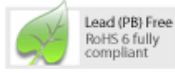


HSMP-3812

Low distortion PIN attenuator diode

Description



Lifecycle status: **Active**



Features

The HSMP-381x family of PIN diodes are the ideal solution for low distortion attenuators.
 $C_t=0.35\text{pF}$, $R_s@100\text{mA}=2.5\text{Ohms}$, $\text{Tau}=1800\text{nSec}$, $F_c=88\text{kHz}$

HSMP-381x, 481x

Surface Mount RF PIN

Low Distortion Attenuator Diodes



Data Sheet

Description/Applications

The HSMP-381x series is specifically designed for low distortion attenuator applications. The HSMP-481x products feature ultra low parasitic inductance in the SOT-23 and SOT-323 packages. They are specifically designed for use at frequencies which are much higher than the upper limit for conventional diodes.

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

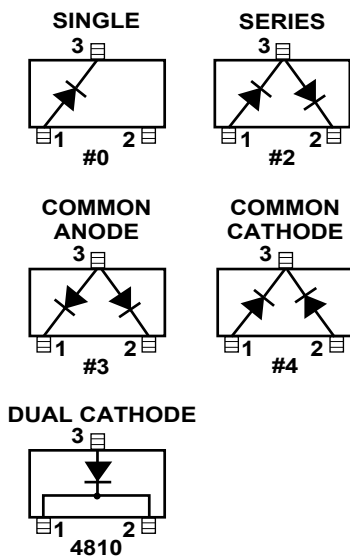
Features

- Diodes Optimized for:
 - Low Distortion Attenuating
 - Microwave Frequency Operation
- Surface Mount Packages
 - Single and Dual Versions
 - Tape and Reel Options Available
- Low Failure in Time (FIT) Rate^[1]

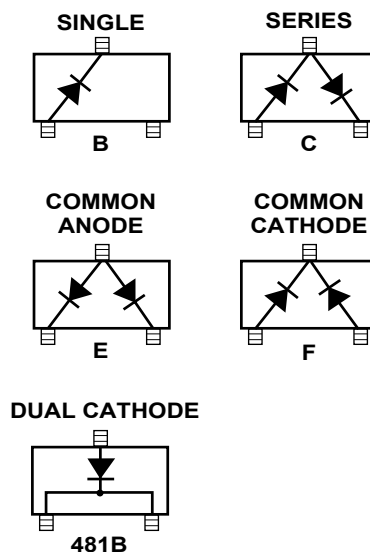
Note:

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	Same as V_{BR}	Same as V_{BR}
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:

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

Electrical Specifications $T_c = +25^\circ\text{C}$ (Each Diode)

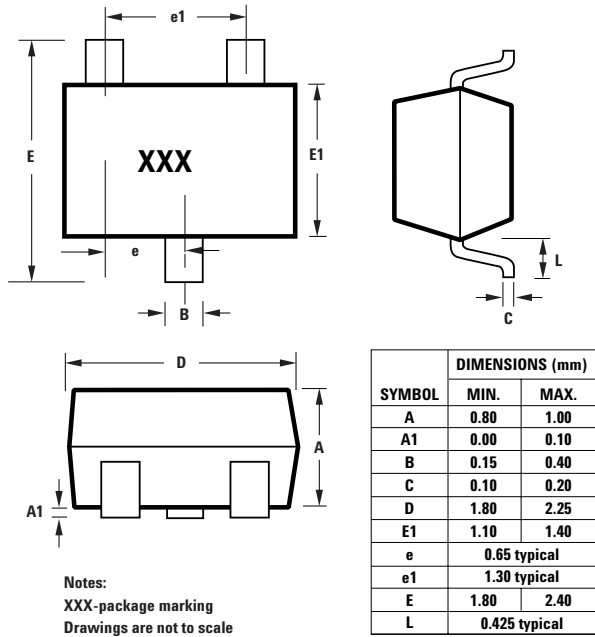
Conventional Diodes

Part Number HSMP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage V_{BR} (V)	Maximum Total Capacitance C_T (pF)	Minimum Resistance at $I_F = 0.01\text{mA}$, R_H (Ω)	Maximum Resistance at $I_F = 20\text{mA}$, R_L (Ω)	Maximum Resistance at $I_F = 100\text{mA}$, R_T (Ω)	Resistance at $I_F = 1\text{mA}$, R_M (Ω)
3810	E0	0	Single	100	0.35	1500	10	3.0	48 to 70
3812	E2	2	Series						
3813	E3	3	Common Anode						
3814	E4	4	Common Cathode						
381B	E0	B	Single						
381C	E2	C	Series						
381E	E3	E	Common Anode						
381F	E4	F	Common Cathode						
Test Conditions				$V_R = V_{BR}$ Measure $I_R \leq 10\mu\text{A}$	$V_R = 50\text{V}$ $f = 1\text{MHz}$	$I_F = 0.01\text{mA}$ $f = 100\text{MHz}$	$I_F = 20\text{mA}$ $f = 100\text{MHz}$	$I_F = 100\text{mA}$ $f = 100\text{MHz}$	$I_F = 1\text{mA}$ $f = 100\text{MHz}$

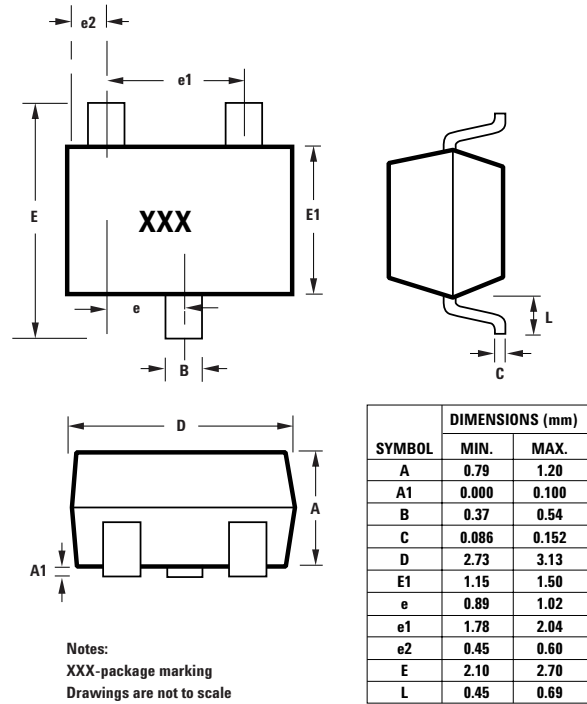
High Frequency (Low Inductance, 500 MHz – 3 GHz) PIN Diodes

Part Number HSMP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage V_{BR} (V)	Maximum Series Resistance R_S (Ω)	Series Resistance $I_F = 1\text{mA}$, R_M (Ω)	Typical Total Capacitance C_T (pF)	Maximum Total Capacitance C_T (pF)	Typical Total Inductance L_T (nH)
4810	EB	B	Dual Cathode	100	3	48 - 70	0.35	0.4	1
481B	EB	B	Dual Cathode						
Test Conditions				$V_R = V_{BR}$ Measure $I_R \leq 10\mu\text{A}$	$I_F = 100\text{mA}$ $f = 100\text{MHz}$	$I_F = 1\text{mA}$ $f = 100\text{MHz}$	$V_R = 50\text{V}$ $f = 1\text{MHz}$	$V_R = 50\text{V}$ $f = 1\text{MHz}$	$f = 500\text{MHz}$ - 3GHz

Package Dimensions
Outline SOT-323 (SC-70)



Outline 23 (SOT-23)

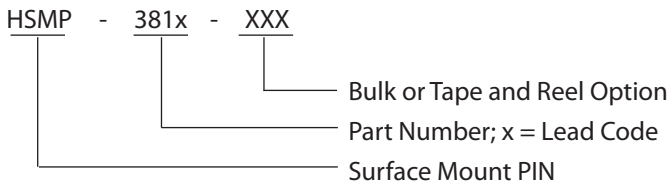


Package Characteristics

- 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."