

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

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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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	Electric Field	Magnetic Field	Power Density	Average Time	
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²) (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/cm². 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°C and 78% RH.

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1.3. Test Result of RF Exposure Evaluation

Product : Active RFID transponder Test Item : RF Exposure Evaluation

Operation Fraguency Dongs	010MHz 021MHz
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	Distance	Antenna	Maximum conducted
@3m		Gain	output power
(dBuV/m)	(m)	(dBi)	(dBm)
93.739	3	-0.7	-0.79

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

Step 2: Calculating power density (Pd)

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

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

Power density is much lower than the limit (0.612 mW/cm²).

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