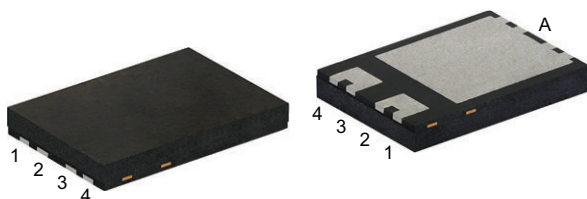
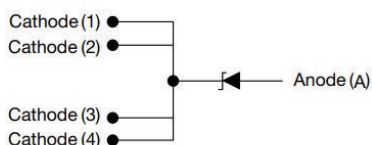


Surface Mount TRANSZORB® Transient Voltage Suppressors



DFN6546A



RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Low-profile package - typical height of 0.88 mm
- Leadless DFN package with side-wettable flanks suitable for customer AOI (Automatic Optical Inspection)
- Ideal for automated placement
- Junction passivation optimized design passivated anisotropic rectifier technology
- Unidirectional
- Excellent clamping capability
- Peak pulse power: 3000 W (10/1000 μ s)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compatible to SMPC (TO-277A) package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
V_{BR}	12 V to 24 V
V_{WM}	10.2 V to 20.5 V
P_{PPM} (10 x 1000 μ s)	3000 W
T_J max.	175 °C
Polarity	Unidirectional
Package	DFN6546A
Circuit configuration	Single

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, medical, and telecommunication.

MECHANICAL DATA

Case: DFN6546A

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and industrial grade

Terminals: matte tin plated leads, solderable per J-STD-002

M3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end, heatsink is anode

MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 μ s waveform (fig. 1) ⁽¹⁾	P_{PPM}	3000	W
Peak pulse current with a 10/1000 μ s waveform (fig. 3) ⁽¹⁾	I_{PPM}	See table next page	A
Operating junction and storage temperature range	T_J, T_{STG}	-65 to +175	°C

Note

⁽¹⁾ Non-repetitive current pulse, per fig. 3 and derated above $T_A = 25$ °C per fig. 2

**ELECTRICAL CHARACTERISTICS** ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}^{(1)}$ AT I_T (V)			TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R (μA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} $T_J = 150\text{ }^{\circ}\text{C}$ I_D (μA)	MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}^{(2)}$ (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	TYPICAL TEMP. COEFFICIENT OF $V_{BR}^{(3)}$ α_T ($\%/^{\circ}\text{C}$)
		MIN.	NOM.	MAX.							
3KDFN12A	3KNA	11.4	12.0	12.6	1.0	10.2	5.0	50	180	16.7	0.070
3KDFN13A	3KNB	12.4	13.0	13.7	1.0	11.1	5.0	50	165	18.2	0.072
3KDFN15A	3KNC	14.3	15.0	15.8	1.0	12.8	2.0	20	142	21.2	0.076
3KDFN16A	3KND	15.2	16.0	16.8	1.0	13.6	2.0	20	133	22.5	0.078
3KDFN18A	3KNE	17.1	18.0	18.9	1.0	15.3	1.0	10	118	25.5	0.080
3KDFN20A	3KNF	19.0	20.0	21.0	1.0	17.1	1.0	10	108	27.7	0.082
3KDFN22A	3KNG	20.9	22.0	23.1	1.0	18.8	1.0	10	98.0	30.6	0.084
3KDFN24A	3KNH	22.8	24.0	25.2	1.0	20.5	1.0	10	90.4	33.2	0.085

Notes

- (1) Pulse test: $t_p \leq 50\text{ ms}$
(2) Surge current waveform per fig. 3 and derated per fig. 2
(3) To calculate V_{BR} vs. junction temperature, use the following formula: V_{BR} at $T_J = V_{BR}$ at $25\text{ }^{\circ}\text{C} \times (1 + \alpha_T \times (T_J - 25))$
(4) All terms and symbols are consistent with ANSI/IEEE C62.35

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance	$R_{\theta JA}^{(1)}$	76	95	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	0.95	1.19	$^{\circ}\text{C/W}$

Notes

- (5) Thermal resistance junction-to-ambient to follow JEDEC[®] 51-2A, device mounted on FR4 PCB, 2 oz., 4.8 mm x 4.72 mm
(6) Thermal resistance junction-to-mount to follow JEDEC[®] 51-14 using Transient Dual Interface Test Method (TDIM)

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	VALUE
IEC 61000-4-2	Contact discharge	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$	ESD	30 kV
	Air discharge			30 kV



ORDERING INFORMATION TABLE

Device code	3K	DFN	xxx	A	-	M3
	1	2	3	4	5	6
1	- Peak pulse power rating (3K = 3000 W)					
2	- DFN package					
3	- Nominal breakdown voltage					
4	- Breakdown voltage tolerance and polarity (A $\pm$ 5 %, unidirectional)					
5	- Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)					
6	- Material / Environment category (M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)					

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
3KDFN12A-M3/H	0.094	H	1500	7" diameter plastic tape and reel
3KDFN12A-M3/I	0.094	I	6000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$, unless otherwise noted)

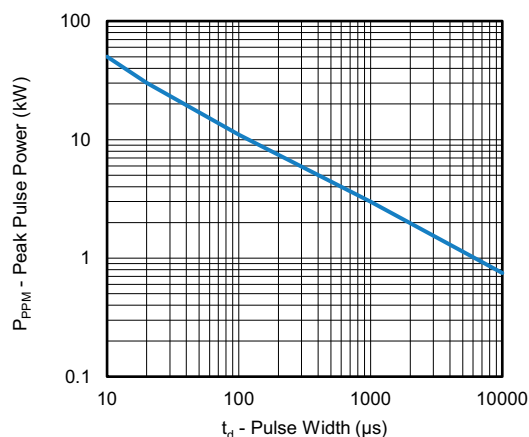


Fig. 1 - Peak Pulse Power Rating Curve

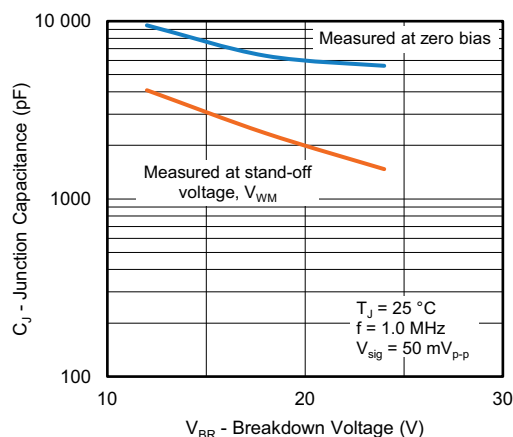


Fig. 4 - Typical Junction Capacitance

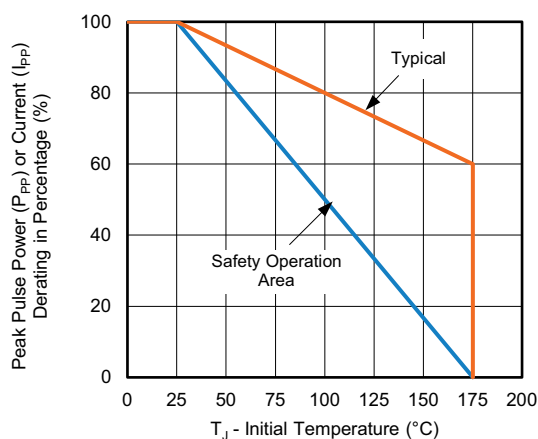


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

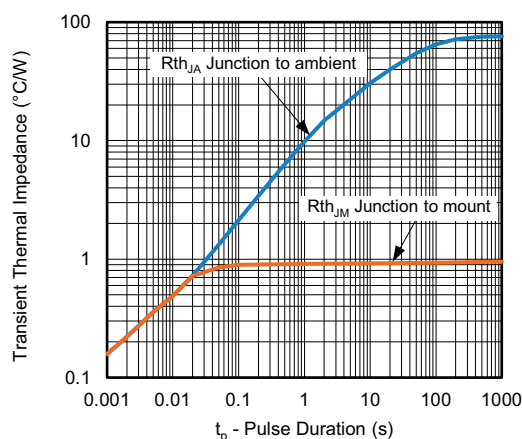


Fig. 5 - Typical Transient Thermal Impedance

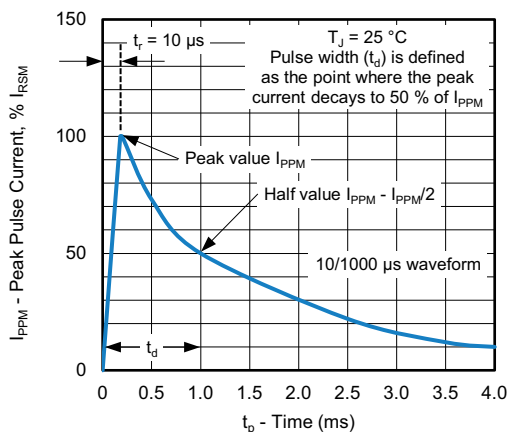


Fig. 3 - Pulse Waveform

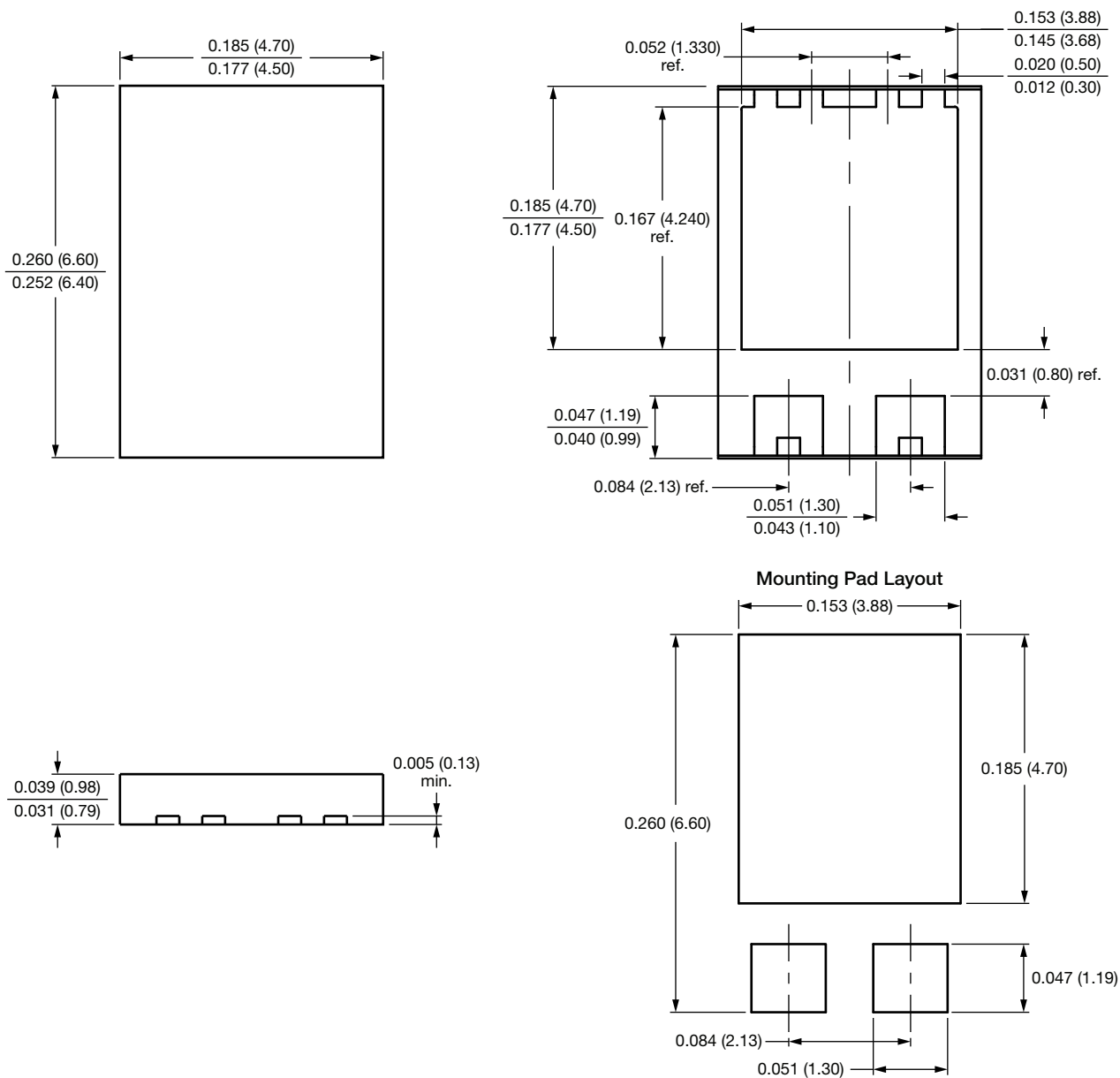
Note

- Fig. 1, power calculations is based on I_{PPM} times defined maximum clamping voltage by pulse width



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN6546A





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