

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE190805204

FCC REPORT

Applicant: Xwireless LLC

Address of Applicant: 11565 Old Georgetown Road, Rockville, MD 20852United States

Equipment Under Test (EUT)

Product Name: LTE smartphone

Model No.: MUV

Trade mark: Vortex

FCC ID: 2ADLJMUV

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 16 Aug., 2019

Date of Test: 17 Aug., to 19 Sep., 2019

Date of report issued: 23 Sep., 2019

Test Result: PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





Version

Version No.	Date	Description
00	23 Sep., 2019	Original

Cavey Chen Date:

Test Engineer Tested by: 23 Sep., 2019

Reviewed by: 23 Sep., 2019

Project Engineer



3 Contents

			Page
1	COV	/ER PAGE	1
2	VER	SION	2
3	100	NTENTS	3
4		T SUMMARY	
5		VERAL INFORMATION	
	5.1	CLIENT INFORMATION	5
	5.2	GENERAL DESCRIPTION OF E.U.T.	
	5.3	TEST ENVIRONMENT AND TEST MODE	6
	5.4	DESCRIPTION OF SUPPORT UNITS	6
	5.5	MEASUREMENT UNCERTAINTY	6
	5.6	LABORATORY FACILITY	6
	5.7	LABORATORY LOCATION	
	5.8	TEST INSTRUMENTS LIST	7
6	TES	T RESULTS AND MEASUREMENT DATA	8
	6.1	ANTENNA REQUIREMENT:	8
	6.2	CONDUCTED EMISSION	9
	6.3	CONDUCTED OUTPUT POWER	12
	6.4	OCCUPY BANDWIDTH	
	6.5	Power Spectral Density	
	6.6	BAND EDGE	
	6.6.		
	6.6.2		
	6.7	Spurious Emission	
	6.7.		
	6.7.2	2 Radiated Emission Method	27
7	TES	T SETUP PHOTO	32
8	EUT	CONSTRUCTIONAL DETAILS	





4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203 & 15.247 (b)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247 (d)	Pass
Spurious Emission	15.205 & 15.209	Pass

All measurement data were performed in accordance with ANSI C63.10: 2013 and KDB 558074 D01 15.247 Meas Guidance v05r02 of test method.

Remark

- 1. Pass: The EUT complies with the essential requirements in the standard.
- 2. N/A: Not Applicable.



5 General Information

5.1 Client Information

Applicant:	Xwireless LLC
Address:	11565 Old Georgetown Road, Rockville, MD 20852United States
Manufacturer/Factory:	Xwireless LLC
Address:	11565 Old Georgetown Road, Rockville, MD 20852United States

5.2 General Description of E.U.T.

Product Name:	LTE smartphone
Model No.:	MUV
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	-0.38 dBi
Power supply:	Rechargeable Li-ion Battery DC3.7V-2000mAh
AC adapter:	Model: MUV Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 800mA
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test. Channel No. 0, 20 & 39 were selected as Lowest, Middle and Highest channel.

Report No: CCISE190805204

5.3 Test environment and test mode

Operating Environment:			
Temperature:	24.0 °C		
Humidity:	54 % RH		
Atmospheric Pressure:	1010 mbar		
Test mode:			
Transmitting mode Keep the EUT in continuous transmitting with modulation			

The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 dB (k=2)

5.6 Laboratory Facility

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

● FCC - Designation No.: CN1211

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

ISED – CAB identifier.: CN0021

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366



5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
				(mm-dd-yy)	(mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-18-2019	03-17-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		b
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	MTS8200	Version: 2.0.0.0		

Conducted Emission:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-18-2019	03-17-2020	
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-18-2019	03-17-2020	
LISN	CHASE	MN2050D	1447	03-18-2019	03-17-2020	
LICNI	Dahda 9 Cahuara	ECH2 75	0.400004/040	07-21-2018	07-20-2019	
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2019	07-20-2020	
Cable	HP	10503A	N/A	03-18-2019	03-17-2020	
EMI Test Software	AUDIX	E3	Version: 6.110919b		b	



6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement: FCC Part 15 C Section 15.203 /247(b)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

E.U.T Antenna:

The BLE antenna is an Internal antenna which cannot replace by end-user, the best-case gain of the antenna is -0.38 dBi.





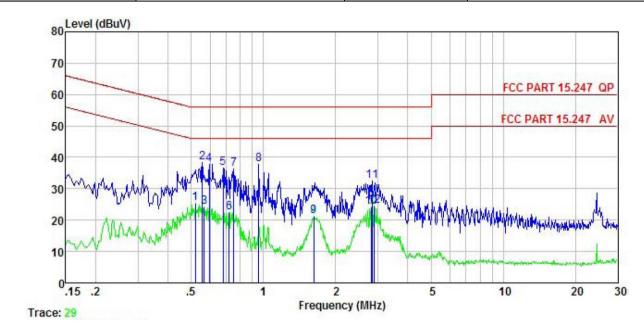
6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:			dBuV)
L	Frequency range (MHz)	Frequency range (MHz) 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 logar	ithm of the frequency.	
Test procedure	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50uH coupling impedance with 500hm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		
Test setup:	Reference Plane LISN 40cm 80cm Filter AC power Equipment Test table/Insulation plane Remark E.U.T. Equipment Under Test LISN: Line impedence Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		



Measurement Data:

Product name:	LTE smartphone	Product model:	MUV
Test by:	Carey	Test mode:	BLE Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%



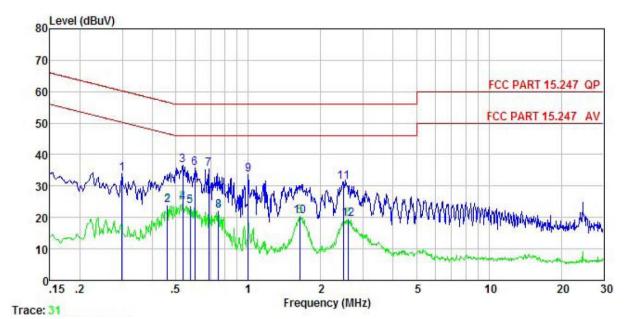
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark	
	MHz	dBu∇	dB	₫B	dBu₹	dBu∀	<u>dB</u>	2-1-1-1-1-1	_
1	0.521	15.11	-0.39	10.76	25.48	46.00	-20.52	Average	
2	0.555	27.98	-0.39	10.76	38.35	56.00	-17.65	QP	
3	0.567	13.71	-0.39	10.76	24.08	46.00	-21.92	Average	
4	0.595	27.44	-0.38	10.77	37.83	56.00	-18.17	QP	
5	0.679	26.19	-0.38	10.77	36.58	56.00	-19.42	QP	
6	0.720	11.95	-0.38	10.78	22.35	46.00	-23.65	Average	
7	0.751	25.93	-0.38	10.79	36.34	56.00	-19.66	QP	
1 2 3 4 5 6 7 8 9	0.958	27.18	-0.38	10.86	37.66	56.00	-18.34	QP	
9	1.619	10.70	-0.40	10.93	21.23	46.00	-24.77	Average	
10	2.809	13.84	-0.44	10.93	24.33			Average	
11	2.839	22.11	-0.44	10.93	32.60		-23.40		
12	2.884	13.89	-0.44	10.92	24.37	46.00	-21.63	Average	

Notes:

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level =Receiver Read level + LISN Factor + Cable Loss.



Product name:	LTE smartphone	Product model:	MUV
Test by:	Carey	Test mode:	BLE Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%



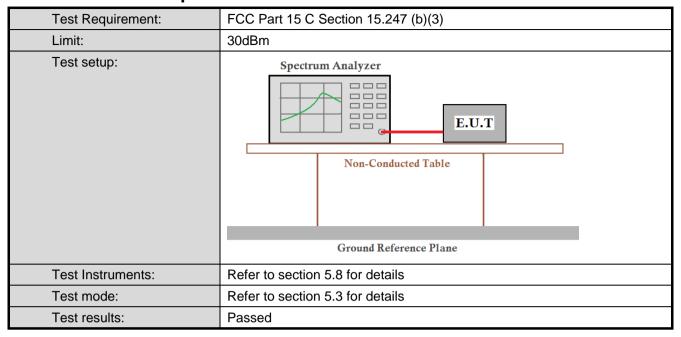
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
,	MHz	dBu∀	₫B	₫B	dBu₹	₫₿uѶ	<u>dB</u>	
1	0.299	23.88	-0.63	10.74	33.99	60.28	-26.29	QP
2	0.461	13.79	-0.65	10.74	23.88	46.67	-22.79	Average
3	0.535	26.46	-0.65	10.76	36.57	56.00	-19.43	QP
2 3 4 5 6 7 8 9	0.535	14.55	-0.65	10.76	24.66	46.00	-21.34	Average
5	0.573	13.42	-0.65	10.76	23.53	46.00	-22.47	Average
6	0.601	25.61	-0.64	10.77	35.74	56.00	-20.26	QP
7	0.686	25.27	-0.64	10.77	35.40	56.00	-20.60	QP
8	0.751	12.02	-0.64	10.79	22.17	46.00	-23.83	Average
9	1.000	23.51	-0.63	10.87	33.75	56.00	-22.25	QP
10	1.645	9.96	-0.66	10.93	20.23	46.00	-25.77	Average
11	2.487	21.12	-0.67	10.94	31.39	56.00	-24.61	QP
12	2.608	9.31	-0.67	10.93	19.57	46.00	-26.43	Average

Notes:

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level =Receiver Read level + LISN Factor + Cable Loss.



6.3 Conducted Output Power

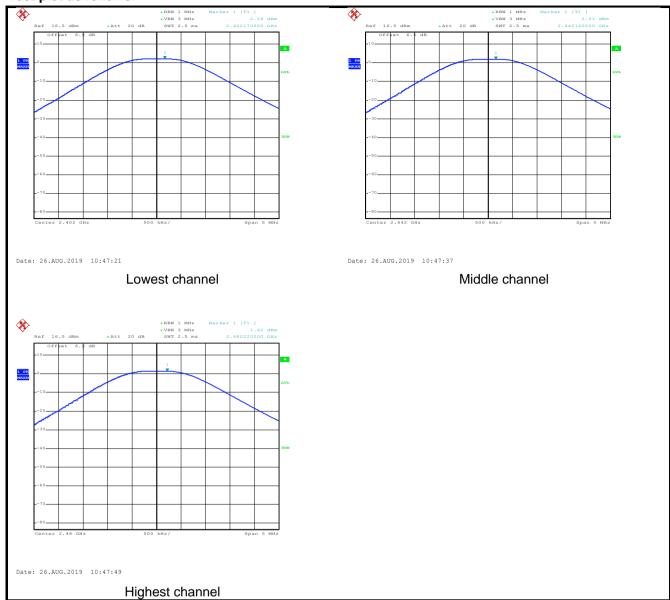


Measurement Data:

modour officerit Butur			
Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	2.18		
Middle	2.01	30.00	Pass
Highest	1.42		



Test plot as follows:





6.4 Occupy Bandwidth

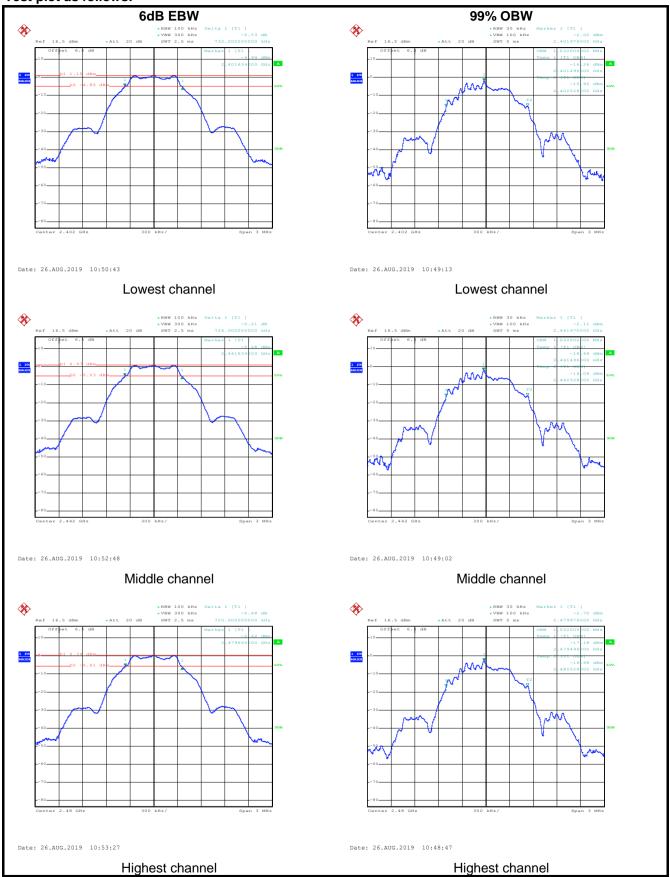
Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB 558074
Limit:	>500kHz
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.732		
Middle	0.726	>500	Pass
Highest	0.720		
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	1.032		
Middle	1.032	N/A	N/A
Highest	1.032		



Test plot as follows:





6.5 Power Spectral Density

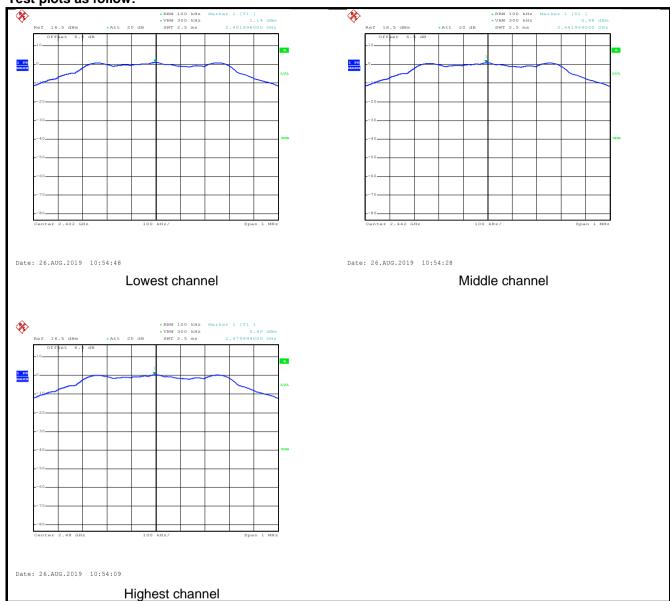
Test Requirement:	FCC Part 15 C Section 15.247 (e)
Limit:	8 dBm
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

mode di cirio i i batai			
Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	1.14		
Middle	0.98	8.00	Pass
Highest	0.40		



Test plots as follow:





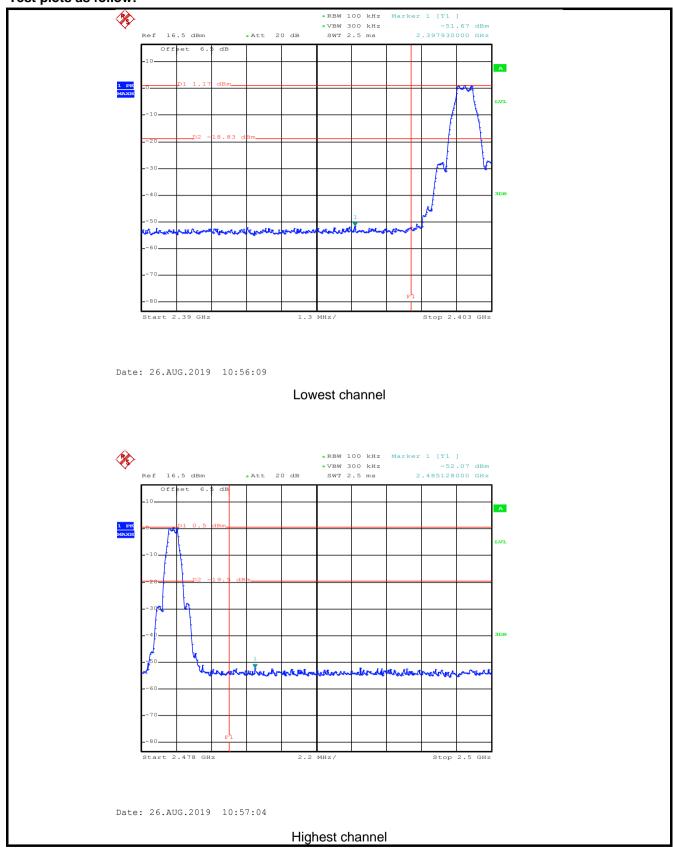
6.6 Band Edge

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spectrum intentional radiator is operating, the radio frequency power is produced by the intentional radiator shall be at least 20 dB below the 100 kHz bandwidth within the band that contains the highest level the desired power, based on either an RF conducted or a radianeasurement.					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Test Instruments:	Refer to section 5.8 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					



Test plots as follow:





6.6.2 Radiated Emission Method

0.0.2	Radialed Ellission i	victilou				
	Test Requirement:	FCC Part 15 C	Section 15.2	205 and 15.209		
	Test Frequency Range:	2.3GHz to 2.5	GHz			
	Test Distance:	3m				
	Receiver setup:	Frequency	Detector	RBW	VBW	Remark
		Above 1GHz	Peak	1MHz	3MHz	Peak Value
			RMS	1MHz	3MHz	Average Value
	Limit:	Frequer	ncy L	imit (dBuV/m @3		Remark
		Above 10	GHz —	54.00 74.00	F	Average Value Peak Value
	Test Procedure:	 The EUT was placed on the top of a rotating table 1.5 meters at the ground at a 3 meter camber. The table was rotated 360 deto determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height are tower. The antenna height is varied from one meter to four meters about the ground to determine the maximum value of the field streng. Both horizontal and vertical polarizations of the antenna are seemake the measurement. For each suspected emission, the EUT was arranged to its wo case and then the antenna was tuned to heights from 1 meters meters and the rota table was turned from 0 degrees to 360 deto find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB lower the limit specified, then testing could be stopped and the peak of the EUT would be reported. Otherwise the emissions that di have 10 dB margin would be re-tested one by one using peak, peak or average method as specified and then reported in a dasheet. 				
	Test setup:	AE Wags	Test Receive	3m 3m and Reference Plane	Antenna Tower	
	Test Instruments:	Refer to section	on 5.8 for deta	ails		
	Test mode:	Refer to section	on 5.3 for deta	ails		
	Test results:	Passed				



		LTE smartphone					Model:	MU	MUV		
		Carey				Test mod	de:	BLI	BLE Tx mode		
Test Channel:	Le	owest chan	nel			Polarizat	ion:	Ver	tical		
Test Voltage:	А	C 120/60Hz	<u>'</u>			Environn	nent:	Ter	np: 24 ℃	Huni: 57%	
11	alDr. March										
110 Level (aBuv/m)			- 1							
100					-						
										0	
80									FCC PART	15 (PK)	
60	mm	~~~~	~~~~~~	mn	~~~~	my war	m	m	FECRARI	15 (AV)	
									2		
40											
20											
02310	2320			2350					-25	2404	
				Fred	quency (M	IHz)					
			intenna				Limit	Over			
	Fre	q Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
	MH	z dBuV	dB/m	₫B	₫₿	dBuV/m	dBu√/m	<u>dB</u>			
1	2390.00		27.07	4.69	0.00	56.86	74.00	-17.14	Peak		
2	2390.00	0 13.46	27.07	4.69	0.00	46.90	54.00	-7.10	Average		

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name: LTE s Test By: Carey		LTE smartphone				Product Model:		MUV		
		arey			Tes	st mode:		BLE Tx mode		
est Channel:	Lowes	t channel			Pol	arization):	Horizon	tal	
est Voltage:	AC 12	0/60Hz			En	vironmer	nt:	Temp: 2	24℃	Huni: 57%
Loyal /dPu	Mm									
110 Level (dBu	Villij									
100										
80									FCC PAR	T 15 (PK)
60	m	- war	~~~	mun	www	m	Am	ma	VFCC-BAR	7-15 (AV)
									7	
40										
F 2/2										
20										
2310 2	320			2350 Eroc	uency (M	IU-1	HÅ.			2404
	Freq	ReadA Level		Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark	
_	MHz	dBu₹	dB/m	₫B	₫B	dBuV/m	dBuV/m	₫B		
		24.15	27.08	4.69	0.00	ET 60	74.00	10.40	D 1	

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name:	LTE smartphone	Product Model:	MUV		
Test By:	Carey	Test mode:	BLE Tx mode		
Test Channel:	nnel: Highest channel Polarization:		Vertical		
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%		
110 Level (dBuV/m) 100 80 60 40 20 02478	Frequency (MHz)	FCC PART 15 (PK) FCC PART 15 (AV) 2500		
F	ReadAntenna Cable Pream req Level Factor Loss Facto	D Limit C C Level Line Li	ver mit Remark		

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

dB/m

27.36

27.36

MHz

2483.500 2483.500 dBuV

25.16

14.15

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

碅

4.81

4.81

0.00

0.00

dB dBuV/m dBuV/m

59.03 74.00 -14.97 Peak 48.02 54.00 -5.98 Average



Product Name:	Name: LTE smartphone Produc			oduct Mo	del:	MUV					
Test By:	Carey	у			Te	st mode:		BLE Tx mode			
Test Channel:	Highe	est chann	el		Ро	larization	:	Horizont	al		
Test Voltage:	AC 12	20/60Hz			En	vironmen	ıt:	Temp: 2	4℃	Huni: 57%	
Lovel to	dDul//m)										
110 Level (aBuv/m)									1	
100										-	
80									FCC PAR	T 15 (PK)	
		200									
60				~	~~				FCS PAR	T 15 (AV)	
		2								1	
40											
20										12	
02478										2500	
24/8				Free	quency (N	1Hz)				2500	
					_		9 4 07 4 07 70 4 70 70	0.600			
	Freq	Keada Level	intenna Factor	Cable Loss	Freamp Factor	Level	Limit Line	Over Limit	Remark		
	MHz	dBuV	<u>dB</u> /m			dBuV/m	dBuV/m				
1 2	2483.500 2483.500	26.06 13.11	27.35 27.35	4.81 4.81				-14.08 -7.03	Peak Average		

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



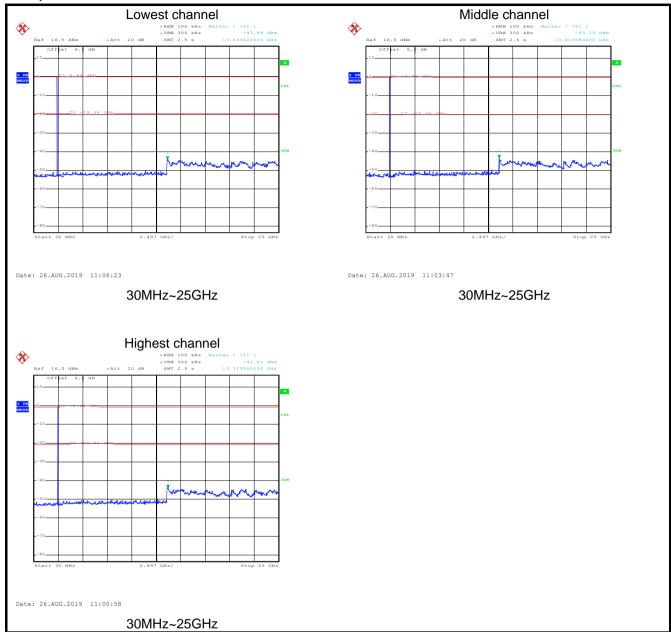
6.7 Spurious Emission

6.7.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)						
rest Requirement.	` '						
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.						
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane						
Test Instruments:	Refer to section 5.8 for details						
Test mode:	Refer to section 5.3 for details						
Test results:	Passed						



Test plot as follows:

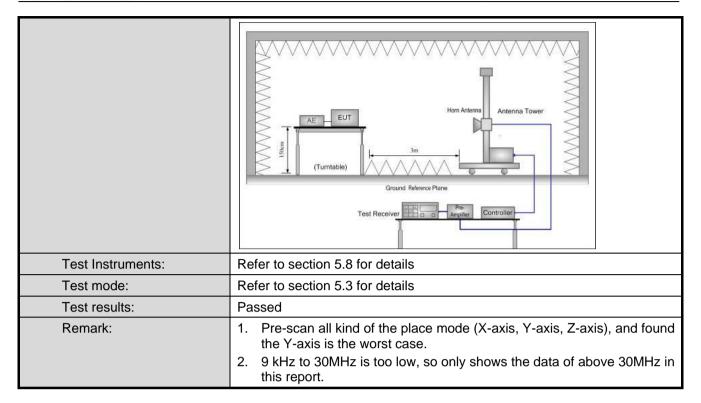




6.7.2 Radiated Emission Method

9kHz to 25GHz 3m								
		9kHz to 25GHz						
Глодиолом	3m							
Frequency	Detector	VB	sW	Remark				
30MHz-1GHz	Quasi-peak	120KHz	3001	КНz	Quasi-peak Value			
Above 1GHz	Peak	1MHz	3M	Hz	Peak Value			
Above 1GHz	RMS	1MHz	3M	Hz	Average Value			
Frequency	y Li	mit (dBuV/m @	3m)		Remark			
30MHz-88M	Hz	40.0		C	Quasi-peak Value			
88MHz-216N	ИHz	43.5		C	Quasi-peak Value			
216MHz-960I	MHz	46.0		C	Quasi-peak Value			
960MHz-1G	Hz	54.0		C	Quasi-peak Value			
Above 1GH	17	54.0			Average Value			
		74.0			Peak Value			
The table of highest rad 2. The EUT antenna, we tower. 3. The antennathe ground Both horizon make the nate of the end of the end of the emission of the EUT have 10 dE	 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi- 							
Turn Table Ground Plane	4m							
	30MHz-88M 88MHz-216M 216MHz-960I 960MHz-1G Above 1GH 1. The EUT 1GHz)/1.5r The table of highest race 2. The EUT antenna, we tower. 3. The antening the ground Both horize make the result of find the limit sport of the EUT have 10 depeak or any sheet. Below 1GHz	30MHz-88MHz 88MHz-216MHz 216MHz-960MHz 960MHz-1GHz Above 1GHz 1. The EUT was placed 1GHz)/1.5m(above 1GH The table was rotated 3 highest radiation. 2. The EUT was set 3 m antenna, which was more tower. 3. The antenna height is with the ground to determine Both horizontal and ver make the measurement. 4. For each suspected encase and then the ante meters and the rota table to find the maximum reates. The test-receiver system Specified Bandwidth with 6. If the emission level of the EUT would be rehave 10 dB margin would peak or average method sheet. Below 1GHz	30MHz-88MHz 40.0 88MHz-216MHz 43.5 216MHz-960MHz 46.0 960MHz-1GHz 54.0 Above 1GHz 54.0 1. The EUT was placed on the top of 1GHz)/1.5m(above 1GHz) above the The table was rotated 360 degrees the highest radiation. 2. The EUT was set 3 meters away antenna, which was mounted on the tower. 3. The antenna height is varied from of the ground to determine the maxim Both horizontal and vertical polarization make the measurement. 4. For each suspected emission, the Exact case and then the antenna was tune meters and the rota table was turned to find the maximum reading. 5. The test-receiver system was set Specified Bandwidth with Maximum Hester in the limit specified, then testing could be for the EUT would be reported. Other have 10 dB margin would be re-tested peak or average method as specifies sheet. Below 1GHz	30MHz-88MHz 40.0 88MHz-960MHz 43.5 216MHz-960MHz 54.0 Above 1GHz 54.0 Above 1GHz 74.0 1. The EUT was placed on the top of a ro 1GHz)/1.5m(above 1GHz) above the groun The table was rotated 360 degrees to deter highest radiation. 2. The EUT was set 3 meters away from the antenna, which was mounted on the top of a tower. 3. The antenna height is varied from one met the ground to determine the maximum val Both horizontal and vertical polarizations of make the measurement. 4. For each suspected emission, the EUT was case and then the antenna was tuned to he meters and the rota table was turned from 0 to find the maximum reading. 5. The test-receiver system was set to Pea Specified Bandwidth with Maximum Hold Mo 6. If the emission level of the EUT in peak most the limit specified, then testing could be stop of the EUT would be reported. Otherwise the have 10 dB margin would be re-tested one be peak or average method as specified and sheet. Below 1GHz	30MHz-88MHz 40.0 60 88MHz-216MHz 43.5 60 960MHz-1GHz 54.0 60 Above 1GHz 74.0 74.0 1. The EUT was placed on the top of a rotating 1GHz)/1.5m(above 1GHz) above the ground at a The table was rotated 360 degrees to determine highest radiation. 2. The EUT was set 3 meters away from the integration and the top of a variat tower. 3. The antenna height is varied from one meter to the ground to determine the maximum value of Both horizontal and vertical polarizations of the amake the measurement. 4. For each suspected emission, the EUT was arracase and then the antenna was tuned to heights meters and the rota table was turned from 0 degree to find the maximum reading. 5. The test-receiver system was set to Peak Des Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was the limit specified, then testing could be stopped at of the EUT would be reported. Otherwise the emi have 10 dB margin would be re-tested one by one peak or average method as specified and then is sheet. Below 1GHz			



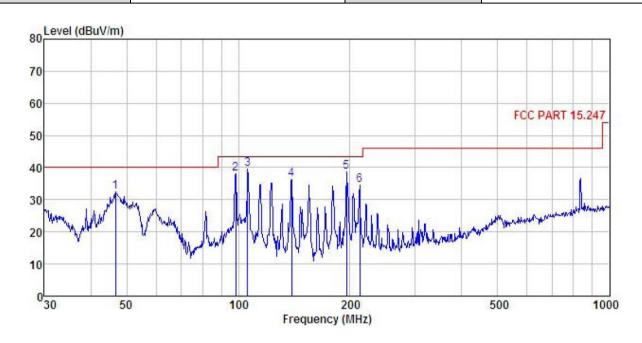




Measurement Data (worst case):

Below 1GHz:

Product Name:	LTE smartphone	Product Model:	MUV
Test By:	Carey	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



	Freq		Antenna Factor				Limit Line	Over Limit	Remark
	MHz	dBu∜		<u>dB</u>	<u>d</u> B	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>d</u> B	
1	46.666	48.78	12.24	1.28	29.85	32.45	40.00	-7.55	QP
2	98.487	53.40	12.13	1.97	29.54	37.96	43.50	-5.54	QP
3	106.013	55.18	11.98	2.01	29.48	39.69	43.50	-3.81	QP
4	139.361	53.55	9.54	2.39	29.28	36.20	43.50	-7.30	QP
4 5 6	195.822	54.12	10.48	2.84	28.86	38.58	43.50	-4.92	QP
6	212.270	49.14	11.15	2.86	28.75	34.40	43.50	-9.10	QP

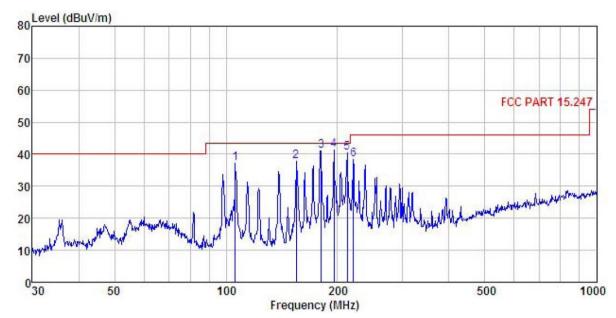
Remark

^{1.} Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

^{2.} The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name:	LTE smartphone	Product Model:	MUV
Test By:	Carey	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



	Freq		Antenna Factor				Limit Line	Over Limit	
	MHz	dBu∜		<u>d</u> B	<u>d</u> B	$\overline{dBuV/m}$	$\overline{dBuV/m}$		
1	106.013	52.79	11.98	2.01	29.48	37.30	43.50	-6.20	QP
2	154.821	55.17	9.10	2.55	29.18	37.64	43.50	-5.86	QP
2	180.649	57.36	9.98	2.73	28.97	41.10	43.50	-2.40	QP
4	195.822	56.99	10.48	2.84	28.86	41.45	43.50	-2.05	QP
5	212.270	55.23	11.15	2.86	28.75	40.49	43.50	-3.01	QP
6	220.617	52.74	11.51				46.00		

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Above 1GHz

Test channel: Lowest channel										
Detector: Peak Value										
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4804.00	49.00	30.85	6.80	41.81	44.84	74.00	-29.16	Vertical		
4804.00	48.28	30.85	6.80	41.81	44.12	74.00	-29.88	Horizontal		
			Dete	ctor: Avera	ge Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4804.00	39.58	30.85	6.80	41.81	35.42	54.00	-18.58	Vertical		
4804.00	39.34	30.85	6.80	41.81	35.18	54.00	-18.82	Horizontal		
	Test channel: Middle channel									
				tector: Peak	Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4884.00	49.08	31.20	6.86	41.84	45.30	74.00	-28.70	Vertical		
4884.00	49.54	31.20	6.86	41.84	45.76	74.00	-28.24	Horizontal		
			Dete	ctor: Avera	ge Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4884.00	39.37	31.20	6.86	41.84	35.59	54.00	-18.41	Vertical		
4884.00	39.03	31.20	6.86	41.84	35.25	54.00	-18.75	Horizontal		
			Test ch	annel: High	est channel					
			De	tector: Peak	Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		

rest charmer. Fighest charmer											
Detector: Peak Value											
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
4960.00	49.31	31.63	6.91	41.87	45.98	74.00	-28.02	Vertical			
4960.00	49.39	31.63	6.91	41.87	46.06	74.00	-27.94	Horizontal			
			Dete	ector: Avera	ge Value						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
4960.00	39.16	31.63	6.91	41.87	35.83	54.00	-18.17	Vertical			
4960.00	39.26	31.63	6.91	41.87	35.93	54.00	-18.07	Horizontal			

Remark

^{1.} Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

^{2.} The emission levels of other frequencies are very lower than the limit and not show in test report.