

## Cooled JFET Amplifiers

The cooled JFET product line contains two primary products; the TIA and the JF-4. Both devices are designed to operate in the cryogenic environment. They consist of a hybrid circuit that is isolated from the cryogenic environment by low conductivity support rods. An internal heater maintains operating temperature independently of the environmental temperature. The devices are packaged in industry standard TO-5 headers and are light tight. Both of these products are qualified for space flight applications.

### JF-4 Integrating Amplifier

#### Features:

- Read noise  $\leq 20 e^-$
- Power dissipation  $\leq 250 \mu W$
- Operating range from 1 to 45 K

The JF-4 is a single channel integrating amplifier module designed for use with infrared detectors operating in the temperature range from 1 to 45 K. It consists of a hybrid circuit containing a balanced JFET integrating amplifier with a voltage gain of 0.9, an input capacitance of 7.5 pf and a read noise of less than  $20 e^-$ . The charge compensated JFET reset switch provides for rapid and accurate reset of the input to ground potential. The device is designed for continuous non-destructive read-out by sampling the output. Output impedance is less than 100 K $\Omega$ . Power dissipation is less than  $250 \mu W$  at a temperature of 4K. A small number of selected JF-4s operate in the LN2 temperature range.

#### Ordering Information

EJ-JF-4

### TIA Front End

#### Features:

- Voltage noise is  $\leq 20 \text{ nV/Hz}^{1/2}$  at 10 Hz
- Power dissipation  $\leq 300 \mu W$
- Operating range from 1 to 45 K

The TIA module consists of a hybrid circuit containing a monolithic-dual silicon JFET. The JFET is carefully selected for low noise and close matching of dc characteristics. The result is a balanced source follower that provides extremely high performance as a TIA input stage. Tests show that for feedback resistors up to  $1 \times 10^{11} \Omega$ , the noise spectrum is dominated by Johnson noise at temperatures down to 4K. Voltage noise is  $\leq 20 \text{ nV/Hz}^{1/2}$  at 10 Hz. Input capacitance is less than 4 pf.

#### Ordering Information

EJ-TIA

### RS-1 Reset Controller

Single channel reset controller and warm preamplifier for the JF-4 integrator. The product contains both the reset pulse generation circuit and a 100 gain first stage preamplifier. A complete circuit diagram is provided at no charge to customers who wish to build this circuit themselves.

#### Ordering Information

EJ-RS-1

### MB-1 Mounting Bracket

Gold plated copper "L" bracket with a single socket affixed with a high thermal conductivity cryogenic epoxy. Designed to meet the cooling requirements of both the JF-4 and the TIA. Custom brackets are available for special or multi-unit applications. Mounting instruction are provided at no charge to customers who wish to build their own mounting bracket.

#### Ordering Information

EJ-MB-1