# RF EXPOSURE TEST FCC ID: 2ABWOCMP771

## 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           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           1900         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							<u> </u>
300	25 mm	25	20	15	10	5	MHz
A50	194	194	155	116	77	39	150
835         16         33         49         66         82           900         16         32         47         63         79           1500         12         24         37         49         61           1900         11         22         33         44         54           1900         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           300         164         192         219         246         274           450         134         157         179         201         224           835         98         115         131         148         164           900	137	137	110	82	55	27	300
SAR Test   Exclusion   Threshold (mW)	112	112	89	67	45	22	450
1500	82	82	66	49	33	16	835
1500		79	63	47	32	16	900
1900	ni i	61	49	37	24	12	1500
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           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           1900         65         76         87         98         109           2450	5.1	54	44	33	22	11	1900
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           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	48	48	38	29	19	10	2450
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           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	40	40	32	24	16	8	3600
5800         6         12         19         25         31           MHz         30         35         40         45         50         mm           150         232         271         310         349         387           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	33	33	26	20	13	7	5200
MHz         30         35         40         45         50         mm           150         232         271         310         349         387           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	32	32	26	19	13	6	5400
150         232         271         310         349         387           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	31	31	25	19	12	6	5800
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           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	50 mm	50	45	40	35	30	MHz
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	387	387	349	310	271	232	150
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	274	274	246	219	192	164	300
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	224	224	201	179	157	134	450
1500         73         86         98         110         122         SAR Test Exclusion Threshold (mW)           1900         65         76         87         98         109         Exclusion Threshold (mW)           2450         57         67         77         86         96           3600         47         55         63         71         79           5200         39         46         53         59         66           5400         39         45         52         58         65	64	164	148	131	115	98	835
1500		158	142	126	111	95	900
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	1.1.	122	110	98	86	73	1500
2450     57     67     77     86     96       3600     47     55     63     71     79       5200     39     46     53     59     66       5400     39     45     52     58     65	00	100	98	87	76	65	1900
5200     39     46     53     59     66       5400     39     45     52     58     65	Threshold (mW)	109	76				
5400     39     45     52     58     65	Tilleshold (ill w)				67	57	
	96	96	86	77			2450
5800         37         44         50         56         62	96 79	96 79	86 71	77 63	55	47	2450 3600
	96 79 66	96 79 66	86 71 59	77 63 53	55 46	47 39	2450 3600 5200

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:

$\leq$ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] •
[ $\sqrt{f_{\text{(GHz)}}}$ ] $\leq$ 3.0 for 1-g SAR and $\leq$ 7.5 for 10-g extremity SAR,16 where
$\square$ f <sub>(GHz)</sub> 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 $\leq 50$ mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation
$\Box$ f <sub>(GHz)</sub> is the RF channel transmit frequency in GHz $\Box$ Power and distance are rounded to the nearest mW and mm before calculation <sub>17</sub> $\Box$ The result is rounded to one decimal place for comparison

distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Maximum Rated Peak RF power for tune up:

IEEE802.11 b, 8.5dBm±1
IEEE802.11 g, 8.5 dBm±1
IEEE802.11 p/HT20 8.5 d

IEEE802.11 n/HT20 , 8.5 dBm±1 IEEE802.11 n/HT40, 7.5 dBm±1

modulation	Maximum Rated Peak RF power (dBm)	Maximum Conducted Output Power (mW)	Exclusion Thresholds Results	Limit
IEEE802.11 b	9.5	8.91	2.767	3.0
IEEE802.11 g	9.5	8.91	2.782	3.0
IEEE802.11 n/HT20	9.5	8.91	2.796	3.0
IEEE802.11 n/HT40	8.5	7.08	2.222	3.0

Conclusion: No SAR is required.

Note: Exclusion Thresholds Results=[(max. power of channel, including tune-up tolerance, <math>mW)/(min. test separation distance, mm)] •  $[ \sqrt{f_{(GHz)}} ]$ 

 $f_{(\text{GHz})}\,\text{is}$  the RF channel transmit frequency in GHz

☐ Distance=5mm

Maximum measured transmitter power.

#### 802.11B

frequency range (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)	Exclusion Thresholds Results	Limit
2412	9.26	8.43	2.618	3.0
2437	9.15	8.22	2.566	3.0
2462	9.19	8.30	2.605	3.0

**Conclusion:** No SAR is required.

Note: Exclusion Thresholds Results=[(max. power of channel, including tune-up tolerance, <math>mW)/(min. test separation distance, mm)] •  $[\sqrt{f_{(GHz)}}]$ 

 $f_{\text{(GHz)}}$  is the RF channel transmit frequency in GHz

☐ Distance=5mm

802.11G	802.11	G
---------	--------	---

frequency range (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)	Exclusion Thresholds Results	Limit
2412	8.93	7.82	2.429	3.0
2437	9.05	8.04	2.510	3.0
2462	8.96	7.87	2.470	3.0

Conclusion: No SAR is required.

Note: Exclusion Thresholds Results=[(max. power of channel, including tune-up tolerance, <math>mW)/(min. test separation distance, mm)] •  $[ \sqrt{f_{(GHz)}} ]$   $f_{(GHz)}$  is the RF channel transmit frequency in GHz

Distance=5mm

### 802.11N20

frequency range (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)	Exclusion Thresholds Results	Limit
2412	8.43	6.97	2.165	3.0
2437	8.38	6.89	2.151	3.0
2462	8.41	6.93	2.175	3.0

**Conclusion:** No SAR is required.

Note: Exclusion Thresholds Results= $[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • <math>[\sqrt{f_{(GHz)}}]$ 

 $f_{\left(GHz\right)}$  is the RF channel transmit frequency in GHz

☐ Distance=5mm

#### 802.11N 40M

frequency range (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)	Exclusion Thresholds Results	Limit
2422	7.57	5.71	1.777	3.0
2437	7.46	5.57	1.739	3.0
2452	7.52	5.65	1.770	3.0

**Conclusion:** No SAR is required.

Note: Exclusion Thresholds Results=[( $max.\ power\ of\ channel$ , including tune-up tolerance, mW)/( $min.\ test\ separation\ distance,\ mm$ )] • [ $\sqrt{f_{(GHz)}}$ ]

 $f_{\left(GHz\right)}$  is the RF channel transmit frequency in GHz

☐ Distance=5mm