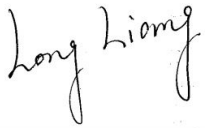
RF Exposure Evaluation Report

APPLICANT	:	Gosuncn Technology Group Co., Ltd.
EQUIPMENT	:	LTE Module
BRAND NAME	:	GOSUNCN
MODEL NAME	:	ME3630
FCC ID	:	2APNR-ME3630
STANDARD	:	47 CFR Part 2.1091 FCC KDB 447498 D01 v06

We, Sporton International (Shenzhen) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.



Reviewed by: Long Liang / Supervisor

Approved by: Johnny Chen / Manager

Sporton International (ShenZhen) Inc.

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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA961802	Rev. 01	Initial issue of report	Jul. 30, 2019

1. Administration Data

1.1. Testing Laboratory

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory		
Test Firm	Sporton International (Shenzhen) Inc.	
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595	
Test Site No.	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CN1256	421272

Applicant	
Company Name	Gosuncn Technology Group Co., Ltd.
Address	6F, 2819 KaiChuang Blvd., Science Town, Huangpu District, Guangzhou City, Guangdong, China.

Manufacturer	
Company Name	Gosuncn Technology Group Co., Ltd.
Address	6F, 2819 KaiChuang Blvd., Science Town, Huangpu District, Guangzhou City, Guangdong, China.

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	LTE Module
Brand Name	GOSUNCN
Model Name	ME3630
IMEI	869374040404732
FCC ID	2APNR-ME3630
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5MHz
Mode	GSM/GPRS/EGPRS AMR/ RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink) LTE: QPSK, 16QAM
Antenna Type	Fixed External Antenna
HW Version	ME3630-MB_A
SW Version	ME3630A1CV1.0B02
EUT Stage	Production Unit
Remark: 1. This device does not support voice function. 2. This device supports GRPS/EGRPS mode up to multi-slot class 33.	

3. Maximum RF average output power among production units

<GSM>

Mode	Burst Average Power (dBm)	
	GSM 850	GSM 1900
GSM 1 Tx slot	33.50	31.50
GPRS 1 Tx slot	33.50	31.50
GPRS 2 Tx slots	33.50	31.50
GPRS 3 Tx slots	33.00	31.00
GPRS 4 Tx slots	33.00	31.00
EDGE 1 Tx slot	27.50	26.00
EDGE 2 Tx slots	27.50	26.00
EDGE 3 Tx slots	27.00	25.00
EDGE 4 Tx slots	27.00	25.00

<WCDMA>

Mode	Average Power (dBm)	
	WCDMA Band II	WCDMA Band V
AMR/RMC 12.2Kbps	24.50	24.50
HSDPA Subtest-1	23.50	23.50
HSDPA Subtest-2	23.50	23.50
HSDPA Subtest-3	23.00	23.00
HSDPA Subtest-4	23.00	23.00
DC-HSDPA Subtest-1	23.50	23.50
DC-HSDPA Subtest-2	23.50	23.50
DC-HSDPA Subtest-3	23.00	23.00
DC-HSDPA Subtest-4	23.00	22.00
HSUPA Subtest-1	23.50	23.50
HSUPA Subtest-2	22.50	22.50
HSUPA Subtest-3	22.50	22.50
HSUPA Subtest-4	23.50	23.50
HSUPA Subtest-5	24.00	24.00
HSPA+ (16QAM) Subtest-1	22.50	22.50

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	24.00
	Band 5	24.00
	Band 7	24.50

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
GPRS 850 (1 Tx slot)	824.2	4.50	33.50	38.00	794.33	0.158	0.549
GPRS 850 (2 Tx slots)	824.2	4.50	33.50	38.00	1577.39	0.314	0.549
GPRS 850 (3 Tx slots)	824.2	4.50	33.00	37.50	2108.63	0.420	0.549
GPRS 850 (4 Tx slots)	824.2	4.50	33.00	37.50	2818.38	0.561	0.549
EGPRS 850 (1 Tx slot)	824.2	4.50	27.50	32.00	199.53	0.040	0.549
EGPRS 850 (2 Tx slots)	824.2	4.50	27.50	32.00	396.22	0.079	0.549
EGPRS 850 (3 Tx slots)	824.2	4.50	27.00	31.50	529.70	0.105	0.549
EGPRS 850 (4 Tx slots)	824.2	4.50	27.00	31.50	706.27	0.141	0.549
GPRS 1900 (1 Tx slot)	1850.2	1.50	31.50	33.00	251.19	0.050	1.000
GPRS 1900 (2 Tx slots)	1850.2	1.50	31.50	33.00	498.82	0.099	1.000
GPRS 1900 (3 Tx slots)	1850.2	1.50	31.00	32.50	666.81	0.133	1.000
GPRS 1900 (4 Tx slots)	1850.2	1.50	31.00	32.50	891.25	0.177	1.000
EGPRS 1900 (1 Tx slot)	1850.2	1.50	26.00	27.50	70.79	0.014	1.000
EGPRS 1900 (2 Tx slots)	1850.2	1.50	26.00	27.50	140.59	0.028	1.000
EGPRS 1900 (3 Tx slots)	1850.2	1.50	25.00	26.50	167.51	0.033	1.000
EGPRS 1900 (4 Tx slots)	1850.2	1.50	25.00	26.50	223.34	0.044	1.000
WCDMA Band 2	1852.4	1.50	24.50	26.00	398.11	0.079	1.000
WCDMA Band 5	826.4	4.50	24.50	29.00	794.33	0.158	0.551
LTE Band 2	1850.7	1.50	24.00	25.50	354.81	0.071	1.000
LTE Band 5	824.7	4.50	24.00	28.50	707.95	0.141	0.550
LTE Band 7	2502.5	8.50	24.50	33.00	1995.26	0.397	1.000

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

5.2. Collocated Power Density Calculation

General Note:

1. This MPE analysis is applicable to any collocated transmitters with EIRP for WLAN is less than or equal to 28dBm and EIRP for Bluetooth is less than or equal to 27dBm.
2. A maximum antenna gain of 7dBi for WLAN/BT has been assumed for all collocated antennas.

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
GSM 850 (1 Tx slot)	824.2	3.00	33.50	36.50	4.47	562.34	0.112	0.549	0.204
GPRS 850 (1 Tx slot)	824.2	3.00	33.50	36.50	4.47	562.34	0.112	0.549	0.204
GPRS 850 (2 Tx slots)	824.2	3.00	33.50	36.50	4.47	1116.71	0.222	0.549	0.405
GPRS 850 (3 Tx slots)	824.2	3.00	33.00	36.00	3.98	1492.79	0.297	0.549	0.541
GPRS 850 (4 Tx slots)	824.2	3.00	33.00	36.00	3.98	1995.26	0.397	0.549	**0.723**
EGPRS 850 (1 Tx slot)	824.2	3.00	27.50	30.50	1.12	141.25	0.028	0.549	0.051
EGPRS 850 (2 Tx slots)	824.2	3.00	27.50	30.50	1.12	280.50	0.056	0.549	0.102
EGPRS 850 (3 Tx slots)	824.2	3.00	27.00	30.00	1.00	375.00	0.075	0.549	0.136
EGPRS 850 (4 Tx slots)	824.2	3.00	27.00	30.00	1.00	500.00	0.100	0.549	0.181
GSM 1900 (1 Tx slot)	1850.2	1.50	31.50	33.00	2.00	251.19	0.050	1.000	0.050
GPRS 1900 (1 Tx slot)	1850.2	1.50	31.50	33.00	2.00	251.19	0.050	1.000	0.050
GPRS 1900 (2 Tx slots)	1850.2	1.50	31.50	33.00	2.00	498.82	0.099	1.000	0.099
GPRS 1900 (3 Tx slots)	1850.2	1.50	31.00	32.50	1.78	666.81	0.133	1.000	0.133
GPRS 1900 (4 Tx slots)	1850.2	1.50	31.00	32.50	1.78	891.25	0.177	1.000	0.177
EGPRS 1900 (1 Tx slot)	1850.2	1.50	26.00	27.50	0.56	70.79	0.014	1.000	0.014
EGPRS 1900 (2 Tx slots)	1850.2	1.50	26.00	27.50	0.56	140.59	0.028	1.000	0.028
EGPRS 1900 (3 Tx slots)	1850.2	1.50	25.00	26.50	0.45	167.51	0.033	1.000	0.033
EGPRS 1900 (4 Tx slots)	1850.2	1.50	25.00	26.50	0.45	223.34	0.044	1.000	0.044
WCDMA Band II	1852.4	1.50	24.50	26.00	0.40	398.11	0.079	1.000	0.079
WCDMA Band V	826.4	3.00	24.50	27.50	0.56	562.34	0.112	0.551	0.203
LTE Band 2	1850.7	1.50	24.00	25.50	0.35	354.81	0.071	1.000	0.071
LTE Band 5	824.7	3.00	24.00	27.00	0.50	501.19	0.100	0.550	0.181
LTE Band 7	2502.5	8.50	24.50	33.00	2.00	1995.26	0.397	1.000	0.397
WLNA2.4GHz Band	2412	7.0	21.0	28.00	0.63	630.96	0.126	1.000	**0.126**
WLNA5GHz Band	5180	7.0	21.0	28.00	0.63	630.96	0.126	1.000	0.126
Bluetooth	2402	7.0	20.0	27.00	0.50	501.19	0.100	1.000	**0.100**

WWAN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ(Power Density / Limit) of WWAN + WLAN + Bluetooth
0.723	0.126	0.100	0.949

Note:

1. For colocation analysis, GPRS 850 (4 Tx slots) is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant.

Conclusion:

Based on 47 CFR §2.1091 and FCC KDB 447498 D01 v06, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
ME3630	GSM850	824.2	33.50	4.50	3.00
	GSM1900	1850.2	31.50	1.50	1.50
	WCDMA Band II	1852.4	24.50	1.50	1.50
	WCDMA Band V	826.4	24.50	4.50	3.00
	LTE Band 2	1850.7	24.00	1.50	1.50
	LTE Band 5	824.7	24.00	4.50	3.00
	LTE Band 7	2502.5	24.50	8.50	8.50
Collocated Transmitters	WLAN2.4GHz	2412.0	21.00		7.00
	WLAN5GHz	5180.0	21.00		7.00
	Bluetooth	2402.0	20.00		7.00