
TEST REPORT

Report No.: SRTC2019-9003(F)-0006
Product Name: LTE/WCDMA/GSM (GPRS) Multi-Mode Digital
Mobile Phone
Model Name: ZTE Blade A7 2019
Applicant: ZTE Corporation
Manufacturer: ZTE Corporation
Specification: FCC Part15B (Certification)
(2019 edition)
ANSI C63.4-2014
FCC ID: SRQ-ZTEA72019

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
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1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: 15th Building, No.30 Shixing Street, Shijingshan District
Testing location: No.80, Zhaojiachang, Beizangcun, Daxing District, Beijing, China.
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Country or Region: China
Contacted person: Liu Jia
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Email: liujiaf@srtc.org.cn

1.3 Applicant's details

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City: Shenzhen
Country or Region: China
Contacted person: Yang Zhao
Tel: +86-29-83600770
Fax: ---
Email: zhao.yangxa@zte.com.cn

1.4 Manufacturer's details

Company: ZTE Corporation
Address: ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Guangdong,China
City: Shenzhen
Country or Region: China
Contacted person: Yang Zhao
Tel: +86-29-83600770
Email: zhao.yangxa@zte.com.cn

1.5 Application details

Date of reception of test sample: 21th Mar. 2019

Date of test: 21th Mar. 2018 to 28th Mar. 2019

1.6 Reference specification

FCC Part 15B, 2019 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile Phone
FCC ID	SRQ-ZTEA72019
Frequency Range	GSM850/ WCDMA band V/LTE band V: Tx:824~849MHz Rx:869~894MHz PCS1900/ WCDMA band II/ LTE band II: Tx:1850~1910MHz Rx:1930~1990MHz WCDMA Band IV/ LTE band IV: Tx:1710~1755MHz Rx:2110~2155MHz LTE band VII: Tx:2500~2570MHz Rx:2620~2690MHz
Modulation Type	GSM/GPRS:GMSK EDGE:8PSK WCDMA:QPSK LTE:QPSK; 16QAM; 64QAM
Duplex Mode	TDD; FDD
Equipment Class	Class B
Antenna Type	Internal fixed antenna
Power Supply	Battery or Charger
Rated Power Supply Voltage	3.85V
Extreme Temperature	Lowest: -10°C Highest: +55°C
Extreme Voltage	Minimum: 3.46V Maximum: 4.4V
HW Version	ukhB
SW Version	TEL_MX_ZTE_Blade_A7_2019V1.0

1.7.2 EUT details

Product Name	Model Name	IMEI
LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile Phone	ZTE Blade A7 2019	864432040007312/864432040006934

1.7.3 Auxiliary equipment details

The EUT's USB cable, headset, battery and charger have different suppliers. For more information, see tables below.

AE (Auxiliary Equipment) 1#: Computer

Manufacturer	Lenovo
Model Number	E40-70
S/N	MP06WE9U
Input Voltage	100V-240V AC

AE (Auxiliary Equipment) 2#: USB Cable

Manufacturer	Dongguan Guojun Plastic Electronic Co.,Ltd
Model Number	USB-MU5-W-70-M-L

AE (Auxiliary Equipment) 3#: USB Cable

Manufacturer	Shen Zhen Shi Yi HUA XING Electron Co.,Ltd
Model Number	USB-MU5-W-70-M-L

AE (Auxiliary Equipment) 4#: Battery

Type	Li-Lon
Manufacturer	Ningbo Veken Battery Co., Ltd.
Model Number	Li3931T44P8h806139
Capacity	3100mah
Nominal Voltage	3.85V

AE (Auxiliary Equipment) 5#: Battery

Type	Li-Lon
Manufacturer	Zhongshan Tianmao Battery Co., Ltd.
Model Number	Li3931T44P8h806139
Capacity	3100mAh
Nominal Voltage	3.85V

AE (Auxiliary Equipment) 6#: Headset

Manufacturer	JUWEI ELECTRONICS CO.,LTD
Model Number	JWEP1036-Z01R

AE (Auxiliary Equipment) 7#: Headset

Manufacturer	ShenZhen FDC Electronic Co.,Ltd
Model Number	DEM-66

AE (Auxiliary Equipment) 8#: Charger

Manufacturer	RUIJING
Model Number	STC-A515A-Z
S/N	/
Input Voltage	100V-240V AC
Frequency	50/60Hz

AE (Auxiliary Equipment) 9#: Charger

Manufacturer	CHENYANG
Model Number	STC-A515A-Z
S/N	/
Input Voltage	100V-240V AC
Frequency	50/60Hz

AE (Auxiliary Equipment) 10#: Charger

Manufacturer	DOKOCOM
Model Number	STC-A515A-A
S/N	/
Input Voltage	100V-240V AC
Frequency	50/60Hz

AE (Auxiliary Equipment) 11#: Charger

Manufacturer	RUIJING
Model Number	STC-A515A-A
S/N	/
Input Voltage	100V-240V AC
Frequency	50/60Hz

AE (Auxiliary Equipment) 12#: Charger

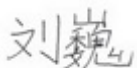
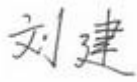
Manufacturer	CHENYANG
Model Number	STC-A515A-A
S/N	/
Input Voltage	100V-240V AC
Frequency	50/60Hz

As the information described in these above tables, the relevant tests have been performed in order to verify in which supply would have the worst features. When the EUT exercised with 2# USB Cable, 4# Battery, 6# Headset and 9# Charger are the worst feature, and record the results in the test report.

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved by Mr. LiuWei Director of the test department 	Checked by Mr. Guo Yu Vice director of the test department 
Tested By: Mr. LIU Jian Test engineer 	Issued date: 2019.04.01

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
24.2°C	40.5%	101.1kPa

Test Setup with laptop:

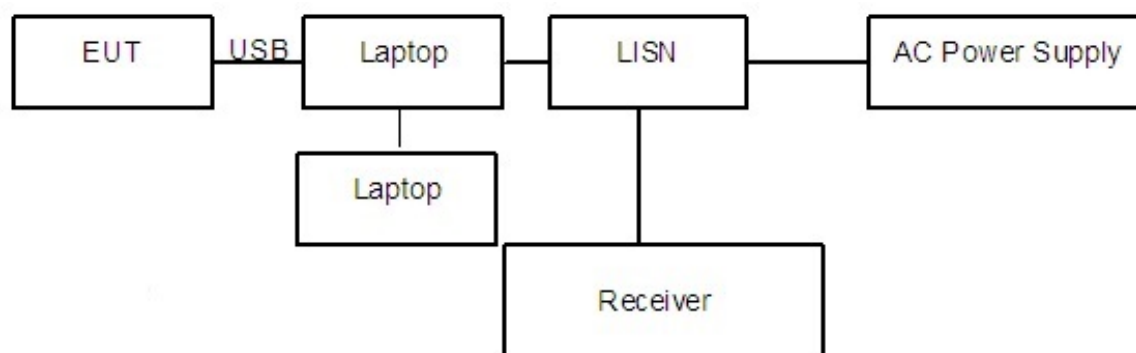


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The accessories of the EUT are connected with the EUT such as headset etc. The EUT was connected with a laptop via the USB cable and was charged. The laptop's LAN port is connected with another laptop via cable. And the data transferring between two laptops is maintained. The EUT copies large data (such as multiple movies) from the computer.

The AC main power supply of the laptop is connected to LISN and LISN is connected to the reference ground. The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

Test Setup with charger:

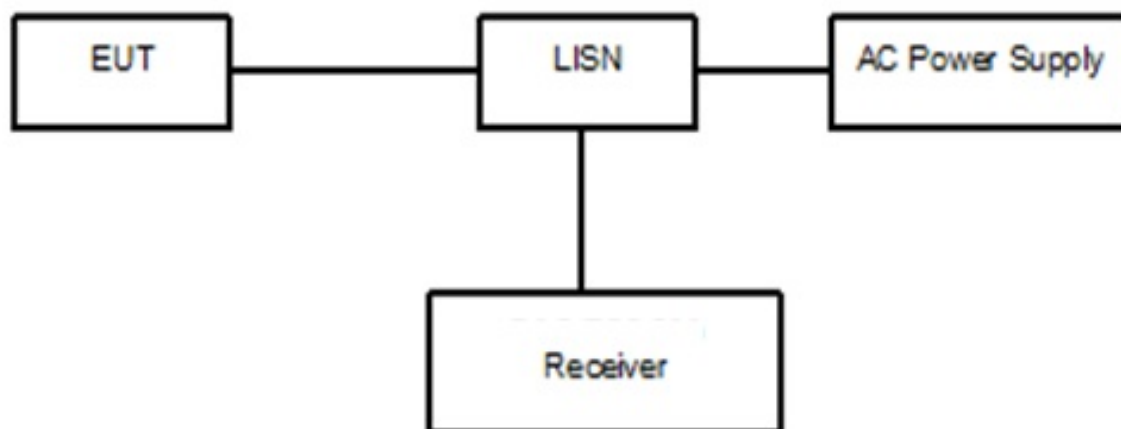


Figure 2

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground. The accessories of the EUT are connected with the EUT such as headset etc. When performing the test, open the function of EUT: FM Receiver, FM, Camera and GPS.

The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

The “reference path loss” , using Corr. as symbol, includes the cable loss, the attenuation of the attenuator and the voltage division factor of AMN.

The measurement results are obtained as described below:

Result= Reading + Corr.

Sample calculation: (52.94 dBuV) = (23.04 dBuV) + (29.9 dB), the corresponding frequency is 0.168091MHz.

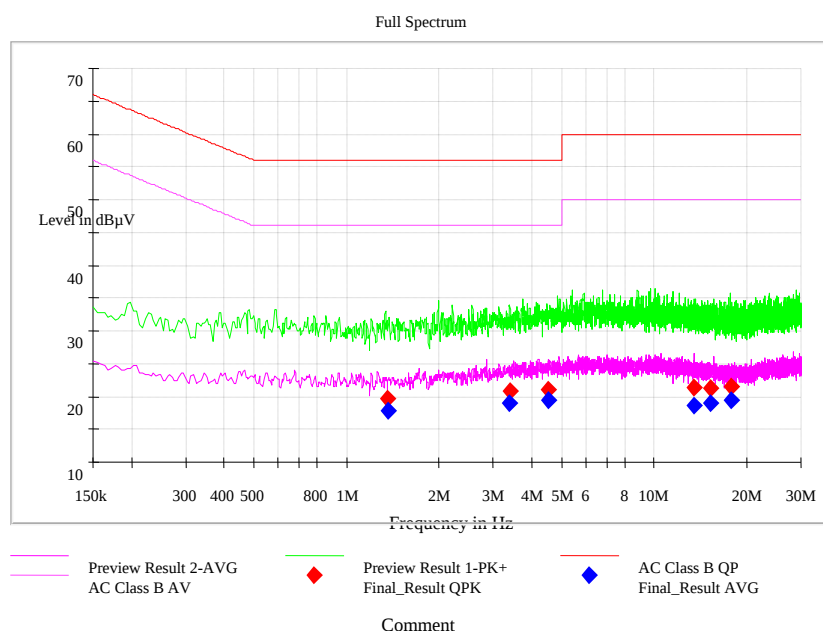
Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15~0.5	66 to 56*	56 to 46*
0.5~5	56	46
5~30	60	50

Note: * Decreases with the logarithm of the frequency

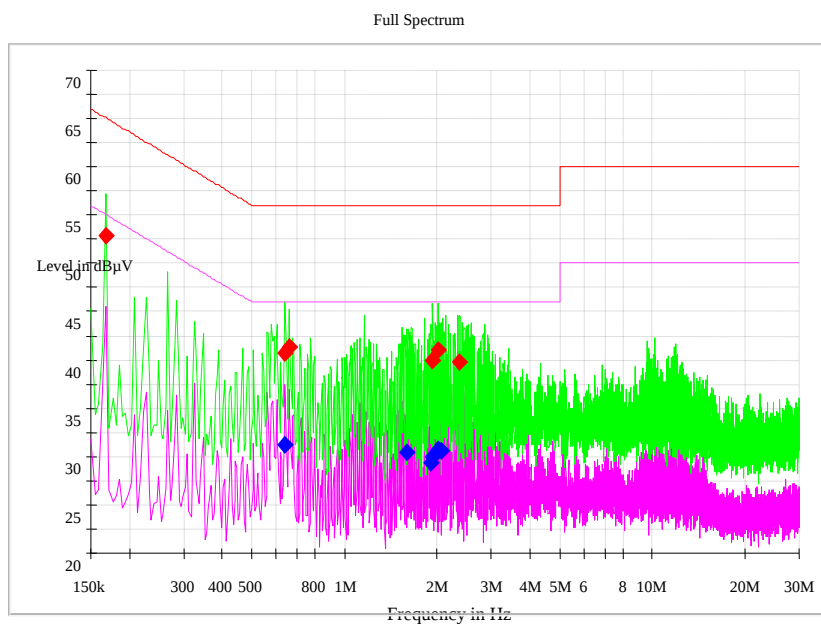
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

EUT + Charger:



Pic2. Conducted emission L Line

MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBµV)	QuasiPeak Reading (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.168091	52.94	23.04	65.05	12.11	29.9
0.642977	40.74	10.74	56	15.26	30
0.661068	41.31	11.31	56	14.69	30
1.936477	39.94	10.04	56	16.06	29.9
2.013364	41	11.1	56	15	29.9
2.370659	39.8	9.9	56	16.2	29.9

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	Average (dBµV)	Average Reading (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.642977	31.15	1.15	46	14.85	30
1.597273	30.41	0.51	46	15.59	29.9
1.895773	29.27	-0.63	46	16.73	29.9
1.936477	30	0.1	46	16	29.9
2.013364	30.68	0.78	46	15.32	29.9
2.054068	30.59	0.69	46	15.41	29.9

EUT + Charger:



Pic3. Conducted emission N Line

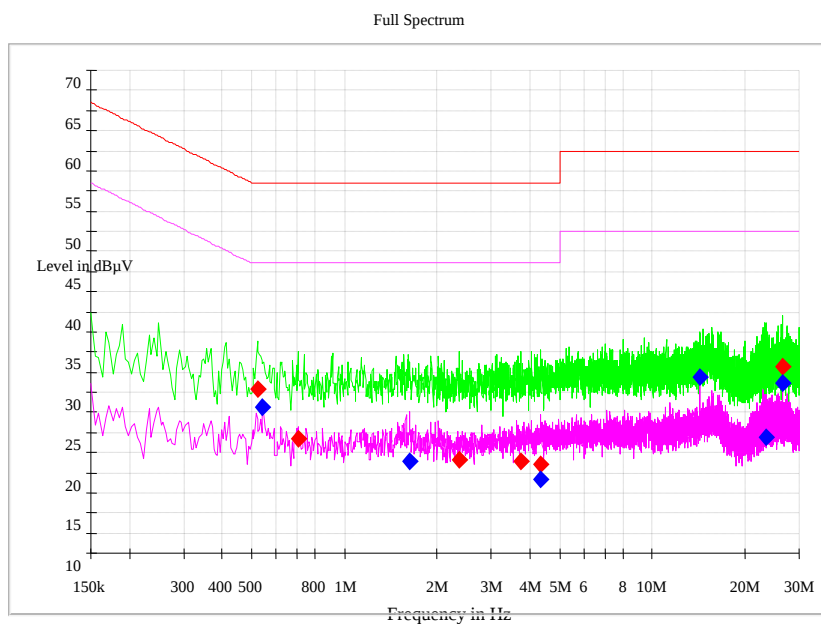
MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBµV)	QuasiPeak Reading (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.575136	43.02	13.02	56	12.98	30
1.950045	40.66	10.76	56	15.34	29.9
2.031455	40.59	10.69	56	15.41	29.9
2.067636	40.69	10.79	56	15.31	29.9
2.108341	40.37	10.47	56	15.63	29.9
2.470159	39.52	9.62	56	16.48	29.9

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	Average (dBµV)	Average Reading (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.579659	33.74	3.74	46	12.26	30
0.638455	30.5	0.5	46	15.5	30
0.661068	32.83	2.83	46	13.17	30
1.633455	29.92	0.02	46	16.08	29.9
2.031455	30.35	0.45	46	15.65	29.9
2.072159	30.09	0.19	46	15.91	29.9

EUT + computer:



Pic4. Conducted emission L Line

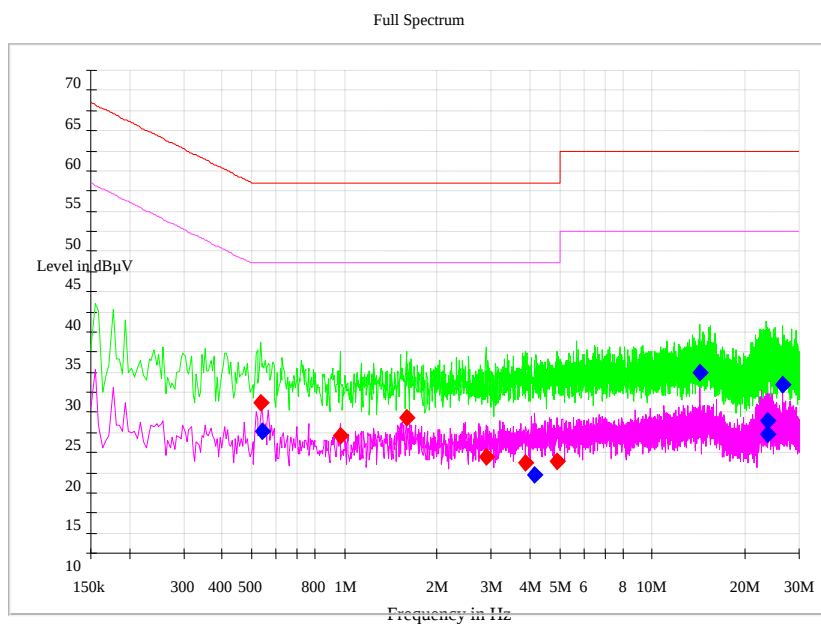
MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBμV)	QuasiPeak Reading (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.520864	30.32	0.32	56	25.68	30
0.706295	24.29	-5.61	56	31.71	29.9
2.357091	21.62	-8.28	56	34.38	29.9
3.736523	21.37	-8.53	56	34.63	29.9
4.351614	20.94	-8.96	56	35.06	29.9
26.626045	33.18	3.18	60	26.82	30

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	Average (dBμV)	Average Reading (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.543477	28.1	-1.9	46	17.9	30
1.624409	21.46	-8.44	46	24.54	29.9
4.329	19.24	-10.66	46	26.76	29.9
14.333273	31.96	1.96	50	18.04	30
23.460136	24.37	-5.63	50	25.63	30
26.626045	31.19	1.19	50	18.81	30

EUT + computer:



Pic5. Conducted emission N Line

MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBμV)	QuasiPeak Reading (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.534432	28.76	-1.24	56	27.24	30
0.968614	24.56	-5.34	56	31.44	29.9
1.588227	26.86	-3.04	56	29.14	29.9
2.877205	22.02	-7.88	56	33.98	29.9
3.867682	21.16	-8.74	56	34.84	29.9
4.894341	21.43	-8.47	56	34.57	29.9

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	Average (dBμV)	Average Reading (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.538955	25.18	-4.82	46	20.82	30
4.161659	19.73	-10.17	46	26.27	29.9
14.337795	32.39	2.39	50	17.61	30
23.559636	24.73	-5.27	50	25.27	30
23.717932	26.49	-3.51	50	23.51	30
26.626045	30.89	0.89	50	19.11	30

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.1°C	39.5%	101.2kPa

Test Setup:

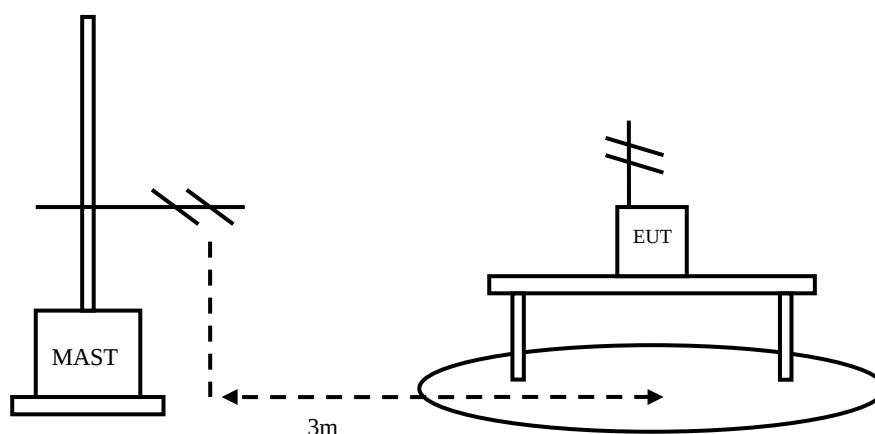


Figure 3

Test Procedure:

EUT+Laptop:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The accessories of the EUT are connected with the EUT such as headset etc. The EUT was connected with a laptop via the USB cable and was charged. The laptop's LAN port is connected with another laptop via cable. And the data transferring between two laptops is maintained. The test set-up and the test methods are performed according to ANSI C63.4:2014. The EUT copies large data (such as multiple movies) from the computer.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna HL562.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing.

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The EUT should work in idle mode. The accessories of the EUT are connected with the EUT such as headset etc. The test set-up and the test methods are performed according to ANSI C63.4:2014. When performing the test, open the function of EUT: FM Receiver, FM, Camera and GPS.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna HL562.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: $30\text{MHz} < f < 1\text{GHz}$

RBW=1MHz, VBW=3MHz, when the test frequency: $f > 1\text{GHz}$

The “reference path loss”, using A_{Rpl} as symbol, includes the factor of receive antenna, the gain of the preamplifier and the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation: $(26.65 \text{ dBuV}) = (44.15 \text{ dBuV}) + (-17.5 \text{ dB})$, the corresponding frequency is 38.911667MHz.

Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB μ V/m)
30~88	Quasi-peak	40
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46
960~1000	Quasi-peak	54
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54
	Peak	74

Test result:

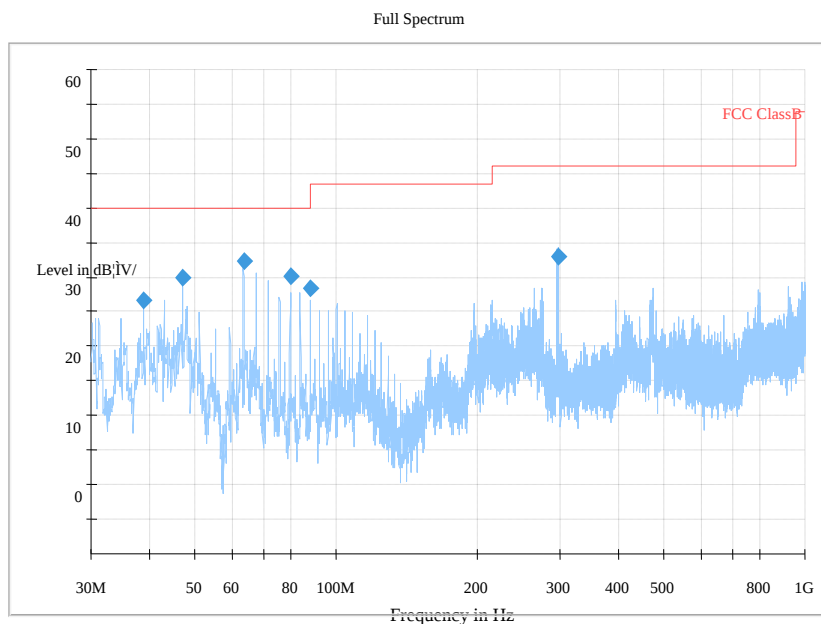
EUT+Laptop

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
38.911667	26.65	-17.5	44.15	V
47.11625	29.91	-22.3	52.21	V
63.485	32.28	-25.9	58.18	V
79.85375	30.07	-23.9	53.97	V
88.057917	28.31	-22.9	51.21	V
297.8625	32.89	-18.2	51.09	V

EUT + charger

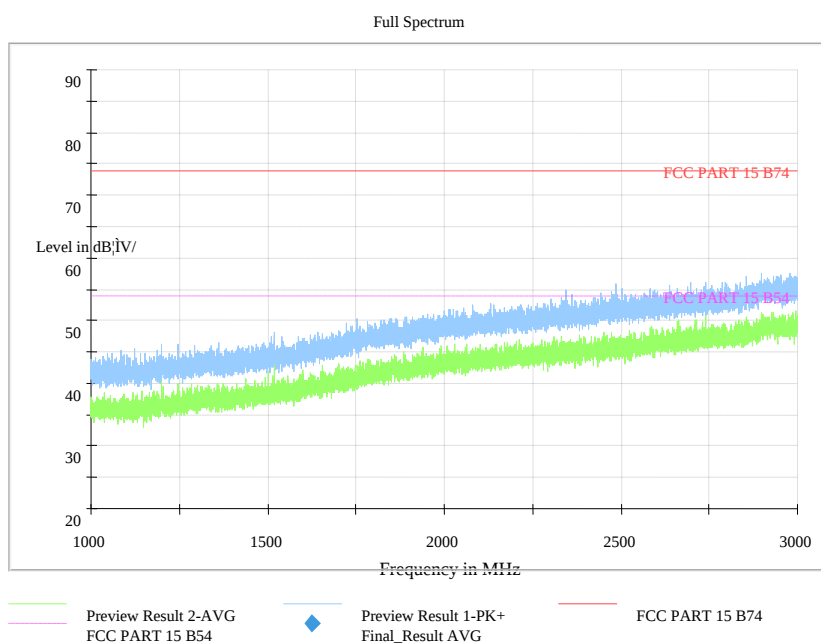
Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
31.2725	35.99	-14	49.99	V
38.22375	19.55	-17.2	36.75	V
47.361667	20.25	-22.5	42.75	V
50.594167	16.18	-24.3	40.48	V
98.244167	15.7	-21.9	37.6	V
940.527083	16.7	-4.2	20.9	V

EUT + Laptop: refer to Pic6, Pic7, Pic8 and Pic9



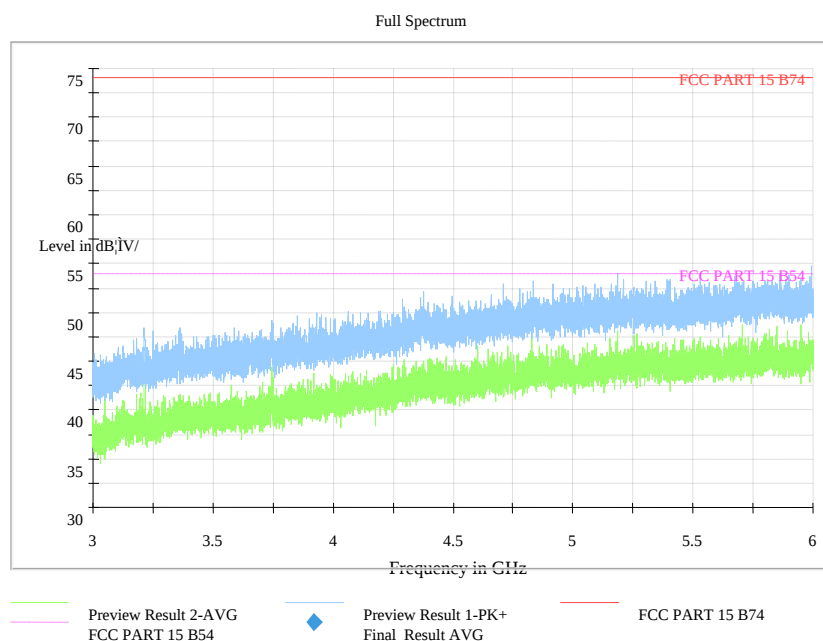
Pic6. Radiated emission(30MHz – 1GHz)

Note : The test data in the graph includes two polarizations: horizontal and vertical



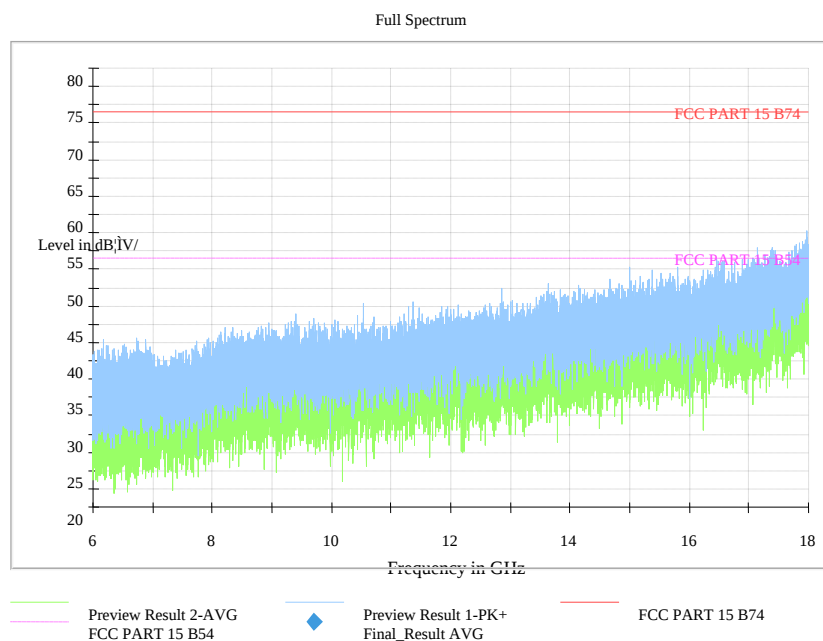
Pic7. Radiated emission (1GHz –3Hz)

Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic8. Radiated emission (3GHz –6Hz)

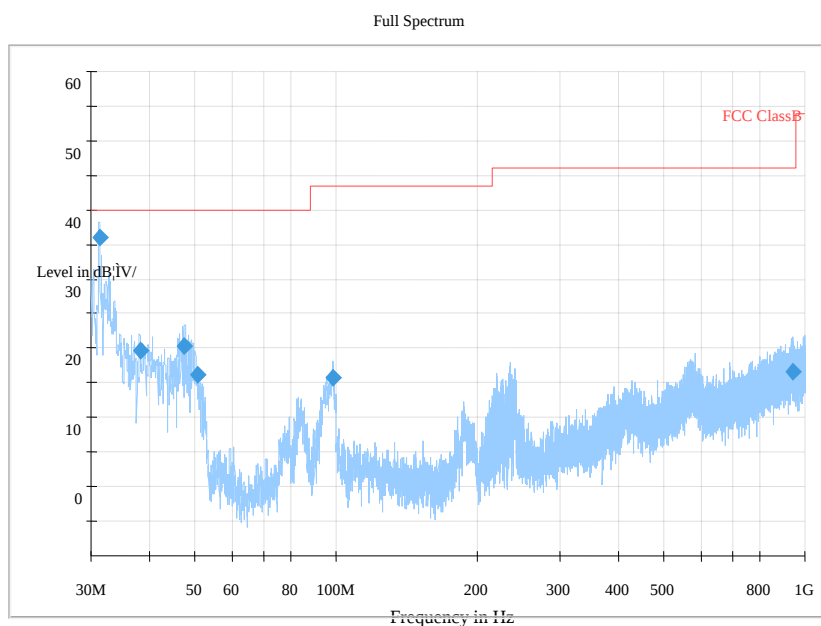
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic9. Radiated emission (6GHz –18Hz)

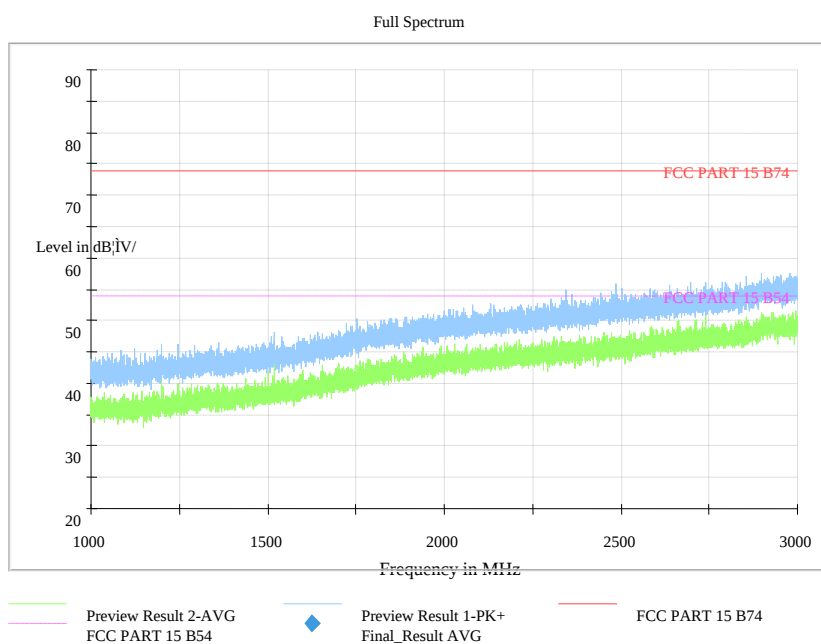
Note : The test data in the graph includes two polarizations: horizontal and vertical

EUT + charger: refer to Pic10, Pic11, Pic12 and Pic13



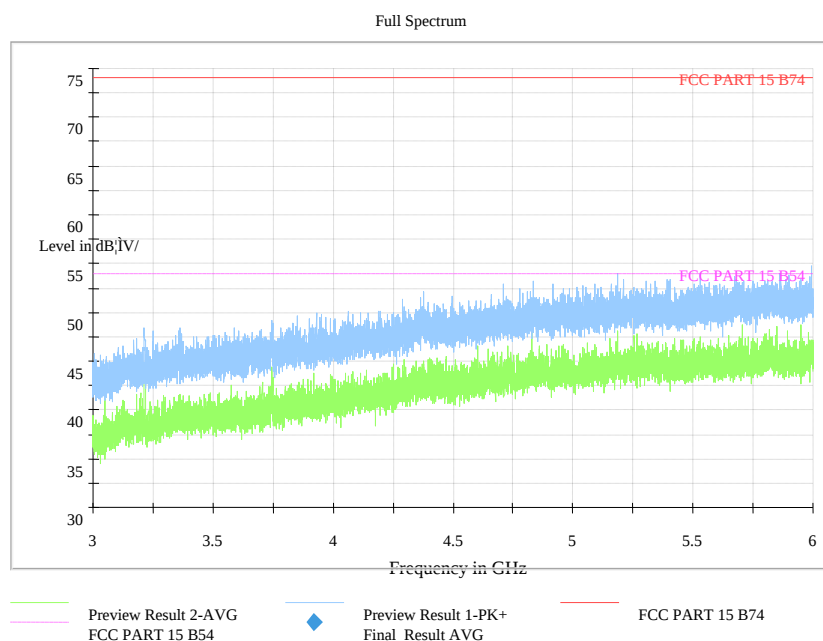
Pic10. Radiated emission(30MHz – 1GHz)

Note : The test data in the graph includes two polarizations: horizontal and vertical



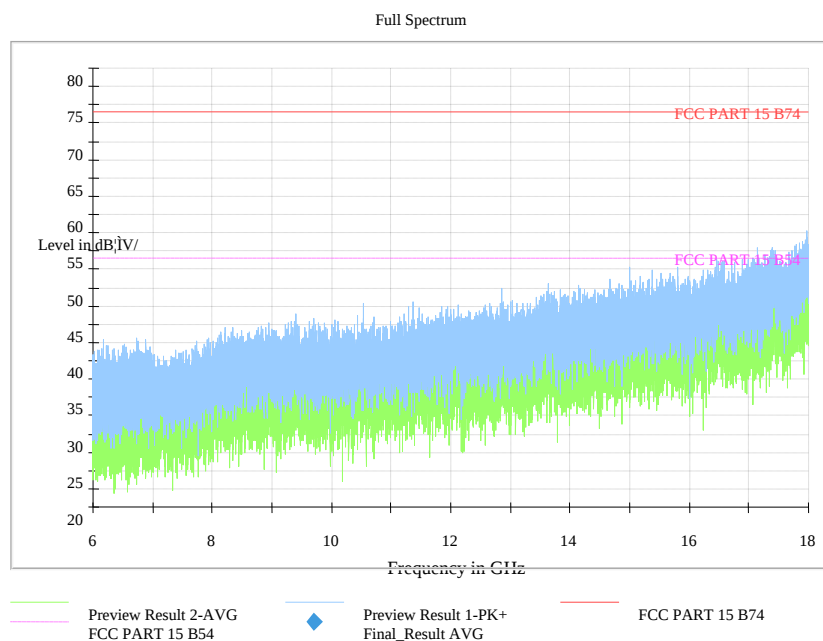
Pic11. Radiated emission (1GHz –3Hz)

Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic12. Radiated emission (3GHz –6Hz)

Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic13. Radiated emission (6GHz –18Hz)

Note : The test data in the graph includes two polarizations: horizontal and vertical

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mS emi-AnechoicChamber	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2019	20th Aug. 2018
3	CMW500 Mobile Station Tester	R&S	160132	20th Aug. 2019	20th Aug. 2018
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
5	ESIB7 EMI test receiver	R&S	100280	20th Aug. 2019	20th Aug. 2018
6	HL562Ultra log test antenna	R&S	100167	20th Aug. 2019	20th Aug. 2018
7	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2019	20th Aug. 2018
8	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	20th Aug. 2019	20th Aug. 2018
9	PS2000 Turn Table	FRANKONIA	-----	-----	-----
10	MA260 Antenna Master	FRANKONIA	-----	-----	-----
11	EMC32EMI test software	R&S	-----	-----	-----

-----The End-----