






Radio Test Report

FCC ID: 2BF5R-CQ3

IC: 32409-CQ3

Report No.	:	TBR-C-202404-0112-41
Applicant	:	Photon Sail Technologies Pte. Ltd.
Equipment Under Test (EUT)		
EUT Name	:	4G Battery Camera
Model No.	:	CQ3
Series Model No.	:	CQ1S, CQ1X, CQ1H, CQ1F, CQ1C, CQ1D, CQ1A, CQ1P
Brand Name	:	----
Sample ID	:	HC-C-202404-0112-04-01&HC-C-202404-0112-04-02
Receipt Date	:	2024-04-15
Test Date	:	2024-04-16 to 2024-04-30
Issue Date	:	2024-04-30
Standards	:	47 CFR Part 2, 22(H), 24(E), 27 RSS-Gen Issue 5, RSS-130 Issue 2, RSS-132 Issue 4 RSS-133 Issue 6, RSS-139 Issue 4
Test Method	:	ANSI C63.26 2015
Conclusions	:	PASS
		In the configuration tested, the EUT complied with the standards specified above.
Test By	:	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">Mike Yan</div>  </div>
Reviewed By	:	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">Camille Li</div>  </div>
Approved By	:	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">IVAN SU</div>  </div>

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TBR-C-202404-0112-41	Rev.01	Initial issue of report	2024-04-28



1. General Information about EUT

1.1 Client Information

Applicant	:	Photon Sail Technologies Pte. Ltd.
Address	:	182 Cecil Street, #23-02 Frasers Tower, Singapore
Manufacturer	:	Photon Sail Technologies Pte. Ltd.
Address	:	182 Cecil Street, #23-02 Frasers Tower, Singapore

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	4G Battery Camera
HVIN	:	CQ3
Model	:	CQ1S, CQ1X, CQ1H, CQ1F, CQ1C, CQ1D, CQ1A, CQ1P
Model Different	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is that names.
Product Description	:	<p>Frequency Bands: LTE Band 2: TX: 1850MHz-1910MHz, RX: 1930MHz-1990MHz LTE Band 4: TX: 1710MHz-1755MHz, RX: 2110MHz-2155MHz LTE Band 5: TX: 824MHz-849MHz, RX: 869MHz-894MHz LTE Band 12: TX: 699MHz -716MHz, RX: 729MHz-746MHz LTE Band 13: TX: 777MHz -787MHz, RX: 746MHz-756MHz LTE Band 66: TX: 1710MHz -1780MHz, RX: 2110MHz-2200MHz</p>
	Antenna Gain:	Dipole Antenna: LTE Band 2: 1.66dBi LTE Band 4: 1.67dBi LTE Band 5: -0.12dBi LTE Band 12: -0.46dBi LTE Band 13: 0.42dBi LTE Band 66: 1.75dBi
	Modulation Type:	QPSK, 16QAM
	Bandwidth:	LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 5: 1.4MHz/3MHz/5MHz/10MHz LTE Band 12: 1.4MHz/3MHz/5MHz/10MHz LTE Band 13: 5MHz/10MHz LTE Band 66: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz
	Category:	Cat 1
Power Rating	:	USB Input: DC 5V1.5A or DC 3.6V 9200mAh by rechargeable Li-ion battery
Software Version	:	N/A
Hardware Version	:	N/A
Remark:		
<p>(1) The antenna gain provided by the applicant, the adapter and verified for the RF conduction test provided by TOBY test lab. (2) The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.</p>		



(3) Channel List

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 2	1.4	1850.7	1880.0	1909.3
	3	1851.5	1880.0	1908.5
	5	1852.5	1880.0	1907.5
	10	1855.0	1880.0	1905.0
	15	1857.5	1880.0	1902.5
	20	1860.0	1880.0	1900.0

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715.0	1732.5	1750.0
	15	1715.5	1732.5	1747.5
	20	1720.0	1732.5	1745.0

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829.0	836.5	844.0

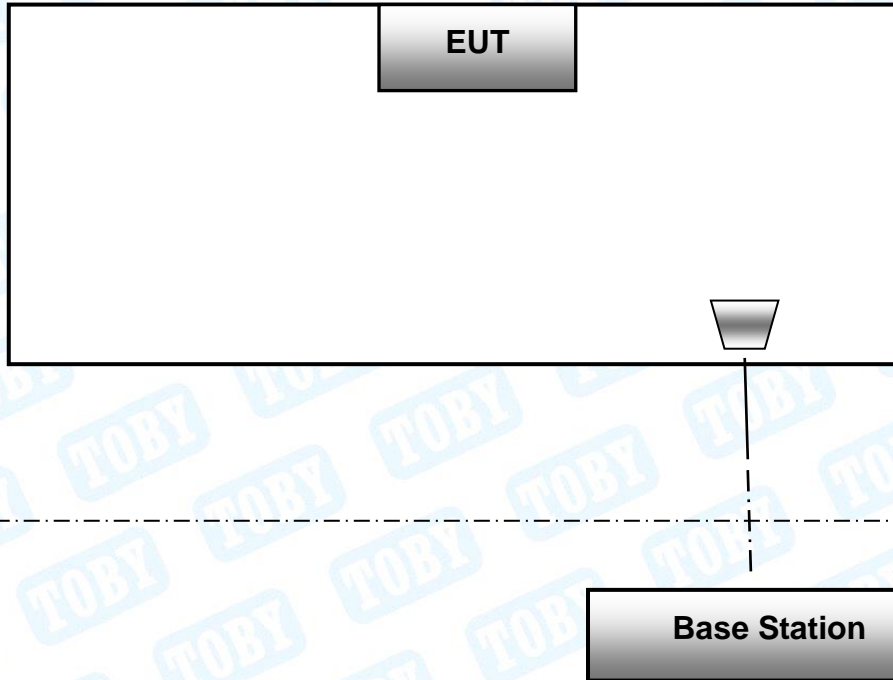
Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704.0	707.5	711.0

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 13	5	779.5	782.0	784.5
	10	---	782.0	---

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE Band 66	1.4	1710.7	1745.0	1779.3
	3	1711.5	1745.0	1778.5
	5	1712.5	1745.0	1777.5
	10	1715.0	1745.0	1775.0
	15	1717.5	1745.0	1772.5
	20	1720.0	1745.0	1770.0



1.3 Block Diagram Showing the Configuration of System Tested



The above block diagram of setup is the normal mode. And more detail please refer to the test setup of each test item of bellow.

1.4 Description of Support Units

The EUT has been tested as an independent unit.



1.5 Measurement Uncertainty

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
RF Power, conducted	/	±0.82 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.6 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A. CAB identifier: CN0056.



2. Test Summary

Test Item	Section	Band	Result
RF Output Power&E.R.P&E.I.R.P	RSS-130 Section 4.6	Band 12&13	PASS
	RSS-132 Section 5.4	Band 5	
	RSS-133 Section 6.4	Band 2	
	RSS-139 Section 6.5	Band 4&66	
Peak-to-Average Ratio	RSS-130 Section 4.6	Band 12&13	PASS
	RSS-132 Section 5.4	Band 5	
	RSS-133 Section 6.4	Band 2	
	RSS-139 Section 6.5	Band 4&66	
99% & -26 dB Occupied Bandwidth	RSS-Gen	Band 2&4&5&12&13&66	PASS
Spurious Emissions at Antenna Terminal	RSS-130 Section 4.7	Band 12&13	
	RSS-132 Section 5.5	Band 5	
	RSS-133 Section 6.5	Band 2	
	RSS-139 Section 6.6	Band 4&66	
Field Strength of Spurious Radiation	RSS-130 Section 4.7	Band 12&13	PASS
	RSS-132 Section 5.5	Band 5	
	RSS-133 Section 6.5	Band 2	
	RSS-139 Section 6.6	Band 4&66	
Out of band emission, Band Edge	RSS-130 Section 4.7	Band 12&13	PASS
	RSS-132 Section 5.5	Band 5	
	RSS-133 Section 6.5	Band 2	
	RSS-139 Section 6.6	Band 4&66	
Frequency stability vs. temperature& vs. voltage	RSS-130 Section 4.5	Band 12&13	PASS
	RSS-132 Section 5.2	Band 5	
	RSS-133 Section 6.3	Band 2	
	RSS-139 Section 6.4	Band 4&66	

Pass: The EUT complies with the essential requirements in the standard.



Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 22.913(a)(2) Part 24.232(c) Part 27.50 (b)(10) Part 27.50 (d)(4) Part 27.50 (h)(2)	PASS
Peak-to-Average Ratio	Part 24.232(d) Part 27.50(d)(5)	PASS
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(a) Part 24.238(b) Part 27.53(h) Part 27.53(m)	PASS
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 24.238(a) Part 27.53 (h) Part 27.53(m)	PASS
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917(a) Part 24.238(a) Part 27.53 (h) Part 27.53(m)	PASS
Out of band emission, Band Edge	Part 24.238(a) Part 22.917(a) Part 27.53 (h) Part 27.53(m)	PASS
Frequency stability vs. temperature	Part 27.54 Part 24.235 Part 22.355 Part 2.1055(a)(1)(b)	PASS
Frequency stability vs. voltage	Part 27.54 Part 24.235 Part 22.355 Part 2.1055(d)(2)	PASS

Pass: The EUT complies with the essential requirements in the standard.

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Radiation Emission	EZ-EMC	EZ	FA-03A2RE+
RF Test System	JS1120	Tonscend	V3.1.46



4. Test Equipment and Test Site

Test Site				
No.	Test Site	Manufacturer	Specification	Used
TB-EMCSR001	Shielding Chamber #1	YIHENG	7.5*4.0*3.0 (m)	X
TB-EMCSR002	Shielding Chamber #2	YIHENG	8.0*4.0*3.0 (m)	√
TB-EMCCA001	3m Anechoic Chamber #A	ETS	9.0*6.0*6.0 (m)	X
TB-EMCCB002	3m Anechoic Chamber #B	YIHENG	9.0*6.0*6.0 (m)	√

Radiation Emission Test(B Site)					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 30, 2023	Aug. 29, 2024
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 20, 2023	Jun. 19, 2024
EMI Test Receiver	Rohde & Schwarz	ESU-8	100472/008	Feb. 23, 2024	Feb. 22, 2025
Bilog Antenna	SCHWARZBECK	VULB 9168	1225	Nov. 13, 2023	Nov. 12, 2025
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2463	Jun. 26, 2022	Jun.25, 2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 27, 2024	Feb.26, 2026
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Feb. 27, 2024	Feb.26, 2026
Horn Antenna	ETS-LINDGREN	3117	00143207	Feb. 27, 2024	Feb.26, 2026
HF Amplifier	Tonscend	TAP9E6343	AP21C806117	Aug. 30, 2023	Aug. 29, 2024
HF Amplifier	Tonscend	TAP051845	AP21C806141	Aug. 30, 2023	Aug. 29, 2024
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Aug. 30, 2023	Aug. 29, 2024
Pre-amplifier	HP	8449B	3008A00849	Feb. 22, 2024	Feb.22, 2025
Highpass Filter	CD	HPM-6.4/18G	---	N/A	N/A
Highpass Filter	CD	HPM-2.8/18G	---	N/A	N/A
Highpass Filter	XINBO	XBLBQ-HTA67(8-25G)	22052702-1	N/A	N/A
Antenna Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Aug. 30, 2023	Aug. 29, 2024
RF Control Unit	Tonsced	JS0806-1	21C8060380	N/A	N/A
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	144382	Aug. 30, 2023	Aug. 29, 2024
Universal Radio Communication Tester	Rohde&Schwarz	CMW500	168796	Feb. 23, 2024	Feb.22, 2025
Temperature and Humidity Chamber	ZhengHang	ZH-QTH-1500	ZH2107264	Jun. 20, 2023	Jun. 19, 2024



5. Conducted RF Output Power

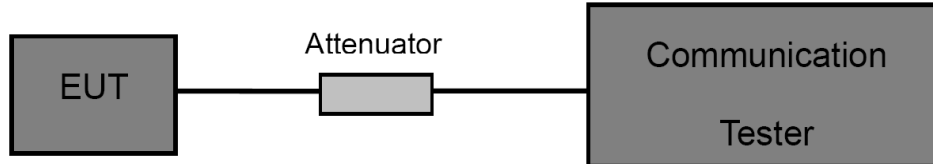
5.1 Test Standard

5.1.1 Test Standard

FCC part 2.1046, FCC part 22.913(a)(2), FCC part 24.232(c),
FCC Part 27.50(b)&(d), FCC Part 27.50 (h)

RSS-130 Section 4.6; RSS-132 Section 5.4; RSS-133 Section 6.4; RSS-139 Section 6.5

5.2 Test Setup



5.3 Test Procedure

- (1) The EUT is coupled to the Base Station with the suitable Attenuator, the path loss is calibrated to correct the reading.
- (2) A call is set up by the Base Station to the generic call set up procedure.
- (3) Set EUT at maximum power level through base station by power level command.
- (4) Then read record the power value from the Base Station in dBm.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

5.6 Test Data

Please refer to the Appendix for LTE.



6. Peak-Average Ratio

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC part 24.232(d); FCC Part 27.50(d); FCC Part 27.50 (h)

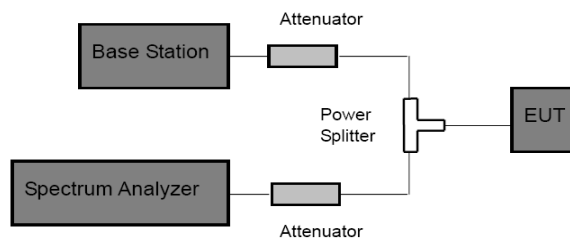
RSS-130 Section 4.6; RSS-132 Section 5.4; RSS-133 Section 6.4; RSS-139 Section 6.5

6.1.2 Test Limit

Peak-to-Average Ratio

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.2 Test Setup



6.3 Test Procedure

According with KDB 971168

- (1) The signal analyzer's CCDF measurement profile is enabled.
- (2) Frequency = carrier center frequency.
- (3) Measurement BW > Emission bandwidth of signal.
- (4) The signal analyzer was set to collect one million samples to generate the CCDF curve.
- (5) Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.
- (6) The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which of the transmitter is operating at maximum power.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

6.6 Test Data

Please refer to the Appendix for LTE.



7. Occupied Bandwidth

7.1 Test Standard and Limit

7.1.1 Test Standard

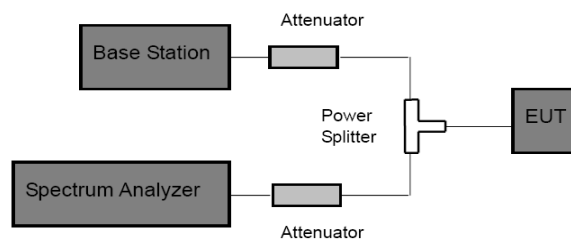
FCC Part 2: 2.1049, FCC Part 22.917(a), FCC part 24.238(b), FCC Part 27.53(h)
FCC Part 27.53(m)
RSS-Gen

7.1.2 Test Limit

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as 99% power and -26dB occupied bandwidths.

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
- (2) The resolution bandwidth of the Spectrum Analyzer is set to at least 1% of the occupied bandwidth. VBW= 3 times RBW.
- (3) The low, middle and the high channels are selected to perform tests respectively.
- (4) Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak; make a line whose value is 26dB lower than the peak; mark two points which the line intersected the waveform at; finally record the delta of the two points as the occupied bandwidth and the plot.
- (5) Set the Spectrum Analyzer Occupied bandwidth function to measure the 99% occupied bandwidth.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

7.6 Test Data

Please refer to the Appendix for LTE.



8. Out of Band Emission at Antenna Terminals

8.1 Test Standard and Limit

8.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057; FCC Part 22.917(a), FCC part 24.238(a);
FCC Part 27.53 (h), FCC Part 27.53(m)

RSS-130 Section 4.7; RSS-132 Section 5.5; RSS-133 Section 6.5; RSS-139 Section 6.6

8.1.2 Test Limit

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

- (i) $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment, and
- (ii) $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

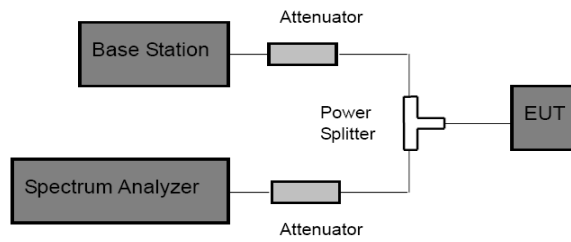
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB



8.2 Test Setup



8.3 Test Procedure

1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.

4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

8.6 Test Data

Please refer to the Appendix for LTE.



9. Band Edge Test

9.1 Test Standard and Limit

9.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057; FCC Part 22.917(a), FCC part 24.238(a)
FCC Part 27.53 (h), FCC Part 27.53(m)

RSS-130 Section 4.7; RSS-132 Section 5.5; RSS-133 Section 6.5; RSS-139 Section 6.6

9.1.2 Test Limit

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

- (i) $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment, and
- (ii) $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

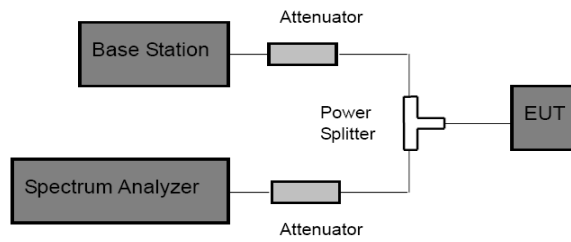
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB



9.2 Test Setup



9.3 Test Procedure

1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.

4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

9.6 Test Data

Please refer to the Appendix for LTE.



10. Radiated Output Power

10.1 Test Standard and Limit

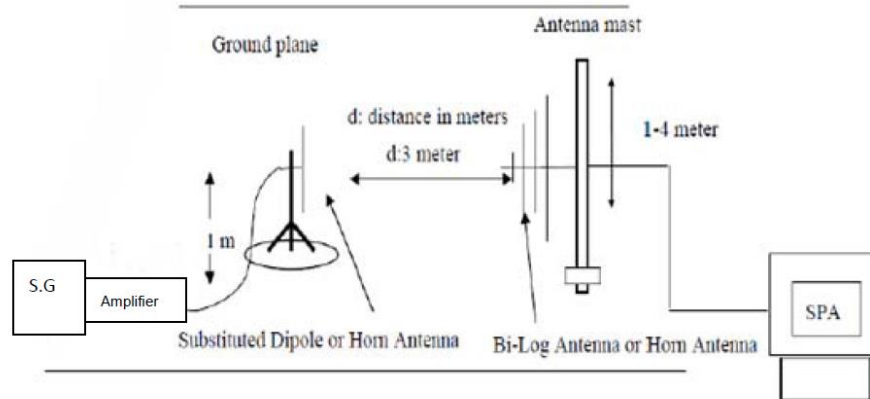
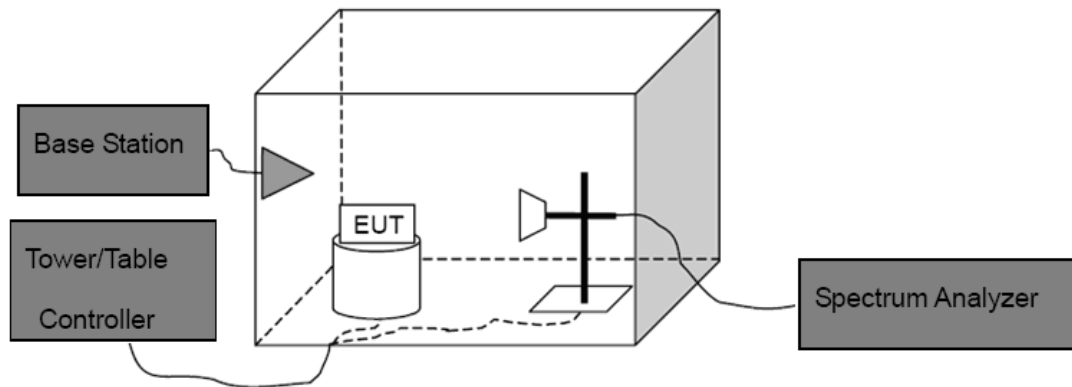
10.1.1 Test Standard

FCC Part 2.1046, FCC Part 22.913(a)(2), FCC part 24.232(c), FCC part 27.50(c),
FCC part 27.50(d)
RSS-130 Section 4.6; RSS-132 Section 5.4; RSS-133 Section 6.4; RSS-139 Section 6.5

10.1.2 Test Limit

E.I.R.P	E.I.R.P	E.R.P	E.R.P
LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 12
2W(33 dBm)	1W(30 dBm)	7W(38.45dBm)	7W(38.45dBm)
E.R.P	E.I.R.P		
LTE Band 13	LTE Band 66		
3W(34.77dBm)	1W(30 dBm)		

10.2 Test Setup



Substituted Method



10.3 Test Procedure

- (1) The EUT was placed on a non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW=3 MHz, VBW=3 MHz and peak detector settings.
- (2) During the measurement, the EUT was enforced in maximum power and linked with the Base Station. The highest was recorded from analyzer power level (LVT) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
- (3) Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to C63.26. The EUT was replaced by dipole antenna (for frequency below 1 GHz) or Horn antenna (for frequency above 1 GHz) at same location with same polarization of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a TX cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.

Note: In test, the S.G Connect the Pre-amplifier(Sonoma 310N Pre-amplifier for frequency below 1 GHz, HP 8449B Pre-amplifier for frequency above 1 GHz)

Then the EUT's EIRP and ERP was calculated with the correction factor:

$ERP = S.G.Level + Antenna Gain Cord.(dB) - Cable Loss(dB)$

$EIRP = S.G.Level + Antenna Gain Cord.(dBi) - Cable Loss(dB)$

10.4 Deviation From Test Standard

No deviation

10.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

10.6 Test Data

Please refer to the Attachment A.

Measurement Data (worst case)



11. Radiated Out Band of Emissions

11.1 Test Standard and Limit

11.1.1 Test Standard

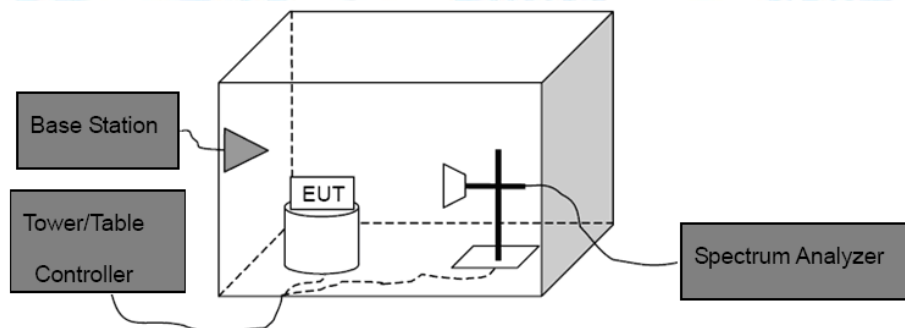
FCC Part 2: 2.1053, FCC Part 22.917(a), FCC part 24.238(a)
FCC Part 27.53 (h), FCC Part 27.53(m)

RSS-130 Section 4.7; RSS-132 Section 5.5; RSS-133 Section 6.5; RSS-139 Section 6.6

11.1.2 Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power(P) by a factor of at least $43+10\log(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

11.2 Test Setup



11.3 Test Procedure

- (1) The test system setup as show in the block diagram above.
- (2) The EUT was placed on an non-conductive rotating platform in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonious of fundamental frequency were measured at 3 m with a test antenna and a spectrum analyzer with RBW=1 MHz, VBW=1 MHz, peak detector settings.
- (3) During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
- (4) When found the maximum level of emissions from the EUT. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB= $10 \log(\text{TX power in Watts}/0.001)$ -the absolute level
Spurious attenuation limit in dB= $43+10 \log(\text{power out in Watts})$

11.4 Deviation From Test Standard

No deviation

11.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

11.6 Test Data

Please refer to the Attachment B.

Measurement Data (worst case)



12. Frequency Stability

12.1 Test Standard and Limit

12.1.1 Test Standard

FCC Part 2.1055(a)(1)(b); FCC Part 22.355; FCC Part 24.235, Part 27.54

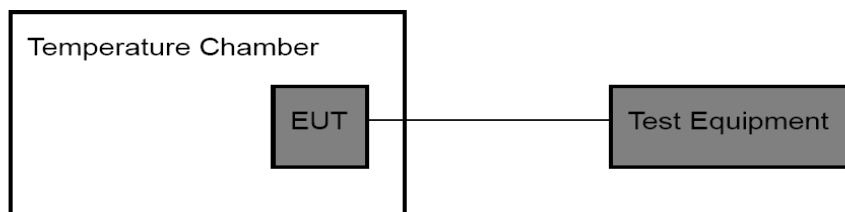
RSS-130 Section 4.5; RSS-132 Section 5.2; RSS-133 Section 6.2; RSS-139 Section 6.4

12.1.2 Test Limit

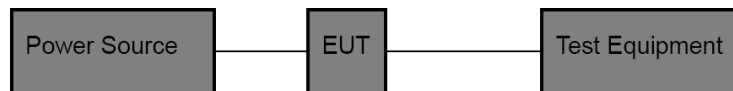
$\pm 2.5\text{ppm}$

12.2 Test Setup

For Temperature Test:



For Voltage Test:



12.3 Test Procedure

Test Procedures for Temperature Variation:

- (1) The EUT was set up in the thermal chamber and connected with the base station.
- (2) With power off, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
- (3) With power off, the temperature was raised in 10°C set up to 50°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
- (4) If the EUT cannot be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

Test Procedures for Voltage Variation:

- (1) The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected with the base station.
- (2) Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.
- (3) The variation in frequency was measured for the worst case.

12.4 Deviation From Test Standard

No deviation

12.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

12.6 Test Data

Please refer to the Appendix for LTE.



ATTACHMENT A--RADIATED OUTPUT POWER

Radiated Power (EIRP) for LTE Band 2 / 1.4M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	21.71	5.01	2.59	24.13
				V	20.95	5.01	2.59	23.37
	1	0	Middle	H	20.02	4.82	2.59	22.25
				V	16.09	4.82	2.59	18.32
	1	0	Highest	H	20.83	4.45	2.59	22.69
				V	12.80	4.45	2.59	14.66
16QAM	1	0	Lowest	H	20.59	5.01	2.59	23.01
				V	14.72	5.01	2.59	17.14
	1	0	Middle	H	19.26	4.82	2.59	21.49
				V	19.25	4.82	2.59	21.48
	1	0	Highest	H	19.08	4.45	2.59	20.94
				V	16.50	4.45	2.59	18.36
FCC/IC Limit (dBm)								33

Radiated Power (EIRP) for LTE Band 2 / 3M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	22.28	5.01	2.59	24.70
				V	19.97	5.01	2.59	22.39
	1	0	Middle	H	18.23	4.82	2.59	20.46
				V	16.53	4.82	2.59	18.76
	1	0	Highest	H	20.36	4.45	2.59	22.22
				V	11.34	4.45	2.59	13.20
16QAM	1	0	Lowest	H	21.74	5.01	2.59	24.16
				V	19.09	5.01	2.59	21.51
	1	0	Middle	H	23.42	4.82	2.59	25.65
				V	17.51	4.82	2.59	19.74
	1	0	Highest	H	18.11	4.45	2.59	19.97
				V	16.24	4.45	2.59	18.10
FCC/IC Limit (dBm)								33



Radiated Power (EIRP) for LTE Band 2 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	20.15	5.01	2.59	22.57
				V	20.57	5.01	2.59	22.99
	1	0	Middle	H	18.05	4.82	2.59	20.28
				V	17.91	4.82	2.59	20.14
	1	0	Highest	H	18.39	4.45	2.59	20.25
				V	14.37	4.45	2.59	16.23
16QAM	1	0	Lowest	H	19.32	5.01	2.59	21.74
				V	17.94	5.01	2.59	20.36
	1	0	Middle	H	22.24	4.82	2.59	24.47
				V	15.04	4.82	2.59	17.27
	1	0	Highest	H	18.14	4.45	2.59	20.00
				V	18.20	4.45	2.59	20.06
FCC/IC Limit (dBm)								33

Radiated Power (EIRP) for LTE Band 2 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.32	5.01	2.59	20.74
				V	17.53	5.01	2.59	19.95
	1	0	Middle	H	23.29	4.82	2.59	25.52
				V	18.58	4.82	2.59	20.81
	1	0	Highest	H	19.16	4.45	2.59	21.02
				V	13.18	4.45	2.59	15.04
16QAM	1	0	Lowest	H	21.02	5.01	2.59	23.44
				V	15.68	5.01	2.59	18.10
	1	0	Middle	H	21.48	4.82	2.59	23.71
				V	20.64	4.82	2.59	22.87
	1	0	Highest	H	21.35	4.45	2.59	23.21
				V	16.56	4.45	2.59	18.42
FCC/IC Limit (dBm)								33



Radiated Power (EIRP) for LTE Band 2 / 15M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.26	5.01	2.59	20.68
				V	18.41	5.01	2.59	20.83
	1	0	Middle	H	22.27	4.82	2.59	24.50
				V	18.68	4.82	2.59	20.91
	1	0	Highest	H	21.69	4.45	2.59	23.55
				V	16.55	4.45	2.59	18.41
16QAM	1	0	Lowest	H	23.30	5.01	2.59	25.72
				V	15.62	5.01	2.59	18.04
	1	0	Middle	H	19.21	4.82	2.59	21.44
				V	15.13	4.82	2.59	17.36
	1	0	Highest	H	22.31	4.45	2.59	24.17
				V	16.98	4.45	2.59	18.84
FCC/IC Limit (dBm)								33

Radiated Power (EIRP) for LTE Band 2 / 20M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	22.31	5.01	2.59	24.73
				V	20.98	5.01	2.59	23.40
	1	0	Middle	H	19.23	4.82	2.59	21.46
				V	20.56	4.82	2.59	22.79
	1	0	Highest	H	21.32	4.45	2.59	23.18
				V	13.02	4.45	2.59	14.88
16QAM	1	0	Lowest	H	23.66	5.01	2.59	26.08
				V	18.33	5.01	2.59	20.75
	1	0	Middle	H	24.34	4.82	2.59	26.57
				V	15.88	4.82	2.59	18.11
	1	0	Highest	H	21.33	4.45	2.59	23.19
				V	18.61	4.45	2.59	20.47
FCC/IC Limit (dBm)								33



Radiated Power (EIRP) for LTE Band 4 / 1.4M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	17.81	5.01	2.59	20.23
				V	21.03	5.01	2.59	23.45
	1	0	Middle	H	21.87	4.82	2.59	24.10
				V	18.24	4.82	2.59	20.47
	1	0	Highest	H	22.48	4.45	2.59	24.34
				V	13.72	4.45	2.59	15.58
16QAM	1	0	Lowest	H	19.90	5.01	2.59	22.32
				V	17.74	5.01	2.59	20.16
	1	0	Middle	H	24.42	4.82	2.59	26.65
				V	18.26	4.82	2.59	20.49
	1	0	Highest	H	21.85	4.45	2.59	23.71
				V	16.54	4.45	2.59	18.40
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 4 / 3M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	20.63	5.01	2.59	23.05
				V	16.88	5.01	2.59	19.30
	1	0	Middle	H	23.21	4.82	2.59	25.44
				V	18.54	4.82	2.59	20.77
	1	0	Highest	H	22.98	4.45	2.59	24.84
				V	16.79	4.45	2.59	18.65
16QAM	1	0	Lowest	H	19.20	5.01	2.59	21.62
				V	13.94	5.01	2.59	16.36
	1	0	Middle	H	20.98	4.82	2.59	23.21
				V	20.16	4.82	2.59	22.39
	1	0	Highest	H	22.13	4.45	2.59	23.99
				V	16.07	4.45	2.59	17.93
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



Radiated Power (EIRP) for LTE Band 4 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	19.20	5.01	2.59	21.62
				V	20.58	5.01	2.59	23.00
	1	0	Middle	H	21.71	4.82	2.59	23.94
				V	15.79	4.82	2.59	18.02
	1	0	Highest	H	18.67	4.45	2.59	20.53
				V	16.12	4.45	2.59	17.98
16QAM	1	0	Lowest	H	19.48	5.01	2.59	21.90
				V	17.46	5.01	2.59	19.88
	1	0	Middle	H	19.91	4.82	2.59	22.14
				V	17.10	4.82	2.59	19.33
	1	0	Highest	H	19.78	4.45	2.59	21.64
				V	18.95	4.45	2.59	20.81
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 4 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.54	5.01	2.59	20.96
				V	16.46	5.01	2.59	18.88
	1	0	Middle	H	19.72	4.82	2.59	21.95
				V	15.18	4.82	2.59	17.41
	1	0	Highest	H	21.35	4.45	2.59	23.21
				V	15.27	4.45	2.59	17.13
16QAM	1	0	Lowest	H	22.65	5.01	2.59	25.07
				V	14.22	5.01	2.59	16.64
	1	0	Middle	H	20.13	4.82	2.59	22.36
				V	17.77	4.82	2.59	20.00
	1	0	Highest	H	21.57	4.45	2.59	23.43
				V	20.74	4.45	2.59	22.60
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



Radiated Power (EIRP) for LTE Band 4 / 15M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.88	5.01	2.59	21.30
				V	18.11	5.01	2.59	20.53
	1	0	Middle	H	18.86	4.82	2.59	21.09
				V	17.99	4.82	2.59	20.22
	1	0	Highest	H	20.82	4.45	2.59	22.68
				V	16.93	4.45	2.59	18.79
16QAM	1	0	Lowest	H	22.13	5.01	2.59	24.55
				V	18.33	5.01	2.59	20.75
	1	0	Middle	H	23.90	4.82	2.59	26.13
				V	15.35	4.82	2.59	17.58
	1	0	Highest	H	19.45	4.45	2.59	21.31
				V	19.28	4.45	2.59	21.14
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 4 / 20M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.72	5.01	2.59	21.14
				V	20.81	5.01	2.59	23.23
	1	0	Middle	H	19.86	4.82	2.59	22.09
				V	18.78	4.82	2.59	21.01
	1	0	Highest	H	20.28	4.45	2.59	22.14
				V	16.71	4.45	2.59	18.57
16QAM	1	0	Lowest	H	21.94	5.01	2.59	24.36
				V	19.34	5.01	2.59	21.76
	1	0	Middle	H	20.22	4.82	2.59	22.45
				V	19.56	4.82	2.59	21.79
	1	0	Highest	H	22.01	4.45	2.59	23.87
				V	21.51	4.45	2.59	23.37
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



Radiated Power (ERP) for LTE Band 5 / 1.4M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	19.12	5.01	2.59	21.54
				V	16.78	5.01	2.59	19.20
	1	0	Middle	H	20.93	4.82	2.59	23.16
				V	19.96	4.82	2.59	22.19
	1	0	Highest	H	23.48	4.45	2.59	25.34
				V	11.56	4.45	2.59	13.42
16QAM	1	0	Lowest	H	20.22	5.01	2.59	22.64
				V	14.67	5.01	2.59	17.09
	1	0	Middle	H	23.90	4.82	2.59	26.13
				V	20.39	4.82	2.59	22.62
	1	0	Highest	H	17.49	4.45	2.59	19.35
				V	18.79	4.45	2.59	20.65
FCC/IC Limit (dBm)								38.45

Radiated Power (ERP) for LTE Band 5 / 3M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	22.00	5.01	2.59	24.42
				V	21.13	5.01	2.59	23.55
	1	0	Middle	H	23.61	4.82	2.59	25.84
				V	17.78	4.82	2.59	20.01
	1	0	Highest	H	20.32	4.45	2.59	22.18
				V	13.35	4.45	2.59	15.21
16QAM	1	0	Lowest	H	20.54	5.01	2.59	22.96
				V	18.47	5.01	2.59	20.89
	1	0	Middle	H	22.38	4.82	2.59	24.61
				V	17.67	4.82	2.59	19.90
	1	0	Highest	H	20.63	4.45	2.59	22.49
				V	17.56	4.45	2.59	19.42
FCC/IC Limit (dBm)								38.45



Radiated Power (ERP) for LTE Band 5 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	21.37	5.01	2.59	23.79
				V	16.36	5.01	2.59	18.78
	1	0	Middle	H	19.49	4.82	2.59	21.72
				V	16.91	4.82	2.59	19.14
	1	0	Highest	H	19.74	4.45	2.59	21.60
				V	14.98	4.45	2.59	16.84
16QAM	1	0	Lowest	H	20.55	5.01	2.59	22.97
				V	16.81	5.01	2.59	19.23
	1	0	Middle	H	23.33	4.82	2.59	25.56
				V	19.21	4.82	2.59	21.44
	1	0	Highest	H	19.18	4.45	2.59	21.04
				V	15.92	4.45	2.59	17.78
FCC/IC Limit (dBm)								38.45

Radiated Power (ERP) for LTE Band 5 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.02	5.01	2.59	20.44
				V	20.90	5.01	2.59	23.32
	1	0	Middle	H	19.34	4.82	2.59	21.57
				V	18.32	4.82	2.59	20.55
	1	0	Highest	H	20.86	4.45	2.59	22.72
				V	11.36	4.45	2.59	13.22
16QAM	1	0	Lowest	H	22.49	5.01	2.59	24.91
				V	14.74	5.01	2.59	17.16
	1	0	Middle	H	23.09	4.82	2.59	25.32
				V	20.30	4.82	2.59	22.53
	1	0	Highest	H	19.41	4.45	2.59	21.27
				V	19.23	4.45	2.59	21.09
FCC/IC Limit (dBm)								38.45



Radiated Power (ERP) for LTE Band 12 / 1.4M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	19.13	5.01	2.59	21.55
				V	18.65	5.01	2.59	21.07
	1	0	Middle	H	22.21	4.82	2.59	24.44
				V	20.69	4.82	2.59	22.92
	1	0	Highest	H	19.14	4.45	2.59	21.00
				V	14.76	4.45	2.59	16.62
16QAM	1	0	Lowest	H	22.92	5.01	2.59	25.34
				V	15.83	5.01	2.59	18.25
	1	0	Middle	H	19.79	4.82	2.59	22.02
				V	15.78	4.82	2.59	18.01
	1	0	Highest	H	21.20	4.45	2.59	23.06
				V	20.04	4.45	2.59	21.90
FCC/IC Limit (dBm)								34.77

Radiated Power (ERP) for LTE Band 12 / 3M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	17.97	5.01	2.59	20.39
				V	15.94	5.01	2.59	18.36
	1	0	Middle	H	23.65	4.82	2.59	25.88
				V	18.35	4.82	2.59	20.58
	1	0	Highest	H	18.86	4.45	2.59	20.72
				V	12.92	4.45	2.59	14.78
16QAM	1	0	Lowest	H	24.16	5.01	2.59	26.58
				V	15.87	5.01	2.59	18.29
	1	0	Middle	H	20.61	4.82	2.59	22.84
				V	15.43	4.82	2.59	17.66
	1	0	Highest	H	18.01	4.45	2.59	19.87
				V	20.48	4.45	2.59	22.34
FCC/IC Limit (dBm)								34.77



Radiated Power (ERP) for LTE Band 12 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	17.65	5.01	2.59	20.07
				V	17.23	5.01	2.59	19.65
	1	0	Middle	H	18.84	4.82	2.59	21.07
				V	20.24	4.82	2.59	22.47
	1	0	Highest	H	23.45	4.45	2.59	25.31
				V	14.10	4.45	2.59	15.96
16QAM	1	0	Lowest	H	22.51	5.01	2.59	24.93
				V	14.20	5.01	2.59	16.62
	1	0	Middle	H	21.65	4.82	2.59	23.88
				V	20.82	4.82	2.59	23.05
	1	0	Highest	H	20.15	4.45	2.59	22.01
				V	17.29	4.45	2.59	19.15
FCC/IC Limit (dBm)								34.77

Radiated Power (ERP) for LTE Band 12 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	22.26	5.01	2.59	24.68
				V	15.48	5.01	2.59	17.90
	1	0	Middle	H	20.97	4.82	2.59	23.20
				V	20.05	4.82	2.59	22.28
	1	0	Highest	H	23.67	4.45	2.59	25.53
				V	13.38	4.45	2.59	15.24
16QAM	1	0	Lowest	H	21.71	5.01	2.59	24.13
				V	15.28	5.01	2.59	17.70
	1	0	Middle	H	20.47	4.82	2.59	22.70
				V	16.54	4.82	2.59	18.77
	1	0	Highest	H	20.63	4.45	2.59	22.49
				V	21.43	4.45	2.59	23.29
FCC/IC Limit (dBm)								34.77



Radiated Power (ERP) for LTE Band 13 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	16.91	5.01	2.59	19.33
				V	21.22	5.01	2.59	23.64
	1	0	Middle	H	18.20	4.82	2.59	20.43
				V	18.75	4.82	2.59	20.98
	1	0	Highest	H	18.86	4.45	2.59	20.72
				V	17.09	4.45	2.59	18.95
16QAM	1	0	Lowest	H	21.28	5.01	2.59	23.70
				V	15.10	5.01	2.59	17.52
	1	0	Middle	H	22.20	4.82	2.59	24.43
				V	19.87	4.82	2.59	22.10
	1	0	Highest	H	18.16	4.45	2.59	20.02
				V	18.15	4.45	2.59	20.01
FCC/IC Limit (dBm)								34.77

Radiated Power (ERP) for LTE Band 13 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	17.59	5.01	2.59	20.01
				V	17.90	5.01	2.59	20.32
	1	0	Middle	H	22.35	4.82	2.59	24.58
				V	19.02	4.82	2.59	21.25
	1	0	Highest	H	23.06	4.45	2.59	24.92
				V	12.71	4.45	2.59	14.57
16QAM	1	0	Lowest	H	20.24	5.01	2.59	22.66
				V	18.20	5.01	2.59	20.62
	1	0	Middle	H	21.02	4.82	2.59	23.25
				V	20.18	4.82	2.59	22.41
	1	0	Highest	H	21.24	4.45	2.59	23.10
				V	18.24	4.45	2.59	20.10
FCC/IC Limit (dBm)								34.77



Radiated Power (EIRP) for LTE Band 66 / 1.4M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	20.79	5.01	2.59	23.21
				V	16.59	5.01	2.59	19.01
	1	0	Middle	H	20.17	4.82	2.59	22.40
				V	19.87	4.82	2.59	22.10
	1	0	Highest	H	22.90	4.45	2.59	24.76
				V	14.39	4.45	2.59	16.25
16QAM	1	0	Lowest	H	19.47	5.01	2.59	21.89
				V	18.36	5.01	2.59	20.78
	1	0	Middle	H	24.28	4.82	2.59	26.51
				V	20.55	4.82	2.59	22.78
	1	0	Highest	H	22.07	4.45	2.59	23.93
				V	20.48	4.45	2.59	22.34
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 66 / 3M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	19.82	5.01	2.59	22.24
				V	16.89	5.01	2.59	19.31
	1	0	Middle	H	22.73	4.82	2.59	24.96
				V	19.59	4.82	2.59	21.82
	1	0	Highest	H	20.01	4.45	2.59	21.87
				V	14.86	4.45	2.59	16.72
16QAM	1	0	Lowest	H	20.60	5.01	2.59	23.02
				V	17.15	5.01	2.59	19.57
	1	0	Middle	H	18.93	4.82	2.59	21.16
				V	18.98	4.82	2.59	21.21
	1	0	Highest	H	19.55	4.45	2.59	21.41
				V	17.96	4.45	2.59	19.82
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



Radiated Power (EIRP) for LTE Band 66 / 5M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	16.76	5.01	2.59	19.18
				V	20.98	5.01	2.59	23.40
	1	0	Middle	H	17.83	4.82	2.59	20.06
				V	16.47	4.82	2.59	18.70
	1	0	Highest	H	18.47	4.45	2.59	20.33
				V	16.01	4.45	2.59	17.87
16QAM	1	0	Lowest	H	22.12	5.01	2.59	24.54
				V	15.33	5.01	2.59	17.75
	1	0	Middle	H	24.36	4.82	2.59	26.59
				V	17.01	4.82	2.59	19.24
	1	0	Highest	H	20.17	4.45	2.59	22.03
				V	18.44	4.45	2.59	20.30
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 66 / 10M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	18.76	5.01	2.59	21.18
				V	15.70	5.01	2.59	18.12
	1	0	Middle	H	21.36	4.82	2.59	23.59
				V	19.02	4.82	2.59	21.25
	1	0	Highest	H	21.03	4.45	2.59	22.89
				V	11.39	4.45	2.59	13.25
16QAM	1	0	Lowest	H	20.92	5.01	2.59	23.34
				V	17.89	5.01	2.59	20.31
	1	0	Middle	H	18.69	4.82	2.59	20.92
				V	14.99	4.82	2.59	17.22
	1	0	Highest	H	17.06	4.45	2.59	18.92
				V	19.54	4.45	2.59	21.40
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



Radiated Power (EIRP) for LTE Band 66 / 15M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	17.68	5.01	2.59	20.10
				V	18.83	5.01	2.59	21.25
	1	0	Middle	H	19.48	4.82	2.59	21.71
				V	16.51	4.82	2.59	18.74
	1	0	Highest	H	21.78	4.45	2.59	23.64
				V	14.16	4.45	2.59	16.02
16QAM	1	0	Lowest	H	21.39	5.01	2.59	23.81
				V	17.08	5.01	2.59	19.50
	1	0	Middle	H	20.66	4.82	2.59	22.89
				V	15.19	4.82	2.59	17.42
	1	0	Highest	H	16.96	4.45	2.59	18.82
				V	17.75	4.45	2.59	19.61
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30

Radiated Power (EIRP) for LTE Band 66 / 20M								
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)
	Size	offset						
QPSK	1	0	Lowest	H	20.72	5.01	2.59	23.14
				V	20.71	5.01	2.59	23.13
	1	0	Middle	H	19.92	4.82	2.59	22.15
				V	18.25	4.82	2.59	20.48
	1	0	Highest	H	20.17	4.45	2.59	22.03
				V	13.40	4.45	2.59	15.26
16QAM	1	0	Lowest	H	21.63	5.01	2.59	24.05
				V	18.38	5.01	2.59	20.80
	1	0	Middle	H	19.58	4.82	2.59	21.81
				V	18.31	4.82	2.59	20.54
	1	0	Highest	H	19.61	4.45	2.59	21.47
				V	19.08	4.45	2.59	20.94
FCC Limit (dBm)								30
IC Limit (dBm/Ch BW)								30



ATTACHMENT B--RADIATED OUT BAND OF EMISSIONS

Measurement Data (worst case)

Internal antenna

Test mode: LTE BAND 2 20MHz (RB size 1 & RB offset 0) for QPSK							
Channel: Middle							
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
7726.96	Horizontal	-56.77	14.94	6.12	-35.71	-13.00	Pass
10868.16	H	-65.36	13.87	7.86	-43.63		
7098.12	Vertical	-39.82	8.02	3.97	-27.83	-13.00	Pass
10821.49	V	-44.94	10.47	5.05	-29.42		
Remark: 1, The testing has been conformed to $10 \times 1880\text{MHz} = 18800\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							
Test mode: LTE BAND 4 20MHz (RB size 1 & RB offset 0) for QPSK							
Channel: Middle							
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
7734.94	Horizontal	-53.82	14.94	6.12	-32.76	-13.00	Pass
10922.34	H	-65.91	13.87	7.86	-44.18		
6736.91	Vertical	-39.12	8.02	3.97	-27.13	-13.00	Pass
8474.28	V	-48.84	10.47	5.05	-33.32		
Remark: 1, The testing has been conformed to $10 \times 1732.5\text{MHz} = 17325\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							



Test mode:	LTE BAND 5 10MHz (RB size 1 & RB offset 0) for QPSK						
Channel:	Middle						
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
7294.51	Horizontal	-54.48	14.94	6.12	-33.42	-13.00	Pass
8551.68	H	-63.86	13.87	7.86	-42.13		
6737.00	Vertical	-36.65	8.02	3.97	-24.66	-13.00	Pass
10305.46	V	-49.70	10.47	5.05	-34.18		
Remark: 1, The testing has been conformed to $10 \times 836.5\text{MHz} = 8365\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							
Test mode:	LTE BAND 12 10MHz (RB size 1 & RB offset 0) for QPSK						
Channel:	Middle						
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
7142.04	Horizontal	-55.19	14.94	6.12	-34.13	-25.00	Pass
9513.63	H	-62.67	13.87	7.86	-40.94		
3597.87	Vertical	-35.13	8.02	3.97	-23.14	-25.00	Pass
4804.66	V	-47.51	10.47	5.05	-31.99		
Remark: 1, The testing has been conformed to $10 \times 707.5\text{MHz} = 7075\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							



Test mode: LTE BAND 13 10MHz (RB size 1 & RB offset 0) for QPSK							
Channel: Middle							
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
8450.58	Horizontal	-54.24	14.94	6.12	-33.18	-25.00	Pass
10869.64	H	-63.34	13.87	7.86	-41.61		
7042.36	Vertical	-35.48	8.02	3.97	-23.49	-25.00	Pass
10843.39	V	-45.18	10.47	5.05	-29.66		
Remark: 1, The testing has been conformed to $10 \times 782.0\text{MHz} = 7820\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							
Test mode: LTE BAND 66 20MHz (RB size 1 & RB offset 0) for QPSK							
Channel: Middle							
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
7915.68	Horizontal	-54.96	14.94	6.12	-33.90	-13.00	Pass
9490.23	H	-63.59	13.87	7.86	-41.86		
6131.17	Vertical	-36.28	8.02	3.97	-24.29	-13.00	Pass
11527.70	V	-49.42	10.47	5.05	-33.90		
Remark: 1, The testing has been conformed to $10 \times 1745.0\text{MHz} = 17450\text{MHz}$. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

-----End of Report-----

