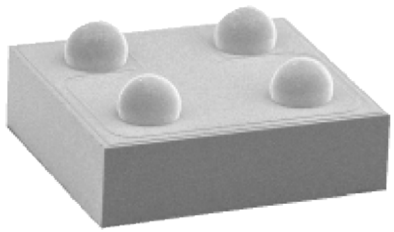
FlipKY®
Chip Scale Package Schottky Barrier Rectifier

IOR®



FlipKY®

FEATURES

- Ultra low V_F per footprint area
- Low leakage
- Low thermal resistance
- One-fifth footprint of SMA
- Super low profile (0.6 mm)
- Available tested on tape and reel

Pb-free
RoHS
COMPLIANT

APPLICATIONS

- Reverse polarity protection
- Current steering
- Freewheeling
- Flyback
- Oring

DESCRIPTION

Vishay's FlipKY® product family utilizes wafer level chip scale packaging to deliver Schottky diodes with the lowest V_F to PCB footprint area in industry. The four bump 1.5 x 1.5 mm devices can deliver up to 1.5 A and occupy only 2.3 mm² of board space. The anode and cathode connections are made through solder bump pads on one side of the silicon enabling designers to strategically place the diodes on the PCB. This design not only minimizes board space but also reduces thermal resistance and inductance, which can improve overall circuit efficiency.

Typical applications include hand-held, portable equipment such as cell phones, MP3 players, bluetooth, GPS, PDAs, and portable hard disk drives where space savings and performance are crucial.

PRODUCT SUMMARY	
$I_{F(AV)}$	1.5 A
V_R	40 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	MAX.	UNITS
V_{RRM}		40	V
$I_{F(AV)}$	Rectangular waveform	1.5	A
I_{FSM}		250	
V_F	at 1.5 Apk, T_J = 125 °C	0.42	V
T_J		- 55 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	FCSP240LTR	UNITS
Maximum DC reverse voltage	V_R	40	V
Maximum working peak reverse voltage	V_{RWM}		

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ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at T_{PCB} = 97 °C, rectangular waveform		1.5	A
Maximum peak one cycle non-repetitive surge current at 25 °C	I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	250	A
		10 ms sine or 6 ms rect. pulse		21	
Non-repetitive avalanche energy	E_{AS}	T_J = 25 °C, I_{AS} = 2.0 A, L = 5.0 mH		10	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x V_R typical		2.0	A

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Maximum forward voltage drop See fig. 1	V_{FM} (1)	at 1.5 A	T_J = 25 °C	0.45	0.49	V
		at 3 A		0.55	0.60	
		at 1.5 A	T_J = 125 °C	0.37	0.42	
		at 3 A		0.51	0.57	
Maximum reverse leakage current See fig. 2	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	15	80	µA
			V_R = 20 V	3.5	20	
			V_R = 10 V	2	10	
			V_R = 5 V	1.5	5	
		T_J = 125 °C	V_R = Rated V_R	9	20	mA
			V_R = 20 V	3.5	8	
			V_R = 10 V	2.5	6	
			V_R = 5 V	2	5	
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C		-	160	pF
Maximum voltage rate of charge	dv/dt	Rated V_R		-	10 000	V/µs

Note

(1) Pulse width < 300 µs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T_J (1)		- 55 to 150	°C
Maximum storage temperature range	T_{Stg}			
Typical thermal resistance, junction to PCB	R_{thJL} (2)	DC operation	40	°C/W
Maximum thermal resistance, junction to ambient	R_{thJA}		62	

Notes

(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

(2) Mounted 1" square PCB

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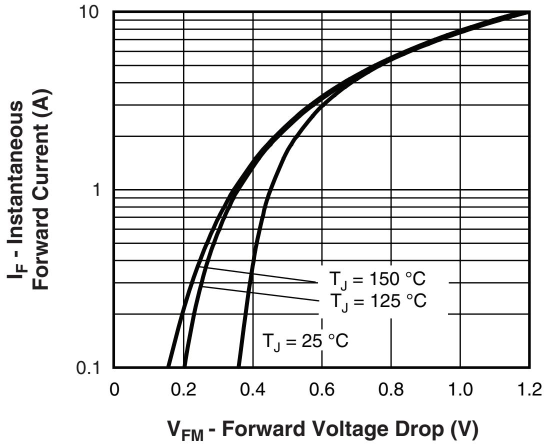


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

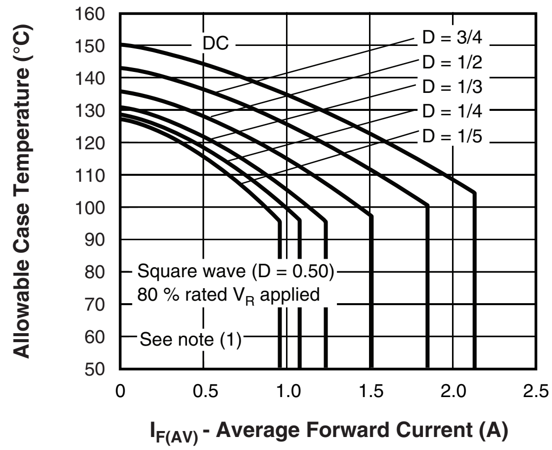


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

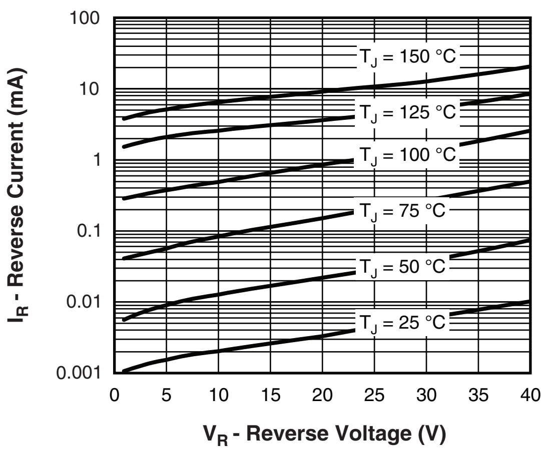


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

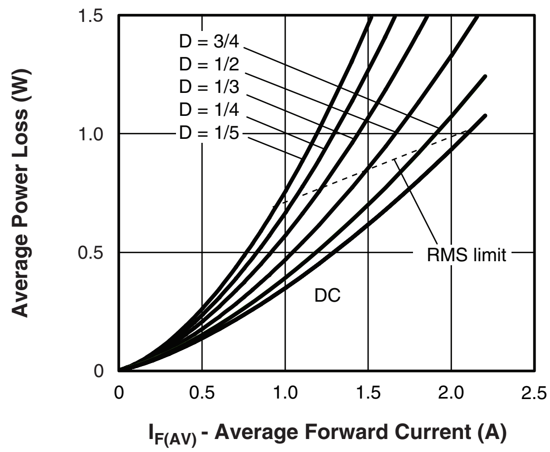


Fig. 5 - Forward Power Loss Characteristics (Per Leg)

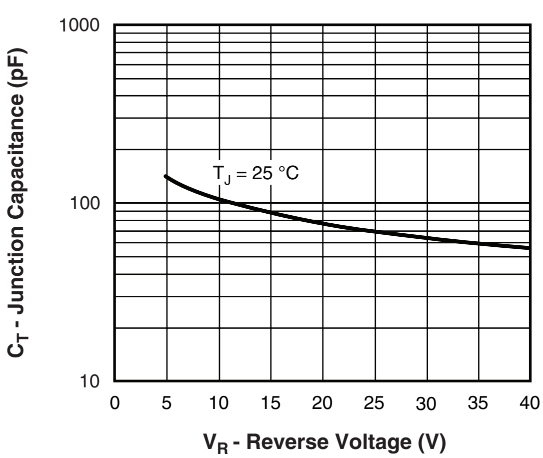


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

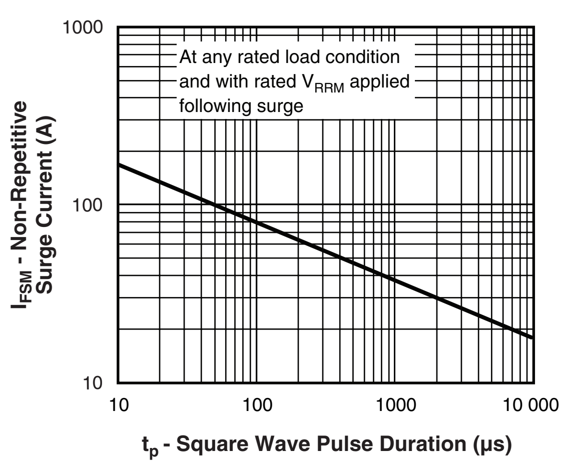


Fig. 6 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); Pd_{REV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at 80 % V_R applied

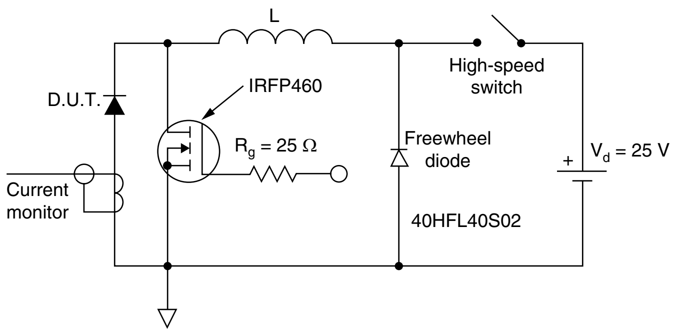
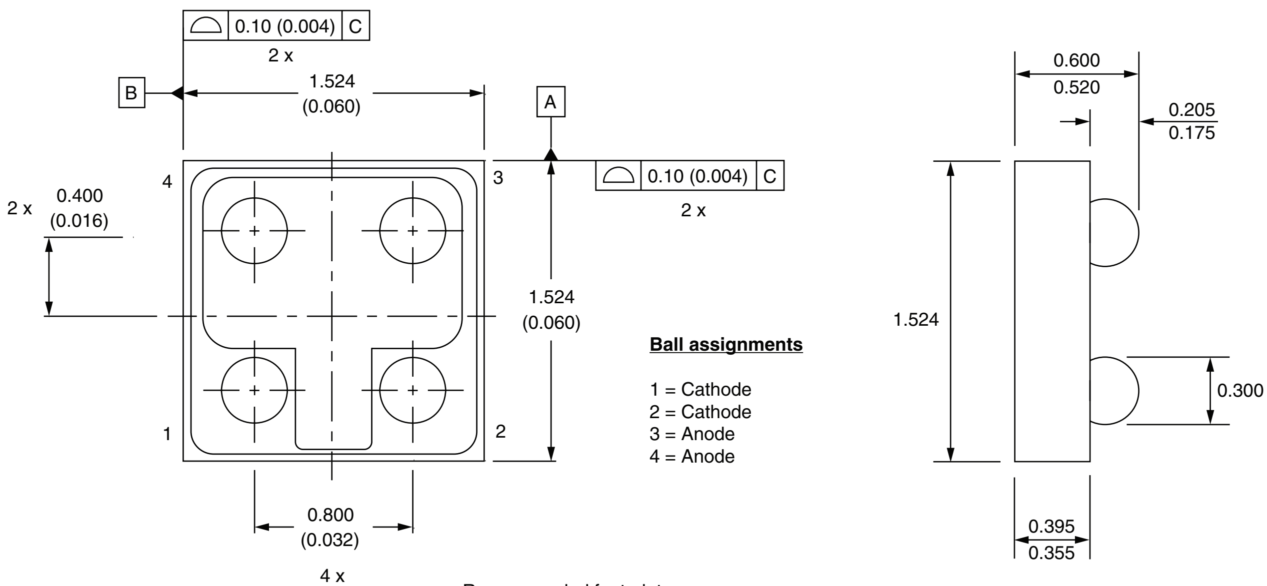
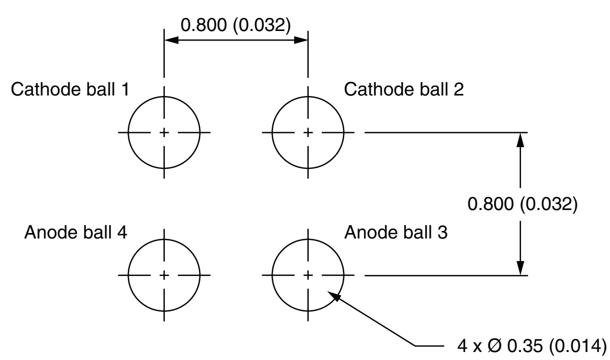


Fig. 7 - Unclamped Inductive Test Circuit

DIMENSIONS in millimeters (inches)



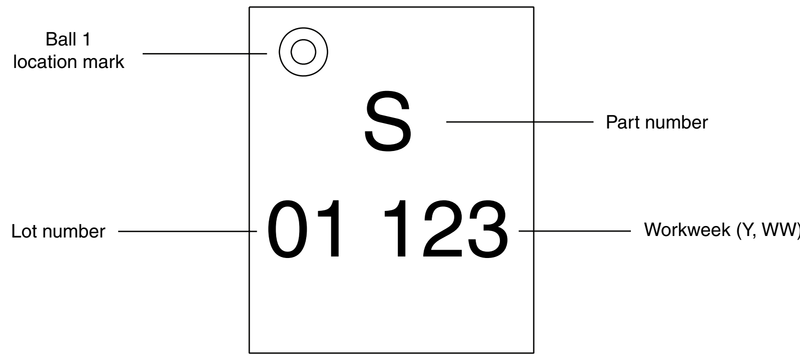
Recommended footprint



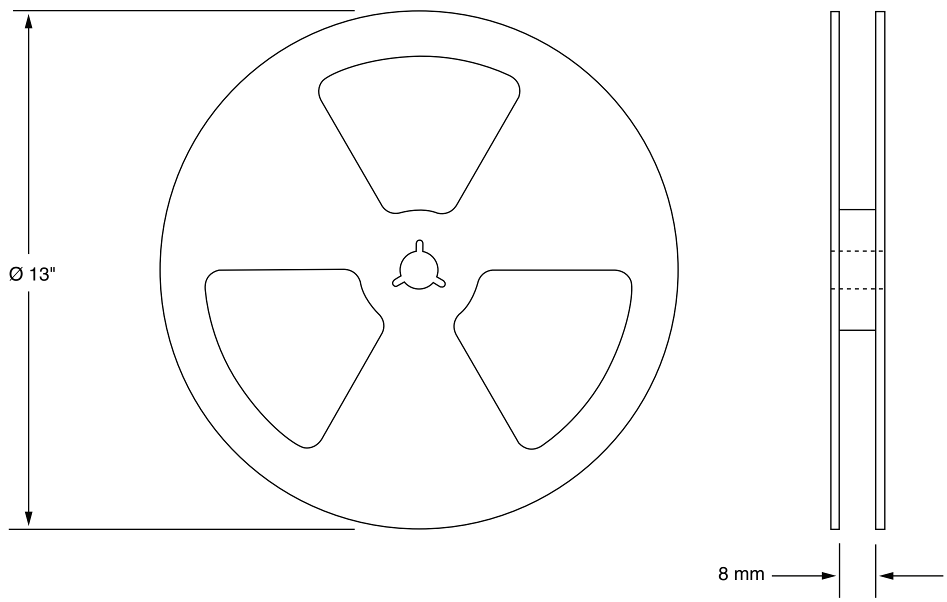
Notes

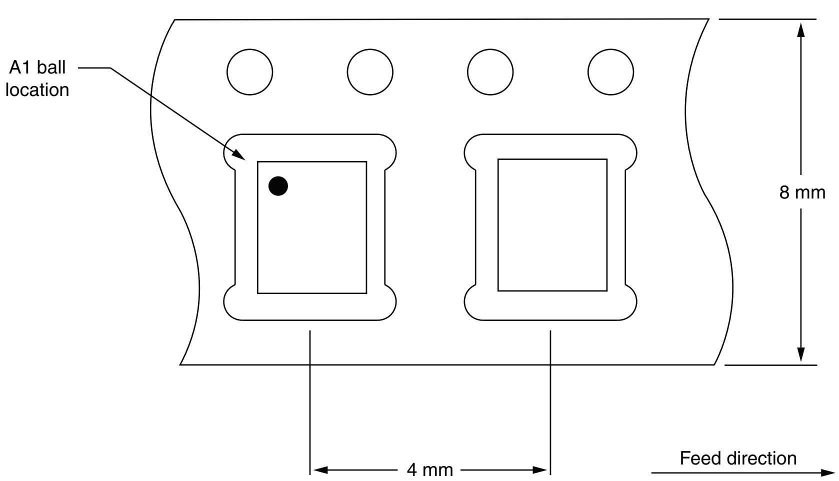
- Dimensioning and tolerancing per ASME Y14.5M-1994
- Controlling dimension: millimeter

PART MARKING INFORMATION



TAPE AND REEL INFORMATION





Conforms to EIA-481 and EIA-541

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