

Vishay General Semiconductor

Surface Mount TRANSZORB® Transient Voltage Suppressors



LINKS TO ADDITIONAL RESOURCES





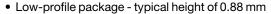






PRIMARY CHARACTERISTICS					
V_{BR}	12 V to 24 V				
V _{WM}	10.2 V to 20.5 V				
P _{PPM} (10 x 1000 μs)	3000 W				
T _J max.	175 °C				
Polarity	Unidirectional				
Package	DFN6546A				
Circuit configuration	Single				

FEATURES





 Leadless DFN package with side-wettable flanks suitable for customer AOI (Automatic Optical Inspection)

C COMPLIANT
HALOGEN

• Ideal for automated placement

- Junction passivation optimized design passivated anisotropic rectifier technology
- Unidirectional
- Excellent clamping capability
- Peak pulse power: 3000 W (10/1000 μs)
- 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 <u>www.vishav.com/doc?99912</u>

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 and JESD 22-B102

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 µs waveform (fig. 1) (1)	P _{PPM}	3000	W			
Peak pulse current with a 10/1000 µs waveform (fig. 3) (1)	I _{PPM}	See table next page	Α			
Operating junction and storage temperature range	T _J , T _{STG}	-65 to +175	°C			

Note

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

3KDFN12A thru 3KDFN24A

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ELECTRICAL CHARACTERISTICS (T _A = 25 °C, unless otherwise noted)											
DEVICE TYPE	DEVICE MARKING CODE	١	REAKDO /OLTAG / _{BR} ⁽¹⁾ A1 (V)	ìΕ	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 °C I _D	MAXIMUM PEAK PULSE SURGE CURRENT I _{PPM} ⁽²⁾ (A)	MAXIMUM CLAMPING VOLTAGE AT I _{PPM} V _C (V)	TYPICAL TEMP. COEFFICIEN T OF V _{BR} ⁽³⁾ α T (%/°C)
		MIN.	NOM.	MAX.				(μΑ)			, ,
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: $t_p \le 50 \text{ ms}$
- (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 °C x (1 + αT x (T_J 25))
- (4) All terms and symbols are consistent with ANSI/IEEE C62.35

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	TYP.	MAX.	UNIT		
Thermal resistance	R _{0JA} (1)	105	132	°C/W		
Thermal resistance	R _{0JM} ⁽²⁾	0.95	1.19	°C/W		

Notes

- (1) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz. standard footprint
- (2) Thermal resistance junction-to-mount to follow JEDEC® 51-14 using Transient Dual Interface Test Method (TDIM)

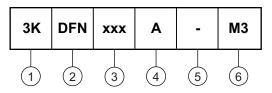
IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS ($T_A = 25~^{\circ}\text{C}$ unless otherwise noted)					
STANDARD	TEST TYPE TEST CONDITIONS SYMBOL VALUE				
IEC 61000-4-2	Contact discharge	C = 150 pF, R = 330 Ω	ESD	30 kV	
IEG 61000-4-2	Air discharge	C = 150 pr, h = 550 \$2	E9D	30 kV	

3KDFN12A thru 3KDFN24A

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ORDERING INFORMATION TABLE

Device code



Peak pulse power rating (3K = 3000 W)

2 - DFN package

Nominal breakdown voltage

- Breakdown voltage tolerance and polarity (A ± 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	Н	1500	7" diameter plastic tape and reel		
3KDFN12A-M3/I	0.094	I	6000	13" diameter plastic tape and reel		



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

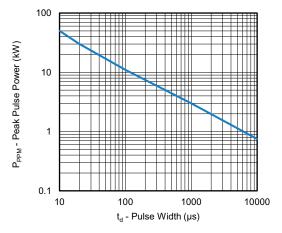


Fig. 1 - Peak Pulse Power Rating Curve

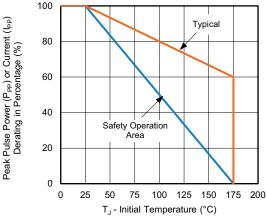


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

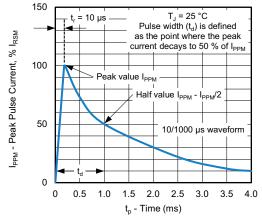


Fig. 3 - Pulse Waveform

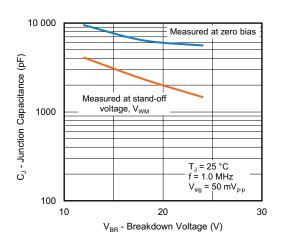


Fig. 4 - Typical Junction Capacitance

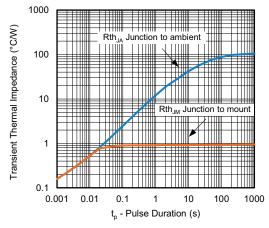


Fig. 5 - Typical Transient Thermal Impedance

Note

· Fig. 1, power calculations is based on IPPM times defined maximum clamping voltage by pulse width

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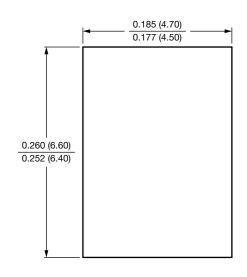


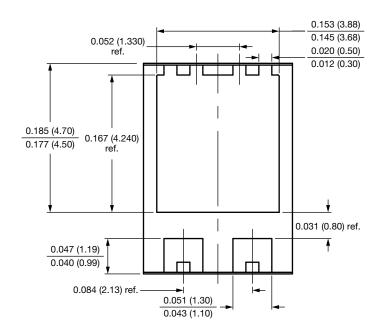


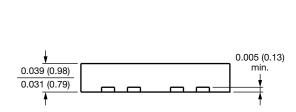
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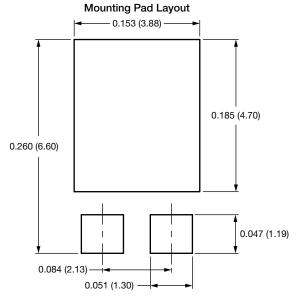
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN6546A











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