§ 15.247(i) Maximum Permissible Exposure

Test Purpose: Co-location of two modules, Z-wave module YL6-143200H5V4 and YL6-143IS205V4

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** 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 levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Calculation –
Co-Location of Z-wave module FCC ID: YL6-143200H5V4 and FCC ID: YL6-143IS205V4

Equation from page 18 of OET 65, Edition 97-01

$S = EIRP / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

YL6-143IS205V4:

MPE Limit Calculation: EUT's operating frequencies @ **912-924MHz**. Therefore, Limit for Uncontrolled exposure: 0.6 mW/cm^2

EIRP = 16 mW

where, S = Power Density (mW/cm^2)
EIRP = Equivalent Isotropic Radiated Power

$S = (16/ 4*3.14*20.0^2) = 0.0032$ **mW/cm^2 @** 20cm separation

YL6-143200H5V4:

MPE Limit Calculation: EUT's operating frequencies @ **908.4 MHz.**
Therefore, Limit for Uncontrolled exposure: 0.6 mW/cm^2

EUT field strength = 93.8495 dBuV/m @ 3m**.**
Using EIRP = E+20log(D) – 104.8,
Measured EIRP = 93.84+9.54-104.8 = -1.42 dBm = 0.72 mW

where, S = Power Density (mW/cm^2)
EIRP = Equivalent Isotropic Radiated Power

$S = (0.72/ 4*3.14*20.0^2) =$ **0.00014 mW/cm^2 @** 20cm separation

MPE Calculation –
Co-Location of Z-wave module FCC ID: YL6-143200H5V4 and FCC ID: YL6-143IS205V4

MPE Summary:

Frequency Range	MPE Result (mW/cm^2)	Limit (mW/cm^2)
912-928 MHz	0.0032	0.6
908.4 MHz	0.00014	0.6

Test Requirements: [MPE1 + MPE2 < 0.6]

Test Results:

MPE(1) **Frequency 902-928(MHZ)**	**MPE(2)** **Frequency 902-928(MHZ)**	**Calculation** [MPE(1) + MPE(2) <0.6]	**MPE Result (**mW/cm^2)	S as a fraction of the limit (%)
0.0032	0.00014	0.00334	**0.00334**	**0.56**

Therefore, the uncontrolled exposure limit is met at 20 cm when both transmitters are operating simultaneously.