4488 P125-30-108-20-A1

Part Number — Amplifier Name

Revision 0.c August 8, 2007
Revision Notes updated drawings, new format

This document applies to part numbers 4488 and 3691

Technical Specifications Summary

Frequency Range:	30 - 108 MHz	Gain:	20dB
P1dB:	125 Watts CW	Efficiency:	45%
Class:	AB	Temperature Range:	-20 to 70°C
Supply Voltage:	28.0V	Max VSWR:	3:1

Amplifier General Description

This gold MOSFET based amplifier has been in steady production for 8 years and offers true broadband performance from 30 - 108 MHz covering VHF communications bands between HF and including FM commercial radio. Designed primarily as a general purpose AM / FM communications amplifier offering 25W minimum AM carrier power, 100W minimum FM power, this amplifier is also used in jamming applications, laser drivers, industrial plasma exciters, etc.
A frequency extension to 120 MHz is possible with this amplifier and has been provided. For higher power operation over a similar range, please refer to P250-20-100-16. A suitable driver for this amplifier is LA10-1-525-40.

- **NO RF Assembly or Circuit Tuning!**
- **20dB Typical Gain 30-108MHz!**
- **-30dBc Typical IMD3 at 125W**
- **Amplifier Disable Line**
- **Operation from +24V to +32V**

Heatsink required for operation.

Amplifier Picture

Shown with option -A11 SMA connectors

Delta RF Technology, Inc.
High Power RF Amplifiers and Accessories
350 South Rock Boulevard • Reno • NV • 89502 • USA

Phone +1.775 DELTA RF [775 335 8273]
Fax +1.775 DELTA FX [775 335 8239]
website: http://www.drft.com
email: sales@drft.com

Electrical Specifications

Parameter	Min	Typ	Max	Units	Notes
Frequency	30		108	MHz	With frequency extension to 120MHz
P1dB	100	125		W, CW	
Carrier Power	25	33		W, CW	AM Signal, 80% Mod, 5% distortion
IMD3		-30		dBc	For 2 tones, 10kHz spacing, 100 W PEP
Power Input		2		W, CW	For 125W
Gain	16	18	20	dB	
Vsupply	22	28	32	V, DC	
Drain Current		8	10	A, DC	
Input VSWR		1.2:1	1.5:1		
Insertion Phase Variation		±5		°	Unit to unit
Gain Variation			±1	dB	Unit to unit
F2 Second Harmonic		-20	-12	dBc	
F3 Third Harmonic		-25		dBc	
Baseplate Operating Temperature	0		70	°C	

Physical Dimensions

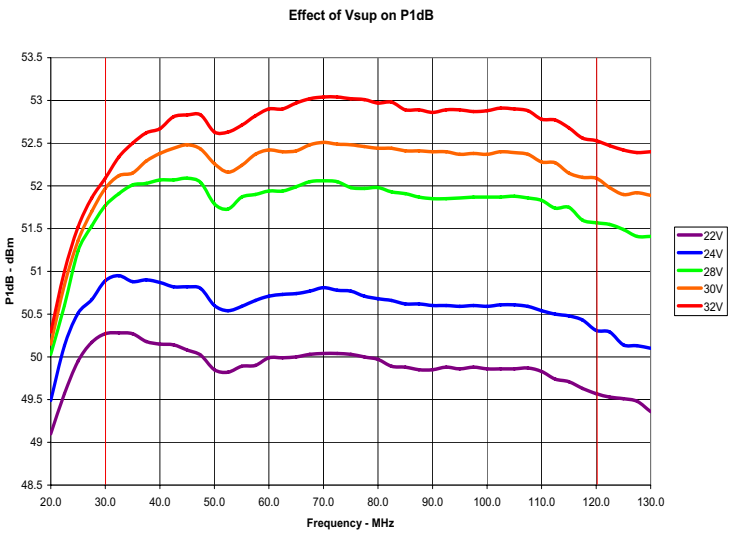
All specifications valid for output impedance 50 Ω, V_{sup} = +28VDC, I_{dq} =1.0A

Absolute Maximum Ratings

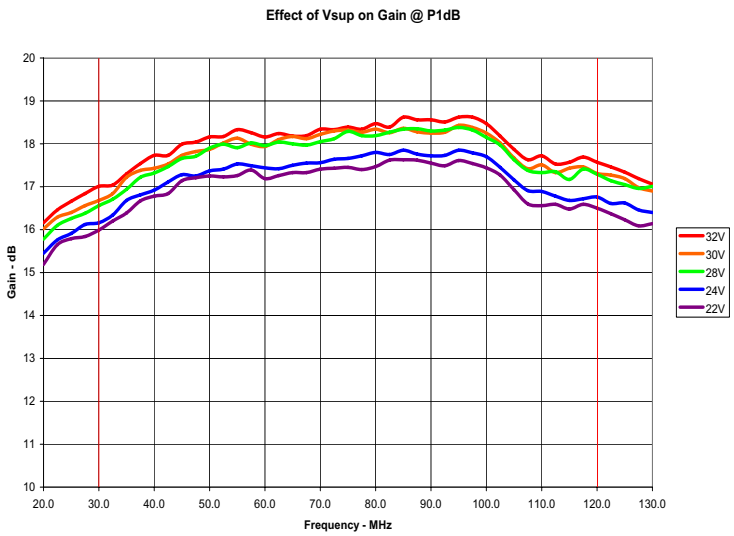
Parameter	Value	Units	Notes
Maximum Operating Voltage	32	V, DC	
Stable Operating Voltage	22-32	V, DC	Max 100W below 24VDC
Maximum Bias Current, Q101	3.0	A, DC	
Maximum Drain Current	12.0	A, DC	
Load Mismatch Survival	5:1		40°C, 12A Current Limit
Storage Temperature	-40 to 105	°C	
Maximum Operating Baseplate Temp	70	°C	

Features, Auxillary Functions

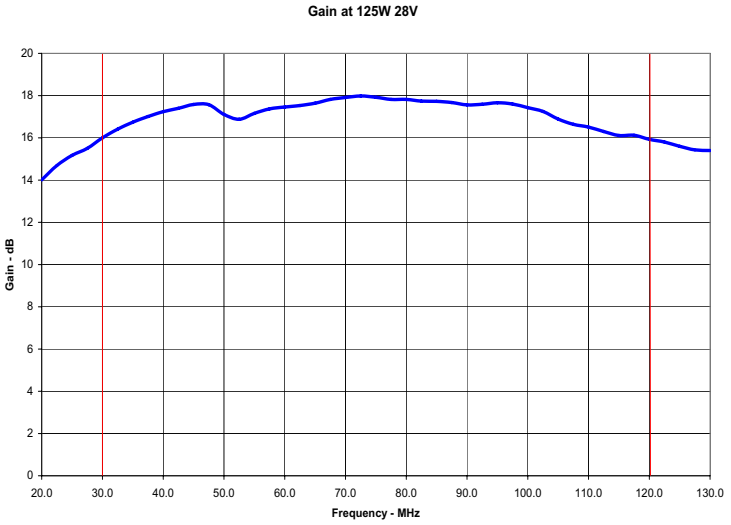
- Temperature Compensated Bias
- Amplifier Disable
- Current Sense



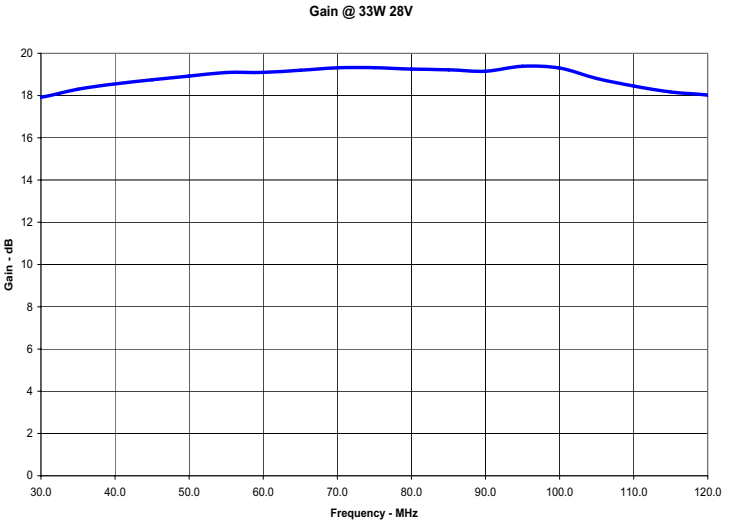
Graph 1. P1dB over Vsup



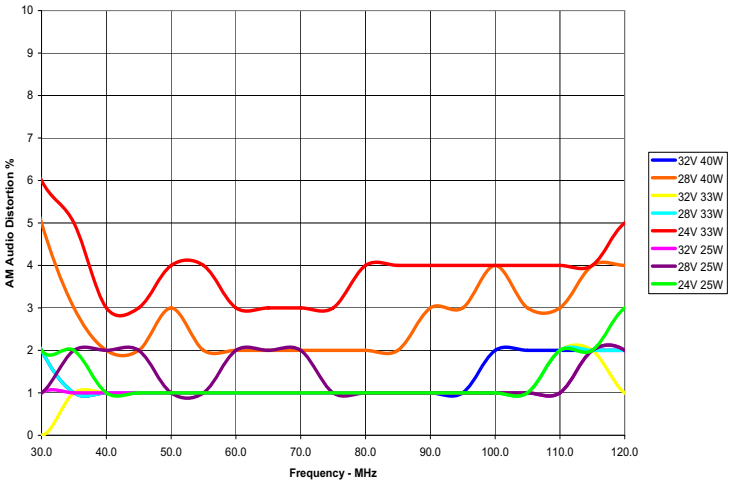
Graph 2. Gain @ P1dB over Vsup



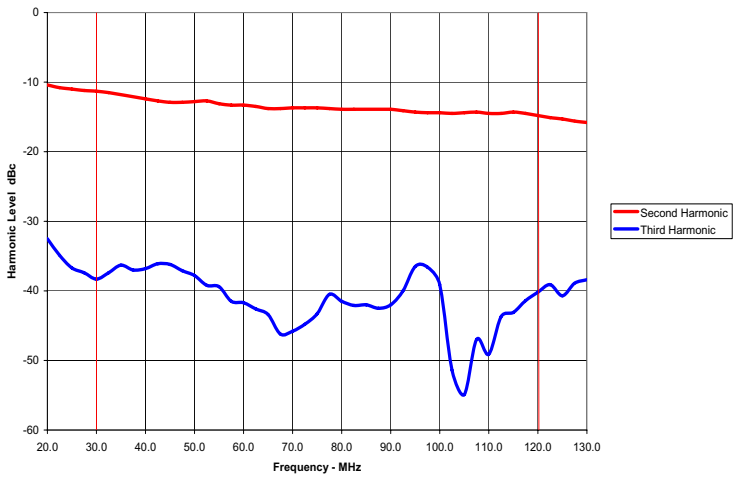
Graph 3. Gain at 125W 28V Vsup



Graph 4. Gain at 33W 32V Typ



Graph 5. Audio Distortion



Graph 6. Harmonics

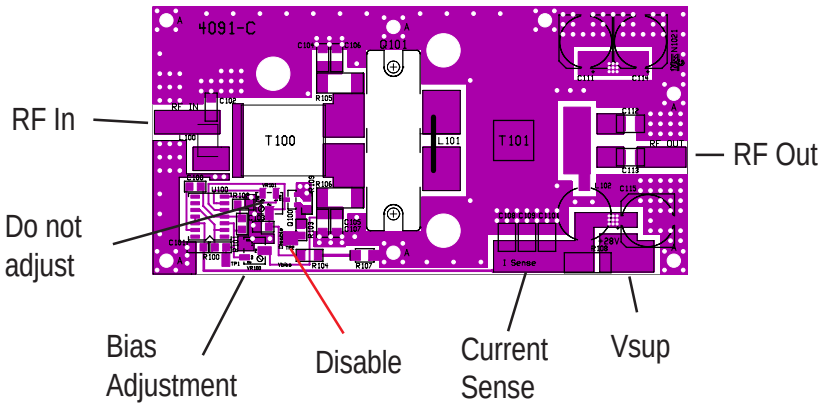
Connections:
Connect amplifier to +Vsup and Ground using solder pads indicated. 16 Gauge wire is recommended for supply and ground. In all cases, use of teflon insulated wires is highly recommended.
Connect coaxial cable to input and output RF connections (semi rigid or flexible) using best RF practices. Ensure output cable is of sufficient power handling capacity. Pads are provided for ground on co-axial connections.
DISABLE pad provided for shutdown - TTL compatible. +5V to disable, ground or open for normal operation.

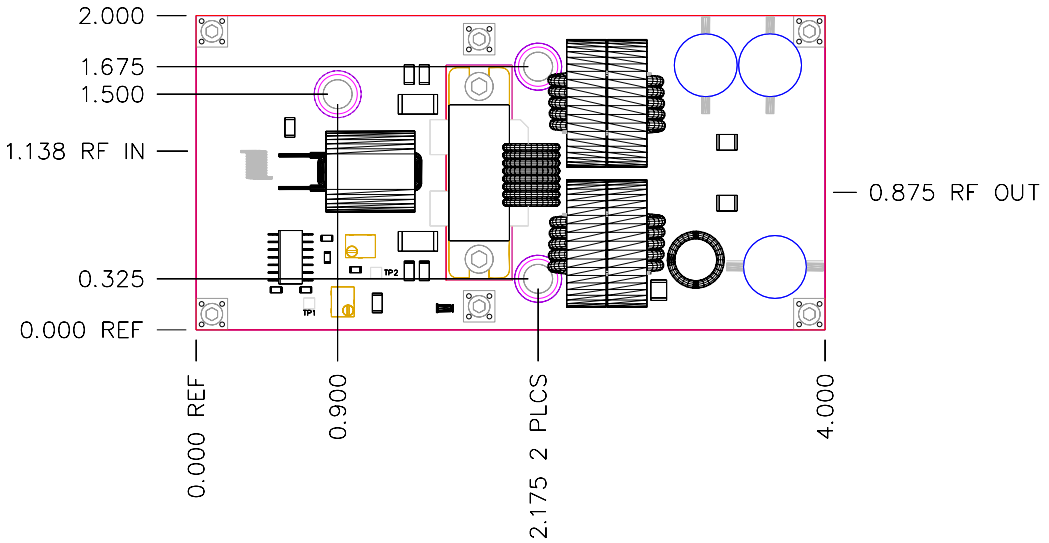
Amplifier Startup:
Ideal amplifier startup allows for application of Vsup with no drive applied. After Vsup has reached minimum operating voltage, drive may be applied. If necessary to start amplifier with drive applied, ensure proper VSWR or chance of oscillation may occur before Vsup is reached.

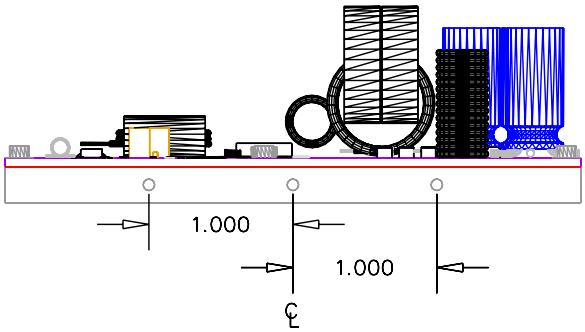
Bias Current:
Bias Current is controlled via temperature compensated bias system that uses a hermetically sealed glass thermistor as reference. If excessive air is directed above the amplifier such that the thermistor is cooled below the temperature of the baseplate, this circuitry may not perform properly. Bias has been pre-set at the factory to 1.0A Q101 at 28VDC. This bias point has been selected to offer the optimum balance between IMD performance, efficiency, and gain. If this bias point is changed, take great care not to exceed the bias listed on page 2 - Absolute Maximum Ratings.

Fault condition - Bad VSWR:
In the case of an output fault, the amplifier may draw excessive current. Care should be taken to current limit the power supply to prevent damage to the amplifier. Disabling the amplifier through DISABLE will prevent damage to the amplifier.

Miscellaneous:
Placing noisy analog or digital systems, such as additional control circuitry, directly over the top of transistor or RF path can cause improper operation in the form of noise or distortion in the output. Care should be taken to locate these components where they will not cause interference or properly shielf these components.



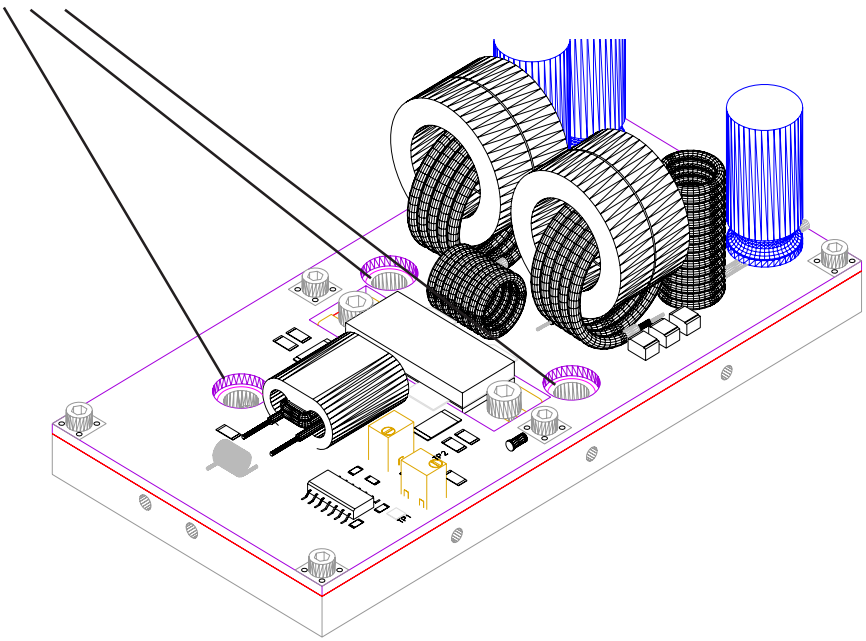




Mounting holes both sides.

Pallet mounting holes clear for #6 mounting screw, side mounting holes clear for #2 screw. Stainless Steel mounting hardware is recommended, grade 18-8 or better. A lock washer of same material should also be used. Ensure mounting surface is flat to better than 0.003" / ". Use a thin layer of thermal compound - Wakefield 120 or equivalent - no more than 0.001 - 0.002" thickness!. Torque all screws to 10 - 12 in-lbs.

Three screw locations



Ordering Information:

Order Code	Description	DRFT Reference
P125-30-108-20-A1	125W VHF Communications Pallet Amplifier	4488
PAB125-30-108-20-A0	125W VHF Communications Pallet Amplifier in enclosure with disable	3691
Options		
-A11	SMA Female Connectors In / Out	0201
-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 Pallet 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 available for most pallet amplifiers. Alodyned 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 critera. 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.