



# RF Exposure

For

## Fluid Life Corporation

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Model No.: Telematics  
FCC ID: 2AYWR-FLWIF11

### ONE STOP GLOBAL CERTIFICATION SOLUTIONS



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# 1. RF Exposure

## 1.1 Limits for Maximum Permissible Exposure (MPE)

TABLE 1 TO §1.1310(E)(1)—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(i) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
<b>(ii) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<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.

## 1.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

Where

P<sub>d</sub> = power density in mW/cm<sup>2</sup>

P<sub>out</sub> = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

r = distance between observation point and center of the radiator in cm

## 1.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Therefore, the device is classified as applicable of Table 1, Maximum Permissible Exposure

### 1.4 Antenna Gain

Brand	Model	Antenna Gain (dBi)	Freq. Range (GHz)	Antenna Type	Connector Type
TAOGLAS	MA600.A.AB C.007	-4.7	0.824 ~ 0.896	MA600 Spartan Screw mount 3 in1 Combination Antenna	SMA(M)
		-2.7	1.71 ~ 1.88		RP-SMA(M)
		-2.3	2.4 ~ 2.5		

### 1.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (numeric)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Cellular 1	846.6	326.6	0.339	20	0.0213	0.551
Cellular 2	1712.4	323.6	0.537	20	0.0334	1
Cellular 3	1880	297.9	0.537	20	0.0308	1
WLAN	2437	92.7	0.589	20	0.0105	1

### 1.6 Colocation calculation

Per KDB Publication 447498 D01, Section 7.2, Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is  $\leq 1.0$ , according to calculated/estimated, numerically modeled, or measured field strengths or power density. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to the MPE limit at the test frequency.

$$[ Pd(1) / LPd(1) ] + [ Pd(2) / LPd(2) ] + \dots + [ Pd(n) / LPd(n) ] < 1,$$

Where,

Pd(n) = Power density of n<sup>th</sup> transmitter at 20 cm

LPd(n) = Power density limit for the n<sup>th</sup> transmitter

$$[ Pd(\text{Cellular 1}) / 0.551 ] + [ Pd(\text{Cellular 2}) / 1 ] + [ Pd(\text{Cellular 3}) / 1 ] + [ Pd(\text{WLAN}) / 1 ] = 0.1134 < 1$$

**Conclusion.** The device complies with KDB Publication 447498 D01 RF radiation exposure limit as a mobile device under the collocation conditions described above.