



## Test Report

Prepared for: G-Wave Incorporated

Model: BDA-LTE/LABC-33/33-90-AB

Description: Commercial/Industrial Booster LTE Unit (700 MHz)

Serial Number: 18091002

FCC ID: Q8KLABC3390AB

To

FCC Part 1.1310

Date of Issue: April 30, 2019

On the behalf of the applicant:

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### Test Report Revision History

<b>Revision</b>	<b>Date</b>	<b>Revised By</b>	<b>Reason for Revision</b>
1.0	April 28, 2019	Greg Corbin	Original Document



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

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**Non-accredited tests contained in this report:**

**N/A**



**EUT Description**

**Model:** BDA-LTE/LABC-33/33-90-AB

**Description:** Commercial/Industrial Booster LTE Unit (700 MHz unit)

**Serial Number:** 18091002

**Additional Information:**

The EUT is a CRMS Part 27 industrial signal booster that operates in the frequency band listed in Table 1.

**Table 1 - Antennas specified for the EUT:**

Port	Frequency Range (MHz)	Antenna Model	Gain (dBi)	Gain (unitless)
Uplink	698 - 716	TDJ-700/2500YG	7.5	5.62
Downlink	728 – 746	TQI-4FC-5	2.0	1.58

**EUT Operation during Tests**

Uplink MPE calculations were performed at the manufacturer's rated output of +33 dBm using an antenna with 7.5 dBi gain.

Downlink MPE calculations were performed at the manufacturer's rated output of +33 dBm using an antenna with 2 dBi gain.

The lowest frequency in each band was used to compute the "worst case" limit.



### Minimum Safe Distance Evaluation - Limits

This is a Fixed device used in 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

Test Frequency, MHz	698
Power, Conducted, mW (P)	2000
Antenna Gain Isotropic	7.5 dBi
Antenna Gain Numeric (G)	5.62
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mw/cm <sup>2</sup>

Power Density (S) = 2.236 mw/cm <sup>2</sup>
Limit = (from above table) = 0.465 mw/cm <sup>2</sup>

With the output power set to **manufacturer rated output power (+33 dBm)** using a 7.5 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

Test Frequency, MHz	698
Power, Conducted, mW (P)	2000
Antenna Gain Isotropic	7.5 dBi
Antenna Gain Numeric (G)	5.62
Limit (L)	0.465 mw/cm <sup>2</sup>

R=√(PG/4πL)			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
43.8	2000	5.62	0.465

With the output power set to the manufacturer's (Mfr) rated output power (+33 dBm) using an antenna with 7.5 dBi gain, the minimum safe distance is 43.8 cm.



### Test Data - Downlink

Test Frequency, MHz	728
Power, Conducted, mW (P)	2000
Antenna Gain Isotropic	2.0 dBi
Antenna Gain Numeric (G)	1.58
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mw/cm <sup>2</sup>

Power Density (S) = 0.629 mw/cm <sup>2</sup>
Limit = (from above table) = 0.485 mw/cm <sup>2</sup>

With the output power set to **manufacturer rated output power (+33 dBm)** using a 2.0 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 - Downlink

Test Frequency, MHz	728
Power, Conducted, mW (P)	2000
Antenna Gain Isotropic	2.0 dBi
Antenna Gain Numeric (G)	1.58
Limit (L)	0.485 mw/cm <sup>2</sup>

R=√(PG/4πL)				
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)	
22.8	2000	1.58	0.485	

With the output power set to the manufacturer's (Mfr) rated output power (+33 dBm) using an antenna with 2.0 dBi gain, the minimum safe distance is 22.8 cm.

END OF TEST REPORT