RF EXPOSURE EVALUATION METHOD

According to KDB 447498 D01 General RF Exposure Guidance v06, 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 Test Exclusion Threshold* condition(s), listed below, is (are) satisfied.

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:

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

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

EUT Specification

EUT	Wireless Thermal Printer				
Frequency band	☐ WLAN: 2.412GHz ~ 2.462GHz				
(Operating)	□ WLAN: 5.150GHz ~ 5.250GHz				
	□ WLAN: 5.725GHz ~ 5.850GHz				
	☑ Others BT:2402-2480MHz				
Device category	□ Portable (<20cm separation)				
	☐ Mobile (>20cm separation)				
	□ Others				
Exposure classification	□ Occupational/Controlled exposure (S = 5mW/cm2)				
	□ General Population/Uncontrolled exposure				
	(S=1mW/cm ²)				
Antenna diversity	⊠ Single antenna				
	□ Multiple antennas				
	☐ Tx diversity				
	☐ Rx diversity				
	☐ Tx/Rx diversity				
Max. output power	-4.724dBm (0.00034W)				
Antenna gain (Max)	2.07dBi				
Evaluation applied					
	□ SAR Evaluation				

RF EXPOSURE EVALUATION METHOD 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	SAR Test Exclusion Threshold (mW)				
835	16	33	49	66	82					
900	16	32	47	63	79					
1500	12	24	37	49	61					
1900	11	22	33	44	54					
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					

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances \leq 50 mm are determined by:

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

Maximum measured transmitter power.

BR+EDR

Operating Mode	Freque ncy	Measur ed Power (dBm)	max. power (mW)	Antenna Gain (dBi)	min. test separation distance (mm)	[√f(GHz)]	Result	Limit
GFSK	2402	-6.207	0.24	2.07	5	1.550	0.1196	3
	2441	-6.003	0.25	2.07	5	1.562	0.1263	3
	2480	-6.365	0.23	2.07	5	1.575	0.1172	3
π/4DQPSK	2402	-5.604	0.28	2.07	5	1.550	0.1374	3
	2441	-5.385	0.29	2.07	5	1.562	0.1457	3
	2480	-5.681	0.27	2.07	5	1.575	0.1371	3
8-DPSK	2402	-4.990	0.32	2.07	5	1.550	0.1582	3
	2441	-4.724	0.34	2.07	5	1.562	0.1696	3
	2480	-5.061	0.31	2.07	5	1.575	0.1582	3

Remark: The best case gain of the antenna is 2.07dBi.

2.07dBi logarithmic terms convert to numeric result is nearly 1.61

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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance,mm)] \cdot [$\sqrt{f(GHz)}$]

The test Result is less than 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

Conclusion: No SAR is required.