

Model PA-TV1-17-400 TV Pallet Amplifier Module

This amplifier module is ideal for final output stages in analog and digital TV broadcast equipment.

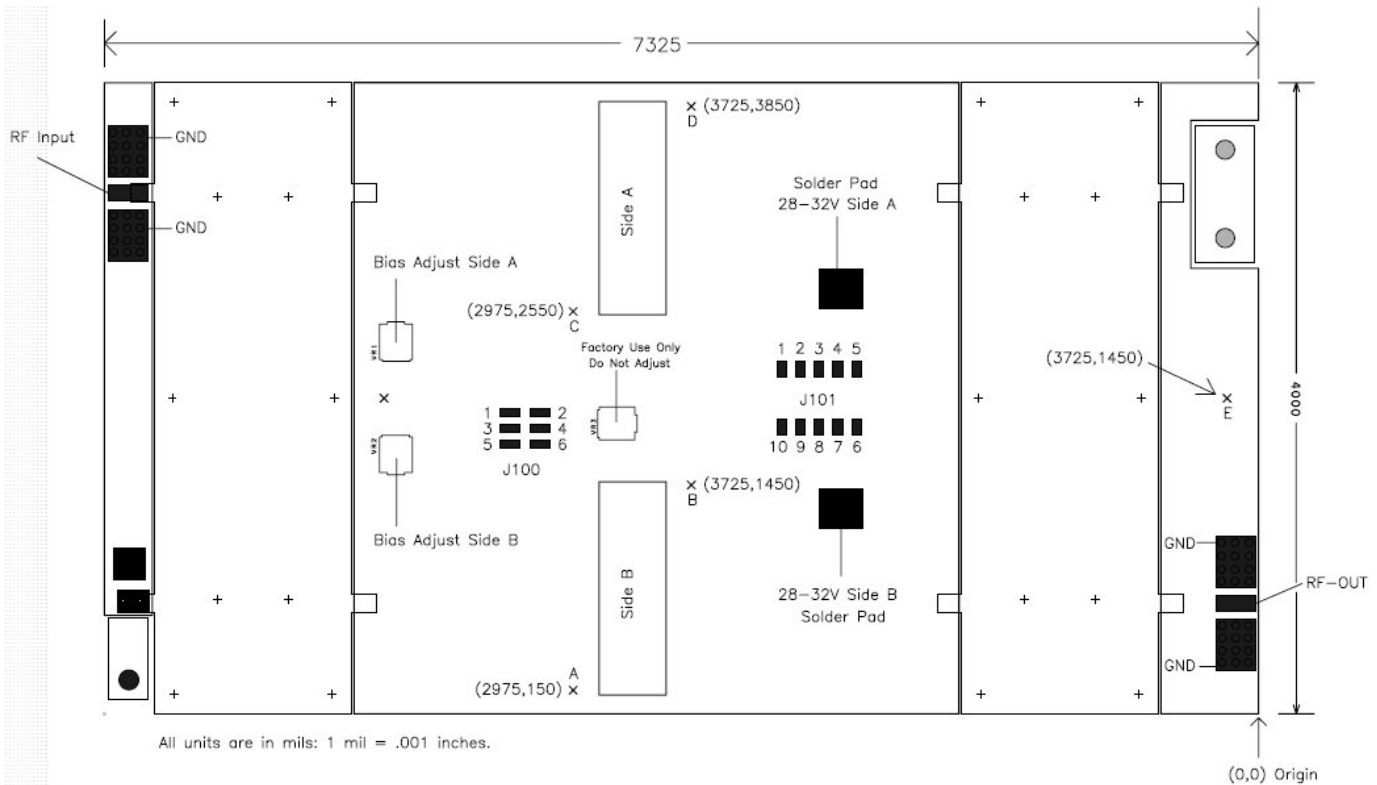
- 55 – 88MHz (CH 2 – 6)
- New updated design with a gold mosfet from a new supplier
- 28- 32 Volts
- Input/output 50 ohms
- Pout: 400W Peak Sync.
- 75 Watts digital power.
- 18dB Gain
- Thermal Tracking Bias
- Broadband “No Tune” design.
- Made in the USA



Dimension (L x W x H inch) [7.325” x 4.000” x 1.5”]

Electrical Specifications: 32V Idq=0.8A x 2 mosfet				
Characteristics	min	typ	max	unit
Operating Frequency range	55		88	MHz
Fundamental output power – CW P1dB		400W		W
Power Input		6	11	W
Input VSWR		1.15	1.20	dB
Power Gain	17	18		dB
Collector Efficiency	32	42		%
Collector Current		20	25	A dc
Insertion Phase variation (unit to unit)		+/-3.5		degrees
Power gain (unit to unit)		+/-0.7		dB
F2 Second Harmonic		-30dB		dB
F3 Third Harmonic		-15dB		dB
Bias Current per transistor: Factory set to 800ma @32V.	0.8	0.8	2.0	A dc
Drain voltage supply	28	32	32	
Base plate operating temperature	0		70	Celsius
Load Mismatch (All phase angles, Id=25A)			5:1	VSWR

Amplifier Drawing: Figure 1



Heatsink Mounting/Hardware

Tips for Mechanical Mounting:

- 1 All holes (Designated "A thru E") are 0.156 inch thru and they are deigned for a #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 0.0025"
- 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

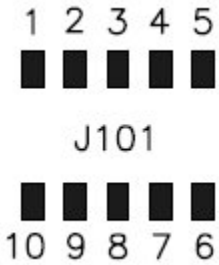
Use of cooling air on top of pallet to keep output transformers cool is recommended. Output transformers are rated for continuous operation at 150C. Keep all external circuitry away from input and output transformers to avoid interference - give at least 1.45" clearance to avoid creating feedback loops.

Note: Our Band 1 and Band 3 400W Pallets have exactly the same dimensions and mounting hole locations.

Warning: Failure to use a proper heat sink will cause the transistors to burn out. This type of failure is not covered by warranty. This product can be ordered with a custom heat sink. Please contact factory for more information.

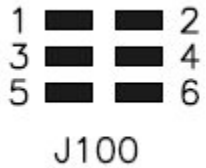
Warning: Careless adjustment of the bias pots will cause the transistors to burn out. This type of failure is not covered by warranty.

Electrical Connections



J101 Pins 2, 3, 8, 9 are Ground
J101 Pins 4, 5, 6, 7 are for main power supply 28 – 32Vdc
J101 Pin 1 = Current monitor transistor A
J101 Pin 10 = Current monitor transistor B

Connector is Molex 43025-1000: Available from Mouser.com
Pin 43030-0001, 43030-0007: Available from Mouser.com
This power connector is optional use. Power may also be connected by soldering directly to the solder pads for transistor A and B shown in figure 1 on page 2.



J100-1 TTL HI when pallet base exceeds 70C
J100-2 Alarm Input: Jumper to J100-1 to enable automatic shut down feature. The amplifier will shut down at 70C.
J100-3 Ground
J100-4 Bias supply. Remove 0 ohm 0805 resistor R108 to power bias circuit from this pin.
J100-5 Temp: Output voltage from LM56 temperature sensor.
J100-6 Bias Disable. Apply TTL HI to disable bias.

This connector is a standard 0.1 inch pitch.

Bias Settings:

The factory bias settings are 0.8A @ 32V at 25C for each mosfet. We feel that this setting offers the best performance tradeoff for gain, linearity, efficiency; however, there are situations where the bias settings may need to be adjusted. If the module is going to be used as a driver stage where maximum linearity is required then we suggest that the bias be increased to 1.6A @ 32V for each mosfet. At 100W average power and 1.6A bias per mosfet, this module can deliver 3rd order IMD performance better than -50dBc. Increasing the bias current above 1.6A degrades the IMD performance of the module at all power levels; therefore, the 1.6A bias should be considered the maximum rating.

Amplifier startup procedure

The amplifier supply voltage must be between 28 – 32V. It is recommended that the amplifier be powered up in this sequence:

- (1) Verify that the amplifier is connected to 50 ohm system at input and output.
- (2) Apply 28 – 32 V supply voltage.
- (3) Enable bias.
- (4) Apply RF input signal.

Amplifier shutdown procedure

Always remove bias and RF input signal before powering down the amplifier.

The amplifier startup and shutdown procedures described here must be followed or damage to the mosfets may result.

Temperature Monitoring

The module is equipped with an LM56 temperature sensor. The module can be configured to shut down automatically when the pallet base exceeds 70C. The automatic shutdown feature can be activated by connecting Pin J100-1 to Pin J100-2. When the temperature falls below 60C the bias will automatically turn on.

It should be noted that airflow above the amplifier may interfere with the accuracy and reliability of this feature and an alternate approach to monitoring the temperature is to send the voltage from J100 pin 5 to a microprocessor. Every installation is unique and using a microprocessor will allow the system integrator to calibrate the pallet base temperature to the LM56 sensor.

Special handling for TV pallet amplifiers:

Input transients can damage this amplifier. Never make or break the input or output connection to the amplifier while bias is enabled. Avoid using step attenuators to control output power, consider using a continuously variable or voltage variable attenuator before the driver stage of the system. If you are using a CATV modulator, avoid changing channels while bias is enabled. Some signal generators and network analyzers can generate transients as well. On network analyzers, avoid changing registers with bias enabled.

On October 10th 2009 we began using new gold mosfets from a new supplier. These new transistors appear to be immune to the transients described above; however, the special handling advice should still be taken into consideration.

Warning: Solid state amplifiers can be easily destroyed! Operating the amplifier outside of its specifications will cause the mosfets to fail. These failures are not covered by warranty.

- Do not over drive the amplifier.
- Do not run the amplifier into an open circuit. Do not run the amplifier when the SWR is unknown. System integrator must foresee adding VSWR protection if there is a risk that the amplifier will be subjected to high VSWR conditions. Do not allow the amplifier to overheat. Do not let the base plate temp exceed 60C.
- Do not adjust the bias settings without a DC ammeter attached.
- If the transistor bias is adjusted then take extra care to set **BOTH TRANSISTORS** to the same bias current.