# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

## 1.1 General Information

**Client Information**

| | |
|---|---|
| Applicant: | Meshify Inc |
| Address of applicant: | 706A West Ben White Blvd., Suite 210, Austin, TX 78704, United States |
| | |
| Manufacturer: | Meshify Inc |
| Address of manufacturer: | 706A West Ben White Blvd., Suite 210, Austin, TX 78704, United States |

**General Description of EUT:**

| | |
|---|---|
| Product Name: | Meshify Pipe Temperature Sensor |
| Brand Name: | Meshify Inc |
| Model No.: | TDUS-05-04 |
| Adding Model(s): | / |
| FCC ID: | 2AQ34-TDUS-05-04 |
| Rated Voltage: | DC1.5V*2 |

**Technical Characteristics of EUT:**

**DSS**

| | |
|---|---|
| Frequency Range: | 902.3-914.9MHz |
| RF Output Power: | 9.07dBm (Conducted) |
| Modulation: | GFSK |
| Quantity of Channels: | 64 |
| Channel Separation: | 200kHz |
| Type of Antenna: | Integral Antenna |
| Antenna Gain: | -4.0dBi |

**DTS**

| | |
|---|---|
| Frequency Range: | 903.0-914.2MHz |
| RF Output Power: | 8.93dBm (Conducted) |
| Modulation: | GFSK |
| Quantity of Channels: | 8 |
| Channel Separation: | 1.6MHz |
| Type of Antenna: | Integral Antenna |
| Antenna Gain: | -4.0dBi |

## 1.2 Standard Applicable

According to §1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm$^2$) | Averaging Times $\mid E \mid^2$, $\mid H \mid^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842/f | 4.89/f | (900/f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | / | / | F/300 | 6 |
| 1500-100000 | / | / | 5 | 6 |

(b) Limits for General Population / Uncontrolled Exposure

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm$^2$) | Averaging Times $\mid E \mid^2$, $\mid H \mid^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | F/1500 | 30 |
| 1500-100000 | / | / | 1 | 30 |

Note: f = frequency in MHz: * = Plane-wave equivalents power density

## 1.3 MPE Calculation Method

$S = (30*P*G) / (377*R^2)$

S = power density (in appropriate units, e.g., mw/cm$^2$)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

## 1.4 MPE Calculation Result

Maximum Tune-Up output power: 10(dBm)

Maximum peak output power at antenna input terminal: 10(mW)

Prediction distance: >20(cm)

Prediction frequency: 902.3 (MHz)

Antenna gain:-4(dBi)

Directional gain (numeric gain): 0.40

The worst case is power density at prediction frequency at 20cm: 0.0008(mw/cm$^2$)

MPE limit for general population exposure at prediction frequency: 0.6015 (mw/cm$^2$)

Result: Pass