FCC RADIO TEST REPORT

FCC ID	:	**IHDT56XC3**
Equipment	:	**Mobile Cellular Phone**
Brand Name	:	**Motorola**
Model Name	:	**XT1921-8**
Applicant	:	**Motorola Mobility LLC** **222 W,Merchandise Mart Plaza, Chicago IL 60654 USA**
Manufacturer	:	**Motorola Mobility LLC** **222 W,Merchandise Mart Plaza, Chicago IL 60654 USA**
Standard	:	**FCC 47 CFR Part 2, and 90(S)**

The product was received on Sep. 26, 2018 and testing was started from Oct. 12, 2018 and completed on Oct. 16, 2018. We, SPORTON INTERNATIONAL INC., 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.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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History of this test report

Report No.	Version	Description	Issued Date
FG892624B	01	Initial issue of report	Nov. 22, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	§2.1046 §90.635	Conducted Output Power and Effective Radiated Power	Reporting only	-
-	-	Peak-to-Average Ratio	Not Required	-
-	§2.1049 §90.209	Bandwidth Limitations	Not Required	-
-	§2.1051 §90.691	Emission masks – In-band emissions	Not Required	-
-	§2.1051 §90.691	Emission masks – Out of band emissions	Not Required	-
-	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	Not Required	-
4.2	§2.1053 §90.691	Field Strength of Spurious Radiation	Pass	Under limit 33.11 dB at 2472.000 MHz

Remark:

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

2. This is a variant report. All the test cases were performed on original report which can be referred to Sporton Report Number FG7D2018-03B.

Reviewed by: Wii Chang

Report Producer: Natasha Hsieh

1 General Description

1.1 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1921-8
FCC ID	IHDT56XC3
IMEI Code	**Conducted :** IMEI : 359543090002839 **Radiation :** IMEI : 359543090003555
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/GNSS/ FM WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	PVT
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Accessory List	
AC Adapter 1	Brand Name : Motorola
	Model Name : SC-61
	Manufacturer : Acbel
AC Adapter 2	Brand Name : Motorola
	Model Name : SC-61
	Manufacturer : Chenyang
Battery	Brand Name : Motorola
	Model Name : GK40
	Manufacturer : Amperex
USB Cable	Brand Name : Saibao
	Model Name : SWT-A083A

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	817.9 MHz ~ 823.1 MHz
Rx Frequency	862.9 MHz ~ 868.1 MHz
Maximum Output Power to Antenna	24.14 dBm
Antenna Type	PIFA Antenna and Coupling Type (LDS) Antenna
Antenna Gain	-0.136 dBi
Type of Modulation	CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO : QPSK/8PSK

1.3 Modification of EUT

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

1.4 Maximum Conducted Power, Frequency Tolerance, and Emission Designator

FCC Rule	Frequency Range (MHz)	System	Type of Modulation	Frequency Tolerance (ppm)	Emission Designator
Part 90(S)	817.9 ~ 823.1	CDMA2000 BC10 1xRTT	QPSK	-	-
Part 90(S)	817.9 ~ 823.1	CDMA2000 BC10 1xEV-DO	QPSK	-	-

1.5 Testing Site

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH05-HY, 03CH07-HY

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

1.6 Applied Standards

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

- FCC 47 CFR Part 2, 90
- ANSI / TIA-603-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 listed below are 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 (Z plane) were recorded in this report.

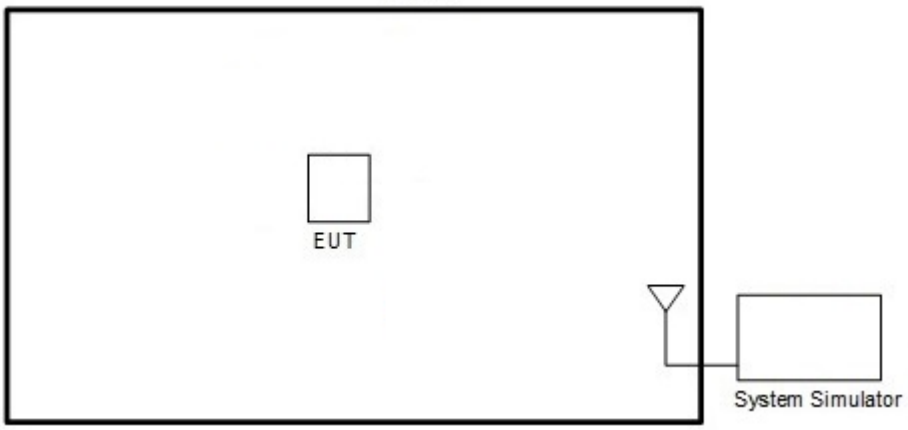
Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for CDMA BC10.

Test Modes	
Band	**Radiated TCs**
CDMA2000 BC10	■ 1xRTT Link ■ 1xEV-DO Link

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

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	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**
CDMA2000 BC10	Channel	-	-	684
	Frequency	-	-	823.1

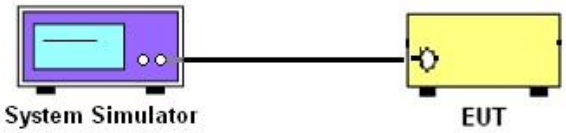
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power Measurement

3.2.1 Description of the Conducted Output Power Measurement

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.

3.2.2 Test Procedures

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

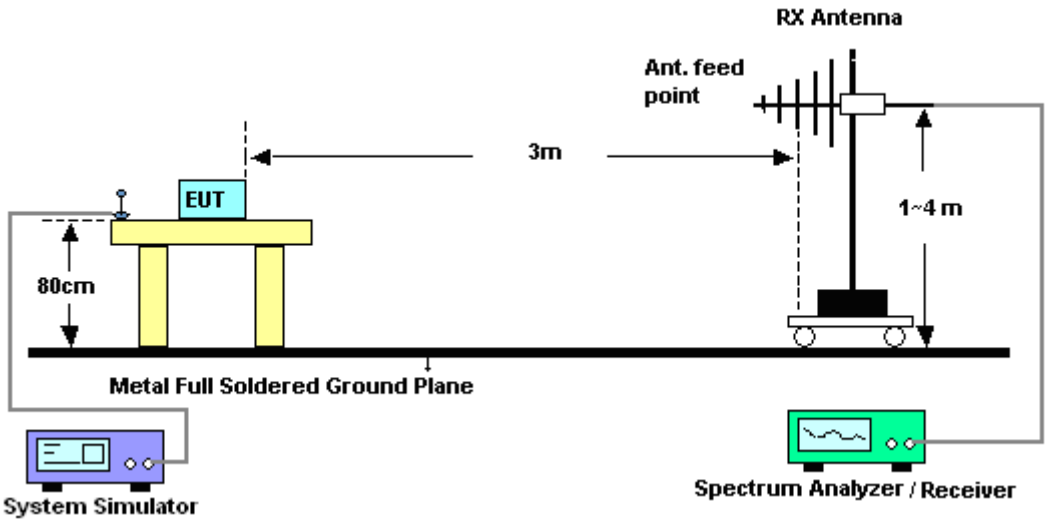
4 Radiated Test Items

4.1 Measuring Instruments

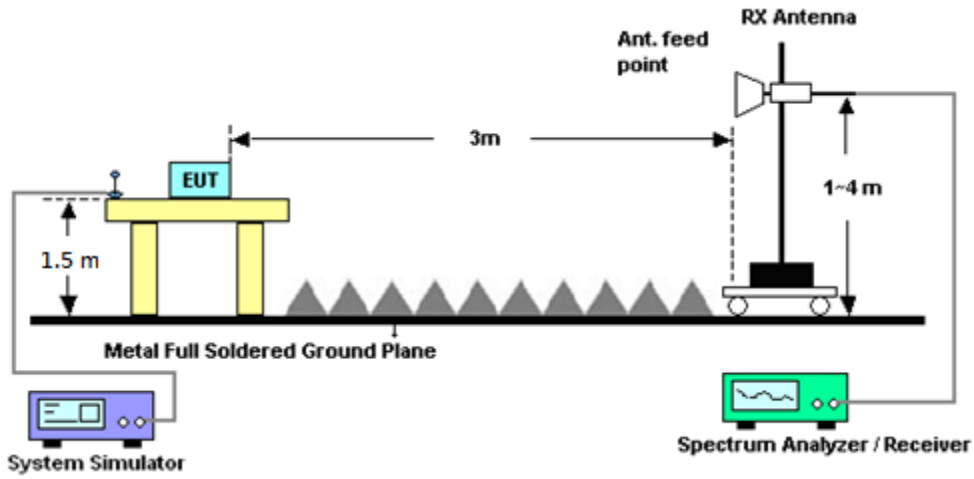
See list of measuring instruments of this test report.

4.1.1 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

4.2 Field Strength of Spurious Radiation Measurement

4.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

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+10log10(P[Watts]) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.2.2 Test Procedures

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.
1. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
2. The table was rotated 360 degrees to determine the position of the highest spurious emission.
3. 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.
4. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
5. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
6. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
7. Taking the record of output power at antenna port.
8. Repeat step 7 to step 8 for another polarization.
9. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
10. ERP (dBm) = EIRP - 2.15
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
12. 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
Base Station	Anritsu	MT8820C	6201341951	GSM / GPRS /WCDMA / LTE	Mar. 21, 2018	Oct. 12, 2018	Mar. 20, 2020	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890089	1V~20V 0.5A~5A	Jan. 12, 2018	Oct. 12, 2018	Jan. 11, 2019	Conducted (TH05-HY)
Coupler	Warison	1-18GHz 20dB 25WSMA Directional Coupler	#B	1G~18GHz	Dec. 04, 2017	Oct. 12, 2018	Dec. 03, 2018	Conducted (TH05-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Dec. 18, 2017	Oct. 13, 2018~ Oct. 16, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00211469	1GHz ~ 18GHz	Aug. 06, 2018	Oct. 13, 2018~ Oct. 16, 2018	Aug. 05, 2019	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00066583	1GHz ~ 18GHz	Aug. 06, 2018	Oct. 13, 2018~ Oct. 16, 2018	Aug. 05, 2019	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Oct. 13, 2018~ Oct. 16, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz ~ 18GHz	Apr. 25, 2018	Oct. 13, 2018~ Oct. 16, 2018	Apr. 24, 2019	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Oct. 13, 2018~ Oct. 16, 2018	Jul. 15, 2019	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	May 21, 2018	Oct. 13, 2018~ Oct. 16, 2018	May 20, 2019	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Apr. 17, 2018	Oct. 13, 2018~ Oct. 16, 2018	Apr. 16, 2019	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 16, 2018	Oct. 13, 2018~ Oct. 16, 2018	Jan. 15, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9KHz~30MHz	Jan. 02, 2018	Oct. 13, 2018~ Oct. 16, 2018	Jan. 01, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 27, 2018	Oct. 13, 2018~ Oct. 16, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 27, 2018	Oct. 13, 2018~ Oct. 16, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 27, 2018	Oct. 13, 2018~ Oct. 16, 2018	Feb. 26, 2019	Radiation (03CH07-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Oct. 13, 2018~ Oct. 16, 2018	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208 368	Control Ant Mast	N/A	Oct. 13, 2018~ Oct. 16, 2018	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Oct. 13, 2018~ Oct. 16, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 13, 2018~ Oct. 16, 2018	N/A	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 251	18GHz- 40GHz	Nov. 10, 2017	Oct. 13, 2018~ Oct. 16, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May. 22, 2018	Oct. 13, 2018~ Oct. 16, 2018	May. 21, 2019	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	805040046 56H	N/A	N/A	Oct. 13, 2018~ Oct. 16, 2018	N/A	Radiation (03CH07-HY)
Filter	Microwave	H1G013G1	SN477215	1.0G High Pass	Dec. 07, 2017	Oct. 13, 2018~ Oct. 16, 2018	Dec. 06, 2018	Radiation (03CH07-HY)
Filter	Microwave	H3G018G1	SN477220	3.0G High Pass	Nov. 21, 2017	Oct. 13, 2018~ Oct. 16, 2018	Nov. 20, 2018	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT800/960-0.2/40-8SSK	SN22	GSM850	Nov. 03, 2017	Oct. 13, 2018~ Oct. 16, 2018	Nov. 02, 2018	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT1747.5-0.4/40-8SS	SN2	DCS 1800	Aug. 22, 2018	Oct. 13, 2018~ Oct. 16, 2018	Aug. 21, 2019	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT2500/2570-10/40-10SSK	SN1 R	LTE Band7	Aug. 22, 2018	Oct. 13, 2018~ Oct. 16, 2018	Aug. 21, 2019	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT698/798-10/40 8SSK	SN1	AWS Band	Nov. 08, 2017	Oct. 13, 2018~ Oct. 16, 2018	Nov. 07, 2018	Radiation (03CH07-HY)

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.05**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.44**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.95**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Conducted Power (*Unit: dBm)			
Band	CDMA 2000 BC10		
Channel	476	580	684
Frequency	817.9	820.5	823.1
1xRTT RC1 SO55	24.04	24.09	24.07
1xRTT RC3 SO55	24.08	**24.14**	24.10
1xRTT RC3 SO32 (+ F-SCH)	24.13	24.11	24.08
1xRTT RC3 SO32 (+SCH)	24.11	24.09	24.08
1xEVDO RTAP 153.6Kbps	**24.08**	24.06	24.03
1xEVDO RETAP 4096Bits	24.07	24.11	24.10

Appendix B. Test Results of ERP and Radiated Test

ERP

<Reporting Only>

Channel	Mode	Conducted		ERP	
		Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)
Lowest	CDMA BC10	24.08	0.2559	21.79	0.1511
Middle	1xRTT	24.14	0.2594	21.85	0.1532
Highest	GT - LC = -0.136 dB	24.10	0.2570	21.81	0.1518
Lowest	CDMA BC10	24.07	0.2553	21.78	0.1508
Middle	1xEV-DO	24.11	0.2576	21.82	0.1522
Highest	GT - LC = -0.136 dB	24.10	0.2570	21.81	0.1518

Radiated Spurious Emission

CDMA 2000 (BC10 1xRTT)

CDMA2000 BC10									
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)
Highest	1648	-53.88	-13	-40.88	-66.23	-55.64	0.98	4.89	H
	2472	-50.18	-13	-37.18	-67.73	-52.06	1.28	5.32	H
	3296	-58.54	-13	-45.54	-78.09	-61.95	1.54	7.10	H
									H
									H
									H
									H
	1648	-57.32	-13	-44.32	-70.12	-59.08	0.98	4.89	V
	2472	-50.09	-13	-37.09	-67.94	-51.97	1.28	5.32	V
	3296	-58.32	-13	-45.32	-78.19	-61.73	1.54	7.10	V
									V
									V
									V
									V

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

CDMA 2000 (BC10 1xEVDO)

CDMA2000 BC10									
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)
Highest	1648	-55.13	-13	-42.13	-67.53	-56.89	0.98	4.89	H
	2472	-50.31	-13	-37.31	-67.87	-52.19	1.28	5.32	H
	3296	-58.18	-13	-45.18	-77.77	-61.59	1.54	7.10	H
									H
									H
									H
									H
	1648	-58.87	-13	-45.87	-71.66	-60.63	0.98	4.89	V
	2472	-46.11	-13	-33.11	-63.99	-47.99	1.28	5.32	V
	3296	-57.81	-13	-44.81	-77.75	-61.22	1.54	7.10	V
									V
									V
									V
									V

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