



## **Compliance Testing, LLC**

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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### **Test Report**

**Prepared for: G-Way Microwave**

**Model: BDA-UHF-36/36-80-AB**

**Description: Bi-Directional amplifier (BDA), amplify DL and UL frequencies in the UHF band.  
The max composite power of this BDA is 36 dbm and has up to 80db gain, comes in AB enclosure**

**FCC ID: Q8KUHF3680AB**

**To**

**FCC Part 1.1310**

**Date of Issue: June 8, 2015**

**On the behalf of the applicant:**

**G-Way Microwave  
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**Attention of:**

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**Greg Corbin  
Project Test Engineer**

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All results contained herein relate only to the sample tested



### Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	June 3, 2015	Greg Corbin	Original Document



### ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless below

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A



### **EUT Description**

**Model:** BDA-UHF-36/36-80-AB

**Description:**

Bi-Directional amplifier (BDA), amplify DL and UL frequencies in the UHF band.

The max composite power of this BDA is 36 dBm and has up to 80db gain, come within AB enclosure

**Firmware:** N/A

**Serial Number:** 15031002, 15031004

### **Additional Information:**

The EUT is classified as a **Class B** industrial signal booster

The EUT is a UHF Bi-directional Amplifier that operates from 406.1 – 430, and 450 – 512 MHz in both directions.

### **EUT Operation during Tests**

The EUT was tested under normal operating conditions with the front panel attenuators set to 0 dB for all measurements.

MPE calculations were performed at the manufacturer's rated output of +36 dBm using an antenna with 0 dBi gain.

MPE calculations were performed at the manufacturer's rated output of +36 dBm +20% using an antenna with 0 dBi gain.



## MPE Evaluation

This is a Fixed device used in an **Uncontrolled** Exposure environment.

### Limits Uncontrolled Exposure

47 CFR 1.1310

Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm <sup>2</sup> ] = 100
1.34-30 MHz:	Limit [mW/cm <sup>2</sup> ] = (180/f <sup>2</sup> )
30-300 MHz:	Limit [mW/cm <sup>2</sup> ] = 0.2
300-1500 MHz:	Limit [mW/cm <sup>2</sup> ] = f/1500
1500-100,000 MHz	Limit [mW/cm <sup>2</sup> ] = 1.0

### Test Data

**Uplink Output Power set to manufacturer's (Mfr) rated output power (+36 dBm) using an antenna with 0 dBi gain**

Test Frequency, MHz	406.1
Power, Mfr rated, mW (P)	3981
Antenna Gain Isotropic	0 dBi
Antenna Gain Numeric (G)	1
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$			
Power Density (S) mw/cm <sup>2</sup>	Power mW (P)	Numeric Gain (G)	Distance (r <sup>2</sup> ) cm
0.792	3981	1	20

Power Density (S) = 0.792 mw/cm <sup>2</sup>
Limit =(from above table) = 0.271 mw/cm <sup>2</sup>

With the output power set to **manufacturer rated output power (+36 dBm)** using a 0 dBi antenna, the EUT does not meet the power density requirements at 20 cm, so the minimum safe distance was calculated below.

## Minimum Safe Distance Evaluation

### Test Data

**Uplink Output Power set to manufacturer's (Mfr) rated output power (+36 dBm) using an antenna with 0 dBi gain**

Test Frequency, MHz	406.1
Power, Mfr rated, mW (P)	3981
Antenna Gain Isotropic	0 dBi
Antenna Gain Numeric (G)	1
Limit (L)	0.271

$R = \sqrt{(PG/4\pi L)}$			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
34.2	3981	1	0.271

With the output power set to the manufacturer's (Mfr) rated output power (+36 dBm) using an antenna with 0 dBi gain, the minimum safe distance is 34.2 cm.



## MPE Evaluation

This is a Fixed device used in an **Uncontrolled** Exposure environment.

### Limits Uncontrolled Exposure

47 CFR 1.1310

Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm <sup>2</sup> ] = 100
1.34-30 MHz:	Limit [mW/cm <sup>2</sup> ] = (180/f <sup>2</sup> )
30-300 MHz:	Limit [mW/cm <sup>2</sup> ] = 0.2
300-1500 MHz:	Limit [mW/cm <sup>2</sup> ] = f/1500
1500-100,000 MHz	Limit [mW/cm <sup>2</sup> ] = 1.0

### Test Data

**Uplink Output Power set to manufacturer's (Mfr) rated output power (+36 dBm) + 20 % using an antenna with 0 dBi gain**

Test Frequency, MHz	406.1
Power, Mfr rated, mW (P)	3981
Power, Mfr rated + 20%, mW (P)	4777.2 mw (3981 + 20% )
Antenna Gain Isotropic	0 dBi
Antenna Gain Numeric (G)	1
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$			
Power Density (S) mw/cm <sup>2</sup>	Power mW (P)	Numeric Gain (G)	Distance (r <sup>2</sup> ) cm
0.950	4772.2	1	20

Power Density (S) = 0.950 mw/cm <sup>2</sup>
Limit =(from above table) = 0.271 mw/cm <sup>2</sup>

With the Uplink output power set to **manufacturer rated output power (+36 dBm) + 20 %** using a 0 dBi antenna, the EUT does not meet the power density requirements at 20 cm, so the minimum safe distance was calculated below.

### Minimum Safe Distance Evaluation

#### Test Data

**Uplink Output Power set to manufacturer's (Mfr) rated output power (+36 dBm) + 20 % using an antenna with 0 dBi gain**

Test Frequency, MHz	406.1
Power, Mfr rated, mW (P)	3981
Power, Mfr rated + 20%, mW (P)	4777.2 mw (3981 + 20% )
Antenna Gain Isotropic	0 dBi
Antenna Gain Numeric (G)	1
Limit (L)	0.271

$R = \sqrt{(PG/4\pi L)}$			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
37.5	4777.2	1	0.271

With the Uplink Output Power set to the manufacturer's (Mfr) rated output power (+36 dBm) + 20 % using an antenna with 0 dBi gain, the minimum safe distance is 37.5 cm.

END OF TEST REPORT