

# Switch and Attenuator Plastic Packaged PIN Diodes



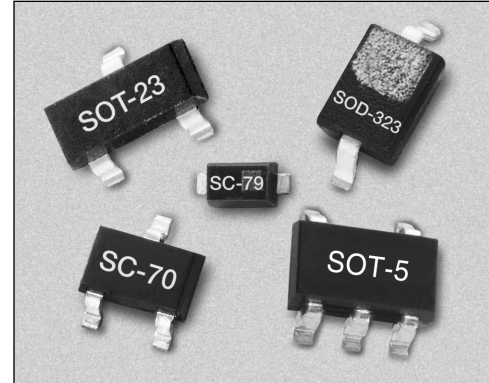
## SMP1302 Series

### 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  $\Omega$ ) commonly used in TV distribution and cellular base station applications. The nominal 50  $\mu\text{m}$  I region width combined with a maximum resistance of 3  $\Omega$  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

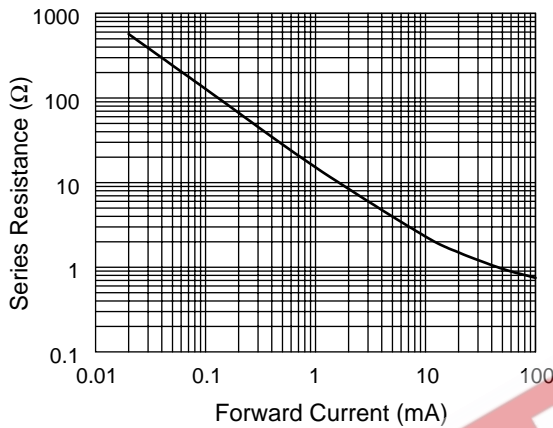
Single	Common Anode	Common Cathode	Series Pair	Single	PI	Single
Marking: PF1	Marking: PF9	Marking: PF3	Marking: PF2		Marking: PFM	
SOT-23	SOT-23	SOT-23	SOT-23	SOD-323	SOT-5	SC-79
♦ SMP1302-001	♦ SMP1302-003	♦ SMP1302-004	♦ SMP1302-005	♦ SMP1302-011	♦ SMP1302-027	♦ SMP1302-079
$L_S = 1.5 \text{ nH}$	$L_S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

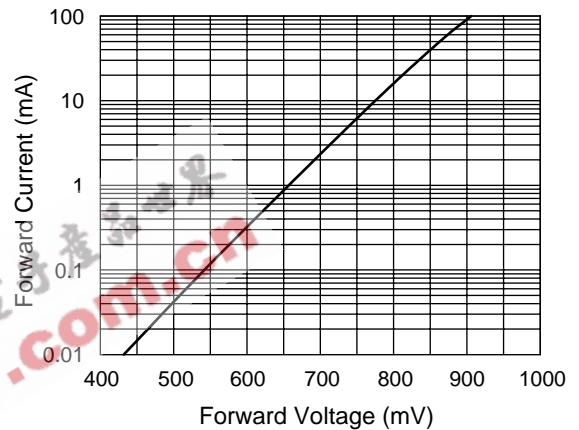
### Electrical Specifications at 25°C

Parameter	Condition	Typ.	Max.	Unit
Reverse Current ( $I_R$ )	$V_R = 200\text{ V}$		10	$\mu\text{A}$
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	$\Omega$
Resistance ( $R_S$ )	$F = 100\text{ MHz}, I = 10\text{ mA}$		3.0	$\Omega$
Resistance ( $R_S$ )	$F = 100\text{ MHz}, I = 100\text{ mA}$		1.5	$\Omega$
Forward Voltage ( $V_F$ )	$I_F = 10\text{ mA}$	0.8		V
Carrier Lifetime ( $\tau_I$ )	$I_F = 10\text{ mA}$	0.7		$\mu\text{S}$
I Region Width		50		$\mu\text{m}$

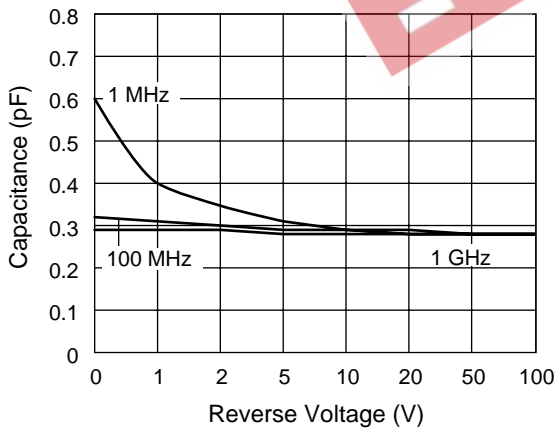
### Typical Performance Data



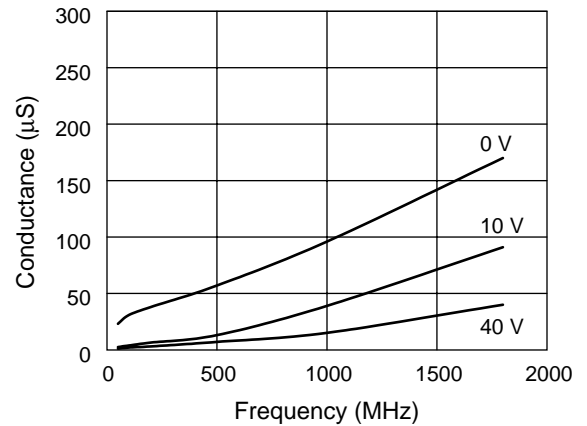
Series Resistance vs. Current @ 100 MHz



DC Characteristic



Capacitance vs. Reverse Voltage

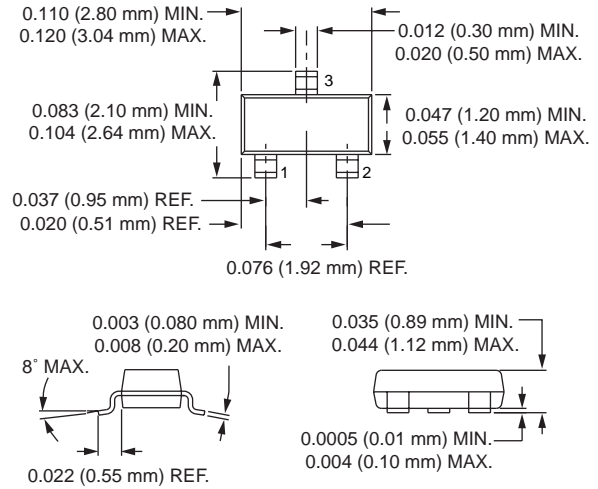


Conductance vs. Frequency and Reverse Voltage

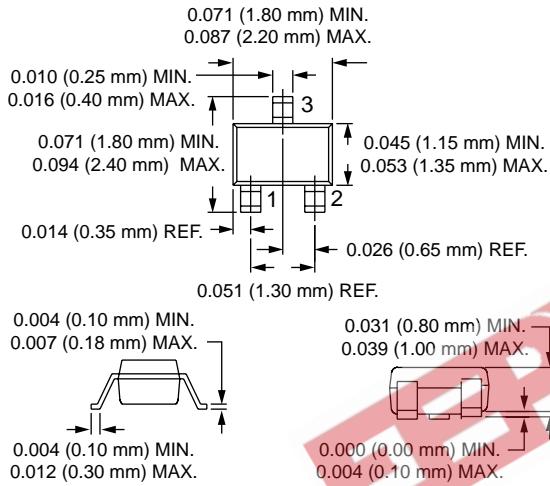
Resistance vs. Temperature @ 100 MHz

I <sub>F</sub> (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

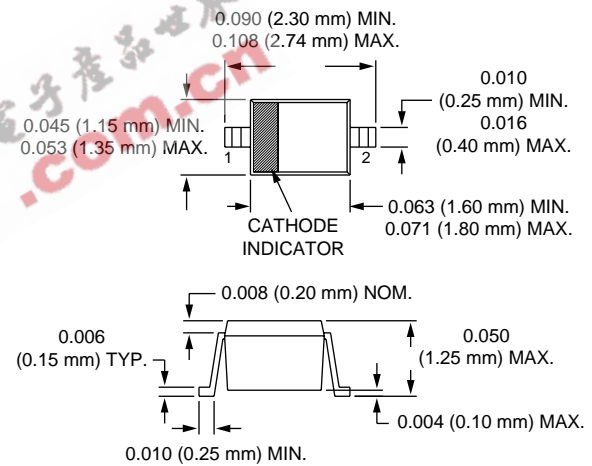
SOT-23



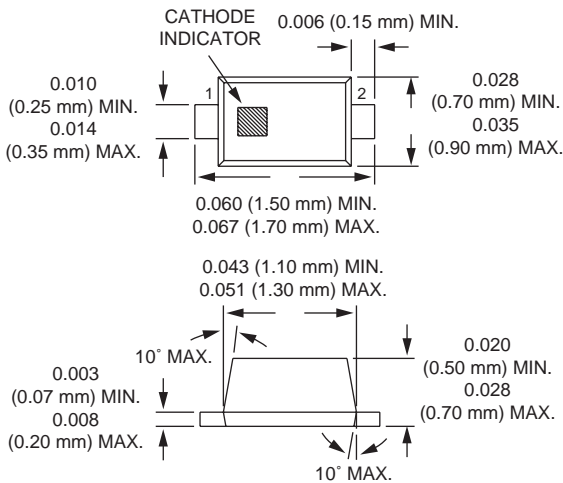
SC-70



SOD-323



SC-79



SOT-5

