



Surface Mount RF PIN Attenuator Diodes

Technical Data

HSMP-380x Series

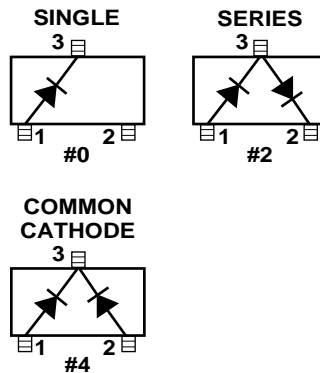
Features

- **Diodes Optimized for Low Distortion Attenuating**
- **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)



Description/Applications

The HSMP-380x series is specifically designed for low distortion attenuator applications while drawing slightly less current than the ultra-low distortion HSMP-381x series.

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

Note: The HSMP-381x series is recommended for new designs.

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

Symbol	Parameter	Units	Absolute Maximum
I_f	Forward Current (1 ms Pulse)	Amp	1
P_t	Total Device Dissipation	mW ^[2]	250
P_{iv}	Peak Inverse Voltage	—	Same as V_{BR}
T_j	Junction Temperature	$^\circ\text{C}$	150
T_{STG}	Storage Temperature	$^\circ\text{C}$	-65 to 150

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to this device.
2. CW Power Dissipation at $T_{LEAD} = 25^\circ\text{C}$. Derate to zero at maximum rated temperature.

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

Part Number HSMP-	Package Marking Code ^[1]	Lead Code	Configuration	Nearest Equivalent Axial Lead Part No. 5082-	Minimum Breakdown Voltage V_{BR} (V)	Maximum Series Resistance R_S (Ω)	Maximum Total Capacitance C_T (pF)	Minimum High Resistance R_H (Ω)	Maximum Low Resistance R_L (Ω)
3800	D0	0	Single	3080	100	2.0	0.37	1000	8
3802	D2	2	Series						
3804	D4	4	Common Cathode						
Test Conditions					$V_R = V_{BR}$ Measure $I_R \leq 10 \mu\text{A}$	$I_F = 100 \text{ mA}$ $f = 100 \text{ MHz}$	$V_R = 50 \text{ V}$ $f = 1 \text{ MHz}$	$I_F = 0.01 \text{ mA}$ $f = 100 \text{ MHz}$	$I_F = 20 \text{ mA}$ $f = 100 \text{ MHz}$

Note:

1. Package marking code is white.

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

Part Number HSMP-	Series Resistance R_S (Ω)	Carrier Lifetime τ (ns)	Reverse Recovery Time T_{rr} (ns)	Total Capacitance C_T (pF)
380x	55	1800	500	0.32 @ 50 V
Test Conditions	$I_F = 1 \text{ mA}$ $f = 100 \text{ MHz}$	$I_F = 50 \text{ mA}$ $I_R = 250 \text{ mA}$	$V_R = 10 \text{ V}$ $I_F = 20 \text{ mA}$ 90% Recovery	

Typical Parameters at $T_A = 25^\circ\text{C}$ (unless otherwise noted), Single Diode

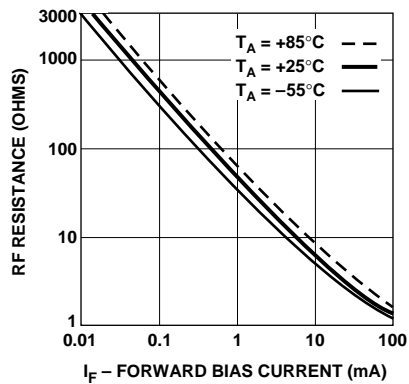


Figure 1. RF Resistance vs. Forward Bias Current.

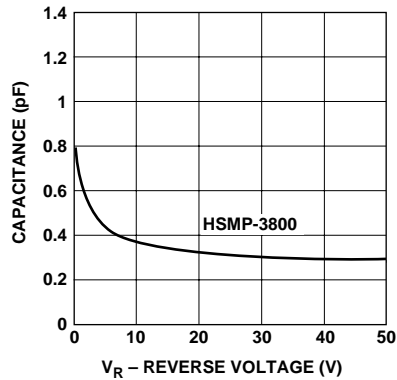


Figure 2. Capacitance vs. Reverse Voltage.

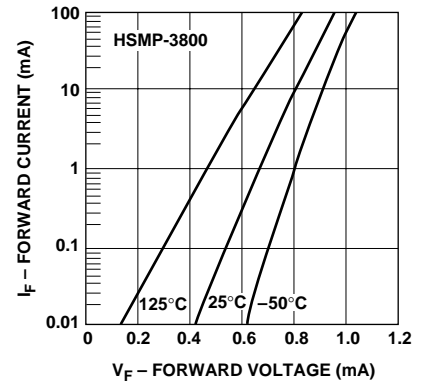
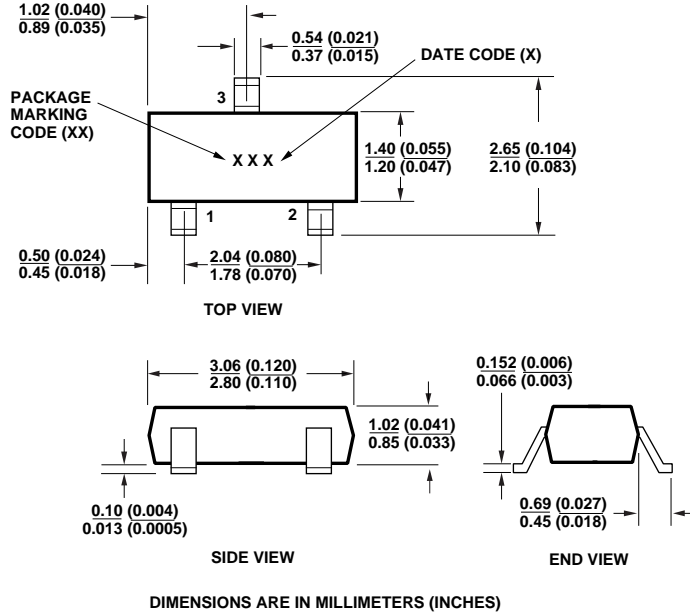
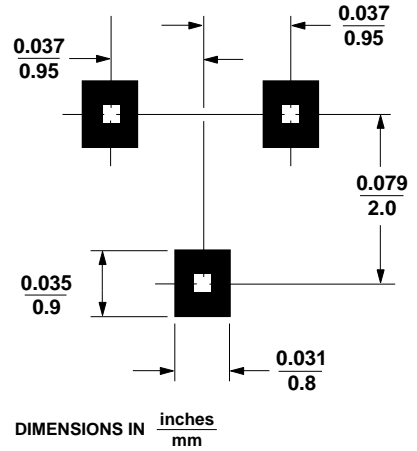


Figure 3. Forward Current vs. Forward Voltage.

**Package Dimensions
Outline 23 (SOT-23)**



**PC Board Footprints
SOT-23**



Package Characteristics

- Lead Material Alloy 42
- Lead Finish Tin-Lead 85-15%
- 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)



Profile Option Descriptions

- BLK = Bulk
 - TR1 = 3K pc. Tape and Reel, Device Orientation; See Figures 4 and 5
 - TR2 = 10K pc. Tape and Reel, Device Orientation; See Figures 4 and 5
- Tape and Reeling conforms to Electronic Industries RS-481, "Taping of Surface Mounted Components for Automated Placement."

Ordering Information

Specify part number followed by option under. For example:

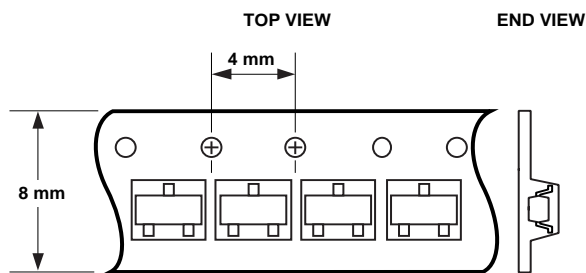
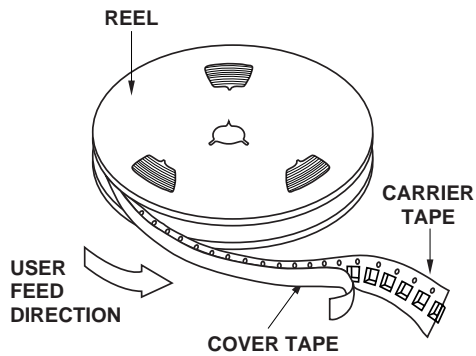
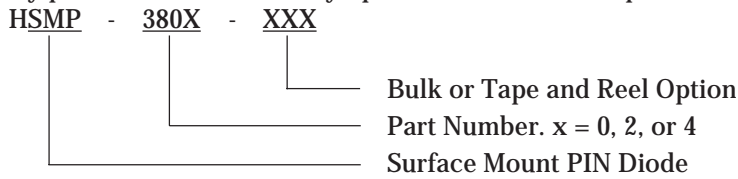


Figure 4. Options -TR1, -TR2 for SOT-23 Packages.

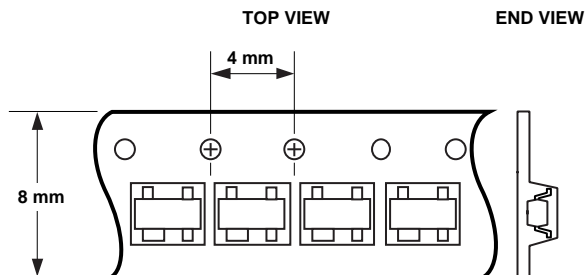


Figure 5. Options -TR1, -TR2 for SOT-143 Packages.