FlipKY®, 1 A

FlipKY®

FEATURES

- Ultralow V_F per footprint area
- Low thermal resistance
- One-fifth footprint of SMA
- Super low profile (< 0.7 mm)
- Available tested on tape and reel
- Small footprint, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Designed for consumer level

DESCRIPTION

True chip-scale packaging is available from Vishay HPP. The FCSP140ETR surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

The FlipKY® package is one-fifth the footprint of a comparable SMA package and has a profile of less than 0.7 mm. Combined with the low thermal resistance of the die level device, this makes the FlipKY the best device for applications where printed circuit board space is at a premium and in extremely thin application environments such as battery packs, cell phones and PCMCIA cards.

PRODUCT SUMMARY	
$I_{F(AV)}$	1 A
V_R	40 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		40	V
I_{FSM}	t_p = 5 µs sine	250	A
V_F	1.0 Apk, T_J = 125 °C	0.38	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	FCSP140ETR	UNITS
Maximum DC reverse voltage	V_R	40	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**VALUES**	**UNITS**
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at T_{PCB} = 112 °C, rectangular waveform		1.0	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	
		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 SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**TYP.**	**MAX.**	**UNITS**
Maximum forward voltage drop See fig. 1	V_{FM} (1)	1 A	T_J = 25 °C	0.43	0.48	V
		2 A		0.51	0.56	
		1 A	T_J = 125 °C	0.34	0.38	
		2 A		0.46	0.53	
Maximum reverse leakage current See fig. 2	I_{RM} (1)	V_R = Rated V_R	T_J = 25 °C	10	80	µA
		V_R = 20 V		3.5	20	
		V_R = 10 V		2	10	
		V_R = 5 V		1.5	5	
		V_R = Rated V_R	T_J = 125 °C	9.0	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 and storage temperature range	T_J (1), T_{Stg}		- 55 to 150	°C
Typical thermal resistance junction to PCB	R_{thJL} (2)	DC operation	40	°C/W
Typical 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 on 1" square PCB

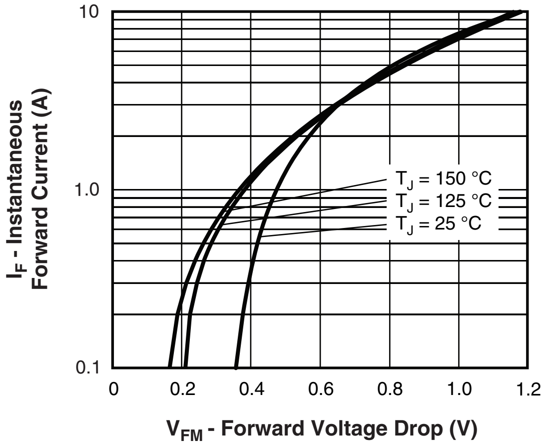

Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

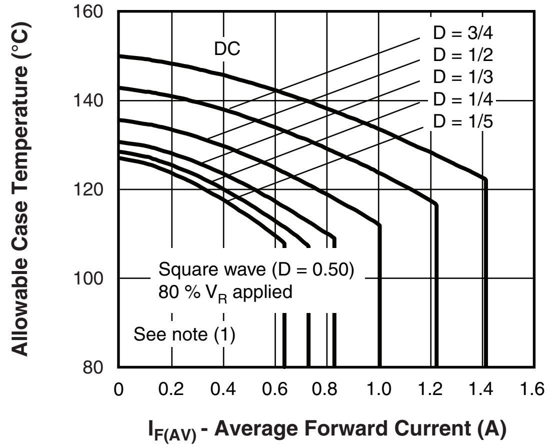

Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

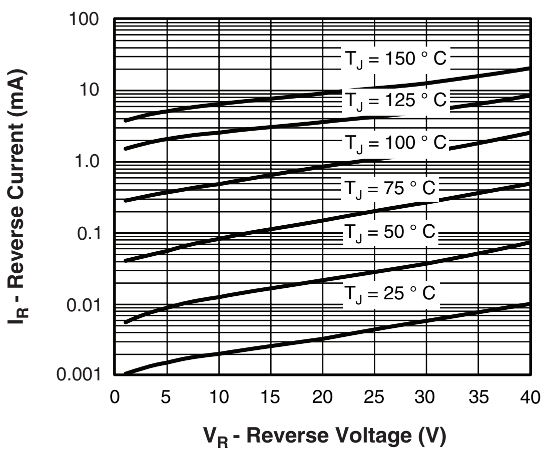

Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

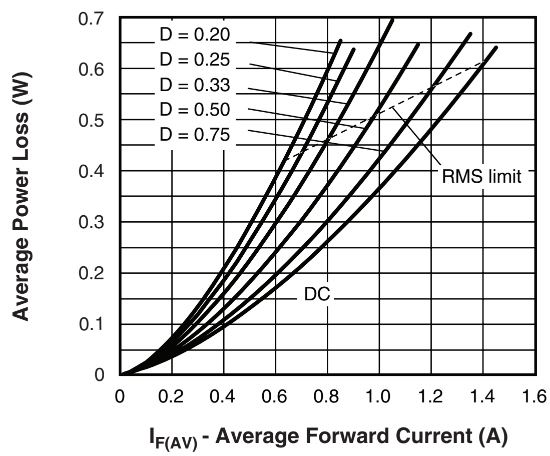

Fig. 5 - Forward Power Loss Characteristics (Per Leg)

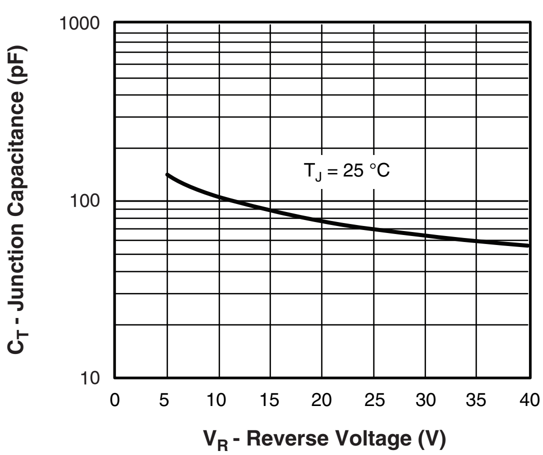

Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

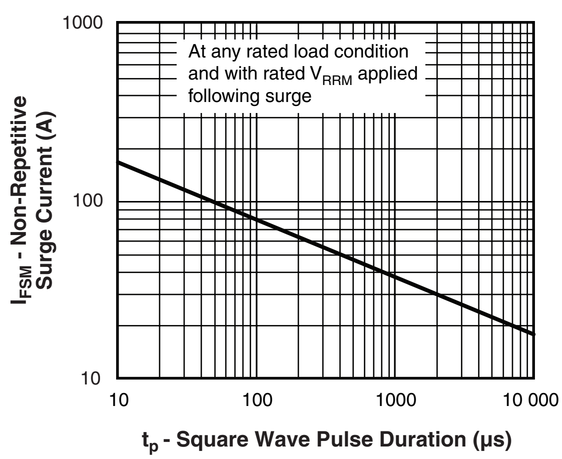

Fig. 6 - Maximum Non-Repetitive Surge Current (Per Leg)

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

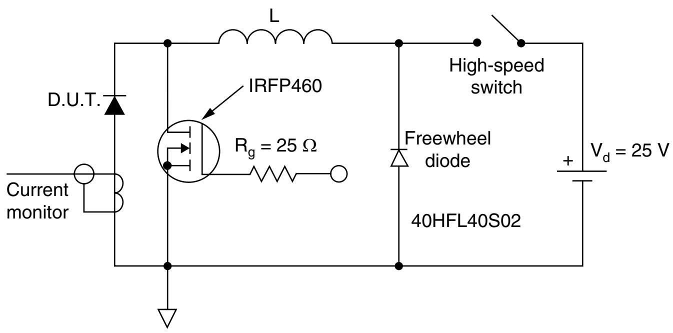

Fig. 7 - Unclamped Inductive Test Circuit

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95359
Part marking information	http://www.vishay.com/doc?95281
Packaging information	http://www.vishay.com/doc?95062

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