

## Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE190300103

# FCC REPORT

Applicant: PCD, LLC

Address of Applicant: 1500 Tradeport Drive, Orlando, Florida, 32824. United States

**Equipment Under Test (EUT)** 

Product Name: Monkey II LTE

Model No.: PL504

Trade mark: PCD

FCC ID: 2ALJJPL504

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

Date of sample receipt: 01 Mar., 2019

**Date of Test:** 01 Mar., to 13 Mar., 2019

Date of report issued: 13 Mar., 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.

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### 2 Version

Version No.	Date	Description
00	13 Mar., 2019	Original

Tested by: Mike OU Date: 13 Mar., 2019

Test Engineer

Reviewed by: Date: 13 Mar., 2019

**Project Engineer** 



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### 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
Pass: The FLIT complies with the essential rec	vuirements in the standard	

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not Applicable.



### 5 General Information

### 5.1 Client Information

Applicant:	PCD, LLC
Address:	1500 Tradeport Drive, Orlando, Florida, 32824. United States
Manufacturer:	PCD, LLC
Address:	1500 Tradeport Drive, Orlando, Florida, 32824. United States

### 5.2 General Description of E.U.T.

Product Name:	Monkey II LTE
Model No.:	PL504
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	-0.59 dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V-2000mAh
AC adapter:	Model: PL504 Input: AC100-240V, 50/60Hz, 0.1A Output: DC 5.0V, 700mA
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.

### 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)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

### 5.6 Laboratory Facility

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

### FCC - Registration No.: 727551

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

### IC - Registration No.: 10106A-1

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 Project No.: CCISE1903001

Report No: CCISE190300103



### 5.8 Test Instruments list

Radiated Emission:							
Test Equipment	Manufacturer Model No.		Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)		
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020		
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-16-2018	03-15-2019		
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019		
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019		
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	\	/ersion: 6.110919	b		
Dra amplifian	LID	0447D	2044400250	03-07-2018	03-06-2019		
Pre-amplifier	HP	8447D	2944A09358	03-07-2019	03-06-2020		
Dro omplifier	CD	PAP-1G18	0 44004	03-07-2018	03-06-2019		
Pre-amplifier	CD	PAP-1G16	11804	03-07-2019	03-06-2020		
Cnootrum analyzar	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019		
Spectrum analyzer	Ronde & Schwarz	F3P30	101454	03-07-2019	03-06-2020		
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019		
EMI Test Receiver	Rohde & Schwarz	ECDD7	404070	03-07-2018	03-06-2019		
EIVII Test Receiver	Ronde & Schwarz	ESRP7	101070	03-07-2019	03-06-2020		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019		
Cable	ZDECL	Z 100-INJ-INJ-01	1000400	03-07-2019	03-06-2020		
Cabla	MICBO COAY	MEDEAGOO	K10742 F	03-07-2018	03-06-2019		
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2019	03-06-2020		
Coblo	CHILINED	CUCOEL EVADO	E9402/4DE	03-07-2018	03-06-2019		
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2019	03-06-2020		
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.	Model No. Serial No.		Cal. Due date (mm-dd-yy)			
EMI Test Receiver	Rohde & Schwarz ESCI 101189		03-07-2018	03-06-2019				
EIVII Test Receiver	Ronde & Schwarz	ESCI	101169	03-07-2019	03-06-2020			
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019			
Puise Limiter	SCHWARZBECK	USRAIVI 2306	9/31	03-07-2019	03-06-2020			
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019			
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019			
0-1-1-	LID	405004	N1/A	03-07-2018	03-06-2019			
Cable	HP	10503A	N/A	03-07-2019	03-06-2020			
EMI Test Software	AUDIX	E3	Version: 6.110919b					



### **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 -0.59 dBi.



### 6.2 Conducted Emission

Test Requirement: FCC Part 15 C Section 15.207  Test Method: ANSI C63.10: 2013  Test Frequency Range: 150 kHz to 30 MHz  Class / Severity: Class B  Receiver setup: RBW=9kHz, VBW=30kHz  Limit: Frequency range (MHz) Limit (dBuV)  Quasi-peak Average  0.15-0.5 66 to 56° 56 to 46° 0.5-5 56 46 5-30 60 50  * Decreases with the logarithm of the frequency.  Test procedure 1. 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.  2. 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).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  Reference Plane  Reference Plane  LISN								
Test Frequency Range:  Class / Severity:  Class B  Receiver setup:  RBW=9kHz, VBW=30kHz  Limit:  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 logarithm of the frequency.  1. 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.  2. 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).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  Reference Plane  Reference Plane  Reference Plane  Test linstruments:  Refer to section 5.8 for details  Test mode:  Refer to section 5.8 for details	Test Requirement:	FCC Part 15 C Section 15	.207					
Class / Severity: Class B  Receiver setup: RBW=9kHz, VBW=30kHz  Limit: Frequency range (MHz) Quasi-peak Average 0.15-0.5 66 to 55° 56 to 46° 0.5-5 56 46 5-30 60 50 * Decreases with the logarithm of the frequency.  Test procedure 1. 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.  2. 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).  3. Both sides of A.C. line are checked for maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.  Test setup: Reference Plane  LISN that provides a 500hm/50uH coupling impedance with 500hm termination. (Please refer to the block diagram of the test setup and photographs).  3. Both sides of A.C. line are checked for maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  LISN the impedence Stabilization Nietwork Test stable height-0 80m  Test Instruments: Refer to section 5.8 for details  Test mode: Refer to section 5.3 for details	Test Method:	ANSI C63.10: 2013	ANSI C63.10: 2013					
Receiver setup:    RBW=9kHz, VBW=30kHz	Test Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz					
Limit:    Frequency range (MHz)	Class / Severity:	Class B						
Prequency range (MHZ)  Quasi-peak  Average  0.15-0.5 66 to 56° 56 to 46°  0.5-0 56 46  5-30 60 50  * Decreases with the logarithm of the frequency.  1. 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 50ohm/50uH coupling impedance for the measuring equipment.  2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane    Vision   Vision	Receiver setup:	RBW=9kHz, VBW=30kHz						
Test setup:    Prequency fange (win2)   Quasi-peak   Average	Limit:	For a series (MILL)	Limit (	(dBuV)				
D.5-5 56 46 5-30 50  * Decreases with the logarithm of the frequency.  1. 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.  2. 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).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  LISN		Quasi-peak Average						
Test procedure  1. 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 50ohm/50uH coupling impedance for the measuring equipment.  2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  Reference Plane  Reference Plane  LISN 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								
* Decreases with the logarithm of the frequency.  Test procedure  1. 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.  2. 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).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane    Reference Plane   E.U.T   EMI   Receiver								
1. 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.  2. 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).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  Reference Plane  Regulpment  LISN  AUX  EQUIPMENT LISN  Receiver  Test table/linsulation 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  Refer to section 5.3 for details				50				
line impedance stabilization network (L.I.S.N.), which provides a 500hm/50uH coupling impedance for the measuring equipment.  2. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).  3. 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 C63.4: 2014 on conducted measurement.  Test setup:  Reference Plane  Reference Plane  Refull E.U.T  AC power  Remark  LISN Line Impedence Stabilization Network  Test lable height-0 8m  Test Instruments:  Refer to section 5.8 for details  Refer to section 5.3 for details								
LISN 40cm 80cm Filter AC power Equipment E.U.T  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		<ol> <li>50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>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 C63.4: 2014 on conducted</li> </ol>						
Test Instruments:  Refer to section 5.3 for details  Refer to section 5.3 for details  Refer to section 5.3 for details	Test setup:	Refere	nce Plane					
Test mode: Refer to section 5.3 for details		AUX Equipment  Test table/Insulation pla  Remark E.U.T: Equipment Under Test LISN: Line Impedence Stabilizatio	J.T Filter  EMI Receiver	— AC power				
	Test Instruments:	Refer to section 5.8 for de	tails					
Test results: Passed	Test mode:	Refer to section 5.3 for de	tails					



#### **Measurement Data:**

Product name	):	Monkey II LT	E	Pro	duct model:		PL504	
Test by:		Alex		Tes	Test mode: BLE Tx mode			Э
Test frequenc	y:	150 kHz ~ 30	) MHz	Pha	Phase: Line			
Test voltage:		AC 120 V/60	Hz	Env	ironment:		Temp: 22.5℃	Huni: 55%
70 60 50 1 2 40 30	d(dBuV)			What was a second of the secon	plane la	9		CC PART15 B QP 1012
10 0.15 Trace: 3	.2 Freq	.5 Read	1 LISN Factor	2 Frequence Cable Loss		5 Limit Line		20 30 Remark
<u>1-42</u>	Treq MHz	dBuV	<u>d</u> B		dBuV	dBuV		
					THE TAX	UDUV	1111	

### Notes:

12

- 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.

10.92

45.06

0.29

3. Final Level =Receiver Read level + LISN Factor + Cable Loss.

33.85

17.755

Project No.: CCISE1903001

60.00 -14.94 QP



	N	Monkey II LTE			duct model:		PL504		
Test by:	A	Alex		Tes	Test mode: BLE Tx mode			Э	
Test frequency:	1	50 kHz ~ 30	) MHz	Pha	se:		Neutral		
Test voltage:	A	AC 120 V/60 Hz			ironment:		Temp: 22.5℃	Huni: 55%	
80 Level (dE 70 60 50 40 1 30	2	4 5	8	1/1/4/1/4/1/4/1/4/1/4/1/4/1/4/1/4/1/4/1	White the Contract of the Cont	9 w/10 10		C PART15 B QP	
10	Titra	M	N. G. Com	M. MAN	/ ""Yu	V' 1'*	AN COMPANY OF THE PARTY OF THE		
0.15 .2	1117	.5	1	2 Frequenc	y (MHz)	5	10	20	
	Freq	Read	1 LISN Factor	_	y (MHz) Level	5 Limit Line	Over	20 Remark	
0.15 .2	Freq	Read	LISN	Frequenc Cable		Limit	Over Limit		

#### Notes:

10

11

12

1. An initial pre-scan was performed on the line and neutral lines with peak detector.

1.01

0.80

0.79

2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

10.85

10.91

10.92

25.45

48.22

32.90

3. Final Level =Receiver Read level + LISN Factor + Cable Loss.

13.59

36.51

21.19

4.926

17.291

17.475

Project No.: CCISE1903001

46.00 -20.55 Average

50.00 -17.10 Average

60.00 -11.78 QP



### **6.3 Conducted Output Power**

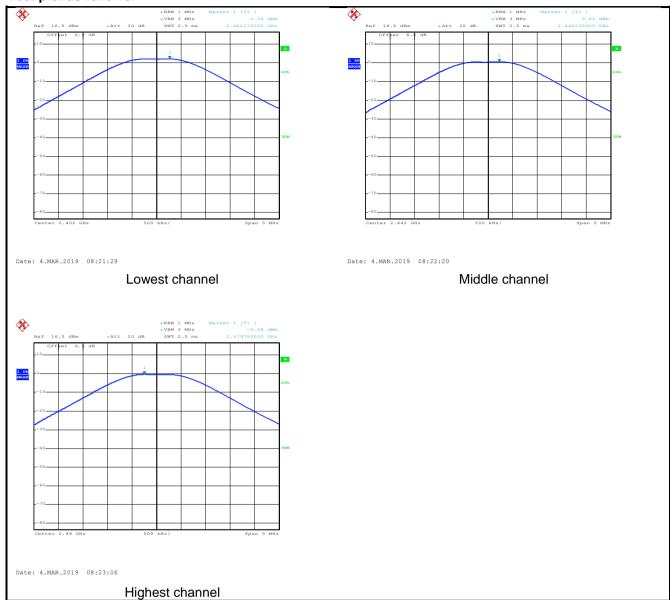
Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)					
Test Method:	ANSI C63.10:2013 and KDB 558074					
Limit:	30dBm					
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane					
Test Instruments:	Refer to section 5.8 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

### **Measurement Data:**

Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	2.24		
Middle	0.61	30.00	Pass
Highest	-0.28		



### Test plot as follows:





### 6.4 Occupy Bandwidth

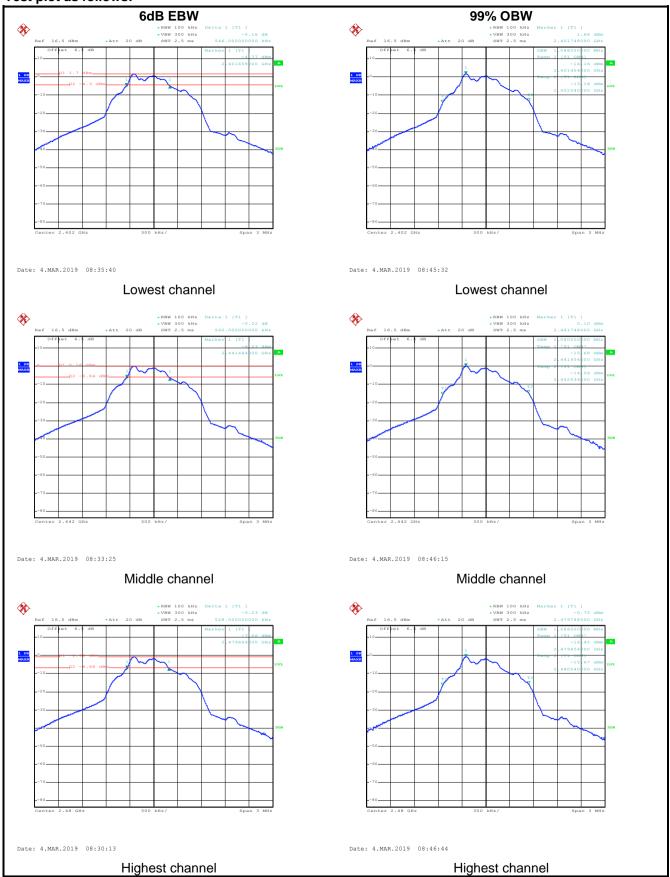
Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)					
Test Method:	ANSI C63.10:2013 and KDB 558074					
Limit:	>500kHz					
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane					
Test Instruments:	Refer to section 5.8 for details					
Test mode:	Refer to section 5.3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

#### **Measurement Data:**

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.546		
Middle	0.540	>500	Pass
Highest	0.528		
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	1.086		
Middle	1.080	N/A	N/A
Highest	1.086		



### Test plot as follows:





### 6.5 Power Spectral Density

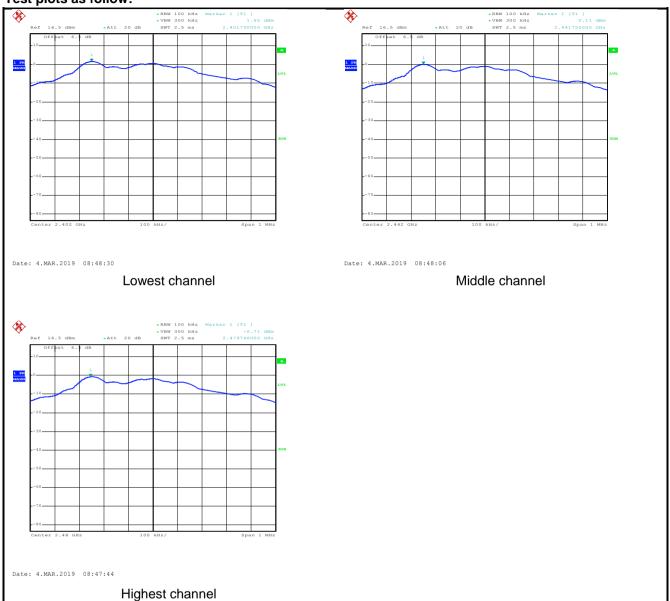
Test Requirement:	FCC Part 15 C Section 15.247 (e)				
Test Method:	ANSI C63.10:2013 and KDB 558074				
Limit:	8 dBm				
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane				
Test Instruments:	Refer to section 5.8 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				

### **Measurement Data:**

Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	1.65		
Middle	0.11	8.00	Pass
Highest	-0.71		



### Test plots as follow:





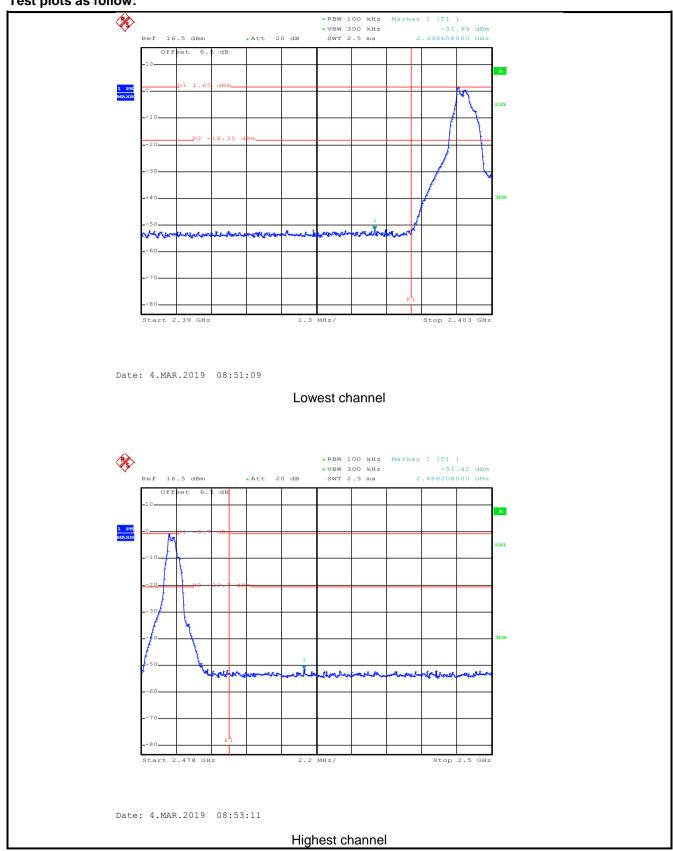
### 6.6 Band Edge

### 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)						
Test Method:	ANSI C63.10:2013 and KDB 558074						
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 plots as follow:





### 6.6.2 Radiated Emission Method

5.6.2 Radiated Emission Method							
Test Requirement:	FCC Part 15 C Section 15.205 and 15.209						
Test Method:	ANSI C63.10:	2013 and K	CDB 558074				
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		
11	Frequer	RMS	1MHz Limit (dBuV/m @3	3MHz	Average Value Remark		
Limit:			54.00		verage Value		
	Above 10	GHz –	74.00		Peak Value		
Test Procedure:	<ol> <li>The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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, quasipeak or average method as specified and then reported in a data</li> </ol>						
Test setup:	AE (T	urntable)  Gr Test Receiv	3m Jound Reference Plane	Antenna Tower			
Test Instruments:	Refer to section	on 5.8 for det	tails				
Test mode:	Refer to section	on 5.3 for det	tails				
Test results:	Passed						
	_						



Product Name:			Monkey II	LTE		P	roduct mo	del:	PL504			
Test By	<i>r</i> :		Caffrey			To	est mode:		BLE Tx me	E Tx mode		
Test Ch	nannel:		Lowest ch	annel		P	olarization	:	Vertical			
Test Vo	ltage:		AC 120/60	)Hz		E	nvironmen	t:	Temp: 24°	C Huni:	57%	
		El N				<u> </u>		'				
110 Le	evel (dBu\	//m)										
100			-				-		-		-	
80									ECC	PART 15 (	DÍA	
									rcc	PART 13	7	
60												
oc.	~~~	~~~	when when	Vanna	-~~~	-	V	and the same	VV FCC	PART 15 (	AV)	
40									2			
40												
20												
023	310 23	20			2350	Ne rese	ener i				2404	
					Parameter Company	uency (MH			120000			
		Freq	KeadA Level	ntenna Factor		Preamp	Level	Limit Line	Over Limit	Remark		
		MHz	dBu∀	dB/m	dB	dB	dBuV/m	dBuV/m	dB			
1		.000	19.50	27.37	4.69				-20.76			
2	2390	.000	7.77	27.37	4.69	0.00	41.51	54.00	-12.49	Averag	е	

### 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: Monke		Monkey II LTE			Product model:			PL504		
est By:		Caffrey			Test mode:			BLE Tx mode		
est Cha	Channel: Lowest channel Polarization: Horizontal									
est Vol	ltage:	AC 120/60	Hz		Environr	ment:	Ten	np: <b>24</b> ℃	Huni: 57%	
L	ovol /dPu\//m\									
110	evel (dBuV/m)									
100										
80								FCC	PART 15 (PK)	
60								FCC	PART 15 (AV)	
	many	~~~~	Way.		Mary Company	Sarana	and the same	^~~···································	and the same of th	
40								2		
20										
0_										
2.	310 2320			2350 Freq	uency (MH	z)			2404	
			Int enna	Cable	Preamp		Limit			
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
	MHz	dBuV	dB/m	dB		$\overline{dBuV/m}$	dBuV/m	<u>d</u> B		
1	2390.000			4.69	0.00	53.53	74.00	-20.47	Peak	
2	2390.000		27.37	4.69	0.00			-12.30	Average	

### 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.

74.00 -21.00 Peak 54.00 -12.57 Average



Product Name:	Monkey II LTE	Product model:	PL504		
Test By:	Caffrey	Test mode:	BLE Tx mode		
Test Channel:	Highest channel	Polarization:	Vertical		
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%		
110 Level (dBuV/r 100 80 60 40	m)		FCC PART 15 (PK) FCC PART 15 (AV)		
	Fre ReadAntenna Cable eq Level Factor Loss Hz dBuV dB/m dI	Factor Level Lin	ne Limit Remark		

### Remark:

1 2 27.57

27.57

18.92

7.35

2483.500

2483.500

0.00

0.00

53.00

41.43

4.81

4.81

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

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



Product Name:	luct Name: Monkey II LTE			Product i	model:	PL50	)4			
est Channel: Highes		Caffrey Highest channel			Test mode:  Polarization:  Environment:		BLE	BLE Tx mode		
							Horiz	Horizontal		
		AC 120/60Hz		Tem			Temp: 24℃ Huni: 57%			
1										
110 Level (dBuV	/m)									
100										
80	1							ECC.	PART 15 (PK)	
	1							rcci	PART 13 (PR)	
60	1	200						500	DADT 45 (ALC	
		1		~~~				FCC PART 15 (AV)		
40		2								
40										
20										
20										
2478				Carrier Carrier		3			250	
		D 1			iency (MHz	(F)		•		
	Frea		Intenna Factor			Level	Limit Line	Over Limit	Remark	
	MHz	dBuV								
	MHZ	سس	dB/m	Ф	Ф	dBuV/m	apav/m	dB		
1 2483.		17.53	27.57	4.81	0.00			-22.39		
2 2483.	. 500	7.36	27.57	4.81	0.00	41.44	54.00	-12.56	Average	

### Remark:

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

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



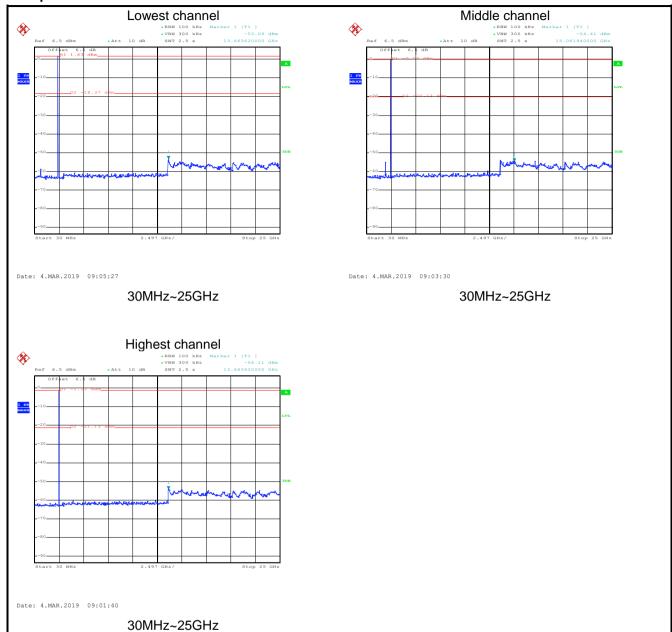
### 6.7 Spurious Emission

### 6.7.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)					
Test Method:	ANSI C63.10:2013 and KDB 558074					
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:

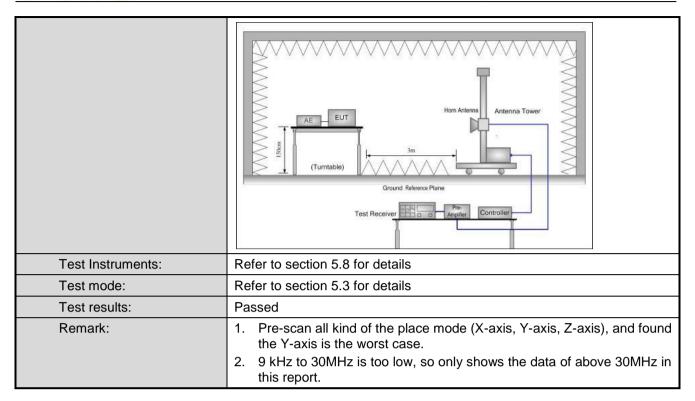




### 6.7.2 Radiated Emission Method

	7.7.2 Radiated Emission Method									
Test Requirement:	FCC Part 15 C Section 15.205 and 15.209									
Test Method:	ANSI C63.10:20	)13								
Test Frequency Range:	9kHz to 25GHz									
Test Distance:	3m									
Receiver setup:	Frequency	Detector	RBW	VBW		Remark				
	30MHz-1GHz	Quasi-pea		300		Quasi-peak Value				
	Above 1GHz		1MHz	3M		Peak Value				
Limite	Frequency	RMS ,	1MHz Limit (dBuV/m (	3M	HZ	Average Value Remark				
Limit:	30MHz-88M		40.0 Quasi-peak Value							
	88MHz-216M		43.5		Quasi-peak Value					
	216MHz-960N	•	46.0			Quasi-peak Value				
	960MHz-1G	Hz	54.0		C	Quasi-peak Value				
	Above 1GH	17	54.0			Average Value				
			74.0			Peak Value				
Test Procedure:						table 0.8m(below				
						a 3 meter camber. the position of the				
	highest rad		1 360 degrees	to deter	mme	the position of the				
	_		meters away	from th	ne inte	erference-receiving				
	·	hich was m	ounted on the	top of a	varia	ble-height antenna				
	tower.				4	fa				
						four meters above the field strength.				
						antenna are set to				
	make the n		•							
						anged to its worst				
						from 1 meter to 4				
				from 0	degre	ees to 360 degrees				
	to find the r		•	to Pea	ak Det	tect Function and				
			system was set to Peak Detect Functio th with Maximum Hold Mode.							
						s 10 dB lower than				
						nd the peak values				
						ssions that did not				
						using peak, quasi- reported in a data				
	sheet.	erage men	nou as specin	eu anu	uieii i	reported in a data				
Test setup:	Below 1GHz									
·	Delow 1G112									
		:	———〒		Antenna	Tower				
			براا							
	l ı									
	l	3m <	1 IV		Search Antenn					
	EUT \	4m	' /							
	<u> </u>	<b>A</b>	<i>✓</i>		Test					
		- ÎT		Rec	eiver –	$\neg$				
	Turn	0.8m 1m	<del>,</del>			<u> </u>				
	Table	0.8m Im								
				<del>,,,,</del>	, 근	_00				
	7777777777	uungi	///////////////////////////////////////	/////	•					
	Ground Plane	/								
	Above 1GHz									



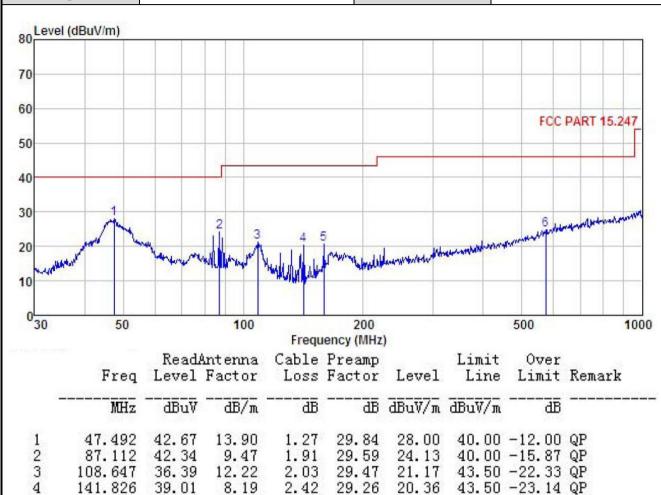




### Measurement Data (worst case):

#### **Below 1GHz:**

Product Name:	Monkey II LTE	Product model:	PL504
Test By:	Caffrey	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



### Remark:

5

6

159.225

572.614

38.02

31.31

9.06

18.56

2.58

3.91

29.14

29.03

20.52

24.75

43.50 -22.98 QP

46.00 -21.25 QP

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

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



Product Name:		Monkey II LTE				oduct mode	el:	PL504		
Test By:		Caffrey				st mode:		BLE Tx mode		
Test Fre	quency:	30 MHz ~ 1 GHz			Po	larization:		Horizontal		
Test Vol	tage:	AC 120/60	)Hz	Environment: Temp: 24°C H			Huni: 57%			
Lev	el (dBuV/m)									
80										
70										
60										
A 70-90								FCC	PART 15.247	
50					-					
40										
30									4164	
30					3	4 5		-Marthamark	Marind Monthson Marinda	
20	1 demina	Leave .	2	Wis is	,	ALL WALLES	philaphological phin	Market Managerille	white the same of	
	Harpetonethoughout	wasternoon bearing by	year Asper	Washington and the	3	ALVIE TO STATE OF THE STATE OF	white the territory of the second	G G	white the way and the	
20 10 miles		horasterne a de marchet and	year of the second	We wanted	A Lun	4 5	white the territory and the same			
20 10 Kurl	Hungarakharakhara 50	however we have property	100	Freque	200		of the state of th	6 	1000	
20 10 miles		Read	100 Ant enna		A Lun	2)	Limit	500		
20 10 miles			Ant enna	Cable	200 Jency (MHz	2)	Limit	500 Over		
20 10 miles	50		Ant enna	Cable	200 uency (MHz Preamp	c)	Limit Line	500 Over Limit	1000	
10 30	50 Freq	Level	Intenna Factor	Cable Loss	200 Jency (MHz Preamp Factor	Level	Limit Line	500 Over Limit	1000 Remark	
20 10 0 30	50 Freq MHz 46.830 110.569	Level dBuV 31.39 33.84	Antenna Factor dB/m 13.85 12.18	Cable Loss dB 1.28 2.05	200 Jency (MHz Preamp Factor  dB 29.85 29.45	Level  dBuV/m  16.67 18.62	Limit Line dBuV/m 40.00 43.50	500 Over Limit ———————————————————————————————————	1000 Remark QP QP	
20 10 0 30	50 Freq MHz 46.830 110.569 183.201	Level  dBuV  31.39 33.84 40.96	Antenna Factor — dB/m 13.85 12.18 10.26	Cable Loss dB 1.28 2.05 2.75	200 Jency (MHz Preamp Factor dB 29.85 29.45 28.95	Level  dBuV/m  16.67 18.62 25.02	Limit Line dBuV/m 40.00 43.50 43.50	500 Over Limit ———————————————————————————————————	1000 Remark QP QP QP QP	
20 10 0 30	Freq MHz 46.830 110.569 183.201 250.301	Level  dBuV  31.39 33.84 40.96 36.30	Antenna Factor — dB/m 13.85 12.18 10.26 13.30	Cable Loss dB 1.28 2.05 2.75 2.81	200 Jency (MHz Preamp Factor ————————————————————————————————————	Level  dBuV/m  16.67 18.62 25.02 23.87	Limit Line dBuV/m 40.00 43.50 43.50 46.00	500 Over Limit 	Tooo Remark	
10 30	50 Freq MHz 46.830 110.569 183.201	Level  dBuV  31.39 33.84 40.96	Antenna Factor — dB/m 13.85 12.18 10.26	Cable Loss dB 1.28 2.05 2.75	200 Jency (MHz Preamp Factor dB 29.85 29.45 28.95	Level  dBuV/m  16.67 18.62 25.02	Limit Line dBuV/m 40.00 43.50 43.50 46.00 46.00	500 Over Limit ———————————————————————————————————	Tooo Remark  QP QP QP QP QP QP QP 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.



#### **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	48.30	30.85	6.80	41.81	44.14	74.00	-29.86	Vertical		
4804.00	48.93	30.85	6.80	41.81	44.77	74.00	-29.23	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	38.56	30.85	6.80	41.81	34.40	54.00	-19.60	Vertical		
			0.00	41.81	34.08	54.00	-19.92	Horizontal		
4804.00	38.24	30.85	6.80	41.01	34.00	3 <del>4</del> .00	-19.92	1 Tonzontar		
	38.24	30.85	Test ch	nannel: Mido	dle channel	34.00	-19.92	Tionzoniai		
	Read Level (dBuV)	Antenna Factor (dB/m)	Test ch	nannel: Midd	dle channel	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4804.00  Frequency	Read Level	Antenna Factor	Test ch De Cable Loss	nannel: Midd tector: Peak Preamp Factor	dle channel c Value Level	Limit Line	Over Limit			
4804.00  Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Test ch De Cable Loss (dB)	nannel: Mido tector: Peak Preamp Factor (dB)	dle channel c Value Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4804.00 Frequency (MHz) 4884.00	Read Level (dBuV) 46.58	Antenna Factor (dB/m) 31.20	Test ch De Cable Loss (dB) 6.86	nannel: Mido tector: Peak Preamp Factor (dB) 41.84	dle channel c Value Level (dBuV/m) 42.80 42.51	Limit Line (dBuV/m) 74.00	Over Limit (dB) -31.20	Polarization Vertical		
4804.00 Frequency (MHz) 4884.00	Read Level (dBuV) 46.58	Antenna Factor (dB/m) 31.20	Test ch De Cable Loss (dB) 6.86	nannel: Mido tector: Peak Preamp Factor (dB) 41.84 41.84	dle channel c Value Level (dBuV/m) 42.80 42.51	Limit Line (dBuV/m) 74.00	Over Limit (dB) -31.20	Polarization Vertical		
4804.00  Frequency (MHz)  4884.00  4884.00  Frequency	Read Level (dBuV) 46.58 46.29 Read Level	Antenna Factor (dB/m) 31.20 31.20 Antenna Factor	Test ch De Cable Loss (dB) 6.86 6.86 Dete Cable Loss	nannel: Mido tector: Peak Preamp Factor (dB) 41.84 41.84 ector: Averaç Preamp Factor	Level (dBuV/m) 42.80 42.51 ge Value	Limit Line (dBuV/m) 74.00 74.00 Limit Line	Over Limit (dB) -31.20 -31.49 Over Limit	Polarization  Vertical  Horizontal		

Test channel: Highest 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	
4960.00	46.86	31.63	6.91	41.87	43.53	74.00	-30.47	Vertical	
4960.00	46.94	31.63	6.91	41.87	43.61	74.00	-30.39	Horizontal	
			Dete	ctor: Averaç	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	36.87	31.63	6.91	41.87	33.54	54.00	-20.46	Vertical	
4960.00	36.55	31.63	6.91	41.87	33.22	54.00	-20.78	Horizontal	
1									

#### Remark.

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

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





### 8 EUT Constructional Details

Reference to the test report No.: CCISE190300101

----End of report-----