RF Exposure evaluation

1 RF Exposure Compliance Requirement

1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06
4.3.1. Standalone SAR test exclusion considerations
Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances
$\leqslant$ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] •
[$\surd$f(GHz)] $\leqslant$ 3.0 for 1-g SAR and $\leqslant$ 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
The test exclusions are applicable only when the minimum test separation distance is $\leqslant$ 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

1.3 EUT RF Exposure

eirp = pt x gt = $(E \times d)^2/30$
where:
pt = transmitter output power in watts,
gt = numeric gain of the transmitting antenna (unitless),
E = electric field strength in V/m, ---$10^{((dB\mu\ V/m)/20)}/10^6$,
d = measurement distance in meters (m)---3m,
So pt = $(E \times d)^2/30$ / gt

For 2.4G wireless:
Field strength = 89.97dBμ V/m @3m
Ant gain 2.34dBi; so Ant numeric gain=1.714mW
So pt={$[10^{(89.97/20)}/10^6 x3]^2/30x1.714$}x1000mW =0.511mW
So (0.511mW/5mm)x $\surd$2.40385GHz = 0.158
0.158<3.0 for 1-g SAR
So the SAR report is not required.

BT

Operation Mode	Channel	Max Peak Conducted Output Power (dBm)	Target power (dBm)	Maximum tune-up Power (mW)	Calculated value	Exclusion threshold
GFSK	Lowest (2402MHz)	0.515	0±1	1.26	0.39	3.0
	Middle (2441MHz)	2.096	2±1	2.00	0.62	
	Highest (2480MHz)	2.529	2±1	2.00	0.63	
Conclusion: the calculated value ≤3.0, SAR is exempted.						
Remark: The Max Conducted Peak Output Power data refer to report Report No.: LP23080282C01-25						

2.4G wireless and Bluetooth cannot transmit at the same time.

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