MPE TEST REPORT

Applicant	MOOV TECHNOLOGY (S) PTE. LTD.
FCC ID	2BBXKRYBIT820
Product	IoT-Box
Brand	Rybit
Model	Rybit820-NA
Report No.	R2305A0558-M1
Issue Date	August 16, 2023

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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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, Pudong Shanghai, P.R.China
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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	MOOV TECHNOLOGY (S) PTE. LTD.
Applicant address	331 North Bridge Road #12-03 Odeon Towers, Singapore
Manufacturer	Micro-Star International Co., Ltd.
Manufacturer address	NO.69, LIDE St., ZHONGHE DISTRICT, NEW TAIPEI CITY / TAIWAN

General Technologies

Model	Rybit820-NA
SN	MRQ22GM0B005022
Hardware Version	1.0.0
Software Version	1.0.0
Date of Sample Received	June 14, 2023
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 Output Power (Measured) /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)

Band	Maximum Tune Up Power		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
WCDMA Band II	23.50	223.872	0.24	1.057
WCDMA Band IV	23.50	223.872	-0.10	0.977
WCDMA Band V	23.50	223.872	-3.59	0.438
LTE Band 2	24.00	251.189	0.24	1.057
LTE Band 4	24.00	251.189	-0.10	0.977
LTE Band 12	24.00	251.189	-4.11	0.388
Band	Maximum Output Power		Antenna Gain (dBi)	Numeric Gain (dBm)
	(dBm)	(mW)		
Bluetooth (Low Energy)	8.03	6.353	-1.61	0.690

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 300~1500 MHz is f/1500, for 1500~100,000MHz is 1.0. So

Band	The Maximum Permissible Exposure (mW/cm^2)
WCDMA Band II	1.000
WCDMA Band IV	1.000
WCDMA Band V	0.549
LTE Band 2	1.000
LTE Band 4	1.000
LTE Band 12	0.466
Bluetooth (Low Energy)	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 Tune up/ Maximum Output Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	PG (mW)	Result (mW/cm^2)	Limit Value (mW/cm^2)	The MPE ratio
WCDMA Band II	23.50	0.24	23.740	236.592	0.047	1.000	0.047
WCDMA Band IV	23.50	-0.10	23.400	218.776	0.044	1.000	0.044
WCDMA Band V	23.50	-3.59	19.910	97.949	0.019	0.549	0.035
LTE Band 2	24.00	0.24	24.240	265.461	0.053	1.000	**0.053**
LTE Band 4	24.00	-0.10	23.900	245.471	0.049	1.000	0.049
LTE Band 12	24.00	-4.11	19.890	97.499	0.019	0.466	0.042
Bluetooth (Low Energy)	8.03	-1.61	6.420	4.385	0.001	1.000	**0.001**

Note: **R** = 20cm

π= 3.1416

The MPE ratio = Mac Result÷Limit Value

1. This MPE analysis is applicable to any collocated transmitters with EIRP for Wi-Fi / Bluetooth LE is less than or equal to 26dBm.
2. A maximum antenna gain of 6dBi for Wi-Fi /BT has been assumed for all collocated antennas.

So the simultaneous transmitting antenna pairs as below:

∑of MPE ratios=WWAN Antenna + Bluetooth LE Antenna = 0.053 + 0.001 = 0.054 <1

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

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

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