FCC Test Report

Equipment	:	**BOOMA2 Micro Bluetooth Speaker**
Brand Name	:	**GOODZ2**
Model No.	:	**FWS218**
FCC ID	:	**2AA5C-FWS218**
Standard	:	**47 CFR FCC Part 15.247**
Operating Band	:	**2400 MHz – 2483.5 MHz**
FCC Classification	:	**DSS**
Applicant	:	**CviLux Corporation** **9F., No.9, Lane 3, Sec 1, Chung-Cheng East Road,** **Tamshui, New Taipei City 25147, Taiwan**

The product sample received on Mar. 19, 2015 and completely tested on May 14, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.
Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 02, 2014.

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:

James Fan / Assistant Manager

Testing Laboratory
1190

Table of Contents

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]: 0.195MHz 45.59 (Margin 8.21dB) - AV 56.75 (Margin 7.05dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	20dB Bandwidth	1.2870 MHz	N/A	Complied
3.2	15.247(a)	Carrier Frequency Separation (ChS)	1.0029 MHz	ChS ≥ BW_{20dB} x2/3.	Complied
3.3	15.247(a)	Number of Hopping Frequencies (N)	Max:79 Min:20	N ≥ 15	Complied
3.4	15.247(a)	Time of Occupancy (Dwell Time)	0.315 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] 1.82	Power [dBm] 21	Complied
3.6	15.247(d)	Emissions in non-restricted frequency bands	Out-of -band emissions are 20dB below the highest power	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.7	15.247(d)	Transmitter Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 191.99MHz 42.46 (Margin 1.04dB) - QP	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

Revision History

Report No.	Version	Description	Issued Date
FR531929	Rev. 01	Initial issue of report	Jun. 02, 2015
FR531929	Rev. 02	Revised product name.	Jun. 16, 2015
FR531929	Rev. 03	Revised product name.	Jul. 08, 2015

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**	**RF Output Power (dBm)**
2400-2483.5	BR / EDR	2402-2480	0-78 [79]	1.82
Note 1: Bluetooth BR uses a GFSK (1Mbps). Note 2: Bluetooth EDR uses a combination of π/4-DQPSK (2Mbps) and 8DPSK (3Mbps). Note 3: RF output power specifies that Maximum Peak Conducted Output Power.				

1.1.2 Antenna Information

Antenna Category	
☒	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				
No.	**Ant. Cat.**	**Ant. Type**	**Connector**	**Gain (dBi)**
1	Integral	Printed	No Connector	2.24

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 hopping 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)**
☒ 78.38% - test mode single channel – DH1	1.06
☒ 77.99% - test mode single channel – DH3	1.08
☒ 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.	

1.1.5 EUT Operational Condition

Power Supply Type	From host: 5Vdc, 500mA From lithium battery: Brand: DONGGUAN YILINK ELECTRONICS TWCHNOLOGY CO.LTD Model: YL702025 Rating: 3.7Vdc, 300mAh

1.2 Accessories and Support Equipment

Accessories				
No.	**Equipment**	**Brand Name**	**Model Name**	**Spec.**
1	Lithium battery	DONGGUAN YILINK ELECTRONICS TWCHNOLOGY CO.LTD	YL702025	Rating: 3.7Vdc, 300mAh.
2	Micro USB cable	---	---	0.25m shielded without core.

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	Latitude E5420	DoC
2	USB control cable	---	---	---

Note: USB control cable is provided by applicant.

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
  Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014

1.4 Testing Location Information

Testing Location					
☒	Sporton Lab	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973			
☒	ICC Lab	ADD : No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsein 333, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted		TH01-HY	Mark Liao	24°C / 62%	May 13 ~ 14, 2015
AC Conduction		CO01-WS*	Peter Lin	22°C / 62%	May 14, 2015
Radiated Emission		03CH02-WS*	Aska Huang	25°C / 65%	May 11, 2015
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, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted		±0.81 dB	N/A
All emissions, radiated	30 – 1000 MHz	±3.62 dB	N/A
	Above 1GHz	±5.60 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	0.82	EDR-3Mbps
EDR	1	2 Mbps	EDR-2Mbps	1.31	
EDR	1	3 Mbps	EDR-3Mbps	**1.82**	

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter			
Test Software Version / Instrument	RF Control Kit v1.0, Bluetooth Tester: R&S CBT		
Modulation Mode	**2402 MHz**	**2441 MHz**	**2480 MHz**
BR,1Mbps	DEFAULT	DEFAULT	DEFAULT
EDR,2Mbps	DEFAULT	DEFAULT	DEFAULT
EDR,3Mbps	DEFAULT	DEFAULT	DEFAULT

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
1	USB charging + Radio link

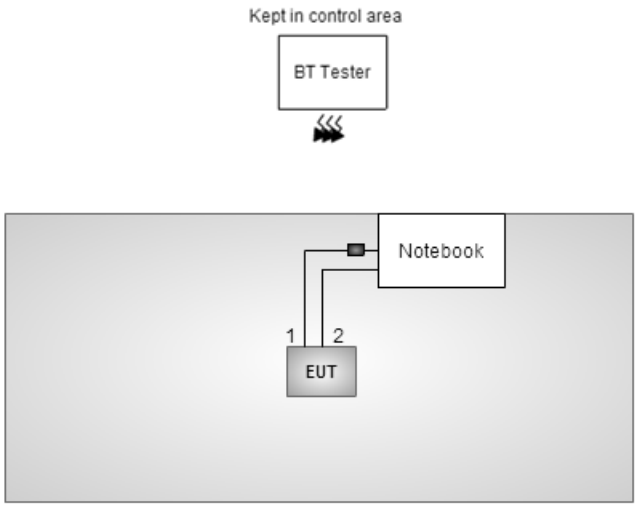
The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, 20dB Bandwidth, Carrier Frequency Separation (ChS)
Test Condition	Conducted measurement at transmit chains
Modulation Mode	BR-1Mbps, EDR-2Mbps, EDR-3Mbps

The Worst Case Mode for Following Conformance Tests	
Tests Item	Number of Hopping Frequencies (N), Time of Occupancy (Dwell Time), Emissions in Non-Restricted Frequency Bands
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 Transmitter Radiated Bandedge 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. The worst planes is Y.		
	☐ EUT will be a battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes. The worst planes is Y.		
Operating Mode	☒ 1. USB charging + Radio link		
Modulation Mode	BR-1Mbps, EDR-3Mbps		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			

2.4 Test Setup Diagram

Test Setup Diagram - Radiated Test



1. USB control cable with 1 core
2. USB, 0.25m non-shielded

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

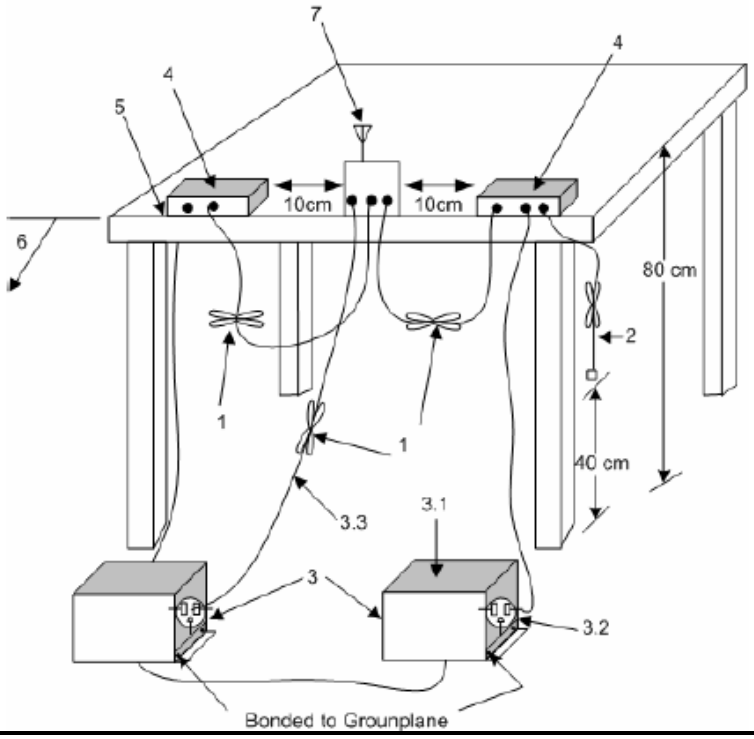
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

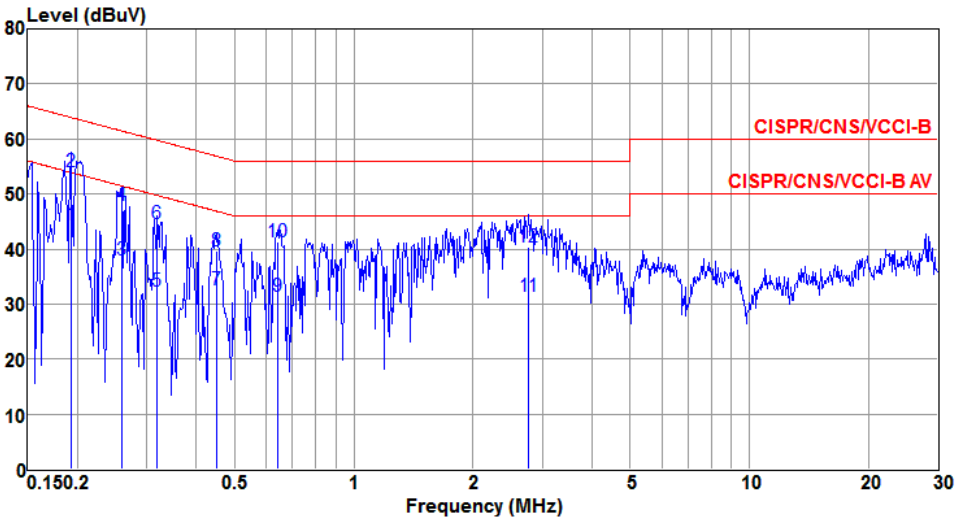
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

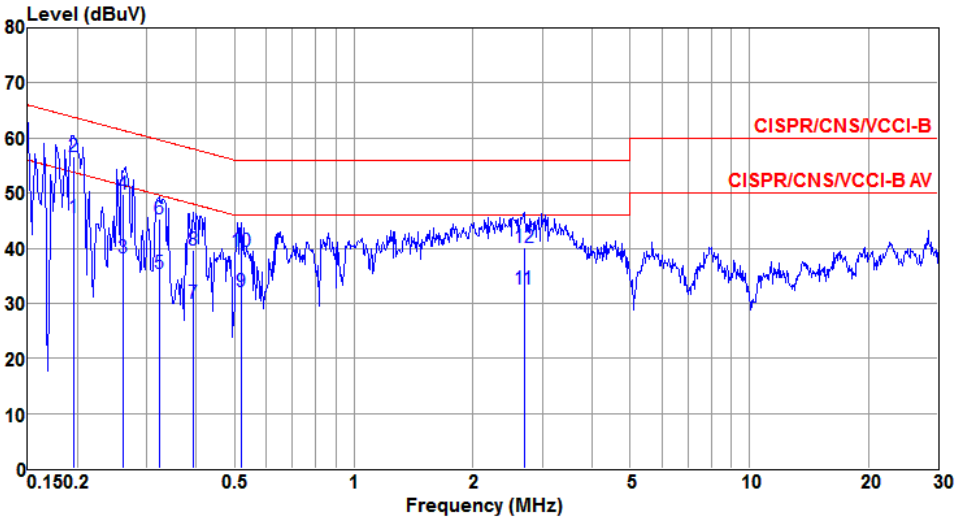
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	USB charging + Radio link		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1*	0.192	44.40	53.93	-9.53	44.24	0.07	0.09	Average
2	0.192	54.17	63.93	-9.76	54.01	0.07	0.09	QP
3	0.259	38.03	51.47	-13.44	37.86	0.07	0.10	Average
4	0.259	47.98	61.47	-13.49	47.81	0.07	0.10	QP
5	0.318	32.44	49.75	-17.31	32.27	0.07	0.10	Average
6	0.318	44.60	59.75	-15.15	44.43	0.07	0.10	QP
7	0.449	32.52	46.89	-14.37	32.33	0.07	0.12	Average
8	0.449	39.62	56.89	-17.27	39.43	0.07	0.12	QP
9	0.641	31.33	46.00	-14.67	31.11	0.08	0.14	Average
10	0.641	41.24	56.00	-14.76	41.02	0.08	0.14	QP
11	2.765	31.37	46.00	-14.63	30.99	0.11	0.27	Average
12	2.765	40.25	56.00	-15.75	39.87	0.11	0.27	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.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	USB charging + Radio link		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.195	45.59	53.80	-8.21	45.43	0.07	0.09	Average
2*	0.195	56.75	63.80	-7.05	56.59	0.07	0.09	QP
3	0.261	38.22	51.41	-13.19	38.05	0.07	0.10	Average
4	0.261	49.79	61.41	-11.62	49.62	0.07	0.10	QP
5	0.322	35.32	49.66	-14.34	35.15	0.07	0.10	Average
6	0.322	45.35	59.66	-14.31	45.18	0.07	0.10	QP
7	0.391	30.04	48.03	-17.99	29.86	0.07	0.11	Average
8	0.391	39.63	58.03	-18.40	39.45	0.07	0.11	QP
9	0.518	32.01	46.00	-13.99	31.82	0.07	0.12	Average
10	0.518	39.36	56.00	-16.64	39.17	0.07	0.12	QP
11	2.692	32.63	46.00	-13.37	32.25	0.11	0.27	Average
12	2.692	40.11	56.00	-15.89	39.73	0.11	0.27	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 ≥ 75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz).
☒	N ≥ 15 and ChS ≥ MAX (20 dB bandwidth x 2/3, 25 kHz).
N: Number of Hopping Frequencies; **ChS**: Hopping Channel Separation	

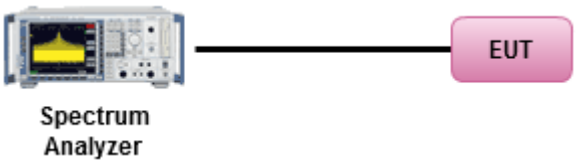
3.2.2 Measuring Instruments

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.

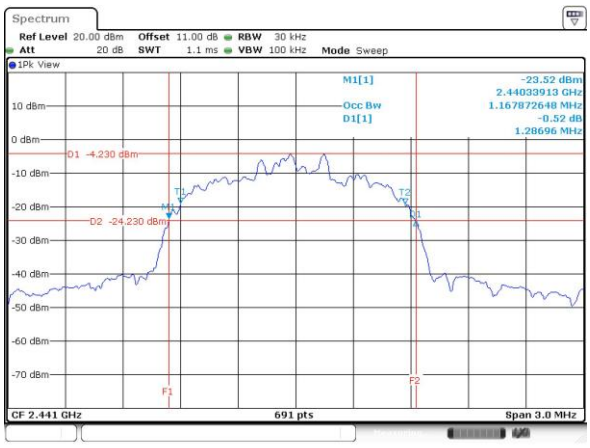
3.2.4 Test Setup

20dB Bandwidth and Carrier Frequency Separation


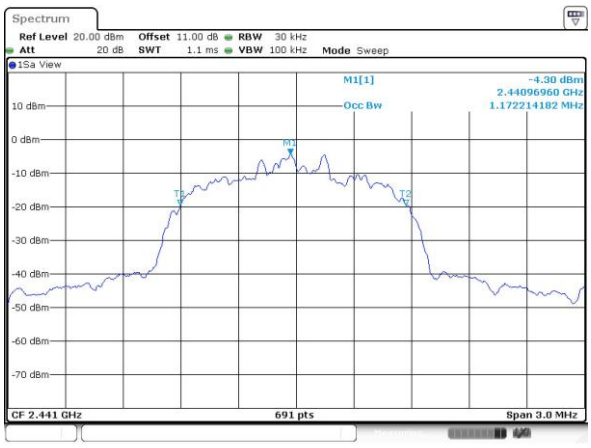
3.2.5 Test Result of 20dB Bandwidth and Carrier Frequency Separation

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	0.9435	0.8857	1.0029	0.629
BR-1Mbps	2441	0.9435	0.8813	1.0029	0.629
BR-1Mbps	2480	0.9435	0.8726	1.0029	0.629
EDR-2Mbps	2402	1.2870	1.1679	1.0029	0.858
EDR-2Mbps	2441	1.2870	1.1635	1.0029	0.858
EDR-2Mbps	2480	1.2696	1.1635	1.0029	0.846
EDR-3Mbps	2402	1.2870	1.1722	1.0029	0.858
EDR-3Mbps	2441	1.2870	1.1722	1.0029	0.858
EDR-3Mbps	2480	1.2870	1.1679	1.0029	0.858
Result		**Complied**			

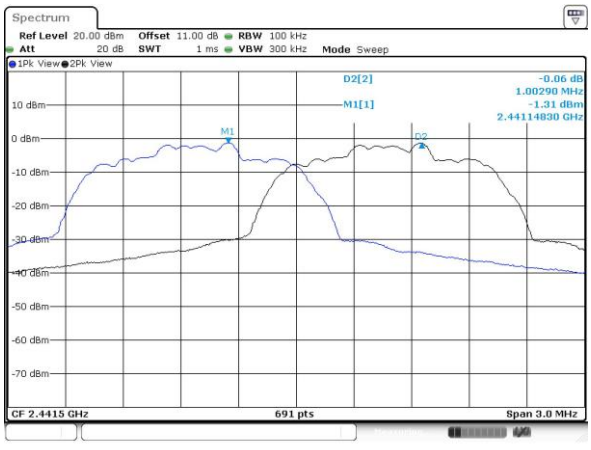
Worst 20dB Bandwidth Plots



Worst OBW 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 ≥ 75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz).
☒	N ≥ 15 and ChS ≥ MAX (20 dB bandwidth x 2/3, 25 kHz).
N: Number of Hopping Frequencies; **ChS**: Hopping Channel Separation	

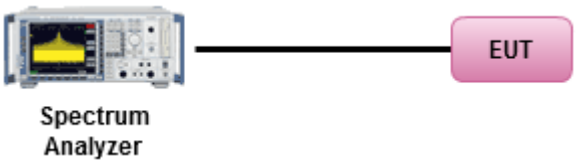
3.3.2 Measuring Instruments

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.

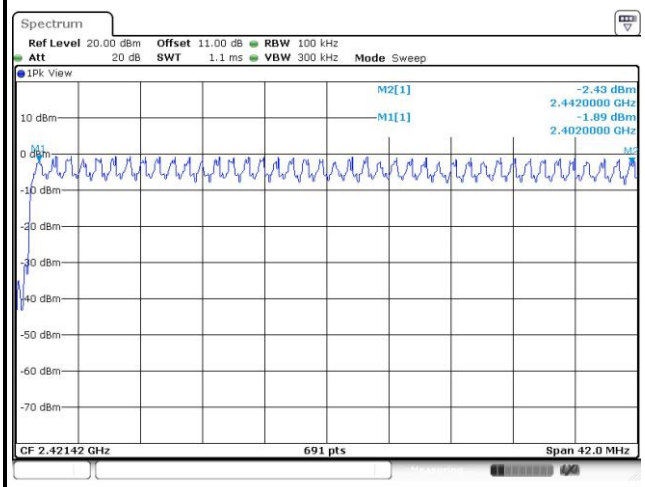
3.3.4 Test Setup

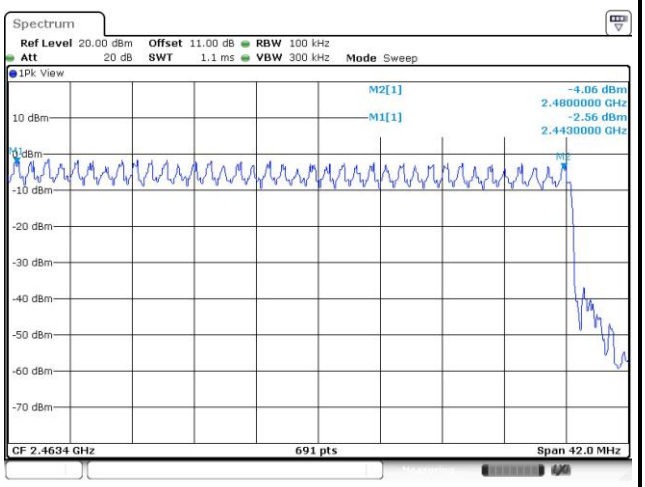
Number of Hopping Frequencies


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**		

EDR-3Mbps





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 x N
N: Number of Hopping Frequencies

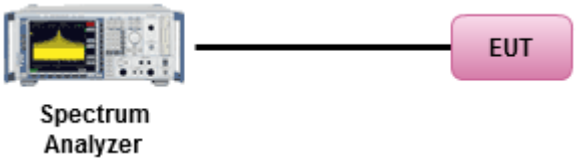
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

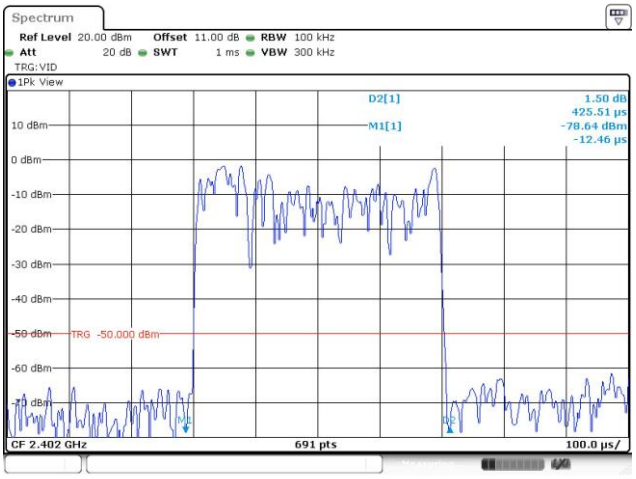
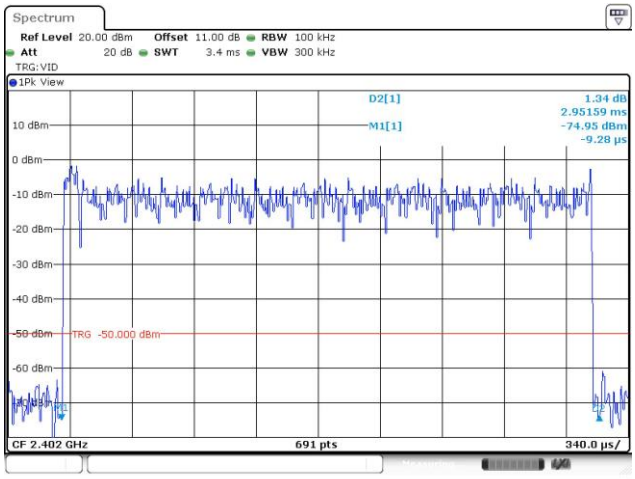
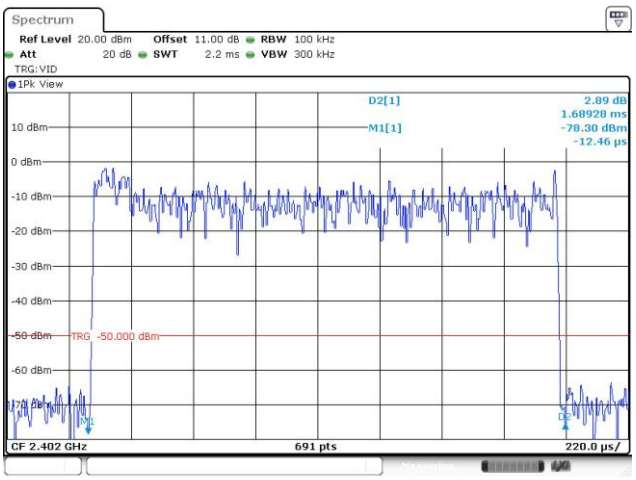
Test Method	
☒	Refer as ANSI C63.10, clause 7.7.4 for dwell time measurement.
☒	Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle.
☒	The DH1 packet can cover a single time slot. A maximum length packet has duration of 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 x 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 TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 5.06 x 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 TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 3.37 x 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

Time of Occupancy (Dwell Time)


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	2.95	106.7	0.315	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.					

8DPSK	
DH1	**DH5**
	
DH3	**--**
	--

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 ≥ 75
☐	If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
☐	If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm
☒	For Hopping Channel: N ≥ 15
☒	If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 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 ≥ 75 - P_{eirp} ≤ 36 dBm (4 W)
☒	For Hopping Channel: 75 > N ≥ 15 - P_{eirp} ≤ 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 for peak power meter.
☐	Refer as ANSI C63.10, clause 6.10.2.1 for spectrum analyzer - (RBW ≥ 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

RF Output Power (Peak Power Meter)


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	0.82	21	2.24	3.06	27
BR-1Mbps	2441	0.26	21	2.24	2.5	27
BR-1Mbps	2480	-1.11	21	2.24	1.13	27
EDR-2Mbps	2402	1.31	21	2.24	3.55	27
EDR-2Mbps	2441	0.75	21	2.24	2.99	27
EDR-2Mbps	2480	-0.6	21	2.24	1.64	27
EDR-3Mbps	2402	**1.82**	21	2.24	4.06	27
EDR-3Mbps	2441	1.32	21	2.24	3.56	27
EDR-3Mbps	2480	-0.84	21	2.24	1.4	27
Result		Complied				

Maximum Average Conducted Output Power Result						
Condition		RF Output Power (dBm)				
Modulation Mode	Freq. (MHz)	Average Power	Duty Factor (dB)	RF Output Power	Antenna Gain (dBi)	EIRP Power
BR-1Mbps	2402	-0.63	1.06	0.43	2.24	2.67
BR-1Mbps	2441	-1.19	1.06	-0.13	2.24	2.11
BR-1Mbps	2480	-2.57	1.06	-1.51	2.24	0.73
EDR-2Mbps	2402	-1.77	1.08	-0.69	2.24	1.55
EDR-2Mbps	2441	-2.33	1.08	-1.25	2.24	0.99
EDR-2Mbps	2480	-3.74	1.08	-2.66	2.24	-0.42
EDR-3Mbps	2402	-1.77	1.08	-0.69	2.24	1.55
EDR-3Mbps	2441	-2.35	1.08	-1.27	2.24	0.97
EDR-3Mbps	2480	-3.77	1.08	-2.69	2.24	-0.45

Note: Average power is for reference only.

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

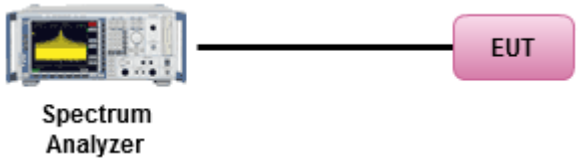
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

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 25GHz
4. Use the peak marker function to determine the maximum amplitude level

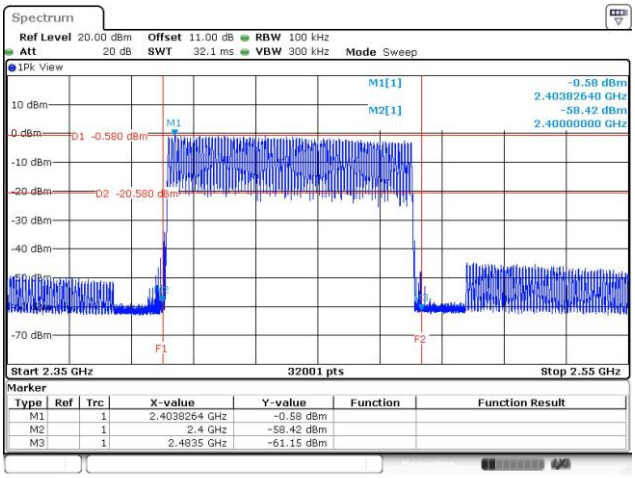
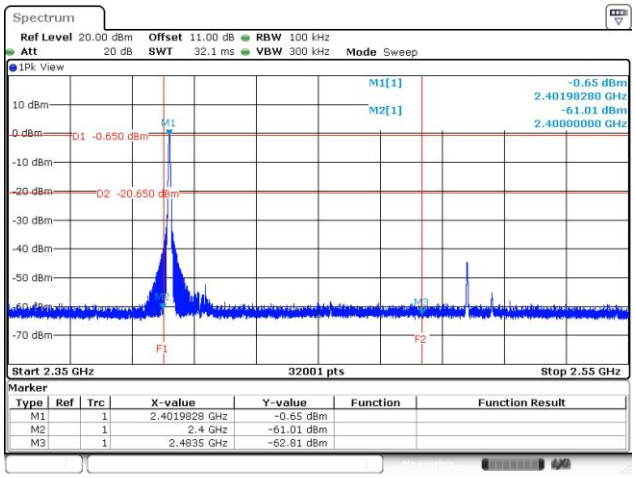
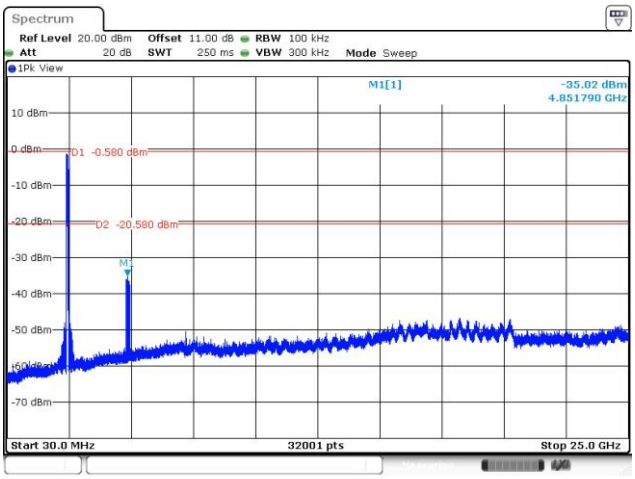
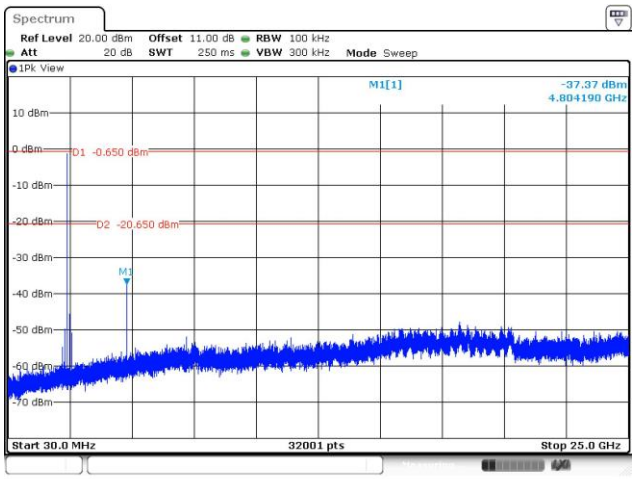
3.6.4 Test Setup

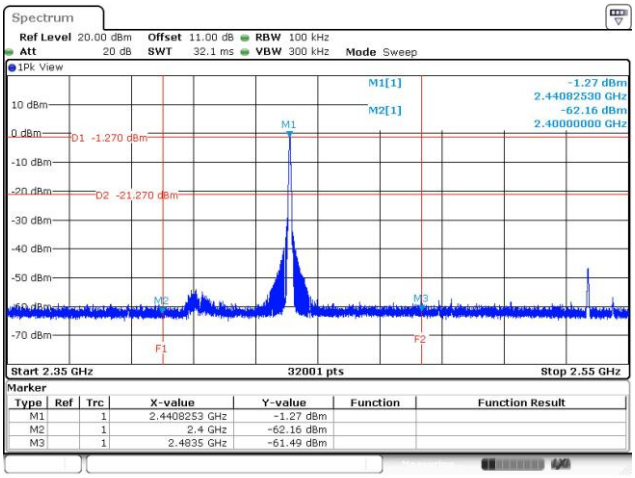
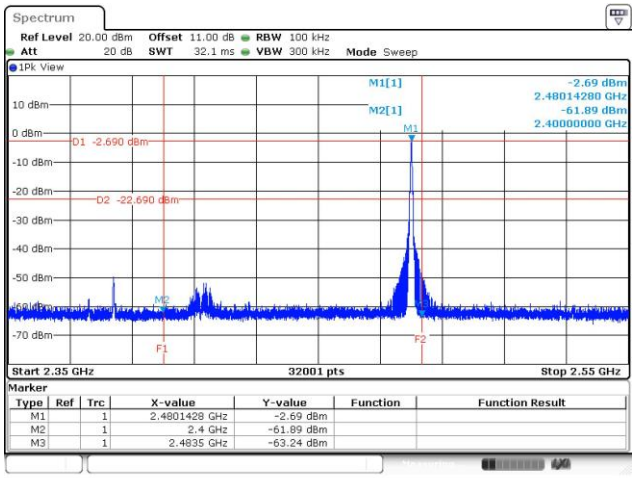
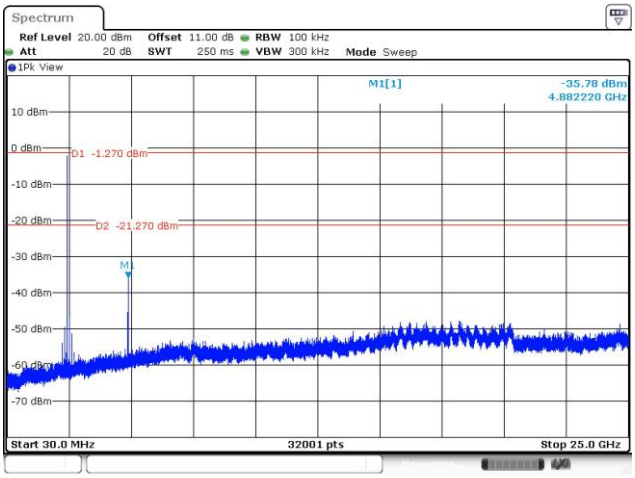
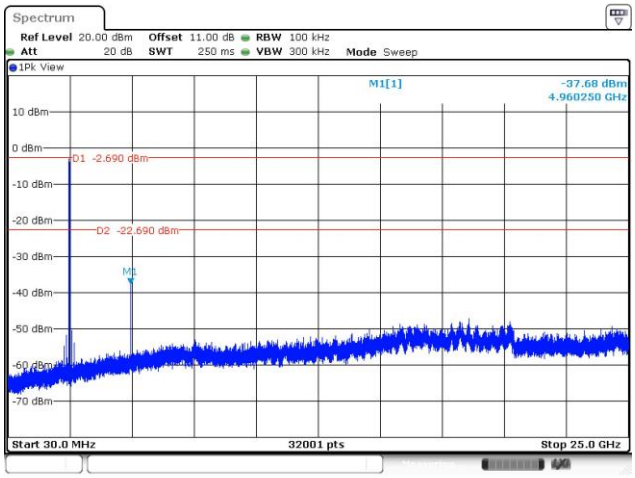
Transmitter Radiated Bandedge Emissions



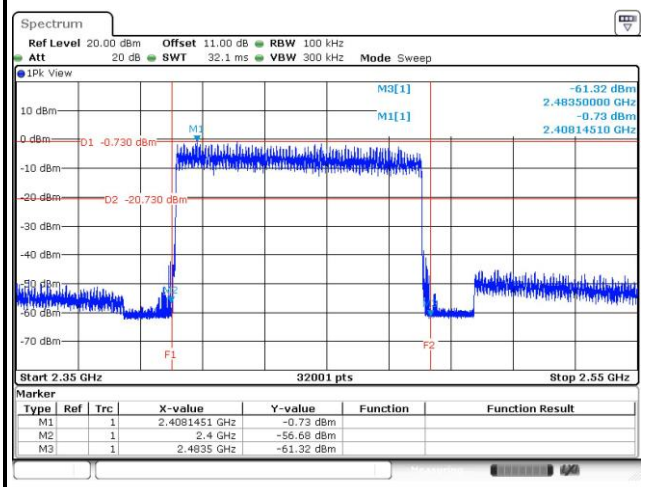
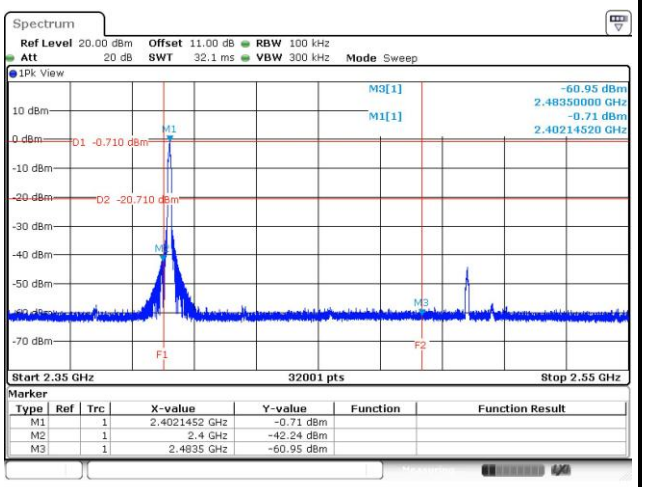
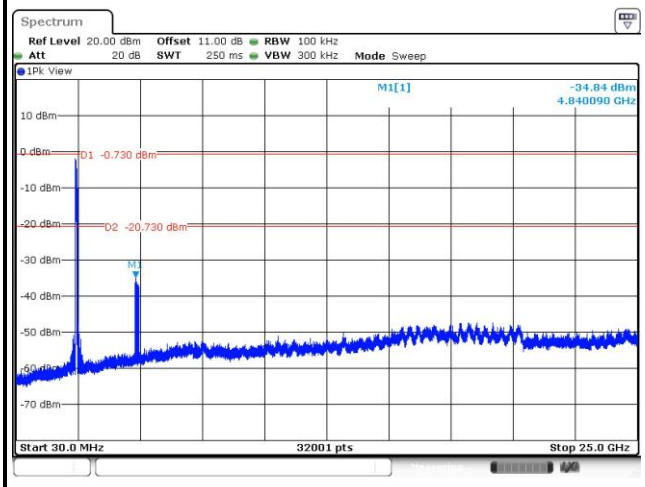
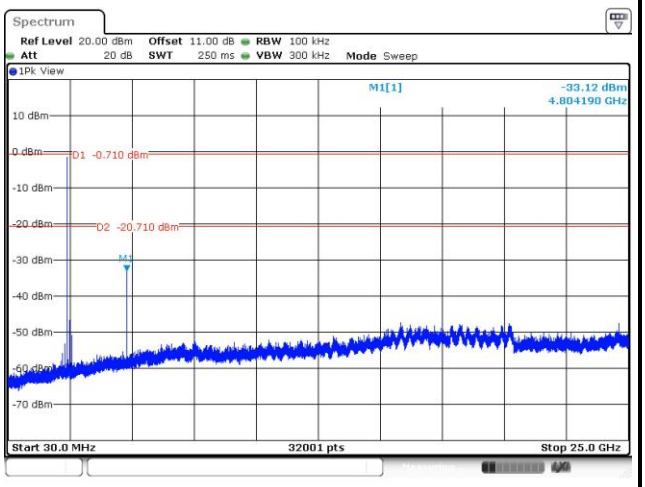
3.6.5 Test Result of Emissions in Non-Restricted Frequency Bands

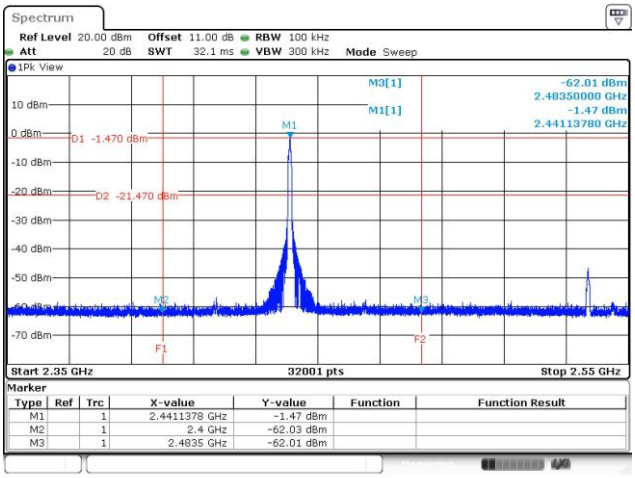
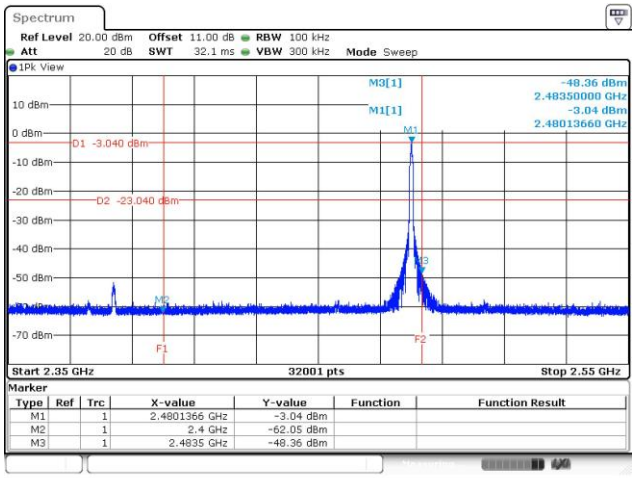
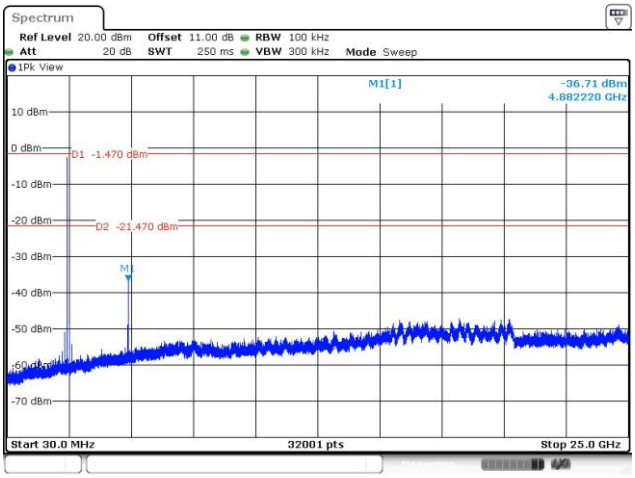
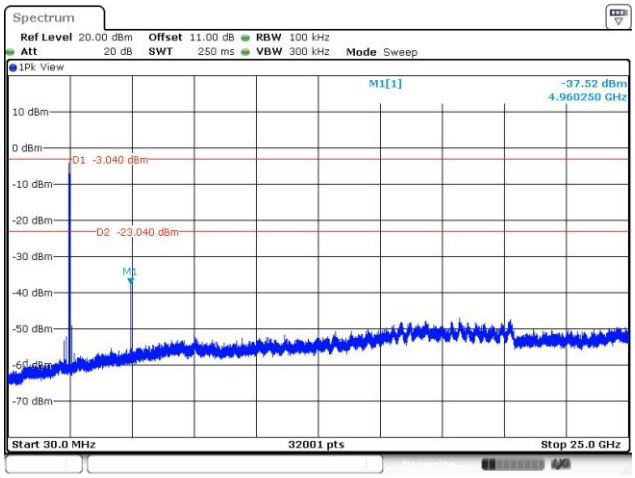
GFSK

Hopping on	Hopping off
30MHz~25GHz (down 20dBc)	TX Freq 2402MHz / 30MHz~25GHz (down 20dBc)
	
	

Hopping off	Hopping off
TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)	TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)
	
	

8DPSK

Hopping on	Hopping off
30MHz~25GHz (down 20dBc)	TX Freq 2402MHz / 30MHz~25GHz (down 20dBc)
	
	

Hopping off	Hopping off
TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)	TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)
	
	

3.7 Transmitter 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.

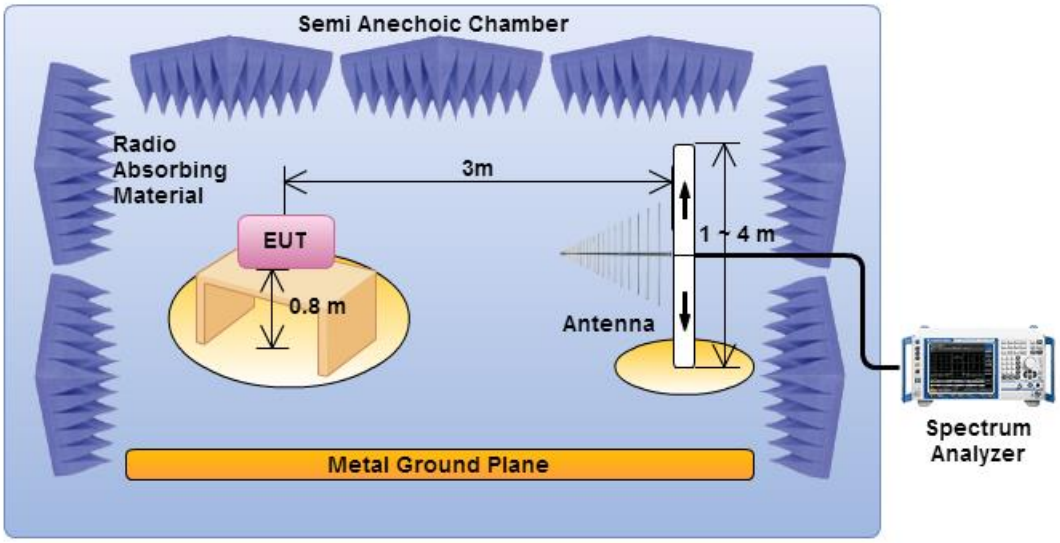
3.7.3 Test Procedures

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 20log (dwell time/100 ms)
	☒	For unwanted emissions into non-restricted bands. 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.
	☒	For unwanted emissions into restricted bands.
		☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☒ 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.
☒	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 6.6 for radiated emissions from above 1 GHz.

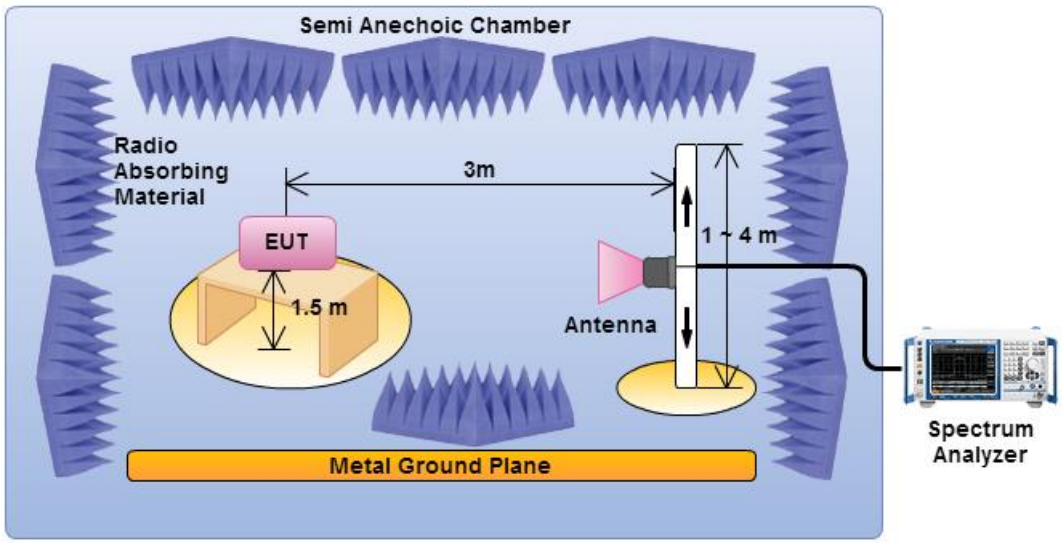
3.7.4 Test Setup

Transmitter Radiated Unwanted Emissions

Below 1GHz test:



Above 1GHz test:



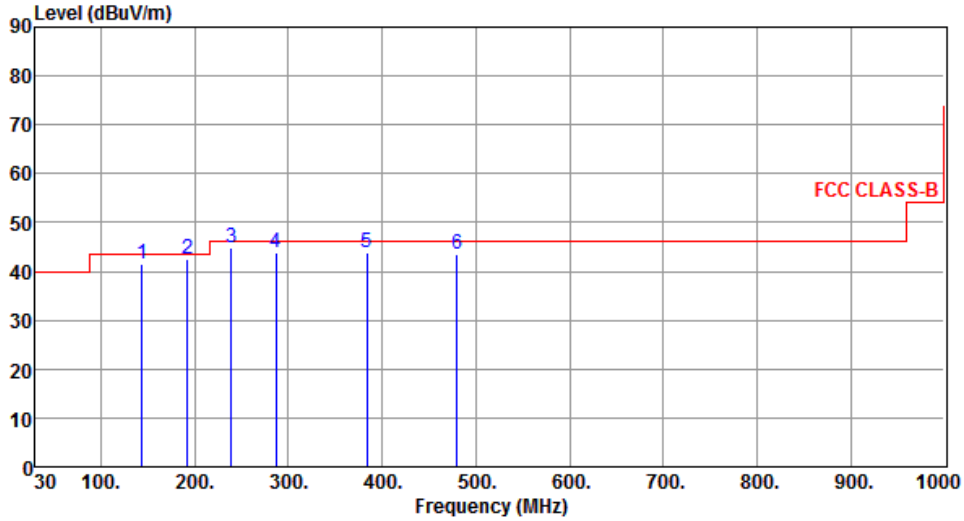
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

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)

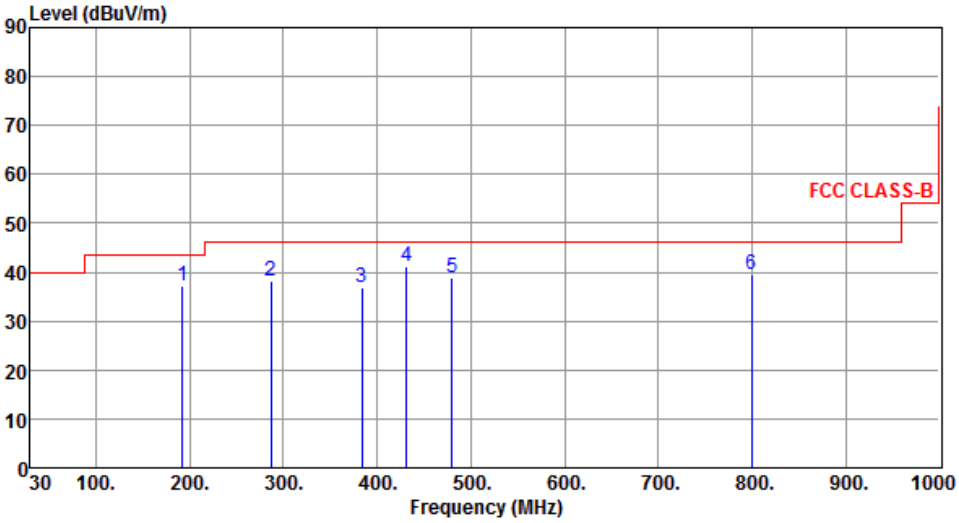
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2402
Polarization	H		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	143.49	41.48	43.50	-2.02	58.67	-17.19	Peak	---	---
2	191.99	42.46	43.50	-1.04	61.80	-19.34	QP	---	---
3	239.52	44.74	46.00	-1.26	62.75	-18.01	QP	---	---
4	287.05	43.98	46.00	-2.02	60.38	-16.40	Peak	---	---
5	384.05	43.76	46.00	-2.24	57.67	-13.91	Peak	---	---
6	480.08	43.66	46.00	-2.34	55.51	-11.85	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	EDR-3Mbps	**Test Freq. (MHz)**	2402
Polarization	V		

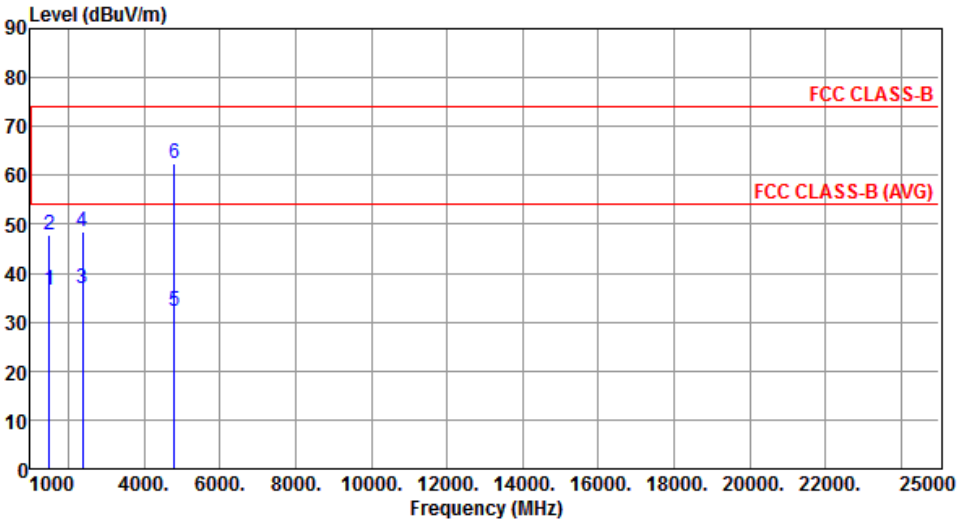


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	191.99	37.11	43.50	-6.39	56.45	-19.34	Peak	---	---
2	287.05	38.20	46.00	-7.80	54.60	-16.40	Peak	---	---
3	384.05	36.71	46.00	-9.29	50.62	-13.91	Peak	---	---
4	431.58	41.12	46.00	-4.88	53.89	-12.77	Peak	---	---
5	480.08	38.75	46.00	-7.25	50.60	-11.85	Peak	---	---
6	799.21	39.61	46.00	-6.39	46.30	-6.69	Peak	---	---

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

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

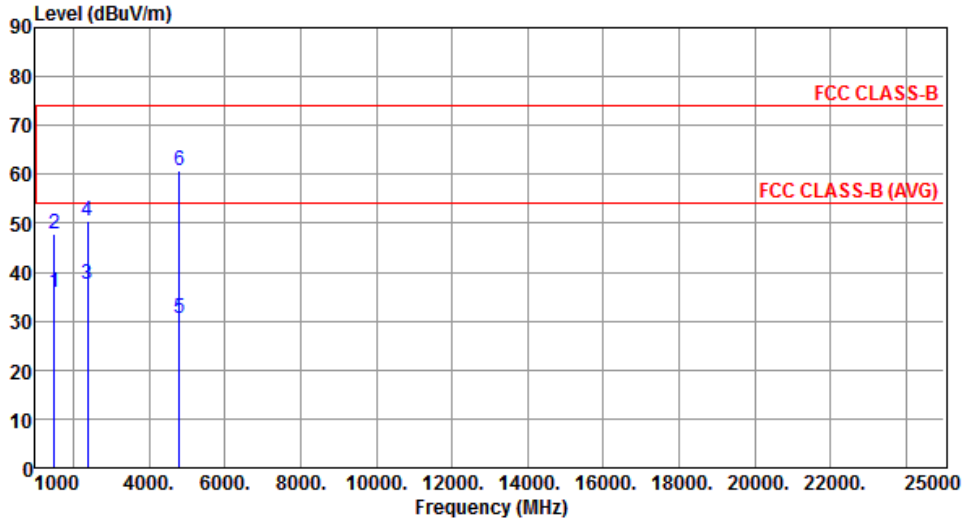
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2402
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	36.65	54.00	-17.35	42.22	-5.57	Average	---	---
2	1500.00	47.74	74.00	-26.26	53.31	-5.57	Peak	---	---
3	2390.00	36.92	54.00	-17.08	39.57	-2.65	Average	---	---
4	2390.00	48.39	74.00	-25.61	51.04	-2.65	Peak	---	---
5	4804.00	32.21	54.00	-21.79	27.28	4.93	Average	---	---
6	4804.00	62.31	74.00	-11.69	57.38	4.93	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

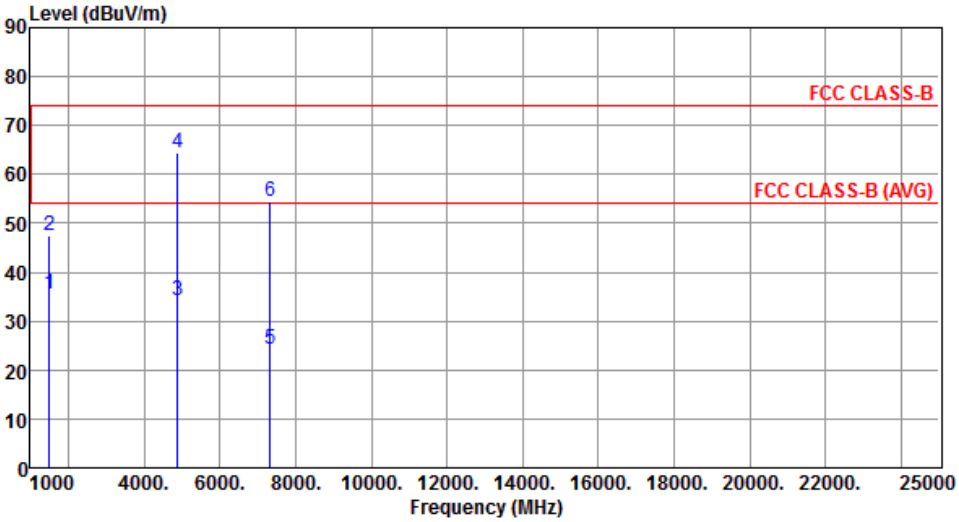
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2402
Operating Function	Transmit	**Polarization**	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.85	54.00	-18.15	41.42	-5.57	Average	---	---
2	1500.00	47.81	74.00	-26.19	53.38	-5.57	Peak	---	---
3	2390.00	37.67	54.00	-16.33	40.32	-2.65	Average	---	---
4	2390.00	50.51	74.00	-23.49	53.16	-2.65	Peak	---	---
5	4804.00	30.52	54.00	-23.48	25.59	4.93	Average	---	---
6	4804.00	60.62	74.00	-13.38	55.69	4.93	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

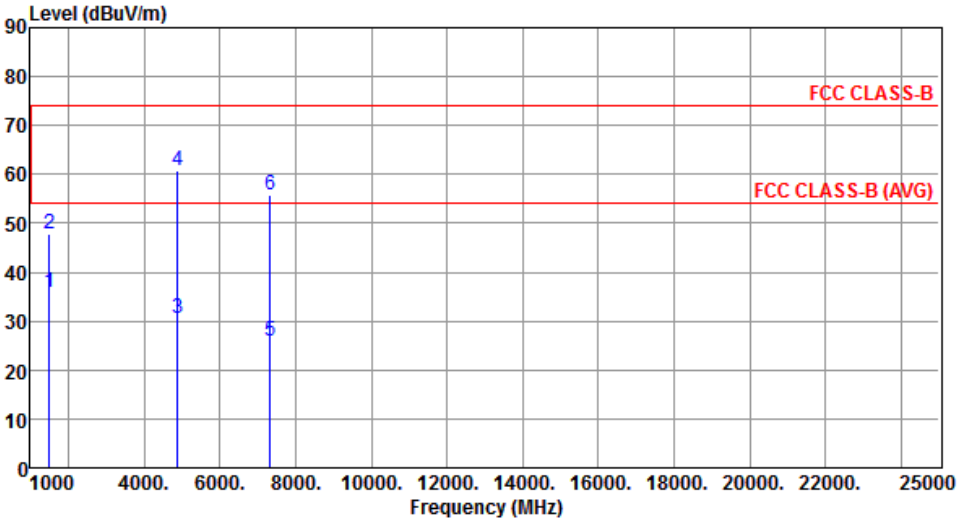
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2441
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.46	54.00	-18.54	41.03	-5.57	Average	---	---
2	1500.00	47.43	74.00	-26.57	53.00	-5.57	Peak	---	---
3	4882.00	34.22	54.00	-19.78	29.11	5.11	Average	---	---
4	4882.00	64.32	74.00	-9.68	59.21	5.11	Peak	---	---
5	7323.00	24.38	54.00	-29.62	14.24	10.14	Average	---	---
6	7323.00	54.48	74.00	-19.52	44.34	10.14	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

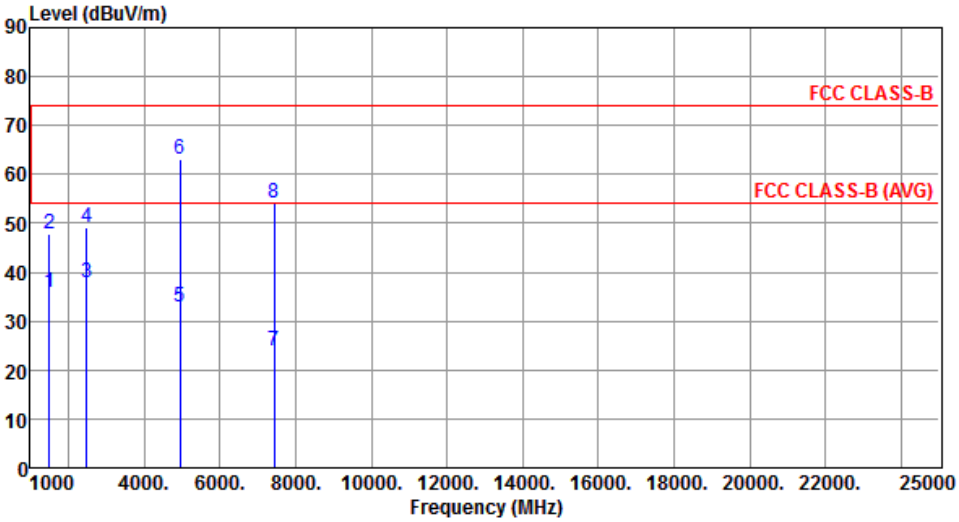
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2441
Operating Function	Transmit	**Polarization**	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.76	54.00	-18.24	41.33	-5.57	Average	---	---
2	1500.00	47.91	74.00	-26.09	53.48	-5.57	Peak	---	---
3	4882.00	30.58	54.00	-23.42	25.47	5.11	Average	---	---
4	4882.00	60.68	74.00	-13.32	55.57	5.11	Peak	---	---
5	7323.00	25.74	54.00	-28.26	15.60	10.14	Average	---	---
6	7323.00	55.84	74.00	-18.16	45.70	10.14	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

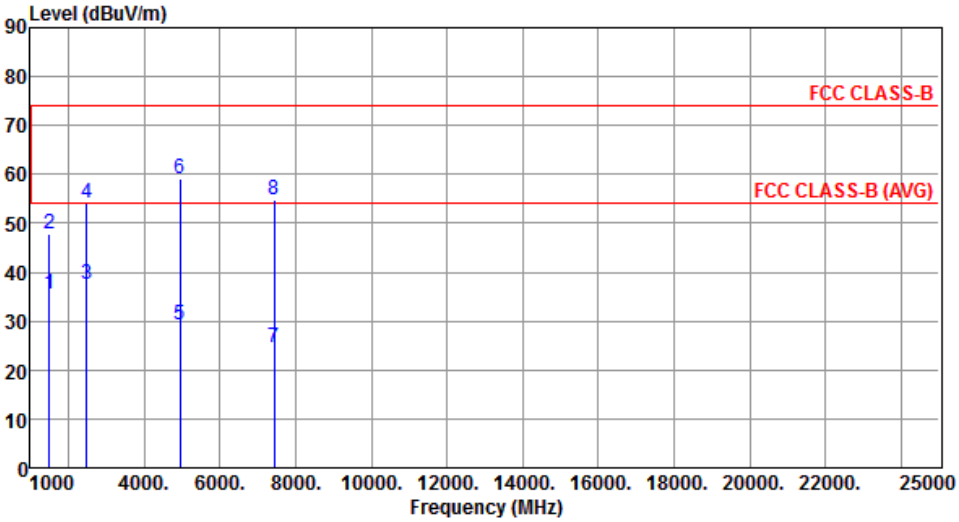
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2480
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.86	54.00	-18.14	41.43	-5.57	Average	---	---
2	1500.00	47.81	74.00	-26.19	53.38	-5.57	Peak	---	---
3	2483.50	37.87	54.00	-16.13	40.21	-2.34	Average	---	---
4	2483.50	49.14	74.00	-24.86	51.48	-2.34	Peak	---	---
5	4960.00	32.92	54.00	-21.08	27.64	5.28	Average	---	---
6	4960.00	63.02	74.00	-10.98	57.74	5.28	Peak	---	---
7	7440.00	24.03	54.00	-29.97	13.62	10.41	Average	---	---
8	7440.00	54.13	74.00	-19.87	43.72	10.41	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	BR-1Mbps	**Test Freq. (MHz)**	2480
Operating Function	Transmit	**Polarization**	V

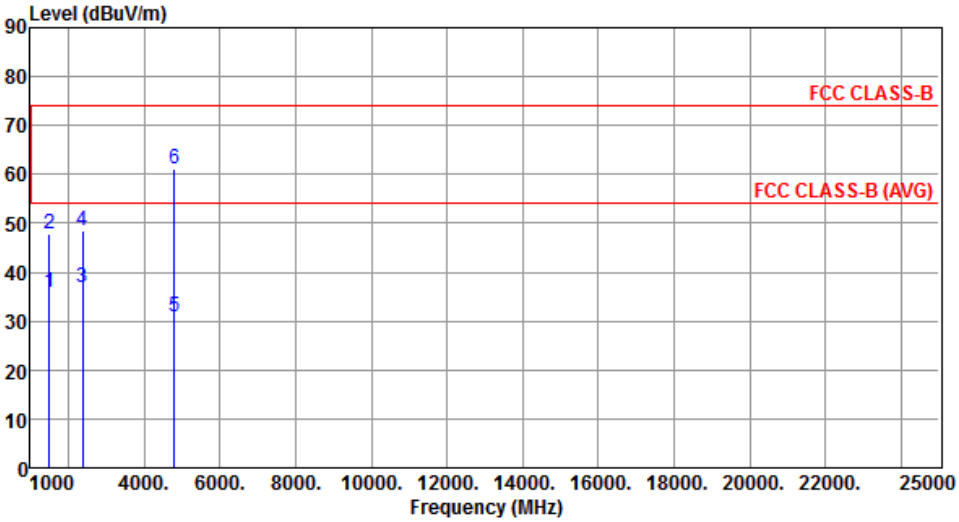


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.59	54.00	-18.41	41.16	-5.57	Average	---	---
2	1500.00	47.68	74.00	-26.32	53.25	-5.57	Peak	---	---
3	2483.50	37.38	54.00	-16.62	39.72	-2.34	Average	---	---
4	2483.50	54.15	74.00	-19.85	56.49	-2.34	Peak	---	---
5	4960.00	29.18	54.00	-24.82	23.90	5.28	Average	---	---
6	4960.00	59.28	74.00	-14.72	54.00	5.28	Peak	---	---
7	7440.00	24.63	54.00	-29.37	14.22	10.41	Average	---	---
8	7440.00	54.73	74.00	-19.27	44.32	10.41	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

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

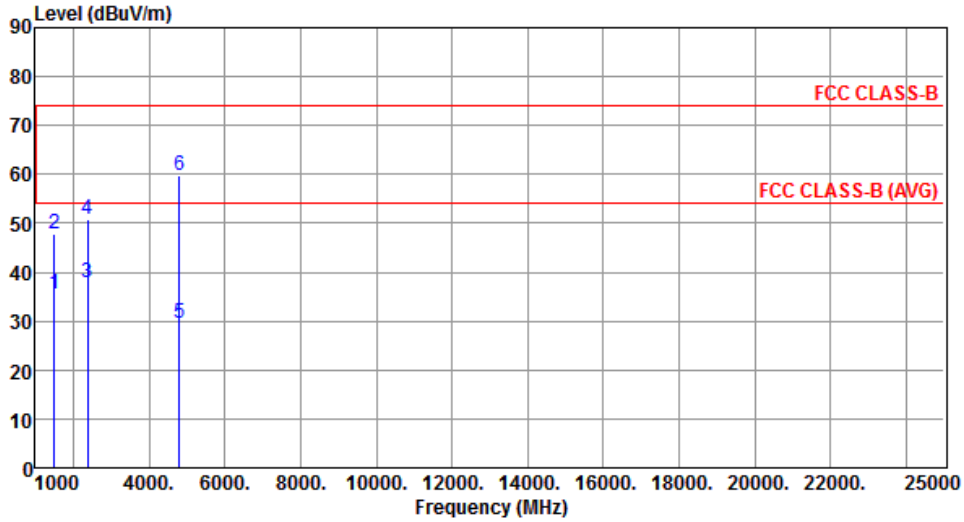
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2402
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.76	54.00	-18.24	41.33	-5.57	Average	---	---
2	1500.00	47.67	74.00	-26.33	53.24	-5.57	Peak	---	---
3	2390.00	36.97	54.00	-17.03	39.62	-2.65	Average	---	---
4	2390.00	48.57	74.00	-25.43	51.22	-2.65	Peak	---	---
5	4804.00	31.04	54.00	-22.96	26.11	4.93	Average	---	---
6	4804.00	61.14	74.00	-12.86	56.21	4.93	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

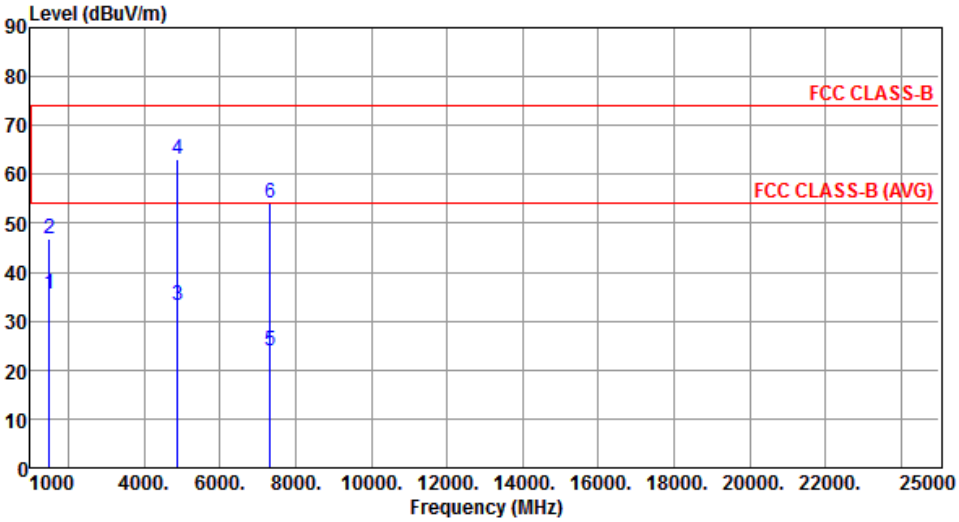
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2402
Operating Function	Transmit	**Polarization**	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.39	54.00	-18.61	40.96	-5.57	Average	---	---
2	1500.00	47.69	74.00	-26.31	53.26	-5.57	Peak	---	---
3	2390.00	37.88	54.00	-16.12	40.53	-2.65	Average	---	---
4	2390.00	50.72	74.00	-23.28	53.37	-2.65	Peak	---	---
5	4804.00	29.59	54.00	-24.41	24.66	4.93	Average	---	---
6	4804.00	59.69	74.00	-14.31	54.76	4.93	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

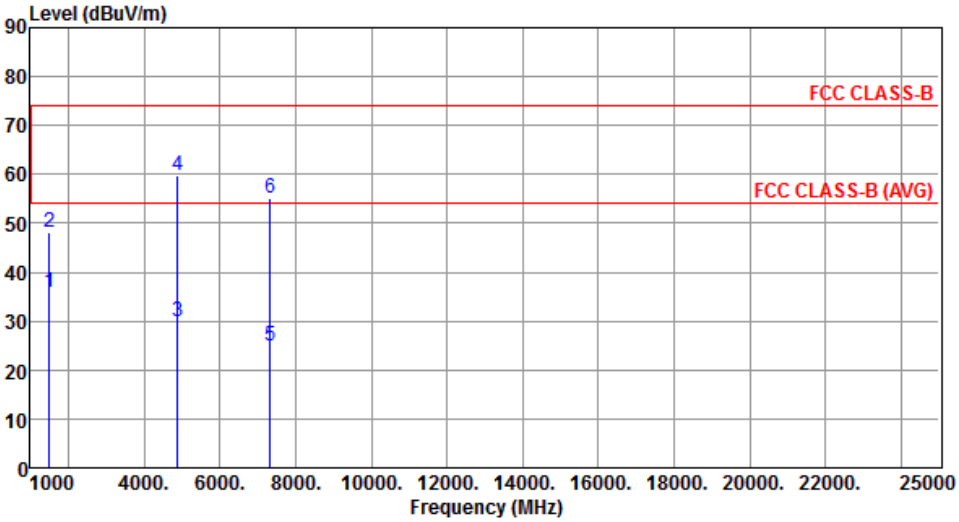
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2441
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.65	54.00	-18.35	41.22	-5.57	Average	---	---
2	1500.00	46.91	74.00	-27.09	52.48	-5.57	Peak	---	---
3	4882.00	33.12	54.00	-20.88	28.01	5.11	Average	---	---
4	4882.00	63.22	74.00	-10.78	58.11	5.11	Peak	---	---
5	7323.00	24.06	54.00	-29.94	13.92	10.14	Average	---	---
6	7323.00	54.16	74.00	-19.84	44.02	10.14	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

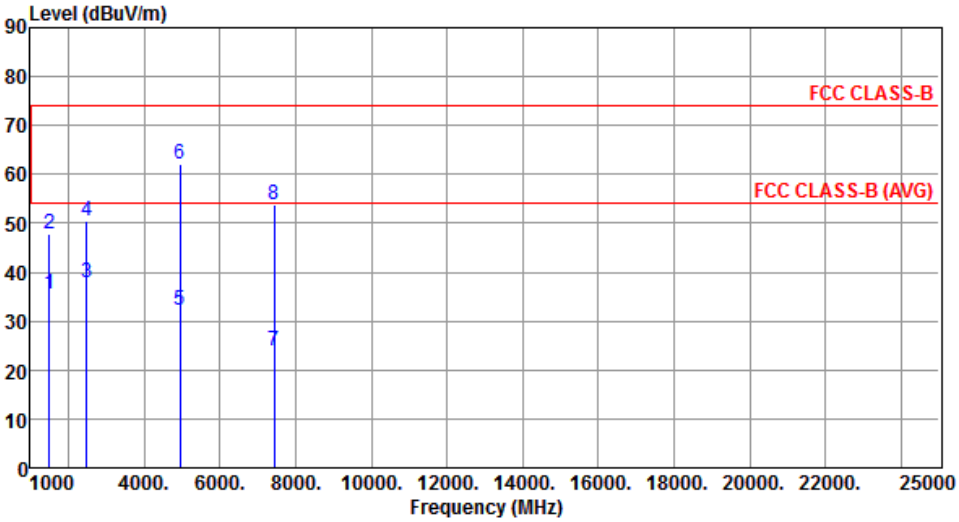
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2441
Operating Function	Transmit	**Polarization**	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.81	54.00	-18.19	41.38	-5.57	Average	---	---
2	1500.00	48.05	74.00	-25.95	53.62	-5.57	Peak	---	---
3	4882.00	29.76	54.00	-24.24	24.65	5.11	Average	---	---
4	4882.00	59.86	74.00	-14.14	54.75	5.11	Peak	---	---
5	7323.00	24.87	54.00	-29.13	14.73	10.14	Average	---	---
6	7323.00	54.97	74.00	-19.03	44.83	10.14	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

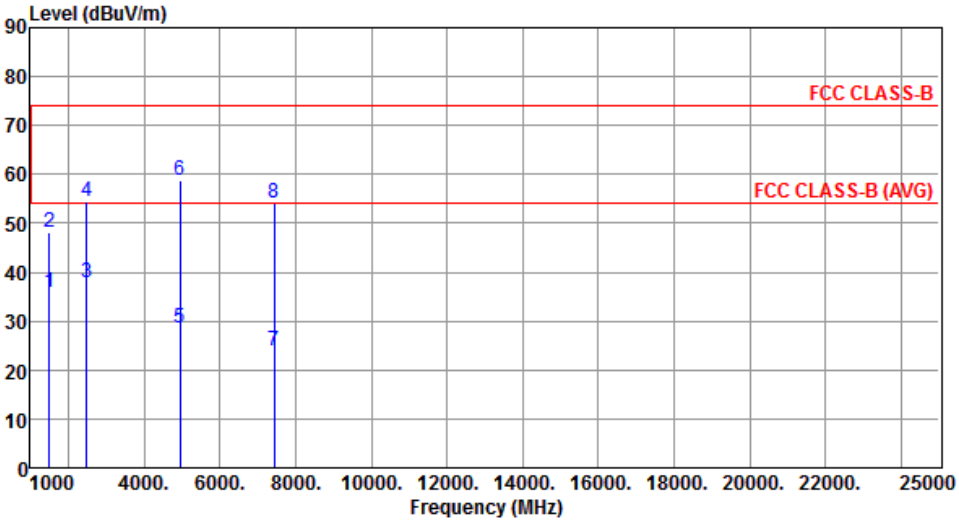
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	EDR-3Mbps	**Test Freq. (MHz)**	2480
Operating Function	Transmit	**Polarization**	H



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	35.60	54.00	-18.40	41.17	-5.57	Average	---	---
2	1500.00	47.95	74.00	-26.05	53.52	-5.57	Peak	---	---
3	2483.50	38.01	54.00	-15.99	40.35	-2.34	Average	---	---
4	2483.50	50.34	74.00	-23.66	52.68	-2.34	Peak	---	---
5	4960.00	32.11	54.00	-21.89	26.83	5.28	Average	---	---
6	4960.00	62.21	74.00	-11.79	56.93	5.28	Peak	---	---
7	7440.00	23.79	54.00	-30.21	13.38	10.41	Average	---	---
8	7440.00	53.89	74.00	-20.11	43.48	10.41	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

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	1500.00	35.84	54.00	-18.16	41.41	-5.57	Average	---	---
2	1500.00	48.05	74.00	-25.95	53.62	-5.57	Peak	---	---
3	2483.50	37.87	54.00	-16.13	40.21	-2.34	Average	---	---
4	2483.50	54.51	74.00	-19.49	56.85	-2.34	Peak	---	---
5	4960.00	28.71	54.00	-25.29	23.43	5.28	Average	---	---
6	4960.00	58.81	74.00	-15.19	53.53	5.28	Peak	---	---
7	7440.00	23.97	54.00	-30.03	13.56	10.41	Average	---	---
8	7440.00	54.07	74.00	-19.93	43.66	10.41	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 ≥ 1/T, where T is “Pulse On Time”, e.g., DH5 VBW≥1/3.125ms, VBW=1kHz.

4 Test Equipment and Calibration Data

Test Item	RF Conducted				
Test Site	(TH01-HY)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Feb. 03, 2015	Feb. 02, 2016
Power Meter	Anritsu	ML2495A	1124009	Jan. 29, 2015	Jan. 28, 2016
Power Sensor	Anritsu	MA2411B	1027452	Jan. 29, 2015	Jan. 28, 2016
Bluetooth Tester	ROHDE&SCHWARZ	CBT	100959	Mar. 03, 2015	Mar. 02, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101499	Dec. 31, 2014	Dec. 30, 2015
Receiver	R&S	ESR3	101657	Jan. 15, 2015	Jan. 14, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-524	Oct. 16, 2014	Oct. 15, 2015
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Oct. 14, 2014	Oct. 13, 2015
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 10, 2014	Nov. 09, 2015
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 10, 2014	Nov. 09, 2015
Preamplifier	Burgeon	BPA-530	100218	Nov. 10, 2014	Nov. 09, 2015
Preamplifier	Agilent	83017A	MY39501309	Sep. 29, 2014	Sep. 28, 2015
Preamplifier	EMC	EMC184045B	980192	Aug. 26, 2014	Aug. 25, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 16, 2014	Dec. 15, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 16, 2014	Dec. 15, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 16, 2014	Dec. 15, 2015
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-003	Dec. 16, 2014	Dec. 15, 2015
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-004	Dec. 16, 2014	Dec. 15, 2015
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

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	100169	Oct. 17, 2014	Oct. 16, 2015
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 17, 2014	Nov. 16, 2015
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 31, 2014	Dec. 30, 2015
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					