

Model UHFTV-30 TV Pallet Amplifier Module

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

- **470– 860MHz**
- **28-32 Volts**
- **Pout: 25W Peak Sync.**
- **10Watts Avg digital power.**
- **40dB Gain at Channel 78****
- **Thermal Tracking Bias**
- **Current Sense Resistor**
- **25W peak sync @-54 IMD**
- **100% NXP mosfets.**
- **Made in the USA.**



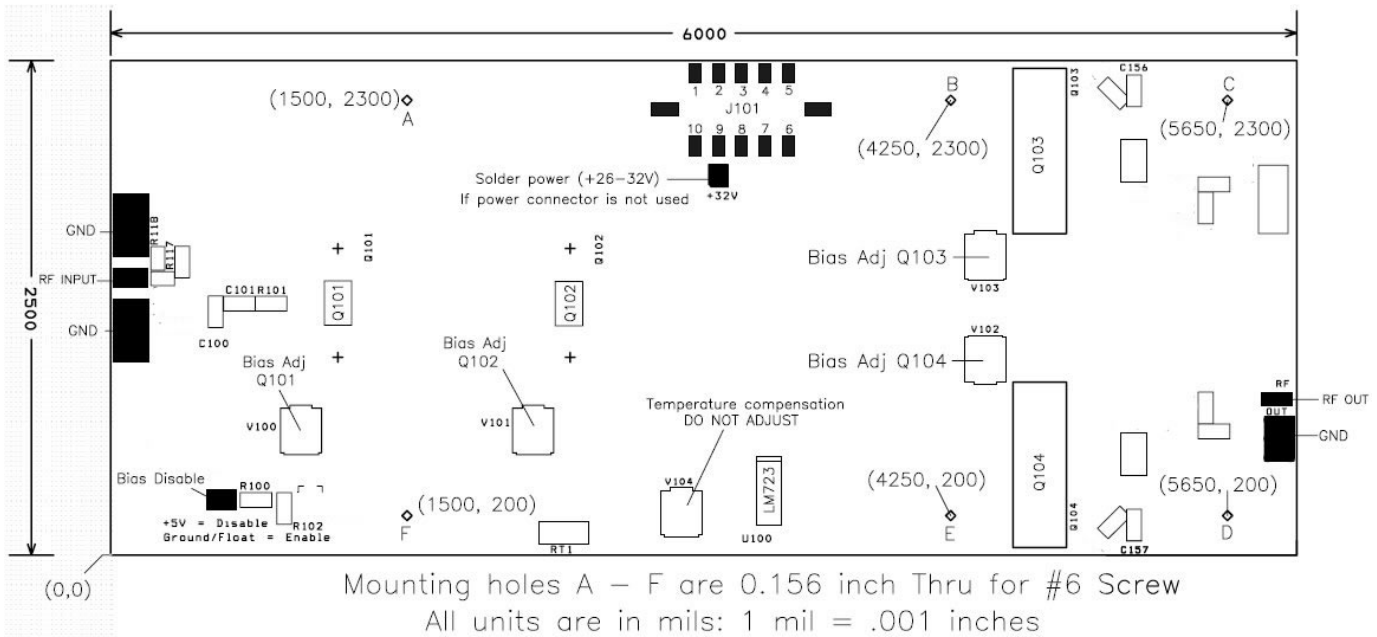
Dimension (L x W x H inch) [6.0" x 2.5" x 0.7"]

Electrical Specifications: 32V, 25C, 5.0A***				
Characteristics	Min	Typical	Max	unit
Operating Frequency range	470		860	MHz
Fundamental output power - CW	70			W
Power Input		3	10	dBm
Input Return Loss		-18	-15	RL
Gain	40.0	40.5	42.0	dB
Collector Efficiency		25		%
Collector Current @ 28V		3.5	4.5	A dc
Supply Voltage	26	28	32	V dc
Insertion Phase variation (unit to unit)		+/-5.0		degrees
Power gain (unit to unit)		+/-1.0		dB
Two Tone IMD; 25W 1MHz Spacing	-38	-40		dBc
F2 Second Harmonic		-20		dB
F3 Third Harmonic		-40		dB
Bias Current: Q101, Q102 @28V		0.25	0.35	A dc
Bias Current: Q103, Q104 @28V	1.0	1.5	2.0	A dc
Frequency response "S21" peak to valley, 470 – 860MHz	+/-0.5	+/-0.65	+/-0.95	dB

****note: In most countries frequencies above 810MHz (Channel 69) are reserved for cellular service; however, this pallet can operate up to 860MHz (Channel 78)**

*****note: pallet may draw up to 5.0 amps on a 32V supply with the maximum bias setting.**

Amplifier Drawing: Figure 1



Heatsink Mounting/Hardware

Tips for Mechanical Mounting:

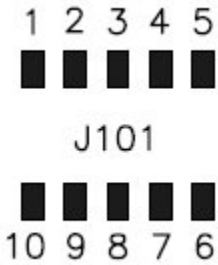
- 1 All holes (Designated "A thru F") are 0.156 inch thru and they are deigned for a #6 Screw. Stainless Steel mounting hardware is recommended, grade 18-8 or better. A lock washer of same material should also be used.
- 2 Ensure mounting surface is flat to better than 0.0025"
- 3 Use a thin layer of 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

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 settings may cause the transistors to burn out. This type of failure is not covered by warranty. If the pallet is being used in a driver application then Bias adjustment is not required.

Do not use substitutes for thermal compound under the pallet (thermal pads). These products disrupt the ground under the pallet and they can create oscillations which can damage final output stages.

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, 6 = Current monitor transistors Q103 and Q104 only.

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 a solder pad shown in figure 1 on page 2.

Theory of operation.

The factory bias settings are shown in the table on page 1 for each mosfet. These settings are for 28V operation. Bias adjustment is not required for 32V operation. The factory bias settings are for class A. This product is designed for use as a driver stage where up to 12 watts of ultra linear peak sync power is needed.

A “driver stage” in a TV application needs to be linear enough not to contribute IMD to the next stage. A 2 tone test, 5 MHz apart that results in -40dbc IMD means that the pallet will have -54dbc IMD with NTSC analog modulation (Full field red). This is considered “ultra linear”

If the pallet is used in a Class AB mode then the bias current on Q103 and Q104 may be reduced. In Class AB the pallet can produce 20 to 25 watts of peak-sync power.

This pallet can drive amplifiers with 1 or 2 BLF861A’s and all of the new 500W pallets that use the new LDMOS high voltage devices. This pallet can be driven directly by any standard TV modulator making it the only driver you will ever need guaranteed!

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.

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.

Note: Our lab testing indicates that this pallet is immune to damage from most transients mainly because this design uses 100% Philips/NXP transistors; however, the special handling procedures should still be followed.

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.

Frequency allocations for TV channels in the U.S.

VHF Low Band:		VHF High Band:	
Channel	Frequency (megahertz)	Channel	Frequency (megahertz)
2	54-60	7	174-180
3	60-66	8	180-186
4	66-72	9	186-192
		10	192-198
5	76-82	11	198-204
6	82-88	12	204-210
		13	210-216

UHF Band:

Chan	Freq (MHz)	Chan	Freq (MHz)	Chan	Freq (MHz)	Chan	Freq (MHz)
14	470-476	32	578-584	50	686-692	68	794-800
15	476-482	33	584-590	51	692-698	69	800-806
16	482-488	34	590-596	52	698-704	70	806-812
17	488-494	35	596-602	53	704-710	71	812-818
18	494-500	36	602-608	54	710-716	72	818-824
19	500-506	37	608-614	55	716-722	73	824-830
20	506-512	38	614-620	56	722-728	74	830-836
21	512-518	39	620-626	57	728-734	75	836-842
22	518-524	40	626-632	58	734-740	76	842-848
23	524-530	41	632-638	59	740-746	77	848-854
24	530-536	42	638-644	60	746-752	78	854-860
25	536-542	43	644-650	61	752-758	79	860-866
26	542-548	44	650-656	62	758-764	80	866-872
27	548-554	45	656-662	63	764-770	81	872-878
28	554-560	46	662-668	64	770-776	82	878-884
29	560-566	47	668-674	65	776-782	83	884-890
30	566-572	48	674-680	66	782-788		
31	572-578	49	680-686	67	788-794		

Channels 70-83 were de-allocated in 1982. They are now cell phone frequencies.
 Channels 52-69 will be de-allocated on February 17, 2009.
 Channel 37 is allocated to radio astronomy