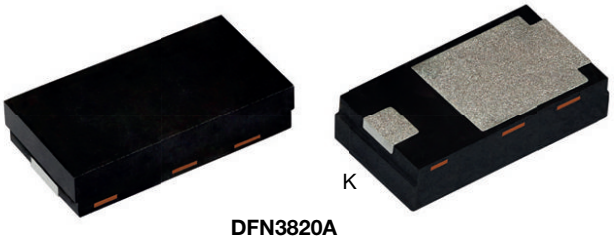
Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DFN3820A

Cathode ○—|◀|—○ Anode

LINKS TO ADDITIONAL RESOURCES

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

PRIMARY CHARACTERISTICS	
V_{BR}	12 V to 51 V
V_{WM}	10.2 V to 43.6 V
P_{PPM} (10 x 1000 µs)	600 W
T_J max.	185 °C
Polarity	Unidirectional
Package	DFN3820A
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
- Unidirectional
- Excellent clamping capability
- Peak pulse power: 600 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 SMP (DO-220AA) 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: DFN3820A
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: 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}	600	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_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) αT (%/°C)
		MIN.	NOM.	MAX.							
T6N12A	ABP	11.4	12.0	12.6	1.0	10.2	2.0	6.0	35.9	16.7	0.070
T6N13A	ABQ	12.4	13.0	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.072
T6N15A	ABR	14.3	15.0	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.076
T6N16A	ABS	15.2	16.0	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.078
T6N18A	ABT	17.1	18.0	18.9	1.0	15.3	1.0	5.0	23.5	25.5	0.080
T6N20A	ABV	19.0	20.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.082
T6N22A	ABW	20.9	22.0	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.084
T6N24A	ABY	22.8	24.0	25.2	1.0	20.5	1.0	5.0	18.1	33.2	0.085
T6N27A	ABZ	25.7	27.0	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.087
T6N30A	ACF	28.5	30.0	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.088
T6N33A	ACG	31.4	33.0	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.089
T6N36A	ACH	34.2	36.0	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.090
T6N39A	ACL	37.1	39.0	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.091
T6N43A	ACM	40.9	43.0	45.2	1.0	36.8	1.0	5.0	10.1	59.3	0.092
T6N47A	ACN	44.7	47.0	49.4	1.0	40.2	1.0	10.0	9.3	64.8	0.092
T6N51A	ACP	48.5	51.0	53.6	1.0	43.6	1.0	10.0	8.6	70.1	0.093

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)	140	175	°C/W
	$R_{\theta JM}$ (2)	5	6.5	°C/W

Notes

(1) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz. standard footprint

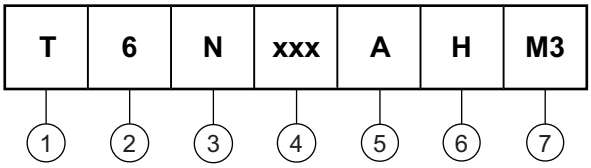
(2) Thermal resistance junction-to-mount to follow JEDEC® 51-14 using transient dual interface test method (TDIM)

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °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



1 - Vishay PAR® TVS product

2 - Peak pulse power rating (6 = 600 W)

3 - Package type (N = DFN package)

4 - Nominal breakdown voltage

5 - Breakdown voltage tolerance and polarity (A ± 5 %, unidirectional)

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**
T6N12AHM3/H [1]	0.023	H	3500	7" diameter plastic tape and reel
T6N12AHM3/I [1]	0.023	I	14 000	13" diameter plastic tape and reel

Note

[1] AEC-Q101 qualified

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

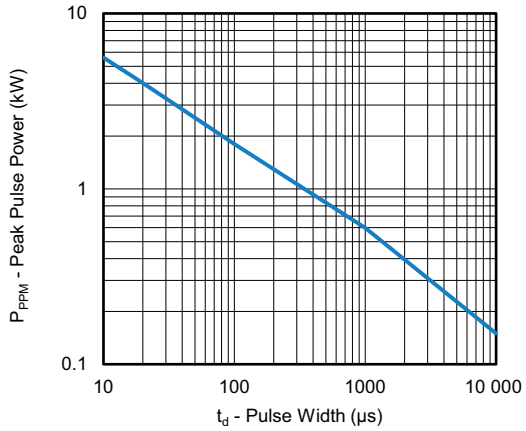


Fig. 1 - Peak Pulse Power Rating Curve

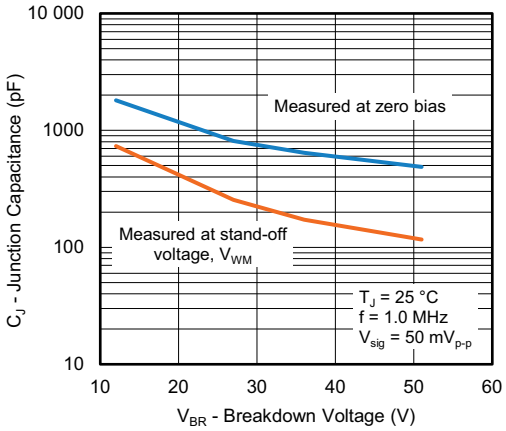


Fig. 4 - Typical Junction Capacitance

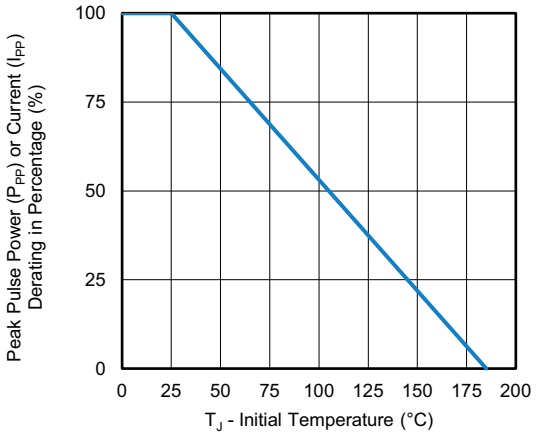


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

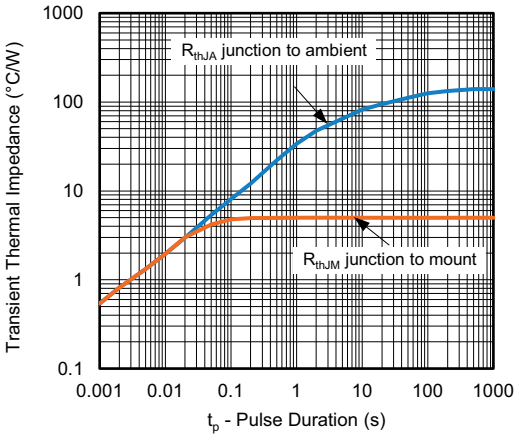


Fig. 5 - Typical Transient Thermal Impedance

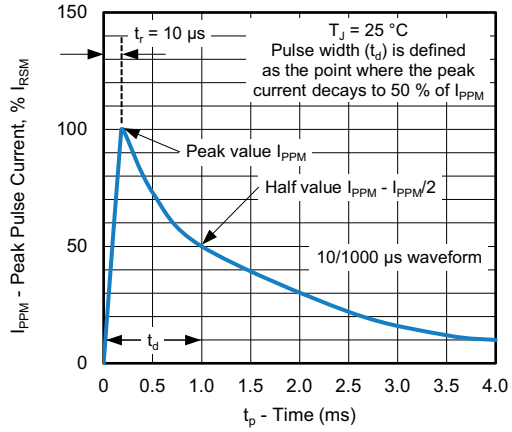


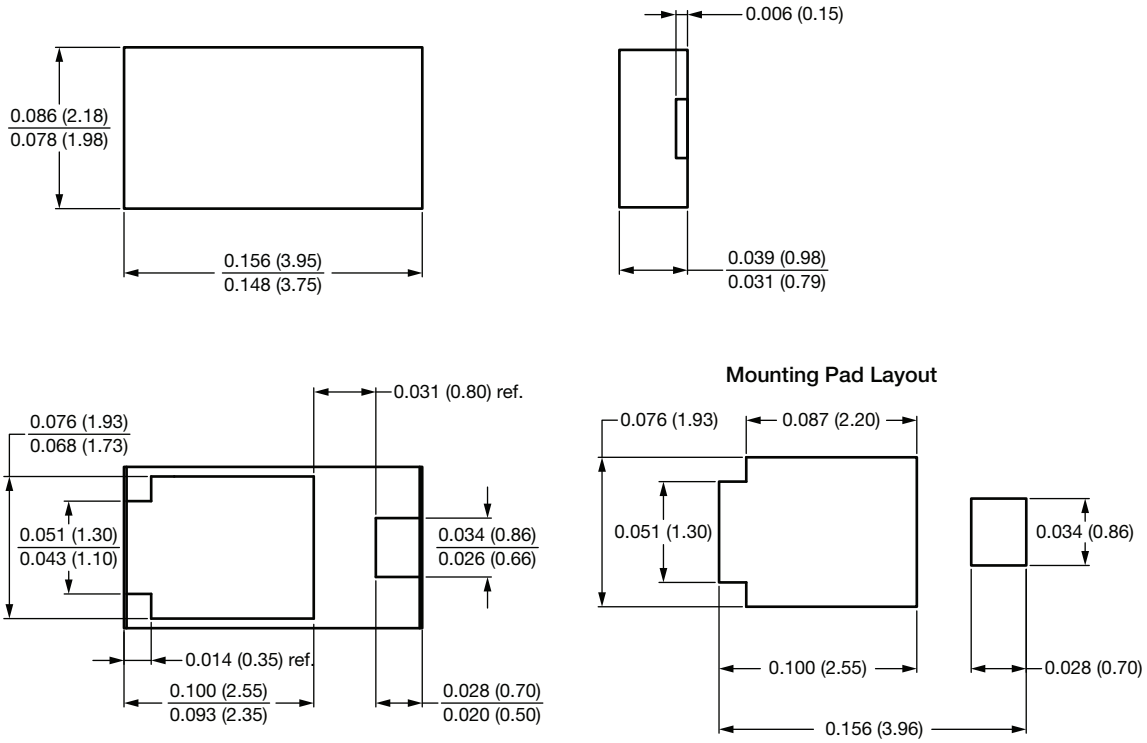
Fig. 3 - Pulse Waveform

Note

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

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN3820A



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