FCC RADIO TEST REPORT

FCC ID	:	ACJFZA3A20A
Equipment	:	Radio module
Brand Name	:	Panasonic
Model Name	:	WW18A
Marketing Name	:	WW18A
Applicant	:	Panasonic Corporation of North America Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490
Manufacturer	:	Panasonic Mobile Communications Co., Ltd. 600 Saedo-cho, Tsuzuki-ku, Yokohama City 224-8539, Japan
Standard	:	FCC 47 CFR Part 2, 22(H), 24(E), 27(L)

The product was received on Nov. 26, 2019 and testing was started from Jun. 10, 2020 and completed on Jun. 13, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FG992410-07A	01	Initial issue of report	Jun. 18, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	§2.1046	Conducted Output Power	Not Required	-
	§22.913 (a)(2)	Effective Radiated Power (WCDMA Band V)		
	§24.232 (c)	Equivalent Isotropic Radiated Power (WCDMA Band II)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (WCDMA Band IV)		
-	§24.232 (d)	Peak-to-Average Ratio	Not Required	-
-	§2.1049 §22.917 (b) §24.238 (b) §27.53 (g)	Occupied Bandwidth (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV)	Not Required	-
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g)	Band Edge Measurement (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV)	Not Required	-
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g)	Conducted Emission (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV)	Not Required	-
-	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	Not Required	-
3.4	§2.1053 §22.917 (a) §24.238 (a) §27.53 (h)	Field Strength of Spurious Radiation (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV)	Pass	Under limit 22.93 dB at 5254.000 MHz

Remark:

1. Not required means after assessing, test items are not necessary to carry out.

2. This is a variant report by adding Vehicle Dock and External antenna for host. All the test cases were performed on original report which can be referred to Sporton Report Number FG992410-02A.

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.

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA and LTE

Product Specification subjective to this standard	
Integrated the Host	Equipment Name: Tablet Computer Brand Name: Panasonic Model Name: FZ-A3 Marketing Name: FZ-A3
Antenna Type	WWAN: Fixed Internal Antenna

Specification of Accessory for Host		
AC Adapter	**Brand Name**	Panasonic
	Model Name	CF-AA6413A
Battery (Small)	**Brand Name**	Panasonic
	Model Name	FZ-VZSUT10U
Battery (Large)	**Brand Name**	Panasonic
	Model Name	FZ-VZSUT11U
USB Cable 1	**Brand Name**	Panasonic
	Model Name	K1HY24YY0021
USB Cable 2	**Brand Name**	ELECOM
	Model Name	USB3-AC10BK
Gadget 1 (2nd USB)	**Brand Name**	Panasonic
	Model Name	N/A
Gadget 2 (BCR)	**Brand Name**	Panasonic
	Model Name	N/A
Cradle	**Brand Name**	Panasonic
	Model Name	FZ-VEBA21U
Vehicle Dock	**Brand Name**	Havis
	Model Name	DS-PAN-1401-2
Shoulder Strap	**Brand Name**	Panasonic
	Model Name	CF-VNS331U
Stylus Pen	**Brand Name**	Panasonic
	Model Name	CF-VNP025U
External antenna (2.4G+5G+GNSS)	**Brand Name**	Airgain
	Model Name	AP-PAN-MMF WG-Q-BL
External antenna (Cellular+2.4G)	**Brand Name**	Airgain
	Model Name	AP-PAN-MMF-C-Q-BL
External antenna (GNSS)	**Brand Name**	Airgain
	Model Name	DHXK1052ZA/X1

Remark: The external antenna can only be connected to the host WLAN antenna 1.

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH13-HY
Test Engineer	Jacky Hung and Wilson Wu
Temperature	21.5~23.5℃
Relative Humidity	49.5~55.5%

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW0007

1.4 Applicable Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 414788 D01 Radiated Test Site 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.
3. The TAF code is not including all the FCC KDB listed without accreditation.

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.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X Plane for Cellular Band and PCS Band; Y Plane for AWS Band) were recorded in this report.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for WCDMA Band V
2. 30 MHz to 18000 MHz for WCDMA Band IV
3. 30 MHz to 19100 MHz for WCDMA Band II

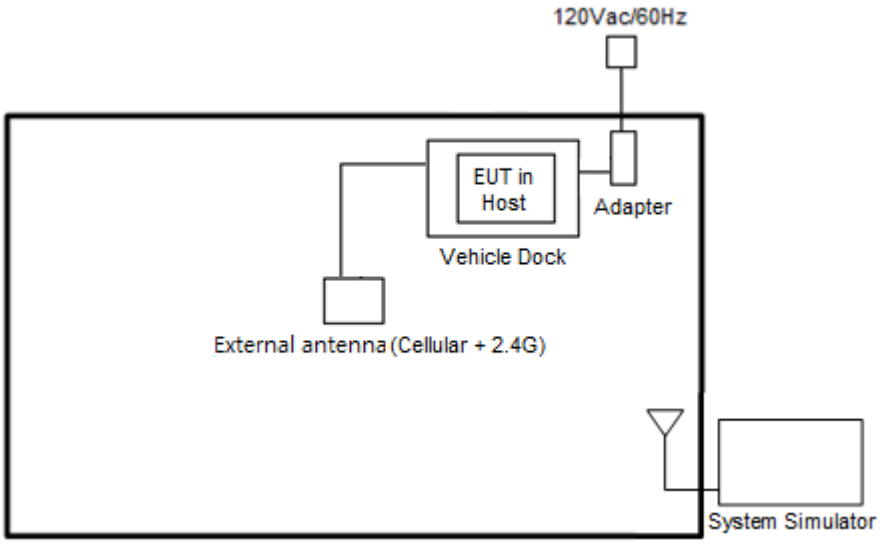
All modes and data rates and positions were investigated.

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

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

Remark: All the radiated test cases were performed with Battery 1.

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	Anritsu	MT8820C	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
WCDMA Band IV	Channel	1312	1413	1513
	Frequency	1712.4	1732.6	1752.6

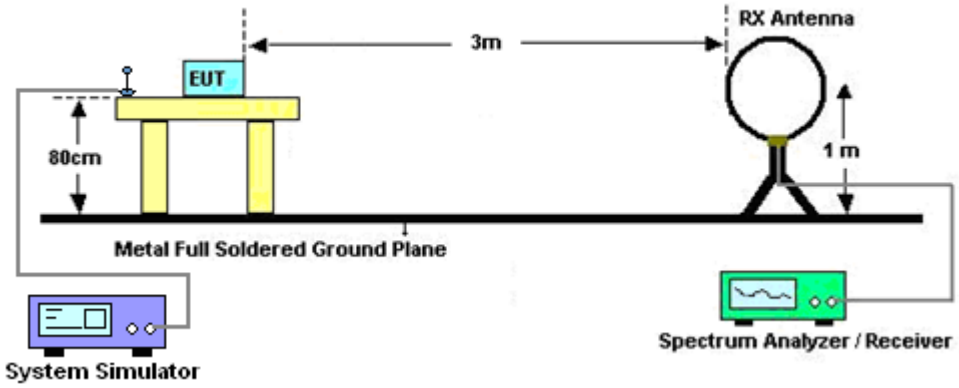
3 Radiated Test Items

3.1 Measuring Instruments

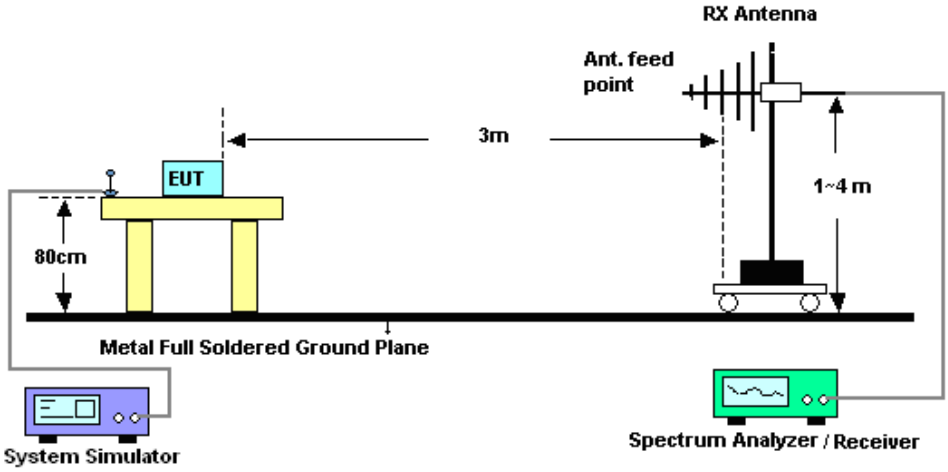
See list of measuring instruments of this test report.

3.2 Test Setup

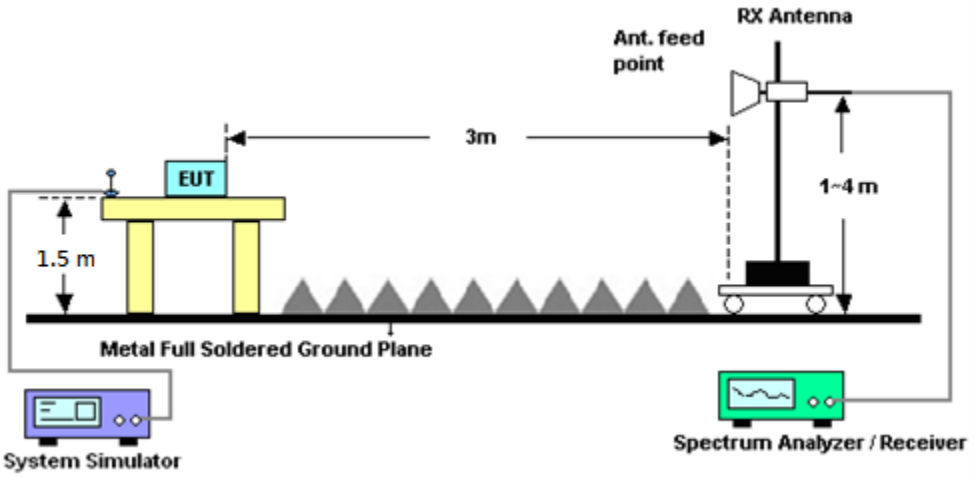
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.4 Field Strength of Spurious Radiation Measurement

3.4.1 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.

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. 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.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. 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.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 17, 2019	Jun. 10, 2020~ Jun. 13, 2020	Dec. 16, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&07	30MHz to 1GHz	Apr. 29, 2020	Jun. 10, 2020~ Jun. 13, 2020	Apr. 28, 2021	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	41912 & 07	30MHz to 1GHz	Apr. 29, 2020	Jun. 10, 2020~ Jun. 13, 2020	Apr. 28, 2021	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jul. 02, 2019	Jun. 10, 2020~ Jun. 13, 2020	Jul. 01, 2020	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1212	1GHz ~ 18GHz	May 20, 2020	Jun. 10, 2020~ Jun. 13, 2020	May 19, 2021	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 19, 2020	Jun. 10, 2020~ Jun. 13, 2020	May 18, 2021	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 28, 2019	Jun. 10, 2020~ Jun. 13, 2020	Oct. 27, 2020	Radiation (03CH13-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Aug. 27, 2019	Jun. 10, 2020~ Jun. 13, 2020	Aug. 26, 2020	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 20, 2020	Jun. 10, 2020~ Jun. 13, 2020	Mar. 19, 2021	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 10, 2020~ Jun. 13, 2020	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 10, 2020~ Jun. 13, 2020	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 10, 2020~ Jun. 13, 2020	N/A	Radiation (03CH13-HY)
Software	Audix	E3 6.2009-8-24	RK-000992	N/A	N/A	Jun. 10, 2020~ Jun. 13, 2020	N/A	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Jun. 10, 2020~ Jun. 13, 2020	Dec. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 12, 2020	Jun. 10, 2020~ Jun. 13, 2020	Feb. 21, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 12, 2020	Jun. 10, 2020~ Jun. 13, 2020	Feb. 21, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Feb. 25, 2020	Jun. 10, 2020~ Jun. 13, 2020	Feb. 24, 2021	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Dec. 10, 2019	Jun. 10, 2020~ Jun. 13, 2020	Dec. 09, 2020	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170980	18GHz~40GHz	Jan. 10, 2020	Jun. 10, 2020~ Jun. 13, 2020	Jan. 09, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN2	3GHz High Pass Filter	Jul. 14, 2019	Jun. 10, 2020~ Jun. 13, 2020	Jul. 13, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-1080-1200-15000-60SS	SN3	1.2GHz High Pass Filter	Jul. 03, 2019	Jun. 10, 2020~ Jun. 13, 2020	Jul. 02, 2020	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP157151	N/A	Jun. 17, 2019	Jun. 10, 2020~ Jun. 13, 2020	Jun. 16, 2020	Radiation (03CH13-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.21**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.24**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.99**

Appendix A. Radiated Spurious Emission

WCDMA850

WCDMA 850									
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	-62.13	-13	-49.13	-75.12	-67.53	1.23	8.78	H
	2478	-58.54	-13	-45.54	-75.35	-65.44	1.44	10.48	H
	3304	-57.66	-13	-44.66	-76.21	-65.61	1.71	11.81	H
									H
									H
									H
	1652	-61.97	-13	-48.97	-74.83	-67.37	1.23	8.78	V
	2478	-58.70	-13	-45.70	-75.78	-65.60	1.44	10.48	V
	3304	-56.79	-13	-43.79	-75.75	-64.74	1.71	11.81	V
									V
									V
									V
									V
Middle	1672	-61.77	-13	-48.77	-74.79	-67.24	1.24	8.85	H
	2508	-59.02	-13	-46.02	-75.78	-65.94	1.44	10.51	H
	3344	-57.73	-13	-44.73	-76.03	-65.77	1.74	11.93	H
									H
									H
									H
	1672	-62.24	-13	-49.24	-75.15	-67.71	1.24	8.85	V
	2508	-58.54	-13	-45.54	-75.5	-65.46	1.44	10.51	V
	3344	-56.47	-13	-43.47	-75.3	-64.51	1.74	11.93	V
									V
									V
									V
									V

Highest	1692	-62.00	-13	-49.00	-75.06	-67.54	1.24	8.93	H
	2538	-58.93	-13	-45.93	-75.74	-65.87	1.44	10.53	H
	3384	-58.08	-13	-45.08	-76.13	-66.21	1.77	12.05	H
									H
									H
									H
									H
	1692	-62.03	-13	-49.03	-75	-67.57	1.24	8.93	V
	2538	-58.47	-13	-45.47	-75.5	-65.41	1.44	10.53	V
	3384	-57.39	-13	-44.39	-76.08	-65.52	1.77	12.05	V
									V
									V
									V
									V

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

WCDMA1900

WCDMA 1900									
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	3707	-39.22	-13	-26.22	-59.77	-49.52	1.98	12.28	H
	5562	-51.90	-13	-38.90	-75.46	-62.05	2.14	12.29	H
	7417	-47.83	-13	-34.83	-75.91	-55.81	2.17	10.15	H
									H
									H
									H
									H
	3707	-42.98	-13	-29.98	-64.06	-53.28	1.98	12.28	V
	5562	-48.02	-13	-35.02	-72.2	-58.17	2.14	12.29	V
	7417	-47.80	-13	-34.80	-75.83	-55.78	2.17	10.15	V
									V
									V
									V
									V
Middle	3763	-41.10	-13	-28.10	-61.79	-51.34	2.01	12.24	H
	5646	-50.59	-13	-37.59	-74.27	-60.87	2.12	12.40	H
	7526	-48.26	-13	-35.26	-76.02	-56.24	2.11	10.09	H
									H
									H
									H
									H
	3763	-44.19	-13	-31.19	-65.38	-54.43	2.01	12.24	V
	5646	-42.34	-13	-29.34	-66.64	-52.62	2.12	12.40	V
	7526	-48.22	-13	-35.22	-75.87	-56.20	2.11	10.09	V
									V
									V
									V
									V

Highest	3819	-39.70	-13	-26.70	-60.5	-49.87	2.04	12.21	H
	5723	-46.79	-13	-33.79	-70.84	-57.20	2.10	12.51	H
	7638	-47.29	-13	-34.29	-74.6	-55.67	2.11	10.50	H
									H
									H
									H
									H
	3819	-41.31	-13	-28.31	-62.58	-51.48	2.04	12.21	V
	5723	-47.94	-13	-34.94	-72.55	-58.35	2.10	12.51	V
	7638	-47.69	-13	-34.69	-75.05	-56.07	2.11	10.50	V
									V
									V
									V
									V

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

WCDMA 1700

WCDMA 1700									
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	3427	-42.51	-13	-29.51	-61.61	-52.88	1.81	12.18	H
	5142	-48.31	-13	-35.31	-71.72	-58.14	2.30	12.13	H
	6857	-50.19	-13	-37.19	-76.42	-58.86	2.37	11.04	H
									H
									H
									H
									H
	3427	-37.14	-13	-24.14	-56.86	-47.51	1.81	12.18	V
	5142	-47.33	-13	-34.33	-71.31	-57.16	2.30	12.13	V
	6857	-48.84	-13	-35.84	-75.63	-57.51	2.37	11.04	V
									V
									V
									V
									V
Middle	3469	-43.52	-13	-30.52	-63.01	-53.98	1.84	12.31	H
	5198	-43.39	-13	-30.39	-66.85	-53.25	2.28	12.14	H
	6934	-48.84	-13	-35.84	-75.3	-57.41	2.40	10.97	H
									H
									H
									H
									H
	3469	-37.14	-13	-24.14	-57.15	-47.60	1.84	12.31	V
	5198	-42.05	-13	-29.05	-66.06	-51.91	2.28	12.14	V
	6934	-48.50	-13	-35.50	-75.58	-57.07	2.40	10.97	V
									V
									V
									V
									V

Highest	3504	-42.04	-13	-29.04	-61.84	-52.57	1.87	12.40	H
	5254	-35.93	-13	-22.93	-59.43	-45.82	2.26	12.15	H
	7011	-45.96	-13	-32.96	-72.69	-54.43	2.41	10.88	H
									H
									H
									H
									H
	3504	-37.23	-13	-24.23	-57.48	-47.76	1.87	12.40	V
	5254	-36.75	-13	-23.75	-60.8	-46.64	2.26	12.15	V
	7011	-46.76	-13	-33.76	-74.14	-55.23	2.41	10.88	V
									V
									V
									V
									V

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