

HSMP-3822

Low resistance PIN switch diode

Description



Lifecycle status: **Active**



Features

The HSMP-382x family of low resistance PIN diodes are optimized for applications where Ultra-low resistance is required. $C_t=0.8\text{pF}$, $R_s@10\text{mA}=0.6\text{Ohms}$, $\text{Tau}=70\text{nSec}$

Data Sheet

Description/Applications

The HSMP-382x series is optimized for switching applications where ultra-low resistance is required. The HSMP-482x diode is ideal for limiting and low inductance switching applications up to 1.5 GHz.

A SPICE model is not available for PIN diodes as SPICE does not provide for a key PIN diode characteristic, carrier lifetime.

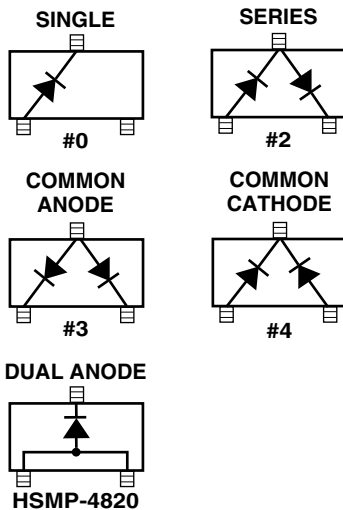
Features

- Diodes Optimized for:
Low Current Switching
Low Distortion Attenuating
- Power Limiting /Circuit Protection
- Surface Mount SOT-23 and SOT-323 Packages
Single and Dual Versions
Tape and Reel Options Available
- Low Failure in Time (FIT) Rate^[1]
- Lead-free

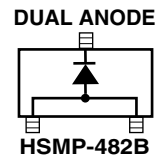
Note:

1. For more information see the Surface Mount PIN Reliability Data Sheet.

Package Lead Code Identification, SOT-23 (Top View)



Package Lead Code Identification, SOT-323 (Top View)



Absolute Maximum Ratings^[1] $T_c = +25^\circ\text{C}$

Symbol	Parameter	Unit	SOT-23	SOT-323
I_f	Forward Current (1 μs Pulse)	Amp	1	1
P_{IV}	Peak Inverse Voltage	V	50	50
T_j	Junction Temperature	$^\circ\text{C}$	150	150
T_{stg}	Storage Temperature	$^\circ\text{C}$	-65 to 150	-65 to 150
θ_{jc}	Thermal Resistance ^[2]	$^\circ\text{C}/\text{W}$	500	150

Notes:

- Operation in excess of any one of these conditions may result in permanent damage to the device.
- $T_c = +25^\circ\text{C}$, where T_c is defined to be the temperature at the package pins where contact is made to the circuit board.

Electrical Specifications $T_c = 25^\circ\text{C}$

Part Number HSMP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage V_{BR} (V)	Maximum Series Resistance R_s (Ω)	Maximum Total Capacitance C_T (pF)
3820	F0	0	Single	50	0.6	0.8
3822	F2	2	Series			
3823	F3	3	Common Anode			
3824	F4	4	Common Cathode			
Test Conditions				$V_R = V_{BR}$ Measure $I_R \leq 10 \mu\text{A}$	$f = 100 \text{ MHz}$ $I_F = 10 \text{ mA}$	$f = 1 \text{ MHz}$ $V_R = 20 \text{ V}$

High Frequency (Low Inductance, 500 MHz – 3 GHz) PIN Diodes

Part Number HSMP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage V_{BR} (V)	Maximum Series Resistance R_s (Ω)	Typical Total Capacitance C_T (pF)	Maximum Total Capacitance C_T (pF)	Typical Total Inductance L_T (nH)
4820	FA	A	Dual Anode	50	0.6	0.75	1.0	1.0
482B	FA	A	Dual Anode					
Test Conditions				$V_R = V_{BR}$ Measure $I_R \leq 10 \mu\text{A}$	$I_F = 10 \text{ mA}$	$f = 1 \text{ MHz}$ $V_R = 20 \text{ V}$	$f = 1 \text{ MHz}$ $V_R = 0 \text{ V}$	$f = 500 \text{ MHz} - 3 \text{ GHz}$

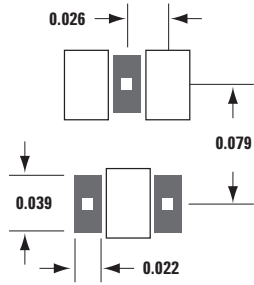
Typical Parameters at $T_c = 25^\circ\text{C}$

Part Number HSMP-	Series Resistance R_s (Ω)	Carrier Lifetime τ (ns)	Reverse Recovery Time T_{rr} (ns)	Total Capacitance C_T (pF)
382x	1.5	70	7	0.60 @ 20 V
Test Conditions		$f = 100 \text{ MHz}$ $I_F = 10 \text{ mA}$	$I_F = 10 \text{ mA}$	$V_R = 10 \text{ V}$ $I_F = 20 \text{ mA}$ 90% Recovery

Assembly Information

SOT-323 PCB Footprint

A recommended PCB pad layout for the miniature SOT-323 (SC-70) package is shown in Figure 19 (dimensions are in inches). This layout provides ample allowance for package placement by automated assembly equipment without adding parasitics that could impair the performance.



Dimensions in inches

Figure 19. Recommended PCB Pad Layout for Avago's SC70 3L/SOT-323 Products.

SOT-23 PCB Footprint

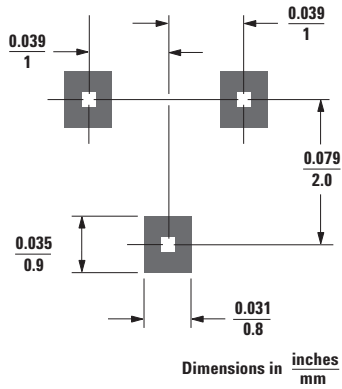
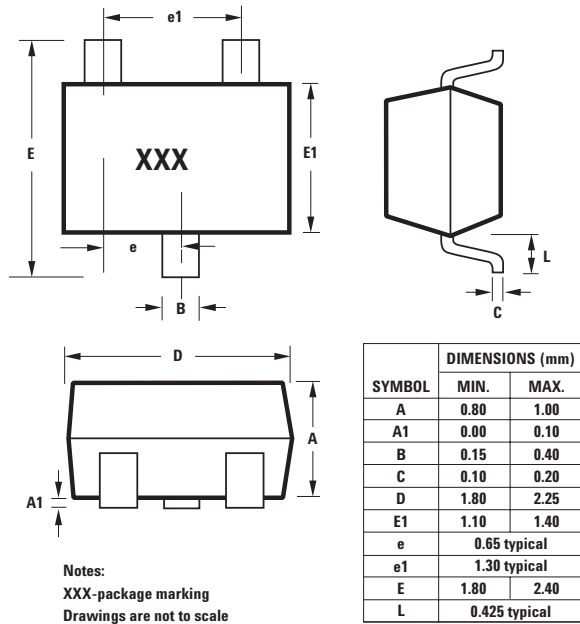


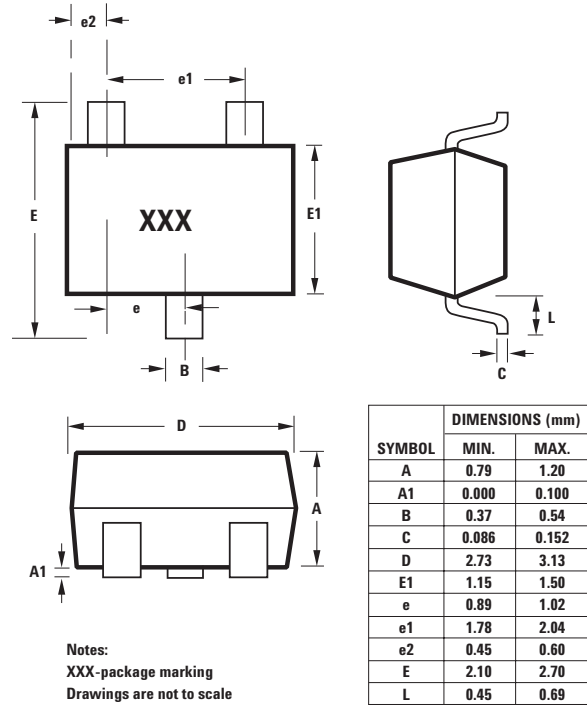
Figure 20. Recommended PCB Pad Layout for Avago's SOT-23 Products.

Package Dimensions

Outline SOT-323 (SC-70)



Outline 23 (SOT-23)

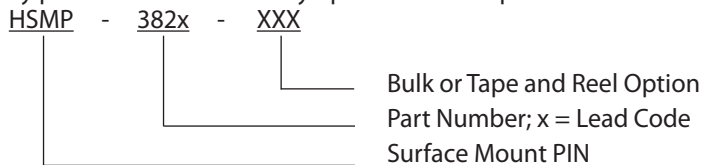


Package Characteristics

Lead Material Copper (SOT-323); Alloy 42 (SOT-23)
 Lead Finish Tin 100% (Lead-free option)
 Maximum Soldering Temperature 260°C for 5 seconds
 Minimum Lead Strength..... 2 pounds pull
 Typical Package Inductance 2 nH
 Typical Package Capacitance 0.08 pF (opposite leads)

Ordering Information

Specify part number followed by option. For example:



Option Descriptions

- BLKG = Bulk, 100 pcs. per antistatic bag
- TR1G = Tape and Reel, 3000 devices per 7" reel
- TR2G = Tape and Reel, 10,000 devices per 13" reel

Tape and Reeling conforms to Electronic Industries RS-481, "Taping of Surface Mounted Components for Automated Placement."