

Silicon - Diode

BAY80

120V / 500mA / 500mW

General Purpose, High Conductance Diode

DATASHEET

OEM – Fairchild

Source: Fairchild Databook 1978

BAY72 • BAY80**GENERAL PURPOSE, HIGH CONDUCTANCE DIODES**

DIFFUSED SILICON PLANAR

- $V_F \dots 1.0 \text{ V (MAX) @ } 100 \text{ mA (BAY72)}$
- $V_F \dots 1.0 \text{ V (MAX) @ } 150 \text{ mA (BAY80)}$

ABSOLUTE MAXIMUM RATINGS (Note 1)**Temperatures**

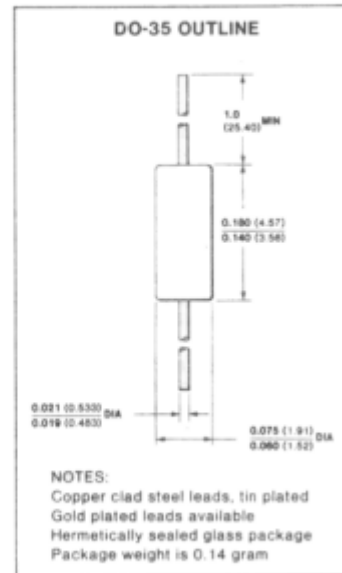
| | |
|--|-----------------|
| Storage Temperature Range | -65°C to +200°C |
| Maximum Junction Operating Temperature | +175°C |
| Lead Temperature | +260°C |

Power Dissipation (Note 2)

| | |
|---|------------|
| Maximum Total Power Dissipation at 25°C Ambient | 500 mW |
| Linear Power Derating Factor (from 25°C) | 3.33 mW/°C |

Maximum Voltage and Currents

| | | | |
|---------------------|---------------------------------|--------|--------|
| WIV | Working Inverse Voltage | BAY 72 | 100 V |
| | | BAY 80 | 120 V |
| I_O | Average Rectified Current | | 200 mA |
| I_F | Continuous Forward Current | | 500 mA |
| i_f | Peak Repetitive Forward Current | | 600 mA |
| $i_f(\text{surge})$ | Peak Forward Surge Current | | 1.0 A |
| | Pulse Width = 1 s | | 4.0 A |
| | Pulse Width = 1 μ s | | |

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL | CHARACTERISTIC | BAY 72 | | BAY 80 | | UNITS | TEST CONDITIONS |
|----------|-------------------------------------|--------|------|--------|------|---------|--|
| | | MIN | MAX | MIN | MAX | | |
| V_F | Forward Voltage | | | | 1.00 | V | $I_F = 150 \text{ mA}$ |
| | | 0.78 | 1.00 | | | V | $I_F = 100 \text{ mA}$ |
| | | 0.73 | 0.92 | | | V | $I_F = 50 \text{ mA}$ |
| | | 0.63 | 0.78 | | | V | $I_F = 10 \text{ mA}$ |
| | | 0.51 | 0.64 | | | V | $I_F = 1.0 \text{ mA}$ |
| I_R | Reverse Current | | | | 100 | nA | $V_R = 120 \text{ V}$ |
| | | | | | 150 | μ A | $V_R = 120 \text{ V}, T_A = 100^\circ\text{C}$ |
| | | | 100 | | | nA | $V_R = 100 \text{ V}$ |
| | | | 100 | | | μ A | $V_R = 100 \text{ V}, T_A = 125^\circ\text{C}$ |
| BV | Breakdown Voltage | 125 | | 150 | | V | $I_R = 100 \mu\text{A}$ |
| C | Capacitance | | 5.0 | | 6.0 | pF | $V_R = 0, f = 1 \text{ MHz}$ |
| t_{rr} | Rev. Rec. Time (note 3) (note 4) | | 50 | | 60 | ns | $I_f = I_r = 30 \text{ mA}, R_L = 75 \Omega$ |
| | | | 400 | | | ns | $I_f = 30 \text{ mA}, V_R = 35 \text{ V}$ |
| V_{fr} | Fwd. Rec. Voltage (note 5) | | 2.5 | | | v | $R_L = 2.0 \text{ k}\Omega, C_L = 10 \text{ pF}$ |
| V_{fr} | Fwd. Rec. Voltage (note 5) | | 2.5 | | | V | $I_f = 100 \text{ mA (pulsed)}$ |
| t_{fr} | Fwd. Rec. Time (note 5) | | 50 | | | ns | $I_f = 100 \text{ mA (pulsed)}$ |
| Q_S | Stored Charge (note 6) | | 250 | | | pC | $I_f = 20 \text{ mA}, I_r = 1.0 \text{ mA}$ |
| R_E | Rect. Efficiency (note 7) | 35 | | | | % | $f = 100 \text{ MHz}$ |

NOTES:

- These ratings are limiting values above which the serviceability of the diode may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
- Recovery to 1.0 mA.
- Recovery to 400 k Ω , Jan 256 Circuit.
- The oscilloscope used as the response detector shall have a bandwidth of at least 10 MHz (3 dB down), and shall be calibrated using a deposited carbon resistor of 50 Ω in the diode test clips. t_{rr} is defined as the difference between the 10% point of the pulse and the point where V_F is to be within 10% of the quiescent value. Pulse conditions shall be 0.1 μ s wide at base, 20 ns maximum rise time, repetition rate = 100 kHz max.
- Measured on the Tektronix "S" unit.
- Rectification efficiency is defined as the ratio of dc load voltage to peak rf input to the circuit. Load resistance of 5.0 k Ω , load capacitance 20 pF.
- For product family characteristic curves, refer to Chapter 4, D1.