TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID. ..... :	2BBDNWNP296
Test Report No..... :	TCT250227E036
Date of issue..... :	Mar. 13, 2025
Testing laboratory ..... :	SHENZHEN TONGCE TESTING LAB
Testing location/ address:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China
Applicant's name..... :	Flaircomm Microelectronics, Inc.
Address..... :	7F, Guomai Building, Guomai Science and Technology Park, 116 JiangBin East Avenue, Mawei District, Fuzhou, Fujian, 350015 China
Manufacturer's name ... :	Flaircomm Microelectronics, Inc.
Address..... :	7F, Guomai Building, Guomai Science and Technology Park, 116 JiangBin East Avenue, Mawei District, Fuzhou, Fujian, 350015 China
Standard(s) ..... :	FCC CFR Title 47 Part 1.1307 FCC CFR Title 47 Part 2.1093 KDB 447498 D01 V06
Product Name..... :	Telematics Control Unit
Trade Mark ..... :	N/A
Model/Type reference..... :	FLC-WNP296, FLC-WNP296X, FLC-STU296X
Rating(s)..... :	DC 9V-16V
Date of receipt of test item ..... :	Feb. 26, 2025
Date (s) of performance of test..... :	Feb. 26, 2025 ~ Mar. 13, 2025
Tested by (+signature) ... :	Rleo LIU
Check by (+signature).... :	Beryl ZHAO
Approved by (+signature):	Tomsin

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1. General Product Information

1.1. EUT description

Product Name.....:	Telematics Control Unit
Model/Type reference.....:	FLC-WNP296
Sample Number.....:	TCT250227E006-0101
Operation Frequency.....:	For BLE: 2402MHz~2480MHz For GSM: TX: GSM/GPRS/EGPRS 850: 824.2MHz ~ 848.8MHz GSM/GPRS/EGPRS 1900: 1850.2MHz ~ 1909.8MHz RX: GSM/GPRS/EGPRS 850: 869.2MHz ~ 893.8MHz GSM/GPRS/EGPRS 1900: 1930.2MHz ~ 1989.8MHz For WCDMA: WCDMA Band V: TX: 826.4MHz ~ 846.6MHz RX: 871.4MHz ~ 891.6MHz WCDMA Band IV: TX: 1712.4MHz ~ 1752.6MHz RX: 2112.4MHz ~ 2152.6MHz WCDMA Band II: TX:1852.4MHz ~ 1907.6MHz RX: 1932.4MHz ~ 1987.6MHz For LTE: LTE Band 2: TX: 1850 MHz ~ 1910 MHz RX: 1930 MHz ~ 1990 MHz LTE Band 4: TX: 1710 MHz ~ 1755 MHz RX: 2110 MHz ~ 2155 MHz LTE Band 5: TX: 824 MHz ~ 849 MHz RX: 869 MHz ~ 894 MHz LTE Band 7: TX: 2500 MHz ~ 2570 MHz RX: 2620 MHz ~ 2690 MHz LTE Band 41: TX: 2555 MHz ~ 2655 MHz RX: 2555 MHz ~ 2655 MHz
Modulation Type.....:	For BLE: GFSK For GSM: GSM/GPRS: GMSK EGPRS: 8PSK WCDMA/HSDPA/HSUPA: QPSK For LTE: QPSK/16QAM
Antenna Type.....:	For BLE: Chip Antenna For GSM/WCDMA/LTE: FPC Antenna and External Antenna (Optional) Note: The two antennas are transmitted from the same port and only one works at the same time.

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Antenna Gain.....:	For BLE: 1.60dBi For GSM: GSM/GPRS/EGPRS 850: -4.11dBi GSM/GPRS/EGPRS 1900: -1.80dBi For WCDMA: WCDMA Band V: -4.11dBi WCDMA Band IV: -2.29dBi WCDMA Band II: -1.80dBi For LTE: LTE Band 2: -1.80dBi LTE Band 4: -2.29dBi LTE Band 5: -4.11dBi LTE Band 7: -2.88dBi LTE Band 41: -1.87dBi
Rating(s).....:	DC 9V-16V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

No.	Model No.	Tested with
1	FLC-WNP296	☒
Other models	FLC-WNP296X, FLC-STU296X	☐

Note: FLC-WNP296 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of FLC-WNP296 can represent the remaining models.

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2. General Information

2.1. Test environment and mode

Item	Normal condition
Temperature	+25ºC
Voltage	DC 12V
Humidity	56%
Atmospheric Pressure:	1010 mbar
Test Mode:	
Transmitting Mode:	Keep the EUT in continuous transmitting by select channel

2.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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3. Facilities and Accreditations

3.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

  SHENZHEN TONGCE TESTING LAB

  Designation Number: CN1205

  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- A2LA-No.: 4320.01

  SHENZHEN TONGCE TESTING LAB

  The testing lab has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

3.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4. Test Results and Measurement Data

According to §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Remark: 1) **For BLE:** The maximum output power for antenna is 5.42dBm (3.48mW) at 2480MHz, 1.60dBi antenna gain(with 1.45 numeric antenna gain.)

For GPRS850: The maximum output power for antenna is 33.30dBm (2137.96mW) at 836.6MHz, -4.11dBi antenna gain(with 0.39 numeric antenna gain.)

For GPRS1900: The maximum output power for antenna is 29.41dBm (872.97mW) at 1909.8MHz, -1.80dBi antenna gain(with 0.66 numeric antenna gain.)

For WCDMA Band V: The maximum output power for antenna is 24.23dBm (264.85mW) at 846.6MHz, -4.11dBi antenna gain(with 0.39 numeric antenna gain.)

For WCDMA Band IV: The maximum output power for antenna is 23.11dBm (204.64mW) at 1712.4MHz, -2.29dBi antenna gain(with 0.59 numeric antenna gain.)

For WCDMA Band II: The maximum output power for antenna is 23.06dBm (202.30mW) at 1852.4MHz, -1.80dBi antenna gain(with 0.66 numeric antenna gain.)

For LTE Band 2: The maximum output power for antenna is 20.33dBm (107.89mW) at 1850.7MHz, -1.80dBi antenna gain(with 0.66 numeric antenna gain.)

For LTE Band 4: The maximum output power for antenna is 20.08dBm (101.86mW) at 1745MHz, -2.29dBi antenna gain(with 0.59 numeric antenna gain.)

For LTE Band 5: The maximum output power for antenna is 16.66dBm (46.34mW) at 836.5MHz, -4.11dBi antenna gain(with 0.39 numeric antenna gain.)

For LTE Band 7: The maximum output power for antenna is 18.82dBm (76.21mW) at 2505MHz, -2.88dBi antenna gain(with 0.52 numeric antenna gain.)

For LTE Band 41: The maximum output power for antenna is 20.08dBm (101.86mW) at 2560MHz, -1.87dBi antenna gain(with 0.65 numeric antenna gain.)

2) For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

Calculation:

Given $E = \frac{\sqrt{30*P*G}}{d}$ & $S = \frac{E^2}{3770}$

Where *E = Field strength in Volts / meter*
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Substituting the MPE safe distance using d=20cm into above equation.
Yields: *S=0.000199*P*G*

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

F=frequency in MHz
*=Plane-wave equivalent power density
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

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Mode	Power(mW)	numeric antenna gain	Power density (mW/cm^2)	Limit (mW/cm^2)	Result
BLE	3.48	1.60	0.001108	1	PASS
GPRS850	2137.96	0.39	0.165927	0.557733	
GPRS1900	872.97	0.66	0.114656	1	
WCDMA Band V	264.85	0.39	0.020555	0.564400	
WCDMA Band IV	204.64	0.59	0.024027	1	
WCDMA Band II	202.30	0.66	0.026570	1	
LTE Band 2	107.89	0.66	0.014170	1	
LTE Band 4	101.86	0.59	0.011959	1	
LTE Band 5	46.34	0.39	0.003596	0.557667	
LTE Band 7	76.21	0.52	0.007886	1	
LTE Band 41	101.86	0.65	0.013176	1	

The device contain transmitters (BLE & GSM, BLE & WCDMA, BLE & LTE) can transmit multiple transmission modes at the same time.

Maximum Emissions Level			
Mode	Total MPE	Limit	Result
BLE & GSM	0.167035	1.0	Pass
BLE & WCDMA	0.027678		
BLE & LTE	0.014284		

*****END OF REPORT*****

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