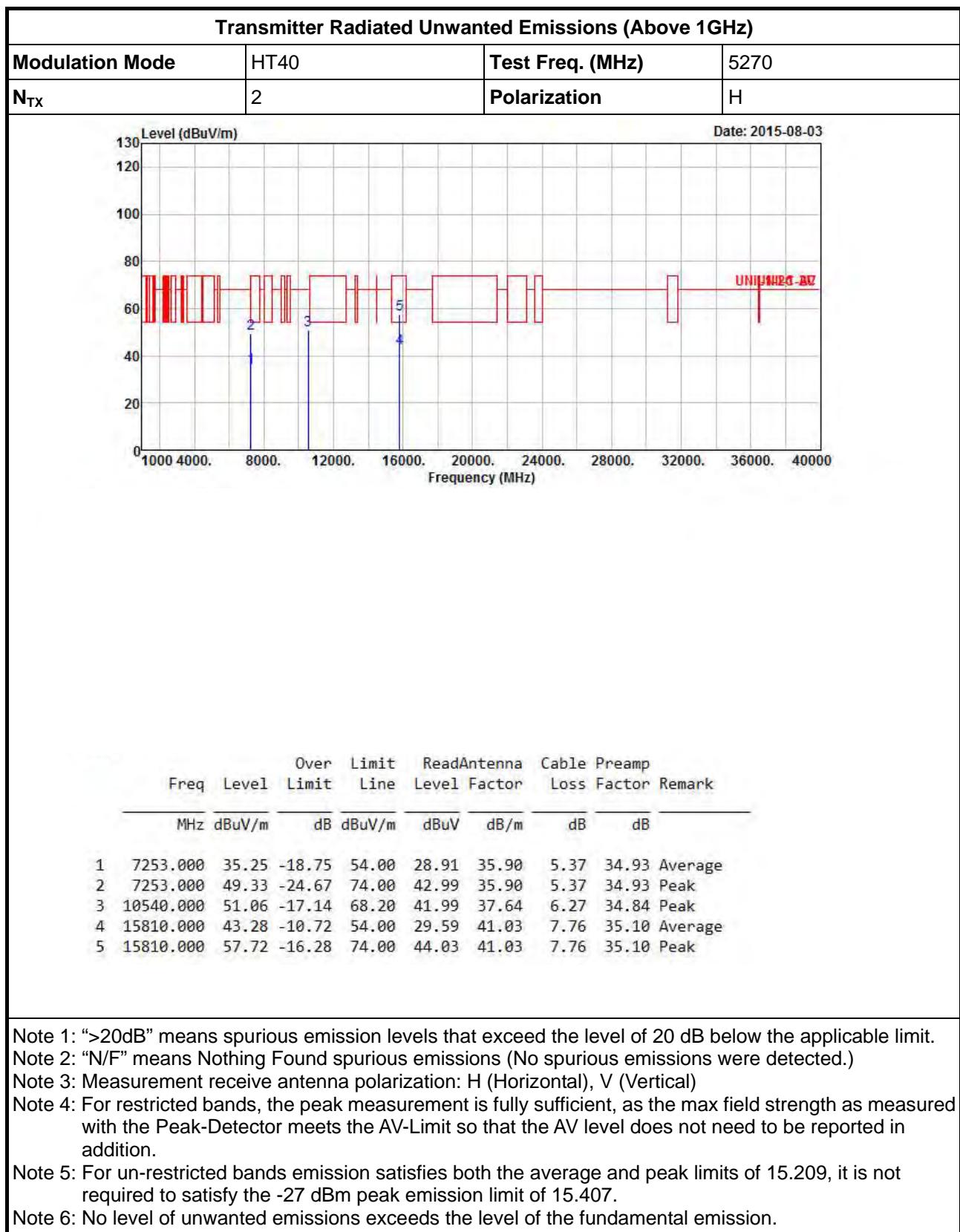


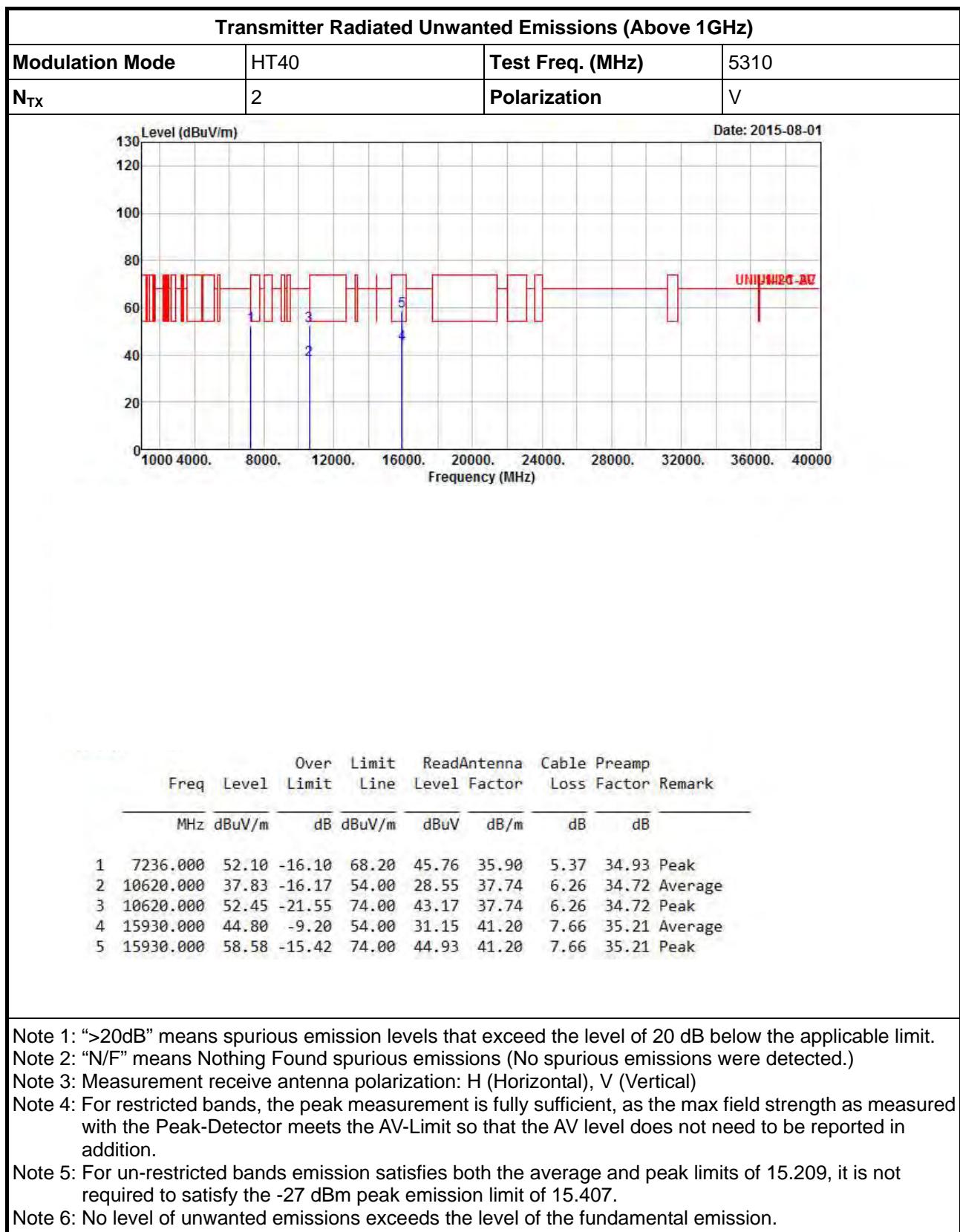


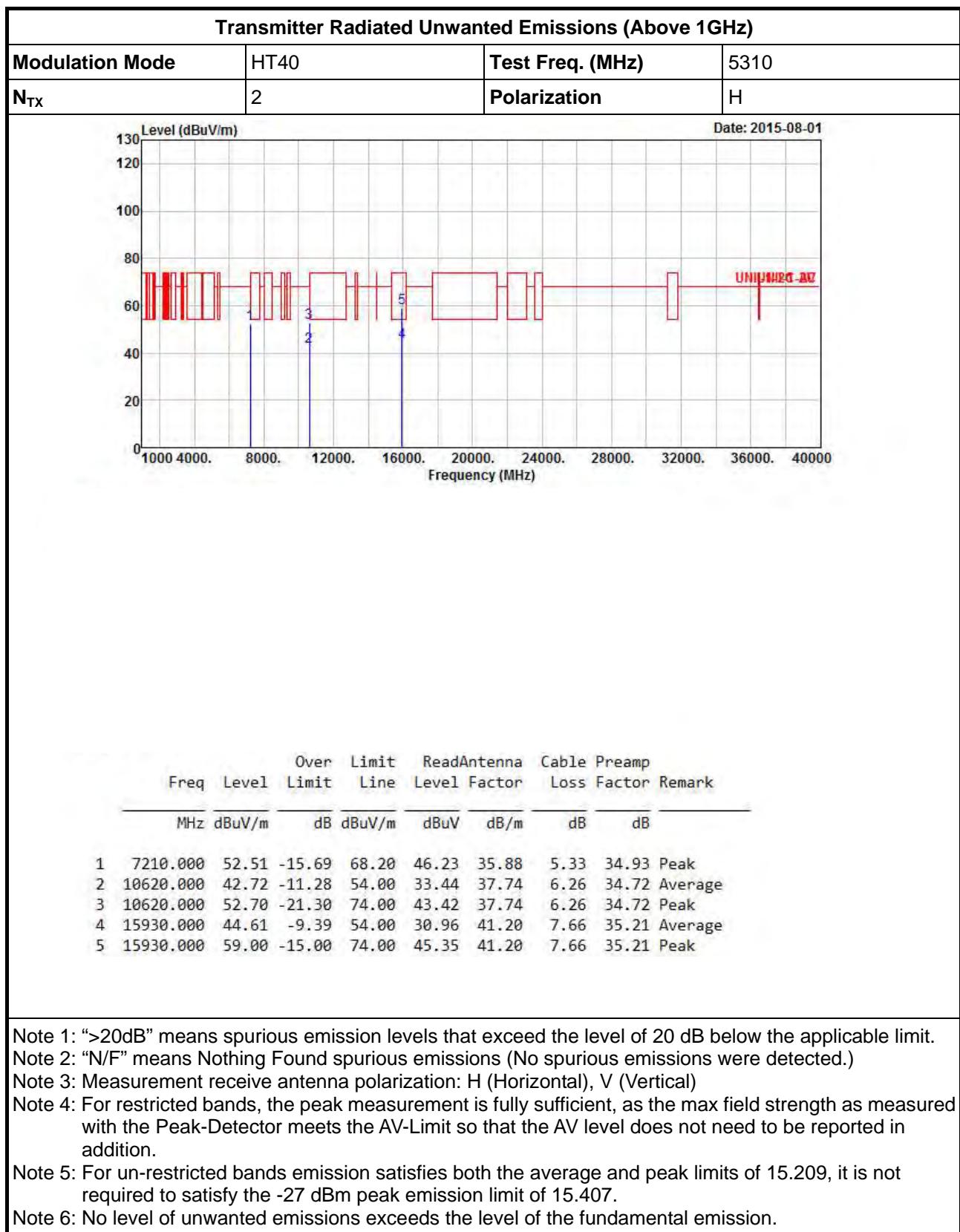


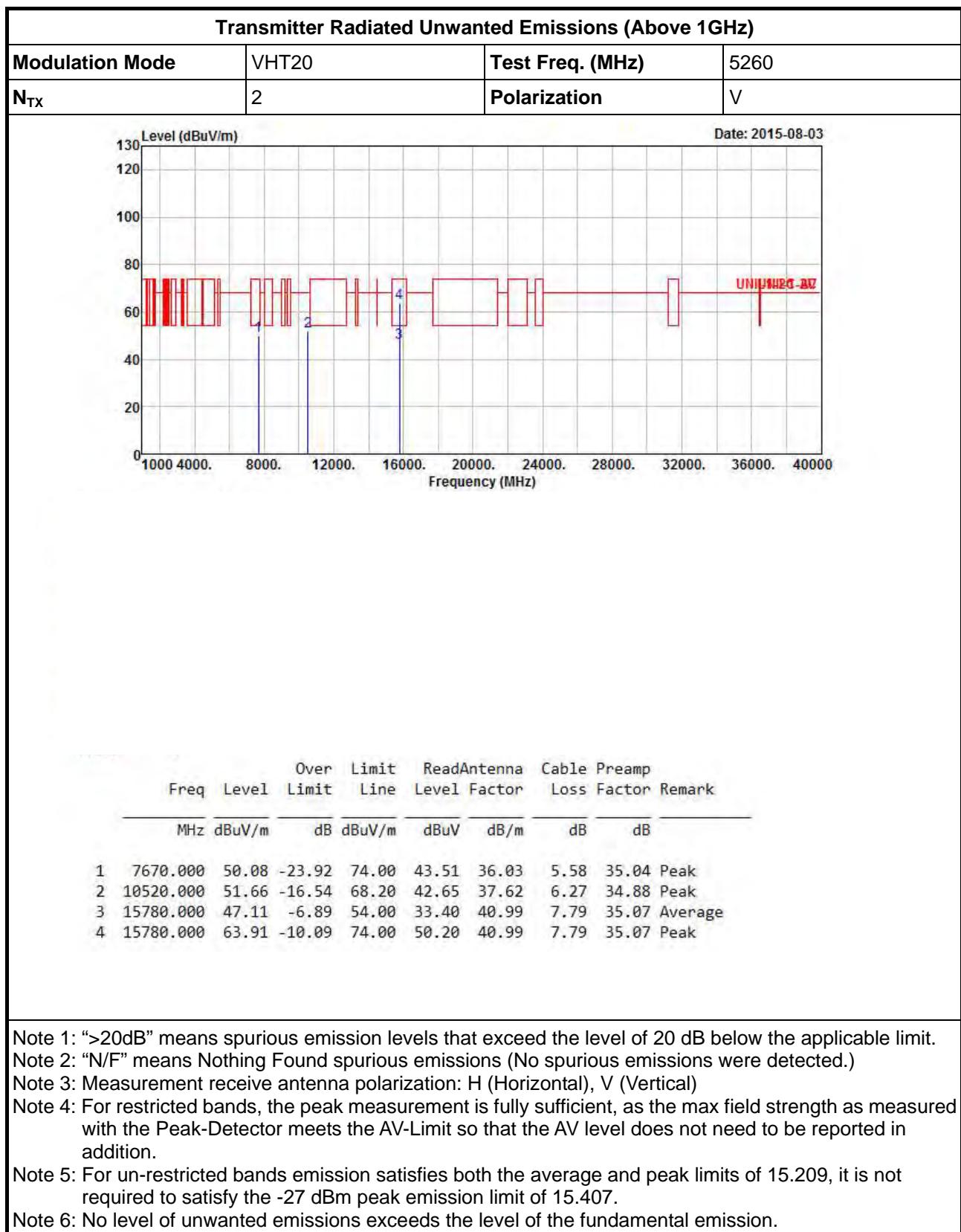


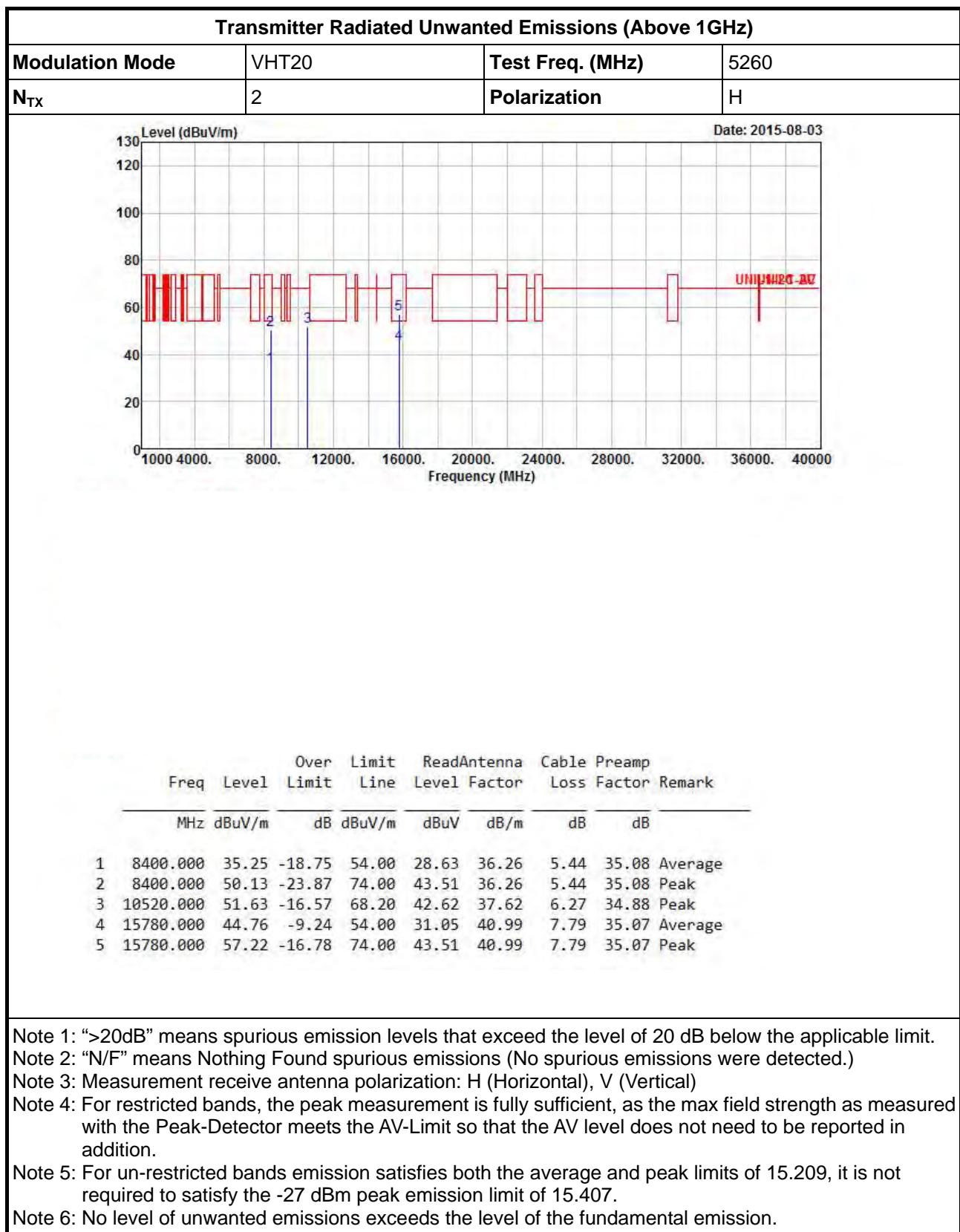


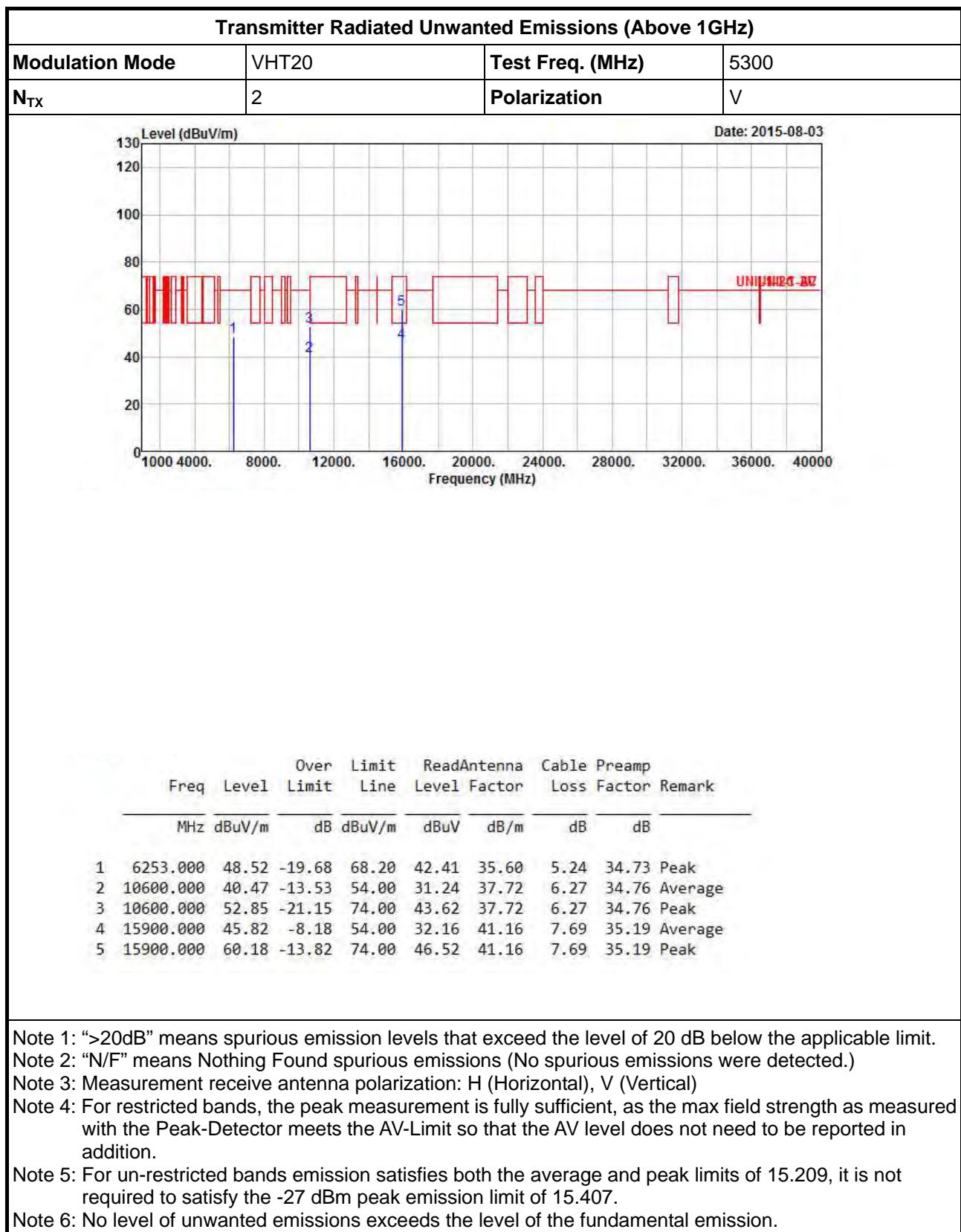


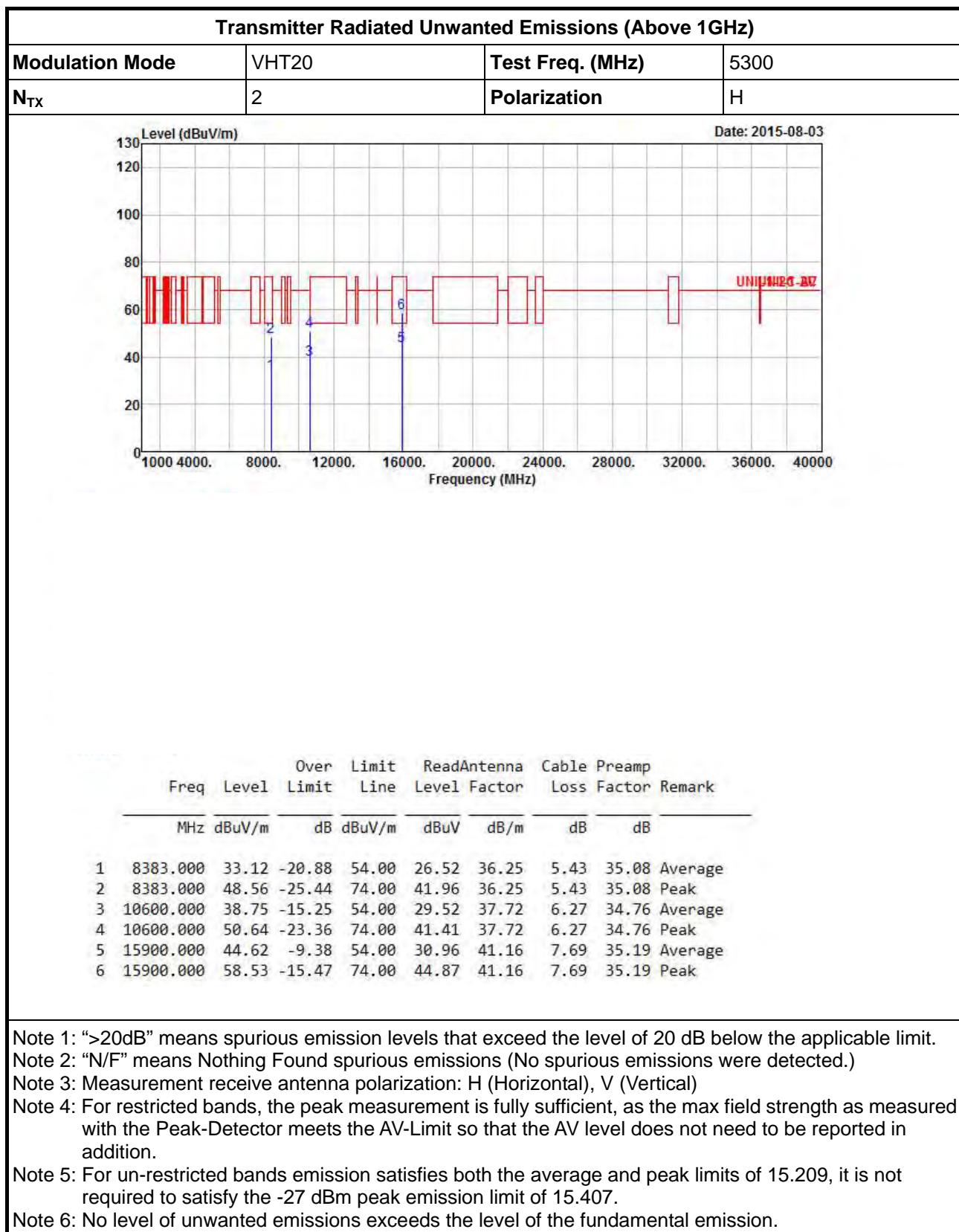


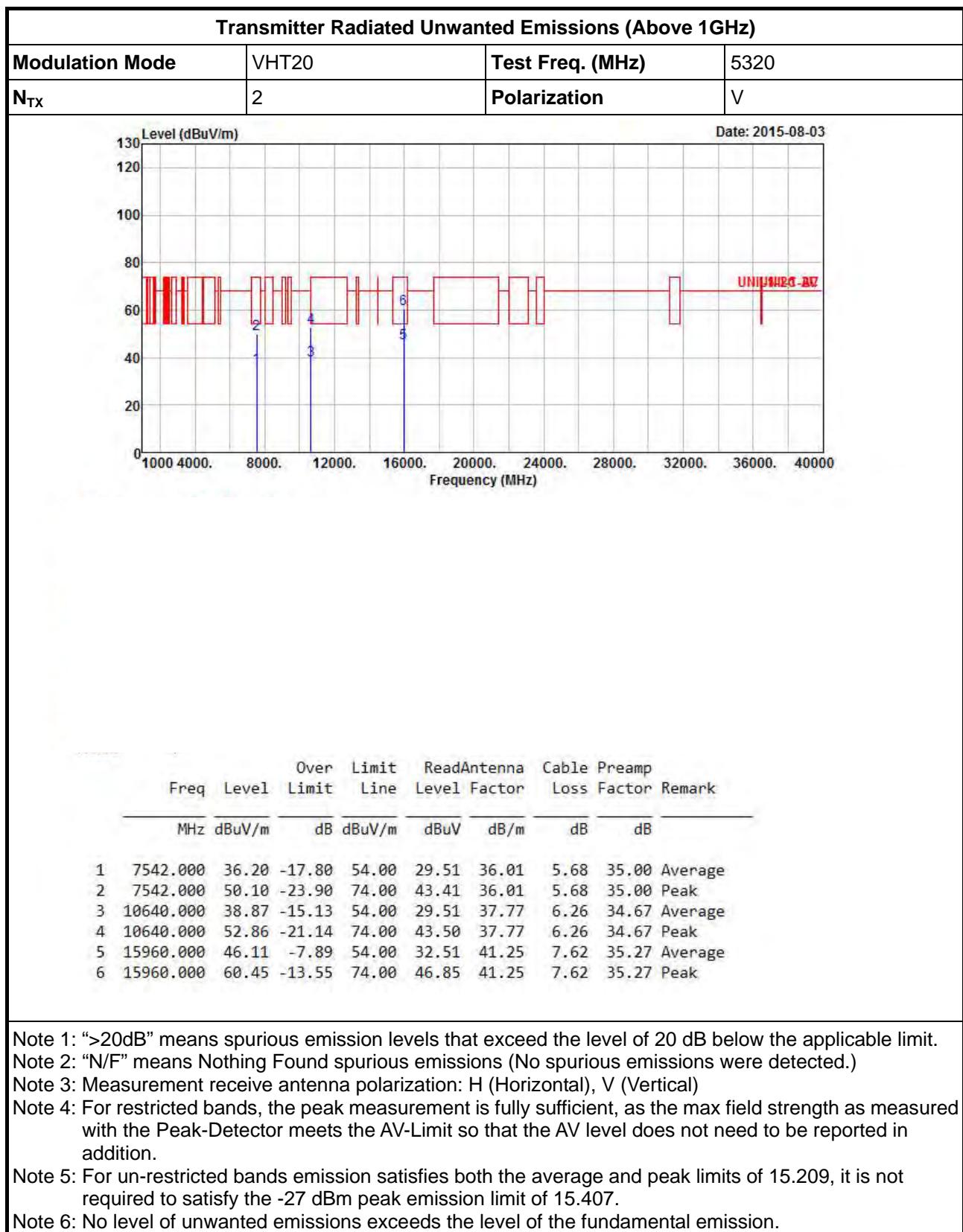


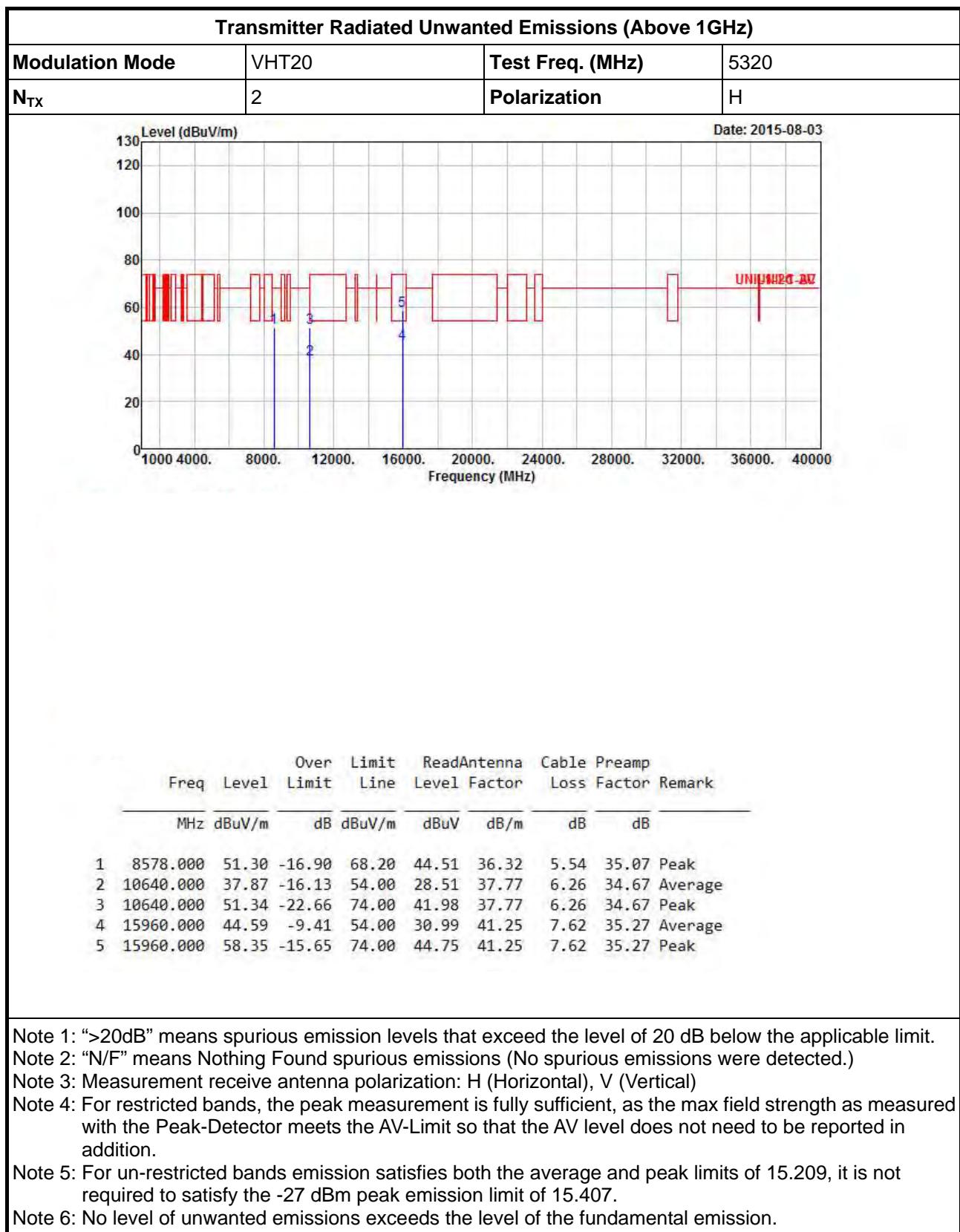


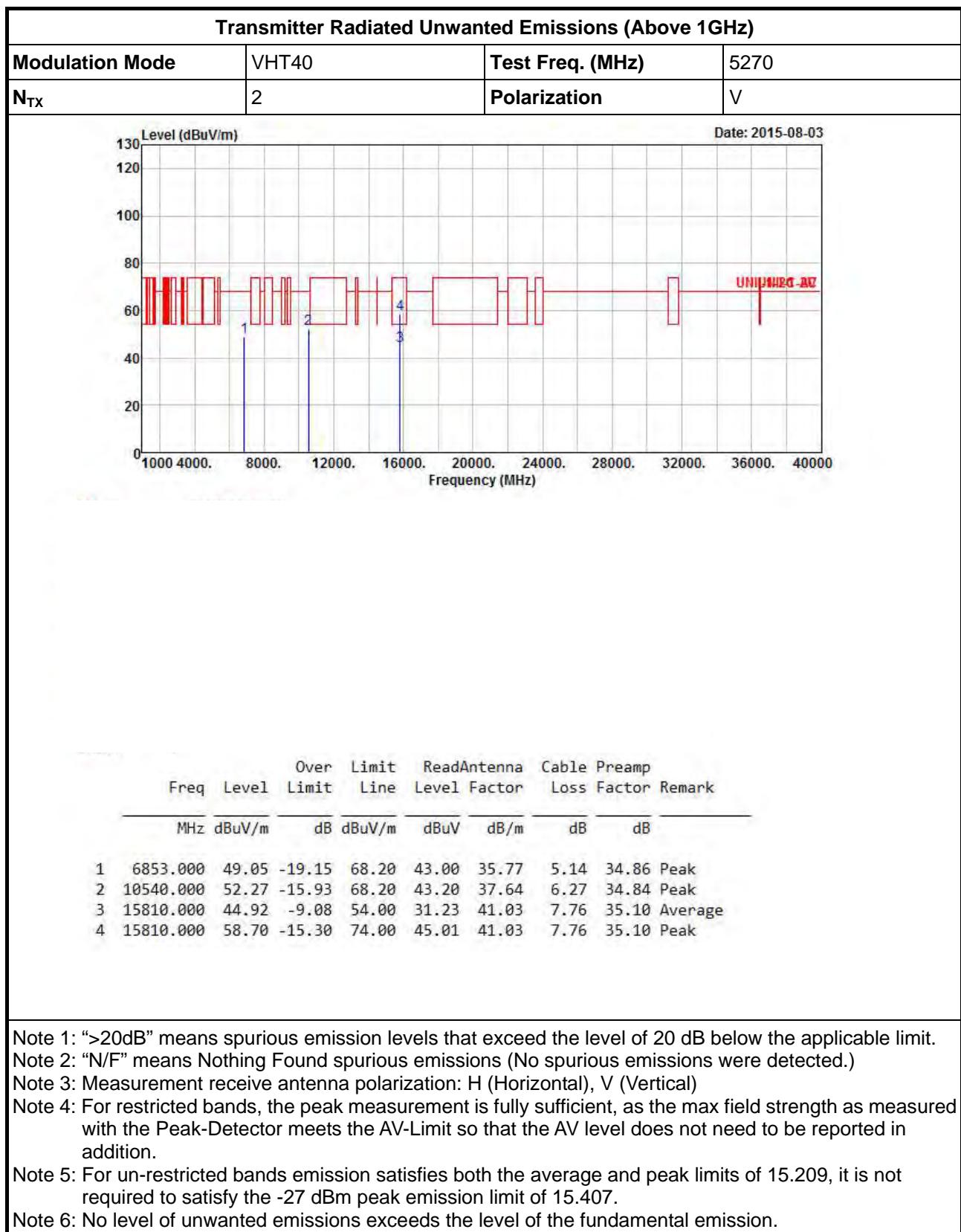


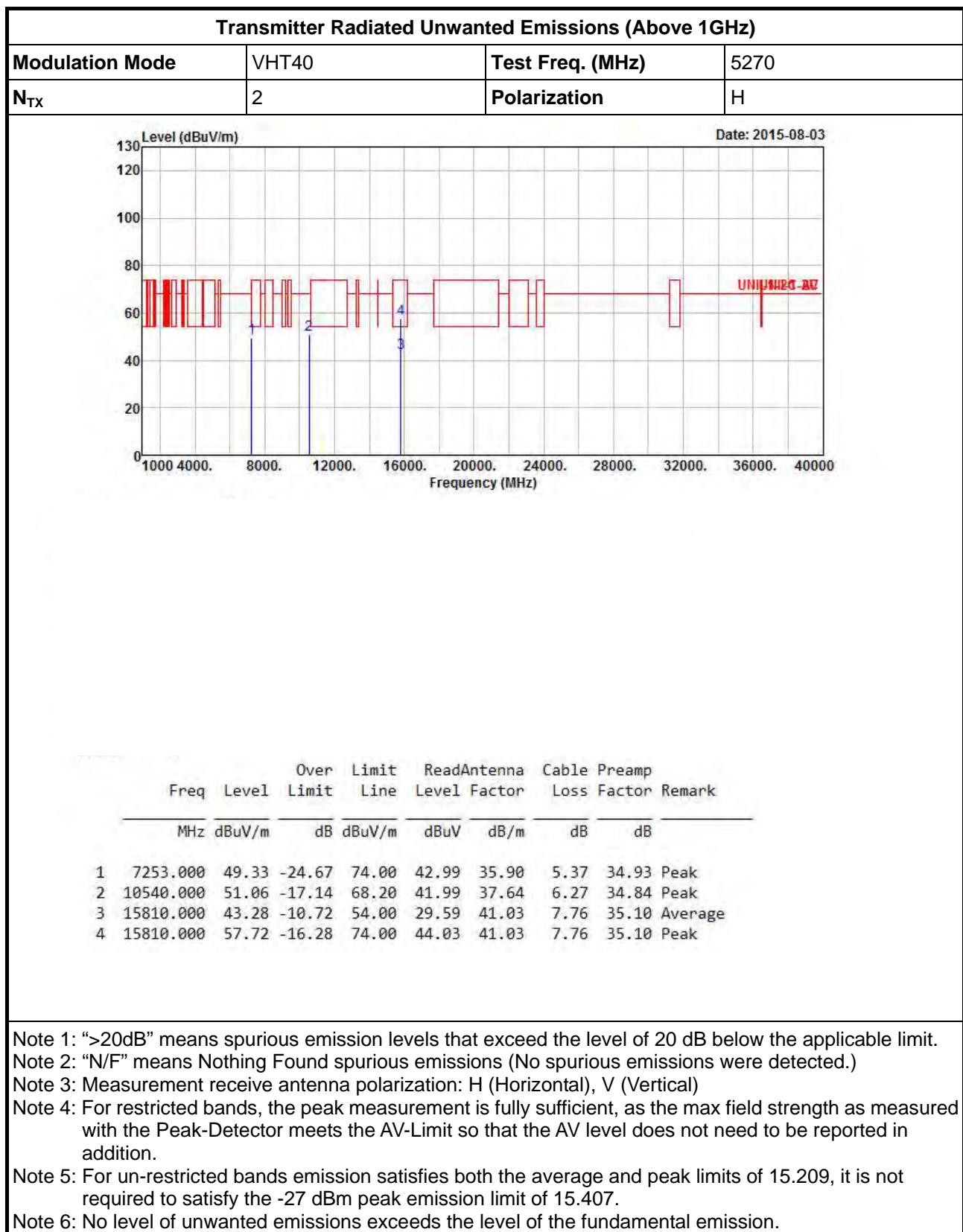


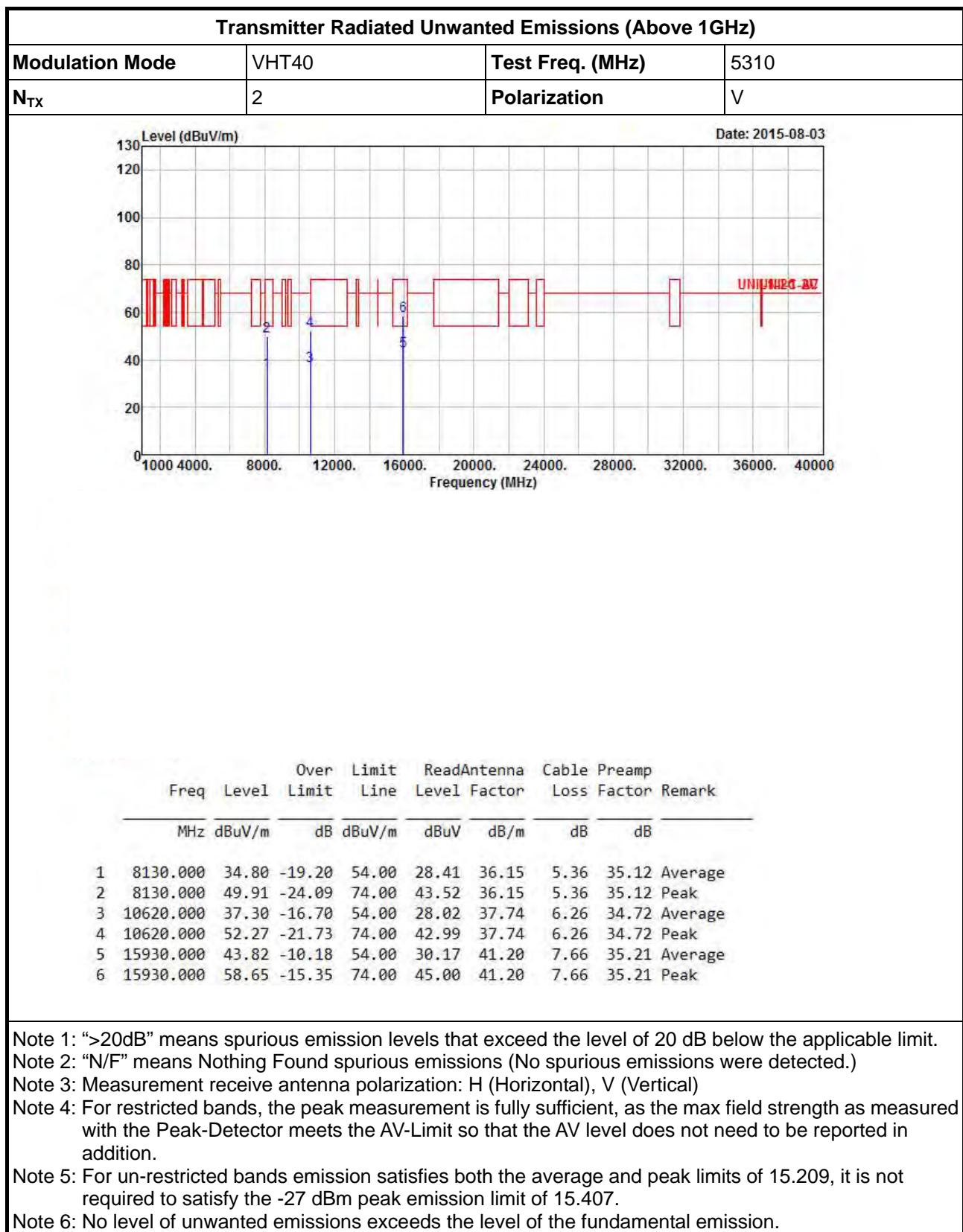


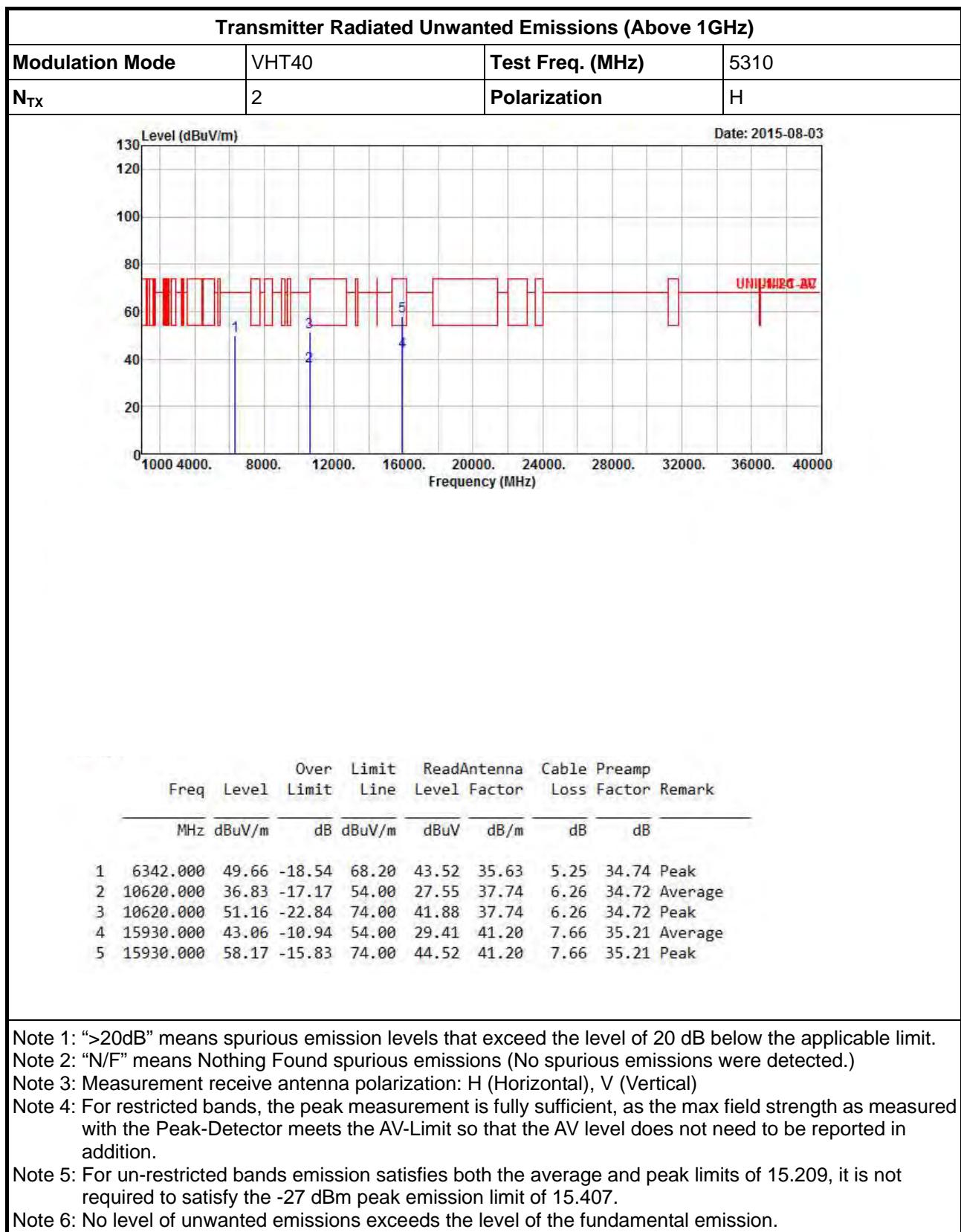


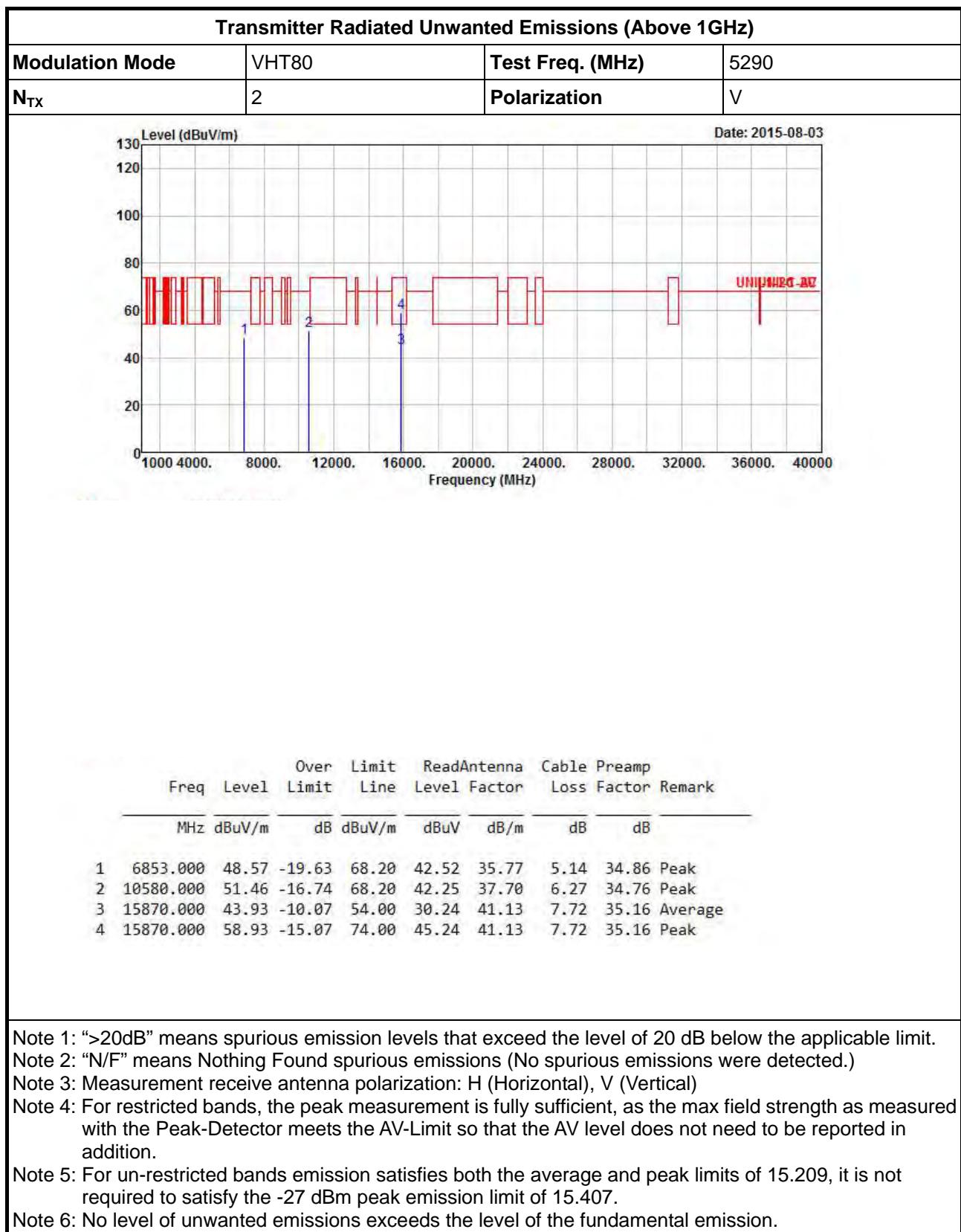


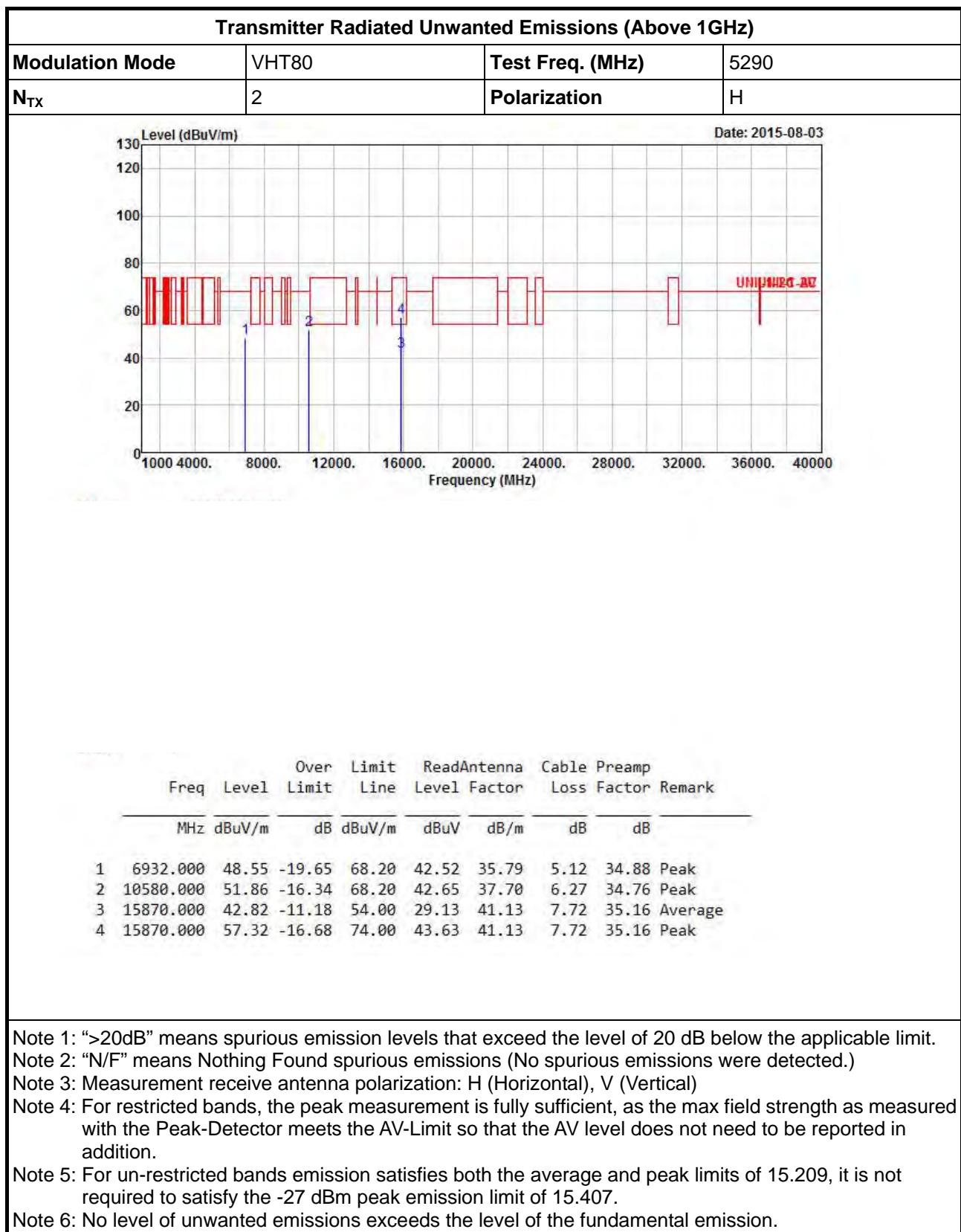






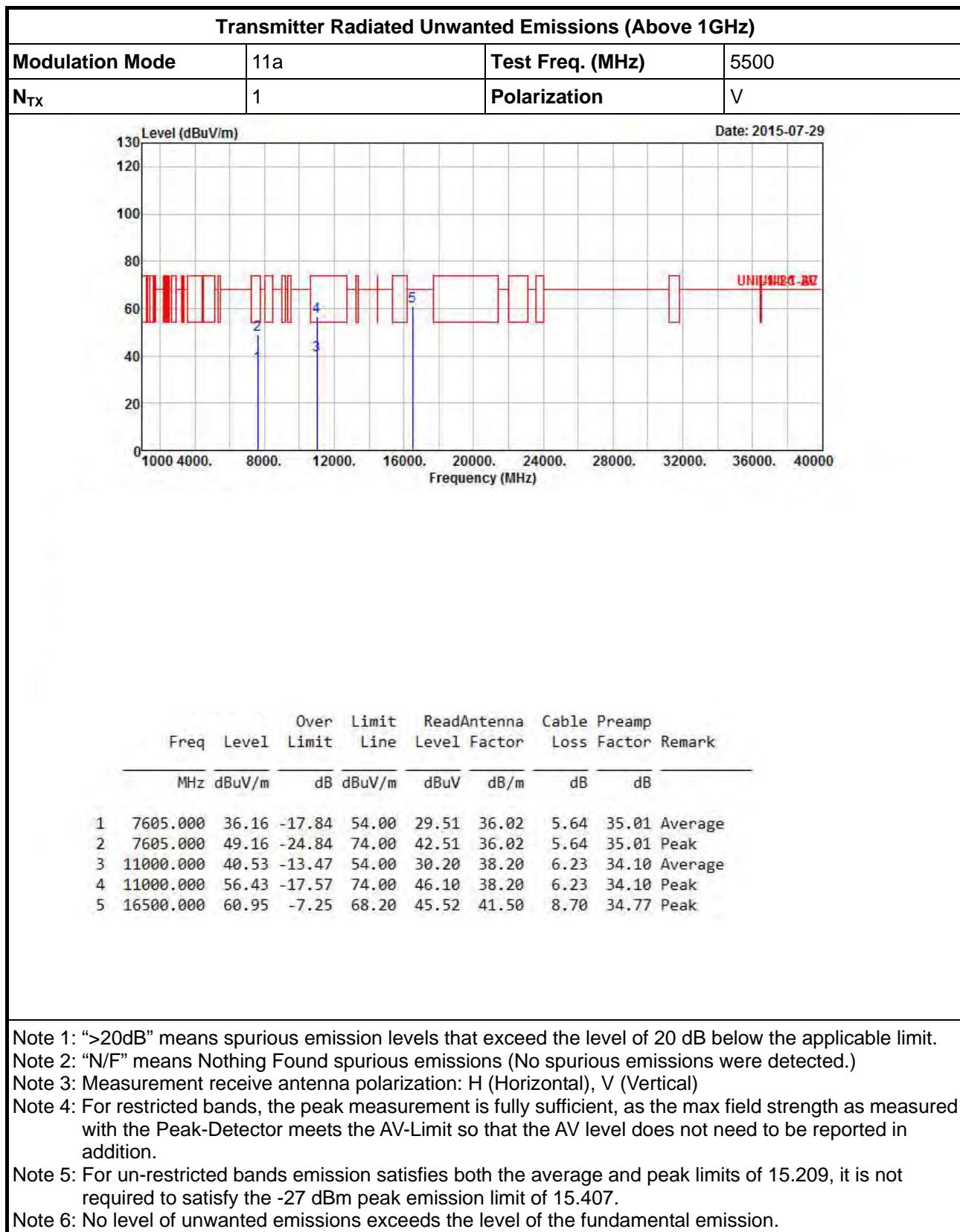








3.6.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 5470-5725MHz





Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11a	Test Freq. (MHz)	5500					
N _{TX}	1	Polarization	H					
Level (dB _{uV/m})			Date: 2015-07-29					
Freq	Level	Over Limit	Limit	Read	Antenna	Cable	Preamp	Remark
MHz	dB _{uV/m}	dB	dB _{uV/m}	dB _{uV}	dB/m	dB	dB	
1 6925.000	48.54	-19.66	68.20	42.50	35.79	5.12	34.87	Peak
2 11000.000	39.84	-14.16	54.00	29.51	38.20	6.23	34.10	Average
3 11000.000	53.84	-20.16	74.00	43.51	38.20	6.23	34.10	Peak
4 16500.000	59.63	-8.57	68.20	44.20	41.50	8.70	34.77	Peak

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

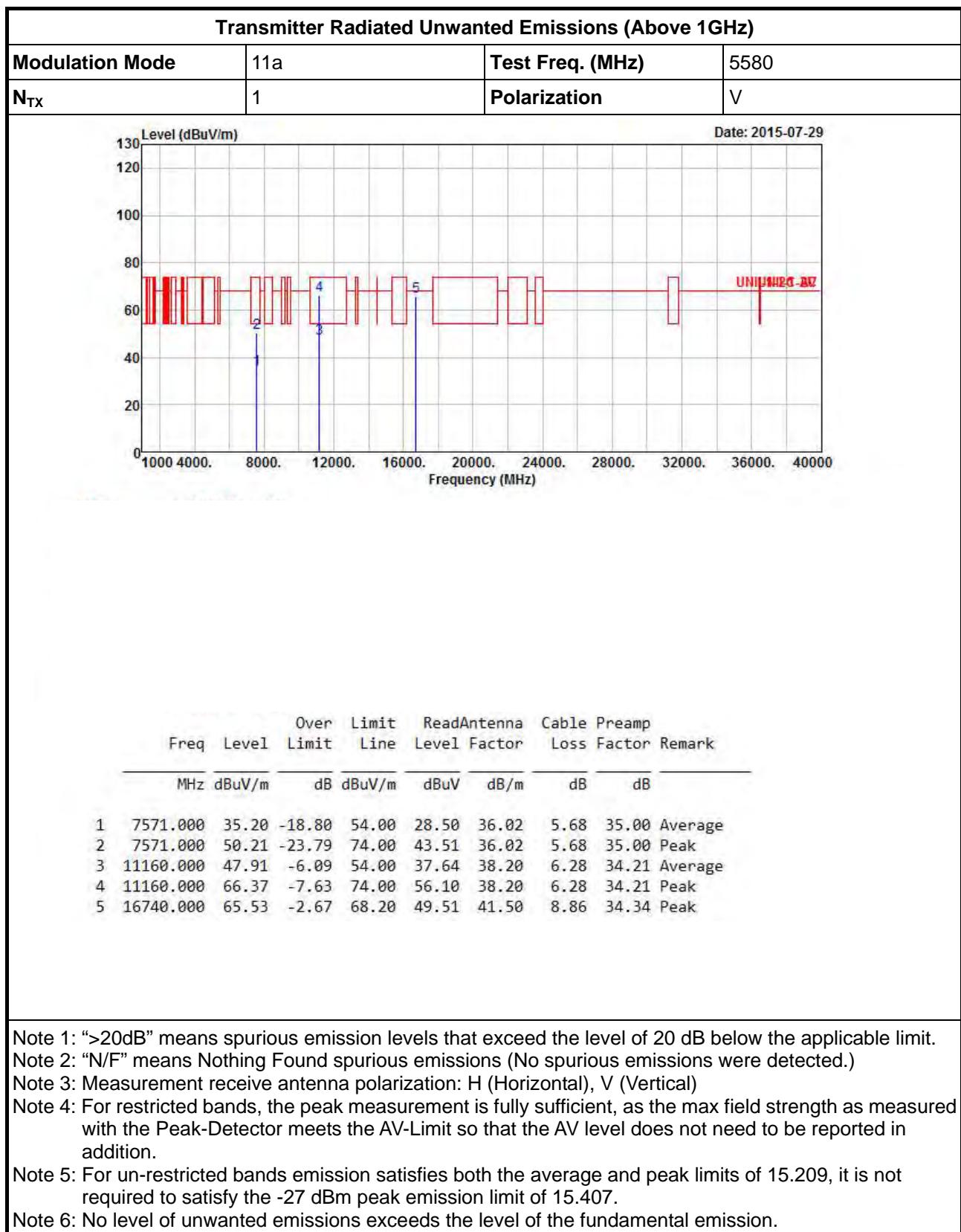
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



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

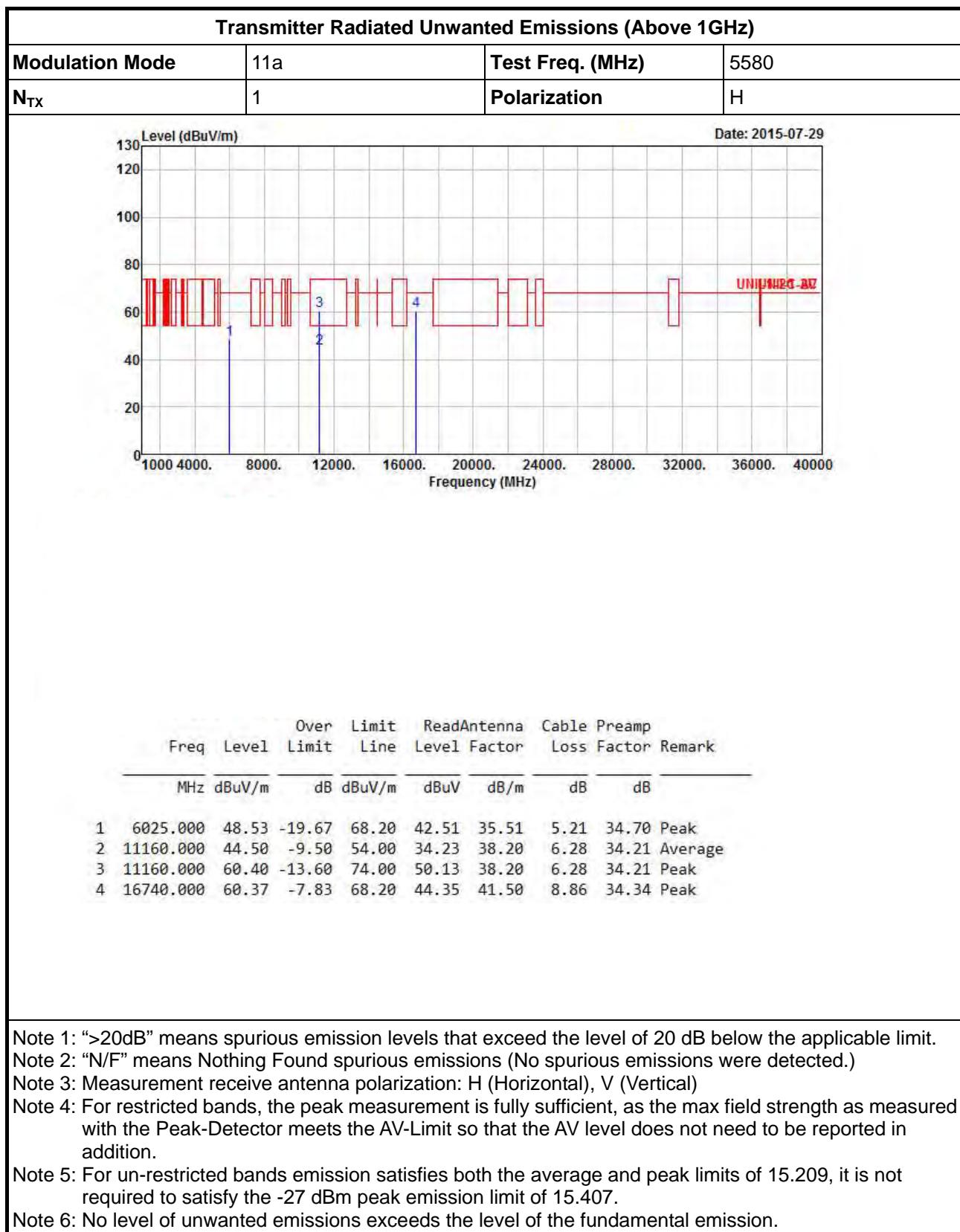
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

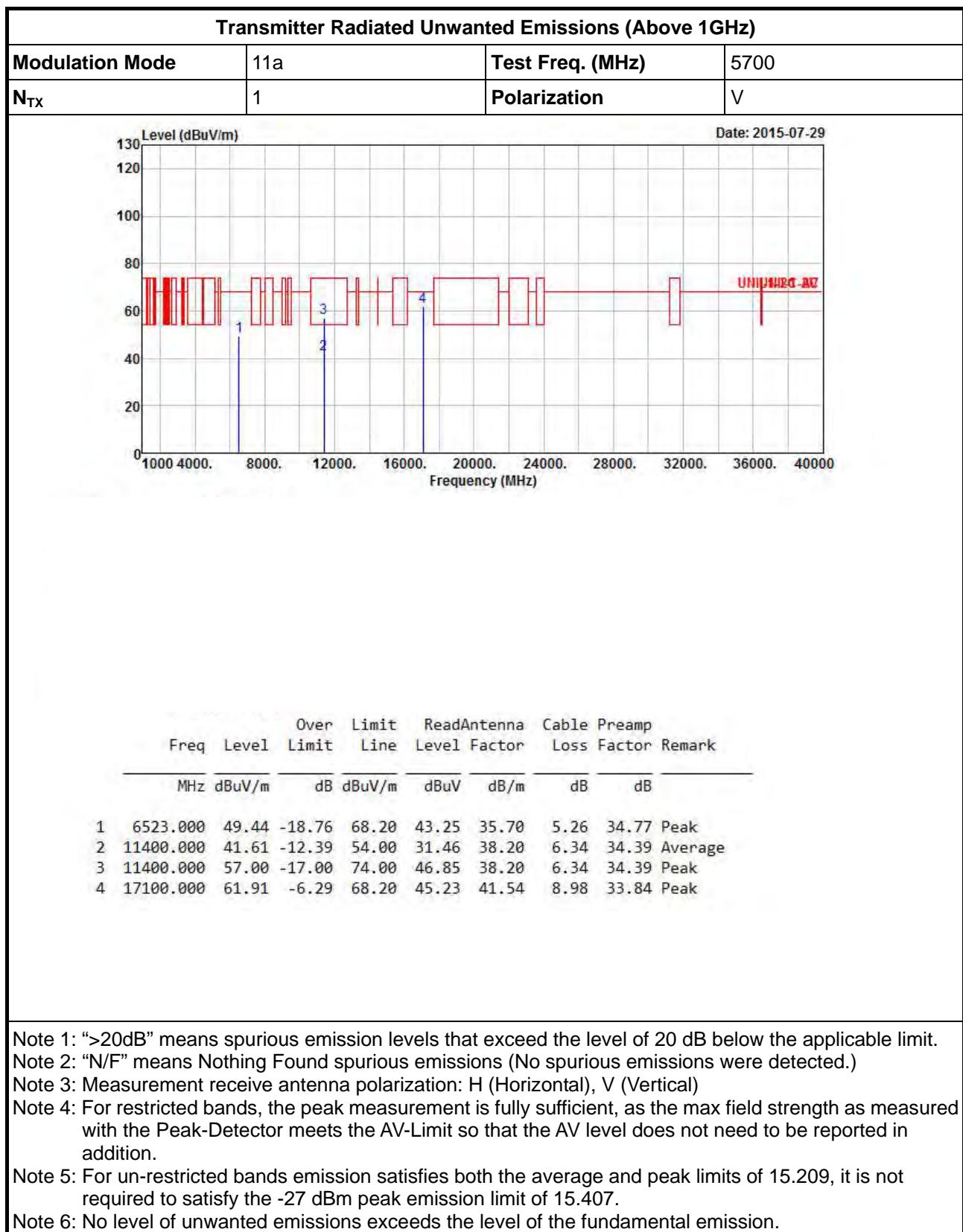
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

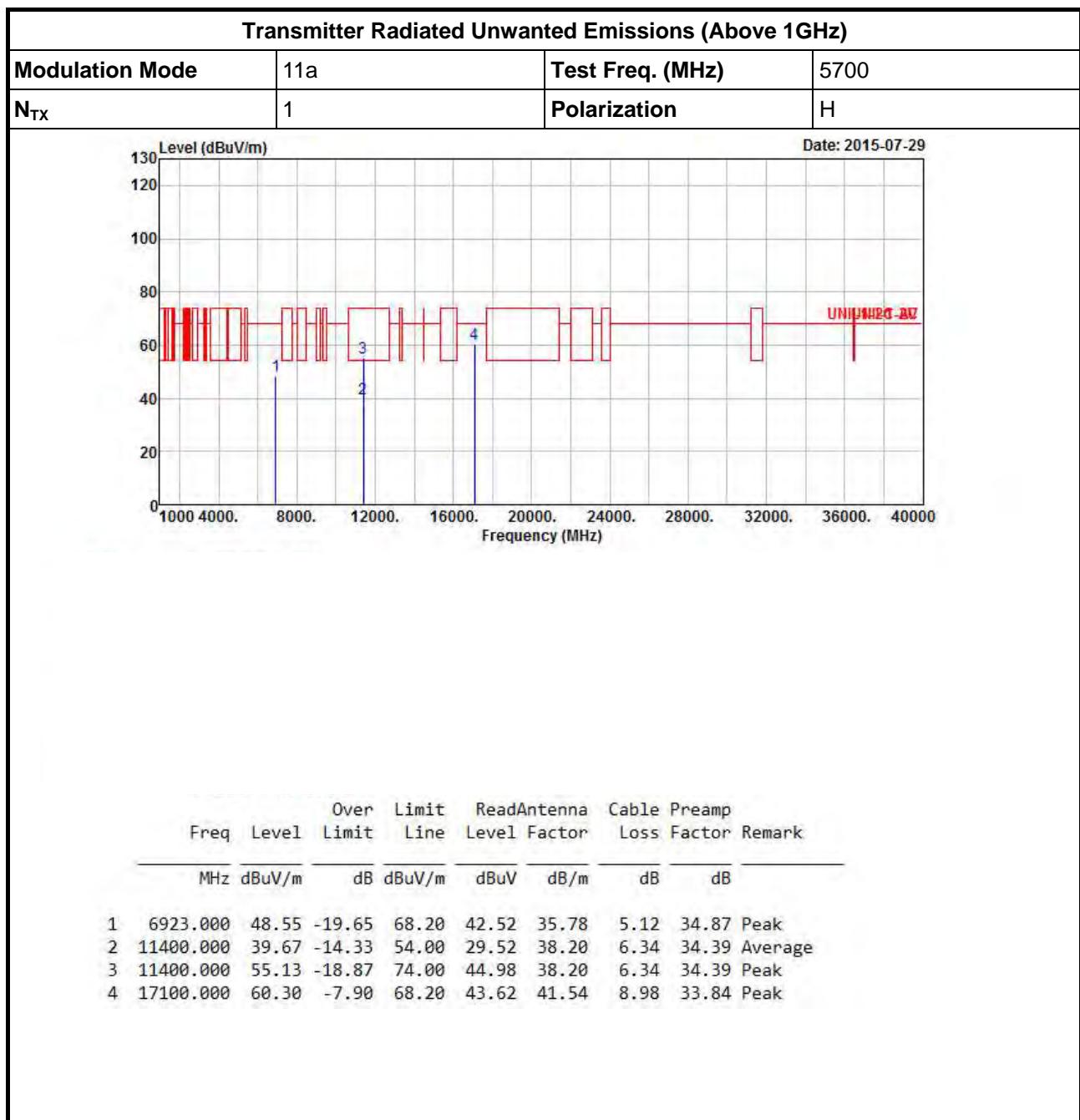
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.







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

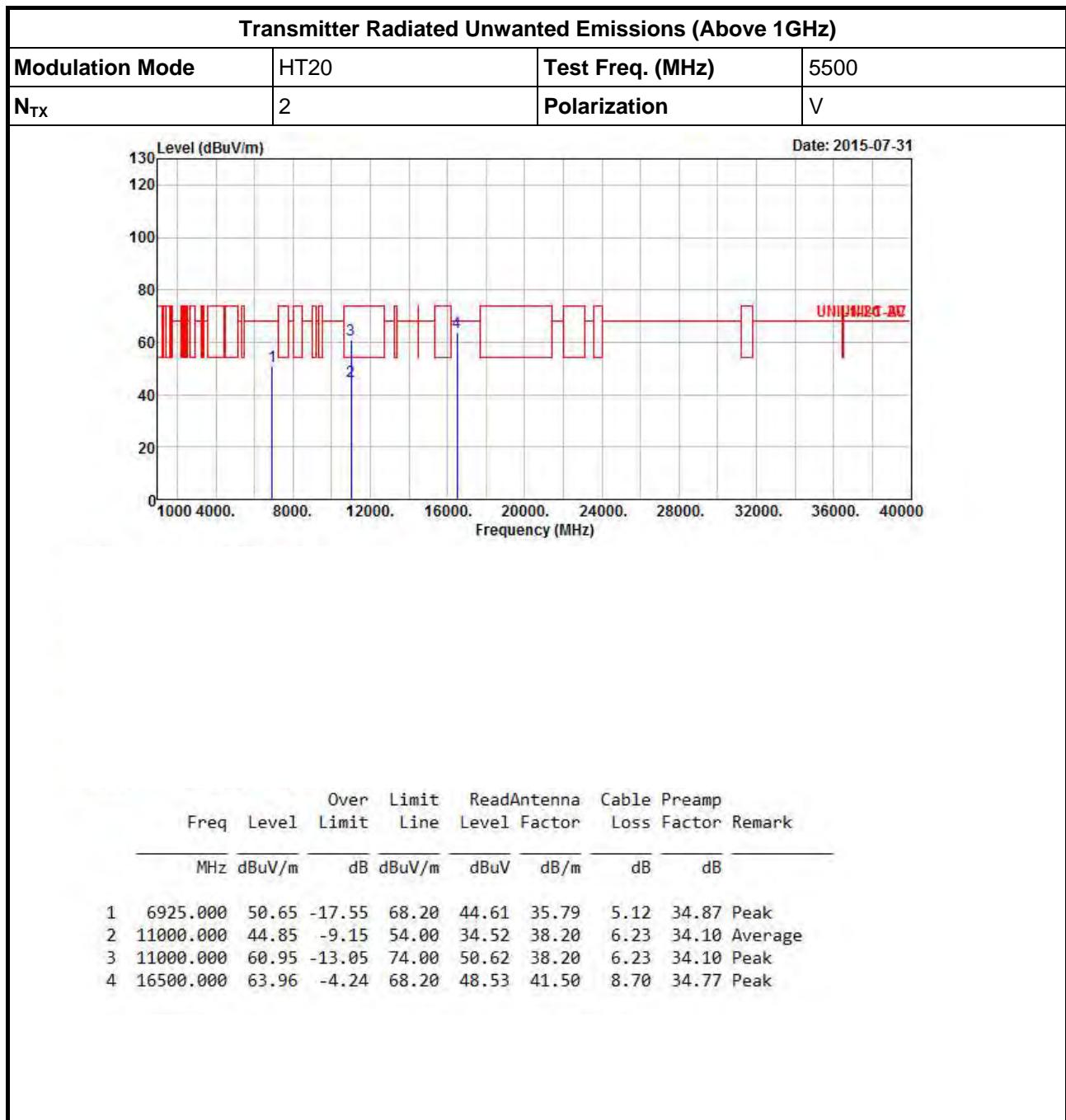
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



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

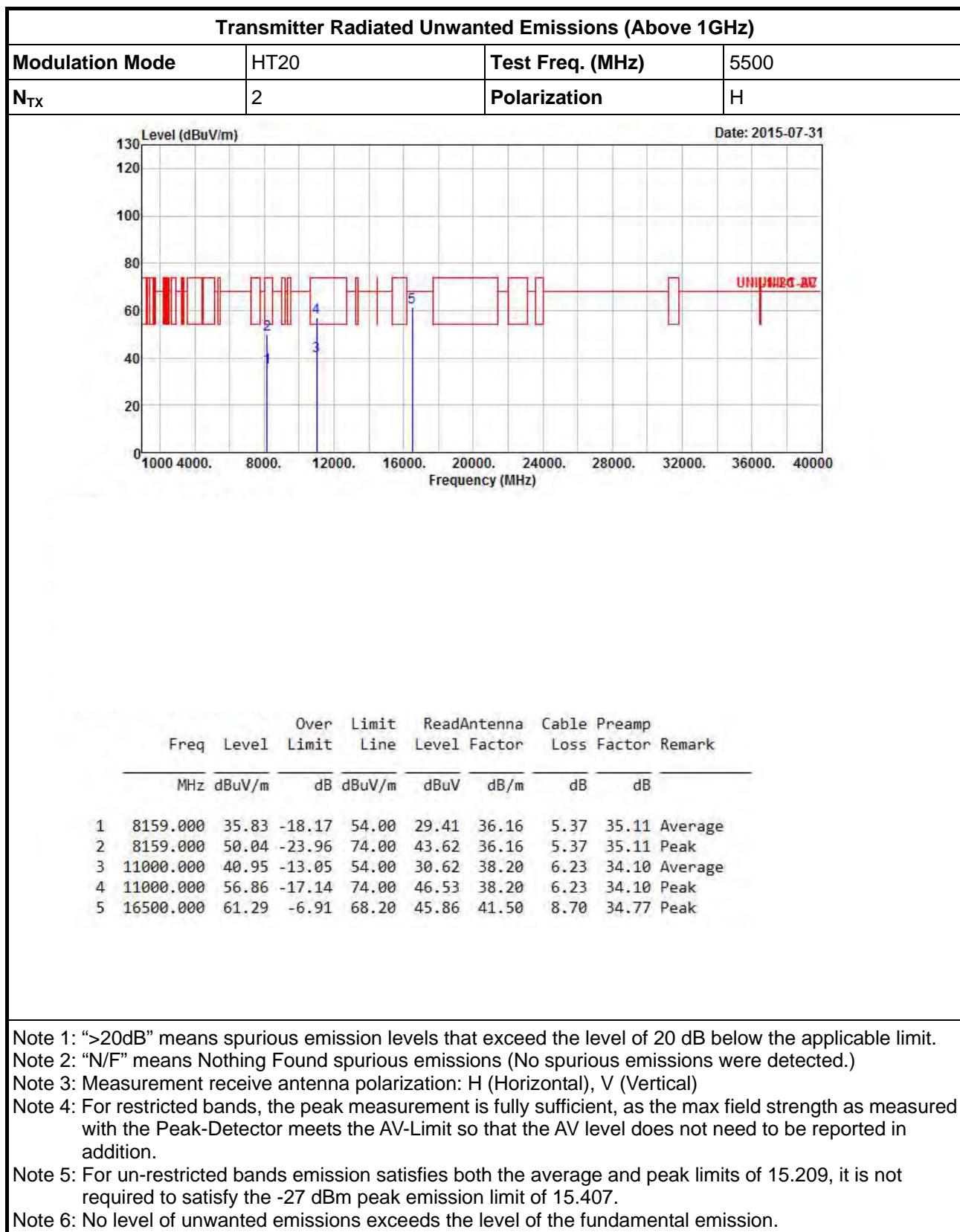
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

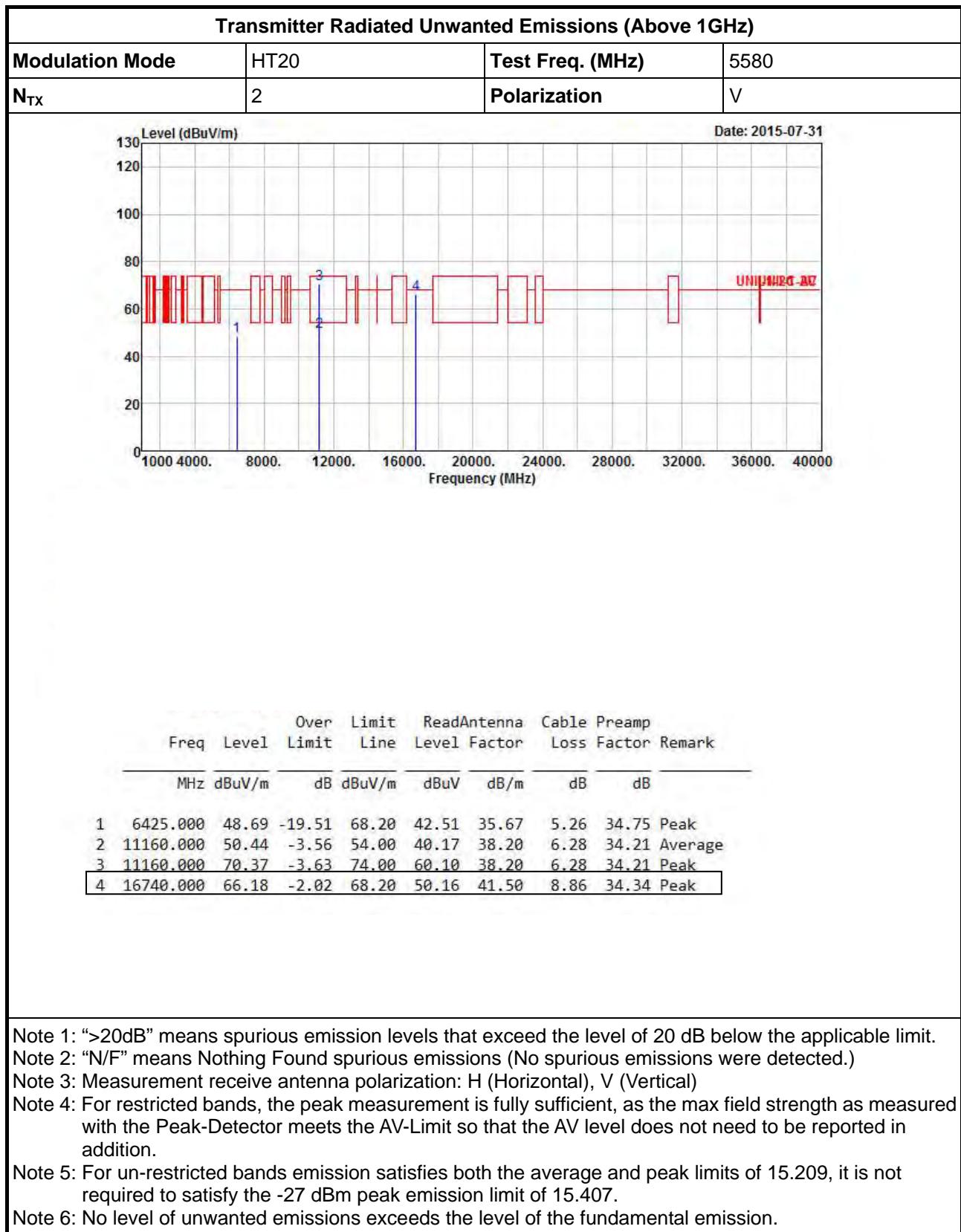
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

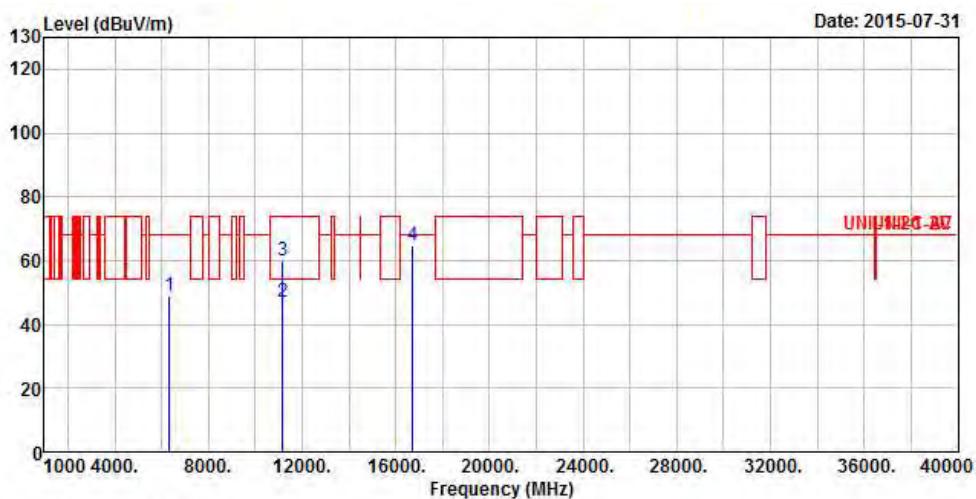






Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	5580
N _{TX}	2	Polarization	H



Freq	Level	Over Limit	Limit Line	Read Antenna		Cable Loss	Preamp Factor	Remark	
				MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m
1	6342.000	49.12	-19.08	68.20	42.98	35.63	5.25	34.74	Peak
2	11160.000	46.79	-7.21	54.00	36.52	38.20	6.28	34.21	Average
3	11160.000	59.79	-14.21	74.00	49.52	38.20	6.28	34.21	Peak
4	16740.000	64.65	-3.55	68.20	48.63	41.50	8.86	34.34	Peak

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

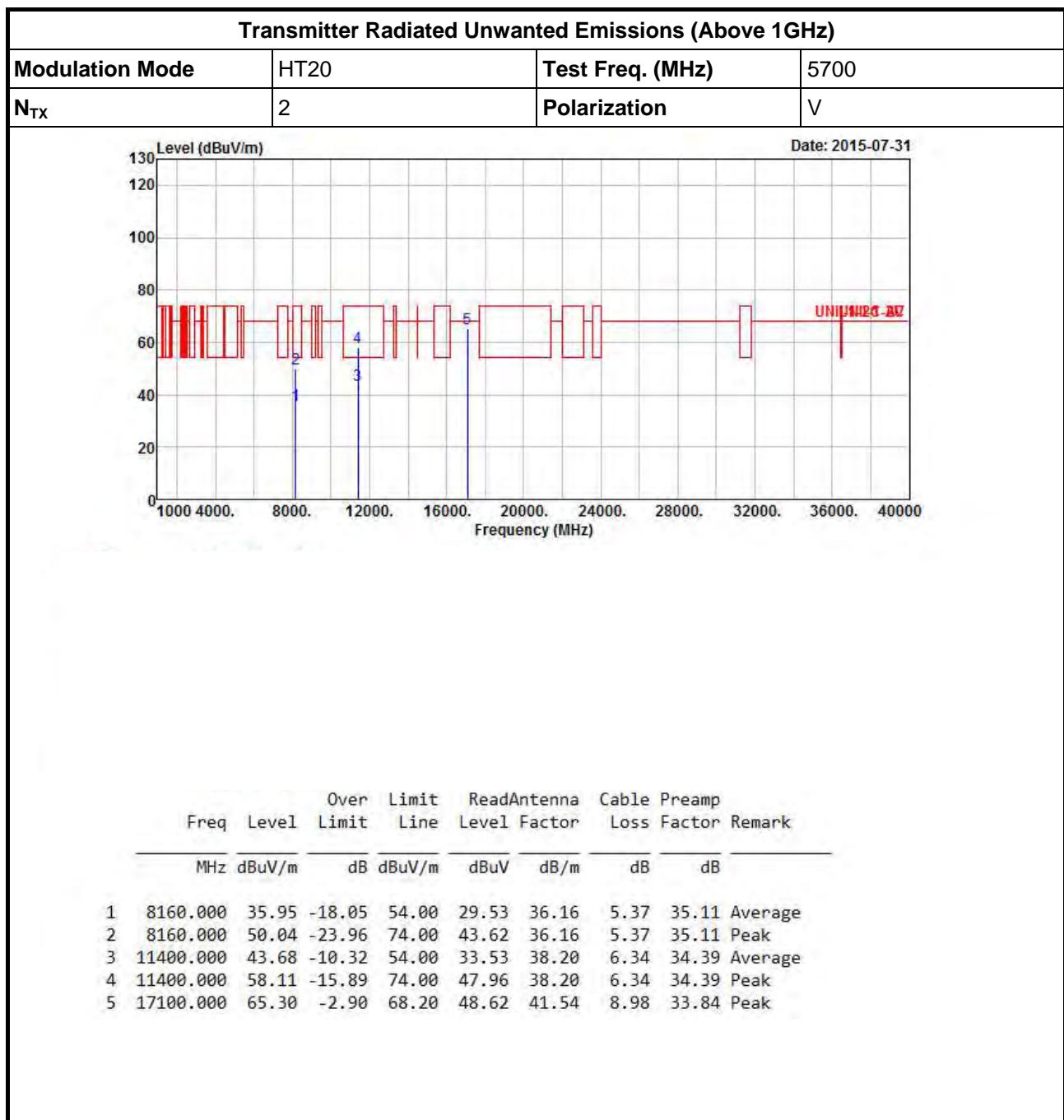
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



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

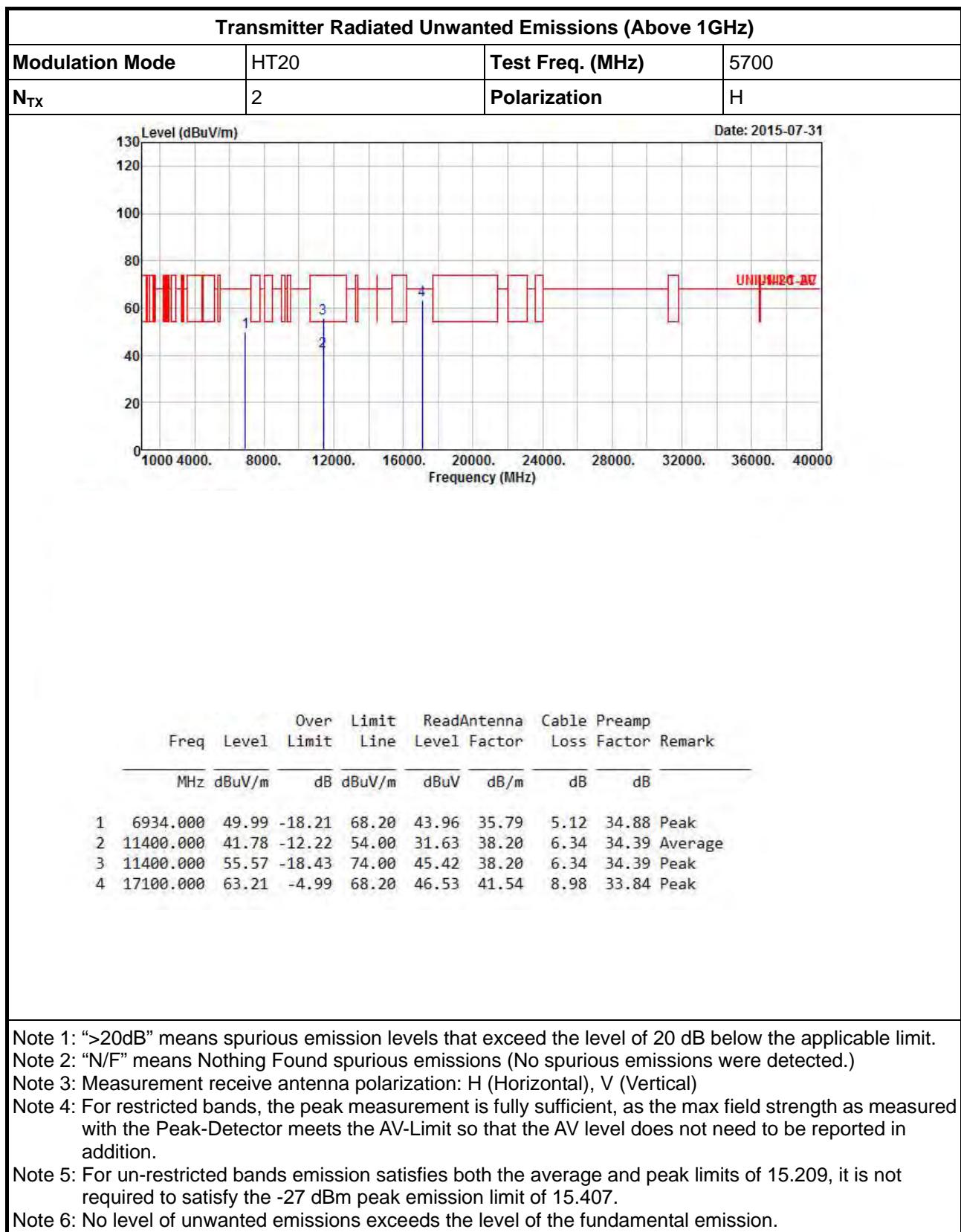
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

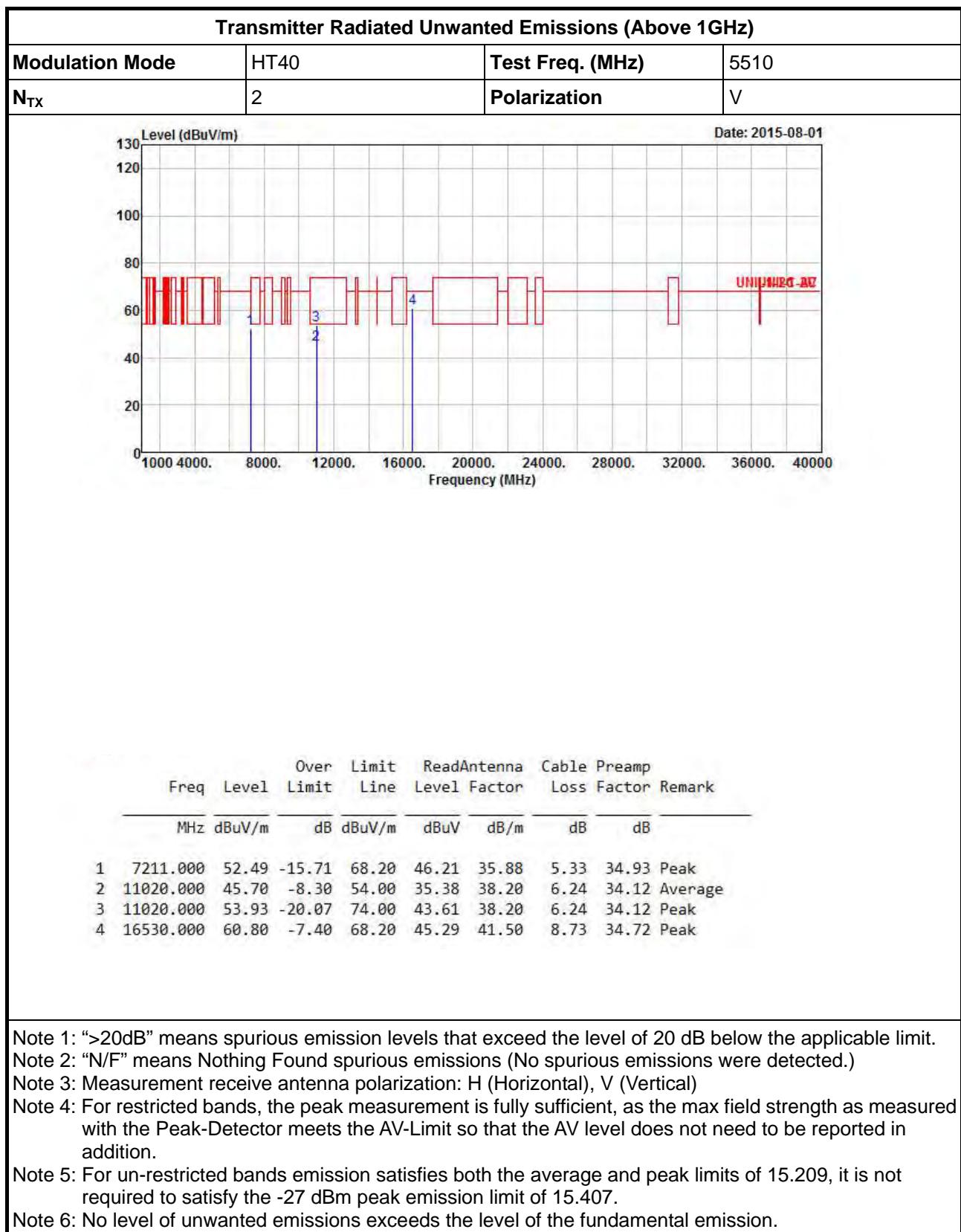
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

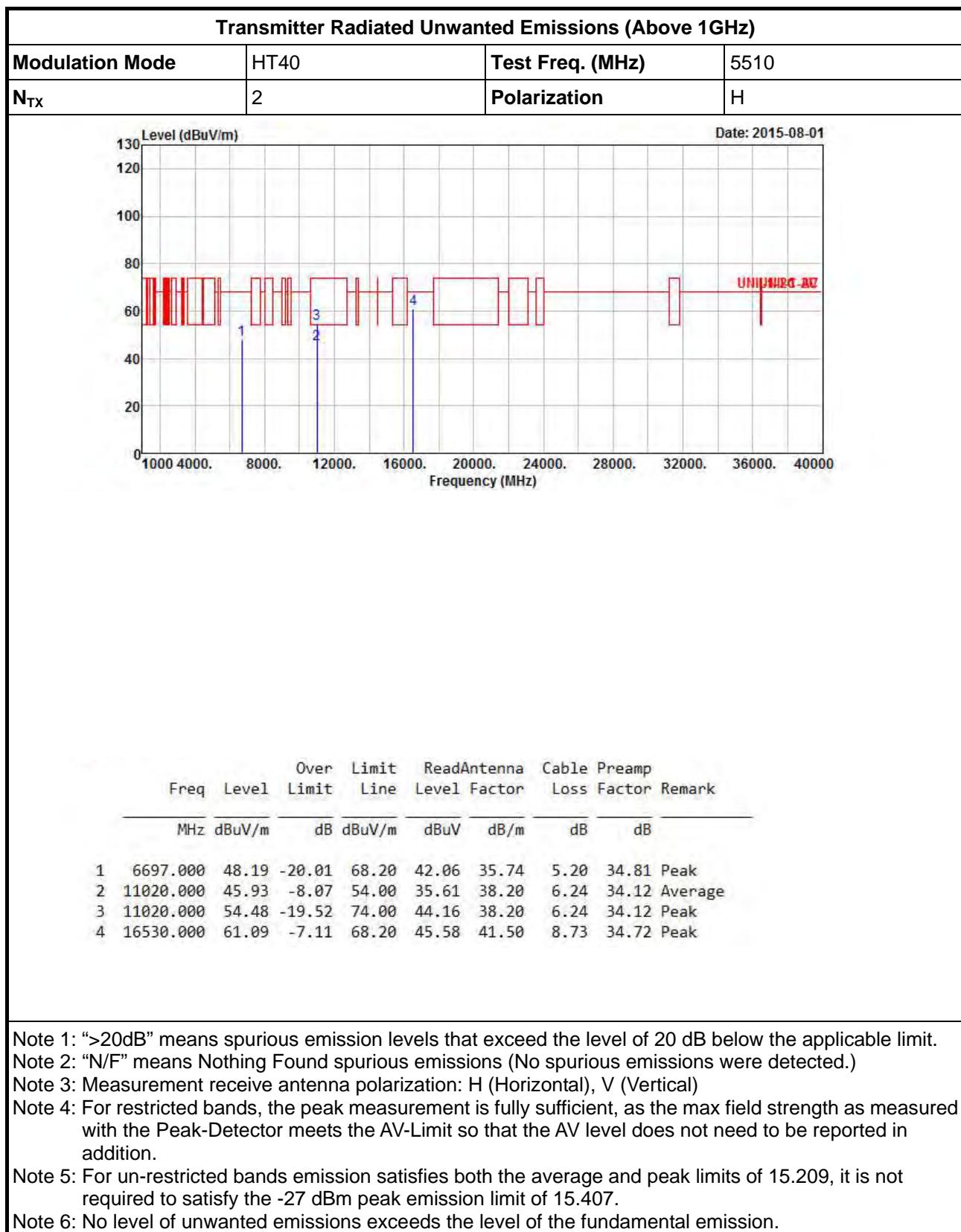
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

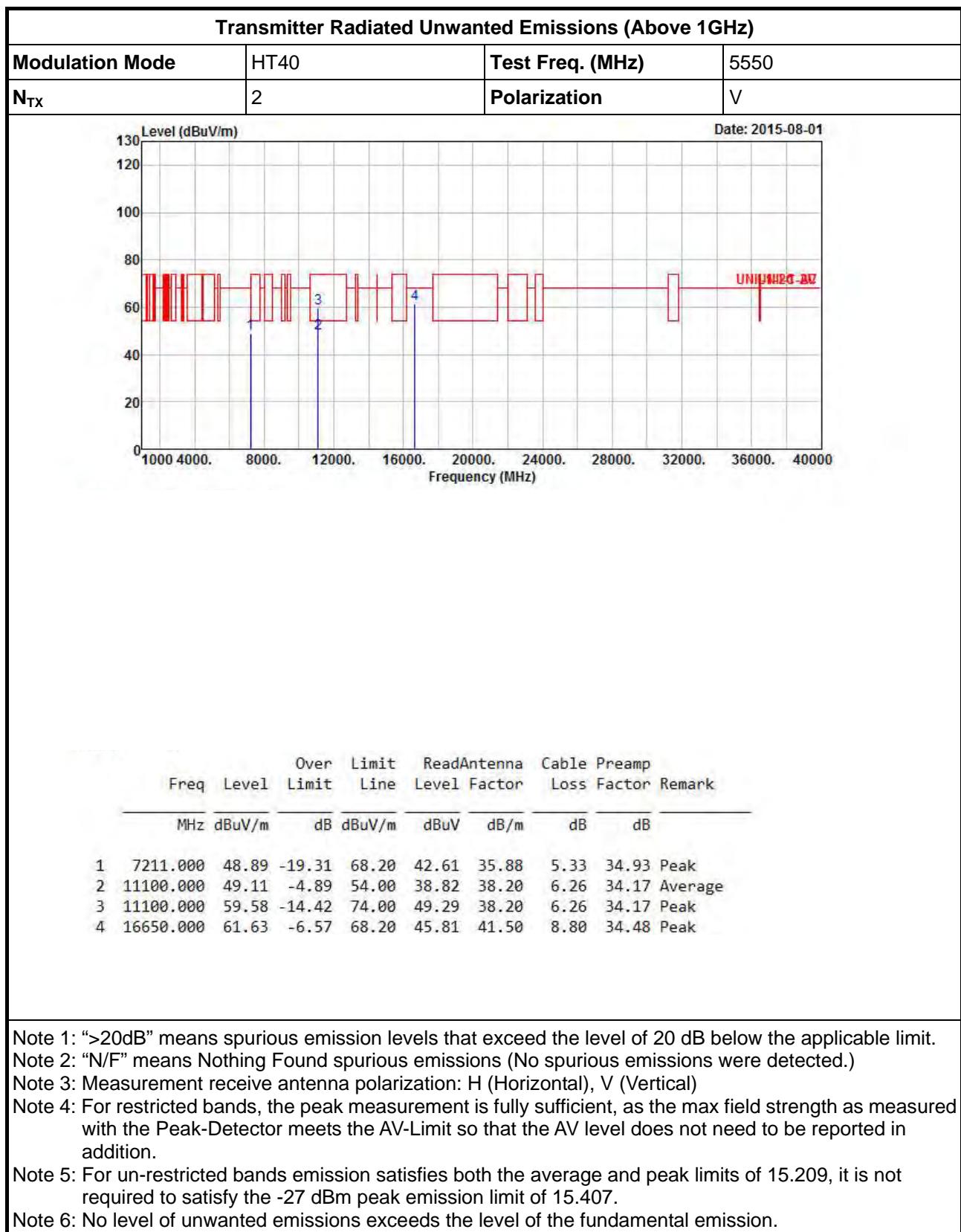
Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.









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

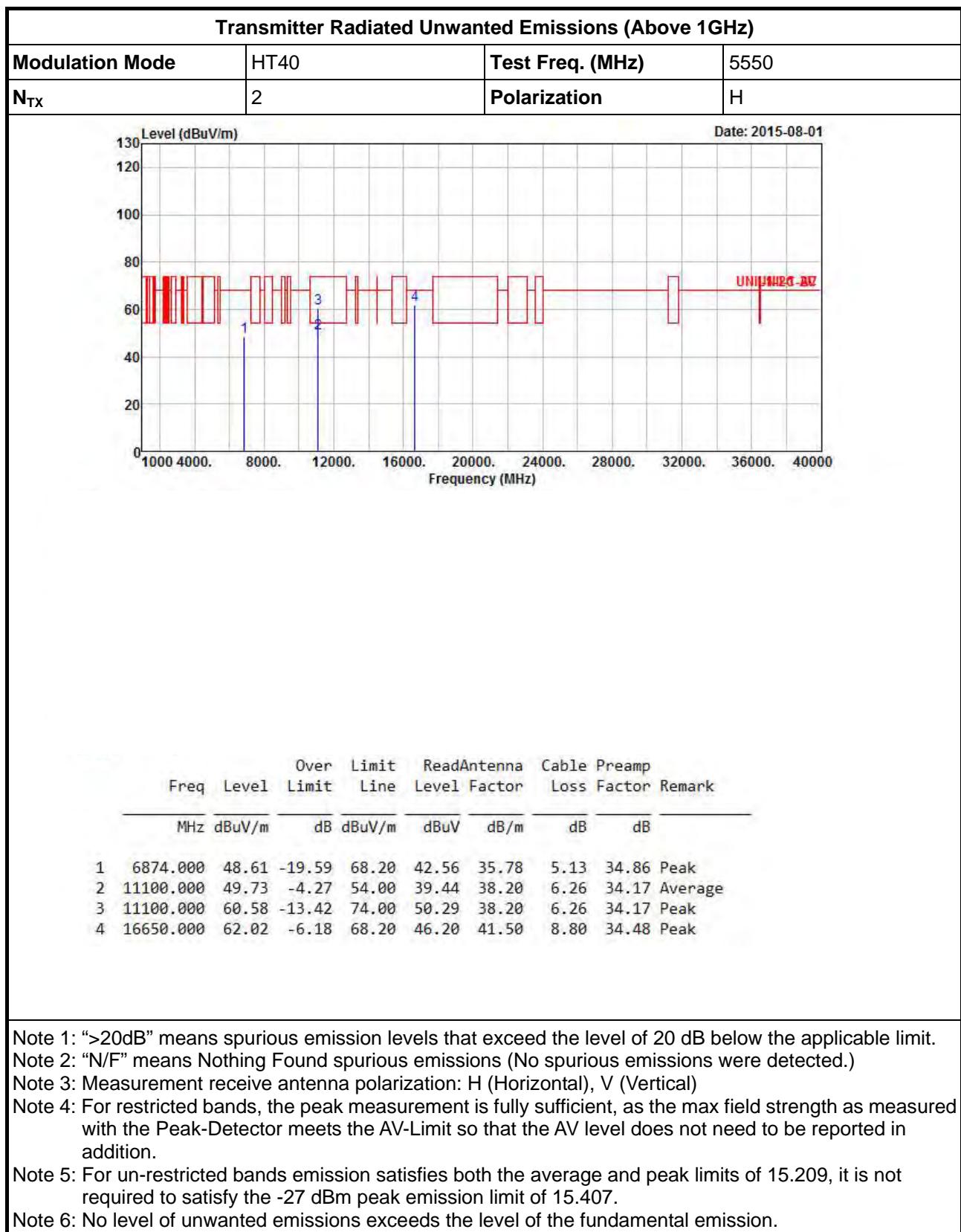
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

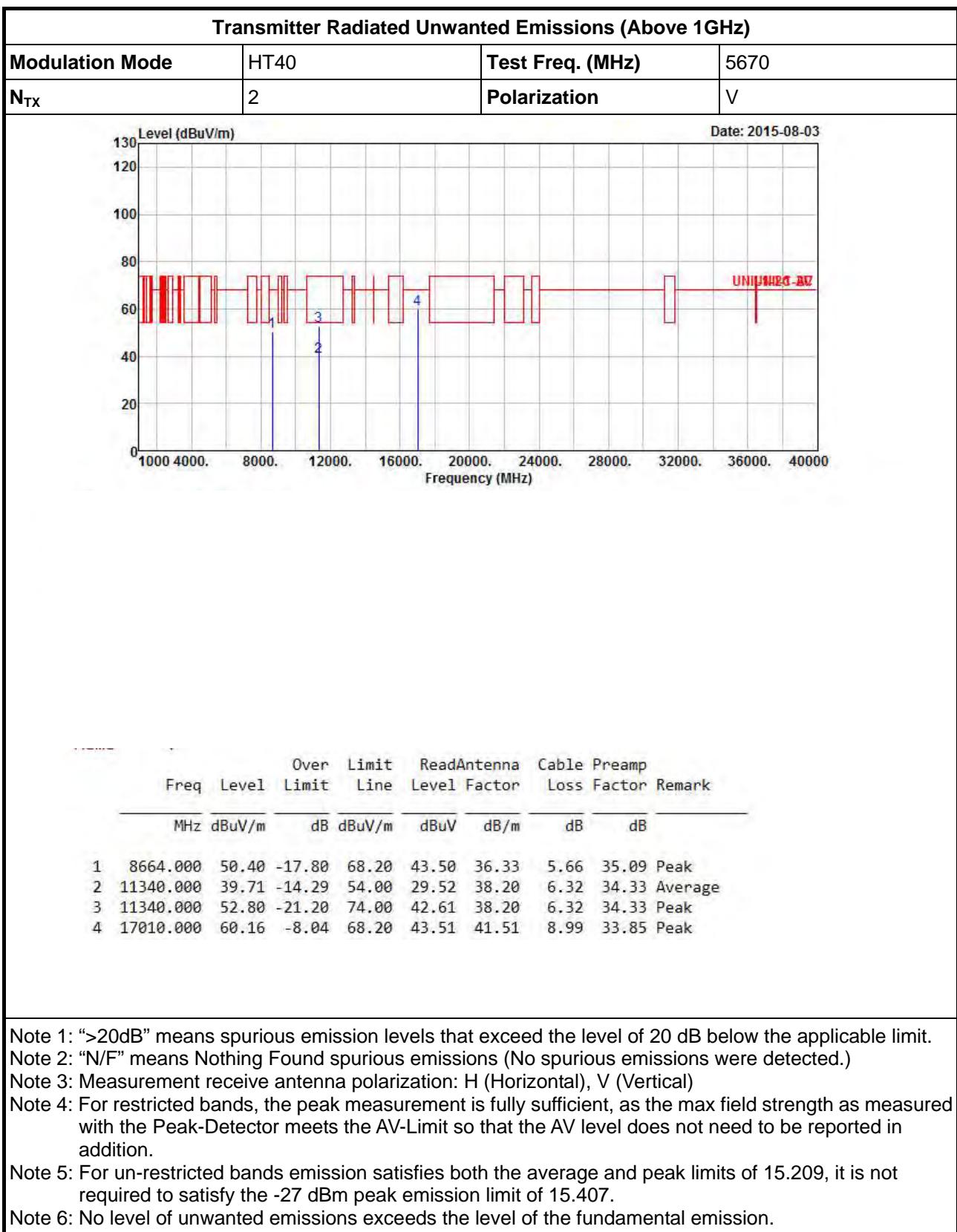
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

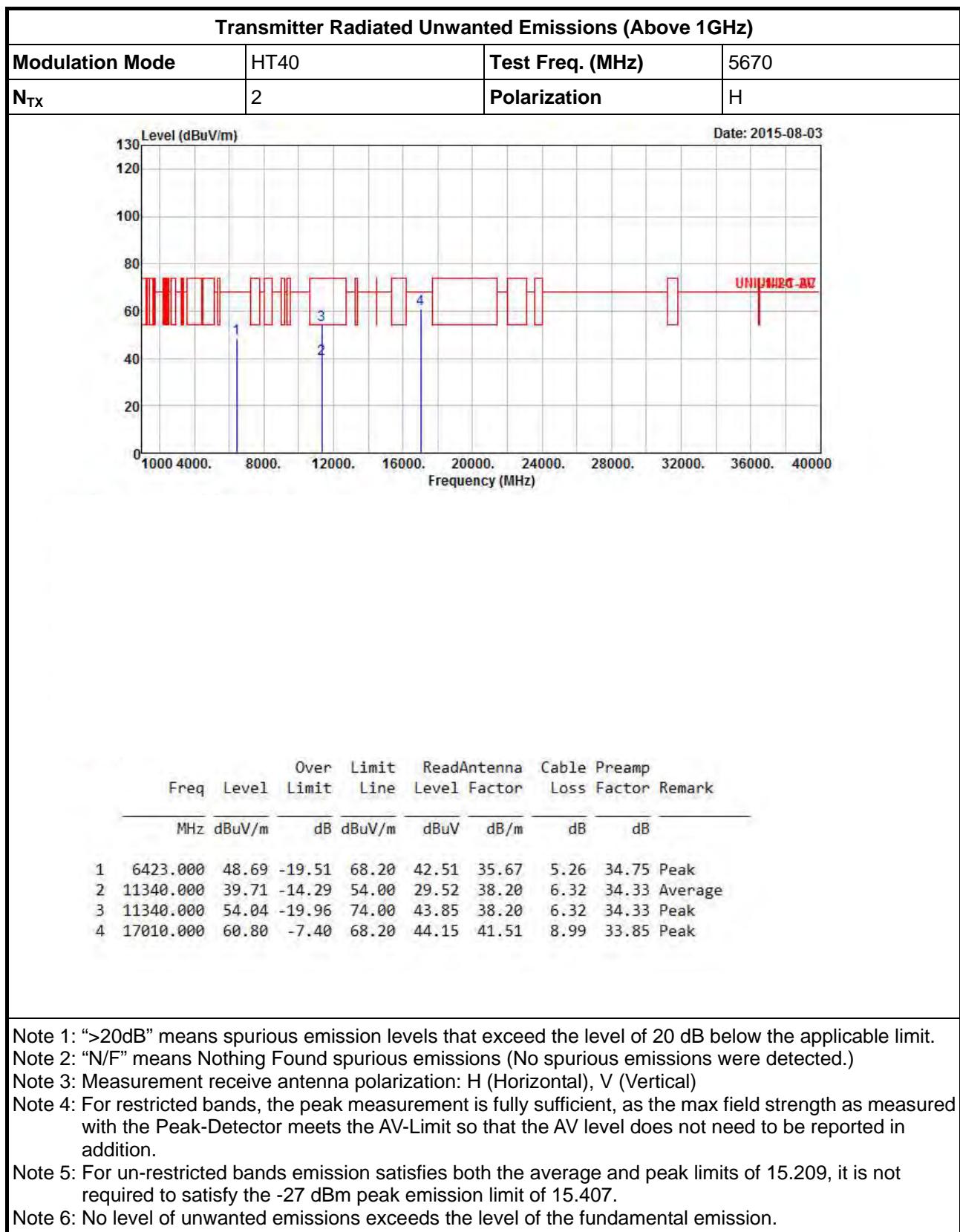
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

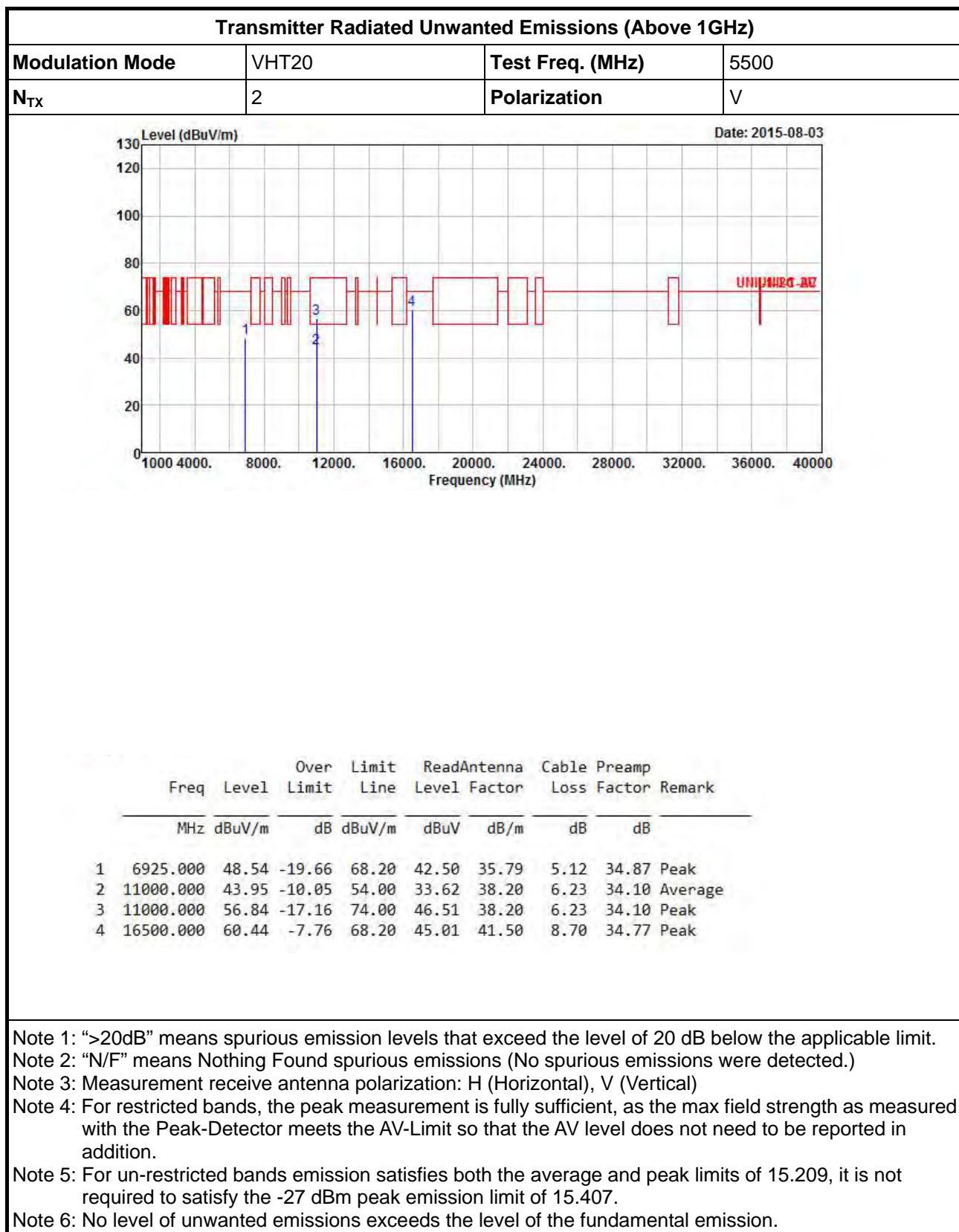
Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

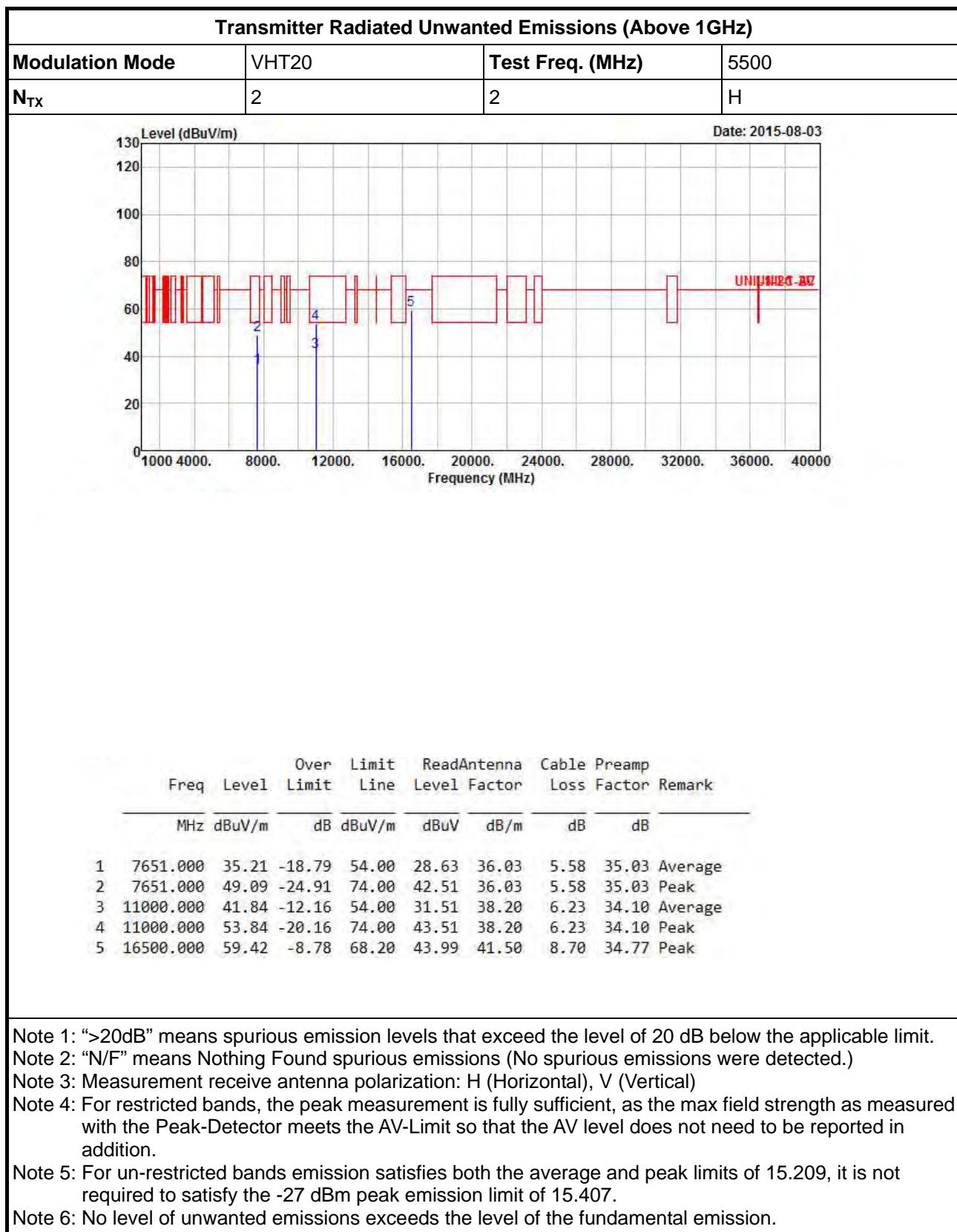
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

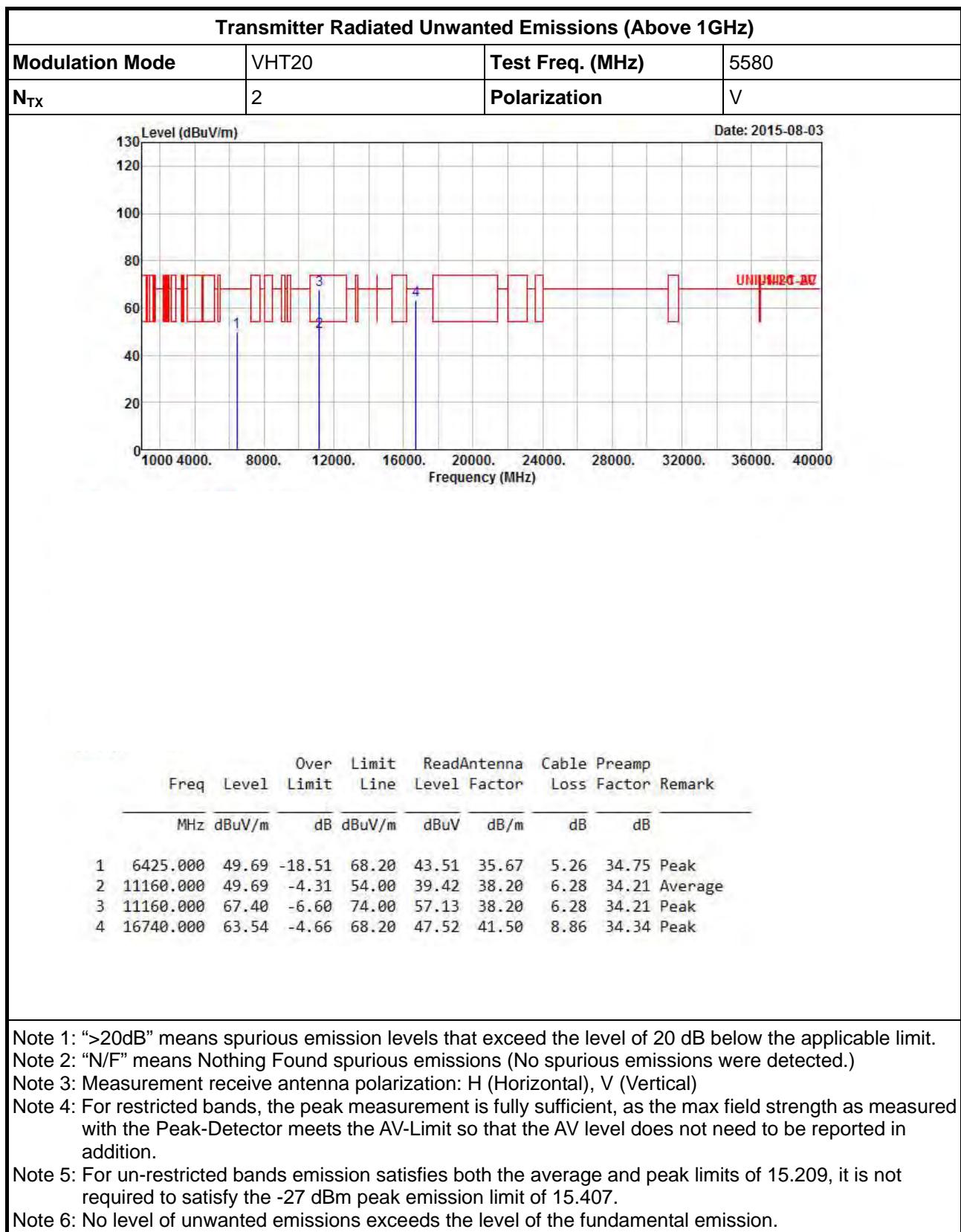


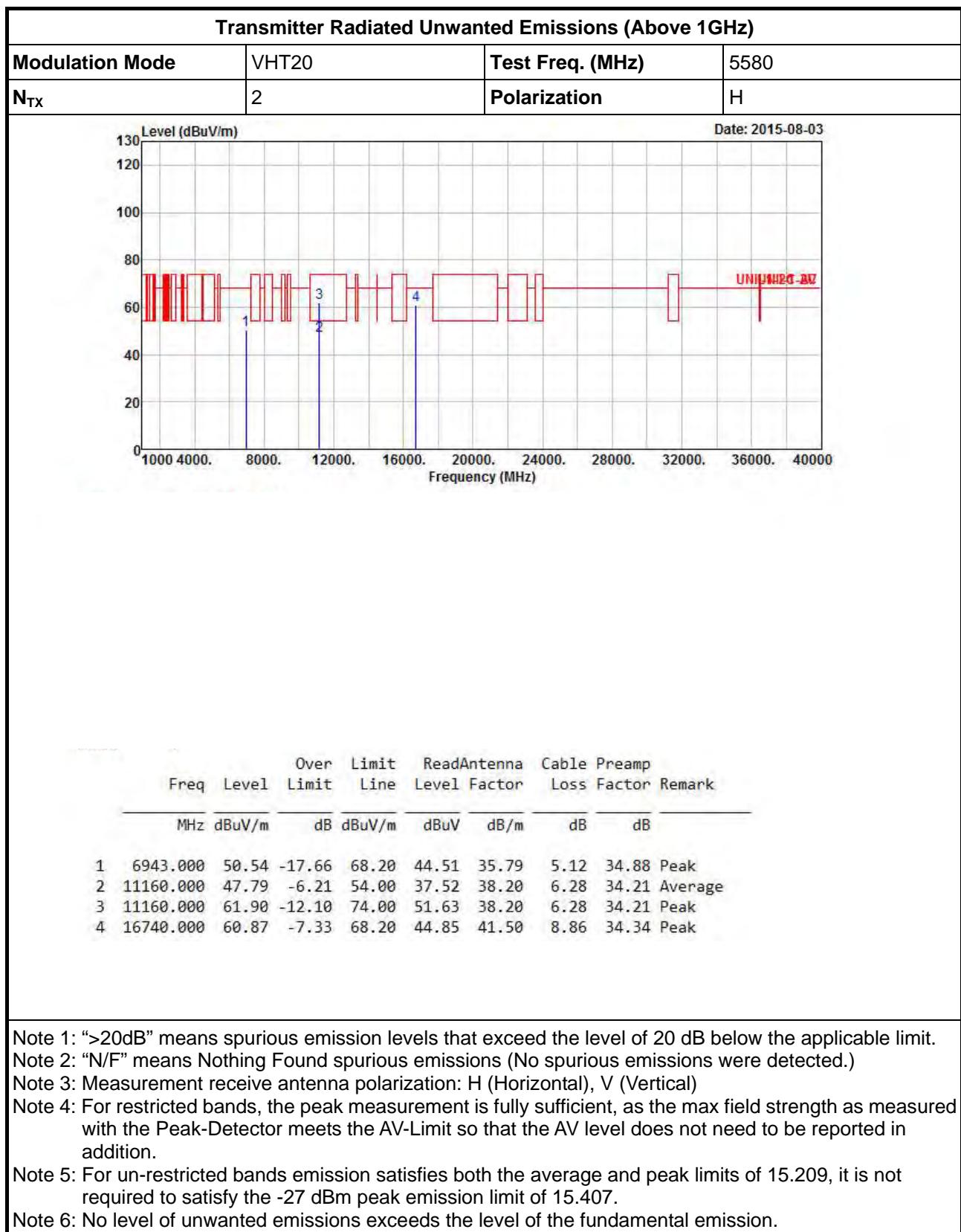


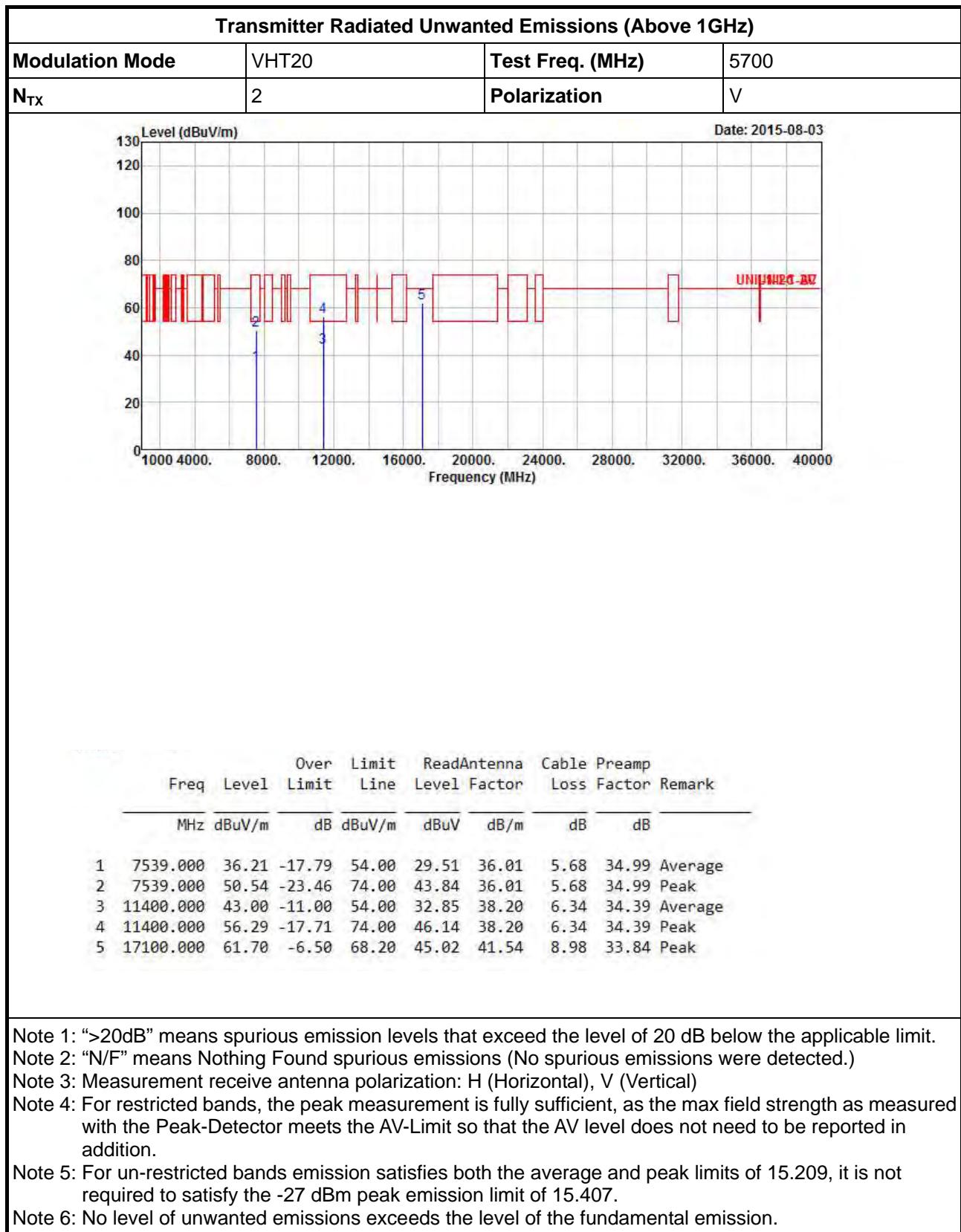












Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

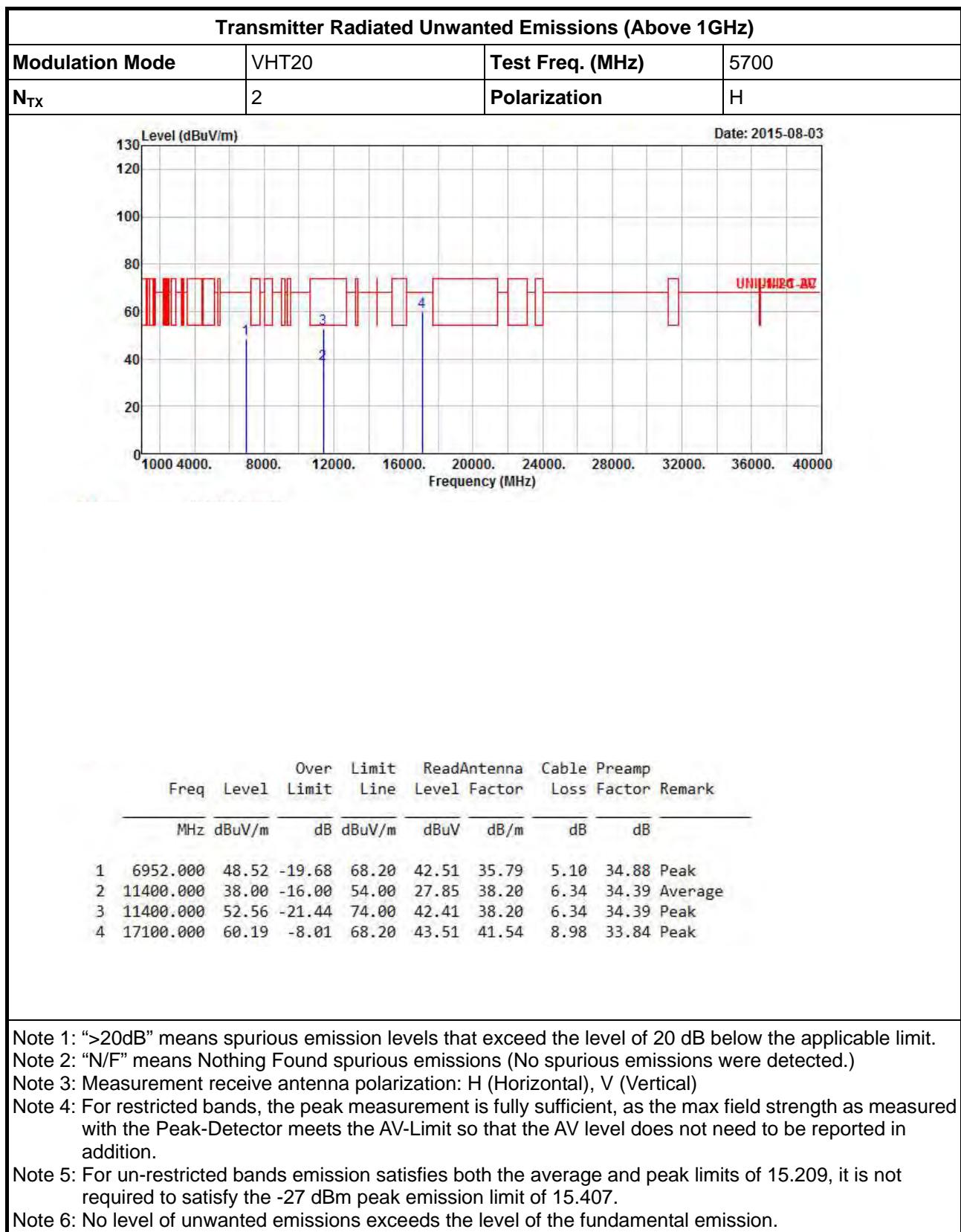
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

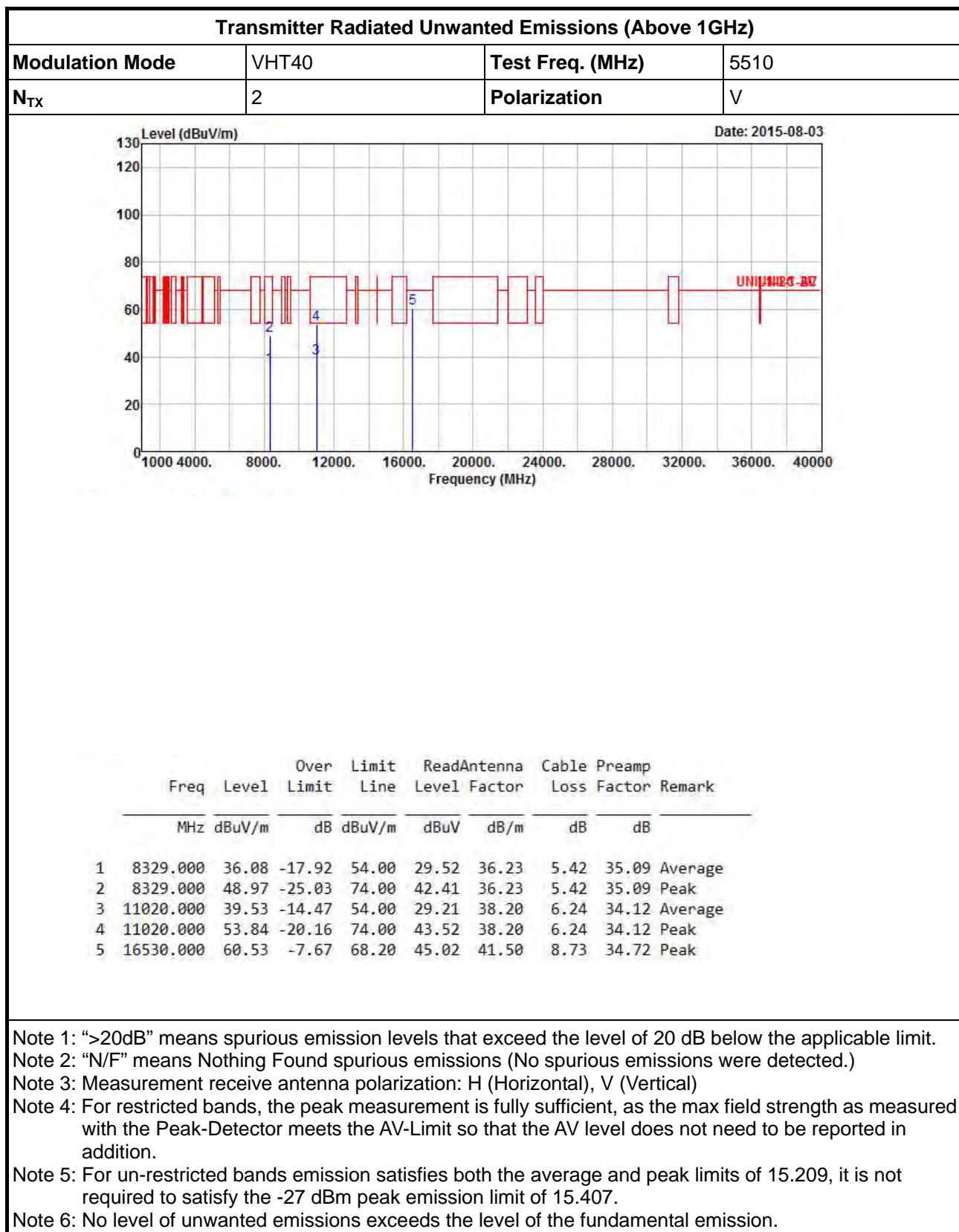
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

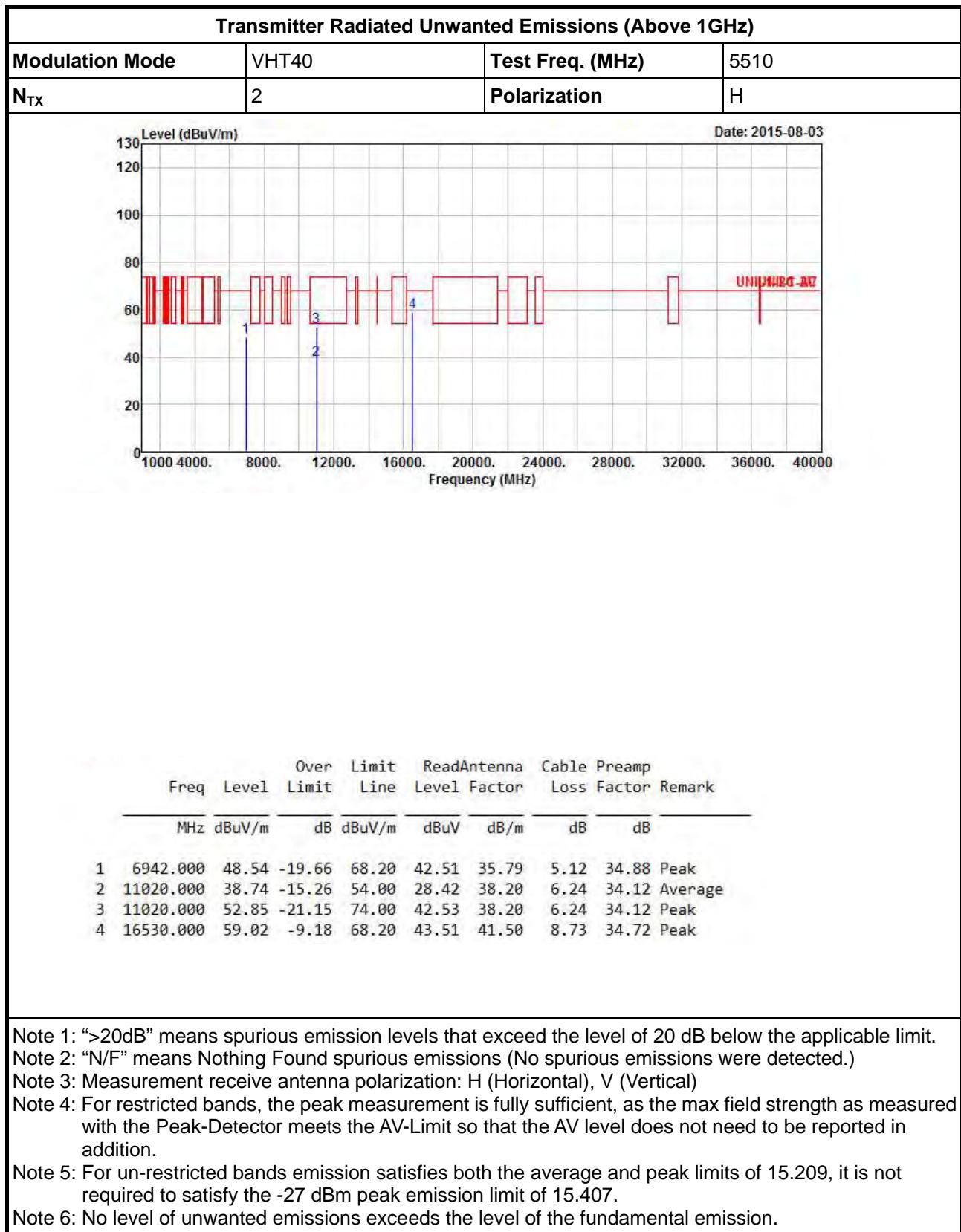
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

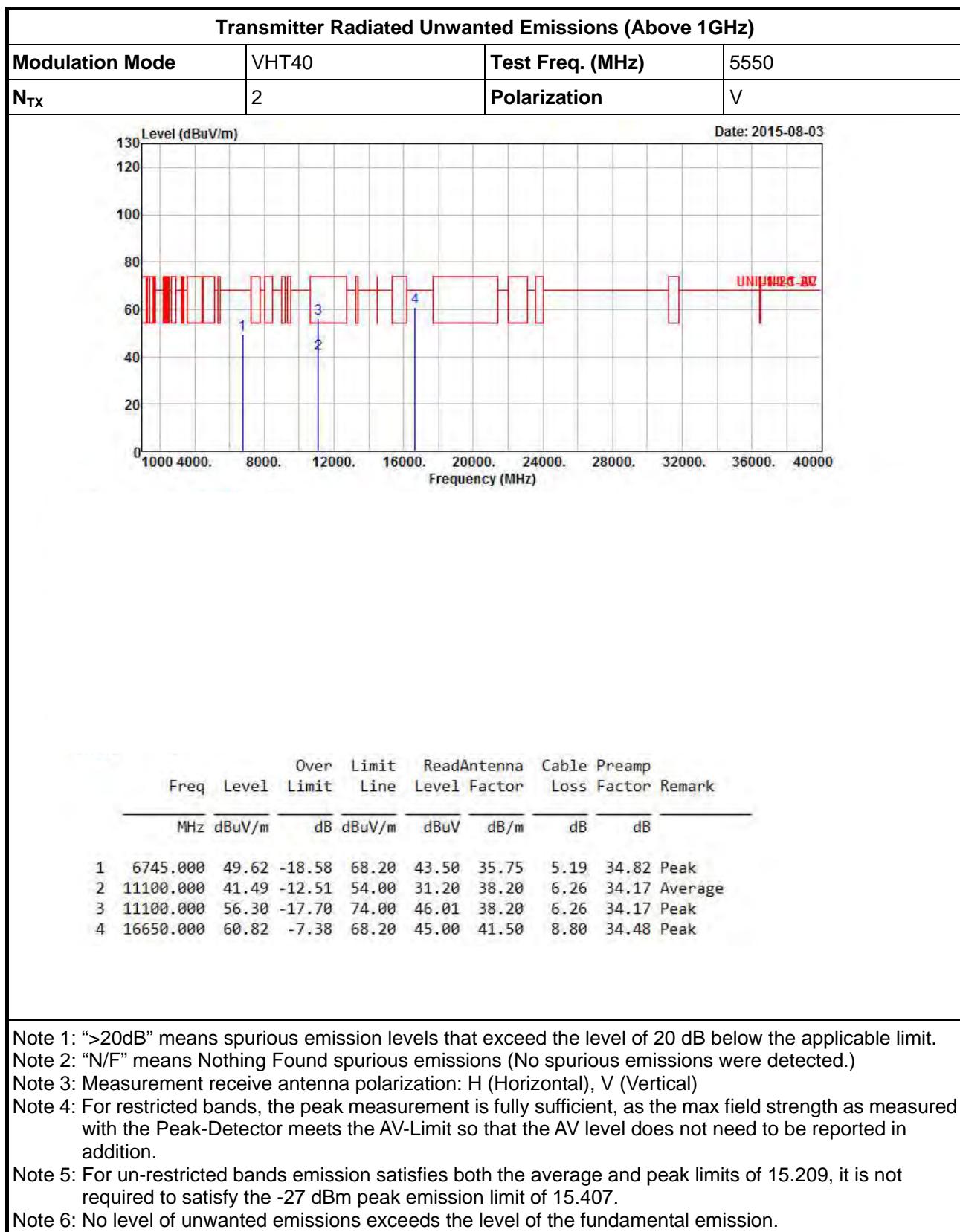
Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

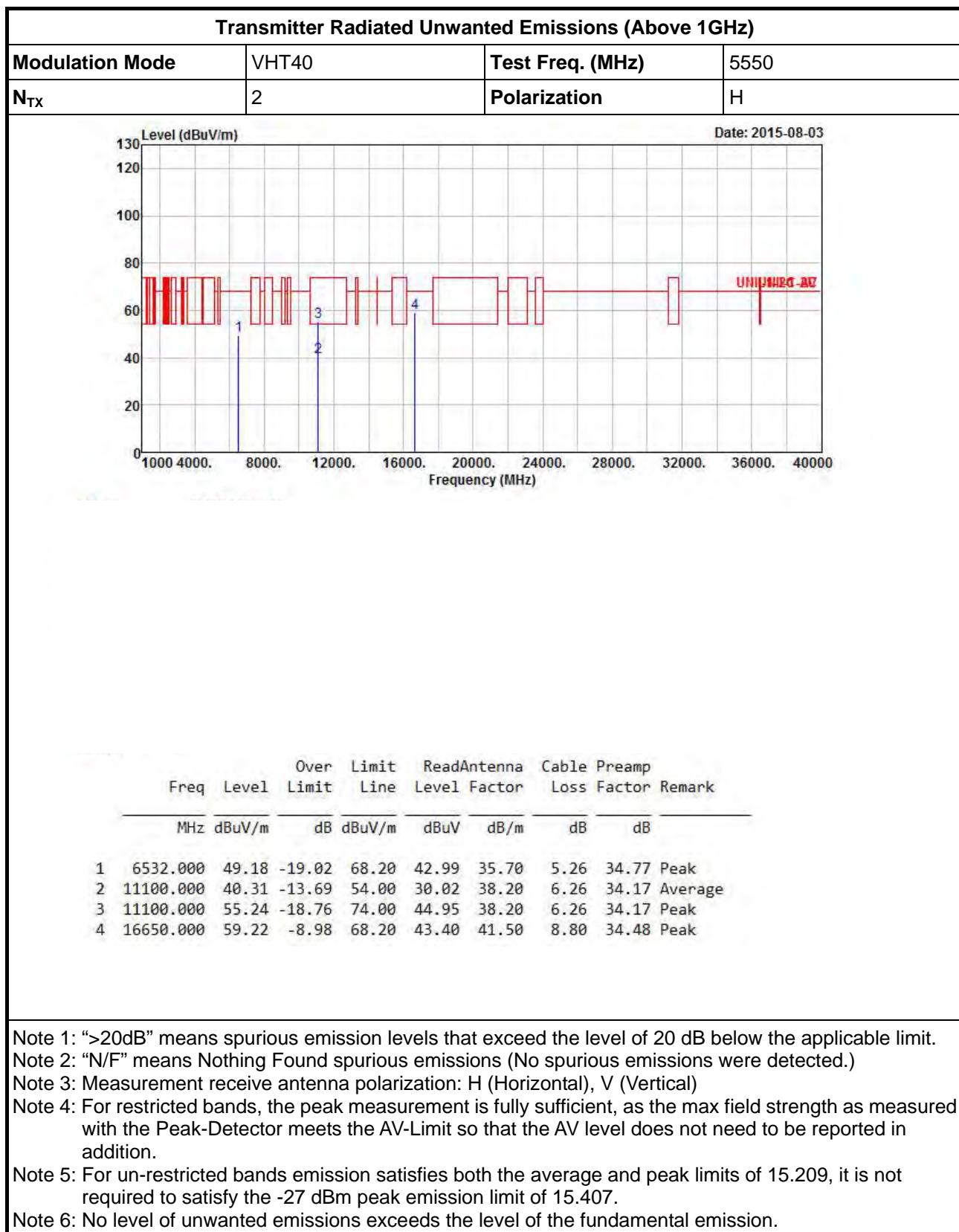
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

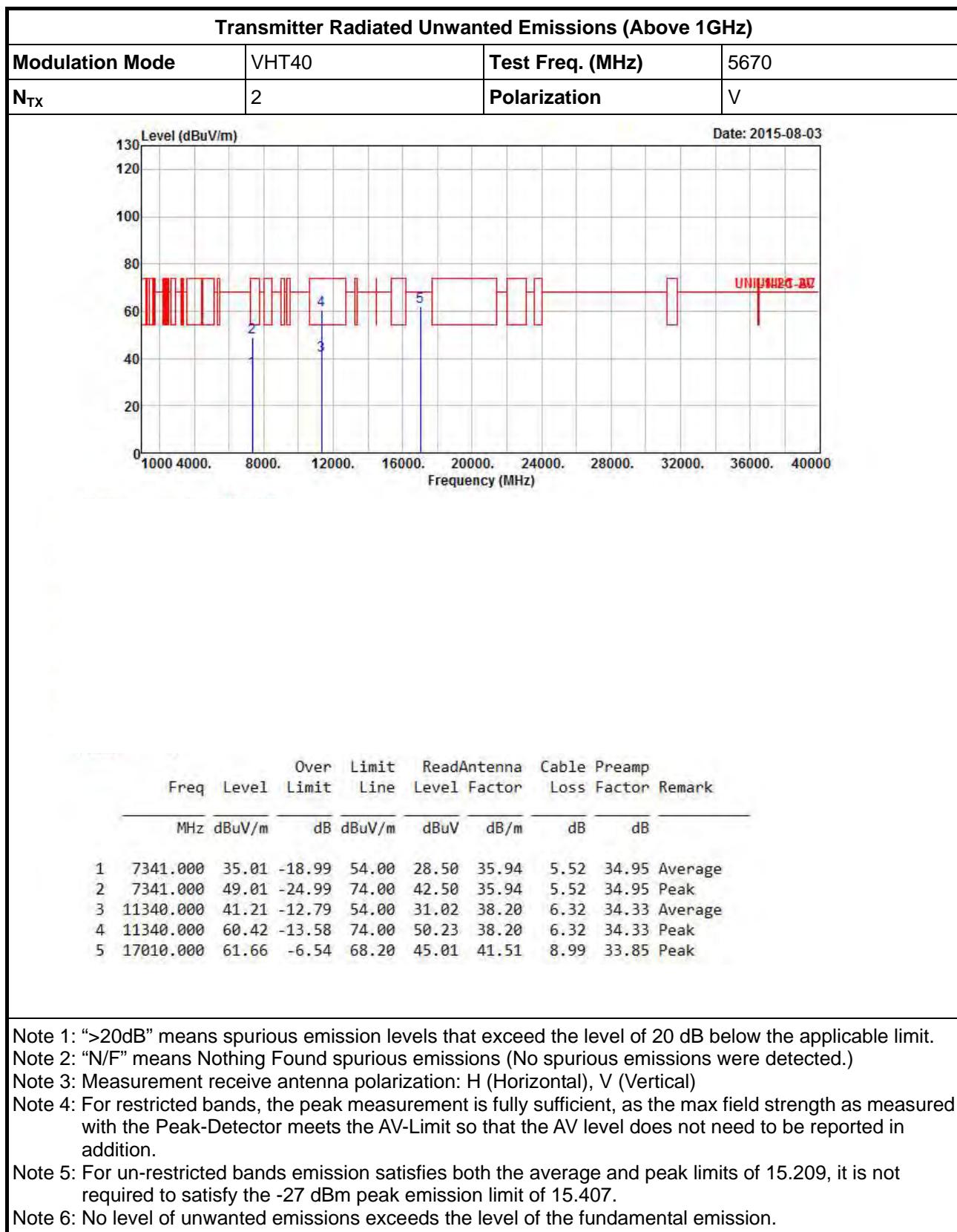


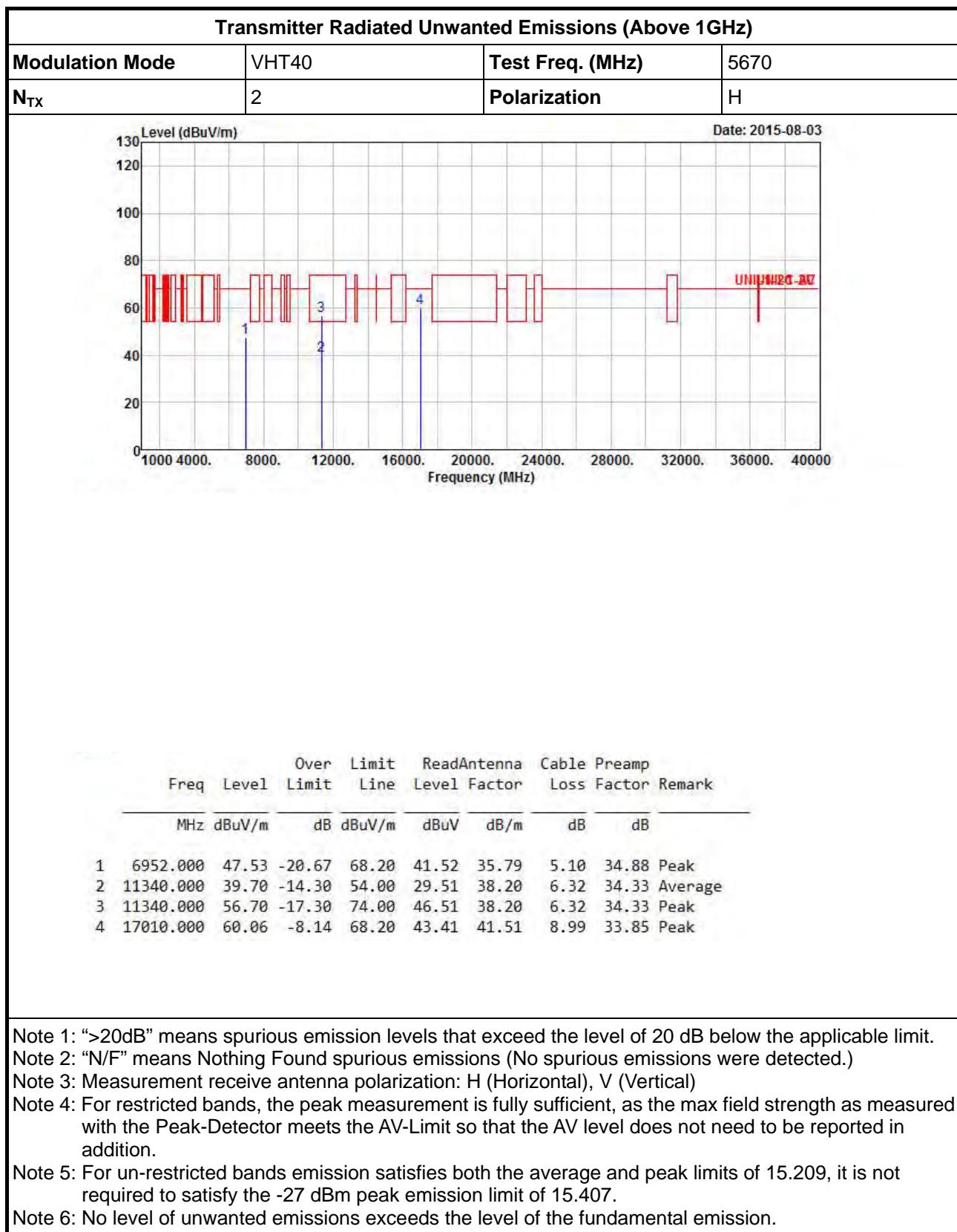


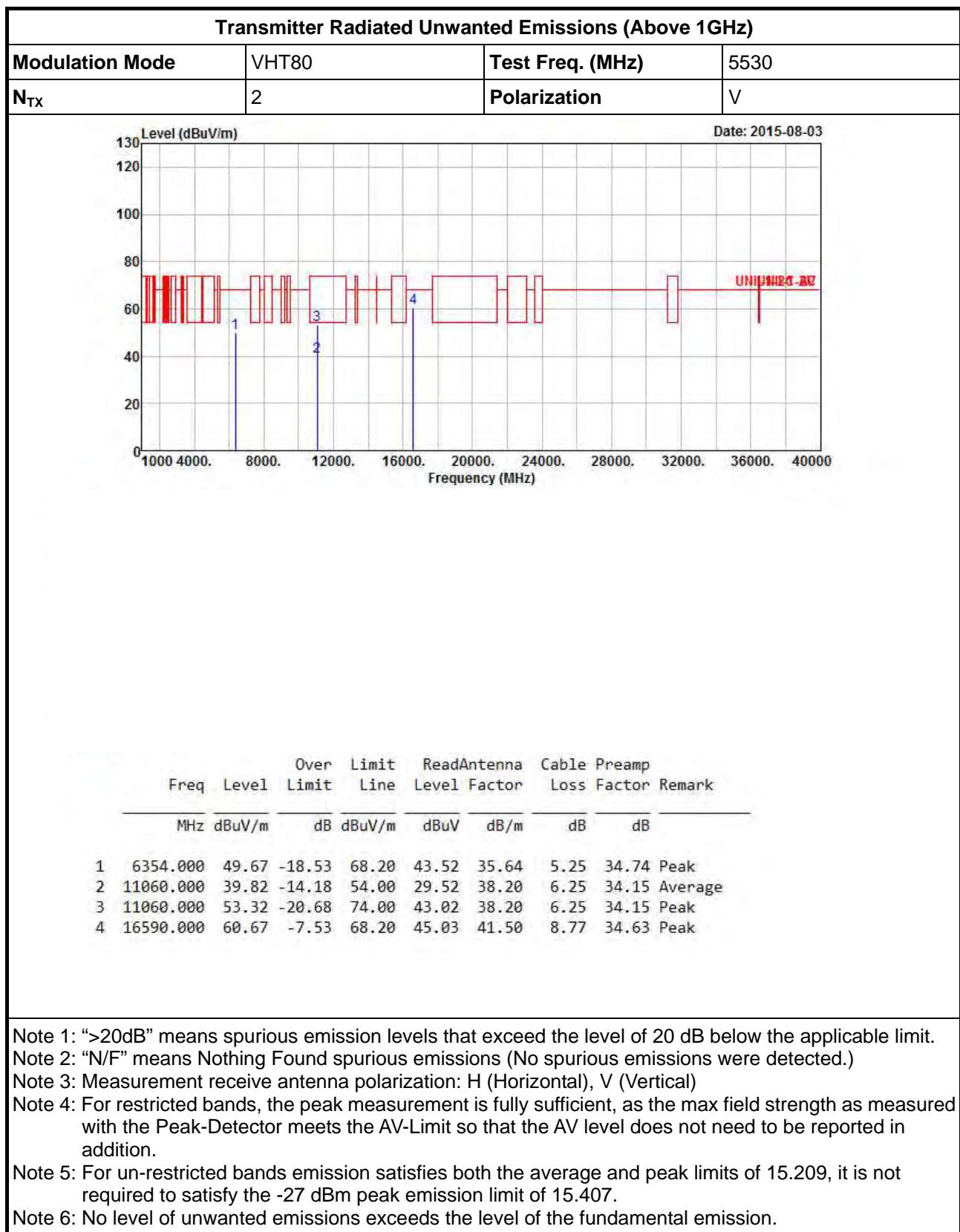












Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

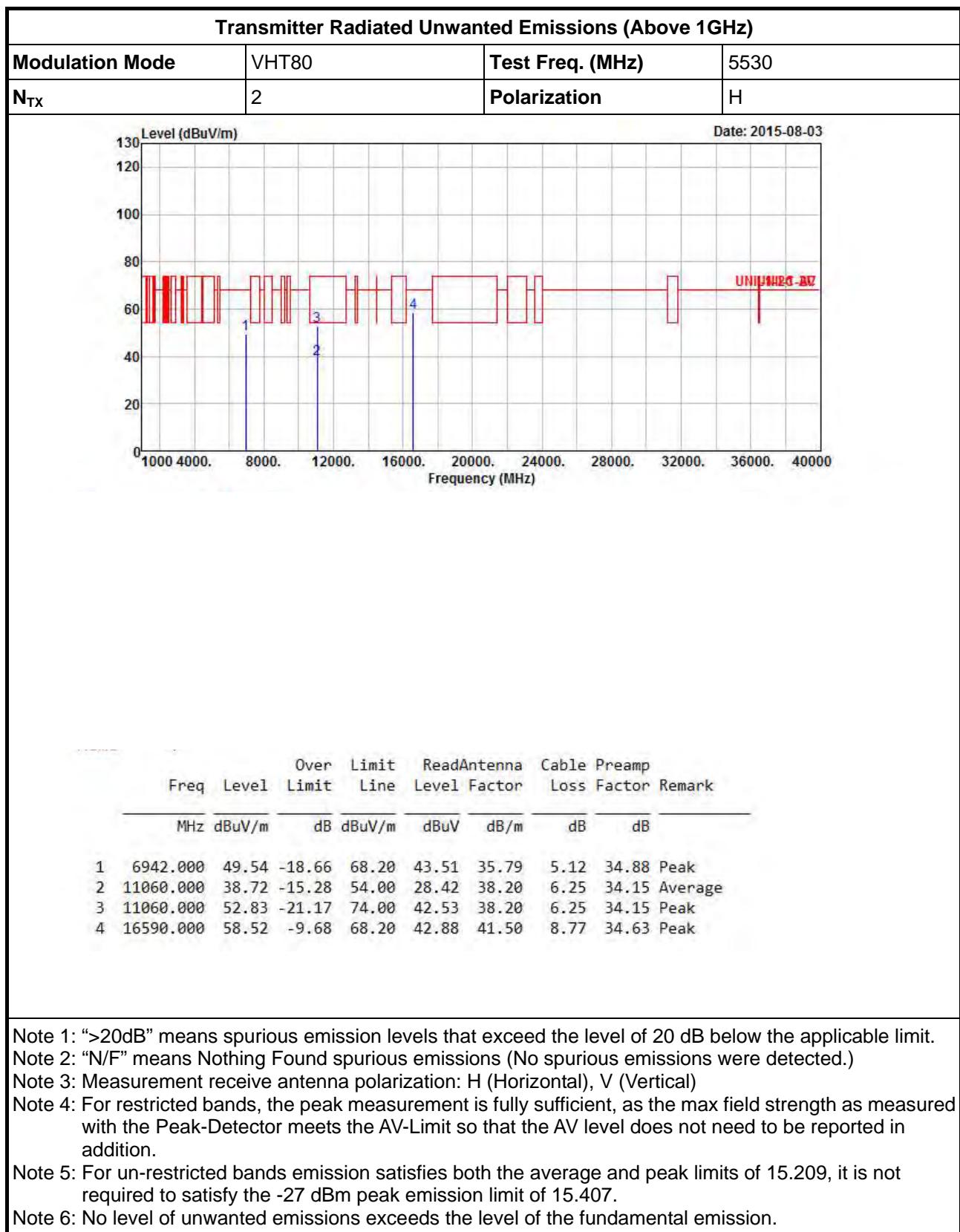
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

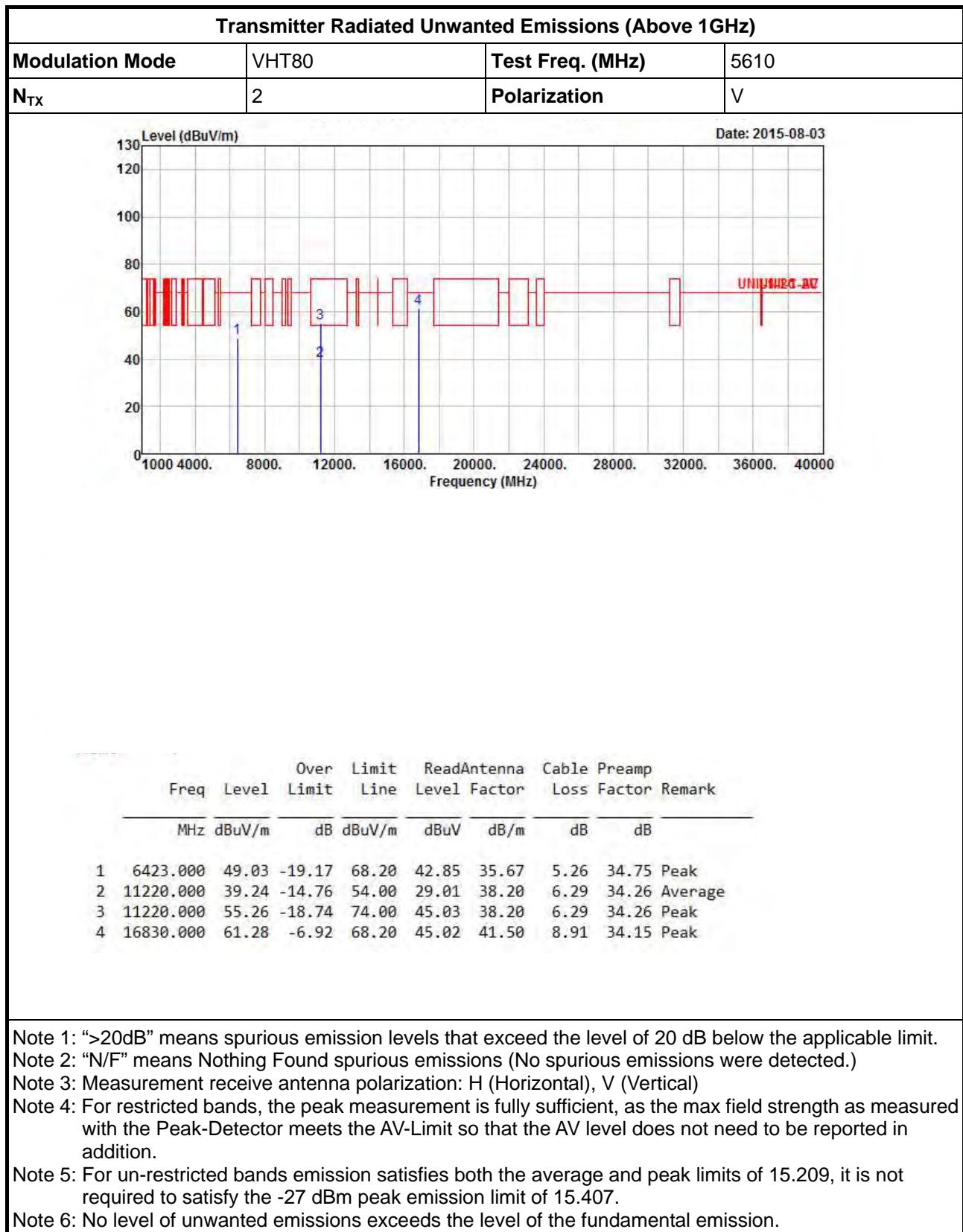
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

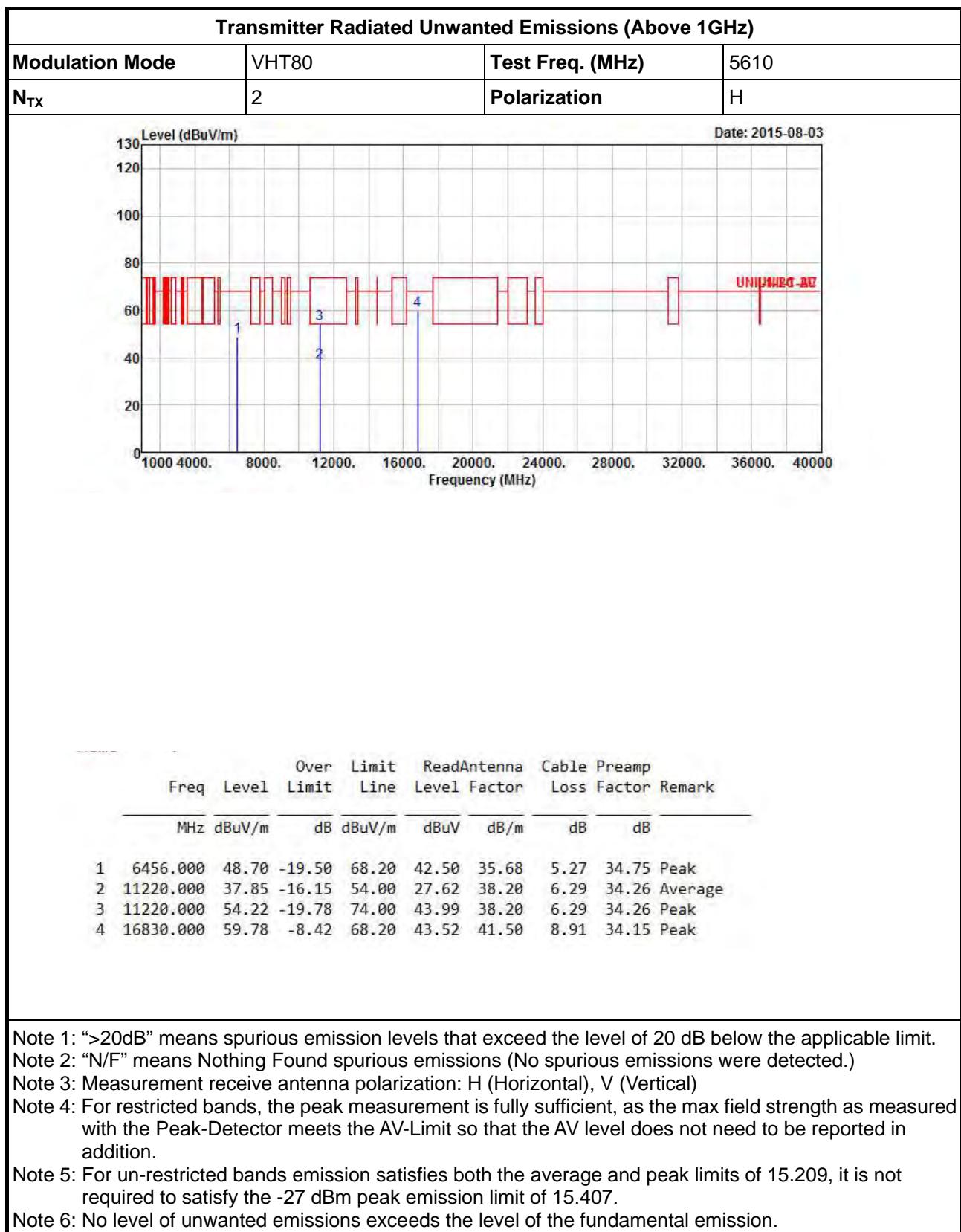
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.







3.7 Frequency Stability

3.7.1 Frequency Stability Limit

Frequency Stability Limit	
UNII Devices	
<input checked="" type="checkbox"/> In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.	
IEEE Std. 802.11n-2009	
<input checked="" type="checkbox"/> The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band.	

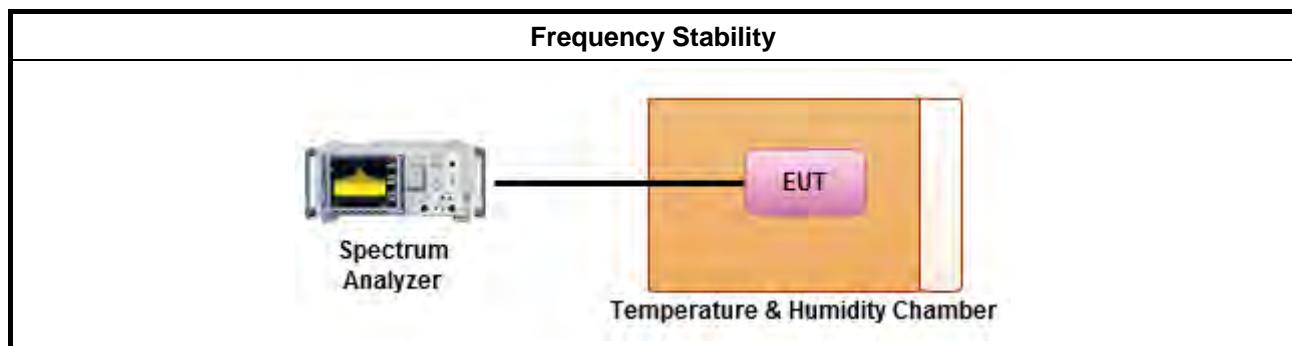
3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.8 for frequency stability tests
<input checked="" type="checkbox"/>	Frequency stability with respect to ambient temperature
<input checked="" type="checkbox"/>	Frequency stability when varying supply voltage
<input checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	For conducted measurements on devices with multiple transmit chains: Measurements need only to be performed on one of the active transmit chains (antenna outputs)
<input type="checkbox"/>	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.

3.7.4 Test Setup





3.7.5 Test Result of Frequency Stability

Frequency Stability Result					
Mode		Frequency Stability (ppm)			
Condition	Freq. (MHz)	0 min	2 min	5 min	10 min
T _{20°C} Vmax	5300	-2.5396	-2.7698	-2.5396	-2.7038
T _{20°C} Vmin	5300	-2.7698	-2.5396	-2.7038	-2.5396
T _{50°C} Vnom	5300	-7.6189	-7.6189	-7.6189	-7.6189
T _{40°C} Vnom	5300	-7.6189	-7.6189	-7.6189	-7.6189
T _{30°C} Vnom	5300	-5.0792	-5.2434	-5.3245	-5.2642
T _{20°C} Vnom	5300	-2.5396	-2.7038	-2.7698	-2.5396
T _{10°C} Vnom	5300	-0.3283	-0.2453	-0.3283	-0.3283
T _{0°C} Vnom	5300	3.6868	3.6038	3.3585	3.1943
T _{-10°C} Vnom	5300	7.3717	7.1264	6.9623	6.7170
T _{-20°C} Vnom	5300	6.5528	7.0453	6.5528	6.5528
Limit (ppm)		±20			
Result		Complied			

Note 1: Measure at 85 % [Vmin] and 115 % [Vmax] of the nominal voltage [Vnom].
Note 2: The nominal voltage refer test report clause 1.1.5 for EUT operational condition.



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, 2014	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 21, 2014	AC Conduction
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz ~ 30MHz	Apr. 21, 2014	AC Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	7.61183201e+012	9kHz ~ 30MHz	Oct. 30, 2014	AC Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	AC Conduction

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	101500	9KHz~40GHz	May 06, 2015	RF Conducted
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jun. 22, 2015	RF Conducted
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100°C	Apr. 07, 2015	RF Conducted
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jul. 28, 2015	RF Conducted

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Oct. 02, 2014	Radiation
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 03, 2015	Radiation
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 24, 2015	Radiation
Amplifier	Agilent	8449B	3008A02373	1GHz ~ 26.5GHz	Aug. 28, 2014	Radiation
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz ~ 18GHz	Nov. 28, 2014	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	Dec. 29, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 08, 2014	Radiation
RF Cable-high	SUHNER	SUCOFLEX106	MY17173/4	1GHz ~ 40GHz	Mar. 04, 2015	Radiation
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Sep 20, 2014	Radiation
Turn Table	Chaintek Instruments	3000	MF7802058	0~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF7802	MF780208205	1 ~ 4 m	N/A	Radiation

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	EMC INSTRUMENTS	EMC184045B	980192	18GHz ~ 40GHz	Aug. 25.2014	Radiation
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Feb. 02, 2015	Radiation

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