RF EXPOSURE

1. Regulation

The SAR exclusion table from RSS-102 issue 6 is reproduced below:

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

Frequency (MHz)	Exemption Limits				
	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)
≤300	45	116	139	163	189
450	32	71	87	104	124
835	21	32	41	54	72
1900	6	10	18	33	57
<u>2450</u>	<u>3</u>	7	16	32	56
3500	2	6	15	29	50
5800	1	5	13	23	32

Frequency (MHz)	Exemption Limits				
	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤300	216	246	280	319	362
450	147	175	208	248	296
835	96	129	172	228	298
1900	92	138	194	257	323
2450	89	128	170	209	245
3500	72	94	114	134	158
5800	41	54	74	102	128

RF EXPOSURE

KDB447498 was used as the guidance.

SAR test exclusion considerations

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

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

Step.2   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

Step.2-1   {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)· (f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

Step.2-2   {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and $\leq$ 6 GHz

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
The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

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.

SAR test exclusion considerations : Bluetooth LE

- Frequency Range :   2 402   MHz   ~   2 480   MHz

- Measured RF Maximum Output Power :   -7.65   dBm

- Target Power & Tolerance   -8.50   dBm   &   ±   1.00   dB

                    (Maximum :   -7.50   dBm   &   Minimum :   -9.50   dBm   )

- Maximum Output Power for the Calculation :   -7.50   dBm

The EUT will only be used with a separation of 5 millimeters between the antenna and the body of the The MPE calculation for this exposure is shown below.

- EIRP   =   P + G
 	
 =   -7.50   dBm   +   2.50   dBi
 	
 =   -5.00   dBm
 	
 =   0.32   mW
	- NOTE
	
	  P : Max tuneup Power (dBm)
	
	  G : Maximum Peak Antenna Gain (dBi)

- P = -7.50 dBm = 0.18 mW	- NOTE P : Max tuneup Power (dBm)

Power Density at the specific separation

- S   =   [(P(mW) / R)] X [√f(GHz)]
 	
 =   [(0.18   /   5.00)] X [√(2.48)]
 	
 = 0.056 01 <   3.0
	- NOTE
	
	  S : Maximum Estimated SAR
	
	  P(mW) : Max tuneup Power (mW)
	
	  R : Distance to the center of the radiation of the
	     antenna (5.00 mm)
	  f(GHz) : the RF channel transmit frequency in GHz