



# Test Report - FCC PART 1.1310 / MPE

## Prepared For: BEI Electronics, LLC

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature

(YYYY-MM-DD): 2021-09-16

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Table of Contents

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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 *FCC Limits for Maximum Permissible Exposure (MPE)*.....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  
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## 1. Customer Information

Applicant: BEI Electronics, LLC  
Address: 4100 N 24TH STREET  
QUINCY IL 62305 United States

## 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



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2.2 Testing was performed, reviewed by

Dates of Testing: 8/3/2021 – 8/5/2021

Signature:

Sr. EMC Engineer  
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

09/16/2021

Signature:

Name & Title:

Kristoffer Costa, EMC Technician

Date of Signature

09/16/2021

Signature:

Name & Title:

Terri Allen, Technical Assistant

Date of Signature

09/16/2021



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

The test sample was received: June 12, 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:	DDE-STXE
Brief Description	FM Broadcast Transmitter
Type of Modular	n/a
Model(s) #	STXe
Firmware version	n/a
Software version	n/a
Serial Number	44625

Technical Characteristics	
Technology	FM Broadcast Transmitter
Frequency Range	88-108 MHz
RF O/P Power (Max.)	3419.79 W
Modulation	FM
Bandwidth & Emission Class	F3E
Duty Cycle	100%
Antenna Connector	n/a
Voltage Rating (AC or Batt.)	AC

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	88 – 108 MHz	n/a	0 dBi
2			



#### 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 <sup>2</sup> )	Averaging Time (minutes)
<b>A Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
<b>B Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<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

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

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

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

Where:

S = Power density, in mW/cm<sup>2</sup>

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm<sup>2</sup> to units of W/m<sup>2</sup> 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/cm<sup>2</sup>

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

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

Where:

DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW



## 5. RF Exposure Results

Transmitter Type: FM Broadcast Transmitter

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)
88-108 MHz	20	64.98	0.00	100%	3147.75	626.225 mW/cm <sup>2</sup>	0.2 mW/cm <sup>2</sup>	1 mW/cm <sup>2</sup>	1119.13

RESULT: Pass at DISTANCE 1119.13 cm





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## 6. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_3417-21-20_FCC_MPE_1	1	Initial release	08/06/2021
TR_3417-21-20_FCC_MPE_2	2	Updated page 5 & 8	11/11/2021



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END OF TEST REPORT

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