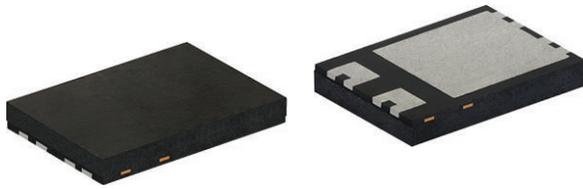


Surface-Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DFN6546A



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
V_{BR}	12 V to 100 V
V_{WM}	10.2 V to 85.5 V
P_{PPM} (10 x 1000 μ s)	3000 W
T_J max.	185 °C
Polarity	Bidirectional
Package	DFN6546A
Circuit configuration	Single

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
- $T_J = 185$ °C capability suitable for high reliability and automotive requirement
- Bidirectional
- 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
- AEC-Q101 qualified
- Automotive ordering code: base P/NHM3
- Compatible to SMPC (TO-277A) package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE



RoHS
COMPLIANT
HALOGEN
FREE

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 automotive.

MECHANICAL DATA

Case: DFN6546A

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

Polarity: no cathode band for bidirectional types

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 +185	°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 °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 °C I _R (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 (%/°C)
		MIN.	NOM.	MAX.							
T3KN12CA	T3NA	11.4	12.0	12.6	1.0	10.2	5.0	50	180	16.7	0.070
T3KN13CA	T3NB	12.4	13.0	13.7	1.0	11.1	5.0	50	165	18.2	0.072
T3KN15CA	T3NC	14.3	15.0	15.8	1.0	12.8	2.0	20	142	21.2	0.076
T3KN16CA	T3ND	15.2	16.0	16.8	1.0	13.6	2.0	20	133	22.5	0.078
T3KN18CA	T3NE	17.1	18.0	18.9	1.0	15.3	1.0	10	118	25.5	0.080
T3KN20CA	T3NF	19.0	20.0	21.0	1.0	17.1	1.0	10	108	27.7	0.082
T3KN22CA	T3NG	20.9	22.0	23.1	1.0	18.8	1.0	10	98.0	30.6	0.084
T3KN24CA	T3NH	22.8	24.0	25.2	1.0	20.5	1.0	10	90.4	33.2	0.085
T3KN27CA	T3NJ	25.7	27.0	28.4	1.0	23.1	1.0	10	80.0	37.5	0.087
T3KN30CA	T3NK	28.5	30.0	31.5	1.0	25.6	1.0	10	72.5	41.4	0.088
T3KN33CA	T3NL	31.4	33.0	34.7	1.0	28.2	1.0	10	65.6	45.7	0.089
T3KN36CA	T3NM	34.2	36.0	37.8	1.0	30.8	1.0	10	60.1	49.9	0.090
T3KN39CA	T3NN	37.1	39.0	41.0	1.0	33.3	1.0	10	55.7	53.9	0.091
T3KN43CA	T3NP	40.9	43.0	45.2	1.0	36.8	1.0	10	50.6	59.3	0.092
T3KN47CA	T3NQ	44.7	47.0	49.4	1.0	40.2	1.0	10	46.3	64.8	0.092
T3KN51CA	T3NR	48.5	51.0	53.6	1.0	43.6	1.0	10	42.8	70.1	0.093
T3KN56CA	T3NS	53.2	56.0	58.8	1.0	47.8	1.0	10	39.0	77.0	0.093
T3KN62CA	T3NT	58.9	62.0	65.1	1.0	53.0	1.0	10	35.3	85.0	0.094
T3KN68CA	T3NU	64.6	68.0	71.4	1.0	58.1	1.0	10	32.6	92.0	0.095
T3KN75CA	T3NV	71.3	75.0	78.8	1.0	64.1	1.0	10	28.8	104	0.095
T3KN82CA	T3NW	77.9	82.0	86.1	1.0	70.1	1.0	10	26.5	113	0.095
T3KN91CA	T3NX	86.5	91.0	95.5	1.0	77.8	1.0	10	24.0	125	0.096
T3KN100CA	T3NY	95.0	100	105	1.0	85.5	1.0	10	21.9	137	0.096

Notes

- (1) Pulse test: t_p ≤ 50 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 _{θJA} ⁽¹⁾	76	95	°C/W
	R _{θJM} ⁽²⁾	0.95	1.19	°C/W

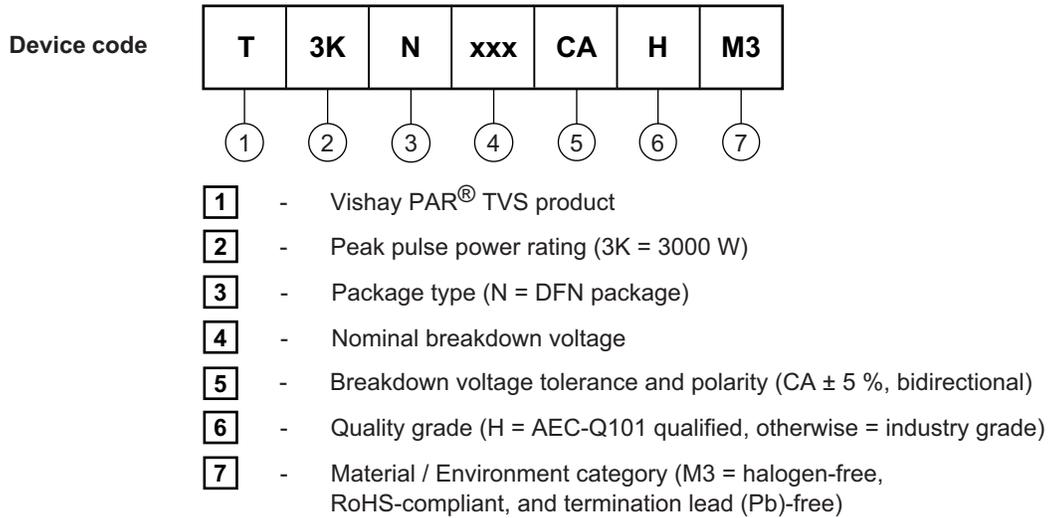
Notes

- (1) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., 4.8 mm x 4.72 mm
- (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 °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
	Air discharge			30 kV



ORDERING INFORMATION TABLE



ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
T3KN12CAHM3/H ⁽¹⁾	0.094	H	1500	7" diameter plastic tape and reel
T3KN12CAHM3/I ⁽¹⁾	0.094	I	6000	13" diameter plastic tape and reel

Note

⁽¹⁾ AEC-Q101 qualified



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

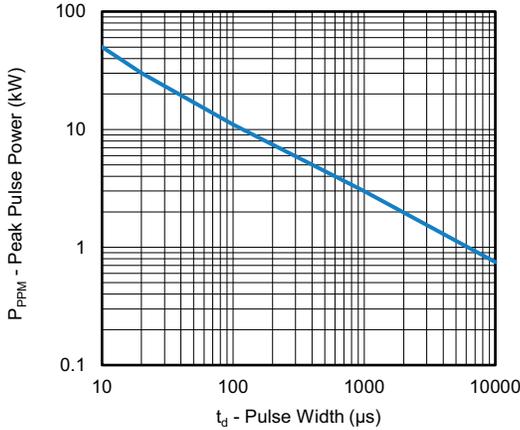


Fig. 1 - Peak Pulse Power Rating Curve

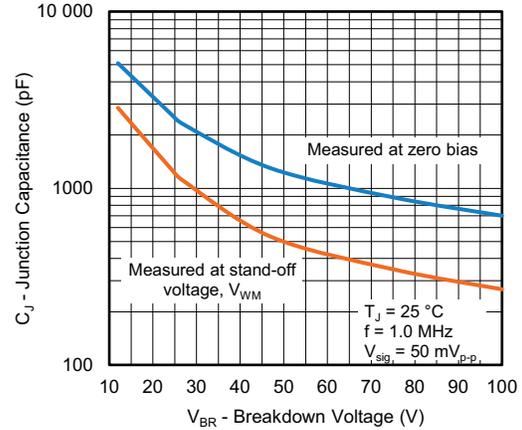


Fig. 4 - Typical Junction Capacitance

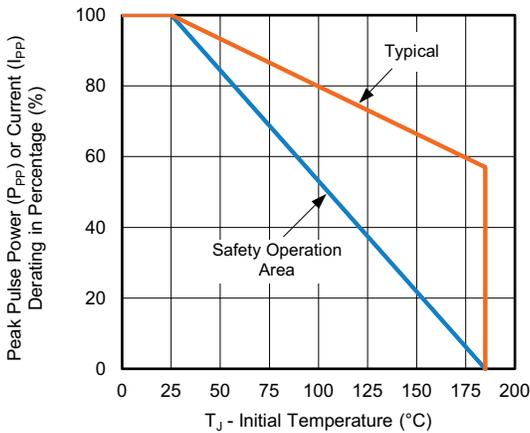


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

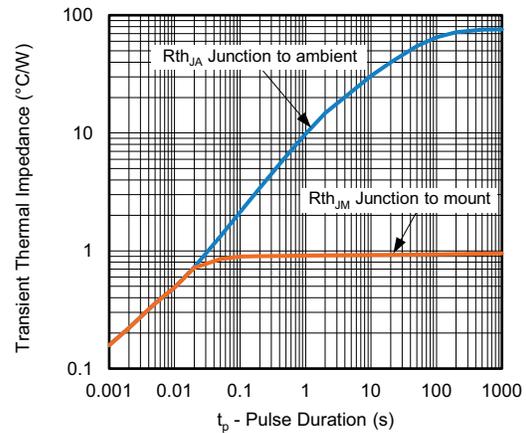


Fig. 5 - Typical Transient Thermal Impedance

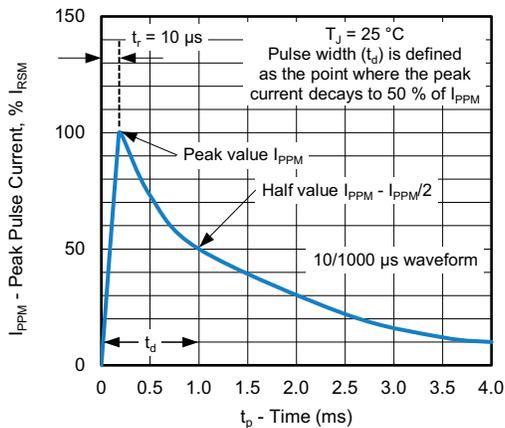


Fig. 3 - Pulse Waveform

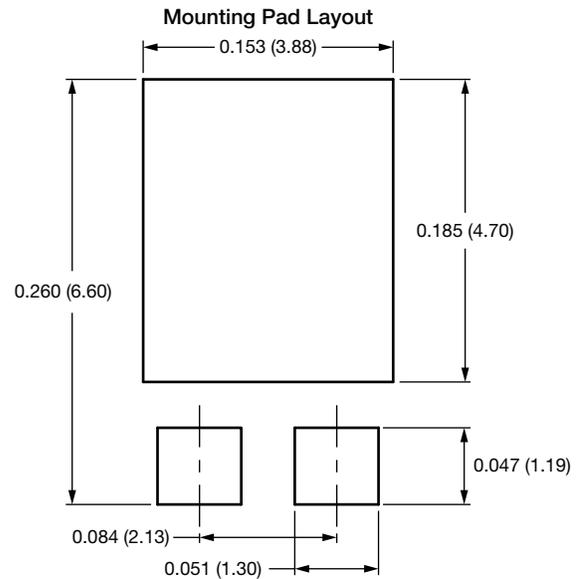
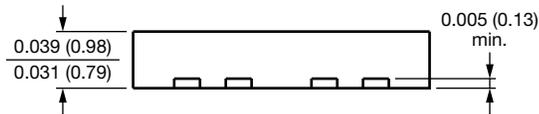
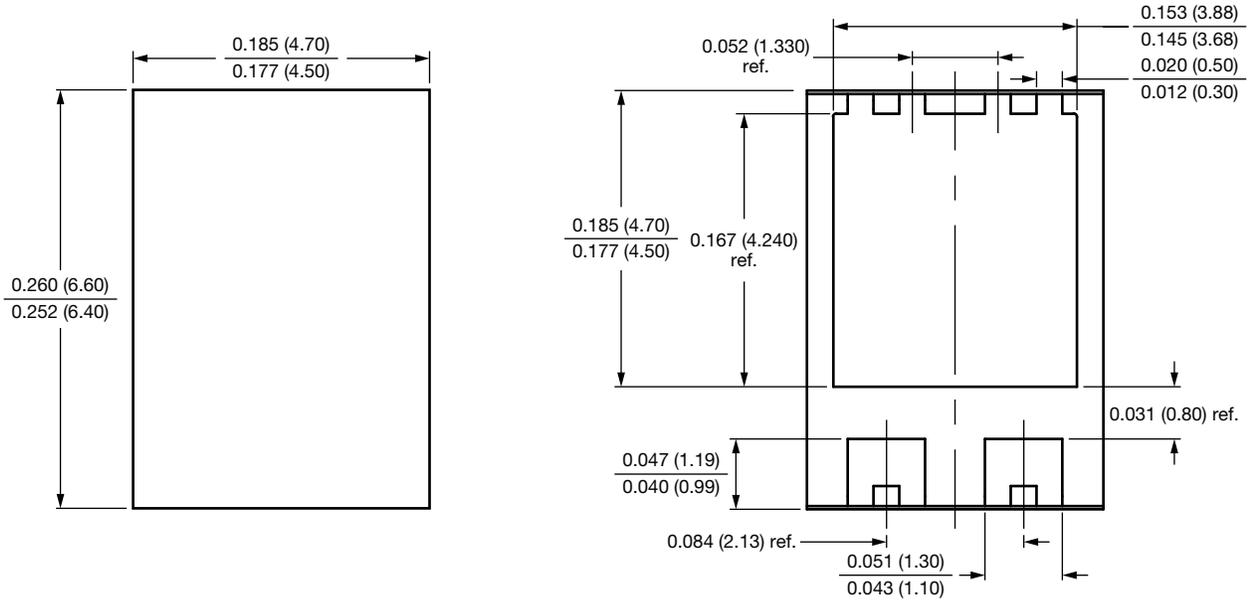
Note

- 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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