MPE TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd.
FCC ID	XMR2022BG955AGL
Product	LTE Cat M1/NB1/GPRS/GNSS Module
Brand	Quectel
Model	BG955A-GL
Report No.	R2208A0765-M1V2
Issue Date	November 18, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310.** The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Table of Contents

Version	Revision description	Issue Date
Rev.0	Initial issue of report.	October 21, 2022
Rev.1	Update data.	November 7, 2022
Rev.2	Update information.	November 18, 2022
Note: This revised report (Report No. R2208A0765-M1V2) supersedes and replaces the previously issued report (Report No. R2208A0765-M1V1). Please discard or destroy the previously issued report and dispose of it accordingly.		

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	Building 3, No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment Under Test

Client Information

Applicant	Quectel Wireless Solutions Co., Ltd.
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd.
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233

General Technologies

Model	BG955A-GL
IMEI	868348060003740
Hardware Version	R1.2
Software Version	BG955AGLAAR02A01
Date of Testing	September 8, 2022~ September 29, 2022
Date of Sample Received	September 6, 2022
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.	

3 Maximum Tune up and Antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by
Numeric gain (G)=10^(antenna gain/10)

and		Burst-Averaged output power (adjusted for tune up) (dBm)	Division Factors	Frame-Averaged output power (adjusted for tune up) (dBm)
GSM850	GSM	35.00	-9.03	25.97
	1 Txslot	35.00	-9.03	25.97
	2 Txslots	35.00	-6.02	28.98
	3 Txslots	35.00	-4.26	30.74
	4 Txslots	35.00	-3.01	**31.99**
GSM1900	GSM	32.00	-9.03	22.97
	1 Txslot	32.00	-9.03	22.97
	2 Txslots	32.00	-6.02	25.98
	3 Txslots	32.00	-4.26	27.74
	4 Txslots	32.00	-3.01	**28.99**

Note:
Division Factors

To average the power, the division factor is as follows:

1Txslot = 1 transmit time slot out of 8 time slots
=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots
=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots
=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots
=> conducted power divided by (8/4) => -3.01 dB

Band	Maximum Tune up	
	(dBm)	(mW)
GSM850	31.99	1581.25
GSM1900	28.99	792.50
LTE eMTC Band 2	25.70	371.54
LTE eMTC Band 4	25.70	371.54
LTE eMTC Band 5	25.70	371.54
LTE eMTC Band 12	25.70	371.54
LTE eMTC Band 13	25.70	371.54
LTE eMTC Band 25	25.70	371.54
LTE eMTC Band 26	25.70	371.54
LTE eMTC Band 66	25.70	371.54
NB-IoT Band 2	25.70	371.54
NB-IoT Band 4	25.70	371.54
NB-IoT Band 5	25.70	371.54
NB-IoT Band 12	25.70	371.54
NB-IoT Band 13	25.70	371.54
NB-IoT Band 17	25.70	371.54
NB-IoT Band 25	25.70	371.54
NB-IoT Band 66	25.70	371.54

4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following.

TABLE 1 – LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 1500~100,000MHz is 1.0.So

Band	The Maximum Permissible Exposure (mW/cm^2)
GSM850	0.549
GSM1900	1.000
LTE eMTC Band 2	1.000
LTE eMTC Band 4	1.000
LTE eMTC Band 5	0.549
LTE eMTC Band 12	0.466
LTE eMTC Band 13	0.518
LTE eMTC Band 25	1.000
LTE eMTC Band 26	0.543
LTE eMTC Band 66	1.000
NB-IoT Band 2	1.000
NB-IoT Band 4	1.000
NB-IoT Band 5	0.549
NB-IoT Band 12	0.466
NB-IoT Band 13	0.518
NB-IoT Band 17	0.469
NB-IoT Band 25	1.000
NB-IoT Band 66	1.000

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	Maximum Conducted Output Power (dBm)	EIRP Limit (dBm)	Margin 1 (dB)	Power Density Limit		Margin 2 (dB)	Final Margin (dB)	Gain (dBi)
				(mW/cm^2)	(dBm)			
GSM850	31.99	40.600	8.61	0.549	34.41	2.42	2.42	2.42
GSM1900	28.99	33.000	4.01	1.000	37.01	8.02	4.01	4.01
LTE eMTC Band 2	25.70	33.000	7.30	1.000	37.01	11.31	7.30	7.30
LTE eMTC Band 4	25.70	30.000	4.30	1.000	37.01	11.31	4.30	4.30
LTE eMTC Band 5	25.70	40.600	14.90	0.549	34.41	8.71	8.71	8.71
LTE eMTC Band 12	25.70	36.850	11.15	0.466	33.70	8.00	8.00	8.00
LTE eMTC Band 13	25.70	36.850	11.15	0.518	34.16	8.46	8.46	8.46
LTE eMTC Band 25	25.70	33.000	7.30	1.000	37.01	11.31	7.30	7.30
LTE eMTC Band 26	25.70	40.600	14.90	0.543	34.36	8.66	8.66	8.66
LTE eMTC Band 66	25.70	30.000	4.30	1.000	37.01	11.31	4.30	4.30
NB-IoT Band 2	25.70	33.000	7.30	1.000	37.01	11.31	7.30	7.30
NB-IoT Band 4	25.70	30.000	4.30	1.000	37.01	11.31	4.30	4.30
NB-IoT Band 5	25.70	40.600	14.90	0.549	34.41	8.71	8.71	8.71
NB-IoT Band 12	25.70	36.850	11.15	0.466	33.70	8.00	8.00	8.00
NB-IoT Band 13	25.70	36.850	11.15	0.518	34.16	8.46	8.46	8.46
NB-IoT Band 17	25.70	36.920	11.22	0.469	33.72	8.02	8.02	8.02
NB-IoT Band 25	25.70	33.000	7.30	1.000	37.01	11.31	7.30	7.30
NB-IoT Band 66	25.70	30.000	4.30	1.000	37.01	11.31	4.30	4.30

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

Band	Maximum Tune up (dBm)	Antenna Gain (dBi)	PG (mW)	Test Result (mW/cm^2)	Limit Value (mW/cm^2)	Conclusion
GSM850	31.99	2.42	2760.578	0.549	0.549	Pass
GSM1900	28.99	4.01	1995.262	0.397	1.000	Pass
LTE eMTC Band 2	25.70	7.30	1995.262	0.397	1.000	Pass
LTE eMTC Band 4	25.70	4.30	1000.000	0.199	1.000	Pass
LTE eMTC Band 5	25.70	8.71	2760.578	0.549	0.549	Pass
LTE eMTC Band 12	25.70	8.00	2344.229	0.466	0.466	Pass
LTE eMTC Band 13	25.70	8.46	2606.154	0.518	0.518	Pass
LTE eMTC Band 25	25.70	7.30	1995.262	0.397	1.000	Pass
LTE eMTC Band 26	25.70	8.66	2728.978	0.543	0.543	Pass
LTE eMTC Band 66	25.70	4.30	1000.000	0.199	1.000	Pass
NB-IoT Band 2	25.70	7.30	1995.262	0.397	1.000	Pass
NB-IoT Band 4	25.70	4.30	1000.000	0.199	1.000	Pass
NB-IoT Band 5	25.70	8.71	2760.578	0.549	0.549	Pass
NB-IoT Band 12	25.70	8.00	2344.229	0.466	0.466	Pass
NB-IoT Band 13	25.70	8.46	2606.154	0.518	0.518	Pass
NB-IoT Band 17	25.70	8.02	2355.049	0.469	0.469	Pass
NB-IoT Band 25	25.70	7.30	1995.262	0.397	1.000	Pass
NB-IoT Band 66	25.70	4.30	1000.000	0.199	1.000	Pass
Note: **R** = 20cm **π**= 3.1416						

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

********END OF REPORT ********

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.