

FCC RF Exposure Compliance for Simultaneous Operations

Configurations for Simultaneous Operations

Configuration 1: BT/BLE + GSM/WCDMA/LTE

Configuration 2: WiFi 2.4GHz + GSM/WCDMA/LTE

Configuration 3: WiFi 5GHz + GSM/WCDMA/LTE

Power Density is calculated from Maximum Conducted Power and Antenna Gain at prediction distance
Maximum of Conducted and Radiated Output Power is used in the calculation. Therefore negative values for antenna gain have been replaced by 0 dBi.

RF Function	BT	BLE	WiFi 2.4	WiFi 5	GSM850	GSM1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13	LTE B25	LTE B26	LTE B38	LTE B41	Σ of MPE ratios
Frequency (MHz)	2402	2402	2412	5200	824.2	1850.2	1852.4	1712.4	826.4	1850.7	1710.7	824.7	2502.5	699.7	779.5	1850.7	824.7	2572.5	2498.5	
Conducted Output Power (dBm)	3.00	1.00	20.00	16.00	26.00	23.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	
Tune Up Tolerance (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Output Power (W)	0.002	0.001	0.100	0.040	0.398	0.200	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	0.316	
Antenna Gain (dBi)	7.50	7.50	11.50	11.50	5.00	7.00	7.00	7.00	5.00	7.00	7.00	5.00	6.00	5.00	5.00	7.00	5.00	6.00	6.00	
Antenna Gain (Numeric)	5.62	5.62	14.13	14.13	3.16	5.01	5.01	5.01	3.16	5.01	5.01	3.16	3.98	3.16	3.16	5.01	3.16	3.98	3.98	
Prediction Distance (cm)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
Time Averaged Duty Cycle (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Calculated Power Density (W/m2)	0.022	0.014	2.810	1.119	2.505	1.989	3.153	3.153	1.989	3.153	3.153	1.989	2.505	1.989	1.989	3.153	1.989	2.505	2.505	
Requirement (W/m2)	10.00	10.00	10.00	10.00	5.50	10.00	10.00	10.00	5.51	10.00	10.00	5.50	10.00	4.67	5.20	10.00	5.50	10.00	10.00	
MPE ratio (PD/Req.)	0.002	0.001	0.281	0.112	0.455	0.199	0.315	0.315	0.361	0.315	0.315	0.362	0.250	0.426	0.383	0.315	0.362	0.250	0.250	
Configuration 1 (MPE Ratio)	0.002	0.001			0.455	0.199	0.315	0.315	0.361	0.315	0.315	0.362	0.250	0.426	0.383	0.315	0.362	0.250	0.250	0.458
Configuration 2 (MPE Ratio)			0.281		0.455	0.199	0.315	0.315	0.361	0.315	0.315	0.362	0.250	0.426	0.383	0.315	0.362	0.250	0.250	0.736
Configuration 3 (MPE Ratio)				0.112	0.455	0.199	0.315	0.315	0.361	0.315	0.315	0.362	0.250	0.426	0.383	0.315	0.362	0.250	0.250	0.567

Requirement: Σ of MPE ratios ≤ 1
The maximum values for GSM/WCDMA/LTE and BT/BLE/WiFi is used in the above calculations.

Antenna Gain	BT	BLE	WiFi	WiFi	2G+3G+4G			
Frequency (MHz)	2402	2402	2412	5500	750	850	1800	2550
2J4A50PCFa, Peak Gain (dBi)	3.0	3.0	3.0	3.5	2.0	2.0	2.7	2.0
2J4A50PCFa, Peak Gain, MIMO (dBi)			6.0	7.0				
Volvo Base_Ant VT Full_Feat (dBi)	7.5	7.5	7.5	7.5	5.0	5.0	7.0	6.0
Volvo WLAN Interior (dBi)	4.0	4.0	4.0	4.0				
Hirschman Interior Phone PK					2.5	3.0	3.5	1.0

The Antennas Volvo Base VT and WLAN Interior are used at the same time, however they will normally be mounted so that they are separated by more than the prediction distance.