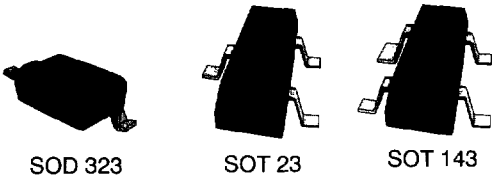
Alpha

Schottky Mixer and Detector Diodes in Surface Mount Plastic Packages

SMS Series

Features

- For High Volume Commercial Applications
- Small Surface Mount Packages
- Low Conversion Loss
- Tight Parameter Distribution
- High Signal Sensitivity
- Optimized Series Resistance
- Tape and Reel for Pick and Place
- 100% DC Tested
- Targeted Performance at ISM Bands (925, 2450 & 5840 MHz)
- ISM Bands



SOD 323 SOT 23 SOT 143

Maximum Ratings

Tj:	150°C
Top:	–20/+100°C
Tstg:	–55/+150°C
I_{max}:	50 – 100 mA
PIV:	Rated V_B
Power Dissipation:	75 mW
Package Material Leads:	Alloy 42 with Sn/Pb Solderplate
Soldering Temperature:	Up to 260°C for 5s
C_{pkg}:	0.12 pF max, typical

Type

- SOT (Low Profile) SOT 23, SOT 143, SOD 323
- Configurations: Series Pair, Singles Unconnected Pair, Quad Ring, Quad Crossover

Description

Alpha's surface mount technology and high frequency capabilities have been merged to provide designers with low cost solutions for mixer and detector circuits.

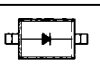
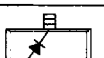
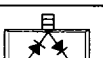
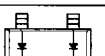
Alpha features a wide variety of configurations to address all mixer and detector designs.

In addition to standard high voltage switching diodes, Alpha has manufactured a complete series of low V_f, low capacitance SOTs that are optimized for narrow band commercial microwave and RF systems.

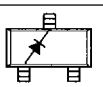
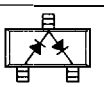
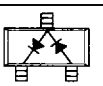
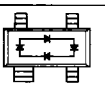
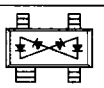
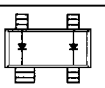
Typical circuit applications include mixers, up converters, down converters, phase detectors, samplers and waveform shaping. Detector circuits take the form of power monitors, high sensitivity ID tags and temperature compensated circuits.

Surface Mount Selection Table

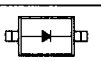
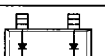
RF Switch and Power Detectors

Typical Parameters										
					SOD 323	SOT 23				SOT 143
Ir @V VR/IR	Vb @ 10 uA Min	Cj @ 0V	Vf @ 1 mA	Vf @ 10 mA	Single	Single	Series	Common Anode	Common Cathode	Unconnected Pair
1V<100n	8V	0.5–0.9 pF	280–340 mV	450 mV	SMS1530–10	SMS1526–10	SMS1527–10	SMS1528–10	SMS1529–10	SMS3991–10
15<500n	20V	0.7–1.1 pF	310–370 mV	450 mV	SMS1530–30	SMS1526–30	SMS1527–30	SMS1528–30	SMS1529–30	SMS3991–30
50<300n	70V	1.3–1.7 pF	490–550 mV	1000 mV	SMS1530–50	SMS1526–50	SMS1527–50	SMS1528–50	SMS1529–50	SMS3991–50

Biased Mixer & Detector Diodes for ISM Applications

Typical Parameters										
					SOT 23			SOT 143		SOT 143
Barrier	Vb @ 10 uA Min	Cj @ 0V	Vf @ 1 mA	Rt @ 10 mA	Single	Series	Reverse Series	Ring	Crossover Ring	Unconnected Pair
Low	2V	0.3–0.5 pF	200–270 mV	8	SMS1043–00	SMS1046–00		SMS3990–00	SMS3992–00	SMS1538–00
Low	2V	0.07–0.13 pF	260–320 mV	18	SMS3989–00	SMS3988–00	SMS1536–00			
Med	2V	0.3–0.5 pF	310–370 mV	8					SMS3999–00	
High	3V	0.3–0.5 pF	520–580 mV	8					SMS3996–00	

Zero Bias Detectors For RF Identification Tags

Typical Parameters										
						SOD 323	SOT 23			SOT 143
Ir @V	Vb @ 10 uA	Cj @ 0V	Vf @ 1 mA	Vf @ 0.1 mA	Rt @ 10 mA Max	Single	Single	Series	Reverse Series	Unconnected Pair
	1.5	0.25	160–280 mV	0.1=60–120	<40	SMS1532–00	SMS3994–00	SMS3995–00	SMS1537–00	SMS1535–00

Markings

Part Number	Marking	Part Number	Marking
SMS1043–00	SG1	SMS1530–50	–
SMS1046–00	SG2	SMS1532–00	–
SMS1526–10	SA1	SMS1535–00	SD0
SMS1526–30	SB1	SMS1536–00	SH8
SMS1526–50	SC1	SMS1537–00	SD8
SMS1527–10	SA2	SMS3988–00	SH2
SMS1527–30	SB2	SMS3989–00	SH1
SMS1527–50	SC2	SMS3990	SE4
SMS1528–10	SA9	SMS3991–10	SA7
SMS1528–30	SB9	SMS3991–30	SB7
SMS1528–50	SC9	SMS3991–50	SC7
SMS1529–10	SA3	SMS3992	SE5
SMS1529–30	SB3	SMS3994	SD1
SMS1529–50	SC3	SMS3995	SD2
SMS1530–10	–	SMS3996	SK5
SMS1530–30	–	SMS3999	SJ5

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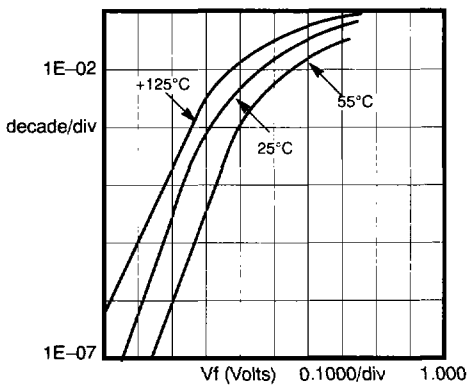
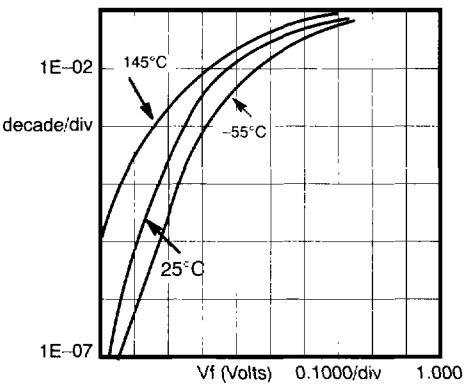
Spice Parameters

Parameter	Unit	SMS1532–00	SMS1530–30	SMS1526–10	SMS1526–50	SMS1043–00	SMS3988–00	SMS3994–00
Is	A	5E–06	1E–11	3E–8	2E–11	3E–7	4E–8	2E–5
Rs	Ohm	30	11	9	11	4	12	22
n		1.05	1.05	1.08	1.08	1.04	1.05	1.1
Td	s	E–11	1E–11	8E–11	8E–11	1E–11	1E–11	1E–11
Cj0	pF	0.14	1.6	0.9	1.6	0.38	0.1	0.15
m		0.4	0.5	0.26	0.4	0.36	0.35	0.23
Eg	eV	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Xti		2	2	2	2	2	2	2
FC		0.5	0.5	0.5	0.5	0.5	5	0.5
Bv	V	2	65	20	65	2.5	3	2
IBV	A	0.0001	1E–05	1E–5	1E–5	1E–5	1E–5	1E–3
V_j		0.34	0.84	0.65	0.84	0.51	0.51	0.34

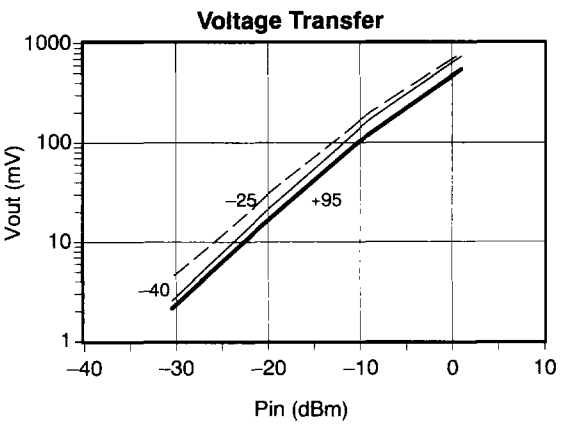
Typical Performance Parameters



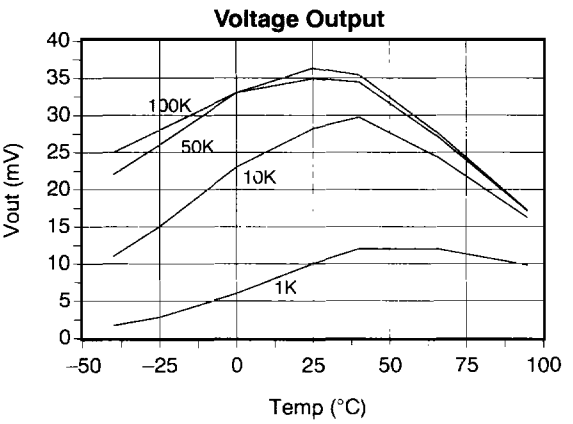
Forward I–V Characteristics as a Function of Temperature for 1530–50



Forward I–V Characteristics as a Function of Temperature for 1532–00



Input Power for 1532–00



Temperature for Various Load Resistors for 1532–00

Packaging

Tape and Reel – 3000 pieces

Bulk Package for less than 1000 pieces

Tape and Reel Information

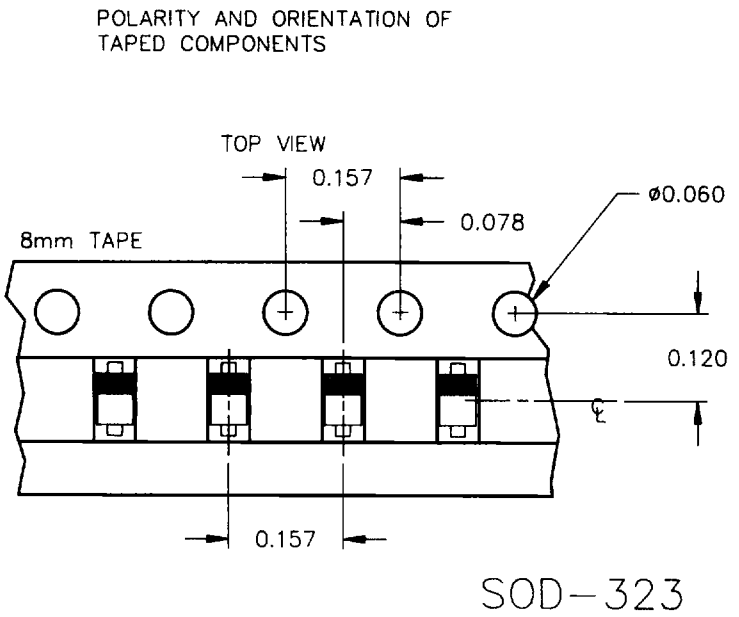


Figure 1. Polarity

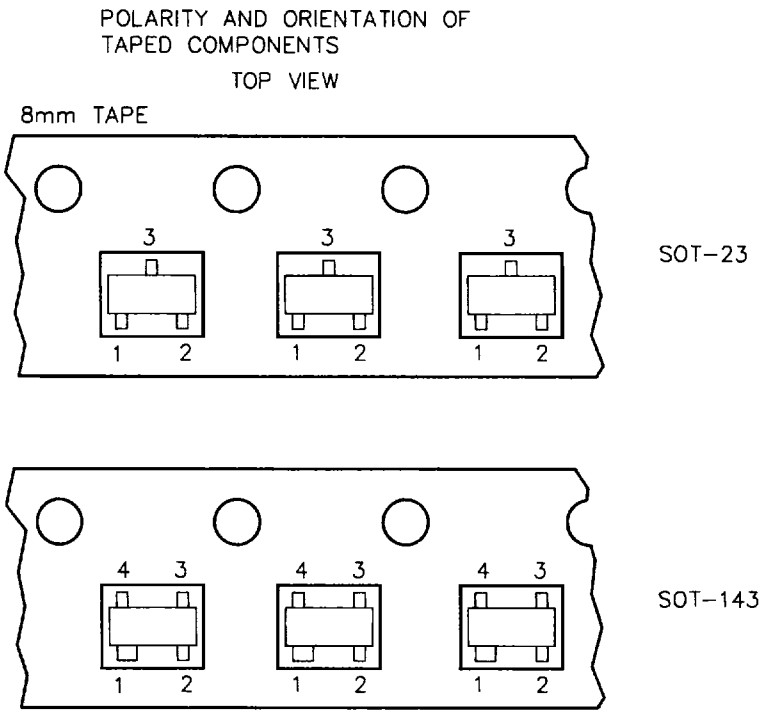


Figure 2. Polarity and Orientation

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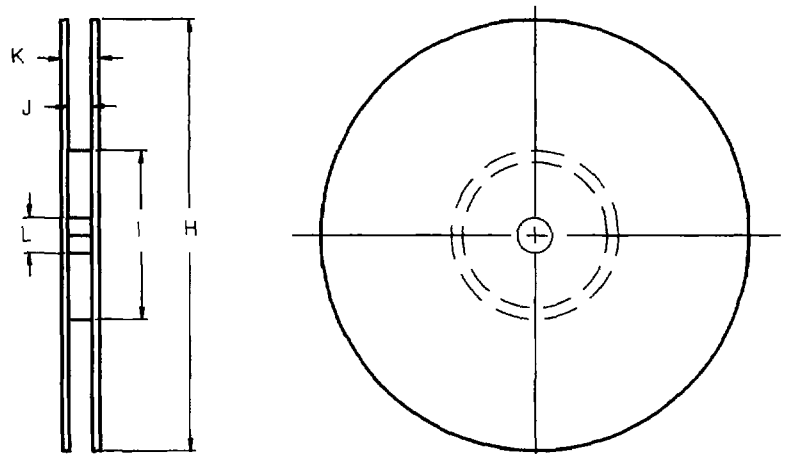
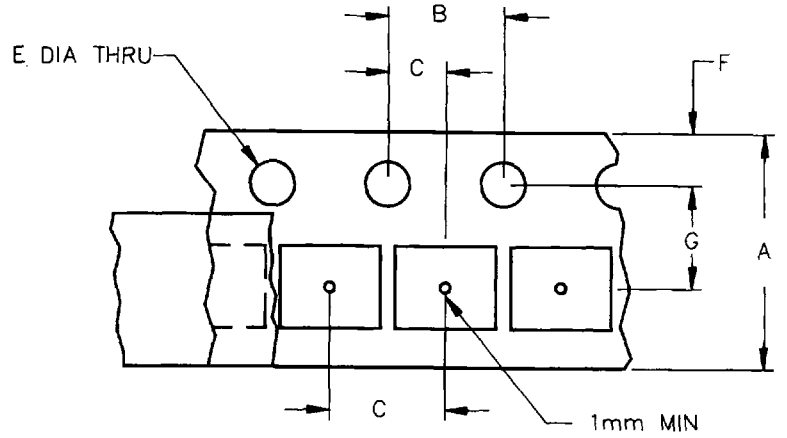
Tape and Reel Information (Continued)



CONFORMS

DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
H	6.8	7.2	173	183
I	2.382	2.50	60.5	63.5
J	0.331	0.390	8.4	9.9
K	–	0.567	–	14.4
L	0.502	0.562	12.75	12.9

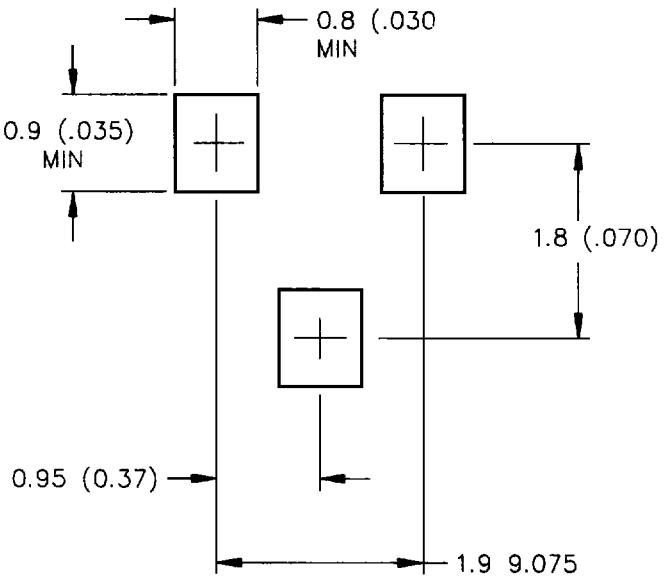
Figure 3. Reel Specification 8 mm Tape



DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.303	0.327	7.7	8.3
B	0.153	0.161	3.9	4.1
C	0.153	0.161	3.9	4.1
D	0.077	0.081	1.95	2.05
E	0.059	0.063	1.5	1.6
F	0.065	0.073	1.65	1.85
G	0.136	0.140	3.45	3.55

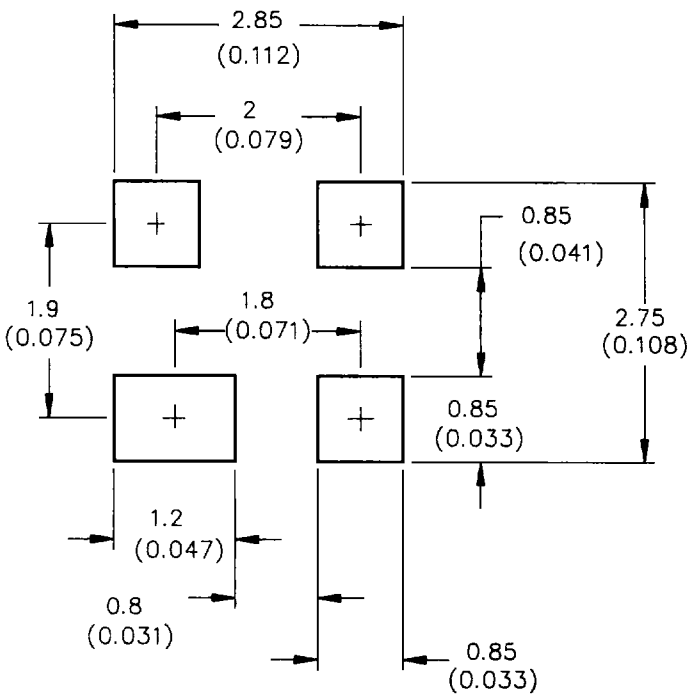
Figure 4. Cavity Specification

Tape and Reel Information (Continued)



DIMENSIONS: MILLIMETERS (INCHES)

SOT–23



DIMENSIONS: MILLIMETERS (INCHES)

SOT–143

Figure 5. Mounting Pad Layouts

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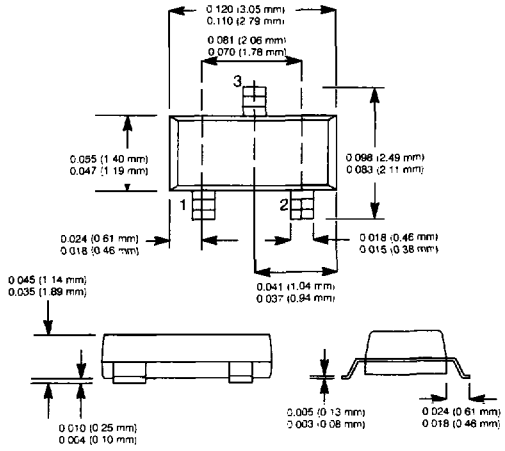
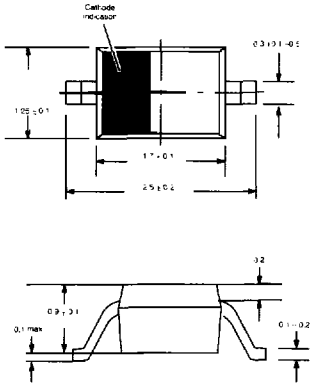
Outline Drawing Dimensions

SOT 23

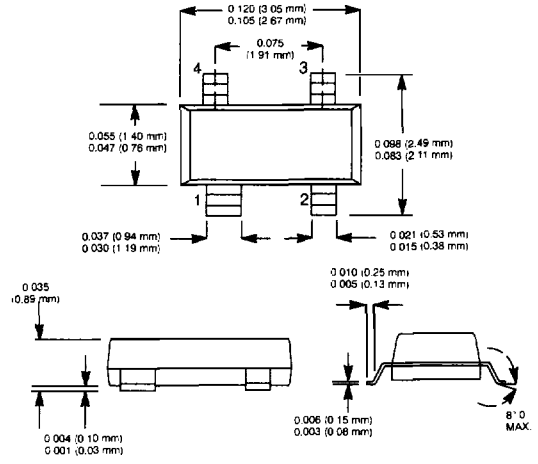


SOD 323

Dimensions in Millimeters



SOT 143



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