

FCC ID: 2AATL-F89ESSM23

RF EXPOSURE TEST

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SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm	
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)	
300	27	55	82	110	137		
450	22	45	67	89	112		
835	16	33	49	66	82		
900	16	32	47	63	79		
1500	12	24	37	49	61		
1900	11	22	33	44	54		
2450	10	19	29	38	48		
3600	8	16	24	32	40		
5200	7	13	20	26	33		
5400	6	13	19	26	32		
5800	6	12	19	25	31		
MHz	30	35	40	45	50		mm
150	232	271	310	349	387		SAR Test Exclusion Threshold (mW)
300	164	192	219	246	274		
450	134	157	179	201	224		
835	98	115	131	148	164		
900	95	111	126	142	158		
1500	73	86	98	110	122		
1900	65	76	87	98	109		
2450	57	67	77	86	96		
3600	47	55	63	71	79		
5200	39	46	53	59	66		
5400	39	45	52	58	65		
5800	37	44	50	56	62		

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{GHz}}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{16} \text{ where}$$

f_{GHz} is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

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For user manual RF Power:

<9.0dBm@11n,<9.8dBm@11b,<9.5dBm@11g

The max.output power E.I.R.P is 9.8dBm=9.55mW, Frequency is 2.462GHz

So $(9.55/5)^* \sqrt{2.462}=2.997 \leq 3.0$

Note: $\sqrt{2.462}=1.569$

Conclusion: No SAR is required.

Maximum measured transmitter power.

Mode	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)
IEEE 802.11 b	CH1: 2412	9.47	8.85
	CH6: 2437	9.31	8.53
	CH11: 2462	9.25	8.41
IEEE 802.11 g	CH1: 2412	9.02	7.98
	CH6: 2437	8.94	7.83
	CH11: 2462	8.85	7.67
IEEE 802.11 n/HT20	CH1: 2412	8.73	7.46
	CH6: 2437	8.46	7.01
	CH11: 2462	8.63	7.29
IEEE 802.11 n/HT40	CH1: 2422	7.58	5.73
	CH4: 2437	7.31	5.38
	CH7: 2452	7.46	5.57

The max.output power E.I.R.P is 9.47dBm=8.85mW, Frequency is 2.412GHz

So $(8.85/5)^* \sqrt{2.412}=2.75 \leq 3.0$

Note: $\sqrt{2.412}=1.553$

Conclusion: No SAR is required.