

TEST: FCC 47 CFR 1.1310 Maximum Permissible Exposure

ENVIRONMENTAL ASSESSMENT

On the T2030-K27-L00 Mobile Transmitter

FCC ID: CASTEL0057

SN: 17085682

In accordance with

ANSI/IEEE Std C95.1, 1999
OET Bulletin 65 97-01

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TABLE OF CONTENTS

	PAGE
Contents:	2
Operating Conditions and Exposure conditions, Minimum Safe Distance calculations.	3
Test results, Transmitter Power.	4
Test results, MPE, Average power calculations.	5
Information to be placed in Manual	6

Operating and Exposure conditions:

Operating Conditions: Mobile transmitter using vehicle mounted antennas only

Exposure conditions: Occupational/Controlled.

Minimum Safe Distance calculations:

$$R = (P G / 4 \pi S)^{1/2}$$

Antenna Type: Monopole

Antenna Gain: 4.5 dBi

Transmitter Power: 15 Watts

Limit: 300 – 1500 MHz: $f/300 \text{ mW/cm}^2$
For $f = 896.1 \text{ MHz}$, $s = 2.987$

Power gain product: $15000 \times 2.8 = 42000 \text{ mW}$

Minimum safe distance: $(42000 / 4\pi \times 2.987)^{1/2} = 33.5\text{cm or } 13.5 \text{ inches.}$

Test Results:

NAME OF TEST: TRANSMITTER OUTPUT POWER (CONDUCTED)

TEST CONDITIONS: Ambient Temperature 20°C
Relative Humidity 40%
Standard Voltage 13.8V DC

SPECIFICATION: FCC 47 CFR 2.1046

GUIDE: TIA/EIA-603 2.2.1

MEASUREMENT PROCEDURE:

1. The Equipment Under Test (EUT) was connected to an RF Power meter using a coaxial attenuator with an impedance of 50 Ohms.
2. The unmodulated output power was measured.

MEASUREMENT RESULTS:

Frequency: 896.1 MHz	Manufacturer's Rated Output Power: 15W nominal
POWER (W)	15
Measurement Uncertainty (dB)	+0.63, -0.68

NAME OF TEST: ENVIRONMENTAL ASSESSMENT

TEST CONDITIONS: Ambient Temperature 20°C
Relative Humidity 40%
Standard Voltage 13.8V DC

SPECIFICATION: FCC 47 CFR 1.1310

GUIDE: ANSI/IEEE Std C95.1, 1999, OET Bulletin 65 97-01

Test Method:

The antenna is mounted on a ground plane which is placed on a non metallic turntable 1.35 m high and clear of nearby objects. Peak power density readings are taken at 0.2m vertical increments using a calibrated isotropic probe at the calculated safe distance from the antenna. The measurement equipment is operated remotely using fibre optics to reduce field perturbations.

Test Results:

Test Distance: 0.335 metres

Probe Height metres	Result for 15 Watts TX power.
0.2	0.017
0.4	0.032
0.6	0.038
0.8	0.049
1.0	0.089
1.2	0.163
1.4	0.442
1.6	0.715
1.8	0.064
2.0	0.105

Calculations of average power (sum of results/number of results):

Body part	Average Power Density, mW/cm ²
Whole Body Probe Height 0.2 to 2.0m	0.171
Upper Body Probe Height 1.0 to 2.0m	0.225
Lower Body Probe Height 0.2 to 0.8m	0.034

Limit, Occupational/controlled exposure:

300 – 1500 MHz: $f/300$ mW/cm²
for 896.1 MHz: 2.987 mW/cm²

Test Equipment Used:

Power Meter:	Rohde and Schwarz NRVS	s/n 841954/005
Isotropic Probe	Holaday HI-422	s/n 95661
Antenna Mast	Tait	
Turntable	Tait	
TEM cell	Rohde and Schwarz S Line	s/n338232/003
Signal Generator	Agilent E4422B	s/nGB40050320
Linear Amplifier	Amplifier Research 25A250	s/n20444

Information to be placed in Installation manual:

Antenna Installation:

Warning: To comply with FCC RF exposure limits, this product must be installed using an antenna with a gain specified below. This antenna must not be mounted at a location such that any person or persons can come closer than the minimum safe distance of 0.34 metres to the antenna.

PRODUCT	ANTENNA GAIN (dBi)
T20X0-K27	4.5

Information to be placed in User Manual:

USA Users:

Safety Training Information.

WARNING:

This product generates Radio Frequency energy during transmissions. It is classified as suitable for "Occupational Use Only". It is not intended for general use in uncontrolled environments.

It must only be used with authorised accessories and antennas.

The operator must ensure that the minimum safe distance between persons and the antenna is not exceeded during transmissions.

Do not exceed a duty cycle ratio of 50% transmit mode to standby or receive modes. The radio is in transmit mode when the PTT button on the microphone is pressed and the "TX" annunciator or warning LED shows.

END