

Muehlau, 05.25.2018

1 RF Exposure Considerations for the RRU4560

FCC ID: WJ9-RRU4560

The transmitter operation for the RRU4560 covers the 902 – 928MHz operating band. The RRU4560 supports up to four external antennas (non cascable) or up to 32 cascable (8 antennas per port), but operates on only one antenna at a time.

The following FCC Rule Parts and procedures are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

KDB447498 D01 v06

Mobile and Portable Devices RF Exposure Procedures and Equipment Authorisation Policies

MPE CALCULATIONS

The MPE calculation used to calculate the safe operating distance for the user is:

$$S = \text{EIRP} / 4 \pi R^2$$

Where

S = Power density

EIRP = Effective Isotropic Radiated Power (EIRP = P x G)

P = Conducted Transmitter Power

G = Antenna Gain (relative to an isotropic radiator)

R = distance to the centre of radiation of the antenna (safe operating distance)

RRU4560 Values:

Transmitter frequency range: 902 – 928MHz

Transmitter power:

(Ref 15.247 (b)(4) – Antennas with gains >6dBi)

- 1) For external 13dBi gain antenna use, 30dBm max. power is reduced by 7dB (13dBi – 6dB)

$$\text{EIRP}_{\text{max}} = +23\text{dBm} + 13\text{dBi antenna gain} = +36\text{dBm} (4.0\text{W})$$

- 2) For external 11dBi gain antenna use, 30dBm max. power is reduced by 5dB (11dBi – 6dB)

$$\text{EIRP}_{\text{max}} = +25\text{dBm} + 11\text{dBi antenna gain} = +36\text{dBm} (4.0\text{W})$$

- 3) For external 8dBi gain antenna use, 30dBm max. power is reduced by 2dB (8dBi – 6dB)

$$\text{EIRP}_{\text{max}} = +28\text{dBm} + 8\text{dBi antenna gain} = +36\text{dBm} (4.0\text{W})$$

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Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of
FCC Rule Part 1.1310 for 2.4GHz

$$S_{req1} = f_{MHz}/1500 \text{ mW/cm}^2 = 902/1500 = 0.6 \text{ mW/cm}^2$$

Calculation:

$$S = EIRP / 4 \pi R^2$$

$$R = \sqrt{EIRP / 4 \pi S}$$

$$R = \sqrt{4000 / (4 \pi \times 0.6)}$$

$$R = \sqrt{4000 / (7.54)}$$

$$R = 23.0$$

$$R = 23\text{cm}$$

Conclusion

The safe operating distance for the RRU4560 for General Population/ Uncontrolled Exposure limits is a minimum of 23cm using for all antennas specified to be used with the equipment

Signature:  Date: 05/25/2018

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