Schottky Barrier Chips for Hybrid Integrated Circuits

Technical Data

5082-0009, 5082-0013, 5082-0023, 5082-0097, HSMS-0001, HSMS-0011, HSMS-0002, HSMS-0012, HSMS-0003, HSMS-0013

Features

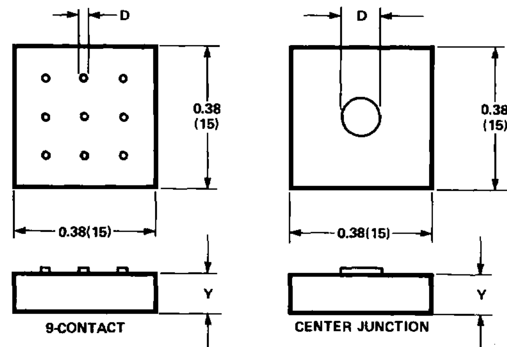
- **Thermocompression/ Thermosonically Bondable**
- **Gold Metallization**
- **Silicon Nitride Passivation**
- **Uniform Electrical Characteristics**
- **Batch Matched Versions Available**
- **Planar Construction**
- **Available in Many Electrical Selections**
- **Ideal for Hybrid Integrated Circuits**

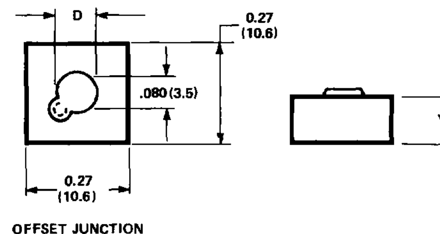
Description/ Applications

These Schottky chips are designed for hybrid applications at DC through K-band frequencies. The passivated planar construction of these Schottky chips provides a wide temperature range capability combined with broad bandwidth performance.

A variety of chips are provided which are optimized for various analog and digital applications. Typical applications of Schottky chips are mixing, detecting, switching, gating, sampling, and wave shaping.

The HSMS-00XX (offset junction) series Schottky diode chips





OFFSET JUNCTION

Dimension	Part Number		
	Center Junction		Offset Junction
	5082-0097	5082-0009 -0013 -0023	HSMS-000X -00XX
D	0.08 (3)	0.02 (0.80)*	0.10 (4)
Y	9.13 (5)	0.10 (4)	0.13 (5)

NOTES:
1. DIMENSIONS IN MILLIMETERS AND (1/1000 INCH).
2. DIMENSION TOLERANCE ±0.03 (1), EXCEPT * WHERE IT IS ±0.006 (0.2).
3. TOP CONTACT IS ANODE EXCEPT 5082-0009, WHERE TOP IS CATHODE.
4. ALL CONTACT METALLIZATION IS GOLD.

Outline 01B – Chip Dimensions

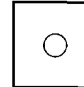
are specifically designed for analog and digital hybrid applications requiring thermosonic or thermocompression bonding techniques. The large bonding pad and offset junction allows easy bonding. The top metallization is a layer of gold deposited on adhesive metal layers for a tarnish-free surface that allows either thermosonic or thermocompression bonding techniques. The bottom metallization is also gold, suitable for epoxy or eutectic die attach methods.

Maximum Ratings

Junction Operating and Storage Temperature
5082-0097, HSMS-00XX .... -65°C to +200°C
5082-0009, -0013, -0023 .... -65°C to +150°C
Power Dissipation @ T_A = 25°C .... 250 mW
Measured in an infinite heat sink derated linearly to zero at maximum rated temperature.
I_F max (1 µs pulse) .... 1 Amp
Operation in excess of any one of these conditions may result in permanent damage.

Electrical Specifications at T_A = 25°C

Schottky Barrier Chips for General Purpose Applications Requiring Thermocompression Bonding Only



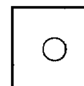
Part Number 5082- / Epoxy or Solder Die Attach[1]	Nearest Equivalent Packaged Part No. 5082-	Minimum Breakdown Voltage V_{BR} (V)	Maximum Forward Voltage V_F (mV)[2]	Maximum Forward Voltage V_F (V) @ I_F (mA)[2]	Maximum Capacitance C_T (pF)	Maximum Reverse Leakage Current I_R (nA) @ V_R (V)
0097	2811	15	410	1.0 20	1.1	100 8
Test Conditions		I_R = 10 µA	I_F = 1 mA		V_R = 0 V f = 1 MHz	

Notes:
1. Recommended methods. See "Assembling and Handling Procedures" for definitions.
2. V_F measured after proper die attach.

Schottky Barrier Chips for General Purpose Applications Requiring Thermosonic or Thermocompression Bonding Only

Part Number HSMS-		Nearest Equivalent Axial Lead Part No. 5082-	Minimum Breakdown Voltage V_{BR} (V)	Maximum Forward Voltage V_F (mV)[2]	Maximum Forward Voltage V_F (V) @	I_F (mV)	Maximum Capacitance C_T (pF)	Maximum Reverse Leakage Current I_R (nA) @	V_R (V)
Epoxy or Eutectic Die Attach[1]	Batch Matched[1]								
0001	0011	2800	70	410	1.0	15	1.72	200	50
0002	0012	2810	20	410	1.0	35	1.2	50	15
0003	0013	2835	8*	340	0.5	10	0.8	100	1
Test Conditions	$\Delta V_F = 15$ mV $I_F = 1$ mA		$I_R = 10\ \mu A$ $*I_R = 100\ \mu A$	$I_F = 1$ mA			$V_R = 0$ V f = 1.0 MHz		

Notes:
1. Standard batch match size, 100 units.
2. V_F measured after proper die attach.



Schottky Barrier Chips for Mixing and Detecting

Part Number 5082-	Nearest Equivalent Packaged Part No. 5082-	Nearest Equivalent Beam Lead Part No. HSCH-	Maximum Junction Capacitance C_T (pF)	Typical Parameters: Noise Figure NF (dB)[1]	Typical Parameters: Tangential Sensitivity T_{SS} (dBm)
0023	2702, 2723	5316	0.16	6.0	-54
0013	HSCH-3206*	5332	0.18	6.0	-42**
0009	2750		0.12	6.6	-55
Test Conditions	*Zero Bias		$V_R = 0$ V f = 1.0 MHz	f = 9.375 GHz	f = 10 GHz BW = 2 MHz $I_{BIAS} = 20\ \mu A$ **Zero Bias

Notes:
1. NF includes 1.5 dB for the IF Amplifier.

Assembly and Handling Procedures for Schottky Chips

See page 3-17.