FCC RF Test Report

APPLICANT	:	Ness Corporation Pty Ltd.
EQUIPMENT	:	Medi-Minder Guardian
BRAND NAME	:	Smartlink (A division of Ness Corporation Pty Ltd.)
MODEL NAME	:	SMIND-GUARD-LTE
FCC ID	:	O2K-SMINDLTE
STANDARD	:	47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)

The product was received on Aug. 28, 2020 and completely tested on Sep. 13, 2020. 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

ACCREDITED Cert #5145.01

Sporton International (ShenZhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG082803A	Rev. 01	Initial issue of report	Oct. 13, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§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	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	1
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	1
3.7	§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	1
3.8	§2.1051 §22.917(a) §24.238(a)	Conducted Emission	< 43+10log10(P[Watts])	PASS	1
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	1
	§2.1055 §24.235		Within Authorized Band		
4.4	§2.1053; §22.917(a); §24.238(a)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 35.67 dB at 7630.400 MHz

Remark 1: The product was installed a RF module (Brand Name: Telit, Model Name: LE910B1-NA, FCC ID: RI7LE910NAV2), the test items are referred to module report “1506FR22-01”.

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

Ness Corporation Pty Ltd.
4/167 Prospect Highway, Seven Hills, NSW, 2147, Australia

1.2 Manufacturer

Ness Corporation Pty Ltd.
4/167 Prospect Highway, Seven Hills, NSW, 2147, Australia

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Medi-Minder Guardian
Brand Name	Smartlink (A division of Ness Corporation Pty Ltd.)
Model Name	SMIND-GUARD-LTE
FCC ID	O2K-SMINDLTE
EUT supports Radios application	WCDMA/LTE/SRD
IMEI Code	Radiation: 355285089993750
HW Version	5
SW Version	1.5
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	**WCDMA:** Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency	**WCDMA:** Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	**WCDMA:** Band V: 23.34 dBm Band II: 22.83 dBm
Antenna Type	Fixed External Antenna
Antenna Gain	2.0 dBi
Type of Modulation	WCDMA: BPSK (Uplink) HSDPA: QPSK (Uplink)

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	WCDMA Band V RMC 12.2Kbps	BPSK	0.2084
Part 24	WCDMA Band II RMC 12.2Kbps	BPSK	0.3041

1.7 Testing Location

<FCC>-SZ

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24

1.9 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)
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

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:

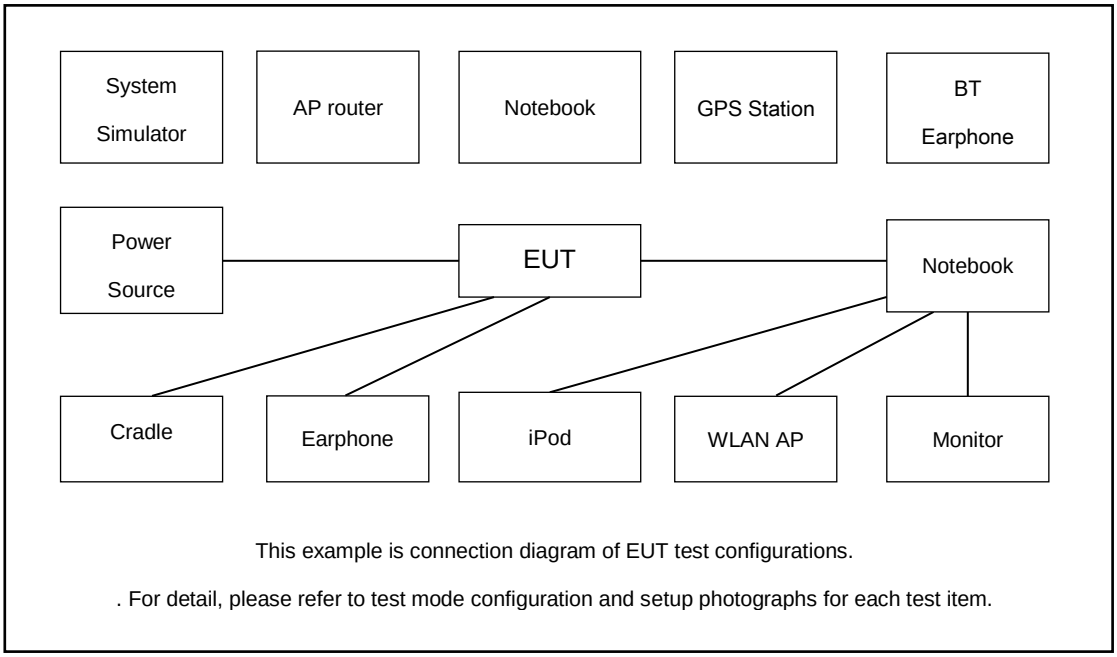
1. 30 MHz to 10th for GSM850 and WCDMA Band V.
2. 30 MHz to 10th for GSM1900 and WCDMA Band II.

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

2.2 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

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.	System Simulator	Agilent	E5515C	N/A	N/A	Unshielded, 1.8 m

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

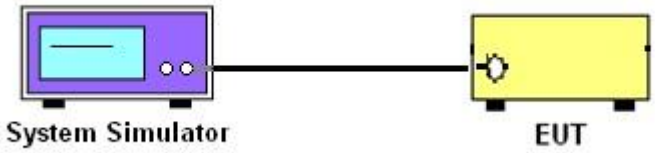
3 Conducted Test Result

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 Conducted Output Power



3.3 Conducted Output Power and ERP/EIRP

3.3.1 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.

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

3.3.2 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.

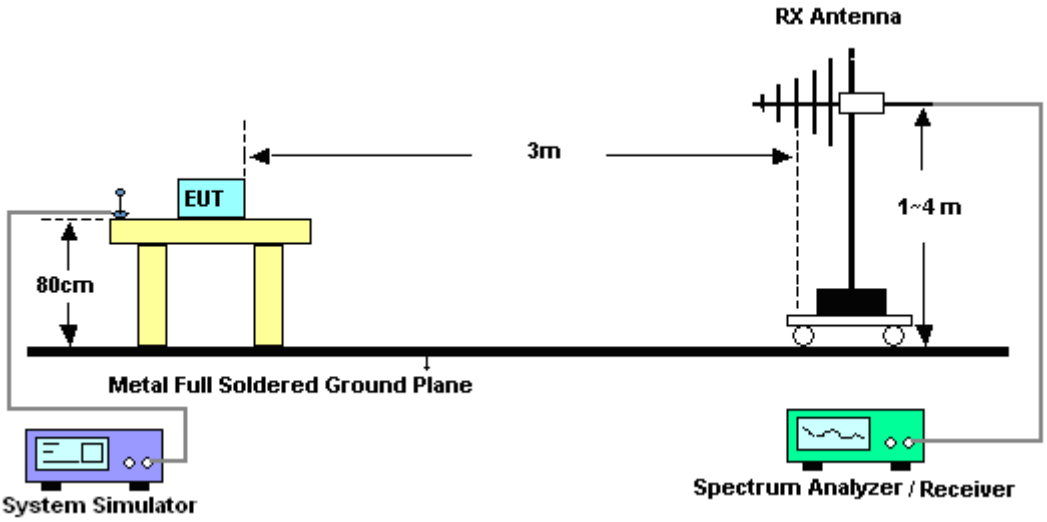
4 Radiated Test Items

4.1 Measuring Instruments

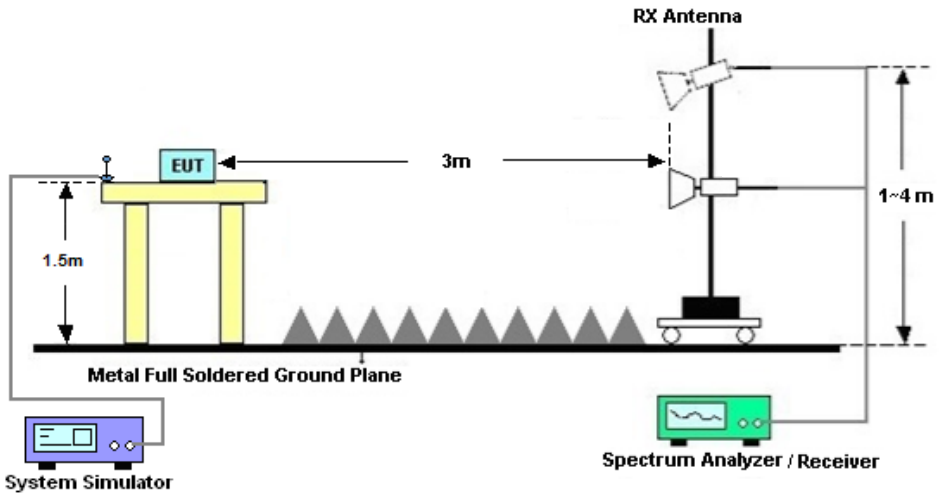
See list of measuring instruments of this test report.

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 (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (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 + 10log(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
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 17, 2020	Sep. 08, 2020	Apr. 16, 2021	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Dec. 26, 2019	Sep. 08, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 16, 2019	Sep. 13, 2020	Oct. 15, 2020	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 21, 2020	Sep. 13, 2020	Jul. 20, 2021	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Nov. 07, 2019	Sep. 13, 2020	Nov. 06, 2020	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	May. 23, 2020	Sep. 13, 2020	Mar. 22, 2021	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 26, 2020	Sep. 13, 2020	Jul. 25, 2021	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 17, 2019	Sep. 13, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 17, 2019	Sep. 13, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 21. 2020	Sep. 13, 2020	Jul. 20. 2021	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY53270156	500MHz~26.5GHz	Oct. 17, 2019	Sep. 13, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Sep. 13, 2020	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 13, 2020	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 13, 2020	NCR	Radiation (03CH04-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))	**2.8dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.1dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9dB**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
RMC 12.2K	23.26	23.33	23.34	22.72	22.83	22.71
HSDPA Subtest-1	22.67	22.78	22.83	22.18	22.20	22.19
HSDPA Subtest-2	22.83	22.87	22.87	22.26	22.37	22.32
HSDPA Subtest-3	22.28	22.37	22.39	21.80	21.89	21.80
HSDPA Subtest-4	22.12	22.12	22.13	21.55	21.58	21.55
HSUPA Subtest-1	22.23	22.00	22.50	21.85	21.46	21.45
HSUPA Subtest-2	20.67	20.67	20.72	20.17	20.12	20.13
HSUPA Subtest-3	21.65	21.68	21.75	21.15	21.19	21.24
HSUPA Subtest-4	20.91	20.94	20.96	20.37	20.44	20.37
HSUPA Subtest-5	22.30	22.50	22.50	22.40	22.40	22.40

ERP/EIRP

WCDMA Band V (G_T - L_C = 2.00 dB)			
Channel	4132	4182	4233
	(Low)	(Mid)	(High)
Frequency (MHz)	826.4	836.4	846.6
Conducted Power (dBm)	23.26	23.33	23.34
Conducted Power (Watts)	0.2118	0.2153	0.2158
ERP(dBm)	23.11	23.18	23.19
ERP(Watts)	0.2046	0.2080	0.2084

WCDMA Band II (G_T - L_C = 2.00 dB)			
Channel	9262	9400	9538
	(Low)	(Mid)	(High)
Frequency (MHz)	1852.4	1880	1907.6
Conducted Power (dBm)	22.72	22.83	22.71
Conducted Power (Watts)	0.1871	0.1919	0.1866
EIRP(dBm)	24.72	24.83	24.71
EIRP(Watts)	0.2965	0.3041	0.2958

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	-50.90	-13	-37.90	-58.95	-54.13	3.98	9.36	H
	2479.2	-53.62	-13	-40.62	-65.65	-57.17	4.85	10.55	H
	3305.6	-59.60	-13	-46.60	-74.46	-64.53	5.50	12.58	H
	1652.8	-53.43	-13	-40.43	-61.55	-56.66	3.98	9.36	V
	2479.2	-53.53	-13	-40.53	-65.61	-57.08	4.85	10.55	V
	3305.6	-55.78	-13	-42.78	-70.57	-60.71	5.50	12.58	V
Middle	1672.8	-49.87	-13	-36.87	-57.47	-53.12	4.00	9.40	H
	2509.2	-52.87	-13	-39.87	-64.94	-56.44	4.88	10.60	H
	3345.6	-59.93	-13	-46.93	-74.68	-64.86	5.52	12.60	H
	1672.8	-53.41	-13	-40.41	-61.20	-56.66	4.00	9.40	V
	2509.2	-51.94	-13	-38.94	-64.13	-55.51	4.88	10.60	V
	3345.6	-57.04	-13	-44.04	-71.81	-61.97	5.52	12.60	V
Highest	1693.2	-50.00	-13	-37.00	-57.76	-53.17	4.10	9.42	H
	2539.8	-53.32	-13	-40.32	-65.64	-56.90	4.90	10.63	H
	3386.4	-59.58	-13	-46.58	-74.28	-64.50	5.55	12.62	H
	1693.2	-51.71	-13	-38.71	-59.65	-54.88	4.10	9.42	V
	2539.8	-53.05	-13	-40.05	-65.40	-56.63	4.90	10.63	V
	3386.4	-57.47	-13	-44.47	-72.18	-62.39	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	-61.42	-13	-48.42	-77.47	-68.18	5.82	12.58	H
	5557.2	-59.07	-13	-46.07	-78.48	-64.79	7.28	13.00	H
	7409.6	-53.36	-13	-40.36	-78.15	-56.52	8.32	11.48	H
	3704.8	-57.02	-13	-44.02	-72.8	-63.78	5.82	12.58	V
	5557.2	-57.64	-13	-44.64	-76.9	-63.36	7.28	13.00	V
	7409.6	-48.90	-13	-35.90	-74.01	-52.06	8.32	11.48	V
Middle	3760	-59.96	-13	-46.96	-76.19	-66.71	5.85	12.60	H
	5640	-58.51	-13	-45.51	-78.82	-64.31	7.30	13.10	H
	7520	-54.43	-13	-41.43	-78.97	-57.58	8.35	11.50	H
	3760	-54.22	-13	-41.22	-70.01	-60.97	5.85	12.60	V
	5640	-58.89	-13	-45.89	-77.99	-64.69	7.30	13.10	V
	7520	-51.62	-13	-38.62	-76.58	-54.77	8.35	11.50	V
Highest	3815.2	-55.68	-13	-42.68	-72.05	-62.42	5.88	12.62	H
	5722.8	-55.86	-13	-42.86	-76.89	-61.67	7.32	13.13	H
	7630.4	-53.51	-13	-40.51	-77.83	-56.67	8.38	11.54	H
	3815.2	-49.94	-13	-36.94	-65.81	-56.68	5.88	12.62	V
	5722.8	-53.10	-13	-40.10	-73.27	-58.91	7.32	13.13	V
	7630.4	-48.67	-13	-35.67	-73.51	-51.83	8.38	11.54	V

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