

RF EXPOSURE EVALUATION REPORT

FCC ID : LHJ-FE5NA0010
Equipment : FE5NA0010, FE5NA0011
Brand Name : Continental
Model Name : FE5NA0010, FE5NA0011
Applicant : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd., Deer Park, IL 60010, USA
Manufacturer : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd., Deer Park, IL 60010, USA
Standard : 47 CFR Part 1.1307

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part1.1307 and it complies with applicable limit.

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.

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



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1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	FE5NA0010, FE5NA0011
Brand Name	Continental
Model Name	FE5NA0010, FE5NA0011
FCC ID	LHJ-FE5NA0010
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 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
Host Information	
Equipment Name	G12N510G1, G12N500G1
Brand Name	Continental
Model Name	G12N510G1, G12N500G1
EUT Stage	Identical Prototype
Internal Antenna Information	
Brand Name	Continental
Model Name	INTANT01
External Antenna Information	
Brand Name	Molex
Model Name	26464255
GM P/N:	26464252
External Antenna Information	
Brand Name	Molex
Model Name	26464260
GM P/N:	26464253

Reviewed by: **Jason Wang**

Report Producer: **Daisy Peng**



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 7	24
	Band 12	24
	Band 13	24
	Band 14	24
	Band 66	24
	Band 71	24
5G NR	n2	24
	n5	24
	n25	24
	n41_HPUE	27
	n66	24
	n71	24
	n77_HPUE	27

3. Determination of exemption

Per 1.1307(b)(3), (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
- (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th} \text{ (mW)} = ERP_{20cm} (d / 20)^x \text{ for distance } d \leq 20cm$$

$$P_{th} \text{ (mW)} = ERP_{20cm} \text{ for distance } 20cm < d \leq 40cm$$

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} \sqrt{f}} \right)$$

$ERP_{20cm} \text{ (mW)}$	$0.3 \text{ GHz} \leq f < 1.5 \text{ GHz}:$	$2040 f$
	$1.5 \text{ GHz} \leq f \leq 6 \text{ GHz}:$	3060

- (C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2.$
1.34-30	$3,450 R^2/f^2.$
30-300	$3.83 R^2.$
300-1,500	$0.0128 R^2 f.$
1,500-100,000	$19.2 R^2.$



4. RF Exposure Evaluation

4.1. Standalone assessment

General Note:

- 1. Pi means the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm
2. Pth means the exemption threshold power (Pth) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i.
3. In this report, Part1.1307(b)(3)(i)(B) perform RF Exposure evaluation
4. The distance of 20cm is for this device.
5. The sum of the ratios of the applicable terms for MPE-based and MPE shall be less than 1, to determine LTE + NR simultaneous transmission exposure compliance.
6. The TCP antenna only support UMTS B2/4/5, LTE B2/4/5/7/12/13/14/66/71

<TCP antenna>

Table with 11 columns: Band, Antenna Gain (dBi), Maximum Conducted Power (dBm), Maximum EIRP (dBm), Maximum ERP (dBm), Maximum EIRP (mW), Maximum ERP (mW), Pi (dBm), Pi (mW), Part1.1307 option(b) Threshold (mW), Part1.1307 option(b) Pi/Pth. The table lists various bands including WCDMA and LTE bands with their respective power and exposure values.



<External sharkfin antenna>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	Pi (dBm)	Pi (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) Pi/Pth
WCDMA Band 2	5.70	24.00	29.7	27.55	933.25	568.85	27.55	568.85	3060.000	0.186
WCDMA Band 4	3.50	24.00	27.5	25.35	562.34	342.77	25.35	342.77	3060.000	0.112
WCDMA Band 5	5.50	24.00	29.5	27.35	891.25	543.25	27.35	543.25	1680.960	0.323
LTE Band 2	5.70	24.00	29.7	27.55	933.25	568.85	27.55	568.85	3060.000	0.186
LTE Band 4	3.50	24.00	27.5	25.35	562.34	342.77	25.35	342.77	3060.000	0.112
LTE Band 5	5.50	24.00	29.5	27.35	891.25	543.25	27.35	543.25	1680.960	0.323
LTE Band 7	1.70	24.00	25.7	23.55	371.54	226.46	24.00	251.19	3060.000	0.082
LTE Band 12	-0.30	24.00	23.7	21.55	234.42	142.89	24.00	251.19	1425.960	0.176
LTE Band 13	4.60	24.00	28.6	26.45	724.44	441.57	26.45	441.57	1585.080	0.279
LTE Band 14	4.60	24.00	28.6	26.45	724.44	441.57	26.45	441.57	1607.520	0.275
LTE Band 66	3.50	24.00	27.5	25.35	562.34	342.77	25.35	342.77	3060.000	0.112
LTE Band 71	0.50	24.00	24.5	22.35	281.84	171.79	24.00	251.19	1352.520	0.186
5G NR n2	5.70	24.00	29.7	27.55	933.25	568.85	27.55	568.85	3060.000	0.186
5G NR n5	5.50	24.00	29.5	27.35	891.25	543.25	27.35	543.25	1680.960	0.323
5G NR n25	5.70	24.00	29.7	27.55	933.25	568.85	27.55	568.85	3060.000	0.186
5G NR n41_HPUE	3.10	27.00	30.1	27.95	1023.29	623.73	27.95	623.73	3060.000	0.204
5G NR n66	3.50	24.00	27.5	25.35	562.34	342.77	25.35	342.77	3060.000	0.112
5G NR n71	0.50	24.00	24.5	22.35	281.84	171.79	24.00	251.19	1352.520	0.186
5G NR n77_HPUE	3.30	27.00	30.3	28.15	1071.52	653.13	28.15	653.13	3060.000	0.213

Maximum LTE Pi/Pth Ratio	Maximum 5G NR Pi/Pth Ratio	Σ (Pi/Pth Ratio) of LTE + 5G NR
0.323	0.323	0.646

Conclusion:

According to 47 CFR §1.1307, the RF exposure analysis concludes that the RF Exposure is FCC compliant.