MPE Calculations

Systems operating under the provision of 47 CFR 1.1307(b)(1) shall be operated in a manor that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines.

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091(b). The MPE calculation for this exposure is shown below.

Using the Antennas with highest output power:

The peak radiated output power (EIRP) is calculated as follows:

Antenna	Frequency (GHz)	Power input to the antenna (P) (dBm)	Power gain of the antenna (G) (dBi)	EIRP (P+G) (dBm)	EIRP $Log^{-1(dBm/10)}$ (mW)
Sony IRX-3400	2.4	24.81	2.13	26.94	494.31
Sony IRX-3400	5	19.71	1.80	21.51	141.58

EIRP = P + G
Where
P = Power input to the antenna (mW).
G = Power gain of the antenna (dBi)

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

Antenna	Frequency (GHz)	Antenna Gain (G) (dBi)	Numeric Antenna Gain $Log^{-1(dBm/10)}$ (dB)
Sony IRX-3400	2.4	2.13	1.63
Sony IRX-3400	5	1.80	1.51

$G = Log^{-1}$ (dB antenna gain/10)

Power density at the specific separation:

Antenna	Frequency (GHz)	Power input to the antenna (P) (mW)	Numeric Power Gain of the Antenna (G) (dB)	Maximum Power Spectral Density $S=PG/(4R^2\pi)$ (mW/cm²)	Maximum Power Spectral Density Limit (mW/cm²)
Sony IRX-3400	2.4	302.69	1.63	0.098	1.00
Sony IRX-3400	5	93.54	1.51	0.028	1.00

$S = PG/(4R^2\pi)$
Where
S = Maximum power density (mW/cm²)
       P = Power input to the antenna (mW).
       G = Numeric power gain of the antenna
R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The maximum permissible exposure (MPE) for the general population is 1mW/cm².

The power density at 20cm does not exceed the 1mW/cm² limit. Therefore, the exposure condition is compliant with FCC rules.