



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1926-5
FCC ID : IHDT56WL3
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Dec. 28, 2017 and testing was completed on Feb. 13, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in 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: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7D2702-05B	Rev. 01	Initial issue of report	Mar. 12, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 8.86 dB at 32.970 MHz



1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1926-5
FCC ID	IHDT56WL3
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE/ Bluetooth v5.0 LE
IMEI Code	Radiation: 351855090018252/ 351855090018260
HW Version	DVT1B
SW Version	evert_n-userdebug 8.0.0 OPW27.88 1825 intcfg,test-keys
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Antenna Type / Gain	PIFA Antenna with gain -2.8 dBi
Type of Modulation	Bluetooth LE : GFSK



1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Re-use of Measured Data

1.6.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT1926-5, FCC ID: IHDT56WL3) is electrically identical to the reference device (Model: XT1926-6, XT1926-7, FCC ID: IHDT56WL4) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

1.6.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix D (Sporton RF Report No. FR7D2702B for the reference device Model: XT1926-6, XT1926-7, FCC ID: IHDT56WL4):

1.6.3 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for conducted power and conducted spurious emission, the test result were consistent with FCC ID: IHDT56WL4 and radiation spurious emission to full re-test..

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

1.6.4 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test	Report Title/Section
DSS	IHDT56WL4	Part15C(FR7D2702A)	All sections (except RSE) applicable
DTS (BLE)	IHDT56WL4	Part15C(FR7D2702B)	All sections (except RSE) applicable
DTS (WLAN)	IHDT56WL4	Part15C(FR7D2702C)	All sections (except RSE) applicable
DXX	IHDT56WL4	Part15C(FR7D2702D)	All sections (except RSE) applicable



1.7 Accessory List

Specification of Accessory			
AC Adapter 1(US)	Brand Name	Motorola (Salom)	Model Name SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 1(EU)	Brand Name	Motorola (Salom)	Model Name SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 1(UK)	Brand Name	Motorola (Salom)	Model Name SC-24
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 1(IN)	Brand Name	Motorola (Salom)	Model Name SC-25
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 1(AU)	Brand Name	Motorola (Salom)	Model Name SC-26
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 1 (Indonesia)	Brand Name	Motorola (Salom)	Model Name SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 2(US)	Brand Name	Motorola (Chenyang)	Model Name SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 2(EU)	Brand Name	Motorola (Chenyang)	Model Name SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 2(UK)	Brand Name	Motorola (Chenyang)	Model Name SC-24
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 2(IN)	Brand Name	Motorola (Chenyang)	Model Name SC-25
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
AC Adapter 2(AU)	Brand Name	Motorola (Chenyang)	Model Name SC-26
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA	
Battery	Brand Name	Motorola (ATL)	Model Name JT40
	Power Rating	3.8Vdc,3200mAh	Type Li-ion Polymer
Earphone 1	Brand Name	Motorola (Jiahe)	Model Name LS-118M-12
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core	
Earphone 2	Brand Name	Motorola (Lianyun)	Model Name TS910A-38AMS01WHR-M
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core	
USB Cable	Brand Name	Motorola (Liqi)	Model Name L32B-053000100-ALL
	Signal Line Type	1.0 meter, shielded cable, without ferrite core	



1.8 Testing Location

SPORTON INTERNATIONAL INC. is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1007 under the FCC-recognized accredited testing laboratories by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.58, Aly. 75, Ln. 564 Wenhua 3rd Rd. Guishan Dist. Taoyuan City Taiwan TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	03CH12-HY	214511

Note: The test site complies with ANSI C63.4 2014 requirement.

1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

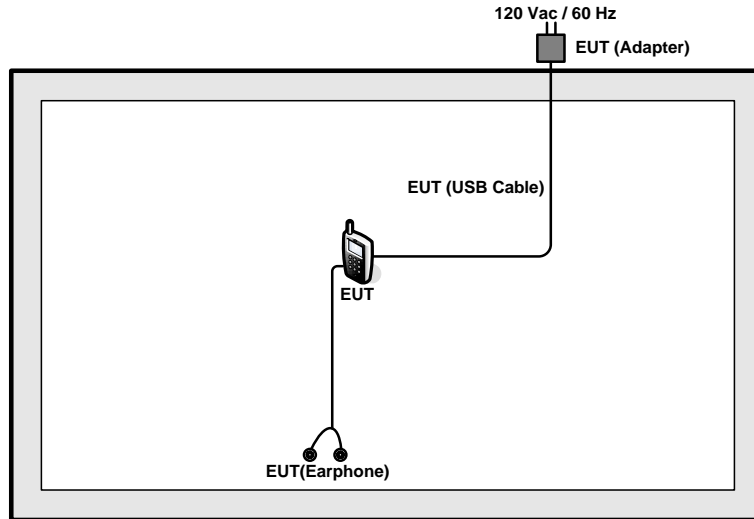
2.1 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth – LE / GFSK
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps

2.2 Connection Diagram of Test System

<Bluetooth – LE Tx Mode>



2.3 EUT Operation Test Setup

For Bluetooth LE function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.



3 Test Result

3.1 Radiated Band Edges and Spurious Emission Measurement

3.1.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

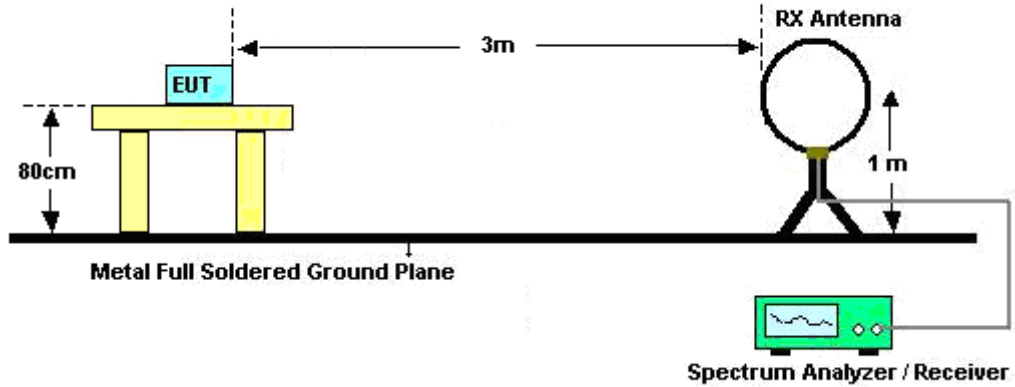


3.1.3 Test Procedures

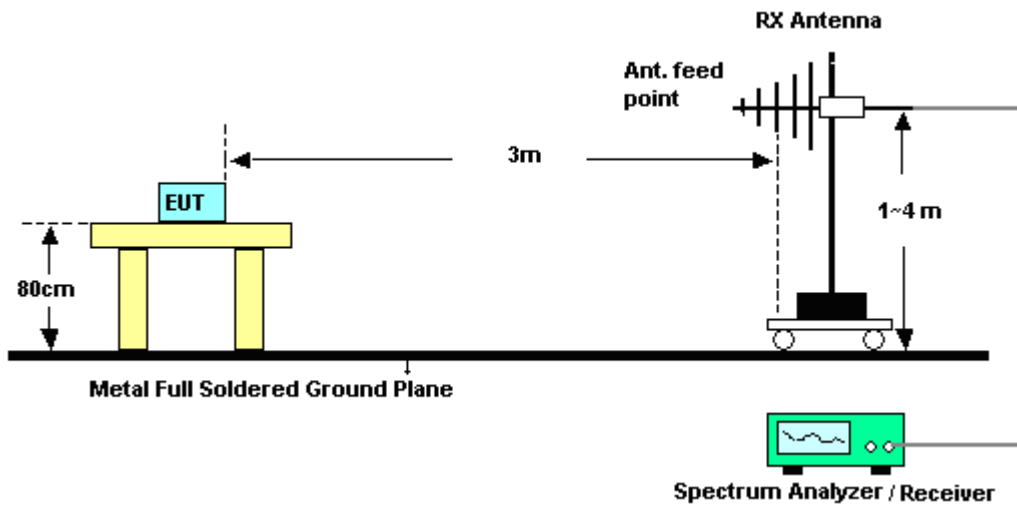
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.1.4 Test Setup

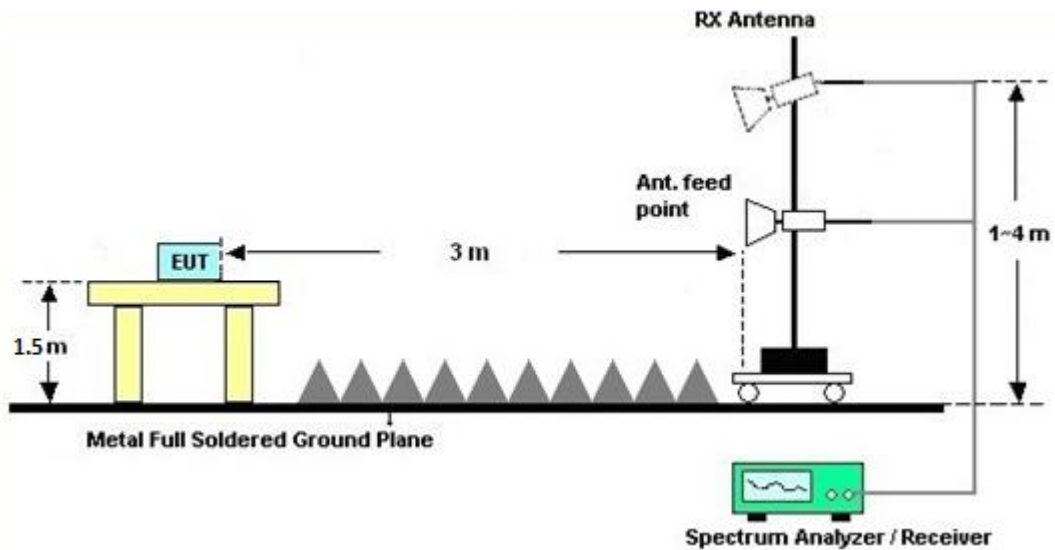
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

3.1.7 Duty Cycle

Please refer to Appendix B.

3.1.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Feb. 09, 2018~ Feb. 13, 2018	Jul. 17, 2018	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-0 6	35414&AT- N0602	30MHz~1GHz	Oct. 14, 2017	Feb. 09, 2018~ Feb. 13, 2018	Oct. 13, 2018	Radiation (03CH12-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Feb. 09, 2018~ Feb. 13, 2018	Nov. 22, 2018	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Feb. 09, 2018~ Feb. 13, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-132 8	1GHz ~ 18GHz	Oct. 20, 2017	Feb. 09, 2018~ Feb. 13, 2018	Oct. 19, 2018	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Oct. 12, 2017	Feb. 09, 2018~ Feb. 13, 2018	Oct. 11, 2018	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 23, 2017	Feb. 09, 2018~ Feb. 13, 2018	Mar. 22, 2018	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY532701 48	1GHz~26.5GHz	Jan. 15, 2018	Feb. 09, 2018~ Feb. 13, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2G Low Pass	Mar. 24, 2017	Feb. 09, 2018~ Feb. 13, 2018	Mar. 23, 2018	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	NCR	Feb. 09, 2018~ Feb. 13, 2018	NCR	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	NCR	Feb. 09, 2018~ Feb. 13, 2018	NCR	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	NCR	Feb. 09, 2018~ Feb. 13, 2018	NCR	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 576	18GHz ~ 40GHz	Apr. 27, 2017	Feb. 09, 2018~ Feb. 13, 2018	Apr. 26, 2018	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 15, 2017	Feb. 09, 2018~ Feb. 13, 2018	Mar. 14, 2018	Radiation (03CH12-HY)

NCR: No Calibration Required



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7dB
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Appendix A. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

BLE 4.2 (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2383.815	53.88	-20.12	74	44.29	27.11	14.06	31.58	115	243	P	H
		2379.615	43.13	-10.87	54	33.54	27.11	14.06	31.58	115	243	A	H
	*	2402	91.91	-	-	82.26	27.15	14.07	31.57	115	243	P	H
	*	2402	90.94	-	-	81.29	27.15	14.07	31.57	115	243	A	H
		2370.375	53.95	-20.05	74	44.38	27.11	14.04	31.58	399	46	P	V
		2385.6	43.1	-10.9	54	33.47	27.15	14.06	31.58	399	46	A	V
	*	2402	89.97	-	-	80.32	27.15	14.07	31.57	399	46	P	V
	*	2402	88.71	-	-	79.06	27.15	14.07	31.57	399	46	A	V
BLE CH 19 2440MHz		2385.18	53.72	-20.28	74	44.13	27.11	14.06	31.58	113	245	P	H
		2354.24	43.08	-10.92	54	33.56	27.07	14.03	31.58	113	245	A	H
	*	2440	92.59	-	-	82.78	27.28	14.1	31.57	113	245	P	H
	*	2440	91.39	-	-	81.58	27.28	14.1	31.57	113	245	A	H
		2490.62	54.17	-19.83	74	44.19	27.4	14.14	31.56	113	245	P	H
		2484.67	43.56	-10.44	54	33.62	27.36	14.14	31.56	113	245	A	H
		2346.26	53.94	-20.06	74	44.46	27.03	14.03	31.58	382	49	P	V
		2369.36	43	-11	54	33.43	27.11	14.04	31.58	382	49	A	V
	*	2440	90.3	-	-	80.49	27.28	14.1	31.57	382	49	P	V
	*	2440	89.02	-	-	79.21	27.28	14.1	31.57	382	49	A	V
		2497.9	53.38	-20.62	74	43.39	27.4	14.14	31.55	382	49	P	V
		2485.51	43.47	-10.53	54	33.53	27.36	14.14	31.56	382	49	A	V



BLE CH 39 2480MHz	*	2480	96.19	-	-	86.27	27.36	14.12	31.56	132	242	P	H
	*	2480	95.29	-	-	85.37	27.36	14.12	31.56	132	242	A	H
		2487.8	53.74	-20.26	74	43.76	27.4	14.14	31.56	132	242	P	H
		2493.8	43.15	-10.85	54	33.16	27.4	14.14	31.55	132	242	A	H
	*	2480	93.26	-	-	83.34	27.36	14.12	31.56	372	127	P	V
	*	2480	92.33	-	-	82.41	27.36	14.12	31.56	372	127	A	V
		2496.88	54.75	-19.25	74	44.76	27.4	14.14	31.55	372	127	P	V
		2484.48	43.64	-10.36	54	33.7	27.36	14.14	31.56	372	127	A	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. 												



2.4GHz 2400~2483.5MHz

BLE 4.2 (Harmonic @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 00 2402MHz		4804	39.42	-34.58	74	66.15	31.32	6.7	64.75	100	0	P	H
		4804	39.29	-34.71	74	66.02	31.32	6.7	64.75	100	0	P	V
BLE CH 19 2440MHz		4880	39.27	-34.73	74	65.78	31.46	6.73	64.7	100	0	P	H
		7320	44.92	-29.08	74	65.54	36.15	8.06	64.83	100	0	P	H
		4880	38.45	-35.55	74	64.96	31.46	6.73	64.7	100	0	P	V
BLE CH 39 2480MHz		7320	44.44	-29.56	74	65.06	36.15	8.06	64.83	100	0	P	V
		4960	39.22	-34.78	74	65.47	31.63	6.75	64.63	100	0	P	H
		7440	44.99	-29.01	74	65.33	36.47	8.07	64.88	100	0	P	H
		4960	38.99	-35.01	74	65.24	31.63	6.75	64.63	100	0	P	V
		7440	44.05	-29.95	74	64.39	36.47	8.07	64.88	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BLE 4.2 (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		31.35	23.45	-16.55	40	29.52	23.7	0.44	30.21	-	-	P	H
		177.69	26.09	-17.41	43.5	40.25	14.88	1.26	30.3	-	-	P	H
		297.84	22.13	-23.87	46	31.74	19.04	1.49	30.14	-	-	P	H
		556.9	27.9	-18.1	46	29.85	25.76	2.01	29.72	-	-	P	H
		858.6	31.96	-14.04	46	29.71	28.99	2.49	29.23	100	0	P	H
		962.9	34.92	-19.08	54	30.09	31.12	2.74	29.03	-	-	P	H
		34.32	31	-9	40	38.49	22.31	0.45	30.25	100	0	P	V
		177.42	20.88	-22.62	43.5	35.04	14.88	1.26	30.3	-	-	P	V
		276.24	21.28	-24.72	46	31.11	18.86	1.48	30.17	-	-	P	V
		450.5	26.65	-19.35	46	31.78	22.99	1.76	29.88	-	-	P	V
		820.8	31.01	-14.99	46	30.07	27.8	2.44	29.3	-	-	P	V
	971.3	35.26	-18.74	54	30.43	31.11	2.74	29.02	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



2.4GHz 2400~2483.5MHz

BLE 5.0 (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2353.89	53.64	-20.36	74	44.12	27.07	14.03	31.58	110	237	P	H
		2330.685	44.52	-9.48	54	35.11	26.99	14.01	31.59	110	237	A	H
	*	2402	91.73	-	-	82.08	27.15	14.07	31.57	110	237	P	H
	*	2402	90.28	-	-	80.63	27.15	14.07	31.57	110	237	A	H
		2373.105	53.71	-20.29	74	44.14	27.11	14.04	31.58	395	49	P	V
		2350.845	44.44	-9.56	54	34.96	27.03	14.03	31.58	395	49	A	V
	*	2402	89.2	-	-	79.55	27.15	14.07	31.57	395	49	P	V
	*	2402	87.28	-	-	77.63	27.15	14.07	31.57	395	49	A	V
BLE CH 19 2440MHz		2327.22	53.59	-20.41	74	44.18	26.99	14.01	31.59	142	258	P	H
		2383.36	44.47	-9.53	54	34.88	27.11	14.06	31.58	142	258	A	H
	*	2440	92.55	-	-	82.74	27.28	14.1	31.57	142	258	P	H
	*	2440	90.94	-	-	81.13	27.28	14.1	31.57	142	258	A	H
		2497.9	54.36	-19.64	74	44.37	27.4	14.14	31.55	142	258	P	H
		2491.6	44.86	-9.14	54	34.88	27.4	14.14	31.56	142	258	A	H
		2371.88	53.95	-20.05	74	44.38	27.11	14.04	31.58	384	48	P	V
		2344.44	44.29	-9.71	54	34.81	27.03	14.03	31.58	384	48	A	V
	*	2440	89.52	-	-	79.71	27.28	14.1	31.57	384	48	P	V
	*	2440	87.82	-	-	78.01	27.28	14.1	31.57	384	48	A	V
		2483.76	53.98	-20.02	74	44.04	27.36	14.14	31.56	384	48	P	V
		2486.63	44.8	-9.2	54	34.86	27.36	14.14	31.56	384	48	A	V



BLE CH 39 2480MHz	*	2480	95.43	-	-	85.51	27.36	14.12	31.56	112	261	P	H
	*	2480	93.53	-	-	83.61	27.36	14.12	31.56	112	261	A	H
		2483.52	55.01	-18.99	74	45.07	27.36	14.14	31.56	112	261	P	H
		2499.96	44.67	-9.33	54	34.68	27.4	14.14	31.55	112	261	A	H
	*	2480	93.02	-	-	83.1	27.36	14.12	31.56	365	142	P	V
	*	2480	91.31	-	-	81.39	27.36	14.12	31.56	365	142	A	V
		2485.24	53.76	-20.24	74	43.82	27.36	14.14	31.56	365	142	P	V
		2495.68	44.6	-9.4	54	34.61	27.4	14.14	31.55	365	142	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BLE 5.0 (Harmonic @ 3m)

BLE	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 00 2402MHz		4804	39.29	-34.71	74	66.02	31.32	6.7	64.75	100	0	P	H
		4804	38.55	-35.45	74	65.28	31.32	6.7	64.75	100	0	P	V
BLE CH 19 2440MHz		4880	39.72	-34.28	74	66.23	31.46	6.73	64.7	100	0	P	H
		7320	44.46	-29.54	74	65.08	36.15	8.06	64.83	100	0	P	H
		4880	39.2	-34.8	74	65.71	31.46	6.73	64.7	100	0	P	V
BLE CH 39 2480MHz		7320	45.49	-28.51	74	66.11	36.15	8.06	64.83	100	0	P	V
		4960	39.86	-34.14	74	66.11	31.63	6.75	64.63	100	0	P	H
		7440	43.84	-30.16	74	64.18	36.47	8.07	64.88	100	0	P	H
		4960	39.23	-34.77	74	65.48	31.63	6.75	64.63	100	0	P	V
		7440	43.84	-30.16	74	64.18	36.47	8.07	64.88	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BLE 5.0 (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		31.35	23.41	-16.59	40	29.48	23.7	0.44	30.21	-	-	P	H
		176.07	25.75	-17.75	43.5	39.87	14.92	1.26	30.3	-	-	P	H
		291.9	22.76	-23.24	46	32.51	18.9	1.5	30.15	-	-	P	H
		582.1	27.75	-18.25	46	29.94	25.45	2.04	29.68	-	-	P	H
		848.1	32.18	-13.82	46	30.23	28.72	2.48	29.25	100	0	P	H
		980.4	35	-19	54	30.17	31.07	2.76	29	-	-	P	H
		32.97	31.14	-8.86	40	38.14	22.77	0.45	30.22	100	0	P	V
		183.9	21.66	-21.84	43.5	36.03	14.62	1.3	30.29	-	-	P	V
		262.2	20.91	-25.09	46	29.95	19.68	1.47	30.19	-	-	P	V
		439.3	27.15	-18.85	46	32.51	22.78	1.76	29.9	-	-	P	V
		895.7	33.22	-12.78	46	30.8	29	2.59	29.17	-	-	P	V
	966.4	34.45	-19.55	54	29.63	31.11	2.74	29.03	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

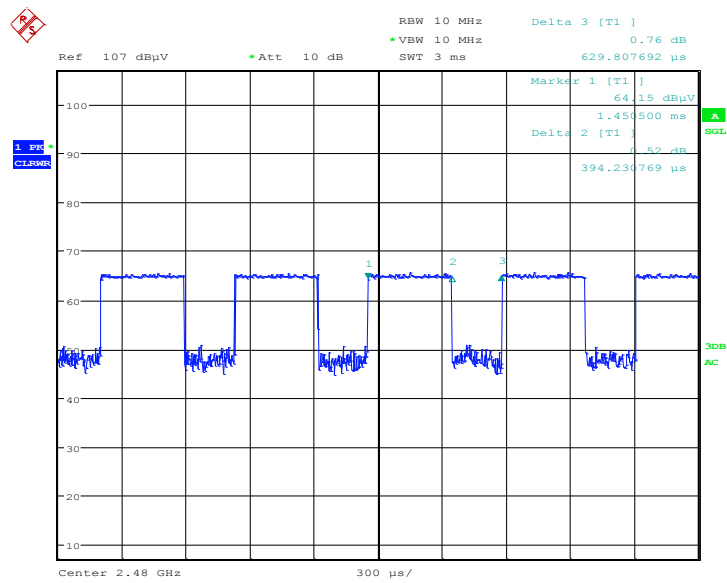
Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix B. Duty Cycle Plots

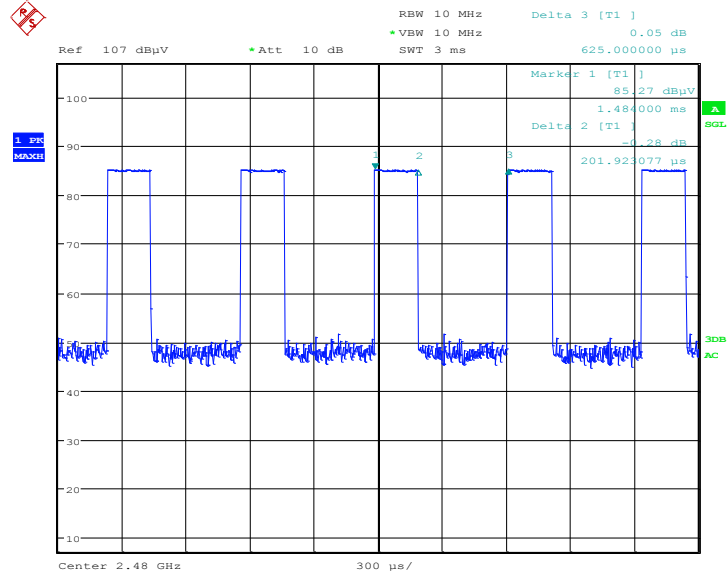
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth v4.2 LE	62.60	0.394	2.537	3kHz
Bluetooth v5.0 LE	32.31	0.202	4.952	10kHz

Bluetooth v4.2 LE





Bluetooth v5.0 LE





Appendix D. Reference Report

Please refer to Sporton report number FR7D2702B which is issued separately.