

## FCC 47 CFR MPE REPORT

Continental Automotive GmbH

CAR RADIO

Model Number: CRD4512UBA-OR

Additional Model: CR4512UBA-OR, TR4512UBA-OR, CRD4512UBA/AGC,

CR4512UBA/AGC, CR4511UA-OR, CRD4512UBA/KOM,

CRD4512UBA/CLA, CR4512UBA/CLA, CRD4512UBA/SDF,

CR4512UBA/SDF, CRD4612UBA, CR4612UBA, CRD4612UBA/KOM,

CRD4612UBA/PRI

FCC ID: Y7O-CRD4512UBA-OR

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## Maximum Permissible Exposure

### 1、Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

#### (a)、Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   2 ,   H   2 or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

#### (b)、Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   2 ,   H   2 or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.0	30

Note: f=frequency in MHz; \*Plane-wave equivalent power density

### 2、MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } P_d \text{ (W/m}^2\text{)} = E^2 / 377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$P_d = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

**3、Conducted Power Result**

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain	
					(dBi)	(Linear)
GFSK	2402	4.29	2.69	$4 \pm 2$	0	1
	2441	6.38	4.35	$6 \pm 2$	0	1
	2480	6.69	4.67	$6 \pm 2$	0	1
8-DPSK	2402	2.24	1.67	$2 \pm 2$	0	1
	2441	4.83	3.04	$5 \pm 2$	0	1
	2480	5.21	3.32	$5 \pm 2$	0	1
BLE	2402	6.05	4.03	$6 \pm 2$	0	1
	2440	7.04	5.06	$7 \pm 2$	0	1
	2480	7.26	5.32	$7 \pm 2$	0	1

**4、Calculated Result and Limit**

Mode	Target power ( dBm )	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
		(dBi)	(Linear)			
2.4G Band						
GFSK	8	0	1	0.00126	1	Compiles
8-DPSK	7	0	1	0.00100	1	Compiles
BLE	9	0	1	0.00158	1	Compiles