

Calculation Method of RF Safety Distance:

$$S = PG/4\pi r^2 = EIRP/4\pi r^2$$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm²
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

$$r = \sqrt{PG/4\pi S} \text{ or;}$$

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

FCC radio frequency exposure limits may not be exceeded at distances closer than r cm from the antenna of this device.

Calculation Example

For General Population/Uncontrolled Exposure, Power Density (S) = F/1500 mW/cm²

For the operating frequency range of 806-821 MHz for this device,

F = lowest operating frequency of 806 MHz, thus Power Density (S) = 806/1500 = 0.537 mW/cm²

EIRP = 43.54 dBm = 22594.36 mW

S = 0.537 mW/cm²

$$\text{Since } r = \sqrt{EIRP/4\pi S}$$

$$\begin{aligned} \text{Then } r &= \sqrt{22594.36 \text{ mW} / 4 \times \pi \times S} \\ &= 58 \text{ cm} \end{aligned}$$

Therefore, a minimum separation distance of 60 cm when used with the Colinear Antenna, PN: HG3DB is necessary to comply with RF exposure requirements. The following RF exposure warning statement will be placed in the installation manual.

RF Exposure Warning:

To ensure user's safety and to satisfy RF exposure requirements, this unit must be installed so that a minimum separation distance of 40 cm or 60 cm is always maintained between the antenna of the transmitting device and the body of nearby persons. Operation at closer than this distance is not recommended. Use ONLY the following antenna supplied by AlarmPath to comply with this warning: Colinear Antenna, PN: HG3DB – 60cm or 1/4 Wave Rigid Whip Antenna, PN: G0DB – 40cm

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- Accreditation: FCC & NVLAP (USA), ACA (Australia), VCCI (Japan), ITI (UK), ACC-LAB (Canada, Europe/APEC/Canada MRA)

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

6.6.3. Test Data

GENERAL POPULATION/UNCONTROLLED ENVIRONMENT

Antenna Type	Frequency (MHz)	Maximum EIRP Power (dBm)	Maximum EIRP Power (mW)	Calculated Minimum r (cm) ⁽¹⁾	Manufacturer's Recommended r
Colinear, PN: HG3DB	806.00	43.54	22594.36	57.85	60 cm
Quarter-wave Rigid Whip	806.00	39.61	9141.13	36.79	40 cm

Notes:

- (1) RF EXPOSURE DISTANCE LIMITS: $r = \sqrt{EIRP/4\pi S}$, where $S=0.537 \text{ mW/cm}^2$

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