Q5 SIGNAL 6M 30W Linear Amplifier

A Down East Microwave Product Manufactured by Q5 SIGNAL, LLC

Part Number 6M30PA

Specifications

Frequency range:	50-54 MHz
Power Out (at 1 dB compression):	30 Watts
Power Out (saturated):	>35 Watts
Power Input for rated power out:	30mW max., 10mW linear
Power requirements:	13.8 VDC @ 7 amps.
Connectors:	Type "N" female
Size:	5.5" L x 5.5" W x 4.2" H with Fan
Active devices:	1 RA30H0608M

Description:

The 6M30PA is a broadband linear power amplifier covering the entire 6M amateur band. It has a linear power output of 30 Watts minimum with 10 mW of drive or a saturated output of over 35 Watts. Type "N" connectors are used on both RF input and output. There is a common DC connector with the + DC and ground supply voltage, PTT-L, and a RF power output monitor. The 6M30PA requires well-regulated 13.8 VDC at 7A for full power output. Keying is done by connecting the PTT-L circuit to ground (activates the Bias circuit). The RF power monitor supplies a relative DC voltage to RF power.

This amplifier design utilizes the Mitsubishi RA30H0608M MOSFET hybrid power module. All regulated voltages and biasing that are required for proper operation are self-contained.

Initial Testing and Instructions for Use:

After testing all coaxial components that will be utilized in the installation, make all RF connections to the 6M30PA. Make the DC connections next to a 13.8 VDC 15A Power supply with the large red and black wires. Apply the DC power to the 6M30PA and observe the fan becoming active. It may be slow at first.

With a proper loads connected to both input and output RF connectors, and **No RF drive applied**, activate the PTT-L circuit by connecting the small black wire to any ground connection on the amplifier or DC supply. The amplifier will now have a quiescent current of between 3 to 6 amps. At this time, the RF monitor voltage (small red wire) should be checked for zero volts referenced to ground. If not 0.00 VDC, disconnect the PTT-L circuit immediately. If voltage rises with PTT-L connected and without drive applied, there may be an oscillation in the amplifier. Re-check all coaxial connections, loads and antennas. If voltage is zero, RF drive may be applied.

Apply the drive gradually if possible while monitoring the voltmeter connected to the Red wire RF monitor. During the initial testing, do not exceed the specified drive level for linear operation listed on the specifications above. If you have a power meter in line, you may

now calibrate your system. If not, the voltage will vary with the output power and saturate before the maximum drive level is obtained. Set output power by adjusting the input drive level.

IMPORTANT: This amplifier design assumes a clean filtered signal will used as a drive source but will require a Lowpass filter on its output to eliminate 2nd and higher harmonics that exist or may be amplified by excessive drive.

Caution:

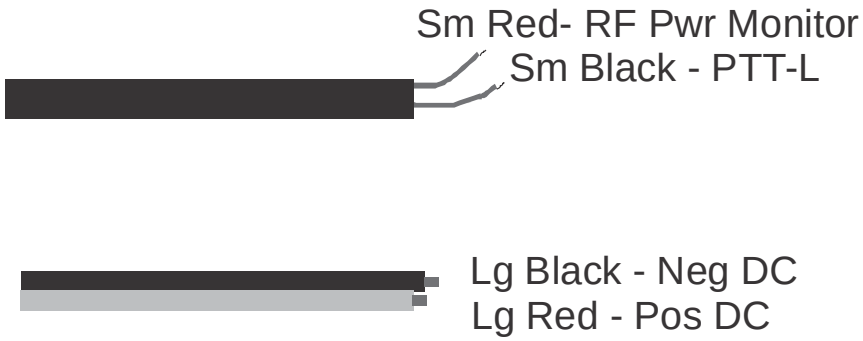
Do not exceed 15 volts on the DC line. When in operation, utilize over voltage protection and any voltage sensing circuits that your power supply may offer. With high current drain, voltage sag will inhibit the amplifier's output power performance and with lower quality power supplies, the voltage may soar beyond the amplifiers specified limits when un-keyed.

Use the highest quality coaxial cables possible on both RF connections. Test all coaxial components at low levels before installing into the final system. Bad coaxial components, improper connections, or antennas that are not matched may cause amplifier oscillations.

Install the amplifier with the heat sink up and fan on top so the amplifier will convection-cool. The fan will push air through the heat sink fins and will cool the amplifier in any mode of operation including continuous duty applications. It is recommended not to keep the amplifier continuously keyed in the transmit mode without applying RF drive.

The RF power monitor is designed to produce a relative voltage output that is capable of driving a digital volt meter up to +6 VDC for full output power. This meter may be calibrated to meet your systems requirements.

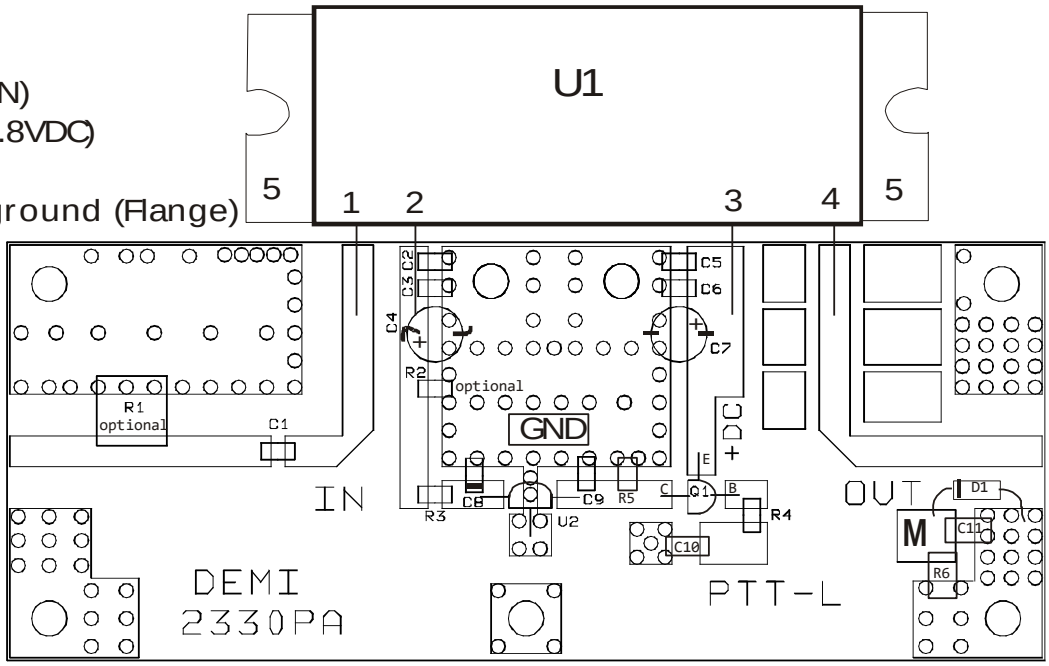
DC Connector Wiring



6M30PA Component Placement

Pin Out

1 RF In
2 Bias (TXON)
3 Vcc (+ 13.8VDC)
4 RF Out
5 RF & DC ground (Flange)



6M30PA Schematic Diagram