



Product operation frequency range and FCC ID number information.

1. Model number: RXA3748, RXA3792 (FCC ID: PX8RXA37), Operation frequency band:

Band 700MHz:

Downlink: 769MHz to 775MHz,

Uplink: 799MHz to 805MHz

Band 800MHz:

Downlink: 851MHz to 862MHz,

Uplink: 806MHz to 817MHz

2. Model number: RXB3748, RXB3792 (FCC ID: PX8RXB37), Operation frequency band:

Band 700MHz:

Downlink: 758MHz to 768MHz,

Uplink: 788MHz to 798MHz;

Downlink: 769MHz to 775MHz,

Uplink: 799MHz to 805MHz

Band 800MHz:

Downlink: 851MHz to 862MHz,

Uplink: 806MHz to 817MHz

Supported signal modulation type:

LTE in 758MHz to 768MHz and 788MHz to 798MHz;

C4FM/HDQPSK/FM in 769MHz to 775MHz and 799MHz to 805MHz;

C4FM/HDQPSK/FM in 851MHz to 862MHz and 806MHz to 817MHz;

Input signal channel space:

12.5kHz for C4FM;

12.5kHz for HDQPSK;

12.5kHz for FM; 25kHz for FM

10MHz for LTE

RF Exposure Compliance Requirement



1. Standard requirement

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density



1. MPE Calculation Method

$$R = \sqrt{\frac{PG}{4\pi S}}$$

$$S \text{ (mW/cm}^2\text{)} = P \cdot G / 4\pi R^2$$

S= Power Density (mW/cm²)

P=Peak RF conducted output Power (mW)

G=EUT Antenna numeric gain (numeric)

R= Separation distance between radiator and human body (cm);

From the maximum EUT RF output power, as well as the gain of the used antenna, according to the RF power density limit above, the minimum distance between the antenna and human body will be calculated.

2. Calculated Result

The permitted max antenna gain for the device is 0dBi.

Take the Limits for General Population / Uncontrolled Exposure.

The limit for Power Density (S)(mW/cm²) = F/1500

Here, F is the operation frequency Mhz.

The declared max conducted power at antenna port (include turn up power +/-1dB)

Uplink: 30dBm

Downlink: 37dBm.

Here takes the worst case (max power uplink: 31dBm, downlink 37dBm and the tested whichever is higher) for evaluate the exposure.



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FCC ID: PX8RXB37

Exposure:

FCC regulation mandate that the ERP of type B signal boosters should not exceed 5W, this booster has a maximum programmable composite output power of 5W(37dBm) for Downlink, 1W(30dBm) for uplink. Therefore, the gain of the antenna should be of 0dBi or less.

Here takes max power uplink: 31dBm, downlink 37dBm, antenna gain=0dBi as worst and strictest condition evaluation exposure and antenna height requirement.

3.1 For downlink: 769MHz to 775MHz,

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For C4FM mode/ For HDQPSK mode/ For FM (12.5k) mode/ For FM (25k) mode						
769.00625	0	1	37	5011	0.51	27.8
772.00625	0	1	37	5011	0.51	27.8
774.99735	0	1	37	5011	0.51	27.8

Uplink: 799MHz to 805MHz:

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For C4FM mode/ For HDQPSK mode/ For FM (12.5k) mode/ For FM (25k) mode						
799.00625	0	1	31	1258	0.51	13.9
802.00625	0	1	31	1258	0.51	13.9
804.99735	0	1	31	1258	0.51	13.9



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3.3 For downlink: 851MHz to 862MHz (worst case max power uplink: 31dBm, **downlink 37dBm**)

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For C4FM mode/ For HDQPSK mode/ For FM (12.5k) mode/ For FM (25k) mode						
851.00625	0	1	37	5011	0.57	26.3
860.50625	0	1	37	5011	0.57	26.3
868.99735	0	1	37	5011	0.57	26.3

3.4 For uplink: 806MHz to 817MHz(worst case max power uplink: **31dBm**, downlink 37dBm)

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For C4FM mode/ For HDQPSK mode/ For FM (12.5k) mode/ For FM (25k) mode						
806.00625	0	1	31	1258	0.54	13.5
815.00625	0	1	31	1258	0.54	13.5
823.99735	0	1	31	1258	0.54	13.5



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LTE:

For downlink: 758MHz to 768MHz (worst case max power uplink: 31dBm, **downlink 37dBm**)

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For LTE mode						
763	0	1	37	5011	0.51	28.0

For uplink: 788MHz to 798MHz (worst case max power uplink: **31dBm**, downlink 37dBm)

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For LTE mode						
793	0	1	31	1258	0.53	13.7



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The worst exposure condition is uplink and down link Simultaneous emission at frequency 769.00625Mhz, take uplink: 31dBm, downlink 37dBm as the max power for evaluate the antenna distance requirement during installation.

$$P_{max} = P_{downlink} + P_{uplink} = 31dBm + 37dBm = (1258 + 5011)mW = 6269mW$$

Frequency (MHz)	Maximum Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Worst power (dBm)	Worst power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (cm)
For C4FM mode/ For HDQPSK mode/ For FM (12.5k) mode/ For FM (25k) mode						
769.00625	0	1	37	6269	0.51	31.2
799.00625	0	1	31		0.53	

Conclusion:

So the recommend use distance away from EUT external antenna is larger than 31.2cm for transmission Simultaneously in downlink and uplink direction.