HSMP-3814

Low distortion PIN attenuator diode

Description

Lead (PB) Free
RoHS 6 fully compliant

Lifecycle status: Active

Features

The HSMP-381x family of PIN diodes are the ideal solution for low distortion attenuators.
Ct=0.35pF, Rs@100mA=2.5Ohms, Tau=1800nSec, Fc=88kHz

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.

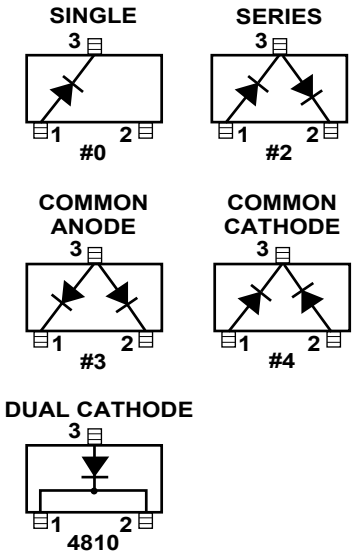
Features

- 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]

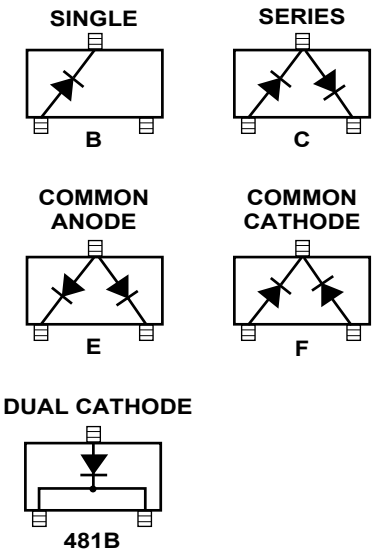
Note:

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] $T_C = +25°C$

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	°C	150	150
T_{stg}	Storage Temperature	°C	-65 to 150	-65 to 150
θ_{jc}	Thermal Resistance [2]	°C/W	500	150

Notes:
1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. $T_C = +25°C$, where T_C is defined to be the temperature at the package pins where contact is made to the circuit board.

Electrical Specifications $T_C = +25°C$ (Each Diode)

Conventional Diodes

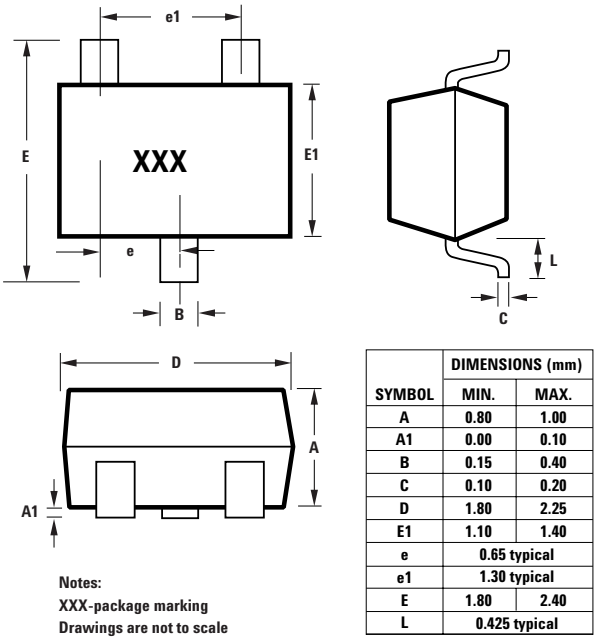
Part Number HSMP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage V_{BR} (V)	Maximum Total Capacitance C_T (pF)	Minimum Resistance at $I_F = 0.01mA$, RH (Ω)	Maximum Resistance at $I_F = 20mA$, R_L (Ω)	Maximum Resistance at $I_F = 100mA$, RT (Ω)	Resistance at $I_F = 1mA$, R_M (Ω)
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 $I_R \leq 10uA$	$V_R = 50V$ f = 1MHz	$I_F = 0.01mA$ f = 100MHz	$I_F = 20mA$ f = 100MHz	$I_F = 100mA$ f = 100MHz	$I_F = 1mA$ f = 100MHz

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 $I_F = 1mA$, 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 $I_R \leq 10\mu A$	$I_F = 100mA$ f = 100MHz	$I_F = 1mA$ f = 100MHz	$V_R = 50V$ f = 1MHz	$V_R = 50V$ f = 1MHz	f = 500MHz - 3GHz

Package Dimensions

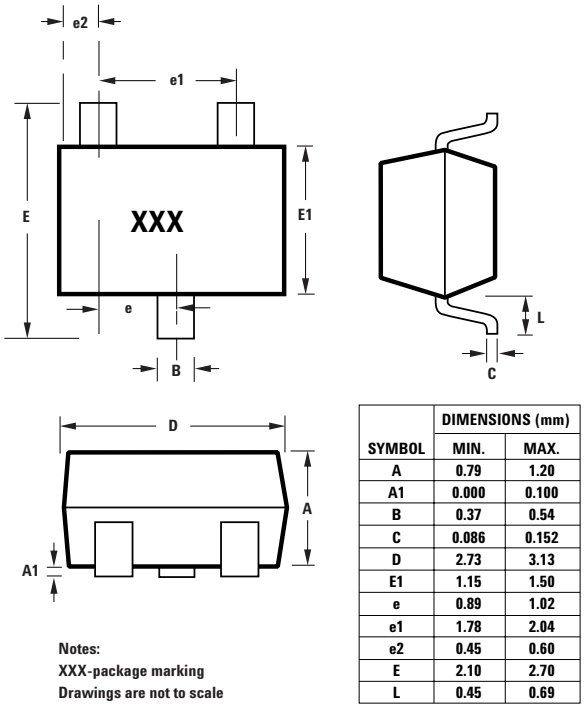
Outline SOT-323 (SC-70)



SYMBOL	DIMENSIONS (mm) MIN.	MAX.
A	0.80	1.00
A1	0.00	0.10
B	0.15	0.40
C	0.10	0.20
D	1.80	2.25
E1	1.10	1.40
e	0.65 typical	
e1	1.30 typical	
E	1.80	2.40
L	0.425 typical	

Notes:
XXX-package marking
Drawings are not to scale

Outline 23 (SOT-23)



SYMBOL	DIMENSIONS (mm) MIN.	MAX.
A	0.79	1.20
A1	0.000	0.100
B	0.37	0.54
C	0.086	0.152
D	2.73	3.13
E1	1.15	1.50
e	0.89	1.02
e1	1.78	2.04
e2	0.45	0.60
E	2.10	2.70
L	0.45	0.69

Notes:
XXX-package marking
Drawings are not to scale

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:

HSMP - 381x - XXX

- XXX: Bulk or Tape and Reel Option
- 381x: Part Number; x = Lead Code
- HSMP: Surface Mount PIN

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."