

FCC Test Report

Equipment : Digitizer
Brand Name : KYE
Model No. : S101 Gorilla
FCC ID : QYLRX10
Standard : 47 CFR FCC Part 15.209
Operating Band : 83 kHz (channel frequency 83kHz)
FCC Classification : DCD (for Part 15 Low Power Transmitter Below 1705 kHz)
Applicant : Getac Technology Corporation.
5F., Building A, No. 209, Sec.1, Nangang Rd.,
Nangang Dist., Taipei City 11568, Taiwan, R.O.C.
Manufacturer : KYE Systems Corporation
No.492, Sec. 5, Chongsin Rd., Sanchong Dist.,
New Taipei City 24160, Taiwan (R.O.C.)

The product sample received on Jun. 19 2015 and completely tested on Aug. 14, 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

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Accessories and Support Equipment.....	6
1.3	Testing Applied Standards	6
1.4	Testing Location Information.....	6
1.5	Measurement Uncertainty	7
2	TEST CONFIGURATION OF EUT	8
2.1	The Worst Case Modulation Configuration	8
2.2	Test Channel Frequencies Configuration.....	8
2.3	The Worst Case Measurement Configuration.....	8
2.4	Test Setup Diagram	9
3	TRANSMITTER TEST RESULT	11
3.1	AC Power-line Conducted Emissions	11
3.2	Transmitter Radiated Emissions	15
3.3	Emission Bandwidth	25
4	TEST EQUIPMENT AND CALIBRATION DATA	28
APPENDIX A. TEST PHOTOS		
APPENDIX B. PHOTOGRAPHS OF EUT		

Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.1590020MHz 53.37 (Margin 12.15dB) - QP 35.55 (Margin 19.97dB) - AV	FCC 15.207	Complied
3.2	15.209	Transmitter Radiated Emissions	[dBuV/m at 3m]:419.940MHz 41.76 (Margin 4.24dB) - PK	FCC 15.209	Complied
3.3	15.215(c)	Emission Bandwidth	20dB Bandwidth 29.81 [kHz]	N/A	Complied



SPORTON INTERNATIONAL INC.
TEL : 886-3-327-3456
FAX : 886-3-327-0973

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range	Modulation	Ch. Frequency (kHz)	Channel Number	Field Strength (dBuV/m)
83 kHz	OOK	83	1	87.75
Note 1: Field strength performed peak level at 3m.				

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
☐	External antenna (dedicated antennas)

1.1.3 Type of EUT

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

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐	Operated normally mode for worst duty cycle
☒	Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)	
☒	100%

1.1.5 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☒ External AC adapter	☐ From Host System	☒ Battery

1.2 Accessories and Support Equipment

Accessories Information				
AC Adapter	Brand Name	FSP GROUP INC.	Model Name	FSP065-REB
	Power Rating	I/P: 100 - 240Vac, 1.5A, O/P: 19Vdc, 3.42A		
	Power Cord	1.5 meter, non-shielded cable, with ferrite core		
Li-ion Battery 1	Brand Name	Getac	Model Name	BP4S1P2100-S
	Power Rating	15.2Vdc, 2160mAh		
Li-ion Battery 2	Brand Name	Getac	Model Name	BP1S1P2100-S
	Power Rating	3.7Vdc, 2100mAh		

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

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

1.4 Testing Location Information

Testing Location				
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.		
		TEL : 886-3-327-3456 FAX : 886-3-318-0055		
Test Condition		Test Site No.	Test Engineer	Test Environment
RF Conducted		TH06-HY	Leo	23.5°C / 63%
AC Conduction		CO04-HY	Zeus	20°C / 60%
Radiated Emission		03CH02-HY	Joe	24.5°C / 61%

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, 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

Mode	Field Strength (dBuV/m at 3m)
OOK	87.75

2.2 Test Channel Frequencies Configuration

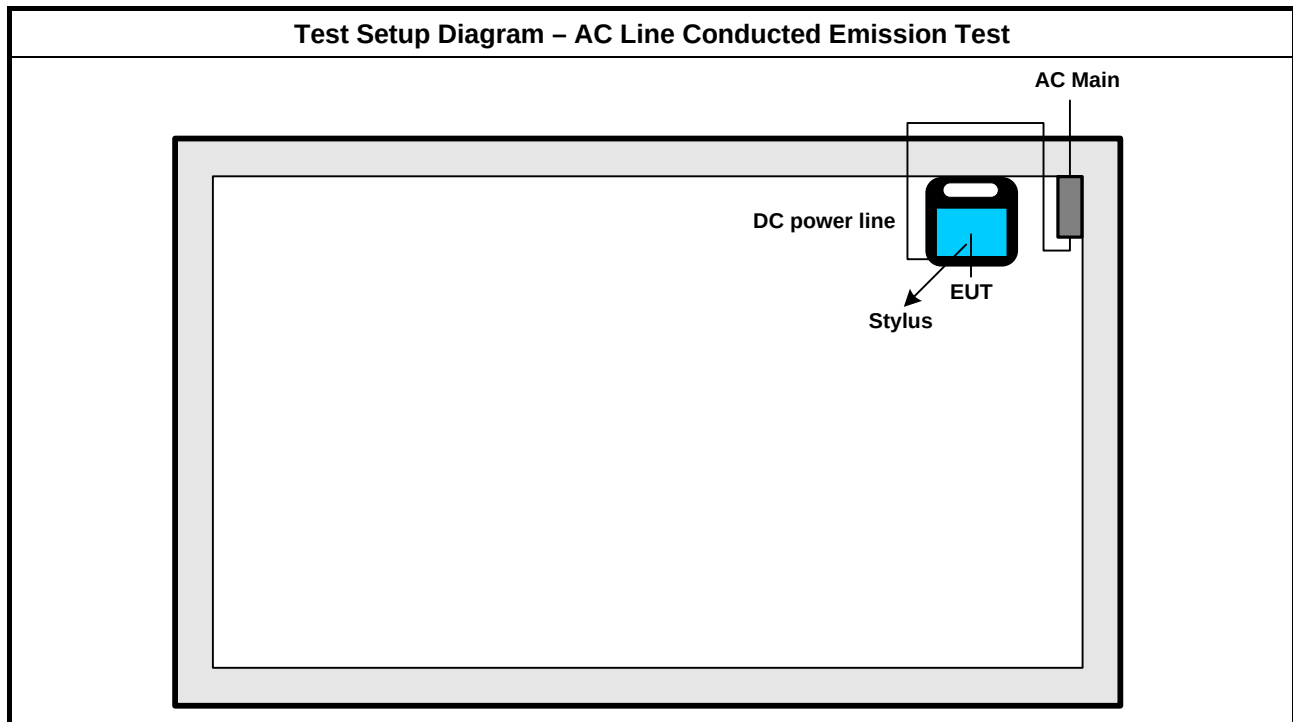
Mode	Test Channel Frequencies (kHz)
OOK	83

2.3 The Worst Case Measurement Configuration

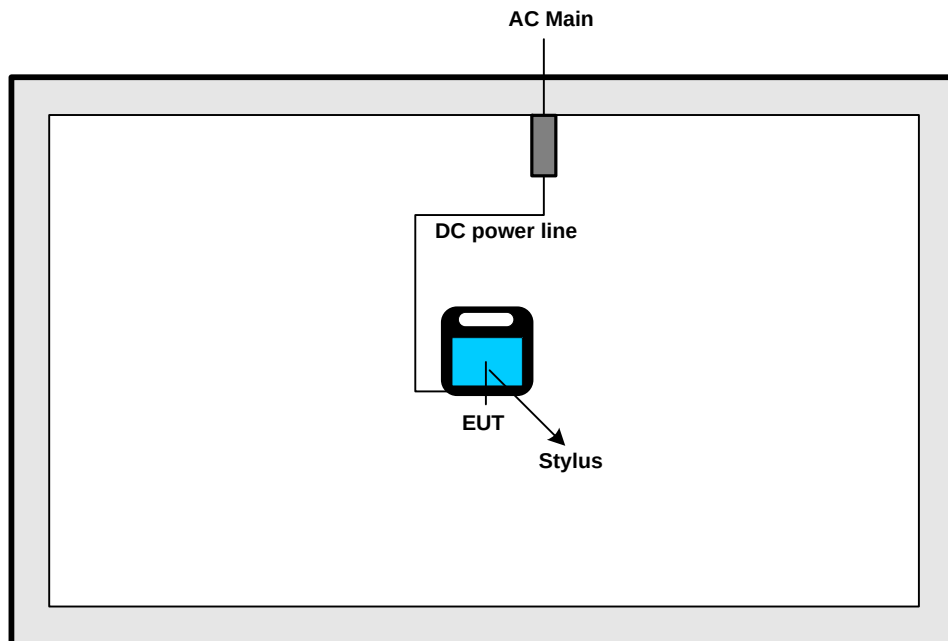
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	Transmit Mode

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth, Field Strength of Fundamental Emissions Transmitter Radiated Unwanted Emissions		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes.		
	☒ 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	☒ 1. Transmit Mode		
Mode	OOK		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	

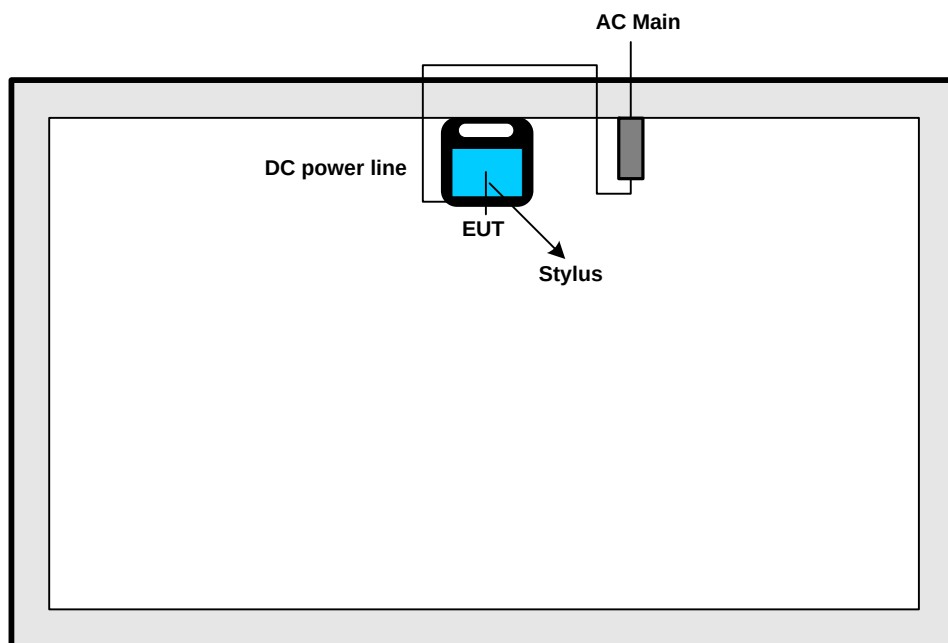
2.4 Test Setup Diagram



Test Setup Diagram - Radiated Below 30MHz Test



Test Setup Diagram - Radiated Above 30MHz Test



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.

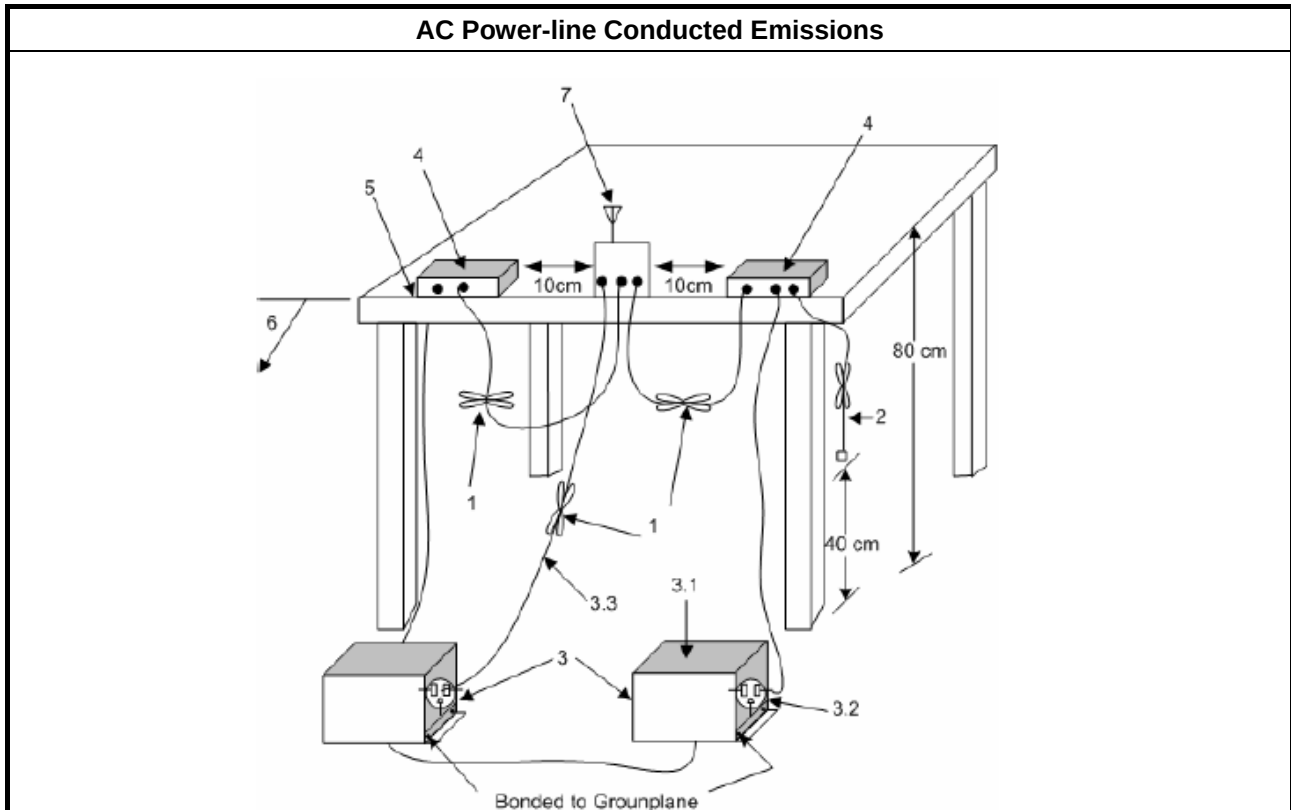
3.1.2 Measuring Instruments

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

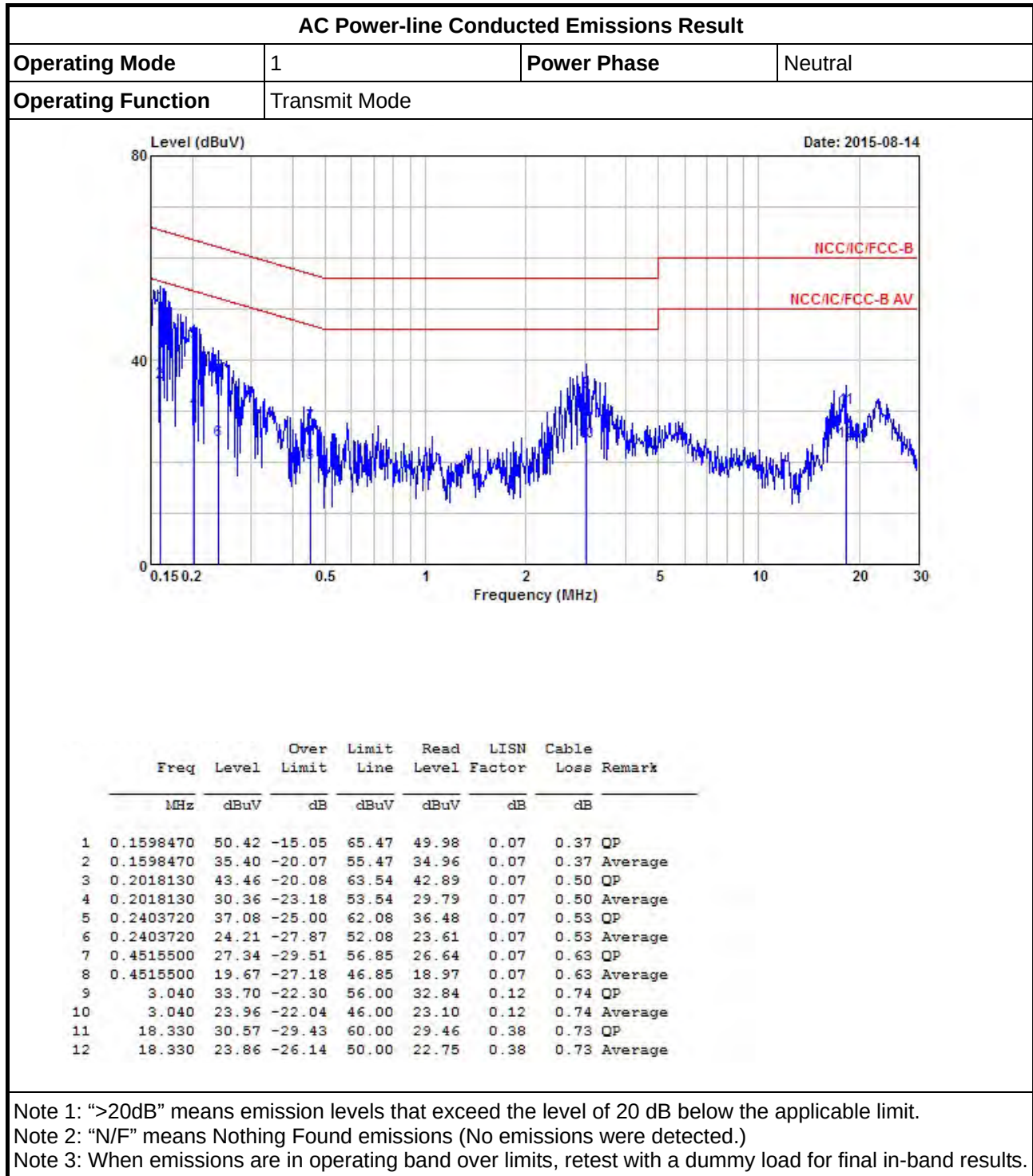
3.1.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.
☒	If AC conducted emissions fall in operating band, then following below test method confirm final result.
☐	Accept measurements done with a suitable dummy load replacing the antenna under the following conditions: (1) Perform the AC line conducted tests with the antenna connected to determine compliance with FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load to determine compliance with FCC 15.207 limits within the transmitter's fundamental emission band.
☒	For a device with a permanent antenna operating at or below 30 MHz, accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) Perform the AC line conducted tests with the permanent antenna to determine compliance with the FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load in lieu of the permanent antenna to determine compliance with the FCC 15.207 limits within the transmitter's fundamental emission band.

3.1.4 Test Setup

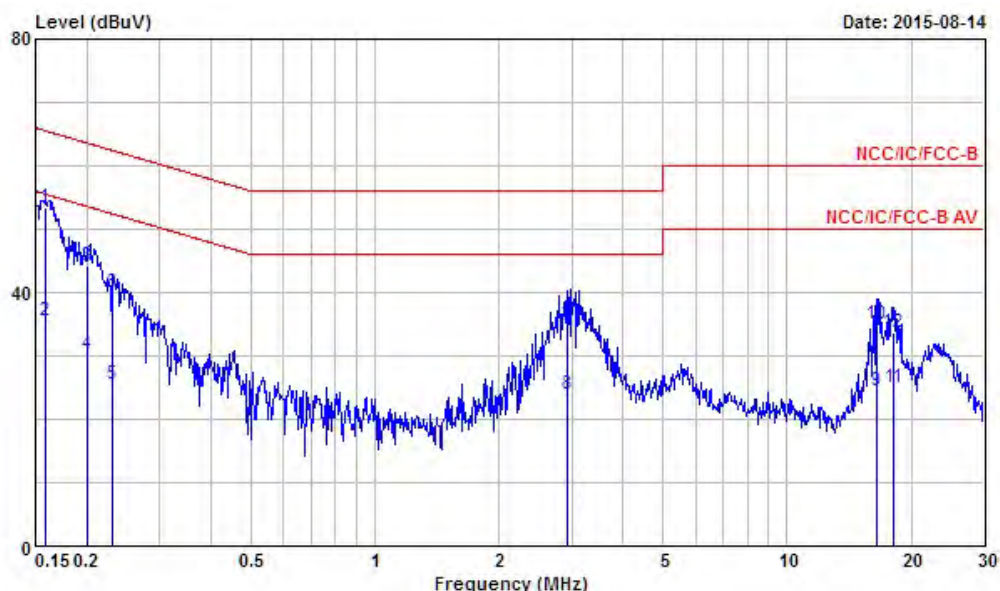


3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Transmit Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1590020	53.37	-12.15	65.52	52.95	0.05	0.37	QP
2	0.1590020	35.55	-19.97	55.52	35.13	0.05	0.37	Average
3	0.2007470	44.14	-19.44	63.58	43.58	0.06	0.50	QP
4	0.2007470	30.20	-23.38	53.58	29.64	0.06	0.50	Average
5	0.2303960	25.65	-26.79	52.44	25.07	0.06	0.52	Average
6	0.2303960	40.02	-22.42	62.44	39.44	0.06	0.52	QP
7	2.930	34.80	-21.20	56.00	33.93	0.12	0.75	QP
8	2.930	23.91	-22.09	46.00	23.04	0.12	0.75	Average
9	16.490	24.59	-25.41	50.00	23.50	0.32	0.77	Average
10	16.490	34.96	-25.04	60.00	33.87	0.32	0.77	QP
11	18.140	25.12	-24.88	50.00	24.05	0.34	0.73	Average
12	18.140	33.57	-26.43	60.00	32.50	0.34	0.73	QP

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.)

Note 3: When emissions are in operating band over limits, retest with a dummy load for final in-band results.

3.2 Transmitter Radiated Emissions

3.2.1 Transmitter Radiated Emissions Limit

Transmitter Radiated 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.

Note 3: the frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 1GHz measurements employing a CISPR quasi-peak detector.

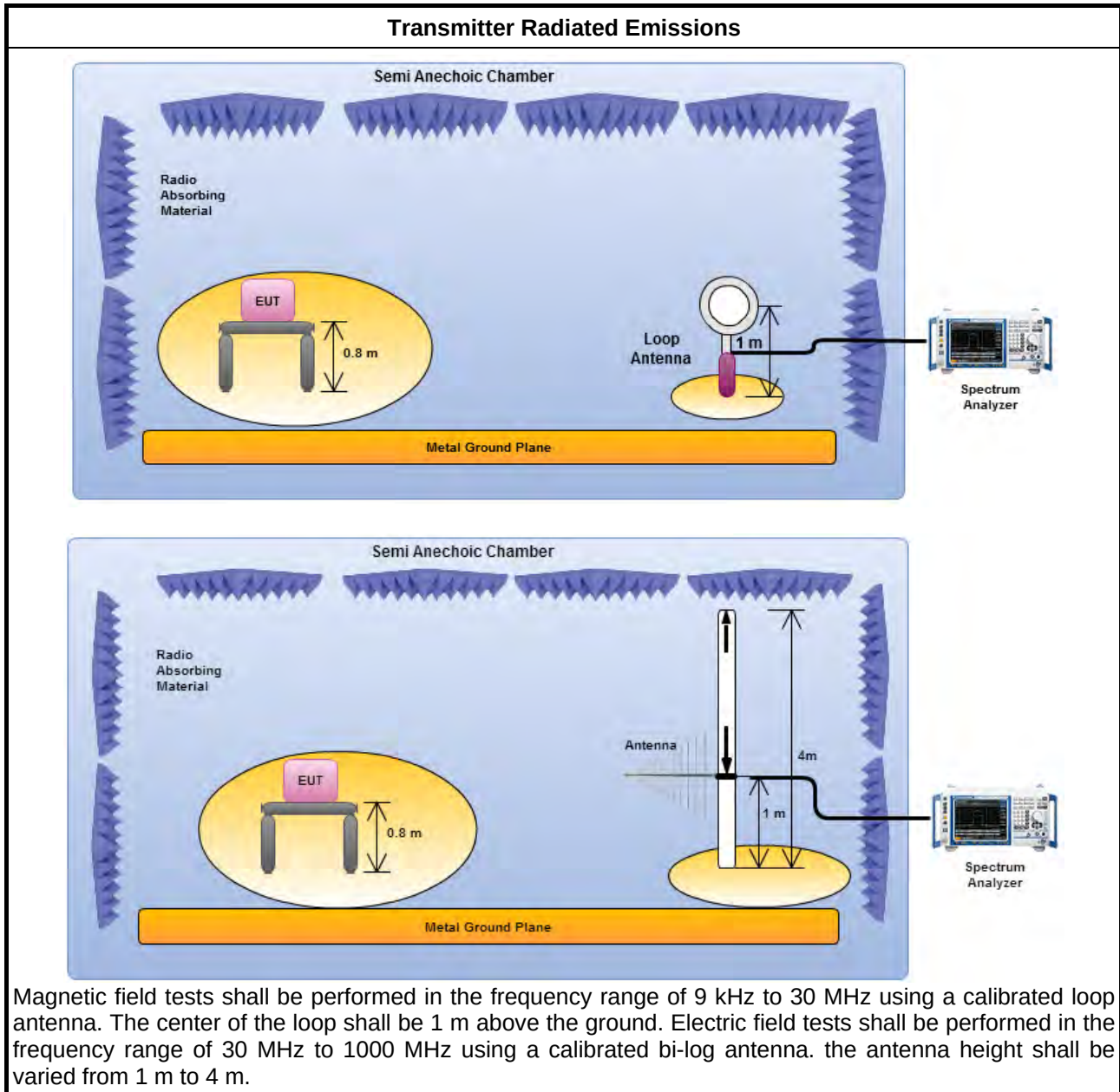
3.2.2 Measuring Instruments

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

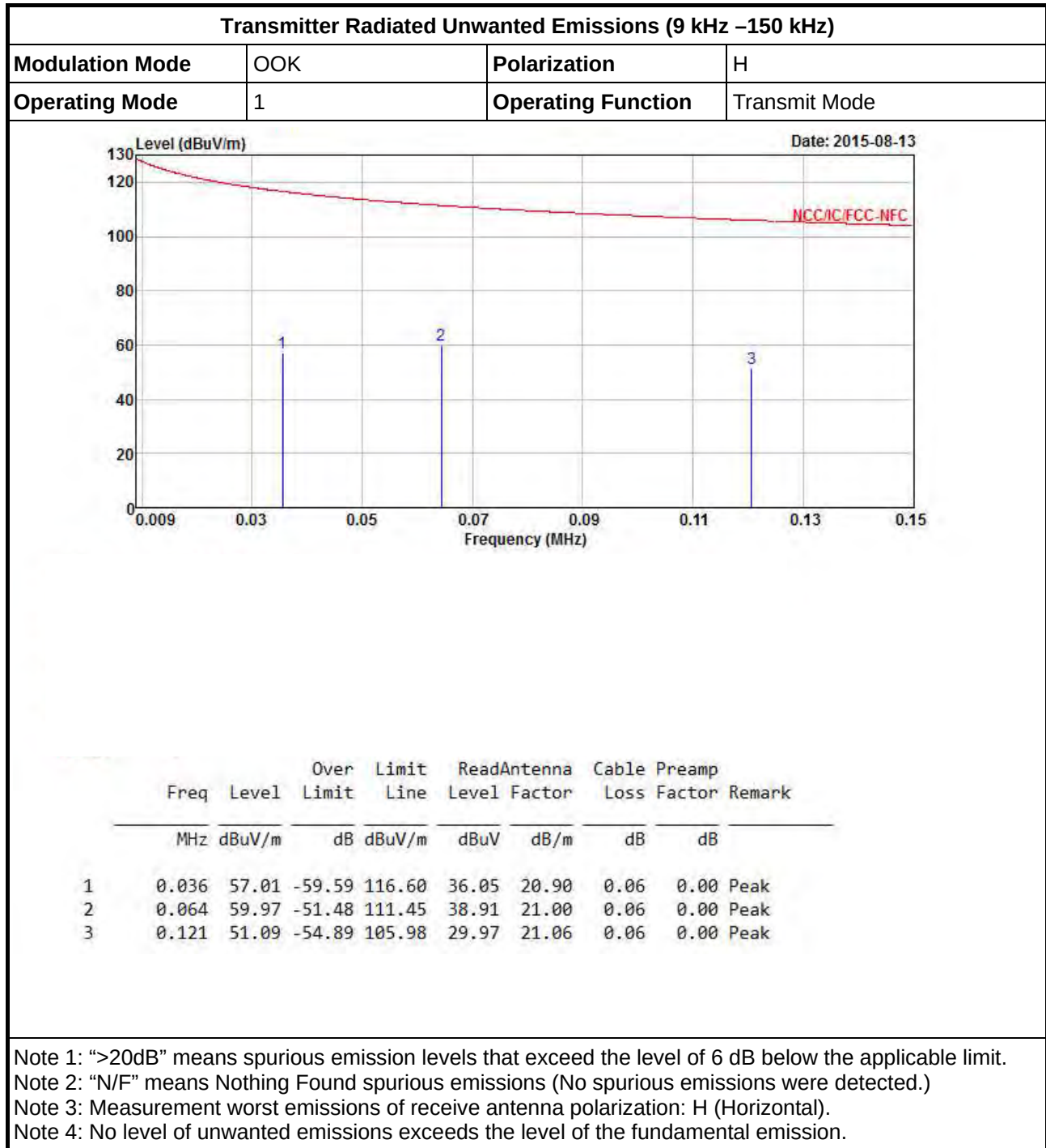
3.2.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. The frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 30MHz measurements employing a CISPR quasi-peak detector. Test distance is 3m.
☒	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be following below methods.
☐	The results shall be extrapolated to the specified distance by making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
☒	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
☒	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.2.4 Test Setup

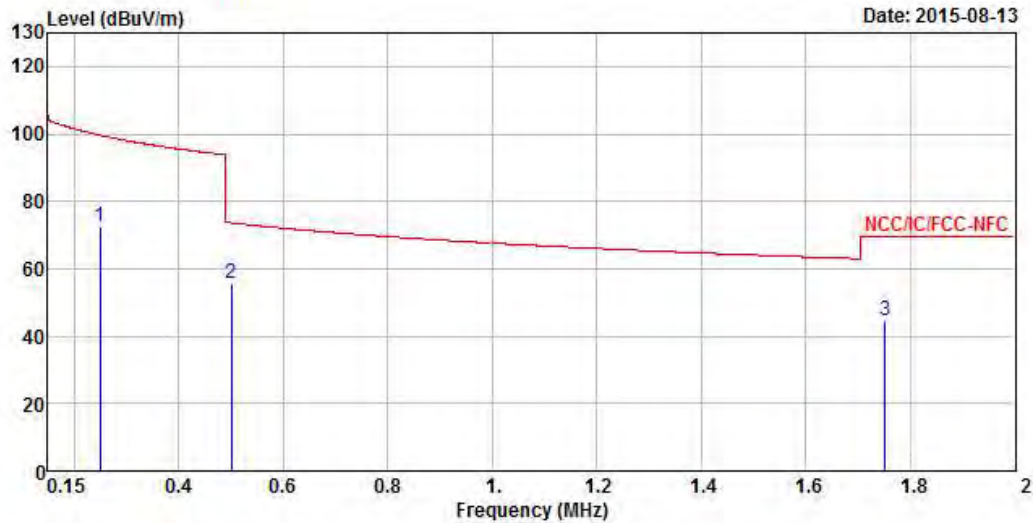


3.2.5 Transmitter Radiated Emissions (Below 30MHz)



Transmitter Radiated Unwanted Emissions (150 kHz – 2 MHz)

Modulation Mode	OOK	Polarization	H
Operating Mode	1	Operating Function	Transmit Mode

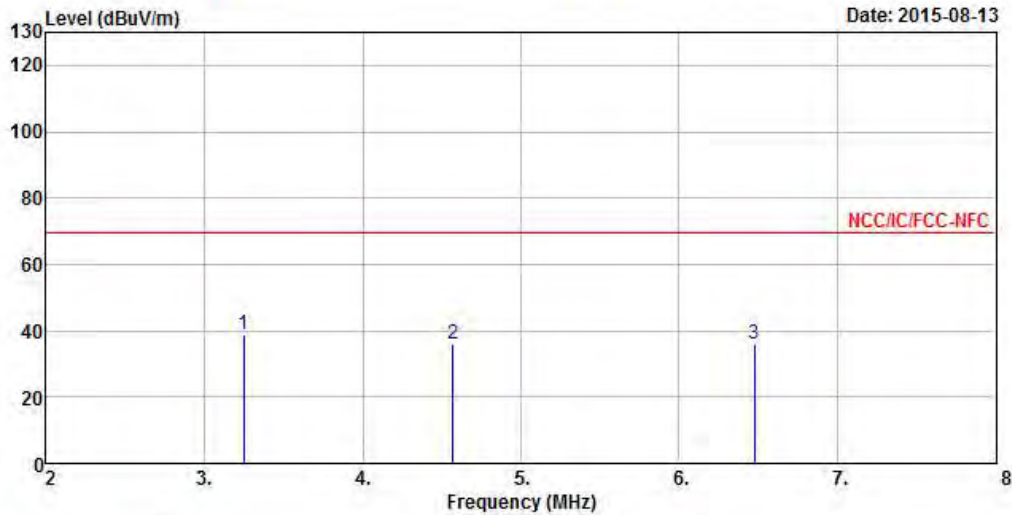


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	0.250	72.41	-27.25	99.66	51.46	20.89	0.06	0.00 Peak
2	0.502	55.49	-18.12	73.61	34.73	20.70	0.06	0.00 Peak
3	1.752	44.74	-24.80	69.54	24.05	20.54	0.15	0.00 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).
 Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (2 MHz – 8 MHz)

Modulation Mode	OOK	Polarization	H
Operating Mode	1	Operating Function	Transmit Mode



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3.248	38.92	-30.62	69.54	18.53	20.20	0.19	0.00	Peak
2	4.568	35.78	-33.76	69.54	14.81	20.73	0.24	0.00	Peak
3	6.476	36.17	-33.37	69.54	14.86	21.02	0.29	0.00	Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

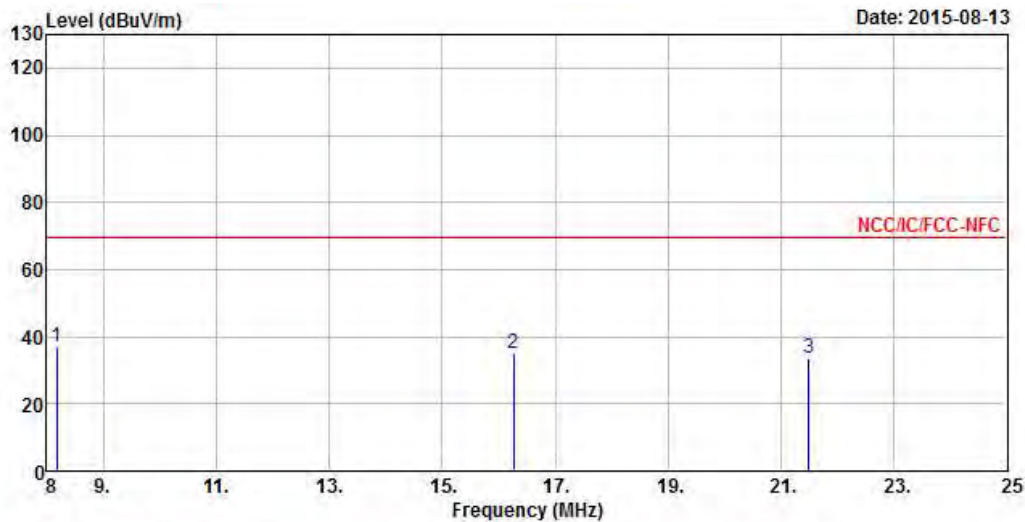
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (8 MHz – 25 MHz)

Modulation Mode	OOK	Polarization	H
Operating Mode	1	Operating Function	Transmit Mode



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	8.170	37.15	-32.39	69.54	15.66	21.15	0.34	0.00 Peak
2	16.262	34.79	-34.75	69.54	12.83	21.43	0.53	0.00 Peak
3	21.498	33.80	-35.74	69.54	11.65	21.53	0.62	0.00 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

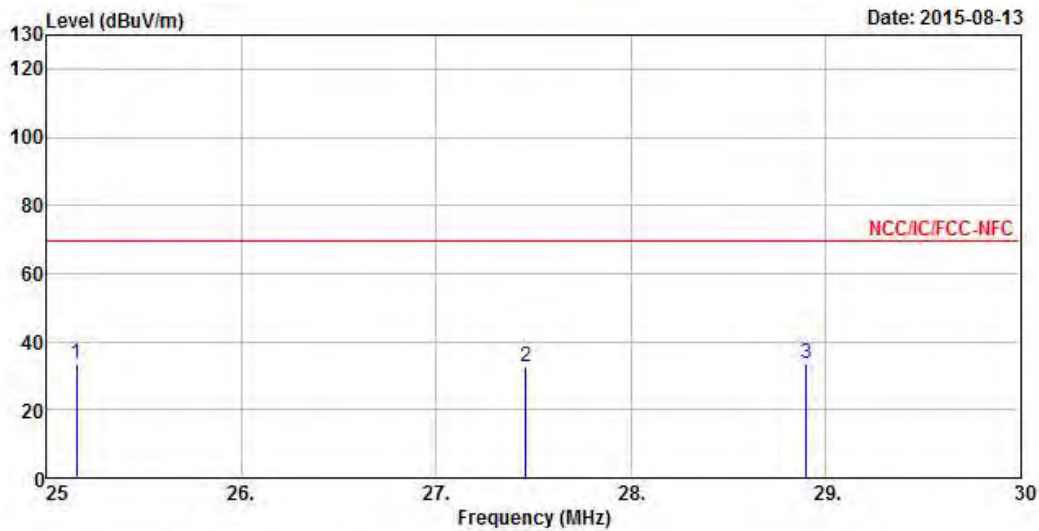
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (25 MHz – 30 MHz)

Modulation Mode	OOK	Polarization	H
Operating Mode	1	Operating Function	Transmit Mode



	Fréq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Factor	Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	25.150	33.61	-35.93	69.54	11.33	21.60	0.68	0.00	Peak
2	27.460	32.78	-36.76	69.54	10.42	21.65	0.71	0.00	Peak
3	28.900	33.47	-36.07	69.54	11.06	21.68	0.73	0.00	Peak

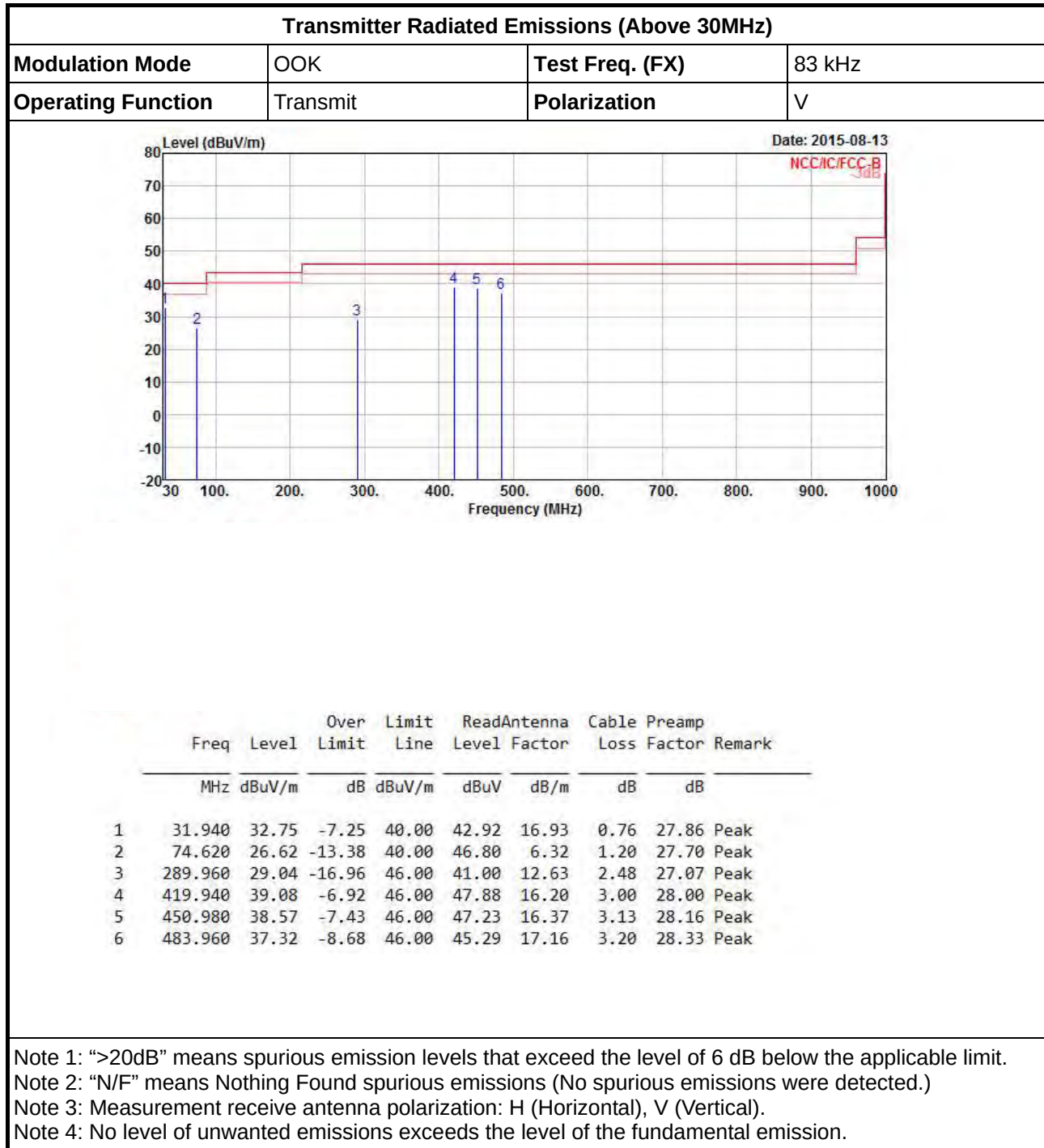
Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

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

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

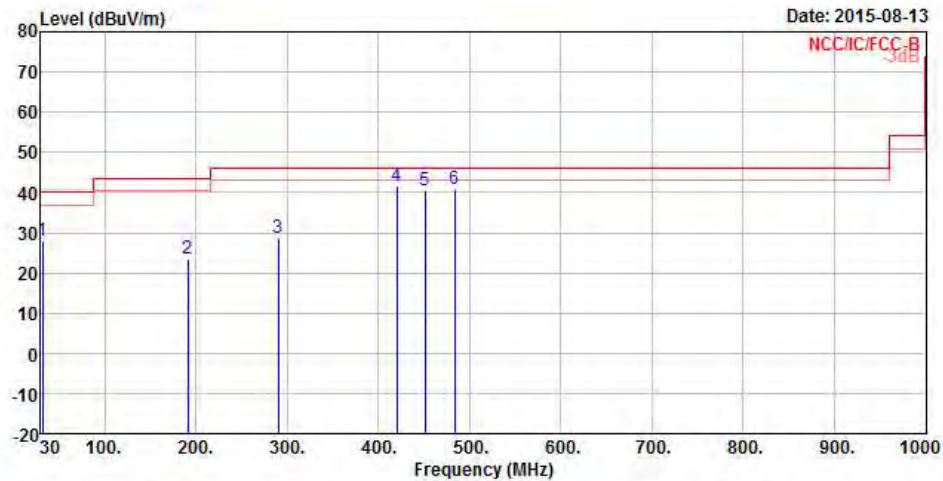
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

3.2.6 Transmitter Radiated Emissions (Above 30MHz)



Transmitter Radiated Emissions (Above 30MHz)

Modulation Mode	OOK	Test Freq. (FX)	83 kHz
Operating Function	Transmit	Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	31.940	28.11	-11.89	40.00	38.28	16.93	0.76	27.86 Peak
2	191.020	23.62	-19.88	43.50	40.28	8.81	2.00	27.47 Peak
3	289.960	28.82	-17.18	46.00	40.78	12.63	2.48	27.07 Peak
4	419.940	41.76	-4.24	46.00	50.56	16.20	3.00	28.00 Peak
5	450.980	40.68	-5.32	46.00	49.34	16.37	3.13	28.16 Peak
6	483.960	40.84	-5.16	46.00	48.81	17.16	3.20	28.33 Peak

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

3.3 Emission Bandwidth

3.3.1 Emission Bandwidth Limit

Emission Bandwidth Limit
N/A

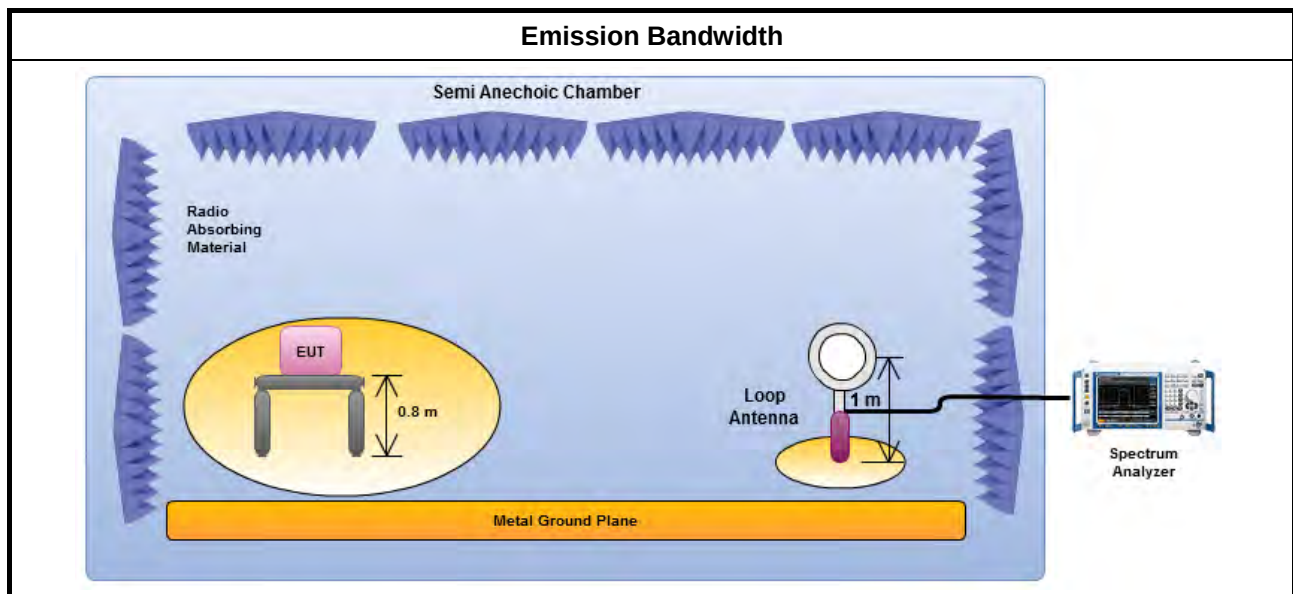
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method
☒ For the emission bandwidth refer ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒ For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

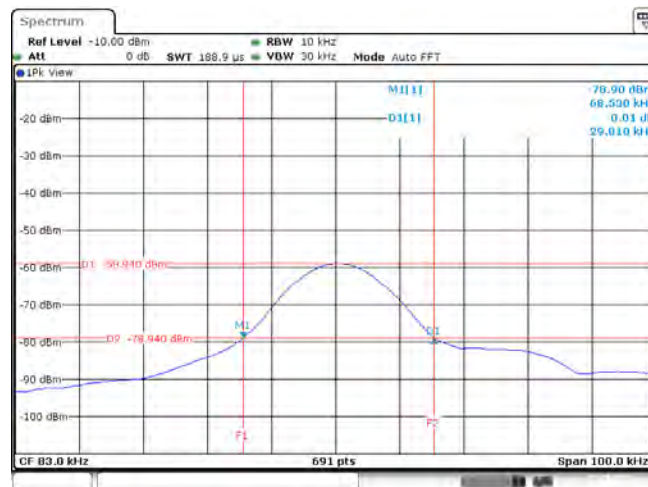
3.3.4 Test Setup



3.3.5 Test Result of Emission Bandwidth

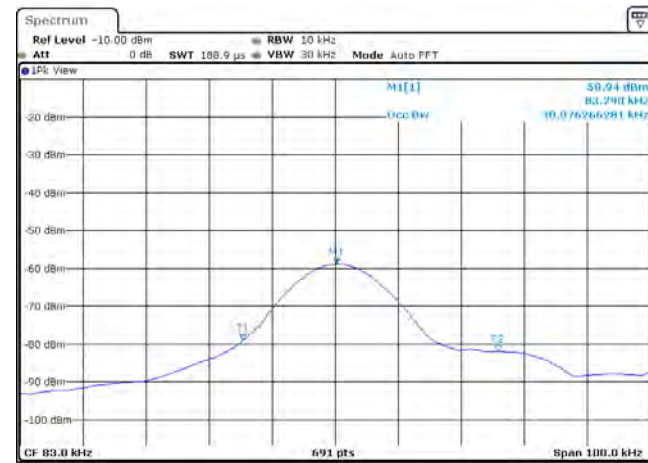
Occupied Channel Bandwidth Result			
Modulation Mode	Frequency (kHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
OOK	83	29.81	40.37
Limit		N/A	N/A
Result		Complied	

20dB Emission Bandwidth Plot



Date: 7.AUG.2015 15:41:17

99% Emission Bandwidth Plot



Date: 7.AUG.2015 15:38:58

3.3.6 Test Result of Field Strength of Fundamental Emissions

Field Strength of Fundamental Emissions Result					
Modulation Mode	Frequency (kHz)	Fundamental (dBuV/m)@3m	Polarization	Margin (dB)	Limit (dBuV/m)@3m
OOK	83	87.75	H	21.47	109.22
Result		Complied			
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal).					
Note 2: The Limit is based on measurement employing an average detector.					
Note 3: The fundamental result is measured by peak detector.					

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101500	9KHz~40GHz	May 06, 2015	RF Conducted

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Apr. 15, 2015	AC Conducted
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2015	AC Conducted
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 31, 2014	AC Conducted
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	NCR	AC 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 Emission
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 03, 2015	Radiation Emission
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 24, 2015	Radiation Emission
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 08, 2014	Radiation Emission
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Sep. 20, 2014	Radiation Emission
Turn Table	Chaintek Instruments	3000	MF7802058	0~ 360 degree	N/A	Radiation Emission
Antenna Mast	MF	MF7802	MF780208205	1 ~ 4 m	N/A	Radiation Emission

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Feb. 02, 2015	Radiation Emission

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