



FCC RF Test Report

APPLICANT : Sony Mobile Communications Inc.
EQUIPMENT : GSM/WCDMA/LTE Phone+Bluetooth,
DTS/UNII a/b/g/n and NFC
BRAND NAME : Sony
FCC ID : PY7-84795R
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

This is a variant report which is only valid together with the original test report. The product was received on Sep. 22, 2016 and testing was completed on Nov. 28, 2016. 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.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : PY7-84795R

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR692210-01B	Rev. 01	Initial issue of report	Feb. 06, 2017
FR692210-01B	Rev. 02	Add frequency channel list in section 2.1.	Feb. 14, 2017



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 8.18 dB at 2490.270 MHz
3.2	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Sony Mobile Communications Inc.

4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

1.2 Manufacturer

Sony Mobile Communications Inc.

4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII, a/b/g/n, GPS, and NFC

Standards-related Product Specification	
Antenna Type / Gain	PIFA Antenna type with gain -0.80 dBi

Remark: This is a variant report. All the test cases were performed on original report which can be referred to Sporton Report Number FR692208-01B.

EUT Information List			
HW Version	SW Version	S/N	Performed Test Item
A	0.85	RQ3002G82J	RF conducted measurement Radiated Spurious Emission

Accessory List	
AC Adapter 1	Model No. : UCH20
	S/N : 1215W48600011
Earphone 1	Model No. : MH410c
	S/N : 1632A86300007A6
USB Cable	Model No. : UCB20
	S/N : 1625A912000332E

Note:

1. Above EUT list and accessory list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test.
3. For other wireless features of this EUT, test report will be issued separately.

1.4 Modification of EUT

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



1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH05-HY

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH12-HY

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

1.6 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 v03r05
- ♦ 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 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
20	2442	-	-	



2.2 Descriptions of Test Mode

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth – LE RF Output Power	
		Data Rate / Modulation	
		GFSK	
		1Mbps	
Ch00	2402MHz	0.10 dBm	
Ch19	2440MHz	0.91 dBm	
Ch39	2480MHz	-0.59 dBm	

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (X plane as worst plane) from all possible combinations.

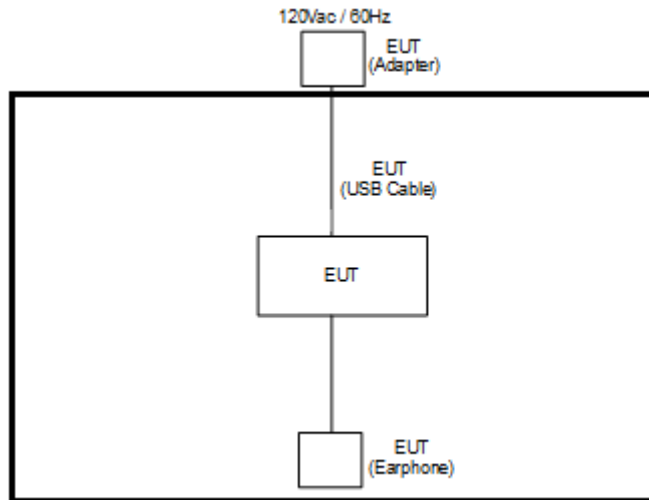
2.3 Test Mode

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 CH19_2440 MHz_1Mbps

2.4 Connection Diagram of Test System

<Bluetooth – LE Tx Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
3.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	N/A	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

For RF test items, an engineering test program was provided and enabled to make EUT transmitting signals.



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 FCC section 15.209 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.

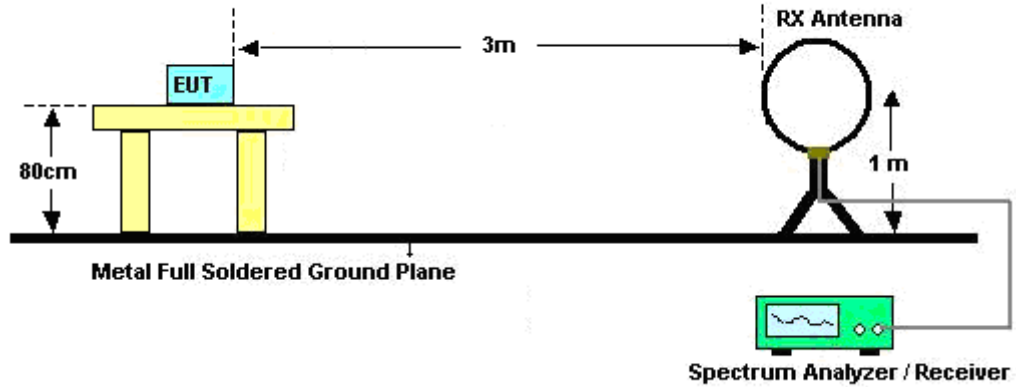


3.1.3 Test Procedures

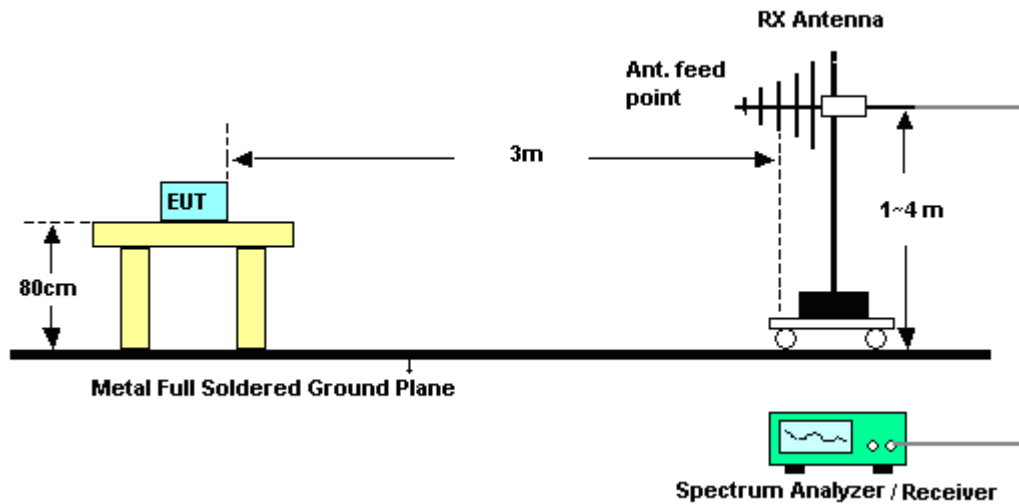
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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

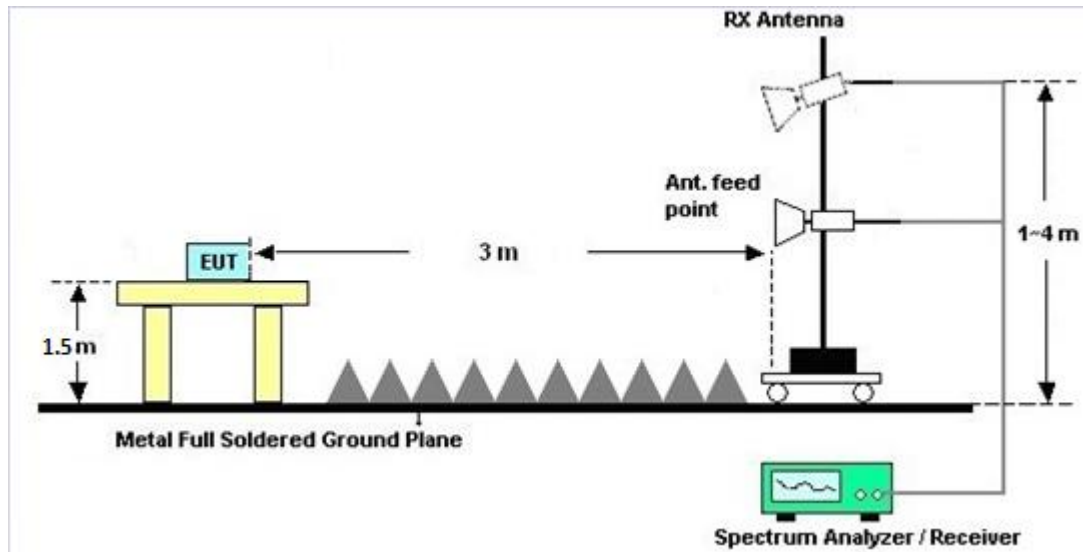
For radiated emissions below 30MHz



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 per 15.31(o) was not reported.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix A and B.



3.2 Antenna Requirements

3.2.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1240001	300MHz~40GHz z	Sep. 07, 2016	Oct. 02, 2016 ~ Nov. 25, 2016	Sep. 06, 2017	Conducted (TH05-HY)
Power Meter	Agilent	E4416A	GB412923 44	300MHz~40GHz z	Jan. 08, 2016	Oct. 02, 2016 ~ Nov. 25, 2016	Jan. 07, 2017	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US404415 48	300MHz~40GHz z	Jan. 07, 2016	Oct. 02, 2016 ~ Nov. 25, 2016	Jan. 06, 2017	Conducted (TH05-HY)
Hygrometer	Testo	608-H2	41410069	N/A	Aug. 28, 2016	Oct. 02, 2016 ~ Nov. 25, 2016	Aug. 27, 2017	Conducted (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY842095 21	1GHz~26GHz	Dec. 03, 2015	Oct. 02, 2016 ~ Nov. 25, 2016	Dec. 02, 2016	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Nov. 22, 2016 ~ Nov. 28, 2016	Sep. 01, 2017	Radiation (03CH12-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 10, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Nov. 09, 2017	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 15, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Oct. 14, 2017	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-152 2	1G~18GHz	Mar. 31, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Mar. 30, 2017	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 576	18GHz ~ 40GHz	Apr. 15, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Apr. 14, 2017	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 21, 2015	Nov. 22, 2016 ~ Nov. 28, 2016	Dec. 20, 2016	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9030A	MY523502 76	3Hz~44GHz	Mar. 21, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Mar. 20, 2017	Radiation (03CH12-HY)
Preamplifier	MITEQ	TTA0204	1872107	2GHz~40GHz	Feb. 15, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Feb. 14, 2017	Radiation (03CH12-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1815698	1GHz~18GHz	Dec. 14, 2015	Nov. 22, 2016 ~ Nov. 28, 2016	Dec. 13, 2016	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY532701 48	1GHz~26.5GHz	Jan. 30, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Jan. 29, 2017	Radiation (03CH12-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Nov. 14, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Nov. 13, 2017	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24958/ 4,MY2865 3/4,MY983 9/4PE	26GHz~40GHz	Jan. 12, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Jan. 11, 2017	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24958/ 4,MY2865 3/4,MY983 9/4PE	1GHz~26GHz	Jan. 12, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Jan. 11, 2017	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24958/ 4,MY2865 3/4,MY983 9/4PE	30MHz~1GHz	Jan. 12, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Jan. 11, 2017	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24958/ 4,MY2865 3/4,MY983 9/4PE	9K~30MHz	Jan. 12, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Jan. 11, 2017	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Nov. 22, 2016 ~ Nov. 28, 2016	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Nov. 22, 2016 ~ Nov. 28, 2016	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Nov. 22, 2016 ~ Nov. 28, 2016	N/A	Radiation (03CH12-HY)
Test Software	Audix	E3	6.2009-8-2 4	N/A	N/A	Nov. 22, 2016 ~ Nov. 28, 2016	N/A	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2G Low Pass	Sep. 19, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Sep. 18, 2017	Radiation (03CH12-HY)
Filter	Microwave	H3G018G1	SN477220	3.0G High Pass	Aug. 25, 2016	Nov. 22, 2016 ~ Nov. 28, 2016	Aug. 24, 2017	Radiation (03CH12-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.10
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.70
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Appendix A. Radiated Spurious Emission

Test Engineer :	Peter Chiu, Karl Hou, and Nick Yu	Temperature :	22~25°C
		Relative Humidity :	53~56%

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 19 2440MHz		2318.26	55.68	-18.32	74	53.04	26.85	7.3	31.51	108	284	P	H
		2340.8	45.25	-8.75	54	42.46	26.92	7.37	31.5	108	284	A	H
	*	2440	93.42	-	-	90.19	27.22	7.49	31.48	108	284	P	H
	*	2440	92.39	-	-	89.16	27.22	7.49	31.48	108	284	A	H
		2490.9	56.14	-17.86	74	52.71	27.37	7.53	31.47	108	284	P	H
		2484.53	45.53	-8.47	54	42.12	27.35	7.53	31.47	108	284	A	H
		2383.78	56.31	-17.69	74	53.3	27.05	7.45	31.49	334	5	P	V
		2365.16	45.22	-8.78	54	42.34	27	7.37	31.49	334	5	A	V
	*	2440	90.41	-	-	87.18	27.22	7.49	31.48	334	5	P	V
	*	2440	89.42	-	-	86.19	27.22	7.49	31.48	334	5	A	V
		2497.76	56.24	-17.76	74	52.78	27.39	7.53	31.46	334	5	P	V
		2490.27	45.82	-8.18	54	42.39	27.37	7.53	31.47	334	5	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 (Harmonic @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
BLE CH 19 2440MHz		4880	39.09	-34.91	74	54.02	32.28	10.89	58.1	100	0	P	H	
		7320	43.39	-30.61	74	51.31	37	14.18	59.1	100	0	P	H	
													H	
													H	
			4880	38.74	-35.26	74	53.67	32.28	10.89	58.1	100	0	P	V
			7320	43.4	-30.6	74	51.32	37	14.18	59.1	100	0	P	V
														V
														V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	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		98.58	23.37	-20.13	43.5	38.86	15.88	1.06	32.43			P	H	
		134.22	26.88	-16.62	43.5	39.95	17.92	1.43	32.42			P	H	
		153.12	32.45	-11.05	43.5	45.77	17.35	1.75	32.42	100	0	P	H	
		441.4	24.33	-21.67	46	30.88	22.94	2.89	32.38			P	H	
		572.3	25.56	-20.44	46	29.76	24.9	3.3	32.4			P	H	
		731.9	28.55	-17.45	46	29.82	27.18	3.89	32.34			P	H	
													H	
													H	
													H	
													H	
													H	
													H	
			35.67	30.23	-9.77	40	39.37	22.54	0.78	32.46	100	0	P	V
			72.12	24.58	-15.42	40	43.42	12.55	1.06	32.45			P	V
			124.77	25.83	-17.67	43.5	39.02	17.8	1.43	32.42			P	V
			523.3	25.12	-20.88	46	30.09	24.24	3.19	32.4			P	V
			643.7	27.51	-18.49	46	30.37	25.93	3.61	32.4			P	V
			762	29.91	-16.09	46	30.57	27.65	3.97	32.28			P	V
													V	
													V	
												V		
												V		
												V		
												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:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

- Level(dBμV/m) =
Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

- Level(dBμV/m)
= Antenna Factor(dB/m) + Cable 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- Level(dBμV/m)
= Antenna Factor(dB/m) + Cable 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)
- 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. Radiated Spurious Emission

Test Engineer :	Peter Chiu, Karl Hou, Nick Yu, and Citta Ke	Temperature :	21~23°C
		Relative Humidity :	54~58%

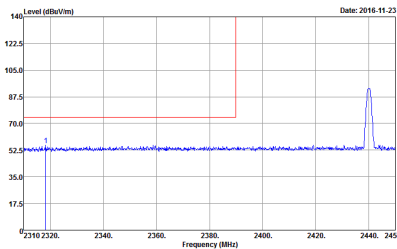
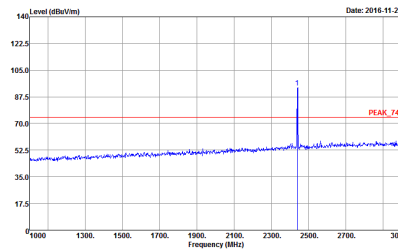
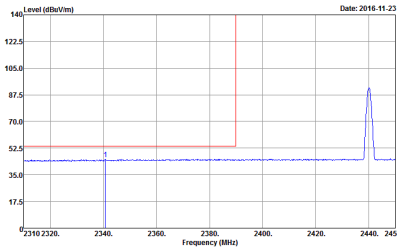
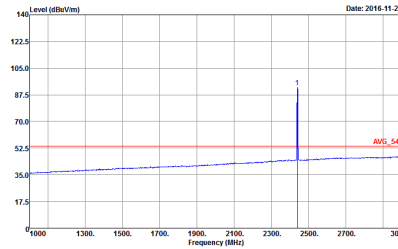
Note symbol

-L	Low channel location
-R	High channel location

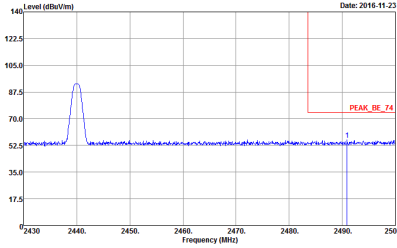
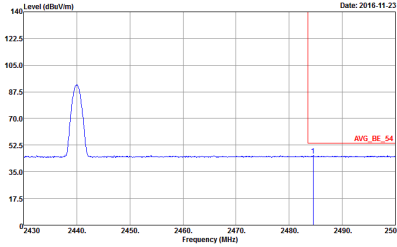


2.4GHz 2400~2483.5MHz

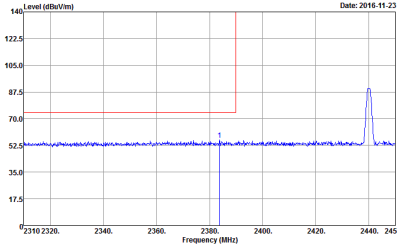
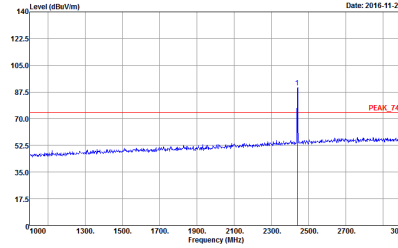
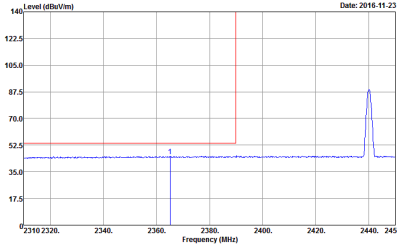
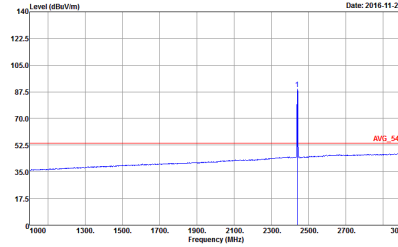
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Date: 2016-11-23</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>	 <p>Date: 2016-11-23</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>
Avg.	 <p>Date: 2016-11-23</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>	 <p>Date: 2016-11-23</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 692210-01 Mode : 3</p>	Left blank
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 692210-01 Mode : 3</p>	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Vertical	Fundamental
Peak	 <p>Level (dBm/Vm) vs Frequency (MHz) plot showing a peak at 2440 MHz. The y-axis ranges from 17.5 to 140 dBm/Vm, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line marks the peak at 2440 MHz.</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>	 <p>Level (dBm/Vm) vs Frequency (MHz) plot showing a peak at 2440 MHz. The y-axis ranges from 17.5 to 140 dBm/Vm, and the x-axis ranges from 1000 to 3000 MHz. A red vertical line marks the peak at 2440 MHz, labeled 'PEAK_74'.</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>
Avg.	 <p>Level (dBm/Vm) vs Frequency (MHz) plot showing the average spectrum. The y-axis ranges from 17.5 to 140 dBm/Vm, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line marks the peak at 2440 MHz.</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>	 <p>Level (dBm/Vm) vs Frequency (MHz) plot showing the average spectrum. The y-axis ranges from 17.5 to 140 dBm/Vm, and the x-axis ranges from 1000 to 3000 MHz. A red vertical line marks the peak at 2440 MHz, labeled 'AVG_54'.</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Project : Peak Mode : 692210-01 : 3</p>

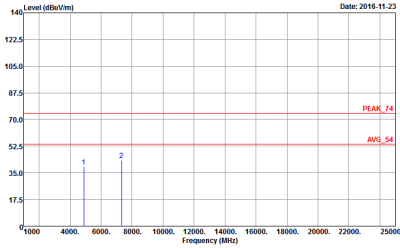
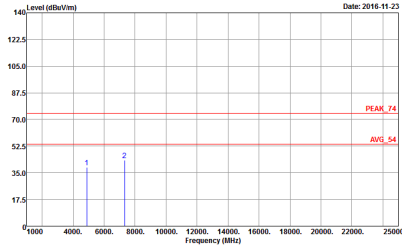


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Vertical	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 692210-01 Mode : 3</p>	Left blank
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 692210-01 Mode : 3</p>	Left blank



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
1	Horizontal	Vertical
<p>Peak Avg.</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 692210-01 Mode : 3</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 692210-01 Mode : 3</p>



Emission below 1GHz

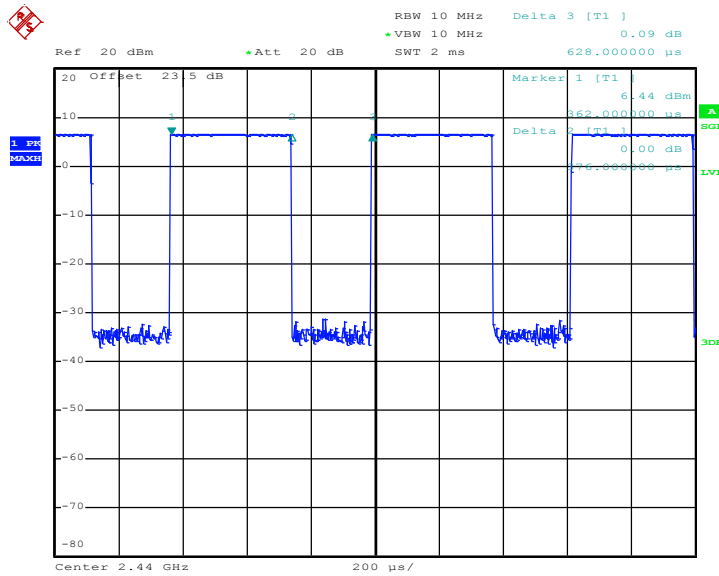
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
1	Horizontal	Vertical
QP / Peak	<p>Site : 03CH12-HY Condition : QP 3m BILOG_6111D_37059 HORIZONTAL Project : 692210-01 Mode : -4</p>	<p>Site : 03CH12-HY Condition : QP 3m BILOG_6111D_37059 VERTICAL Project : 692210-01 Mode : -4</p>

Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
Bluetooth -LE	59.87	376	2.66	3kHz

Bluetooth - LE



Date: 2.OCT.2016 14:19:12



Appendix D. Original Report

Please refer to Sporton report number FR692208-01B