HSMP-381Z
Low Distortion Attenuator RF PIN Diodes
In Surface Mount SOD-323 Package

Data Sheet

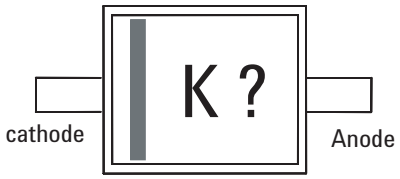
Description/Applications

Avago Technologies' HSMP-381Z is designed for low distortion attenuator applications. It is housed in a low cost, industrial standard surface mount package - SOD-323. This package offers customers who already use them in SOT-23 and SOT-323 packages, a logical transition to a smaller package outline to accommodate end product design with limited board space.

The HSMP-381Z has low distortion and high IP3 characteristics. The device can operate in microwave frequencies and suitable to be used as attenuating circuits in Infrastructure and CATV applications.

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

Package Marking and Pin Connections



Note:
Package marking provides orientation and identification

"K" = Device Code

"?" = Month code indicates the month of manufacture

Features

- 2 Leads Surface Mount Package
- Low Distortion Attenuating
- Microwave Frequency Operation
- Tape and Reel Options Available
- Low Failure in Time (FIT) Rate
- MSL1 & Lead Free

Table 1. Absolute Maximum Ratings [1] at Tc = +25°C

Symbol	Parameter	Unit	Max Rating
I_f	Forward Current (1 µs Pulse)	Amp	1
P_{IV}	Peak Inverse Voltage	V	100
T_j	Junction Temperature	°C	150
T_{stg}	Storage Temperature	°C	-60 to 150
θ_{jb}	Thermal Resistance [2]	°C/W	135

Notes:
1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. Thermal Resistance is measured from junction to board using IR method.

Table 2. Electrical Specifications at Tc = +25°C

	Minimum Breakdown Voltage V_{BR} (V)	Maximum Total Capacitance C_T (pF)	Minimum Resistance at I_F = 0.01mA, R_H (Ω)	Maximum Resistance at I_F = 20mA, R_L (Ω)	Maximum Resistance at I_F = 100mA, R_T (Ω)	Resistance at I_F = 1mA, R_M (Ω)
	100	0.35	1500	10	3.0	48 to 70
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	IF = 1mA f = 100MHz

Note : Rs parameters are tested under AQL 1.0

Table 3. Typical Parameters at Tc = +25°C

	Carrier Lifetime τ (ns)	Reverse Recovery Time T_{rr} (ns)	Total Capacitance C_T (pF)
	1500	300	0.27
Test Conditions	I_F = 50mA I_R = 250mA	V_R = 10V I_F = 20mA 90% Recovery	V_R = 50V f = 1MHz

Typical Performance Curves at Tc = +25°C

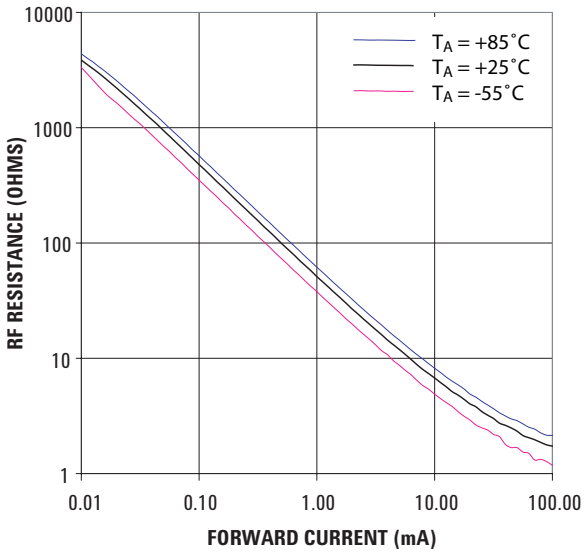


Figure 1. RF Resistance vs. Forward Bias Current

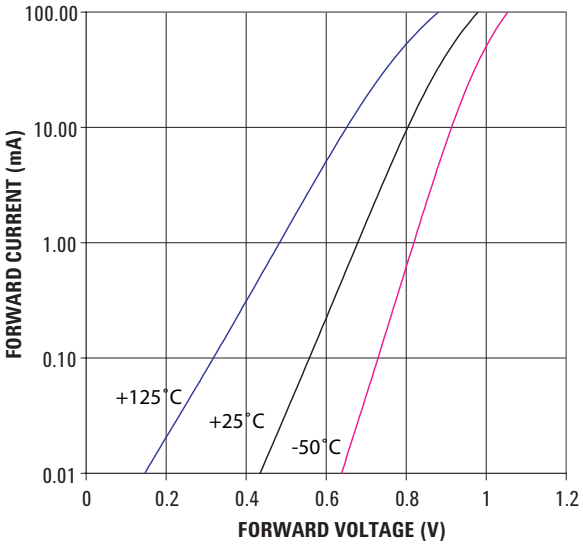


Figure 2. Forward Current vs. Forward Voltage

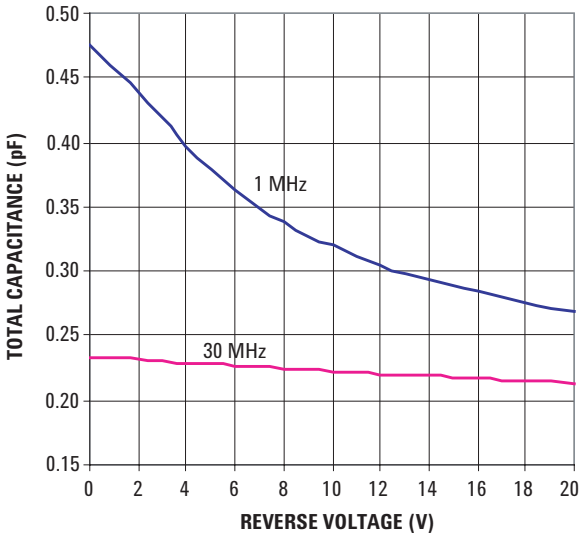


Figure 3. RF Capacitance vs. Reverse Bias

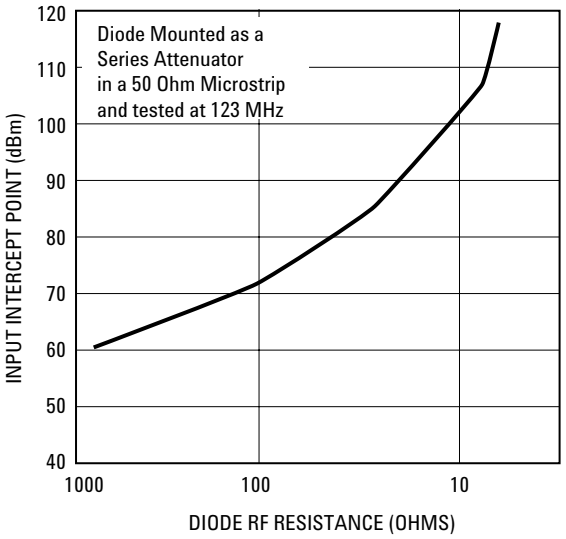
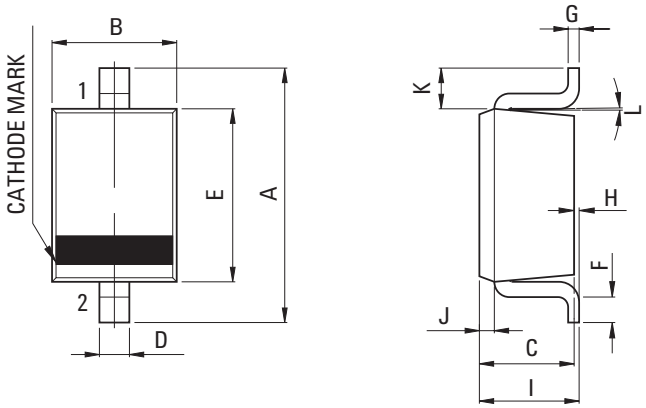


Figure 4. 2nd Harmonic Input Intercept Point vs. Diode RF Resistance

Note:

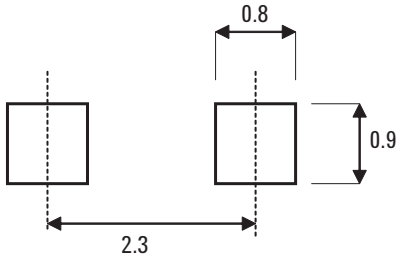
3. Typical values were derived using limited samples during initial product characterization and may not be representative of the overall distribution.

Package Outline and Dimension



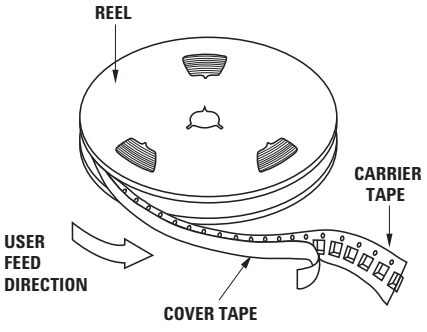
DIM	MILLIMETERS
A	2.50±0.2
B	1.25±0.05
C	0.90±0.05
D	0.30+0.06/-0.04
E	1.70±0.05
F	MIN 0.17
G	0.126±0.03
H	0~0.1
I	1.0 MAX
J	0.15±0.05
K	0.4
L	2°+4/-2
M4	~6°

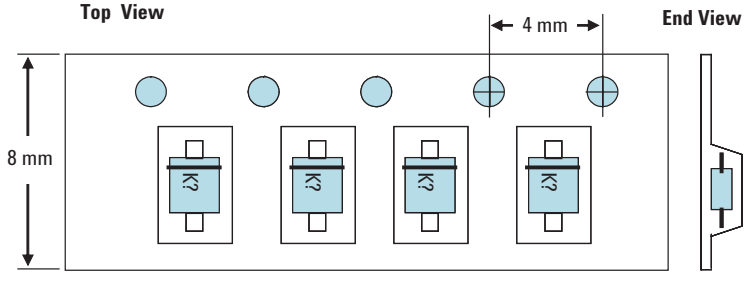
PCB Footprint



Dimension in mm

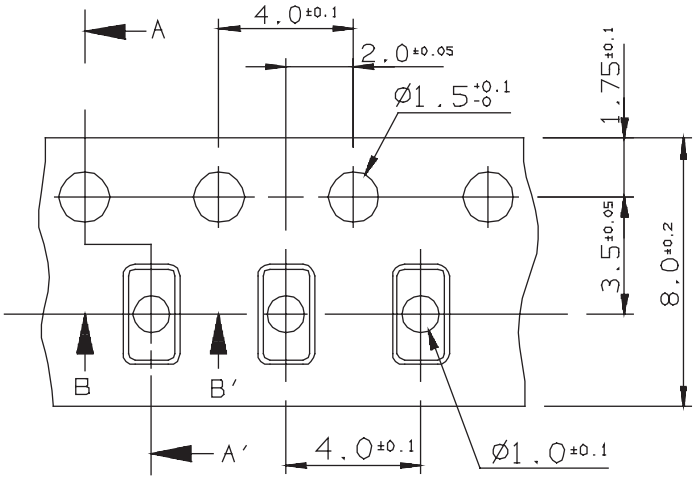
Device Orientation

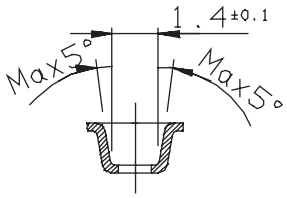




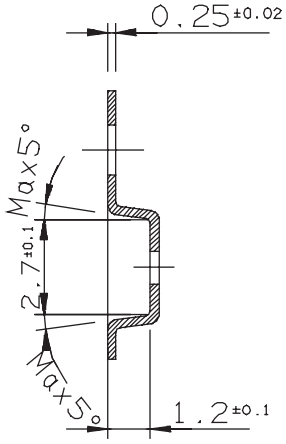
Note: "K" represents package marking code
"?" represents date code

Tape Dimensions





B - B′ SECTION



A - A′ SECTION

Specification < Unit: mm >

A. hole pitch : 50 Pitch Tolerance : 200 ± 0.3

Part Number Ordering Information

Part number	No. of Units	Container
HSMP-381Z-BLKG	100	Anti-static bag
HSMP-381Z-TR1G	3000	7″ reel

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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AV02-0406 - July 31, 2007