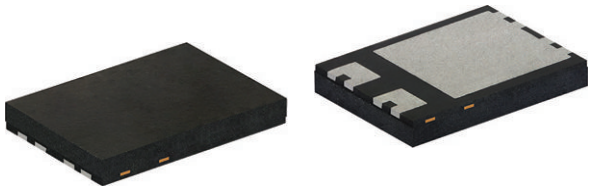
Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DFN6546A

LINKS TO ADDITIONAL RESOURCES

Ultra Librarian EDA / CAD | Related Documents | Packages | Marking | Application Notes

PRIMARY CHARACTERISTICS	
V_{BR}	12 V to 100 V
V_{WM}	10.2 V to 85.5 V
P_{PPM} (10 x 1000 µs)	2000 W
T_J max.	185 °C
Polarity	Bidirectional
Package	DFN6546A
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE

RoHS COMPLIANT

HALOGEN FREE

- 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: 2000 W (10/1000 µs)
- 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

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 µs waveform (fig. 1) (1)	P_{PPM}	2000	W
Peak pulse current with a 10/1000 µs 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) αT (%/°C)
		MIN.	NOM.	MAX.							
T2KN12CA	T2NA	11.4	12.0	12.6	1.0	10.2	5.0	50	120	16.7	0.070
T2KN13CA	T2NB	12.4	13.0	13.7	1.0	11.1	5.0	50	110	18.2	0.072
T2KN15CA	T2NC	14.3	15.0	15.8	1.0	12.8	2.0	20	94.3	21.2	0.076
T2KN16CA	T2ND	15.2	16.0	16.8	1.0	13.6	2.0	20	88.9	22.5	0.078
T2KN18CA	T2NE	17.1	18.0	18.9	1.0	15.3	1.0	10	78.4	25.5	0.080
T2KN20CA	T2NF	19.0	20.0	21.0	1.0	17.1	1.0	10	72.2	27.7	0.082
T2KN22CA	T2NG	20.9	22.0	23.1	1.0	18.8	1.0	10	65.4	30.6	0.084
T2KN24CA	T2NH	22.8	24.0	25.2	1.0	20.5	1.0	10	60.2	33.2	0.085
T2KN27CA	T2NJ	25.7	27.0	28.4	1.0	23.1	1.0	10	53.3	37.5	0.087
T2KN30CA	T2NK	28.5	30.0	31.5	1.0	25.6	1.0	10	48.3	41.4	0.088
T2KN33CA	T2NL	31.4	33.0	34.7	1.0	28.2	1.0	10	43.8	45.7	0.089
T2KN36CA	T2NM	34.2	36.0	37.8	1.0	30.8	1.0	10	40.1	49.9	0.090
T2KN39CA	T2NN	37.1	39.0	41.0	1.0	33.3	1.0	10	37.1	53.9	0.091
T2KN43CA	T2NP	40.9	43.0	45.2	1.0	36.8	1.0	10	33.7	59.3	0.092
T2KN47CA	T2NQ	44.7	47.0	49.4	1.0	40.2	1.0	10	30.9	64.8	0.092
T2KN51CA	T2NR	48.5	51.0	53.6	1.0	43.6	1.0	10	28.5	70.1	0.093
T2KN56CA	T2NS	53.2	56.0	58.8	1.0	47.8	1.0	10	26.0	77.0	0.093
T2KN62CA	T2NT	58.9	62.0	65.1	1.0	53.0	1.0	10	23.5	85.0	0.094
T2KN68CA	T2NU	64.6	68.0	71.4	1.0	58.1	1.0	10	21.7	92.0	0.095
T2KN75CA	T2NV	71.3	75.0	78.8	1.0	64.1	1.0	10	19.2	104	0.095
T2KN82CA	T2NW	77.9	82.0	86.1	1.0	70.1	1.0	10	17.7	113	0.095
T2KN91CA	T2NX	86.5	91.0	95.5	1.0	77.8	1.0	10	16.0	125	0.096
T2KN100CA	T2NY	95.0	100	105	1.0	85.5	1.0	10	14.6	137	0.096

Notes

(1) Pulse test: $t_p \leq 50$ 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	$R_{\theta JA}$ (1)	76	95	°C/W
	$R_{\theta JM}$ (2)	1.2	1.5	°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 °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

Device code

T	2K	N	xxx	CA	H	M3
1	2	3	4	5	6	7

1 - Vishay PAR® TVS product

2 - Peak pulse power rating (2K = 2000 W)

3 - Package type (N = DFN package)

4 - Nominal breakdown voltage

5 - Breakdown voltage tolerance and polarity (CA ± 5 %, bidirectional)

6 - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)

7 - 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
T2KN12CAHM3/H (1)	0.094	H	1500	7" diameter plastic tape and reel
T2KN12CAHM3/I (1)	0.094	I	6000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

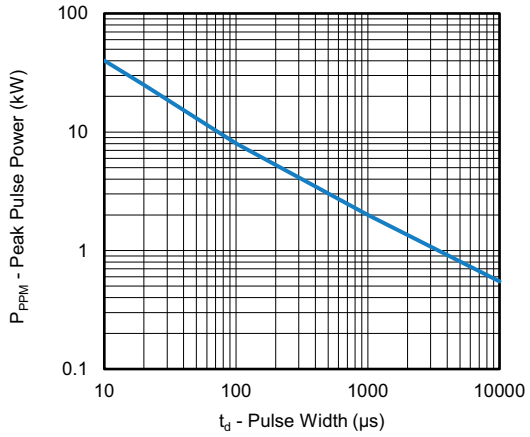


Fig. 1 - Peak Pulse Power Rating Curve

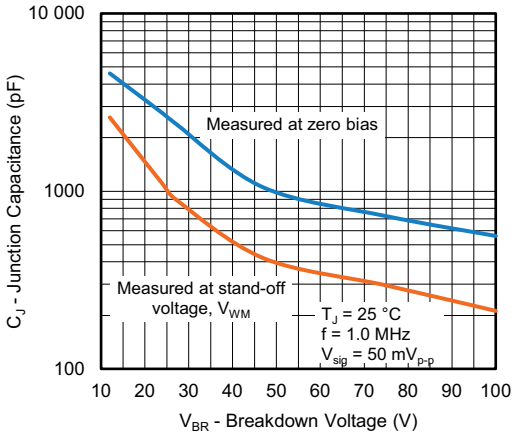


Fig. 4 - Typical Junction Capacitance

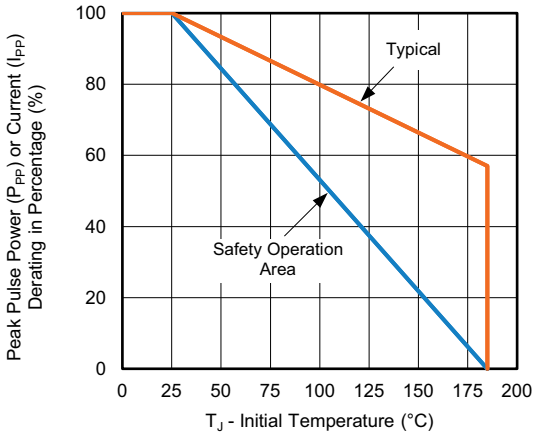


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

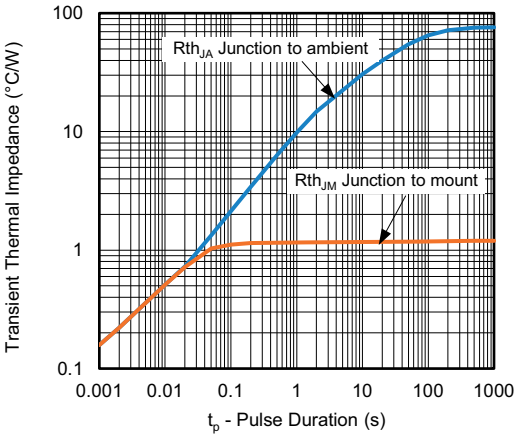


Fig. 5 - Typical Transient Thermal Impedance

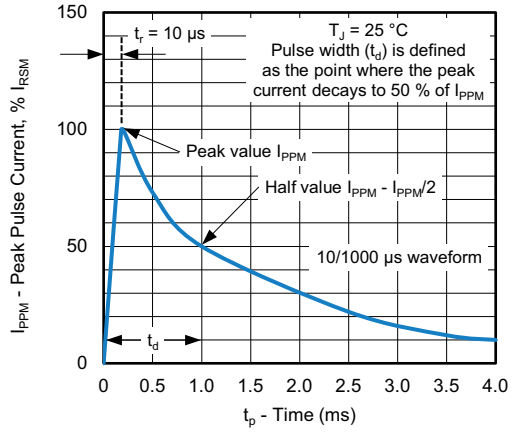


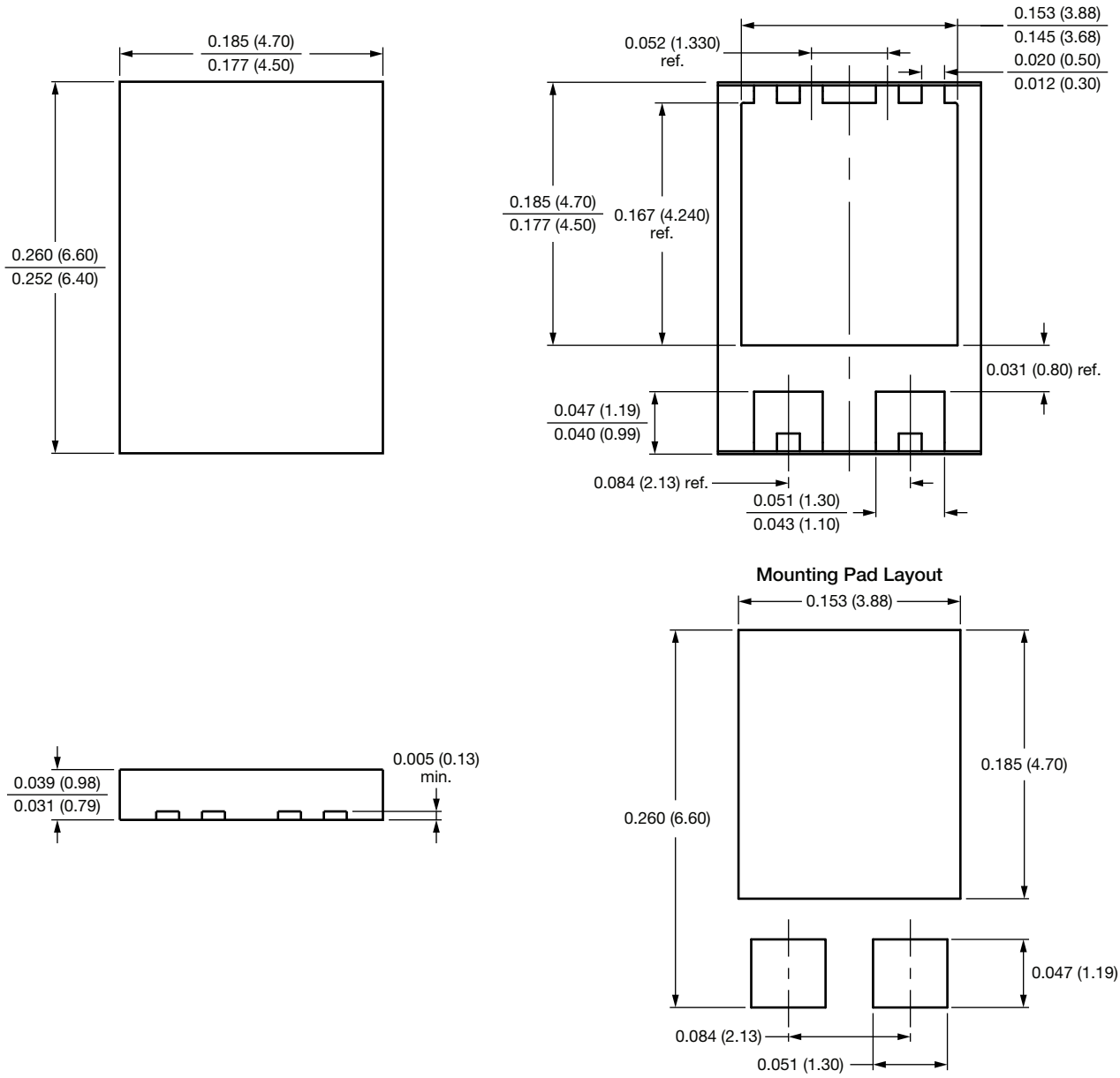
Fig. 3 - Pulse Waveform

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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