



# FCC Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : USB Modem  
**BRAND NAME** : ZTE  
**MODEL NAME** : MF833CA  
**FCC ID** : SRQ-MF833CA  
**STANDARD** : 47 CFR Part 15 Subpart B  
**CLASSIFICATION** : Certification

The product was received on Oct. 21, 2019 and testing was completed on Nov. 01, 2019. 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.

*Jason Jia*

Reviewed by: Jason Jia / Supervisor

*James Huang*

Approved by: James Huang / Manager



**Sporton International (Kunshan) Inc.**

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China



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### REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC902111	Rev. 01	Initial issue of report	Nov. 13, 2019



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 11.87 dB at 0.479 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 6.48 dB at 39.700 MHz

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



# 1. General Description

## 1.1. Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,Nanshan District,Shenzhen, Guangdong, 518057,P.R.China

## 1.2. Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,Nanshan District,Shenzhen, Guangdong, 518057,P.R.China

## 1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	USB Modem
Brand Name	ZTE
Model Name	MF833CA
FCC ID	SRQ-MF833CA
EUT supports Radios application	GPRS/EGPRS/WCDMA/LTE
IMEI Code	Conduction: 867156040001101 Radiation: N/A
HW Version	MF833CAHW1.0
SW Version	MF833CAV1.0
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	
<b>Tx Frequency</b>	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 12 : 699.7 MHz ~ 715.3 MHz
<b>Rx Frequency</b>	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 12 : 729.7 MHz ~ 745.3 MHz
<b>Antenna Type</b>	Dipole Antenna
<b>Type of Modulation</b>	GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : QPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (16QAM uplink is not supported) DC-HSDPA : 64QAM LTE: QPSK / 16QAM

### 1.5. Modification of EUT

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



### 1.6. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

<b>Test Firm</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-KS 03CH06-KS	CN1257	314309

### 1.7. Applicable Standards

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

- 47 CFR 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

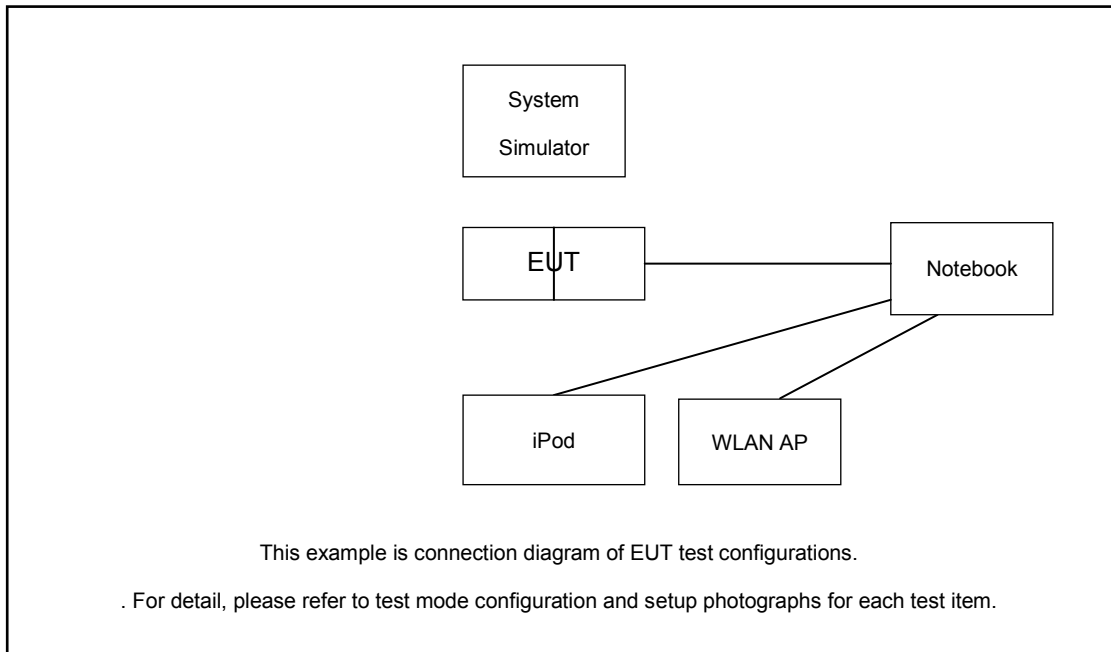
The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM850 Rx(Middle) + Charging from Notebook Mode 2: WCDMA Band II Rx + Data Link with Notebook Mode 3: LTE Band 5 Rx(Low) + Charging from Notebook Mode 4: LTE Band 12 Rx(High) + Charging from Notebook Mode 5: LTE Band 7 Rx + Charging from Notebook
Radiated Emissions	Mode 1: GSM850 Rx(Middle) + Charging from Notebook Mode 2: WCDMA Band II Rx + Data Link with Notebook Mode 3: LTE Band 5 Rx(Low) + Data Link with Notebook Mode 4: LTE Band 12 Rx(High) + Data Link with Notebook Mode 5: LTE Band 7 Rx + Data Link with Notebook
<b>Remark:</b> <ol style="list-style-type: none"> <li>The worst case of AC is mode 4; only the test data of this mode is reported.</li> <li>The worst case of RE is mode 3; only the test data of this mode is reported.</li> <li>Data Link with Notebook means data application transferred mode between EUT and Notebook</li> <li>Pre-scanned Low/Middle/High channel for GSM850/LTE Band 5/12, the worst channel was recorded in this report.</li> </ol>	



## 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.	Base Station	R&S	CMU 200	N/A	N/A	Unshielded,1.8m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
3.	WLAN AP	D-Link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
4.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
5.	iPod	Apple	A1199	Fcc DoC	Shielded, 1.2m	N/A
6.	USB HD	Lenovo	LH310	N/A	Shielded, 1.2m	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 programs installed in the EUT were programmed during the test.

1. Data application is transferred between Notebook and EUT.



### 3. Test Result

#### 3.1. Test of AC Conducted Emission Measurement

##### 3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

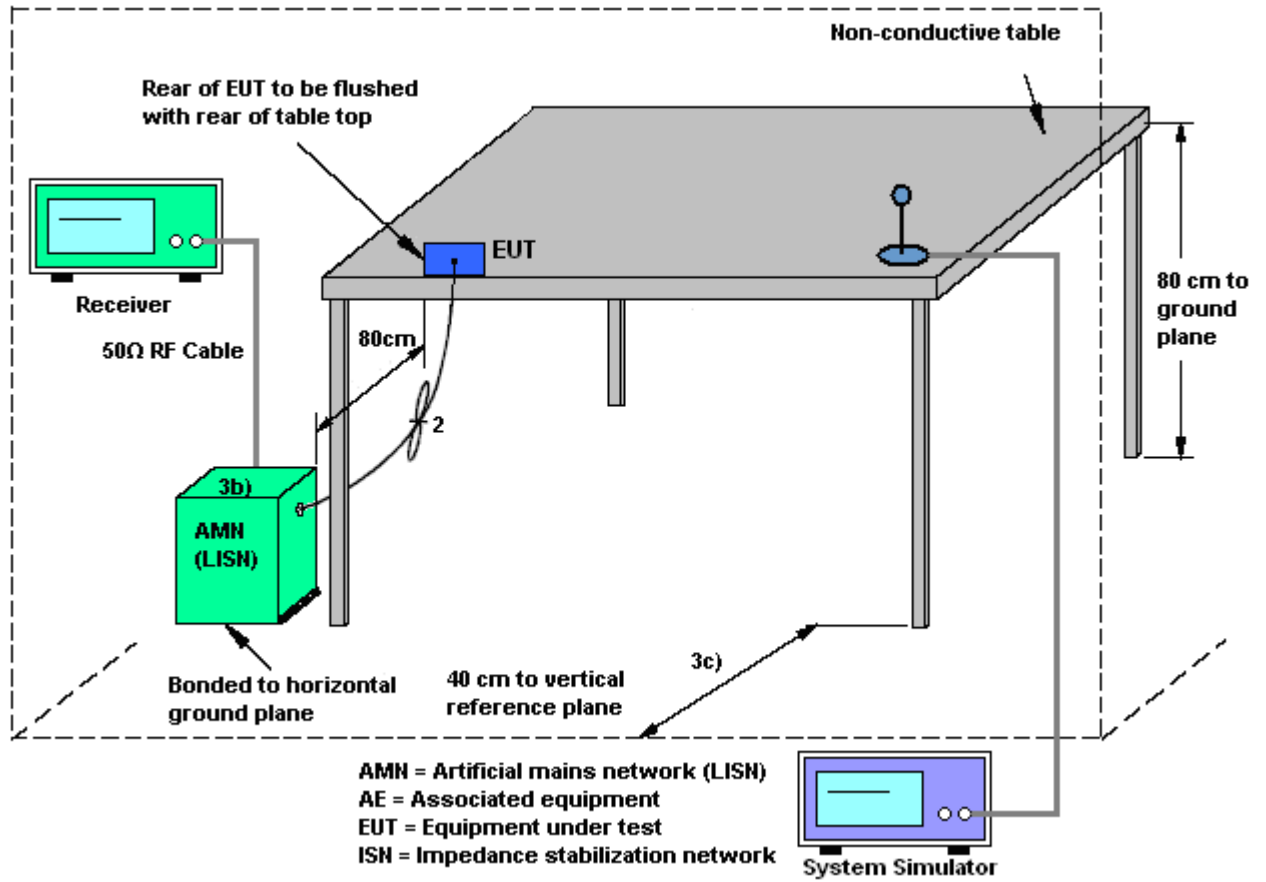
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedure

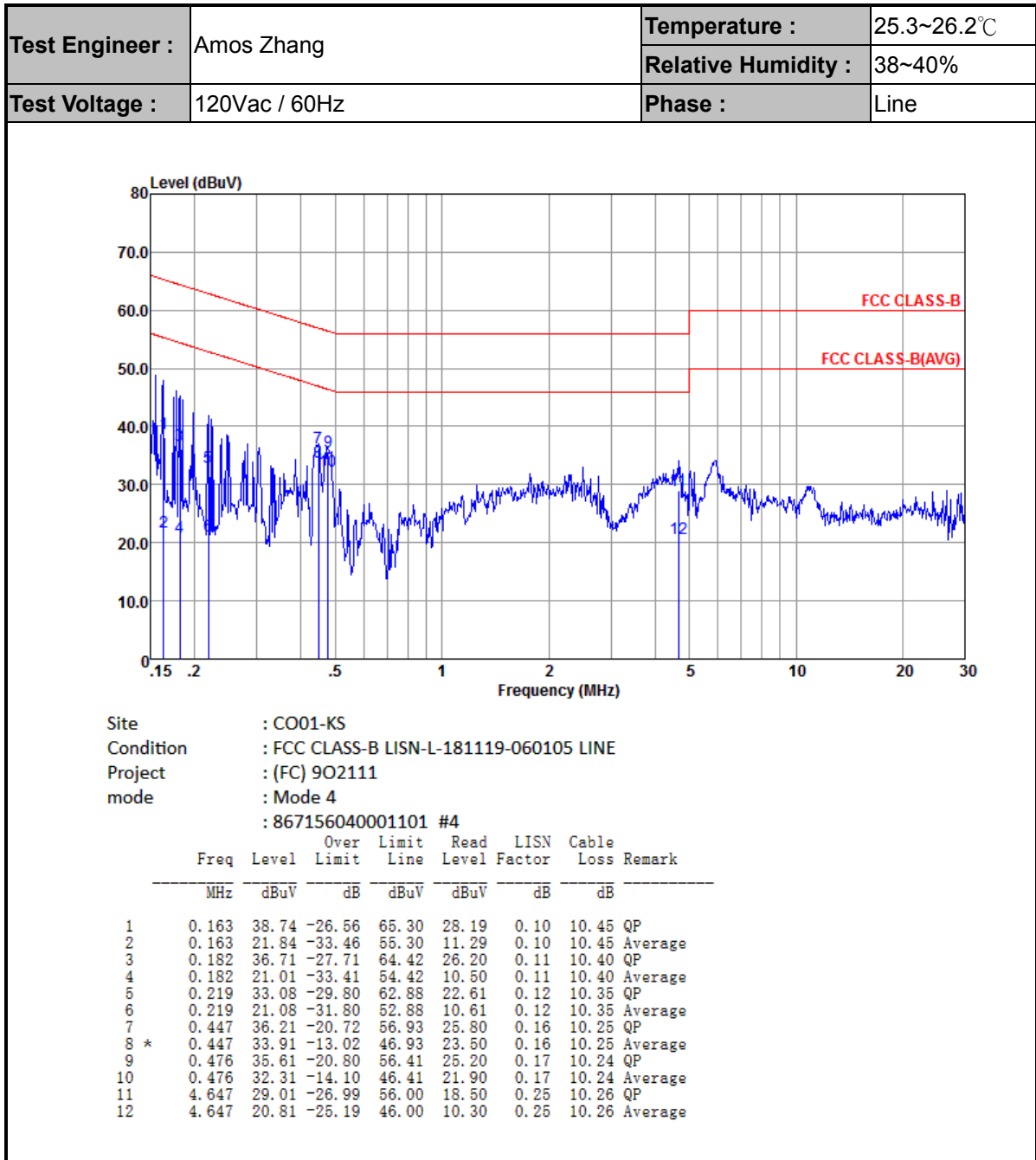
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

### 3.1.4 Test Setup



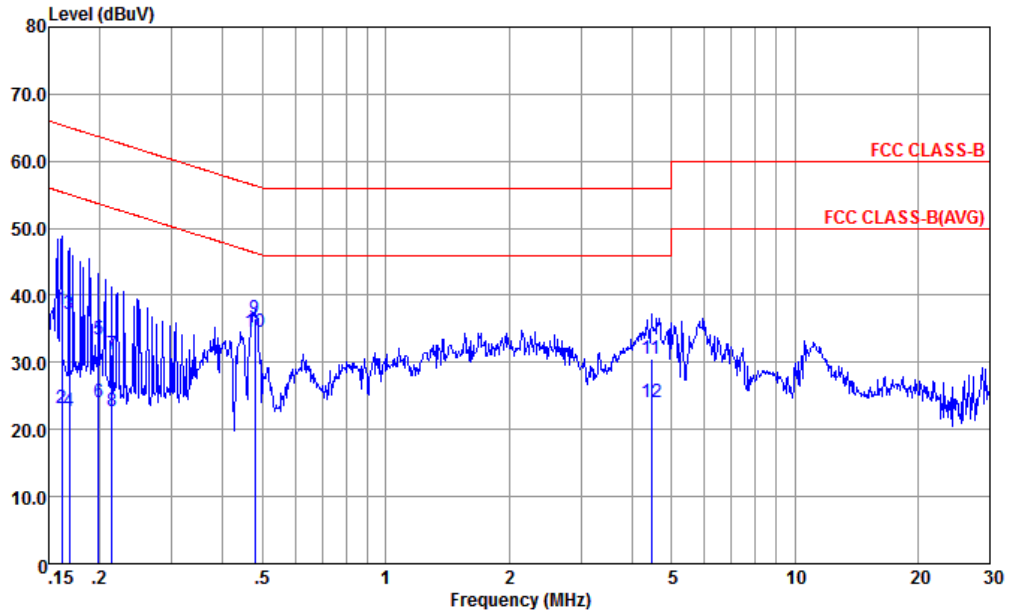


3.1.5 Test Result of AC Conducted Emission





Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-KS  
 Condition : FCC CLASS-B LISN-N-181119-060105 NEUTRAL  
 Project : (FC) 902111  
 mode : Mode 4  
 : 867156040001101 #4

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.162	37.83	-27.55	65.38	27.20	0.18	10.45	QP
2	0.162	23.23	-32.15	55.38	12.60	0.18	10.45	Average
3	0.169	37.21	-27.82	65.03	26.60	0.18	10.43	QP
4	0.169	22.81	-32.22	55.03	12.20	0.18	10.43	Average
5	0.199	33.44	-30.23	63.67	22.90	0.17	10.37	QP
6	0.199	24.14	-29.53	53.67	13.60	0.17	10.37	Average
7	0.214	31.13	-31.92	63.05	20.61	0.17	10.35	QP
8	0.214	22.83	-30.22	53.05	12.31	0.17	10.35	Average
9	0.479	36.59	-19.77	56.36	26.20	0.15	10.24	QP
10 *	0.479	34.49	-11.87	46.36	24.10	0.15	10.24	Average
11	4.454	30.64	-25.36	56.00	20.20	0.18	10.26	QP
12	4.454	24.14	-21.86	46.00	13.70	0.18	10.26	Average

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



### 3.2. Test of Radiated Emission Measurement

#### 3.2.1. 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

#### 3.2.2. Measuring Instruments

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



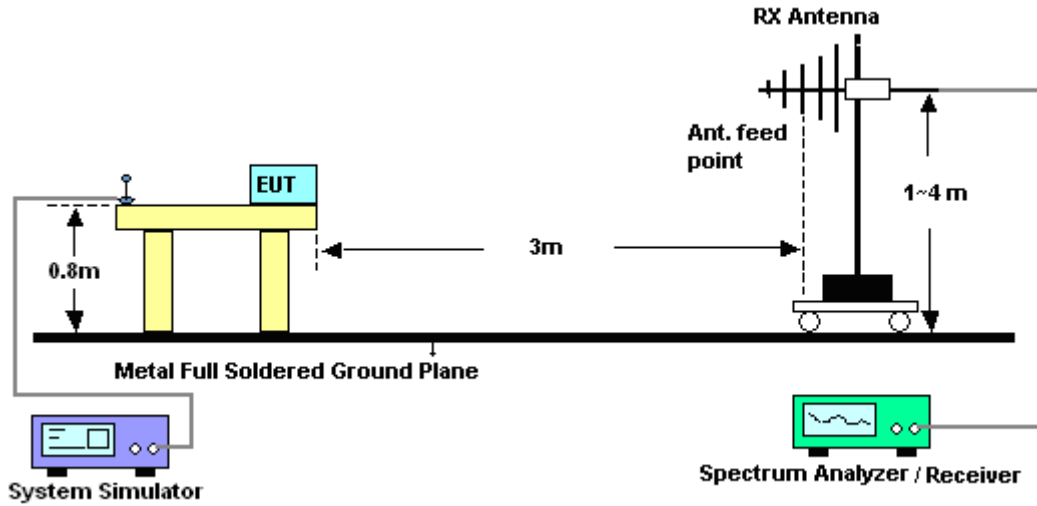
### **3.2.3. Test Procedures**

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 $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

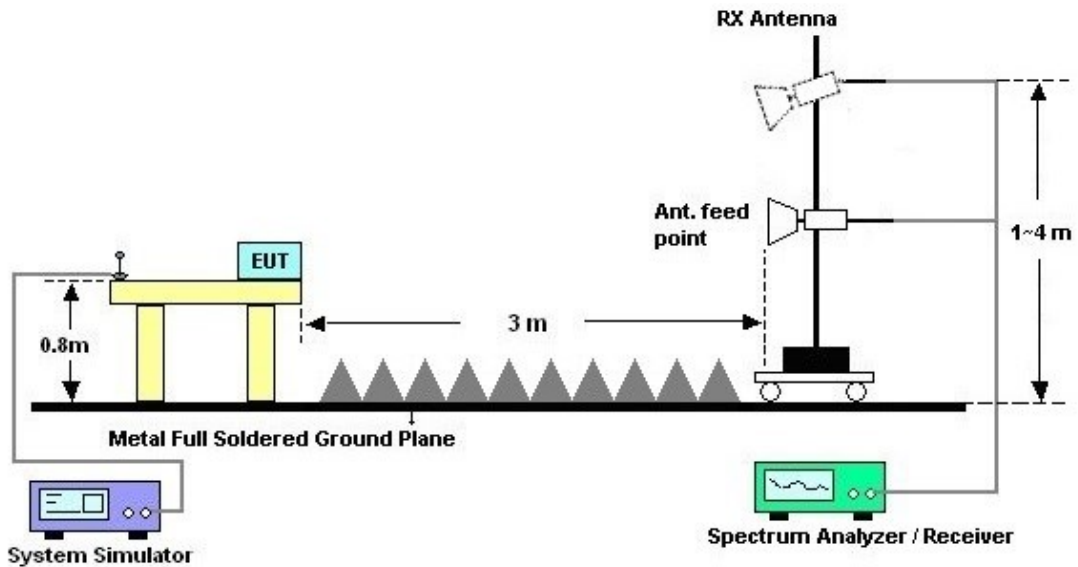


### 3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



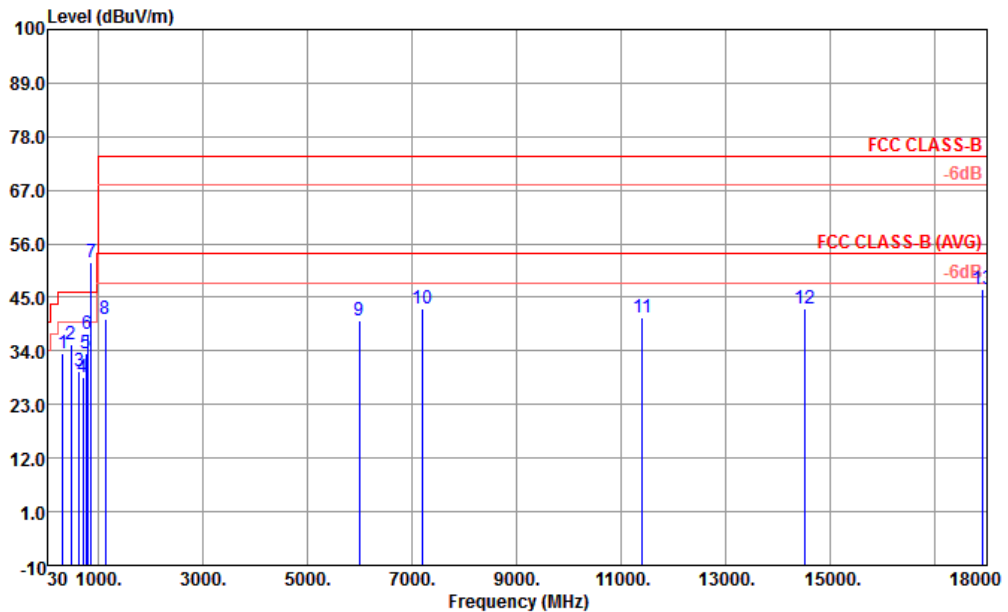
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

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

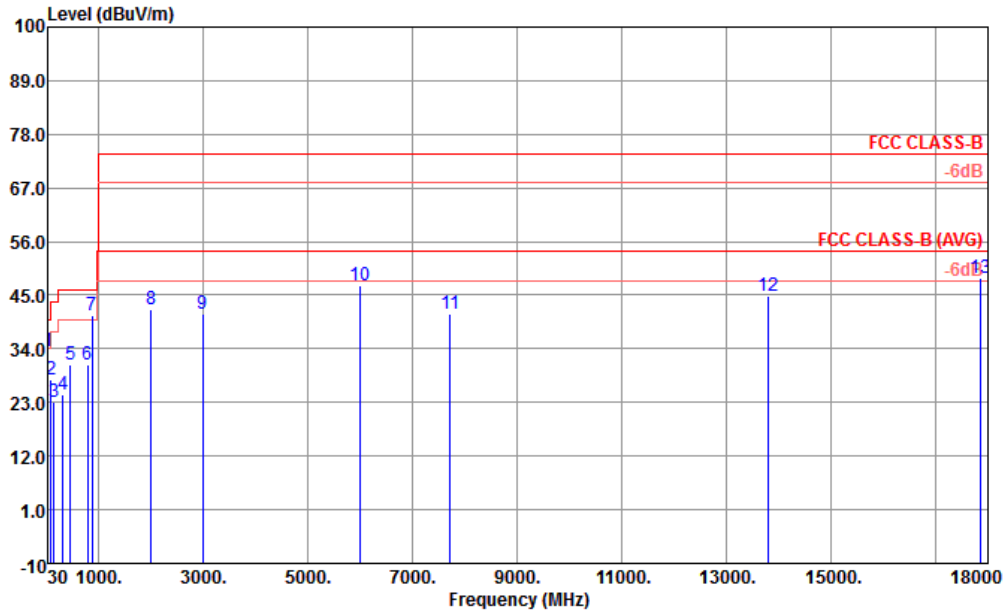


Site : 03CH06-KS  
 Condition : FCC CLASS-B 3m LF ANT 6112D SN35406 HORIZONTAL  
 Project : (FC) 902111

	Freq	Level	Over	Limit	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Factor	cm	deg	
1	319.06	33.44	-12.56	46.00	44.95	1.87	19.67	33.05	---	---	Peak
2	473.29	35.40	-10.60	46.00	43.42	2.29	22.92	33.23	---	---	Peak
3	643.04	29.74	-16.26	46.00	35.63	2.69	24.73	33.31	---	---	Peak
4	703.18	28.74	-17.26	46.00	34.19	2.89	24.93	33.27	---	---	Peak
5	772.05	33.59	-12.41	46.00	37.82	3.07	25.76	33.06	---	---	Peak
6	798.24	37.55	-8.45	46.00	41.33	3.14	26.08	33.00	100	0	Peak
7 *	870.99	52.13			54.93	3.30	26.38	32.48	---	---	Peak
8	1144.00	40.57	-33.43	74.00	76.76	3.78	22.63	62.60	---	---	Peak
9	6000.00	40.35	-33.65	74.00	63.05	9.01	32.52	64.23	---	---	Peak
10	7192.00	42.76	-31.24	74.00	61.88	9.96	35.28	64.36	---	---	Peak
11	11403.00	40.99	-33.01	74.00	53.55	13.28	39.55	65.39	---	---	Peak
12	14517.00	42.56	-31.44	74.00	51.66	14.60	39.49	63.19	---	---	Peak
13	17901.00	46.72	-27.28	74.00	47.10	16.40	46.25	63.03	---	---	Peak



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



Site : 03CH06-KS  
 Condition : FCC CLASS-B 3m LF ANT 6112D SN35406 VERTICAL  
 Project : (FC) 902111

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB/m	dB	cm	deg	
1	39.70	33.52	-6.48	40.00	47.37	0.54	18.60	32.99	100	0	Peak
2	96.93	27.62	-15.88	43.50	43.49	0.96	16.10	32.93	---	---	Peak
3	148.34	23.09	-20.41	43.50	38.11	1.24	16.70	32.96	---	---	Peak
4	317.12	24.76	-21.24	46.00	36.31	1.87	19.62	33.04	---	---	Peak
5	471.35	30.62	-15.38	46.00	38.69	2.28	22.88	33.23	---	---	Peak
6	798.24	30.89	-15.11	46.00	34.67	3.14	26.08	33.00	---	---	Peak
7	872.93	40.89			13.66	3.31	26.39	32.47	---	---	Peak
8	2008.00	42.04	-31.96	74.00	76.55	5.17	24.80	64.48	---	---	Peak
9	3000.00	41.21	-32.79	74.00	70.91	6.29	27.10	63.09	---	---	Peak
10	6000.00	46.87	-27.13	74.00	69.57	9.01	32.52	64.23	---	---	Peak
11	7720.00	41.25	-32.75	74.00	59.21	10.44	36.07	64.47	---	---	Peak
12	13788.00	44.74	-29.26	74.00	54.32	14.30	39.88	63.76	---	---	Peak
13	17865.00	48.60	-25.40	74.00	49.16	16.38	46.07	63.01	---	---	Peak

Note:

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



### 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY57290157	3Hz~8.5GHz;Max 30dBm	Jul. 18, 2019	Oct. 30, 2019	Jul. 17, 2020	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz-44GHz	Apr. 16, 2019	Oct. 30, 2019	Apr. 15, 2020	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 28, 2018	Oct. 30, 2019	Dec. 27, 2019	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 27, 2019	Oct. 30, 2019	Jan. 26, 2020	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHZ	Aug. 06, 2019	Oct. 30, 2019	Aug. 05, 2020	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Apr. 15, 2019	Oct. 30, 2019	Apr. 14, 2020	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Oct. 30, 2019	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Oct. 30, 2019	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Oct. 30, 2019	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 16, 2019	Nov. 01, 2019	Apr. 15, 2020	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2019	Nov. 01, 2019	Oct. 10, 2020	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Nov. 19, 2018	Nov. 01, 2019	Nov. 18, 2019	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2019	Nov. 01, 2019	Oct. 10, 2020	Conduction (CO01-KS)

NCR: No Calibration Required



## 5. Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.9dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.0dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.0dB
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