

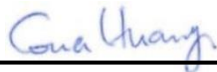
RF EXPOSURE EVALUATION REPORT

FCC ID : COFNCT8101
Equipment : Infinitracker
Brand Name : Infinitracker
Model Name : NCT-8101
Applicant : Universal Global Scientific Industrial Co., Ltd.
141, Lane 351, Sec. 1, Taiping Road., Tsaotuen,
Nantou 54261, Taiwan
Manufacturer : Universal Global Scientific Industrial Co., Ltd.
141, Lane 351, Sec. 1, Taiping Road., Tsaotuen,
Nantou 54261, Taiwan
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part 2.1091 and it complies with applicable limit.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.



Approved by: Cona Huang / Deputy Manager

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
Equipment	Infinitracker
Brand Name	Infinitracker
EUT Type	IoT Gateway
Model Name	NCT-8101
FCC ID	COFNCT8101
Wireless Technology and Frequency Range	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 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 66: 1710 MHz ~ 1780 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	LTE: BPSK, QPSK, 16QAM Bluetooth LE
HW Version	V2.0
SW Version	mfw_nrf9160_1.2.0
EUT Stage	Identical Prototype

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

Reviewed by: Jason Wang

Report Producer: Ching Chen

Band	Antenna Gain (dBi)
LTE B2	3.06
LTE B4	2.24
LTE B5	0.28
LTE B12	0.84
LTE B13	1.25
LTE B17	0.84
LTE B25	3.06
LTE B26	0.59
LTE B66	2.38

2. Maximum RF average output power among production units
<LTE Cat M1>

Band	Maximum Average Power (dBm)
LTE B2	22.5
LTE B4	22.5
LTE B5	22.5
LTE B12	23.0
LTE B13	23.0
LTE B17	23.0
LTE B25	22.0
LTE B26	22.5
LTE B66	22.5

<LTE NB-IOT>

Band	Maximum Average Power (dBm)
LTE B2	22.5
LTE B4	23.0
LTE B5	23.0
LTE B12	23.0
LTE B13	23.0
LTE B17	23.0
LTE B25	23.0
LTE B26	23.0
LTE B66	23.0

Mode	Average power (dBm)	
	LE	
	1Mbps	2Mbps
Tune-up Limit	6.5	6.5



3. 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/f ²)	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/f ²)	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



4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

Band	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
LTE Band 2	3.06	22.50	25.560	0.360	359.749	0.072	1.000	0.072
LTE Band 4	2.24	23.00	25.240	0.334	334.195	0.067	1.000	0.067
LTE Band 5	0.28	23.00	23.280	0.213	212.814	0.042	0.549	0.077
LTE Band 12	0.84	23.00	23.840	0.242	242.103	0.048	0.466	0.103
LTE Band 13	1.25	23.00	24.250	0.266	266.073	0.053	0.518	0.102
LTE Band 17	0.84	23.00	23.840	0.242	242.103	0.048	0.469	0.103
LTE Band 25	3.06	23.00	26.060	0.404	403.645	0.080	1.000	0.080
LTE Band 26	0.59	23.00	23.590	0.229	228.560	0.045	1.000	0.045
LTE Band 66	2.38	23.00	25.380	0.345	345.144	0.069	1.000	0.069
Bluetooth	1.29	6.50	7.790	0.006	6.012	0.001	1.000	0.001

4.2. Collocated Power Density Calculation

WWAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WWAN +Bluetooth
0.103	0.001	0.104

Note:

- For collocation analysis, LTE Band 12 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
- 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 + Bluetooth.
- Considering the WWAN collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

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