



ELECTRONICS

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W6ORGy Notes

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Downeast Microwave 30 Watt pep 23cm Linear Amp



DEMI is producing a series of 23 cm linear amplifiers built around the Mitsubishi RA18H1213G power MOSFET module - 30, 60 and 120 Watt using 1, 2 or 4 of these bricks. The module is rated at 18 Watts by Mitsubishi and is very linear with low IM up to that level. DEMI is rating the amp at over 30 Watts pep on all modes including ATV with just a little sync stretching using the standard set up procedure (see AM ATV Amp Setup on our Application Note web page and Linear Amplifier Setup in your transmitter manual). It works out great that when the sync tip is set at 30 Watts, the pedestal is then set to 18 Watts which means all the picture information below the blanking will be in the very linear portion of the bricks gain curve.

This single brick amp can be driven directly with 50 mW from our TXA5-70S-23 ATV exciter modulator board which is used in the RTX or TX23-.1 ATV transmitter. The 2 and 4 brick amps you can use the RTX23-3.

The bricks gain rolls off quite a bit below 1270 MHz, and was verified at DEMI. We got more than 40 Watts pep out at 1289.25 MHz but 25 at 1253.25 MHz. The roll off is all inside the brick. We tried some external fine peaking by adding a .5-3 pF variable cap 1/2 wave out on the input strip line (at the brick side of C1) and also part way on the output strip line. We were able to get a little more power out, and improve the low end gain tilt a bit.

The monitor output on this amp is a simple diode detector which is brought out on one of the cable leads. This positive DC voltage is an indicator of RF output and can be used for drive and pedestal setup, but I found that if a scope is placed on the white monitor lead rather than a DC Voltmeter, you could also see the modulated video waveform. For ATV use, it would be simple to reverse the diode and connect to an emitter follower so as to drive a video monitor.

Power supply requirements are a regulated 12 to 14 Vdc at up to 10 Amps. With no drive the current draw was 4 Amps and did go to 10 Amps at full drive. The power lead resistance and inductance were significant enough with the 10 Amp peaks on the sync tip that there was some sync tip droop. I was able to cure that with a 330 mF 25 V electrolytic which can be seen in the center of the photo. The cap will be in the production units. DEMI will have two versions: 2330PA tuned to cover 1270 to 1300 MHz and 2330PATV tuned to cover 1250 to 1290 MHz. Built price will be \$240 and \$190 in kit form including the fan - a good deal for a fine all mode 23 cm linear amp, www.downtownmicrowave.com

