1601 North A.W. Grimes Blvd., Suite B
Round Rock, TX 78665
e-mail: info@ptitest.com
(512) 244-3371 Fax: (512) 244-1846

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

The results of power measurement and intended use are compared to the RF exposure exemption criteria.

1.2 Criteria

Section Reference	Date
KDB 447498 D01 Mobile Portable RF Exposure v05r01	22 Nov 2016

1.3 Procedure

Measured peak power, calculated average, and spacing for the intended application are used to determine the maximum permissible exposure.

1.4 Exposure Calculation

This device is fixed and mobile device professionally installed on airframes. General uncontrolled (public) limits are assumed; safe distance and exposure at 20 cm are calculated.

Table 1.4.1 Peak Power Measured In 10 MHz RBW, 50 MHz VBW	
Measured Power (peak)	53.6 dBm or 229 Watts

Table 1.4.2 Calculated Duty Cycle and Average Power	
Measured Power (peak)	53.6 dBm or 229 Watts
Transmit Times (µs)	Per TSO-C199: 100 Mode A/C, 19 Short Mode S, 10 Long Mode S, 1 Short Squitter, 3.7 Long Squitters
Total Transmit Time	2011.584 **µs**
Maximum Duty Cycle	0.2012 %
Averaging Factor	10 $\log_{10}$ (0.002012%) = -27 dB
Average Power	P_{peak} + $Factor_{avg}$ = 53.6 – 27 = 26.6 dBm or 457 mW

Table 1.4.3 Power Calculation for Exposure, Highest frequency 1090.0 MHz			
Average Power dBm	**Maximum Antenna Gain dBi**	**Calculated EIRP dBm**	**EIRP In Linear Terms mW**
26.6	2.0	28.6	724.4

$$S = \frac{Pwr_{avg} * Gain_{Antenna}}{4 * \pi * Distance_{Antenna}{}^{2}}$$

Find safe Distance for maximum exposure of f/1500 = 1090/1500 = 0.73 mW/cm^2:

Distance$_{safe}$ = √(P·G/4·π· S) given Pwr$_{avg}$ = 724.4 mW, Gain = 1*, S = 0.73 mW/cm.
**Gain included in term P.*

Distance$_{safe}$ = √(724.4 / 4 · π · 0.72) = 9.0 cm.

Find field density at 20 cm for General Population (uncontrolled) exposure:

Limit S = 1090/1500 = 0.73 mW/cm^2:

S = (P·G) / (4 · π · [Distance]^2) = given Pwr$_{avg}$ = 724.4 mW, Gain = 1*, Distance = 20 cm.
**Gain included in term P.*

S = (724.4) / (4 · π · [20 cm] ^{2}) = 0.14 mW/cm^2

0.14 mW/cm^2 < 0.73 mW/cm^2

The EUT satisfies the requirements.

Signed:

Eric Lifsey

***