



FCC RF Test Report

APPLICANT : Fibocom Wireless Inc.
EQUIPMENT : 5G Module
BRAND NAME : Fibocom
MODEL NAME : FM350-GL
FCC ID : ZMOFM350GL
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Mar. 08, 2021 and completely tested on Apr. 14, 2021. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG130810A	Rev. 01	Initial issue of report	Apr. 28, 2021

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
4.4	§2.1053; §22.917(a); §24.238(a); §27.53(h)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 42.30 dB at 7409.600 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



1 General Description

1.1 Applicant

Fibocom Wireless Inc.

1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

1.2 Manufacturer

Fibocom Wireless Inc.

1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	5G Module
Brand Name	Fibocom
Model Name	FM350-GL
FCC ID	ZMOFM350GL
EUT supports Radios application	WCDMA/LTE/5G NR GNSS
IMEI Code	Radiation: 882146050002276
HW Version	V1.0.6
SW Version	81600.0000.00.09.03.03
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report for FM350-GL. The change note could be referred to the product equality declaration which is exhibit separately. Based on the similarity between current and previous project, only the related test cases from original test report (Sporton Report Number FG051802A) were verified for the differences.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz Band IV: 1710 MHz ~ 1755 MHz
Rx Frequency	WCDMA: Band V: 869 MHz ~ 894 MHz Band II: 1930 MHz ~ 1990 MHz Band IV: 2110 MHz ~ 2155 MHz
Type of Modulation	WCDMA : BPSK HSDPA/DC-HSDPA : QPSK HSUPA : QPSK HSPA+ : 16QAM DC-HSDPA : 64QAM

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International (Shenzhen) Inc.		
Test Location	Site	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398	
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

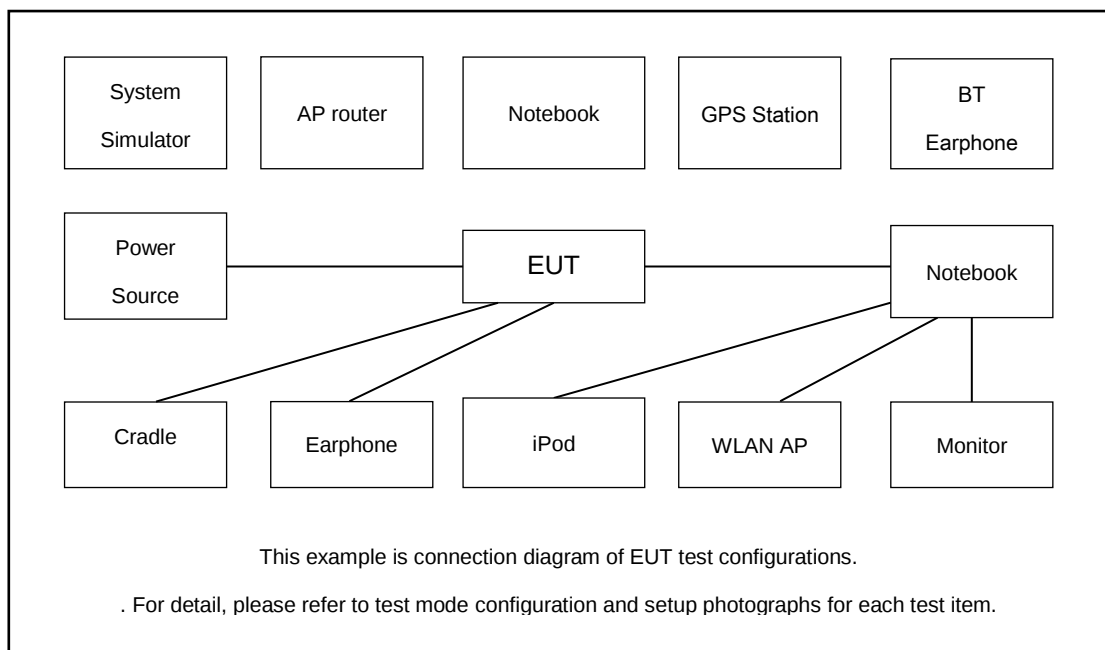
1. 30 MHz to 10th harmonic for WCDMA Band V.
2. 30 MHz to 10th harmonic for WCDMA Band IV.
3. 30 MHz to 10th harmonic for WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
Band	Radiated TCs	Conducted TCs
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

2.2 Connection Diagram of Test System





2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Test jig	N/A	N/A	N/A	N/A	N/A

2.4 Frequency List of Low/Middle/High Channels

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
WCDMA Band V	Channel	4132	4182	4233
	Frequency	826.4	836.4	846.6
WCDMA Band II	Channel	9262	9400	9538
	Frequency	1852.4	1880.0	1907.6
WCDMA Band IV	Channel	1312	1413	1513
	Frequency	1712.4	1732.6	1752.6

3 Conducted Test Result

3.1 Conducted Output Power and ERP/EIRP

3.1.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for WCDMA Band II.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.1.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

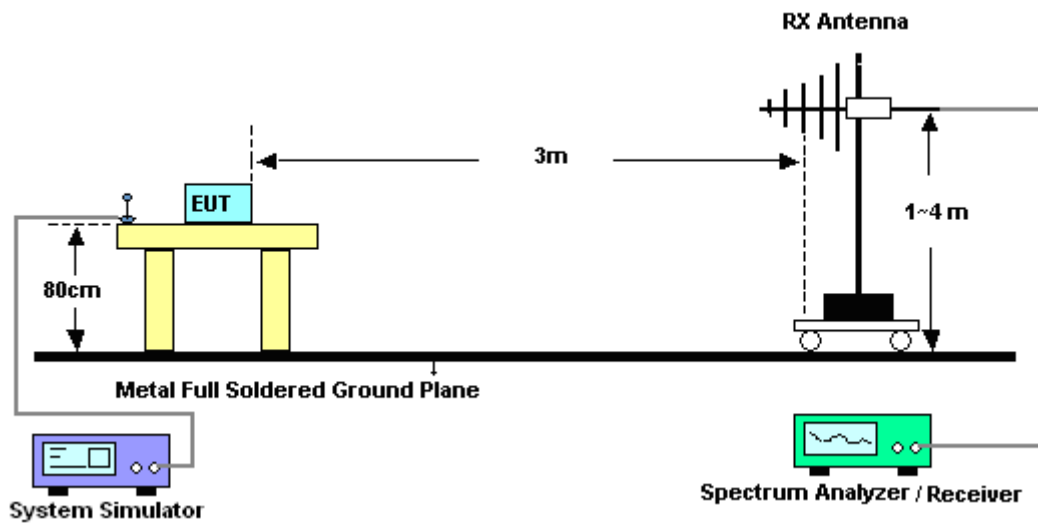
4 Radiated Test Items

4.1 Measuring Instruments

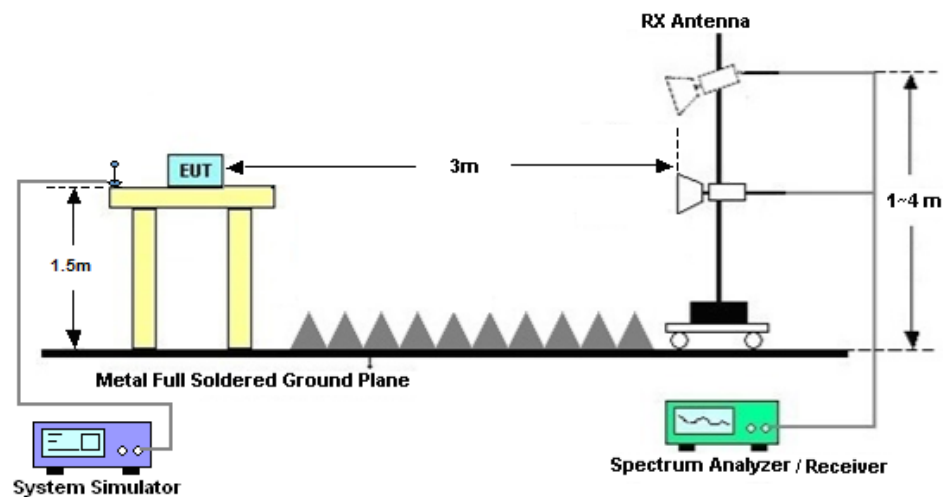
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Field Strength of Spurious Radiation Measurement

4.4.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12. $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 17, 2020	Mar. 19, 2021~ Apr. 14, 2021	Apr. 16, 2021	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Jun. 22, 2020	Mar. 19, 2021~ Apr. 14, 2021	Jun. 21, 2021	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 30, 2020	Mar. 19, 2021~ Apr. 14, 2021	Apr. 29, 2021	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz ~3000MHz	Oct. 17, 2020	Mar. 19, 2021~ Apr. 14, 2021	Oct. 16, 2021	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 21, 2020	Mar. 19, 2021~ Apr. 14, 2021	Jul. 20, 2021	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 23, 2020	Mar. 19, 2021~ Apr. 14, 2021	Apr. 22, 2021	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5G Hz	Dec. 25, 2020	Mar. 19, 2021~ Apr. 14, 2021	Dec. 24, 2021	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Mar. 19, 2021~ Apr. 14, 2021	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Mar. 19, 2021~ Apr. 14, 2021	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Mar. 19, 2021~ Apr. 14, 2021	NCR	Radiation (03CH03-SZ)

NCR: No Calibration Required



6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.0dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.6dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.8dB
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Appendix A. Test Results of Conducted Test

ERP/EIRP

WCDMA Band V ($G_T - L_C = 3.0$ dB)			
Channel	4132	4182	4233
	(Low)	(Mid)	(High)
Frequency	826.4	836.4	846.6
(MHz)			
Conducted Power (dBm)	23.55	23.50	23.60
Conducted Power (Watts)	0.2265	0.2239	0.2291
ERP(dBm)	24.40	24.35	24.45
ERP(Watts)	0.2754	0.2723	0.2786

WCDMA Band II ($G_T - L_C = 4.0$ dB)			
Channel	9262	9400	9538
	(Low)	(Mid)	(High)
Frequency	1852.4	1880	1907.6
(MHz)			
Conducted Power (dBm)	23.46	23.40	23.19
Conducted Power (Watts)	0.2218	0.2188	0.2084
EIRP(dBm)	27.46	27.40	27.19
EIRP(Watts)	0.5572	0.5495	0.5236

WCDMA Band IV ($G_T - L_C = 3.0$ dB)			
Channel	1312	1413	1513
	(Low)	(Mid)	(High)
Frequency	1712.4	1732.6	1752.6
(MHz)			
Conducted Power (dBm)	23.41	23.44	23.45
Conducted Power (Watts)	0.2193	0.2208	0.2213
EIRP(dBm)	26.41	26.44	26.45
EIRP(Watts)	0.4375	0.4406	0.4416



Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

WCDMA Band V(RMC 12.2Kbps)									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1652.8	-66.75	-13	-53.75	-73.03	-69.98	3.98	9.36	H
	2479.2	-64.56	-13	-51.56	-74.89	-68.11	4.85	10.55	H
	3305.6	-63.63	-13	-50.63	-75.98	-68.56	5.50	12.58	H
	1652.8	-66.85	-13	-53.85	-73.00	-70.08	3.98	9.36	V
	2479.2	-64.40	-13	-51.40	-75.08	-67.95	4.85	10.55	V
	3305.6	-63.23	-13	-50.23	-76.03	-68.16	5.50	12.58	V
Middle	1672.8	-66.58	-13	-53.58	-72.80	-69.83	4.00	9.40	H
	2509.2	-64.54	-13	-51.54	-74.79	-68.11	4.88	10.60	H
	3345.6	-64.14	-13	-51.14	-76.17	-69.07	5.52	12.60	H
	1672.8	-66.91	-13	-53.91	-72.85	-70.16	4.00	9.40	V
	2509.2	-64.32	-13	-51.32	-74.90	-67.89	4.88	10.60	V
	3345.6	-63.68	-13	-50.68	-76.09	-68.61	5.52	12.60	V
Highest	1693.2	-67.02	-13	-54.02	-73.35	-70.19	4.10	9.42	H
	2539.8	-64.91	-13	-51.91	-75.20	-68.49	4.90	10.63	H
	3386.4	-64.62	-13	-51.62	-76.63	-69.54	5.55	12.62	H
	1693.2	-67.11	-13	-54.11	-73.21	-70.28	4.10	9.42	V
	2539.8	-64.57	-13	-51.57	-75.20	-68.15	4.90	10.63	V
	3386.4	-64.28	-13	-51.28	-76.81	-69.20	5.55	12.62	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



WCDMA Band II(RMC 12.2Kbps)									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3704.8	-61.94	-13	-48.94	-76.48	-68.70	5.82	12.58	H
	5557.2	-61.00	-13	-48.00	-78.55	-66.72	7.28	13.00	H
	7409.6	-55.55	-13	-42.55	-78.24	-58.71	8.32	11.48	H
	3704.8	-61.85	-13	-48.85	-76.68	-68.61	5.82	12.58	V
	5557.2	-61.22	-13	-48.22	-78.8	-66.94	7.28	13.00	V
	7409.6	-55.30	-13	-42.30	-78.03	-58.46	8.32	11.48	V
Middle	3760	-61.88	-13	-48.88	-76.53	-68.63	5.85	12.60	H
	5640	-60.87	-13	-47.87	-78.62	-66.67	7.30	13.10	H
	7520	-55.82	-13	-42.82	-78.13	-58.97	8.35	11.50	H
	3760	-61.85	-13	-48.85	-76.68	-68.60	5.85	12.60	V
	5640	-60.58	-13	-47.58	-78.22	-66.38	7.30	13.10	V
	7520	-55.97	-13	-42.97	-78.16	-59.12	8.35	11.50	V
Highest	3815.2	-61.52	-13	-48.52	-76.29	-68.26	5.88	12.62	H
	5722.8	-60.13	-13	-47.13	-78.17	-65.94	7.32	13.13	H
	7630.4	-55.97	-13	-42.97	-78.22	-59.13	8.38	11.54	H
	3815.2	-61.49	-13	-48.49	-76.35	-68.23	5.88	12.62	V
	5722.8	-60.08	-13	-47.08	-78.21	-65.89	7.32	13.13	V
	7630.4	-56.18	-13	-43.18	-78.24	-59.34	8.38	11.54	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



WCDMA Band IV(RMC 12.2Kbps)									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3424.8	-63.89	-13	-50.89	-76.18	-70.77	5.60	12.48	H
	5137.2	-60.39	-13	-47.39	-77.89	-66.07	7.10	12.78	H
	6849.6	-57.99	-13	-44.99	-78.47	-61.38	8.38	11.77	H
	3424.8	-62.89	-13	-49.89	-75.74	-69.77	5.60	12.48	V
	5137.2	-60.65	-13	-47.65	-78.09	-66.33	7.10	12.78	V
	6849.6	-58.34	-13	-45.34	-78.59	-61.73	8.38	11.77	V
Middle	3465.2	-63.56	-13	-50.56	-76.31	-70.41	5.65	12.50	H
	5197.8	-60.46	-13	-47.46	-78.02	-66.13	7.13	12.80	H
	6930.4	-57.42	-13	-44.42	-78.27	-60.82	8.40	11.80	H
	3465.2	-63.23	-13	-50.23	-76.52	-70.08	5.65	12.50	V
	5197.8	-60.54	-13	-47.54	-78.05	-66.21	7.13	12.80	V
	6930.4	-57.52	-13	-44.52	-78.38	-60.92	8.40	11.80	V
Highest	3505.2	-63.28	-13	-50.28	-76.47	-70.12	5.68	12.52	H
	5257.8	-61.34	-13	-48.34	-78.31	-67.01	7.15	12.82	H
	7010.4	-56.87	-13	-43.87	-78.06	-60.30	8.42	11.85	H
	3505.2	-62.63	-13	-49.63	-76.36	-69.47	5.68	12.52	V
	5257.8	-61.35	-13	-48.35	-78.28	-67.02	7.15	12.82	V
	7010.4	-56.68	-13	-43.68	-78.07	-60.11	8.42	11.85	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.