



Excellence in Compliance Testing

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## **Certification Exhibit**

**FCC ID: YKD-25TWD3000-029**

**FCC Rule Part: 15.247**

**ACS Project Number: 12-2102**

Manufacturer: L-3 Communications CyTerra Corporation  
Model: Range-R Link

## **RF Exposure**

**General Information:**

Applicant: L-3 Communications CyTerra Corporation  
 ACS Project: 12-2102  
 Device Category: Mobile (standalone); Handheld (integrated within host device Range-R)  
 Environment: General Population/Uncontrolled Exposure

**Technical Information:**

Antenna Type: Chip Antenna  
 Antenna Gain: 2 dBi  
 Maximum Transmitter Conducted Power: 16.064 dBm  
 Maximum System EIRP: 18.064 dBm, 64.03 mW  
 Exposure Conditions: Greater than 20 centimeters

MPE Calculation

The Power Density (mW/cm<sup>2</sup>) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

- S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)
- P = power input to the antenna (in appropriate units, e.g., mW)
- G = power gain of the antenna in the direction of interest relative to an isotropic radiator
- R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Stand Alone Mode:

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm <sup>2</sup> )	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )
2412	16.063814	1.00	40.40	2	1.585	20	0.013

Collocated Mode:

Summation of Power Densities – Simultaneous Transmissions

This Range-R Link (FCC ID: YKD-25TWD3000-029) when implemented within the Range-R host device is collocated with a radar transceiver (FCC ID: YKD-25TWD3000) operating at 3.18 GHz – 3.42 GHz. These radios can operate simultaneously and therefore the maximum RF exposure is determined by the summation of power densities. The limit utilized is the lower limit specified for all simultaneous transmitters. The limit used to show compliance to the 20cm separation distance is 1.0 mW/cm<sup>2</sup>.

The Range-R radar transceiver uses a 1 dBi Cavity-Backed spiral antenna.

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )
3180	14.24	1.00	26.55	1	1.259	20	0.007

The maximum power density as calculated by a summation of power densities for each simultaneous transmission combination as follows:

2.4 GHz 802.11b/g/n WLAN Module and Radar Transceiver Operating Simultaneously:

2.4 GHz 802.11b/g/n WLAN Transceiver:	0.013 (mW/cm <sup>2</sup> )
3 GHz Radar Transceiver:	0.007 (mW/cm <sup>2</sup> )
<b><u>TOTAL:</u></b>	<b><u>0.020 (mW/cm<sup>2</sup>)</u></b>

**Installation Guidelines**

The installation manual should contain text similar to the following advising how to install the equipment to maintain compliance with the FCC RF exposure requirements:

**RF Exposure**

In accordance with FCC requirements of human exposure to radio frequency fields, the radiating element shall be installed such that a minimum separation distance of 20 centimeters will be maintained.

**Justification for Exclusion:**

The 802.11b/g/n WLAN module Range-R Link, FCC ID: YKD-25TWD3000-029, was not evaluated for SAR for the portable mode of operation when integrated within the Range-R, FCC ID: YKD-27WD3000.

The RANGE-R, FCC ID: YKD-25TWD3000, is a stand-alone portable, handheld, battery operated system. It is designed to detect moving and near stationary personnel through walls constructed of common building materials. It is designed to be operated while handheld only and provide a separation distance of > 20cm from the body.

Per KDB 447498 section 4(c), the Range-R is excluded from hand SAR based on maximum output power < 1000·[f(GHz)]<sup>-0.5</sup> mW. With a maximum operating frequency of 3.42 GHz, the power threshold per KDB 447498 section 4(c) is equivalent to 541 mW.

Per KDB 390029 the RANGE-R, FCC ID: YKD-25TWD3000 was allowed to be filed for collocation with WiFi module (FCC ID XF6-RS9110N1102) under a Class II Permissive Change without a SAR evaluation due to their respective RF output power levels. L-3 Communications CyTerra Corporation initiated a change in ID on the FCC ID XF6-RS9110N1102 which is now referred to as the Range-R Link (FCC ID: YKD-25TWD3000-029) to address the collocation requirements under the Class II Permissive Change. Per KDB 390029, the Range-R Link and the Range-R are exempted from SAR evaluation for simultaneous transmission in the collocated configuration.

**Conclusion**

This device complies with the MPE requirements by providing adequate separation between the device, any radiating structure and the general population.