



FCC Test Report

Equipment : M904S
Brand Name : MtM
Model No. : M904S
FCC ID : 2AJ9P-M904S
Standard : 47 CFR FCC Part 15.247
RF Specification : Bluetooth LE
Frequency : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Applicant : MtM Technology Corporation
8F, 178 MinQuan East Road Section 3,Taipei,
Taiwan (R.O.C.)
Manufacturer : ASE Group.
No.26, Chin 3rd Rd., N.E.P.Z.,Nantze,
Kaohsiung, Taiwan

The product sample received on Apr. 29, 2016 and completely tested on Aug. 25, 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 EP. Photographs of EUT v01**



Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.3	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.48MHz 27.51 (Margin 28.85dB) - QP 22.16 (Margin 24.20dB) - AV	FCC 15.207	Complied
3.2	15.247(a)	DTS Bandwidth	Refer as Appendix A	$\geq 500\text{kHz}$	Complied
3.3	15.247(b)	Fundamental Emission Output Power	Refer as Appendix B	Power [dBm]:30	Complied
3.4	15.247(e)	Power Spectral Density	Refer as Appendix C	PSD [dBm/3kHz]:8	Complied
3.5	15.247(d)	Test Result of Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2528.384 MHz: 33.76 dB Restricted Bands [dBuV/m at 3m]: 2490.172 MHz 64.27 (Margin 9.73 dB) - PK 46.00 (Margin 8.00 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]: 4960 MHz 48.16 (Margin 5.84dB) - AV 57.88 (Margin 16.12dB) - PK	Non-Restricted Bands:> 20 dBc Restricted Bands: FCC 15.209	Complied



Revision History



1 General Description

1.1 Information

1.1.1 Product Details

The difference between the report no. : N/A	
The Difference	N/A

Evaluated Test Items	N/A
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1.1.2 RF General Information

Band	Mode	BWch (MHz)	Nss-Min	Nant
2.4G	BT-LE	1	1	1

Note:

- 2.4G is the 2.4GHz Band (2.4-2.4835GHz).
- Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs.

1.1.3 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 checked="" type="checkbox"/>	External antenna (dedicated antennas)
	<input checked="" type="checkbox"/> Single power level with corresponding antenna(s).
	<input type="checkbox"/> Multiple power level and corresponding antenna(s).
	<input type="checkbox"/> RF connector provided
	<input 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)	Connector	Model No.
1	Integral	PIFA	2	I-Pex	001-0014
2	External	Dipole	1.8	RP-SMA(M)	GW26.0151



1.1.4 Type of EUT

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

1.1.5 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"/> 69.6% - test mode single channel – LE	1.57

1.1.6 EUT Operational Condition

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

1.1.7 EUT Operate Information

Items	Description		
Operate Condition	<input checked="" type="checkbox"/>	Point-to-multipoint (P2M)	<input type="checkbox"/> Point-to-point (P2P)



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

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	TEL :	886-3-327-3456	FAX : 886-3-327-6973
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Jeo	26°C / 57%	25/08/2016
RF Conducted	TH01-HY	Gary	23.5°C / 62%	12/08/2016
Radiated	03CH03-HY	Streak	23.6°C / 57%	19/08/2016

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			
Bluetooth Version	Transmit Chains (N_{TX})	Data Rate	Modulation Mode
LE	1	1 Mbps	LE-1Mbps

Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.
Note 2: Modulation modes consist below configuration:
DSSS LE-1Mbps: GFSK (1Mbps)

2.2 Test Channel Mode

Test Software Version		nFRgo Studio V1.17.0.3211					
Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Power Setting
2.4G	LE-1Mbps	20	1	1	2402	L	Default
2.4G	LE-1Mbps	20	1	1	2440	M	Default
2.4G	LE-1Mbps	20	1	1	2480	H	Default

Abbreviation Explanation

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Test Cond.	Abbreviation
2.4G	BT-LE,	1	1	1	2402	L	TN,VN	2.4G;BT-LE;1;1;1;2402;TN,VN

Note:

- ◆ Test range channel consist of L (Low Ch.), M (Middle Ch.), H (High Ch.), S (Single Ch.).



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	PIFA Ant. Mode
2	Dipole 1 Ant. Mode
3	Dipole 2 Ant. 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						
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.						
Operating Mode < 1GHz	<input checked="" type="checkbox"/> 1. PIFA Ant. Mode <input checked="" type="checkbox"/> 2. Dipole 1 Ant. Mode <input checked="" type="checkbox"/> 3. Dipole 2 Ant. Mode						
Orthogonal Planes of EUT	<table><thead><tr><th>X Plane</th><th>Y Plane</th><th>Z Plane</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table>	X Plane	Y Plane	Z Plane			
X Plane	Y Plane	Z Plane					
Worst Planes of EUT	V						
Worst Planes of Ant. (PIFA)	V						
Worst Planes of Ant. (Dipole 1)							
Worst Planes of Ant. (Dipole 2)	V						



2.4 Support Equipment

Support Equipment –AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Test Fixture	-	-	-
2	AC Adapter for Test fixture	ECOPAC	3A-181WP05A	-

Note: Support equipment No.1 was provided by customer.

Support Equipment –Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Test Fixture	-	-	-
2	AC Adapter for Test fixture	ECOPAC	3A-181WP05A	-

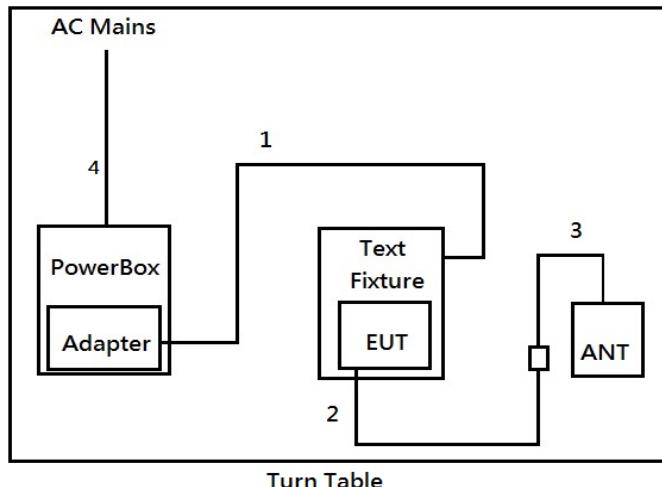
Note: Support equipment No.1 was provided by customer.

Support Equipment - RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Test Fixture	-	-	-
2	Notebook	Lenovo	-	-
3	AC Adapter for Notebook	Lenovo	-	-

Note: Support equipment No.1 was provided by customer.

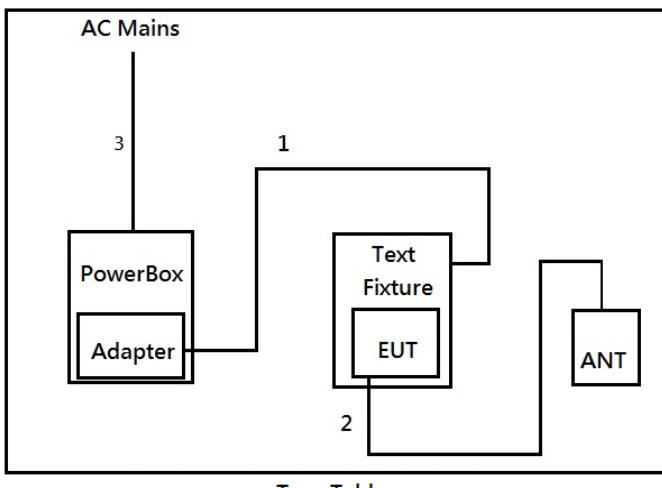
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test (Mode 1)

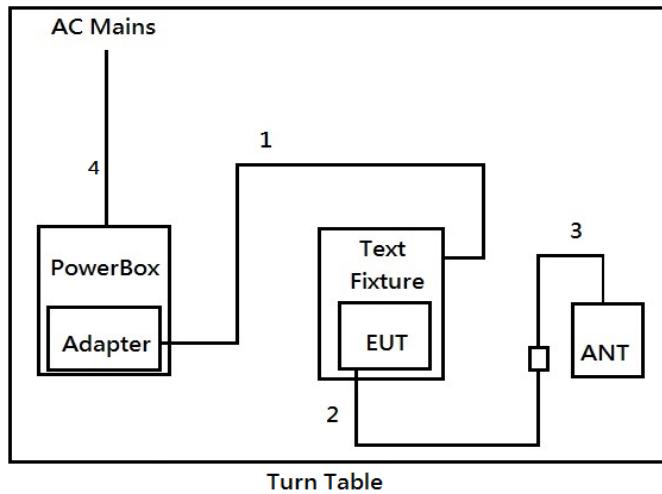


1. DC power line , 1m , Non-shielding
2. RF cable line , 0.28m , Non-shielding
3. RF cable line , 0.1m , Non-shielding
4. AC power line , 1.8m , Non-shielding

Test Setup Diagram – AC Line Conducted Emission Test (Mode 2, 3)

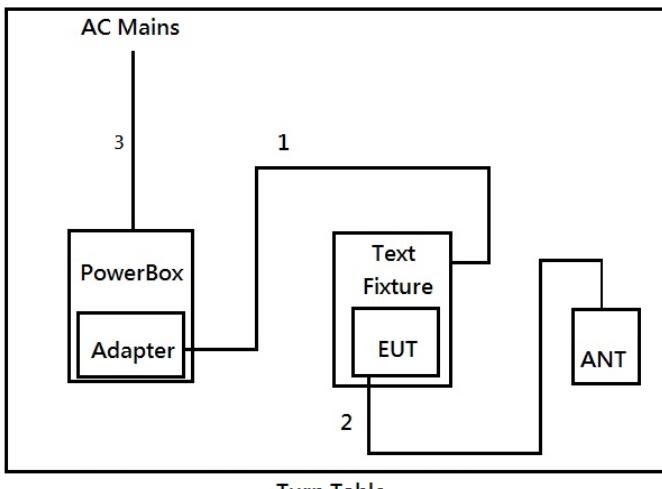


1. DC power line , 1m , Non-shielding
2. RF cable line , 0.28m , Non-shielding
3. AC power line , 1.8m , Non-shielding

**Test Setup Diagram - Radiated Test(Mode 1)**

Turn Table

1. DC power line , 1m , Non-shielding
2. RF cable line , 0.28m , Non-shielding
3. RF cable line , 0.1m , Non-shielding
4. AC power line , 1.8m , Non-shielding

Test Setup Diagram - Radiated Test(Mode 2, 3)

Turn Table

1. DC power line , 1m , Non-shielding
2. RF cable line , 0.28m , Non-shielding
3. AC power line , 1.8m , 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.

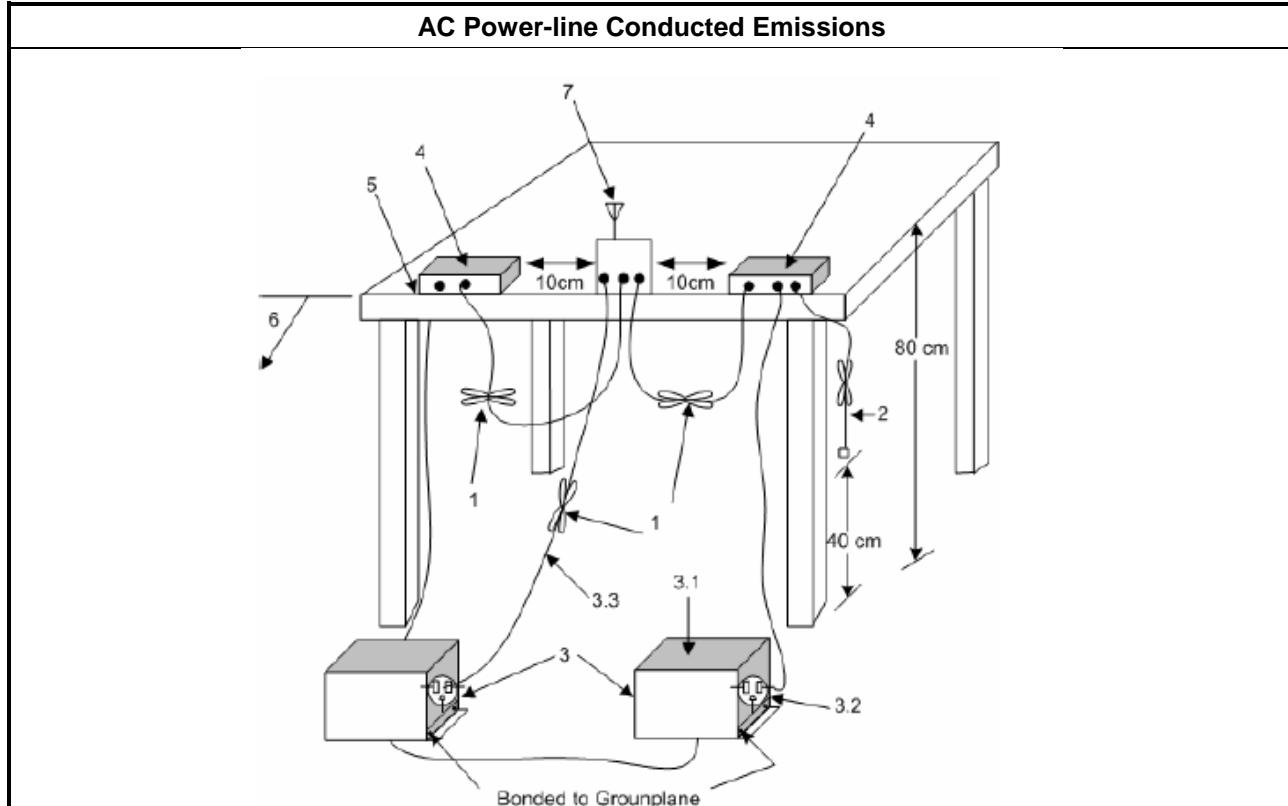
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
▪ 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.

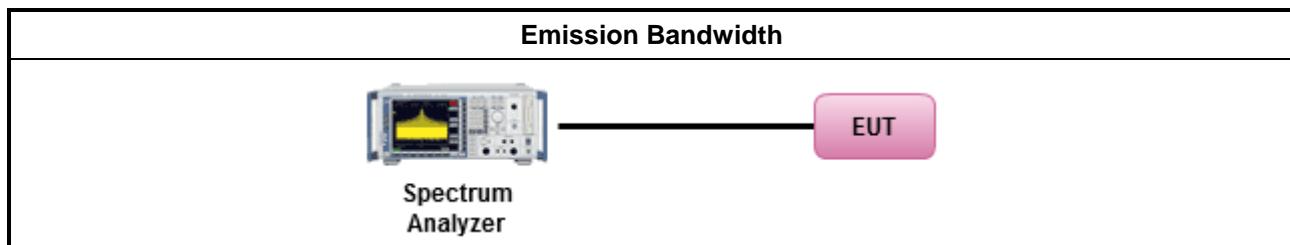
3.2.2 Measuring Instruments

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 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	
▪ 2400-2483.5 MHz Band:	
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	▪ Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8dB$ dBm
e.i.r.p. Power Limit:	
▪ 2400-2483.5 MHz Band	
	▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	▪ Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	▪ Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm.	

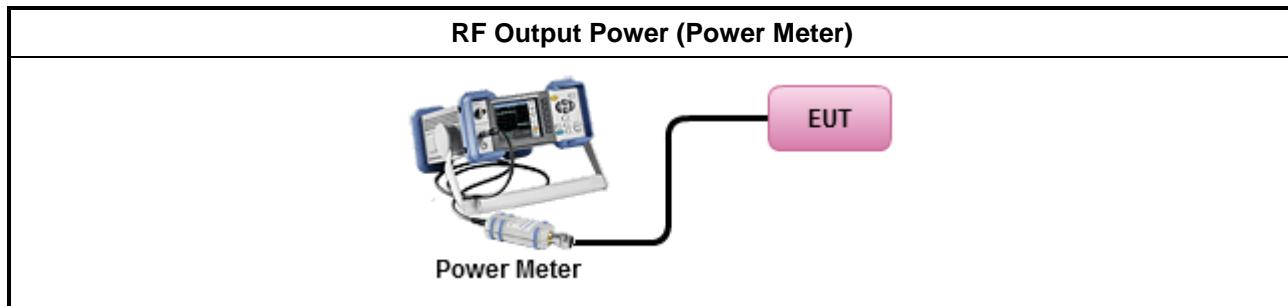
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	<input type="checkbox"/> Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW \geq EBW method). <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 9.1.2 Option 2 (peak power meter for VBW \geq DTS BW)
▪ Maximum Average Conducted Output Power	Duty cycle \geq 98% <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging). Duty cycle < 98% <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).
▪ 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.▪ 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
▪ Power Spectral Density (PSD) $\leq 8 \text{ dBm}/3\text{kHz}$

3.4.2 Measuring Instruments

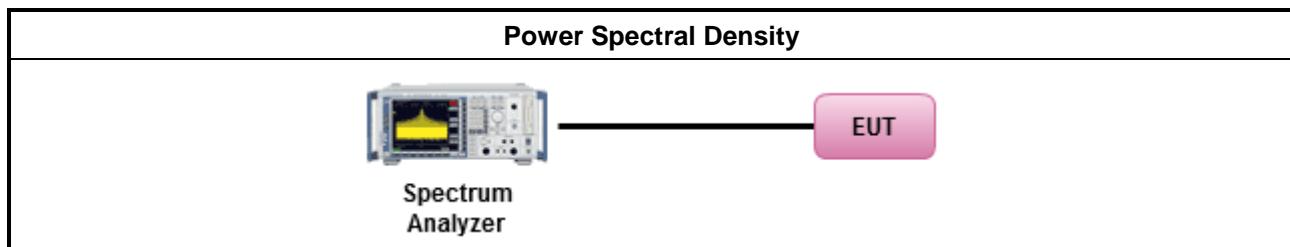
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method
▪ 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 $\geq 98\%$
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.5 Method AVGPSD-2 (spectral trace averaging).
Duty cycle $< 98\%$
<input type="checkbox"/> Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)
▪ For conducted measurement.
<ul style="list-style-type: none">▪ If The EUT supports multiple transmit chains using options given below:<ul style="list-style-type: none"><input type="checkbox"/> Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.<input type="checkbox"/> Option 2: Measure and 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

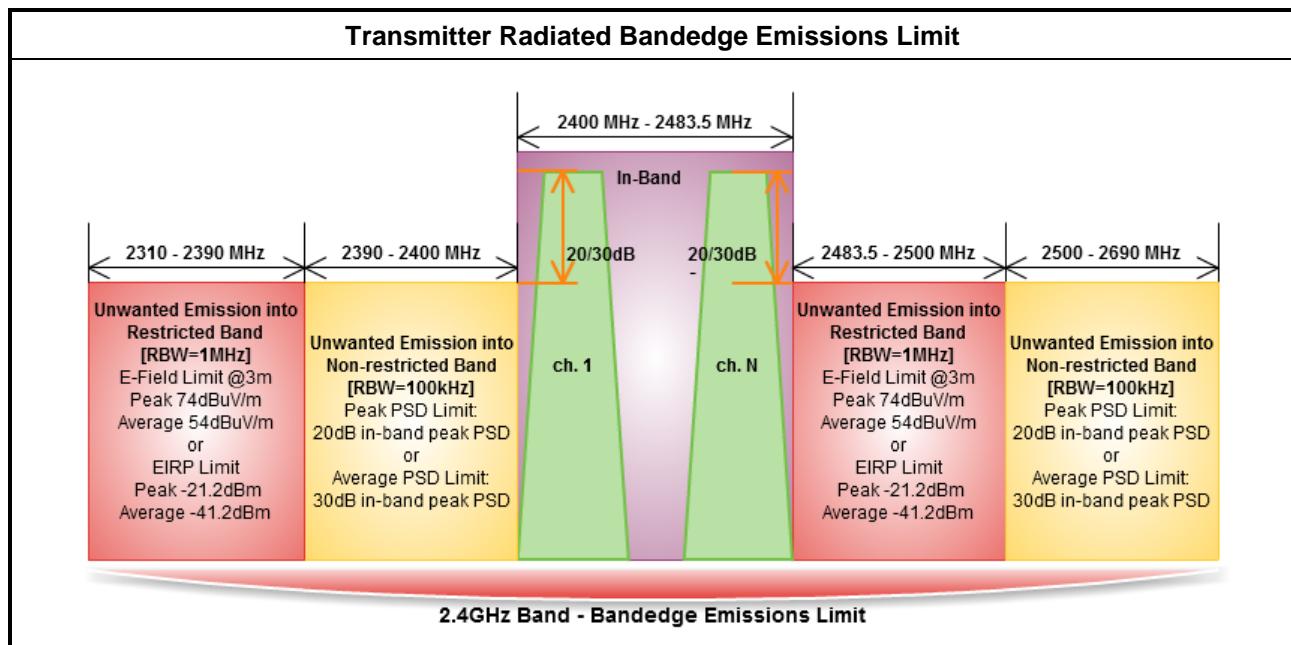


3.4.5 Test Result of Power Spectral Density

Refer as Appendix C

3.5 Transmitter Radiated Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



3.5.2 Measuring Instruments

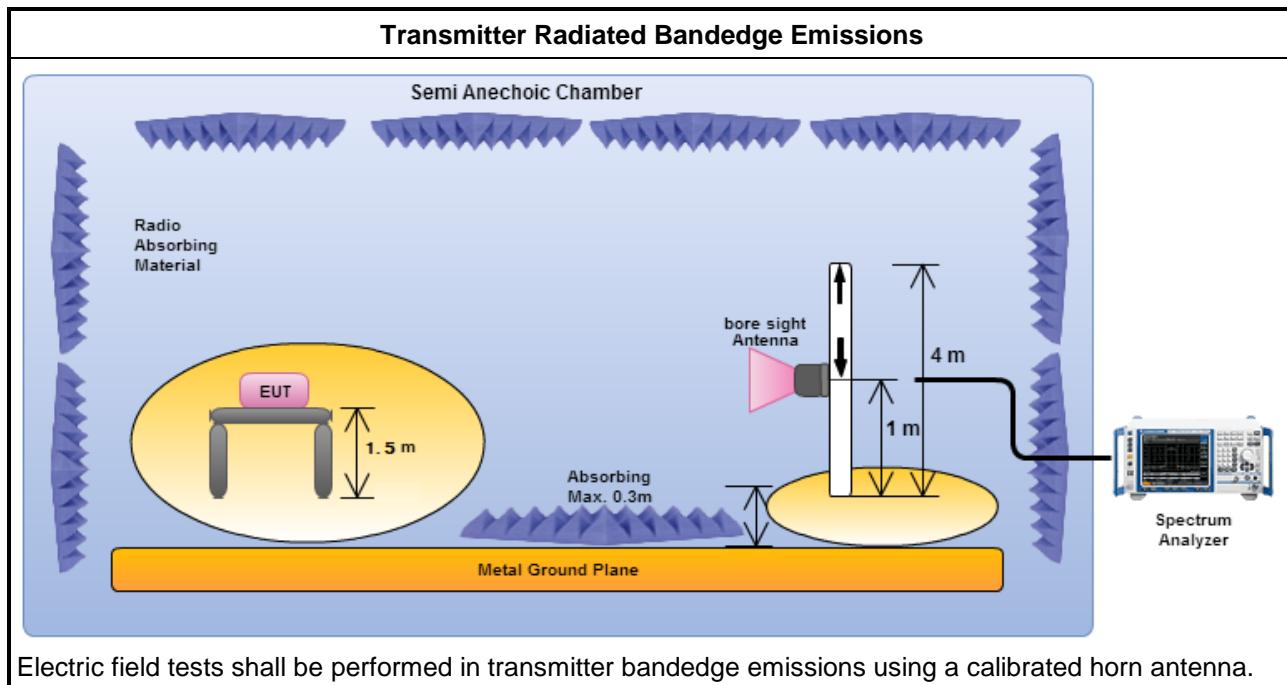
Refer a test equipment and calibration data table in this test report.



3.5.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> The average emission levels shall be measured in [duty cycle \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 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.

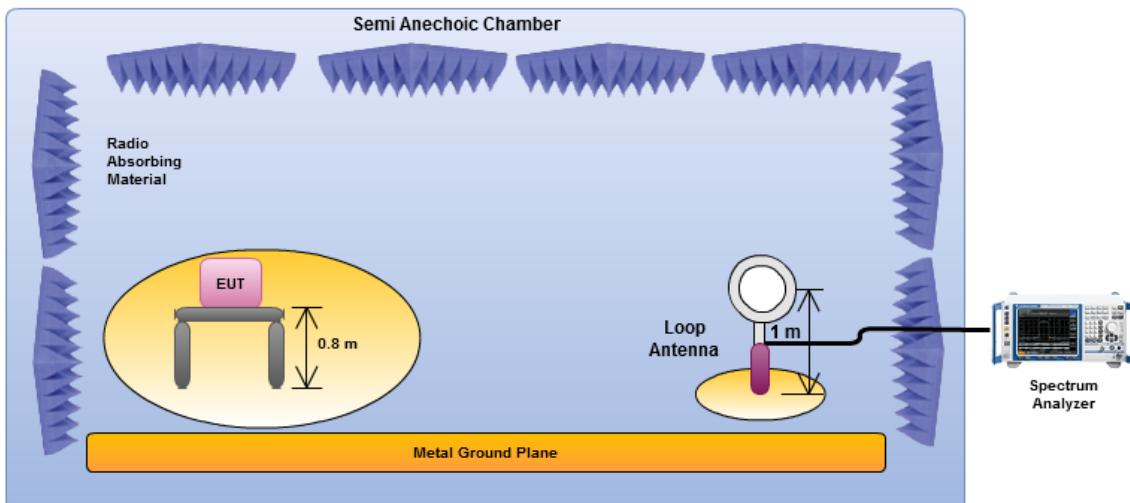


3.6.3 Test Procedures

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.

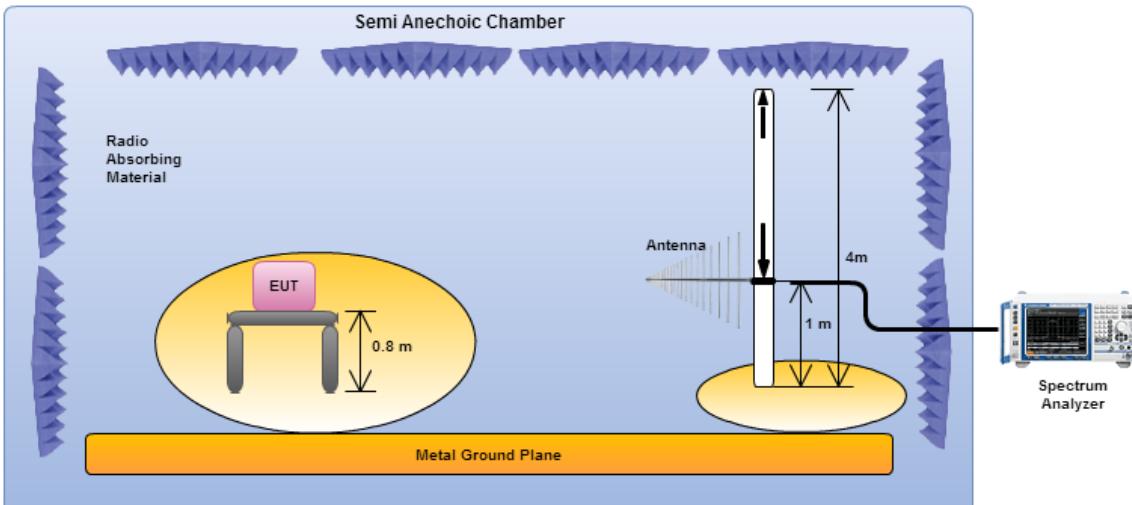
3.6.4 Test Setup

Transmitter Spurious and Out of Band Emissions (9 kHz - 30 MHz)

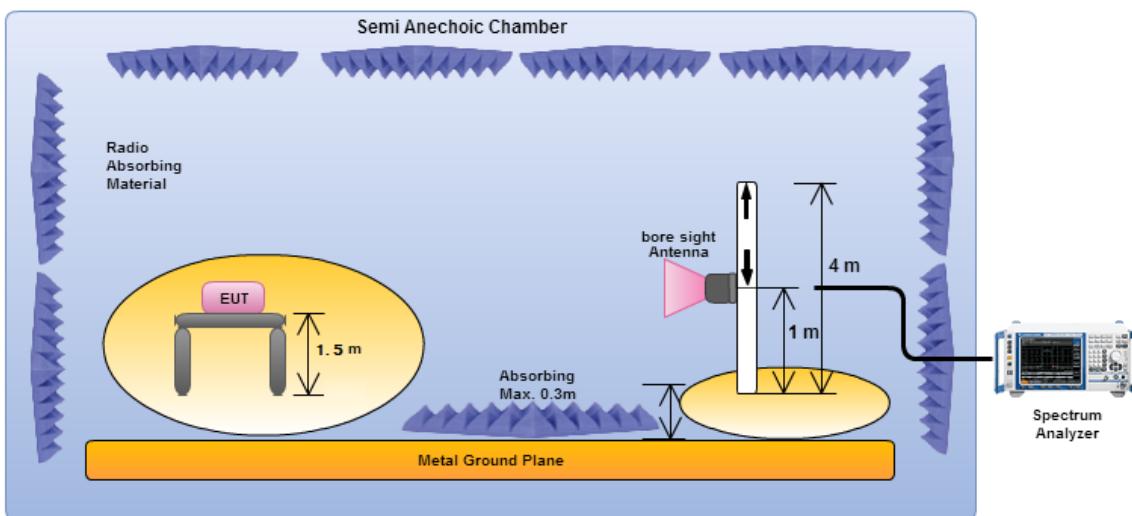


Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna.

Transmitter Radiated Unwanted Emissions (below 1GHz)



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 (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported. Any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

3.6.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix E



4 Test Equipment and Calibration Data

Instrument for AC Conduction

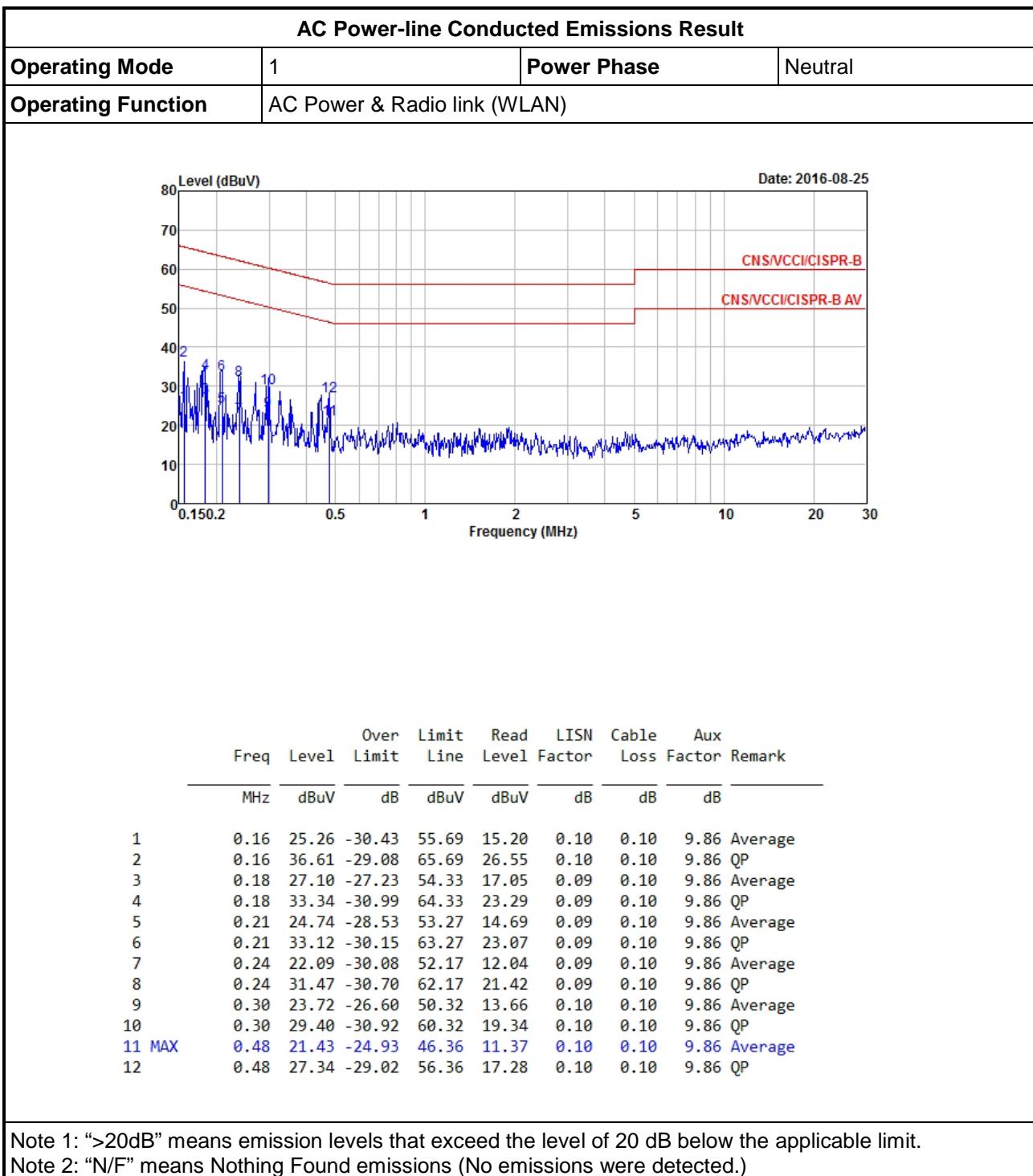
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
EMC Receiver	R&S	ESR-3	102051	9KHz ~ 3.6GHz	19/04/2016	18/04/2017
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	26/01/2016	25/01/2017
LISN (Support Unit)	R&S	ENV216	101295	9kHz ~ 30MHz	04/11/2015	03/11/2016
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	30/10/2015	29/10/2016

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	9KHz~40GHz	12/05/2016	11/05/ 2017
Power Sensor	Anritsu	MA2411B	917017	300MHz ~ 40GHz	04/02/2016	03/02/2017
Power Meter	Anritsu	ML2495A	949003	300MHz ~ 40GHz	04/02/2016	03/02/2017
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	21/07/2016	20/07/2017

Instrument for Radiated Test

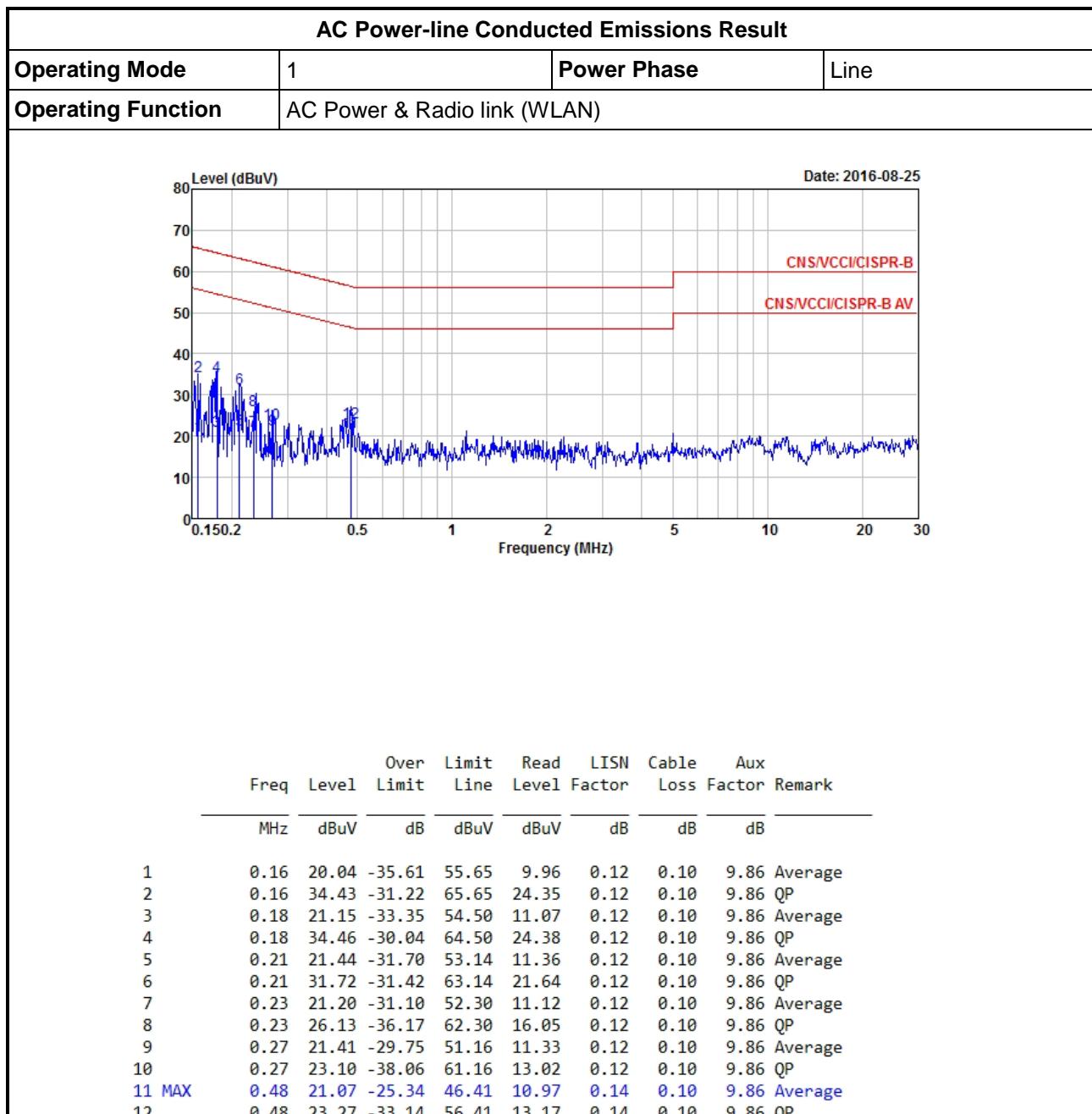
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	R&S	FSP 40	100593	9kHz~40GHz	26/10/2016	25/10/2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	03/06/2016	02/06/2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz ~ 18GHz 3m	03/06/2016	02/06/2017
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	01/07/2016	30/06/2017
Amplifier	Agilent	8449B	3008A02602	1GHz ~ 26.5GHz	20/09/2016	19/09/2017
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 01543	1GHz ~ 18GHz	22/04/2016	21/04/2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz ~ 40GHz	29/01/2016	28/01/2017
Bilog Antenna	SCHAFFNER	CBL 6112B	2723	30MHz ~ 1GHz	01/10/2016	30/09/2017
Amplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	01/06/2015	31/05/2017
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz-30 MHz	02/02/2015	01/02/2017





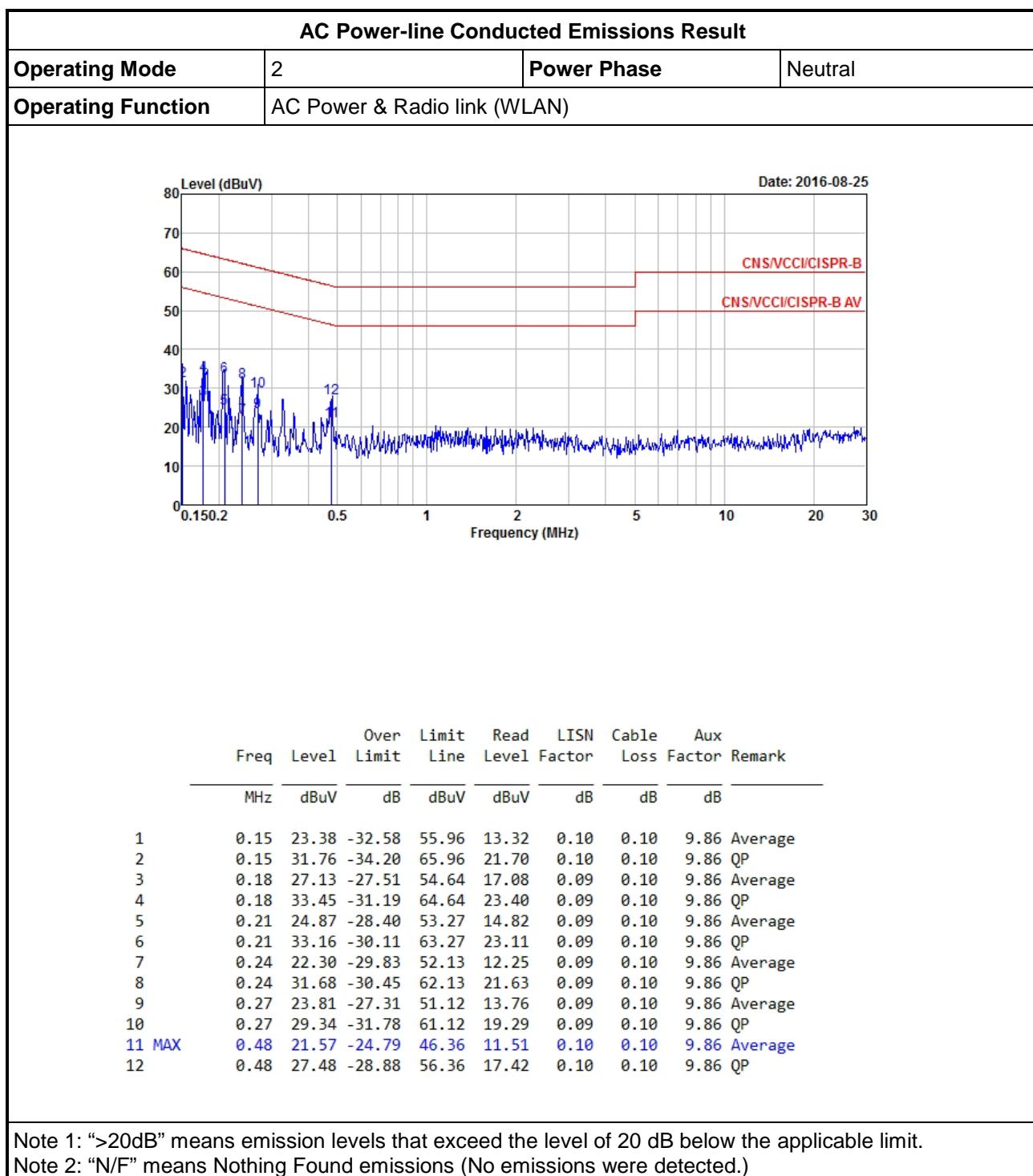
AC Power-line Conducted Emissions (For PIFA)

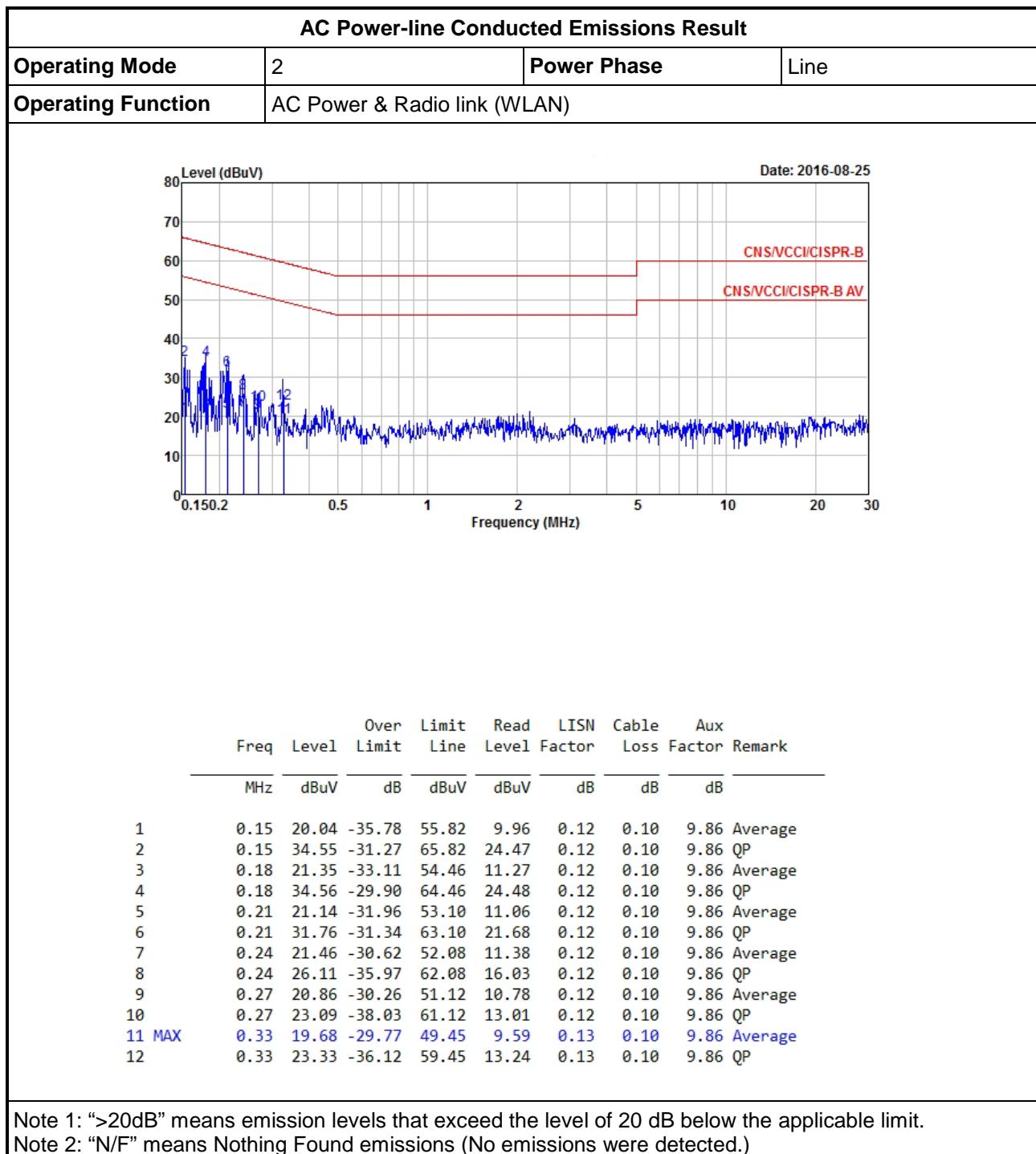
Appendix I

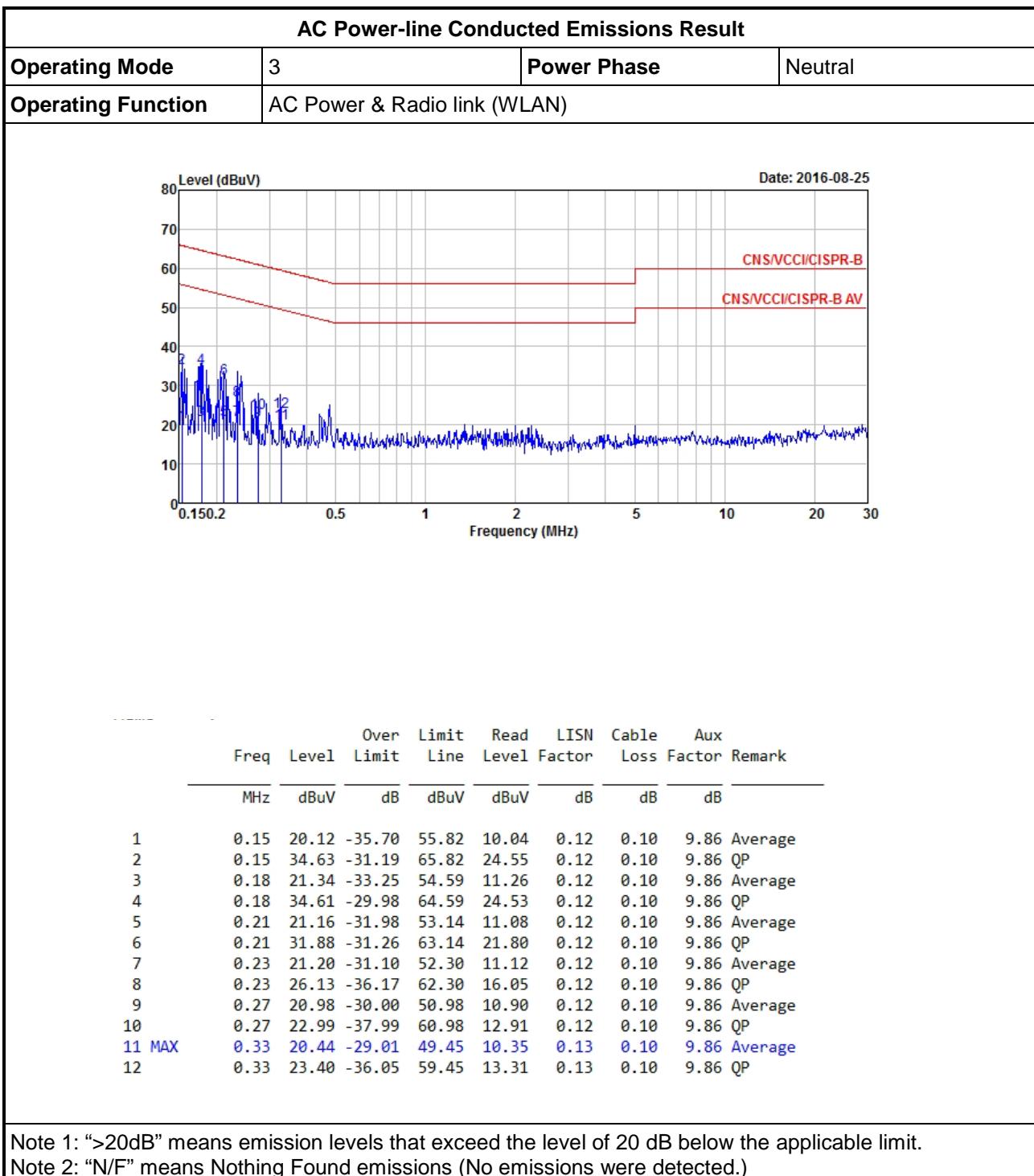


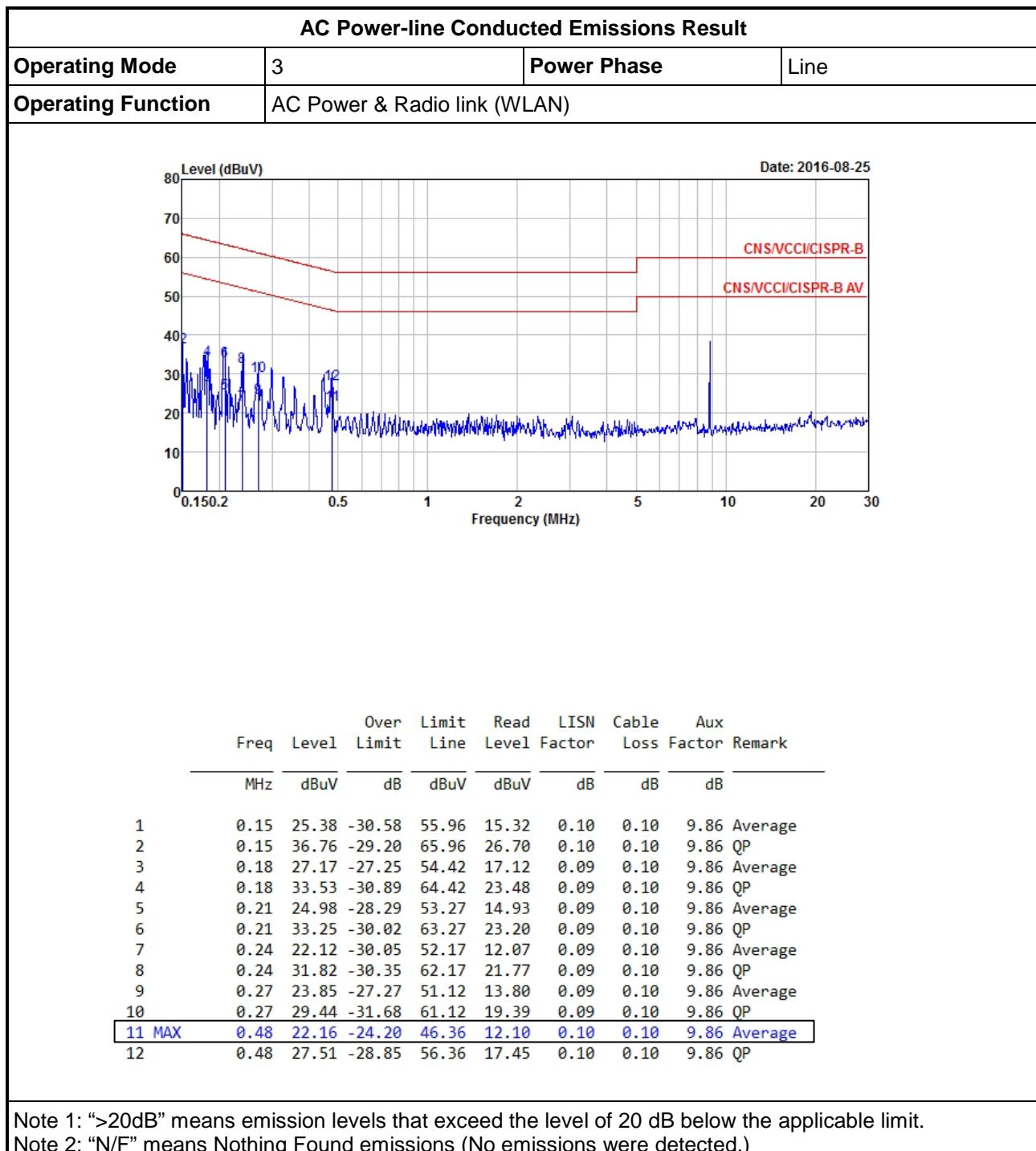
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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









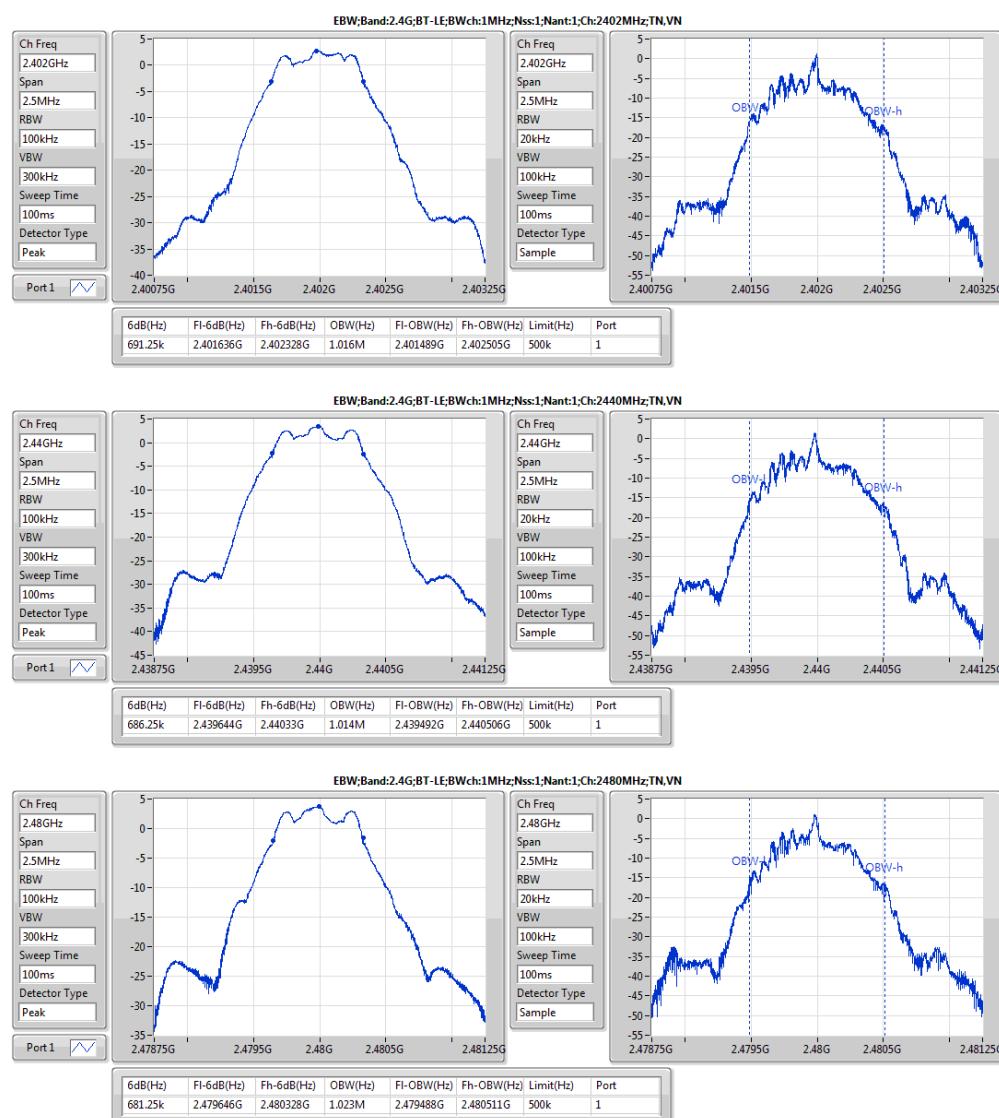
**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4G:BT-LE;1;1;1	691.25k	1.023M	1M02F1D	681.25k	1.014M



Result

Mode	Result	Limit	P1-N dB (Hz)	P1-OBW (Hz)
2.4G;BT-LE;1;1;1;2402;L;TN,VN	Pass	500k	691.25k	1.016M
2.4G;BT-LE;1;1;1;2440;M;TN,VN	Pass	500k	686.25k	1.014M
2.4G;BT-LE;1;1;1;2480;H;TN,VN	Pass	500k	681.25k	1.023M





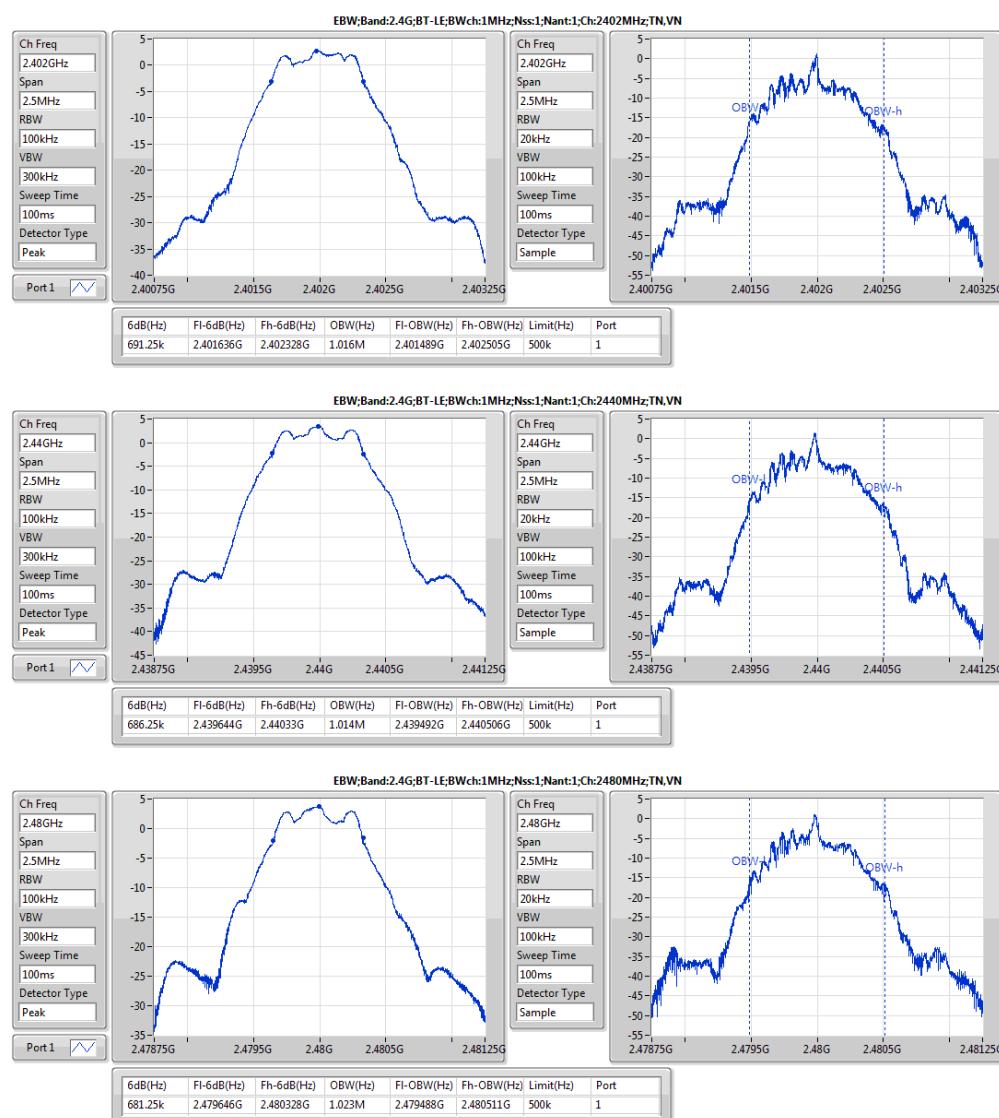
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4G:BT-LE;1;1;1	691.25k	1.023M	1M02F1D	681.25k	1.014M



Result

Mode	Result	Limit	P1-N dB (Hz)	P1-OBW (Hz)
2.4G;BT-LE;1;1;1;2402;L;TN,VN	Pass	500k	691.25k	1.016M
2.4G;BT-LE;1;1;1;2440;M;TN,VN	Pass	500k	686.25k	1.014M
2.4G;BT-LE;1;1;1;2480;H;TN,VN	Pass	500k	681.25k	1.023M



**Summary**

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
2.4G-BT-LE;1;1;1	3.56	0.00227	5.56	0.0036



Result

Mode	Result	DG (dBi)	EIRP (dBm)	EIRP Lim. (dBm)	Sum (dBm)	Sum Lim. (dBm)	P1 (dBm)
2.4G:BT-LE;1;1;1;2402;L;TN,VN	Pass	2.00	4.62	36.00	2.62	30.00	2.62
2.4G:BT-LE;1;1;1;2440;M;TN,VN	Pass	2.00	5.27	36.00	3.27	30.00	3.27
2.4G:BT-LE;1;1;1;2480;H;TN,VN	Pass	2.00	5.56	36.00	3.56	30.00	3.56

**Summary**

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
2.4G-BT-LE;1;1;1	2.80	0.00191	4.80	0.00302

**Result**

Mode	Result	DG (dBi)	EIRP (dBm)	EIRP Lim. (dBm)	Sum (dBm)	Sum Lim. (dBm)	P1 (dBm)
2.4G:BT-LE;1;1;1;2402;L;TN,VN	Pass	2.00	3.96	36.00	1.96	30.00	1.96
2.4G:BT-LE;1;1;1;2440;M;TN,VN	Pass	2.00	4.58	36.00	2.58	30.00	2.58
2.4G:BT-LE;1;1;1;2480;H;TN,VN	Pass	2.00	4.80	36.00	2.80	30.00	2.80

**Summary**

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
2.4G-BT-LE;1;1;1	3.56	0.00227	5.36	0.00344



Result

Mode	Result	DG (dBi)	EIRP (dBm)	EIRP Lim. (dBm)	Sum (dBm)	Sum Lim. (dBm)	P1 (dBm)
2.4G:BT-LE;1;1;1;2402;L;TN,VN	Pass	1.80	4.42	36.00	2.62	30.00	2.62
2.4G:BT-LE;1;1;1;2440;M;TN,VN	Pass	1.80	5.07	36.00	3.27	30.00	3.27
2.4G:BT-LE;1;1;1;2480;H;TN,VN	Pass	1.80	5.36	36.00	3.56	30.00	3.56

**Summary**

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
2.4G-BT-LE;1;1;1	2.80	0.00191	4.60	0.00288



Result

Mode	Result	DG (dBi)	EIRP (dBm)	EIRP Lim. (dBm)	Sum (dBm)	Sum Lim. (dBm)	P1 (dBm)
2.4G:BT-LE;1;1;1;2402;L;TN,VN	Pass	1.80	3.76	36.00	1.96	30.00	1.96
2.4G:BT-LE;1;1;1;2440;M;TN,VN	Pass	1.80	4.38	36.00	2.58	30.00	2.58
2.4G:BT-LE;1;1;1;2480;H;TN,VN	Pass	1.80	4.60	36.00	2.80	30.00	2.80

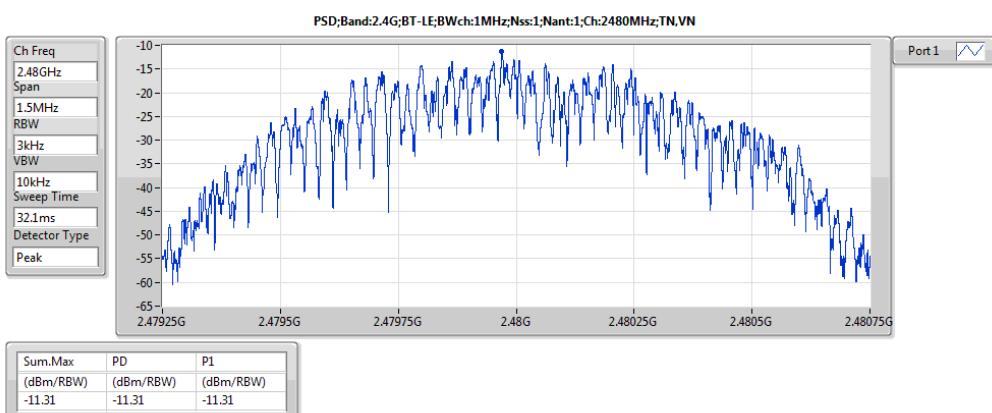
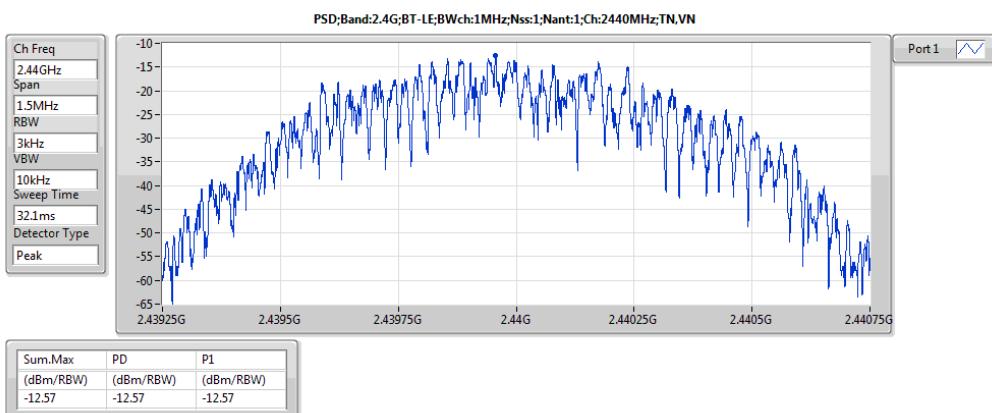
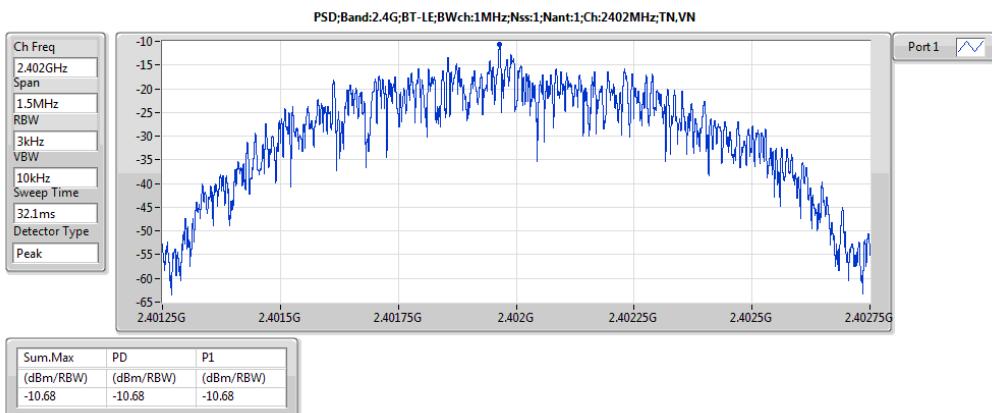
**Summary**

Mode	PD (dBm/RBW)	EIRP.PD (dBm/RBW)
2.4G:BT-LE;1;1;1	-10.68	-8.68



Result

Mode	Result	Meas.RBW (Hz)	Lim.RBW (Hz)	BWCF (dB)	DG (dBi)	Sum.Max (dBm/RBW)	PD (dBm/RBW)	PD.Limit (dBm/RBW)	EIRP.PD.Li m (dBm/RBW)	EIRP.PD.Li m (dBm/RBW)	P1 (dBm/RBW)
2.4G;BT-LE;1;1;1;2402;L;TN,VN	Pass	3k	3k	0.00	2.00	-10.68	-10.68	8.00	-8.68	Inf	-10.68
2.4G;BT-LE;1;1;1;2440;M;TN,VN	Pass	3k	3k	0.00	2.00	-12.57	-12.57	8.00	-10.57	Inf	-12.57
2.4G;BT-LE;1;1;1;2480;H;TN,VN	Pass	3k	3k	0.00	2.00	-11.31	-11.31	8.00	-9.31	Inf	-11.31



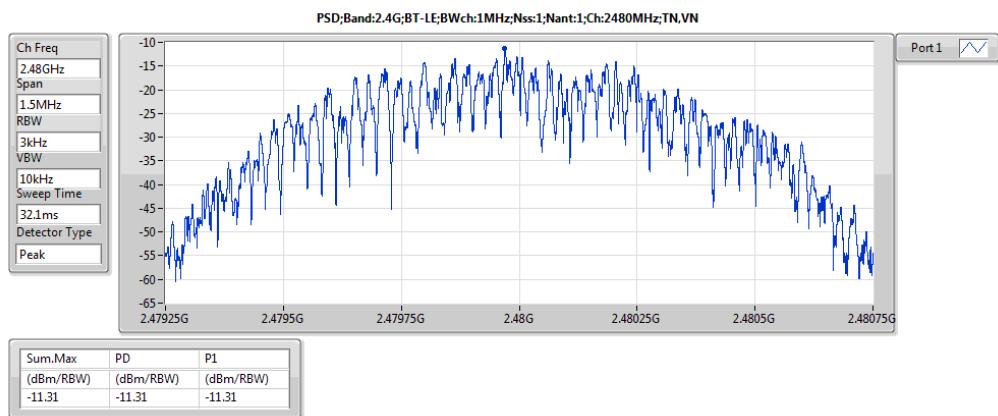
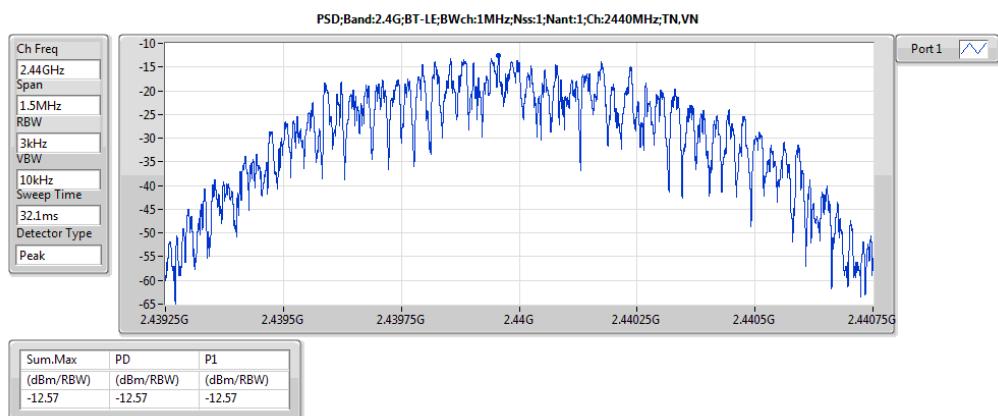
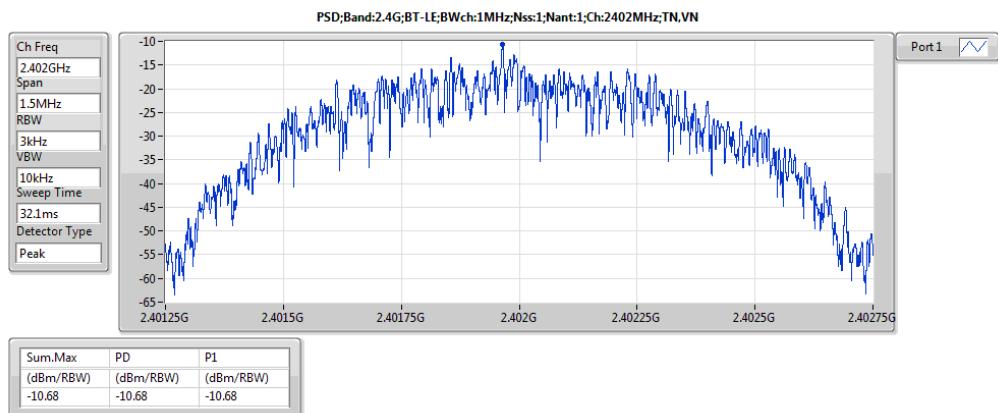
**Summary**

Mode	PD (dBm/RBW)	EIRP.PD (dBm/RBW)
2.4G:BT-LE;1;1;1	-10.68	-8.88



Result

Mode	Result	Meas.RBW (Hz)	Lim.RBW (Hz)	BWCF (dB)	DG (dBi)	Sum.Max (dBm/RBW)	PD (dBm/RBW)	PD.Limit (dBm/RBW)	EIRP.PD.Li m (dBm/RBW)	EIRP.PD.Li m (dBm/RBW)	P1 (dBm/RBW)
2.4G;BT-LE;1;1;1;2402;L;TN,VN	Pass	3k	3k	0.00	1.80	-10.68	-10.68	8.00	-8.88	Inf	-10.68
2.4G;BT-LE;1;1;1;2440;M;TN,VN	Pass	3k	3k	0.00	1.80	-12.57	-12.57	8.00	-10.77	Inf	-12.57
2.4G;BT-LE;1;1;1;2480;H;TN,VN	Pass	3k	3k	0.00	1.80	-11.31	-11.31	8.00	-9.51	Inf	-11.31





Transmitter Radiated Bandedge Emissions (For PIFA)

Appendix D

Mode 1_PIFA Ant. Mode

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.
LE-1Mbps	1	2402	97.89	2392.008	58.45	39.44	20	H
LE-1Mbps	1	2480	99.27	2505.360	59.37	39.90	20	H

Note 1: Measurement worst emissions of receive antenna polarization

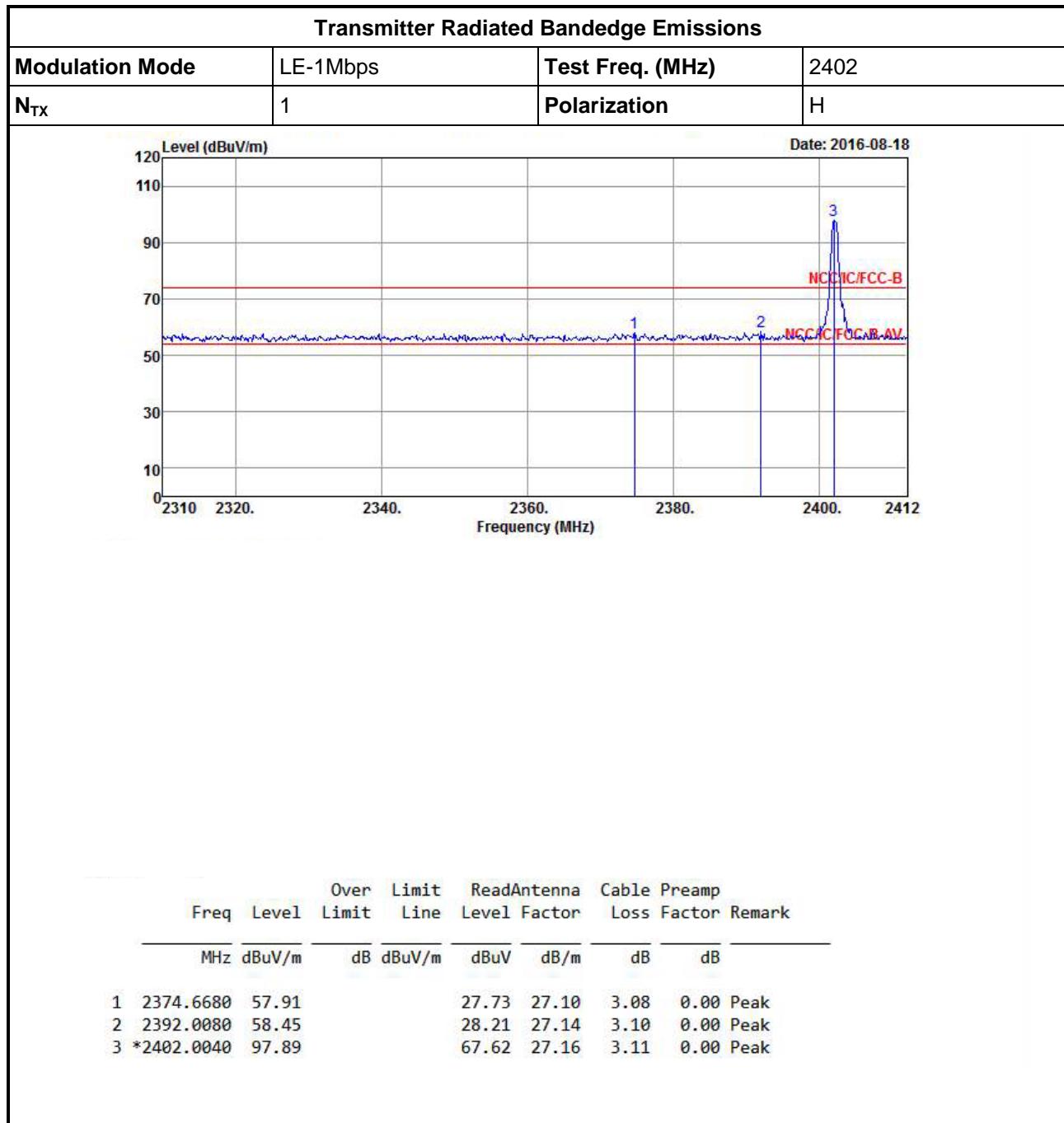
2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)										
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
LE-1Mbps	1	2402	3	2368.140	59.54	74	2368.140	43.33	54	H
LE-1Mbps	1	2480	3	2490.240	64.09	74	2490.240	45.82	54	H

Note 1: Measurement worst emissions of receive antenna polarization.

Note 2: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is “Pulse On Time”, e.g., LE VBW≥1/625us, VBW=3kHz.



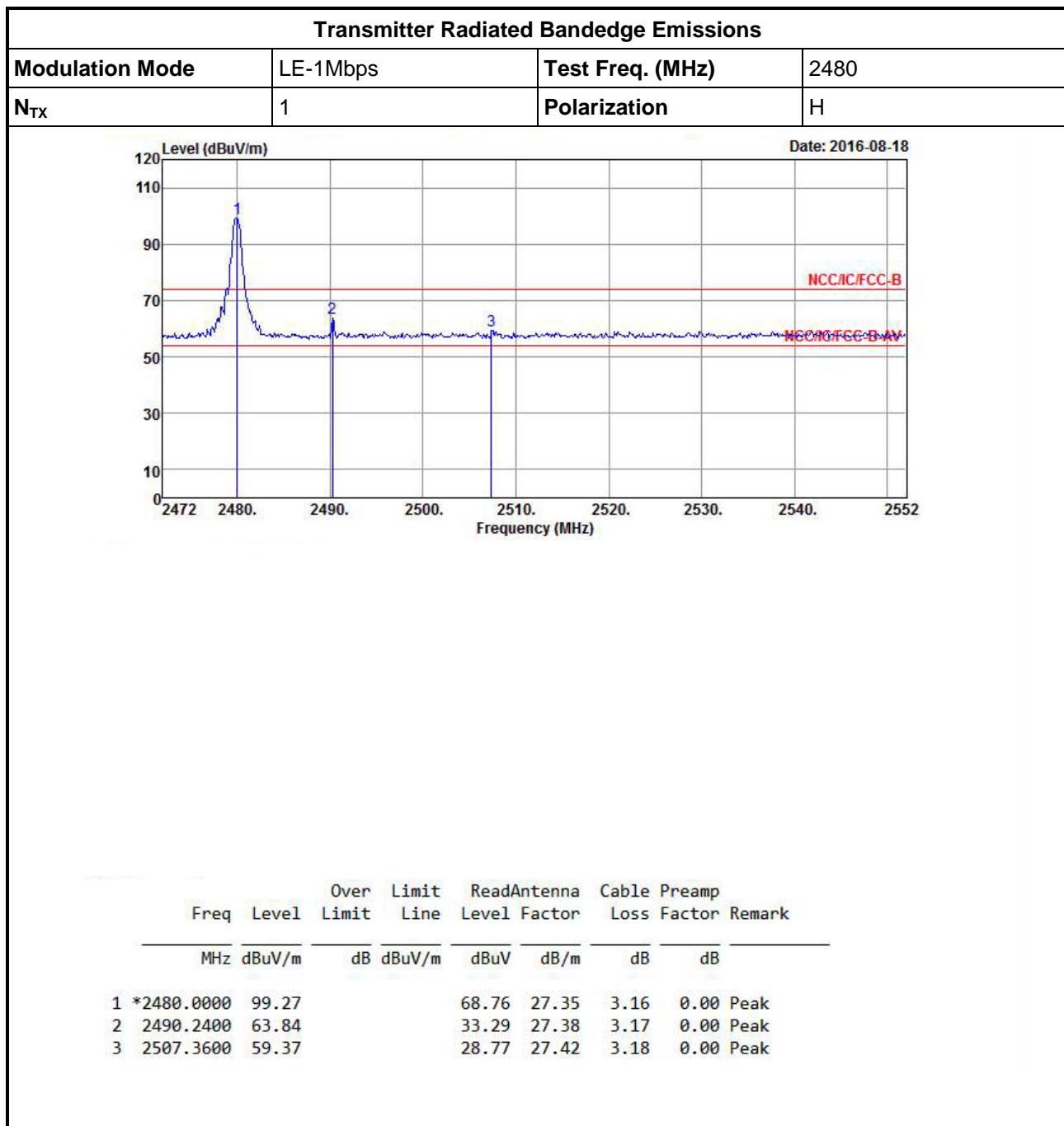
Transmitter Radiated Bandedge Emissions (Non-restricted Band) PIFA Ant. Mode





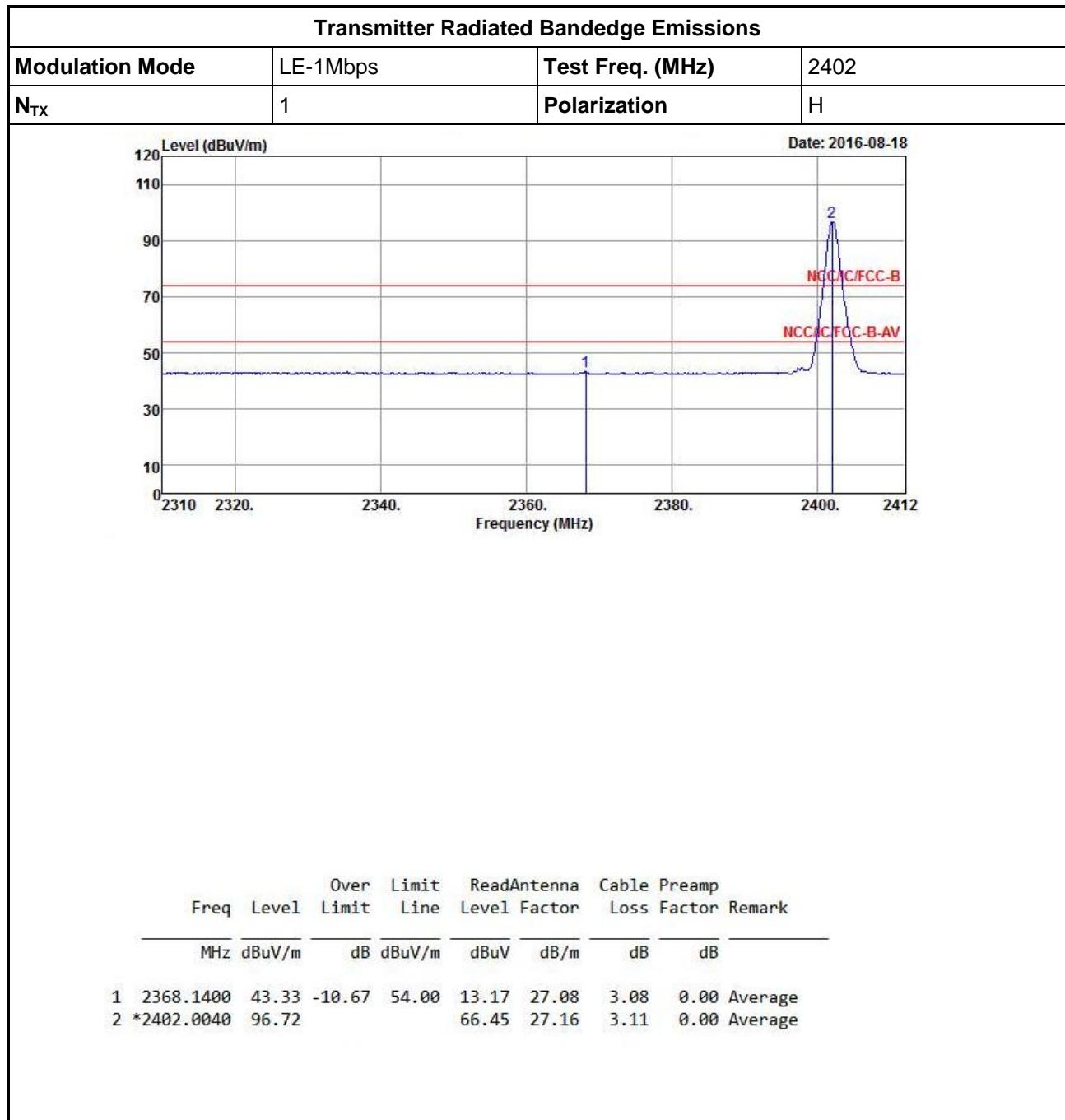
Transmitter Radiated Bandedge Emissions (For PIFA)

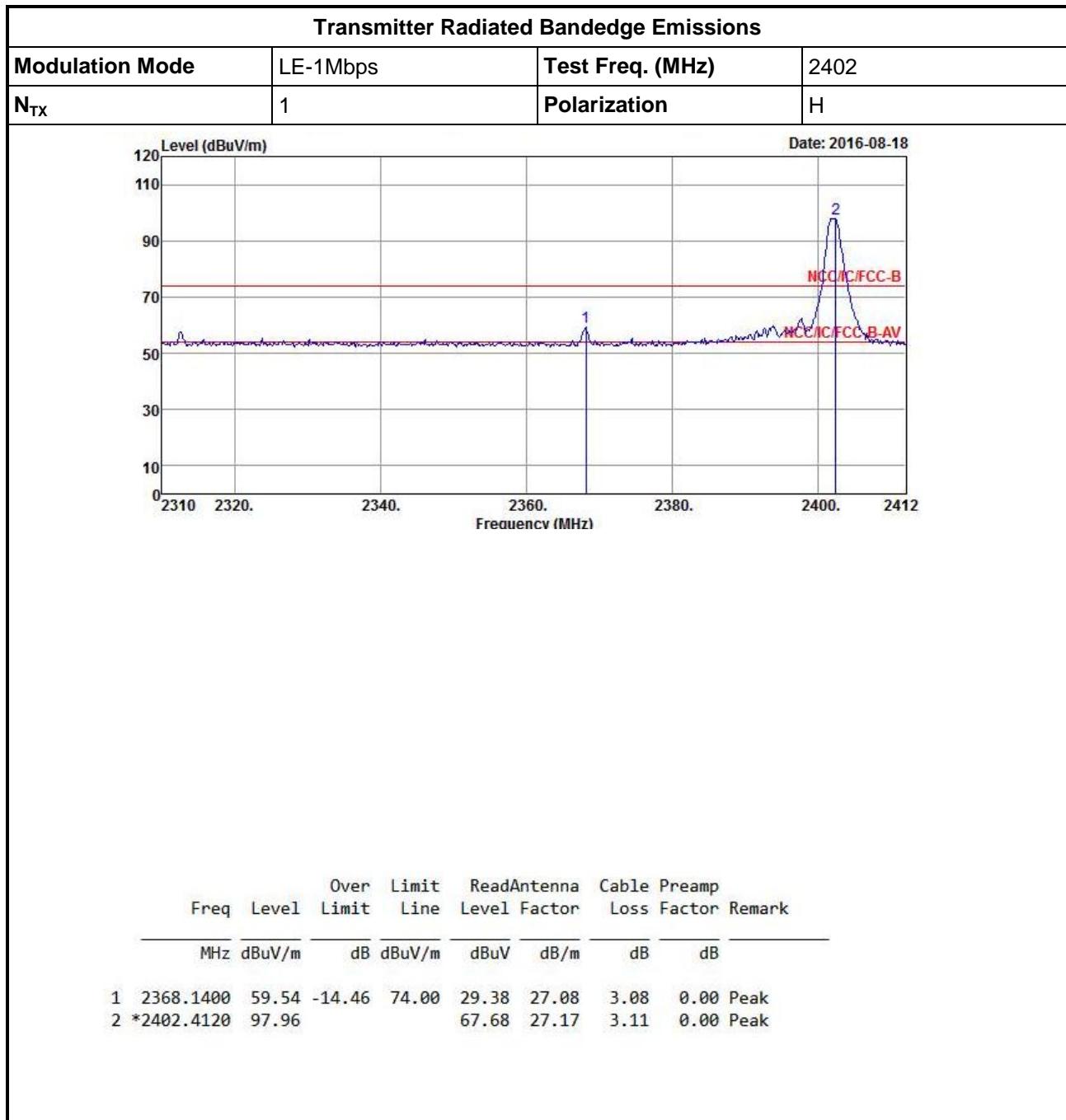
Appendix D





Transmitter Radiated Bandedge Emissions (Restricted Band) PIFA Ant. Mode

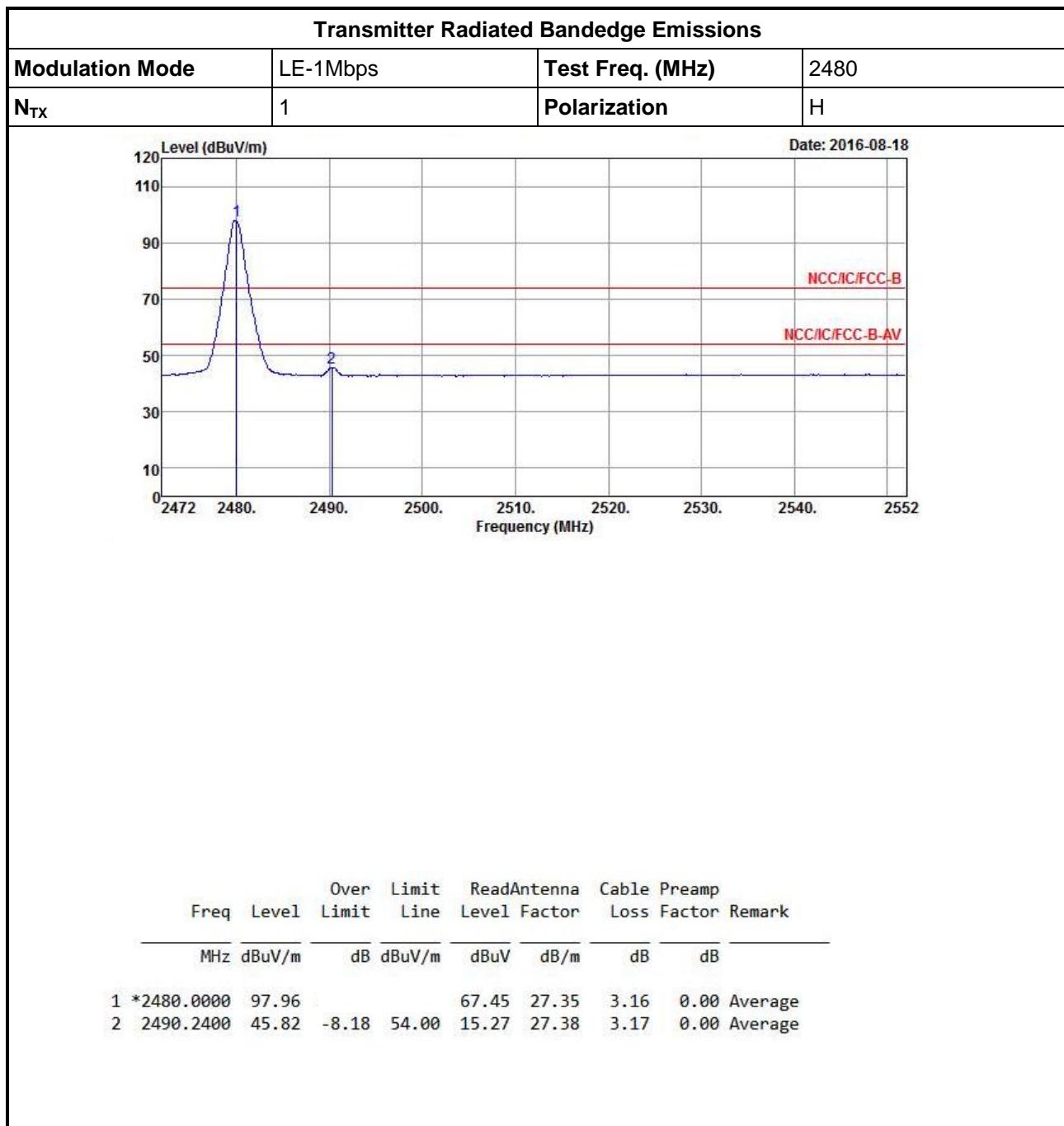






Transmitter Radiated Bandedge Emissions (For PIFA)

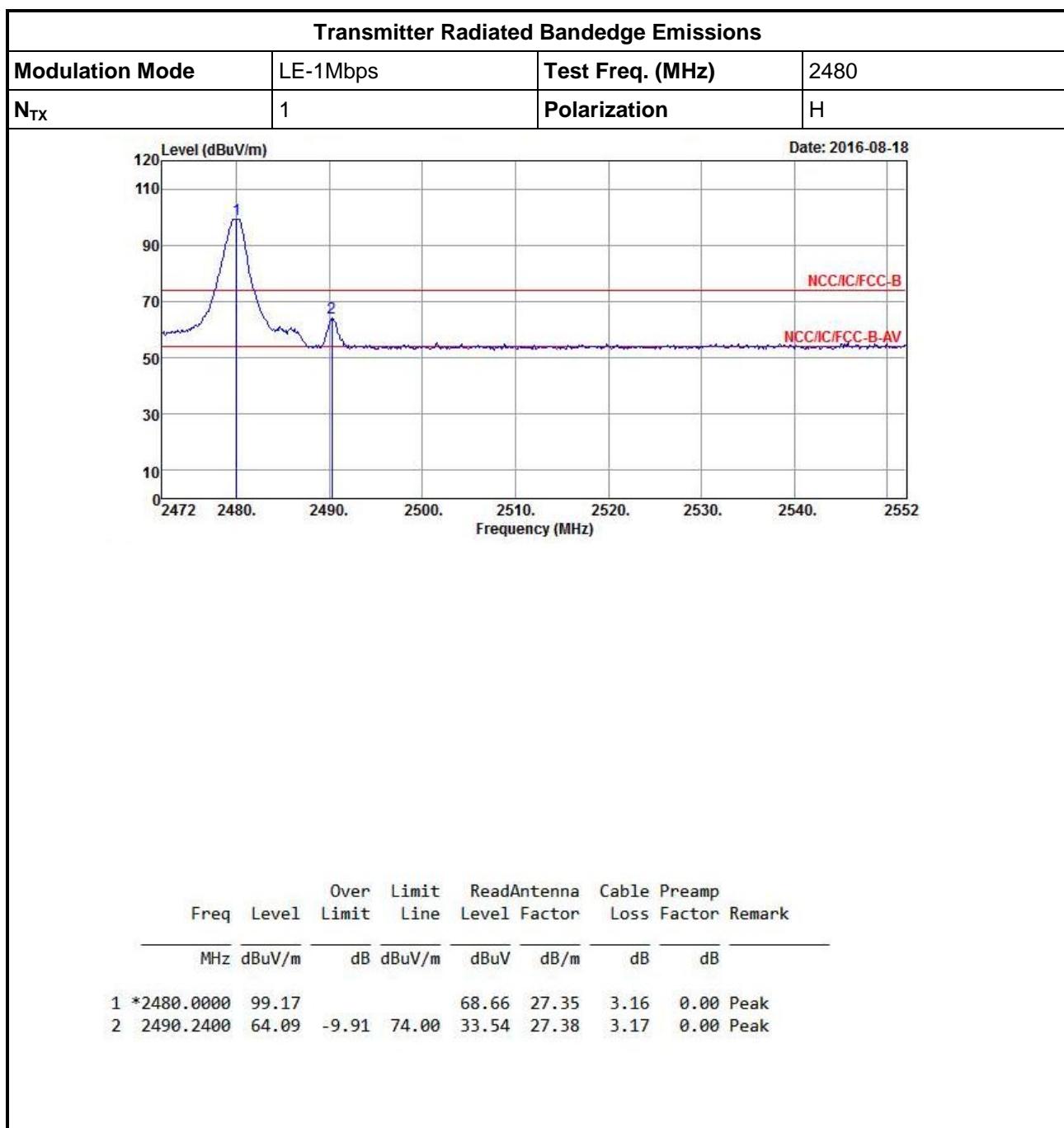
Appendix D





Transmitter Radiated Bandedge Emissions (For PIFA)

Appendix D





Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D

Mode 2_Dipole 1 Ant. Mode

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.
LE-1Mbps	1	2402	98.38	2397.516	59.51	38.87	20	V
LE-1Mbps	1	2480	98.01	2500.832	59.06	38.95	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.
LE-1Mbps	1	2402	3	2367.936	62.24	74	2367.936	43.58	54	V
LE-1Mbps	1	2480	3	2490.172	64.27	74	2490.172	46.00	54	V

Note 1: Measurement worst emissions of receive antenna polarization.

Note 2: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.

Mode 3_Dipole 2 Ant. Mode

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.
LE-1Mbps	1	2402	99.81	2397.924	60.71	39.10	20	V
LE-1Mbps	1	2480	92.77	2528.384	59.01	33.76	20	V

Note 1: Measurement worst emissions of receive antenna polarization

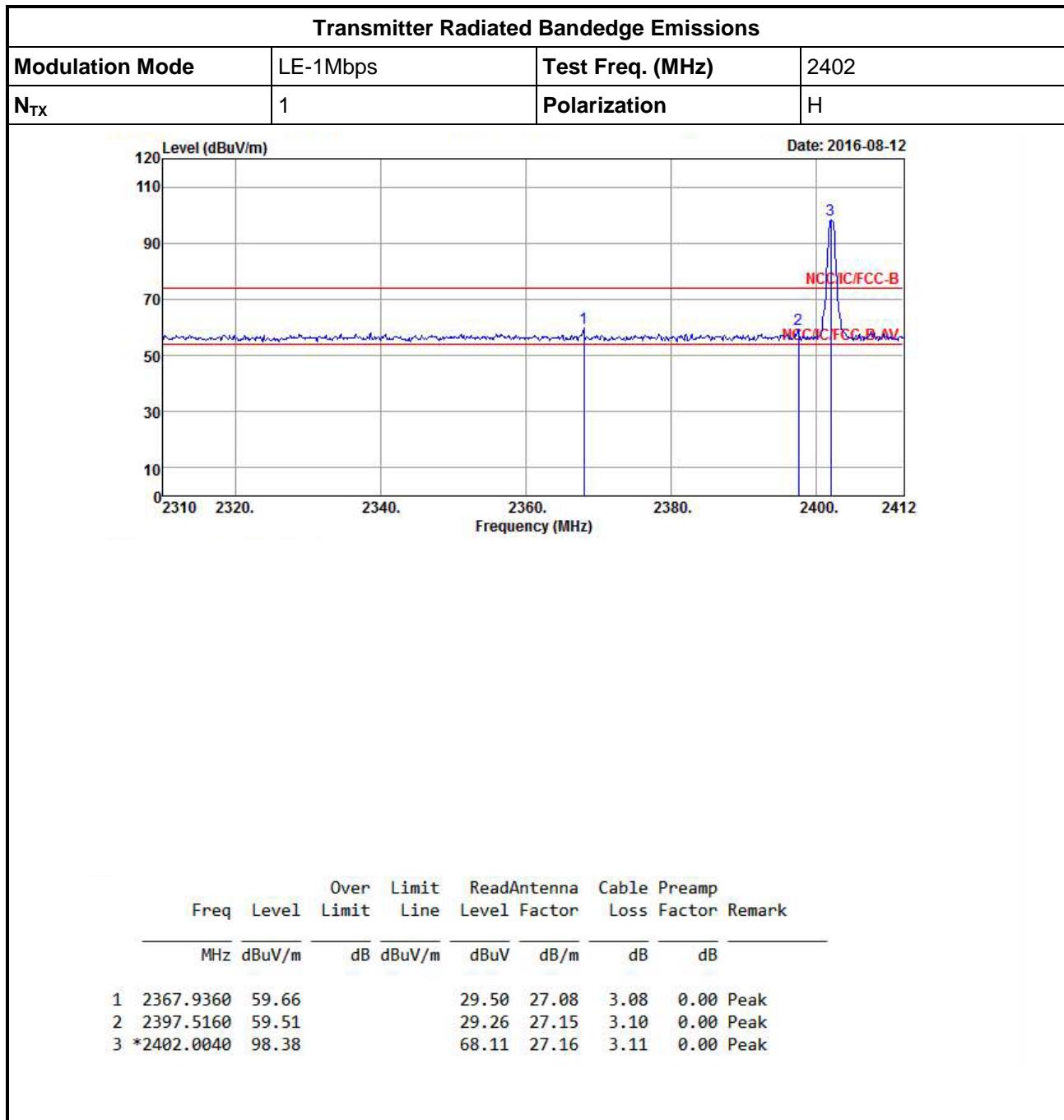
2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)										
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
LE-1Mbps	1	2402	3	2368.140	63.76	74	2368.140	44.02	54	V
LE-1Mbps	1	2480	3	2490.664	63.70	74	2490.500	45.79	54	V

Note 1: Measurement worst emissions of receive antenna polarization.

Note 2: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



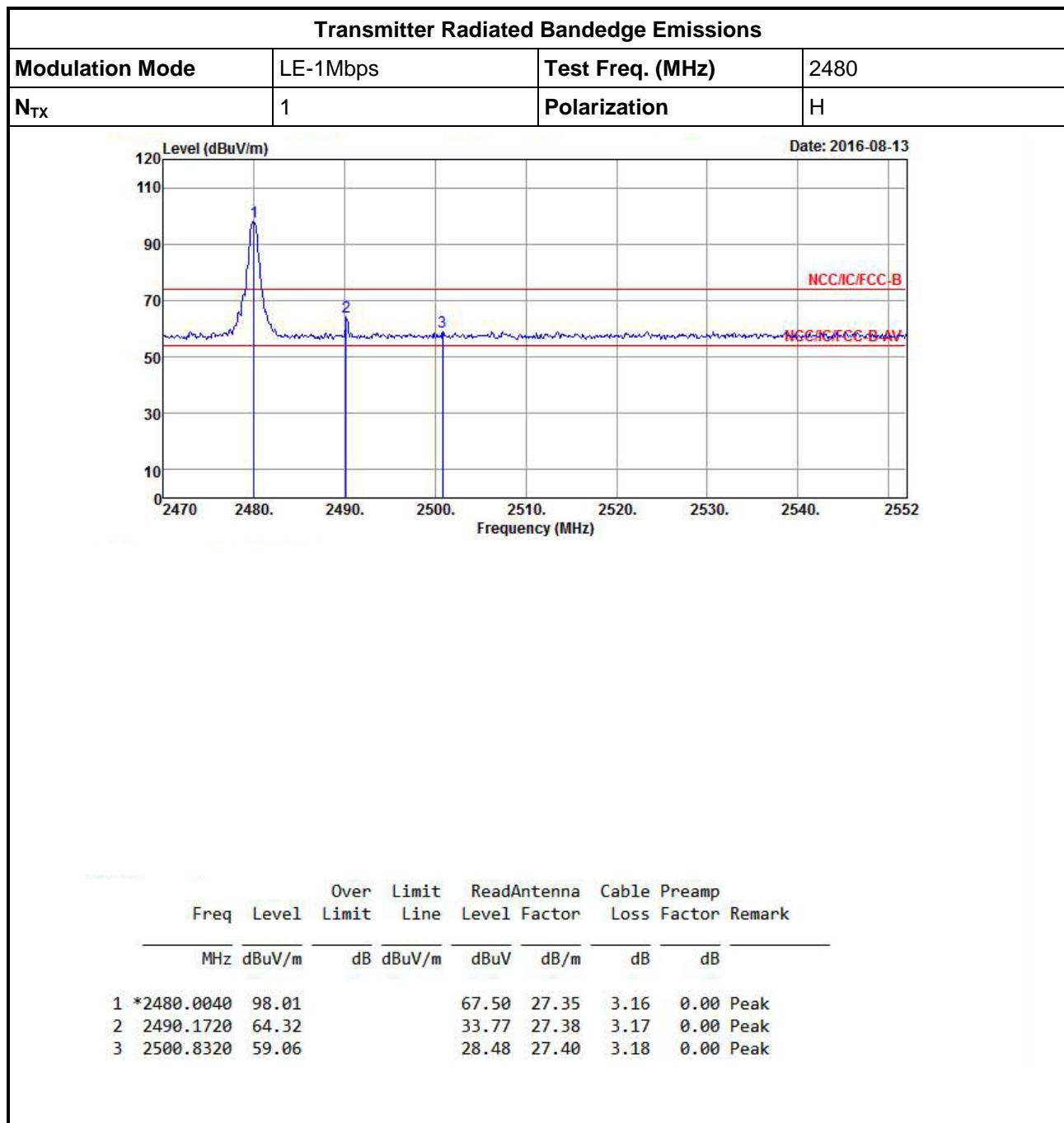
Transmitter Radiated Bandedge Emissions (Non-restricted Band) Dipole 1 Ant. Mode





Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D

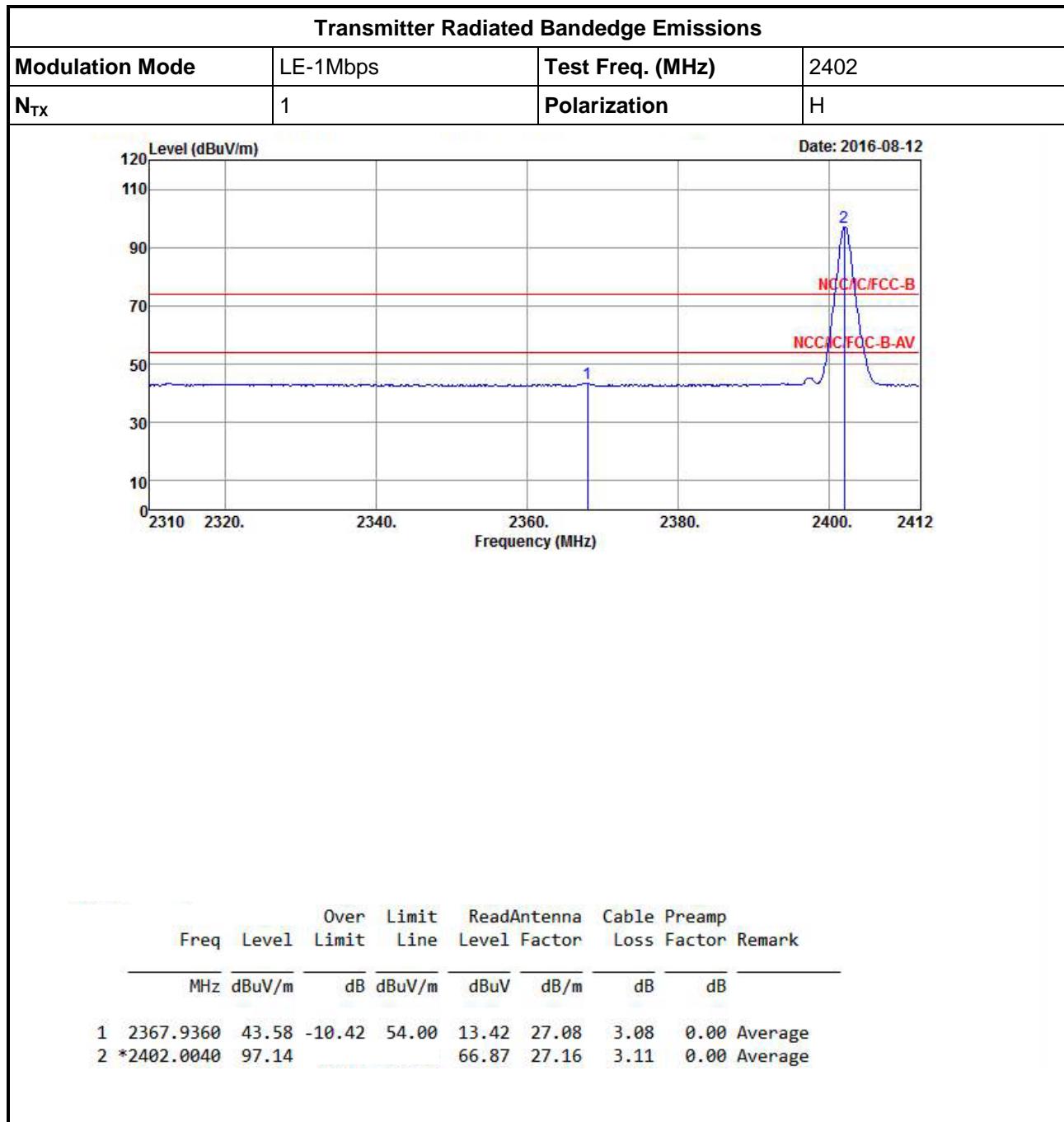




Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D

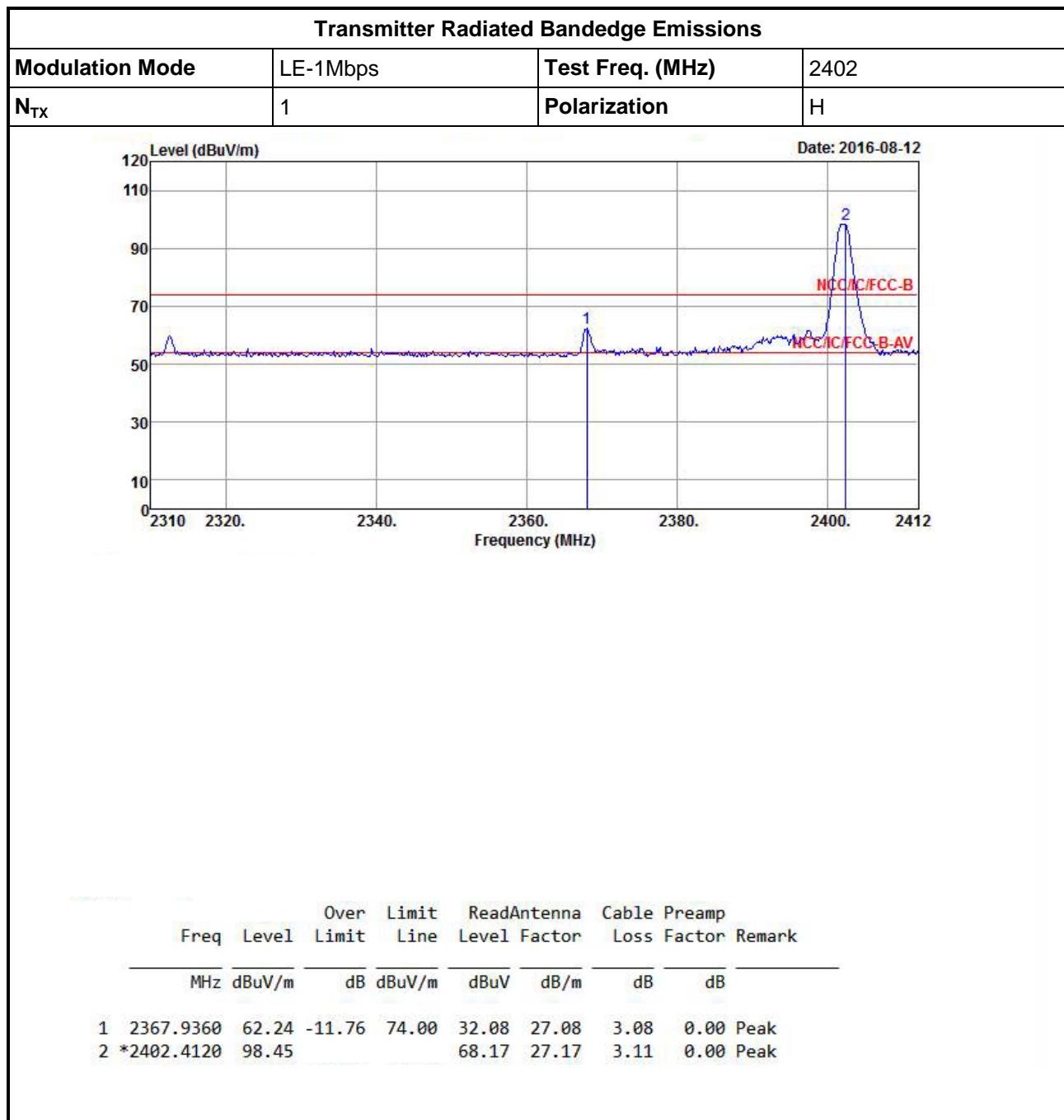
Transmitter Radiated Bandedge Emissions (Restricted Band) Dipole 1 Ant. Mode





Transmitter Radiated Bandedge Emissions (For Dipole)

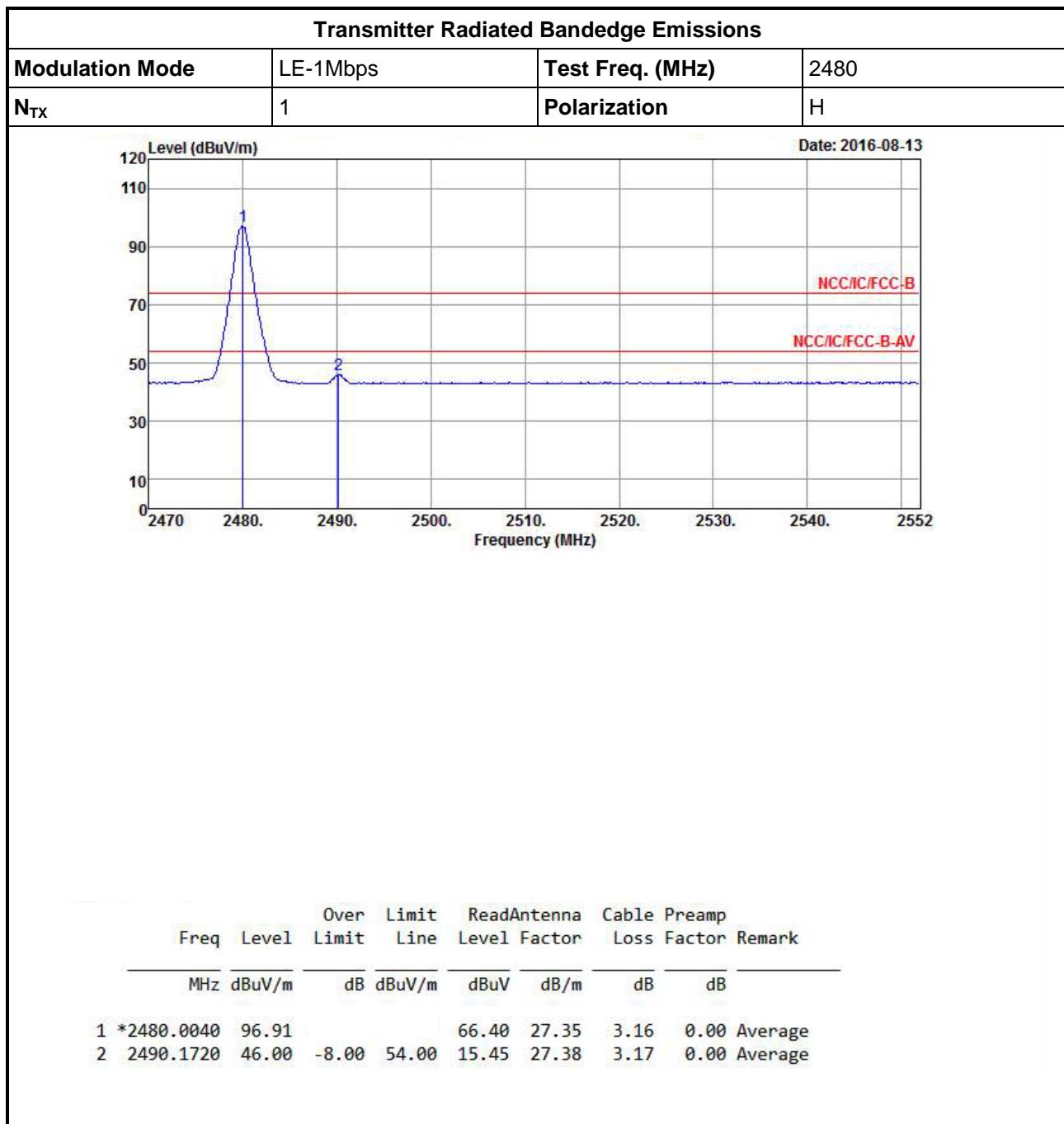
Appendix D





Transmitter Radiated Bandedge Emissions (For Dipole)

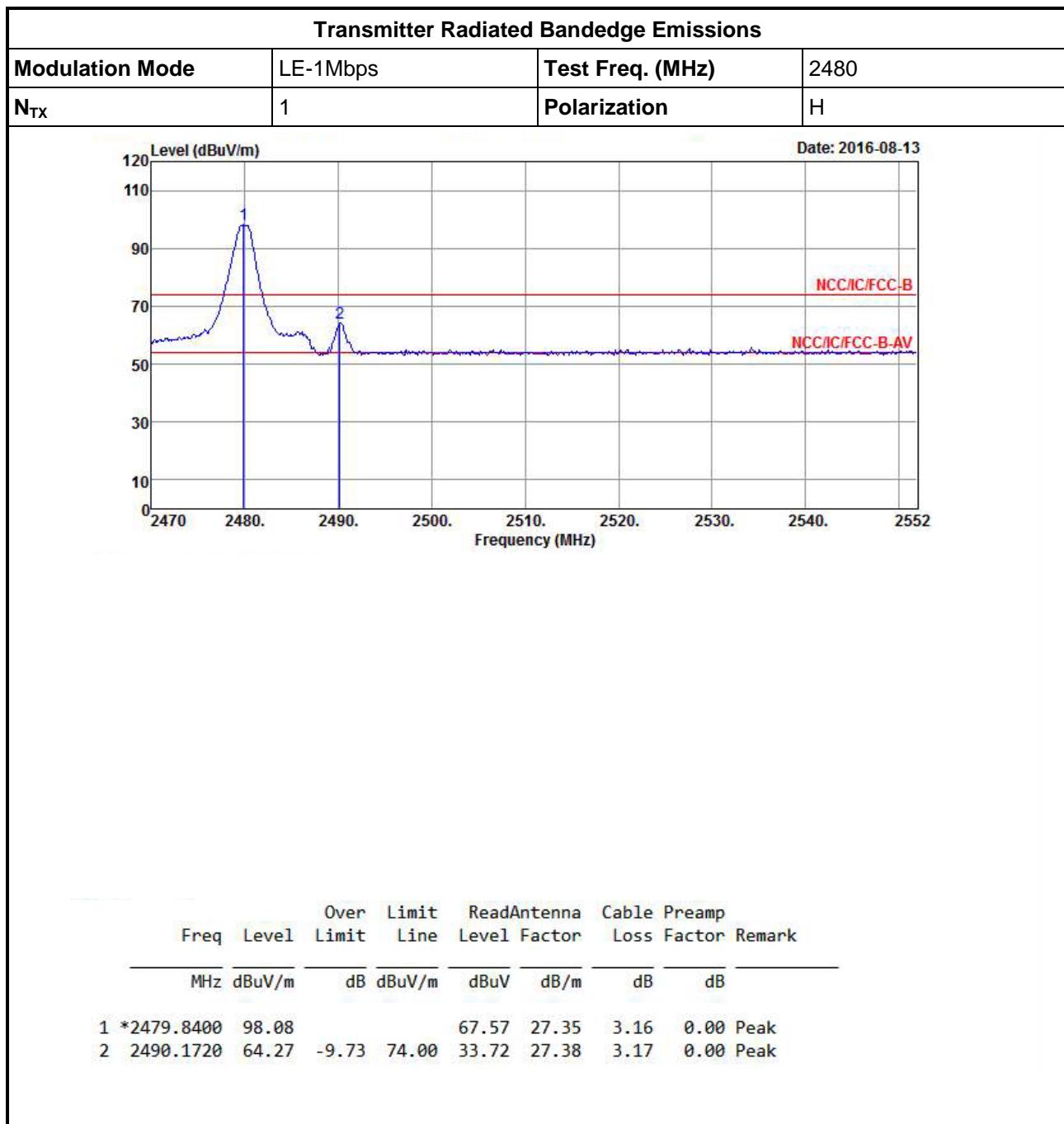
Appendix D





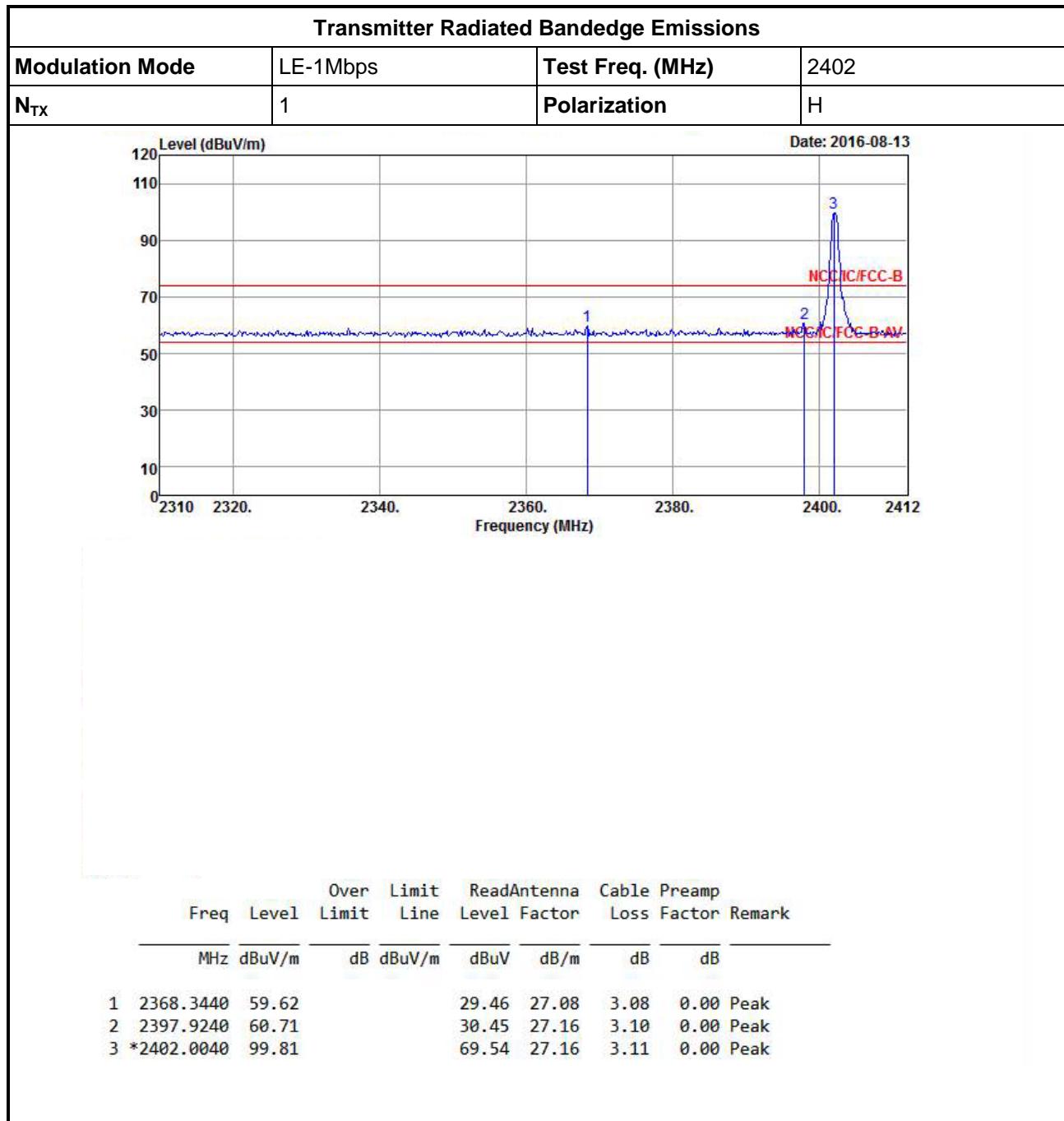
Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D





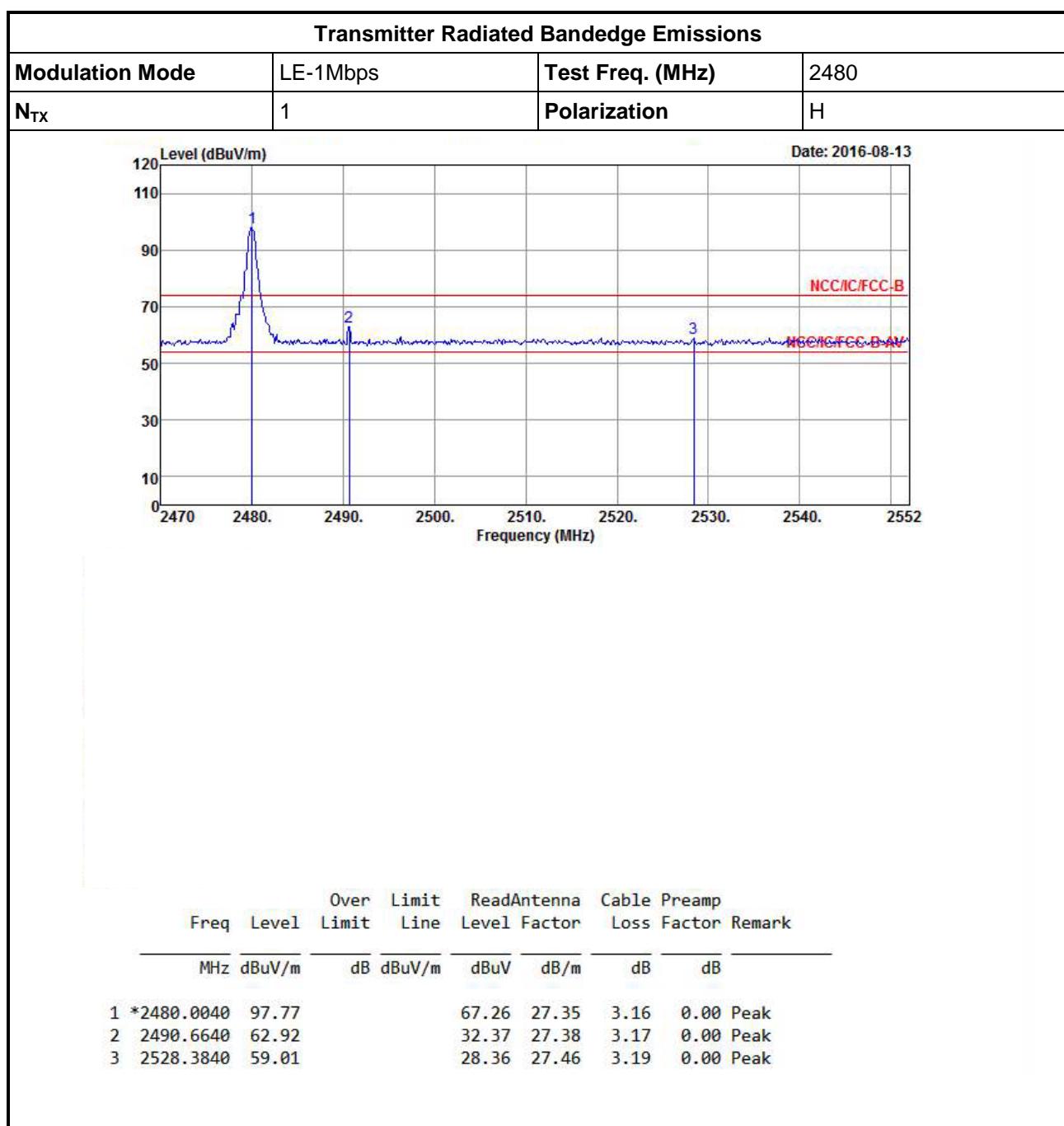
Transmitter Radiated Bandedge Emissions (Non-restricted Band) Dipole 2 Ant. Mode





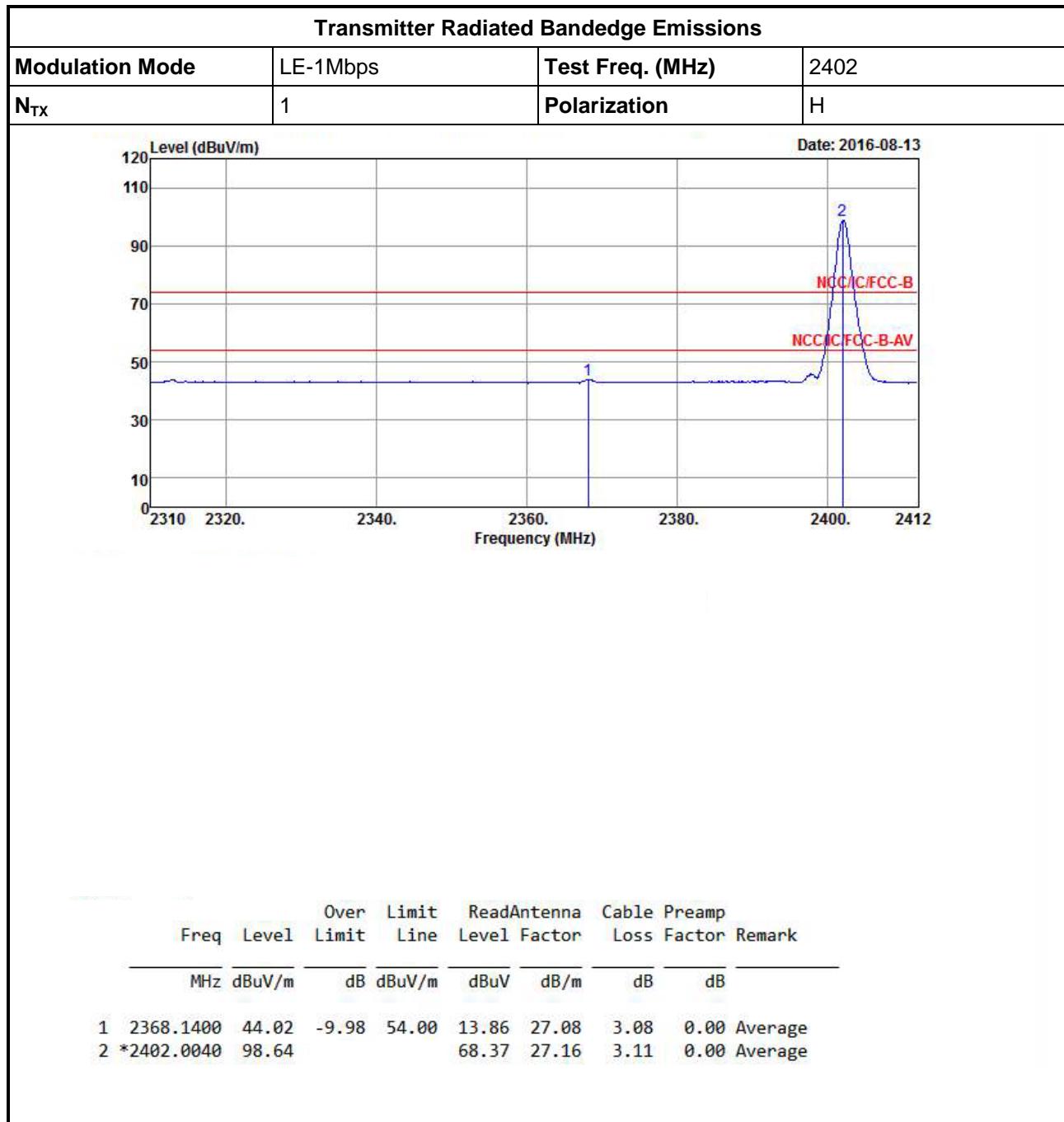
Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D





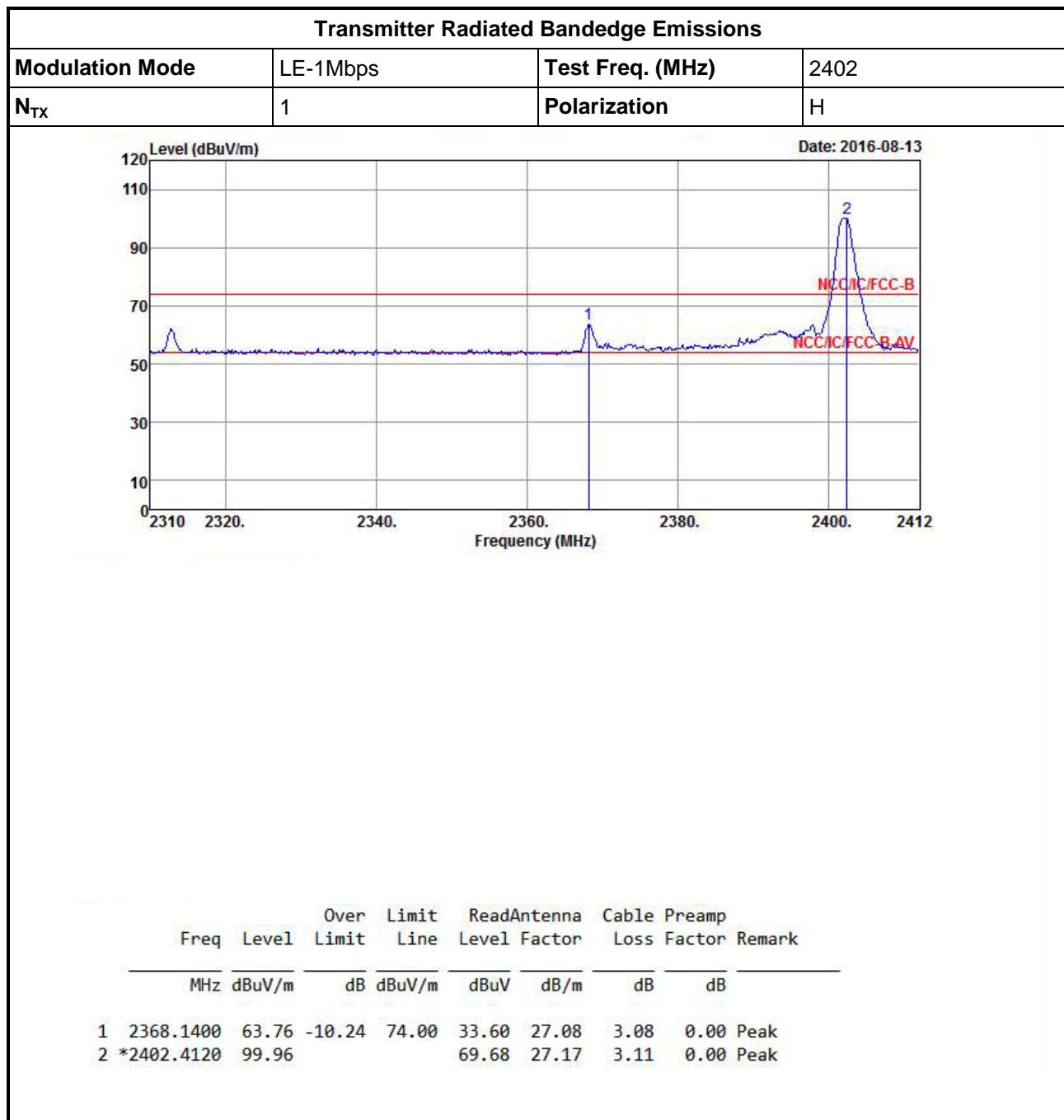
Transmitter Radiated Bandedge Emissions (Restricted Band) Dipole 2 Ant. Mode





Transmitter Radiated Bandedge Emissions (For Dipole)

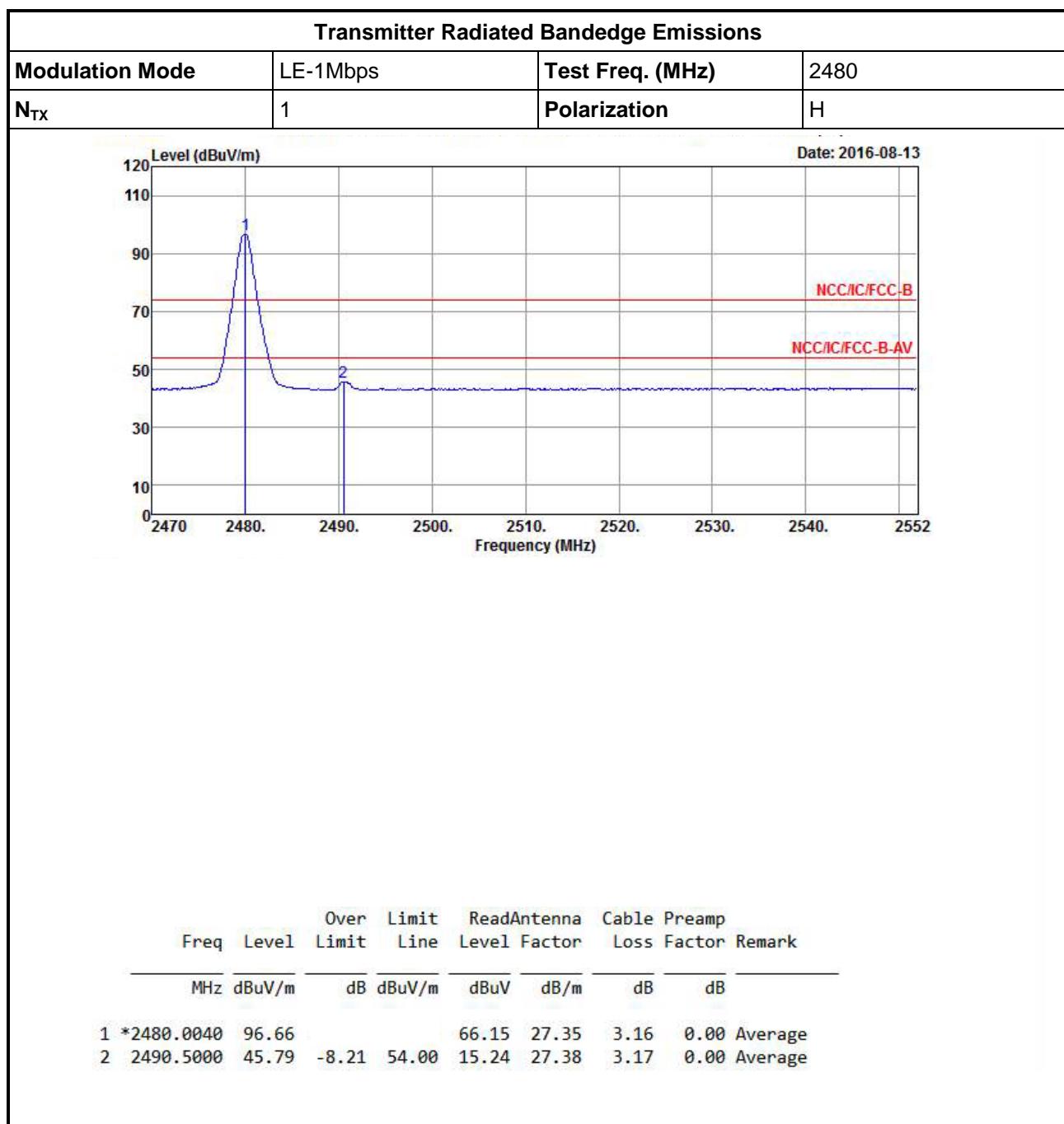
Appendix D





Transmitter Radiated Bandedge Emissions (For Dipole)

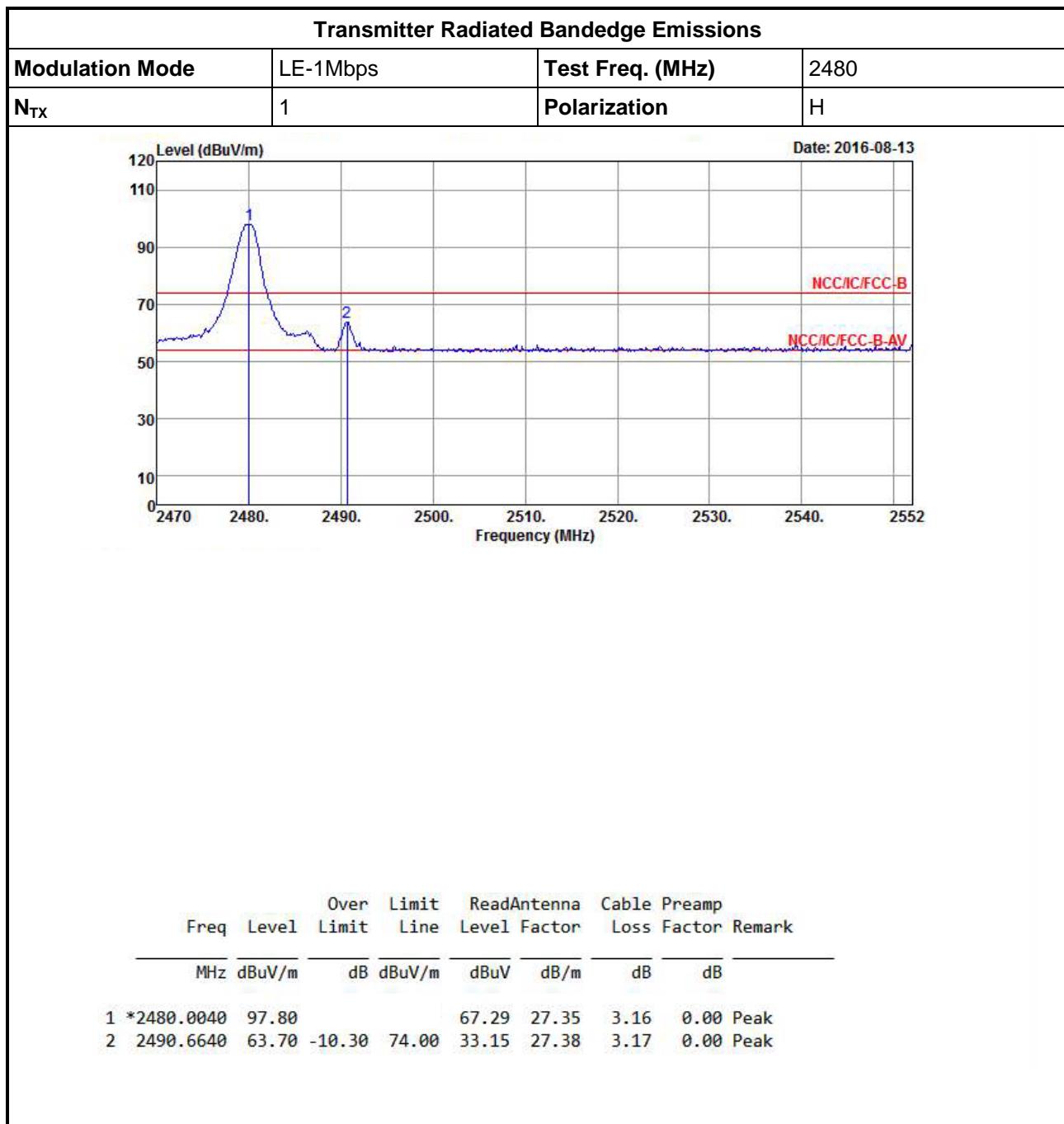
Appendix D





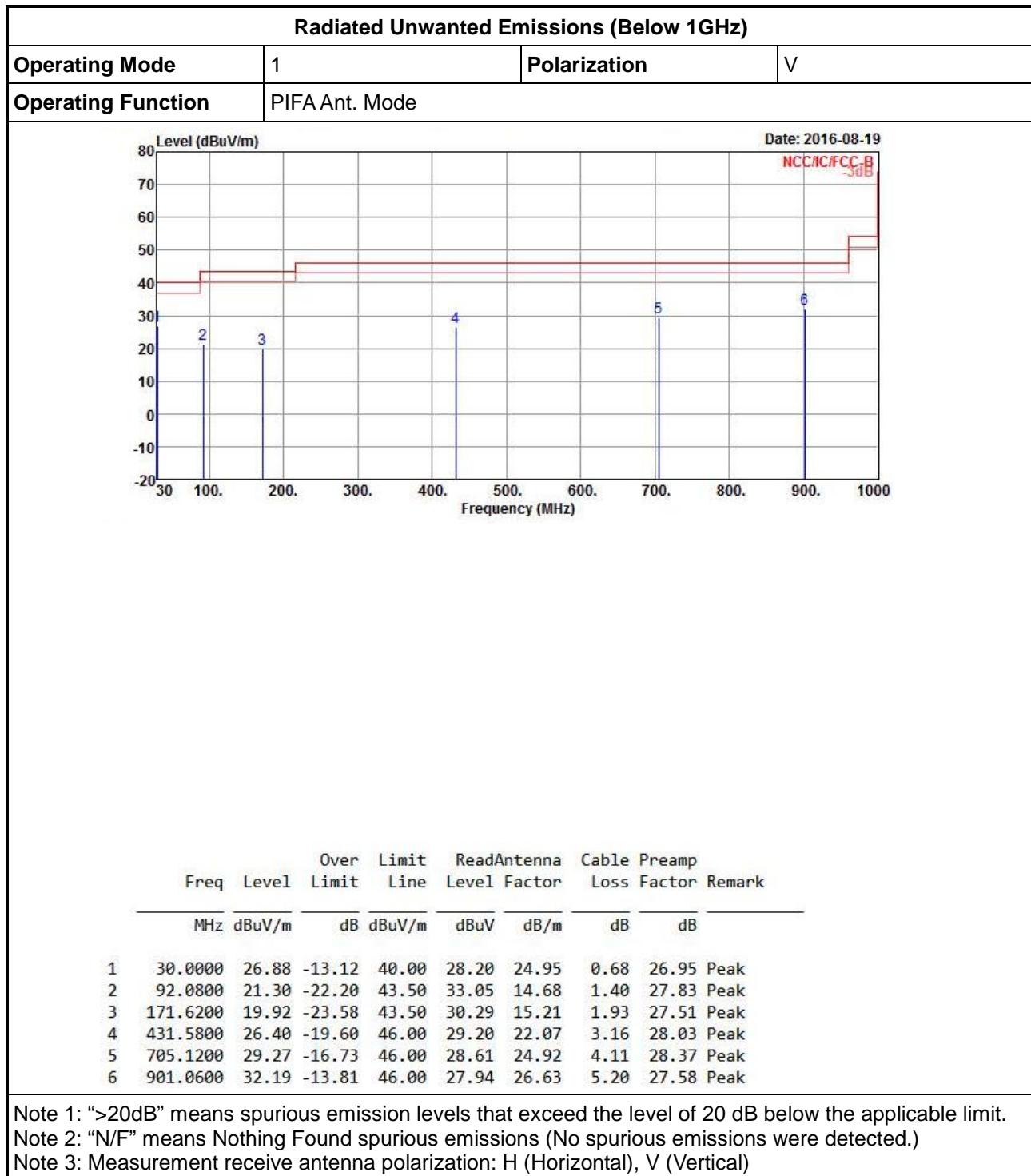
Transmitter Radiated Bandedge Emissions (For Dipole)

Appendix D





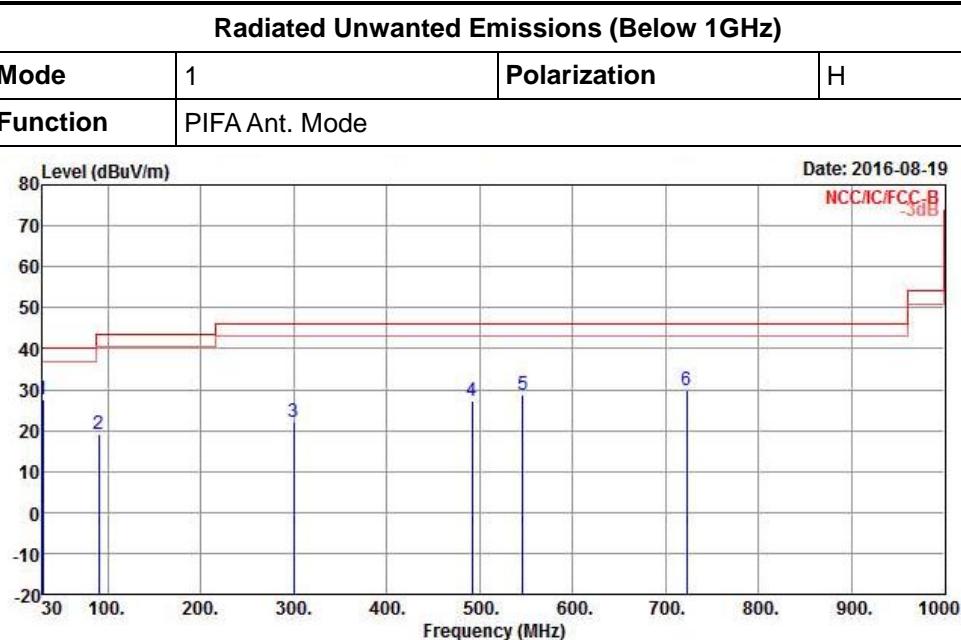
Transmitter Radiated Unwanted Emissions (Below 1GHz)





Transmitter Radiated Unwanted Emissions (For PIFA)

Appendix E



Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	
		Limit	Line	Level	Factor	Loss	Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
0.0000	27.46	-12.54	40.00	28.78	24.95	0.68	26.95	Peak
.1400	19.27	-24.23	43.50	31.46	14.26	1.35	27.80	Peak
.6600	22.18	-23.82	46.00	27.84	18.99	2.53	27.18	Peak
.7200	27.32	-18.68	46.00	29.42	22.92	3.37	28.39	Peak
.0400	28.56	-17.44	46.00	29.54	23.79	3.58	28.35	Peak
.5800	30.00	-16.00	46.00	29.07	25.08	4.13	28.28	Peak

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

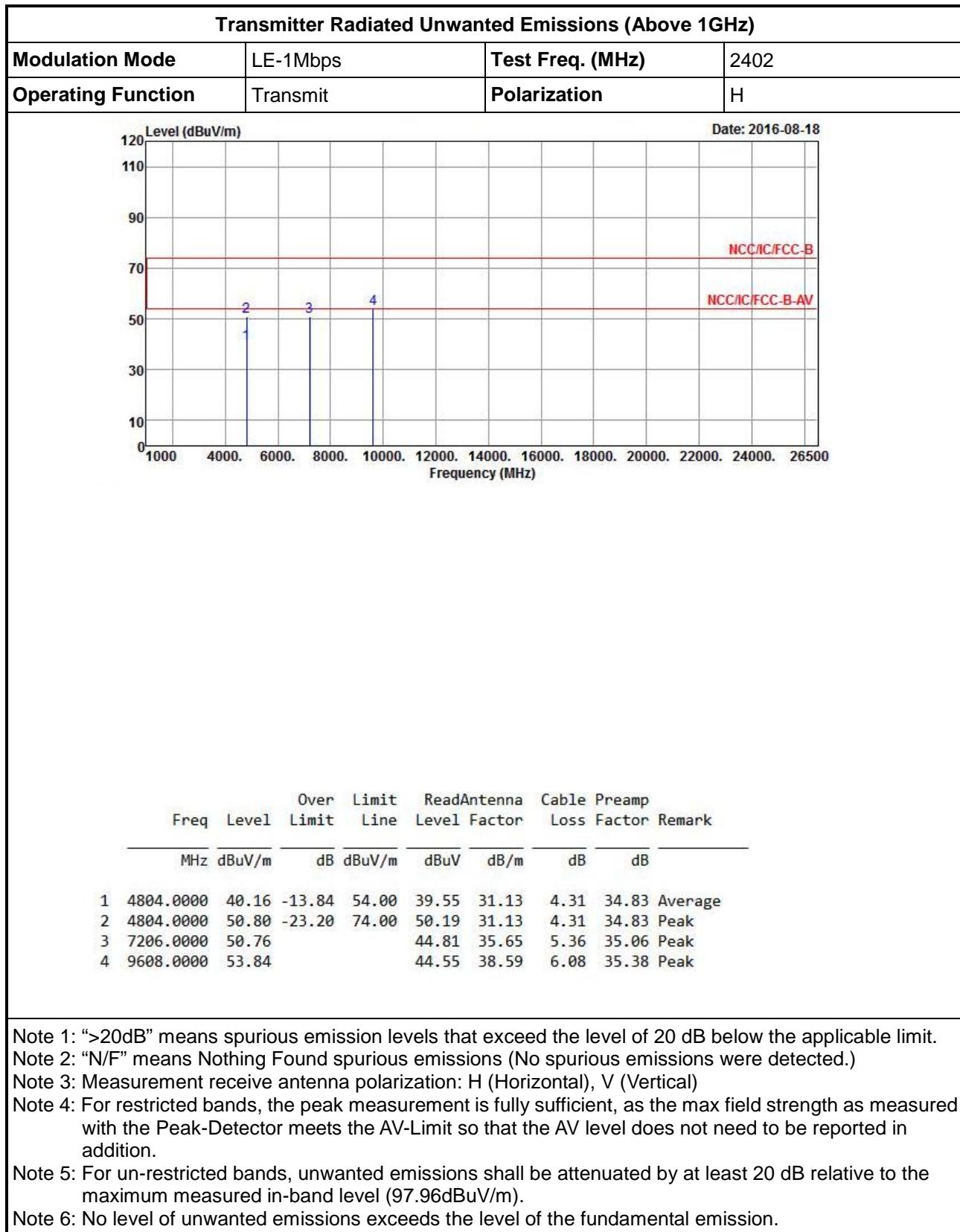
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

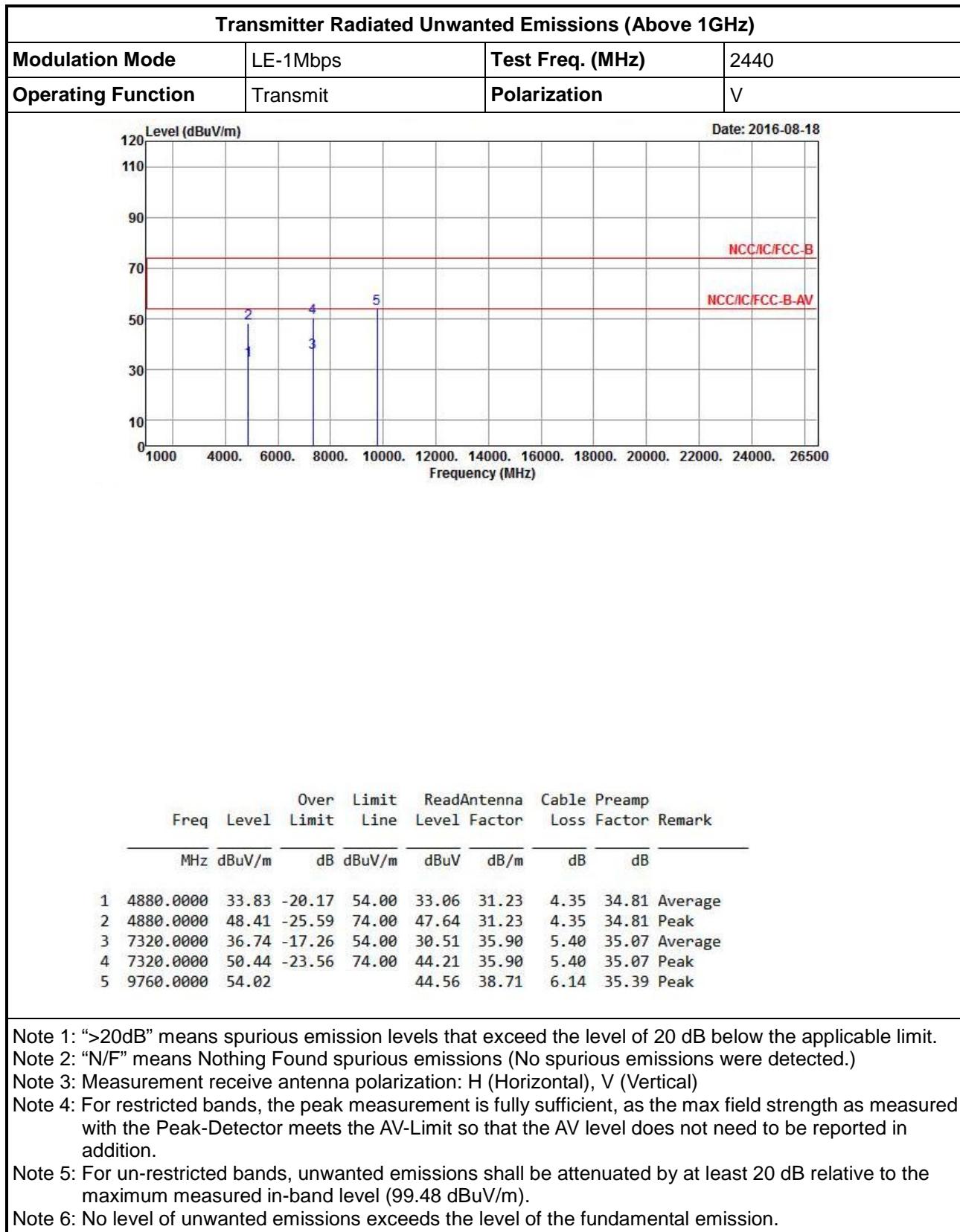
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

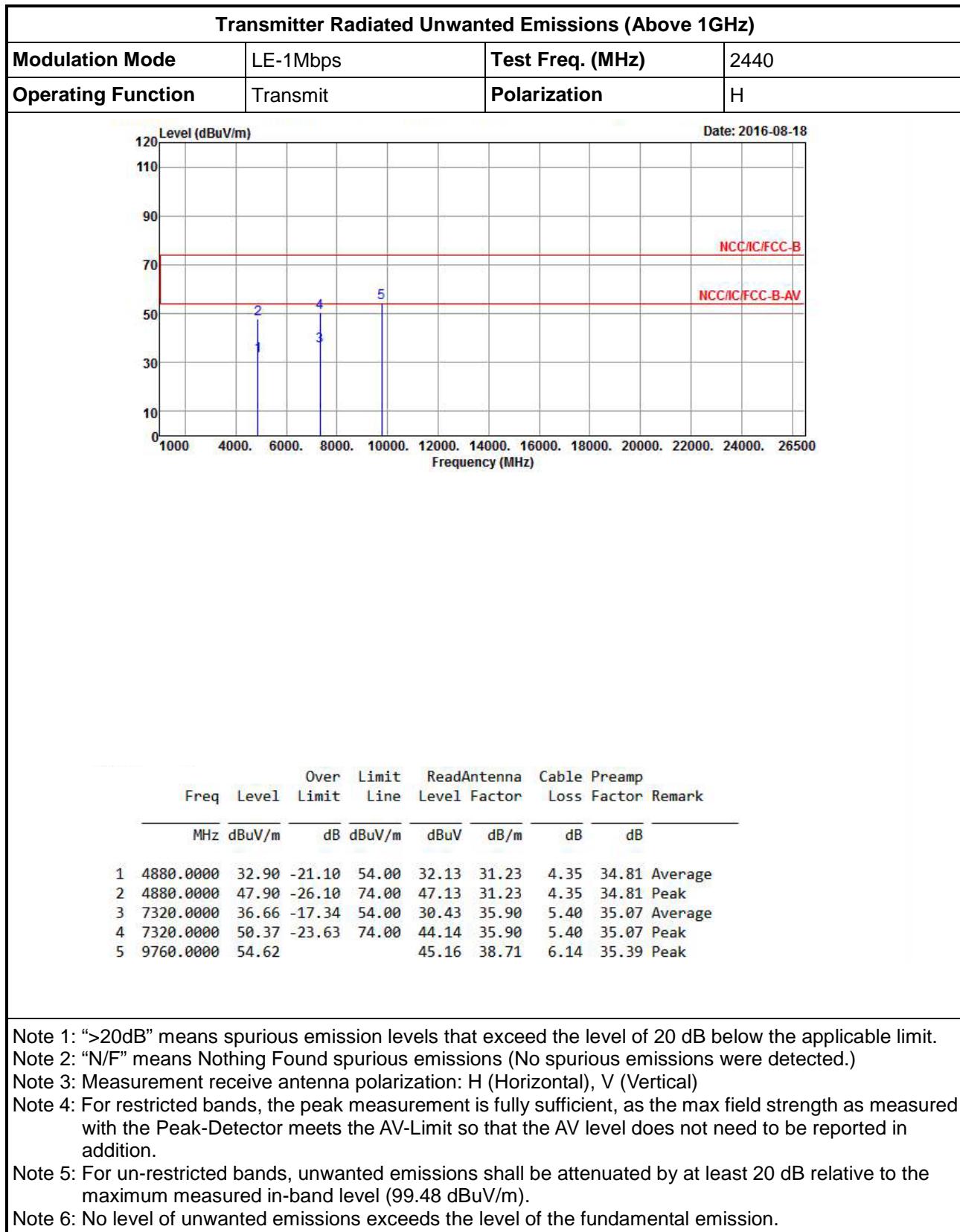


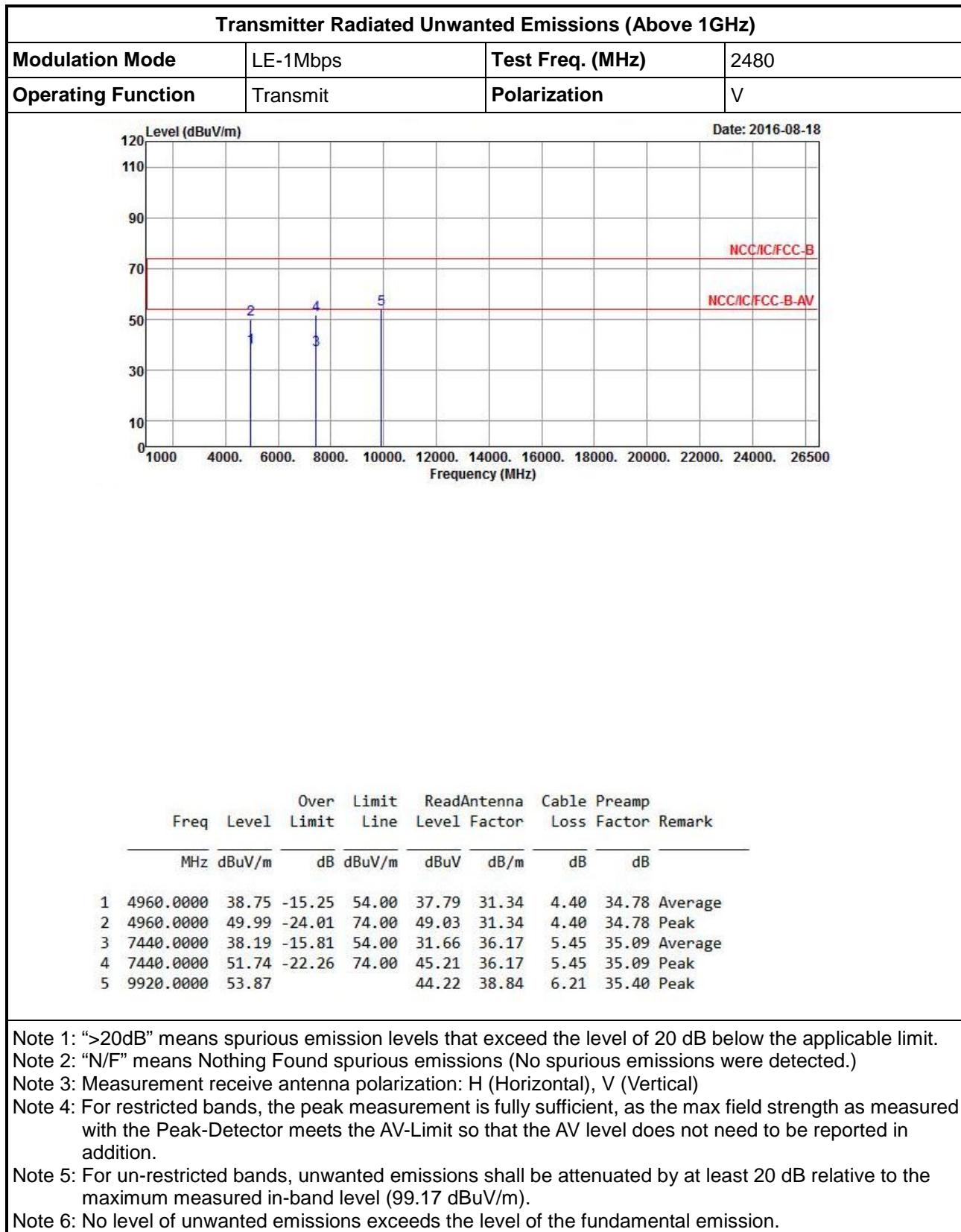
Transmitter Radiated Unwanted Emissions (Above 1GHz)

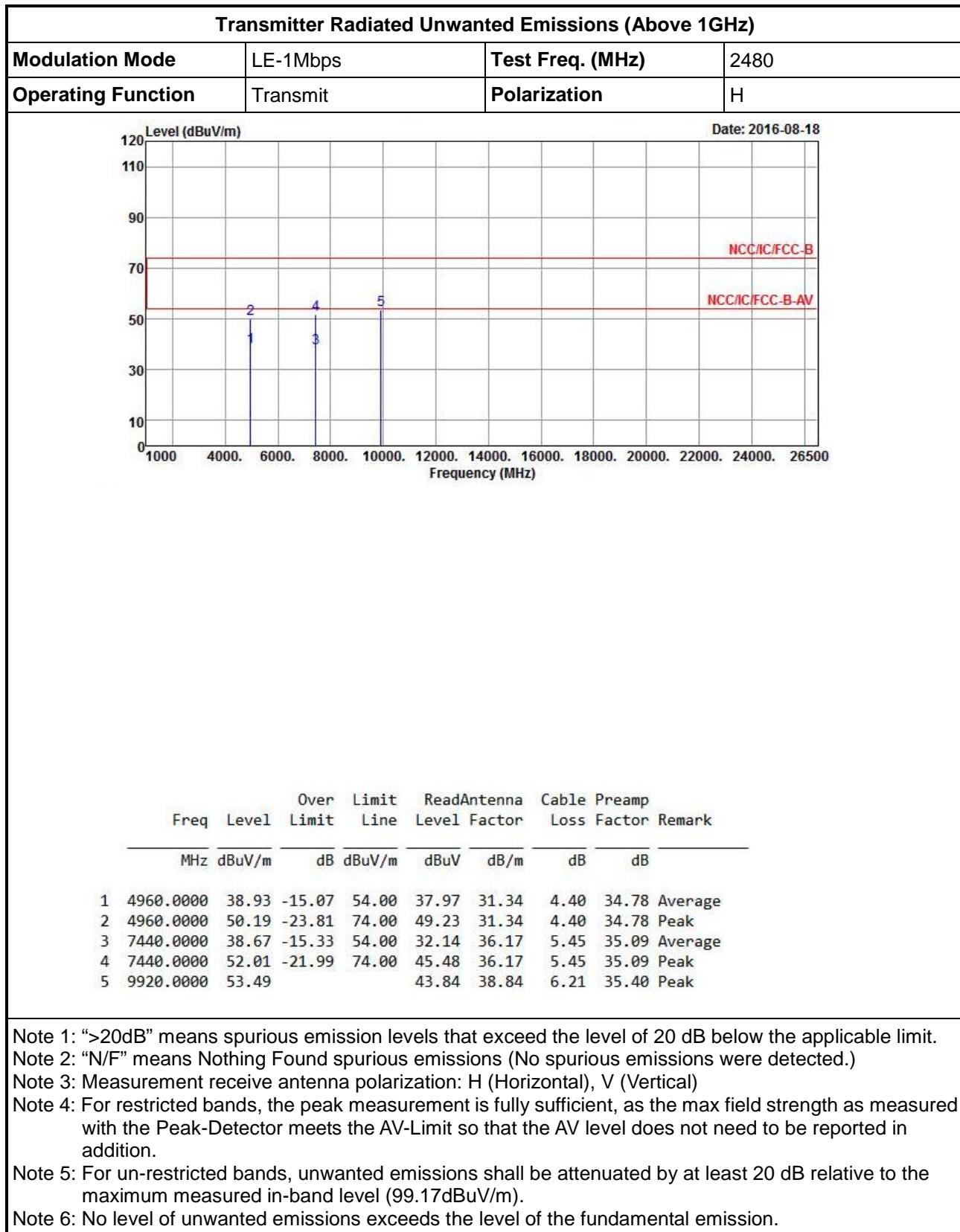
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																					
Modulation Mode		LE-1Mbps		Test Freq. (MHz)		2402																																																															
Operating Function		Transmit		Polarization		V																																																															
Date: 2016-08-18																																																																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 2px;">Freq</th> <th style="text-align: center; padding: 2px;">Level</th> <th style="text-align: center; padding: 2px;">Over Limit</th> <th style="text-align: center; padding: 2px;">Limit</th> <th style="text-align: center; padding: 2px;">Read</th> <th style="text-align: center; padding: 2px;">Antenna</th> <th style="text-align: center; padding: 2px;">Cable</th> <th style="text-align: center; padding: 2px;">Preamp</th> <th colspan="2" style="text-align: center; padding: 2px;">Remark</th> </tr> <tr> <th style="text-align: center; padding: 2px;">MHz</th> <th style="text-align: center; padding: 2px;">dBuV/m</th> <th style="text-align: center; padding: 2px;">dB</th> <th style="text-align: center; padding: 2px;">dBuV/m</th> <th style="text-align: center; padding: 2px;">Line</th> <th style="text-align: center; padding: 2px;">Level</th> <th style="text-align: center; padding: 2px;">Factor</th> <th style="text-align: center; padding: 2px;">Loss</th> <th style="text-align: center; padding: 2px;">Factor</th> <th style="text-align: center; padding: 2px;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;">1</td> <td style="text-align: center; padding: 2px;">4804.0000</td> <td style="text-align: center; padding: 2px;">40.92</td> <td style="text-align: center; padding: 2px;">-13.08</td> <td style="text-align: center; padding: 2px;">54.00</td> <td style="text-align: center; padding: 2px;">40.31</td> <td style="text-align: center; padding: 2px;">31.13</td> <td style="text-align: center; padding: 2px;">4.31</td> <td style="text-align: center; padding: 2px;">34.83</td> <td style="text-align: center; padding: 2px;">Average</td> </tr> <tr> <td style="text-align: center; padding: 2px;">2</td> <td style="text-align: center; padding: 2px;">4804.0000</td> <td style="text-align: center; padding: 2px;">51.86</td> <td style="text-align: center; padding: 2px;">-22.14</td> <td style="text-align: center; padding: 2px;">74.00</td> <td style="text-align: center; padding: 2px;">51.25</td> <td style="text-align: center; padding: 2px;">31.13</td> <td style="text-align: center; padding: 2px;">4.31</td> <td style="text-align: center; padding: 2px;">34.83</td> <td style="text-align: center; padding: 2px;">Peak</td> </tr> <tr> <td style="text-align: center; padding: 2px;">3</td> <td style="text-align: center; padding: 2px;">7206.0000</td> <td style="text-align: center; padding: 2px;">51.73</td> <td></td> <td></td> <td style="text-align: center; padding: 2px;">45.78</td> <td style="text-align: center; padding: 2px;">35.65</td> <td style="text-align: center; padding: 2px;">5.36</td> <td style="text-align: center; padding: 2px;">35.06</td> <td style="text-align: center; padding: 2px;">Peak</td> </tr> <tr> <td style="text-align: center; padding: 2px;">4</td> <td style="text-align: center; padding: 2px;">9608.0000</td> <td style="text-align: center; padding: 2px;">53.86</td> <td></td> <td></td> <td style="text-align: center; padding: 2px;">44.57</td> <td style="text-align: center; padding: 2px;">38.59</td> <td style="text-align: center; padding: 2px;">6.08</td> <td style="text-align: center; padding: 2px;">35.38</td> <td style="text-align: center; padding: 2px;">Peak</td> </tr> </tbody> </table>										Freq	Level	Over Limit	Limit	Read	Antenna	Cable	Preamp	Remark		MHz	dBuV/m	dB	dBuV/m	Line	Level	Factor	Loss	Factor		1	4804.0000	40.92	-13.08	54.00	40.31	31.13	4.31	34.83	Average	2	4804.0000	51.86	-22.14	74.00	51.25	31.13	4.31	34.83	Peak	3	7206.0000	51.73			45.78	35.65	5.36	35.06	Peak	4	9608.0000	53.86			44.57	38.59	6.08	35.38	Peak
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2	4804.0000	51.86	-22.14	74.00	51.25	31.13	4.31	34.83	Peak																																																												
3	7206.0000	51.73			45.78	35.65	5.36	35.06	Peak																																																												
4	9608.0000	53.86			44.57	38.59	6.08	35.38	Peak																																																												
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Transmitter Radiated Unwanted Emissions (Below 1GHz)





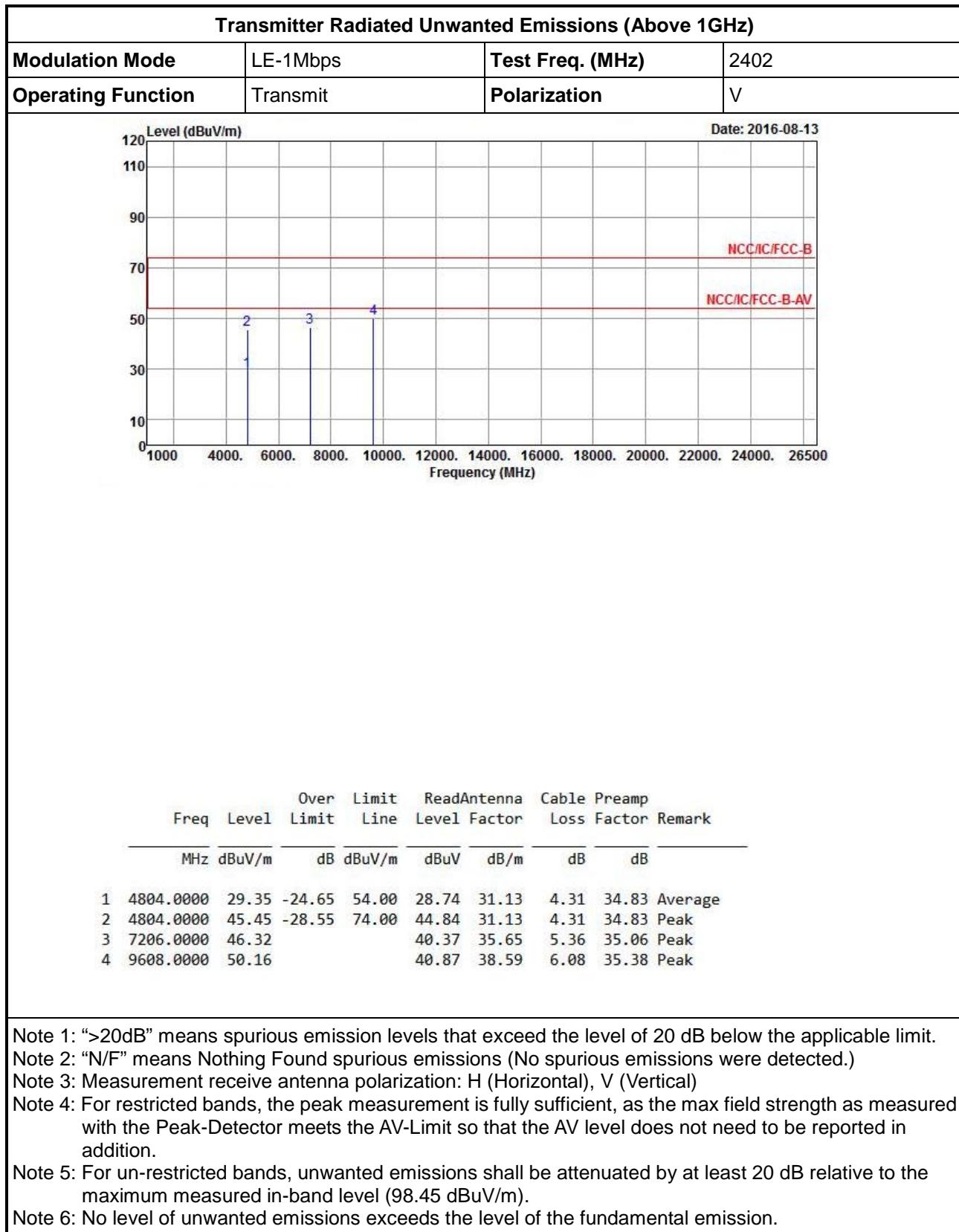
Transmitter Radiated Unwanted Emissions (For Dipole 1)

Appendix E





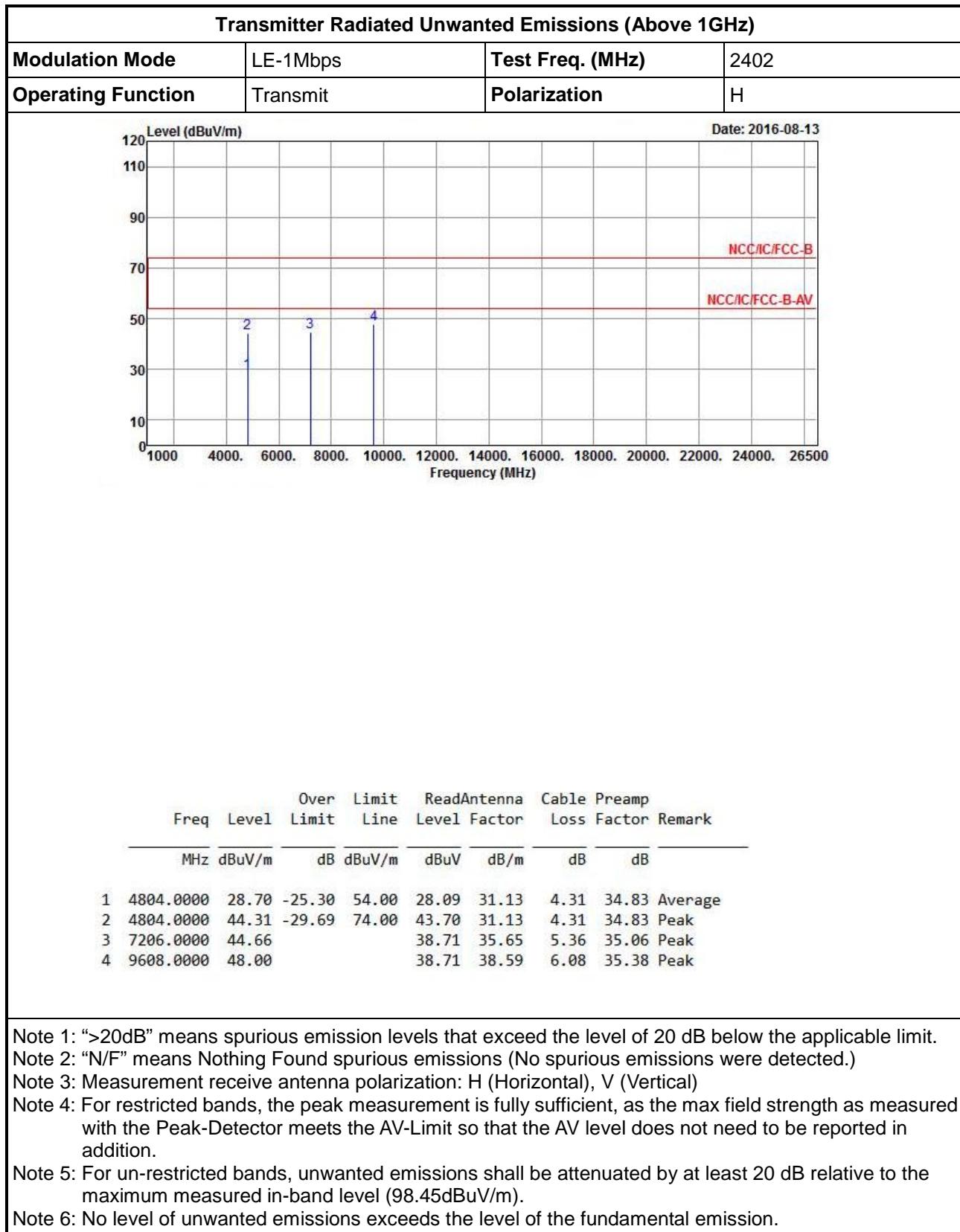
Transmitter Radiated Unwanted Emissions (Above 1GHz)





Transmitter Radiated Unwanted Emissions (For Dipole 1)

Appendix E





Transmitter Radiated Unwanted Emissions (For Dipole 1)

Appendix E

Transmitter Radiated Unwanted Emissions (Above 1GHz)																															
Modulation Mode		LE-1Mbps		Test Freq. (MHz)		2440																									
Operating Function		Transmit		Polarization		V																									
Level (dBuV/m)								Date: 2016-08-13																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Freq</th> <th rowspan="2">Level</th> <th>Over</th> <th>Limit</th> <th>Read</th> <th>Antenna</th> <th>Cable</th> <th>Preamplifier</th> <th rowspan="2">Remark</th> </tr> <tr> <th>Line</th> <th>Limit</th> <th>Level</th> <th>Factor</th> <th>Loss</th> <th>Factor</th> </tr> </thead> <tbody> <tr> <td>MHz</td> <td>dBuV/m</td> <td>dB</td> <td>dBuV/m</td> <td>dBuV</td> <td>dB/m</td> <td>dB</td> <td>dB</td> <td></td> </tr> </tbody> </table>								Freq	Level	Over	Limit	Read	Antenna	Cable	Preamplifier	Remark	Line	Limit	Level	Factor	Loss	Factor	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
Freq	Level	Over	Limit	Read	Antenna	Cable	Preamplifier			Remark																					
		Line	Limit	Level	Factor	Loss	Factor																								
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB																								
1	4880.0000	37.95	-16.05	54.00	37.18	31.23	4.35	34.81 Average																							
2	4880.0000	47.50	-26.50	74.00	46.73	31.23	4.35	34.81 Peak																							
3	7320.0000	35.41	-18.59	54.00	29.18	35.90	5.40	35.07 Average																							
4	7320.0000	46.21	-27.79	74.00	39.98	35.90	5.40	35.07 Peak																							
5	9760.0000	50.66			41.20	38.71	6.14	35.39 Peak																							
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Transmitter Radiated Unwanted Emissions (For Dipole 1)

Appendix E

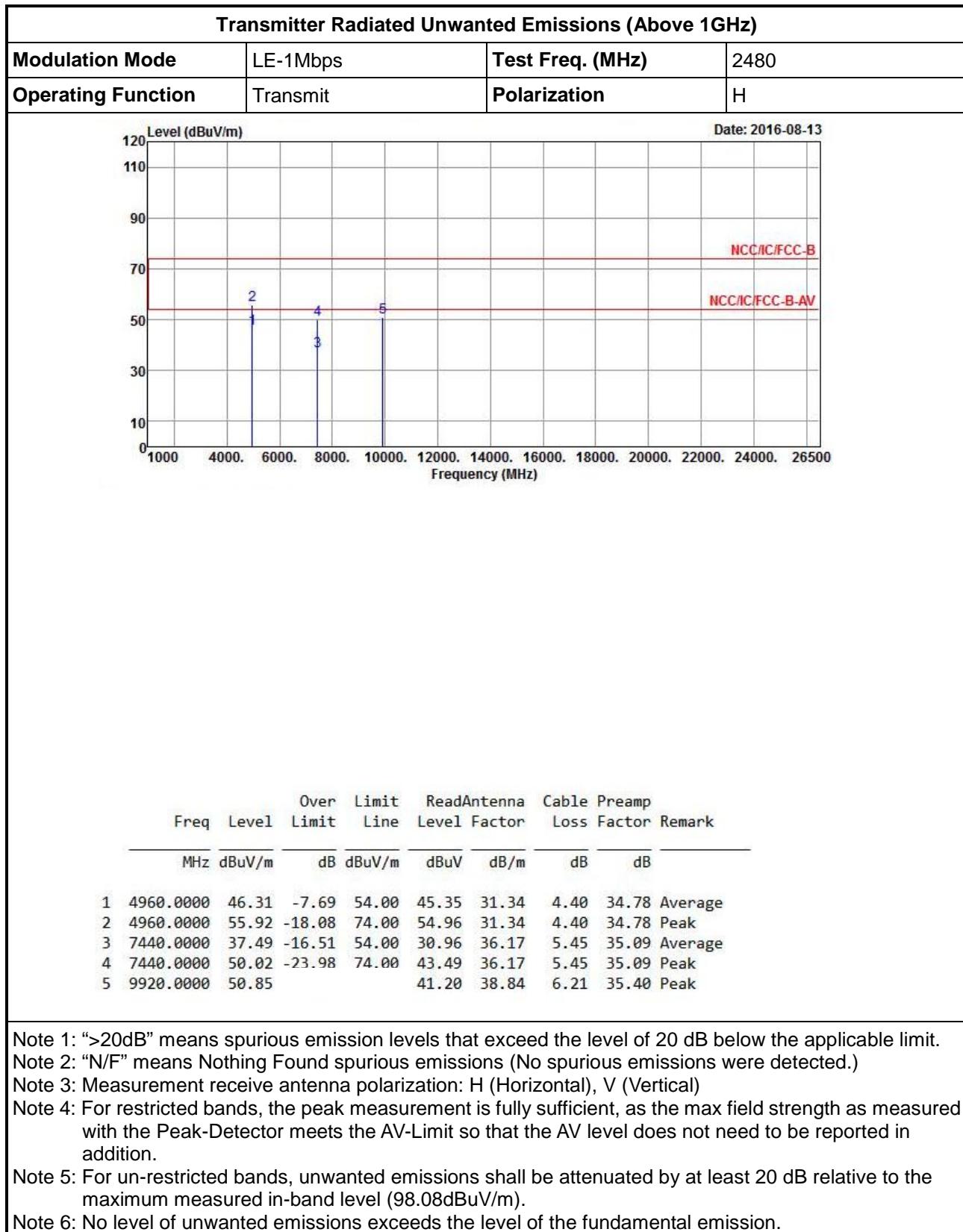
Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																													
Modulation Mode		LE-1Mbps		Test Freq. (MHz)		2440																																																																							
Operating Function		Transmit		Polarization		H																																																																							
Level (dBuV/m)									Date: 2016-08-13																																																																				
									NCC/IC/FCC-B																																																																				
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Transmitter Radiated Unwanted Emissions (For Dipole 1)

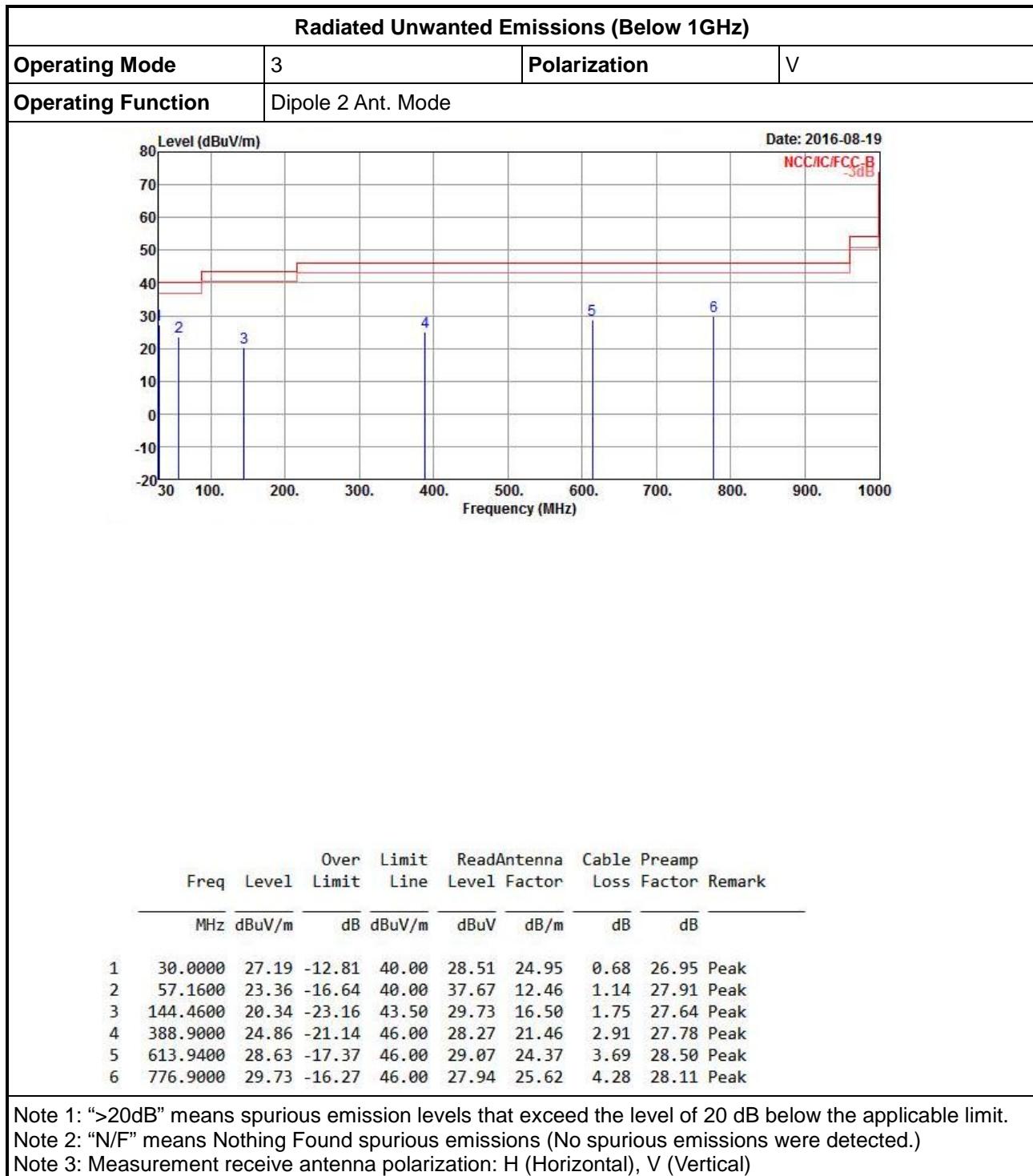
Appendix E

Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																											
Modulation Mode		LE-1Mbps		Test Freq. (MHz)		2480																																																																					
Operating Function		Transmit		Polarization		V																																																																					
Level (dBuV/m)								Date: 2016-08-13																																																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Freq</th> <th rowspan="2" style="text-align: center;">Level</th> <th rowspan="2" style="text-align: center;">Over Limit</th> <th rowspan="2" style="text-align: center;">Read</th> <th rowspan="2" style="text-align: center;">Antenna</th> <th rowspan="2" style="text-align: center;">Cable</th> <th rowspan="2" style="text-align: center;">Preamp</th> <th colspan="2" rowspan="2" style="text-align: center;">Remark</th> </tr> <tr> <th style="text-align: center;">Line</th> <th style="text-align: center;">Level</th> <th style="text-align: center;">Factor</th> <th style="text-align: center;">Loss</th> <th style="text-align: center;">Factor</th> </tr> <tr> <th style="text-align: center;">MHz</th> <th style="text-align: center;">dBuV/m</th> <th style="text-align: center;">dB</th> <th style="text-align: center;">dBuV/m</th> <th style="text-align: center;">dBuV</th> <th style="text-align: center;">dB/m</th> <th style="text-align: center;">dB</th> <th style="text-align: center;">dB</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">4960.0000</td> <td style="text-align: center;">48.16</td> <td style="text-align: center;">-5.84</td> <td style="text-align: center;">54.00</td> <td style="text-align: center;">47.20</td> <td style="text-align: center;">31.34</td> <td style="text-align: center;">4.40</td> <td style="text-align: center;">34.78 Average</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">4960.0000</td> <td style="text-align: center;">57.88</td> <td style="text-align: center;">-16.12</td> <td style="text-align: center;">74.00</td> <td style="text-align: center;">56.92</td> <td style="text-align: center;">31.34</td> <td style="text-align: center;">4.40</td> <td style="text-align: center;">34.78 Peak</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">7440.0000</td> <td style="text-align: center;">43.96</td> <td style="text-align: center;">-10.04</td> <td style="text-align: center;">54.00</td> <td style="text-align: center;">37.43</td> <td style="text-align: center;">36.17</td> <td style="text-align: center;">5.45</td> <td style="text-align: center;">35.09 Average</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">7440.0000</td> <td style="text-align: center;">56.70</td> <td style="text-align: center;">-17.30</td> <td style="text-align: center;">74.00</td> <td style="text-align: center;">50.17</td> <td style="text-align: center;">36.17</td> <td style="text-align: center;">5.45</td> <td style="text-align: center;">35.09 Peak</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">9920.0000</td> <td style="text-align: center;">53.20</td> <td></td> <td></td> <td style="text-align: center;">43.55</td> <td style="text-align: center;">38.84</td> <td style="text-align: center;">6.21</td> <td style="text-align: center;">35.40 Peak</td> </tr> </tbody> </table>	Freq	Level	Over Limit	Read	Antenna	Cable	Preamp	Remark		Line	Level	Factor	Loss	Factor	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		1	4960.0000	48.16	-5.84	54.00	47.20	31.34	4.40	34.78 Average	2	4960.0000	57.88	-16.12	74.00	56.92	31.34	4.40	34.78 Peak	3	7440.0000	43.96	-10.04	54.00	37.43	36.17	5.45	35.09 Average	4	7440.0000	56.70	-17.30	74.00	50.17	36.17	5.45	35.09 Peak	5	9920.0000	53.20			43.55	38.84	6.21	35.40 Peak							
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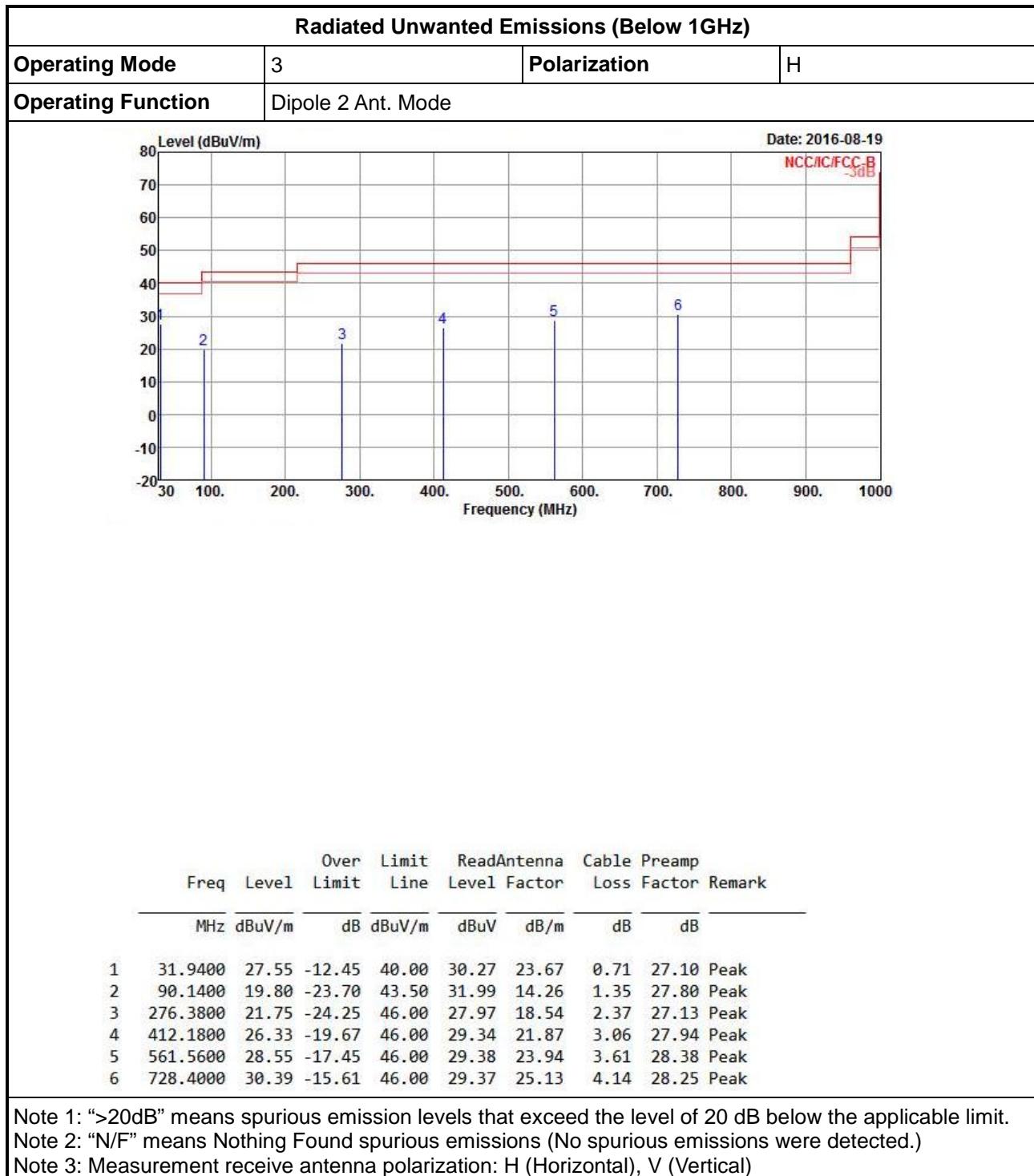
Transmitter Radiated Unwanted Emissions (Below 1GHz)





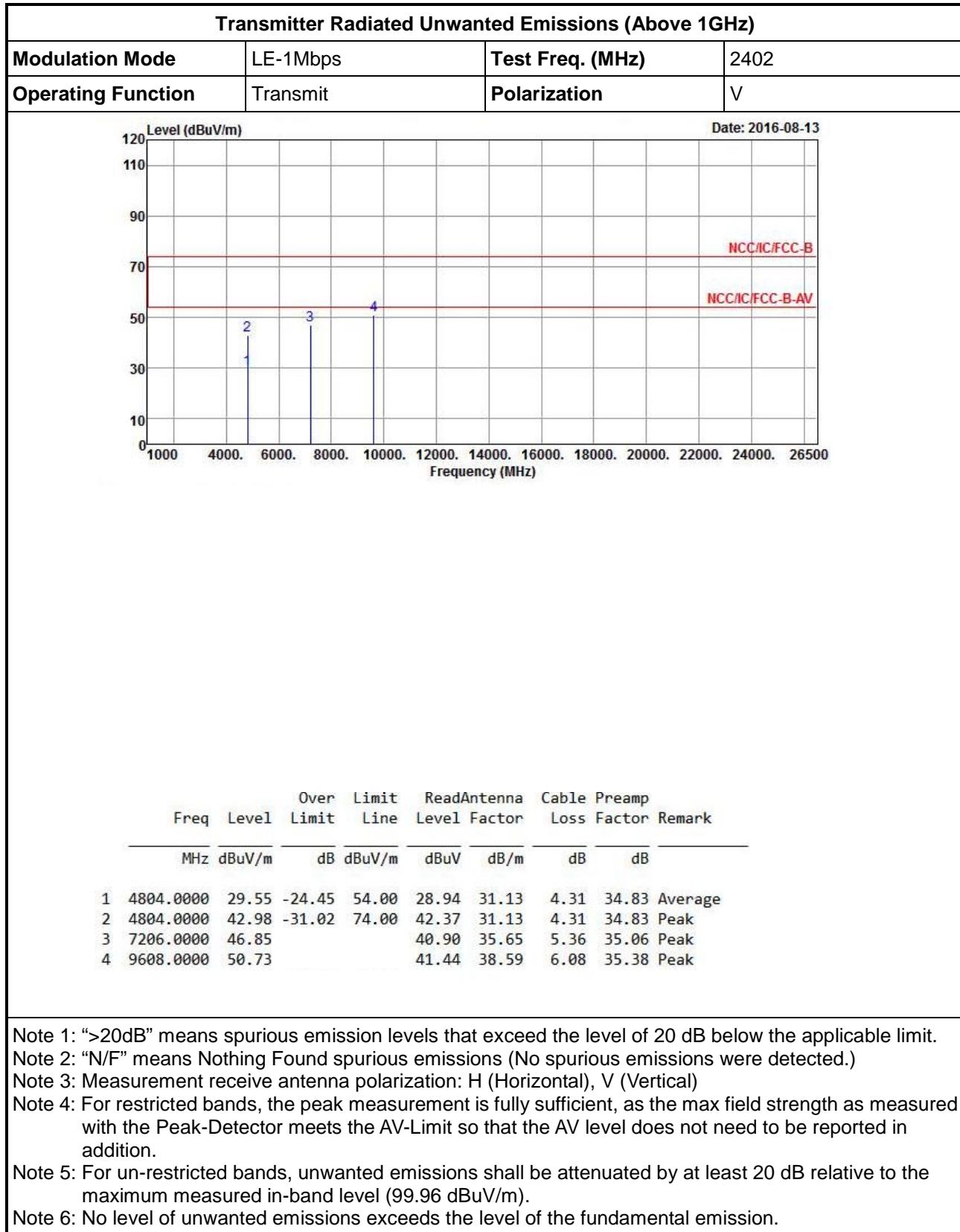
Transmitter Radiated Unwanted Emissions (For Dipole 2)

Appendix E





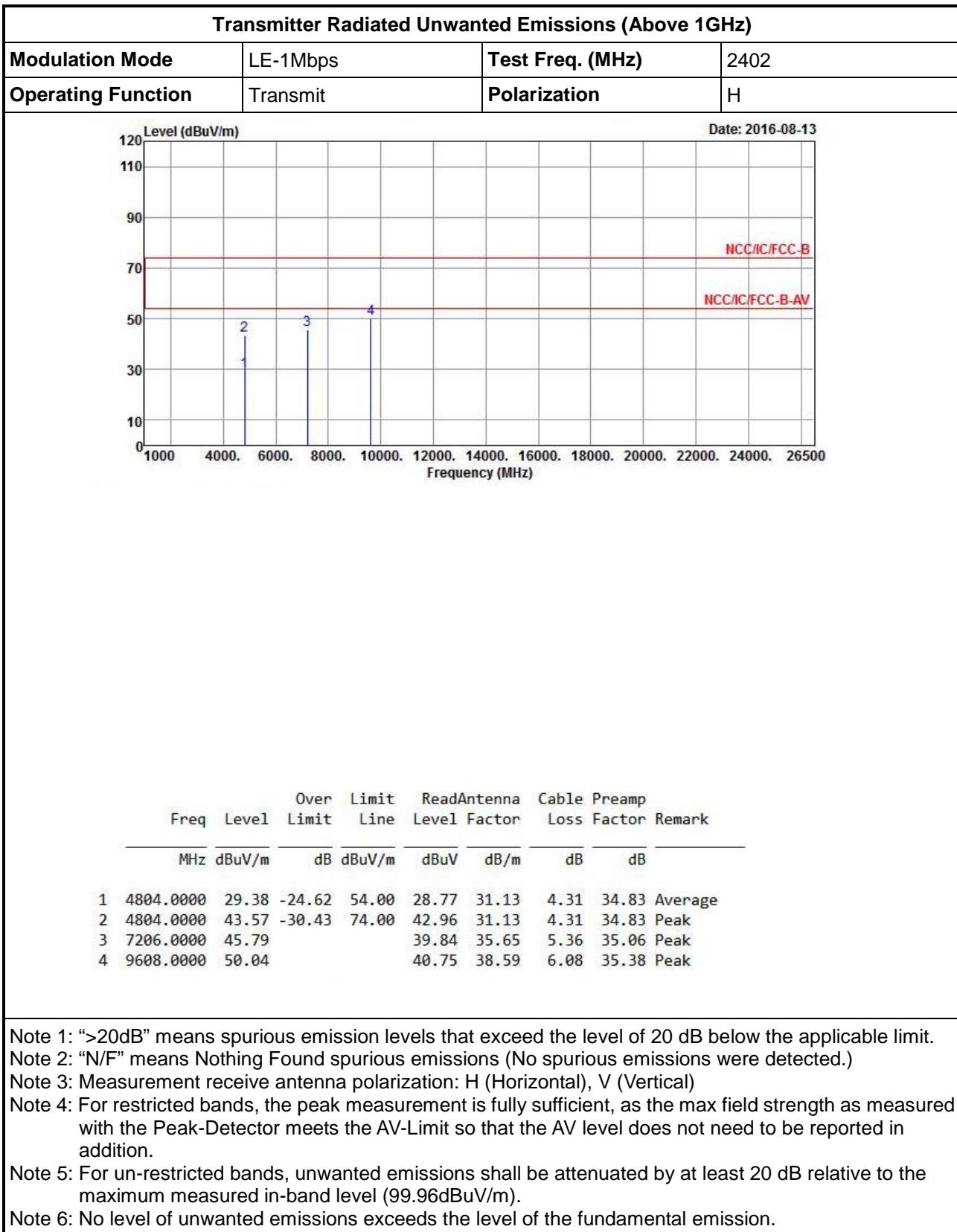
Transmitter Radiated Unwanted Emissions (Above 1GHz)





Transmitter Radiated Unwanted Emissions (For Dipole 2)

Appendix E



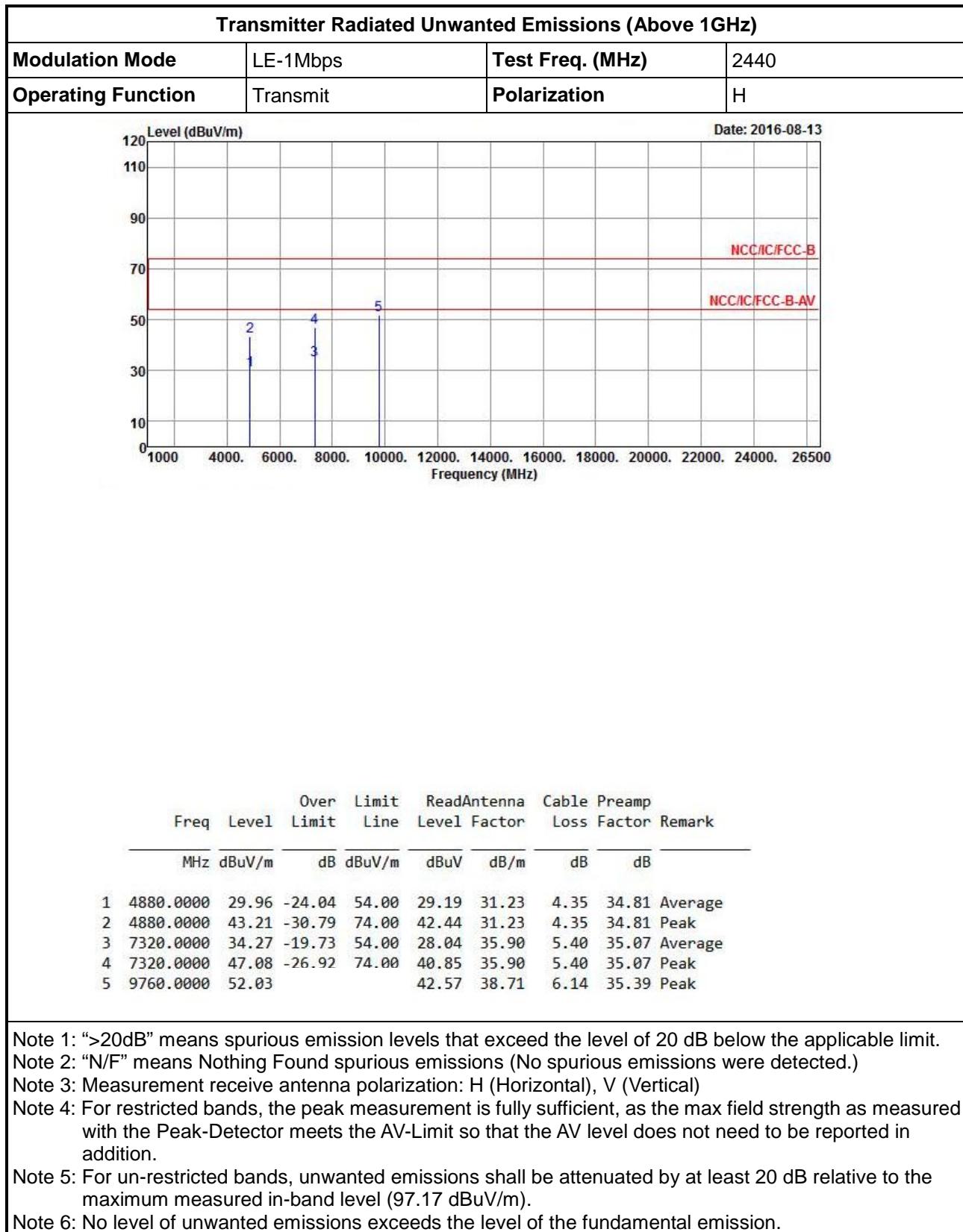


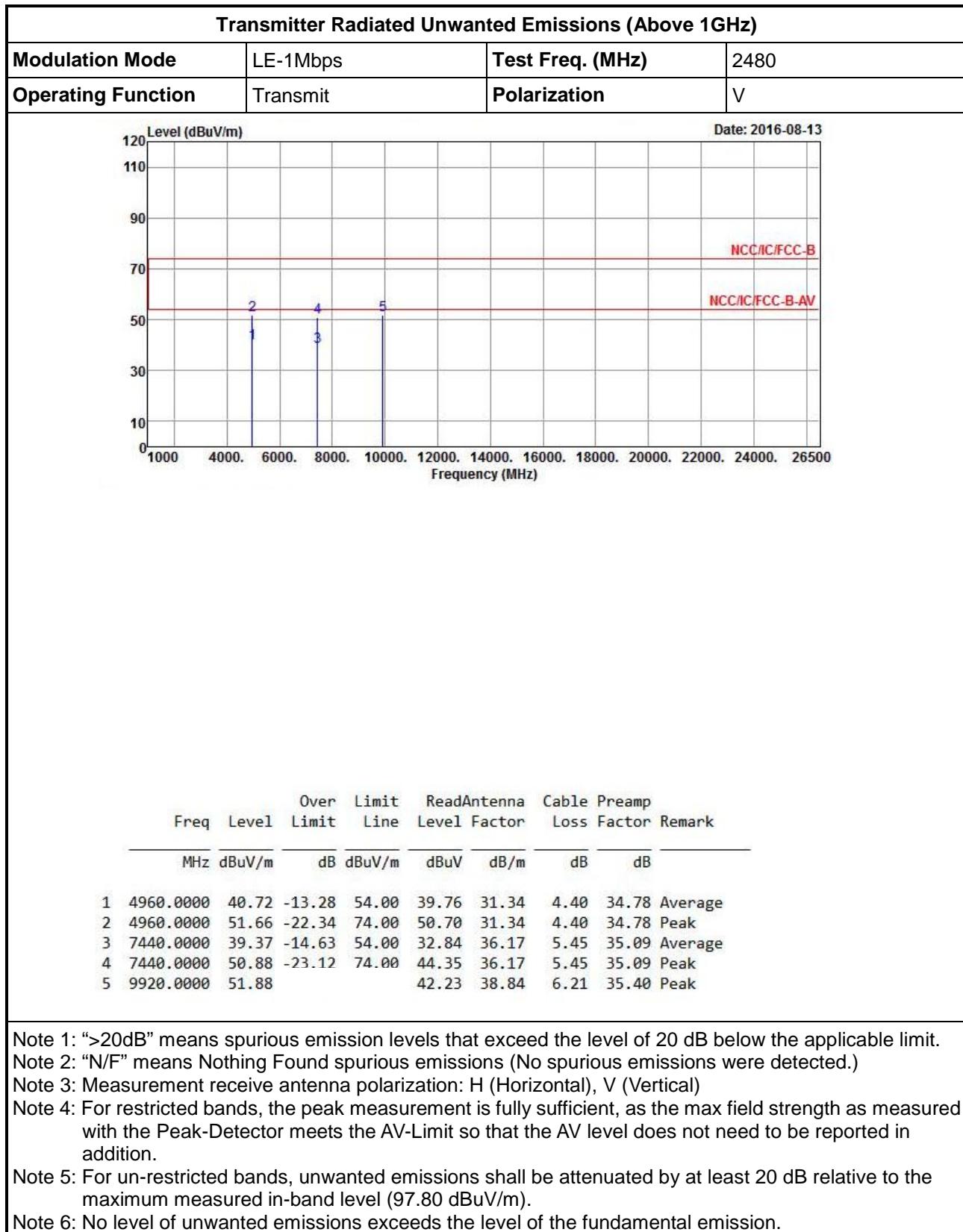
Transmitter Radiated Unwanted Emissions (For Dipole 2)

Appendix E

Transmitter Radiated Unwanted Emissions (Above 1GHz)													
Modulation Mode		LE-1Mbps		Test Freq. (MHz)		2440							
Operating Function		Transmit		Polarization		V							
Level (dBuV/m)									Date: 2016-08-13				
Freq	Level	Over Limit	Limit	Read	Antenna	Cable	Preamplifier						
MHz	dBuV/m	dB	dBuV/m	Line	Level Factor	dBuV	dB/m	dB	dB				
1	4880.0000	29.17	-24.83	54.00	28.40	31.23	4.35	34.81	Average				
2	4880.0000	42.07	-31.93	74.00	41.30	31.23	4.35	34.81	Peak				
3	7320.0000	34.10	-19.90	54.00	27.87	35.90	5.40	35.07	Average				
4	7320.0000	47.59	-26.41	74.00	41.36	35.90	5.40	35.07	Peak				
5	9760.0000	50.63			41.17	38.71	6.14	35.39	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 (97.17 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

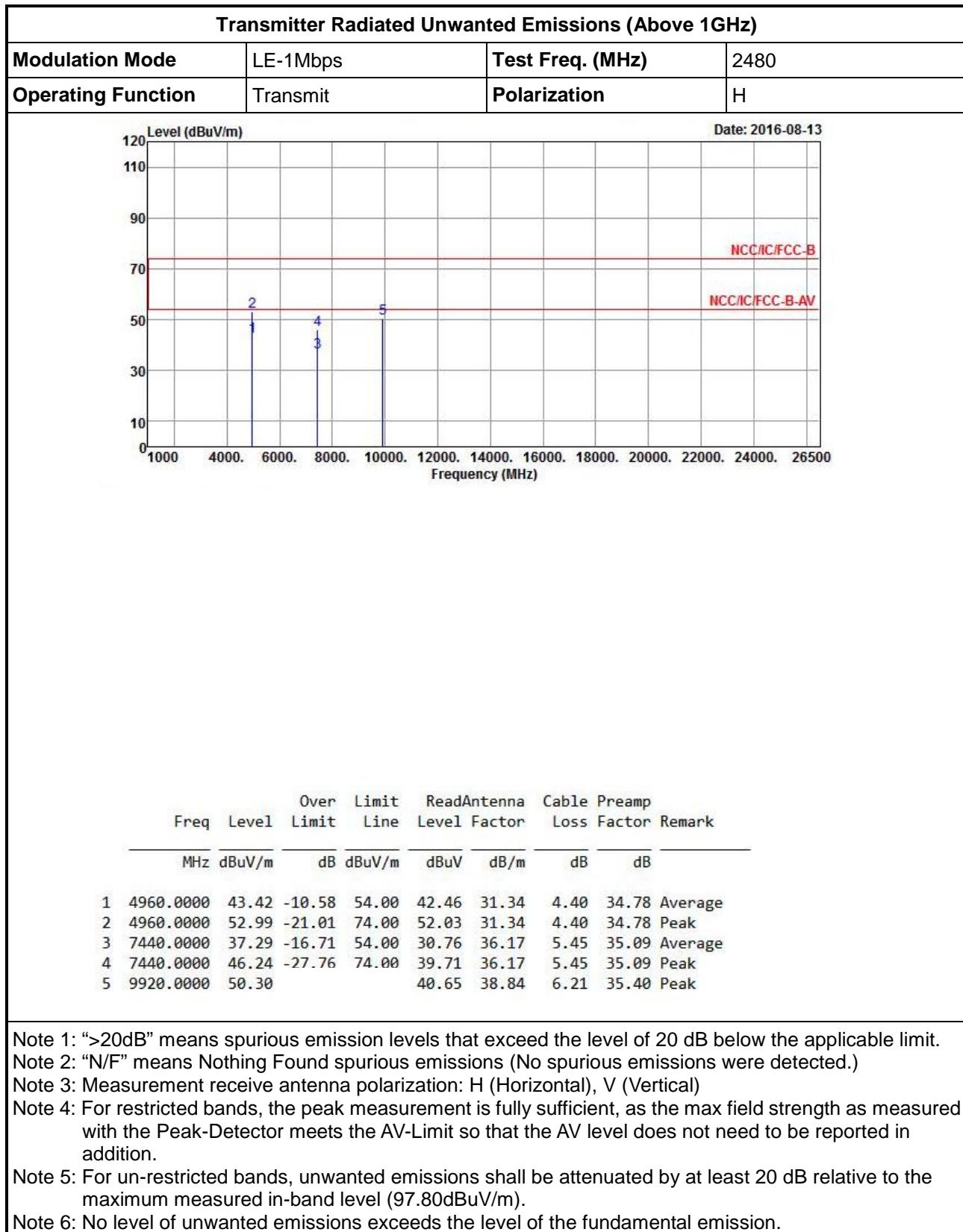






Transmitter Radiated Unwanted Emissions (For Dipole 2)

Appendix E





Appendix A. Test Photos

1. Photographs of Conducted Emissions Test Configuration

Mode 1

FRONT VIEW



REAR VIEW





Mode 1

SIDE VIEW





Mode 2

FRONT VIEW



REAR VIEW





Mode 2

SIDE VIEW





Mode 3

FRONT VIEW



REAR VIEW





Mode 3

SIDE VIEW

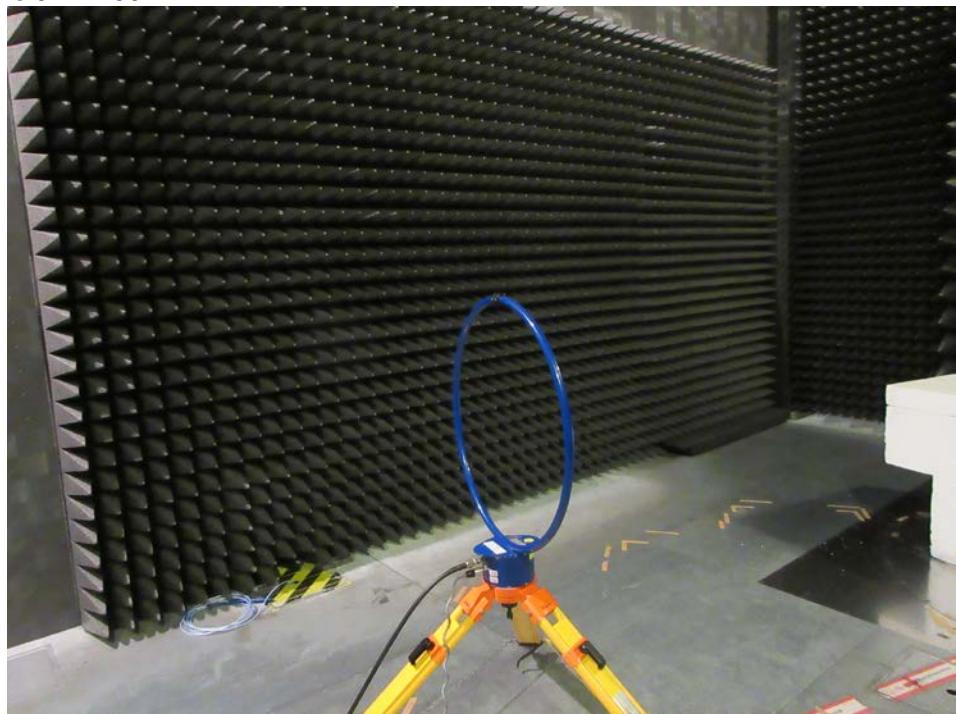




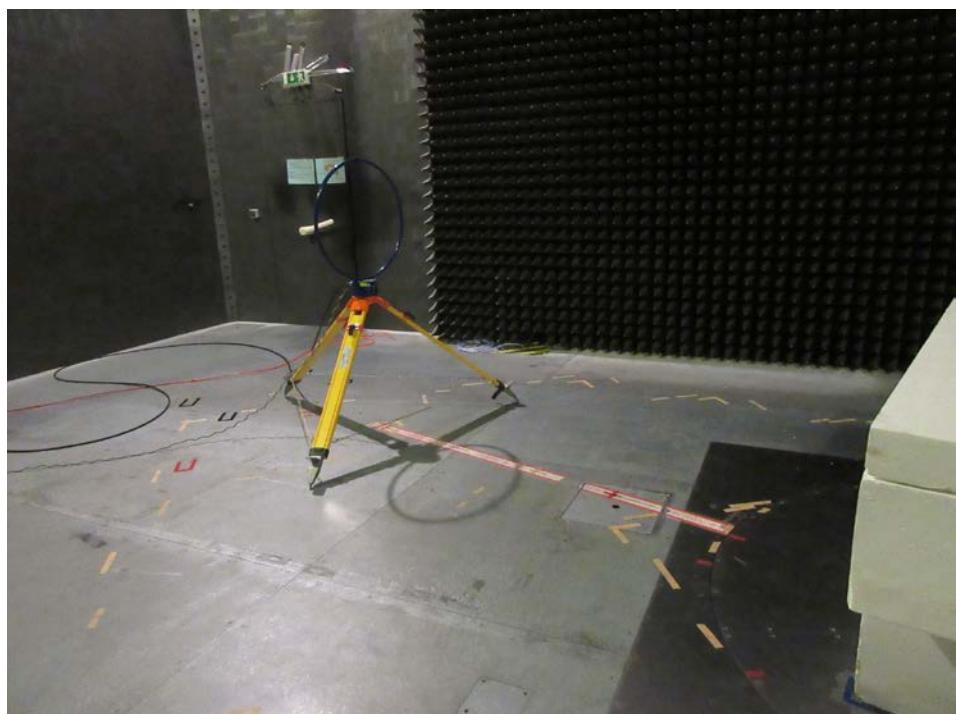
1 Photographs of Radiated Emissions Test Configuration

For radiated emissions 9kHz~30MHz

FRONT VIEW



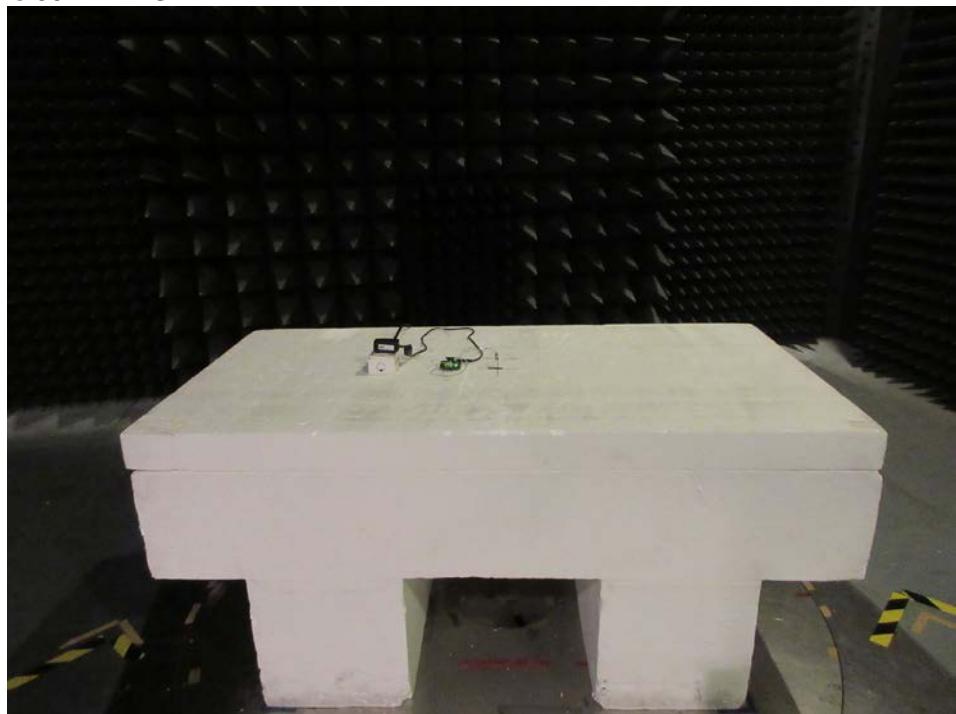
REAR VIEW



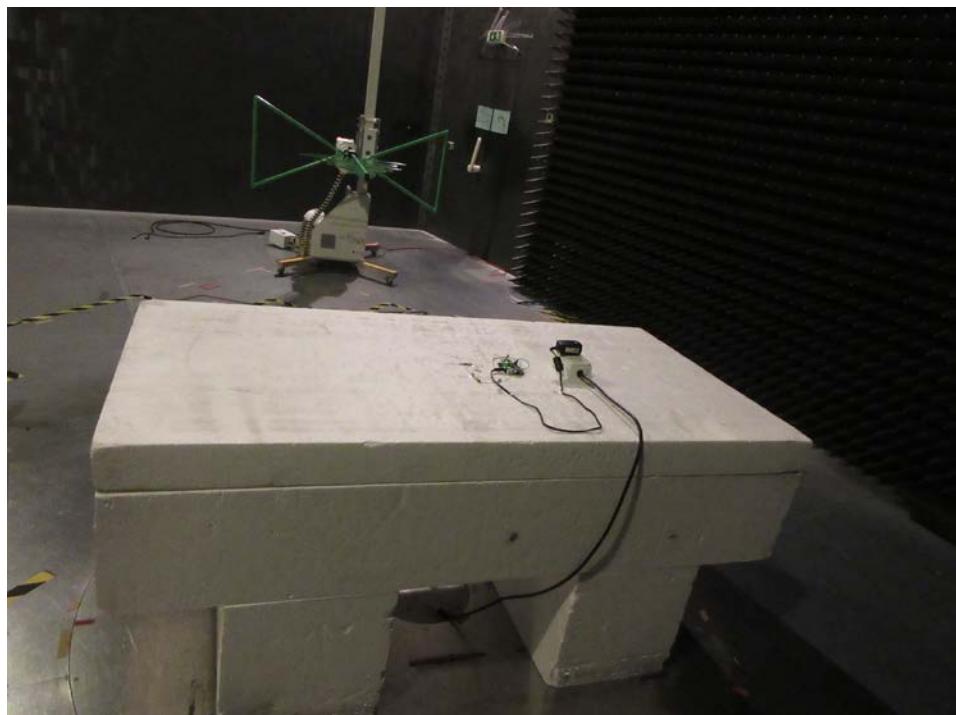


For radiated emissions 30MHz~1GHz
Mode 1

FRONT VIEW



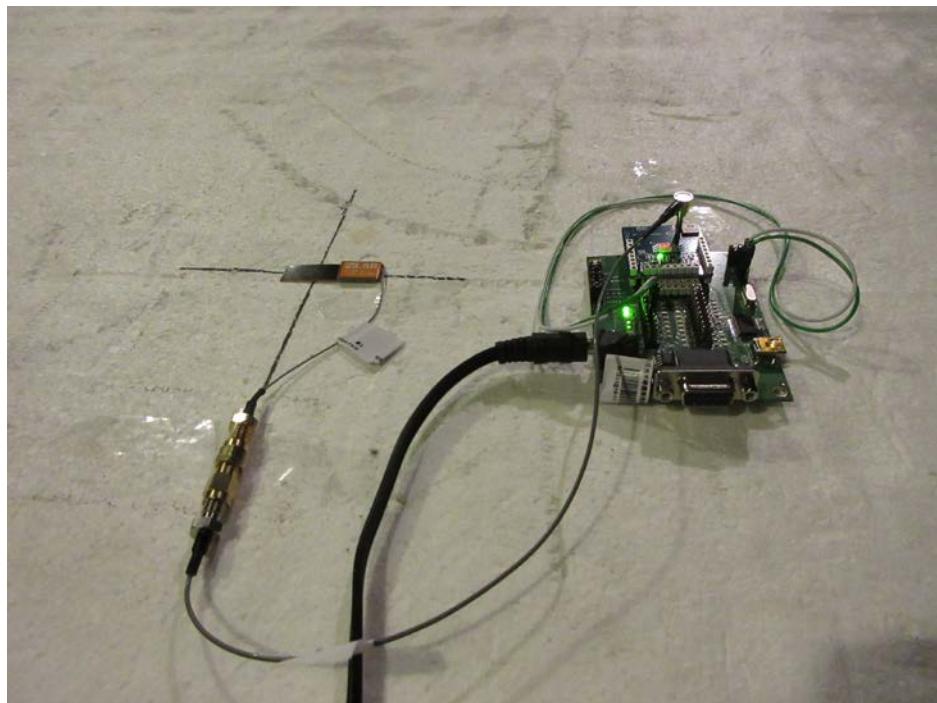
REAR VIEW





Mode 1

EUT take a close-up



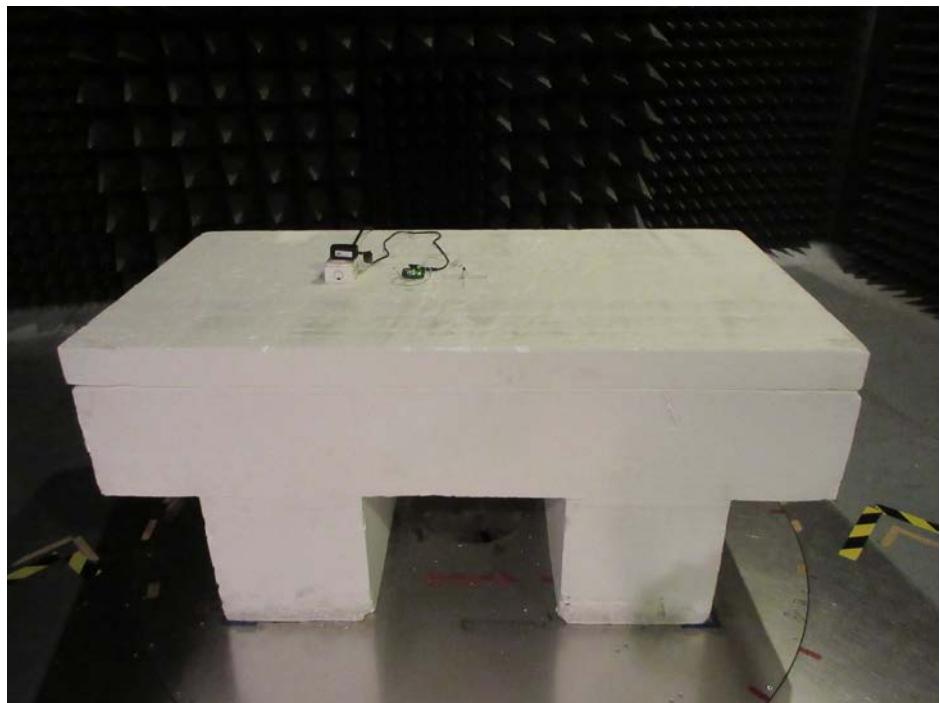
EUT take a close-up



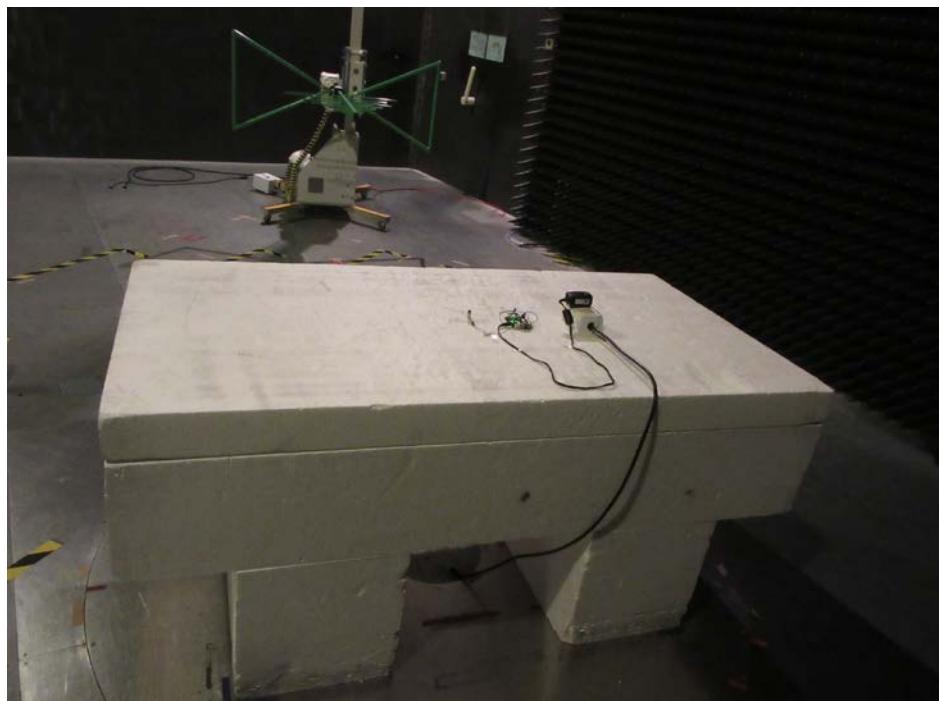


Mode 2

FRONT VIEW



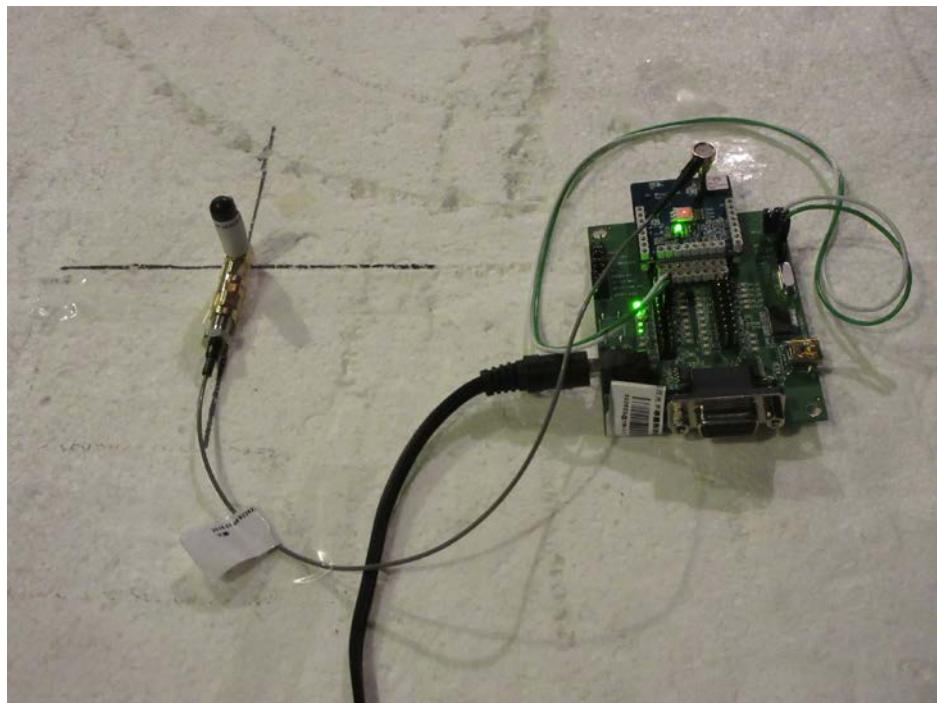
REAR VIEW





Mode 2

EUT take a close-up



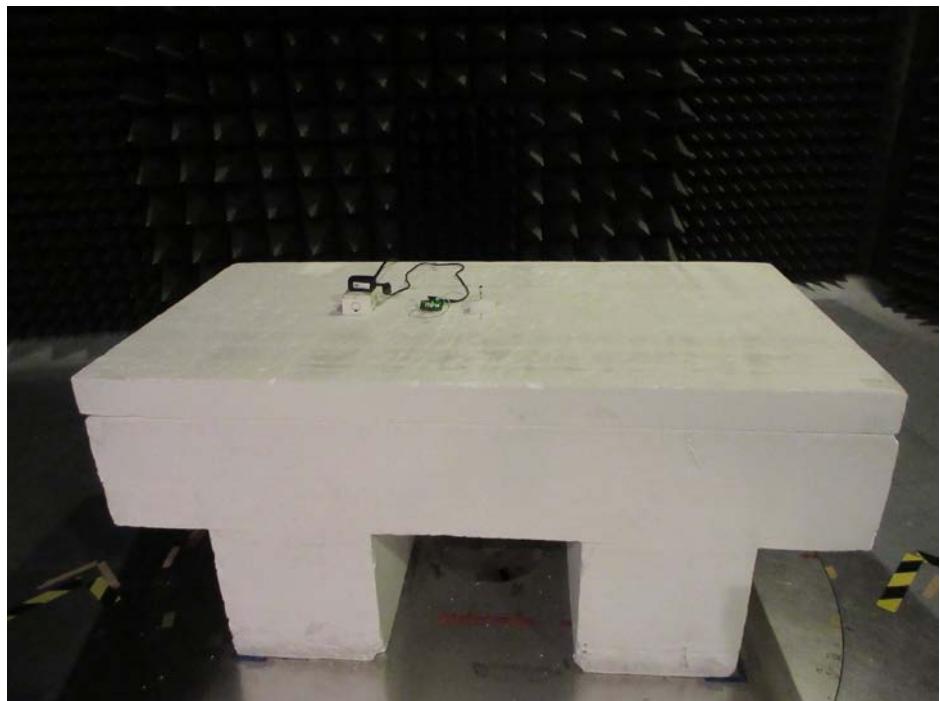
EUT take a close-up



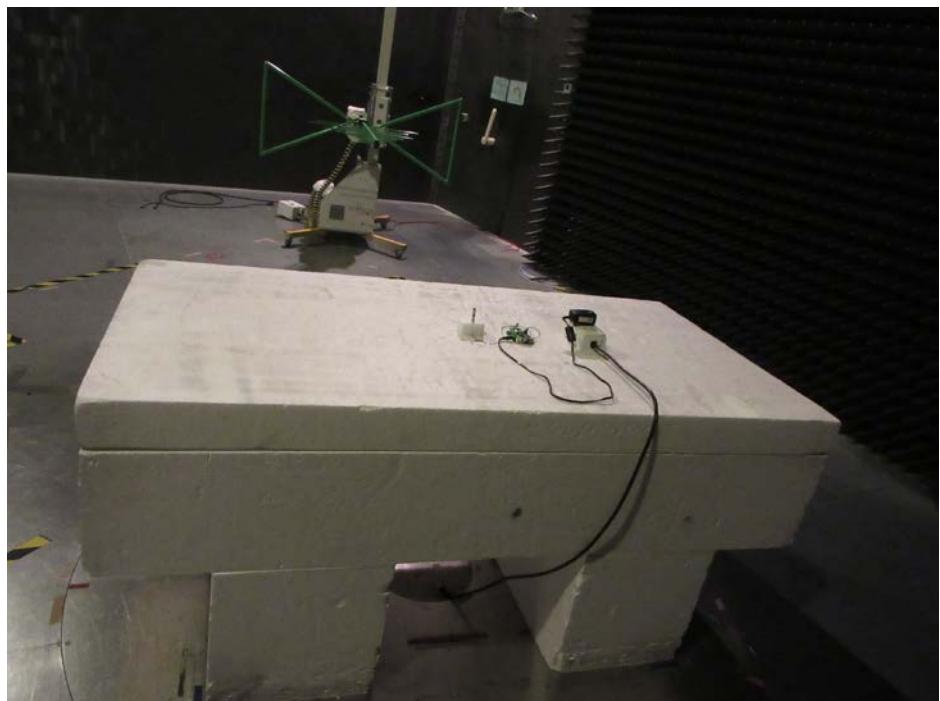


Mode 3

FRONT VIEW



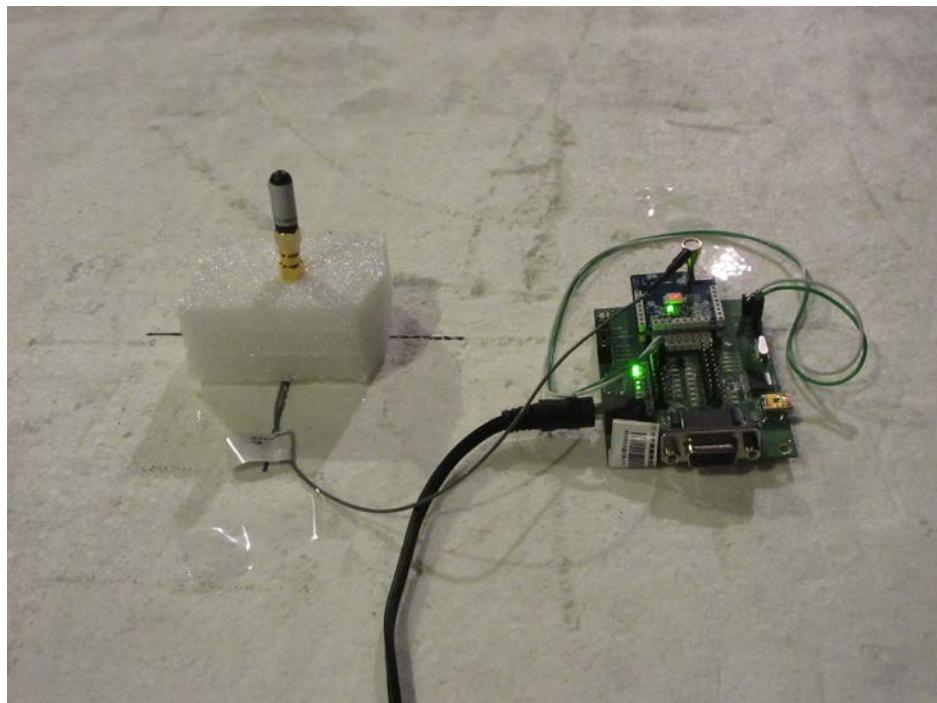
REAR VIEW





Mode 3

EUT take a close-up



EUT take a close-up

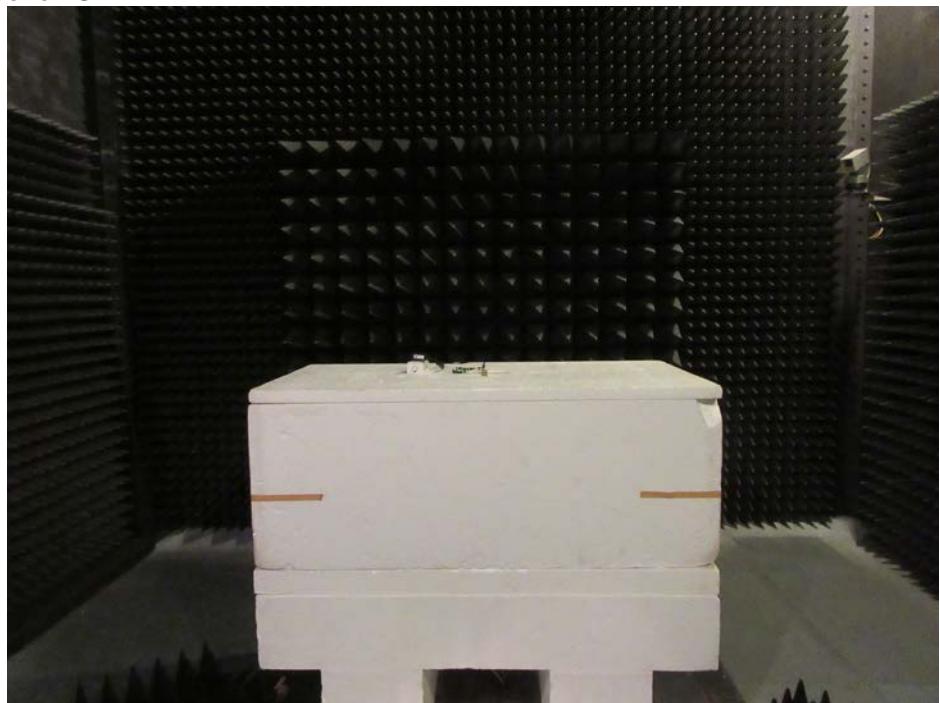




For radiated emissions above 1GHz

Mode 1

FRONT VIEW



REAR VIEW





Mode 2

FRONT VIEW



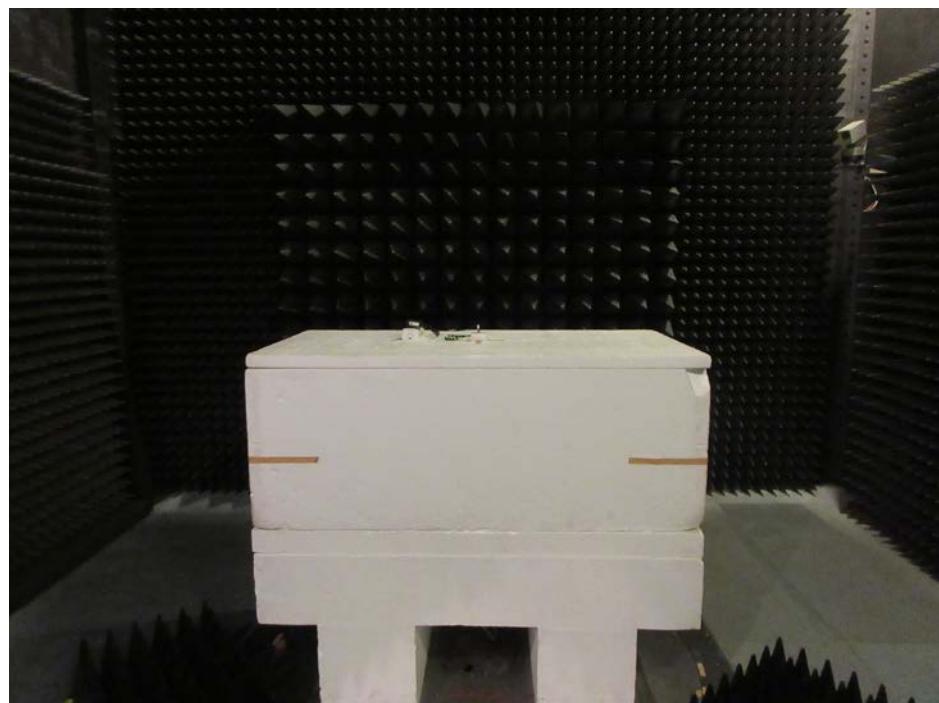
REAR VIEW





Mode 3

FRONT VIEW



REAR VIEW

