



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1944-6
FCC ID : IHDT56XF5
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Dec. 20, 2017 and testing was completed on Feb. 01, 2018. We, Sporton International (Kunshan) 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 test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.

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REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|--------------|---------|-------------------------|---------------|
| FG7D2007-01A | Rev. 01 | Initial issue of report | Feb. 23, 2018 |
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SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|----------------|-----------------------|--------------------------------------|--|--------|---|
| 3.4 | §2.1053 §22.917(a) | Field Strength of Spurious Radiation | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS | Under limit 18.66 dB at 2510.00 MHz |



1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---------------------------------|---|
| Equipment | Mobile Cellular Phone |
| Brand Name | Motorola |
| Model Name | XT1944-6 |
| FCC ID | IHDT56XF5 |
| EUT supports Radios application | GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR/ Bluetooth v 4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE/ |
| IMEI Code | Radiation: 354134090006213/354134090006221 |
| HW Version | DVT1B |
| SW Version | nora_row_n-userdebug 8.0.0 OPP27.60 222 intcfg,test-keys |
| 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 | GSM/GPRS/EDGE: 850: 824.2 MHz ~ 848.8 MHz 1900: 1850.2 MHz ~ 1909.8MHz WCDMA: Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz |
| Rx Frequency | GSM/GPRS/EDGE: 850: 869.2 MHz ~ 893.8 MHz 1900: 1930.2 MHz ~ 1989.8 MHz WCDMA: Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz |
| Antenna Type | LDS Antenna |
| Antenna Gain | Cellular Band: -3.05 dBi |
| Type of Modulation | GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM(Uplink is not supported) DC-HSDPA : 64QAM |

1.5 Specification of Accessory

| Specification of Accessory | | | | |
|----------------------------|------------------|---|------------|--------------------------------|
| AC Adapter 1(US) | Brand Name | Motorola (Acbel) | Model Name | SPN5945A C-P35 |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 1(EU) | Brand Name | Motorola (Acbel) | Model Name | SPN5944A C-P36 |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 1(UK) | Brand Name | Motorola (Acbel) | Model Name | SPN5940A C-P37 |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 1(IN) | Brand Name | Motorola (Acbel) | Model Name | SA18C19493 C-P49 |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 1(AU) | Brand Name | Motorola (Acbel) | Model Name | SPN5953A C-P48 |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 1(AR) | Brand Name | Motorola (Acbel) | Model Name | SPN5942A C-P47 |
| | Power Rating | I/P: 100-240 Vac, 500mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 2(US) | Brand Name | Motorola (Salom) | Model Name | SSW-2919UMTJ C-P35 SPN5945A |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 2(EU) | Brand Name | Motorola (Salom) | Model Name | SSW-2919EU C-P36 SPN5944A |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 2(UK) | Brand Name | Motorola (Salom) | Model Name | SSW-2919UK C-P37 SPN5940A |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 2(AU) | Brand Name | Motorola (Salom) | Model Name | SSW-2919AU C-P48 SPN5953A |
| | Power Rating | I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA | | |
| AC Adapter 2(AR) | Brand Name | Motorola (Salom) | Model Name | SSW-2919AR C-P47 SPN5955A |
| | Power Rating | I/P: 100-240 Vac, 500mA, O/P: 5.2Vdc,2000mA | | |
| Battery | Brand Name | Lenovo (SCUD) | Model Name | BL270 |
| | Power Rating | 3.85/4.4Vdc,4000mAh | Type | Li-ion |
| Earphone | Brand Name | Motorola (NEW Leaders) | Model Name | NLD-EM300V-01SF |
| | Signal Line Type | 1.2 meter, non-shielded cable, without ferrite core | | |
| USB Cable | Brand Name | Motorola (Saibao) | Model Name | SLQ-A081A |
| | Signal Line Type | 1.0 meter, shielded cable, without ferrite core | | |

1.6 Modification of EUT

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



1.7 Re-use of Measured Data

1.7.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT1944-6, FCC ID: IHDT56XF5) is electrically identical to the reference device (Model: XT1922-1, FCC ID: IHDT56XB6 / Model: XT1944-3, XT1944-4, FCC ID: IHDT56XF4) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

1.7.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., some difference of population/depoulation to enable support of different cellular bands, please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix C (Sporton RF Report No. FG7D0507-01A for the reference device Model: XT1922-1, FCC ID: IHDT56XB6) and (Sporton RF Report No. FG7D2007A for the reference device Model: XT1944-3, XT1944-4, FCC ID: IHDT56XF4):

1.7.3 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for radiated spurious emission, Conducted Band-edge and Conducted spurious emission, the test result were consistent with FCC ID: IHDT56XB5, IHDT56XB6 and IHDT56XF4.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

1.7.4 Reference detail Section:

| Equipment Class | Reference FCC ID | Folder Test | Report Title/Section |
|-----------------|------------------|--------------------------------|--|
| PCE (2G/3G) | IHDT56XB5 | Part22H.24E (FG7D0507A) | All conducted sections applicable for GSM 1900/WCDMA Band II |
| PCE (2G/3G) | IHDT56XB6 | Part22H.24E (FG7D0507-01A) | All conducted sections applicable for GSM 850 / WCDMA Band V |
| PCE (2G/3G) | IHDT56XF4 | Part22H.24E.27L (FG7D2007A) | Conducted power/ERP/EIRP for all bands and RSE for GSM 1900/WCDMA Band II applicable |



1.8 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

| | | |
|---------------------------|---|---------------------------------------|
| Test Site | Sporton International (Kunshan) Inc. | |
| Test Site Location | No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL: +86-512-57900158 FAX: +86-512-57900958 | |
| Test Site No. | Sporton Site No. | FCC Test Firm Registration No. |
| | 03CH03-KS | 630927 |

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

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/TIA-603-E
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03
- ♦ 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 v03 with maximum output power.

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

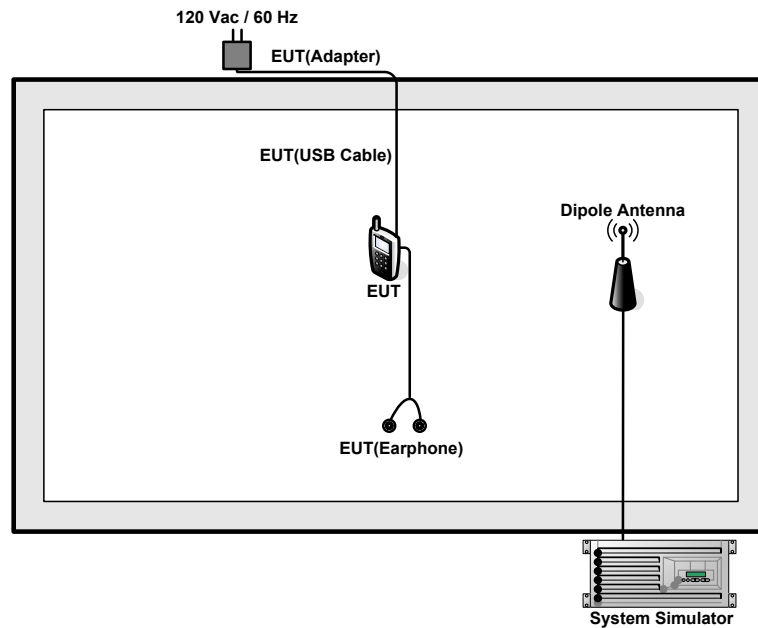
Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.

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

| Test Modes | |
|--------------|--|
| Band | Radiated TCs |
| GSM 850 | <ul style="list-style-type: none">■ GSM Link■ EDGE class 8 Link |
| WCDMA Band V | <ul style="list-style-type: none">■ 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. | Power Supply | GW | GPS-3030D | N/A | N/A | Unshielded, 1.8 m |

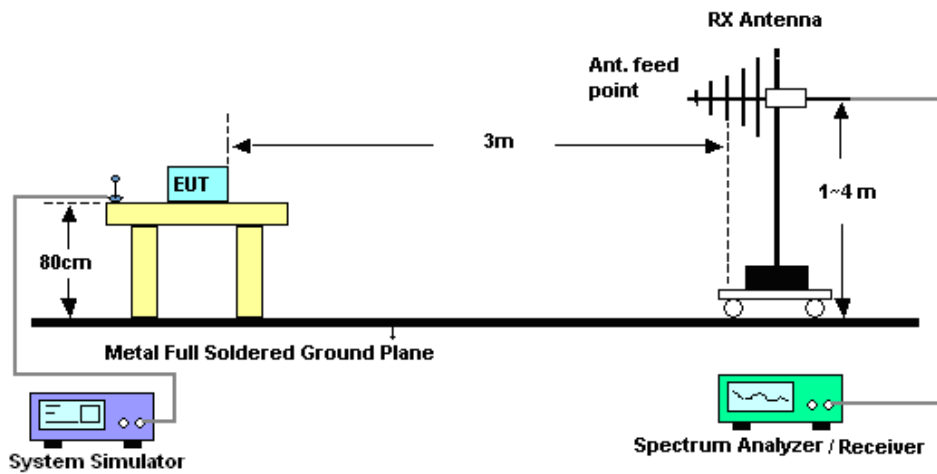
3 Radiated Test Items

3.1 Measuring Instruments

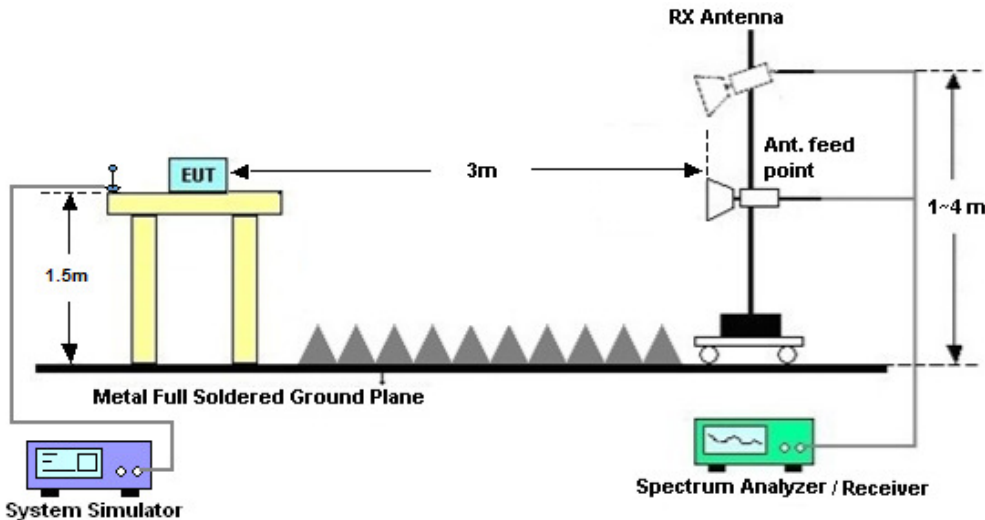
See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 For radiated test from 30MHz to 1GHz



3.2.2 For radiated test above 1GHz



3.3 Test Result of Radiated Test

Please refer to Appendix A.



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

1. The testing follows FCC KDB 971168 D01 v03 Section 5.8 and ANSI/TIA-603-E Section 2.2.12.
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)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13dBm.$



4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|-----------------------|--------------|--------------------------------|------------|----------------------|------------------|---------------|---------------|-----------------------|
| EXA Spectrum Analyzer | Keysight | N9010A | MY55150244 | 10Hz~44GHz | Apr. 18, 2017 | Feb. 01, 2018 | Apr. 17, 2018 | Radiation (03CH03-KS) |
| Bilog Antenna | TeseQ | CBL6112D | 35406 | 25MHz~2GHz | Apr. 22, 2017 | Feb. 01, 2018 | Apr. 21, 2018 | Radiation (03CH03-KS) |
| Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-1356 | 1GHz~18GHz | Apr. 22, 2017 | Feb. 01, 2018 | Apr. 21, 2018 | Radiation (03CH03-KS) |
| SHF-EHF Horn | Schwarzbeck | BBHA 9170 | BBHA170249 | 15GHz~40GHz | Feb. 15, 2017 | Feb. 01, 2018 | Feb. 14, 2018 | Radiation (03CH03-KS) |
| Amplifier | com-power | PA-103A | 161069 | 1MHz~1000MHz / 32 dB | Apr. 18, 2017 | Feb. 01, 2018 | Apr. 17, 2018 | Radiation (03CH03-KS) |
| high gain Amplifier | MITEQ | AMF-7D-00 101800-30-1 0P | 2025788 | 1GHz~18GHz | Apr. 18, 2017 | Feb. 01, 2018 | Apr. 17, 2018 | Radiation (03CH03-KS) |
| Amplifier | Agilent | 8449B | 3008A02370 | 1GHz~26.5GHz | Oct. 12, 2017 | Feb. 01, 2018 | Oct. 11, 2018 | Radiation (03CH03-KS) |
| AC Power Source | Chroma | 61601 | F104090004 | N/A | NCR | Feb. 01, 2018 | NCR | Radiation (03CH03-KS) |
| Turn Table | ChamPro | EM 1000-T | 060762-T | 0~360 degree | NCR | Feb. 01, 2018 | NCR | Radiation (03CH03-KS) |
| Antenna Mast | ChamPro | EM 1000-A | 060762-A | 1 m~4 m | NCR | Feb. 01, 2018 | NCR | Radiation (03CH03-KS) |

NCR: No Calibration Required



5 Uncertainty of Evaluation

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

| | |
|---|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 2.8dB |
|---|-------|

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

| | |
|---|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.3dB |
|---|-------|



Appendix A. Test Results of Radiated Test

Radiated Spurious Emission

| GSM850 (GSM) | | | | | | | | | |
|--------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| 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) |
| Middle | 1674 | -52.68 | -13 | -39.68 | -57.77 | -54.59 | 1.14 | 5.20 | H |
| | 2510 | -46.26 | -13 | -33.26 | -56.79 | -48.89 | 1.12 | 5.90 | H |
| | 3345 | -61.59 | -13 | -48.59 | -71.56 | -64.80 | 1.34 | 6.70 | H |
| | 1674 | -49.85 | -13 | -36.85 | -55.59 | -51.76 | 1.14 | 5.20 | V |
| | 2510 | -44.45 | -13 | -31.45 | -55.81 | -47.08 | 1.12 | 5.90 | V |
| | 3345 | -60.53 | -13 | -47.53 | -70.66 | -63.74 | 1.34 | 6.70 | V |

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

| EDGE850 (GSM) | | | | | | | | | |
|---------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| 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) |
| Middle | 1674 | -53.87 | -13 | -40.87 | -58.96 | -55.78 | 1.14 | 5.20 | H |
| | 2510 | -31.66 | -13 | -18.66 | -42.93 | -34.29 | 1.12 | 5.90 | H |
| | 3345 | -61.27 | -13 | -48.27 | -71.24 | -64.48 | 1.34 | 6.70 | H |
| | 1672 | -51.11 | -13 | -38.11 | -56.44 | -53.02 | 1.14 | 5.20 | V |
| | 2510 | -37.29 | -13 | -24.29 | -49.10 | -39.92 | 1.12 | 5.90 | V |
| | 3345 | -61.28 | -13 | -48.28 | -71.41 | -64.49 | 1.34 | 6.70 | V |

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

| 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) |
| Middle | 1672 | -62.22 | -13 | -49.22 | -67.31 | -64.13 | 1.14 | 5.20 | H |
| | 2510 | -56.94 | -13 | -43.94 | -68.05 | -59.57 | 1.12 | 5.90 | H |
| | 3345 | -59.33 | -13 | -46.33 | -69.30 | -62.54 | 1.34 | 6.70 | H |
| | 1672 | -60.65 | -13 | -47.65 | -65.98 | -62.56 | 1.14 | 5.20 | V |
| | 2510 | -57.12 | -13 | -44.12 | -66.78 | -59.75 | 1.12 | 5.90 | V |
| | 3345 | -60.77 | -13 | -47.77 | -70.90 | -63.98 | 1.34 | 6.70 | V |

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



Appendix C. Reference Report

Please refer to Sporton report number FG7D2007A and FG7D0507-01A which are issued separately.