



Test Report - FCC PART 1.1310 / MPE

Prepared For: UNICATION CO., LTD.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature
(YYYY-MM-DD): 2020-11-20

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 TESTING3

 2.1 TEST LABORATORY3

 2.2 TESTING WAS PERFORMED, REVIEWED BY4

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 *FCC Limits for Maximum Permissible Exposure (MPE)*.....6

 4.2 EQUATIONS.....7

5. RF EXPOSURE RESULTS8

6. HISTORY OF TEST REPORT CHANGES9



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

1. Customer Information

Applicant: UNICATION CO., LTD.
Address: 5F., No. 6, Wu-Kung 5 Road
Hsinchuang City, Taipei, Taiwan

Contact:: Mr. Robert Marchetto
Telephone: 604-205-7450 x3315
Email address: rmarchetto@uniamericas.com

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: November 11, 2020 – November 16, 2020

Signature:  _____

Name & Title: Franklin Rose, EMC Specialist

Date of Signature

(YYYY-MM-DD): 2020-11-20

Signature:  _____



Name & Title: Tim Royer, EMC Engineer

Date of Signature

(YYYY-MM-DD): 2020-11-20



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

The test sample was received: November 2, 2020

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:	LEA-R017800
Brief Description	700/800 MHz Repeater
Type of Modular	n/a
Model(s) #	R017800T (TX); R017800R (RX)
Trade name	n/a
Firmware version	n/a
Software version	DSP version RP1 Nov 27 2019 01:42 GMT 002R GE
Serial Number	CR01 sn: R01SRB80001 TX01 sn: R01STB800001 CR01 sn: R01SRB80002 TX01 sn: R01STB800002

Technical Characteristics	
Technology	FM Analog & Digital Repeater/Base Station
Frequency Range	762 – 776 MHz, 792 - 806 MHz, 806 – 825 MHz, 851 – 870 MHz
RF O/P Power (Max.)	130 W (51.14 dBm)
Modulation	FM/CFSK
Bandwidth & Emission Class	11K0F3E, 16K0F3E, 7K80FXE, 7K80FXD, 7K80FXW, 8K10F1E, 8K10F1D
Number of Channels	Variable
Duty Cycle	Tested at 100%
Antenna Type	n/a
Antenna Gain (for each ant.)	0 dBi
Antenna Connector	N
Voltage Rating (AC or Batt.)	120/240 V AC; 48 V DC

Antenna Characteristics		
Frequency Range	Mode / BW	Antenna Gain
n/a	n/a	0 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: Fixed Mount, SISO, Non-colocated TX
(1 possible RF pathway)

Transmitter, Part 90

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)
762-870 MHz	20	52.13	0.00	100%	163.31	3.2489 mW/cm ²	0.508 mW/cm ²	2.54 mW/cm ²	159.94

RESULT: Passes Limit at Distance: 160 cm



6. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_4164-20_FCC_MPE_1	1	Initial release	November 20, 2020



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

END OF TEST REPORT
