

Report No: CCISE190704608

# FCC REPORT (WCDMA)

Applicant:	PAX Technology Limited		
Address of Applicant:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong		
Equipment Under Test (B	EUT)		
Product Name:	POS Terminal		
Model No.:	IM30		
Trade mark:	PAX		
FCC ID:	V5PIM304GBW		
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part 22 Subpart H FCC CFR Title 47 Part 24 Subpart E FCC CFR Title 47 Part 27 Subpart L		
Date of sample receipt:	11 Jul., 2019		
Date of Test:	11 Jul., to 19 Aug., 2019		
Date of report issued:	20 Aug., 2019		
Test Result:	PASS*		

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

Authorized Signature:



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.

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# 2. Version

Version No.	Date	Description
00	20 Aug., 2019	Original

Tested by:

Mike.0U

Date:

20 Aug., 2019

Test Engineer

Reviewed by:

Winner Thang

Date:

20 Aug., 2019

**Project Engineer** 



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# 4. Test Summary

Test Item	Section in CFR 47	Result		
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass (Please refer to MPE Report)		
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 24.232 (c) Part 27.50 (d)(4)	Pass*		
Peak-to-Average Power Ratio	Part 24.232 (d) Part 27.50(d)(5)	Pass*		
Modulation Characteristics	Part 2.1047	Pass		
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53(h)	Pass*		
Out of band emission at antenna terminals	Part 2.1053 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Pass*		
Field strength of spurious radiation	Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Pass		
Frequency stability vs. temperature	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(a)(1)(b)	Pass*		
Frequency stability vs. voltage	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(d)(2)	Pass*		
Pass: The EUT complies with the essential requirements in the standard. Pass*: please refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A.				

# 5. General Information

### 5.1 Client Information

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
Manufacturer:	PAX Computer Technology(Shenzhen) Co. Ltd.
Address:	401-402 No.3 Building, Software Park, Nanshan district, Shenzhen, Guangdong, P.R.C.

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

-	
Product Name:	POS Terminal
Model No.:	IM30
Operation Frequency range:	WCDMA Band V: 826.4MHz-846.6MHz
	WCDMA Band II: 1852.4 MHz-1907.6 MHz
	WCDMA Band IV: 1712.4 MHz-1752.6 MHz
Modulation type:	UMTS: QPSK
Antenna type:	Internal Antenna
Antenna gain:	WCDMA Band V: 2.3 dBi
	WCDMA Band II: 2.3 dBi
	WCDMA Band IV: 2.3 dBi
Power supply:	DC 12V-48V
Test Sample Condition:	The test samples were provided in good working order with no visible defects.



#### **Operation Frequency List:**

WCDMA Band V		WCDMA Band II		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	
4132	826.40	9262	1852.40	
4133	826.60	9263	1852.60	
4182	836.40	9399	1879.80	
4183	836.60	9400	1880.00	
4184	836.80	9401	1880.20	
4232	846.40	9537	1907.40	
4233	846.60	9538	1907.60	
WCDM	A Band IV			
Channel	Channel Frequency (MHz)			
1312	1712.40			
1313	1712.60			
1412	1732.40			
1413	1732.60			
1414	1732.80			
1512	1752.40			
1513	1752.60			

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, and the selected channel see below:

WCDMA Band V			WCDMA Band II		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest	4132	826.40	Lowest	9262	1852.40
Middle	4183	836.60	Middle	9400	1880.00
Highest	Highest 4233		Highest	9538	1907.60
	WCDMA Band I	V			
Chanı	nel	Frequency(MHz)			
Lowest	Lowest 1312				
Middle 1413		1732.60			
Highest 1513		1752.60			



### 5.3 Test modes

Operating Environment:				
Temperature:	Temperature: Normal: $15^{\circ}$ ~ $35^{\circ}$ , Extreme: $-30^{\circ}$ ~ $+50^{\circ}$			
Humidity:	20 % ~ 75 % RH			
Atmospheric Pressure:	1008 mbar			
Voltage:	Nominal: 24Vdc, Extreme: Low 10.2 Vdc, High 55.2 Vdc			
Test mode:				
RMC mode	Keep the EUT communication with simulated station in RMC mode			
HSDPA	Keep the EUT communication with simulated station in HSDPA mode			
HSUPA	Keep the EUT communication with simulated station in HSUPA mode			
each type band with rate emission was measured	Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes with power adaptor, earphone and Data cable. Just the worst case position (H mode)			

shown in report.

### **5.4 Description of Support Units**

Test Equipment	Manufacturer	Model No.	Serial No.	
Simulated Station Anritsu		MT8820C	6201026545	

### 5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
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: <u>https://portal.a2la.org/scopepdf/4346-01.pdf</u>



### 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

### 5.8 Test Instruments list

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
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
<b>Biconical Antenna</b>	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
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	\ \	/ersion: 6.110919	C
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
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-10-2018	11-09-2019
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Signal Generator	R&S	SMR20	1008100050	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	-
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
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	10-31-2018	10-30-2019
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2018	09-23-2019
Simulated Station	Dobdo & Cobucar		140402	07-16-2018	07-15-2019
Simulated Station	Rohde & Schwarz	CMW500	140493	07-16-2019	07-15-2020



# 6. Test results

# 6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	FCC part 22.913(a)(5), FCC part 24.232(c), FCC part 27.50(d)(4)
Test Method:	ANSI/TIA-603-D 2010
Limit:	WCDMA Band V: 7W, WCDMA Band II: 2W, WCDMA Band IV: 1W
Test setup:	ATT EUT
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Conducted Output Power is Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A. Only retest ERP and EIRP



#### **Measurement Data:**

Big         Big <th colspan="2"></th> <th colspan="3">Burst Average power (dBm)</th>			Burst Average power (dBm)		
Subtest 1         22.58         22.52         22.4           UMTS 850         Subtest 2         22.62         22.60         22.52           HSDPA         Subtest 3         22.12         22.12         22.60           Subtest 4         22.13         22.12         22.60         22.52           Subtest 4         22.13         22.12         22.12         22.60           Subtest 4         22.33         22.24         22.26         22.33         22.27           DC-HSDPA         Subtest 3         21.86         21.85         21.7         21.86         21.85         21.7           UMTS 850         Subtest 3         21.23         20.92         20.5         31.7         21.5           UMTS 850         Subtest 3         21.23         20.92         20.5         31.7         21.7         21.47         21.6           UMTS 850 RMC         12.2k0ps         23.42         23.53         23.4         23.63         23.4           EUT Mode         Subtest 1         22.87         22.76         22.6           UMTS 1900         Subtest 2         22.88         22.62         22.6           UMTS 1900         Subtest 3         22.40         22.35         22.	EUT Mode		4132	4183	4233
UMTS 850 HSDPA         Subtest 2         22.62         22.60         22.5           HSDPA         Subtest 3         22.12         22.12         22.0           Subtest 4         22.13         22.12         22.0           Subtest 1         22.31         22.24         22.2           UMTS 850 DC-HSDPA         Subtest 2         22.36         22.33         22.7           UMTS 850 HSUPA         Subtest 4         21.86         21.85         21.7           UMTS 850 HSUPA         Subtest 4         22.12         22.15         21.5           UMTS 850 HSUPA         Subtest 4         21.73         20.92         20.5           Subtest 4         21.57         21.47         21.5         21.5           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Max. ERP (dBm)         23.68         28.26         22.65           EUT Mode         Subtest 1         22.87         22.76         22.66           UMTS 1900         Subtest 1         22.88         22.82         22.62           UMTS 1900         Subtest 1         22.63         22.64         22.62			826.40 (MHz)	836.60 (MHz)	846.60 (MHz)
HSDPA         Subtest 3         22.12         22.12         22.12         22.12           Subtest 4         22.33         22.44         22.3         22.33         22.24           UMTS 850         Subtest 2         22.36         22.33         22.24         22.3           DC-HSDPA         Subtest 3         21.86         21.85         21.7           Subtest 1         22.12         22.15         21.7           Subtest 3         21.86         21.85         21.7           Subtest 1         22.12         22.15         21.5           Subtest 1         22.12         22.15         21.5           Subtest 1         22.12         22.15         21.7           Subtest 3         21.23         20.92         20.9           Subtest 4         21.57         21.47         21.5           Subtest 5         22.20         22.4         22.0         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Max. ERP (dBm)         23.68         22.00         22.4           UMTS 1900         Subtest 1         22.87         22.76         22.6           UMTS 1900         Subtest 3         22.40 <td></td> <td>Subtest 1</td> <td>22.58</td> <td>22.52</td> <td>22.49</td>		Subtest 1	22.58	22.52	22.49
Subtest 4         22.13         22.12         22.0           UMTS 850         Subtest 1         22.31         22.24         22.3           DC-HSDPA         Subtest 2         22.36         22.33         22.2           DC-HSDPA         Subtest 3         21.86         21.85         21.7           Subtest 4         21.88         21.85         21.7         21.5         21.5           UMTS 850         Subtest 3         21.23         20.92         20.92         20.92           Subtest 3         21.23         20.92         22.4         22.4         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         2.3         2.3         23.42           Max. ERP (dBm)         23.68         22.80         22.82           EUT Mode         Subtest 1         22.87         22.76         22.4           Max. ERP (dBm)         38.45         22.34         22.4         22.5           UMTS 1900         Subtest 1         22.88         22.82         22.4           MSUBPA         Subtest 3         22.40         22.35         22.4           UMTS 1900         Subtest 4         22.34	UMTS 850	Subtest 2	22.62	22.60	22.54
Subtest 1         22.31         22.24         22.32           DC-HSDPA         Subtest 2         22.36         22.33         22.33           DC-HSDPA         Subtest 3         21.86         21.85         21.7           Subtest 3         21.86         21.86         21.85         21.7           Subtest 4         22.12         22.15         21.5         21.5           MMTS 850         Subtest 2         21.53         21.37         21.37           Subtest 3         21.23         20.92         20.6           Subtest 4         21.57         21.47         21.5           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53           Antenna Gain (dBi)         23.68         23.68           ERP Limit (dBm)         38.45         22.64           Max. ERP (dBm)         38.45         22.82           UMTS 1900         Subtest 1         22.63         22.62           UMTS 1900         Subtest 1         22.63         22.57         22.64           DC-HSDPA         Subtest 1         22.63         22.57         22.64           DC-HSDPA         Subtest 1 <td< td=""><td>HSDPA</td><td>Subtest 3</td><td>22.12</td><td>22.12</td><td>22.04</td></td<>	HSDPA	Subtest 3	22.12	22.12	22.04
UMTS 850 DC-HSDPA         Subtest 2         22.36         22.33         22.2 3           UMTS 850 HSUPA         Subtest 3         21.86         21.85         21.7 5           UMTS 850 HSUPA         Subtest 1         22.12         22.15         21.5 7           UMTS 850 HSUPA         Subtest 2         21.53         21.37         21.5 7           UMTS 850 RMC         12.2kbps         22.0         22.0         22.4 7         21.47         21.5 7           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4 7         23.68           ERP Limit (dBm)         38.45         3         38.45         3         3           EUT Mode         Subtest 1         22.87         22.76         22.6 7           UMTS 1900         Subtest 1         22.87         22.35         22.4 7           UMTS 1900         Subtest 3         22.40         22.35         22.4 7           UMTS 1900         Subtest 4         22.38         22.34         22.4 7         22.64         22.57         22.6 7         22.6		Subtest 4	22.13	22.12	22.05
DC-HSDPA         Subtest 3         21.86         21.85         21.7           Subtest 4         21.88         21.86         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.8         21.3         21.4         21.3         21.4         21.4         21.6         22.4         22.4         22.4         22.4         22.4         22.6         22.6         22.6         22.46<		Subtest 1	22.31	22.24	22.23
Subtest 4         21.88         21.86         21.5           UMTS 850 HSUPA         Subtest 1         22.12         22.15         21.5           Subtest 3         21.33         20.92         20.5           Subtest 4         21.57         21.47         21.5           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         .         2.3         23.68           ERP (dBm)         23.68         22.80         22.85           WMTS 1900         Subtest 1         22.87         22.76         22.6           UMTS 1900         Subtest 1         22.87         22.76         22.6           UMTS 1900         Subtest 2         22.38         22.32         22.4           UMTS 1900         Subtest 1         22.63         22.52         22.6           UMTS 1900         Subtest 2         22.64         22.57         22.6           UMTS 1900         Subtest 3         22.16         22.10         22.2           UMTS 1900         Subtest 4         22.16         22.10         22.2           UMTS 1900         Subtest 3         21.4	UMTS 850	Subtest 2	22.36	22.33	22.29
Subtest 1         22.12         22.15         21.53           UMTS 850 HSUPA         Subtest 2         21.53         21.37         21.35           Subtest 3         21.23         20.92         20.55           Subtest 4         21.57         21.47         21.5           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Max. ERP (dBm)         23.68         23.68         23.68         23.68           ERP Limit (dBm)         38.45         38.45         38.45         38.45           UMTS 1900         Subtest 1         22.87         22.76         22.62           UMTS 1900         Subtest 2         22.88         22.82         22.42           UMTS 1900         Subtest 3         22.40         22.35         22.40           UMTS 1900         Subtest 4         22.38         22.34         22.40           UMTS 1900         Subtest 3         22.16         22.57         22.64           UMTS 1900         Subtest 4         22.16         22.10         22.24           UMTS 1900         Subtest 3         22.16         22.10         22.57         22.64           UMTS 1900         Subtest 2         21.69	DC-HSDPA	Subtest 3	21.86	21.85	21.79
UMTS 850 HSUPA         Subtest 2         21.53         21.37         21.3           MUPA         Subtest 3         21.23         20.92         20.92           Subtest 4         21.57         21.47         21.53           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         2.3         2.3         23.68         23.68           ERP Limit (dBm)         38.45         38.45         38.45           Burst Average power (dBm)           9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           Subtest 1         22.87         22.82         22.6           UMTS 1900         Subtest 2         22.88         22.82         22.6           HSDPA         Subtest 3         22.40         22.35         22.4           UMTS 1900         Subtest 3         22.16         22.10         22.2           UMTS 1900         Subtest 4         22.16         22.10         22.2           UMTS 1900         Subtest 3         22.16         22.10         22.2           UMTS 1900 <t< td=""><td></td><td>Subtest 4</td><td>21.88</td><td>21.86</td><td>21.80</td></t<>		Subtest 4	21.88	21.86	21.80
Subtest 3         21.23         20.92         20.5           HSUPA         Subtest 4         21.57         21.47         21.5           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         2.3         23.68         23.68         23.68           ERP Limit (dBm)         38.45         38.45         38.45         38.45           Burst Average power (dBm)           Subtest 1         22.87         22.62           UMTS 1900         Subtest 2         22.88         22.82         22.82           UMTS 1900         Subtest 3         22.16         22.10		Subtest 1	22.12	22.15	21.90
HSUPA         Subtest 3         21.23         20.92         20.53           Subtest 4         21.57         21.47         21.57         21.47         21.57           UMTS 850 RMC         12.2kbps         23.42         23.53         23.42           Antenna Gain (dBi)         2.3         2.3         2.3         2.3           Max, ERP (dBm)         23.68         2.3         2.3         2.3           Burst Average power (dBm)           9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           UMTS 1900         Subtest 1         22.87         22.76         22.82           UMTS 1900         Subtest 2         22.88         22.82         22.82           UMTS 1900         Subtest 3         22.40         22.35         22.40           MAX ERP (dBm)         Subtest 4         22.38         22.34         22.40           UMTS 1900         Subtest 1         22.63         22.52         22.64           DC-HSDPA         Subtest 3         22.16         22.10         22.16           UMTS 1900         Subtest 4         22.16         22.10         22.16           UMTS 1900 RMC         Subtest 5 <td></td> <td>Subtest 2</td> <td>21.53</td> <td>21.37</td> <td>21.38</td>		Subtest 2	21.53	21.37	21.38
Subtest 4         21.57         21.47         21.57           Subtest 5         22.50         22.20         22.4           UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)		Subtest 3	21.23	20.92	20.96
UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         2.3         23.68         23.64         23.68         23.64         22.64         22.67         22.66         22.64         22.57         22.66         22.64         22.57         22.64         23.74         23.68         22.16         23.68         22.16         23.64         23.67         22.64         23.63         23.64	HSUPA	Subtest 4	21.57	21.47	21.52
UMTS 850 RMC         12.2kbps         23.42         23.53         23.4           Antenna Gain (dBi)         2.3         23.68         23.64         23.68         23.64         22.64         22.67         22.66         22.64         22.57         22.66         22.64         22.57         22.64         23.74         23.68         22.16         23.68         22.16         23.64         23.67         22.64         23.63         23.64		Subtest 5	22.50	22.20	22.40
Max. ERP (dBm)         23.68           ERP Limit (dBm)         38.45           EUT Mode         9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           UMTS 1900         Subtest 1         22.87         22.76         22.82           HSDPA         Subtest 2         22.88         22.82         22.40           UMTS 1900         Subtest 3         22.40         22.35         22.4           UMTS 1900         Subtest 4         22.38         22.34         22.4           UMTS 1900         Subtest 1         22.63         22.52         22.6           UMTS 1900         Subtest 2         22.64         22.57         22.6           UMTS 1900         Subtest 3         22.16         22.10         22.2           UMTS 1900         Subtest 4         22.16         22.10         22.2           Subtest 3         22.16         22.10         22.2         22.6           UMTS 1900         Subtest 3         22.16         22.10         22.2           UMTS 1900         Subtest 4         22.16         22.2.4         22.1           UMTS 1900 RMC         Subtest 5         22.80         21.31         21.5	UMTS 850 RMC	12.2kbps	23.42	23.53	23.45
ERP Limit (dBm)         38.45           Burst Average power (dBm)           EUT Mode         9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           UMTS 1900         Subtest 1         22.87         22.76         22.8           HSDPA         Subtest 2         22.88         22.82         22.4           UMTS 1900         Subtest 3         22.40         22.35         22.4           Subtest 4         22.38         22.34         22.4           UMTS 1900         Subtest 1         22.63         22.52         22.6           UMTS 1900         Subtest 2         22.64         22.57         22.6           DC-HSDPA         Subtest 3         22.16         22.10         22.2           Subtest 4         22.14         22.08         22.1         22.4           UMTS 1900         Subtest 3         22.16         22.10         22.2           Subtest 4         22.13         22.10         22.2         22.4           UMTS 1900         Subtest 3         21.40         21.31         21.6           Subtest 5         22.80         22.80         22.8         22.5           S	Antenna Gain (c	lBi)		2.3	
Burst Average power (dBm)           9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           UMTS 1900         Subtest 1         22.87         22.76         22.8           HSDPA         Subtest 2         22.88         22.82         22.4           UMTS 1900         Subtest 3         22.40         22.35         22.4           UMTS 1900         Subtest 4         22.38         22.52         22.6           UMTS 1900         Subtest 1         22.63         22.52         22.6           UMTS 1900         Subtest 2         22.64         22.57         22.6           DC-HSDPA         Subtest 3         22.16         22.10         22.2           UMTS 1900         Subtest 4         22.14         22.08         22.1           UMTS 1900         Subtest 1         22.16         22.10         22.2           UMTS 1900         Subtest 2         21.69         21.70         21.6           Subtest 3         21.40         21.31         21.5         22.64           UMTS 1900         Subtest 4         22.15         22.64         22.1           UMTS 1900 RMC         Subtest 5         22.80				23.68	
EUT Mode         9262         9400         953           1852.40 (MHz)         1880.00 (MHz)         1907.60           UMTS 1900         Subtest 1         22.87         22.76         22.8           HSDPA         Subtest 2         22.88         22.82         22.8           UMTS 1900         Subtest 3         22.40         22.35         22.4           Subtest 4         22.38         22.34         22.4           Subtest 1         22.63         22.52         22.6           UMTS 1900         Subtest 1         22.63         22.52         22.6           DC-HSDPA         Subtest 2         22.64         22.57         22.6           DC-HSDPA         Subtest 3         22.16         22.10         22.2           Subtest 1         22.64         22.2.7         22.6           DC-HSDPA         Subtest 2         21.66         22.10         22.2           Subtest 3         22.14         22.08         22.1           Subtest 4         22.14         22.08         22.1           Subtest 5         22.80         22.80         22.80           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           <	ERP Limit (dBr	n)		38.45	
Image: Mark Mark Mark Mark Mark Mark Mark Mark				<b>4</b> 1 1	1
UMTS 1900 HSDPA         Subtest 1         22.87         22.76         22.8           UMTS 1900 HSDPA         Subtest 2         22.88         22.82         22.8           UMTS 1900 DC-HSDPA         Subtest 4         22.38         22.34         22.4           Subtest 1         22.63         22.52         22.6           UMTS 1900 DC-HSDPA         Subtest 2         22.64         22.57         22.6           Subtest 3         22.16         22.10         22.2         22.6           Subtest 4         22.16         22.10         22.2         22.6           Subtest 3         22.16         22.10         22.2         22.6           Subtest 4         22.14         22.08         22.1         22.1           Subtest 3         22.16         22.10         22.2         22.1         22.1           Subtest 4         22.14         22.08         22.1	EUT Mode				9538
UMTS 1900 HSDPA         Subtest 2         22.88         22.82         22.82           MSDPA         Subtest 3         22.40         22.35         22.40           Subtest 4         22.38         22.34         22.40           Subtest 4         22.38         22.34         22.40           UMTS 1900 DC-HSDPA         Subtest 1         22.63         22.52         22.60           Subtest 3         22.16         22.10         22.22         22.60           Subtest 3         22.16         22.10         22.22         22.60           Subtest 4         22.14         22.08         22.12           Subtest 3         22.16         22.10         22.22           Subtest 4         22.14         22.08         22.14           Subtest 1         22.16         22.24         22.14           Subtest 3         21.40         21.31         21.66           Subtest 3         21.40         21.31         21.66           Subtest 4         21.75         21.66         21.80           Subtest 5         22.80         22.80         22.90           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Max. EIRP (dBm)<				· · · · ·	1907.60 (MHz)
HSDPA         Subtest 3         22.40         22.35         22.40           Subtest 4         22.38         22.34         22.40           UMTS 1900         Subtest 1         22.63         22.52         22.64           DC-HSDPA         Subtest 2         22.64         22.57         22.64           Subtest 3         22.16         22.10         22.22         22.64           DC-HSDPA         Subtest 3         22.16         22.10         22.22           Subtest 4         22.14         22.08         22.14           UMTS 1900         Subtest 4         22.16         22.24         22.14           Subtest 1         22.16         22.10         22.22         22.14           UMTS 1900         Subtest 3         21.40         21.70         21.66           Subtest 3         21.40         21.31         21.5         21.66           Subtest 4         21.75         21.66         21.8         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Max. EIRP (dBm)         26.47         26.47         26.47					22.89
Subtest 4         22.38         22.34         22.4           Subtest 1         22.63         22.52         22.6           DC-HSDPA         Subtest 2         22.64         22.57         22.6           Subtest 3         22.16         22.10         22.2         22.2           Subtest 4         22.16         22.10         22.2         22.2           Subtest 3         22.16         22.10         22.2         22.1           Subtest 4         22.14         22.08         22.1         22.1           Subtest 1         22.16         22.24         22.1           Subtest 3         21.40         21.31         21.6           Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         23.7         23.7           Max. EIRP (dBm)         26.47         26.47					22.85
Subtest 1         22.63         22.52         22.60           DC-HSDPA         Subtest 2         22.64         22.57         22.60           Subtest 3         22.16         22.10         22.22           Subtest 4         22.14         22.08         22.10           Subtest 4         22.14         22.08         22.11           Subtest 1         22.16         22.24         22.12           Subtest 2         21.69         21.70         21.60           HSUPA         Subtest 3         21.40         21.31         21.55           Subtest 4         21.75         21.66         21.80           Subtest 5         22.80         22.80         22.90           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         2.3         2.4         2.3	HSDPA				22.47
UMTS 1900 DC-HSDPA         Subtest 2         22.64         22.57         22.60           Subtest 3         22.16         22.10         22.22           Subtest 4         22.14         22.08         22.11           UMTS 1900 HSUPA         Subtest 1         22.16         22.24         22.11           Subtest 1         22.16         22.24         22.11         22.24         22.11           UMTS 1900 HSUPA         Subtest 2         21.69         21.70         21.66         21.40           UMTS 1900 RMC         Subtest 3         21.40         21.31         21.55         22.80         22.80         22.95           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         2.3         26.47					22.45
DC-HSDPA         Subtest 3         22.16         22.10         22.2           Subtest 4         22.14         22.08         22.1           Subtest 1         22.16         22.24         22.1           Subtest 1         22.16         22.24         22.1           Subtest 1         22.16         22.24         22.1           Subtest 2         21.69         21.70         21.6           Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         2.3         26.47					22.65
Subtest 4         22.14         22.08         22.14           UMTS 1900         Subtest 1         22.16         22.24         22.1           Subtest 2         21.69         21.70         21.6           Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         2.3         2.4					22.60
Subtest 1         22.16         22.24         22.1           Subtest 2         21.69         21.70         21.6           Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.8           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         26.47         26.47	DC-HSDPA				22.22
UMTS 1900 HSUPA         Subtest 2         21.69         21.70         21.6           Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         23.3         26.47         26.47					22.19
UMI S 1900 HSUPA         Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.8           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         26.47         26.47					22.18
Subtest 3         21.40         21.31         21.5           Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         26.47         26.47	UMTS 1900				21.66
Subtest 4         21.75         21.66         21.8           Subtest 5         22.80         22.80         22.9           UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         26.47         26.47					21.59
UMTS 1900 RMC         12.2kbps         24.17         24.02         23.7           Antenna Gain (dBi)         2.3         2.3         26.47         26.47					21.85
Antenna Gain (dBi)     2.3       Max. EIRP (dBm)     26.47					22.90
Max. EIRP (dBm) 26.47			24.17		23.78
EIRP Limit (dBm) 33.00					
				33.00	
Note: Burst Average power (dBm) is Refer to FCC ID: ZMONL668AM00	5, , ,				
EIRP (dBm) = Burst Average power (dBm) + Antenna Gain (dBi). ERP (dBm ) = EIRP (dBm) - 2.15 (dB).	( ) 51		).		



EUT Mode		Burst Average power (dBm)		
		1312	1412	1513
		1712.40 (MHz)	1732.40 (MHz)	1752.60 (MHz)
	Subtest 1	22.38	22.44	22.41
UMTS 1700	Subtest 2	22.39	22.40	22.35
HSDPA	Subtest 3	21.92	21.93	21.88
	Subtest 4	21.91	21.92	21.88
	Subtest 1	22.12	22.18	22.16
UMTS 1700	Subtest 2	22.12	22.12	22.09
DC-HSDPA	Subtest 3	21.65	21.65	21.62
	Subtest 4	21.65	21.65	21.62
	Subtest 1	21.64	21.84	21.66
UMTS 1700	Subtest 2	21.02	21.23	21.22
	Subtest 3	20.93	20.81	20.93
HSUPA	Subtest 4	21.46	21.37	21.21
	Subtest 5	22.90	22.30	22.30
UMTS 1700 RMC	12.2kbps	23.74	23.63	23.65
Antenna Gain (dBi)		2.3		
Max. EIRP (dBm)		26.04		
EIRP Limit (dBm)		30.00		



### 6.2 Peak-to-Average Power Ratio

Test Requirement:	FCC part 24.232(d), FCC part 27.50(d)(5)
Test Method	ANSI/TIA-603-D 2010
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test setup:	
	System simulator
	Spectrum Analyzer
Test Procedure:	<ol> <li>The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>Set the CCDF option in spectrum analyzer, RBW ≥ OBW,</li> <li>Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.</li> <li>Repeat step 1~3 at other frequency and modulations.</li> </ol>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A.



### 6.3 Occupy Bandwidth

Test Requirement:	FCC part 22.917(b), FCC part 24.238(b), FCC Part 27.53(h)
Test Method:	ANSI/TIA-603-D 2010
Test setup:	System simulator Splitter ATT EUT Spectrum Analyzer
Test Procedure:	<ol> <li>The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>RBW was set to about 1% of emission BW, VBW= 3 times RBW.</li> <li>-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.</li> </ol>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A.





### 6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H & 24E & 27L there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

### 6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC Part 27.53 (h)
Test Method:	ANSI/TIA-603-D 2010
Limit:	-13dBm
Test setup:	System simulator Splitter ATT EUT Spectrum Analyzer
Test Procedure:	<ol> <li>The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.</li> <li>For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.</li> <li>Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ol>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A.



### 6.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC part 27.53(h)
Test Method:	ANSI/TIA-603-D 2010
Limit:	-13dBm
Test setup:	Below 1GHz
Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-
	<ul> <li>conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li> <li>4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)</li> </ul>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

#### Measurement Data (worst case):

	WCD	MA BAND V 12.2k RM	/IC	
		Lowest channel		
	Spurious Emission			
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
1652.80	Vertical	-55.86		
2479.20	V	-42.95	-13.00	Pass
3305.60	V	-49.87		
1652.80	Horizontal	-58.62		
2479.20	Н	-51.47	-13.00	Pass
3305.60	Н	-49.36		
		Middle channel		
	Spurious	Emission	Lingit (dDm)	Decult
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
1673.20	Vertical	-55.38		Pass
2509.80	V	-42.93	-13.00	
3346.40	V	-49.27		
1673.20	Horizontal	-58.46		Pass
2509.80	Н	-51.09	-13.00	
3346.40	Н	-49.53		
		Highest channel		
<b>F</b> (1411)	Spurious	Emission		
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
1693.20	Vertical	-55.42		
2539.80	V	-42.81	-13.00	Pass
3386.40	V	-49.38		
1693.20	Horizontal	-55.06		
2539.80	Н	-51.13	-13.00	Pass
3386.40	Н	-49.74		
Remark:			1 L	



	WCE	MA Band II 12.2k RM	MC	
		Lowest channel		
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result
Frequency (MHZ)	Polarization	Level (dBm)	Linin (dbin)	Result
3704.80	Vertical	-49.79	-13.00	Pass
5557.20	V	-40.68	-13.00	Fa55
3704.80	Horizontal	-50.88	-13.00	Pass
5557.20	Н	-45.03	-13.00	Pass
		Middle channel		
	Spurious	Emission	Limit (dDm)	Result
Frequency (MHz)	Polarization	Level (dBm)	– Limit (dBm)	Result
3760.00	Vertical	-49.67	10.00	Deee
5640.00	V	-40.53	13.00	Pass
3760.00	Horizontal	-50.82	-13.00	Pass
5640.00	Н	-45.26	-13.00	Pass
Highest channel				
Spurious Emission		Decult		
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm) Result	
3815.20	Vertical	-49.37	12.00	Deee
5722.80	V	-40.76	-13.00	Pass
3815.20	Horizontal	-50.37	12.00	Deee
5722.80	Н	-45.14	-13.00	Pass
Remark: 1. The emission levels	of below 1 GHz are very	lower than the limit and	not show in test report.	



	WCD	MA Band IV 12.2k RI	мс	
		Lowest channel		
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result
Frequency (MHZ)	Polarization	Level (dBm)	Linni (abin)	Result
3424.40	Vertical	-46.34	-13.00	Pass
5136.60	V	-41.29	-13.00	Fass
3424.40	Horizontal	-49.83	-13.00	Pass
5136.60	Н	-45.36	-13.00	Fass
		Middle channel		
Fraguanay (MHz)	Spurious	Emission	Limit (dDm)	Result
Frequency (MHz)	Polarization	Level (dBm)	– Limit (dBm)	Result
3464.80	Vertical	-46.27	-13.00	Pass
5197.20	V	-41.38	-13.00	Pass
3464.80	Horizontal	-49.79	-13.00	Pass
5197.20	Н	-45.48	-13.00	Fass
Highest channel				
Spurious Emission		Popult		
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm) Result	
3505.20	Vertical	-46.37	12.00	Deee
5257.80	V	-41.69	13.00	Pass
3505.20	Horizontal	-49.86	-13.00	Pass
5257.80	Н	-45.35	-13.00	rass
Remark: 1. The emission levels	of below 1 GHz are very	lower than the limit and	not show in test report.	



### 6.7 Frequency stability V.S. Temperature measurement

Test Requirement:       FCC Part 22.355, FCC Part 24.235, FCC Part 27.54, FCC Part 2.1055(a)(1)(b)         Test Method:       ANSI/TIA-6-3-D 2010         Limit:       ±2.5 ppm for GSM 850 and WCDMA 850         Within authorized band for PCS 1900 and W1900 and W1700         Test setup:       Image: Comparison of the setup of th	<u>ר</u>	
Test Method:       ANSI/TIA-6-3-D 2010         Limit:       ±2.5 ppm for GSM 850 and WCDMA 850 Within authorized band for PCS 1900 and W1900 and W1700         Test setup:       SS         SS       Divider         EuT       EuT         Temperature & Humidit	<u>ר</u>	
Limit:       ±2.5 ppm for GSM 850 and WCDMA 850 Within authorized band for PCS 1900 and W1900 and W1700         Test setup:       SS         SS       Divider         Divider       Temperature & Humidition		
Limit:       Within authorized band for PCS 1900 and W1900 and W1700         Test setup:       SS         SS       Divider         Divider       EUT         Temperature & Humidit	<u>ר</u>	
SA Divider Divider Temperature & Humidi Power Source	ר	
Test presedure: 1. The equipment under test was corrected to an external	Jity Chamber	
<ol> <li>Test procedure:</li> <li>The equipment under test was connected to an external supply and input rated voltage.</li> <li>RF output was connected to a frequency counter or analyzer via feed through attenuators.</li> <li>The EUT was placed inside the temperature chamber.</li> <li>Set the spectrum analyzer RBW low enough to obtain t frequency resolution and measure EUT 25°C operating frequency.</li> <li>Turn EUT off and set the chamber temperature to -30°C temperature stabilized for approximately 30 minutes refrequency.</li> <li>Repeat step measure with 10°C increased per stage until temperature of +50°C reached</li> </ol>	the desired requency as C. After the ecorded the	
Test Instruments: Refer to section 5.8 for details		
Test mode: Refer to section 5.3 for details		
Test results: Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01.		



### 6.8 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 22.355, FCC Part 24.235, FCC Part 27.54, FCC Part 2.1055(d)(2)
Test Method:	ANSI/TIA-603-D 2010
Limit:	±2.5ppm Within authorized band for PCS 1900 and W1900 and W1700
Test setup:	SA EUT EUT EUT Divider Temperature & Humidity Chamber Power Source
Test procedure:	<ol> <li>Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.</li> <li>Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.</li> <li>Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.</li> </ol>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to FCC ID: ZMONL668AM00, Report No.: FG8O1914-01A.