

RF EXPOSURE EVALUATION

EUT Specification

EUT	Smart Power Outlet
Model Name	DRSM004
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input checked="" type="checkbox"/> Others(Bluetooth: 2.402GHz ~ 2.480GHz)
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	15.35dBm(34.28mW) for WIFI -4.73dBm (0.34mW) for BLE
Antenna gain	0dBi for WIFI 1dBi for BLE
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> 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: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

P_d = Power density in mW/cm^2

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, $1mW/cm^2$. 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

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	14.28	± 0.5	30.06	0.005980	1
Middle	2437	15.35	± 0.5	38.46	0.007651	1
High	2462	15.23	± 0.5	37.41	0.007442	1
Test Mode: 802.11g						
Low	2412	11.83	± 0.5	17.10	0.003402	1
Middle	2437	12.89	± 0.5	21.83	0.004343	1
High	2462	12.73	± 0.5	21.04	0.004186	1
Test Mode: 802.11n(HT20)						
Low	2412	11.20	± 0.5	14.79	0.002942	1
Middle	2437	12.18	± 0.5	18.54	0.003688	1
High	2462	12.15	± 0.5	18.41	0.003663	1
Test Mode: 802.11n40(HT40)						
Low	2422	11.68	± 0.5	16.52	0.003287	1
Middle	2437	12.03	± 0.5	17.91	0.003563	1
High	2452	12.41	± 0.5	19.54	0.003887	1
Test Mode: BLE						
Low	2402	-5.42	± 0.5	0.32	0.000080	1
Middle	2440	-5.08	± 0.5	0.35	0.000088	1
High	2480	-4.73	± 0.5	0.38	0.000095	1

Note: For the device consider simultaneous transmission of WIFI and BT, the worst MPE = $0.007651 + 0.000095 = 0.007746 mW/cm^2 < 1mW/cm^2$