

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Class II Permissive Change
P2SR900CE
4171B-R900CE
23-0193
February 27, 2024
Neptune Technology Group, Inc.
R900

MPE/SAR exclusion/RF Exposure Evaluation

Maximum Permissible Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, **d**, of 5 cm (Mobile condition) from the EUT.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE for 902 MHz – 928 MHz:

Limit: 0.61 mW/cm²

Peak Power (dBm) = 18.32 dBm

Peak Power (Watts) = 0.068 W

Gain of Transmit Antenna = +6.0 dB_i = 3.98 numeric

d = Distance = 20 cm = 0.2 m

$$\begin{aligned} S &= (PG / 4\pi d^2) = EIRP/4A = 0.068(3.98)/4\pi \cdot 0.2^2 \cdot 0.2 \\ &= 0.2706/0.5030 = 0.5380 \text{ W/m}^2 \\ &= (0.5380 \text{ W/m}^2) (1\text{m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\ &= 0.05380 \text{ mW/cm}^2 \end{aligned}$$

which is << less than S = 0.61 mW/cm²

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FCC Simultaneous MPE (R900 + Telit module) Calculations:

Total MPE (%) = [(900 MHz MPE result/limit *100)+[Cell Band MPE result/limit *100]
<< 100%

$[(0.054 \text{ mW/cm}^2/0.61 \text{ mW/cm}^2)*100]+[(0.09 \text{ mW/cm}^2/0.52 \text{ mW/cm}^2)*100]= 26.2\%$
<< 100%

The Telit module MPE values were recorded from the attached RF Exposure report for the module. Test report number: CN21N817 002. See Table 8 pg. 11 of 13.

In this application the Telit module is used with the 2.14 dBi antenna.

All calculations performed by:

Test Engineer: Gabriel Medina

Date: October 17, 2023

Signature: 

Test Engineer: George Yang

Date: February 27, 2024

Signature: 

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RF Exposure Evaluation – IC

According to RSS-102, Table 4

At or above 300 MHz and below 6 GHz the Power Density (W/m²) shall be less than $0.02619 \times f^{0.6834}$ adjusted for tune up tolerance where applicable, where f= frequency in MHz.

For 902-928 MHz band: Limit = $0.02619 \times 915^{0.6834} = 2.77$ (W/m²)

Peak Power (Watts) = 0.068 W

Gain of Transmit Antenna = +6.0 dBi = 3.98 numeric

d= Distance = 20 cm = 0.2 m

$$\begin{aligned} S &= (PG/4\pi d^2) = EIRP/4A = 0.068(3.98)/4\pi \cdot 0.2^2 \cdot 0.2 \\ &= 0.2706/0.5030 = 0.5380 \text{ W/m}^2 \end{aligned}$$

Which is less than S = 2.77 (W/m²)

IC Simultaneous MPE (R900 + Telit module) Calculations:

Total MPE (%) = [(900 MHz MPE result/limit *100)+[Cell Band MPE result/limit *100]
<< 100%]

$[(0.538 \text{ W/m}^2/2.77 \text{ W/m}^2)*100]+[(0.94 \text{ W/m}^2/2.6 \text{ W/m}^2)*100]= 55.6\% << 100\%$

The Telit module MPE values were recorded from the attached RF Exposure report for the module. Test report number: CN21N817 002. See Table 10 pg. 12 of 13.

In this application the Telit module is used with the 2.14 dBi antenna.

All calculations performed by:

Test Engineer: Gabriel Medina

Date: October 17, 2023

Signature: 

Test Engineer: George Yang

Date: February 27, 2024

Signature: 