RF Exposure Requirements

Product Description: AP9-NFC
Model No.: AP9-NFC
FCC ID: QAM-NFC
IC: 5459A-NFC

According to the KDB 447498 D01 V06, clause 4.3 and RSS-102 Issue 5, the following RF exposure evaluation shall to demonstrate RF exposure compliance.

Product maximum power:
Tx frequency: 13.56 MHz Type of Modulation: ASK
Antenna Type: PCB antenna
Nominal rated field strength: 54 dBμV/m at 3m
Maximum allowed field strength of production tolerance: +/- 1dB

Based on the Maximum allowed field strength of production tolerance was 55 dBμV/m at 3m in frequency 13.56MHz, thus;

The EIRP = [(FS*D) ^2*1000 / 30] = 0.00009mW
Thus;
Conducted power = Radiated Power (EIRP) – Antenna Gain
So;

Conducted Power = 0.00009 mW.
The SAR Exclusion Threshold Level for 13.56MHz when the minimum test separation distance is < 50 mm:
= [474 * (1 + log(100/f(MHz))]/2
= 443mW

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance[4,5]

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)	Exemption Limits (mW)				
	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
≤300	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

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.