



Test Report

Prepared for: G-Way Incorporated

Model: 900MHz Industrial Booster

Description: DL/896-901 MHz UL/935-940 MHz, DL/901-902MHz UL/940-941 MHz

Serial Number: 16051002

FCC ID: Q8KPS93790C

To

FCC Part 1.1310

for Part 20 (90-S) test report

Date of Issue: September 21, 2016

On the behalf of the applicant:

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	September 21, 2016	Greg Corbin	Original Document



ILAC / A2LA

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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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FCC Site Reg. #349717

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Non-accredited tests contained in this report:

N/A



EUT Description

Model: 900MHz Industrial Booster

Description: DL/896-901 MHz UL/935-940 MHz, DL/901-902MHz UL/940-941 MHz

Serial Number: 16051002

Additional Information:

The EUT is classified as a Part 90-S **Class B** industrial signal booster from 935 to 940 MHz uplink and 896 – 901 MHz downlink bands.

The EUT is classified as a Part 24-D **Class B** industrial signal booster from 940 - 941 MHz uplink and 901 - 902 MHz downlink bands.

The EUT is a Bi-directional Amplifier that operates in the Frequency ranges listed in Table 1.

System Power is 120 VAC @ 60 Hz.

Table 1

Frequency (MHz)	
Base to Mobile	Mobile to Base
935 - 940	896 - 901
940 - 941	901 - 902

Antennas specified for the EUT:

Antenna type	Model	Gain - dBi
Wideband High Gain Ceiling Antenna	TQI-4FC-5	2
Full Band Directional Antenna	TDJ-700/2500YG	8.5

EUT Operation during Tests

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

30 dB, 50 watt attenuators were installed on both RF ports for all tests.

MPE calculations were performed at the manufacturer's rated output of +37 dBm using an antenna with 8.5 dBi gain.

MPE calculations were performed at the manufacturer's rated output of +37 dBm +20% using an antenna with 8.5 dBi gain.

**MPE Evaluation**

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

Test Data

Uplink Output Power set to manufacturer's (Mfr) rated output power (+37 dBm) using an antenna with 8.5 dBi gain

Test Frequency, MHz	896
Power, Conducted, mW (P)	5011
Antenna Gain Isotropic	8.5 dBi
Antenna Gain Numeric (G)	7.08
Distance (R)	20 cm
$S = \frac{P * G}{4\pi r^2}$	
Power Density (S) mw/cm ²	
	7.058

Power Density (S) = 7.058 mw/cm ²
Limit =(from above table) = 0.597 mw/cm ²

With the output power set to **manufacturer rated output power (+37 dBm)** using a 8.5 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

This is a Fixed device used in Uncontrolled Exposure environment.

Test Data

Uplink Output Power set to manufacturer's (Mfr) rated output power (+37 dBm) using an antenna with 8.5 dBi gain

Test Frequency, MHz	896
Power, Conducted, mW (P)	5011
Antenna Gain Isotropic	8.5 dBi
Antenna Gain Numeric (G)	7.08
Limit (L)	0.597

R=√(PG/4πL)			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
68.8 cm	5011	7.08	0.597

With the output power set to the manufacturer's (Mfr) rated output power (+37 dBm) using an antenna with 8.5 dBi gain, the minimum safe distance is 68.8 cm.



Test Data

Uplink Output Power set to manufacturer's (Mfr) rated output power (+37 dBm) + 20% using an antenna with 8.5 dBi gain

Test Frequency, MHz	896
Power, Conducted, mW (P)	6013.2 (37 dBm + 20%)
Antenna Gain Isotropic	8.5 dBi
Antenna Gain Numeric (G)	7.08
Distance (R)	20 cm

$$S = \frac{P * G}{4\pi r^2}$$

Power Density (S) mw/cm ²
8.469

Power Density (S) = 8.469 mw/cm ²
Limit =(from above table) = 0.597mw/cm ²

With the output power set to **manufacturer rated output power (+37 dBm)** using a 8.5 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 Output Power set to manufacturer's (Mfr) rated output power (+37 dBm) + 20% using an antenna with 8.5 dBi gain

Test Frequency, MHz	896
Power, Conducted, mW (P)	6013.2 (37 dBm + 20%)
Antenna Gain Isotropic	8.5 dBi
Antenna Gain Numeric (G)	7.08
Limit (L)	0.597

R=√(PG/4πL)			
Distance (R) cm			
75.4 cm	Power mW (P)	Numeric Gain (G)	Limit (L)
	6013.2	7.08	0.597

With the output power set to the manufacturer's (Mfr) rated output power (+37 dBm) using an antenna with 8.5 dBi gain, the minimum safe distance is 75.4 cm.

END OF TEST REPORT