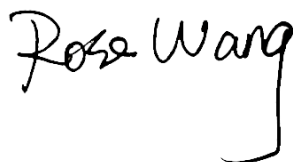


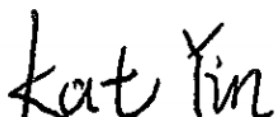
RF Exposure Evaluation Report

APPLICANT : Continental Automotive Systems, Inc.
EQUIPMENT : WT50RW02
BRAND NAME : Continental
MODEL NAME : WT50RW02
FCC ID : LHJ-WT50RW02
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

We, Sporton International (Kunshan) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Reviewed by: Rose Wang / Supervisor



Approved by: Kat Yin / Manager



Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA962519	Rev. 01	Initial issue of report	Aug. 06, 2019

**1. Administration Data****1.1. Testing Laboratory**

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

Applicant	
Company Name	Continental Automotive Systems, Inc.
Address	21440 W Lake Cook Rd.

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	WT50RW02
Brand Name	Continental
Model Name	WT50RW02
FCC ID	LHJ-WT50RW02
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz 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: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz
Mode	GPRS/EGPRS RMC 12.2Kbps HSDPA HSUPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM
HW Version	WT50RW02
EUT Stage	Identical Prototype
Remark: 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description. 2. This device does not support voice function. 3. This device supports GRPS/EGRPS mode up to multi-slot class 12.	

**3. Maximum RF average output power among production units****<GSM>**

Mode	Burst Average Power (dBm)	
	GSM 850	GSM 1900
GPRS 1 Tx slot	33.50	30.50
GPRS 2 Tx slots	31.50	28.50
GPRS 3 Tx slots	29.50	27.50
GPRS 4 Tx slots	28.00	26.50
EDGE 1 Tx slot	27.50	26.00
EDGE 2 Tx slots	25.50	25.50
EDGE 3 Tx slots	24.00	24.50
EDGE 4 Tx slots	22.50	22.50

<WCDMA>

Mode	Average Power (dBm)		
	WCDMA Band II	WCDMA Band IV	WCDMA Band V
RMC 12.2Kbps	24.50	24.50	24.50
HSDPA Subtest-1	23.00	23.00	23.00
HSDPA Subtest-2	23.00	23.00	23.00
HSDPA Subtest-3	22.50	22.50	22.50
HSDPA Subtest-4	22.50	22.50	22.50
HSUPA Subtest-1	23.00	23.00	23.00
HSUPA Subtest-2	21.00	21.00	21.00
HSUPA Subtest-3	22.00	22.00	22.00
HSUPA Subtest-4	21.00	21.00	21.00
HSUPA Subtest-5	23.00	23.00	23.00

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	24.00
	Band 4	24.00
	Band 5	24.00
	Band 7	24.00
	Band 38	24.00
	Band 41	24.00



4. 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



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone 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)
GPRS 850 (1 Tx slot)	824.2	4.50	33.50	38.00	6.31	794.33	0.158	0.549
GPRS 850 (2 Tx slots)	824.2	4.50	31.50	36.00	3.98	995.27	0.198	0.549
GPRS 850 (3 Tx slots)	824.2	4.50	29.50	34.00	1.53	941.89	0.187	0.549
GPRS 850 (4 Tx slots)	824.2	4.50	28.00	32.50	1.08	891.25	0.177	0.549
EGPRS 850 (1 Tx slot)	824.2	4.50	27.50	32.00	0.97	199.53	0.040	0.549
EGPRS 850 (2 Tx slots)	824.2	4.50	25.50	30.00	1.00	250.00	0.050	0.549
EGPRS 850 (3 Tx slots)	824.2	4.50	24.00	28.50	0.71	265.48	0.053	0.549
EGPRS 850 (4 Tx slots)	824.2	4.50	22.50	27.00	0.50	250.59	0.050	0.549
GPRS 1900 (1 Tx slot)	1850.2	2.50	30.50	33.00	2.00	251.19	0.050	1.000
GPRS 1900 (2 Tx slots)	1850.2	2.50	28.50	31.00	1.26	314.73	0.063	1.000
GPRS 1900 (3 Tx slots)	1850.2	2.50	27.50	30.00	1.00	374.97	0.075	1.000
GPRS 1900 (4 Tx slots)	1850.2	2.50	26.50	29.00	0.79	398.11	0.079	1.000
EGPRS 1900 (1 Tx slot)	1850.2	2.50	26.00	28.50	0.71	89.13	0.018	1.000
EGPRS 1900 (2 Tx slots)	1850.2	2.50	25.50	28.00	0.63	157.74	0.031	1.000
EGPRS 1900 (3 Tx slots)	1850.2	2.50	24.50	27.00	0.50	187.95	0.037	1.000
EGPRS 1900 (4 Tx slots)	1850.2	2.50	22.50	25.00	0.32	158.11	0.031	1.000
WCDMA Band 2	1852.4	2.50	24.50	27.00	0.50	501.19	0.100	1.000
WCDMA Band 4	1712.4	6.00	24.50	30.50	1.12	1122.02	0.223	1.000
WCDMA Band 5	826.4	4.50	24.50	29.00	0.79	794.33	0.158	0.551
LTE Band 2	1850.7	2.50	24.00	26.50	0.45	446.68	0.089	1.000
LTE Band 4	1710.7	6.00	24.00	30.00	1.00	1000.00	0.199	1.000
LTE Band 5	824.7	4.50	24.00	28.50	0.71	707.95	0.141	0.550
LTE Band 7	2502.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000
LTE Band 38	2572.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000
LTE Band 41	2505.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000

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

5.2. Collocated Power Density Calculation

Note:

1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 30dBm and for Bluetooth is less than or equal to 29dBm.
2. A maximum antenna gain of 7dBi for WLAN/BT has been assumed for all collocated antennas.

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
GPRS 850 (1 Tx slot)	824.2	4.50	33.50	38.00	6.31	794.33	0.158	0.549	0.288
GPRS 850 (2 Tx slots)	824.2	4.50	31.50	36.00	3.98	995.27	0.198	0.549	0.361
GPRS 850 (3 Tx slots)	824.2	4.50	29.50	34.00	2.51	941.89	0.187	0.549	0.341
GPRS 850 (4 Tx slots)	824.2	4.50	28.00	32.50	1.78	891.25	0.177	0.549	0.323
EGPRS 850 (1 Tx slot)	824.2	4.50	27.50	32.00	1.58	199.53	0.040	0.549	0.072
EGPRS 850 (2 Tx slots)	824.2	4.50	25.50	30.00	1.00	250.00	0.050	0.549	0.091
EGPRS 850 (3 Tx slots)	824.2	4.50	24.00	28.50	0.71	265.48	0.053	0.549	0.096
EGPRS 850 (4 Tx slots)	824.2	4.50	22.50	27.00	0.50	250.59	0.050	0.549	0.091
GPRS 1900 (1 Tx slot)	1850.2	2.50	30.50	33.00	2.00	251.19	0.050	1.000	0.050
GPRS 1900 (2 Tx slots)	1850.2	2.50	28.50	31.00	1.26	314.73	0.063	1.000	0.063
GPRS 1900 (3 Tx slots)	1850.2	2.50	27.50	30.00	1.00	374.97	0.075	1.000	0.075
GPRS 1900 (4 Tx slots)	1850.2	2.50	26.50	29.00	0.79	398.11	0.079	1.000	0.079
EGPRS 1900 (1 Tx slot)	1850.2	2.50	26.00	28.50	0.71	89.13	0.018	1.000	0.018
EGPRS 1900 (2 Tx slots)	1850.2	2.50	25.50	28.00	0.63	157.74	0.031	1.000	0.031
EGPRS 1900 (3 Tx slots)	1850.2	2.50	24.50	27.00	0.50	187.95	0.037	1.000	0.037
EGPRS 1900 (4 Tx slots)	1850.2	2.50	22.50	25.00	0.32	158.11	0.031	1.000	0.031
WCDMA Band II	1852.4	2.50	24.50	27.00	0.50	501.19	0.100	1.000	0.100
WCDMA Band IV	1712.4	6.00	24.50	30.50	1.12	1122.02	0.223	1.000	0.223
WCDMA Band V	826.4	4.50	24.50	29.00	0.79	794.33	0.158	0.551	0.287
LTE Band 2	1850.7	2.50	24.00	26.50	0.45	446.68	0.089	1.000	0.089
LTE Band 4	1710.7	6.00	24.00	30.00	1.00	1000.00	0.199	1.000	0.199
LTE Band 5	824.7	4.50	24.00	28.50	0.71	707.95	0.141	0.550	0.256
LTE Band 7	2502.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000	0.397
LTE Band 38	2572.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000	0.397
LTE Band 41	2505.5	9.00	24.00	33.00	2.00	1995.26	0.397	1.000	0.397
WLNA2.4GHz Band	2412	7.0	23.00	30.00	1.00	1000.00	0.199	1.000	0.199
WLNA5GHz Band	5180	7.0	23.00	30.00	1.00	1000.00	0.199	1.000	0.199
Bluetooth	2402	7.0	22.00	29.00	0.79	794.33	0.158	1.000	0.158

WWAN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN + Bluetooth
0.397	0.199	0.158	0.754

Note:

1. For collocation analysis, LTE Band 7 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. 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.
3. 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 47 CFR §2.1091 and FCC KDB 447498 D01 v06, 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	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
WT50RW02	GSM850	824.2	33.50	4.50	4.50
	GSM1900	1850.2	30.50	2.50	2.50
	WCDMA Band II	1852.4	24.50	2.50	2.50
	WCDMA Band IV	1712.4	24.50	6.00	6.00
	WCDMA Band V	826.4	24.50	4.50	4.50
	LTE Band 2	1850.7	24.00	2.50	2.50
	LTE Band 4	1710.7	24.00	6.00	6.00
	LTE Band 5	824.7	24.00	4.50	4.50
	LTE Band 7	2502.5	24.00	9.00	9.00
	LTE Band 38	2572.5	24.00	9.00	9.00
	LTE Band 41	2505.5	24.00	9.00	9.00
Collocated Transmitters	WLAN2.4GHz	2412.0	23.00		7.00
	WLAN5GHz	5180.0	23.00		7.00
	Bluetooth	2402.0	22.00		7.00