

**IEEE C95.1 2005  
KDB 447498 D01 V06  
47 C.F.R. Part 1, Subpart I, Section 1.1310  
47 C.F.R. Part 2, Subpart J, Section 2.1091**

## **RF EXPOSURE REPORT**

**For**

**Automotive Radar**

**Model: LRR-20**

**Trade Name: MANDO**

*Issued to*

**MANDO corp.**

**21, Pangyo-ro 255beon-gil, Bundang-gu, Gyeonggi-do, Seongnam-si, 463-400, South Korea**

*Issued by*

**Compliance Certification Services Inc.**

**No.11, Wugong 6th Rd., Wugu Dist.,  
New Taipei City 24891, Taiwan. (R.O.C.)**

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**Issued Date: September 30, 2016**



Testing Laboratory  
1309

## Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 30, 2016	Initial Issue	ALL	Doris Chu

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## 1. TEST RESULT CERTIFICATION

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

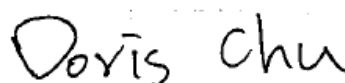
APPLICABLE STANDARDS	
STANDARD	TEST RESULT
IEEE C95.1 2005 KDB 447498 D03 47 C.F.R. Part 1, Subpart I, Section 1.1310 47 C.F.R. Part 2, Subpart J, Section 2.1091	No non-compliance noted

Approved by:



\_\_\_\_\_  
Miller Lee  
Manager  
Compliance Certification Services Inc.

Test by:



\_\_\_\_\_  
Doris Chu  
Report coordinator  
Compliance Certification Services Inc.

## 2. LIMIT

According to §15.247(i), 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 levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

## 3. EUT SPECIFICATION

<b>EUT</b>	Automotive Radar
<b>Model</b>	LRR-20
<b>Trade Name</b>	MANDO
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> 76.0 – 77.0 GHz <input type="checkbox"/> Others
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure ( $S = 5\text{mW}/\text{cm}^2$ ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ( $S=1\text{mW}/\text{cm}^2$ )
<b>Maximum Average output power (EIRP)</b>	76.0 – 77.0 GHz: 15.87 dBm (38.637 mW)
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

## 4. TEST RESULTS

**No non-compliance noted.**

### Calculation

Given  $E = \frac{\sqrt{30 \times P}}{d}$  &  $S = \frac{E^2}{377}$

Where  $E$  = Field strength in Volts / meter

$P$  = EIRP Power in Watts

$d$  = Distance in meters

$S$  = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P}{377 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000)}{377 \times (d/100)^2} = 0.0796 \times \frac{P}{d^2} \quad \textbf{Equation 1}$$

Where  $d$  = Distance in cm

$P$  = EIRP Power in mW

$S$  = Power density in mW / cm<sup>2</sup>

## 5. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using  $d = 20$  cm into Equation 1:

$$S = 0.000199 \times P$$

Where  $P = \text{EIRP Power in mW}$

$S = \text{Power density in mW / cm}^2$

### 76.0 – 77.0 GHz:

Frq.(GHz)	P (mW)	D (cm)	Power density in mW / cm <sup>2</sup>	Limit (mW/cm2)
76.5	38.637	20	0.0077	1