

ASI, AP Series of PIN Switching Diodes are passivated epitaxial silicon devices. PIN Switching Diodes are designed to provide two impedance states, one approaching an open circuit (reverse bias), and a short circuit (forward bias). These devices are designed to cover a wide range of control applications that are in the category of RF switching, phase shifting modulation, duplexing, limiting and pulse forming. The diodes in this series are housed in hermetically sealed packages. This series can also be obtained in dice form.

ABSOLUTE MAXIMUM RATINGS:

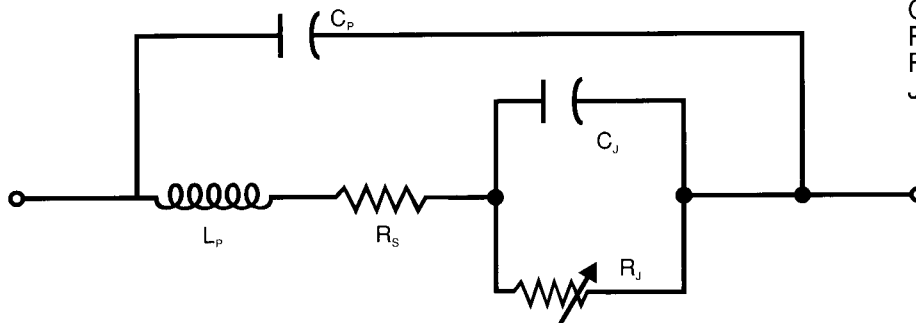
Storage Temperature:
-65°C to +175°C

Operating Temperature:
-65°C to +175°C

All of the PIN Switching diodes meet or exceed the military environmental specifications of MIL-S-19500, MIL-STD-202 and methods of MIL-STD-750 that specify mechanical, electrical, thermal and environmental tests.

PIN JUNCTION EQUIVALENT CIRCUITS

The equivalent circuit for a PIN JUNCTION is as follows:



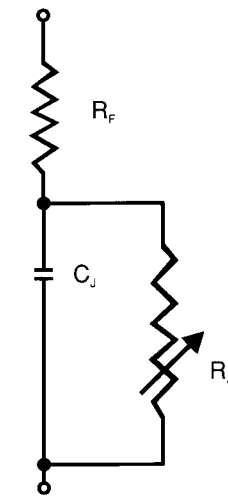
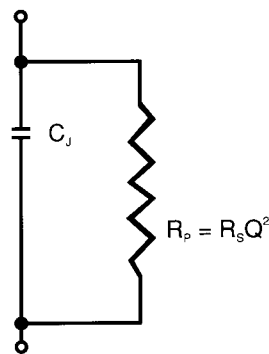
C_p = Package Capacitance
 L_p = Package Inductance
 C_j = Junction Capacitance
 R_s = Series Resistance
 R_j = Conductivity Modulated Junction Resistance

The reverse and forward biased equivalent circuits for a PIN JUNCTION are as follows:

HIGH Q CAPACITOR



REVERSE BIAS



FORWARD BIAS

CURRENT CONTROLLED RESISTOR



HIGH BIAS

PIN SWITCHING DIODES

| PART NUMBER | $V_{B,MIN}^1$ @10 μ A (volts) | $C_{J,6}^2$ max. (PF) | $R_{S,max}^3$ @20mA (Ohms) | $R_{S,max}$ @100mA (Ohms) | $T_L^{4typ.}$ (nsec) | T_S^5 10-90%, 90-10% | O_R^{6max} ($^{\circ}$ C/W) |
|------------------------|---|-----------------------------|----------------------------------|---------------------------------|-------------------------|------------------------------|-----------------------------------|
| FAST SWITCHING | | | | | | | |
| AP700A | 70 | 0.05 | 2.8 | 2.5 | 50 | 5 | 60 |
| AP700B | 70 | 0.10 | 2.0 | 1.8 | 50 | 5 | 60 |
| AP700C | 70 | 0.20 | 1.7 | 1.5 | 50 | 5 | 50 |
| AP700D | 70 | 0.30 | 1.2 | 1.0 | 50 | 5 | 50 |
| AP1000A | 100 | 0.05 | 2.6 | 2.0 | 100 | 10 | 50 |
| AP1000B | 100 | 0.10 | 2.0 | 1.7 | 100 | 10 | 45 |
| AP1000C | 100 | 0.20 | 1.5 | 1.2 | 100 | 10 | 45 |
| AP1000D | 100 | 0.30 | 1.2 | 1.0 | 100 | 10 | 40 |
| AP2000A | 200 | 0.10 | 2.4 | 1.8 | 200 | 20 | 40 |
| AP2000B | 200 | 0.20 | 1.4 | 0.9 | 200 | 20 | 35 |
| AP2000C | 200 | 0.30 | 1.0 | 0.8 | 200 | 20 | 35 |
| ULTRA FAST SWITCHING | | | | | | | |
| AP0300A | 30 | 0.15 | 1.5 | | 10 | 1 5 | 40 |
| AP0300B | 30 | 0.20 | 1.2 | | 10 | 1 5 | 40 |
| AP0300C | 30 | 0.25 | 1.0 | | 10 | 1 5 | 35 |
| PRECISION ATTENUATOR | | $C_{J,50typ.}$ | $R_{S,min}$ @0.01 mA | $R_{S,typ}$ @20 mA | $R_{S,max}$ @100 mA | $T_{L,min}$ | |
| AP1500A | 150 | 0.05 | 1000 | 2.5 | 2.0 | 500 | 25 |
| AP1500B | 150 | 0.10 | 600 | 2.0 | 1.5 | 500 | 20 |
| AP1500C | 150 | 0.15 | 500 | 1.7 | 1.2 | 500 | 15 |
| AP1500D | 150 | 0.20 | 400 | 1.5 | 1.0 | 500 | 12 |
| AP1500E | 150 | 0.25 | 350 | 1.2 | 0.8 | 500 | 10 |
| AP1500F | 150 | 0.30 | 300 | 1.0 | 0.6 | 500 | 9 |
| MEDIUM POWER SWITCHING | | $C_{J,50typ}$ | $R_{S,typ}$ @20 mA | $R_{URS,max}$ @100 mA | $T_{L,min}$ | | |
| AP3000A | 300 | 0.05 | 3.0 | 1.7 | 600 | 300 | 25 |
| AP3000B | 300 | 0.10 | 2.0 | 1.2 | 800 | 400 | 200 |
| AP3000C | 300 | 0.30 | 1.5 | 0.6 | 1000 | 500 | 12 |
| AP3000D | 300 | 0.50 | 1.0 | 0.5 | 1000 | 500 | 10 |
| AP5000A | 500 | 0.10 | 2.0 | 1.2 | 1200 | 600 | 18 |
| AP5000B | 500 | 0.30 | 1.5 | 0.6 | 1200 | 600 | 10 |
| AP5000C | 500 | 0.50 | 1.0 | 0.5 | 1200 | 600 | 9 |

NOTES:

- Breakdown voltage (V_B) is measured at 10 μ A of reverse bias current.
- Junction capacitance is measured on a 1 MHz Boonton capacitance bridge.
- Series resistance is measured at 1 GHz using transmission loss techniques
- Minority carrier lifetime is measured with $I_F=10$ mA and $I_R=6$ mA at the 90% recovery point.
- Switching time is measured between $I_F=10$ mA and $V_R=10$ V.
- Thermal resistance is measured using ΔV_F versus T_{IME} in a thermal impedance meter and an infinite heat sink.
- Available in package styles 01, 15, 51, 52, 53. Other styles available on request.

ADVANCED SEMICONDUCTOR, INC.

7525 Ethel Avenue • North Hollywood, California 91605 • U.S.A.
 Tel: (818) 982-1200 • (800) 423-2354 • Fax: (818) 765-3004
 email: sales@adsemi.com • web: www.adsemi.com