



Test Report - FCC PART 1.1310 / MPE

Applicant: Kelvin Hughes Limited Voltage

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 9/7/2021

This test report shall not be reproduced except in full without the written and signed permission of Timco Engineering Inc. (IIA). This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.



Table of Contents

1.	CUSTOMER INFORMATION.....	3
2.	LOCATION OF TESTING.....	3
2.1	TEST LABORATORY	3
2.2	TESTING WAS PERFORMED, REVIEWED BY.....	4
3.	TEST SAMPLE(S) (EUT/DUT).....	5
3.1	DESCRIPTION OF THE EUT.....	5
4.	TEST METHODS & APPLICABLE REGULATORY LIMITS.....	6
4.1	TEST METHODS/STANDARDS/GUIDANCE:	6
4.1.1	<i>FCC Limits for Maximum Permissible Exposure (MPE)</i>	6
4.2	EQUATIONS.....	7
5.	RF EXPOSURE RESULTS.....	8
6.	HISTORY OF TEST REPORT CHANGES.....	9



Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

1. Customer Information

Customer: Kelvin Hughes Limited
Address: Voltage Mollison Avenue
Enfield, United Kingdom EN3 7XQ

2. Location of Testing

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780
FCC Designation # US1070
FCC site registration is under A2LA certificate # 0955.01
ISED Canada test site registration # 2056A
EU Notified Body # 1177
For all designations see A2LA scope # 0955.01



Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

2.2 Testing was performed, reviewed by

Dates of Testing: 4/30/2019

Signature:

Sr. EMC Engineer
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

9/7/2021



3. Test Sample(s) (EUT/DUT)

The test sample was received: 6/25/2021

3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID:	CICDTX-A603-SF
Brief Description	S Band Radar
Type of Modular	n/a
Model(s) #	DTX-A1-APNA
Firmware version	n/a
Software version	n/a
Serial Number	n/a

Technical Characteristics	
Technology	S Band Radar
Frequency Range	2900-3100
RF O/P Power (Max.)	11.72W
Modulation	n/a
Bandwidth & Emission Class	PON
Duty Cycle	n/a
Antenna Connector	n/a
Voltage Rating (AC or Batt.)	110-120 VAC/ 50-60Hz

Antenna Characteristics		
Frequency Range	Mode / BW	Antenna Gain
2900-3100MHz	n/a	27.5 dBi



4. Test methods & Applicable Regulatory Limits

4.1 Test methods/Standards/Guidance:

The following guidance FCC KDB 447498 D01 General RF Exposure Guidance v06 was used for RF exposure evaluation as per FCC Part 1.1310 and FCC Part 2.1091 and part 2.1093. Full test results are available in this report.

4.1.1 FCC Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging Time (minutes)
A Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
B Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30



4.2 Equations

POWER DENSITY

$$E(V/m) = \text{SQRT} (30 * P * G) / d$$

$$Pd(W/m^2) = E^2 / 377$$

$$S = \text{EIRP} / (4 * \text{Pi} * D^2)$$

Where:

S = Power density, in mW/cm²

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm² to units of W/m² by multiplying by 10.

DISTANCE

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

Where:

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power, in mW

S = Power density in mW/cm²

SOURCE-BASED DUTY CYCLE (When applicable (for example, multi-slot mobile phone applications) A duty cycle factor may be applied.)

$$\text{Source-based time-average EIRP} = (DC / 100) * \text{EIRP}$$

Where:

DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW



5. RF Exposure Results

Transmitter Type: S Band Radar

Separation Distance: 20 cm

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
2900-3100 MHz	20	40.69	27.50	100%	6591.74	1311.385 mW/cm ²	1 mW/cm ²	5 mW/cm ²	724.26

RESULT: Pass at DISTANCE 724.26 cm



6. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_319UT16_FCC_MPE_	1	Initial release	9/7/2021
	2	Updated address on page 3	11/12/2021



Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

END OF TEST REPORT
