RF Exposure Evaluation Report

APPLICANT	:	Emerson Digital Cold Chain, Inc.
EQUIPMENT	:	GO Tracker 2.1
BRAND NAME	:	Emerson
MODEL NAME	:	GO Tracker 2.1
FCC ID	:	AMH101018
STANDARD	:	47 CFR Part 2.1091 FCC KDB 447498 D01 v06

We, Sporton International Inc. (Shenzhen), 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 Inc. (Shenzhen), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.01

Sporton International Inc. (Shenzhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA230701	Rev. 01	Initial issue of report.	Apr. 22, 2022

1. Administration Data

1.1. Testing Laboratory

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

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
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.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	Emerson Digital Cold Chain, Inc.
Address	7121 Fairway Drive Suite 400 Palm Beach Gardens Florida 33418 United States

Manufacturer	
Company Name	Queclink Wireless Solutions Co., Ltd.
Address	No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	GO Tracker 2.1
Brand Name	Emerson
Model Name	GO Tracker 2.1
FCC ID	AMH101018
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz LTE Category M1: LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 85 : 698 MHz ~ 716 MHz NB-IOT Category NB2 : NB-IOT Band 2 : 1850 MHz ~ 1910 MHz NB-IOT Band 4 : 1710 MHz ~ 1755 MHz NB-IOT Band 5 : 824 MHz ~ 849 MHz NB-IOT Band 12 : 699 MHz ~ 716 MHz NB-IOT Band 13 : 777 MHz ~ 787 MHz NB-IOT Band 25 : 1850 MHz ~ 1915 MHz NB-IOT Band 66 : 1710 MHz ~ 1780 MHz NB-IOT Band 71 : 663 MHz ~ 698 MHz NB-IOT Band 85 : 698 MHz ~ 716 MHz
Mode	GPRS/EGPRS LTE Category M1: QPSK / 16QAM NB-IOT Category NB2 :BPSK / QPSK
HW Version	V2.01
SW Version	R00A01V15
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Comments and Explanations:
1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain and the safe distance used for evaluate RF exposure were declared by manufacturer.

3. Maximum RF average output tune up power among production units

<GSM>

Mode	Burst average power(dBm)	
	GSM 850	GSM 1900
GPRS (1 Tx slot)	35.00	32.00
GPRS (2 Tx slots)	35.00	31.00
GPRS (3 Tx slots)	33.00	30.00
GPRS (4 Tx slots)	31.00	29.00
EDGE (1 Tx slot)	28.00	28.00
EDGE (2 Tx slots)	27.00	27.00
EDGE (3 Tx slots)	25.00	25.00
EDGE (4 Tx slots)	24.00	24.00

<LTE>

Mode		Maximum Average power(dBm)
LTE Cat M1	Band 2	25.70
	Band 4	25.70
	Band 5	25.70
	Band 12	25.70
	Band 13	25.70
	Band 25	25.70
	Band 66	25.70
	Band 85	25.70
NB-IOT	Band 2	25.70
	Band 4	25.70
	Band 5	25.70
	Band 12	25.70
	Band 13	25.70
	Band 25	25.70
	Band 66	25.70
	Band 71	25.70
	Band 85	25.70

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)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
GPRS 850 (1 Tx slot)	824.2	-1.10	35.00	33.900	2.455	309.030	0.062	0.549
GPRS 850 (2 Tx slots)	824.2	-1.10	35.00	33.900	2.455	616.595	0.123	0.549
GPRS 850 (3 Tx slots)	824.2	-1.10	33.00	31.900	1.549	580.764	0.116	0.549
GPRS 850 (4 Tx slots)	824.2	-1.10	31.00	29.900	0.977	489.779	0.097	0.549
EGPRS 850 (1 Tx slot)	824.2	-1.10	28.00	26.900	0.490	61.660	0.012	0.549
EGPRS 850 (2 Tx slots)	824.2	-1.10	27.00	25.900	0.389	97.724	0.019	0.549
EGPRS 850 (3 Tx slots)	824.2	-1.10	25.00	23.900	0.245	92.045	0.018	0.549
EGPRS 850 (4 Tx slots)	824.2	-1.10	24.00	22.900	0.195	97.724	0.019	0.549
GPRS 1900 (1 Tx slot)	1850.2	1.40	32.00	33.400	2.188	275.423	0.055	1.000
GPRS 1900 (2 Tx slots)	1850.2	1.40	31.00	32.400	1.738	436.516	0.087	1.000
GPRS 1900 (3 Tx slots)	1850.2	1.40	30.00	31.400	1.380	517.607	0.103	1.000
GPRS 1900 (4 Tx slots)	1850.2	1.40	29.00	30.400	1.096	549.541	0.109	1.000
EGPRS 1900 (1 Tx slot)	1850.2	1.40	28.00	29.400	0.871	109.648	0.022	1.000
EGPRS 1900 (2 Tx slots)	1850.2	1.40	27.00	28.400	0.692	173.780	0.035	1.000
EGPRS 1900 (3 Tx slots)	1850.2	1.40	25.00	26.400	0.437	163.682	0.033	1.000
EGPRS 1900 (4 Tx slots)	1850.2	1.40	24.00	25.400	0.347	173.780	0.035	1.000
CAT M1 Band 2	1850.7	1.40	25.70	27.100	0.513	512.861	0.102	1.000
CAT M1 Band 4	1710.7	1.60	25.70	27.300	0.537	537.032	0.107	1.000
CAT M1 Band 5	824.7	-1.10	25.70	24.600	0.288	288.403	0.057	0.550
CAT M1 Band 12	699.7	-6.40	25.70	19.300	0.085	85.114	0.017	0.466
CAT M1 Band 13	779.5	-2.60	25.70	23.100	0.204	204.174	0.041	0.520
CAT M1 Band 25	1850.7	1.40	25.70	27.100	0.513	512.861	0.102	1.000
CAT M1 Band 66	1710.7	1.60	25.70	27.300	0.537	537.032	0.107	1.000
CAT M1 Band 85	700.5	-6.40	25.70	19.300	0.085	85.114	0.017	0.467
NB-IOT Band 2	1850.1	1.40	25.70	27.100	0.513	512.861	0.102	1.000
NB-IOT Band 4	1710.1	1.60	25.70	27.300	0.537	537.032	0.107	1.000
NB-IOT Band 5	824.1	-1.10	25.70	24.600	0.288	288.403	0.057	0.549
NB-IOT Band 12	699.1	-6.40	25.70	19.300	0.085	85.114	0.017	0.466
NB-IOT Band 13	777.1	-2.60	25.70	23.100	0.204	204.174	0.041	0.518
NB-IOT Band 25	1850.1	1.40	25.70	27.100	0.513	512.861	0.102	1.000
NB-IOT Band 66	1710.1	1.60	25.70	27.300	0.537	537.032	0.107	1.000
NB-IOT Band 71	663.1	-11.00	25.70	14.700	0.030	29.512	0.006	0.442
NB-IOT Band 85	698.1	-6.40	25.70	19.300	0.085	85.114	0.017	0.465

Note:

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

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

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