

FCC TEST REPORT

Product Name: Mobile Phone Trade Mark: MI Model No.: MCG3B Report Number: 170803008EMC-1 Test Standards: FCC 47 CFR Part 15 Subpart B Test Result: PASS Date of Issue: September 4, 2017

Prepared for:

Xiaomi Communications Co.,Ltd. The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd. 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China TEL: +86-755-2823 0888 FAX: +86-755-2823 0886

Tested by:	Kevin Livery Kevin Liang Senior Engineer	Reviewed by:	Jim Long Jim Long Senior Supervisor	-
Approved by:	Billy Li	Date:	September 4, 2017	

Technical Director

Version

Version No.	Date	Description
V1.0	September 4, 2017	Original



CONTENTS

1.	GENE	ERAL INFORMATION	4
	1.1	CLIENT INFORMATION	Л
	1.2	EUT INFORMATION	
		1.2.1 GENERAL DESCRIPTION OF EUT	
		1.2.2 DESCRIPTION OF ACCESSORIES	
	1.3	DESCRIPTION OF SUPPORT UNITS	
	1.4	TEST LOCATION.	
	1.5	TEST FACILITY	
	1.6	DEVIATION FROM STANDARDS	
	1.7	ABNORMALITIES FROM STANDARD CONDITIONS	
	1.8	OTHER INFORMATION REQUESTED BY THE CUSTOMER	7
	1.9	MEASUREMENT UNCERTAINTY	7
2.	тсет	SUMMARY	Q
2. 3.		PMENT LIST	
3. 4.		CONFIGURATION	
	_		-
	4.1	Environmental conditions for testing	
		4.1.1 NORMAL OR EXTREME TEST CONDITIONS	
		4.1.2 RECORD OF NORMAL ENVIRONMENT.	
	4.2	TEST MODES	
	4.3		
		4.3.1 FOR RADIATED EMISSIONS TEST SETUP4.3.2 FOR CONDUCTED EMISSIONS TEST SETUP	
	4.4	4.3.2 FOR CONDUCTED EMISSIONS TEST SETUP	
5.		RENCE DOCUMENTS FOR TESTING	
6.	EMC	REQUIREMENTS SPECIFICATION	13
	6.1	RADIATED EMISSION	13
	6.2	CONDUCTED EMISSION	
	-		
		X 1 PHOTOS OF TEST SETUP	
API	PENDI	X 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS	21

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant: Xiaomi Communications Co.,Ltd.			
Address of Applicant:	The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China		
Manufacturer:	N/A		
Address of Manufacturer:	N/A		

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Mobile Phone		
Model No.:	MCG3B		
Add. Model No.:	N/A		
Trade Mark:	MI		
DUT Stage:	Identical Prototype		
Power Supply:	DC 5V from adaptor, Battery 3.85V		
Classification of digital devices:	Class B		
Highest Internal Frequency:	1.2 GHz		
Software Version:	MIUI8		
Hardware Version:	ersion: P2.0		
Sample Received Date: August 4, 2017			
Sample Tested Date: August 4, 2017 to August 25, 2017			

1.2.2 Description of Accessories

Adapter(1)			
Trade Mark:	XIAOMI		
Model No.:	MDY-09-EE		
Input:	100-240 V~50/60 Hz 0.2A Max		
Output:	5.0 V == 1.0 A		
AC Cable:	N/A		
DC Cable: 0.8 Meter, Shielded without ferrite			
Manufacturer:	Dongguan Aohai Power Technology Co., Ltd.		

Adapter(2)			
Trade Mark:	Trade Mark: XIAOMI		
Model No.:	Model No.: MDY-09-EE		
Input: 100-240 V~50/60 Hz 0.2A Max			
Output:	5.0 V == 1.0 A		
AC Cable:	AC Cable: Meter, N/A		
DC Cable:	DC Cable: 0.8 Meter, Shielded without ferrite		
Manufacturer: Dongguan Aohai Power Technology Co., Ltd.			

Battery(1)		
Trade Mark:	MI	
Model No.:	BN34	
Battery Type: Lithium-ion Rechargeable Battery		
Rated Voltage: 3.85 Vdc		
Limited Charge Voltage: 4.4 Vdc		
Rated Capacity: 2910mAh		
Manufacturer: SCUD(Fujian)Electronics Co., Ltd.		

Battery(2)		
Trade Mark:	MI	
Model No.:	BN34	
Battery Type:	Lithium-ion Rechargeable Battery	
Rated Voltage: 3.85 Vdc		
Limited Charge Voltage:	4.4 Vdc	
Rated Capacity: 2910mAh		
Manufacturer: Sunwoda Electronic Co., Ltd.		

Cable(1)			
Trade Mark:	N/A		
Model No.: KLC-2639			
Description: USB Micro-B Plug Cable			
Cable Type: Unshielded without ferrite			
Length:	0.8 Meter		

Cable(2)			
Trade Mark:	N/A		
Model No.:	0US231XI0015		
Description:	USB Micro-B Plug Cable		
Cable Type:	Unshielded without ferrite		
Length:	0.8 Meter		

Uni⊛nTrust

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested independently

1) Support Equipment				
Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	E450	SL10G10780	UnionTrust
Wireless AP	SiZong	WN1200A3	WS1505000003	UnionTrust
Key-Press Attenuator	Huaxin	KT2.5-90/1S-2S	N/A	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109 Telephone: +86 (0) 755 2823 0888 Fax: +86 (0) 755 2823 0886

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.

Designation Number: CN1194 Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product 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.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases					
Test Item	Test Requirement	Test Method	Result		
Conducted Emission	FCC 47 CFR Part 15.107	ANSI C63.4-2014	PASS		
Radiated Emission	FCC 47 CFR Part 15.109	ANSI C63.4-2014	PASS		
Note:					
1) N/A: In this whole report not application.					



3. EQUIPMENT LIST

	Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)	
>	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 20, 2015	Dec. 19, 2018	
	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Dec. 22, 2016	Dec. 22, 2017	
	Receiver	R&S	ESIB26	100114	Dec. 22, 2016	Dec. 22, 2017	
	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Dec. 22, 2016	Dec. 22, 2017	
	Loop Antenna	ETS-LINDGREN	6502	00202525	Jun. 24, 2015	Jun. 23, 2018	
	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Jul. 24, 2015	Jul. 23, 2018	
	Preamplifier	HP	8447F	2805A02960	Dec. 22, 2016	Dec. 22, 2017	
	Broadband Antenna (Pre-amplifier)	ETS-LINDGREN	3142E-PA	00201891	Dec. 30, 2016	Dec. 30, 2017	
	Horn Antenna	ETS-LINDGREN	3117	00164202	Jul. 24, 2015	Jul. 23, 2018	
	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	Dec. 30, 2016	Dec. 30, 2017	
	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jul. 28, 2015	Jul. 27, 2018	
	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Jul. 29, 2015	Jul. 28, 2018	
	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A	
	Test Software	Audix	e3	Software Version: 9.160323			

	Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)	
>	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Dec. 22, 2016	Dec. 22, 2017	
>	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Dec. 22, 2016	Dec. 22, 2017	
>	LISN	R&S	ESH2-Z5	860014/024	Dec. 22, 2016	Dec. 22, 2017	
	LISN	ETS-Lindgren	3816/2SH	00201088	Aug. 24, 2016	Aug. 23, 2017	
>	Test Software	Audix	e3	Sof	tware Version: 9.16	0323	

4. TEST CONFIGURATION 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests					
Test Condition	Ambient					
Test Condition	Temperature (°C)	Voltage (V)	Relative Humidity (%)			
NT/NV	+15 to +35	3.85	20 to 75			
Remark: 1) NV: Normal Voltage; NT: Normal Temperature						

4.1.2 Record of Normal Environment

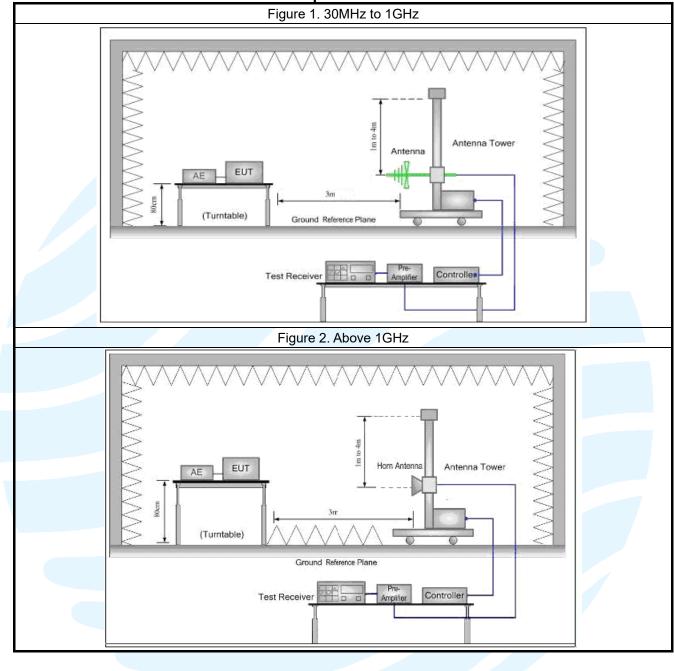
Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)	Tested by
Conducted Emission	25.6	56	102.2	Beasy
Radiated Emission	25.6	56	102.2	Tony

4.2 TEST MODES

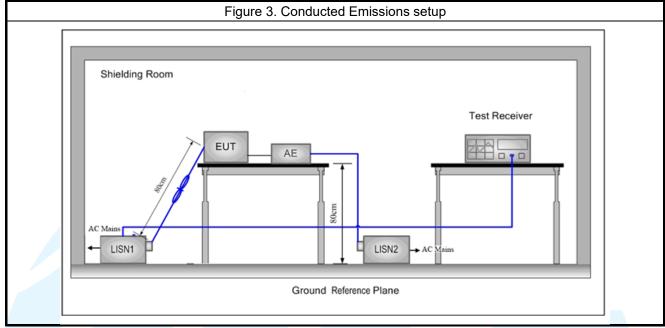
Test Item	EMI Test Modes
	Mode 1: WCDMA1900 Idle+Adaptor1+Bluetooth Idle+Wlan
	Idle+Earphone+ Camera+SIM 1
	Mode 2: GSM850 Idle+Adaptor2+Bluetooth Idle+Wlan Idle+Earphone+MP4
	Playing+SIM 1
Radiated Emission	Mode 3: LTE Band5 Idle+Adaptor1+Bluetooth Idle+Wlan Idle+Earphone+FM
	Mode 4: LTE Band7 Idle+USB1 Link+Bluetooth Idle+Wlan Idle+Earphone
	+GPS Rx+SIM 1
	Mode 5: LTE Band7 Idle+USB2 Link+Bluetooth Idle+Wlan Idle+Earphone
	+GPS Rx+SIM 1
	Mode 1: WCDMA1900 Idle+Adaptor1+Bluetooth Idle+Wlan
	Idle+Earphone+ Camera+SIM 1
	Mode 2: GSM850 Idle+Adaptor2+Bluetooth Idle+Wlan Idle+Earphone+MP4
	Playing+SIM 1
Conducted Emission	Mode 3: LTE Band5 Idle+Adaptor1+Bluetooth Idle+Wlan Idle+Earphone+FM ON+SIM 1
	Mode 4: LTE Band7 Idle+USB1 Link+Bluetooth Idle+Wlan Idle+Earphone
	+GPS Rx+SIM 1
	Mode 5: LTE Band7 Idle+USB2 Link+Bluetooth Idle+Wlan Idle+Earphone +GPS Rx+SIM 1
Remark:	
The above test modes in boldfac	e were the worst cases, only the test data of these modes shown on this reported

4.3 TEST SETUP

4.3.1 For Radiated Emissions test setup



4.3.2 For Conducted Emissions test setup



4.4SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the fifth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title	
1	FCC 47 CFR Part15 Subpart B	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	

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f)	Detector type	Measurement receiver bandwidth		
(MHz)	Detector type	RBW	VBW	
$30 \le f \le 1\ 000$	Quasi Peak	120 kHz	300 kHz	
£>1000	Peak	1 MHz	3 MHz	
f ≥1000	Average	1 MHz	10 Hz	

Measured frequency range

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Limits:

Limits for Class B devices

	limits at 3m (dBµV/m)				
Frequency (MHz)	QP Detector	PK Detector	AV Detector		
30-88	40.0				
88-216	43.5				
216-960	46.0	-	-		
960 to 1000	54.0				
Above 1000		74.0	54.0		

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Remark:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level $(dB\mu V/m) = 20 \log Emission level (\mu V/m)$.

3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

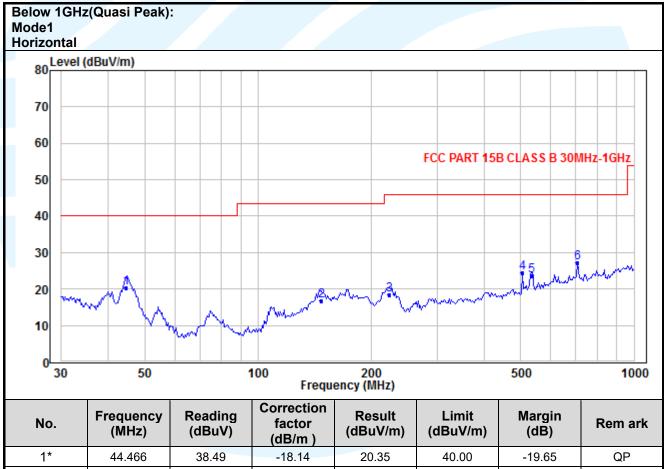
Page 14 of 22

- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.
- 2. Above 1GHz test procedure as below:
- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

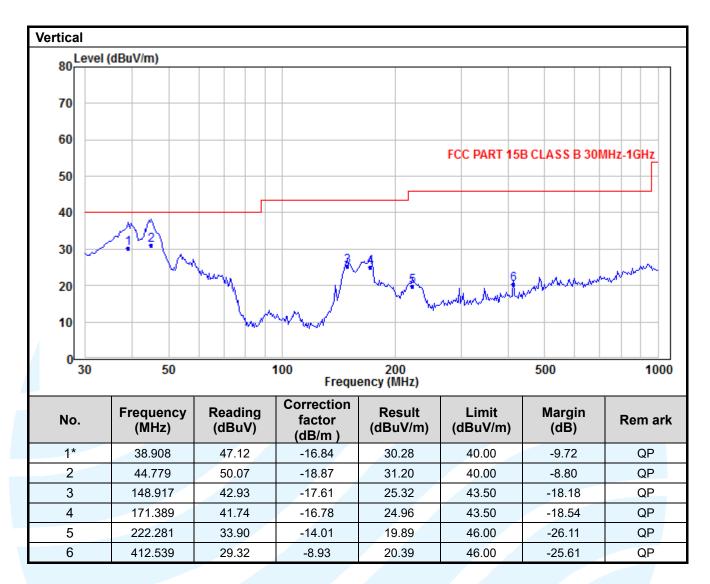
Equipment Used: Refer to section 3 for details.

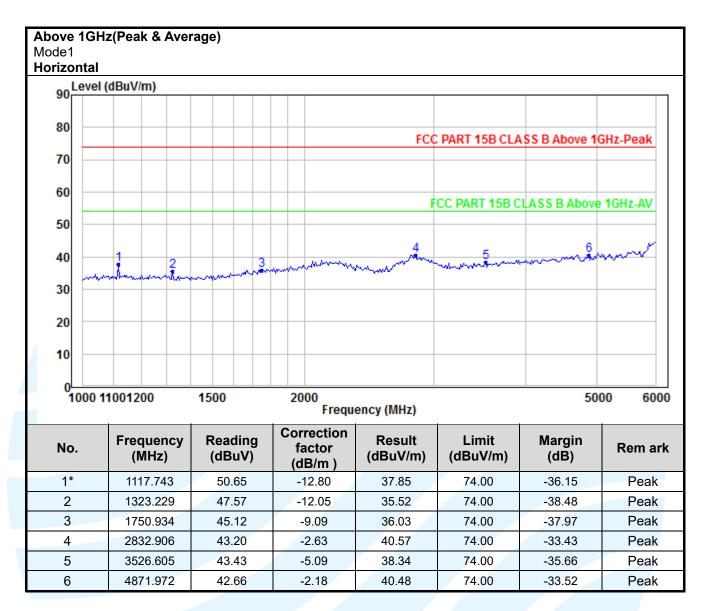
Test Result: Pass

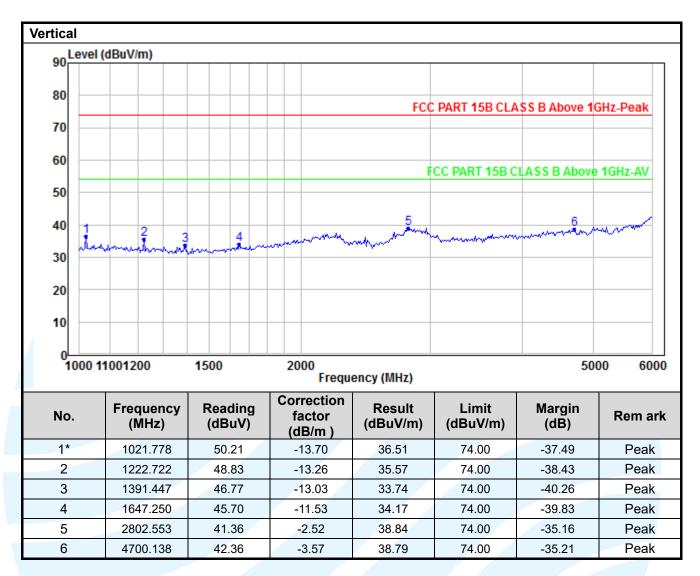
The measurement worst data as follows:



L.	44.400	38.49	-18.14	20.35	40.00	-19.05	QP
2	146.839	33.73	-17.09	16.64	43.50	-26.86	QP
3	223.848	32.72	-14.31	18.41	46.00	-27.59	QP
4	505.789	31.53	-7.00	24.53	46.00	-21.47	QP
5	535.038	29.79	-6.02	23.77	46.00	-22.23	QP
6	708.694	29.73	-2.46	27.27	46.00	-18.73	QP







Remark:

1. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

6.2 CONDUCTED EMISSION

Test Requirement:FCC 47 CFR Part 15.107Test Method:ANSI C63.4-2014

Limits:

Limits for Class B devices

Frequency range	Limits (dB(µV)			
(MHz)	Quasi-peak	Average		
0,15 to 0,50	66 to 56	56 to 46		
0,50 to 5	56	46		
5 to 30	60	50		

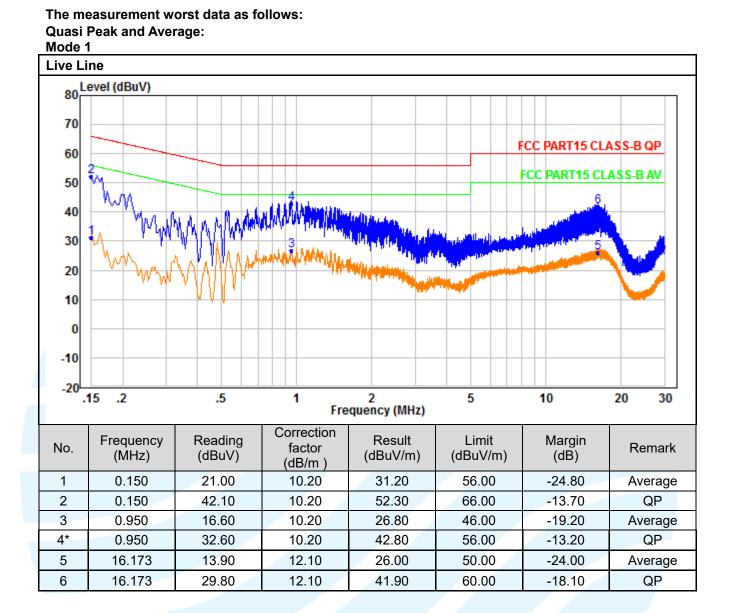
Remark:

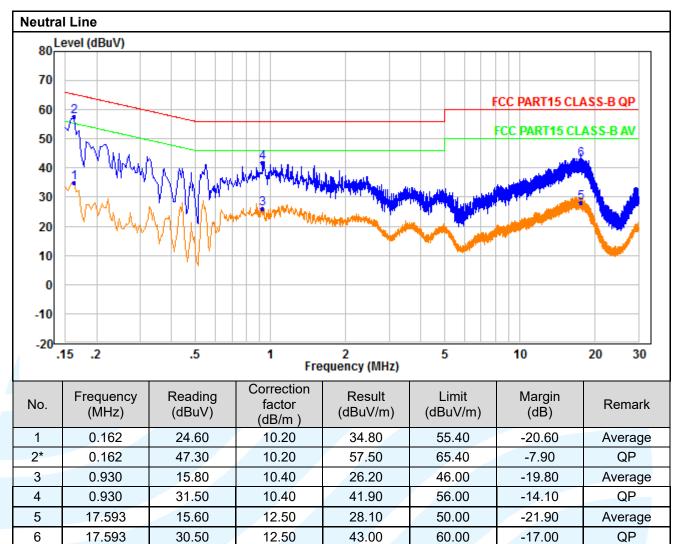
- 1. The lower limit shall apply at the transition frequencies.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
- **Test Setup:** Refer to section 4.3.2 for details.

Test Procedures:

- 1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- 2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

Equipment Used:Refer to section 3 for details.Test Result:Pass





Remark:

1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.



Labelling Requirements

Each digital device which has been verified as complying with the Class B limits shall have permanently attached in a conspicuous location for the user to observe, a label with the following statement:

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Information to User

The following warning or similar statement shall be provided in a conspicuous location in the operator's manual so that the user of a Class B digital device is aware of its interference potential. Additional information about corrective measures may also be provided to the user at the manufacturer's option.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The instruction manual for a Class B external switching power supply that is separately marketed shall also include sufficient information to insure that the complete system is capable of complying with the requirements for a Class B external switching power supplies. The manual should also caution the user that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. Finally, the manual should instruct the user to use any special accessories, i.e. shielded cables, necessary for compliance with the standards.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required above may be included in the manual in that alternative form, provided that the user can be reasonably expected to have the capability to access information in that form.