
FCC Test Report

Report No.: AGC04834210304FE02

FCC ID : 2AAJGR3000-LG
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Industrial LoRaWAN Gateway
BRAND NAME : 
MODEL NAME : R3000-LG4LB, R3000-LG4LA
APPLICANT : Guangzhou Robustel LTD
DATE OF ISSUE : Apr. 23, 2021
STANDARD(S) : FCC Part 22H & 24E& 27L Rules
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 23, 2021	Valid	Initial Release

Note: The test results refer module certification report No. (**HR/2019/1001601**, brand name is **Quectel**, model name is **EC25-G**, Hardware version is **R1.0** and Software version is **EG25GGBR07A06M4G**.)

Except for radiated power and radiated spurious re-evaluation. The rest of the test data can be referred to Module FCC ID: XMR201903EG25G.

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VERIFICATION OF COMPLIANCE

Applicant	Guangzhou Robustel LTD
Address	ROOM F315, NO.95 DAGUAN MIDDLE ROAD, TIANHE DISTRICT, Guangzhou, China
Manufacturer	Guangzhou Robustel LTD
Address	ROOM F315, NO.95 DAGUAN MIDDLE ROAD, TIANHE DISTRICT, Guangzhou, China
Factory	Guangzhou Robustel LTD
Address	Room 501, Building 2, No. 63, Yong' an Avenue, Huangpu District, Guangzhou
Product Designation	Industrial LoRaWAN Gateway
Brand Name	
Test Model	R3000-LG4LB
Series Model	R3000-LG4LA
Difference Description	All the same except the model name.
Date of test	Mar. 19, 2021~Apr. 23, 2021
Deviation	No any deviation from the test method.
Condition of Test Sample	Normal

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-E-2016. The sample tested as described in this report is in compliance with the FCC Rules Part 22H, 24E and 27L. The test results of this report relate only to the tested sample identified in this report.

Prepared By



Donjon Huang
(Project Engineer)

Apr. 23, 2021

Reviewed By



Calvin Liu
(Reviewer)

Apr. 23, 2021

Approved By



Forrest Lei
Authorized Officer

Apr. 23, 2021

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1. GENERAL TECHNICAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Industrial LoRaWAN Gateway
Hardware Version:	1.0
Software Version:	3.1.6
Support Networks:	GPRS, EDGE, HSDPA, HSUPA
Frequency Bands:	<input checked="" type="checkbox"/> GPRS 850 <input checked="" type="checkbox"/> PCS1900 (U.S. Bands) <input type="checkbox"/> GSM 900 <input type="checkbox"/> DCS 1800 (Non-U.S. Bands) <input checked="" type="checkbox"/> UMTS FDD Band II <input checked="" type="checkbox"/> UMTS FDD Band IV <input checked="" type="checkbox"/> UMTS FDD Band V (U.S. Bands) <input type="checkbox"/> UMTS FDD Band I <input type="checkbox"/> UMTS FDD Band VIII (Non-U.S. Bands)
Type of Modulation:	GMSK,8PSK Modulation For GPRS/EDGE BPSK,QPSK Modulation For HSDPA/HSUPA
Frequency Range:	GPRS/EDGE 850: 824.2MHz-848.8 MHz GPRS/EDGE 1900: 1850.2MHz-1909.8 MHz WCDMA Band II: 1852.4MHz-1907.6 MHz WCDMA Band IV: 1712.4-1752.6 MHz WCDMA Band V: 826.4-846.6 MHz
Antenna Type:	Suction Cup Antenna&Glue Stick Antenna
Antenna gain: (Suction Cup Antenna)	GSM850:3.5dBi PCS1900: 3.5dBi WCDMA850:3.5dBi WCDMA1700:3.5dBi WCDMA1900:3.5dBi
Antenna gain: (Glue Stick Antenna)	GSM850:3.45dBi PCS1900: 3.45dBi WCDMA850:3.45dBi WCDMA1700:3.45dBi WCDMA1900:3.45dBi
Power Supply:	DC 12V by adapter
Dual Card:	GSM /WCDMA Card Slot
Extreme Vol. Limits:	DC10.2V to 13.8V (Normal: DC 12V)
Extreme Temp. Tolerance	-20 °C to +50 °C

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Suction Cup Antenna:

GSM/WCDMA SLOT 1:

	Maximum ERP/EIRP (dBm)
GPRS 850	30.74
PCS 1900	29.34
UMTS BAND V	23.36
UMTS BAND II	24.87
UMTS BAND IV	24.45

GSM/WCDMA SLOT 2:

	Maximum ERP/EIRP (dBm)
GPRS 850	29.57
PCS 1900	28.73
UMTS BAND V	22.83
UMTS BAND II	24.13
UMTS BAND IV	24.08

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Glue Stick Antenna

GSM/WCDMA SLOT 1:

	Maximum ERP/EIRP (dBm)
GPRS 850	30.42
PCS 1900	29.12
UMTS BAND V	23.13
UMTS BAND II	24.27
UMTS BAND IV	24.25

GSM/WCDMA SLOT 2:

	Maximum ERP/EIRP (dBm)
GPRS 850	29.75
PCS 1900	28.69
UMTS BAND V	22.86
UMTS BAND II	23.91
UMTS BAND IV	23.75

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1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AAJGR3000-LG**, filing to comply with the FCC Part 22H&24E&27L requirements.

1.3 TEST METHODOLOGY

The tests were performed according to following standards:

FCC Part 22 Public Mobile Services.

FCC Part 24 Personal Communications Services.

FCC Part 27 Miscellaneous Wireless Communications Services.

FCC Part 2 Frequency allocations and radio treaty matters, general rules and regulations.

TIA/EIA 603 E: March 2016 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

ANSI-C63.26:2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

KDB971168 D01 v03r01 Measurement Guidance For Certification Of Licensed Digital Transmitters

1.4 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

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FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842

1.6 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS
Temperature range	15~35°C	-20°C~50°C
Humidity range	20 % to 75 %.	20 % to 75 %.
Pressure range	86-106kPa	86-106kPa
Power supply	DC 12.0V	LV:10.2VHV:13.8
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

1.7 MEASUREMENT UNCERTAINTY

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)
Radio Frequency	± 6.5 x 10-8	(1)
RF Power, Conducted	± 0.9 dB	(1)

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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1.8 SPECIAL ACCESSORIES

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.9 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System



Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Remark
1	Industrial LoRaWAN Gateway	R3000-LG4LB	2AAJGR3000-LG	EUT
2	Adapter	GQ24-120150-AX	Input:100-240V AC 50/60Hz, 1.0A Output: DC 12V 1.5A	AE
3	Suction Cup Antenna	--	--	AE
4	Glue Stick Antenna	--	--	AE

Note: All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.

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3.SUMMARY OF TEST RESULTS

3.1 TEST CONDITION : RADIATED TEST

Item	Test Description	FCC Rules	Result
1	Effective Radiated Power	§22.913(a)(5)	Pass
2	Equivalent Isotropic Radiated Power	§24.232(c), §27.50(d)(4)	Pass
3	Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a), §27.53(h)	Pass

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4. DESCRIPTION OF TEST MODES

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GPRS/ EDGE850	TX (824 MHz ~ 849 MHz)	Channel 128	Channel 190	Channel 251
		824.2 MHz	836.6 MHz	848.8 MHz
WCDMA Band V	TX (824 MHz ~ 849 MHz)	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GPRS/EDGE1900	TX (1850 MHz-1910 MHz)	Channel 512	Channel 661	Channel 810
		1850.2 MHz	1880.0 MHz	1909.8 MHz
WCDMA Band II	TX (1850 MHz-1910 MHz)	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
WCDMA Band IV	TX (1710 MHz-1755 MHz)	Channel 1312	Channel 1412	Channel 1513
		1712.4 MHz	1732.4 MHz	1752.6 MHz

Pre-scan all bandwidth and RB, find worse case mode are chosen to the report, the worse mode applicability and tested channel detail as below:

Band	Radiated	Conducted
GPRS/ EDGE 850/1900	GPRS (GMSK, 1Tx-slot) Link EDGE (8PSK, 1Tx-slot) Link	GPRS (GMSK, 1Tx-slot) Link EDGE (8PSK, 1Tx-slot) Link
WCDMA Band II/IV/V	RMC 12.2kbps Link	RMC 12.2kbps Link

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According to 3GPP 25.101 sub-clause 6.2.2 , the maximum output power is allowed to be reduced by following the table.

Table 6.1aA: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX(CM-1,0)

Note: CM=1 for $\beta_{d}/\beta_{c}=12/15, \beta_{hs}/\beta_{c}=24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

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4.2 EMISSION DESIGNATOR

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

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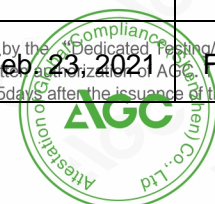
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5. LIST OF TEST EQUIPMENT

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03, 2020	Jul. 02, 2021
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Dec.07, 2020	Dec.06, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	768	Oct. 09, 2019	Oct. 08, 2021
preamplifier	ChengYi	EMC184045S E	980508	Sep. 21, 2020	Sep. 20, 2021
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.10, 2020	Jun.09, 2021
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.20, 2019	Sep.19, 2021
SIGNAL ANALYZER	Agilent	N9020A	MY52090123	Sep. 03, 2020	Sep. 02, 2021
USB Wideband Power Sensor	Agilent	U2021XA	MY54110007	Jun. 08, 2020	Jun. 07, 2021
Universal Radio Communication Tester	R&S	CMU200	120237	Jul. 03, 2020	Jul. 02, 2022
Universal Radio Communication Tester	Agilent	8960	GB46200384	Aug. 20, 2020	Aug. 21, 2021
Power Splitter	Agilent	11636A	34	Jun.10, 2020	Jun.09, 2021
Attenuator	JFW	50FHC-006-5 0	N/A	Jun.10, 2020	Jun.09, 2021
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170		Sep. 21, 2019	Sep. 20, 2021
Horn Ant (18G-40GHz)	ETS	QWH_SL_18 _40_K_SG		Sep. 21, 2019	Sep. 20, 2021
Power Splitter	Agilent	11636A	/	Sep.16, 2020	Sep.15, 2021
CMU200	R&S	120237	/	July 03, 2020	July 02, 2022
Artificial Mains Network ENV216	R&S	101242	/	July 03, 2020	July 02, 2022
Filter Bank Notch (1880-915MHz)	MICRO-TRONICS	010		Feb.23, 2021	Feb.22, 2022

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Filter Bank Notch 2 (1710-1785MHz)	MICRO-TRONICS	009	/	Feb. 23, 2021	Feb. 22, 2022
Filter Bank Notch 3 (1920-1980MHz)	MICRO-TRONICS	008	/	Feb. 23, 2021	Feb. 22, 2022

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6. RADIATED OUTPUT POWER

6.1 MEASUREMENT OVERVIEW

The radiation test is carried out in a semi-anechoic chamber.

According to the test, put the device under test on a non-conductive platform 3 meters away from the receiving antenna (ANSI/TIA-603-E-2016 Article 2.2.17).

The following rules are for the maximum radiated power limit requirements of the product:

Mode	Nominal Peak Power
GSM 850	< 7 Watts max. ERP (38.45dBm)
PCS 1900	< 2 Watts max. EIRP (33dBm)
WCDMA Band II	< 2 Watts max. EIRP (33dBm)
WCDMA Band IV	< 1 Watts max. EIRP (30dBm)
WCDMA Band V	< 7 Watts max. ERP (38.45dBm)

6.2 MEASUREMENT METHOD

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW \geq 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize.

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Radiation Construction Method:

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula:

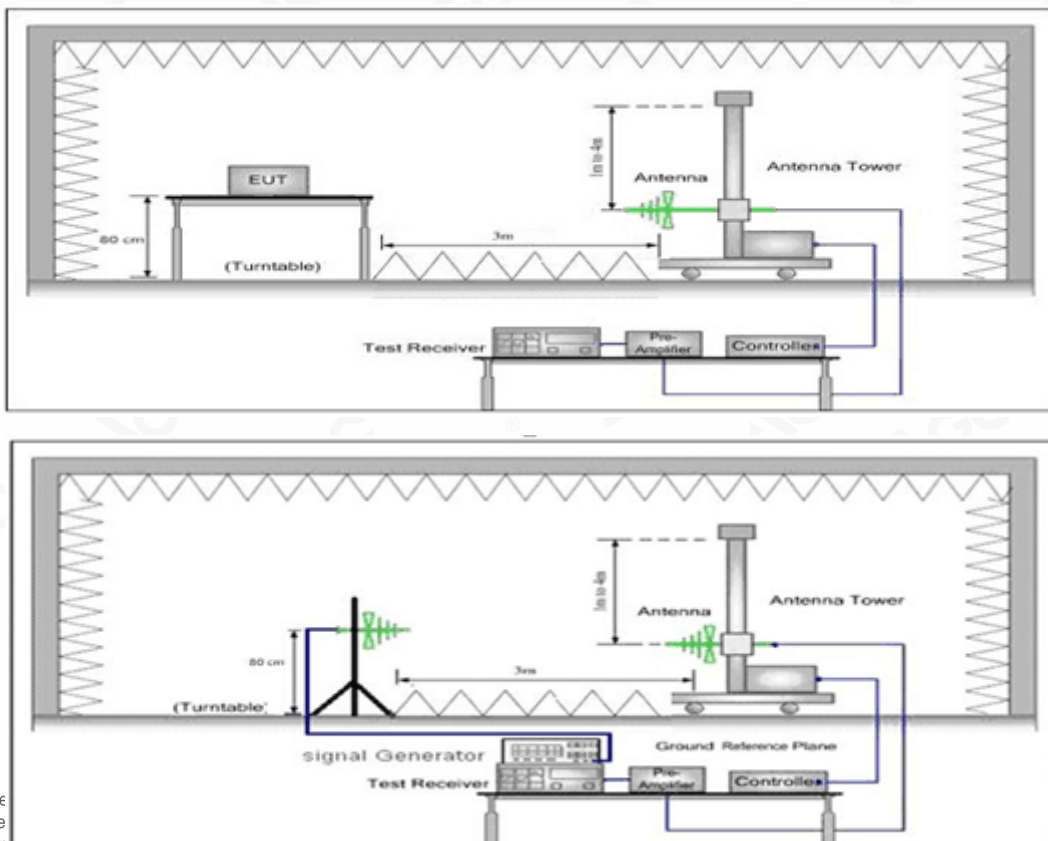
$$Pd(dBm) = Pg(dBm) - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

Where: Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes (X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

6.3 MEASUREMENT SETUP

Radiated Below 1 GHz

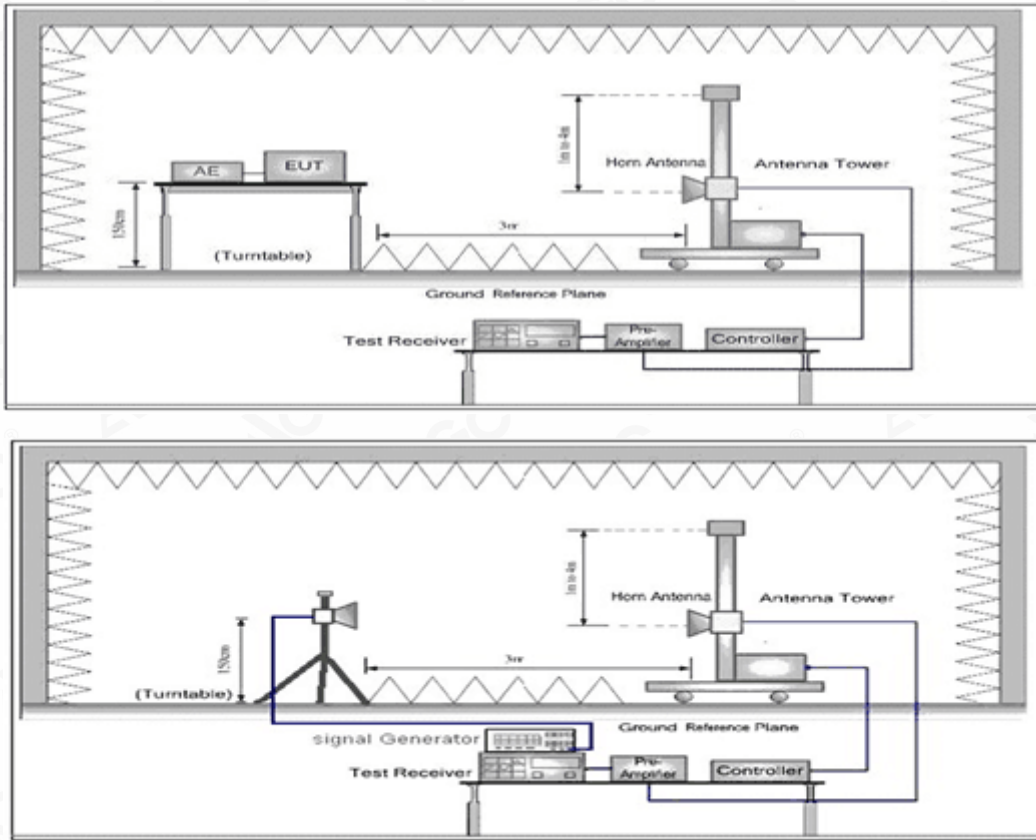


Any report having not been stamped is deemed to be presented in the report as a preliminary report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.

Inspection of test results test report.



Radiated Above 1 GHz



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6.4 MEASUREMENT RESULT

Suction Cup Antenna:

Mode	Ch./ Freq.		Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit W	ERP	
	channel	Freq. (MHz)						W	dBm
GPRS850	128	824.2	26.05	5.90	1.21	H	< 7.00	1.19	30.74
	190	836.6	25.85	5.90	1.22	H		1.13	30.53
	251	848.8	26.01	5.90	1.25	H		1.16	30.66
EDGE	128	824.2	20.56	5.90	1.21	H		0.33	25.25
	190	836.6	20.73	5.90	1.22	H		0.35	25.41
	251	848.8	20.73	5.90	1.25	H		0.35	25.38
WCDMA850	4132	826.4	18.67	5.90	1.21	H		1.19	23.36
	4183	836.6	18.63	5.90	1.25	H		1.13	23.28
	4233	846.6	18.53	5.90	1.24	H		1.16	23.19
HSPA	4132	826.4	17.73	5.90	1.21	H		0.33	22.42
	4183	836.6	17.58	5.90	1.25	H		0.35	22.23
	4233	846.6	17.86	5.90	1.24	H		0.35	22.52

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Mode	Ch./ Freq.		Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP		
	channel	Freq. (MHz)					W	W	dBm	
PCS1900	512	1850.2	22.85	8.6	2.11	H	< 2.00	0.86	29.34	
	661	1880.0	22.83	8.6	2.15	H		0.85	29.28	
	810	1909.8	22.74	8.6	2.15	H		0.83	29.19	
EDGE	512	1850.2	18.54	8.6	2.11	H		0.32	25.03	
	661	1880.0	18.66	8.6	2.15	H		0.32	25.11	
	810	1909.8	18.76	8.6	2.15	H		0.33	25.21	
WCDMA 1900	9262	1852.4	18.26	8.6	2.11	H		0.30	24.75	
	9400	1880.0	18.15	8.6	2.15	H		0.29	24.60	
	9538	1907.6	18.42	8.6	2.15	H		0.31	24.87	
HSPA	9262	1852.4	16.62	8.6	2.11	H		0.20	23.11	
	9400	1880.0	16.83	8.6	2.15	H		0.21	23.28	
	9538	1907.6	16.80	8.6	2.15	H		0.21	23.25	
WCDMA 1700	1312	1712.4	18.19	8.3	2.05	H		< 1.00	0.28	24.44
	1412	1732.4	18.20	8.3	2.05	H			0.28	24.45
	1513	1752.6	18.16	8.3	2.06	H			0.28	24.40
HSPA	1312	1712.4	16.82	8.3	2.05	H	0.20		23.07	
	1412	1732.4	16.87	8.3	2.05	H	0.21		23.12	
	1513	1752.6	17.01	8.3	2.06	H	0.21		23.25	

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Glue Stick Antenna:

Mode	Ch./ Freq.		Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq. (MHz)					W	W	dBm
GPRS850	128	824.2	25.59	5.90	1.21	H	< 7.00	1.07	30.28
	190	836.6	25.74	5.90	1.22	H		1.10	30.42
	251	848.8	25.59	5.90	1.25	H		1.06	30.24
EDGE	128	824.2	20.44	5.90	1.21	H		0.33	25.13
	190	836.6	20.40	5.90	1.22	H		0.32	25.08
	251	848.8	20.46	5.90	1.25	H		0.32	25.11
WCDMA850	4132	826.4	18.39	5.90	1.21	H		0.20	23.08
	4183	836.6	18.48	5.90	1.25	H		0.21	23.13
	4233	846.6	18.44	5.90	1.24	H		0.20	23.10
HSPA	4132	826.4	17.37	5.90	1.21	H		0.16	22.06
	4183	836.6	17.46	5.90	1.25	H		0.16	22.11
	4233	846.6	17.42	5.90	1.24	H		0.16	22.08

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Mode	Ch./ Freq.		Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit W	EIRP	
	channel	Freq. (MHz)						W	dBm
PCS1900	512	1850.2	22.54	8.6	2.11	H	< 2.00	0.80	29.03
	661	1880.0	22.67	8.6	2.15	H		0.82	29.12
	810	1909.8	22.60	8.6	2.15	H		0.80	29.05
EDGE	512	1850.2	18.40	8.6	2.11	H		0.31	24.89
	661	1880.0	18.60	8.6	2.15	H		0.32	25.05
	810	1909.8	18.56	8.6	2.15	H		0.32	25.01
WCDMA 1900	9262	1852.4	17.65	8.6	2.11	H		0.26	24.14
	9400	1880.0	17.78	8.6	2.15	H		0.26	24.23
	9538	1907.6	17.82	8.6	2.15	H		0.27	24.27
HSPA	9262	1852.4	16.56	8.6	2.11	H		0.20	23.05
	9400	1880.0	16.65	8.6	2.15	H		0.20	23.10
	9538	1907.6	16.63	8.6	2.15	H		0.20	23.08
WCDMA 1700	1312	1712.4	17.87	8.3	2.05	H	< 1.00	0.26	24.12
	1412	1732.4	17.86	8.3	2.05	H		0.26	24.11
	1513	1752.6	18.01	8.3	2.06	H		0.27	24.25
HSPA	1312	1712.4	16.75	8.3	2.05	H		0.20	23.00
	1412	1732.4	16.80	8.3	2.05	H		0.20	23.05
	1513	1752.6	16.79	8.3	2.06	H		0.20	23.03

Note:1. $EIRP/ERP = \text{Substitute LEVEL (dBm)} + \text{Ant. Gain} - \text{C.L (Cable Loss)}$

2. All polarizations and modes have been tested, only the worst mode is recorded in the report

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7. RADIATED SPURIOUS EMISSION

7.1. PROVISIONS APPLICABLE

(A) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least $43+10\log(P)$ dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm.

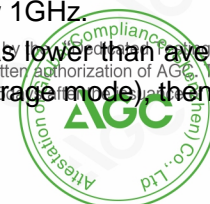
At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

(B) For specific criteria, please refer to the description in section 9.2 of the report for corresponding evaluation.

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.

9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.



stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

11. For spurious emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated. The spurious emissions is calculated by the following formula;

$$\text{Result(dBm)} = \text{Pg(dBm)} + \text{Factor(dB)}$$

$$\text{Factor(dB)} = \text{Ant Gain(dB)} - \text{Cable Loss(dB)} + \text{Power Splitter(dB)} \quad (\text{Above } 1\text{GHz})$$

$$\text{Factor(dB)} = \text{Ant Gain(dB)} - \text{Cable Loss(dB)} \quad (\text{Below } 1\text{GHz})$$

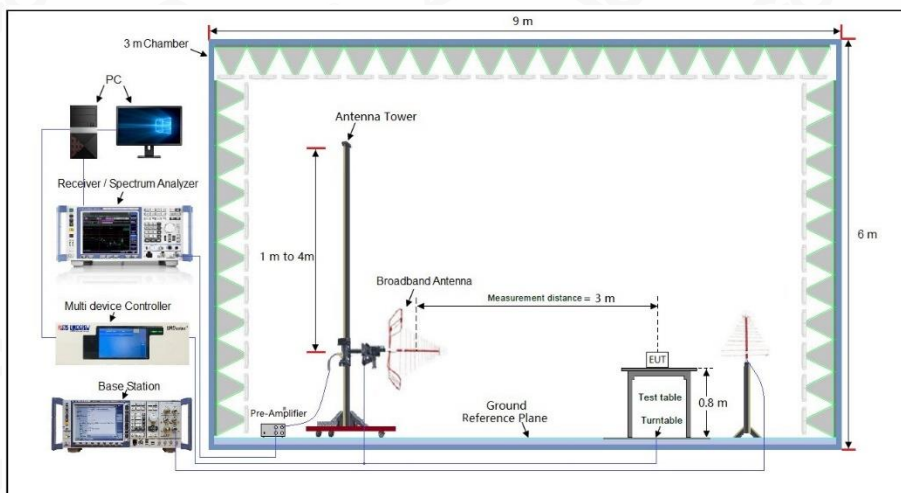
Where: Pgis the generator output power into the substitution antenna.

If the fundalmatal frequency is below 1GHz, RF output power has been converted to EIRP.

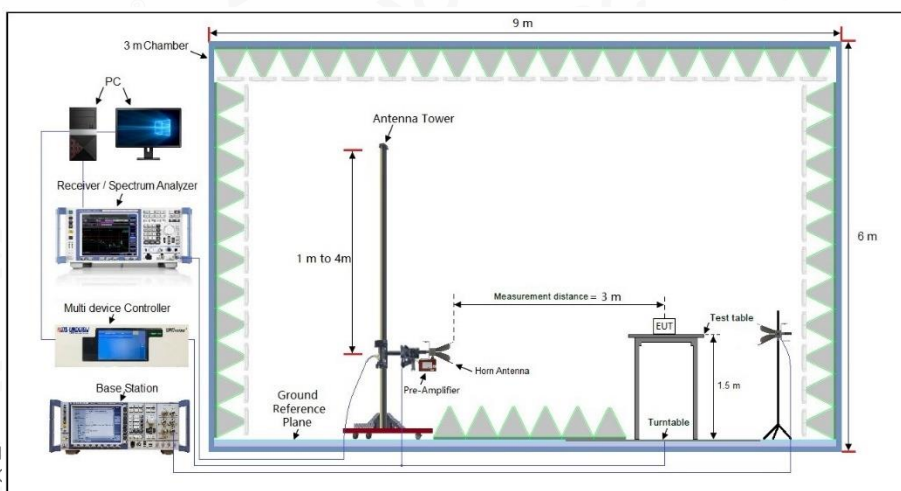
$$\text{EIRP(dBm)} = \text{ERP(dBm)} + 2.15$$

7.3. MEASUREMENT SETUP

RADIATED EMISSIONS 30MHZ TO 1GHZ TEST SETUP



RADIATED EMISSIONS ABOVE 1GHZ TEST SETUP



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Testing/Inspection
AGC The test results
are based on the test report.



7.4 MEASUREMENT RESULT

Suction Cup Antenna:

The measurement Below 1GHz data as follows:

GSM 850							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	159.759	-67.31	15.52	-51.79	-13.00	-38.79	Horizontal
2	240.144	-63.33	16.75	-46.58	-13.00	-33.58	Horizontal
3	754.963	-60.89	19.35	-41.54	-13.00	-28.54	Horizontal
4	46.708	-65.27	10.44	-54.83	-13.00	-41.83	Vertical
5	433.340	-62.85	17.75	-45.10	-13.00	-32.10	Vertical
6	502.247	-59.80	18.66	-41.14	-13.00	-28.14	Vertical
GSM_ Middle Channel							
1	31.735	-63.41	9.78	-53.63	-13.00	-40.63	Horizontal
2	159.759	-64.35	13.75	-50.60	-13.00	-37.60	Horizontal
3	240.144	-63.12	16.75	-46.37	-13.00	-33.37	Horizontal
4	43.233	-64.57	10.23	-54.34	-13.00	-41.34	Vertical
5	433.340	-62.88	17.75	-45.13	-13.00	-32.13	Vertical
6	498.730	-60.54	18.02	-42.52	-13.00	-29.52	Vertical
GSM_ Highest Channel							
1	159.759	-64.35	13.75	-50.60	-13.00	-37.60	Horizontal
2	240.144	-63.68	16.75	-46.93	-13.00	-33.93	Horizontal
3	679.435	-60.94	19.01	-41.93	-13.00	-28.93	Horizontal
4	43.233	-63.66	10.23	-53.43	-13.00	-40.43	Vertical
5	433.340	-62.11	17.75	-44.36	-13.00	-31.36	Vertical
6	498.730	-59.31	18.02	-41.29	-13.00	-28.29	Vertical

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PCS 1900							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	159.759	-68.10	15.52	-52.58	-13.00	-39.58	Horizontal
2	240.144	-64.18	16.75	-47.43	-13.00	-34.43	Horizontal
3	754.963	-59.82	19.35	-40.47	-13.00	-27.47	Horizontal
4	46.708	-66.17	10.44	-55.73	-13.00	-42.73	Vertical
5	433.340	-63.21	17.75	-45.46	-13.00	-32.46	Vertical
6	502.247	-60.70	18.66	-42.04	-13.00	-29.04	Vertical
GSM_ Middle Channel							
1	31.735	-65.66	9.78	-55.88	-13.00	-42.88	Horizontal
2	159.759	-65.75	13.75	-52.00	-13.00	-39.00	Horizontal
3	240.144	-63.95	16.75	-47.20	-13.00	-34.20	Horizontal
4	43.233	-63.94	10.23	-53.71	-13.00	-40.71	Vertical
5	433.340	-64.21	17.75	-46.46	-13.00	-33.46	Vertical
6	498.730	-60.01	18.02	-41.99	-13.00	-28.99	Vertical
GSM_ Highest Channel							
1	159.759	-64.59	13.75	-50.84	-13.00	-37.84	Horizontal
2	240.144	-62.63	16.75	-45.88	-13.00	-32.88	Horizontal
3	679.435	-60.06	19.01	-41.05	-13.00	-28.05	Horizontal
4	43.233	-64.95	10.23	-54.72	-13.00	-41.72	Vertical
5	433.340	-63.11	17.75	-45.36	-13.00	-32.36	Vertical
6	498.730	-60.37	18.02	-42.35	-13.00	-29.35	Vertical

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WCDMA Band II							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-64.82	15.52	-49.30	-13.00	-36.3	Horizontal
2	240.144	-61.93	16.75	-45.18	-13.00	-32.18	Horizontal
3	754.963	-57.74	19.35	-38.39	-13.00	-25.39	Horizontal
4	46.708	-63.35	10.44	-52.91	-13.00	-39.91	Vertical
5	433.340	-60.06	17.75	-42.31	-13.00	-29.31	Vertical
6	502.247	-58.01	18.66	-39.35	-13.00	-26.35	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-61.58	9.78	-51.80	-13.00	-38.8	Horizontal
2	159.759	-63.34	13.75	-49.59	-13.00	-36.59	Horizontal
3	240.144	-60.45	16.75	-43.70	-13.00	-30.7	Horizontal
4	43.233	-63.36	10.23	-53.13	-13.00	-40.13	Vertical
5	433.340	-61.14	17.75	-43.39	-13.00	-30.39	Vertical
6	498.730	-57.81	18.02	-39.79	-13.00	-26.79	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-63.44	13.75	-49.69	-13.00	-36.69	Horizontal
2	240.144	-61.33	16.75	-44.58	-13.00	-31.58	Horizontal
3	679.435	-58.92	19.01	-39.91	-13.00	-26.91	Horizontal
4	43.233	-60.99	10.23	-50.76	-13.00	-37.76	Vertical
5	433.340	-61.79	17.75	-44.04	-13.00	-31.04	Vertical
6	498.730	-57.32	18.02	-39.30	-13.00	-26.30	Vertical

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WCDMA Band IV							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-63.79	15.52	-48.27	-13.00	-35.27	Horizontal
2	240.144	-60.89	16.75	-44.14	-13.00	-31.14	Horizontal
3	754.963	-58.64	19.35	-39.29	-13.00	-26.29	Horizontal
4	46.708	-62.85	10.44	-52.41	-13.00	-39.41	Vertical
5	433.340	-60.78	17.75	-43.03	-13.00	-30.03	Vertical
6	502.247	-57.87	18.66	-39.21	-13.00	-26.21	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-62.29	9.78	-52.51	-13.00	-39.51	Horizontal
2	159.759	-62.85	13.75	-49.10	-13.00	-36.10	Horizontal
3	240.144	-59.36	16.75	-42.61	-13.00	-29.61	Horizontal
4	43.233	-61.53	10.23	-51.30	-13.00	-38.30	Vertical
5	433.340	-62.69	17.75	-44.94	-13.00	-31.94	Vertical
6	498.730	-57.41	18.02	-39.39	-13.00	-26.39	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-63.29	13.75	-49.54	-13.00	-36.54	Horizontal
2	240.144	-61.46	16.75	-44.71	-13.00	-31.71	Horizontal
3	679.435	-58.19	19.01	-39.18	-13.00	-26.18	Horizontal
4	43.233	-61.51	10.23	-51.28	-13.00	-38.28	Vertical
5	433.340	-60.42	17.75	-42.67	-13.00	-29.67	Vertical
6	498.730	-56.81	18.02	-38.79	-13.00	-25.79	Vertical

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WCDMA Band V							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-64.05	15.52	-48.53	-13.00	-35.53	Horizontal
2	240.144	-61.46	16.75	-44.71	-13.00	-31.71	Horizontal
3	754.963	-57.15	19.35	-37.80	-13.00	-24.80	Horizontal
4	46.708	-63.59	10.44	-53.15	-13.00	-40.15	Vertical
5	433.340	-60.24	17.75	-42.49	-13.00	-29.49	Vertical
6	502.247	-57.72	18.66	-39.06	-13.00	-26.06	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-63.08	9.78	-53.30	-13.00	-40.3	Horizontal
2	159.759	-62.38	13.75	-48.63	-13.00	-35.63	Horizontal
3	240.144	-59.63	16.75	-42.88	-13.00	-29.88	Horizontal
4	43.233	-62.96	10.23	-52.73	-13.00	-39.73	Vertical
5	433.340	-61.36	17.75	-43.61	-13.00	-30.61	Vertical
6	498.730	-57.81	18.02	-39.79	-13.00	-26.79	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-63.14	13.75	-49.39	-13.00	-36.39	Horizontal
2	240.144	-61.40	16.75	-44.65	-13.00	-31.65	Horizontal
3	679.435	-58.90	19.01	-39.89	-13.00	-26.89	Horizontal
4	43.233	-62.42	10.23	-52.19	-13.00	-39.19	Vertical
5	433.340	-59.46	17.75	-41.71	-13.00	-28.71	Vertical
6	498.730	-57.25	18.02	-39.23	-13.00	-26.23	Vertical

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The measurement Above 1GHz data as follows:

GSM 850							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	1648.400	-88.54	23.50	-65.04	-13.00	-52.04	Horizontal
2	2472.600	-88.13	29.47	-58.66	-13.00	-45.66	Horizontal
3	1648.400	-88.95	23.72	-65.23	-13.00	-52.23	Vertical
4	2472.600	-88.51	29.47	-59.04	-13.00	-46.04	Vertical
GSM_ Middle Channel							
1	1673.200	-89.31	23.50	-65.81	-13.00	-52.81	Horizontal
2	2509.800	-91.34	29.47	-61.87	-13.00	-48.87	Horizontal
3	1673.200	-90.84	23.72	-67.12	-13.00	-54.12	Vertical
4	2509.800	-93.71	29.47	-64.24	-13.00	-51.24	Vertical
GSM_ Highest Channel							
1	1697.600	-90.97	23.50	-67.47	-13.00	-54.47	Horizontal
2	2546.400	-92.26	29.47	-62.79	-13.00	-49.79	Horizontal
3	1697.600	-91.44	23.72	-67.72	-13.00	-54.72	Vertical
4	2546.400	-92.83	29.47	-63.36	-13.00	-50.36	Vertical

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PCS 1900							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	3700.400	-88.08	32.11	-55.97	-13.00	-42.97	Horizontal
2	5550.600	-87.74	33.21	-54.53	-13.00	-41.53	Horizontal
3	3700.400	-89.66	32.09	-57.57	-13.00	-44.57	Vertical
4	5550.600	-86.59	34.03	-52.56	-13.00	-39.56	Vertical
GSM_ Middle Channel							
1	3760.000	-83.09	32.11	-50.98	-13.00	-37.98	Horizontal
2	5640.000	-86.40	33.21	-53.19	-13.00	-40.19	Horizontal
3	3760.000	-90.83	32.09	-58.74	-13.00	-45.74	Vertical
4	5640.000	-87.09	34.03	-53.06	-13.00	-40.06	Vertical
GSM_ Highest Channel							
1	3819.600	-88.00	32.11	-55.89	-13.00	-42.89	Horizontal
2	5729.400	-87.51	33.21	-54.30	-13.00	-41.30	Horizontal
3	3819.600	-89.68	32.09	-57.59	-13.00	-44.59	Vertical
4	5729.400	-87.94	34.03	-53.91	-13.00	-40.91	Vertical

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WCDMA Band II							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	3704.800	-82.88	31.09	-51.79	-13.00	-38.79	Horizontal
2	5557.200	-89.34	34.14	-55.20	-13.00	-42.20	Horizontal
3	3704.800	-80.80	33.13	-47.67	-13.00	-34.67	Vertical
4	5557.200	-85.42	32.66	-52.76	-13.00	-39.76	Vertical
RMC 12.2kbps_ Middle Channel							
1	3760.000	-79.56	31.09	-48.47	-13.00	-35.47	Horizontal
2	5640.000	-88.45	34.14	-54.31	-13.00	-41.31	Horizontal
3	3760.000	-79.80	33.13	-46.67	-13.00	-33.67	Vertical
4	5640.000	-84.31	32.66	-51.65	-13.00	-38.65	Vertical
RMC 12.2kbps_ Highest Channel							
1	3815.200	-82.72	31.09	-51.63	-13.00	-38.63	Horizontal
2	5722.800	-85.55	34.14	-51.41	-13.00	-38.41	Horizontal
3	3815.200	-82.32	33.13	-49.19	-13.00	-36.19	Vertical
4	5722.800	-83.12	32.66	-50.46	-13.00	-37.46	Vertical

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WCDMA Band IV							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	3424.800	-90.12	32.11	-58.01	-13.00	-45.01	Horizontal
2	5137.200	-88.54	34.13	-54.41	-13.00	-41.41	Horizontal
3	3424.800	-90.58	32.11	-58.47	-13.00	-45.47	Vertical
4	5137.200	-87.61	34.13	-53.48	-13.00	-40.48	Vertical
RMC 12.2kbps_ Middle Channel							
1	3464.800	-89.07	32.11	-56.96	-13.00	-43.96	Horizontal
2	5197.200	-87.89	34.13	-53.76	-13.00	-40.76	Horizontal
3	3464.800	-89.99	32.11	-57.88	-13.00	-44.88	Vertical
4	5197.200	-86.94	34.13	-52.81	-13.00	-39.81	Vertical
RMC 12.2kbps_ Highest Channel							
1	3505.200	-89.19	32.11	-57.08	-13.00	-44.08	Horizontal
2	5257.800	-87.16	34.13	-53.03	-13.00	-40.03	Horizontal
3	3505.200	-89.34	32.11	-57.23	-13.00	-44.23	Vertical
4	5257.800	-85.91	34.13	-51.78	-13.00	-38.78	Vertical

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WCDMA Band V							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	1652.800	-83.92	23.12	-60.80	-13.00	-47.80	Horizontal
2	2479.200	-85.57	28.47	-57.10	-13.00	-44.10	Horizontal
3	1652.800	-83.93	23.12	-60.81	-13.00	-47.81	Vertical
4	2479.200	-84.14	28.47	-55.67	-13.00	-42.67	Vertical
RMC 12.2kbps_ Middle Channel							
1	1672.800	-81.75	23.12	-58.63	-13.00	-45.63	Horizontal
2	2509.200	-83.45	28.47	-54.98	-13.00	-41.98	Horizontal
3	1672.800	-82.98	23.12	-59.86	-13.00	-46.86	Vertical
4	2509.200	-81.71	28.47	-53.24	-13.00	-40.24	Vertical
RMC 12.2kbps_ Highest Channel							
1	1693.200	-81.78	23.12	-58.66	-13.00	-45.66	Horizontal
2	2539.800	-82.94	28.47	-54.47	-13.00	-41.47	Horizontal
3	1693.200	-82.42	23.12	-59.30	-13.00	-46.30	Vertical
4	2539.800	-83.00	28.47	-54.53	-13.00	-41.53	Vertical

Note:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit
4. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test. Subsequently, only the worst case emissions are reported.

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Glue Stick Antenna:

The measurement Below 1GHz data as follows:

GSM 850							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	159.759	-64.93	15.52	-49.41	-13.00	-36.41	Horizontal
2	240.144	-61.67	16.75	-44.92	-13.00	-31.92	Horizontal
3	754.963	-59.43	19.35	-40.08	-13.00	-27.08	Horizontal
4	46.708	-65.11	10.44	-54.67	-13.00	-41.67	Vertical
5	433.340	-60.96	17.75	-43.21	-13.00	-30.21	Vertical
6	502.247	-57.56	18.66	-38.90	-13.00	-25.90	Vertical
GSM_ Middle Channel							
1	31.735	-61.12	9.78	-51.34	-13.00	-38.34	Horizontal
2	159.759	-64.07	13.75	-50.32	-13.00	-37.32	Horizontal
3	240.144	-62.13	16.75	-45.38	-13.00	-32.38	Horizontal
4	43.233	-62.19	10.23	-51.96	-13.00	-38.96	Vertical
5	433.340	-61.96	17.75	-44.21	-13.00	-31.21	Vertical
6	498.730	-60.10	18.02	-42.08	-13.00	-29.08	Vertical
GSM_ Highest Channel							
1	159.759	-62.77	13.75	-49.02	-13.00	-36.02	Horizontal
2	240.144	-63.64	16.75	-46.89	-13.00	-33.89	Horizontal
3	679.435	-60.74	19.01	-41.73	-13.00	-28.73	Horizontal
4	43.233	-61.47	10.23	-51.24	-13.00	-38.24	Vertical
5	433.340	-61.10	17.75	-43.35	-13.00	-30.35	Vertical
6	498.730	-57.79	18.02	-39.77	-13.00	-26.77	Vertical

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PCS 1900							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	159.759	-66.17	15.52	-50.65	-13.00	-37.65	Horizontal
2	240.144	-63.29	16.75	-46.54	-13.00	-33.54	Horizontal
3	754.963	-59.73	19.35	-40.38	-13.00	-27.38	Horizontal
4	46.708	-65.03	10.44	-54.59	-13.00	-41.59	Vertical
5	433.340	-62.63	17.75	-44.88	-13.00	-31.88	Vertical
6	502.247	-59.42	18.66	-40.76	-13.00	-27.76	Vertical
GSM_ Middle Channel							
1	31.735	-63.70	9.78	-53.92	-13.00	-40.92	Horizontal
2	159.759	-64.66	13.75	-50.91	-13.00	-37.91	Horizontal
3	240.144	-62.78	16.75	-46.03	-13.00	-33.03	Horizontal
4	43.233	-61.83	10.23	-51.60	-13.00	-38.60	Vertical
5	433.340	-63.76	17.75	-46.01	-13.00	-33.01	Vertical
6	498.730	-58.47	18.02	-40.45	-13.00	-27.45	Vertical
GSM_ Highest Channel							
1	159.759	-64.44	13.75	-50.69	-13.00	-37.69	Horizontal
2	240.144	-61.99	16.75	-45.24	-13.00	-32.24	Horizontal
3	679.435	-57.86	19.01	-38.85	-13.00	-25.85	Horizontal
4	43.233	-62.80	10.23	-52.57	-13.00	-39.57	Vertical
5	433.340	-61.72	17.75	-43.97	-13.00	-30.97	Vertical
6	498.730	-59.52	18.02	-41.50	-13.00	-28.50	Vertical

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WCDMA Band II							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-63.04	15.52	-47.52	-13.00	-34.52	Horizontal
2	240.144	-59.46	16.75	-42.71	-13.00	-29.71	Horizontal
3	754.963	-56.62	19.35	-37.27	-13.00	-24.27	Horizontal
4	46.708	-62.36	10.44	-51.92	-13.00	-38.92	Vertical
5	433.340	-59.26	17.75	-41.51	-13.00	-28.51	Vertical
6	502.247	-57.02	18.66	-38.36	-13.00	-25.36	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-61.37	9.78	-51.59	-13.00	-38.59	Horizontal
2	159.759	-61.13	13.75	-47.38	-13.00	-34.38	Horizontal
3	240.144	-59.79	16.75	-43.04	-13.00	-30.04	Horizontal
4	43.233	-61.56	10.23	-51.33	-13.00	-38.33	Vertical
5	433.340	-60.99	17.75	-43.24	-13.00	-30.24	Vertical
6	498.730	-56.08	18.02	-38.06	-13.00	-25.06	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-61.82	13.75	-48.07	-13.00	-35.07	Horizontal
2	240.144	-60.76	16.75	-44.01	-13.00	-31.01	Horizontal
3	679.435	-58.71	19.01	-39.70	-13.00	-26.70	Horizontal
4	43.233	-60.38	10.23	-50.15	-13.00	-37.15	Vertical
5	433.340	-59.36	17.75	-41.61	-13.00	-28.61	Vertical
6	498.730	-56.47	18.02	-38.45	-13.00	-25.45	Vertical

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WCDMA Band IV							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-63.34	15.52	-47.82	-13.00	-34.82	Horizontal
2	240.144	-59.64	16.75	-42.89	-13.00	-29.89	Horizontal
3	754.963	-56.94	19.35	-37.59	-13.00	-24.59	Horizontal
4	46.708	-60.37	10.44	-49.93	-13.00	-36.93	Vertical
5	433.340	-59.61	17.75	-41.86	-13.00	-28.86	Vertical
6	502.247	-57.83	18.66	-39.17	-13.00	-26.17	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-59.97	9.78	-50.19	-13.00	-50.19	Horizontal
2	159.759	-62.49	13.75	-48.74	-13.00	-48.74	Horizontal
3	240.144	-58.79	16.75	-42.04	-13.00	-42.04	Horizontal
4	43.233	-60.58	10.23	-50.35	-13.00	-50.35	Vertical
5	433.340	-61.85	17.75	-44.10	-13.00	-44.10	Vertical
6	498.730	-55.27	18.02	-37.25	-13.00	-37.25	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-62.48	13.75	-48.73	-13.00	-35.73	Horizontal
2	240.144	-61.04	16.75	-44.29	-13.00	-31.29	Horizontal
3	679.435	-57.98	19.01	-38.97	-13.00	-25.97	Horizontal
4	43.233	-59.26	10.23	-49.03	-13.00	-36.03	Vertical
5	433.340	-59.35	17.75	-41.60	-13.00	-28.60	Vertical
6	498.730	-54.87	18.02	-36.85	-13.00	-23.85	Vertical

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WCDMA Band V							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	159.759	-63.10	15.52	-47.58	-13.00	-34.58	Horizontal
2	240.144	-61.27	16.75	-44.52	-13.00	-31.52	Horizontal
3	754.963	-55.79	19.35	-36.44	-13.00	-23.44	Horizontal
4	46.708	-61.87	10.44	-51.43	-13.00	-38.43	Vertical
5	433.340	-60.20	17.75	-42.45	-13.00	-29.45	Vertical
6	502.247	-57.01	18.66	-38.35	-13.00	-25.35	Vertical
RMC 12.2kbps_ Middle Channel							
1	31.735	-60.78	9.78	-51.00	-13.00	-38.00	Horizontal
2	159.759	-62.12	13.75	-48.37	-13.00	-35.37	Horizontal
3	240.144	-59.06	16.75	-42.31	-13.00	-29.31	Horizontal
4	43.233	-60.88	10.23	-50.65	-13.00	-37.65	Vertical
5	433.340	-59.37	17.75	-41.62	-13.00	-28.62	Vertical
6	498.730	-55.89	18.02	-37.87	-13.00	-24.87	Vertical
RMC 12.2kbps_ Highest Channel							
1	159.759	-60.78	13.75	-47.44	-13.00	-34.44	Horizontal
2	240.144	-62.12	16.75	-42.53	-13.00	-29.53	Horizontal
3	679.435	-59.06	19.01	-37.81	-13.00	-24.81	Horizontal
4	43.233	-60.88	10.23	-50.35	-13.00	-37.35	Vertical
5	433.340	-59.37	17.75	-41.01	-13.00	-28.01	Vertical
6	498.730	-55.89	18.02	-38.04	-13.00	-25.04	Vertical

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The measurement Above 1GHz data as follows:

GSM 850							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	1648.400	-88.97	23.50	-65.47	-13.00	-52.47	Horizontal
2	2472.600	-88.45	29.47	-58.98	-13.00	-45.98	Horizontal
3	1648.400	-89.03	23.72	-65.31	-13.00	-52.31	Vertical
4	2472.600	-88.92	29.47	-59.45	-13.00	-46.45	Vertical
GSM_ Middle Channel							
1	1673.200	-89.36	23.50	-65.86	-13.00	-52.86	Horizontal
2	2509.800	-91.47	29.47	-62.00	-13.00	-49.00	Horizontal
3	1673.200	-91.25	23.72	-67.53	-13.00	-54.53	Vertical
4	2509.800	-93.72	29.47	-64.25	-13.00	-51.25	Vertical
GSM_ Highest Channel							
1	1697.600	-91.22	23.50	-67.72	-13.00	-54.72	Horizontal
2	2546.400	-92.74	29.47	-63.27	-13.00	-50.27	Horizontal
3	1697.600	-91.84	23.72	-68.12	-13.00	-55.12	Vertical
4	2546.400	-92.95	29.47	-63.48	-13.00	-50.48	Vertical

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PCS 1900							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
GSM_ Lowest Channel							
1	3700.400	-88.33	32.11	-56.22	-13.00	-43.22	Horizontal
2	5550.600	-88.11	33.21	-54.90	-13.00	-41.90	Horizontal
3	3700.400	-89.98	32.09	-57.89	-13.00	-44.89	Vertical
4	5550.600	-86.75	34.03	-52.72	-13.00	-39.72	Vertical
GSM_ Middle Channel							
1	3760.000	-83.58	32.11	-51.47	-13.00	-38.47	Horizontal
2	5640.000	-86.74	33.21	-53.53	-13.00	-40.53	Horizontal
3	3760.000	-91.13	32.09	-59.04	-13.00	-46.04	Vertical
4	5640.000	-87.24	34.03	-53.21	-13.00	-40.21	Vertical
GSM_ Highest Channel							
1	3819.600	-88.25	32.11	-56.14	-13.00	-43.14	Horizontal
2	5729.400	-87.70	33.21	-54.49	-13.00	-41.49	Horizontal
3	3819.600	-90.11	32.09	-58.02	-13.00	-45.02	Vertical
4	5729.400	-88.24	34.03	-54.21	-13.00	-41.21	Vertical

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WCDMA Band II							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	3704.800	-83.37	31.09	-52.28	-13.00	-39.28	Horizontal
2	5557.200	-89.73	34.14	-55.59	-13.00	-42.59	Horizontal
3	3704.800	-81.00	33.13	-47.87	-13.00	-34.87	Vertical
4	5557.200	-85.78	32.66	-53.12	-13.00	-40.12	Vertical
RMC 12.2kbps_ Middle Channel							
1	3760.000	-79.74	31.09	-48.65	-13.00	-35.65	Horizontal
2	5640.000	-88.70	34.14	-54.56	-13.00	-41.56	Horizontal
3	3760.000	-80.11	33.13	-46.98	-13.00	-33.98	Vertical
4	5640.000	-84.72	32.66	-52.06	-13.00	-39.06	Vertical
RMC 12.2kbps_ Highest Channel							
1	3815.200	-82.97	31.09	-51.88	-13.00	-38.88	Horizontal
2	5722.800	-85.95	34.14	-51.81	-13.00	-38.81	Horizontal
3	3815.200	-82.42	33.13	-49.29	-13.00	-36.29	Vertical
4	5722.800	-83.55	32.66	-50.89	-13.00	-37.89	Vertical

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WCDMA Band IV							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	3424.800	-90.58	32.11	-58.47	-13.00	-45.47	Horizontal
2	5137.200	-88.87	34.13	-54.74	-13.00	-41.74	Horizontal
3	3424.800	-90.61	32.11	-58.50	-13.00	-45.50	Vertical
4	5137.200	-88.05	34.13	-53.92	-13.00	-40.92	Vertical
RMC 12.2kbps_ Middle Channel							
1	3464.800	-89.25	32.11	-57.14	-13.00	-44.14	Horizontal
2	5197.200	-88.18	34.13	-54.05	-13.00	-41.05	Horizontal
3	3464.800	-90.37	32.11	-58.26	-13.00	-45.26	Vertical
4	5197.200	-87.40	34.13	-53.27	-13.00	-40.27	Vertical
RMC 12.2kbps_ Highest Channel							
1	3505.200	-89.62	32.11	-57.51	-13.00	-44.51	Horizontal
2	5257.800	-87.26	34.13	-53.13	-13.00	-40.13	Horizontal
3	3505.200	-89.58	32.11	-57.47	-13.00	-44.47	Vertical
4	5257.800	-86.28	34.13	-52.15	-13.00	-39.15	Vertical

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WCDMA Band V							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
RMC 12.2kbps_ Lowest Channel							
1	1652.800	-84.86	23.12	-61.74	-13.00	-48.74	Horizontal
2	2479.200	-86.18	28.47	-57.71	-13.00	-44.71	Horizontal
3	1652.800	-84.16	23.12	-61.04	-13.00	-48.04	Vertical
4	2479.200	-83.23	28.47	-54.76	-13.00	-41.76	Vertical
RMC 12.2kbps_ Middle Channel							
1	1672.800	-82.69	23.12	-59.57	-13.00	-46.57	Horizontal
2	2509.200	-83.91	28.47	-55.44	-13.00	-42.44	Horizontal
3	1672.800	-83.53	23.12	-60.41	-13.00	-47.41	Vertical
4	2509.200	-81.62	28.47	-53.15	-13.00	-40.15	Vertical
RMC 12.2kbps_ Highest Channel							
1	1693.200	-80.91	23.12	-57.79	-13.00	-44.79	Horizontal
2	2539.800	-82.67	28.47	-54.20	-13.00	-41.20	Horizontal
3	1693.200	-81.85	23.12	-58.73	-13.00	-45.73	Vertical
4	2539.800	-82.67	28.47	-54.20	-13.00	-41.20	Vertical

Note:

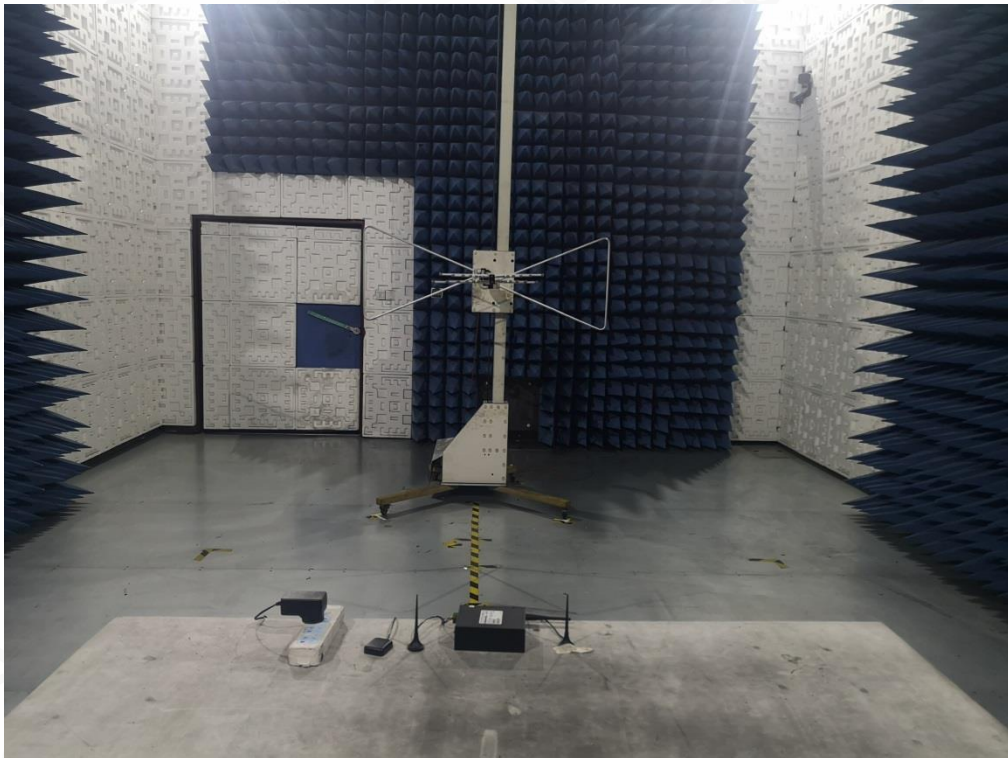
1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit
4. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test. Subsequently, only the worst case emissions are reported.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION-Suction Cup Antenna



RADIATED SPURIOUS ABOVE 1G EMISSION-Suction Cup Antenna

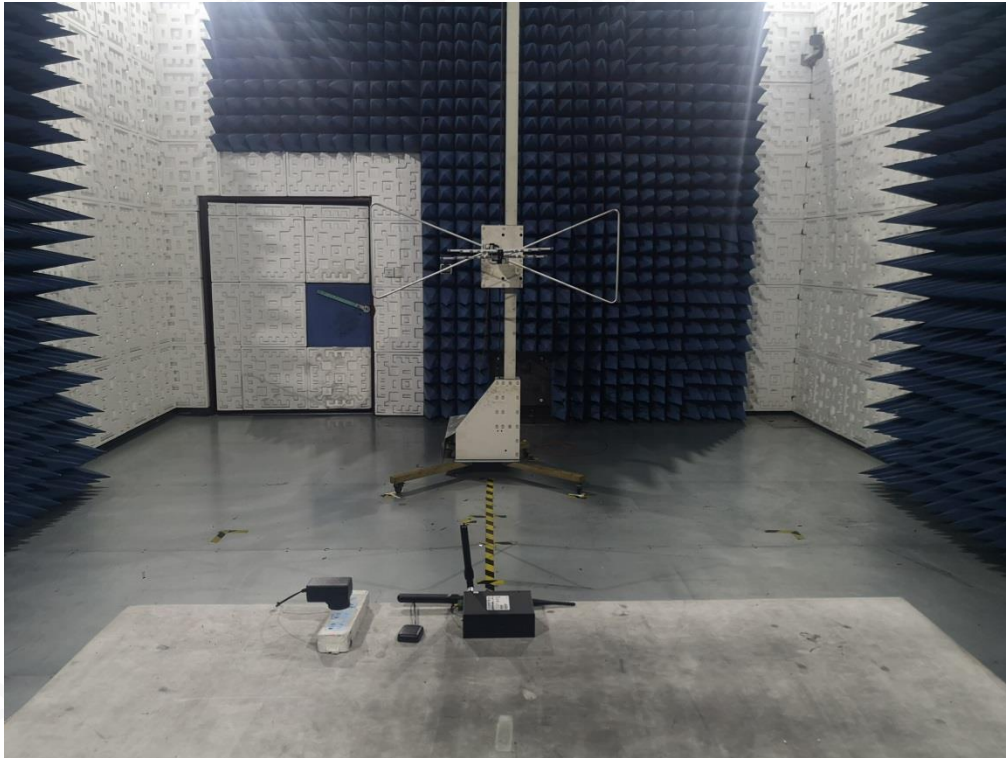


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RADIATED SPURIOUS EMISSION- Glue Stick Antenna



RADIATED SPURIOUS ABOVE 1G EMISSION- Glue Stick Antenna



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APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC04834210304AP01

----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.
5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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