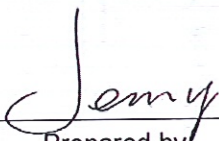


RF EXPOSURE EVALUATION REPORT

Applicant..... :ICE Cobotics (Guangdong) Company Limited
Address..... :Fushan Section Road, Xiangshi Road, Liaobu Town, Dongguan City, Guangdong
Province, P.R. China
Manufacturer..... :ICE Cobotics (Guangdong) Company Limited
Address..... :Fushan Section Road, Xiangshi Road, Liaobu Town, Dongguan City, Guangdong
Province, P.R. China
Factory..... :ICE Cobotics (Guangdong) Company Limited
Address..... :Fushan Section Road, Xiangshi Road, Liaobu Town, Dongguan City, Guangdong
Province, P.R. China
Product Name..... :4G Modem
Brand Name..... :ICE COBOTICS
Model No. :ICE400160-MODEM
FCC ID..... :2AWHZ-ICE400160
Measurement Standard..... :47 CFR FCC Part 2.1091
Receipt Date of Samples.... :November 31, 2021
Date of Tested..... :December 01, 2021 to May 11, 2022
Date of Report..... :May 11 2022

This report shows that above equipment is technically compliant with the requirements of the standards above. All test results in this report apply only to the tested sample(s). Without prior written approval of Dongguan Nore Testing Center Co., Ltd, this report shall not be reproduced except in full.


Prepared by

Jenny Liu / Project Engineer


Approved by

Iori Fan / Authorized Signatory

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Revision History

Report Number	Description	Issued Date
NTC2111312FV00-1	Initial Issue	2022-05-11

1. General Description of EUT

Product Information	
Product Name:	4G Modem
Main Model Name:	ICE400160-MODEM
Additional Model Name:	N/A
Model Difference:	N/A
S/N:	40016021500002
Brand Name:	ICE COBOTICS
Hardware Version:	V4.3
Software Version:	V1.0.10
Rating:	DC 12-48V / 200mA (Typical DC 12V)
Typical Arrangement:	Tabletop
I/O Port:	Refer to the user manual
Exposure Category:	Uncontrolled environment/general population
Device Category:	Mobile
Evaluation applied:	MPE
Accessories Information	
Adapter:	N/A
Cable:	N/A
Other:	N/A
Additional Information	
Note:	N/A
Remark:	All the information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual.

Technical Specification – GSM & WCDMA

Frequency Range:	GSM/GPRS/EGPRS 850: 824.2 ~ 848.8 MHz GSM/GPRS/EGPRS 1900: 1805.2 ~ 1909.8 MHz WCDMA Band V: 826.4 ~ 846.6 MHz WCDMA Band II: 1852.4 ~ 1907.6 MHz
Modulation Type:	GSM/GPRS: GMSK EDGE: GMSK, 8DPSK WCDMA: QPSK
Antenna Type:	External / PIFA
Antenna Gain:	GSM/GPRS/EDGE 850: 0.69 dBi GSM/GPRS/EDGE 1900: 2.82 dBi WCDMA Band II: 2.82 dBi WCDMA Band V: 0.69 dBi
Remark:	N/A

Technical Specification - WLAN

Frequency Range:	2412-2462MHz for IEEE 802.11b/g/n(HT20) 2422-2452MHz for IEEE 802.11n(HT40)
Modulation Technology:	DSSS, OFDM
Modulation Type:	CCK, DQPSK, DBPSK, 64-QAM, 16-QAM, QPSK, BPSK
Antenna Type:	External / PIFA
Antenna Gain:	4.37dBi (Declared by the manufacturer)
Remark:	N/A

Technical Specification - LTE	
Frequency Range:	LTE Band 2: 1850.7 ~ 1909.3 MHz LTE Band 4: 1710.7 ~ 1754.3 MHz LTE Band 5: 824.7 ~ 848.3 MHz LTE Band 7: 2502.5 ~ 2567.5 MHz LTE Band 12: 699.7 ~ 715.3 MHz LTE Band 13: 779.5 ~ 784.5 MHz LTE Band 25: 1850.7 ~ 1914.3 MHz LTE Band 26: 824.7 ~ 848.3 MHz LTE Band 41: 2498.5 ~ 2687.5 MHz
Modulation Type:	QPSK / 16QAM
Antenna Type:	External / PIFA
Antenna Gain:	LTE Band 2: 2.81 dBi LTE Band 4: 3.89 dBi LTE Band 5: 0.22 dBi LTE Band 7: 1.70 dBi LTE Band 12: -1.38 dBi LTE Band 13: -1.18 dBi LTE Band 25: 2.81 dBi LTE Band 26: 0.22 dBi LTE Band 41: 1.70 dBi
Remark:	N/A

2. Maximum Permissible RF Exposure

According to FCC §1.1310: 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 §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Limits For Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density(mW/cm ²)	Average Time (minutes)
(A) Limits for Occupational/Control Exposures				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100000			1.0	30
f = frequency in MHz				
* = Plane-wave equivalent power density				

The MPE was calculated at **20cm** 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 in mW/cm²

P = Output Power to antenna in mW

G = Gain of antenna in linear scale.

R = Distance to centre of the antenna in cm.

π = 3.14159

3. Test Facility

Test Site	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Accreditations and Authorizations	:	<p>The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 Listed by CNAS, August 13, 2018 The Certificate Registration Number is L5795.</p> <p>The Laboratory has been assessed and proved to be in compliance with ISO17025 Listed by A2LA, November 01, 2017 The Certificate Registration Number is 4429.01</p> <p>Listed by FCC, November 06, 2017 Test Firm Registration Number: 907417</p> <p>Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743A</p>
Test Site Location	:	Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

4. Maximum RF Output Power of EUT

Mode	Band	RF Output Power (dBm)	Maximum RF Output Power with Tune-up tolerance (dBm)
GSM 850	GPRS 850	32.48	35
	EGPRS 850	26.13	30
GSM 1900	GPRS 1900	28.98	33
	EGPRS 1900	25.35	28
WCDMA	Band II	22.77	25.5
WCDMA	Band V	22.55	25.5
LTE	Band 2	24.03	25.5
	Band 4	24.20	25.5
	Band 5	25.17	25.5
	Band 7	23.88	25.5
	Band 12	24.81	25.5
	Band 13	24.62	25.5
	Band 25	24.85	25.5
	Band 26	24.80	25.5
	Band 41	22.83	25.5
WLAN	2.4G	16.22	20.0

5. RF Exposure Evaluation Results

Band	Frequency (MHz)	Max. RF Power (dBm)	Ant. Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density Ratio
LTE Band 2	1850.7	25.5	2.81	28.31	677.64	0.1348	1.0000	0.1348
LTE Band 4	1710.7	25.5	3.89	29.39	868.96	0.1729	1.0000	0.1729
LTE Band 5	824.7	25.5	0.22	25.72	373.25	0.0743	0.5498	0.1351
LTE Band 7	2502.5	25.5	1.70	27.20	524.81	0.1044	1.0000	0.1044
LTE Band 12	699.7	25.5	-1.38	24.12	258.23	0.0514	0.4665	0.1102
LTE Band 13	779.5	25.5	-1.18	24.32	270.40	0.0538	0.5197	0.1035
LTE Band 25	1850.7	25.5	2.81	28.31	677.64	0.1348	1.0000	0.1348
LTE Band 26	814.7	25.5	0.22	25.72	373.25	0.0743	0.5498	0.1351
LTE Band 41	2498.5	25.5	1.70	27.20	524.81	0.1044	1.0000	0.1044
WIFI 2.4G	2412	20.0	4.37	24.37	273.53	0.0544	1.0000	0.0544
GSM 850 - GPRS	824.2	35	0.69	35.69	463.45	0.0922	0.5495	0.1678
GSM 850 - EGPRS	824.2	30	0.69	30.69	146.55	0.0292	0.5495	0.0531
GSM 1900 - GPRS	1850.2	33	2.82	35.82	477.53	0.0950	1.0000	0.0950
GSM 1900 - EGPRS	1850.2	28	2.82	30.82	151.01	0.0300	1.0000	0.0300
WCDMA Band V	826.4	25.5	2.82	28.32	679.20	0.1351	0.5509	0.2452
WCDMA Band II	1852.4	25.5	0.69	26.19	415.91	0.0827	1.0000	0.0827

Remark:

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

2. Max EIRP for GSM = Max EIRP + Time Average Factor

Time Average factor: - 9.03dB (1 slot) / Time Average factor: - 6.02dB (2 slot)

Time Average factor: - 4.26dB (3 slot) / Time Average factor: - 3.01dB (4 slot)

RF exposure evaluation for simultaneity transmitting condition:

Maximum GSM / WCDMA / LTE Power Density Ratio	Maximum WLAN Density Ratio	Total Power Density Ratio	Power Density Ratio Limit
0.2452	0.0544	0.2996	1

---End---