VARIANT FCC RF TEST REPORT

Applicant:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA

Manufacturer or Supplier:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA
Product:	FE5NA0010, FE5NA0011
Brand Name:	Continental
Model Name:	FE5NA0010, FE5NA0011
FCC ID:	LHJ-FE5NA0010
Date of tests:	Jan. 19, 2023 ~ Feb. 23, 2023

The tests have been carried out according to the requirements of the following standard:

☒ **FCC PART 22, Subpart H** ☒ **FCC PART 24, Subpart E** ☒ **FCC Part 27, Subpart C, M** ☒ **FCC Part 2**
☒ **ANSI/TIA/EIA-603-D** ☒ **ANSI C63.26-2015**
☒ **ANSI/TIA/EIA-603-E**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Simon Wang Date: Feb. 23, 2023	Luke Lu Date: Feb. 23, 2023

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-220214W001RF05	Original release	Jul. 30, 2022
W7L-230201W001RF05	Based on the original product changing the software version, The new sample only verify conducted power. The results of conducted power are similar or lower, so the report conducted power doesn't updated.	Feb. 23, 2023

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1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22/24/27 & Part 2		
STANDARD SECTION	**TEST TYPE**	**RESULT**
§2.1046	Conducted Output Power	See Note
§22.913 (a)	Equivalent Radiated Power (5G NR n5)	See Note
§24.232(c)	Equivalent Isotropically Radiated Power (5G NR n2)	See Note
§2.1055 §22.355 §24.235	Frequency Stability	See Note
§2.1049	Occupied Bandwidth	See Note
§22.913 (d) §24.232(d)	Peak to average ratio*	See Note
§2.1051 §22.917(a) §24.238(a)	Band Edge Measurements	See Note
§2.1051 §22.917(a) §24.238(a)	Conducted Spurious Emissions	See Note
§2.1053 §22.917(a) §24.238(a)	Radiated Spurious Emissions	See Note

* Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.

NOTE: Please refer to the original report W7L-220214W001RF05.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Maximum Peak Output Power	±2.06dB
Frequency Stability	±76.97Hz
Radiated emissions (30MHz~1GHz)	±4.98dB
Radiated emissions (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Band Edge Measurements	±4.70dB
Peak to average ratio	±0.76dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 21,22	Feb. 20,23
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.15,22	May.14,23
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.04,22	Sep.03,23
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 06,22	Mar. 05,23
Horn Antenna	ETS-LINDGREN	3117	00168692	Mar. 06,22	Mar. 05,23
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 24, 22	Aug. 23, 23
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 15,22	Feb. 14,23
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,23	Feb. 13,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 21,22	Feb.20,23
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120	3.1.36	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	May. 07,22	May. 06,23
Power Meter	Anritsu	ML2495A	1506002	Feb. 22,22	Feb. 21,23
Power Sensor	Anritsu	MA2411B	1339352	May. 07,22	May. 06,23
Temperature Chamber	ESPEC	SH-242	93000855	May. 12,22	May. 11,23
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 18,22	Feb. 17,23
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 17,23	Feb. 16,24
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.12,22	May.11,23
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 24,22	Aug. 23,23

NOTE: 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	FE5NA0010, FE5NA0011	
BRAND NAME	Continental	
MODEL NAME	FE5NA0010, FE5NA0011	
NOMINAL VOLTAGE	EUT 4.0V	
MODULATION TYPE	**NR Band n2/n5**	DFT-s-OFMA(π/2 BPSK,QPSK,16QAM,64QAM,256QAM); CP-OFMA(QPSK,16QAM,64QAM,256QAM);
SUPPORT ENDC COMBINE	**NR Band n2**	5A_n2
		12A_n2
		14A_n2
	NR Band n5	2A_n5
		66A_n5
FREQUENCY RANGE	**NR Band n2**	1852.5MHz ~ 1907.5MHz
	NR Band n5	826.5MHz ~ 846.5MHz
MAX. ERP POWER MAX. ERP/EIRP POWER	**NR Band n2 Channel Bandwidth: 5MHz**	421.70mW
	NR Band n2 Channel Bandwidth: 10MHz	418.79mW
	NR Band n2 Channel Bandwidth: 15MHz	422.67mW
	NR Band n2 Channel Bandwidth: 20MHz	423.64mW
	NR Band n5 Channel Bandwidth: 5MHz	171.00mW
	NR Band n5 Channel Bandwidth: 10MHz	172.19mW

	NR Band n5 Channel Bandwidth: 15MHz	171.79mW
	NR Band n5 Channel Bandwidth: 20MHz	172.98mW
EMISSION DESIGNATORGOGN	**NR Band n5 Channel Bandwidth: 5MHz**	2BPSK: 4M51G7D
		QPSK: 4M49G7D
		16QAM: 4M49W7D
		64QAM: 4M50W7D
		256QAM: 4M50W7D
	NR Band n5 Channel Bandwidth: 10MHz	2BPSK: 8M92G7D
		QPSK: 8M91G7D
		16QAM: 8M92W7D
		64QAM: 8M91W7D
		256QAM: 8M92W7D
	NR Band n5 Channel Bandwidth: 15MHz	2BPSK: 13M5G7D
		QPSK: 13M5G7D
		16QAM: 13M5W7D
		64QAM: 13M5W7D
		256QAM: 13M5W7D
	NR Band n5 Channel Bandwidth: 20MHz	2BPSK: 17M9G7D
		QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
		256QAM: 17M9W7D
ANTENNA TYPE	Monopole Antenna with 2.45dBi gain for NR Band n2 Monopole Antenna with 0.58dBi gain for NR Band n5	
HW VERSION	FE5NA0010	P4.1
	FE5NA0011	P4.2
SW VERSION	MODEMSA515M_LE2.1_01.14.39	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-40-85 ℃	
EXTREME VOLTAGE	EUT 3.8V - EUT 4.2V	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
5G NR	1TX/4RX

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

4. Max ERP/EIRP is according to Max conducted power calculate for EN_DC combine.

5. According to the information provided by the manufacturer, The difference between FE5NA0010, FE5NA0011 is as follows:

TA-code	L2/L5 GNSS	Band Difference
FE5NA0010	support	/
FE5NA0011	not support	BOM change: depopulated passive components from the GNSS RF front-end

2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

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