



RF Exposure Evaluation

FCC ID	2AYNHTL-AGBCC2541
IC	3449A-TLAGBCC2541
Model No.	AG-052C, AG-052B, AG-052A, AG-0529
Bluetooth Specification	V4.0 LE
Frequency Range	2402~2480MHz

According to FCC KDB 447498 Section 4.3 - General SAR test exclusion guidance

1. Standalone SAR test exclusion considerations

FCC :

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

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

where

- (1). $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- (2). Power and distance are rounded to the nearest mW and mm before calculation³¹
- (3). 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 distance is $<$ 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.



IC :

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW
Frequency (MHz)	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance.

2. Simultaneous transmission SAR test exclusion considerations

When an antenna qualifies for the standalone SAR test exclusion of above 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) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$, for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.
- 2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.



3. Calculation Result:

1) Standalone SAR test exclusion Calculation

FCC

Mode	Frequency Band (MHz)	Output Power (dBm)	Output Power (mW)	Threshold Result @5mm	SAR Test Exclusion Limit	
					mW	Exclusion Threshold
BT (Upper Board)	2402 ~ 2480	0	1	0.31	7	3.0
BT (Lower Board)	2402 ~ 2480	0	1	0.31	7	3.0

IC

Mode	Frequency Band (MHz)	Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	EIRP (mW)	IC SAR Test Exclusion Threshold (mW)
BT (Upper Board)	2402~2480	0	1	3.3	2.14	4
BT (Lower Board)	2402~2480	0	1	3.3	2.14	4

2) Simultaneous transmission SAR test exclusion Calculation

Mode	Frequency Band (MHz)	Output Power (dBm)	Output Power (mW)	SAR Result (W/Kg) @5mm	Simultaneous transmission SAR (W/Kg)	SAR Limit (W/Kg)
BT (Upper Board)	2402 ~ 2480	0	1	0.04	0.08	1.6
BT (Lower Board)	2402 ~ 2480	0	1	0.04		

So, this device can complies the SAR test exclusion.