RF Exposure RFK-LMSWDJH819

The CA-819 (800 / 1900 MHz) dual band RF Compensator is operated as a mobile device as defined in 2.1091(b) bases on its design and installation. The compensator is installed into a vehicle such that it is physically secured and is generally located more than 20 cm from the end-user. This information is included in the user manual. It is suggested that the antenna be installed such that there is at least 20 cm of separation between the occupants of the vehicle and the antenna.

The CA-819 (800 / 1900 MHz) dual band RF Compensator has a transmitted conducted power of 0.5 W in both cellular and PCS bands. The mobile antenna supplied with the transceiver has a maximum gain of 3 dB, and minimum cable loss of –1.0 dB, together resulting in a maximum EIRP of 1 W. Since the transmit cellular band (824-849 MHz) is below 1.5 GHz and its EIRP with the supplied antenna is below 1.5 and transmit PCS band (1850-1910 MHz) is above 1.5 GHz and its EIRP with the supplied antenna is below 3W, the 800 / 1900 MHz RF Compensator is categorically excluded from routine environmental evaluation per 2.1091(c).

RF Exposure – MPE Calculations

Input

Transmitter Power: 500 mW

Antenna Gain: 3 dB

Cable loss: 1 dB @ 824 – 849 MHz
2 dB @ 1850 – 1910 MHz

Frequency range: 824-849 MHz and 1850-1910 MHz

Assumptions

1. A single ¼ wavelength radiating antenna is assumed.

2. Closest exposure distance is assumed to be 20 cm

RF Exposure – MPE Calculations

Calculations

The following results shall be assumed to be accurate for the far-field only. These predictions will over-estimate power density in the near–field. Based on the use of a ¼ wavelength radiator, a distance of 20 cm is considered to be in the far-field for all cases.

$S = PG/4*PI*R^2$

@ 824 – 849 MHz

P is 500 mW
G is 2 dB (Antenna gain – loss) or $10^{(2/20)}$ or 1.25
R is 20 cm

S = 0.125 mW/cm^2

For Occupational/Controlled Exposure
From 300 to 1500 MHz, power density limit is f/300 mW/cm^2
@ 824 MHz, power density limit is **2.75 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure
From 300 to 1500 MHz, power density limit is f/1500 mW/cm^2
@ 824 MHz, Power density limit is **0.55 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**

@ 1850 – 1910 MHz

P is 500 mW
G is 1 dB (Antenna gain – loss) or $10^{(1/20)}$ or 1.12
R is 20 cm

S = 0.112 mW/cm^2

For Occupational/Controlled Exposure
From 1,500 to 100,000 MHz, power density limit is **5 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure
From 1,500 to 100,000 MHz, power density limit is **1 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**