



RF EXPOSURE EVALUATION REPORT

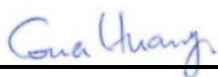
FCC ID : LHJ-FE4NA0210
Equipment : FE4NA0210
Brand Name : Continental
Model Name : FE4NA0210
Applicant : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd.
Manufacturer : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd
Standard : 47 CFR Part 2.1091

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

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

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History of this test report

Report No.	Version	Description	Issued Date
FA031205	Rev. 01	Initial issue of report	Jul. 24, 2020

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	FE4NA0210
Brand Name	Continental
Model Name	FE4NA0210
FCC ID	LHJ-FE4NA0210
Wireless Technology and Frequency Range	WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 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 14: 788 MHz ~ 798 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM
HW Version	FE4NA0210
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: Wan Liu

2. Maximum RF average output power among production units

Mode		Maximum Average power(dBm)
WCDMA	Band II	24
	Band IV	24
	Band V	24
LTE	Band 2	24
	Band 4	24
	Band 5	24
	Band 12	24
	Band 13	24
	Band 14	24
	Band 66	24



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	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP (dBm)	Maximum ERP (W)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum Output Power Limit (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
WCDMA Band 2	1850	9.00	24.00	30.850	1.216	33.000	1.995	2.000	1995.262	0.397	1.000
WCDMA Band 4	1710	6.00	24.00	27.850	0.610	30.000	1.000	1.000	1000.000	0.199	1.000
WCDMA Band 5	826	10.00	24.00	31.850	1.531	34.000	2.512	7.000	2511.886	0.500	0.551
LTE Band 2	1850	9.00	24.00	30.850	1.216	33.000	1.995	2.000	1995.262	0.397	1.000
LTE Band 4	1710	6.00	24.00	27.850	0.610	30.000	1.000	1.000	1000.000	0.199	1.000
LTE Band 5	824	9.00	24.00	30.850	1.216	33.000	1.995	7.000	1995.262	0.397	0.549
LTE Band 12	699	9.00	24.00	30.850	1.216	33.000	1.995	3.000	1995.262	0.397	0.466
LTE Band 13	777	9.00	24.00	30.850	1.216	33.000	1.995	3.000	1995.262	0.397	0.518
LTE Band 14	788	9.00	24.00	30.850	1.216	33.000	1.995	3.000	1995.262	0.397	0.525
LTE Band 66	1710	6.00	24.00	27.850	0.610	30.000	1.000	1.000	1000.000	0.199	1.000

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

4.2. Collocated 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)	Power Density / Limit
WCDMA Band 2	1850	9.00	24.00	33.0	2.00	1995.26	0.397	1.000	0.397
WCDMA Band 4	1710	6.00	24.00	30.0	1.00	1000.00	0.199	1.000	0.199
WCDMA Band 5	804	8.00	24.00	32.0	1.58	1584.89	0.315	0.536	0.589
LTE Band 2	1850	9.00	24.00	33.0	2.00	1995.26	0.397	1.000	0.397
LTE Band 4	1710	6.00	24.00	30.0	1.00	1000.00	0.199	1.000	0.199
LTE Band 5	824	8.00	24.00	32.0	1.58	1584.89	0.315	0.549	0.574
LTE Band 12	699	8.00	24.00	32.0	1.58	1584.89	0.315	0.466	0.677
LTE Band 13	777	8.00	24.00	32.0	1.58	1584.89	0.315	0.518	0.609
LTE Band 14	788	8.00	24.00	32.0	1.58	1584.89	0.315	0.525	0.601
LTE Band 66	1710	6.00	24.00	30.0	1.00	1000.00	0.199	1.000	0.199
WLAN2.4GHz Band	2412	5.0	26.0	31.0	1.26	1258.93	0.251	1.000	0.251
WLAN5GHz Band	5180	5.0	26.0	31.0	1.26	1258.93	0.251	1.000	0.251
Bluetooth	2402	5.0	15.0	20.0	0.10	100.00	0.020	1.000	0.020

Note:

1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 26dBm and for Bluetooth is less than or equal to 15dBm.
2. A maximum antenna gain of 5 dBi for WLAN/BT has been assumed for all collocated antennas.

WWAN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WWAN+WLAN+Bluetooth
0.677	0.251	0.020	0.948

Note:

1. 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 + WLAN + Bluetooth.
2. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant

**Conclusion:**

Based on FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Technology	Band	Maximum Conducted Power (dBm)	Stanalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
FE4NA0210	UMTS	2	24.0	9.00	9.00
		4	24.0	6.00	6.00
		5	24.0	10.00	8.00
	LTE	2	24.0	9.00	9.00
		4	24.0	6.00	6.00
		5	24.0	10.00	8.00
		12	24.0	9.00	8.00
		13	24.0	9.00	8.00
		14	24.0	9.00	8.00
		66	24.0	6.00	6.00