

# 4415

Part Number

# LA10-1-525-40

Amplifier Name

Revision 1.b Release Date May 1 2007

Revision Notes - Updated Electrical Specifications (F2,F3)

This document covers part numbers 4415, 3690

### Technical Specifications Summary

Frequency Range:	1 - 525 MHz	Gain:	40 dB
P1dB:	10 Watts CW	Efficiency:	15%
Class:	A	Temperature Range:	-20 to 60°C
Supply Voltage:	28.0V	Max VSWR:	∞:1

### Amplifier General Description

This LDMOSFET / MOSFET based amplifier offers an incredible performance and bandwidth combination. This unit requires only power supply and heat sink to provide 10W over 1 MHz to 525 MHz from only 0dBm input. This true class A amplifier uses all gold metallized MOSFETS (output) LDMOSFETS (IPA) for a rugged amplifier that can both be used in the laboratory and the field.

This true class A amplifier can be used in a variety of laboratory applications, and is suitable to be driven to full power from most signal generators. For communications use, this amplifier can be used to directly drive broadband antennas without requiring circulators or other isolation. Because the amplifier is inherently stable, a variety of filters, multiplexers may also be driven directly.

The amplifier is certified for use over a broad variety of supply voltages and exhibits stable operation from 22 - 32 V with only minimal affect on performance on lower voltages. Data on gain have been provided for this use.

If lower power operation is required, please refer to LA2-1-525-30 which offers 2W operation over the same frequency range. For higher frequency operation, LA1-1-1024-30, which offers 1W from 1 - 1024MHz, or LA10-400-1000-40 which offers 10W operation from 400 - 1000 MHz.

### Amplifier Picture



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Parameter	Min	Typ	Max	Units	Notes
Frequency	1		525	MHz	
P1dB	10			W, CW	
Psat		20		W, CW	
Linear Power Out	10			W	
IMD3	-30			dBc	For 2 tones, 10kHz spacing, 10 W PEP
Power Input		-2		dBm	For 10W Output
Gain	40	42		dB	10W Output
Gain Variation			±1.5	dB	10W Output
Vsupply	20		32	V, DC	
Drain Current		2.4	3.0	A, DC	10W Output
Input VSWR			1.5:1		
Insertion Phase Variation		±5		°	Unit to unit
Gain Variation			±1.5	dB	Unit to unit
F2 Second Harmonic		-25		dBc	
F3 Third Harmonic		-25		dBc	
Baseplate Operating Temperature	0		60	°C	

Physical Dimensions 2.4" x 4.0" 1.1" / 6.1cm x 10.2cm x 2.8cm

All specifications valid for output impedance 50  $\Omega$ ,  $V_{sup} = +28VDC$ ,  $I_{dq} = 2.4A$

## Absolute Maximum Ratings

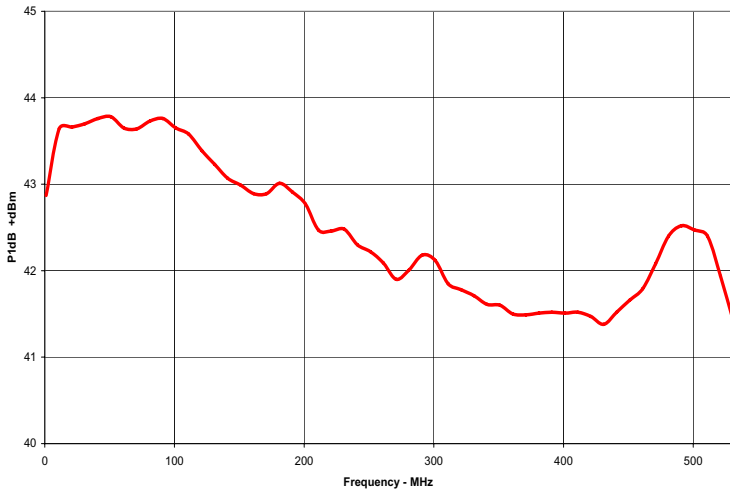
Parameter	Value	Units	Notes
Maximum Operating Voltage	32	V, DC	
Stable Operating Voltage	22 - 32	V, DC	
Maximum Bias Current, Q101	0.5	A, DC	
Maximum Bias Current, Q102	2.0	A, DC	
Maximum Drain Current	3.0	A, DC	
Load Mismatch Survival	$\infty$		
Storage Temperature	-40 to +105	°C	
Maximum Operating Baseplate Temp	60	°C	

## Features, Auxillary Functions

- ◆ Optional Amplifier Disable
- ◆ Optional Hi Side Current Sense

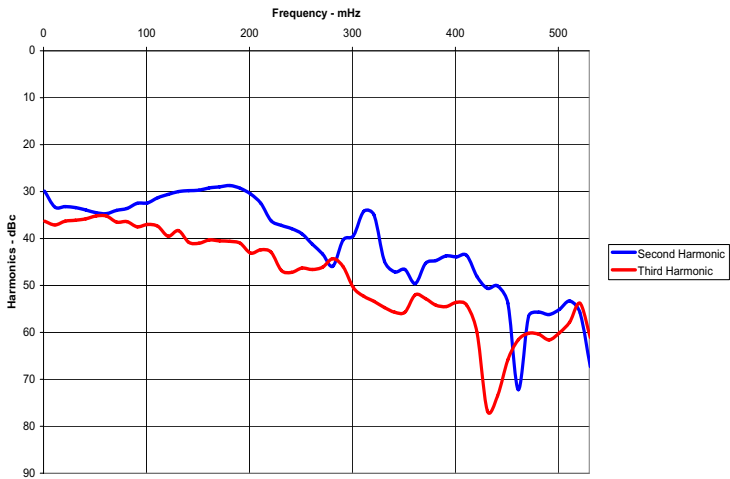


LA10-1-525-40 P1dB 28V DC



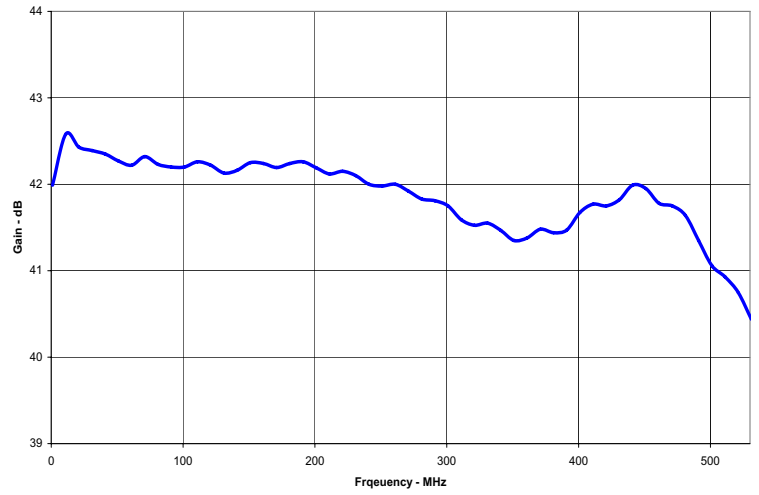
Graph 1. P1dB

LA10-1-525-40 Harmonics 10W



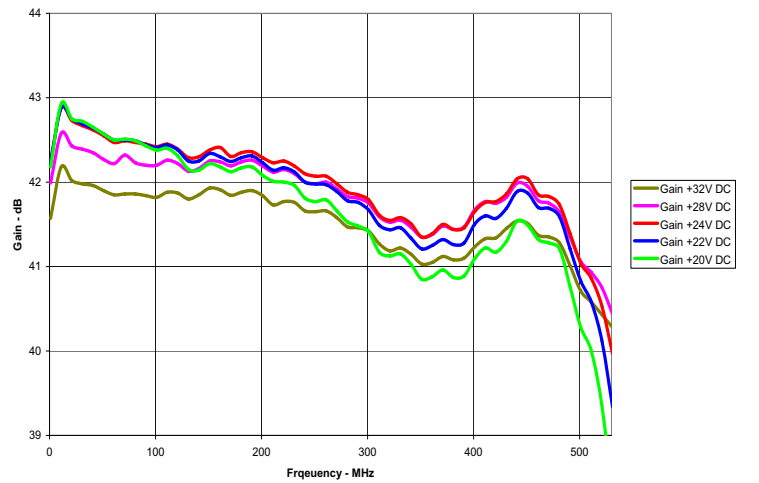
Graph 3. Harmonics

LA10-1-525-40 Gain at 10W



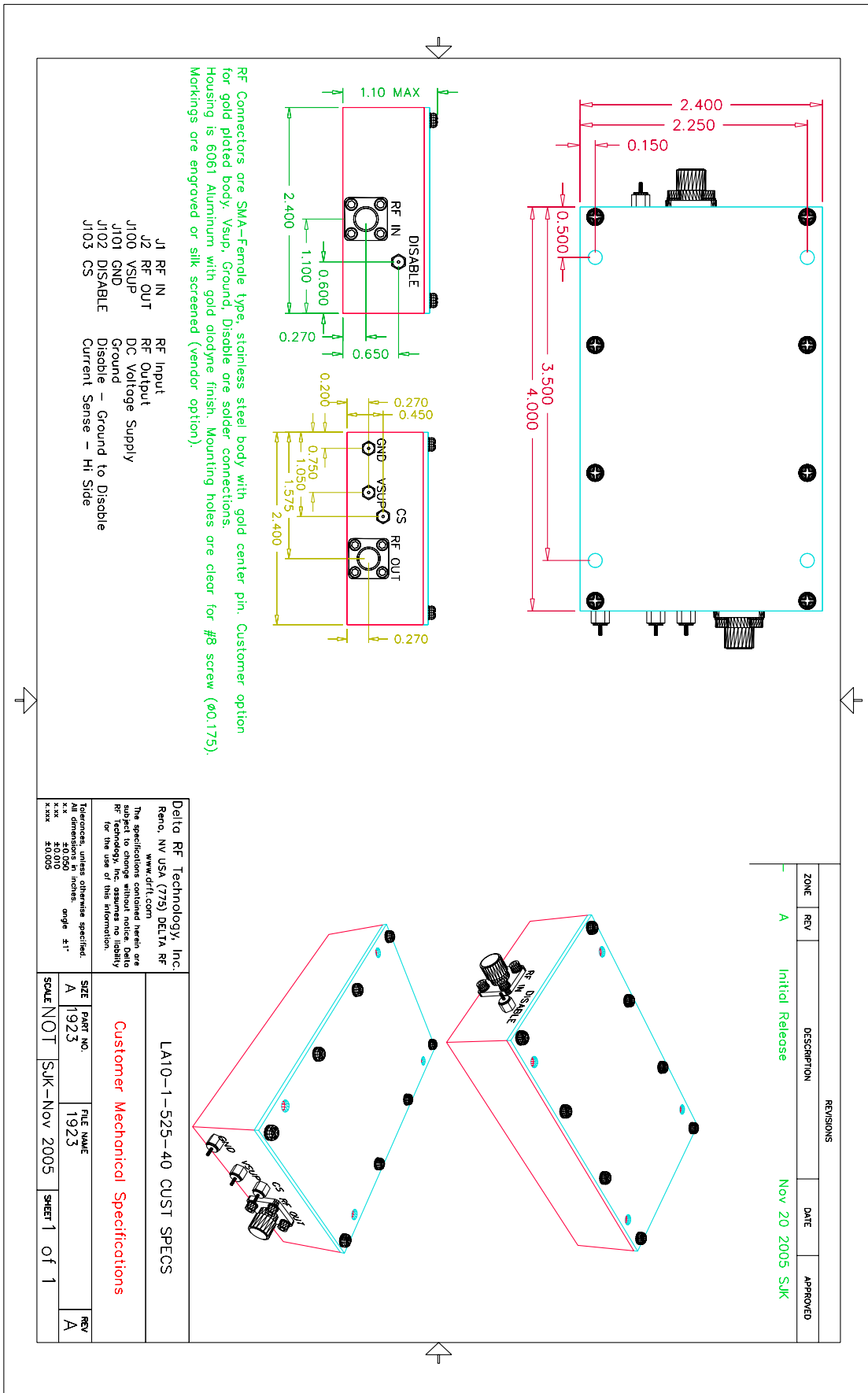
Graph 2. Gain

LA10-1-525-40 Gain at 10W



Graph 4. Gain vs. Voltage

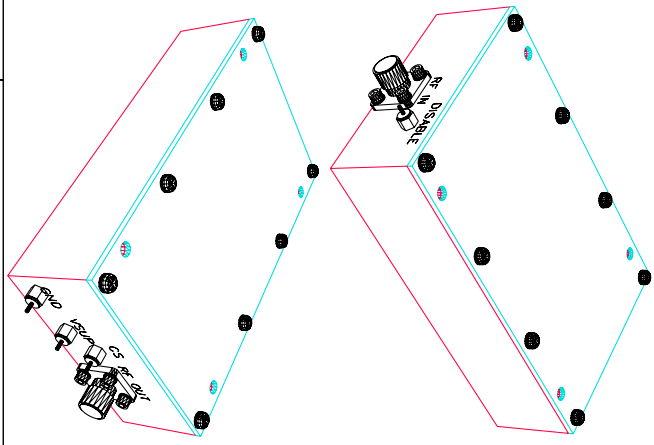




REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
-	A	Initial Release	Nov 20 2005	SJK

Delta RF Technology, Inc. Reno, NV USA (775) DELTA RF www.drft.com		LA10-1-525-40 CUST SPECS	
The specifications contained herein are subject to change without notice. Delta RF Technology, Inc. is not responsible for the use of this information.			
Tolerances, unless otherwise specified: All dimensions in inches angle ±1° .xxx 0.000 x.xxx ±0.005			
SIZE	PART NO.	FILE NAME	REV
A	1923	1923	A
SCALE	NOT	SJK-Nov 2005	SHEET 1 of 1

Customer Mechanical Specifications



Laboratory amplifier must be mounted to appropriate heatsink prior to operation. Operation of amplifier without appropriate heatsink and cooling will destroy the amplifier and void the warranty.

An appropriate heatsink is one that is capable of dissipating 75W of heat. This will require mounting the amplifier to the heatsink using appropriate heat sink compound and hardware. A thin layer means 0.001" - 0.002" thickness, and screws should have lockwashers. Stainless steel hardware is preferred. Airflow will generally be required in order to keep the baseplate mounting surface below temperature requirements listed on the specifications page.

After mechanical mounting is complete, connect power -  $V_{sup}$  and Ground. RF output and input should be connected, then power applied. While it is not necessary to maintain a proper output load on this amplifier, please be careful not to touch the RF Output terminal whenever the amplifier is powered. Dangerous RF levels may be present whenever the amplifier is energized, and despite low power rating of this amplifier, can cause RF burns and shocks.

Please consult the factory for further applications assistance.



**Ordering Information:**

Order Code	Description	DRFT Reference
LA10-1-525-40	10W Laboratory Amplifier	4415
LA10-1-525-40-A1	10W Laboratory Amplifier with Disable Function	3690

For both models, request CS option at time of ordering. If it is not requested, no CS pin will be installed.

**Options**

-A12	Heat Sink Option	0202
-A13	Heat Sink Option with DC Fan, pre wired	0203
-A14	Ruggedized for vibration	0204
-T2	Extended Burn In	0271
-T3	Extended Data Collection	0272

**Standard Amplifier Options:**

**SMA Female Connectors**, Input and Output. Stainless Body, Gold Center pin, 4-hole SMA bolted to pallet amplifier edge through bottom two holes located at amplifiers RF IN and RF OUT locations. All stainless steel hardware.

**Enclosure**- all aluminum machined enclosure. Alodined aluminum, alloy 6061-T6. SMA Female input and output RF connectors. Supply voltage and ground through solder / feedthrough connections. Module must be bolted to appropriate heatsink.

**Heat Sink** - aluminum extruded heat sink, black anodized. Pallet amplifier or module will be bolted to heatsink. Customer will be required to provide adequate airflow.

**Heat sink with fan** - aluminum extruded heat sink as above, with included fan bolted to push air through the heat sink. Depending on heat requirements, a second fan may also be provided on the output of the unit.

**Ruggedized** - all screws have threadlocking compound applied, and all flying components are staked and attached to base. Designed to withstand MIL-STD-810E 514.4 Category 8.

**Testing Options:**

**Standard** - includes power test and brief burn - in under laboratory conditions. Printed test report gives graph of Gain and Input Return Loss at rated P1dB and Voltage Conditions. Report shows pass/fail criteria. All amplifiers include this test.

**Extended burn in** - 8-hour burn in at P1dB with standard test run at completion. Unit is monitored during test and any discrepancy reported. Standard test data is included.

**Extended data collection** - Standard data is run and included. Detailed data is taken point by point giving the customer 25 - 70 frequency points, depending on the amplifier model. For each frequency point, data is generated to include gain, input power, input return loss, current, second harmonic, third harmonic, efficiency, audio distortion.

Other tests available - Vibration, Temp cycling, Shock. Please inquire.

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