



Engineering Analysis MPE for 2.4 GHz Transceiver

FCC ID: RAR20000003

BelAir Networks

This analysis was performed as part of the FCC certification requirements for spread spectrum devices, according to the requirements of: FCC part 15.247 (b) (4), and FCC OET Bulletin 65 “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”.

- Module RAR20000003 will be mounted in BelAir Networks host units and will be professionally installed (Fixed) to provide a minimum separation distance of 25.1 cm (10 inches) from all persons as detailed in co-location compliance table below.
- The device will not be co-located or operated in conjunction with any other antenna or transmitter not described in this table and application.
- This device will only be operated according to the exposure conditions described in this application.
- End users and installers will be provided with antenna installation and transmitter operating conditions for satisfying RF exposure compliance.

The measured worst case transmit power yielding the worst case EIRP were used for the MPE calculations. Calculations were performed based on FCC OET Bulletin 65. The calculations are performed based on the following formula provided in OET 65:

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

Co-location compliance for multiple frequency exposure criteria to the power density exposure limit is detailed in the table below:

Co-location Compliance for Integrated 802.11b/g & 802.11a Radios at 25.1 cm										
802.11 b/g Radio RAR20000003		802.11a Radio RARxxxxxx						Total Density for co-located radios [mW/cm ²]		
Worst Case Total EIRP [dBm]	Max Power Density [mW/cm ²]	Worst Case Total EIRP [dBm]	Max Power Density [mW/cm ²]	Worst Case Total EIRP [dBm]	Max Power Density [mW/cm ²]	Worst Case Total EIRP [dBm]	Max Power Density [mW/cm ²]	[mW/cm ²]	Limit [mW/cm ²]	
35.00	0.40	RAR 20001001		RAR 20001001		RAR 20001001		0.70	1	complies
		29.00	0.10	29.00	0.10	29.00	0.10			
35.00	0.40	RAR 20001002		RAR 20001002		RAR 20001002		1.00	1	complies
		32.00	0.20	32.00	0.20	32.00	0.20			
35.00	0.40	RAR 20005001		RAR 20005001		RAR 20005001		0.70	1	complies
		29.00	0.10	29.00	0.10	29.00	0.10			



This calculation is a worst-case analysis since it assumes the device is continuously transmitting. The device utilizes the 802.11 WLAN protocol which operates in time-division duplex (TDD) mode, so the transmit duty cycle can never be 100% in normal operation. It is also assumed that the antennas are transmitting in the same direction.

Based on these calculations and using the limit for general population/uncontrolled environment of 1.0 mW/cm^2 at 2.4 GHz, the BelAir Networks units meets MPE requirements set forth in documents above, with a minimum safety distance between antenna and operator of 25.1 cm (10 inches).

Products which contain module RAR20000003 (B2CC043AA-A) shall only be installed by professional installers trained by BelAir Networks or its authorized agents. In addition to normal installation procedures and good installation practice, professional installers are responsible to ensure that:

1. Only an approved antenna (see Product Manual) is connected to the module, and,
2. The antenna is mounted in such a manner and in such a location that access to the antenna by the general population is minimized. Access to the antenna by the general population is limited to greater than 25.1 cm (10 inches) during normal operation.

The equipment therefore fulfills the requirements on power density for general population/uncontrolled exposure and therefore complies with the requirements of FCC Part 15.247 (b) (4) and FCC Bulletin 65.