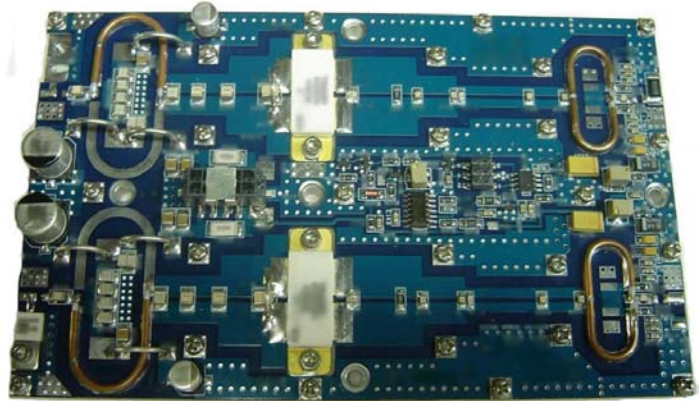


## Model UHFTV-150 TV Pallet Amplifier Module

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

- 470– 860MHz
- 32 Volts
- Pout: 180W Peak Sync.
- 40 Watts digital power.
- 13dB Gain
- Thermal Tracking Bias
- DC Power Connector
- Temperature Monitoring
- Current Sense Resistors
- BLF861A Mosfet
- Made in the USA

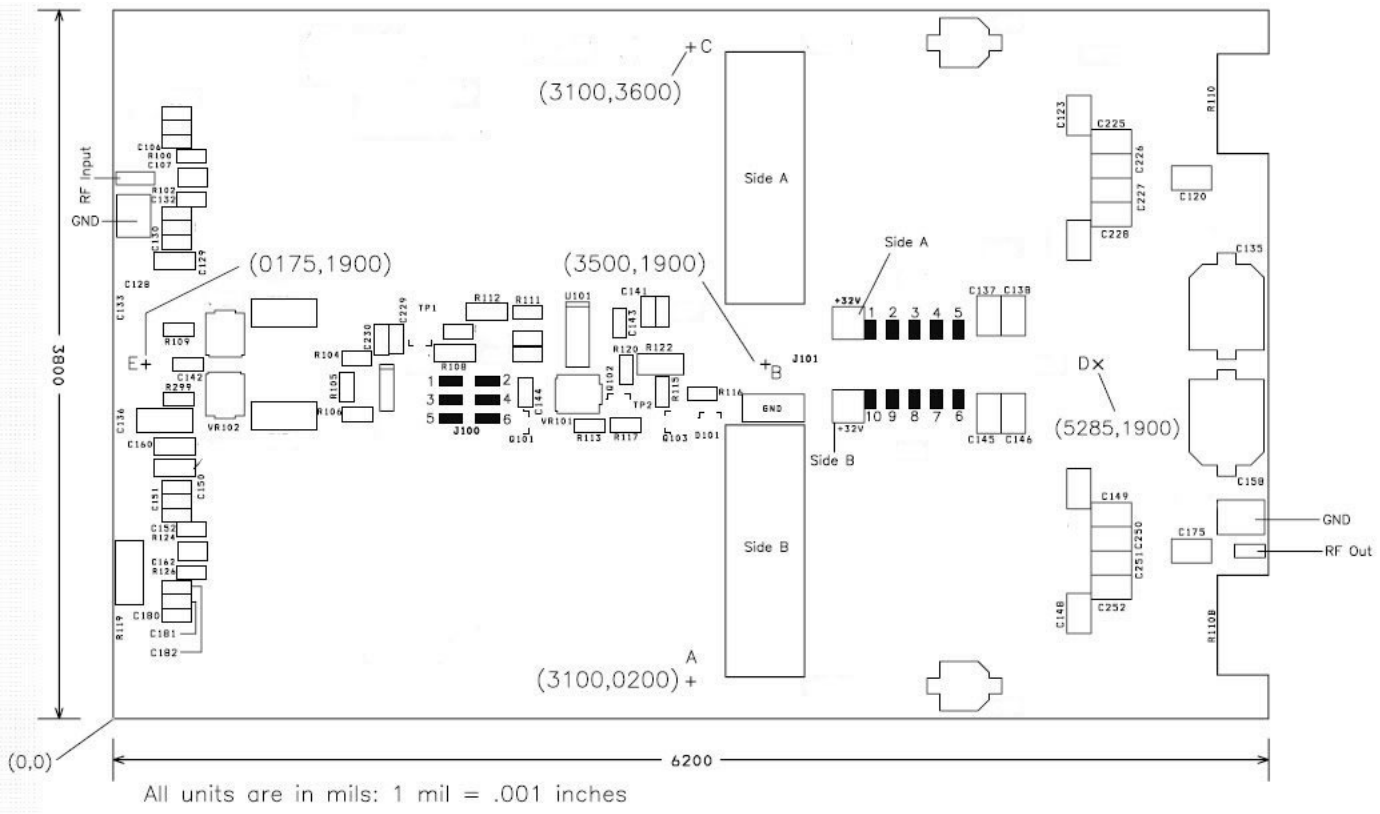


Dimension (L x W x H inch) [6.2" x 3.8" x 0.85"]

Absolute Maximum Ratings			
Symbol	Parameter	Value	Unit
Vs	Drain voltage supply	34	V DC
Is	Supply Current	16	A dc
VSWR	Load Mismatch (All phase angles, Id=15A)	10 to 1	
Tc	Base plate operating temperature	0 to +70C	Celsius
RF IN	RF Input	10	Watts
RF OUT	RF Output CW	200	Watts

Electrical Specifications				
Characteristics	min	typ	max	unit
Operating Frequency range	470		860	MHz
Fundamental output power - CW	200			W
Power Input		5	10	W
Input VSWR		1.2	1.5	VSWR
Power Gain	12	13		dB
Collector Efficiency		35		%
Collector Current		15	16	A dc
Supply Voltage	28	32	32	V dc
Insertion Phase variation (unit to unit)		+/-5.0		degrees
Power gain (unit to unit)		+/-0.5		dB
Two Tone IMD; 150W 1MHz Spacing	-40			dBc
F2 Second Harmonic		-20dB		dB
F3 Third Harmonic		-35dB		dB
Bias Current per transistor: Factory set to 1.0A @32V.	1.0	1.0	3.0	A dc
Frequency response: S21 peak to valley	+/-0.65	+/-0.8	+/-1.0	dB

Amplifier Drawing: Figure 1



## Heatsink Mounting/Hardware

+

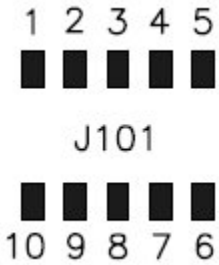
### Tips for Mechanical Mounting:

- 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

Keep all external circuitry away from input and output baluns to avoid interference - give at least 0.75" clearance to avoid creating feedback loops.

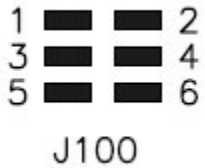
**Warning: Failure to use a proper heat sink will cause the transistors to burn out. This type of failure is not covered by warranty. This product can be ordered with a custom heat sink. Please contact factory for more information.**

### Electrical Connections



J101 Pins 3, 4, 7, 8 are Ground  
J101 Pins 1, 2, 9, 10 are for main power supply 28 – 32Vdc  
J101 Pin 5 = Current monitor transistor A  
J101 Pin 6 = 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 R107 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 1.0A @ 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

### 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. (bias will automatically disable below 24V)
- (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:

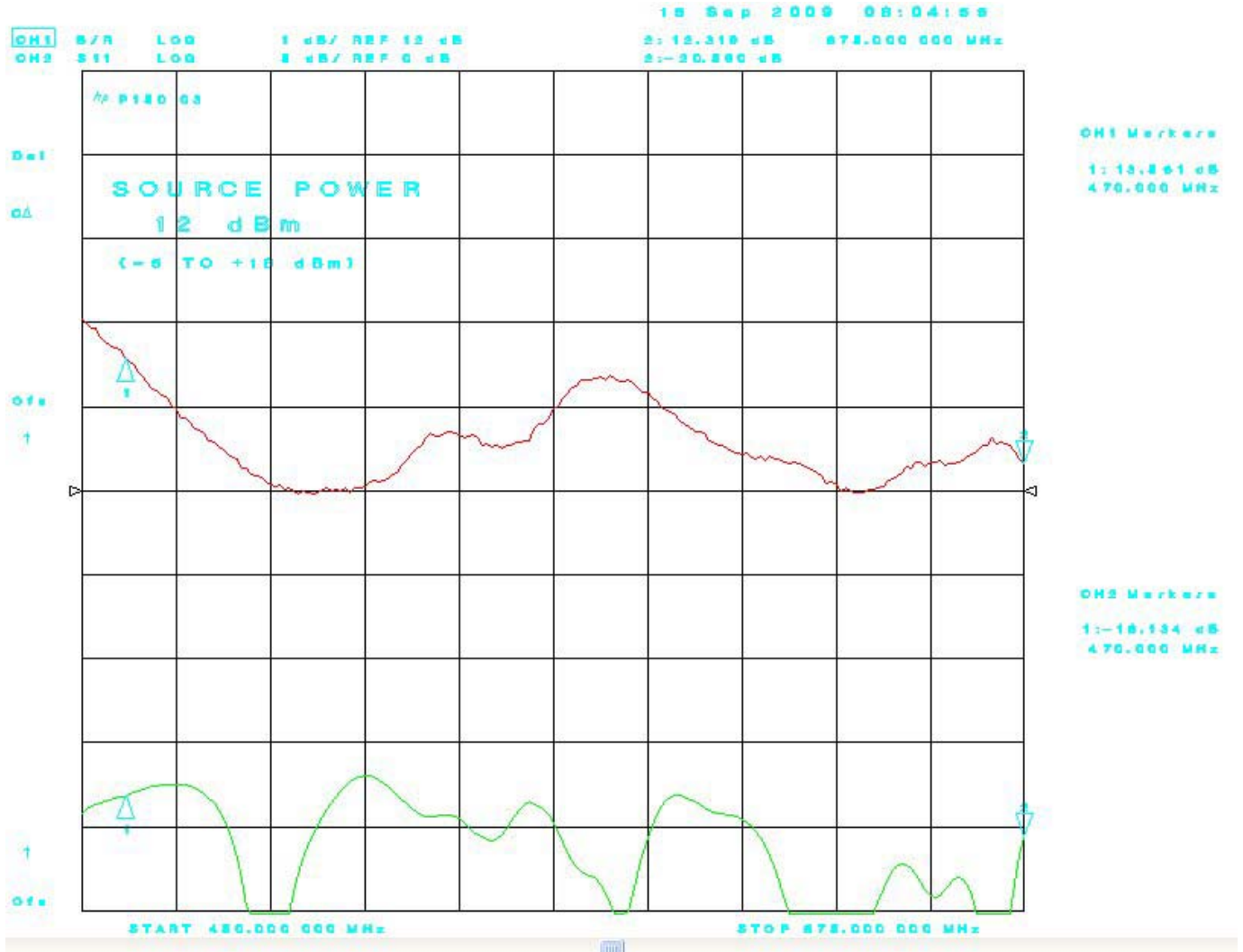
Input transients may damage this amplifier. Never make or break the input or output connection to the amplifier while bias is enabled. Avoid using step attenuators to control output power, consider using a continuously variable or voltage variable attenuator before the driver stage of the system. If 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. It should be noted that the BLF861A is the most rugged transistor that exists for UHF and it will tolerate abuse better than most devices.

**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.

### Disclaimer

Manufacturing UHF amplifiers and transmitters requires a high degree of skill and experience. This product is marketed to commercial manufacturers of UHF TV broadcast equipment; however, we welcome business from all customers.



**This is a frequency response plot from our 8753E network analyzer. The red trace is gain and the green trace is input return loss. All UHF TV products that we manufacture are sweep tested on Agilent 8753 network analyzers.**

**Start Freq: 450MHz**

**Stop Freq: 870MHz**

**Scale/div for gain “S21” is 1dB, Scale/div for return loss ‘S11” is 5dB.**

**Centerline reference level is 12dB for gain and 0dB for return loss.**

*This test setup uses an 8753E option 011 with a boosted source amplifier. The actual input level is 33dbm not 12dbm.*