
Project #: 22861-15

Company: SuperDeker

EUT: Super Deker

Maximum Permissible Exposure Evaluation Report

Prepared for:

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1.0 Maximum Permissible Exposure Evaluation (Supplements the test report.)

The measured power is considered for the intended use of the device and resulting RF exposure to the user.

1.1 Reference

Supplements and references this test report: 22861_SuperDeker_Test Report_Final.pdf

1.2 Criteria

Section Reference	Date
447498 D01 General RF Exposure Guidance v06 // RSS-102 Issue 5	21 Oct 2021

1.3 Procedure

Using measurement of peak power and considering the intended application, determine the permissible exposure level, applicability of exclusion, or whether additional exposure tests (SAR) are indicated. When applicable justify conclusion for selected exposure level and separation distance.

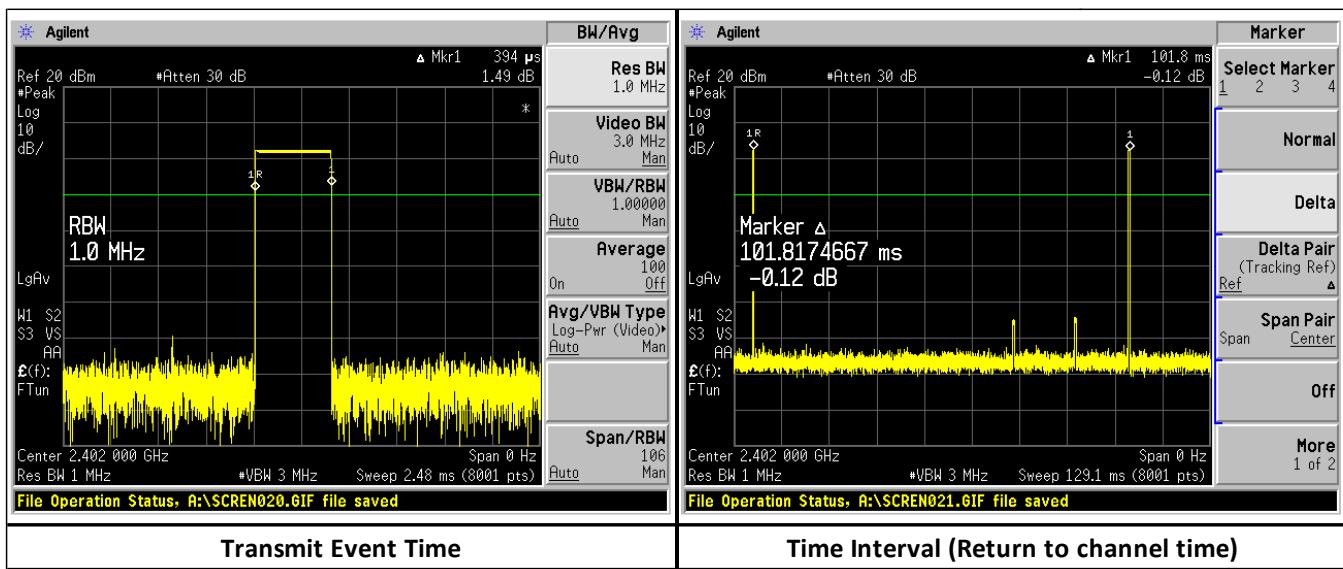
The transmitter antenna is located inside the unit such that the user cannot be closer than 5mm to the antenna during normal operation. During continuous transmission the device operates under a low duty cycle packet scheme.

1.4 Duty Cycle Correction Factor Measurement

Measurement is based on intervals not to exceed 100 msec. Maximum transmitter on time is divided by the lesser of 100 msec or the actual measured minimum transmitter interval time. The result is converted to dB and applied as needed to peak measurements of transmitter artifacts to determine average power. This is not a pass/fail measurement.

Duty Cycle - Conducted Test Data												
Project Number:		22861-15			Test Date(s):			3/2/2022				
Environmental Conditions:		Temperature		24.2 °C	Humidity		30	RH	Barometric Pressure		30.11	in Hg
Measurement Parameters:		RBW	1	MHz	VBW	3	MHz	Span	0	MHz	Detector	Peak
Measured On Time (ms)	Max On Time Allowed (ms)	On Time Result	Measured Time Interval (ms)			Duty Cycle Factor (dB) (20 * Log(On time/Interval))				Duty Cycle Factor Allowed (dB)		
0.394	400	Pass	101.8			48.25				20		

Plotted measurements are shown in the next page.



1.5 Power to Exposure Calculation

For 2.4 GHz radio power is determined by conducted measurement. Safe exposure distance was calculated for the allowed maximum uncontrolled public exposure limit.

Table 1.4.1 Power Calculation for Exposure, 2.4 GHz Radio (Highest frequency 2.480 GHz)

Measured Conducted Peak Power dBm	Source Duty Cycle Factor dB	Antenna Gain dBi	Calculated EIRP dBm	EIRP In Linear Terms mW
-1.44	-20	2.71	-18.73	0.0134

1.6 SAR Exemption Calculation – FCC

According to KDB 447498 D01 General RF Exposure Guidance v06 section 4.3.1. 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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$

- $f(\text{GHz})$ 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

Calculated power (max power including tune up tolerance) = 0.0124 mW

SAR exemption calculation applying 5 mm separation distance:

$$[(0.0134 \text{ mW}) / (5 \text{ mm})] \cdot [\sqrt{2.440 \text{ (GHz)}}] = 0.04$$

So, $0.04 \leq 3.0$ at a separation distance of 5 mm.

1.7 SAR Exemption Calculation – IC

Applying Table 1 of clause 2.5.1 applying 0.5cm (or 5mm) spacing column and row 2450 MHz. The exemption limit is 4 mW.

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

$0.04 \text{ mW} < 4 \text{ mW}$

1.8 Conclusion

FCC and IC exposure limits are satisfied at a separation distance of 5 mm.

End of Report