

**Appendix A: FCC Part 1.1307, 1.1310, 2.1091, 2.1093; IC RSS-Gen: RF Exposure**

**MPE Co-location Calculations**

The maximum permissible RF exposure for an uncontrolled environment is specified in FCC 1.1310 table 1B.

From OET 65,  $S = \text{EIRP} / 4\pi R^2$

*where:*

S = Power density (mW/cm<sup>2</sup>)

EIRP = Equivalent Isotropic Radiated Power

R = 20 cm separation distance

**Power Density for Z-Wave**

The MPE limit for the above device operating at 908.4 MHz for uncontrolled environments is 0.6 mW/cm<sup>2</sup>

EUT fundamental field strength at 908.4 MHz = 92.7 dBuV/m at 3 meters (from DXT test report)

$S = 0.00011 \text{ mW/cm}^2 = \text{at } 20 \text{ cm separation}$

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**Power Density for FCC ID: XMR201909EG91NAX**

Power: conducted power from grant

Max Antenna Gain: Alarm.com specified

Separation distance: 20 cm

The worst-case ratios are highlighted and used in the ratio summary table.

	Center Freq (MHz)	Power (W)	Max Antenna Gain (dBi)	Max Antenna Gain (Num)	EIRP (W)	Power Density (mW/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	FCC Ratio	ISED Limit (mW/cm <sup>2</sup> )	ISED Ratio
LTE BAND 2	1880.0	0.278	7.9	6.17	1.71	0.34	1.00	0.34	0.45	0.76
LTE BAND 4	1732.5	0.270	4.9	3.09	0.83	0.17	1.00	0.17	0.43	0.39
LTE BAND 5	836.5	0.265	6.0	3.98	1.05	0.21	0.56	0.37	0.26	0.81
<b>LTE BAND 12</b>	<b>707.5</b>	0.265	5.5	3.55	0.94	0.19	0.47	<b>0.40</b>	0.23	<b>0.81</b>
LTE BAND 13	782.0	0.248	5.8	3.80	0.94	0.19	0.52	0.36	0.25	0.75
LTE BAND 25	1882.5	0.251	7.9	6.17	1.55	0.31	1.00	0.31	0.45	0.68
LTE BAND 26	831.5	0.254	6.0	3.98	1.01	0.20	0.55	0.37	0.26	0.77

**Co-location - Summary of MPE: Z-Wave + XMR201909EG91NAX**

Transmitter	Frequency (MHz)	MPE Result (mW/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	FCC Ratio	ISED Limit (mW/cm <sup>2</sup> )	ISED Ratio	
Z-Wave	908.4	0.00011	0.6	0.00018	0.28	0.0004	
LTE Band 12	669.7 – 715.3	0.19	0.47	0.40	0.23	0.81	
				<b>Sum of Ratios</b>	<b>0.40</b>	<b>Sum of Ratios</b>	<b>0.81</b>

Sum of FCC ratios = 0.40 < 1, therefore compliant.

Sum of ISED ratios = 0.81 < 1, therefore compliant

Thus, the EUT meets the uncontrolled exposure limit at 20 cm when all transmitters are transmitting simultaneously.

**Power Density and Ratios for FCC ID: XMR202007BG95M6**

Power: conducted power from grant

Max Antenna Gain: Alarm.com specified

Separation distance: 20 cm

The worst-case ratios are highlighted and used in the ratio summary table.

	Center Freq (MHz)	Power (W)	Max Antenna Gain (dBi)	Max Antenna Gain (Num)	EIRP (W)	Power Density (mW/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	FCC Ratio	ISED Limit (mW/cm <sup>2</sup> )	ISED Ratio
LTE BAND 2	1880.0	0.248	7.9	6.17	1.53	0.30	1.00	0.30	0.45	0.68
LTE BAND 4	1732.5	0.238	4.9	3.09	0.74	0.15	1.00	0.15	0.43	0.34
LTE BAND 5	836.5	0.251	6.0	3.98	1.00	0.20	0.56	0.35	0.26	0.76
LTE BAND 12	707.5	0.278	5.5	3.55	0.99	0.20	0.47	0.42	0.23	0.85
LTE BAND 13	782.0	0.235	5.8	3.80	0.89	0.18	0.52	0.34	0.25	0.71
LTE BAND 25	1882.5	0.248	7.9	6.17	1.53	0.30	1.00	0.30	0.45	0.68
LTE BAND 26	831.5	0.251	6.0	3.98	1.00	0.20	0.55	0.36	0.26	0.76
LTE BAND 66	1745.0	0.238	4.9	3.09	0.74	0.15	1.00	0.15	0.43	0.34
LTE BAND 85	707.0	0.278	5.5	3.55	0.99	0.20	0.47	0.42	0.23	0.85

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**Co-location - Summary of MPE: Z-Wave + XMR202007BG95M6**

Transmitter	Frequency (MHz)	MPE Result (mW/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	FCC Ratio	ISED Limit (mW/cm <sup>2</sup> )	ISED Ratio
Z-Wave	908.4	0.00011	0.6	0.00018	0.28	0.0004
LTE Band 12	669.7 – 715.3	0.20	0.47	0.42	0.23	0.85
			<b>Sum of Ratios</b>	<b>0.42</b>	<b>Sum of Ratios</b>	<b>0.85</b>

Sum of FCC ratios = 0.42 < 1, therefore compliant.

Sum of ISED ratios = 0.85 < 1, therefore compliant

Thus, the EUT meets the uncontrolled exposure limit at 20 cm when all transmitters are transmitting simultaneously.