



Excellence in Compliance Testing

Certification Exhibit

FCC ID: YKD-25TWD3000

FCC Rule Part: 90

ACS Project Number: 12-2102

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

RF Exposure

General Information:

Applicant: L-3 Communications CyTerra Corporation
 ACS Project: 12-2102
 Device Category: Mobile (Handheld)
 Environment: General Population/Uncontrolled Exposure

Technical Information:

Antenna Type: Cavity-Backed Spiral
 Antenna Gain: 1 dBi
 Maximum Transmitter Conducted Power: 14.24 dBm
 Maximum System EIRP: 15.24 dBm, 33.42 mW
 Exposure Conditions: Greater than 20 centimeters

MPE Calculation

The Power Density (mW/cm²) is calculated as follows:

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

Where:

- S = power density (in appropriate units, e.g. mW/cm²)
- 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/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
3180	14.24	1.00	26.55	1	1.259	20	0.007

Co-Located Mode:

Summation of Power Densities – Simultaneous Transmissions

This Range-R (FCC ID: YKD-25TWD3000) radar transceiver can be co-located with a (FCC ID: YKD-25TWD3000-029) 802.11b/g/n WLAN module. 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/cm².

The 802.11b/g/n WLAN module uses a 2 dBi chip 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 ²)
2412	16.063814	1.00	40.40	2	1.585	20	0.013

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/cm²)
 3 GHz Radar Transceiver: 0.007 (mW/cm²)
TOTAL: **0.020 (mW/cm²)**

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 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)]-0.5 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.