# RF Exposure Evaluation declaration

Product Name : Active RFID transponder

Model No.　　 : i-Q350 RCM

FCC ID　　　 : OO4-ILR-IQ350WAM2

Applicant : Identec Solutions AG

Address 　: Millennium Park 2, 6890 Lustenau , Austria

Date of Receipt 　　: July 16, 2015

Date of Declaration : Oct. 14, 2015

Report No. 　　　　: 1570435R-RFUSP66V00-A

# 1. RF Exposure Evaluation

## 1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b) LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm$^2$) | Average Time (Minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 300-1500 | -- | -- | F/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 300-1500 | -- | -- | F/1500 | 6 |
| 1500-100,000 | -- | -- | 1 | 30 |

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in mW/cm$^2$

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd id the limit of MPE, 1 mW/cm$^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

## 1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18℃ and 78％ RH.

### 1.3. Test Result of RF Exposure Evaluation

Product     :     Active RFID transponder
Test Item   :     RF Exposure Evaluation

| Operation Frequency Range | 919MHz-921MHz |
|---|---|

**Antenna List**

| No. | Manufacturer | Part number | Antenna Type | Peak Gain |
|---|---|---|---|---|
| 1 | Würth Elektronik eiSos GmbH & Co.KG | 7488910092 | Chip Antenna | -0.7dBi |

**Step 1: Field strength is converted into Pout (dBm)**

| Radiated Power @3m (dBuV/m) | Distance (m) | Antenna Gain (dBi) | Maximum conducted output power (dBm) |
|---|---|---|---|
| 93.739 | 3 | -0.7 | -0.79 |

$$P = \frac{(Ed)^2}{30G}$$   Note:

**Step 2: Calculating power density (Pd)**

| Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm2) |
|---|---|
| 0.8336 | 0.0001 |

Pd = (Pout*G)/(4*pi*r$^2$)

Power density is much lower than the limit (0.612 mW/cm$^2$).