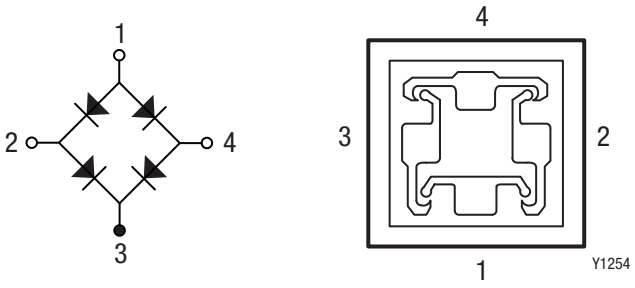
PRELIMINARY DATA SHEET

Schottky Diode Quad Mixer Chips Supplied on Film Frame

Features

- Designed for high-performance, double-balanced mixers
- Three barrier heights available
- Schottky diodes supplied 100% tested, sawn, mounted on film frame
- Low cost
- Available lead (Pb)-free, RoHS-compliant, and Green



Description

This Skyworks family of Si Schottky diodes are configured as bridge quads intended for use in double-balanced mixers. Each bridge quad die is comprised of four Schottky junctions. There are three barrier heights available: DMF4102-099 is composed of low-barrier diodes, which can be driven with low-power local oscillator signals; DME4101-099 is composed of medium-barrier diodes, for applications in which moderate-power local oscillator signals are available; and, DMJ4103-099 is composed of high-barrier diodes for applications that require very low distortion performance and have higher local oscillator power available. These bridge quads are 100% tested, sawn and supplied on film frame in wafer quantities.

Electrical and Physical Specifications

Absolute maximum ratings for the Schottky diodes are provided in Table 1. Electrical specifications are noted in Table 2. The chip dimensions are shown in Table 3. SPICE model parameters are defined in Table 4.

Typical performance data is indicated in Figure 1. The outline drawing is shown in Figure 2.

Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.

Table 1. Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Forward current	I_F		75		mA
Power dissipation @ 25 °C at the base of the chip	P		75		mW/per junction
Storage temperature	T_{STG}	–65		+200	°C
Operating temperature	T_{OP}	–65		+150	°C
Electrostatic discharge: Human Body Model (HBM), Class 0	ESD			<250	V

Note 1: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

***CAUTION**: Although this device is designed to be as robust as possible, electrostatic discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times.*

Table 2. Electrical Specifications at 25 °C (Notes 1 and 2)

Part Number	V_B I_R = 10 µA (V)	C_J V_R = 0 V, f = 1 MHz (pF)		V_F @ I_F = 1 mA (mV)		ΔV_F @ I_F = 1 mA (mV)	R_T (Note 3) I_F = 10 mA (Ω)
	Min	Min	Max	Min	Max	Max	Max
DMF4102-099	2	0.15	0.30	250	310	10	14
DME4101-099	3	0.15	0.30	325	425	10	14
DMJ4103-099	4	0.15	0.30	550	650	10	14

Note 1: The above Schottky diode chips are processed on 100 mm silicon wafers, 100% DC tested, sawn and shipped on 6" film frame hoops. Electrical rejects are identified with black ink.

Note 2: All parameters are based upon a single junction.

Note 3: R_T is the slope resistance.

Table 3. Chip Dimensions

Part Number	Quantity of Good Diodes Per Wafer		Bonding Pad Nominal (In.)	Chip Size Nominal (In.)	Chip Height Nominal (In.)
	Min.	Nom.			
DMF4102-099	27,000	30,000	0.0035 ± 0.0005	0.0150 ± 0.001	0.006 ± 0.001
DME4101-099	23,000	28,000	0.0035 ± 0.0005	0.0150 ± 0.001	0.006 ± 0.001
DMJ4103-099	27,000	30,000	0.0035 ± 0.0005	0.0150 ± 0.001	0.006 ± 0.001

Table 4. SPICE Model Parameters (Per Junction)

Part Number Prefix	I_S (A)	R_S (Ω)	N	t_T (s)	C_{JO} (pF)	M	E_G (eV)	V_J (V)	XTI	F_C	B_V (V)	I_{BV} (A)
DMF4102	1.1×10^{-7}	6	1.04	1×10^{-11}	0.22	0.32	0.69	0.495	2	0.5	2	1×10^{-5}
DME4101	2.4×10^{-9}	6	1.04	1×10^{-11}	0.20	0.37	0.69	0.595	2	0.5	3	1×10^{-5}
DMJ4103	8.5×10^{-13}	6	1.04	1×10^{-11}	0.20	0.42	0.69	0.800	2	0.5	4	1×10^{-5}

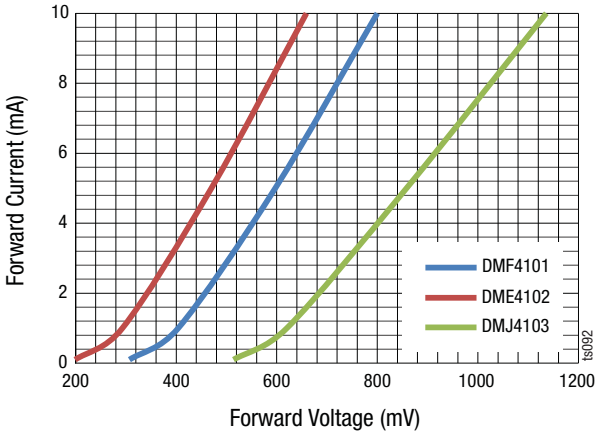


Figure 1. Typical DC Characteristic at 25 °C

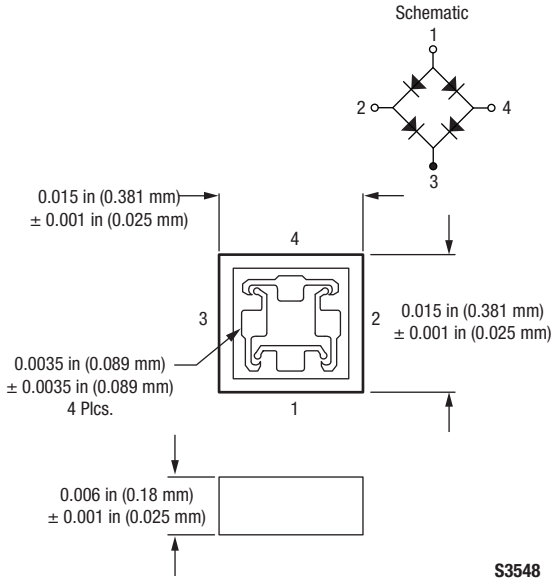


Figure 2. Outline Drawing

Wafer on Film

Figure 3 illustrates the wafer on film.

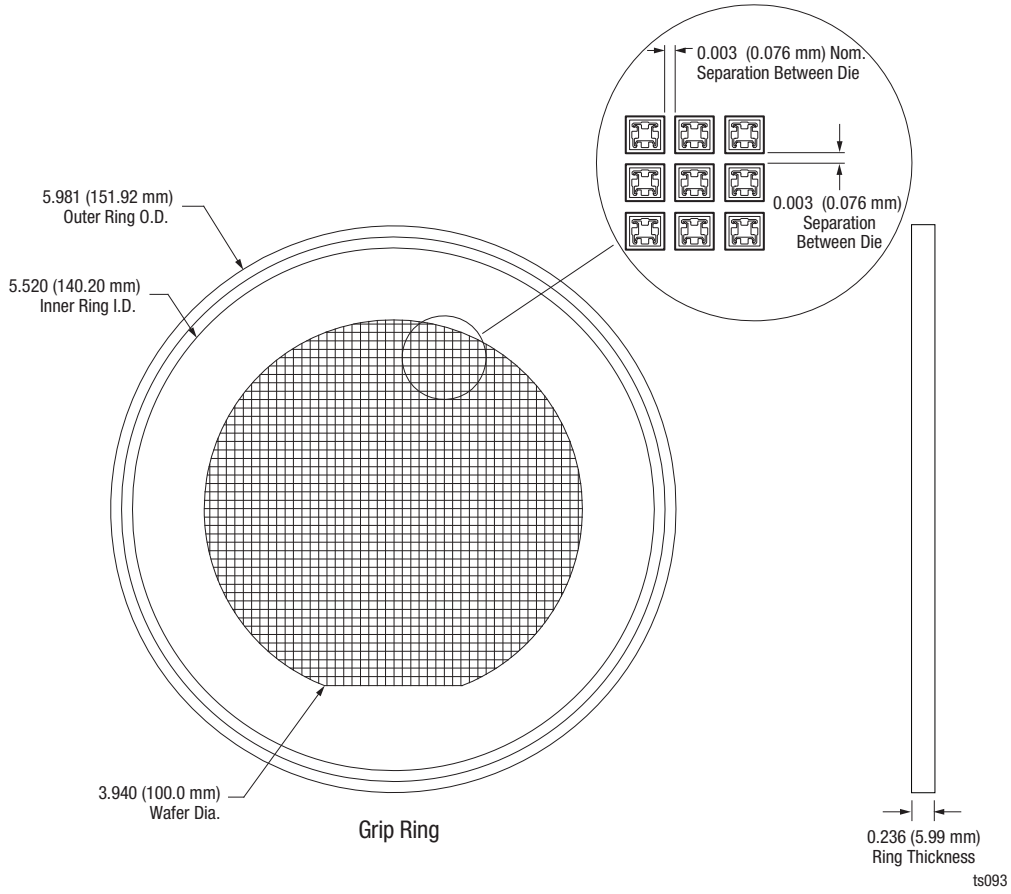


Figure 3. Wafer on Film

Wafer Film Frame Description

- Wafer on nitto tape
- Color: light blue
- Thickness: 2.2 ~ 3.0 mils
- Tensile strength: 6.6 (lbs. in width)
- Ring material: plastic