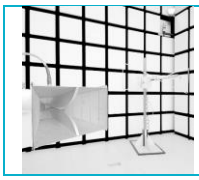
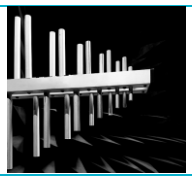
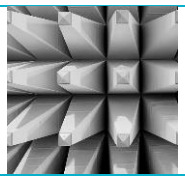

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RF Exposure Evaluation according to KDB 447498 D01 v06

Report identification number: 1-3390/21-01-08_FCC

Certification numbers and labeling requirements	
FCC ID	XKB-D3500CLV2

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1. SAR test exclusion (KDB 447498 D01 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 Test Exclusion Threshold* condition(s), listed below, is (are) satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum *test separation distance* required for the exposure conditions. The minimum *test separation distance* defined in 4.1 f) is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. To qualify for SAR test exclusion, the *test separation distances* applied must be fully explained and justified, typically in the SAR measurement or SAR analysis report, by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, according to the required *published RF exposure KDB procedures*. When no other RF exposure testing or reporting are required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for SAR test exclusion. When required, the device specific conditions described in the other *published RF exposure KDB procedures* must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops and tablets, etc.

a) 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*)] · [$\sqrt{f_{(GHz)}}$] ≤ 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 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 ≤ 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.

b) 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 (also illustrated in Appendix B):

   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

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

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

   1) For *test separation distances* > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/$f_{(MHz)}$)]

   2) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

   3) SAR measurement procedures are not established below 100 MHz.

2. EUT technologies

Declared minimum safety distance: **20 cm**

SRD Technology	Frequency [MHz]		Reference	Output Power [dBm]			Power [mW]		Share of Limit
	f_{Min}	f_{Max}	#	P_{cond}	P_{EIRP}	$P_{RF\ Exp}$	P_{Result}	P_{Limit}	%
RFID 13.56 MHz	13.56	13.56	A, B	33.6	-15.0	**33.6**	**2290.87**	**2400.40**	**95.44%**

Note: For SAR test exclusion a test separation distance of 199 mm was considered.

Referenced Documents:

#	Results from:
A	Test Report 1-3390/21-01-02, page 19
B	Datasheet PN5190.pdf, page 7 (see Annex A)

3. Collocation overview:

Only RFID available.

4. Conclusion

This prediction demonstrates the following:
The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Conclusion: RF exposure evaluation is not required.

Annex A: Technical Documentation PN5190 (Extract) – Max. Power:

5 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$VDD_{(VBAT)}$	supply voltage on pin VBAT (analog and digital supply)	VBAT ≥ VDDIO	2.4	-	5.5	V
$VDD_{(VDDIO)}$	supply voltage on pin VDDIO (supply for host interface and GPIO's)	1.8 V supply	1.62	-	1.98	V
		3.3 V supply	2.4	-	3.6	V
I_{pd}	power-down current	$VDD_{(VDDPA)}$ = $VDD_{(VDDIO)}$ =$VDD_{(VDD)}$ 3.0 V; hard power-down state; pin VEN set LOW, T_{amb} = 25 °C, External supply by VDDIO	-	40	105	µA
I_{stb}	standby current	T_{amb} = 25 °C	-	45	110	µA
I_{ULPCD}	average ultra-low-power card detection current	T_{amb} = 25 °C, VDD(VDDPA) = VDD(VDDIO) =VDD(VDD) 3.0 V, 330 ms Polling interval, 50 R antenna matching	-	22	-	µA
$IDD_{(VDDPA)}$	supply current on pin VDDPA	supplied via VUP_TX (TX_LDO active)	-	-	350	mA
		supplied without DC-DC and TXLDO active	-	-	400	mA
$P_{(PA)}$	Transmitter output power	supplied via VUP_TX (TX_LDO active)	-	-	2.0	W
		supplied without DC-DC and TXLDO active	-	-	2.3	W
T_{amb}	ambient operating temperature	in still air with exposed pins soldered on a 4 layer JEDEC PCB,	-40	-	+85	°C
		in still air with exposed pins soldered on a 4 layer JEDEC PCB, TX current = 120 mA @ VDDPA=3.6 V	-40	-	+105	°C
T_{stg}	storage temperature	no supply voltage applied	-55	-	+150	°C
T_{j_max}	maximum junction temperature	-	-	-	+125	°C