

FCC RF Exposure Compliance for Simultaneous Operations

Configurations for Simultaneous Operations
Configuration 1: BT/BLE + GSM/WCDMA/LTE
Configuration 2: WiFi 2.4 + 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 Therefore negative values for antenna gain have been replaced by 0 dBi.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	GSM850	GSM1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13	LTE B25	LTE B26_1	LTE B26_2	LTE B38	LTE B41	Σ of MPE ratios
Frequency (MHz)	2402	2402	2412	824.2	1850.2	1852.4	1712.4	826.4	1850.7	1711	824.7	2502.5	699.7	779.5	1850.7	814.7	824.7	2572.5	2498.5	
Conducted Output Power (dBm)	3.00	1.00	20.00	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	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	0.398	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	0.316	
Antenna Gain (dBi)	8.00	8.00	12.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	3.10	3.20	3.20	4.00	2.00	2.00	3.10	3.10	
Antenna Gain (Numeric)	6.31	6.31	15.85	1.58	2.51	2.51	2.51	2.51	2.51	2.51	1.58	2.04	2.09	2.09	2.51	1.58	1.58	2.04	2.04	
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)	0.025	0.016	3.153	1.255	0.997	1.580	1.580	1.580	1.580	1.580	0.997	1.284	1.314	1.314	1.580	0.997	0.997	1.284	1.284	
Requirement (W/m2)	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	5.43	5.50	10.00	10.00	
MPE ratio (PD/Req.)	0.003	0.002	0.315	0.228	0.100	0.158	0.158	0.287	0.158	0.158	0.181	0.128	0.282	0.253	0.158	0.184	0.181	0.128	0.128	
Configuration 1 (MPE Ratio)	0.003	0.002		0.228	0.100	0.158	0.158	0.287	0.158	0.158	0.181	0.128	0.282	0.253	0.158	0.184	0.181	0.128	0.128	0.284
Configuration 2 (MPE Ratio)			0.315	0.228	0.100	0.158	0.158	0.287	0.158	0.158	0.181	0.128	0.282	0.253	0.158	0.184	0.181	0.128	0.128	0.597

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																				
Frequency (MHz)	2402	2402	2412	824.2	1850.2	1852.4	1712.4	826.4	1850.7	1711	824.7	2502.5	699.7	779.5	1850.7	814.7	824.7	2572.5	2498.5	
2J4A50PCFa, Peak Gain (dBi)	3.7	3.7	3.7	2.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	3.1	2.0	2.0	4.0	2.0	2.0	3.1	3.1	
2J4A50PCFa, Peak Gain, MIMO (dBi)			6.7																	
Volvo Base_Ant VT Full_Feat (dBi)	8.0	8.0	8.0	2.0	3.1	3.1	3.1	2.0	3.1	3.1	2.0	1.6	3.2	3.2	3.1	2.0	2.0	1.6	1.6	
Volvo WLAN Interior (dBi)			4.0																	
Hirschman Interior Phone PK				1.6	0.6	0.6	0.6	1.6	0.6	0.6	1.6	-0.1	0.7	0.7	0.6	1.6	1.6	-0.1	-0.1	

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.