



RF Exposure Evaluation Report

APPLICANT : Thundercomm Technology Co., Ltd
EQUIPMENT : Cellular Module
BRAND NAME : TurboX
MODEL NAME : CM6125
FCC ID : 2AOHHTURBOXCM6125
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.



Approved by: Si Zhang

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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	Thundercomm Technology Co., Ltd
Address	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122

Manufacturer	
Company Name	Thundercomm Technology Co., Ltd
Address	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122



2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Cellular Module
Brand Name	TurboX
Model Name	CM6125
FCC ID	2AOHHTURBOXCM6125
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 41: 2535 MHz ~ 2655 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM 802.11b/g/n HT20/HT40 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
Antenna Gain	WCDMA Band II : 3.0 dBi WCDMA Band IV : 4.5 dBi WCDMA Band V : 1.2 dBi LTE Band 2 : 3.0 dBi LTE Band 4 : 4.5 dBi LTE Band 5 : 1.2 dBi LTE Band 7 : 4.0 dBi LTE Band 12 : 1.2 dBi LTE Band 13 : 1.2 dBi LTE Band 14 : 1.2 dBi LTE Band 17 : 1.2 dBi LTE Band 25 : 3.0 dBi LTE Band 26 : 1.2 dBi LTE Band 41 : 4.0 dBi LTE Band 66: 4.5 dBi LTE Band 71: 2.0 dBi WLAN2.4GHz/Bluetooth: 4.0 dBi WLAN5.2GHz: 3.1 dBi WLAN5.3GHz: 3.2 dBi WLAN5.5GHz: 3.2 dBi WLAN5.8GHz: 3.1 dBi
Antenna Type	WWAN : Monopole Antenna WLAN5GHz : Dipole Antenna



	WLAN2.4GHz/Bluetooth : Monopole Antenna
HW Version	V03
SW Version	Turbox-CM6125_xx.xx_la1.0.V.userdebug.20220509.0843
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The EUT has no voice function.

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 also the safe distance used for evaluate RF exposure were declared by manufacturer.



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

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	24.00
	Band IV	24.00
	Band V	24.00

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	24.00
	Band 4	24.00
	Band 5	24.00
	Band 7	24.00
	Band 12	24.00
	Band 13	24.00
	Band 14	24.00
	Band 17	24.00
	Band 25	24.00
	Band 26	24.00
	Band 41	24.00
	Band 66	24.00
	Band 71	24.00



<2.4GHz WLAN>

Frequency	Mode	Maximum Average Power (dBm)
WLAN 2.4GHz	802.11b	18.00
	802.11g	17.00
	802.11n-HT20	17.00
	802.11n-HT40	17.00

<5GHz WLAN>

Frequency	Mode	Maximum Average Power (dBm)
WLAN 5.2GHz	802.11a	16.50
	802.11n-HT20	15.50
	802.11n-HT40	16.00
	802.11ac-VHT20	15.50
	802.11ac-VHT40	16.00
	802.11ac-VHT80	16.00
WLAN 5.3GHz	802.11a	16.50
	802.11n-HT20	15.50
	802.11n-HT40	16.00
	802.11ac-VHT20	15.50
	802.11ac-VHT40	16.00
	802.11ac-VHT80	16.00
WLAN 5.5GHz	802.11a	16.50
	802.11n-HT20	15.50
	802.11n-HT40	16.50
	802.11ac-VHT20	15.50
	802.11ac-VHT40	16.50
	802.11ac-VHT80	16.50
WLAN 5.8GHz	802.11a	16.50
	802.11n-HT20	16.00
	802.11n-HT40	16.50
	802.11ac-VHT20	15.50
	802.11ac-VHT40	16.50
	802.11ac-VHT80	16.50

<Bluetooth>

Frequency	Mode	Maximum Average Power (dBm)
Bluetooth	BR/EDR	13.00
	LE	9.00



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/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



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)	Power Density / Limit
WCDMA Band 2	1852.4	3.00	24.00	27.000	501.187	0.100	1.000	0.100
WCDMA Band 4	1712.4	4.50	24.00	28.500	707.946	0.141	1.000	0.141
WCDMA Band 5	826.4	1.20	24.00	25.200	331.131	0.066	0.551	0.120
LTE Band 2	1850.7	3.00	24.00	27.000	501.187	0.100	1.000	0.100
LTE Band 4	1710.7	4.50	24.00	28.500	707.946	0.141	1.000	0.141
LTE Band 5	824.7	1.20	24.00	25.200	331.131	0.066	0.550	0.120
LTE Band 7	2502.5	4.00	24.00	28.000	630.957	0.126	1.000	0.126
LTE Band 12	699.7	1.20	24.00	25.200	331.131	0.066	0.466	0.141
LTE Band 13	779.5	1.20	24.00	25.200	331.131	0.066	0.520	0.127
LTE Band 14	790.5	1.20	24.00	25.200	331.131	0.066	0.527	0.125
LTE Band 17	706.5	1.20	24.00	25.200	331.131	0.066	0.471	0.140
LTE Band 25	1850.7	3.00	24.00	27.000	501.187	0.100	1.000	0.100
LTE Band 26	814.7	1.20	24.00	25.200	331.131	0.066	0.543	0.121
LTE Band 41	2537.5	4.00	24.00	28.000	630.957	0.126	1.000	0.126
LTE Band 66	1710.7	4.50	24.00	28.500	707.946	0.141	1.000	0.141
LTE Band 71	665.5	2.00	24.00	26.000	398.107	0.079	0.444	0.179
Bluetooth	2402.0	4.00	13.00	17.000	50.119	0.010	1.000	0.010
2.4GHz WLAN	2412.0	4.00	18.00	22.000	158.489	0.032	1.000	0.032
5.2GHz WLAN	5180.0	3.10	16.50	19.600	91.201	0.018	1.000	0.018
5.3GHz WLAN	5260.0	3.20	16.50	19.700	93.325	0.019	1.000	0.019
5.5GHz WLAN	5500.0	3.20	16.50	19.700	93.325	0.019	1.000	0.019
5.8GHz WLAN	5745.0	3.10	16.50	19.600	91.201	0.018	1.000	0.018

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.



5.2. Collocated Power Density Calculation

Power Density / Limit				Σ (Power Density / Limit) of WWAN+2.4GHz WLAN/ WWAN+5GHz WLAN/ WWAN+ Bluetooth
1	2	3	4	1+ max(2, 3, 4)
WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	
0.179	0.032	0.019	0.010	0.211

Note:

For collocation analysis, LTE Band 71 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.

1. Chose the worst power density among WLAN2.4/5GHz/BT to do co-located.
2. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
3. According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
4. According to the EUT characteristic, WLAN 2.4GHz and WLAN 5GHz can't transmit simultaneously.
5. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)].

Conclusion:

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

-----THE END-----