

# PAD SERIES

## PICO AMPERE DIODES

### FEATURES

DIRECT REPLACEMENT FOR SILICONIX PAD SERIES

REVERSE BREAKDOWN VOLTAGE  $BV_R \geq -30V$

REVERSE CAPACITANCE  $C_{RSS} \leq 2.0pF$

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

@ 25 °C (unless otherwise stated)

### Maximum Temperatures

Storage Temperature -65 to +150 °C

Operating Junction Temperature -55 to +135 °C

### Maximum Power Dissipation

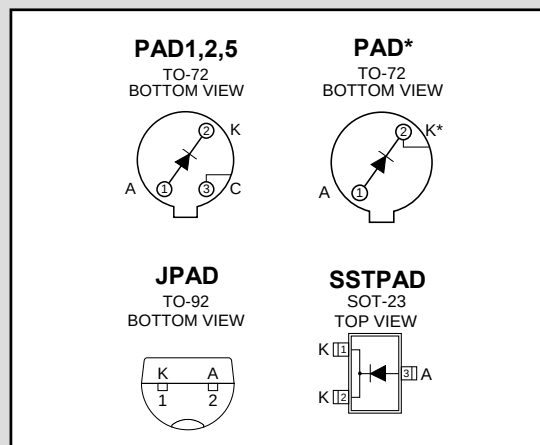
Continuous Power Dissipation (PAD) 300mW

Continuous Power Dissipation (J/SSTPAD) 350mW

### Maximum Currents

Forward Current (PAD) 50mA

Forward Current (J/SSTPAD) 10mA



\* Cathode tied to Case

### COMMON ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated)

| SYMBOL    | CHARACTERISTIC            | MIN        | TYP | MAX | UNITS | CONDITIONS            |
|-----------|---------------------------|------------|-----|-----|-------|-----------------------|
| $BV_R$    | Reverse Breakdown Voltage | ALL PAD    | -45 |     | V     | $I_R = -1\mu A$       |
|           |                           | ALL SSTPAD | -30 |     |       |                       |
|           |                           | ALL JPAD   | -35 |     |       |                       |
| $V_F$     | Forward Voltage           |            | 0.8 | 1.5 |       | $I_F = 5mA$           |
| $C_{RSS}$ | Total Reverse Capacitance | PAD1,5     | 0.5 | 0.8 | pF    | $V_R = -5V, f = 1MHz$ |
|           |                           | All Others | 1.5 | 2   |       |                       |

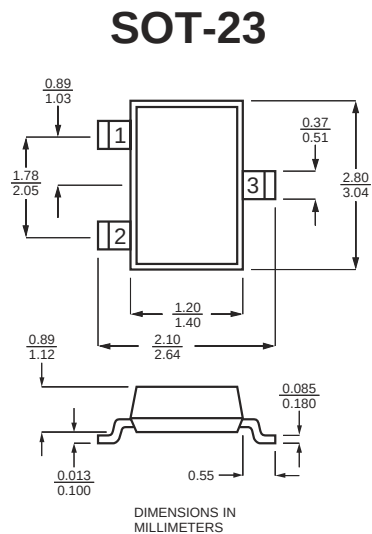
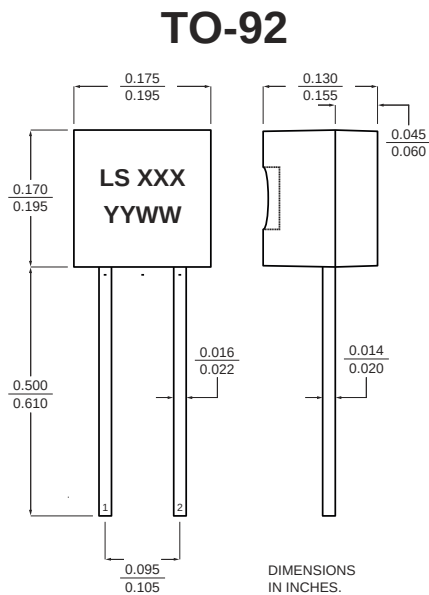
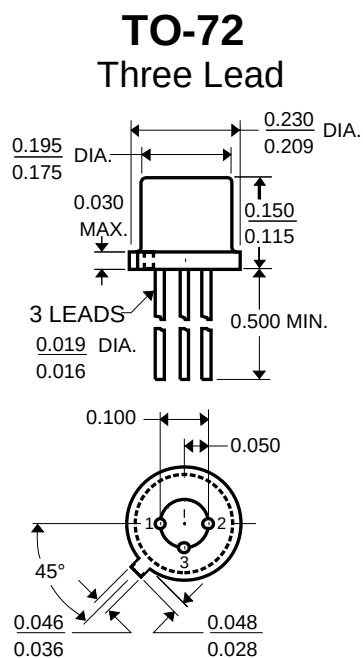
### SPECIFIC ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated)

| SYMBOL | CHARACTERISTIC                               | PAD <sup>2</sup> | JPAD <sup>2</sup> | SSTPAD <sup>2</sup> | UNITS | CONDITIONS   |
|--------|----------------------------------------------|------------------|-------------------|---------------------|-------|--------------|
| $I_R$  | Maximum Reverse Leakage Current <sup>2</sup> | (SST/J)PAD1      | -1                |                     | pA    | $V_R = -20V$ |
|        |                                              | (SST/J)PAD2      | -2                |                     |       |              |
|        |                                              | (SST/J)PAD5      | -5                | -5                  |       |              |
|        |                                              | (SST/J)PAD10     | -10               | -10                 |       |              |
|        |                                              | (SST/J)PAD20     | -20               | -20                 |       |              |
|        |                                              | (SST/J)PAD50     | -50               | -50                 |       |              |
|        |                                              | (SST/J)PAD100    | -100              |                     |       |              |
|        |                                              | (SST/J)PAD200    |                   | -200                |       |              |
|        |                                              | (SST/J)PAD500    |                   | -500                |       |              |

Input Differential Voltage limited to 0.8V (typ) by JPADS D<sub>1</sub> and D<sub>2</sub>. Common Mode Input voltage limited by JPADS D<sub>3</sub> and D<sub>4</sub> to  $\pm 15V$ .

Typical Sample and Hold circuit with clipping. JPAD diodes reduce offset voltages fed capacitively from the JFET switch gate.

The circuit diagram shows a two-stage op-amp precision rectifier. The first stage is a voltage follower where the op-amp output is connected to the gate of a 2N4393 JFET, whose source is grounded and drain is connected to the inverting input of the op-amp. The input signal  $e_{in}$  is applied to the non-inverting input of this op-amp. The output of the first stage is connected to the inverting input of a second op-amp. The second op-amp's non-inverting input is grounded. Its output is connected to a network of two diodes (JPAD5 D1 and D2), a feedback capacitor  $C$ , and a load resistor  $R$ . Diode D1 is oriented towards the op-amp output, while D2 is oriented away from it. The output voltage is  $V_{OUT}$ .



1. Absolute maximum ratings are limiting values above which serviceability may be impaired.
2. The PAD type number denotes its maximum reverse current value in pico amperes. Devices with  $I_R$  values intermediate to those shown are available upon request.

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