

Report No.: SEWA2211000082RG04

Rev.: 01

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TEST REPORT

Application No.: SEWA2211000082RG
Applicant: Continental Automotive Systems, Inc.
Address of Applicant: 21440 West Lake Cook, Deer Park, Illinois 60010, USA
Manufacturer: Continental Automotive Systems, Inc.
Address of Manufacturer: 21440 West Lake Cook, Deer Park, Illinois 60010, USA
EUT Description: FE5RWR131
Model No.: FE5RWR131
Trade Mark: Continental
FCC ID: LHJ-FE5RWR131
Standards: 47 CFR Part 2.1091
FCC KDB 447498 D01 v06
Date of Receipt: 2023/02/01 (for report SEWA2211000080RG04)
2023/02/01 (for report SEWA2211000082RG04)
Date of Issue: 2023/09/08

Test Result:	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Well Wei

Well Wei
Wireless Laboratory Manager



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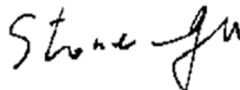
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/09/08		Original

Prepared By	
	(Nick Hu) / Test Engineer
Checked By	
	(Stone Gu) / Reviewer



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Remark:

This test report (Report No.: SEWA2211000082RG04 issue on 2023/09/08) is based on the original test report (Report No.: SEWA2211000080RG04 issued on 2023/08/31).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Therefore in this report the LTE Band 38 were recalculated and other items in this report are based on the previous report with report number SEWA2211000080RG04 issued on 2023/08/31.



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2 General Information

2.1 Client Information

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Address of Applicant:	21440 West Lake Cook, Deer Park, Illinois 60010, USA
Manufacturer:	Continental Automotive Systems, Inc.
Address of Manufacturer:	21440 West Lake Cook, Deer Park, Illinois 60010, USA

2.2 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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2.3 General Description of EUT

EUT Description:	FE5RWR131			
Model No.:	FE5RWR131			
Trade Mark:	Continental			
Hardware Version:	P1.1			
Software Version:	MODEMSA515M_LE.2.1_01.18.02			
Power Supply:	DC 14V			
Antenna Type:	☒ External, ☐ Integrated			
HPUE Power Class:	LTE Band 41; NR Band n77			
Antenna Gain:	GSM850:	2.56dBi (Ant1)	GSM1900:	1.93dBi (Ant1)
	WCDMA Band V:	2.56dBi (Ant1)		
	LTE Band 2:	1.93dBi (Ant1)	LTE Band 4:	1.93dBi (Ant1)
	LTE Band 5:	2.56dBi (Ant1)	LTE Band 7:	1.24dBi (Ant1)
	LTE Band 25:	1.93dBi (Ant1)	LTE Band 26:	2.56dBi (Ant1)
	LTE Band 38:	1.24dBi (Ant1)	LTE Band 41:	1.24dBi (Ant1)
	NR Band n77:	-0.84dBi (Ant2)		
	ENDC:			
	DC_2A_n77A; DC_5A_n77A; DC_7A_n77A; DC_41A_n77A			
Note:				
The antenna gain are derived from the gain information report provided by the manufacturer.				
Remark:				
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.				

3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

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).

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



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3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually

3.1.3 EUT RF Exposure Evaluation

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM850	824.2	2.56	33.50	33.91	38.45	0.0968	0.5495	7.10	10.10	7.10	Pass
GSM1900	1850.2	1.93	30.50	32.43	33.00	0.0419	1.0000	2.50	15.70	2.50	Pass
WCDMA Band V	826.4	2.56	24.00	24.41	38.45	0.0901	0.5509	16.60	10.42	10.42	Pass
LTE Band 2	1850.7	1.93	24.00	25.93	33.00	0.0779	1.0000	9.00	13.01	9.00	Pass
LTE Band 4	1710.7	1.93	24.00	25.93	30.00	0.0779	1.0000	6.00	13.01	6.00	Pass
LTE Band 5	824.7	2.56	24.00	24.41	38.45	0.0901	0.5498	16.60	10.41	10.41	Pass
LTE Band 7	2502.5	1.24	24.00	25.24	33.00	0.0665	1.0000	9.00	13.01	9.00	Pass
LTE Band 25	1850.7	1.93	24.00	25.93	33.00	0.0779	1.0000	9.00	13.01	9.00	Pass
LTE Band 26 (814-824)	814.7	2.56	24.00	24.41	NA	0.0901	0.5431	NA	10.36	10.36	Pass
LTE Band 26 (824-849)	824.7	2.56	24.00	24.41	38.45	0.0901	0.5498	16.60	10.41	10.41	Pass
LTE Band 38	2572.5	1.24	24.00	25.24	33.00	0.0665	1.0000	9.00	13.01	9.00	Pass
LTE Band 41	2498.5	1.24	24.00	25.24	33.00	0.0665	1.0000	9.00	13.01	9.00	Pass
LTE Band 41(HPUE)	2498.5	1.24	27.00	28.24	33.00	0.1327	1.0000	6.00	10.01	6.00	Pass
NR Band n77 (3700-3980)	3710.0	-0.84	24.00	23.16	30.00	0.0412	1.0000	6.00	13.01	6.00	Pass
NR Band n77 (3700-3980)(HPUE)	3710.0	-0.84	27.00	26.16	30.00	0.0822	1.0000	3.00	10.01	3.00	Pass



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Remark: Frame-average power=Burst power+ Division Factors (-9.19)

Due to the EUT support NR ENDC and CA

$$\sum_{i=1}^n \frac{S_{E_i}(\text{duty factor})}{MPE_{E_i}} < 1$$

Both LTE and NR/LTE band can transmit simultaneously, the formula of the calculated the MPE is:

NOTE The corresponding MEs must be expressed in terms of power density in the above summation

Therefore, the worst-case(DC_5A_n77A) situation is 0.164+0.082=0.246, which is less than “1”, this confirmed that the device comply with MPE limit.

---End of Report---



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