

Revision 1.e Release Date July 13, 2007

Revision Notes Added module information. This document applies to part numbers 1481 and 4018

Technical Specifications Summary

Frequency Range:	30 - 120 MHz	Gain:	20dB
P1dB:	125 Watts CW	Efficiency:	55%
Class:	AB	Temperature Range:	0 to 70°C
Supply Voltage:	28V	Max VSWR:	5:1

Amplifier General Description

The P125-30-120-20 pallet amplifier offers excellent broadband operation in a cost-effective package. Using all gold-metallized MOSFET construction, this amplifier offers rugged performance from 30- 90 MHz, with extended operation possible to 120MHz. Designed for communications applications, -30dBc IMD performance is achieved at 100W minimum from 30 to 90MHz and above!

- **NO RF Assembly or Circuit Tuning!**
- **20dB Typical Gain 30-120MHz!**
- **-30dBc Typical IMD3 at 125W**
- **Amplifier Disable Line**
- **Operation from +24V to +32V**

Proper Heatsink Required

Amplifier Picture



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Parameter	Min	Typ	Max	Units	Notes	
Frequency	30		120	MHz		
P1dB	100	125		W, CW	Amplifier is designed for 125W Max	
Psat			150	W, CW		
Linear Power Out	100	125		W		
Power Input		2.0	10.0	W, CW		
Gain	18	20		dB		
Vsupply	24	28	32	V, DC		
Drain Current		8	11	A, DC		
Input VSWR		1.5:1	2.0:1			
Insertion Phase Variation		±5		°		Unit to unit
Gain Variation		±1		dB		Unit to unit
F2 Second Harmonic		-35		dBc		
F3 Third Harmonic		-15		dBc		
Baseplate Operating Temperature	0		+70	°C		

Physical Dimensions 2.0" x 4.0" x 1.5" / 5cm x 10cm x 4m

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

Absolute Maximum Ratings

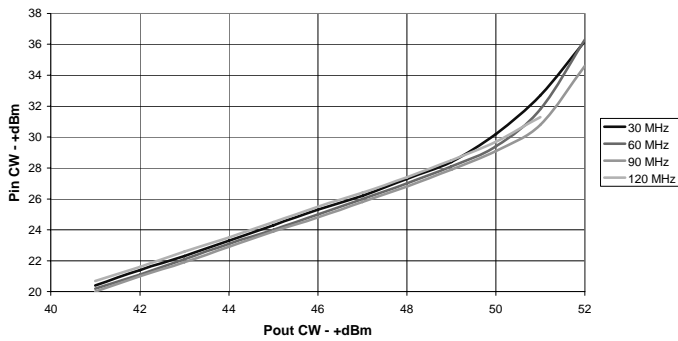
Parameter	Value	Units	Notes
Maximum Operating Voltage	32.0	VDC	
Stable Operating Voltage	+24.0 to +32.0	VDC	
Maximum Bias Current	3.0	A,DC	Factory set to 1.0A
Maximum Drain Current	12	A,DC	
Load Mismatch Survival	5:1		
Storage Temperature	-40 to +105	°C	
Maximum Operating Baseplate Temp	+70	°C	

Features, Auxillary Functions

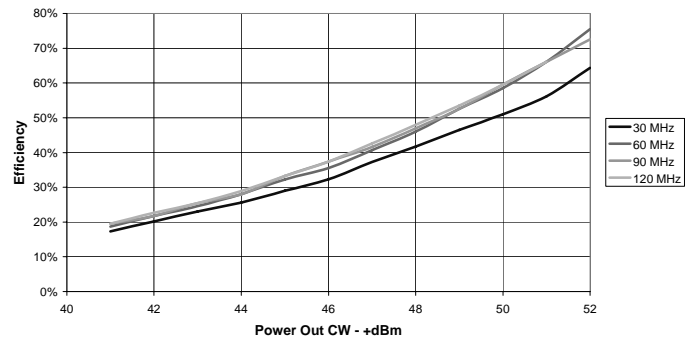
- ◆ Temperature Compensated Bias
- ◆ Amplifier Disable
- ◆ Broadband Operation



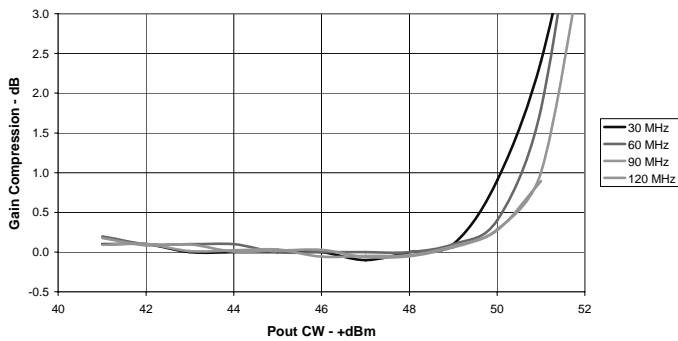
Pin vs. Pout



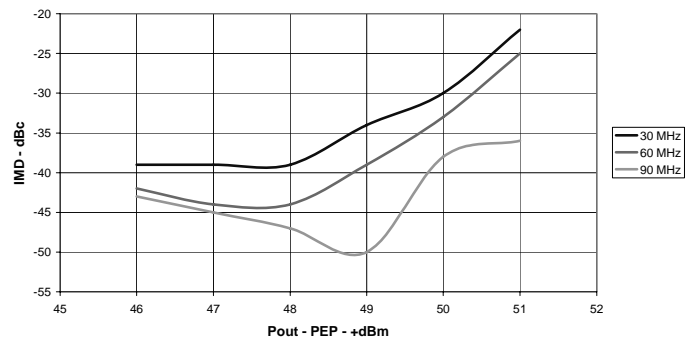
Efficiency vs. Power Out



Gain Compression

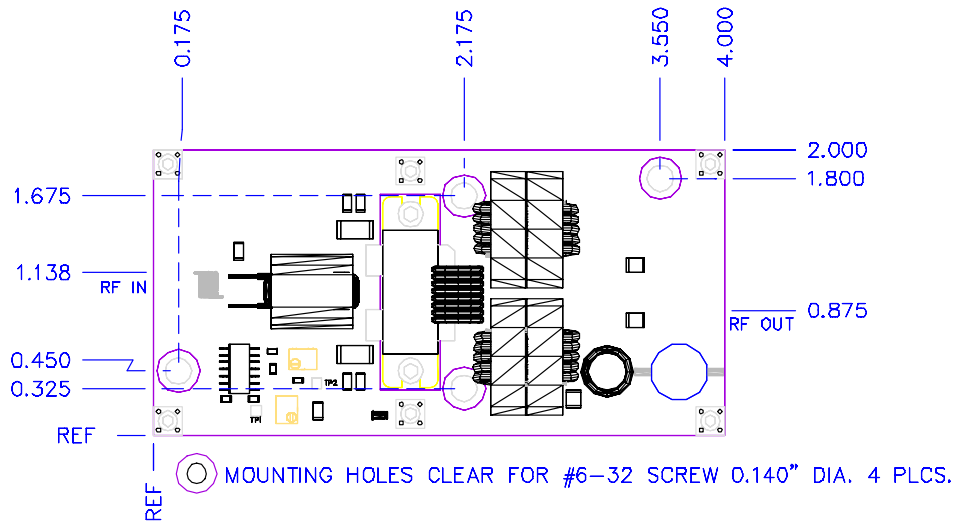


2 Tone IMD, 10kHz Tone Separation



All data presented taken at default conditions - $V_{sup} = +28V$ DC, $I_{dq} = 1.0A$, baseplate temperature 25C, into a broadband 50 ohm load. All data is typical - actual performance may vary depending on installation and operating parameters.



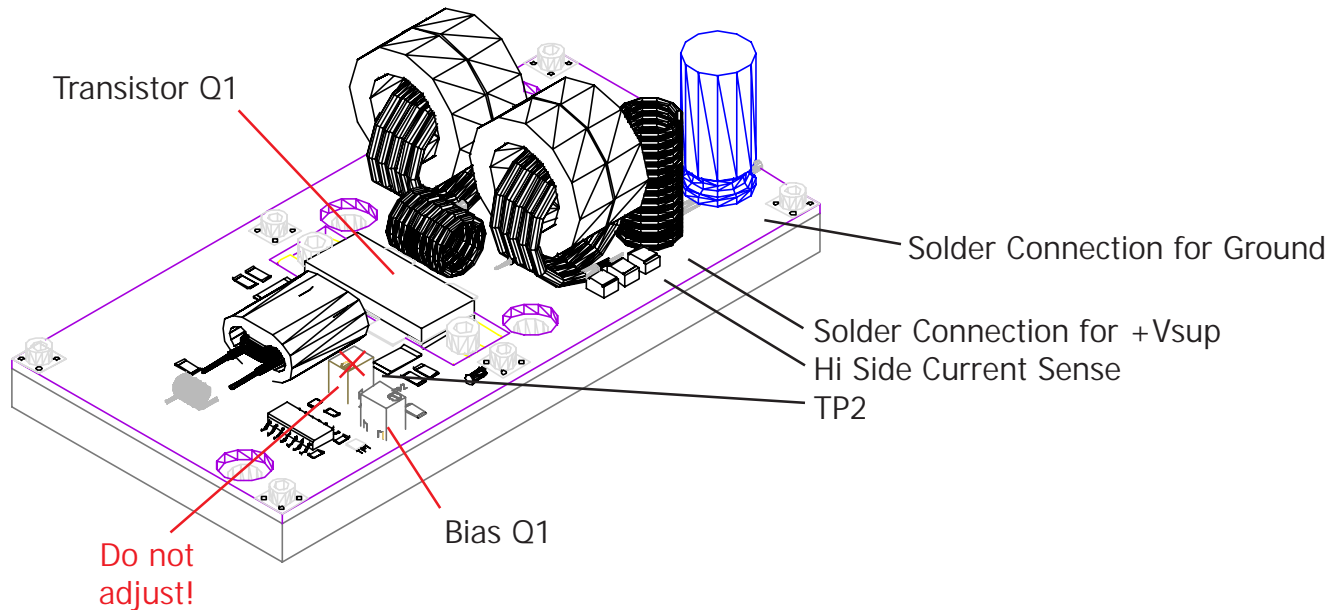


Tips for Mechanical Mounting:

- 1 All holes are clear for #6 Screw. Stainless Steel mounting hardware is recommended, grade 18-8 or better. A lock washer of same material should also be used.
- 2 Ensure mounting surface is flat to better than 0.003" / "
- 3 Use a thin layer of thermal compound on the backside of the PA - no more than 0.001" - 0.002" thickness!
- 4 Torque all screws to 10-12 in-lbs

washer of



**Connections:**

Connect amplifier to +Vsup and Ground using solder pads indicated. 14 gauge wire minimum is recommended for supply and ground. In all cases, use of teflon insulated wire 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.

'TP2' has been provided as an amplifier shutdown control. To disable the amplifier, ground this point. For proper operation, leave this pad open circuit (or float). Applying a positive voltage will damage the amplifier.

Amplifier Startup

+Vsup should be applied to amplifier with no drive applied. The system must allow drain voltage to reach +26V minimum before applying drive or damage can result to the amplifier and void warranty. This typically takes between 2 - 10 seconds and should be verified by the system integrator. **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 Q1 +28.0V DC. This bias point has been selected to offer the optimum balance between IMD performance, efficiency, and gain. If the bias point is changed, take great care not to exceed the bias listed on page 1 - 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. Grounding TP2 will disable the amplifier and prevent further damage to the amplifier.

Amplifier Shutdown

To prevent damage to amplifier and surrounding systems, drive should be removed prior to powering down PA. This can also be accomplished by applying ground to TP2. Power can then safely be removed from PA.

Miscellaneous:

Placing noisy analog or digital systems, such as additional control circuitry, directly over the top of transistors or RF path can cause improper operation. Care should be taken to locate these components where they will not cause interference.



Ordering Information:

Order Code	Description	DRFT Reference
P125-30-120-20	125W VHF Broadband Communications Module	1418
PAB125-30-120-20	Amplifier in Enclosure	4018

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
-A15	Wire harness, 1' length, 10 wires for pallet amplifier only (NON-FM)	0205
-A16	Wire harness, customer specified length for pallet amplifier only	0206
-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. 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.

Power Connector - a 10 pin molex connector is used on all standard pallet amplifiers to supply +Vsup and Ground connections, as well as hi-side current shunts for current monitoring. Delta RF offers the mating connector with 1' wires - Red (Vsup), Black (Ground), Yellow (Current monitor). All wires are 18 gauge teflon insulated wires. Customer may optionally specify wire length and wire color.

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.

The specifications contained herein are subject to change without notice. Delta RF Technology, Inc. assumes no liability for the use of this information.

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