FCC Test Report

Equipment	:	Mobile Phone
Brand Name	:	Xi
Model No.	:	F-06E
FCC ID	:	VQK-F06E
Standard	:	47 CFR FCC Part 15.247
Operating Band	:	2400 MHz – 2483.5 MHz
FCC Classification	:	DSS
Applicant Manufacturer	:	FUJITSU LIMITED 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan

The product sample received on Mar. 10, 2013 and completely tested on Mar. 29, 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: Wayne Hsu

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]:1.230MHz 34.01 (Margin 11.99dB) - AV 38.69 (Margin 17.31dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	20dB Bandwidth	1.237 MHz	N/A	Complied
3.2	15.247(a)	Carrier Frequency Separation (ChS)	1 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)	0.314 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] 8.91	Power [dBm] 21	Complied
3.6	15.247(c)	Transmitter Radiated Bandedge Emissions	Restricted Bands [dBuV/m at 3m]:2483.5MHz 51.14 (Margin 22.86dB) - PK 30.80 (Margin 23.20dB) - AV	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]:30.24MHz 25.11 (Margin 14.89dB) - PK	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

Revision History

Report No.	Version	Description	Issued Date
FR322231AD	Rev. 01	Initial issue of report	Apr. 02, 2013

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)**	**Co-location**
2400-2483.5	BR / EDR	2402-2480	0-78 [79]	8.91	YES
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. 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	
☒	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**	**Brand**	**Model**	**Gain (dBi)**
1	Integral	λ /4 Monopole	-	-	-8.5

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
IMEI No.	355250050011164 / 355250050008145
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)**
☐ 100% - normally hopping - DH5	0
☒ 78.38% - test mode single channel - DH5	1.06
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

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**	**Spec.**
1	Cradle	Fujitsu limited	CA50601-1791	5.0Vdc, 1.5A
2	Battery	Fujitsu limited	CA54310-0046	3.8V, 3,020mA Li-ion

Support Equipment AC Line Conducted Emission Radiated Below / Above 1GHz Test				
No.	**Equipment**	**Brand Name**	**Model Name**	**Spec.**
1	AC Adapter (provided by client)	NTT docomo	AC Adaptor 04	I/P:100-240Vac, 50~60Hz O/P:5Vdc, 1800mA Power cord: 1m non-shielded cable w/ 2 cores.
2	Earphone	Apple	MD827FE/A	-

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

1.4 Testing Location Information

Testing Location					
☒	HWA YA	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	
☐	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL : 886-3-656-9065		FAX : 886-3-656-9085	

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Ian Lee	24.3°C / 65%	10-Mar-13 ~ 11-Mar-13
AC Conduction	CO04-HY	Ian Lee	23°C / 51%	29-Mar-13
Radiated Emission	03CH05-HY	Daniel Hsu	22.3°C / 62%	11-Mar-13

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
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A
	1 – 18 GHz	±0.67 dB	N/A
	18 – 40 GHz	±0.83 dB	N/A
	40 – 200 GHz	N/A	N/A
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	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	8.01	EDR-3Mbps
EDR	1	2 Mbps	EDR-2Mbps	8.56	
EDR	1	3 Mbps	EDR-3Mbps	8.91	
Note 1: Bluetooth BR uses a combination of GFSK (1Mbps). Note 2: Bluetooth EDR uses a combination of π/4-DQPSK (2Mbps) and 8DPSK (3Mbps). Note 3: Modulation modes consist below configuration: FHSS BR-1Mbps: GFSK (1Mbps), EDR-2Mbps: π/4-DQPSK (2Mbps), EDR-3Mbps: 8DPSK(3Mbps) Note 4: RF output power specifies that Maximum Peak Conducted Output Power.					

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	QRCT v3.0.7.0		
Modulation Mode	**2402 MHz**	**2440 MHz**	**2480 MHz**
BR,1Mbps	9	9	9
EDR,2Mbps	9	9	9
EDR,3Mbps	9	9	9

2.4 The Worst Case Measurement Configuration

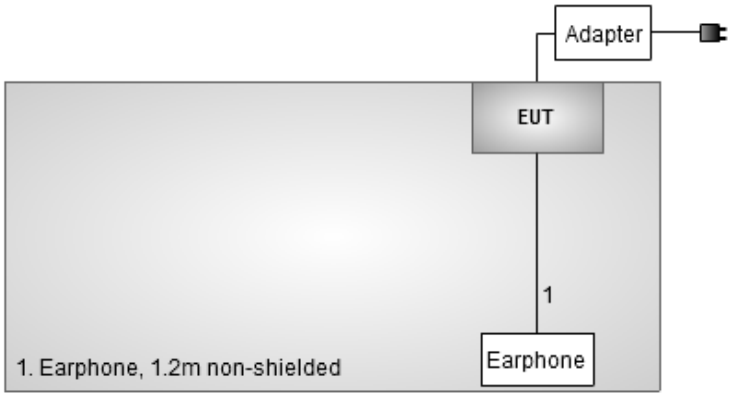
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	AC power & Radio link (BT)
2	AC power with cradle & Radio link (BT)
For operating mode 1 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, 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	BR-1Mbps, EDR-3Mbps

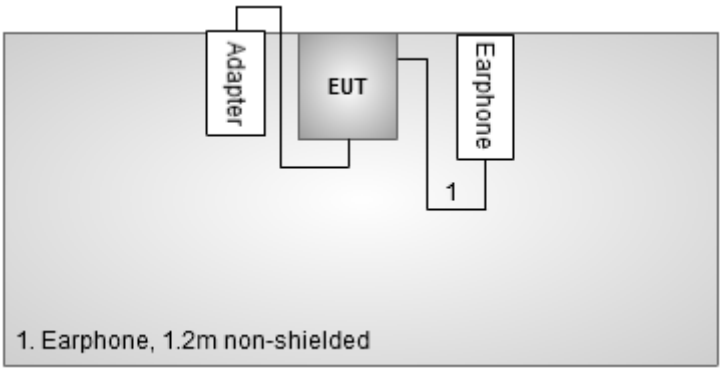
The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. The worst planes is 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 X.		
Operating Mode < 1GHz	☒ 1. AC Power & Radio link (BT)		
	☒ 2. AC power with cradle & Radio link (BT)		
Modulation Mode	BR-1Mbps, EDR-3Mbps		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
For operating mode 1 is the worst case and it was record in this test report.			

2.5 Test Setup Diagram

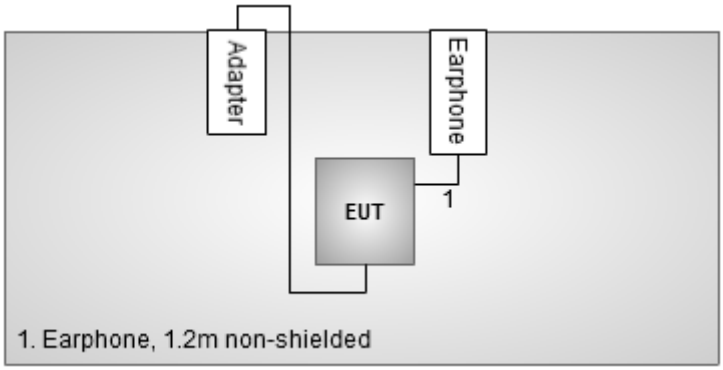
Test Setup Diagram – AC Line Conducted Emission Test	
Operating Mode 1	AC power & Radio link (BT)



Test Setup Diagram - Radiated below 1GHz Test	
Operating Mode 1	AC Power & Radio link (BT)



Test Setup Diagram - Radiated above 1GHz Test	
Operating Mode 1	AC Power & Radio link (BT)



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

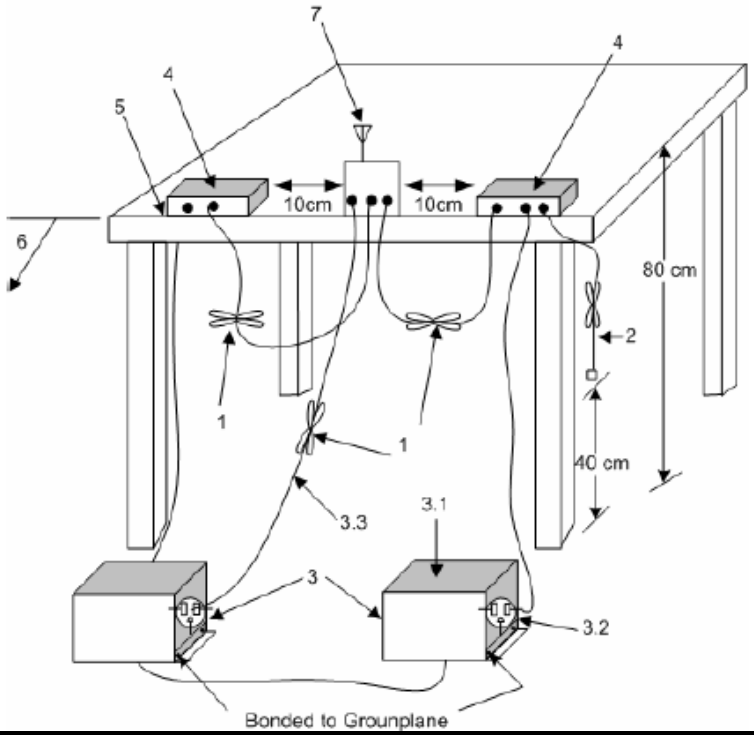
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

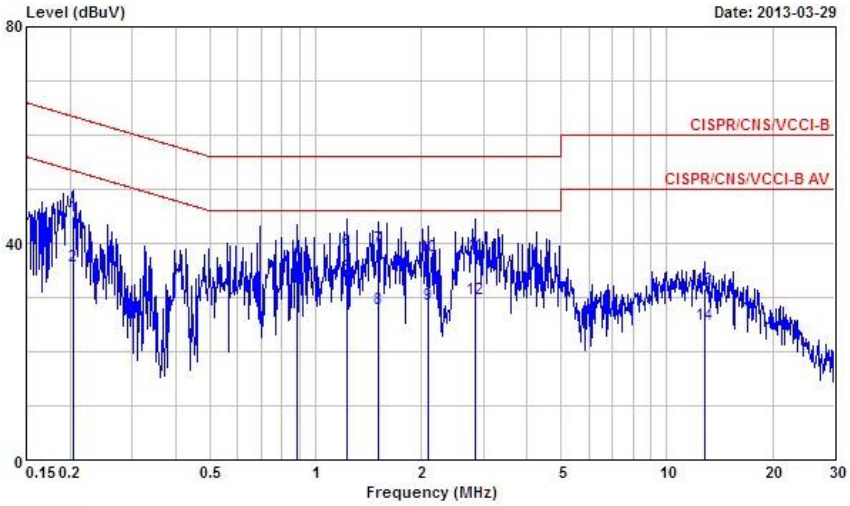
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

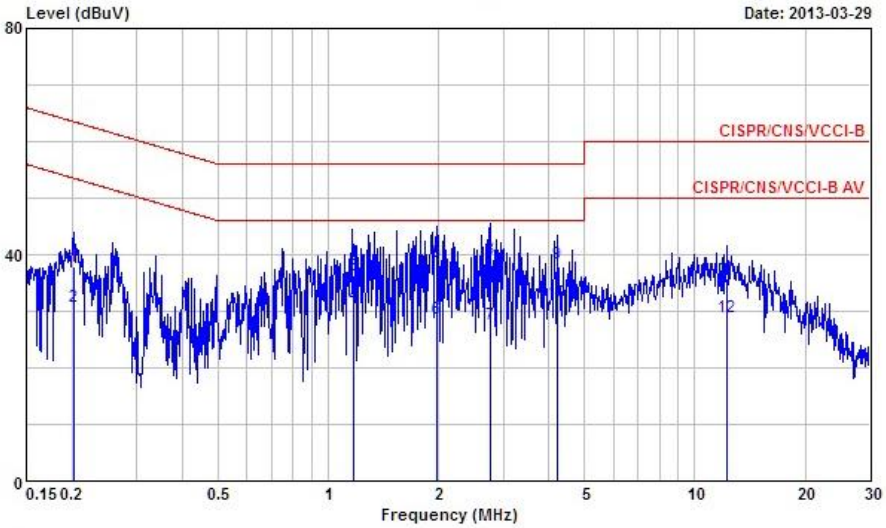
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	AC power & Radio link (BT)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2039630	45.00	-18.45	63.45	44.59	0.11	0.30	QP
2	0.2039630	35.89	-17.56	53.45	35.48	0.11	0.30	Average
3	@0.8849860	31.91	-14.09	46.00	31.49	0.11	0.31	Average
4	0.8849860	36.78	-19.22	56.00	36.36	0.11	0.31	QP
5	@ 1.230	34.01	-11.99	46.00	33.56	0.12	0.33	Average
6	1.230	38.69	-17.31	56.00	38.24	0.12	0.33	QP
7	1.510	39.26	-16.74	56.00	38.78	0.12	0.36	QP
8	1.510	27.80	-18.20	46.00	27.32	0.12	0.36	Average
9	2.090	28.75	-17.25	46.00	28.23	0.13	0.39	Average
10	2.090	37.74	-18.26	56.00	37.22	0.13	0.39	QP
11	2.850	37.98	-18.02	56.00	37.49	0.14	0.35	QP
12	2.850	29.84	-16.16	46.00	29.35	0.14	0.35	Average
13	12.850	31.56	-28.44	60.00	30.94	0.26	0.36	QP
14	12.850	24.94	-25.06	50.00	24.32	0.26	0.36	Average

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	AC power & Radio link (BT)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2028850	38.01	-25.48	63.49	37.48	0.23	0.30	QP
2	0.2028850	30.82	-22.67	53.49	30.29	0.23	0.30	Average
3	1.170	36.44	-19.56	56.00	35.89	0.23	0.32	QP
4	1.170	31.02	-14.98	46.00	30.47	0.23	0.32	Average
5	1.980	38.56	-17.44	56.00	37.91	0.25	0.40	QP
6	1.980	28.77	-17.23	46.00	28.12	0.25	0.40	Average
7	2.760	27.50	-18.50	46.00	26.88	0.27	0.35	Average
8	2.760	39.28	-16.72	56.00	38.66	0.27	0.35	QP
9	4.200	38.44	-17.56	56.00	37.84	0.30	0.30	QP
10	4.200	31.50	-14.50	46.00	30.90	0.30	0.30	Average
11	12.190	35.84	-24.16	60.00	35.03	0.46	0.35	QP
12	12.190	29.03	-20.97	50.00	28.22	0.46	0.35	Average

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

3.2 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 ≥ 79 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	

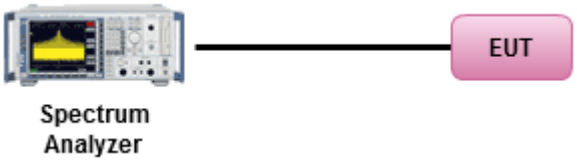
3.2.2 Measuring Instruments

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

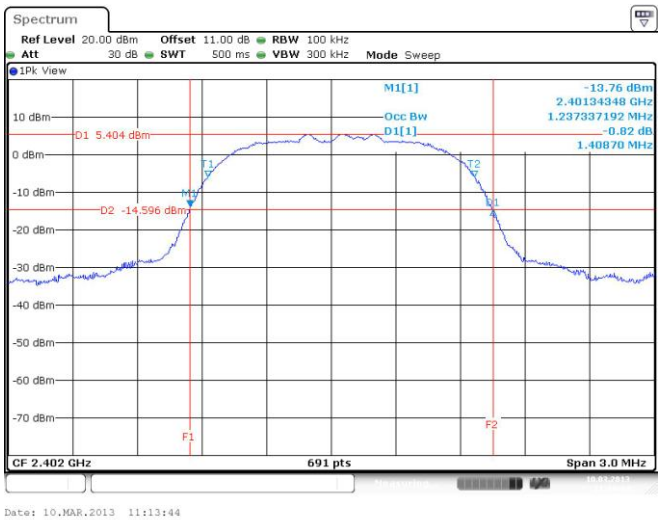
20dB Bandwidth and Carrier Frequency Separation
 Spectrum Analyzer

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)**
EDR-3Mbps	2402	1.409	1.237	1.00	0.939
EDR-3Mbps	2440	1.404	1.233	1.00	0.936
EDR-3Mbps	2480	1.400	1.229	1.00	0.933
Result		**Complied**			

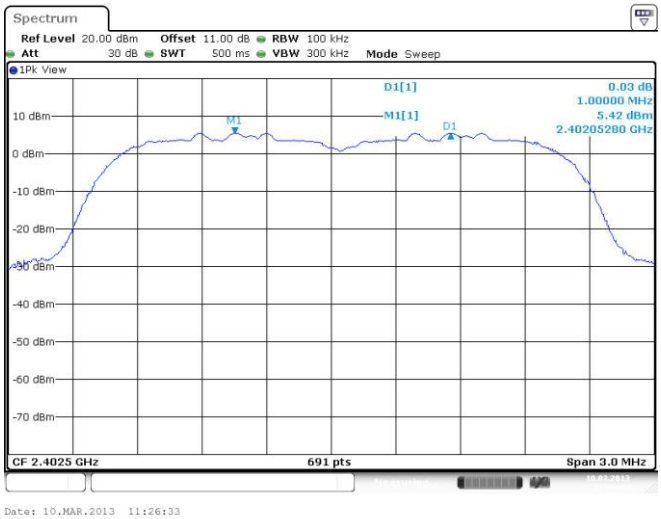
Worst 20dB Bandwidth Plots

EDR-3Mbps



Worst Carrier Frequency Separation Plots

EDR-3Mbps



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 ≥ 79 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	

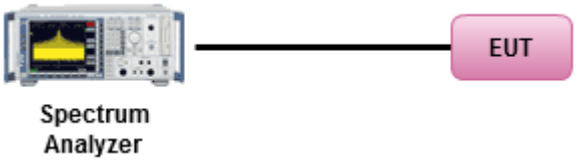
3.3.2 Measuring Instruments

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

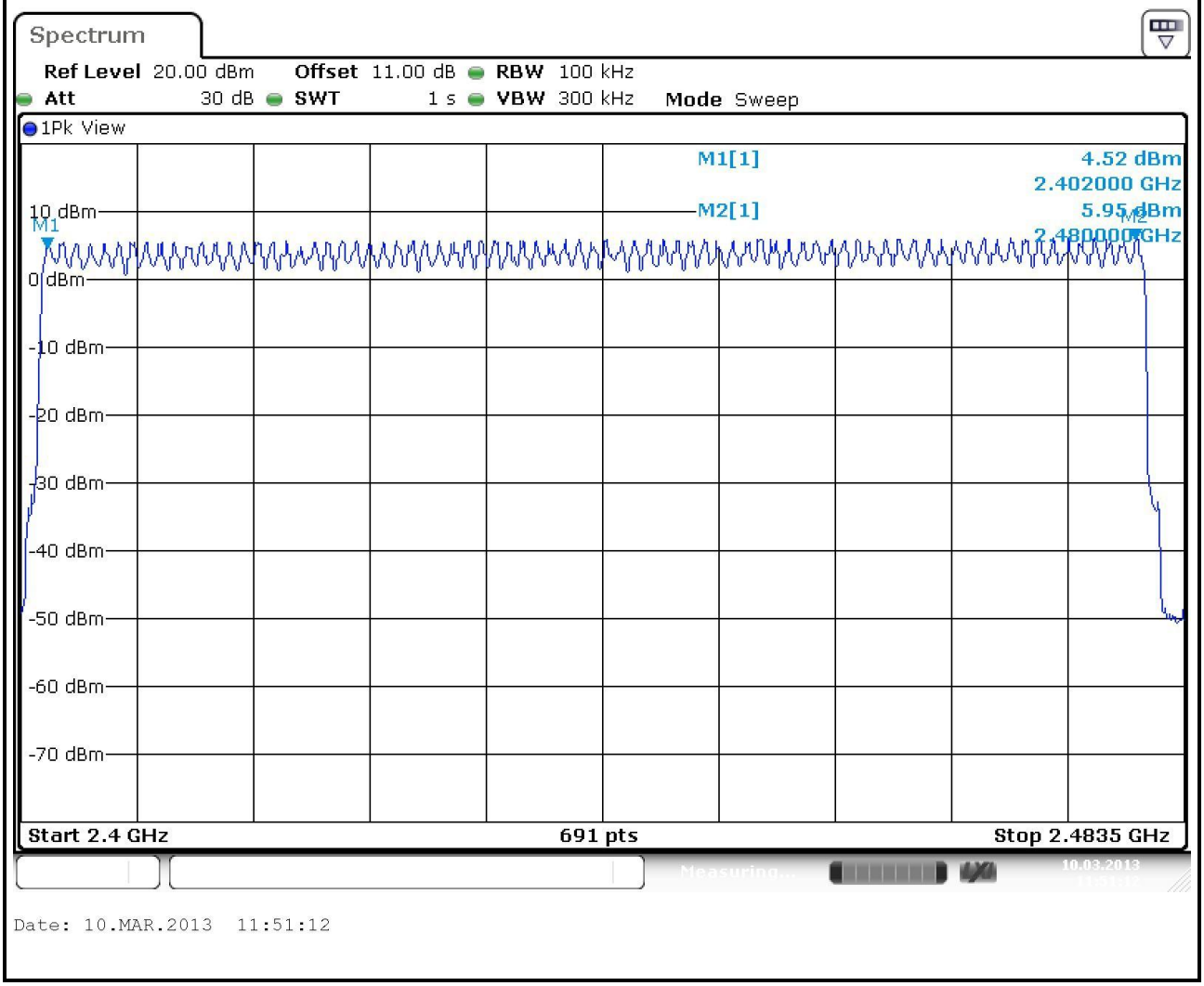
Number of Hopping Frequencies
 Spectrum Analyzer

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**		

Number of Hopping Frequencies Plots

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

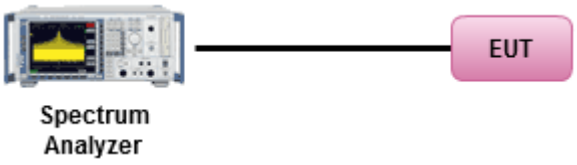
3.4.2 Measuring Instruments

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 RX, 1 time slot TX). 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 RX, 1 time slot TX). 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

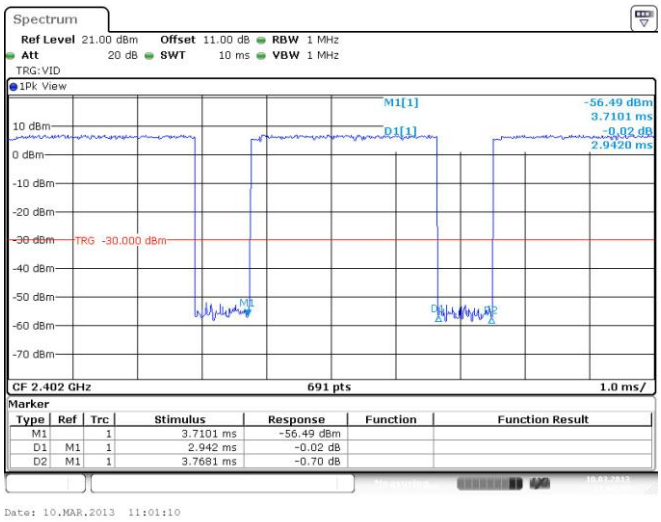
Time of Occupancy (Dwell Time)


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	2.942	106.7	0.314	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.					

Worst Pulse Time per Hop Plots

EDR-3Mbps



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 ≥ 79
		☐ 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 ≥ 79 - P_{eirp} ≤ 36 dBm (4 W)
	☒	For Hopping Channel: 79 > 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 a) for peak power meter.
☐	Refer as ANSI C63.10, clause 6.10.2.1 a) 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)

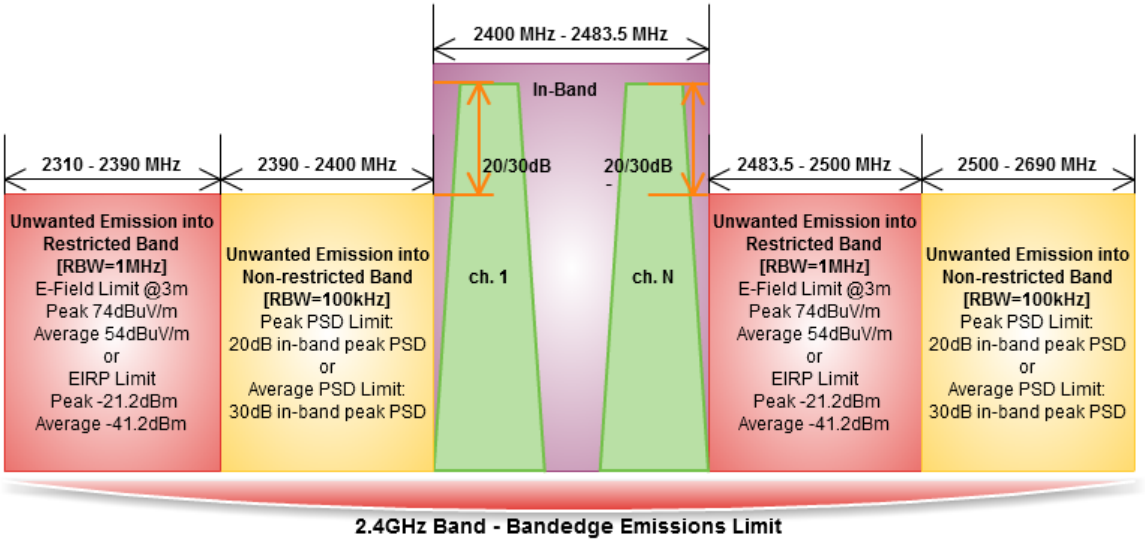

3.5.5 Test Result of Maximum Peak Conducted Output Power

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	7.38	21	-8.5	-1.12	27
BR-1Mbps	2440	7.61	21	-8.5	-0.89	27
BR-1Mbps	2480	8.01	21	-8.5	-0.49	27
EDR-3Mbps	2402	8.34	21	-8.5	-0.16	27
EDR-3Mbps	2440	8.72	21	-8.5	0.22	27
EDR-3Mbps	2480	8.91	21	-8.5	0.41	27
Result		Complied				

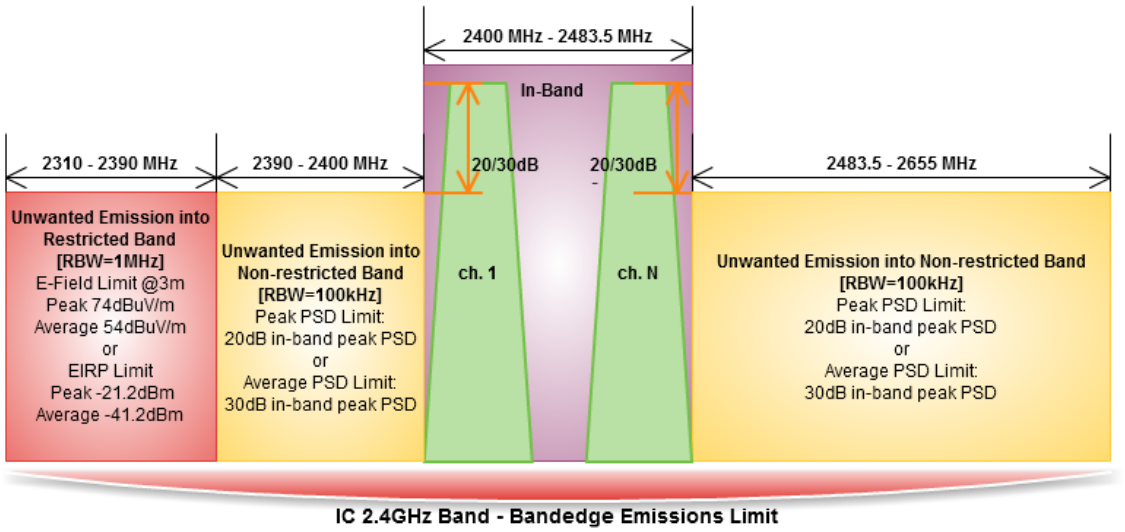
3.6 Transmitter Radiated Bandedge Emissions

3.6.1 Transmitter Radiated Bandedge Emissions Limit

Transmitter Radiated Bandedge Emissions Limit



Transmitter Radiated Bandedge Emissions Limit



3.6.2 Measuring Instruments

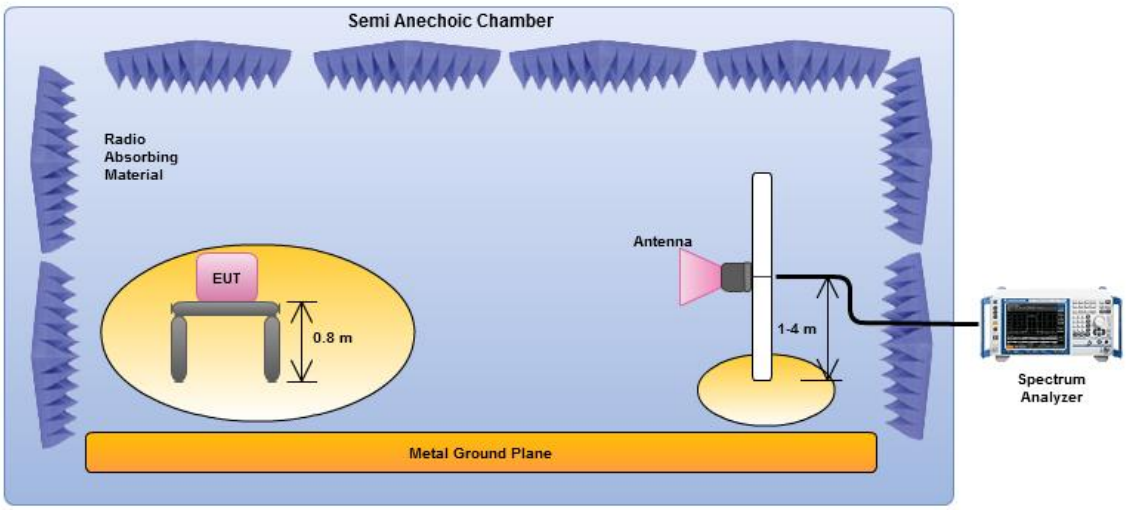
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method – General Information			
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.		
☒	For the transmitter unwanted emissions shall be measured using following options below:		
	☒	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 the transmitter bandedge emissions shall be measured using following options below:		
	☒	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.	
	☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.	
	☒	Refer as ANSI C63.10, clause 7.7.9 for band-edge testing into non-restricted bands.	
☒	For radiated measurement, refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.		

3.6.4 Test Setup

Transmitter Radiated Bandedge Emissions

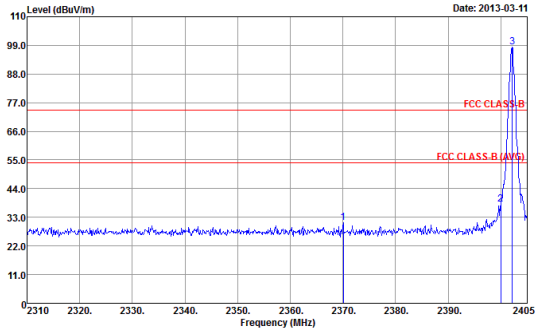


Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.

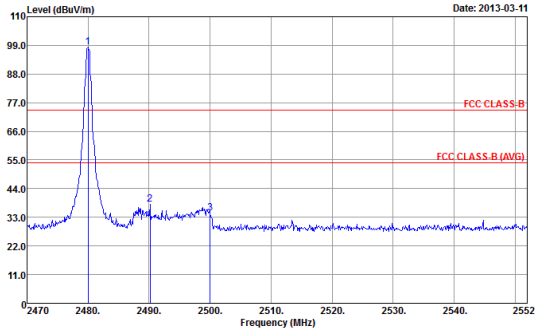
3.6.5 Test Result of Transmitter Radiated Bandedge Emissions

Transmitter Radiated Bandedge Emissions Result								
Modulation	BT-1M		**Non-restricted Band Emissions**					
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2402	98.40	2399.7	37.89	60.51	20	PK	H
2500-2690	2480	98.44	2500.01	34.49	63.95	20	PK	H

Low Bandedge



Up Bandedge



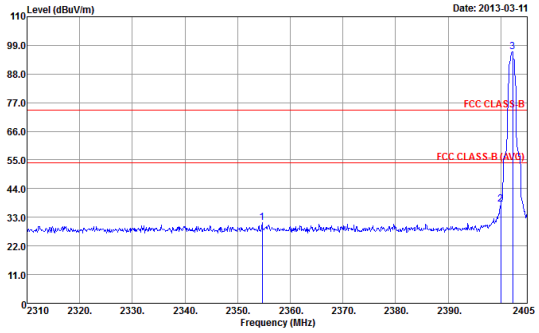
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result								
Modulation	BT-1M		**Restricted Band Emissions**					
Restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/1MHz)**	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit (dBuV/m)**	**Level Type**	**Pol. note 1**
2310-2390	2402	99.26	2390	3	40.57	74	PK	H
2310-2390	2402	69.16	2390	3	27.03	54	AV	H
2483.5-2500	2480	99.57	2483.5	3	51.14	74	PK	H
2483.5-2500	2480	69.47	2483.5	3	30.80	54	AV	H

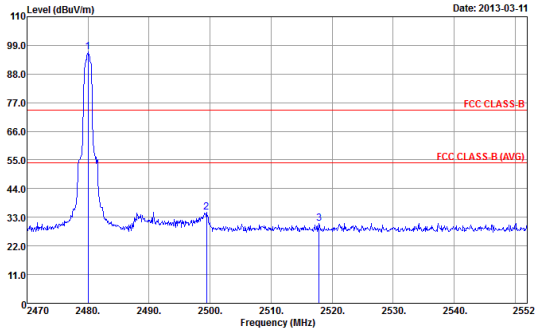
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).
Note 2: The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). The DH5 was the worst duty cycle.
For normal hopping, hopping rate is 1600 hops/79ch/sec, theory one hopping in 100ms. The average correction factor = 20 log (3.125/100) =-30.1dB.

Transmitter Radiated Bandedge Emissions Result								
Modulation	EDR-3M		**Non-restricted Band Emissions**					
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2402	96.55	2399.97	37.91	58.64	20	PK	V
2500-2690	2480	96.45	2517.89	30.77	65.68	20	PK	V

Low Bandedge



Up Bandedge



Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result								
Modulation	EDR-3M		**Restricted Band Emissions**					
Restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/1MHz)**	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit (dBuV/m)**	**Level Type**	**Pol. note 1**
2310-2390	2402	97.70	2390	3	39.49	74	PK	V
2310-2390	2402	67.80	2390	3	26.75	54	AV	V
2483.5-2500	2480	97.94	2483.5	3	49.41	74	PK	V
2483.5-2500	2480	67.84	2483.5	3	28.91	54	AV	V

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).
Note 2: 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). The DH5 was the worst duty cycle.
For normal hopping, hopping rate is 1600 hops/79ch/sec, theory one hopping in 100ms. The average correction factor = 20 log (3.125/100) =-30.1dB.

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

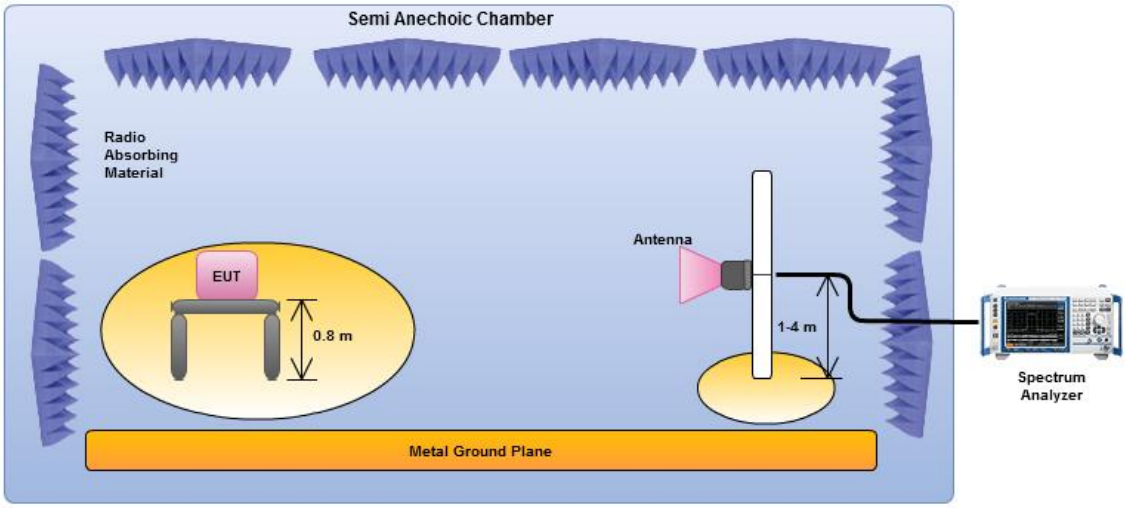
Refer a test equipment and calibration data table in this test report.

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).		
	☒	Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.	
	☒	Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.	
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	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



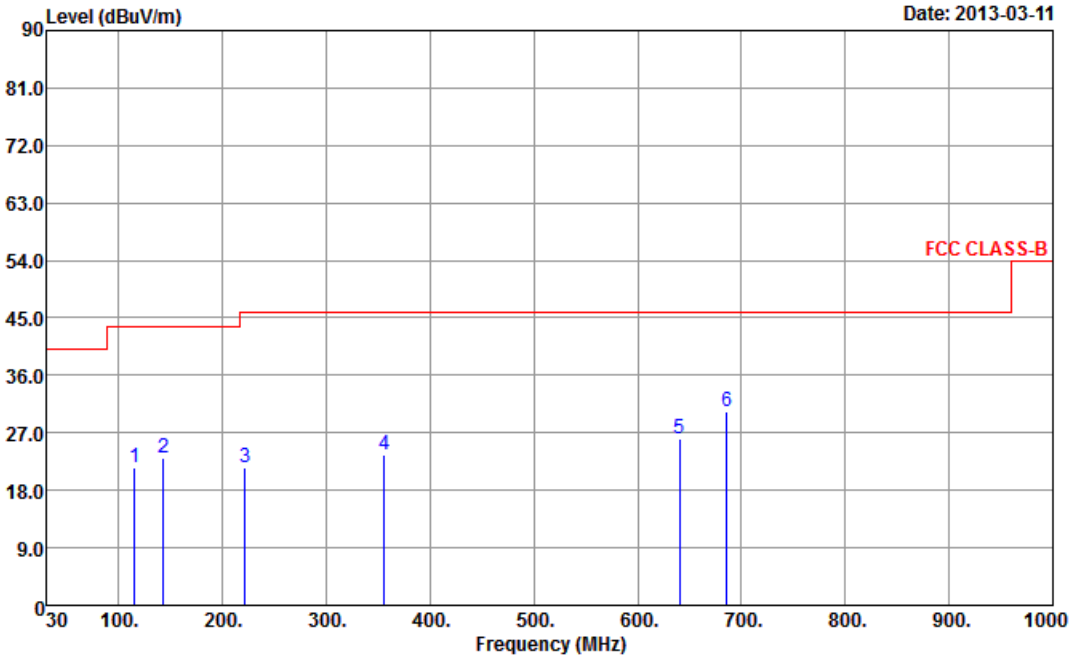
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn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

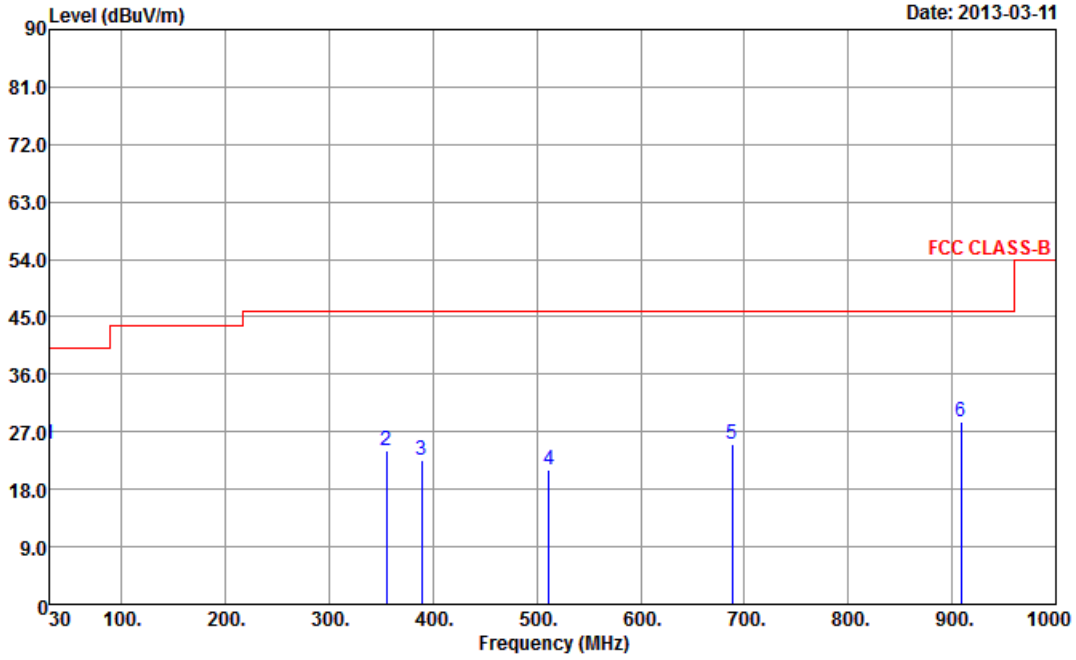
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	H
Operating Function	AC power & Radio link (BT)		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	115.33	21.48	-22.02	43.50	39.99	11.80	1.14	31.45	---	---	Peak
2	143.24	22.96	-20.54	43.50	41.77	11.17	1.28	31.26	---	---	Peak
3	221.38	21.52	-24.48	46.00	41.52	9.42	1.53	30.95	---	---	Peak
4	355.67	23.58	-22.42	46.00	38.09	14.56	2.01	31.08	---	---	Peak
5	640.25	26.17	-19.83	46.00	33.34	20.59	2.40	30.16	---	---	Peak
6	685.81	30.24	-15.76	46.00	37.33	20.52	2.57	30.18	---	---	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)			
Operating Mode	1	**Polarization**	V
Operating Function	AC power & Radio link (BT)		

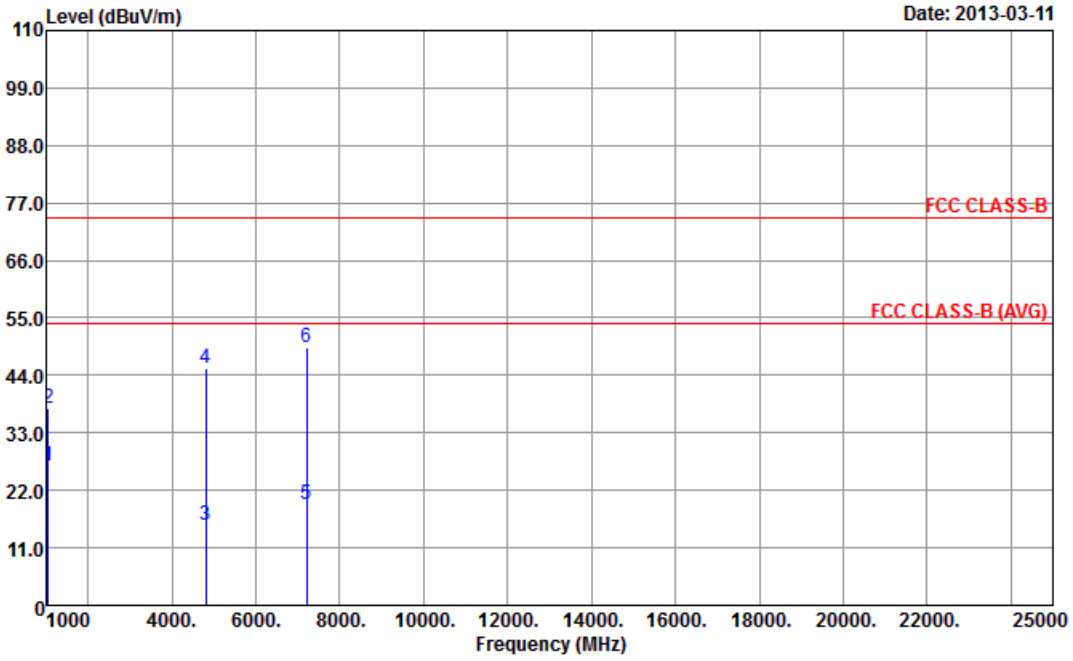


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.24	25.11	-14.89	40.00	36.48	19.64	0.63	31.64	---	---	Peak
2	354.67	24.15	-21.85	46.00	38.66	14.55	2.02	31.08	---	---	Peak
3	388.92	22.46	-23.54	46.00	35.92	15.47	2.16	31.09	---	---	Peak
4	511.28	21.07	-24.93	46.00	31.30	18.21	2.25	30.69	---	---	Peak
5	688.29	25.16	-20.84	46.00	32.20	20.57	2.58	30.19	---	---	Peak
6	908.88	28.59	-17.41	46.00	32.81	23.57	2.23	30.02	---	---	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 BT-1M

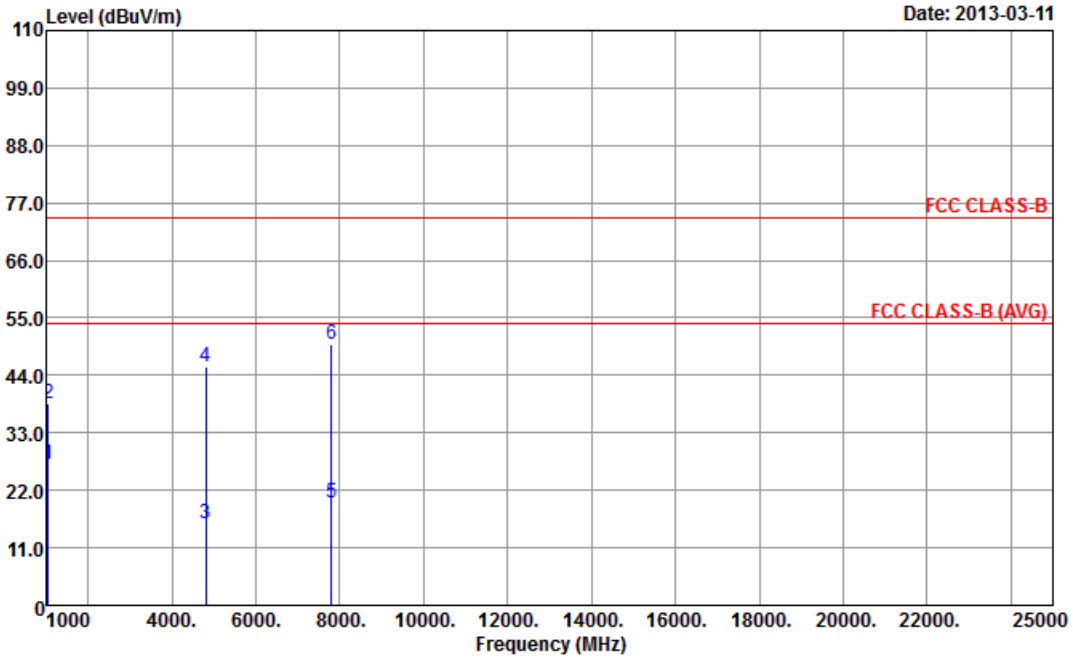
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F1
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.59	-27.41	54.00	33.79	27.91	2.95	38.06	---	---	Average
2	1050.00	37.74	-36.26	74.00	44.94	27.91	2.95	38.06	---	---	Peak
3	4804.00	15.22	-38.78	54.00	9.42	34.26	6.50	34.96	---	---	Average
4	4804.00	45.32	-28.68	74.00	39.52	34.26	6.50	34.96	---	---	Peak
5	7206.00	19.21	-34.79	54.00	9.91	36.06	8.22	34.98	---	---	Average
6	7206.00	49.31	-24.69	74.00	40.01	36.06	8.22	34.98	---	---	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: 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).

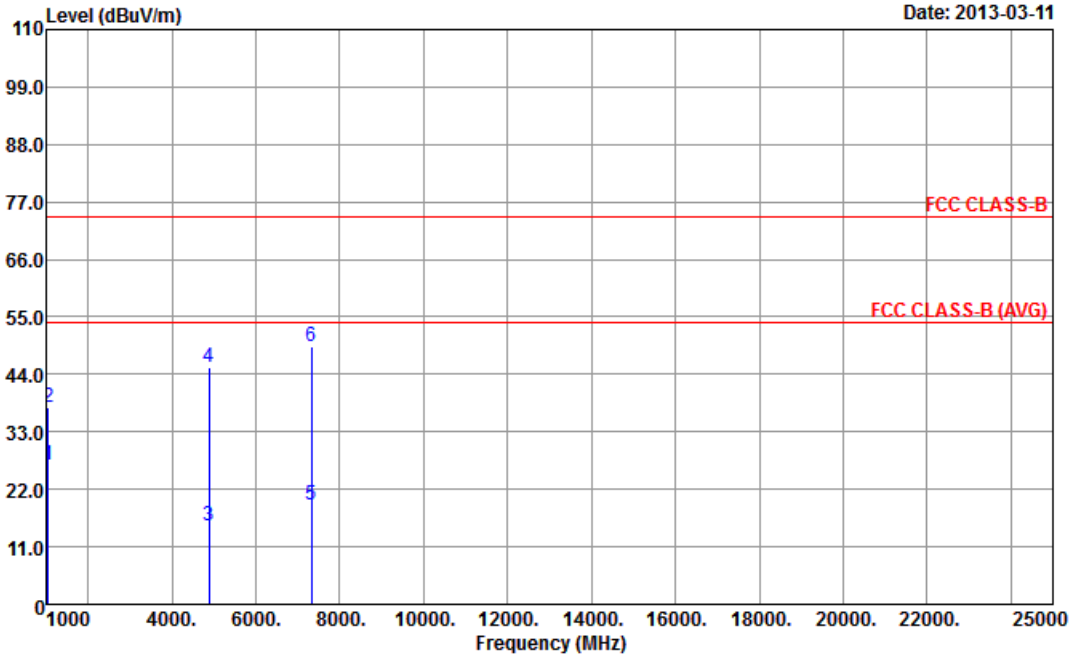
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F1
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.83	-27.17	54.00	34.03	27.91	2.95	38.06	---	---	Average
2	1050.00	38.52	-35.48	74.00	45.72	27.91	2.95	38.06	---	---	Peak
3	4804.00	15.49	-38.51	54.00	9.69	34.26	6.50	34.96	---	---	Average
4	4804.00	45.59	-28.41	74.00	39.79	34.26	6.50	34.96	---	---	Peak
5	7806.00	19.76	-34.24	54.00	9.92	36.06	8.82	35.04	---	---	Average
6	7806.00	49.86	-24.14	74.00	40.02	36.06	8.82	35.04	---	---	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: 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).

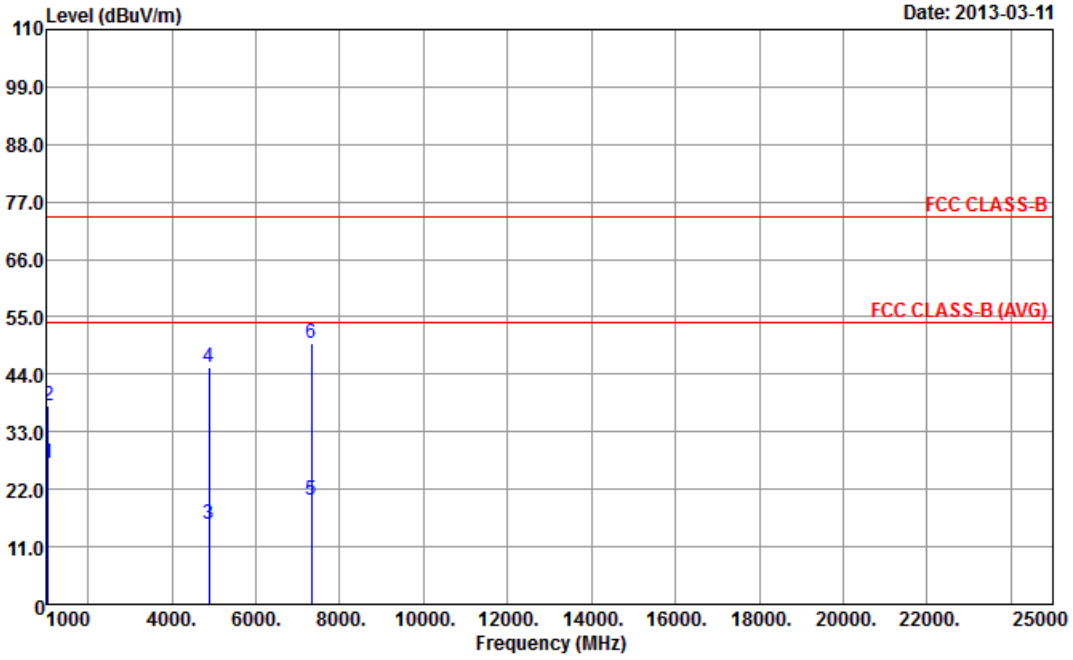
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F2
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.58	-27.42	54.00	33.78	27.91	2.95	38.06	---	---	Average
2	1050.00	37.71	-36.29	74.00	44.91	27.91	2.95	38.06	---	---	Peak
3	4882.00	15.17	-38.83	54.00	9.34	34.28	6.53	34.98	---	---	Average
4	4882.00	45.27	-28.73	74.00	39.44	34.28	6.53	34.98	---	---	Peak
5	7323.00	19.13	-34.87	54.00	9.69	36.04	8.43	35.03	---	---	Average
6	7323.00	49.23	-24.77	74.00	39.79	36.04	8.43	35.03	---	---	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: 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).

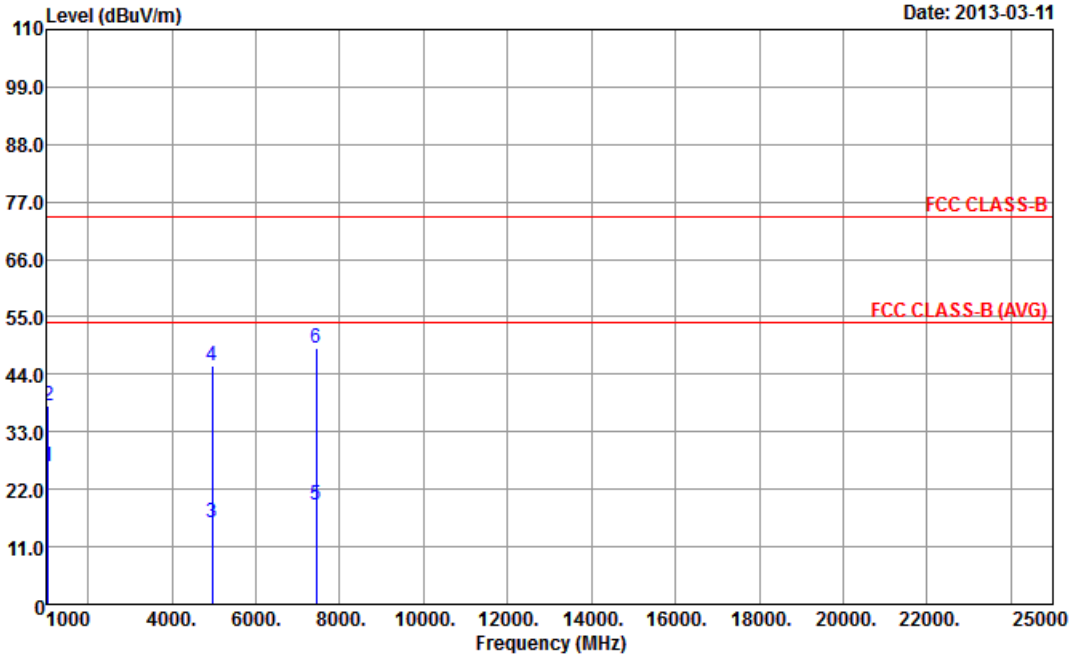
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F2
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.89	-27.11	54.00	34.09	27.91	2.95	38.06	---	---	Average
2	1050.00	38.14	-35.86	74.00	45.34	27.91	2.95	38.06	---	---	Peak
3	4882.00	15.30	-38.70	54.00	9.47	34.28	6.53	34.98	---	---	Average
4	4882.00	45.40	-28.60	74.00	39.57	34.28	6.53	34.98	---	---	Peak
5	7323.00	19.87	-34.13	54.00	10.43	36.04	8.43	35.03	---	---	Average
6	7323.00	49.97	-24.03	74.00	40.53	36.04	8.43	35.03	---	---	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: 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).

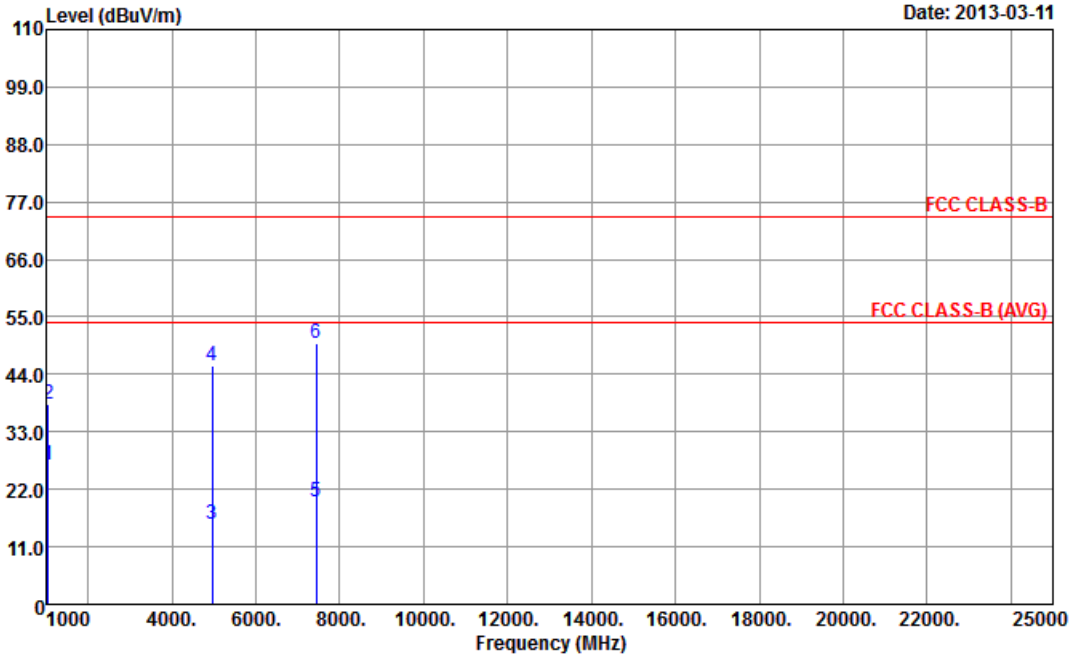
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F3
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.38	-27.62	54.00	33.58	27.91	2.95	38.06	---	---	Average
2	1050.00	37.91	-36.09	74.00	45.11	27.91	2.95	38.06	---	---	Peak
3	4960.00	15.53	-38.47	54.00	9.66	34.29	6.57	34.99	---	---	Average
4	4960.00	45.63	-28.37	74.00	39.76	34.29	6.57	34.99	---	---	Peak
5	7440.00	19.01	-34.99	54.00	9.42	36.01	8.66	35.08	---	---	Average
6	7440.00	49.11	-24.89	74.00	39.52	36.01	8.66	35.08	---	---	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: 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).

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F3
Operating Mode	1	**Polarization**	V

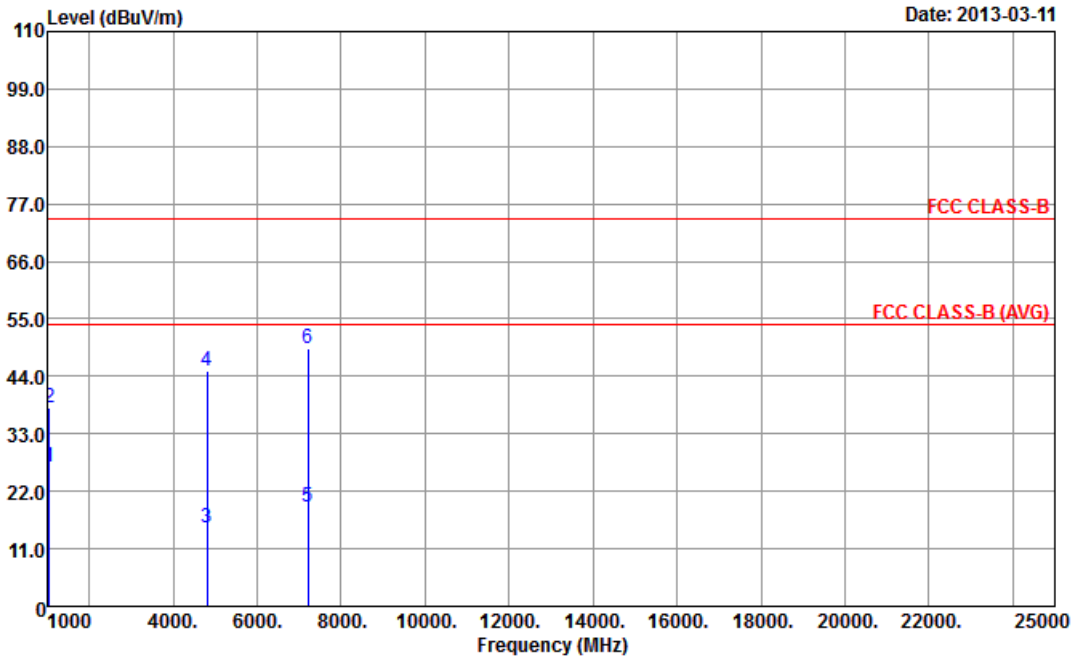


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.61	-27.39	54.00	33.81	27.91	2.95	38.06	---	---	Average
2	1050.00	38.45	-35.55	74.00	45.65	27.91	2.95	38.06	---	---	Peak
3	4960.00	15.42	-38.58	54.00	9.55	34.29	6.57	34.99	---	---	Average
4	4960.00	45.52	-28.48	74.00	39.65	34.29	6.57	34.99	---	---	Peak
5	7440.00	19.72	-34.28	54.00	10.13	36.01	8.66	35.08	---	---	Average
6	7440.00	49.82	-24.18	74.00	40.23	36.01	8.66	35.08	---	---	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: 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).

3.7.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for EDR-3M

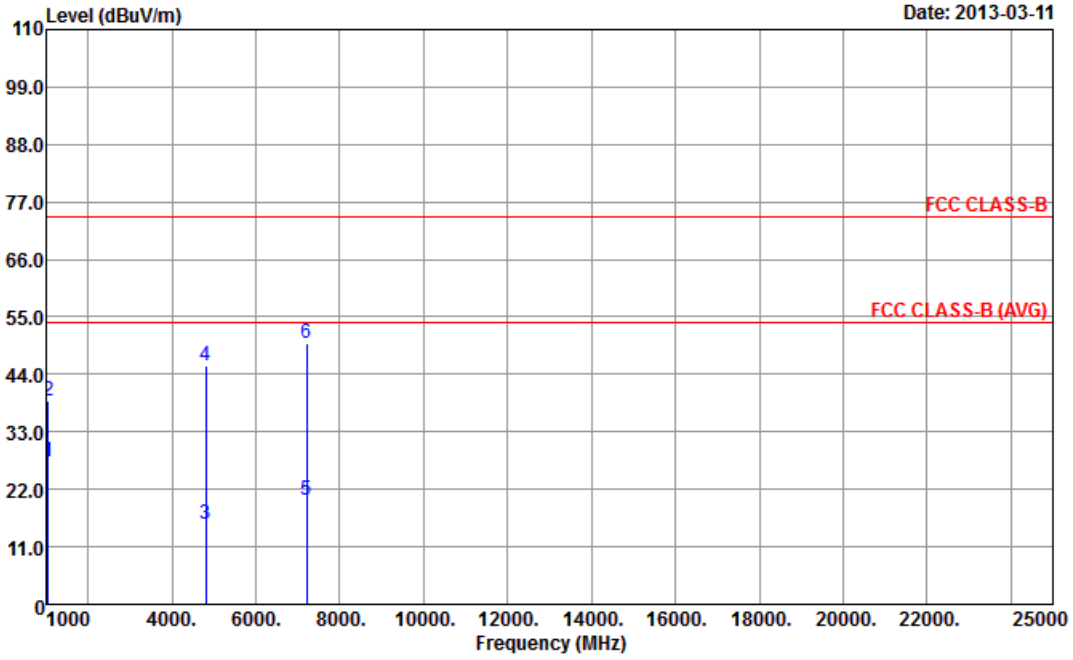
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F1
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.79	-27.21	54.00	33.99	27.91	2.95	38.06	---	---	Average
2	1050.00	37.85	-36.15	74.00	45.05	27.91	2.95	38.06	---	---	Peak
3	4804.00	15.06	-38.94	54.00	9.26	34.26	6.50	34.96	---	---	Average
4	4804.00	45.16	-28.84	74.00	39.36	34.26	6.50	34.96	---	---	Peak
5	7206.00	19.11	-34.89	54.00	9.81	36.06	8.22	34.98	---	---	Average
6	7206.00	49.21	-24.79	74.00	39.91	36.06	8.22	34.98	---	---	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: 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).

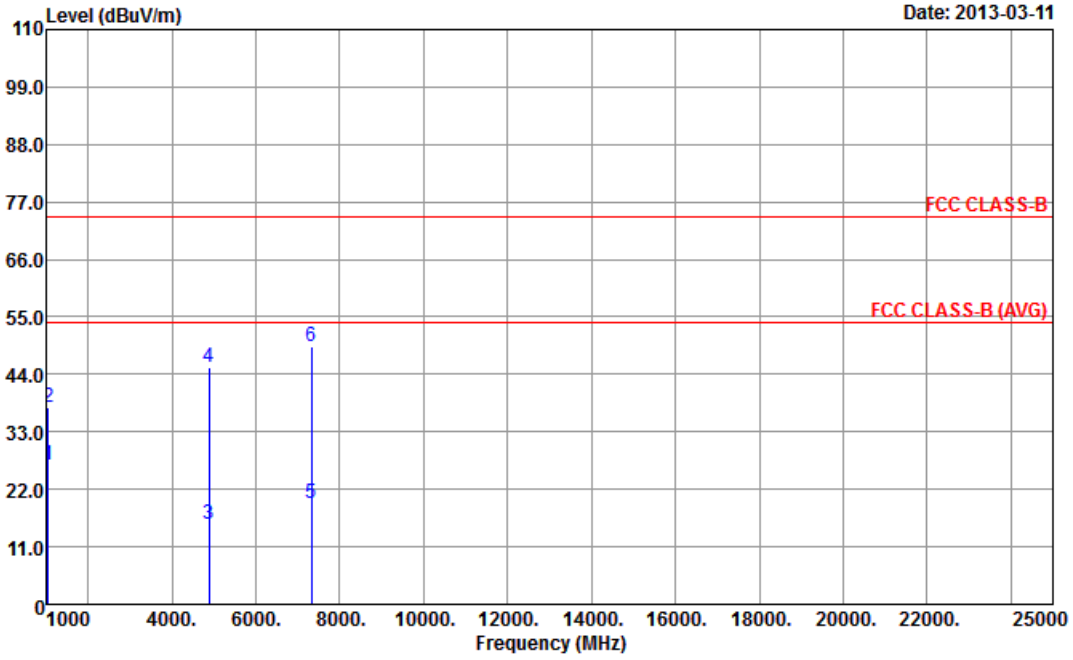
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F1
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	27.13	-26.87	54.00	34.33	27.91	2.95	38.06	---	---	Average
2	1050.00	38.84	-35.16	74.00	46.04	27.91	2.95	38.06	---	---	Peak
3	4804.00	15.42	-38.58	54.00	9.62	34.26	6.50	34.96	---	---	Average
4	4804.00	45.52	-28.48	74.00	39.72	34.26	6.50	34.96	---	---	Peak
5	7206.00	19.83	-34.17	54.00	10.53	36.06	8.22	34.98	---	---	Average
6	7206.00	49.93	-24.07	74.00	40.63	36.06	8.22	34.98	---	---	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: 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).

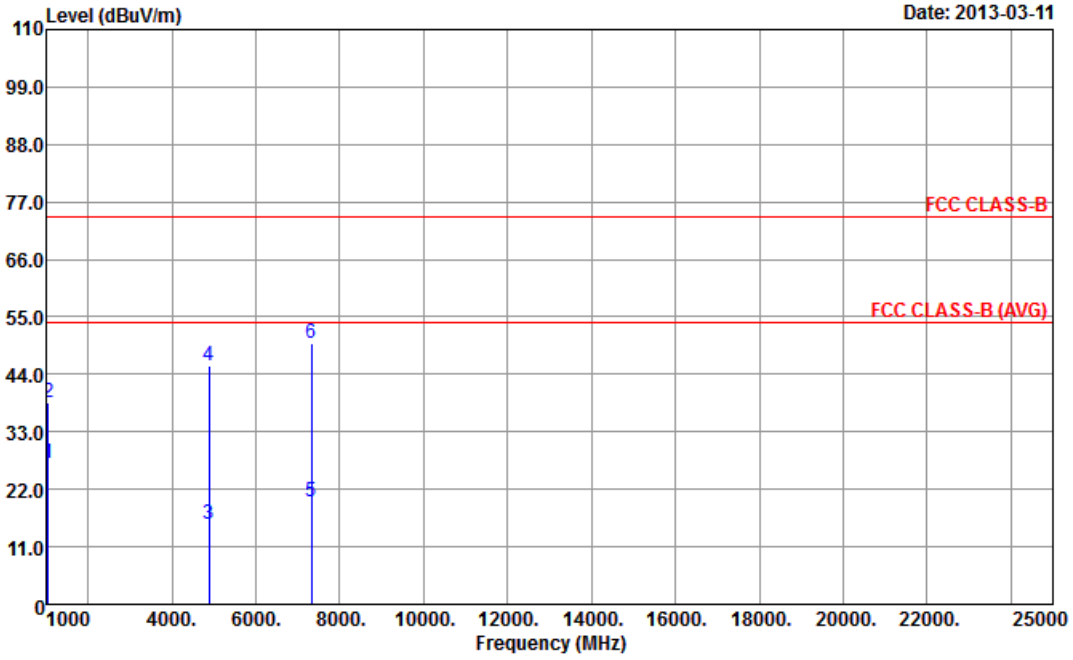
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F2
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	26.52	-27.48	54.00	33.72	27.91	2.95	38.06	---	---	Average
2	1050.00	37.67	-36.33	74.00	44.87	27.91	2.95	38.06	---	---	Peak
3	4882.00	15.26	-38.74	54.00	9.43	34.28	6.53	34.98	---	---	Average
4	4882.00	45.36	-28.64	74.00	39.53	34.28	6.53	34.98	---	---	Peak
5	7323.00	19.28	-34.72	54.00	9.84	36.04	8.43	35.03	---	---	Average
6	7323.00	49.38	-24.62	74.00	39.94	36.04	8.43	35.03	---	---	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: 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).

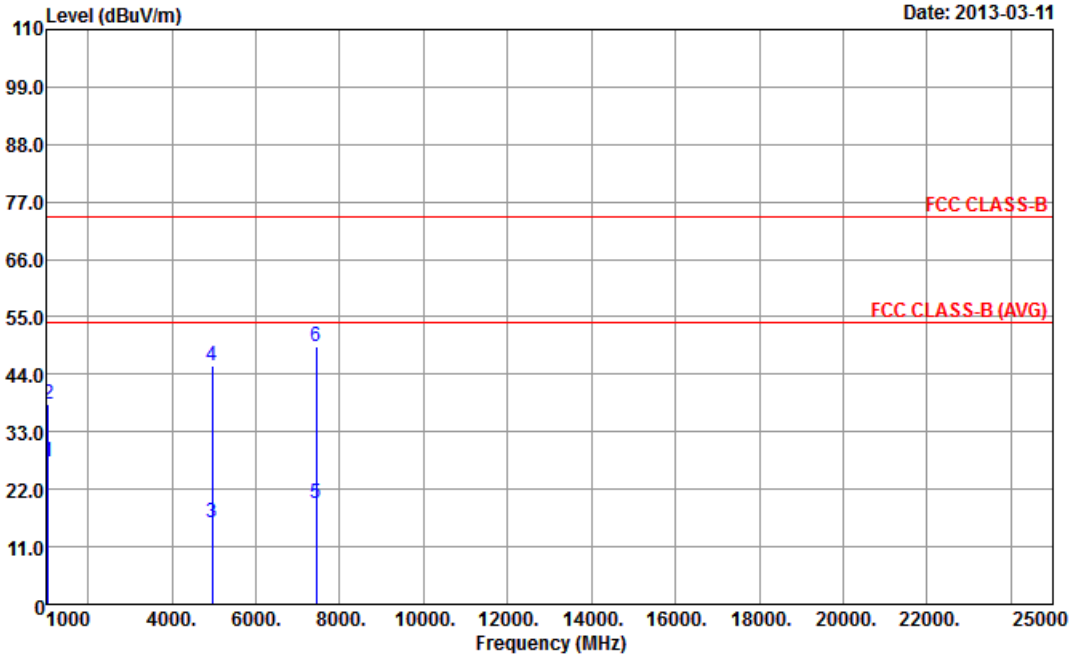
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F2
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	27.02	-26.98	54.00	34.22	27.91	2.95	38.06	---	---	Average
2	1050.00	38.59	-35.41	74.00	45.79	27.91	2.95	38.06	---	---	Peak
3	4882.00	15.43	-38.57	54.00	9.60	34.28	6.53	34.98	---	---	Average
4	4882.00	45.53	-28.47	74.00	39.70	34.28	6.53	34.98	---	---	Peak
5	7323.00	19.74	-34.26	54.00	10.30	36.04	8.43	35.03	---	---	Average
6	7323.00	49.84	-24.16	74.00	40.40	36.04	8.43	35.03	---	---	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: 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).

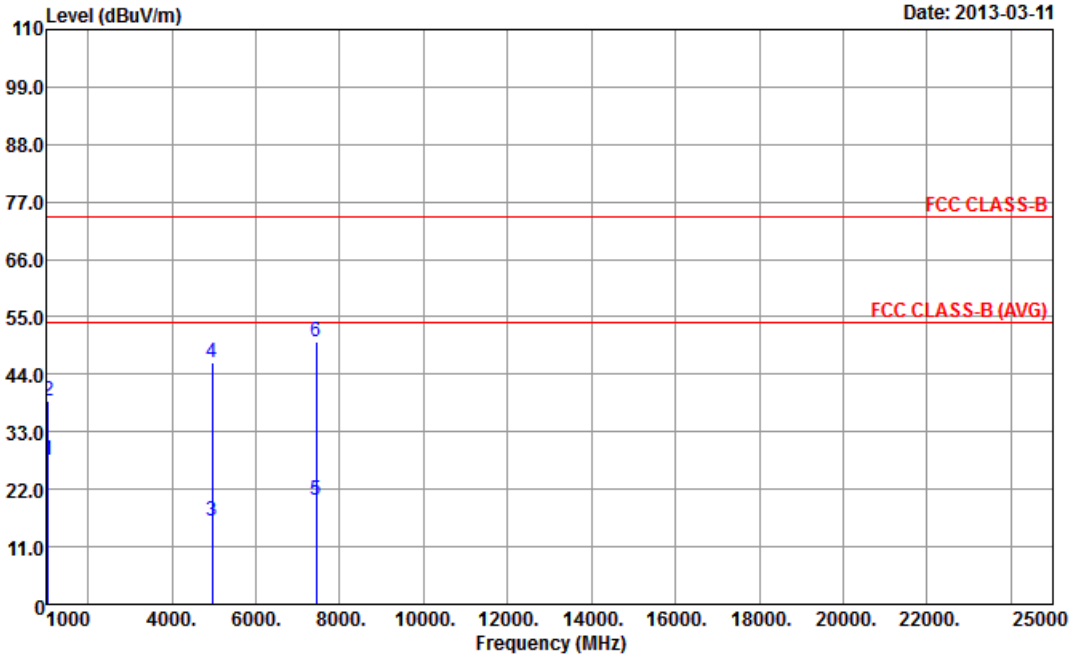
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F3
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	27.15	-26.85	54.00	34.35	27.91	2.95	38.06	---	---	Average
2	1050.00	38.24	-35.76	74.00	45.44	27.91	2.95	38.06	---	---	Peak
3	4960.00	15.52	-38.48	54.00	9.65	34.29	6.57	34.99	---	---	Average
4	4960.00	45.62	-28.38	74.00	39.75	34.29	6.57	34.99	---	---	Peak
5	7440.00	19.27	-34.73	54.00	9.68	36.01	8.66	35.08	---	---	Average
6	7440.00	49.37	-24.63	74.00	39.78	36.01	8.66	35.08	---	---	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: 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).

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Bluetooth	**Test Freq. (FX)**	F3
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1050.00	27.67	-26.33	54.00	34.87	27.91	2.95	38.06	---	---	Average
2	1050.00	38.92	-35.08	74.00	46.12	27.91	2.95	38.06	---	---	Peak
3	4960.00	16.05	-37.95	54.00	10.18	34.29	6.57	34.99	---	---	Average
4	4960.00	46.15	-27.85	74.00	40.28	34.29	6.57	34.99	---	---	Peak
5	7440.00	20.01	-33.99	54.00	10.42	36.01	8.66	35.08	---	---	Average
6	7440.00	50.11	-23.89	74.00	40.52	36.01	8.66	35.08	---	---	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: 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).

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9 kHz ~ 2.75 GHz	Nov. 22, 2012	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz – 30MHz	Jan. 21, 2013	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9 kHz ~ 30 MHz	Apr. 20, 2012	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	7.61183201e+012	9kHz ~ 30MHz	Nov. 09, 2012	Conduction (CO04-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 30	100023/030	9KHz ~ 30GHz	Apr. 27, 2012	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 19, 2012	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Nov. 21, 2012	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 26, 2012	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	Sep. 08, 2012	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	Sep. 08, 2012	Conducted (TH01-HY)
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	1GHz ~ 26.5GHz	NA	Conducted (TH01-HY)
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345669/4	1GHz ~ 26.5GHz	NA	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 02, 2012	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP	100055	9Kz – 40GHz	Jun. 06, 2012	Radiation (03CH05-HY)
Receiver	R&S	ESIB26	100337	20Hz – 26.5GHz	Jun.21, 2012	Radiation (03CH05-HY)
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH05-HY	30 MHz - 1 GHz 3m	N/A	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161050	1 MHz ~ 1 GHz	Feb. 26, 2013	Radiation (03CH05-HY)
Amplifier	Agilent	8449B	3008A02665	1GHz – 26.5 GHz	Aug. 28, 2012	Radiation (03CH05-HY)
Horn Antenna	ETS-LINDGREN	3117	66584	1GHz~18GHz	Aug. 09, 2012	Radiation (03CH05-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170517	18G~40G	Jan. 14, 2013	Radiation (03CH05-HY)
RF Cable-R03m	Jye Bao	RG142	03CH05-HY	30 MHz - 1 GHz	Oct. 14, 2012	Radiation (03CH05-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX104	03CH05-HY	1GHz~40GHz	Oct. 14, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30 MHz - 1 GHz	Oct. 06, 2012	Radiation (03CH05-HY)
Turn Table	HD	HD100	420/611	0 - 360 degree	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	HD100	240/666	1 m - 4 m	N/A	Radiation (03CH05-HY)

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