



FCC Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1952-2
FCC ID : IHDT56XR3
STANDARD : FCC CFR Title 47 Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Dec. 18, 2018 and testing was completed on Dec. 21, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 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 (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.
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Jiangsu Province, China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC8D1823	Rev. 01	Initial issue of report	Jan. 25, 2019



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.35 dB at 37.760 MHz for Quasi-Peak



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	XT1952-2
FCC ID	IHDT56XR3
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(downlink only)/LTE WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth BR/EDR/LE
IMEI Code	Radiation: 352173100021533/352173100021541 for Sample1 352173100032118/352173100032126 for Sample2
HW Version	DVT 2
SW Version	PPY29.13
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT, the differences between two samples are only for memory, the sample 1 is 2+32GB capacity, the sample 2 is 4+64GB capacity. According to the difference, we evaluate the sample 1 to perform full test and the sample 2 verify worse case of the sample 1 for Radiation.
3. Sample 1 & Sample2 are dual SIM slot.
4. This is a variant report for XT1952-2. For model change note, please refer the product equality declaration exhibit submitted. Based on the similarity between current and previous project, only the worst case of RSE from original test report (Sporton Report Number FC890510-01) were verified for the differences.



1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2179.3 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz GNSS : 1559 MHz ~ 1610 MHz FM
Antenna Type	WWAN : Fixed Antenna WLAN : monopole Antenna Bluetooth : monopole Antenna GNSS: monopole Antenna FM : Extrenal Headset Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (Uplink is not supported) DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK FM

1.5. Specification of Accessory

Specification of Accessory				
AC Adapter 1 (US)	Brand Name	Motorola(Acbel)	Model Name	SC-61
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 1 (EU)	Brand Name	Motorola(Acbel)	Model Name	SC-62
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 1 (UK)	Brand Name	Motorola(Acbel)	Model Name	SC-63
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 1(AR)	Brand Name	Motorola(Acbel)	Model Name	SC-64
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 1 (Chile)	Brand Name	Motorola(Acbel)	Model Name	SC-62
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 2 (US)	Brand Name	Motorola(Chenyang)	Model Name	SC-61
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 2 (EU)	Brand Name	Motorola(Chenyang)	Model Name	SC-62
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 2(UK)	Brand Name	Motorola(Chenyang)	Model Name	SC-63
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 2(AR)	Brand Name	Motorola(Chenyang)	Model Name	SC-64
	Power Rating	I/P: 100 - 240 Vac, 0.13A, O/P: 5Vdc 1000mA		
AC Adapter 3 (IN)	Brand Name	Motorola(Salom)	Model Name	SC-44
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (AU)	Brand Name	Motorola(Salom)	Model Name	SC-45
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (BR)	Brand Name	Motorola(Salom)	Model Name	SC-47
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (US)	Brand Name	Motorola(Salom)	Model Name	SC-41
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (EU)	Brand Name	Motorola(Salom)	Model Name	SC-42
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (Chile)	Brand Name	Motorola(Salom)	Model Name	SC-42
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 3 (AR)	Brand Name	Motorola(Salom)	Model Name	SC-46
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 4 (AU)	Brand Name	Motorola(Acbel)	Model Name	SC-45
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		



AC Adapter 4 (US)	Brand Name	Motorola(Acbel)	Model Name	SC-41
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 4 (EU)	Brand Name	Motorola(Acbel)	Model Name	SC-42
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 4 (AR)	Brand Name	Motorola(Acbel)	Model Name	SC-46
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 5 (BR)	Brand Name	Motorola(Cliptech/Tenpao)	Model Name	SC-47
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
AC Adapter 6 (BR)	Brand Name	Motorola(Salom/Flex)	Model Name	SC-47
	Power Rating	I/P: 100 - 240 Vac, 0.3A, O/P: 5Vdc 2000mA		
Earphone 1	Brand Name	Motorola (Lianyun)	Model Name	LYM500-036-002
	Signal Line	1.2 meter, non-shielded cable, without ferrite core		
Earphone 2	Brand Name	Motorola (Lyand)	Model Name	SH38C37773
	Signal Line	1.1 meter, non-shielded cable, without ferrite core		
USB Cable 1	Brand Name	Motorola(LiQi)	Model Name	L32B-053000100/ L32B-053000100L
	Signal Line	1.0 meter, shielded cable, without ferrite core		
USB Cable 2	Brand Name	Motorola (SaiBao)	Model Name	S32B-053000100/ S32B-053000100L
	Signal Line	1.0 meter, shielded cable, without ferrite core		
USB Cable 3	Brand Name	Motorola (I SHENG)	Model Name	SC18C28955
	Signal Line	1.0 meter, shielded cable, without ferrite core		
Battery	Brand Name	Motorola (SCUD)	Model Name	JE40
	Power Rating	3.8Vdc, 3000mAh	Type	Li-ion

1.6. Modification of EUT

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

1.7. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0).

Test Site	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province, China TEL : 86-512-57900158 FAX : 86-512-57900958		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	03CH02-KS	CN5013	630927

1.8. Applicable Standards

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

- ♦ FCC CFR Title 47 Part 15 Subpart B
- ♦ ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

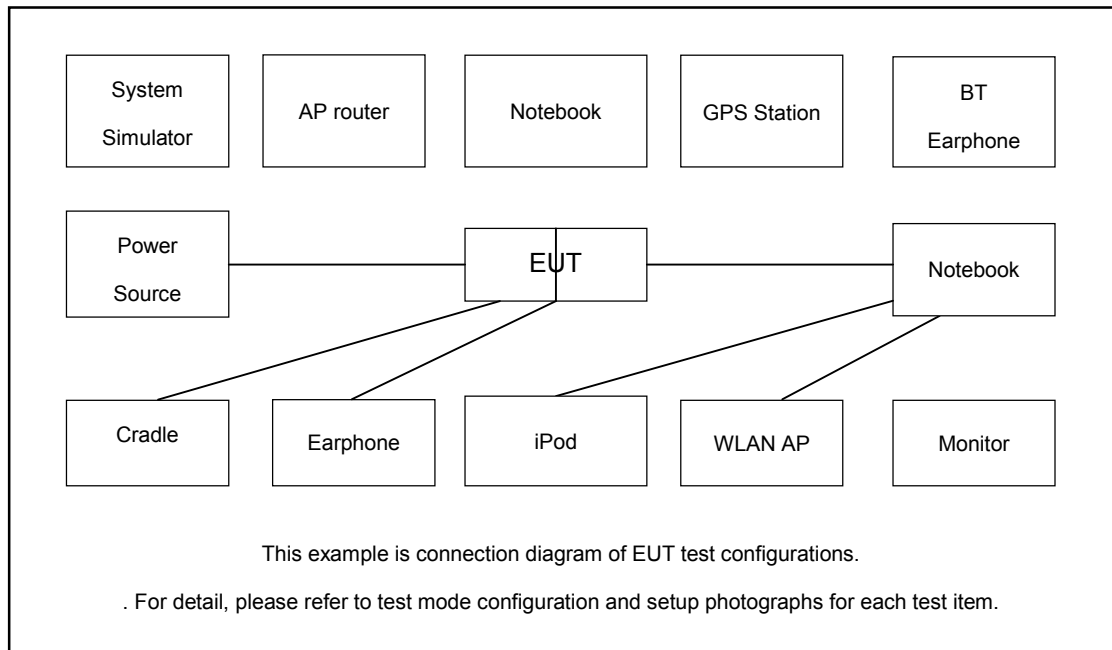
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
Radiated Emissions	Mode 1: WCDMA Band V Idle + Earphone1 + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Colur bar) + USB Cable1 (Charging from Adapter1) + SIM1 for Sample1
	Mode 2: WCDMA Band V Idle + Earphone1 + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + USB Cable1 (Charging from Adapter1) + SIM1 for Sample1
	Mode 3: WCDMA Band V Idle + Earphone1 + Bluetooth Idle + WLAN (2.4G) Idle + GNSS Rx + USB Cable1 (Data Link with Notebook) + SIM1 for Sample2
Remark: 1. The worst case of RE is mode 1; only the test data of this mode is reported. 2. Data Link with Notebook means data application transferred mode between EUT and Notebook.	

2.2. Connection Diagram of Test System



2.3. 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, 1.8m
2.	Vector Signal Generator	R&S	SMBV100A	258305	N/A	N/A
3.	WLAN AP	TP-LINK	TL-WDR5600	N/A	N/A	Unshielded, 1.8m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
5.	Notebook	Dell	MT320	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
6.	SD Card	SanDisk	Uitra	N/A	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between Notebook and EUT via USB cable.
2. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.
3. Turn on camera to capture images.
4. Turn on MPEG4 function.
5. Turn on FM receiver function to make the EUT receive continuous signals from FM station

3. Test Result

3.1. Test of Radiated Emission Measurement

3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2. Measuring Instruments

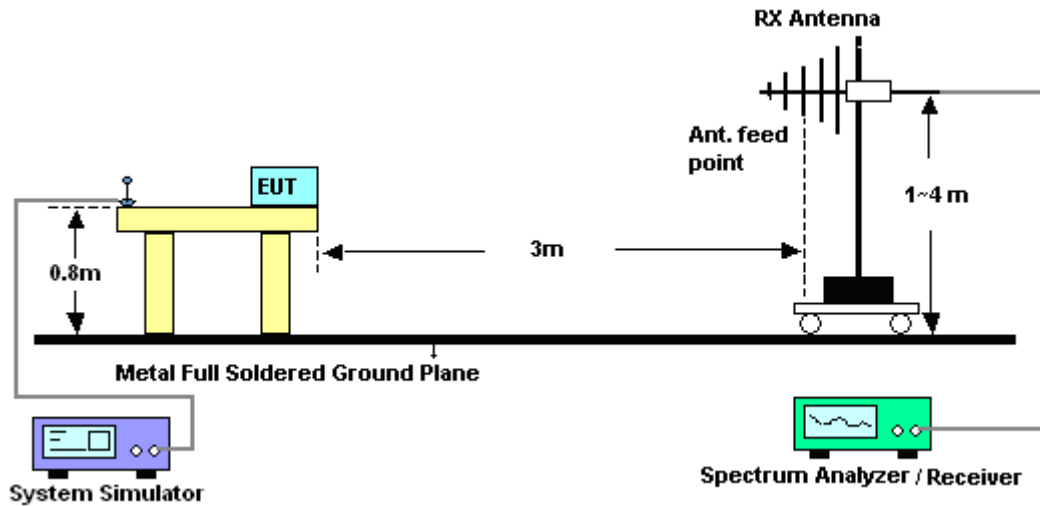
The measuring equipment is listed in the section 4 of this test report.

3.1.3. Test Procedures

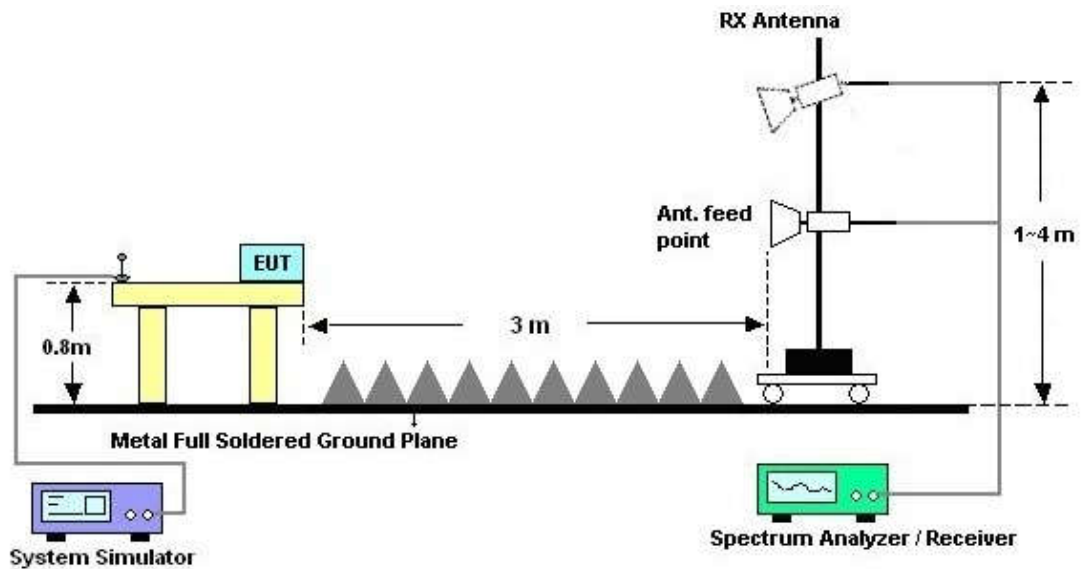
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, 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.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dB μ V/m) = 20 log Emission level (μ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.1.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



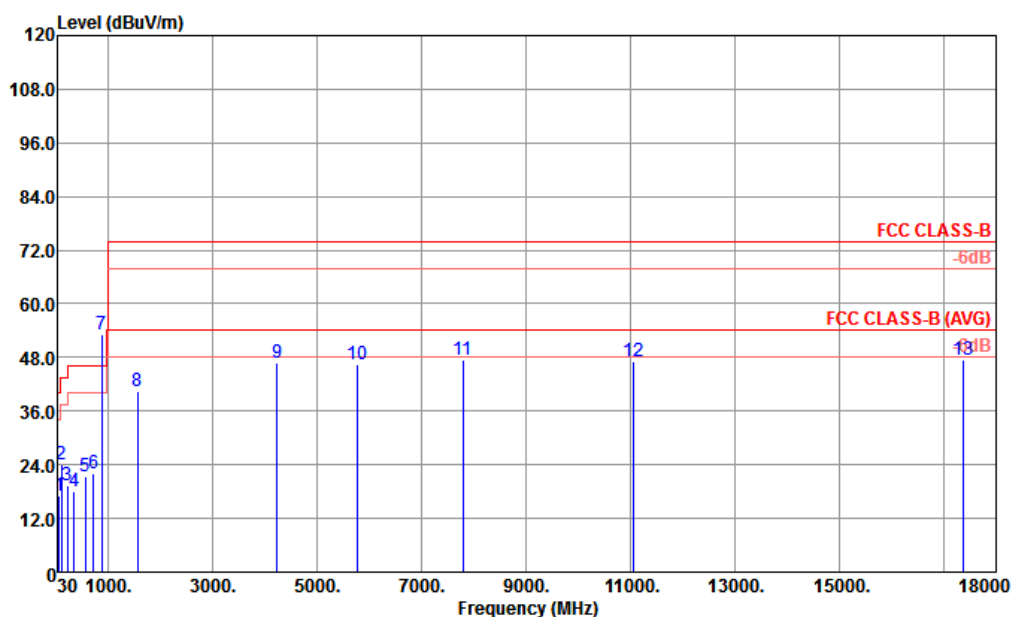
For radiated emissions above 1GHz





3.1.5. Test Result of Radiated Emission

Test Engineer :	Imp Xu	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		

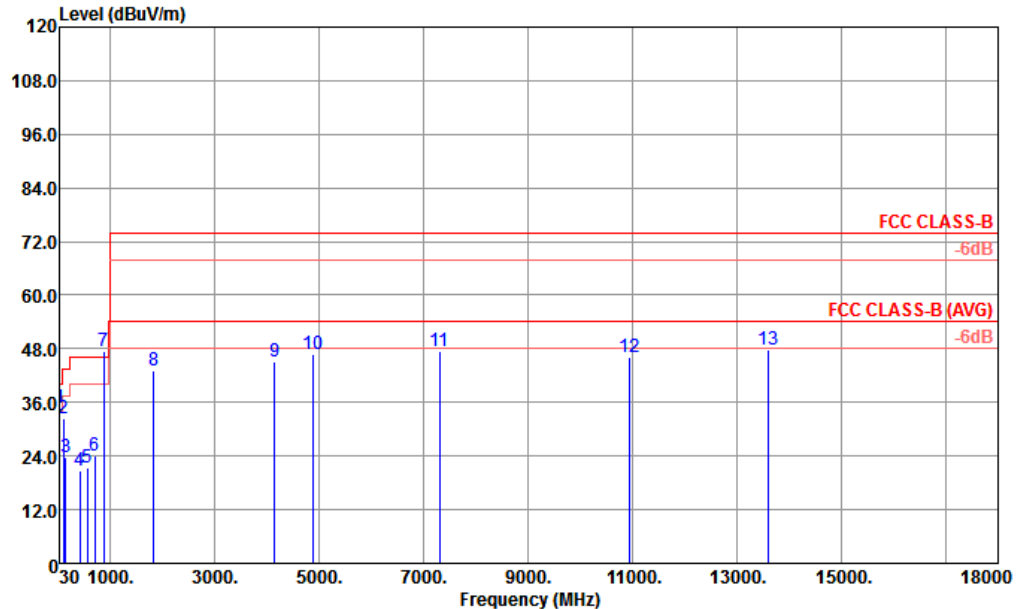


Site : 03CH02-KS
Condition : FCC CLASS-B 3m LF 23182-3M HORIZONTAL

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	62.98	16.91	-23.09	40.00	35.56	12.46	0.82	31.93	---	Peak
2	108.57	24.14	-19.36	43.50	37.53	17.47	1.07	31.93	100	Peak
3	219.15	19.50	-26.50	46.00	34.75	15.11	1.56	31.92	---	Peak
4	356.89	18.09	-27.91	46.00	27.77	20.49	1.91	32.08	---	Peak
5	564.47	21.54	-24.46	46.00	27.49	23.90	2.51	32.36	---	Peak
6	725.49	22.08	-23.92	46.00	26.78	24.90	2.69	32.29	---	Peak
7 *	881.66	53.05			55.35	26.29	2.99	31.58	---	Peak
8	1560.00	40.59	-33.41	74.00	44.86	28.93	4.07	37.27	---	Peak
9	4240.00	46.65	-27.35	74.00	40.65	35.51	7.34	36.85	---	Peak
10	5784.00	46.60	-27.40	74.00	40.44	34.88	8.22	36.94	---	Peak
11	7792.00	47.32	-26.68	74.00	39.29	35.70	9.46	37.13	---	Peak
12	11052.00	46.99	-27.01	74.00	34.24	38.97	11.43	37.65	---	Peak
13	17370.00	47.54	-26.46	74.00	27.70	41.27	14.15	35.58	---	Peak



Test Engineer :	Imp Xu	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m LF 23182-3M VERTICAL

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor			
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 !	37.76	34.65	-5.35	40.00	46.03	19.94	0.64	31.96	100	360 QP
2	109.54	32.30	-11.20	43.50	45.64	17.52	1.07	31.93	---	Peak
3	157.07	23.75	-19.75	43.50	38.40	16.00	1.28	31.93	---	Peak
4	423.82	20.82	-25.18	46.00	28.92	21.98	2.08	32.16	---	Peak
5	564.47	21.51	-24.49	46.00	27.46	23.90	2.51	32.36	---	Peak
6	706.09	24.12	-21.88	46.00	29.12	24.67	2.66	32.33	---	Peak
7 *	880.69	47.52	---	---	49.84	26.28	2.99	31.59	---	Peak
8	1840.00	43.17	-30.83	74.00	46.26	29.40	4.38	36.87	---	Peak
9	4144.00	45.18	-28.82	74.00	39.40	35.34	7.25	36.81	---	Peak
10	4880.00	46.70	-27.30	74.00	39.91	35.61	7.92	36.74	---	Peak
11	7312.00	47.55	-26.45	74.00	39.49	35.89	9.12	36.95	---	Peak
12	10944.00	46.17	-27.83	74.00	33.57	38.89	11.39	37.68	---	Peak
13	13590.00	47.94	-26.06	74.00	30.88	39.68	12.65	35.27	---	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Aug. 08, 2018	Dec. 21, 2018	Aug. 07, 2019	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44G,MAX 30dB	Apr. 17, 2018	Dec. 21, 2018	Apr. 16, 2019	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz~2GHz	Jan. 29, 2018	Dec. 21, 2018	Jan. 28, 2019	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Jan. 21, 2018	Dec. 21, 2018	Jan. 20, 2019	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Dec. 21, 2018	Feb. 06, 2019	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Feb. 08, 2018	Dec. 21, 2018	Feb. 07, 2019	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Aug. 06, 2018	Dec. 21, 2018	Aug. 05, 2019	Radiation (03CH02-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5G Hz	Apr. 18, 2018	Dec. 21, 2018	Apr. 17, 2019	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Dec. 21, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Dec. 21, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Dec. 21, 2018	NCR	Radiation (03CH02-KS)

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% ($U = 2Uc(y)$)	4.8 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2 dB
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