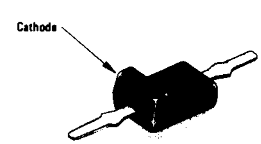
MPN3401 (SILICON)
MPN3402

SILICON PIN DIODE

. . . designed primarily for VHF band switching applications but also suitable for use in general-purpose switching and attenuator circuits. Supplied in an inexpensive low-inductance plastic package for low cost, high-volume consumer and industrial requirements.

- Rugged PIN Structure Coupled with Wirebond Construction for Optimum Reliability
- Both 1 pF and 2 pF Devices for Design Selectivity
- Very Low Series Resistance at 100 MHz – 0.34 Ohms (Typ) @ I_F = 10 mAdc
- Low Inductance Mini-L Package
- Mini-L Ridge Clearly Identifies Cathode Lead for Easy Handling and Mounting

SILICON PIN SWITCHING DIODE



MPN3401 – BROWN RIDGE
MPN3402 – BROWN RIDGE, RED BODY STRIPE

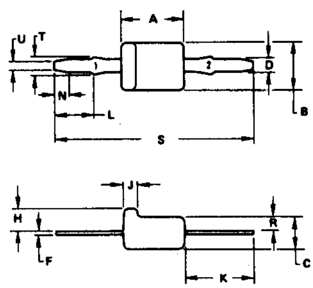
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Voltage	V_R	35	Volts
Forward Power Dissipation @ T_A = 25°C Derate above 25°C	P_F	400 4.0	mW mW/°C
Junction Temperature	T_J	+125	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage (I_R = 10 μA)	$V_{(BR)R}$	35	–	–	Volts
Diode Capacitance (Note 1) MPN3401 (V_R = 20 Vdc, f = 1.0 MHz) MPN3402	C_T	– –	– –	1.0 2.0	pF
Series Resistance (Figure 5) MPN3401 (I_F = 10 mA) MPN3402	R_S	– –	– –	0.7 0.6	Ohms
Reverse Leakage Current (V_R = 25 Vdc)	I_R	–	–	0.1	μA
Series Inductance (Note 2) (f = 250 MHz) (Measured at Lead Stop ≈ 1/8")	L_S	–	3.0	–	nH
Case Capacitance (f = 1.0 MHz)	C_C	–	0.1	–	pF

NOTES
1. C_T is measured using a capacitance bridge (Boonton Electronics Model 75A or equivalent).
2. L_S is measured on a package having a short instead of a die, using an impedance bridge (Boonton Radio Model 250A RX Meter).



PIN 1. CATHODE
2. ANODE

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	3.86	4.11	0.152	0.162
B	2.92	3.18	0.115	0.125
C	1.91	2.16	0.075	0.085
D	0.64	0.89	0.025	0.035
F	0.08	0.18	0.003	0.007
H	1.30	1.55	0.051	0.061
J	0.64	0.89	0.025	0.035
K	4.06	4.32	0.160	0.170
L	2.36	2.62	0.093	0.103
N	1.12	1.37	0.044	0.054
R	0.79	1.04	0.031	0.041
S	11.99	12.75	0.472	0.502
T	1.14	1.40	0.045	0.055
U	0.43	0.69	0.017	0.027

CASE 226

27

TYPICAL ELECTRICAL CHARACTERISTICS

FIGURE 1 – SERIES RESISTANCE

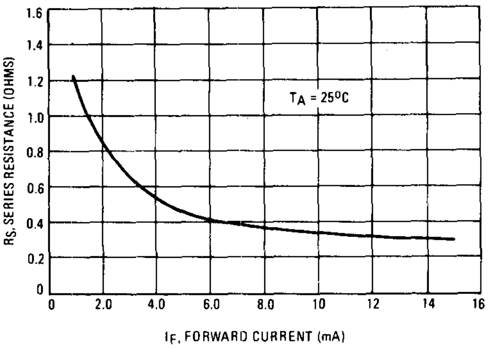


FIGURE 2 – FORWARD VOLTAGE

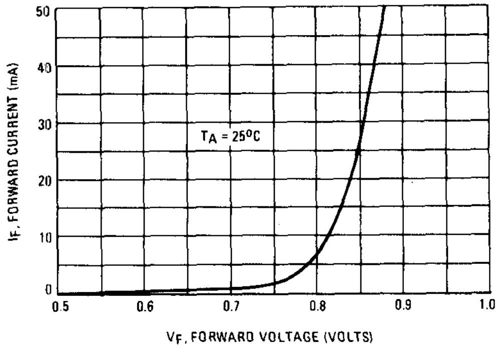


FIGURE 3 – DIODE CAPACITANCE

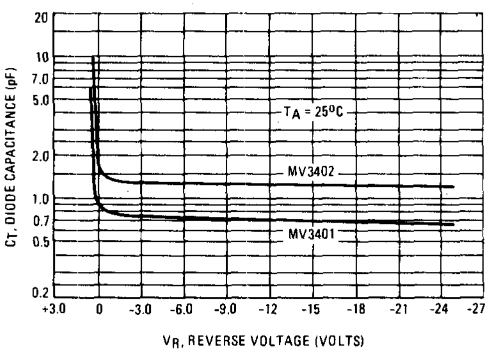


FIGURE 4 – LEAKAGE CURRENT

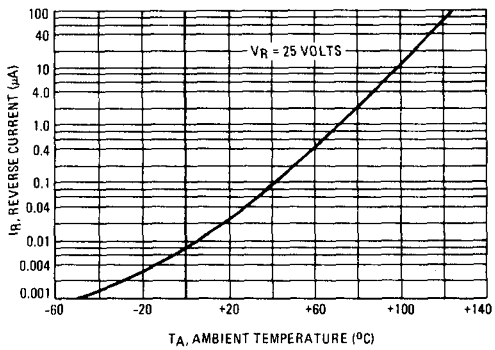
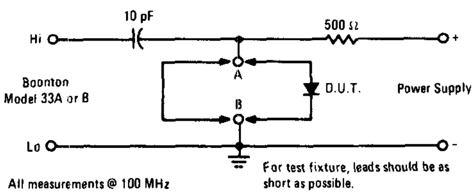


FIGURE 5 – FORWARD SERIES RESISTANCE TEST METHOD



To measure series resistance, a 10 pF capacitor is used to reduce the forward capacitance of the circuit and to prevent shorting of the external power supply through the bridge. The small signal from the bridge is prevented from shorting through the power supply by the 500-ohm resistor. The resistance of the 10 pF capacitor can be considered negligible for this measurement.

1. The RF Admittance Bridge (Boonton 33A or B) must be initially balanced, with the test circuit connected to the bridge test terminals. The conductance scale will be set at zero and the capacitance scale will be set at 120 pF, as required when using the 100 MHz test coil.
2. Use a short length of wire to short the test circuit from point "A" to "B". Then connect the power supply providing 10 mA of bias current to the test circuit.
3. Adjust the capacitance scale arm of the bridge and the "G" zero control for a minimum null on the "null meter". The null occurs at approximately 130 pF.
4. Replace the wire short with the device to be tested. Bias the device to a forward conductance state of 10 mA.
5. Obtain a minimum null on the "null meter", with the capacitance and conductance scale adjustment arms.
6. Read conductance (G) direct from the scale. Now read the capacitance value from the scale (≈ 130 pF) and subtract 120 pF which yields capacitance (C). The forward resistance (R_S) can now be calculated from:

$$R_S = \frac{2.533\,G}{C^2}$$

Where:
G – in micromhos,
C – in pF,
R_S – in ohms