

RF EXPOSURE EVALUATION

EUT Specification

EUT	IP Camera
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☒ WLAN: 5.725GHz ~ 5825GHz ☐ Others(Bluetooth: 2.402GHz ~ 2.480GHz)
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	For 2.4G: 15.80dBm(38.02mW), For 5G: 9.80dBm(9.77mW)
Antenna gain	2.27dBi for 2.4G; -0.09dBi for 5G
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in Mw

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

For 2.4G

Channel	Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Tune-UP power (mW)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
Test Mode: 802.11b						
Low	2412	15.80	±0.1	38.90	0.0131	1
Middle	2437	13.90	±0.1	25.12	0.0084	1
High	2462	13.40	±0.1	22.39	0.0075	1
Test Mode: 802.11g						
Low	2412	14.07	±0.1	26.12	0.0088	1
Middle	2437	14.28	±0.1	27.42	0.0092	1
High	2462	13.79	±0.1	24.49	0.0082	1
Test Mode: 802.11n(HT20)						
Low	2412	15.47	±0.1	36.06	0.0121	1
Middle	2437	15.36	±0.1	35.16	0.0118	1
High	2462	14.67	±0.1	29.99	0.0101	1
Test Mode: 802.11n(HT40)						
Low	2422	15.04	±0.1	32.66	0.0110	1
Middle	2437	14.97	±0.1	32.14	0.0108	1
High	2452	14.44	±0.1	28.44	0.0095	1

For 5.8G

Channel	Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Tune-UP power (mW)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
Test Mode: 802.11a						
Low	5745	8.94	±0.1	8.02	0.0016	1
Middle	5785	8.06	±0.1	6.55	0.0013	1
High	5825	8.19	±0.1	6.75	0.0013	1
Test Mode: 802.11n(HT20)						
Low	5745	9.73	±0.1	9.62	0.0019	1
Middle	5785	9.39	±0.1	8.89	0.0017	1
High	5825	9.17	±0.1	8.45	0.0016	1
Test Mode: 802.11n(HT40)						
Low	5755	8.74	±0.1	7.66	0.0015	1
High	5795	8.78	±0.1	7.73	0.0015	1
Test Mode: 802.11ac (VHT20)						
Low	5745	9.14	±0.1	8.39	0.0016	1
Middle	5785	9.39	±0.1	8.89	0.0017	1
High	5825	8.98	±0.1	8.09	0.0016	1
Test Mode: 802.11ac (VHT40)						
Low	5755	8.98	±0.1	8.09	0.0016	1
High	5795	8.62	±0.1	7.45	0.0015	1
Test Mode: 802.11ac (VHT80)						
Channel	5775	9.80	±0.1	9.77	0.0019	1