

MPE Calculation

Model Name : **SP149**
FCC ID : **S7A-SP149**

Device Category : **Portable device**
Separation distance : **35.8 mm**

KDB 447498 - 4.3.1 a)

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Modulation	Frequency (MHz)	Min. Test separation distance (mm)	Measured Maximum Average power (dBm)	Tune-up tolerance (dB)	Max. Power with tune-up tolerance		Standalone SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm	Limit	Result
					(dBm)	(mW)			
GFSK	2402	35.80	11.04	± 1.00	12.04	16.00	0.6925	3.00	PASS
	2441		11.29		12.29	16.94	0.7394	3.00	PASS
	2480		10.61		11.61	14.49	0.6373	3.00	PASS
$\pi/4$ DQPSK	2402	35.80	6.26	± 1.00	7.26	5.32	0.2304	3.00	PASS
	2441		7.09		8.09	6.44	0.2811	3.00	PASS
	2480		5.87		6.87	4.86	0.2140	3.00	PASS
8DPSK	2402	35.80	6.34	± 1.00	7.34	5.42	0.2346	3.00	PASS
	2441		7.16		8.16	6.55	0.2857	3.00	PASS
	2480		5.90		6.90	4.90	0.2154	3.00	PASS
BT LE 1M	2402	35.80	2.02	± 1.00	3.02	2.00	0.0868	3.00	PASS
	2442		3.08		4.08	2.56	0.1117	3.00	PASS
	2480		2.01		3.01	2.00	0.0880	3.00	PASS
BT LE 2M	2402	35.80	2.25	± 1.00	3.25	2.11	0.0915	3.00	PASS
	2442		2.41		3.41	2.19	0.0957	3.00	PASS
	2480		2.42		3.42	2.20	0.0967	3.00	PASS
MESH	2410	35.80	14.24	± 1.00	15.24	33.42	1.4492	3.00	PASS
	2445		14.00		15.00	31.62	1.3812	3.00	PASS
	2475		13.30		14.30	26.92	1.1828	3.00	PASS
802.11b	2412	35.80	7.35	± 1.00	8.35	6.84	0.2967	3.00	PASS
	2442		7.44		8.44	6.98	0.3048	3.00	PASS
	2462		7.18		8.18	6.58	0.2882	3.00	PASS
802.11g	2412	35.80	5.65	± 1.00	6.65	4.62	0.2006	3.00	PASS
	2442		5.69		6.69	4.67	0.2037	3.00	PASS
	2462		5.46		6.46	4.43	0.1940	3.00	PASS
802.11n(HT20)	2412	35.80	3.31	± 1.00	4.31	2.70	0.1170	3.00	PASS
	2442		3.38		4.38	2.74	0.1197	3.00	PASS
	2462		3.18		4.18	2.62	0.1148	3.00	PASS
802.11n(HT40)	2412	35.80	4.03	± 1.00	5.03	3.18	0.1381	3.00	PASS
	2442		3.74		4.74	2.98	0.1300	3.00	PASS
	2452		3.93		4.93	3.11	0.1361	3.00	PASS

KDB 447498 - 4.3.2 b)

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}/x]$ W/kg, for test separation distances ≤ 50 mm;

where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

Modulation	Frequency (MHz)	Min. Test separation distance	Max. Power with tune-up tolerance		Simultaneous transmission SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm ($x=7.5$)	Limit	Result
		(mm)	(dBm)	(mW)			
Bluetooth	2480	35.80	12.29	16.94	0.3360	0.40	PASS
MESH	2475	35.80	15.24	33.42			
WLAN	2462	35.80	8.44	6.98			