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RF Exposure Evaluation Report

APPLICANT	CATTRON-THEIMEG INCORPORATED
	58 W. SHENANGO STREET SHARPSVILLE PA 16150-1198 USA
FCC ID	CN279546-91071
MODEL NUMBER	79546+91071 TRX
PRODUCT DESCRIPTION	220 MHz RF MODULE
STANDARD APPLIED	CFR 47 Part 2.1091
PREPARED BY	Sid Sanders

We, TIMCO ENGINEERING, INC. would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and meets the requirements.

The attached report shall not be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

GENERAL REMARKS

Attestations

This equipment has been evaluated in accordance with the standards identified in this report. To the best of my knowledge and belief, these evaluations were performed using the procedures described in this report.

I attest that the necessary evaluations were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:



Sid Sanders

Engineering Project Manager

Date: 12/4/2014

GENERAL INFORMATION

EUT Description	220 MHz RF MODULE
FCC ID	CN279546-91071
Model Number	79546+91071 TRX
Frequency Range	216-222
Type of Emission	7K60F1D, 7K60F1E 7K60F1W, 7K60FXE, 7K60FXD
Modulation	FM
EUT Power Source	<input checked="" type="checkbox"/> 110–120Vac/50– 60Hz
	<input checked="" type="checkbox"/> DC Power 12V
	<input type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed
	<input checked="" type="checkbox"/> Mobile
	<input type="checkbox"/> Portable
Test Conditions	The temperature was 24-26°C with a relative humidity of 50-64%.
Revision History to the EUT	None
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

RF Exposure Requirements

General information

Device type: RF Module

Devices that operate under Part 90 of this chapter are subject to RF exposure evaluation prior to equipment authorization or use.

Antenna

Whip antenna 0dBi

½ Wavelength Omni antenna 5.15 dBi

Helical antenna -8 dBi

Operating configuration and exposure conditions:

The conducted output power is shown in the table below. Typical use qualifies for a maximum duty cycle factor of 100%.

Operation: A typical installation consists of an antenna TO Hand separation of at least 152mm.

Nom. Attenuation for RG 213/U:

Frequency MHz	Attenuation per 100ft. dB
1	.27
10	.55
50	1.3
100	1.9
200	2.7
400	4.1
700	6.5
900	7.6
1000	8.0
4000	21.5

MPE Calculation:

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

Applicant: CATTRON-

FCC ID: CN279546-91071

Report: C\CATTRON\1935AUT14\1935AUT14RFExp Rpt.docxt

The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.11310, Table 1.

**Minimum Separation Distance for Mobile or Fixed Devices
General Population/Uncontrolled Exposure**

Insert values in yellow highlighted boxes to determine Minimum Separation Distance

Max Power	1.5	W	<i>equals</i>	Max Power	1500	mW
Duty Cycle	100	%	<i>equals</i>	Duty Factor	0.5	numeric
Antenna Gain	5.15	dBi	<i>equals</i>	Gain numeric	3.273407	numeric
Coax Loss	0	dB		Gain - Coax Loss	3.273407	numeric
Power Density	0.2	mW/cm ²				
Frequency	222	MHz				

Enter power Density from the chart to the right

Rule Part 1.1310, Table 1

Frequency range	Power density	Enter this value
MHz	mW/cm ²	mW/cm ²
0.3-1.34	100	100
1.34-30	180/f ²	0.0
30-300	0.2	0.2
300-1,500	f/1500	0.1
1,500-100,000	1	1

f = frequency in MHz

Minimum Separation Distance	31 cm	0.31 m
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Minimum Separation in Inches 12.2 Inches