

## FlipKY<sup>®</sup>, 1 A


 FlipKY<sup>®</sup>

### FEATURES

- Ultra low  $V_F$  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
- Lead (Pb)-free
- Designed for consumer level


**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

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

### DESCRIPTION

True chip-scale packaging is available from Vishay HPP. The FCSP140TR 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<sup>®</sup> 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.

[www.DataSheet4U.com](http://www.DataSheet4U.com)

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_F$	Rectangular waveform	1.0	A
$V_{RRM}$		40	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	250	A
$V_F$	1.0 Apk, $T_J = 125^\circ C$	0.38	V
$T_J$	Range	- 55 to 150	$^\circ C$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	FCSP140TR	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 $T_{PCB} = 112\text{ °C}$ , rectangular waveform		1.0	A
Maximum peak one cycle non-repetitive surge current at 25 °C	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s 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	$E_{AS}$	$T_J = 25\text{ °C}$ , $I_{AS} = 2.0\text{ A}$ , $L = 5.0\text{ mH}$		10	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu$ s Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ 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	$T_J = 25\text{ °C}$	0.43	0.48	V
		2 A		0.51	0.56	
		1 A	$T_J = 125\text{ °C}$	0.34	0.38	
		2 A		0.46	0.53	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$V_R = \text{Rated } V_R$	$T_J = 25\text{ °C}$	10	80	$\mu$ A
		$V_R = 20\text{ V}$		3.5	20	
		$V_R = 10\text{ V}$		2	10	
		$V_R = 5\text{ V}$		1.5	5	
		$V_R = \text{Rated } V_R$	$T_J = 125\text{ °C}$	9.0	20	mA
		$V_R = 20\text{ V}$		3.5	8	
		$V_R = 10\text{ V}$		2.5	6	
		$V_R = 5\text{ V}$		2	5	
Maximum junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		-	160	pF
Maximum voltage rate of change	dV/dt	Rated $V_R$		-	10 000	V/ $\mu$ s

[www.DataSheet4U.com](http://www.DataSheet4U.com)
**Note**

 (1) Pulse width < 300  $\mu$ s, 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

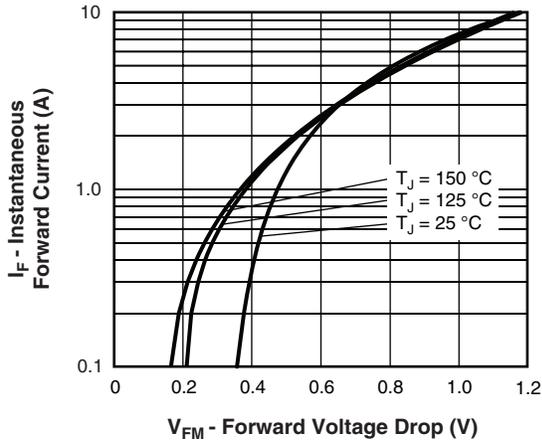


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

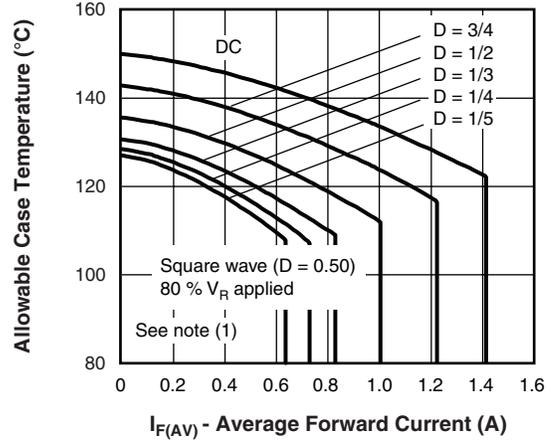


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

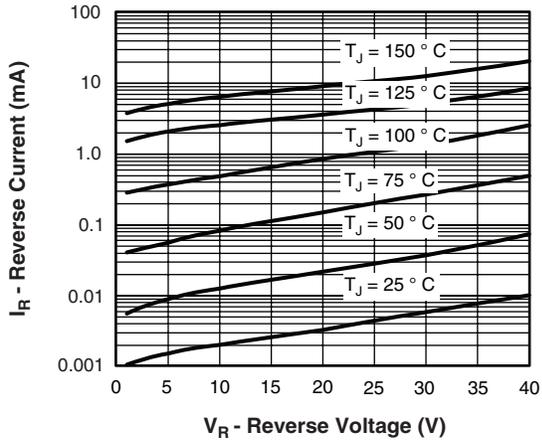


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

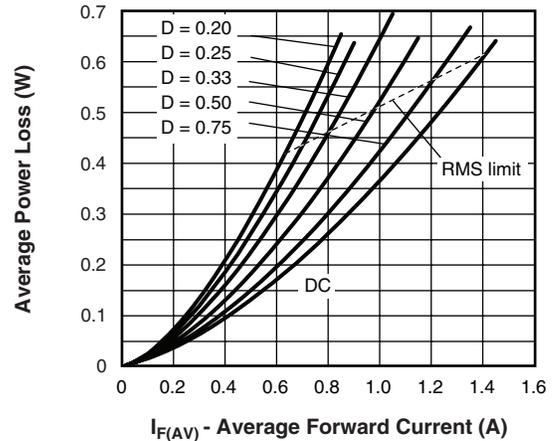


Fig. 5 - Forward Power Loss Characteristics (Per Leg)

www.DataSheet4U.com

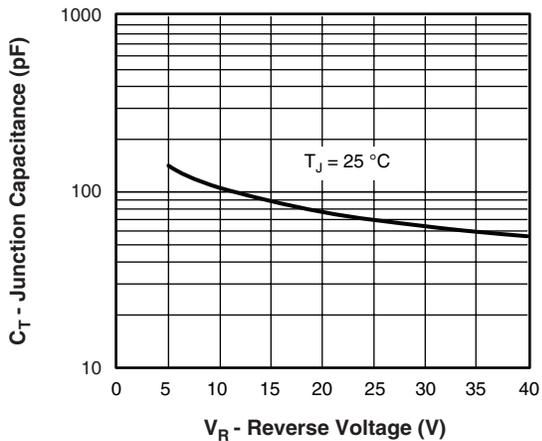


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

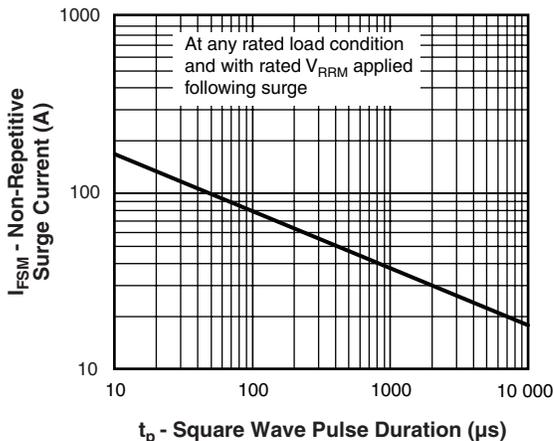


Fig. 6 - Maximum Non-Repetitive Surge Current (Per Leg)

**Note**

(1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

$P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at 80 %  $V_R$  applied

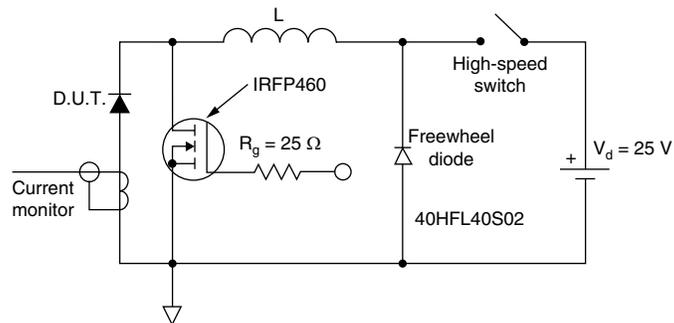


Fig. 7 - Unclamped Inductive Test Circuit

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95052">http://www.vishay.com/doc?95052</a>
Part marking information	<a href="http://www.vishay.com/doc?95281">http://www.vishay.com/doc?95281</a>
Packaging information	<a href="http://www.vishay.com/doc?95062">http://www.vishay.com/doc?95062</a>



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.