

Switch and Attenuator Plastic Packaged PIN Diodes



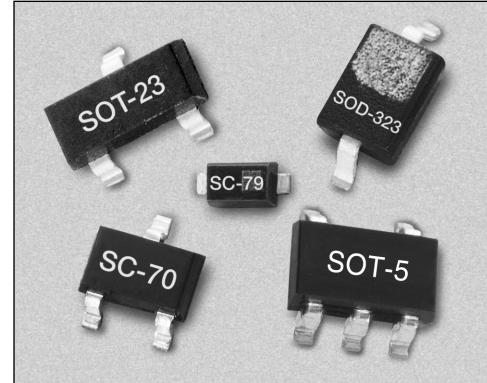
SMP1302 Series

Features

- Low Distortion Design
- Frequency Range from HF to > 2 GHz
- Designed for Base Station and Handset Applications

Description

The SMP1302 series of plastic packaged, surface mountable, low capacitance (0.3 pF) silicon PIN diodes are designed for high volume switch and attenuator applications from 10 MHz to beyond 2 GHz. These diodes are designed for use in low distortion PI and TEE attenuators with low drive current (maximum resistance at 1 mA is 10 Ω) commonly used in TV distribution and cellular base station applications. The nominal 50 μm I region width combined with a maximum resistance of 3 Ω at 10 mA, make these diodes useful in large signal switch applications. Available as single and dual diodes in a selection of plastic packages including SOT-23, SOD-323, small footprint SC-79 and miniature SC-70. Available in a SOT-5 (SMP1302-027) package as a four diode array designed for insertion in the commonly used 4 diode PI attenuator circuit.



Absolute Maximum Ratings

| Characteristic | Value |
|---|-----------------|
| Reverse Voltage (V_R) | 200 V |
| Power Dissipation @ 25°C Lead Temperature (P_D) | 250 mW |
| Storage Temperature (T_{ST}) | -65°C to +150°C |
| Operating Temperature (T_{OP}) | -65°C to +150°C |
| ESD Human Body Model | Class 1C |

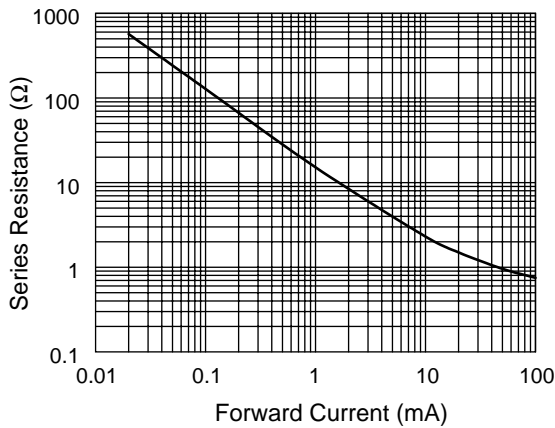
| | | | | | | |
|------------------------|------------------------|------------------------|------------------------|------------------------|---------------|------------------------|
| | | | | | | |
| Single | Common Anode | Common Cathode | Series Pair | Single | PI | Single |
| Marking: PF1 | Marking: PF9 | Marking: PF3 | Marking: PF2 | | Marking: PFM | |
| SOT-23 | SOT-23 | SOT-23 | SOT-23 | SOD-323 | SOT-5 | SC-79 |
| ♦ SMP1302-001 | ♦ SMP1302-003 | ♦ SMP1302-004 | ♦ SMP1302-005 | ♦ SMP1302-011 | ♦ SMP1302-027 | ♦ SMP1302-079 |
| $L_S = 1.5 \text{ nH}$ | $L_S = 1.5 \text{ nH}$ | $L_S = 1.5 \text{ nH}$ | $L_S = 1.5 \text{ nH}$ | $L_S = 1.5 \text{ nH}$ | | $L_S = 0.7 \text{ nH}$ |
| | SC-70 | SC-70 | SC-70 | | | |
| | ♦ SMP1302-073 | ♦ SMP1302-074 | ♦ SMP1302-075 | | | |
| | $L_S = 1.4 \text{ nH}$ | $L_S = 1.4 \text{ nH}$ | $L_S = 1.4 \text{ nH}$ | | | |

♦ Available through distribution.

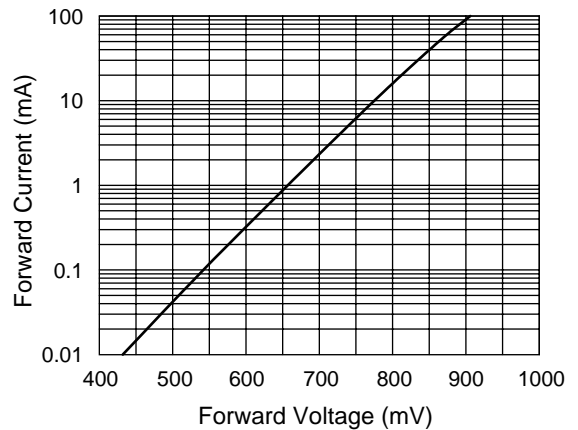
Electrical Specifications at 25°C

| Parameter | Condition | Typ. | Max. | Unit |
|-------------------------------|---|------|------|---------------|
| Reverse Current (I_R) | $V_R = 200\text{ V}$ | | 10 | μA |
| Capacitance (C_T) | $F = 1\text{ MHz}, V = 30\text{ V}$ | | 0.30 | pF |
| Resistance (R_S) | $F = 100\text{ MHz}, I = 1\text{ mA}$ | 15 | 20 | Ω |
| Resistance (R_S) | $F = 100\text{ MHz}, I = 10\text{ mA}$ | | 3.0 | Ω |
| Resistance (R_S) | $F = 100\text{ MHz}, I = 100\text{ mA}$ | | 1.5 | Ω |
| Forward Voltage (V_F) | $I_F = 10\text{ mA}$ | 0.8 | | V |
| Carrier Lifetime (τ_I) | $I_F = 10\text{ mA}$ | 0.7 | | μS |
| I Region Width | | 50 | | μm |

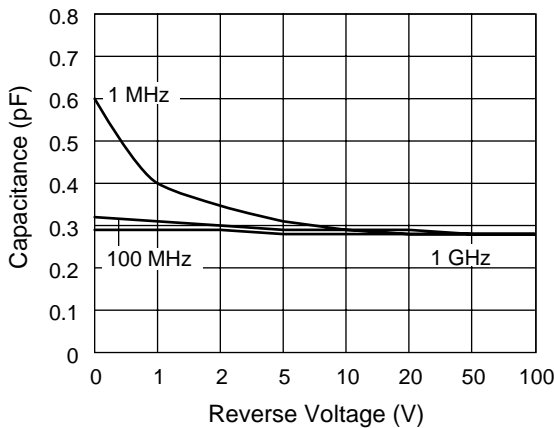
Typical Performance Data



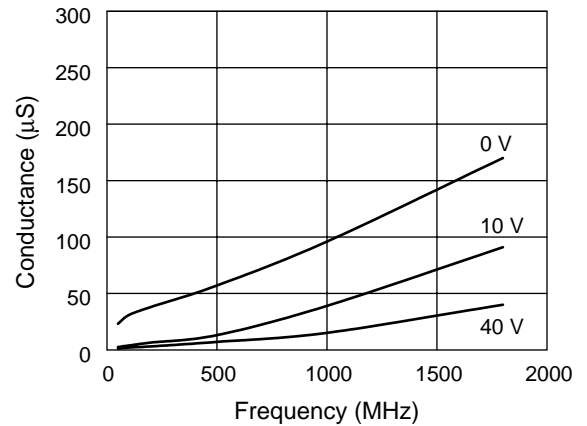
Series Resistance vs. Current @ 100 MHz



DC Characteristic



Capacitance vs. Reverse Voltage

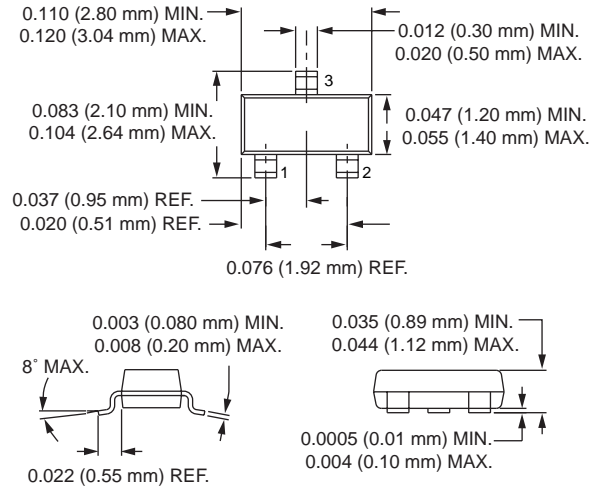


Conductance vs. Frequency and Reverse Voltage

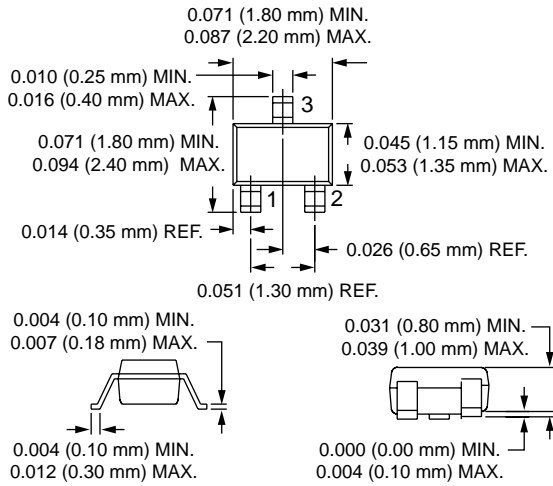
Resistance vs. Temperature @ 100 MHz

| I_F (mA) | R -55°C (Ω) | R -15°C (Ω) | R +25°C (Ω) | R +65°C (Ω) | R +100°C (Ω) |
|---------------|-------------------|-------------------|-------------------|-------------------|--------------------|
| | -55.00 | -15.00 | 25.0 | 65.0 | 100.00 |
| 0.02 | 599.00 | 653.00 | 692.0 | 715.0 | 722.00 |
| 0.10 | 123.00 | 135.00 | 143.0 | 154.0 | 161.00 |
| 0.30 | 42.20 | 46.60 | 49.7 | 54.3 | 56.80 |
| 1.00 | 13.50 | 15.00 | 16.2 | 17.9 | 18.80 |
| 10.00 | 2.00 | 2.30 | 2.6 | 2.9.0 | 3.00 |
| 20.00 | 1.34 | 1.50 | 1.7 | 2.0 | 2.00 |
| 100.00 | 0.60 | 0.74 | 1.0 | 1.1 | 1.10 |

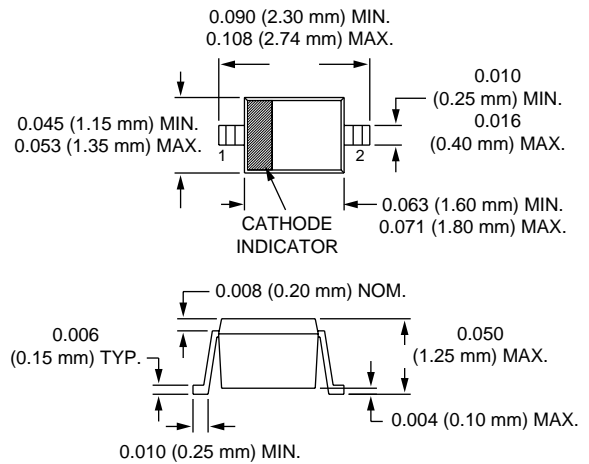
SOT-23



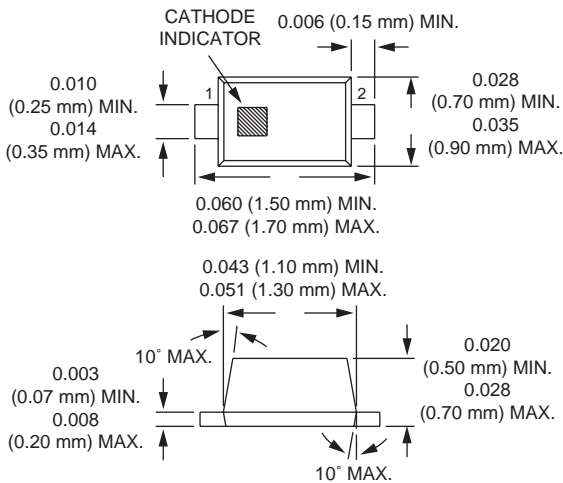
SC-70



SOD-323



SC-79



SOT-5

