Exposure Evaluation

hd33™ 150-450

Dual-Band Medium Power Remote Unit

FCCID: HCOHD332PSDH10A

Date: Jan 19, 2018

Dali Wireless, Inc.
535 Middlefield Road, Suite 280
Menlo Park, CA 94025
http://www.daliwireless.com

RF Exposure Evaluation

According to FCC Part 1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. More information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation".

Band 1: VHF

In the Frequency Range of 30 to 300 MHz, the maximum power density limit for the occupational/controlled exposures is 1 mW/cm^2 for an average time of 6 minutes.

In the Frequency Range of 30 to 300 MHz, the maximum power density limit for the general population/uncontrolled exposures is 0.2 mW/cm^2 for an average time of 30 minutes.

The antenna connected to the product is specific to the deployment. The worst case scenario occurs when using a very high gain outdoor/indoor antenna. However a typical indoor antenna is shown in the following example:

The highest expected output power is 34 dBm at 157.5MHz. For an output level of 34 dBm with an indoor antenna gain of 3 dBi, the EIRP is 37 dBm.

The maximum power density safe exposure level for general population/uncontrolled exposure of 30 minutes for the frequency of 157.5 MHz is 0.2 mW/cm^2.

Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Max EIRP (mW)	Power Density Limit Allowed (mW/cm^2)	Safe Distance (cm)
34	3	5012	0.2	45

RF Exposure Evaluation Distance Calculation

$$d = \sqrt{(EIRP/4\pi S)}$$

Where:

d = Distance to the center of radiation of the antenna (cm) for the allowable Power Density

S = Allowable Power Density Limit (mW/cm^2)

EIRP = Equivalent isotropically radiated power (mW) = $10^{[\text{TX Power (dBm)} + \text{Ant Gain (dBi)}/10]}$

As shown above, the minimum safe distance where the MPE limit is reached is 45 cm from the unit with a 3 dBi antenna and no distribution loss.

If the antenna will be positioned closer to end users than 45 cm, then the installer must calculate the safe distance for a given installation using the formulas provided.

Band 2: UHF

In the Frequency Range of 300 to 1500 MHz, the maximum power density limit for the occupational/controlled exposures is f/300 mW/cm^2 for an average time of 6 minutes.

In the Frequency Range of 300 to 1500 MHz, the maximum power density limit for the general population/uncontrolled exposures is f/1500 mW/cm^2 for an average time of 30 minutes.

The antenna connected to the product is specific to the deployment. The worst case scenario occurs when using a very high gain indoor/outdoor antenna. However a typical indoor antenna is shown in the following example:

The highest expected output power is 34 dBm at 481MHz. For an output level of 34 dBm with an indoor antenna gain of 2 dBi, the EIRP is 36 dBm.

The maximum power density safe exposure level for general population/uncontrolled exposure of 30 minutes for the frequency of 481 MHz is 0.321 mW/cm^2.

Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Max EIRP (mW)	Power Density Limit Allowed (mW/cm^2)	Safe Distance (cm)
34	2	3981	0.321	32

RF Exposure Evaluation Distance Calculation

$$d = \sqrt{(EIRP/4\pi S)}$$

Where:

d = Distance to the center of radiation of the antenna (cm) for the allowable Power Density

S = Allowable Power Density Limit (mW/cm^2)

EIRP = Equivalent isotropically radiated power (mW) = $10^{[\text{TX Power (dBm) + Ant Gain (dBi)}/10]}$

As shown above, the minimum safe distance where the MPE limit is reached is 32 cm from the unit with a 2 dBi antenna and no distribution loss.

If the antenna will be positioned closer to end users than 32 cm, then the installer must calculate the safe distance for a given installation using the formulas provided.