



FCSP140TR

Vishay High Power Products

FlipKY[®], 1 A



FlipKY[®]

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[®] 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.

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}		



FCSP140TR

Vishay High Power Products

FlipKY[®], 1 A



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 μ s sine or 3 μ 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 μ 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	μ 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/ μ s

Note

(1) Pulse width < 300 μ 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

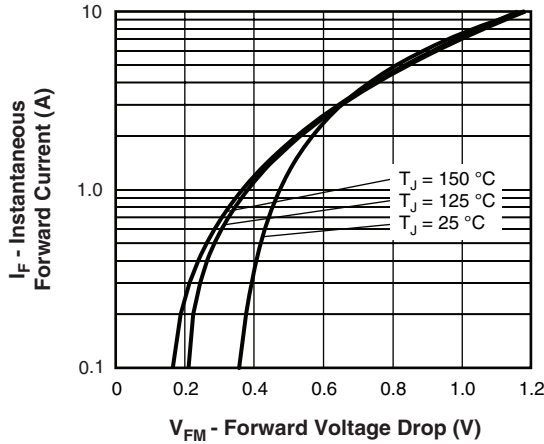


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

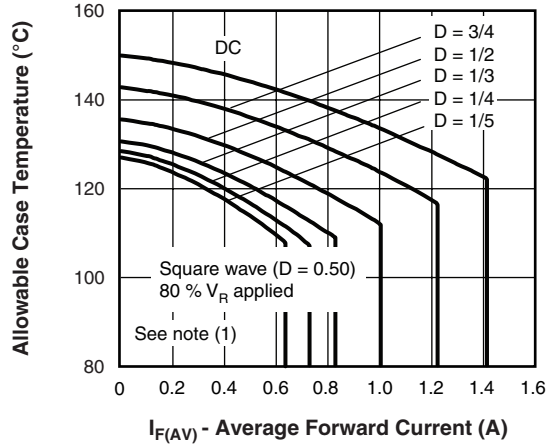


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

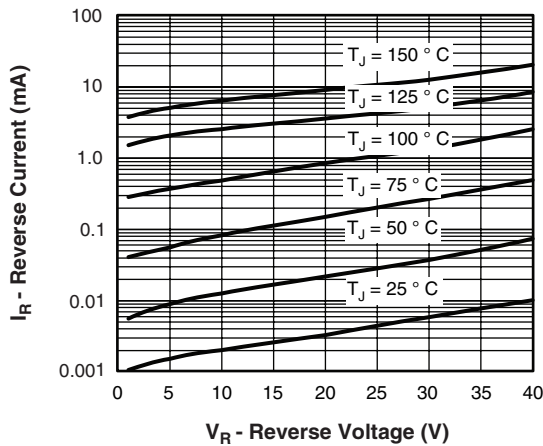


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

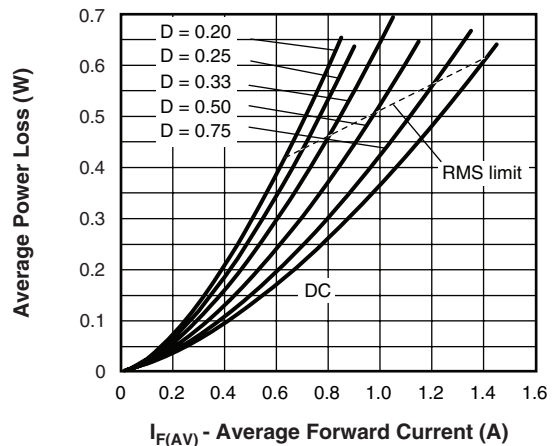


Fig. 5 - Forward Power Loss Characteristics (Per Leg)

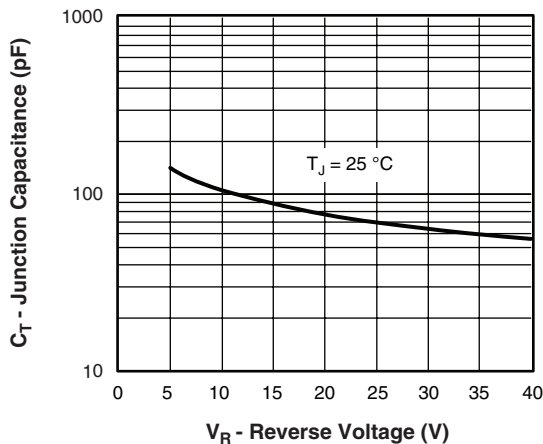


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

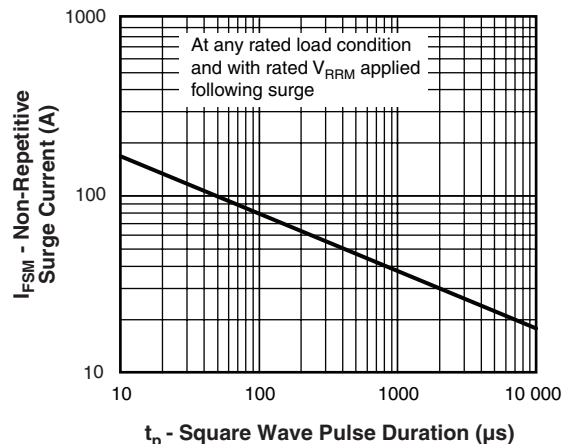


Fig. 6 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

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

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

FCSP140TR

Vishay High Power Products

FlipKY[®], 1 A

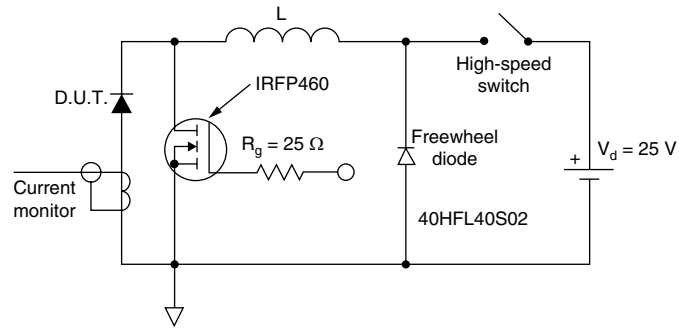


Fig. 7 - Unclamped Inductive Test Circuit

LINKS TO RELATED DOCUMENTS

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95052
Part marking information	http://www.vishay.com/doc?95281
Packaging information	http://www.vishay.com/doc?95062



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.