

FCC

EMC

TEST REPORT

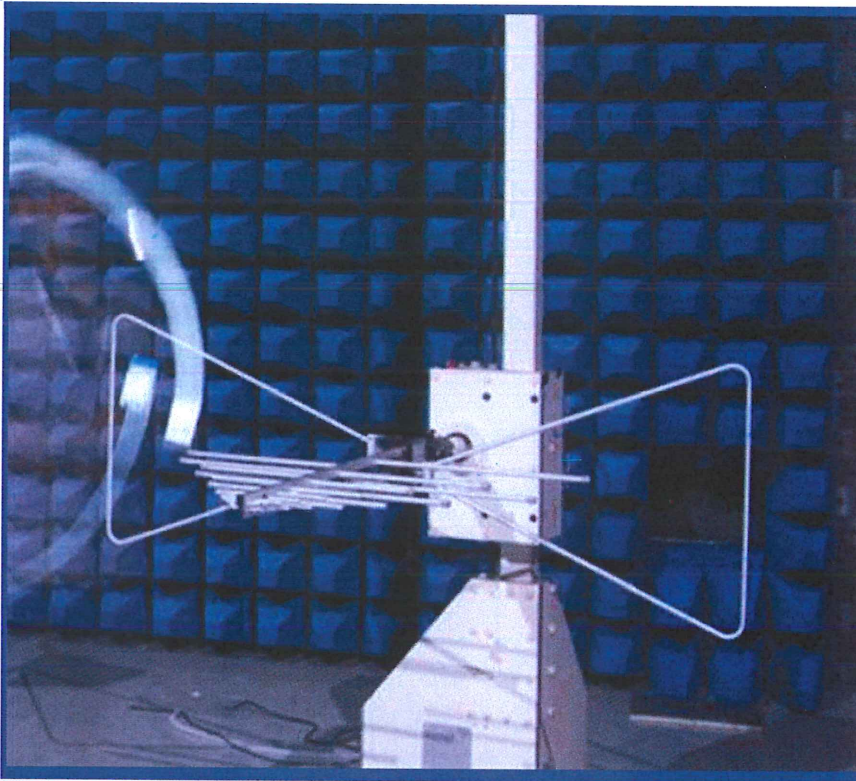
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Mobile Phone

ISSUED TO
Guangdong OPPO Mobile Telecommunication Corp., Ltd.

NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City,
Guangdong, China



Tested by: Xia Long
Xia Long

Date: Apr. 09, 2020

Approved by: Wei Yanquan
(Chief Engineer)

Date: Apr. 09, 2020

Report No.: BL-SZ2020267-401

EUT Name: Mobile Phone

Model Name: CPH2067

Brand Name: OPPO

Test Standard: 47 CFR Part 15 Subpart B

FCC ID: R9C-CPH2067

Test Conclusion: Pass

Test Date: Feb. 29, 2020 ~ Mar. 09, 2020

Date of Issue: Apr. 09, 2020

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Apr. 09, 2020</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20°C to 25°C
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

- (1) The test report refer to the BALUN report mode v6.8.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Guangdong OPPO Mobile Telecommunication Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City, Guangdong, China

2.2 Manufacturer Information

Manufacturer	Guangdong OPPO Mobile Telecommunication Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City, Guangdong, China

2.3 Factory Information

N/A	Guangdong OPPO Mobile Telecommunication Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City, Guangdong, China

2.4 General Description for Equipment under Test (EUT)

EUT Name	Mobile Phone
Model Name Under Test	CPH2067
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	11
Software Version	ColorOS 7.1
Dimensions (Approx.)	162.0*75.5*8.9 mm
Weight (Approx.)	192g (with battery)

2.5 Ancillary Equipment

Ancillary Equipment 1	Li-Polymer Battery 1	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh
	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	Sunwoda Electronic Co., Ltd.
Ancillary Equipment 2	Li-Polymer Battery (alternative) 2	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh
	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	Sunwoda Electronic India Private Limited
Ancillary Equipment 3	Li-Polymer Battery (alternative) 3	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh
	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	Sunwoda Electronic Co., Ltd. Branch 3
Ancillary Equipment 4	Li-Polymer Battery (alternative) 4	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh
	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	TWS Technology (Guangzhou) Limited.
Ancillary Equipment 5	Li-Polymer Battery (alternative) 5	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh

	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	Huizhou Desay Battery Co., Ltd
Ancillary Equipment 6	Li-Polymer Battery (alternative) 6	
	Brand Name	OPPO
	Model No.	BLP781
	Serial No.	N/A
	Capacitance	Rated: 4880mAh/18.88Wh Typical: 5000mAh/19.35Wh
	Rated Voltage	3.87 V
	Limited Voltage	4.45 V
	Manufacturer	Dongguan NVT Technology Co., Ltd.
Ancillary Equipment 7	Power Supply Unit	
	Brand Name	OPPO
	Model No.	OP92KAUH
	Serial No.	N/A
	Rated Input	100-240VAC 50-60Hz 0.5A
	Rated Output	5.0VDC 2A or 9.0VDC (US Plug)
Ancillary Equipment 8	Power Supply Unit (alternative) 2	
	Brand Name	OPPO
	Model No.	OP92JAUH
	Serial No.	N/A
	Rated Input	100-240VAC 50-60Hz 0.5A
	Rated Output	5.0VDC 2A or 9.0VDC (US Plug)
Ancillary Equipment 9	USB Cable	
	Model No.	DL143
	Length (Approx.)	1.0 m
Ancillary Equipment 10	Headset	
	Model No.	MH156
	Length (Approx.)	1.2 m
Note 1: Letter in () means plug type.		
Note 2: All adapters are tested, only the worst data of OP92KAUH (US Plug) shown in this report.		
Note 3: All batteries are tested, only the worst data of BLP781 (TWS Technology (Guangzhou) Limited) shown in this report.		

2.6 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EDGE 850/900/1800/1900 MHz 3G Network WCDMA/HSDPA/HSUPA/DC-HSDPA/HSPA+ Band 1/2/4/5/6/8/19 4G Network LTE FDD Band 1/2/3/4/5/7/8/12/17/18/19/20/26/28/66 LTE TDD Band 38/39/40/41 LTE CA Uplink (UL): 3C, 7C, 38C, 40C, 41C Bluetooth 5.0 (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20), 802.11ac(VHT20) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) Band 1/2/3/4 SRD, GPS, GLONASS, BDS, Galileo, FM, NFC
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3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	FCC 47 CFR Part 15 Subpart B (10-1-18 Edition)	Unintentional Radiators
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	15.109	Pass	Annex A .1
2	Conducted Emission, AC Ports	15.107	Pass	Annex A .2

3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	2.96 dB
Radiated emissions (30 MHz-1 GHz)	3.66 dB
Radiated emissions (1 GHz-18 GHz)	5.57 dB
Radiated emissions (18 GHz-40 GHz)	6.12 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	23°C to 25°C	AC 120 V/60 Hz or AC 240 V/50 Hz or DC 3.87 V from Battery	50% to 55%	100 kPa to 102 kPa

4.2 Test Equipment List

Radiated Emission Test For Frequency Below 1 GHz (10 m)						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2019.07.04	2020.07.03	☐
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-0883	2018.05.11	2020.05.10	☐
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	N/A	2018.08.08	2021.08.07	☐
Test Software	BALUN	BL410_E	V19.918	--	--	☐

Radiated Emission Test For Frequency Below 1 GHz (3 m)						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2019.10.29	2020.10.28	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2018.08.22	2020.08.21	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1600	2018.07.12	2020.07.11	☐
Anechoic Chamber	YIHENG	9m*6m*6m	N/A	2018.07.18	2021.07.17	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

Radiated Emission Test For Frequency 1 GHz-18 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2019.10.29	2020.10.28	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1148	2018.07.12	2020.07.11	☒
Anechoic Chamber	YIHENG	9m*6m*6m	N/A	2018.07.18	2021.07.17	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

Radiated Emission Test For Frequency Above 18 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE &	FSV40	101544	2020.02.19	2021.02.18	☒

Radiated Emission Test For Frequency Above 18 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
	SCHWARZ					
Test Antenna-Horn	A-INFOMW	LB-180400KF	J211060273	2019.01.05	2021.01.04	☒
Anechoic Chamber	YIHENG	9m*6m*6m	N/A	2018.07.18	2021.07.17	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

Conducted disturbance Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2019.06.13	2020.06.12	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2019.07.04	2020.07.03	☒
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.4m*3.1m*2.8m	N/A	2018.08.16	2021.08.15	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

4.3 Test Enclosure list

Description	Manufacturer	Model	Serial No.	Length	Description	Use
PC	Dell	015K3N	N/A	N/A	Special Handled	☐
Laptop	Apple	A1465	N/A	N/A	N/A	☒
Printer	HP	DESKJET 1000	N/A	N/A	N/A	☐
Keyboard	Logitech	Y-BP62a	N/A	N/A	N/A	☐
Mouse	Logitech	M100	N/A	N/A	N/A	☐
USB disk	Kingston	N/A	N/A	N/A	N/A	☐
TF Card	Kingston	N/A	N/A	N/A	N/A	☒
VGA Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
HDMI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
DVI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
Coaxial video cable	N/A	N/A	N/A	2.0 m	Shielded with core	☐
iPhone	Apple	A1586	N/A	N/A	N/A	☐
Phone	MI	M4	N/A	N/A	N/A	☐
Bluetooth Earphone	SAMSUNG	Gear Circle	N/A	N/A	N/A	☒
Wireless Communication s Test Set	R&S	CMW500	142028	N/A	Cal. Due 2020.06.13	☒
WIFI Router	TP-LINK	TL-WDR7500	N/A	N/A	N/A	☒
Earphone	N/A	OPPO	N/A	1.1 m	N/A	☐
Car Battery	Camel	55530	N/A	N/A	12 V/55 Ah	☐
Artificial load	N/A	N/A	N/A	N/A	2.5 Ω /100 W	☐
Artificial load	N/A	N/A	N/A	N/A	5 Ω /100 W	☐
Electronic Load	ITECH	IT8511	N/A	N/A	N/A	☐
USB Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
DC Power Supply	ITECH	IT6863A	60001401068 7210006	N/A	N/A	☐
LCD Monitor	SAMSUNG	UA32C4000P	N/A	N/A	N/A	☐
LCD Monitor	Dell	U241HB	N/A	N/A	N/A	☐
RJ45 Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐

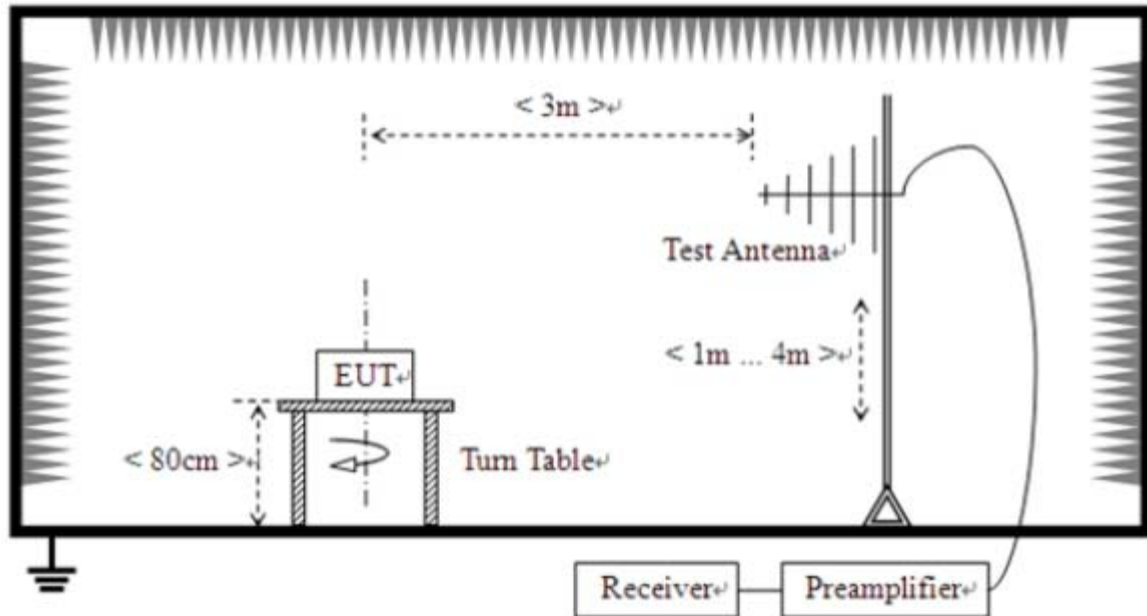
4.4 Test Configurations

Test Configurations (TC) No.	Description
Traffic Test Mode	
TC01	<u>The GSM 850 MHz Test Mode</u> GSM 850 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + GPS RX
TC02	<u>The EGPRS 850 MHz Test Mode</u> EDGE 850 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + GLONASS RX
TC03	<u>The GSM 850 MHz Test Mode with internal speaker</u> GSM 850 Link + Adapter + USB Cable + Battery + BT Link + WIFI Link (2.4G) + BDS RX
TC04	<u>The GSM 1900 MHz Test Mode</u> GSM 1900 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + Galileo RX
TC05	<u>The GPRS 1900 MHz Test Mode</u> GPRS 1900 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + GPS RX
TC06	<u>The WCDMA Band 2 Test Mode</u> WCDMA Band 2 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + BDS RX
TC07	<u>The WCDMA Band 4 Test Mode</u> WCDMA Band 4 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + Galileo RX
TC08	<u>The WCDMA Band 5 Test Mode</u> WCDMA Band 5 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + GPS RX
TC09	<u>The FDD LTE Band 2 Test Mode</u> LTE Band 2 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + Galileo RX
TC10	<u>The FDD LTE Band 4 Test Mode</u> LTE Band 4 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + GLONASS RX
TC11	<u>The FDD LTE Band 5 Test Mode</u> LTE Band 5 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + BDS RX
TC12	<u>The FDD LTE Band 7 Test Mode</u> LTE Band 7 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + Galileo RX
TC13	<u>The FDD LTE Band 12 Test Mode</u> LTE Band 12 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + GLONASS RX

TC14	<u>The FDD LTE Band 17 Test Mode</u> LTE Band 17 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + BDS RX
TC15	<u>The FDD LTE Band 26 Test Mode</u> LTE Band 26 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + GPS RX
TC16	<u>The FDD LTE Band 66 Test Mode</u> LTE Band 66 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + BDS RX
TC17	<u>The TDD LTE Band 38 Test Mode</u> LTE Band 38 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (5G) + Galileo RX
TC18	<u>The TDD LTE Band 41 Test Mode</u> LTE Band 41 Link + Adapter + USB Cable + Battery + Headset + BT Link + WIFI Link (2.4G) + BDS RX
TC19	<u>The LTE CA_7C Test Mode</u> LTE CA_7C Link + Adapter + USB Cable + Battery + BT Link + WIFI Link (2.4G) + GPS RX
TC20	<u>The LTE CA_38C Test Mode</u> LTE CA_38C Link + Adapter + USB Cable + Battery + BT Link + WIFI Link (5G) + GLONASS RX
TC21	<u>The LTE CA_41C Test Mode</u> LTE CA_41C Link + Adapter + USB Cable + Battery + BT Link + WIFI Link (5G) + Galileo RX
TC22	<u>The NFC Test Mode</u> EUT + Adapter + USB Cable + Battery + NFC
TC23	<u>The Idle Test Mode</u> GSM 850(Idle) + Adapter + Battery + Headset + USB Cable + NFC RX
Amusement Test Mode	
TC24	<u>The Camera Test Mode</u> EUT + Adapter + USB Cable + Battery + Headset + TF Card
TC25	<u>The Video Play Test Mode</u> EUT + Adapter + USB Cable + Battery + Headset + TF Card
TC26	<u>The USB Test Mode</u> EUT + USB Cable + Battery + Headset + Laptop+ TF Card

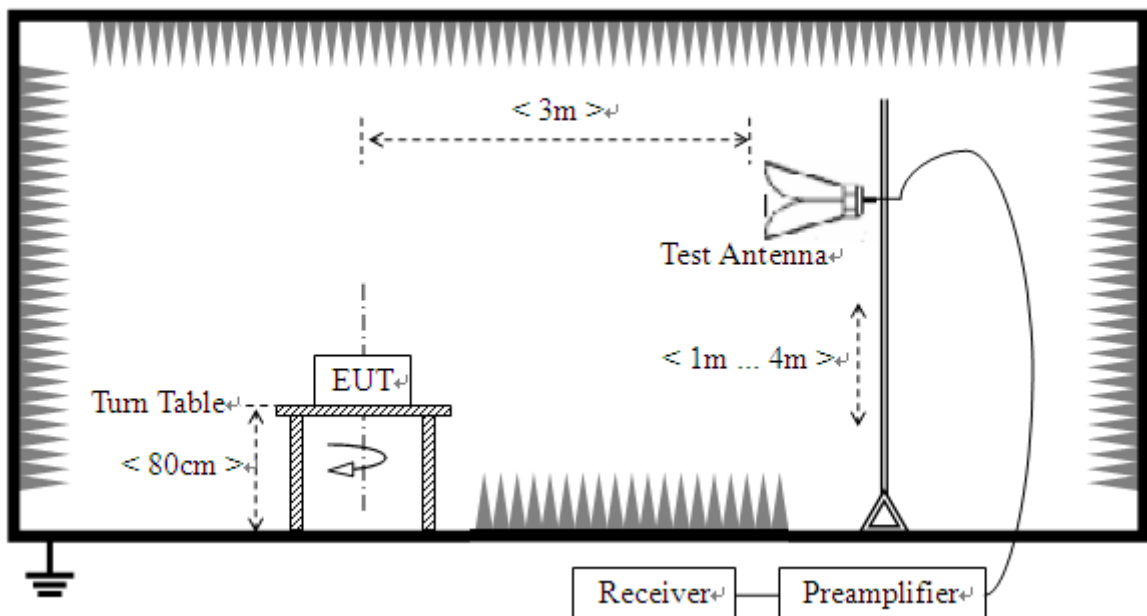
4.5 Test Setups

Test Setup 1



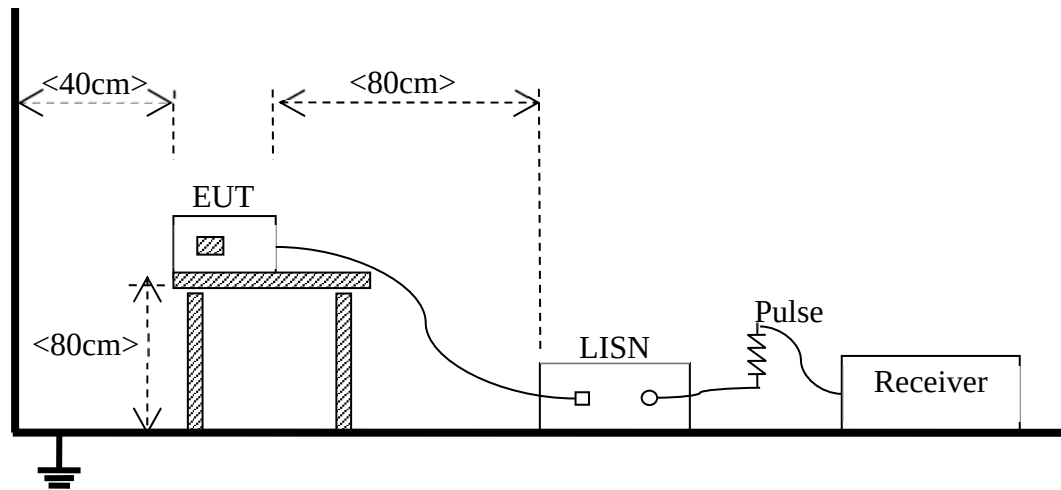
(For Radiated Emission Test (30 MHz-1 GHz))

Test Setup 2



(For Radiated Emission Test (above 1 GHz))

Test Setup 3



(For Conducted Emission, AC Ports Test)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1&2
	Test Configuration	TC01~TC26 ^{Note}
Conducted Emission, AC Ports	Test Env.	NTNV
	Test Setup	Test Setup 3
	Test Configuration	TC01~TC26 ^{Note}
Note: Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report. The GSM 850 MHz Test Mode is the worst mode in this report.		

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency range (MHz)	Class B (at 3 m)		Class B (at 10 m)	Class A (at 10 m)	
	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)
30 - 88	100	40	30	90	39
88 - 216	150	43.5	33.5	150	43.5
216 - 960	200	46	36	210	46.4
Above 960	500	54	44	300	49.5

NOTE:

- 1) Field Strength (dB $\mu\text{V/m}$) = $20 \times \log [\text{Field Strength } (\mu\text{V/m})]$.
- 2) In the emission tables above, the tighter limit applies at the band edges.

5.1.1.2 Test Setup

Refer to 4.5 section (test setup 1 to test setup 2) for radiated emission test, the photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

NOTE:

1. Results (dB $\mu\text{V/m}$) = Reading (dB μV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain (dB)

3. Over limit = Results – Limit.

5.1.2 Conducted Emission

5.1.2.1 Test Limit

Frequency range (MHz)	Class A	
	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	79	66
0.50 - 30	73	60

Frequency range (MHz)	Class B	
	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- 1) The lower limit shall apply at the band edges.
- 2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.2.2 Test Setup

Refer to 4.5 section test (test setup 3) for conducted emission, the photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

NOTE:

1. Results (dBuV/m) = Reading (dBuV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor = Insertion loss + Cable loss

3. Over limit = Results – Limit.

ANNEX A TEST RESULTS

A.1 Radiated Emission

Note 1: The symbol of "--" in the table which means not application.

Note 2: For the test data above 1 GHz, according the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: This frequency which near 850 MHz with circle should be ignored because they are MS and SS carrier frequency, the marked spikes near 2400 MHz with circle should be ignored because they are Bluetooth or WIFI carrier frequency.

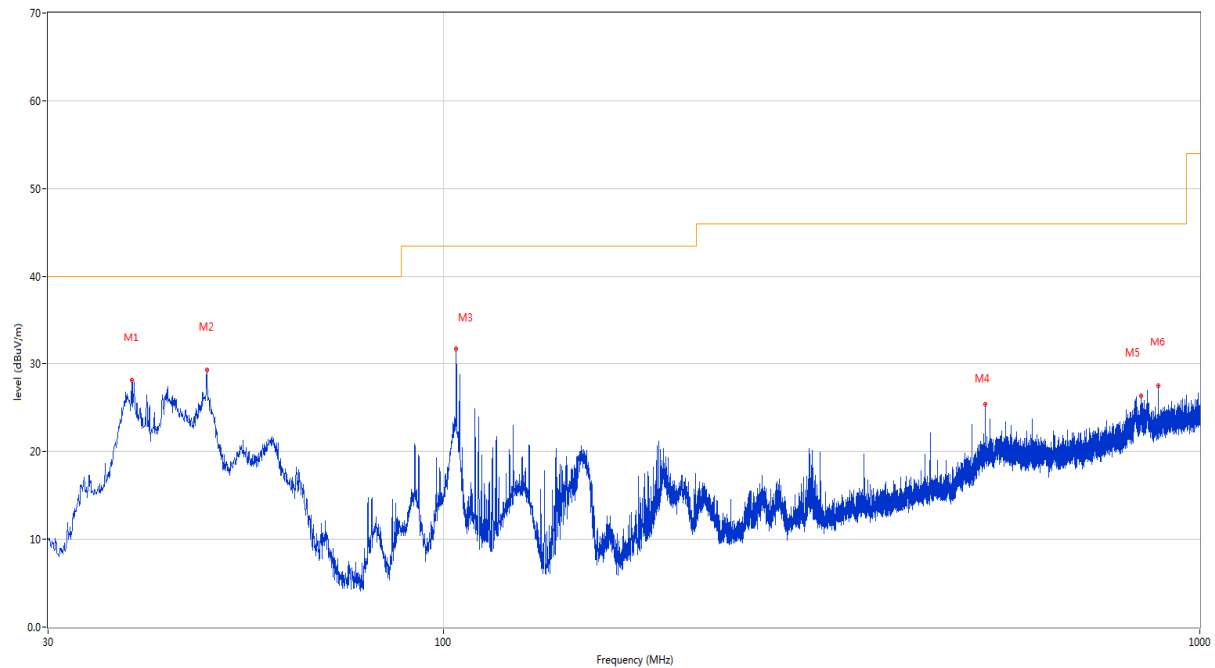
Note 4: The spurious from 18G-40G is noise only, do not show on the report.

Note 5: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

Test Data and Plots

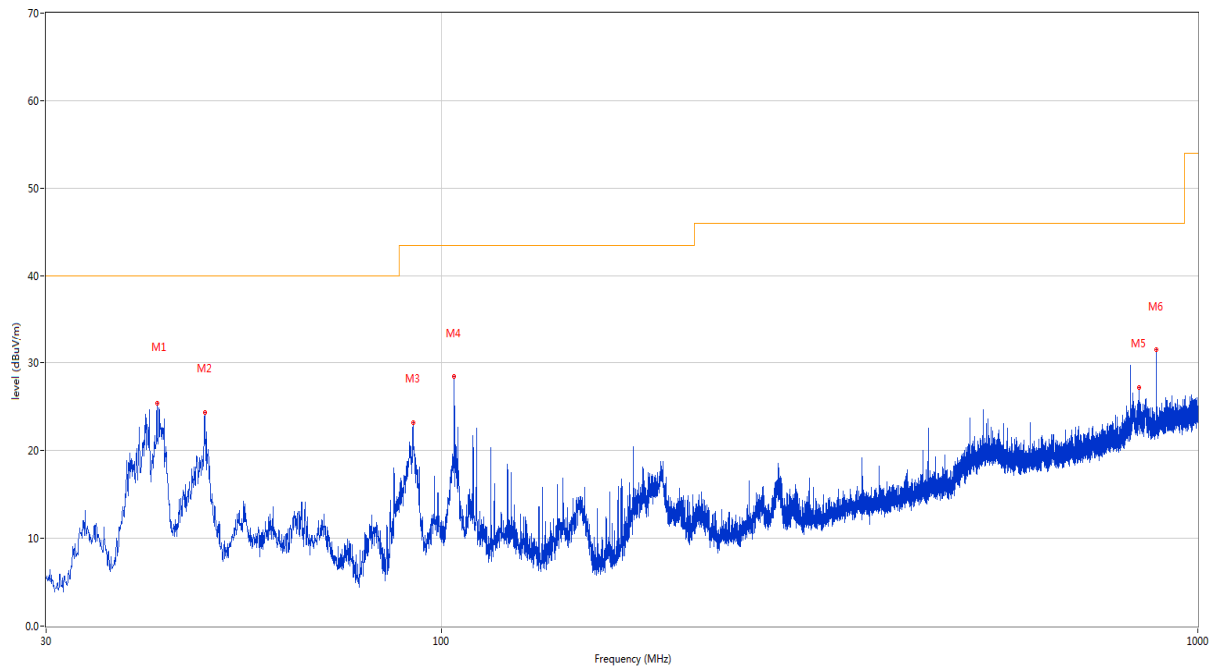
The GSM 850 MHz Test Mode

A.1.1 Test Antenna Vertical, 30 MHz – 1 GHz



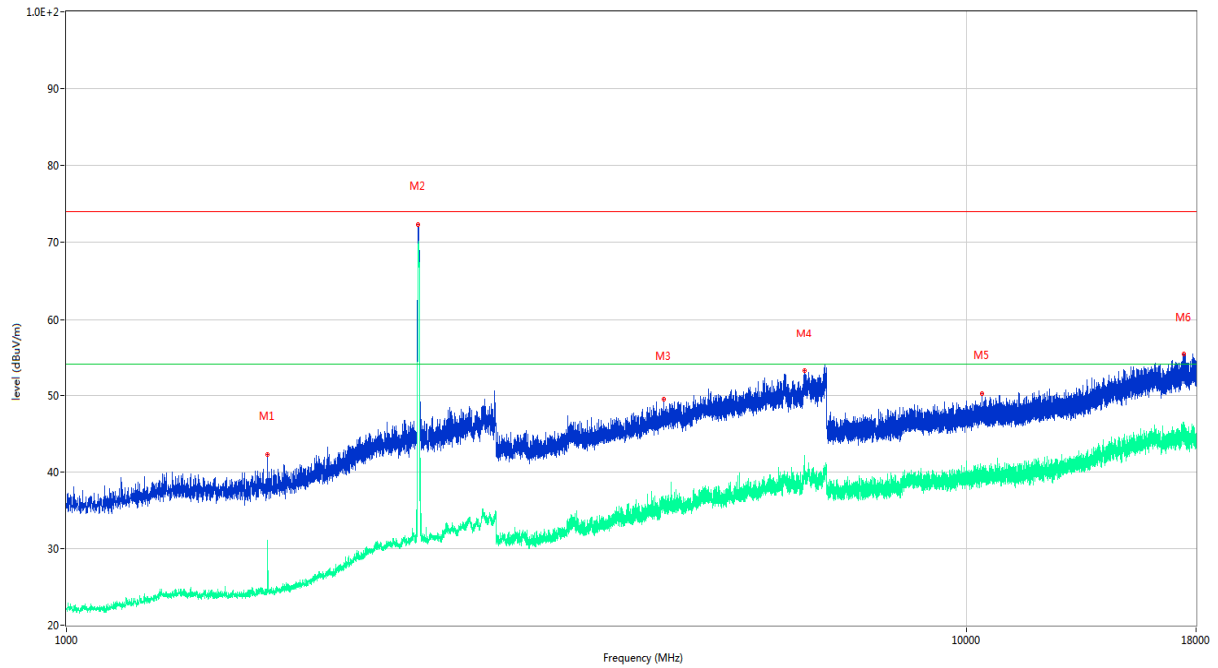
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	38.730	28.09	-24.51	40.0	-11.91	Peak	335.20	100	Vertical	Pass
2	48.672	29.28	-22.44	40.0	-10.72	Peak	293.40	100	Vertical	Pass
3	103.914	31.68	-24.30	43.5	-11.82	Peak	360.00	200	Vertical	Pass
4	520.044	25.42	-15.96	46.0	-20.58	Peak	114.90	100	Vertical	Pass
5	835.779	26.27	-7.96	46.0	-19.73	Peak	3.30	200	Vertical	N/A
6	881.563	27.46	-10.34	46.0	-18.54	Peak	3.70	100	Vertical	N/A

A.1.2 Test Antenna Horizontal, 30 MHz – 1 GHz



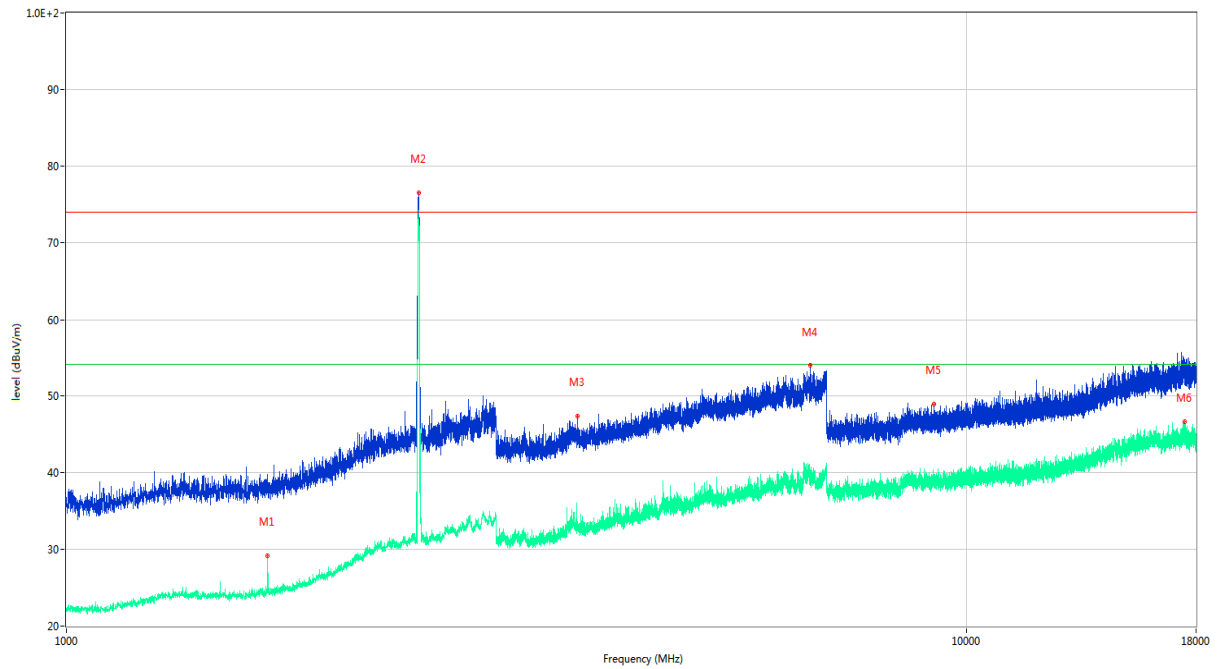
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	42.077	25.38	-23.33	40.0	-14.62	Peak	357.80	200	Horizontal	Pass
2	48.624	24.29	-22.44	40.0	-15.71	Peak	232.90	100	Horizontal	Pass
3	91.741	23.17	-25.60	43.5	-20.33	Peak	108.20	200	Horizontal	Pass
4	103.914	28.45	-24.30	43.5	-15.05	Peak	247.90	200	Horizontal	Pass
5	835.633	27.13	-7.94	46.0	-18.87	Peak	292.30	100	Horizontal	N/A
6	881.563	31.44	-10.34	46.0	-14.56	Peak	157.50	100	Horizontal	N/A

A.1.3 Test Antenna Vertical, 1 GHz – 18 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1673.500	42.24	-16.98	74.0	-31.76	Peak	217.00	100	Vertical	N/A
1**	1673.500	31.01	-16.98	54.0	-22.99	AV	217.00	100	Vertical	N/A
2	2461.000	72.35	-12.29	74.0	-1.65	Peak	45.00	100	Vertical	N/A
2**	2461.000	69.53	-12.29	54.0	15.53	AV	45.00	100	Vertical	N/A
3	4607.500	49.53	-3.55	74.0	-24.47	Peak	13.00	100	Vertical	Pass
3**	4607.500	35.41	-3.55	54.0	-18.59	AV	13.00	100	Vertical	Pass
4	6606.500	53.18	0.66	74.0	-20.82	Peak	210.00	100	Vertical	Pass
4**	6606.500	39.96	0.66	54.0	-14.04	AV	210.00	100	Vertical	Pass
5	10413.000	50.22	0.53	74.0	-23.78	Peak	0.00	100	Vertical	Pass
5**	10413.000	39.39	0.53	54.0	-14.61	AV	0.00	100	Vertical	Pass
6	17464.001	55.35	3.85	74.0	-18.65	Peak	78.00	100	Vertical	Pass
6**	17464.001	45.02	3.85	54.0	-8.98	AV	78.00	100	Vertical	Pass

A.1.4 Test Antenna Horizontal, 1 GHz – 18 GHz

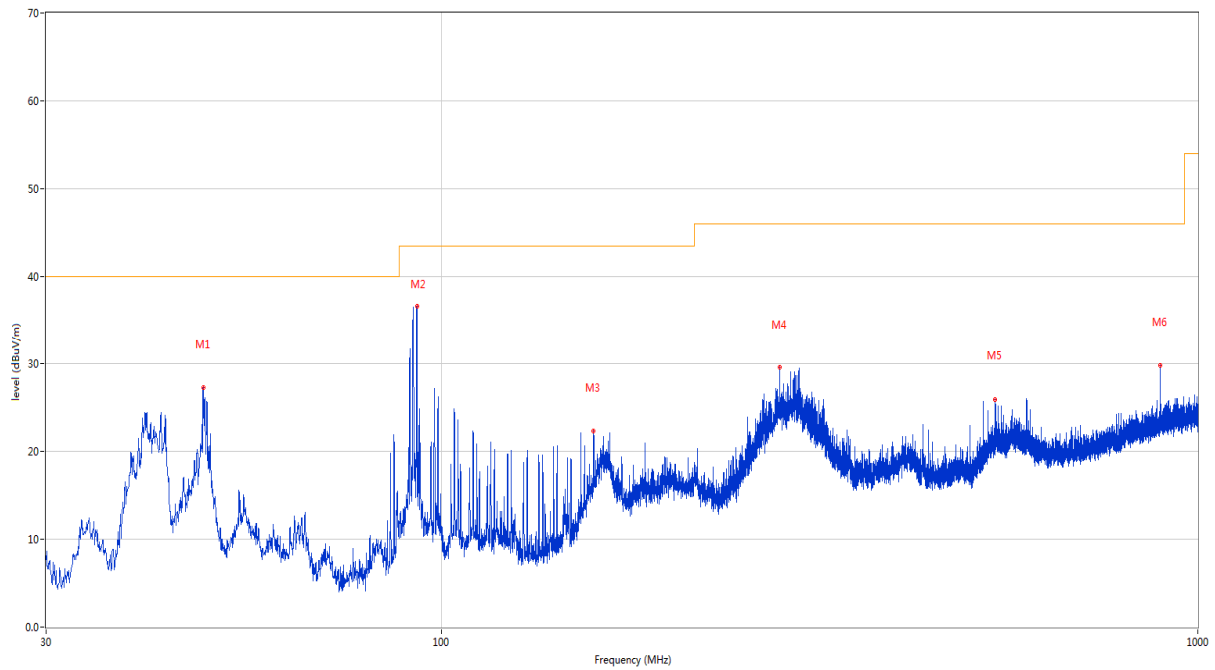


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1674.000	37.89	-16.98	74.0	-36.11	Peak	15.00	100	Horizontal	N/A
1**	1674.000	29.18	-16.98	54.0	-24.82	AV	15.00	100	Horizontal	N/A
2	2463.000	76.56	-12.42	74.0	2.56	Peak	41.00	100	Horizontal	N/A
2**	2463.000	73.37	-12.42	54.0	19.37	AV	41.00	100	Horizontal	N/A
3	3699.000	47.28	-5.81	74.0	-26.72	Peak	125.00	100	Horizontal	Pass
3**	3699.000	32.72	-5.81	54.0	-21.28	AV	125.00	100	Horizontal	Pass
4	6705.500	53.96	-0.63	74.0	-20.04	Peak	12.00	100	Horizontal	Pass
4**	6705.500	39.19	-0.63	54.0	-14.81	AV	12.00	100	Horizontal	Pass
5	9197.500	48.91	-0.71	74.0	-25.09	Peak	218.00	100	Horizontal	Pass
5**	9197.500	38.69	-0.71	54.0	-15.31	AV	218.00	100	Horizontal	Pass
6	17467.501	53.40	3.81	74.0	-20.60	Peak	248.00	100	Horizontal	Pass
6**	17467.501	46.56	3.81	54.0	-7.44	AV	248.00	100	Horizontal	Pass

Test Data and Plots

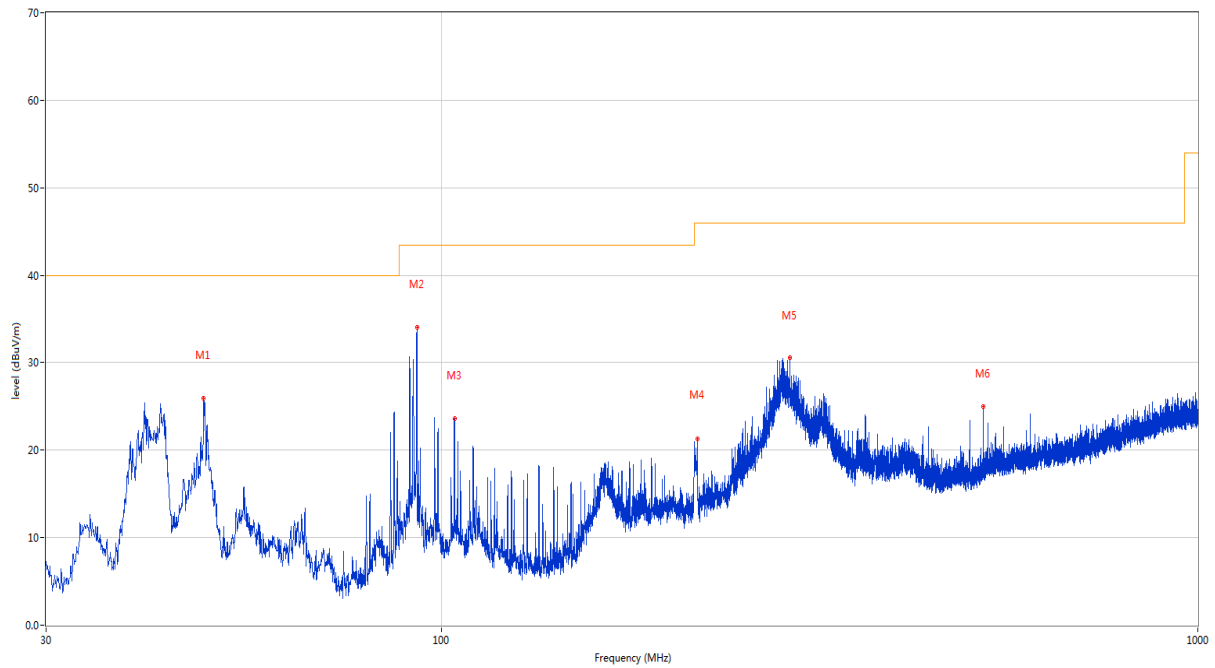
The USB Test Mode

A.1.5 Test Antenna Vertical, 30 MHz – 1 GHz



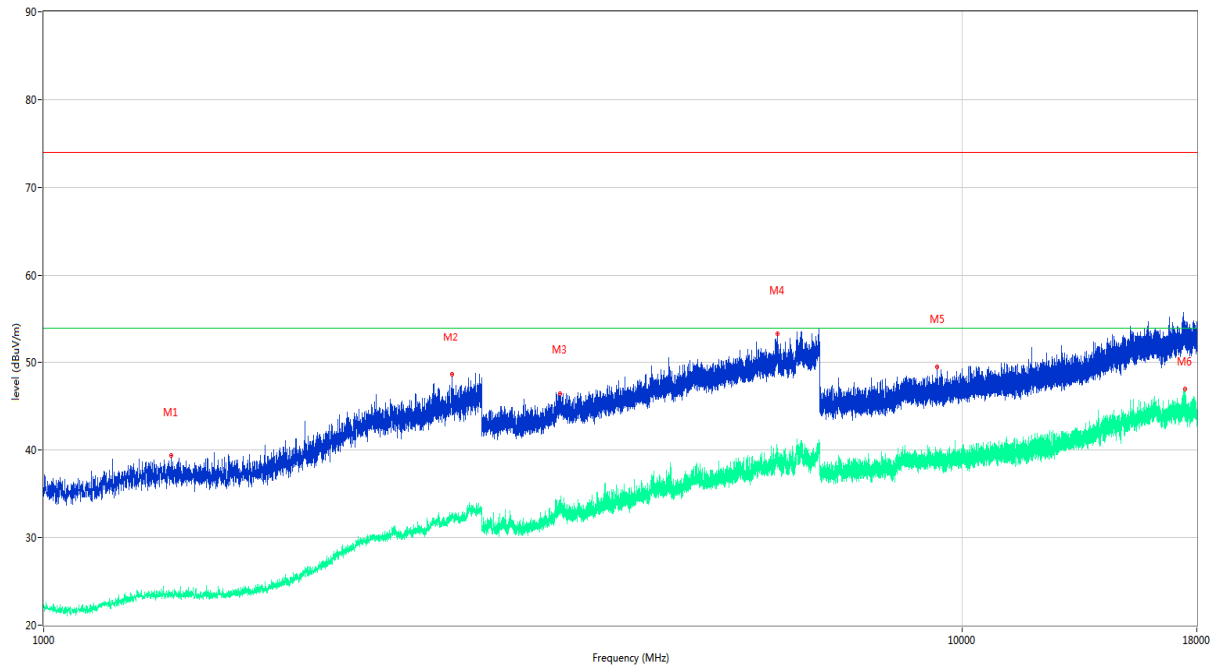
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	48.430	27.30	-22.55	40.0	-12.70	Peak	134.60	100	Vertical	Pass
2	92.759	36.68	-25.53	43.5	-6.82	Peak	37.00	100	Vertical	Pass
3	158.913	22.33	-27.48	43.5	-21.17	Peak	152.90	100	Vertical	Pass
4	280.163	29.61	-21.77	46.0	-16.39	Peak	41.00	200	Vertical	Pass
5	539.977	25.92	-15.85	46.0	-20.08	Peak	29.30	100	Vertical	Pass
6	891.020	29.77	-10.12	46.0	-16.23	Peak	166.00	100	Vertical	Pass

A.1.6 Test Antenna Horizontal, 30 MHz – 1 GHz



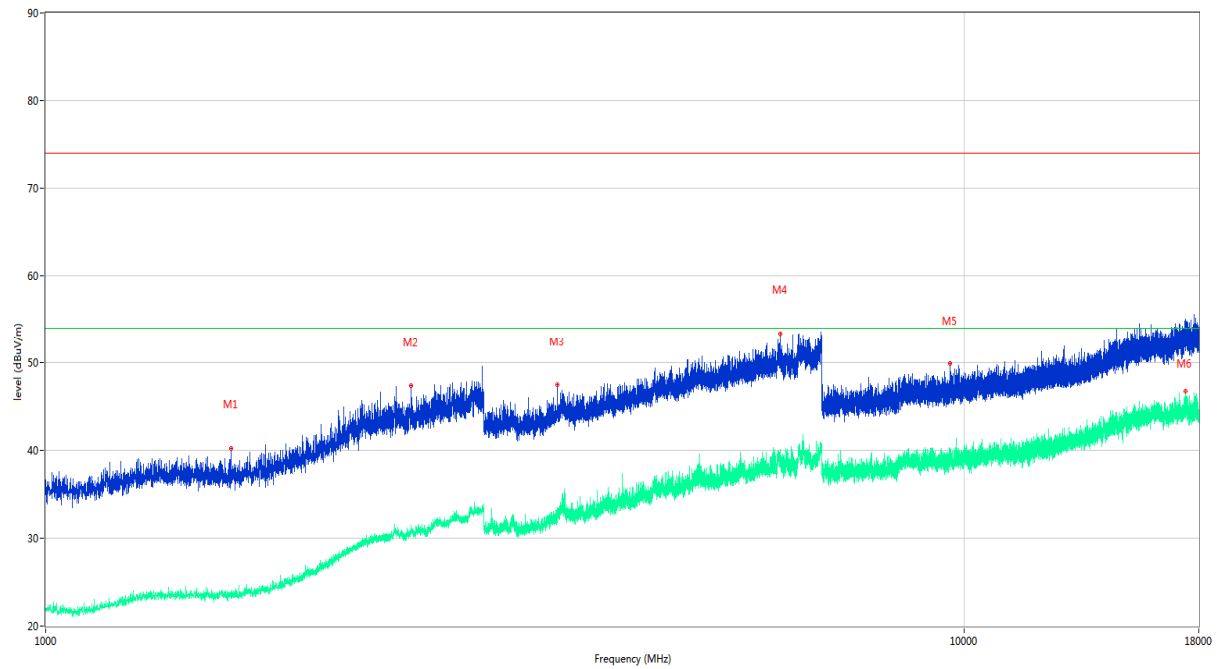
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	48.478	25.93	-22.54	40.0	-14.07	Peak	36.60	200	Horizontal	Pass
2	92.808	34.06	-25.52	43.5	-9.44	Peak	130.30	200	Horizontal	Pass
3	104.011	23.62	-24.38	43.5	-19.88	Peak	101.20	200	Horizontal	Pass
4	217.840	21.26	-24.11	46.0	-24.74	Peak	106.00	100	Horizontal	Pass
5	288.796	30.53	-21.94	46.0	-15.47	Peak	273.40	100	Horizontal	Pass
6	519.995	24.93	-16.23	46.0	-21.07	Peak	54.70	200	Horizontal	Pass

A.1.7 Test Antenna Vertical, 1 GHz – 18 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1376.000	39.37	-17.43	74.0	-34.63	Peak	6.00	100	Vertical	Pass
1**	1376.000	23.11	-17.43	54.0	-30.89	AV	6.00	100	Vertical	Pass
2	2782.000	48.68	-10.51	74.0	-25.32	Peak	114.00	100	Vertical	Pass
2**	2782.000	32.09	-10.51	54.0	-21.91	AV	114.00	100	Vertical	Pass
3	3651.500	46.37	-6.23	74.0	-27.63	Peak	1.00	100	Vertical	Pass
3**	3651.500	33.39	-6.23	54.0	-20.61	AV	1.00	100	Vertical	Pass
4	6288.500	53.36	0.22	74.0	-20.64	Peak	181.00	100	Vertical	Pass
4**	6288.500	39.33	0.22	54.0	-14.67	AV	181.00	100	Vertical	Pass
5	9383.999	49.53	-0.62	74.0	-24.47	Peak	184.00	100	Vertical	Pass
5**	9383.999	38.31	-0.62	54.0	-15.69	AV	184.00	100	Vertical	Pass
6	17462.999	52.96	3.86	74.0	-21.04	Peak	31.00	100	Vertical	Pass
6**	17462.999	46.95	3.86	54.0	-7.05	AV	31.00	100	Vertical	Pass

A.1.8 Test Antenna Horizontal, 1 GHz – 18 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1590.500	40.23	-17.57	74.0	-33.77	Peak	305.00	100	Horizontal	Pass
1**	1590.500	23.52	-17.57	54.0	-30.48	AV	305.00	100	Horizontal	Pass
2	2499.500	47.35	-12.10	74.0	-26.65	Peak	38.00	100	Horizontal	Pass
2**	2499.500	31.16	-12.10	54.0	-22.84	AV	38.00	100	Horizontal	Pass
3	3605.500	47.45	-7.35	74.0	-26.55	Peak	275.00	100	Horizontal	Pass
3**	3605.500	32.47	-7.35	54.0	-21.53	AV	275.00	100	Horizontal	Pass
4	6306.000	53.41	-0.68	74.0	-20.59	Peak	122.00	100	Horizontal	Pass
4**	6306.000	38.30	-0.68	54.0	-15.70	AV	122.00	100	Horizontal	Pass
5	9642.000	49.85	-0.19	74.0	-24.15	Peak	329.00	100	Horizontal	Pass
5**	9642.000	38.96	-0.19	54.0	-15.04	AV	329.00	100	Horizontal	Pass
6	17416.499	52.74	4.76	74.0	-21.26	Peak	360.00	100	Horizontal	Pass
6**	17416.499	46.75	4.76	54.0	-7.25	AV	360.00	100	Horizontal	Pass

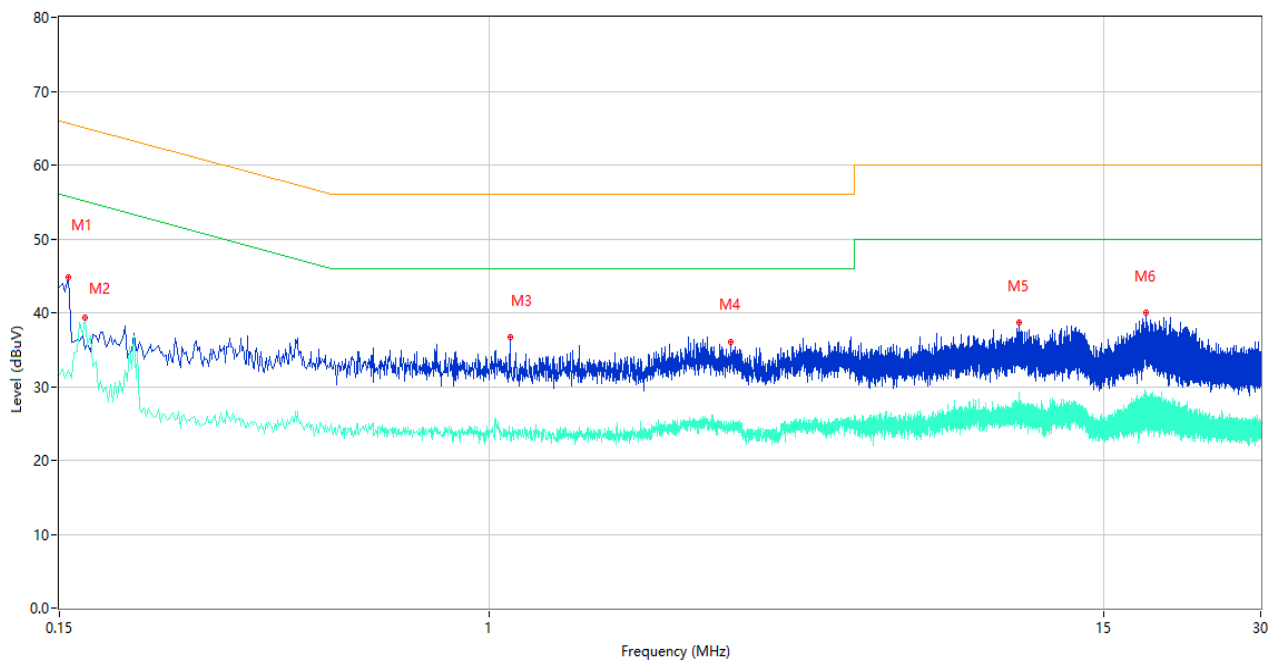
A.2 Conducted Emission

Note: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

Test Data and Plots

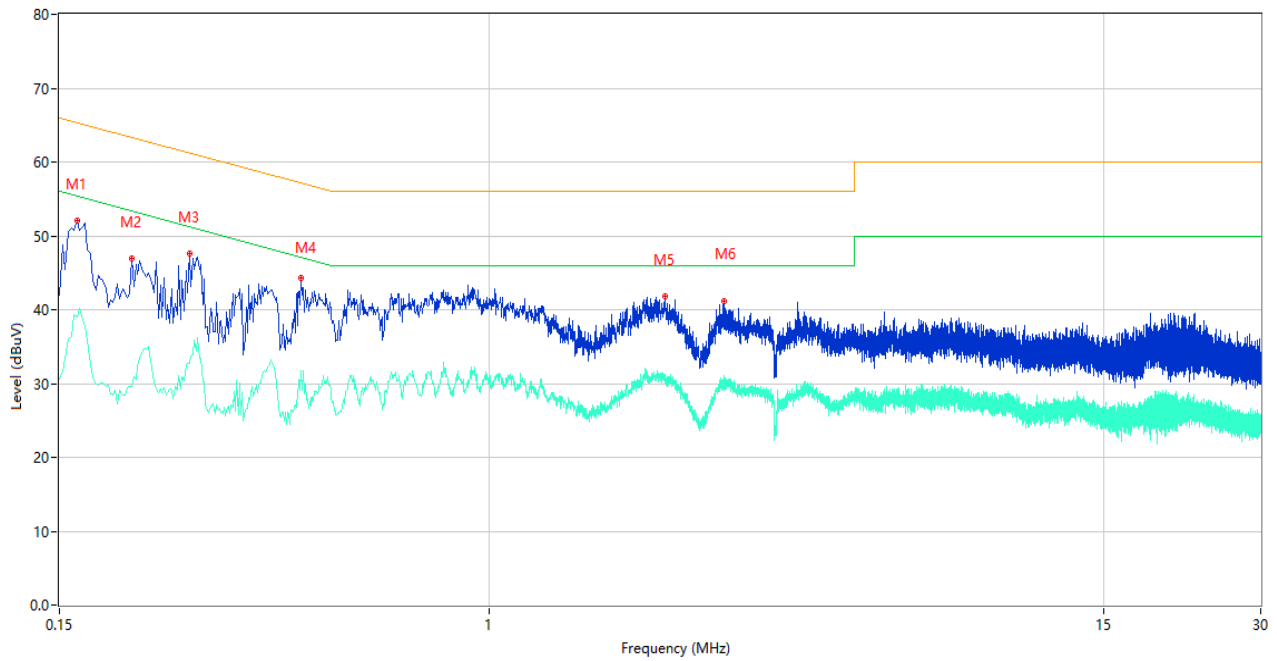
The GSM 850 MHz Test Mode

A.2.1 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.156	44.81	10.41	65.67	-20.86	Peak	L	Pass
1**	0.156	32.26	10.41	55.67	-23.41	AV	L	Pass
2	0.168	35.04	10.40	65.06	-30.02	Peak	L	Pass
2**	0.168	39.38	10.40	55.06	-15.68	AV	L	Pass
3	1.094	36.63	10.23	56.00	-19.37	Peak	L	Pass
3**	1.094	23.36	10.23	46.00	-22.64	AV	L	Pass
4	2.896	35.98	10.28	56.00	-20.02	Peak	L	Pass
4**	2.896	24.19	10.28	46.00	-21.81	AV	L	Pass
5	10.352	38.63	10.37	60.00	-21.37	Peak	L	Pass
5**	10.352	27.21	10.37	50.00	-22.79	AV	L	Pass
6	18.074	40.07	10.49	60.00	-19.93	Peak	L	Pass
6**	18.074	29.31	10.49	50.00	-20.69	AV	L	Pass

A.2.2 N Phase

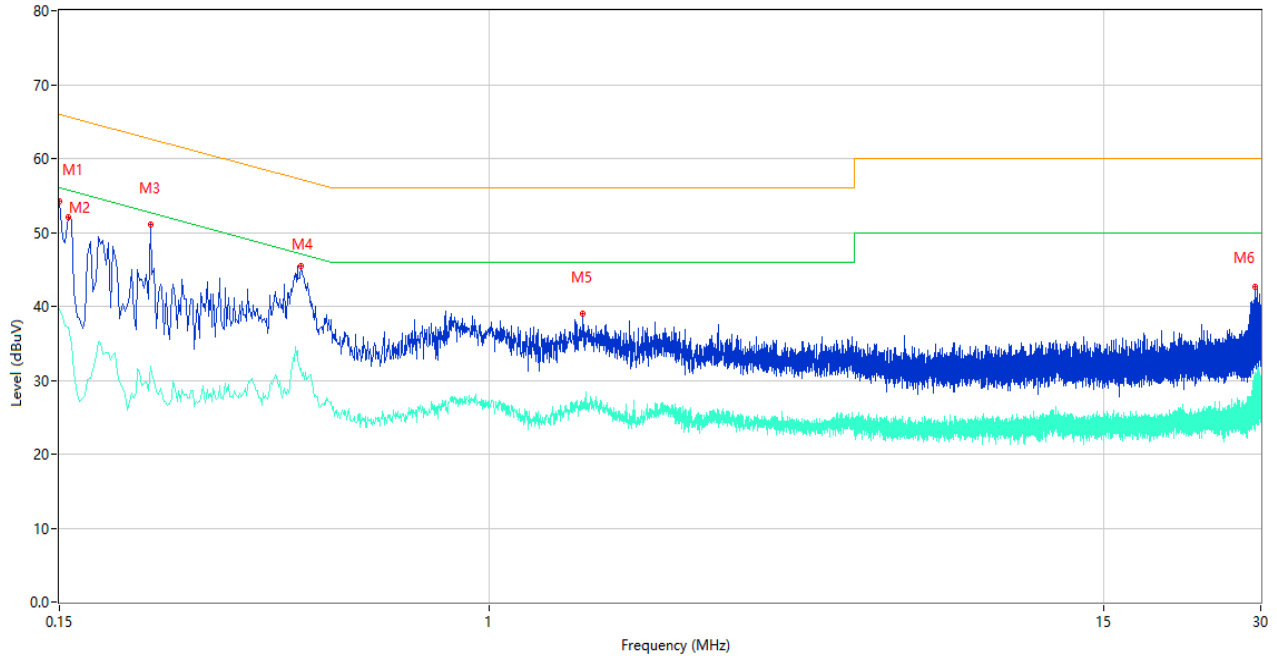


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.162	52.04	10.40	65.36	-13.32	Peak	N	Pass
1**	0.162	39.08	10.40	55.36	-16.28	AV	N	Pass
2	0.206	46.92	10.38	63.37	-16.45	Peak	N	Pass
2**	0.206	29.59	10.38	53.37	-23.78	AV	N	Pass
3	0.266	47.53	10.34	61.24	-13.71	Peak	N	Pass
3**	0.266	32.78	10.34	51.24	-18.46	AV	N	Pass
4	0.436	44.25	10.31	57.14	-12.89	Peak	N	Pass
4**	0.436	31.77	10.31	47.14	-15.37	AV	N	Pass
5	2.170	41.74	10.27	56.00	-14.26	Peak	N	Pass
5**	2.170	30.54	10.27	46.00	-15.46	AV	N	Pass
6	2.820	41.15	10.29	56.00	-14.85	Peak	N	Pass
6**	2.820	30.68	10.29	46.00	-15.32	AV	N	Pass

Test Data and Plots

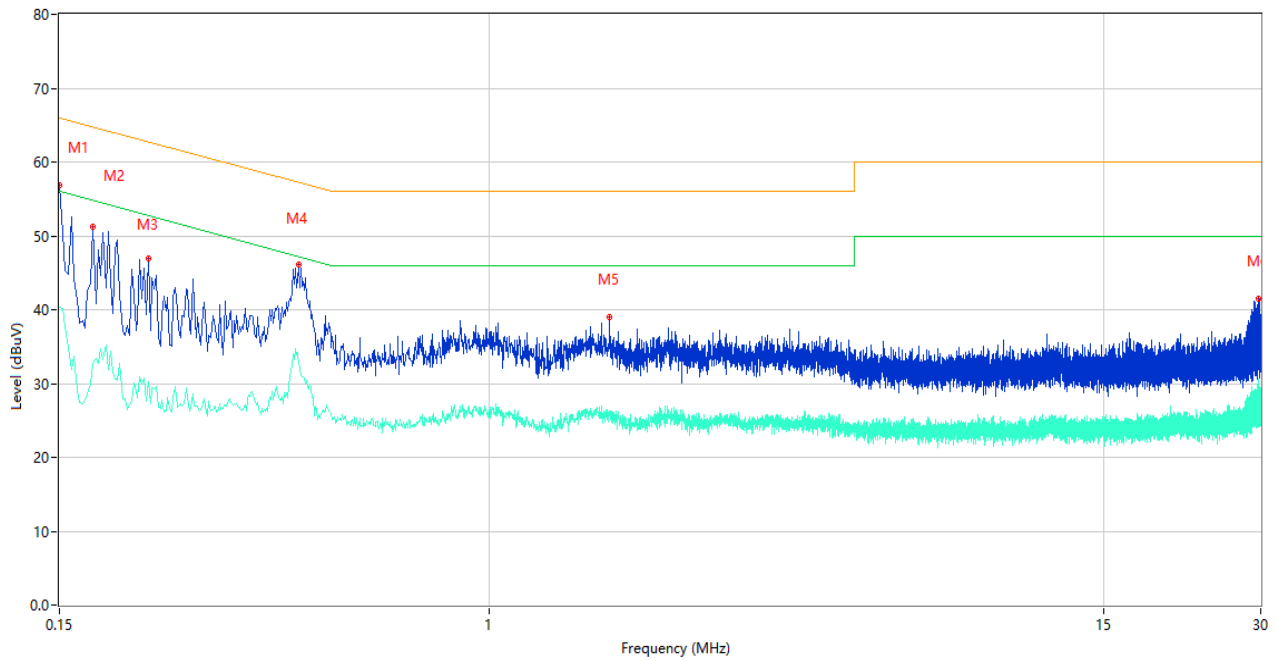
The USB Test Mode

A.2.3 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	54.28	10.41	66.00	-11.72	Peak	L	Pass
1**	0.150	39.68	10.41	56.00	-16.32	AV	L	Pass
2	0.156	52.12	10.41	65.67	-13.55	Peak	L	Pass
2**	0.156	37.17	10.41	55.67	-18.50	AV	L	Pass
3	0.224	51.04	10.37	62.67	-11.63	Peak	L	Pass
3**	0.224	31.87	10.37	52.67	-20.80	AV	L	Pass
4	0.436	45.42	10.31	57.14	-11.72	Peak	L	Pass
4**	0.436	31.49	10.31	47.14	-15.65	AV	L	Pass
5	1.510	38.96	10.25	56.00	-17.04	Peak	L	Pass
5**	1.510	26.57	10.25	46.00	-19.43	AV	L	Pass
6	29.312	42.58	10.74	60.00	-17.42	Peak	L	Pass
6**	29.312	25.05	10.74	50.00	-24.95	AV	L	Pass

A.2.4 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	56.78	10.41	66.00	-9.22	Peak	N	Pass
1**	0.150	40.35	10.41	56.00	-15.65	AV	N	Pass
2	0.174	51.27	10.39	64.77	-13.50	Peak	N	Pass
2**	0.174	32.75	10.39	54.77	-22.02	AV	N	Pass
3	0.222	46.89	10.37	62.74	-15.85	Peak	N	Pass
3**	0.222	30.32	10.37	52.74	-22.42	AV	N	Pass
4	0.432	46.09	10.31	57.21	-11.12	Peak	N	Pass
4**	0.432	33.30	10.31	47.21	-13.91	AV	N	Pass
5	1.700	38.95	10.26	56.00	-17.05	Peak	N	Pass
5**	1.700	26.08	10.26	46.00	-19.92	AV	N	Pass
6	29.690	41.49	10.75	60.00	-18.51	Peak	N	Pass
6**	29.690	26.83	10.75	50.00	-23.17	AV	N	Pass

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2020267-AE-1.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2020267-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2020267-AI.PDF”.

--END OF REPORT--