20 RF Exposure

KDB 447498

Section 4.3 General SAR test reduction and exclusion guidance

For Standalone SAR exclusion consideration, when SAR Exclusion Threshold requirement in KDB 447498 is satisfied, standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

In the frequency range below 100 MHz to 6 GHz and test separation distance of 50mm, the SAR Test Exclusion Threshold for operation in the 2400 – 2483.5 MHz band will be determined as follows

SAR Exclusion Threshold (SARET)

SAR Exclusion Threshold   =   Step 1 + Step 2

Step 1

$$NT = [(MP/TSD^A) * \sqrt{f_{GHz}}]$$

NT   =   Numeric Threshold (3.0 for 1-g SAR and 7.5 for 10-g SAR)
MP   =   Max Power of channel (mW) (inc tune up)
TSD^A =   Min Test separation Distance or 50mm (whichever is lower) = 50

We can transpose this formula to allow us to find the maximum power of a channel allowed and compare this to the measured maximum power.

$$= [(NT \times TSD^A) / \sqrt{f_{GHz}}]$$

For Distances Greater than 50 mm Step 2 applies

Step 2

$$(TSD^B – 50mm) * 10\}$$

Where:
TSD^B =   Min Test separation Distance (mm) = 50

Operating Frequency 2.402 GHz

SARET	=	$[(3.0 \times 50) / \sqrt{2.402}] + \{ (50 - 50) * 10 \}$
SARET	=	$[150 / 1.55] + (0 * 10)$
SARET	=	96.77mW

Operating Frequency 2.442 GHz

SARET	=	$[(3.0 \times 50) / \sqrt{2.442}] + \{ (50 - 50) * 10 \}$
SARET	=	$[150 / 1.56] + (0 * 10)$
SARET	=	96.15mW

Operating Frequency 2.481 GHz

SARET	=	$[(3.0 \times 50) / \sqrt{2.481}] + \{ (50 - 50) * 10 \}$
SARET	=	$[150 / 1.57] + (0 * 10)$
SARET	=	95.54mW

Mode 1				
Evaluation Frequency	2402	2442	2481	MHz
SAR Exclusion Threshold	96.77	96.15	95.54	Watts
Conduced Power	0.37	0.61	0.72	dBm
Antenna Gain	-1.65	-1.65	-1.65	dBi
EIRP	0.74	0.79	0.81	mW
SAR Evaluation	*Exempt*			

Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

Operating Frequency 2.404 GHz

SARET	=	[(3.0 x 50) / √2.404] + { (50 − 50) * 10 }
SARET	=	[150 / 1.55] + (0 * 10 }
SARET	=	96.77mW

Operating Frequency 2.440 GHz

SARET	=	[(3.0 x 50) / √2.44] + { (50 − 50) * 10 }
SARET	=	[150 / 1.56] + (0 * 10 }
SARET	=	96.15mW

Operating Frequency 2.480 GHz

SARET	=	[(3.0 x 50) / √2.48] + { (50 − 50) * 10 }
SARET	=	[150 / 1.57] + (0 * 10 }
SARET	=	95.54mW

Mode 2				
Evaluation Frequency	2404	2440	2480	MHz
SAR Exclusion Threshold	96.77	96.15	95.54	Watts
Conduced Power	2.80	3.02	3.23	dBm
Antenna Gain	-1.65	-1.65	-1.65	dBi
EIRP	1.30	1.37	1.44	mW
SAR Evaluation	*Exempt*			

Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.