

FCC Test Report

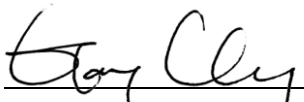
Equipment : Personal Computer
Brand Name : SONY
Model No. : SVF15NB1GL
FCC ID : AK8SVF15NB1GL
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DSS
Applicant : Sony Corporation
1-7-1 Konan Minato-ku, Tokyo, Japan
Manufacturer : Sony Corporation
1-7-1 Konan Minato-ku, Tokyo, Japan

This report only contains BR and EDR mode test result.

The product sample received on Jul. 26, 2013 and completely tested on Oct. 17, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

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

Reviewed by:



Gary Chang / Manager



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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	0.159MHz: 38.89dBuV (16.63dB) - AV 55.24dBuV (10.28dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	20dB Bandwidth	BR: 0.9638MHz EDR:1.4457 MHz	N/A	Complied
3.2	15.247(a)	Carrier Frequency Separation (ChS)	BR: 1.0072MHz EDR:1.0043MHz	ChS $\geq$ 20 dB BW x 2/3.	Complied
3.3	15.247(a)	Number of Hopping Frequencies (N)	Max: 79 Min: 20	N $\geq$ 15	Complied
3.4	15.247(a)	Time of Occupancy (Dwell Time)	0.312 sec	0.4 s within 0.4 x N	Complied
3.5	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm] BR: 5.3 EDR: 3.78	Power [dBm] 21	Complied
3.6	15.247(c)	Emissions in Non-Restricted Frequency Bands	Meet the requirement of limit	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.7	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 167.74MHz 39.81 (Margin 3.69dB) - PK	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

Revision History

[illegible]

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number	Co-location
2400-2483.5	BR / EDR	2402-2480	0-78 [79]	YES
Note 1: Bluetooth BR uses a GFSK (1Mbps). Note 2: Bluetooth EDR uses a combination of $\pi/4$ -DQPSK (2Mbps) and 8DPSK (3Mbps). Note 3: RF output power specifies that Maximum Peak Conducted Output Power. Note 4: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (EUT has simultaneously co-transmitting that operating BT and WWAN.)				

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☐	Integral antenna (antenna permanently attached)
☐	Temporary RF connector provided
☐	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.
☒	External antenna (dedicated antennas)
☒	RF connector provided
☒	Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...)
☐	Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...)

Antenna General Information				
Antenna Pair No.	Ant. Cat.	Ant. Type	Gain (dBi) of Antenna 1	Gain (dBi) of Antenna 2
SONY_IRX-7690(B)	Integral	PIFA	0.77	-0.62

Note: Antenna 2 is selected for final test since only antenna 2 will be used for Bluetooth function.

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:

1.1.3 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☒ Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
☒ 77.99% - test mode single channel - DH5	1.08
Bluetooth ACL packets can be 1, 3, or 5 time slots. The DH1 packet can cover a single time slot. The DH3 packet can cover up to 3 time slots. The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle.	

1.1.4 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☐ External DC adapter	☒ Battery

1.2 Accessories and Support Equipment

Accessories				
No.	Equipment	Brand Name	Model Name	Remarks
1	AC Adapter	SONY	VGP-AC19V75	I/P: 100-240Vac, 1.2A, 50/60Hz O/P: 19.5Vdc, 2.3A 0.8m non-shielded cable w/o core
2	Battery	SONY	VGP-BPS40	15Vdc, 3170mAh, 48Wh

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	---	---	---	---

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 C63.10-2009
- ♦ FCC Public Notice DA 00-705
- ♦ FCC KDB 412172 - Guidelines for Determining the ERP and EIRP

1.4 Testing Location Information

Testing Location				
☒	Sporton Lab	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055		
☒	ICC Lab	ADD : No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsein 333, Taiwan (R.O.C.) TEL : 886-3-271-8666 FAX : 886-3-318-0155		
Test Condition		Test Site No.	Test Engineer	Test Environment
RF Conducted		TH01-HY	Aaron Liang	23°C / 62%
*AC Conduction		CO01-WS	Skys Huang	23°C / 68%
*Radiated Emission		03CH02-WS	Skys Huang	21°C / 69%
Test site registered number [657002] with FCC. Test site registered number [10807A-2] with IC.				

Note: * Sporton Lab subcontracts this test item to ICC lab (TAF: 2732).

ICC lab is a TAF accreditation test firm and also is an approved provider of Sporton lab.

1.5 Measurement Uncertainty

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

Measurement Uncertainty			
Test Item		Uncertainty	Limit
AC power-line conducted emissions		± 2.26 dB	N/A
Emission bandwidth,		± 1.42 %	N/A
RF output power, conducted		± 0.63 dB	N/A
All emissions, radiated	30 – 1000 MHz	± 3.9 dB	N/A
	Above 1GHz	± 4.2 dB	N/A
Temperature		± 0.8 °C	N/A
Humidity		± 3 %	N/A
DC and low frequency voltages		± 3 %	N/A
Time		± 1.42 %	N/A
Duty Cycle		± 1.42 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing					
Bluetooth Mode	Transmit Chains (N _{TX})	Data Rate	Modulation Mode	RF Output Power (dBm)	Worst Mode
BR	1	1 Mbps	BR-1Mbps	5.3	BR-1Mbps
EDR	1	2 Mbps	EDR-2Mbps	5.19	
EDR	1	3 Mbps	EDR-3Mbps	3.78	

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Bluetooth Mode	Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)
BR / EDR	2402-(F1), 2440-(F2), 2480-(F3)

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter			
Test Software Version	DRTU		
Modulation Mode	2402 MHz	2440 MHz	2480 MHz
BR	8	8	8
EDR	6	6	6
EDR	6	6	6

2.4 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

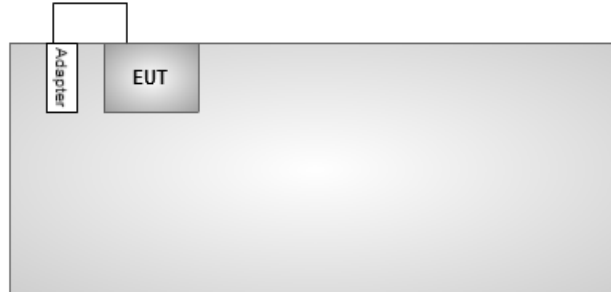
The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power
Test Condition	Conducted measurement at transmit chains
Modulation Mode	BR-1Mbps, EDR-3Mbps

The Worst Case Mode for Following Conformance Tests	
Tests Item	20dB Bandwidth, Carrier Frequency Separation (ChS) Number of Hopping Frequencies (N), Time of Occupancy (Dwell Time)
Test Condition	Conducted measurement at transmit chains
Modulation Mode	EDR-3Mbps

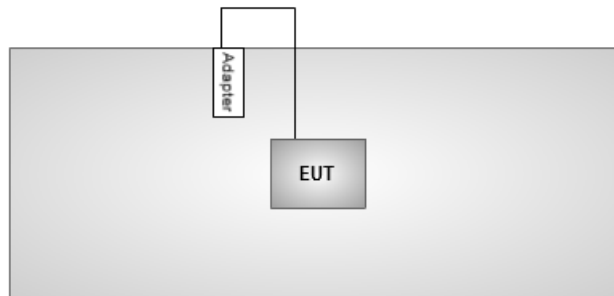
The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Emissions in Non-Restricted Frequency Bands		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. The worst planes is X.		
	☒ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is Z.		
Operating Mode	☒ 1. Transmit		
Modulation Mode	BR-1Mbps, EDR-3Mbps		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Test Setup Diagram – Radiated Emission 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.

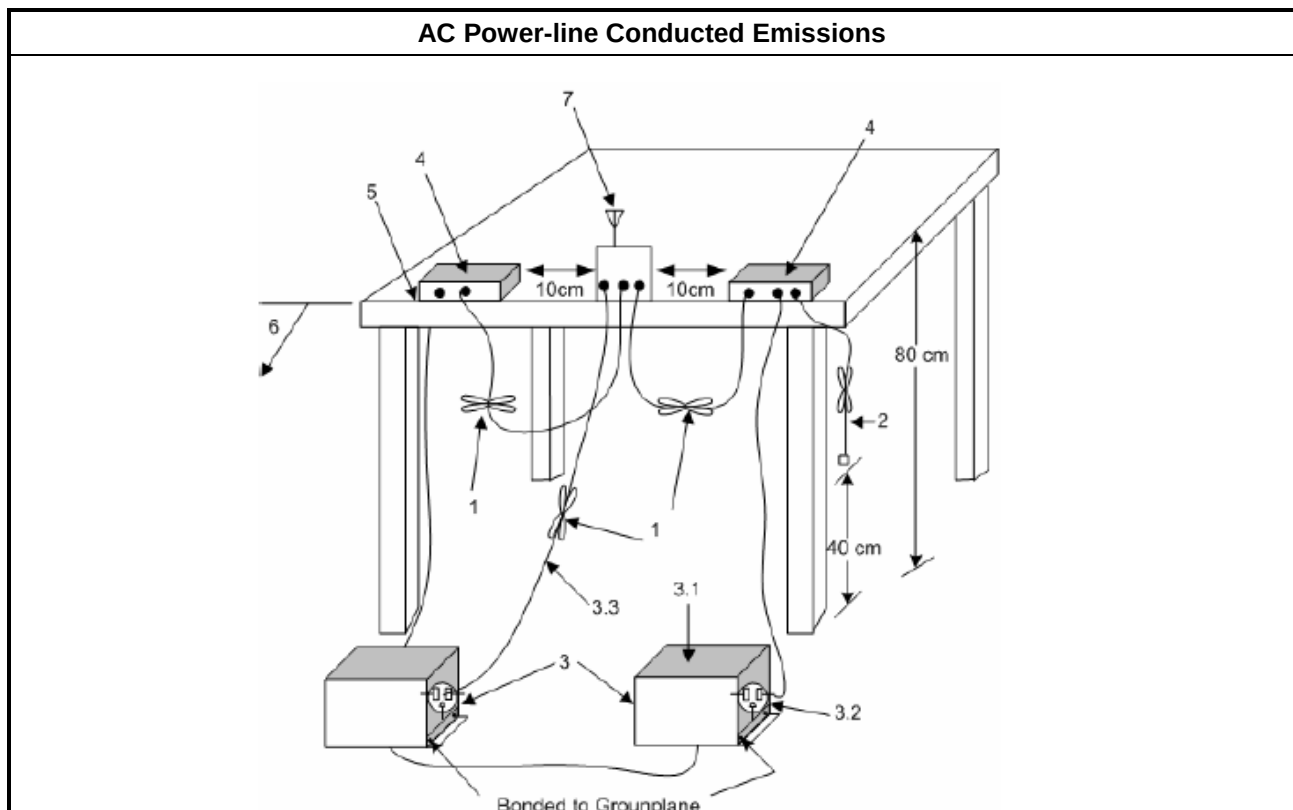
3.1.2 Measuring Instruments

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

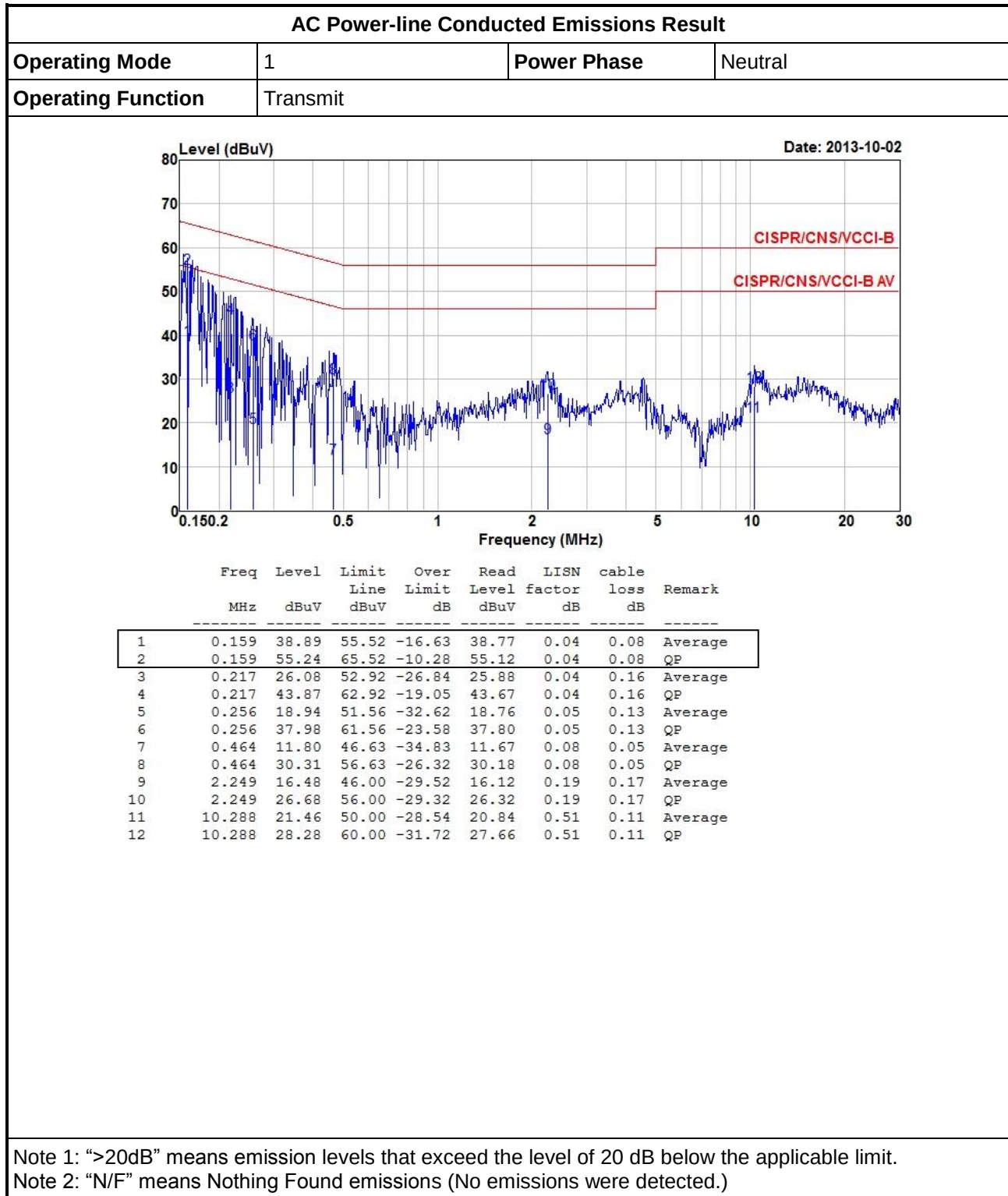
3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

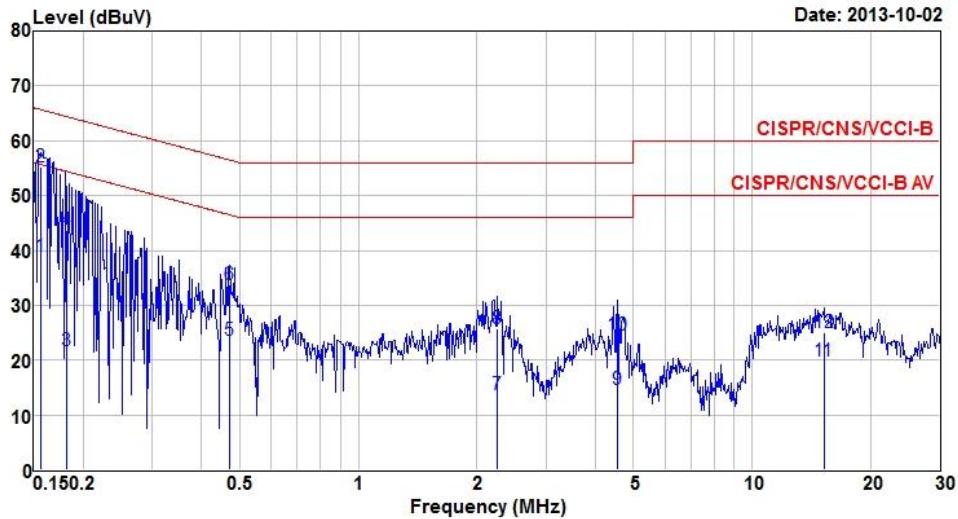


3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Transmit		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	38.90	55.65	-16.75	38.77	0.05	0.08	Average
2	0.156	55.31	65.65	-10.34	55.18	0.05	0.08	QP
3	0.182	21.77	54.42	-32.65	21.58	0.05	0.14	Average
4	0.182	43.67	64.42	-20.75	43.48	0.05	0.14	QP
5	0.471	23.64	46.49	-22.85	23.51	0.08	0.05	Average
6	0.471	33.72	56.49	-22.77	33.59	0.08	0.05	QP
7	2.261	13.76	46.00	-32.24	13.38	0.21	0.17	Average
8	2.261	25.76	56.00	-30.24	25.38	0.21	0.17	QP
9	4.549	14.65	46.00	-31.35	14.24	0.19	0.22	Average
10	4.549	24.63	56.00	-31.37	24.22	0.19	0.22	QP
11	15.226	19.74	50.00	-30.26	18.61	1.00	0.13	Average
12	15.226	25.03	60.00	-34.97	23.90	1.00	0.13	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.)

3.2 20dB Bandwidth and Carrier Frequency Separation

3.2.1 20dB Bandwidth and Carrier Frequency Separation Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
☒	2400-2483.5 MHz Band:
☐	$N \geq 79$ and ChS $\geq$ MAX (20 dB bandwidth, 25 kHz).
☒	$N \geq 15$ and ChS $\geq$ MAX (20 dB bandwidth x 2/3, 25 kHz).
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

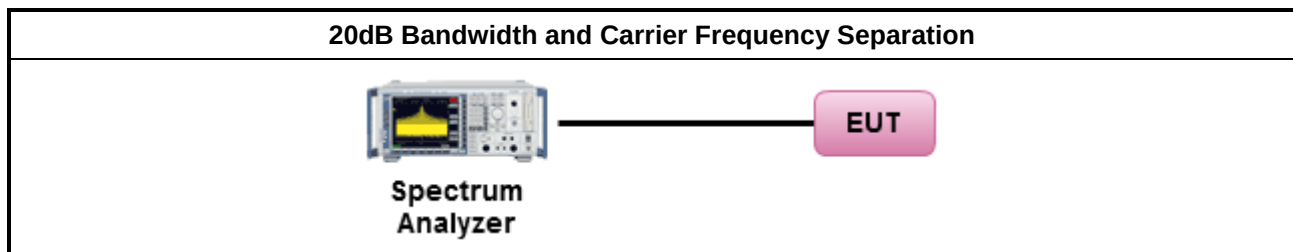
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

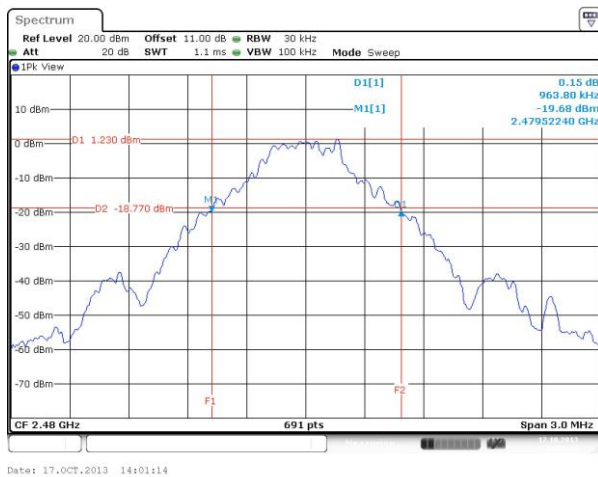
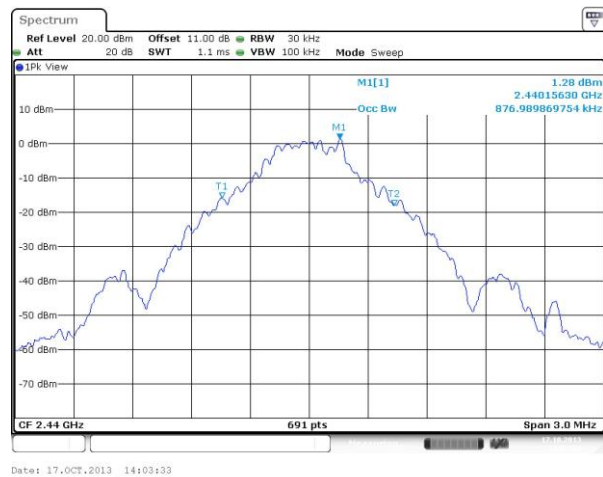
Test Method	
☒	Refer as ANSI C63.10, clause 6.9.1 for 20 dB bandwidth measurement.
☒	Refer as ANSI C63.10, clause 7.7.2 for carrier frequency separation measurement.
☒	For conducted measurement.
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☐	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.2.4 Test Setup



3.2.5 Test Result of 20dB Bandwidth and Carrier Frequency Separation

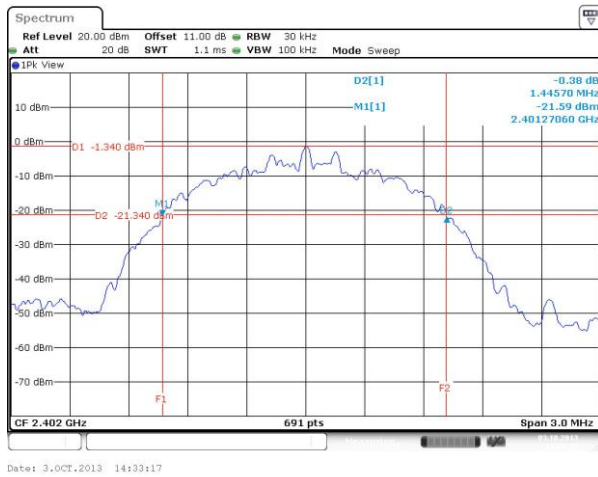
20dB Bandwidth and Carrier Frequency Separation Result					
Modulation Mode	Freq. (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)
BR-1Mbps	2402	0.9551	0.87264	1.0029	0.6367
BR-1Mbps	2440	0.9551	0.87699	1.0029	0.6367
BR-1Mbps	2480	0.9638	0.86830	1.0072	0.6425
Result		Complied			

Worst 20dB Bandwidth Plots

Worst 99% Bandwidth Plots

Worst Carrier Frequency Separation Plots

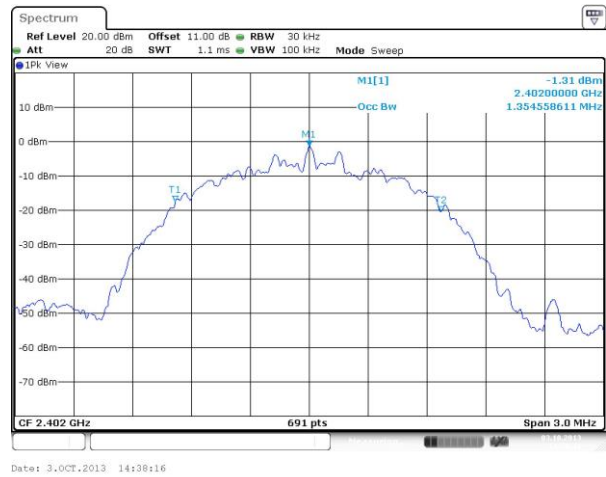

20dB Bandwidth and Carrier Frequency Separation Result

Modulation Mode	Freq. (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)
EDR-3Mbps	2402	1.4457	1.35455	1.0043	0.9638
EDR-3Mbps	2440	1.4457	1.35021	1.0043	0.9638
EDR-3Mbps	2480	1.4414	1.34587	1.0043	0.9609
Result		Complied			

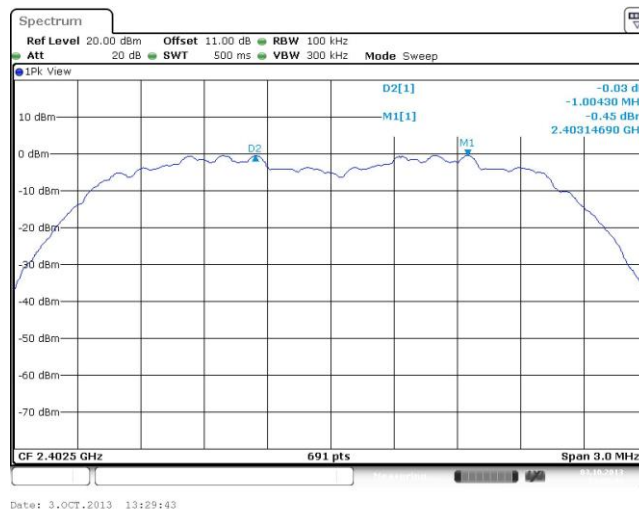
Worst 20dB Bandwidth Plots



Worst 99% Bandwidth Plots



Worst Carrier Frequency Separation Plots



3.3 Number of Hopping Frequencies

3.3.1 Number of Hopping Frequencies Limit

Number of Hopping Frequencies Limit for Frequency Hopping Systems	
☒	2400-2483.5 MHz Band:
☐	$N \geq 79$ and ChS $\geq$ MAX (20 dB bandwidth, 25 kHz).
☒	$N \geq 15$ and ChS $\geq$ MAX (20 dB bandwidth x 2/3, 25 kHz).
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

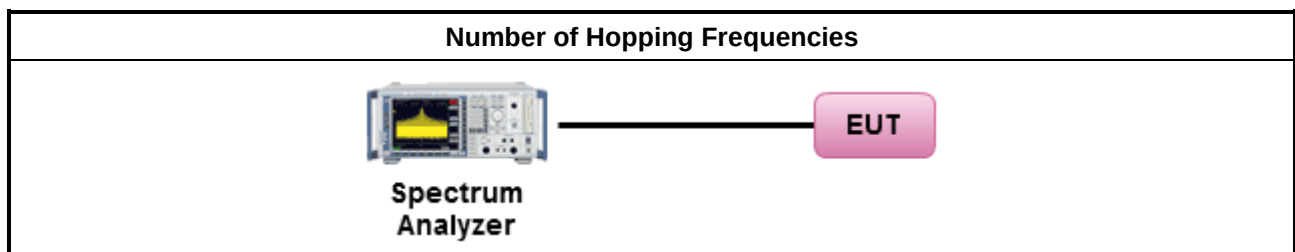
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

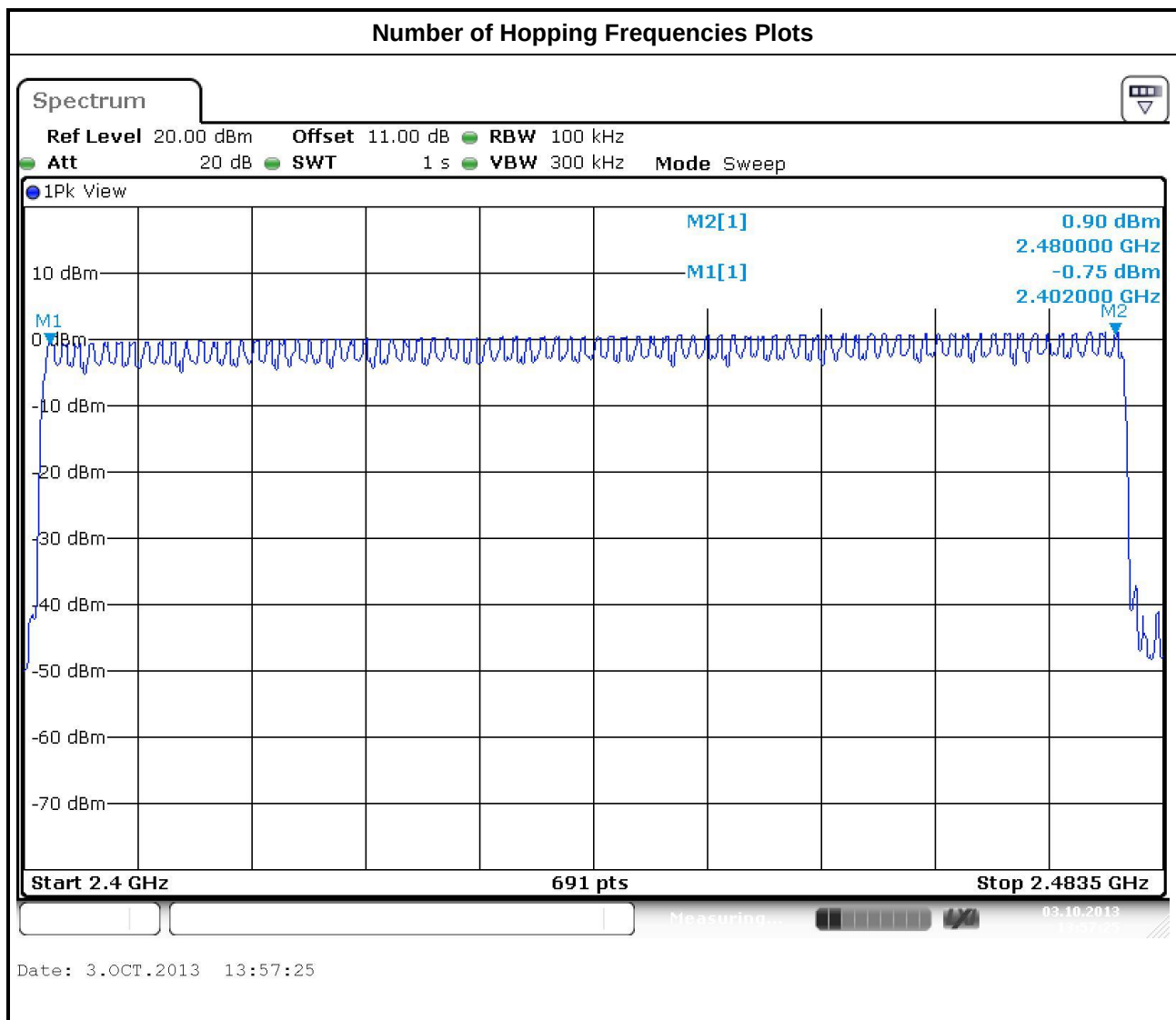
Test Method	
☒	Refer as ANSI C63.10, clause 7.7.3 for number of hopping frequencies measurement.
☒	For conducted measurement.
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☐	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.3.4 Test Setup



3.3.5 Test Result of Number of Hopping Frequencies

Number of Hopping Frequencies Result			
Modulation Mode	Freq. (MHz)	Hopping Channel Number (N)	Hopping Channel Number Limits
EDR-3Mbps	2402-2480	79	15
Result	Complied		



3.4 Time of Occupancy (Dwell Time)

3.4.1 Time of Occupancy (Dwell Time) Limit

Time of Occupancy (Dwell Time) Limit for Frequency Hopping Systems
☒ 2400-2483.5 MHz Band: Dwell time ≤ 0.4 second within $0.4 \times N$
N: Number of Hopping Frequencies

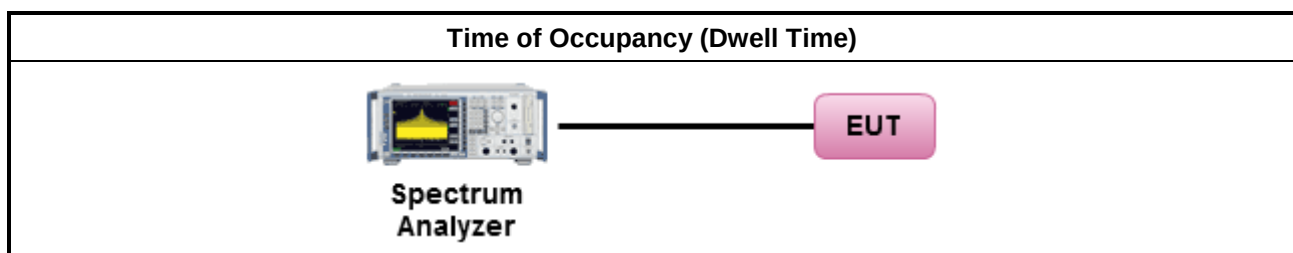
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

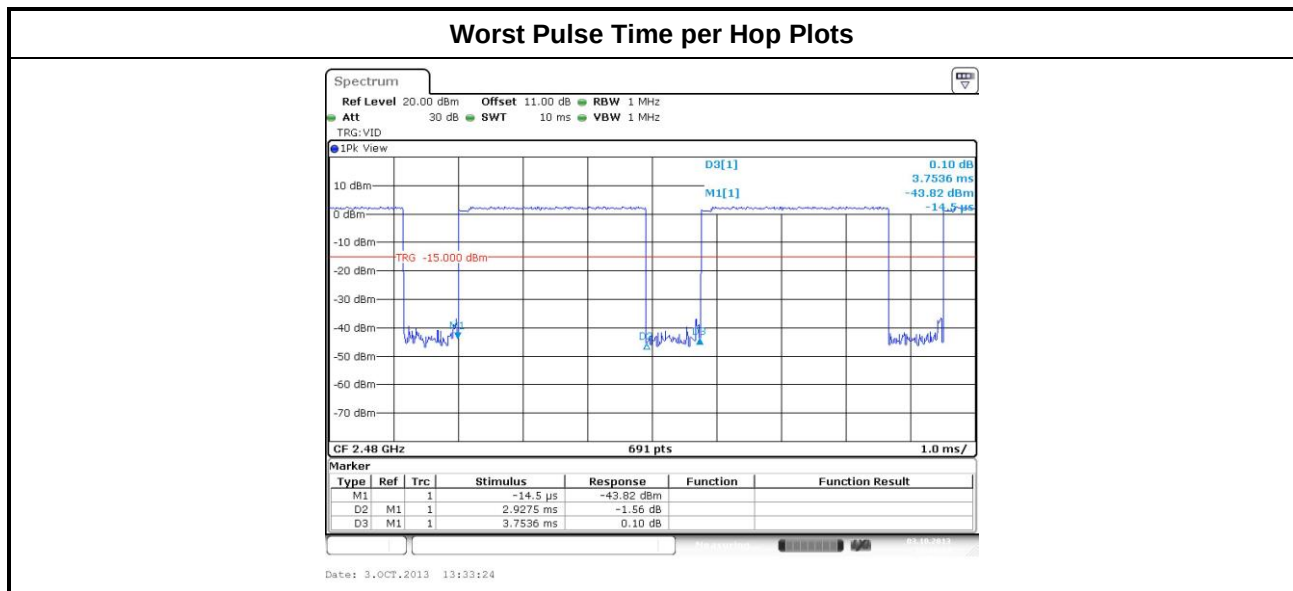
Test Method
☒ Refer as ANSI C63.10, clause 7.7.4 for dwell time measurement.
☒ Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle.
☐ The DH1 packet can cover a single time slot. A maximum length packet has duration of 1 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 1/1600 seconds, or 0.625ms. DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.
☐ The DH3 packet can cover up to 3 time slots. A maximum length packet has duration of 3 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 3/1600 seconds, or 1.875ms. DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
☒ The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds
☒ For conducted measurement.
☒ The EUT supports single transmit chain and measurements performed on this transmit chain. ☐ The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.4.4 Test Setup



3.4.5 Test Result of Time of Occupancy (Dwell Time)

Time of Occupancy (Dwell Time) Result					
Modulation Mode	Freq. (MHz)	Pulse Time per Hop (ms)	Number of Pulse in [0.4 x N sec]	Dwell Time in [0.4 x N sec] (s)	Dwell Time Limits (s)
EDR-3Mbps	2402	2.9275	106.7	0.312	0.4
Result		Complied			
Bluetooth ACL packets can be 1, 3, or 5 time slots. The DH1 packet can cover a single time slot. The DH3 packet can cover up to 3 time slots. The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.					



3.5 RF Output Power

3.5.1 RF Output Power Limit

RF Output Power Limit for Frequency Hopping Systems	
Maximum Peak Conducted Output Power Limit	
☒ 2400-2483.5 MHz Band:	
☐	For Hopping Channel: $N \geq 79$
☐	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
☐	If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
☒	For Hopping Channel: $N \geq 15$
☒	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 21$ dBm (0.125 W)
☐	If $G_{TX} > 6$ dBi, then $P_{Out} = 21 - (G_{TX} - 6)$ dBm
e.i.r.p. Power Limit:	
☒ 2400-2483.5 MHz Band:	
☐	For Hopping Channel: $N \geq 79$ - $P_{eirp} \leq 36$ dBm (4 W)
☒	For Hopping Channel: $79 > N \geq 15$ - $P_{eirp} \leq 27$ dBm (0.5 W)
G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm. N: Number of Hopping Frequencies ChS: Hopping Channel Separation	

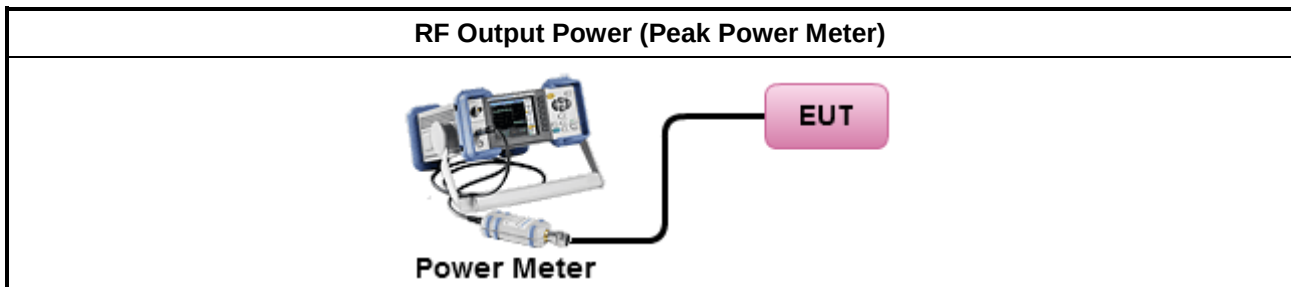
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
☒ Maximum Peak Conducted Output Power	
☐	Refer as FCC DA 00-0705, spectrum analyzer for peak power.
☒	Refer as FCC DA 00-0705, peak power meter for peak power.
☐	Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter.
☐	Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW $\geq$ EBW).
☒ For conducted measurement.	
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☐	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.5.4 Test Setup



3.5.5 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result						
Condition		RF Output Power (dBm)				
Modulation Mode	Freq. (MHz)	RF Output Power	Power Limit	Antenna Gain (dBi)	EIRP Power	EIRP Limit
BR-1Mbps	2402	3.93	21	-0.62	3.31	27
BR-1Mbps	2440	4.87	21	-0.62	4.25	27
BR-1Mbps	2480	5.3	21	-0.62	4.68	27
EDR-3Mbps	2402	2.4	21	-0.62	1.78	27
EDR-3Mbps	2440	3.33	21	-0.62	2.71	27
EDR-3Mbps	2480	3.78	21	-0.62	3.16	27
Result		Complied				

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

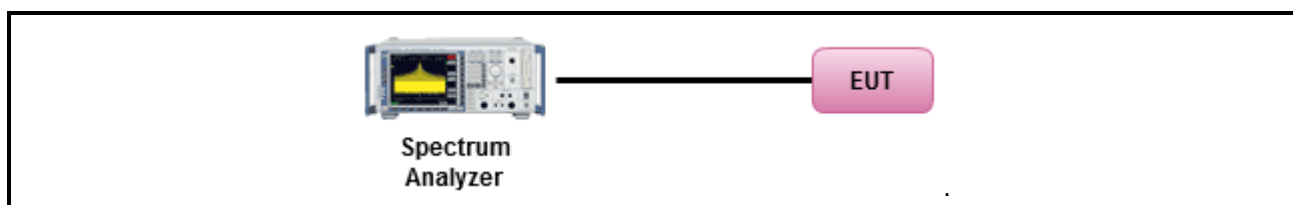
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

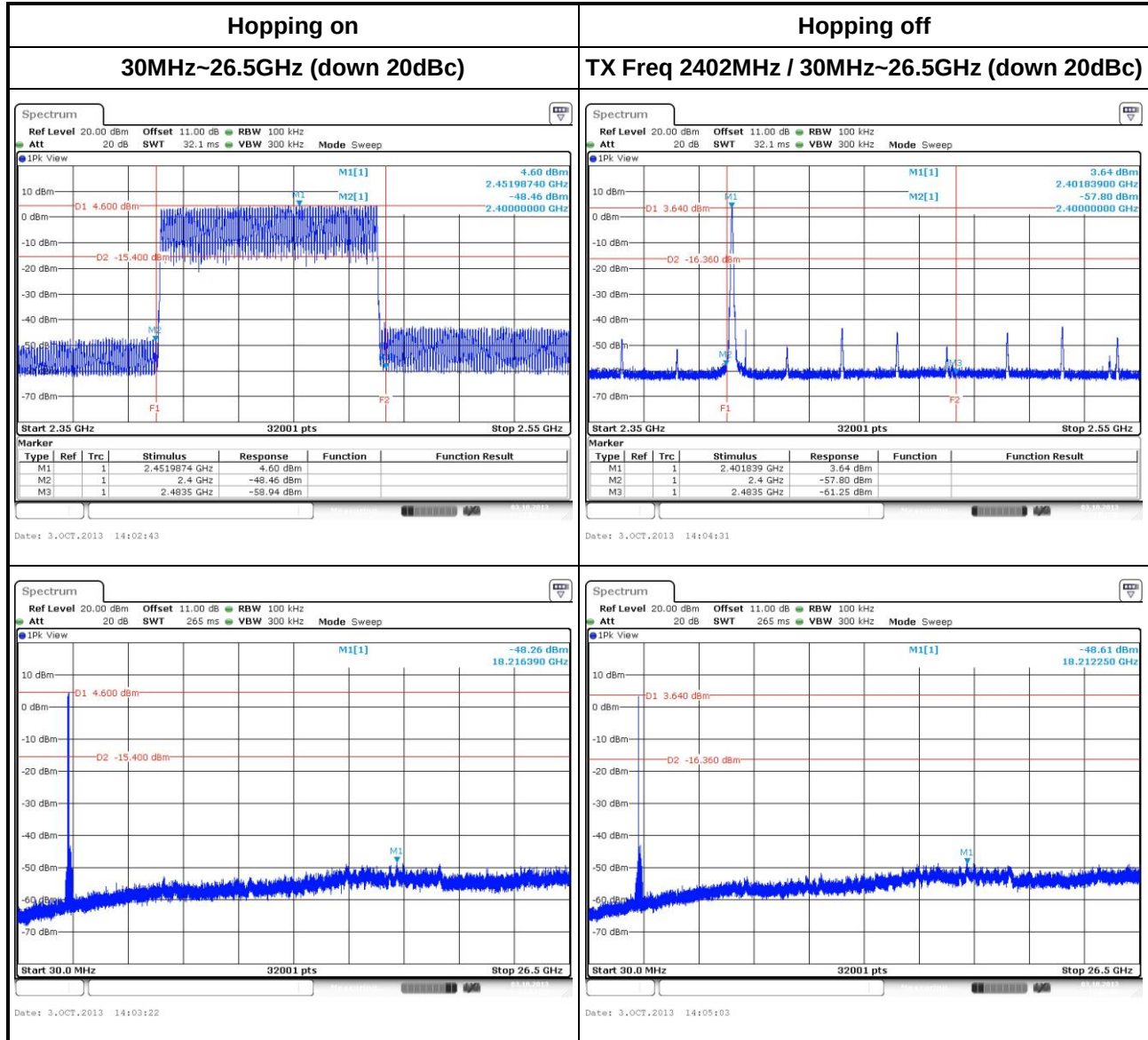
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 26.5GHz
4. Use the peak marker function to determine the maximum amplitude level

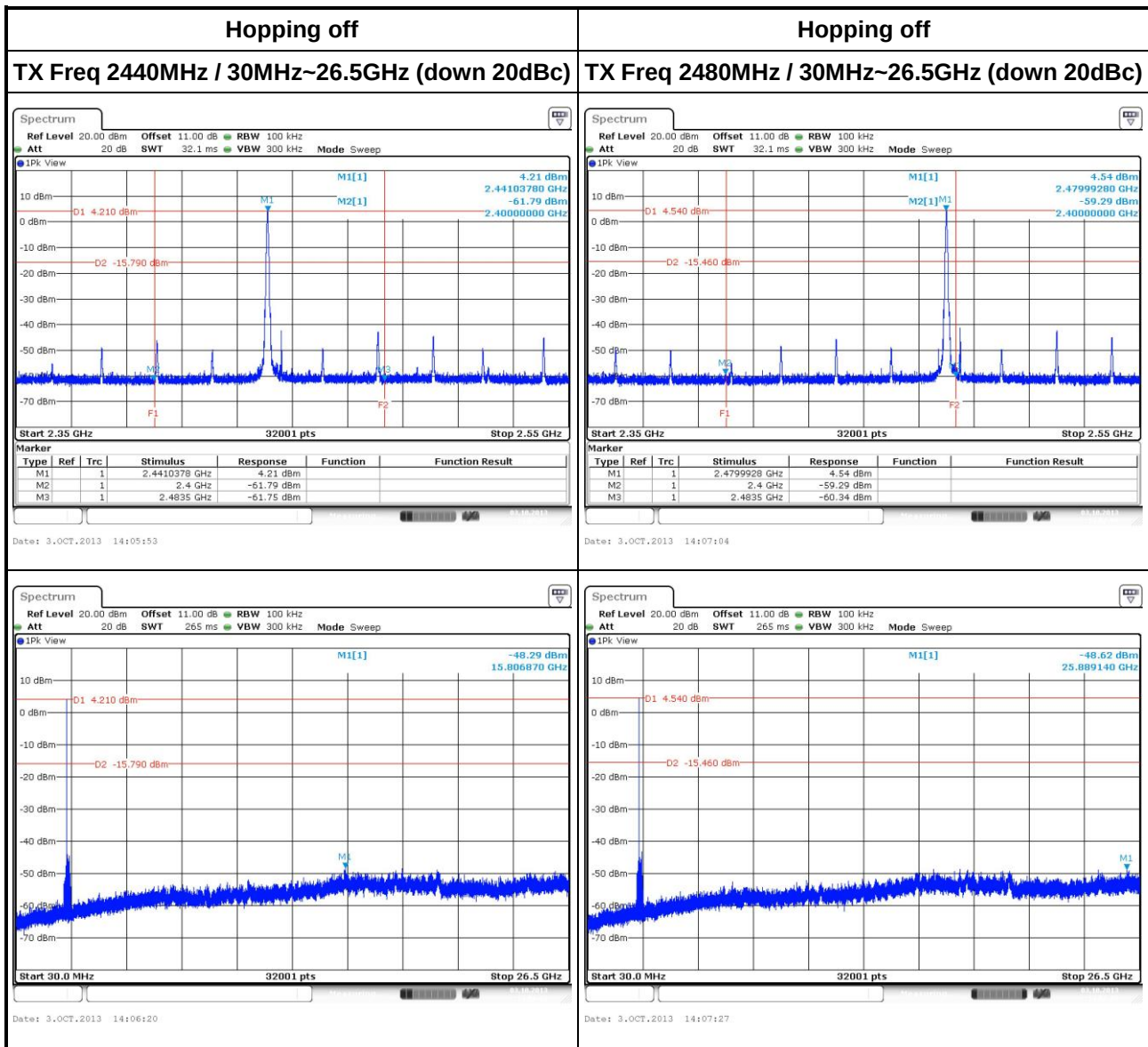
3.6.4 Test Setup



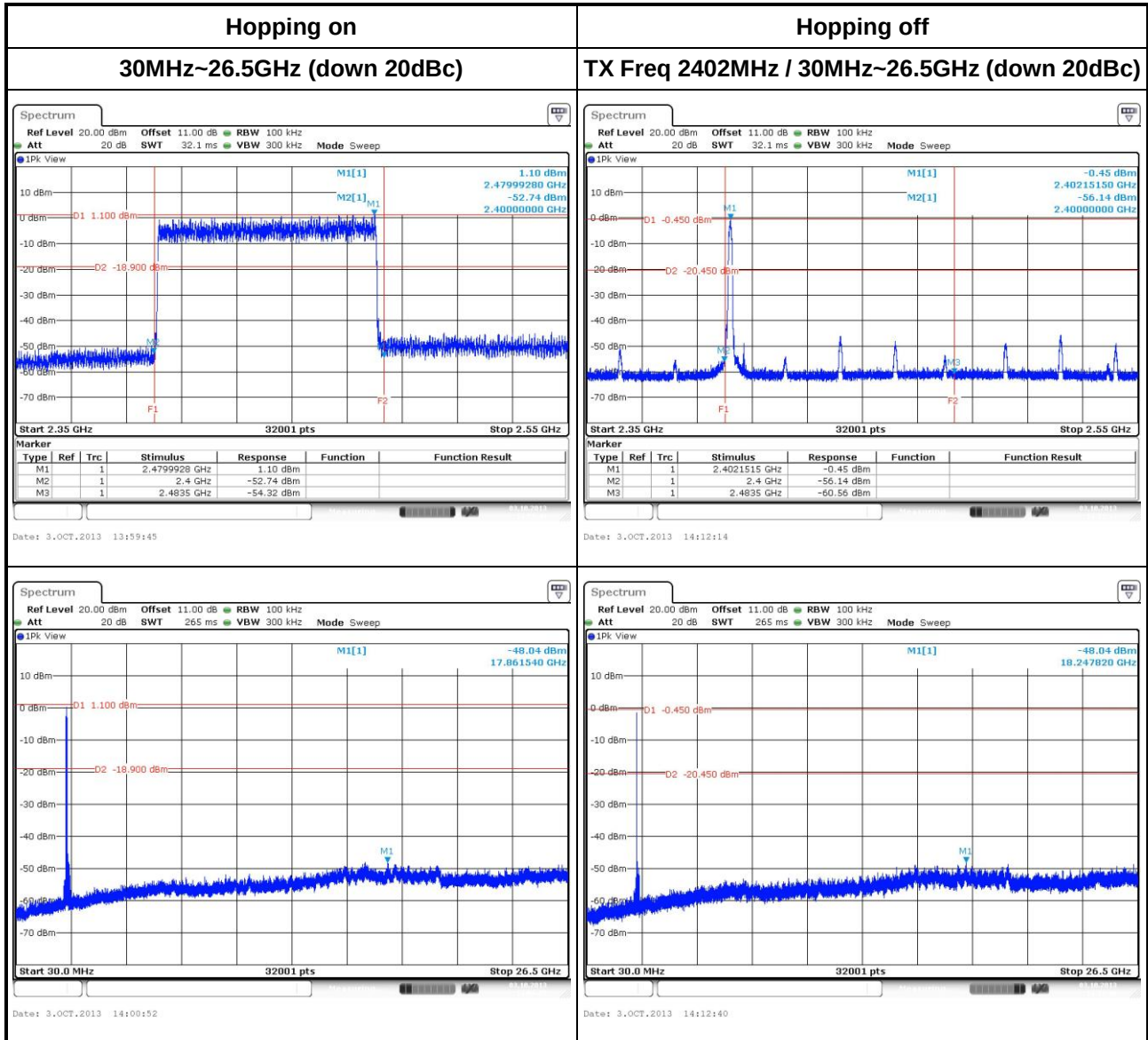
3.6.5 Test Result of Emissions in non-restricted frequency bands

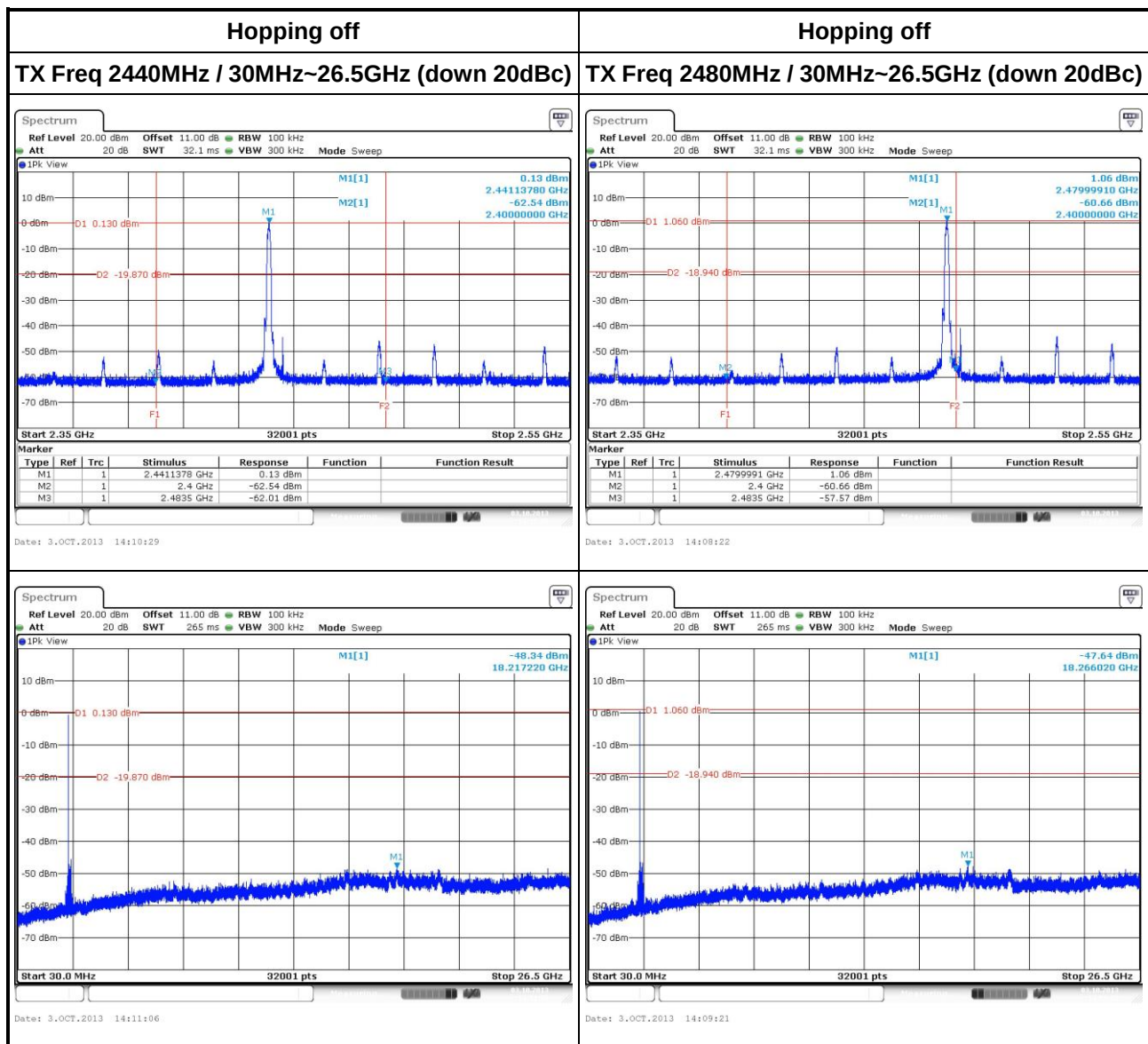
GFSK





8DPSK





3.7 Transmitter Radiated Unwanted Emissions

3.7.1 Transmitter 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.

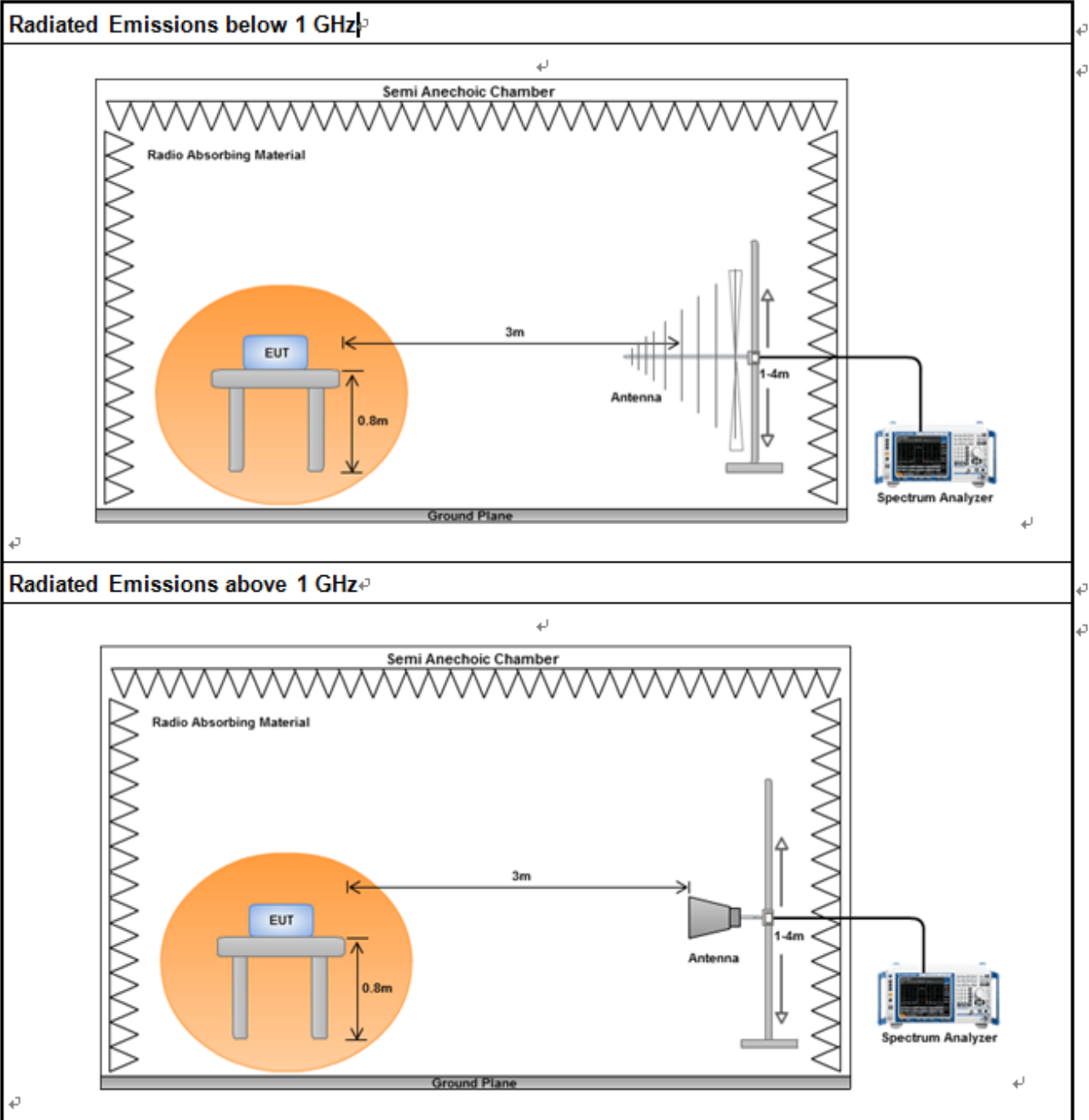
3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

Test Method – General Information	
☒	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).
☒	For the transmitter unwanted emissions shall be measured using following options below:
☒	Refer as FCC DA 00-0705, for spurious radiated emissions. The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$
☒	For unwanted emissions into non-restricted bands, 20 dB relative to the in-band peak output power in 100 kHz.
☒	For unwanted emissions into restricted bands.
☐	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle $\geq 98\%$.
☒	☒ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
☒	☒ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
☐	Refer as FCC DA 00-0705, for conducted measurement.
☒	For radiated measurement.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.

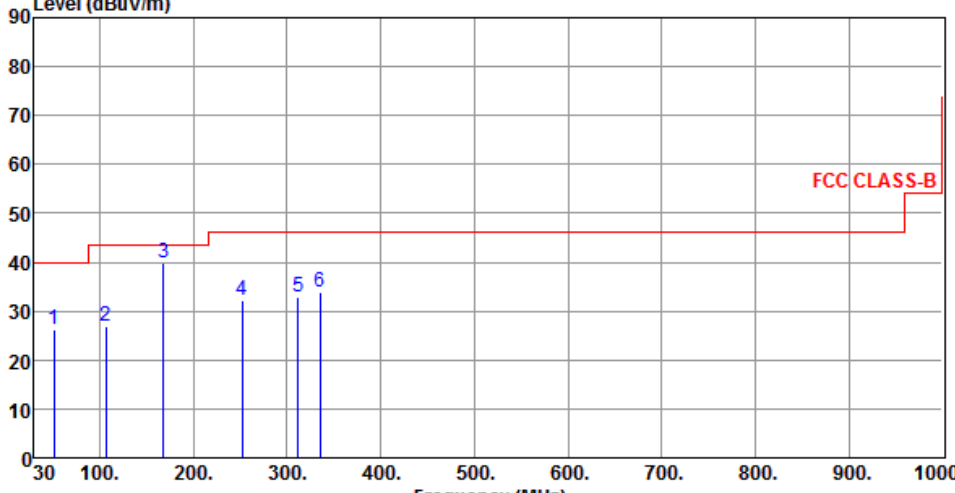
3.7.4 Test Setup



3.7.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

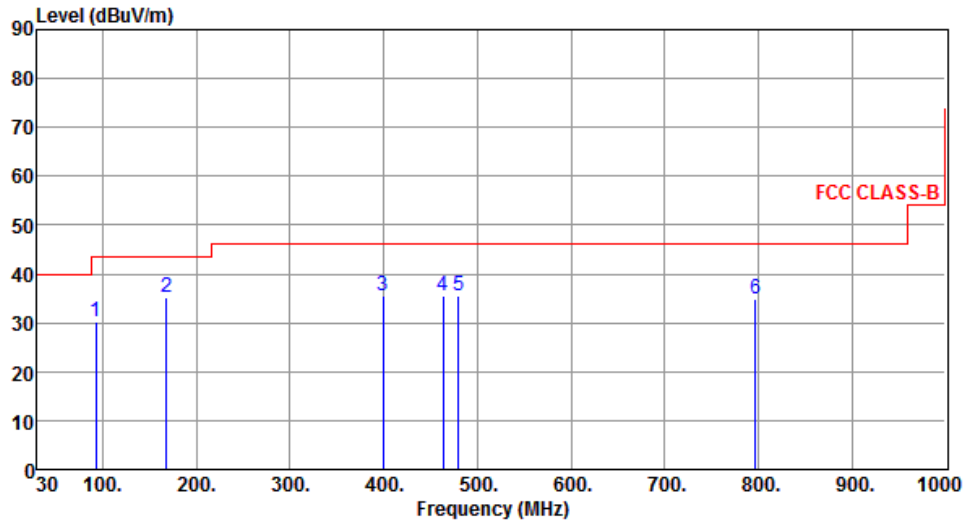
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.7.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Transmitter Radiated Unwanted Emissions (Below 1GHz)																																																																															
Modulation Mode	BR-1Mbps				Test Freq. (MHz)		2480																																																																								
Operating Function	Transmit				Polarization		H																																																																								
Level (dBUV/m)  <table><thead><tr><th></th><th>Freq. MHz</th><th>Emission level dBUV/m</th><th>Limit dBUV/m</th><th>Margin dB</th><th>SA reading dBUV</th><th>Factor dB</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr></thead><tbody><tr><td>1</td><td>51.34</td><td>26.13</td><td>40.00</td><td>-13.87</td><td>42.17</td><td>-16.04</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>2</td><td>106.63</td><td>26.95</td><td>43.50</td><td>-16.55</td><td>47.13</td><td>-20.18</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>167.74</td><td>39.81</td><td>43.50</td><td>-3.69</td><td>56.49</td><td>-16.68</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>4</td><td>252.13</td><td>32.19</td><td>46.00</td><td>-13.81</td><td>49.47</td><td>-17.28</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>5</td><td>312.27</td><td>32.84</td><td>46.00</td><td>-13.16</td><td>48.13</td><td>-15.29</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>6</td><td>335.55</td><td>33.72</td><td>46.00</td><td>-12.28</td><td>48.46</td><td>-14.74</td><td>Peak</td><td>---</td><td>---</td></tr></tbody></table>											Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg	1	51.34	26.13	40.00	-13.87	42.17	-16.04	Peak	---	---	2	106.63	26.95	43.50	-16.55	47.13	-20.18	Peak	---	---	3	167.74	39.81	43.50	-3.69	56.49	-16.68	Peak	---	---	4	252.13	32.19	46.00	-13.81	49.47	-17.28	Peak	---	---	5	312.27	32.84	46.00	-13.16	48.13	-15.29	Peak	---	---	6	335.55	33.72	46.00	-12.28	48.46	-14.74	Peak	---	---
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg																																																																						
1	51.34	26.13	40.00	-13.87	42.17	-16.04	Peak	---	---																																																																						
2	106.63	26.95	43.50	-16.55	47.13	-20.18	Peak	---	---																																																																						
3	167.74	39.81	43.50	-3.69	56.49	-16.68	Peak	---	---																																																																						
4	252.13	32.19	46.00	-13.81	49.47	-17.28	Peak	---	---																																																																						
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6	335.55	33.72	46.00	-12.28	48.46	-14.74	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 (Below 1GHz)

Modulation Mode	BR-1Mbps	Test Freq. (MHz)	2480
Operating Function	Transmit	Polarization	V

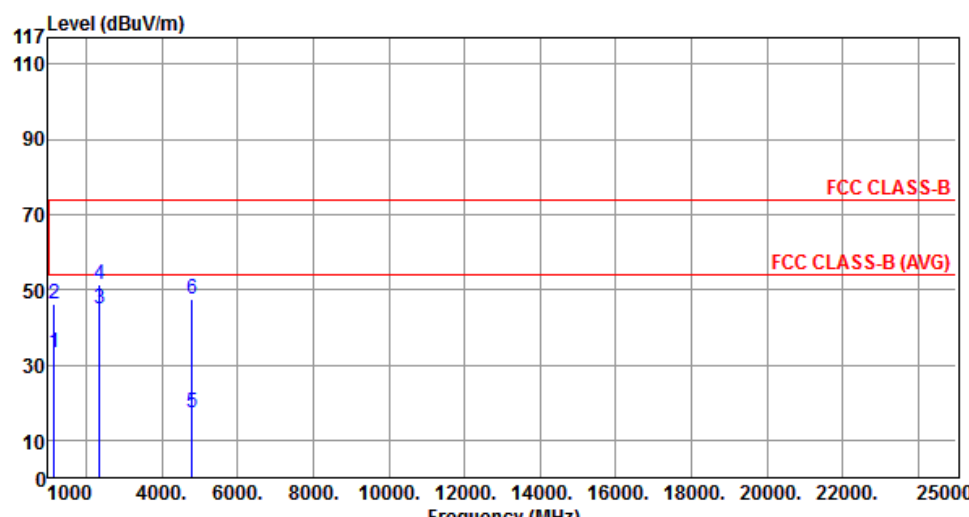


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	93.05	30.31	43.50	-13.19	52.32	-22.01	Peak	---	---
2	167.74	35.17	43.50	-8.33	51.85	-16.68	Peak	---	---
3	399.57	35.45	46.00	-10.55	48.50	-13.05	Peak	---	---
4	463.59	35.60	46.00	-10.40	47.16	-11.56	Peak	---	---
5	480.08	35.57	46.00	-10.43	46.86	-11.29	Peak	---	---
6	797.27	35.00	46.00	-11.00	41.11	-6.11	Peak	---	---

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

3.7.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Transmitter Radiated Unwanted Emissions (Above 1GHz)									
Modulation Mode	BR-1Mbps				Test Freq. (MHz)	2402			
Operating Function	Transmit				Polarization	H			



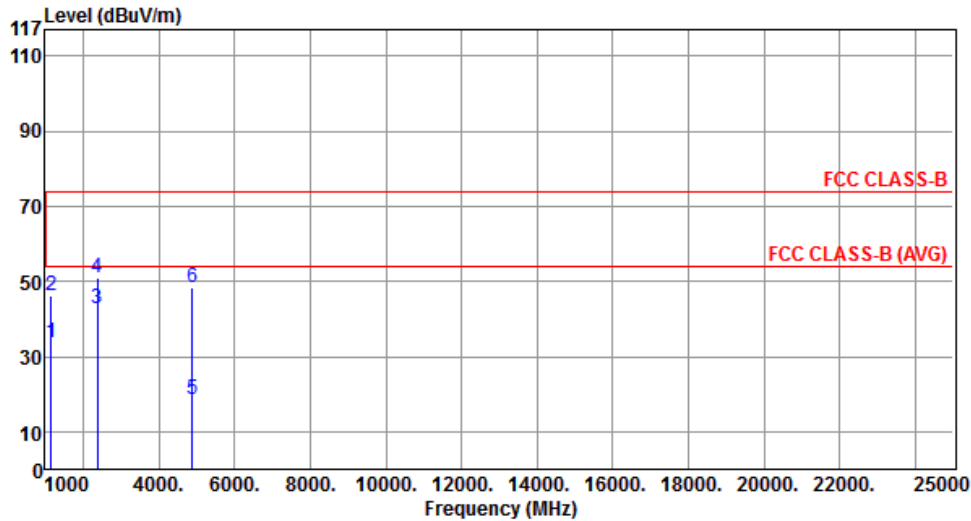
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.12	54.00	-20.88	41.94	-8.82	Average	---	---
2	1160.00	45.99	74.00	-28.01	54.81	-8.82	Peak	---	---
3	2360.00	44.85	54.00	-9.15	47.89	-3.04	Average	---	---
4	2360.00	51.25	74.00	-22.75	54.29	-3.04	Peak	---	---
5	4804.00	17.45	54.00	-36.55	12.80	4.65	Average	---	---
6	4804.00	47.55	74.00	-26.45	42.90	4.65	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600x5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.

Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																																																			
Modulation Mode	BR-1Mbps				Test Freq. (MHz)	2402																																																																																													
Operating Function	Transmit				Polarization	V																																																																																													
Level (dBuV/m) <table><thead><tr><th></th><th>Freq.</th><th>Emission</th><th>Limit</th><th>Margin</th><th>SA</th><th>Factor</th><th>Remark</th><th>ANT</th><th>Turn</th></tr><tr><th></th><th>MHz</th><th>level</th><th>dBuV/m</th><th>dB</th><th>reading</th><th>dB</th><th></th><th>High</th><th>Table</th></tr><tr><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>cm</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>1160.00</td><td>36.30</td><td>54.00</td><td>-17.70</td><td>45.12</td><td>-8.82</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>2</td><td>1160.00</td><td>46.52</td><td>74.00</td><td>-27.48</td><td>55.34</td><td>-8.82</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>2360.00</td><td>41.25</td><td>54.00</td><td>-12.75</td><td>44.29</td><td>-3.04</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>4</td><td>2360.00</td><td>49.45</td><td>74.00</td><td>-24.55</td><td>52.49</td><td>-3.04</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>5</td><td>4804.00</td><td>14.79</td><td>54.00</td><td>-39.21</td><td>10.14</td><td>4.65</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>6</td><td>4804.00</td><td>44.89</td><td>74.00</td><td>-29.11</td><td>40.24</td><td>4.65</td><td>Peak</td><td>---</td><td>---</td></tr></tbody></table>											Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn		MHz	level	dBuV/m	dB	reading	dB		High	Table									cm	deg	1	1160.00	36.30	54.00	-17.70	45.12	-8.82	Average	---	---	2	1160.00	46.52	74.00	-27.48	55.34	-8.82	Peak	---	---	3	2360.00	41.25	54.00	-12.75	44.29	-3.04	Average	---	---	4	2360.00	49.45	74.00	-24.55	52.49	-3.04	Peak	---	---	5	4804.00	14.79	54.00	-39.21	10.14	4.65	Average	---	---	6	4804.00	44.89	74.00	-29.11	40.24	4.65	Peak	---	---
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn																																																																																										
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Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit. Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical) Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level. Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600 \times 5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW$\geq 1/3.125ms$, VBW=1kHz.																																																																																																			

Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	BR-1Mbps	Test Freq. (MHz)	2440
Operating Function	Transmit	Polarization	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.51	54.00	-20.49	42.33	-8.82	Average	---	---
2	1160.00	46.28	74.00	-27.72	55.10	-8.82	Peak	---	---
3	2380.00	42.75	54.00	-11.25	45.69	-2.94	Average	---	---
4	2380.00	50.80	74.00	-23.20	53.74	-2.94	Peak	---	---
5	4882.00	18.45	54.00	-35.55	13.67	4.78	Average	---	---
6	4882.00	48.55	74.00	-25.45	43.77	4.78	Peak	---	---

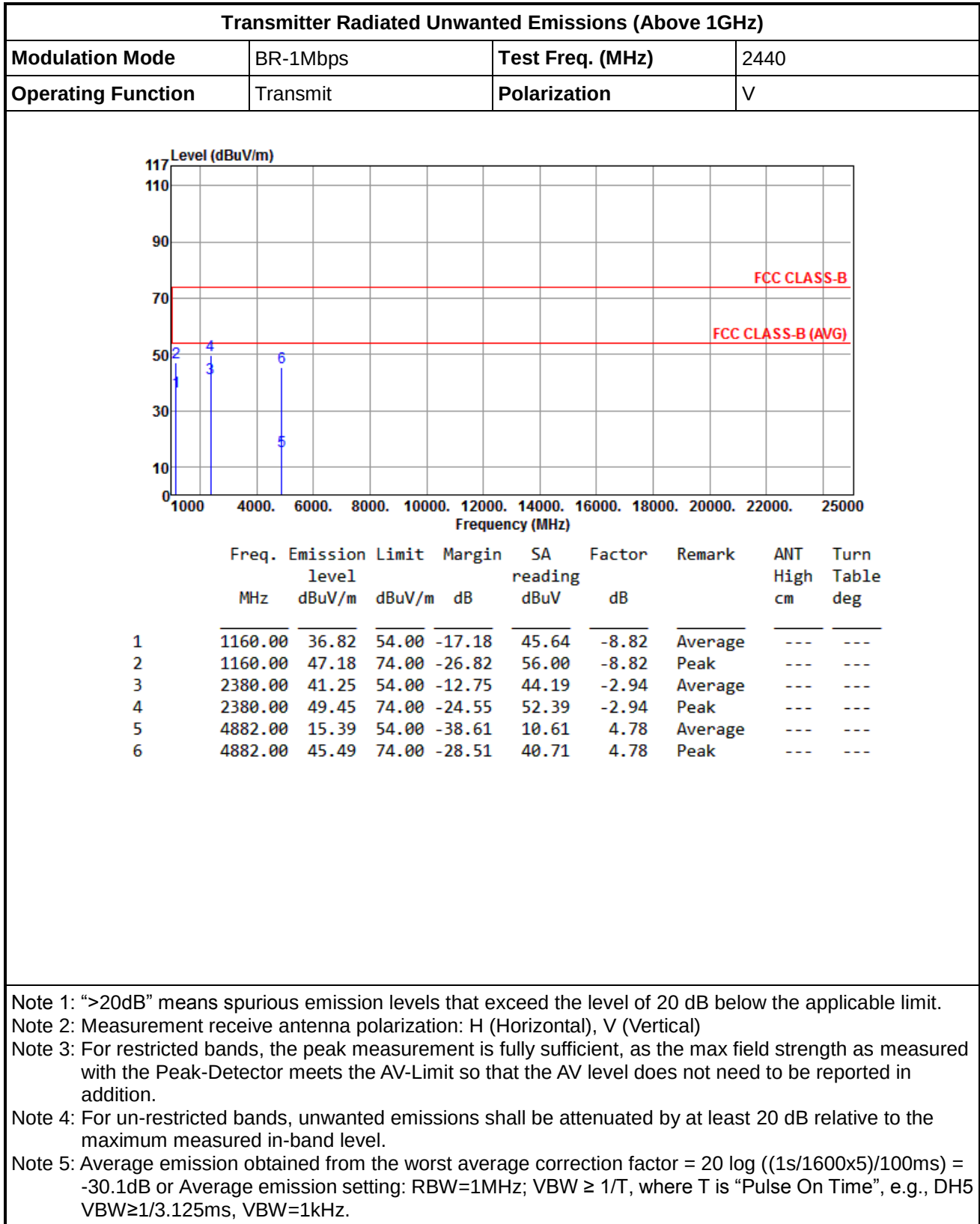
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

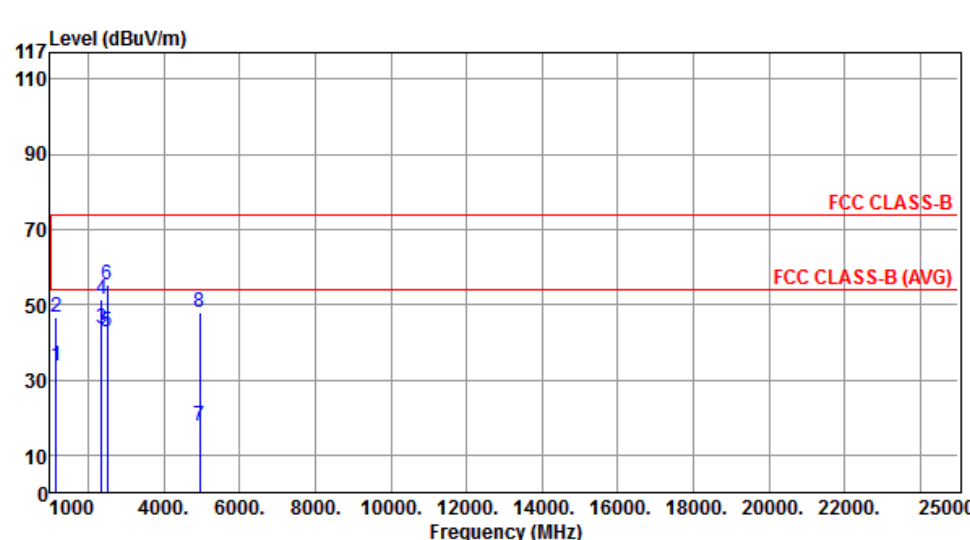
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

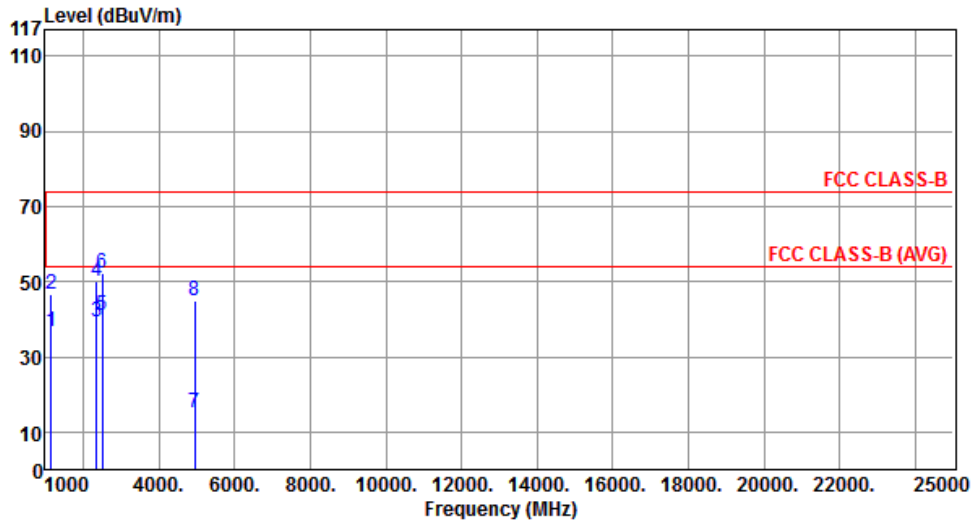
Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600 \times 5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																																																																							
Modulation Mode	BR-1Mbps				Test Freq. (MHz)	2480																																																																																																																	
Operating Function	Transmit				Polarization	H																																																																																																																	
Level (dBuV/m)  <table><thead><tr><th></th><th>Freq.</th><th>Emission</th><th>Limit</th><th>Margin</th><th>SA</th><th>Factor</th><th>Remark</th><th>ANT</th><th>Turn</th></tr><tr><th></th><th>MHz</th><th>level</th><th>dBuV/m</th><th>dB</th><th>reading</th><th>dB</th><th></th><th>High</th><th>Table</th></tr><tr><th></th><th></th><th></th><th></th><th></th><th>dBuV</th><th></th><th></th><th>cm</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>1160.00</td><td>33.82</td><td>54.00</td><td>-20.18</td><td>42.64</td><td>-8.82</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>2</td><td>1160.00</td><td>46.68</td><td>74.00</td><td>-27.32</td><td>55.50</td><td>-8.82</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>2360.00</td><td>43.45</td><td>54.00</td><td>-10.55</td><td>46.49</td><td>-3.04</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>4</td><td>2360.00</td><td>51.55</td><td>74.00</td><td>-22.45</td><td>54.59</td><td>-3.04</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>5</td><td>2499.00</td><td>42.75</td><td>54.00</td><td>-11.25</td><td>45.09</td><td>-2.34</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>6</td><td>2499.00</td><td>55.05</td><td>74.00</td><td>-18.95</td><td>57.39</td><td>-2.34</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>7</td><td>4960.00</td><td>17.71</td><td>54.00</td><td>-36.29</td><td>12.80</td><td>4.91</td><td>Average</td><td>---</td><td>---</td></tr><tr><td>8</td><td>4960.00</td><td>47.81</td><td>74.00</td><td>-26.19</td><td>42.90</td><td>4.91</td><td>Peak</td><td>---</td><td>---</td></tr></tbody></table>											Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn		MHz	level	dBuV/m	dB	reading	dB		High	Table						dBuV			cm	deg	1	1160.00	33.82	54.00	-20.18	42.64	-8.82	Average	---	---	2	1160.00	46.68	74.00	-27.32	55.50	-8.82	Peak	---	---	3	2360.00	43.45	54.00	-10.55	46.49	-3.04	Average	---	---	4	2360.00	51.55	74.00	-22.45	54.59	-3.04	Peak	---	---	5	2499.00	42.75	54.00	-11.25	45.09	-2.34	Average	---	---	6	2499.00	55.05	74.00	-18.95	57.39	-2.34	Peak	---	---	7	4960.00	17.71	54.00	-36.29	12.80	4.91	Average	---	---	8	4960.00	47.81	74.00	-26.19	42.90	4.91	Peak	---	---
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1	1160.00	33.82	54.00	-20.18	42.64	-8.82	Average	---	---																																																																																																														
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7	4960.00	17.71	54.00	-36.29	12.80	4.91	Average	---	---																																																																																																														
8	4960.00	47.81	74.00	-26.19	42.90	4.91	Peak	---	---																																																																																																														
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit. Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical) Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level. Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600 \times 5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW$\geq 1/3.125ms$, VBW=1kHz.																																																																																																																							

Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	BR-1Mbps	Test Freq. (MHz)	2480
Operating Function	Transmit	Polarization	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	36.60	54.00	-17.40	45.42	-8.82	Average	---	---
2	1160.00	46.83	74.00	-27.17	55.65	-8.82	Peak	---	---
3	2360.00	39.45	54.00	-14.55	42.49	-3.04	Average	---	---
4	2360.00	50.25	74.00	-23.75	53.29	-3.04	Peak	---	---
5	2499.00	41.08	54.00	-12.92	43.42	-2.34	Average	---	---
6	2499.00	52.45	74.00	-21.55	54.79	-2.34	Peak	---	---
7	4960.00	14.91	54.00	-39.09	10.00	4.91	Average	---	---
8	4960.00	45.01	74.00	-28.99	40.10	4.91	Peak	---	---

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

Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

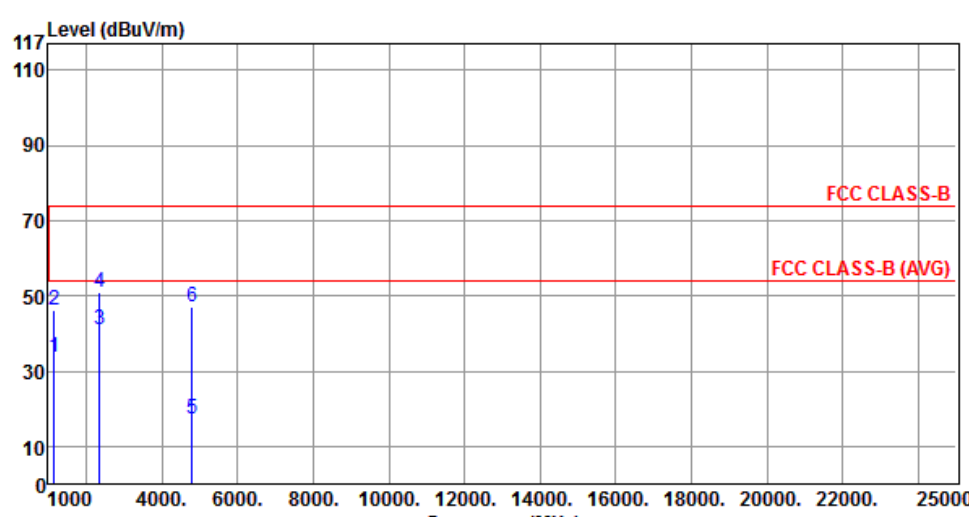
Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600 \times 5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.

3.7.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Transmitter Radiated Unwanted Emissions (Above 1GHz)									
Modulation Mode	EDR-3Mbps				Test Freq. (MHz)	2402			
Operating Function	Transmit				Polarization	H			



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.56	54.00	-20.44	42.38	-8.82	Average	---	---
2	1160.00	46.13	74.00	-27.87	54.95	-8.82	Peak	---	---
3	2360.00	40.85	54.00	-13.15	43.89	-3.04	Average	---	---
4	2360.00	50.95	74.00	-23.05	53.99	-3.04	Peak	---	---
5	4804.00	17.10	54.00	-36.90	12.45	4.65	Average	---	---
6	4804.00	47.20	74.00	-26.80	42.55	4.65	Peak	---	---

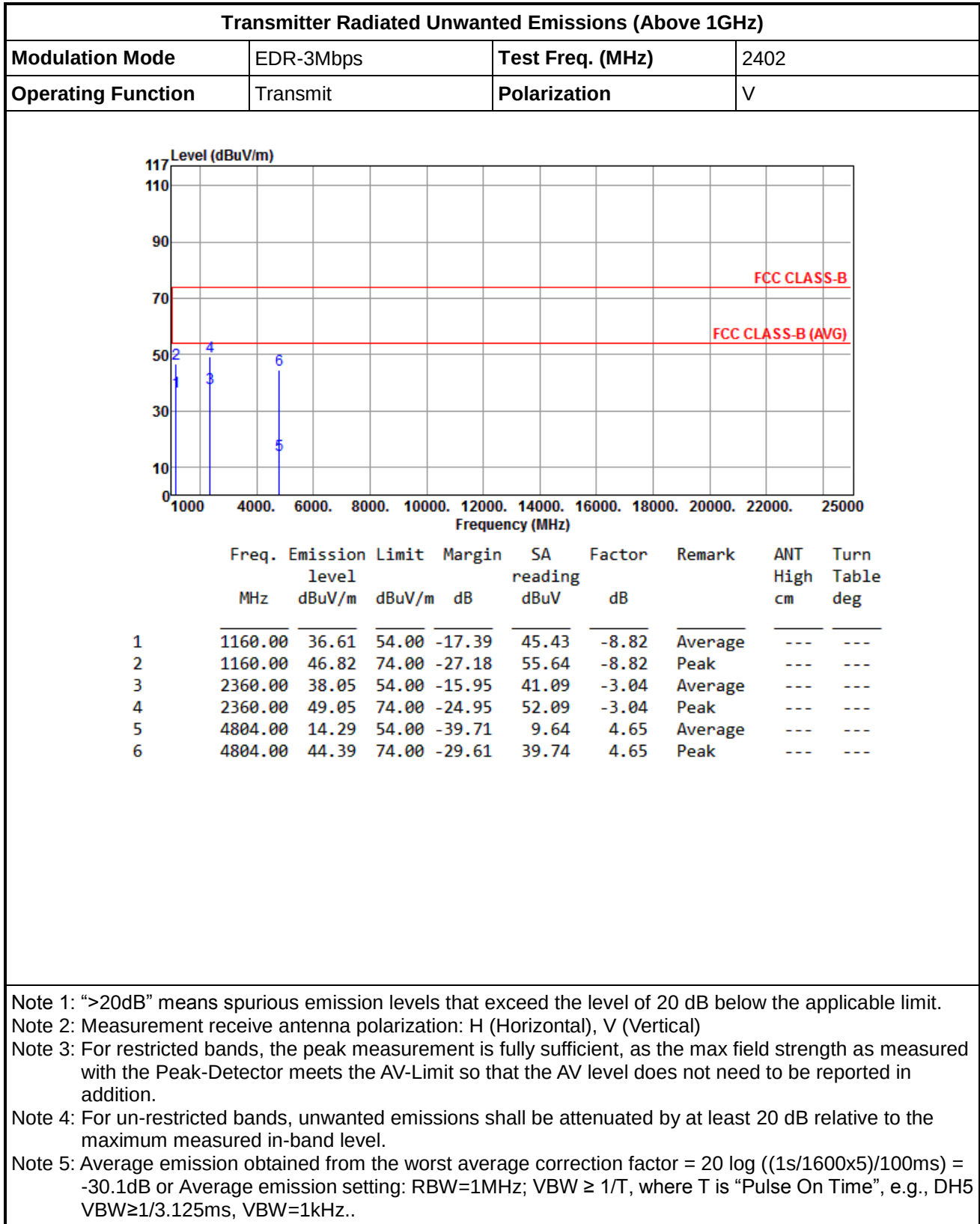
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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.

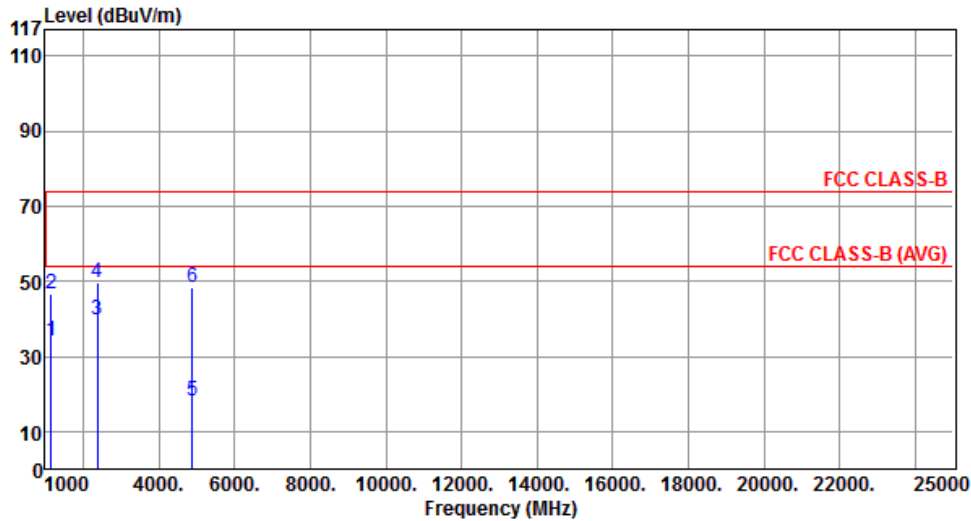
Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600x5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	EDR-3Mbps	Test Freq. (MHz)	2440
Operating Function	Transmit	Polarization	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.92	54.00	-20.08	42.74	-8.82	Average	---	---
2	1160.00	46.68	74.00	-27.32	55.50	-8.82	Peak	---	---
3	2380.00	39.65	54.00	-14.35	42.59	-2.94	Average	---	---
4	2380.00	49.65	74.00	-24.35	52.59	-2.94	Peak	---	---
5	4882.00	18.23	54.00	-35.77	13.45	4.78	Average	---	---
6	4882.00	48.33	74.00	-25.67	43.55	4.78	Peak	---	---

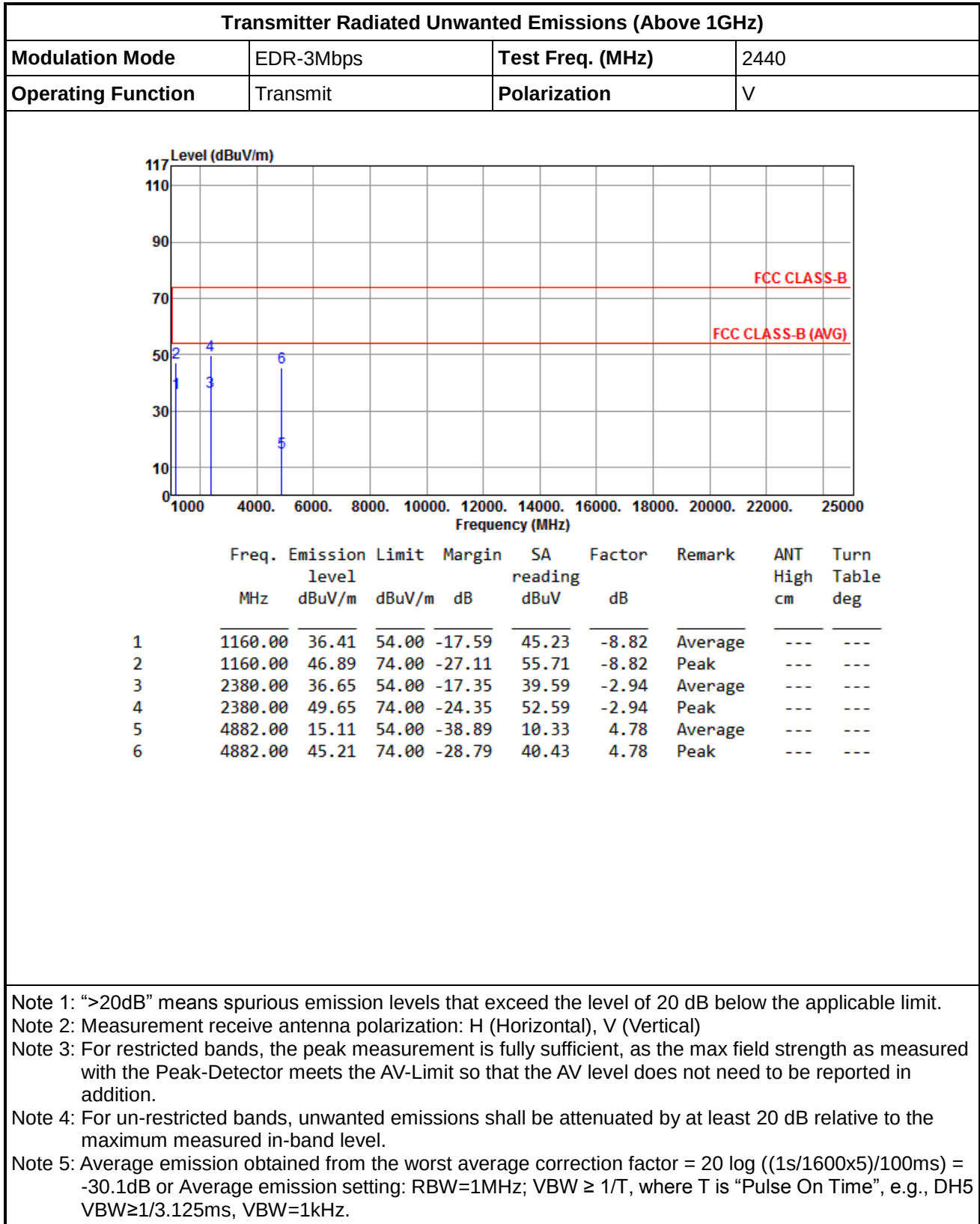
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

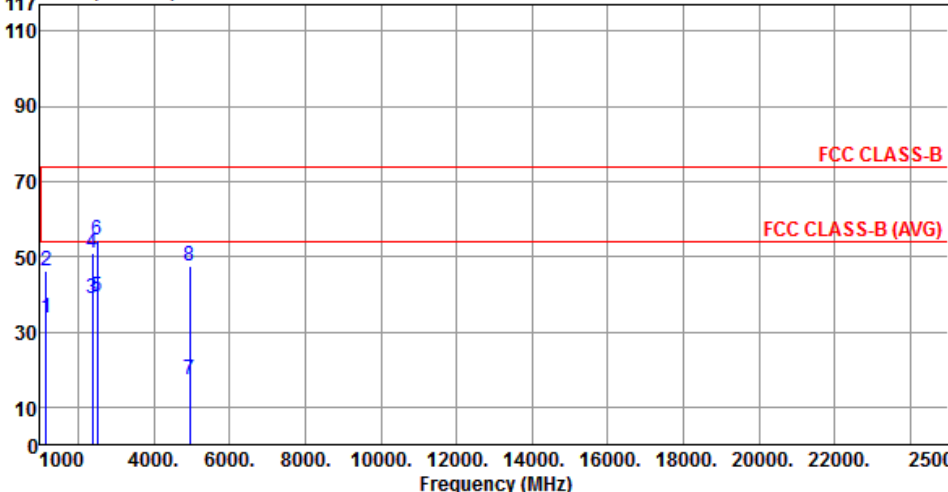
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

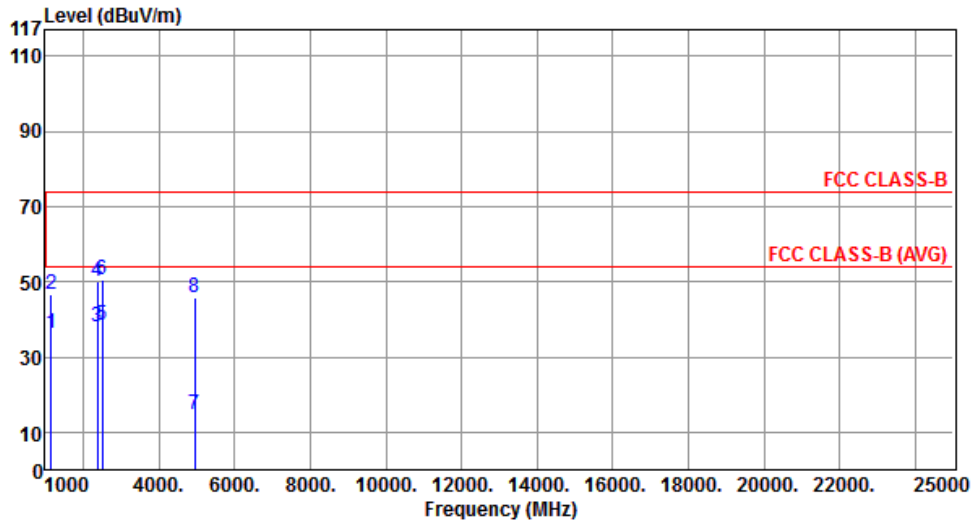
Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600x5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)																																																																																																													
Modulation Mode	EDR-3Mbps				Test Freq. (MHz)		2480																																																																																																						
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Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	EDR-3Mbps	Test Freq. (MHz)	2480
Operating Function	Transmit	Polarization	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	36.22	54.00	-17.78	45.04	-8.82	Average	---	---
2	1160.00	46.58	74.00	-27.42	55.40	-8.82	Peak	---	---
3	2380.00	37.95	54.00	-16.05	40.89	-2.94	Average	---	---
4	2380.00	50.05	74.00	-23.95	52.99	-2.94	Peak	---	---
5	2499.00	38.25	54.00	-15.75	40.59	-2.34	Average	---	---
6	2499.00	50.55	74.00	-23.45	52.89	-2.34	Peak	---	---
7	4960.00	14.59	54.00	-39.41	9.68	4.91	Average	---	---
8	4960.00	45.69	74.00	-28.31	40.78	4.91	Peak	---	---

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

Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Note 5: Average emission obtained from the worst average correction factor = $20 \log ((1s/1600x5)/100ms) = -30.1dB$ or Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., DH5 VBW $\geq 1/3.125ms$, VBW=1kHz.

4 Test Equipment and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100358	May. 17, 2013	May. 16, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013
50 ohm terminal	NA	50	01	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	02	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	03	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH02-WS	Jan. 02, 2013	Jan. 01, 2014
Spectrum Analyzer	R&S	FSV40	101499	Jan. 28, 2013	Jan. 27, 2014
Receiver	R&S	ESR3	101657	Jan. 30, 2013	Jan. 29, 2014
Bilog Antenna	Schwarzbeck	VULB9168	VULB9168-524	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120D	BBHA 9120 D 1095	Jan. 29, 2013	Jan. 28, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100218	Dec. 14, 2012	Dec. 13, 2013
Amplifier	Agilent	83017A	MY39501309	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-003	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-004	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	060608	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					



FCC Test Report

Report No. : FR372656AD

Test Item	RF Conducted				
Test Site	TH01-HY				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
Spectrum Analyzer	R&S	FSP 40	100305	Mar. 20, 2013	Mar. 19, 2014
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	Nov. 21, 2012	Nov. 20, 2013
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 14, 2014
Power Sensor	Anritsu	MA2411B	0917017	Feb. 02, 2013	Feb. 01, 2014
Power Meter	Anritsu	ML2495A	0949003	Feb. 02, 2013	Feb. 01, 2014
Note: Calibration Interval of instruments listed above is one year.					