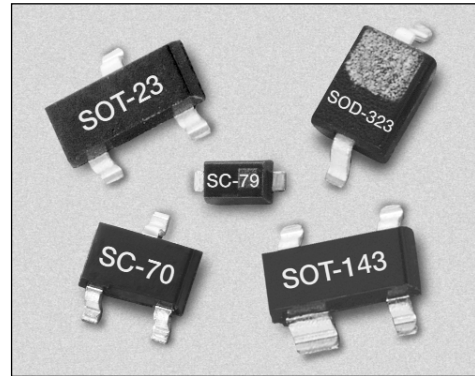


# Surface Mount Mixer and Detector Schottky Diodes



## Features

- Tight Parameter Distribution
- Available as Singles and Pairs
- 100% DC Tested
- Designed for High Volume Commercial Applications
- Available in Tape and Reel Packaging



## Description

These low cost, surface mountable plastic packaged silicon mixer Schottky diodes are designed for RF and microwave mixers and detectors. They include low barrier diodes and zero bias detectors, combining Alpha's advanced semiconductor technology with low cost packaging techniques. All diodes are 100% DC tested and deliver tight parameter distribution, minimizing performance variability. They are available in SC-70, SC-79, SOD-323, SOT-23 and SOT-143 packages. Wiring configurations include singles, common cathode, series pairs and unconnected pairs. Applications include low noise receivers used in high sensitivity ID tags, wireless systems, radio designs and may be used at frequencies to 10 GHz. SPICE model parameters are included as a design tool.

## Absolute Maximum Ratings

Characteristic	Value
Reverse Voltage ( $V_R$ )	Rated $V_B$
Forward Current - Steady State ( $I_F$ )	50 mA
Power Dissipation ( $P_D$ )	75 mW
Storage Temperature ( $T_{ST}$ )	-65°C to +150°C
Operating Temperature ( $T_{OP}$ )	-65°C to +150°C
Junction Temperature ( $T_J$ )	150°C
Soldering Temperature	260°C for 5 Seconds

Single	Single	Single	Common Cathode	Series Pair	Reverse Series Pair	Unconnected Pair	Reverse Unconnected Pair
SC-79	SOD-323	SOT-23		SOT-23	SOT-23	SOT-143	SOT-143
	♦ SMS1546-011	♦ SMS1546-001		♦ SMS1546-005		♦ SMS1546-015	
	Cathode Mark	Marking: SG1		Marking: SG2		Marking: SG7	
♦ SMS7621-079	♦ SMS7621-011	♦ SMS7621-001		♦ SMS7621-005	♦ SMS7621-006	♦ SMS7621-015	
Cathode Mark	Cathode Mark	Marking: SH1		Marking: SH2	Marking: SH8	Marking: SH7	
♦ SMS7630-079	♦ SMS7630-011	♦ SMS7630-001		♦ SMS7630-005	♦ SMS7630-006	$L_S = 1.5$ nH	♦ SMS7630-020
Anode Mark	Cathode Mark	Marking: SD1		Marking: SD2	Marking: SD8		Marking: SD0
$L_S = 0.7$ nH	$L_S = 1.5$ nH	$L_S = 1.5$ nH		$L_S = 1.5$ nH	$L_S = 1.5$ nH		$L_S = 1.5$ nH
			SC-70	SC-70	SC-70		
			♦ SMS7621-074	♦ SMS7621-075	♦ SMS7621-076		
			Marking: SH3	Marking: SH2	Marking: SH8		
				♦ SMS7630-075	♦ SMS7630-076		
				Marking: SD2	Marking: SD8		
			$L_S = 1.4$ nH	$L_S = 1.4$ nH	$L_S = 1.4$ nH		

♦ Available through distribution.

## Electrical Specifications at 25°C (Per Junction)

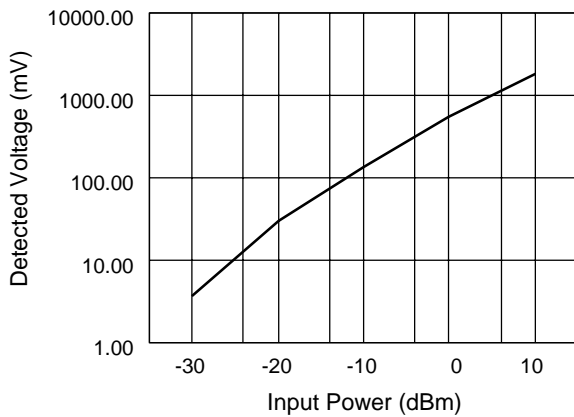
### Low Barrier Mixer and Detectors

Part Number	Barrier	$V_B @ 10 \mu A (V)$	$C_T @ 0 V (pF)$	$V_F @ 1 mA (mV)$	Pair Configuration (b) $V_F @ 1 mA (mV)$	$R_T^* @ 10 mA (\Omega)$
		Min.	Typ.		Max.	Max.
SMS1546 Series	Low	2	0.50	200–270	10	8
SMS7621 Series	Low	2	0.25	260–320	10	18

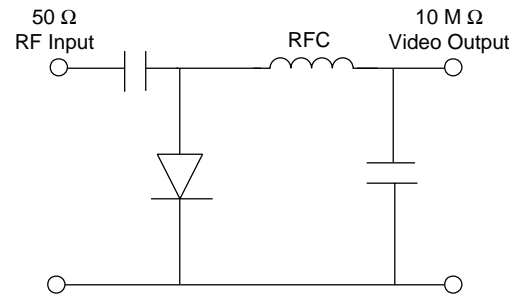
\* $R_T$  is the slope resistance.

### Zero Bias Detectors

Part Number	$V_B @ 100 \mu A (V)$	$C_T @ 0.15 V (pF)$	$V_F @ 0.1 mA (mV)$	$V_F @ 1 mA (mV)$	Pair Configuration (b) $V_F @ 1 mA (mV)$	$R_V (\Omega)$
	Min.	Typ.			Max.	Typ.
SMS7630 Series	1.0	0.30	60–120	135–240	10	5000



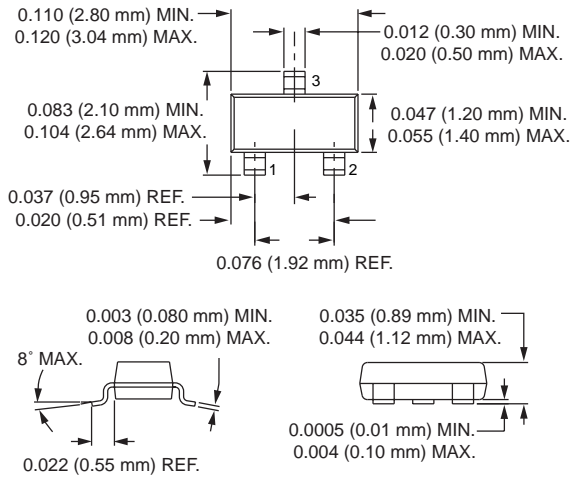
**Typical Detector Characteristics @ 1.8 GHz**



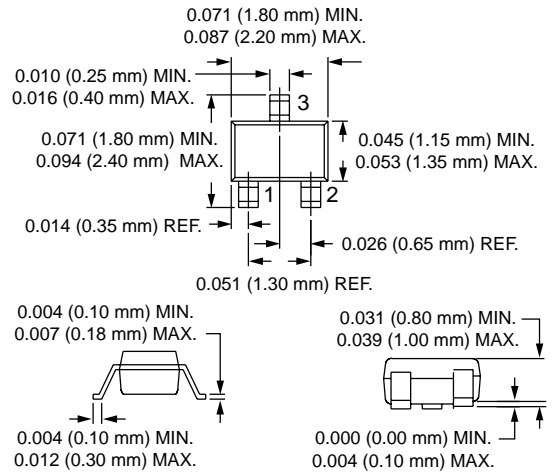
## SPICE Model Parameters (Per Junction)

Parameter	Unit	SMS1546	SMS7621	SMS7630
IS	A	3E-7	4E-8	5E-06
$R_S$	$\Omega$	4	12	20
N		1.04	1.05	1.05
TT	S	1E-11	1E-11	1E-11
$C_{J0}$	pF	0.38	0.10	0.14
M		0.36	0.35	0.40
$E_G$	eV	0.69	0.69	0.69
XTI		2	2	2
$F_C$		0.5	0.5	0.5
$B_V$	V	3	3	2
$I_{BV}$	A	1E-5	1E-5	1E-4
$V_J$	V	0.51	0.51	0.34

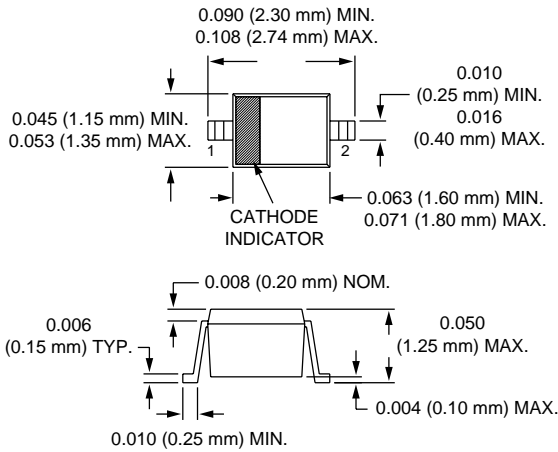
**SOT-23**



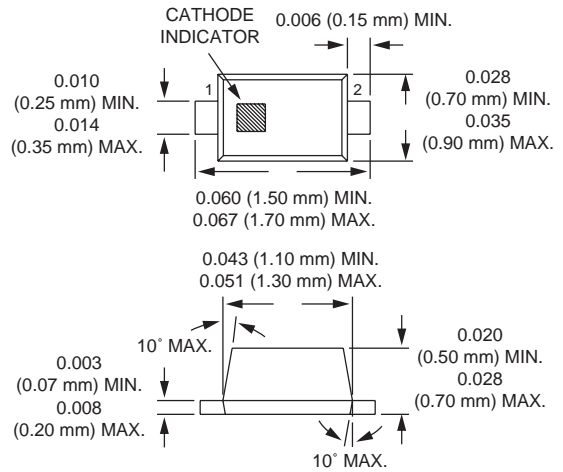
**SC-70**



**SOD-323**



**SC-79**



**SOT-143**

