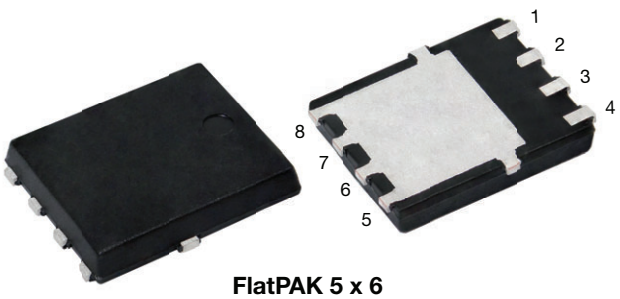
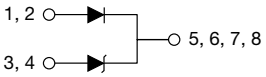
Two-in-One Solution Surface-Mount



FlatPAK 5 x 6



FEATURES

- Automotive two-in-one solution for rectifier and TRANSZORB® TVS
- Oxide planar chip junction
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

TYPICAL APPLICATIONS

Secondary protection for sensor units, distributed airbag modules and low power DC / DC converters under power distributer

MECHANICAL DATA

Case: FlatPAK 5 x 6

Molding compound meets UL 94 V-0 flammability rating

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HM3 suffix meets JESD 201 class 2 whisker test

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS		
Standard Rectifier	$I_{F(AV)}$	3 A
	V_{RRM}	600 V
	I_{FSM}	40 A
	V_F at I_F = 3A (T_J = 125 °C	0.86 V
Transient Voltage Suppressors	V_{BR}	27 V
	V_{WM}	23.1 V
	P_{PPM}	200 W
T_J max.	175 °C	
Package	FlatPAK 5 x 6	
Circuit configuration	Common cathode	

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
TECHNOLOGY	**PARAMETER**	**SYMBOL**	**R3T2FPHM3**	**UNIT**
	Device marking code		R3T2FP	
Standard Rectifier	Maximum repetitive peak reverse voltage	V_{RRM}	600	V
	Maximum DC forward current	$I_{F(AV)}$ (1)	3	A
		$I_{F(AV)}$ (2)	2	
	Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	40	A
Transient Voltage Suppressors	Peak pulse power dissipation with a 10/1000 µs waveform (3)	P_{PPM}	200	W
	Peak pulse current with a 10/1000 µs waveform (3)	I_{PPM}	5.3	A
Operating junction temperature range		T_J (4)	-55 to +175	°C
Storage temperature range		T_{STG}	-55 to +175	°C

Notes

(1) Mounted on 3 x 3 cm aluminum pad area

(2) Free air mounted on recommended pad area

(3) Non-repetitive current pulse per Fig.10 and derated above T_A = 25 °C per Fig.8

(4) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)								
TECHNOLOGY	**PARAMETER**	**TEST CONDITIONS**		**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Standard Rectifier	Instantaneous forward voltage	I_F = 1.5 A	T_J = 25 °C	V_F (1)	-	0.91	-	V
		I_F = 3A	T_J = 25 °C		-	0.97	1.1	
		I_F = 1.5 A	T_J = 125 °C		-	0.79	-	
		I_F = 3 A	T_J = 125 °C		-	0.86	0.98	
	Reverse current	Rated V_R	T_J = 25 °C	I_R (2)	-	-	10	µA
			T_J = 125 °C		-	13	100	
	Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	-	1.5	-	µs
	Typical junction capacitance	4.0 V, 1 MHz		C_J	-	19	-	pF
Transient Voltage Suppressors	Breakdown Voltage (3)	I_T =1.0 mA		V_{BR}	25.7	27.0	28.4	V
	Stand-off Voltage			V_{WM}	-	23.1	-	V
	Maximum Reverse Leakage	Rated V_{WM}		I_D	-	-	0.5	µA
	Maximum Clamping Voltage	I_{PPM} = 5.3 A, 10/1000 µs waveform		V_C	-	-	37.5	V
	Typical junction capacitance	0 V		C_J		330		pF
	Typical junction capacitance	23.1 V		C_J		95		pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: pulse width ≤ 5 ms
(3) Pulse test: t_p ≤ 50 ms

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-005	Charged device model (CDM)	V = 500 V		C3	> 1 kV
IEC 61000-4-2 (2)	Contact mode	C = 150 pF, R = 330 Ω		4	> 8 kV
	Air-discharge mode (1)	C = 150 pF, R = 330 Ω		4	> 15 kV

Notes

(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV
(2) System ESD standard

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Thermal resistance per diode	$R_{\theta JA}$ (1)(2)	80	-	°C/W
	$R_{\theta JM}$ (3)	3.0	4.0	

Notes

(1) The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint
(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
R3T2FPHM3/I (1)	0.10	I	6000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

RATINGS AND CHARACTERISTICS CURVES FOR RECTIFIERS (T_A = 25 °C unless otherwise noted)

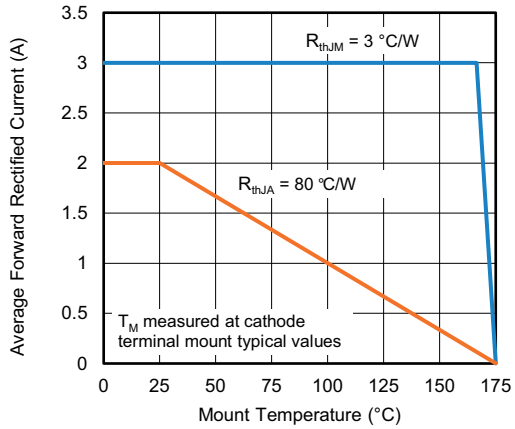


Fig. 1 - Maximum Forward Derating Curve

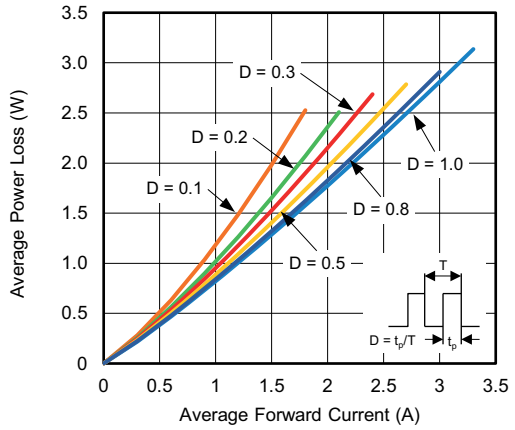


Fig. 2 - Forward Power Loss Characteristics

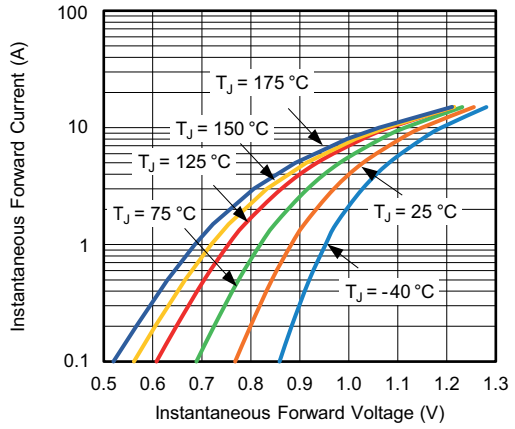


Fig. 3 - Typical Instantaneous Forward Characteristics

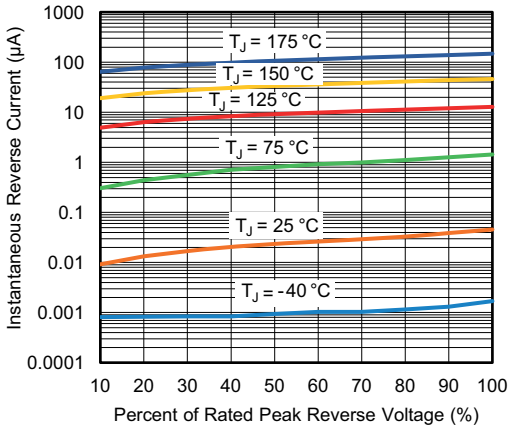


Fig. 4 - Typical Reverse Leakage Characteristics

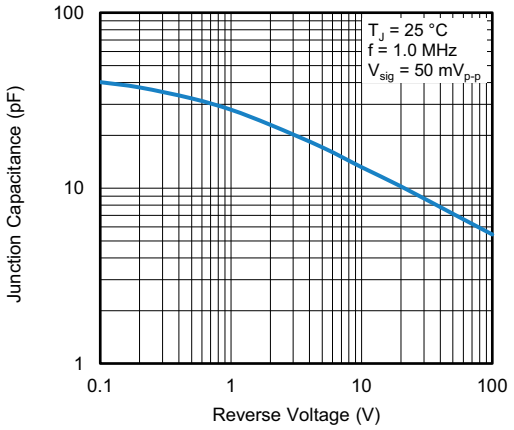


Fig. 5 - Typical Junction Capacitance

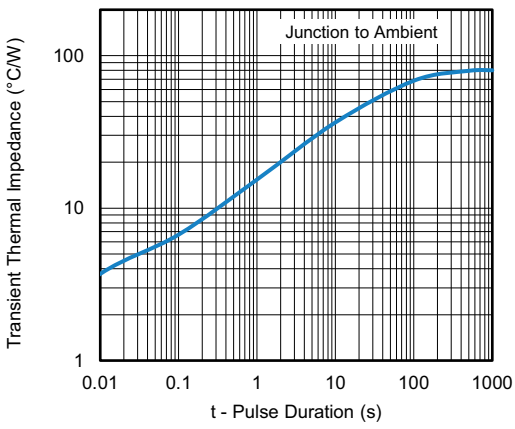


Fig. 6 - Typical Transient Thermal Impedance

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

RATINGS AND CHARACTERISTICS CURVES FOR TVS (T_A = 25 °C unless otherwise noted)

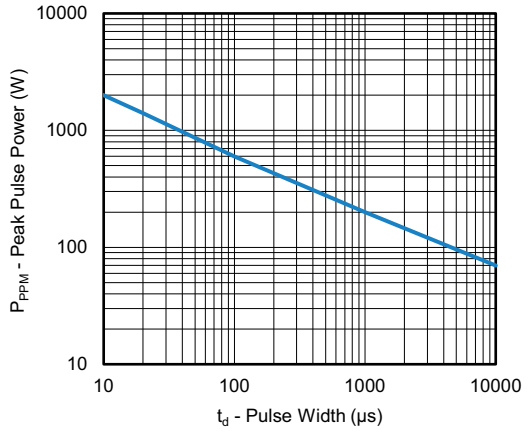


Fig. 7 - Peak Pulse Power Derating Curve

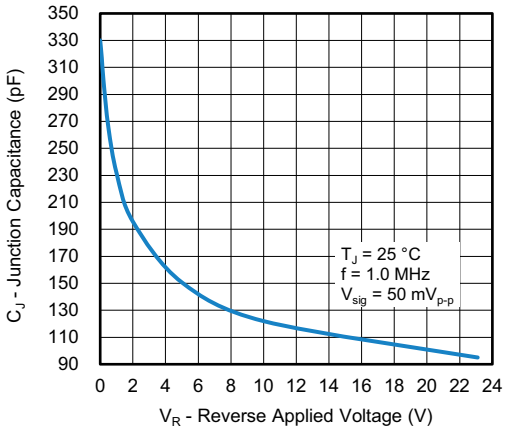


Fig. 9 - Typical Junction Capacitance

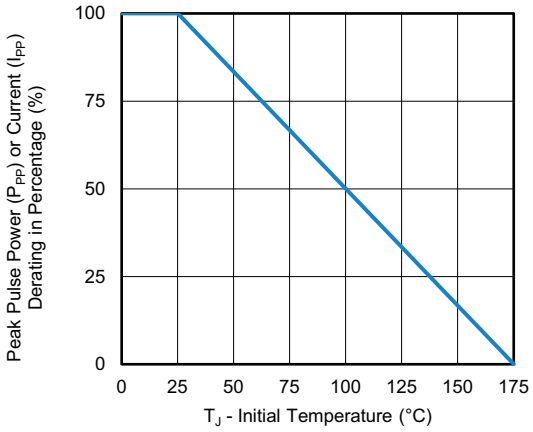


Fig. 8 - Pulse Power or Current vs. Initial Junction Temperature

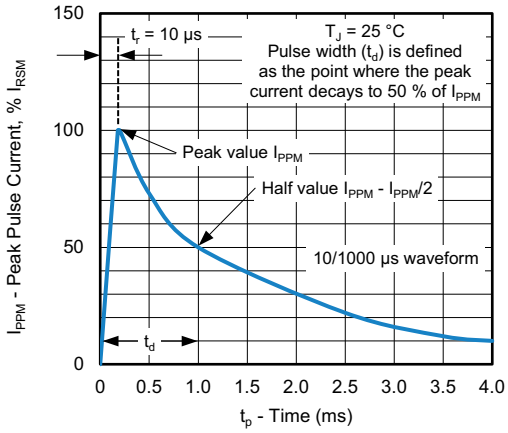
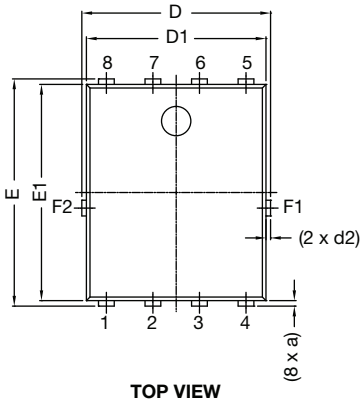


Fig. 10 - Pulse Waveform

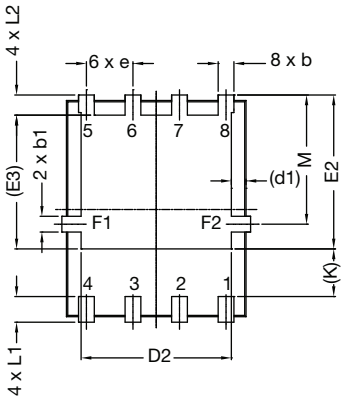
For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

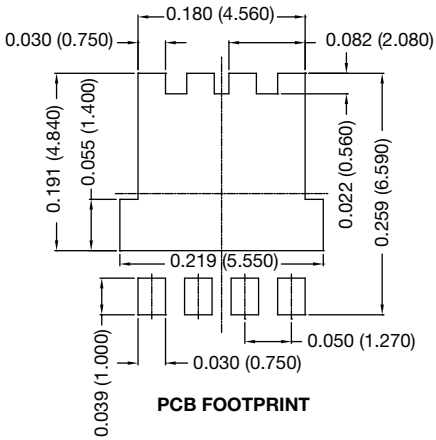
FlatPAK 5 x 6



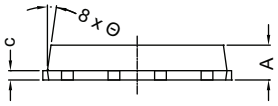
TOP VIEW



BOTTOM VIEW



PCB FOOTPRINT



SIDE VIEW

DIM.	INCHES			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	0.039	0.043	0.89	0.99	1.09
(a)	-	0.006	-	-	0.15	-
b	0.013	0.017	0.020	0.32	0.43	0.52
b1	0.013	0.017	0.020	0.32	0.43	0.52
c	0.008	-	0.014	0.20	-	0.35
D	0.197	0.203	0.209	5.00	5.15	5.30
D1	0.189	0.193	0.197	4.80	4.90	5.00
D2	0.154	0.161	0.169	3.90	4.10	4.30
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
E	0.238	0.244	0.250	6.05	6.20	6.35
E1	0.228	0.232	0.236	5.80	5.90	6.00
E2	0.157	0.165	0.173	4.00	4.20	4.40
(E3)	-	0.144	-	-	3.65	-
e	0.050 BSC			1.27 BSC		
(K)	0.039	-	-	1.00	-	-
L1	0.019	-	0.043	0.48	-	1.10
L2	0.012	-	0.031	0.30	-	0.80
M	0.128	0.138	0.148	3.25	3.50	3.75
Θ	0°	-	10°	0°	-	10°

Notes

- Dimensioning and tolerancing per ASME Y14.5-2009
- Dimensions D1 and E1 do not include mold flash or gate burrs
- Dimension (XX) means reference only

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

© 2024 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED