

RF Exposure Evaluation declaration

Product Name : UHF Band MMDS Transceiver
Model No. : TRX-310
FCC ID. : OUP970900101

Applicant : TRANSYSTEM INC.

Address : No.1-2, Li-Hsin Rd. 1, Science-Based Industrial
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Report No. : 08A216R-RF-US-Exp
Version : V1.0

The declaration results relate only to the samples calculated.

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

Where

P_d = power density in mW/cm^2

P_{out} = 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

P_d is 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°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	UHF Band MMDS Transceiver
Test Mode	Mode 1: Transmit
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Lists:

antenna : gain = 2dBi, which is 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance for antenna gain=2dBi

16QAM (160 ksps)		
Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
704.2	202.77	0.0637
709.8	233.88	0.0735
710.2	228.56	0.0718
715.8	198.61	0.0624

16QAM (320 ksps)		
Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
704.2	201.37	0.0633
709.8	223.87	0.0704
710.2	220.29	0.0692
715.8	190.55	0.0599

16QAM (640 ksps)		
Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
704.2	183.23	0.0576
709.8	207.97	0.0654
710.2	204.17	0.0642
715.8	176.60	0.0555

16QAM (1280 ksps)		
Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
705.8	213.30	0.0670
708.2	233.35	0.0733
711.8	229.61	0.0722
714.2	208.93	0.0657

16QAM (2560 ksps)		
Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
705.8	216.27	0.0680
708.2	233.35	0.0733
711.8	228.56	0.0718
714.2	208.93	0.0657

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².