Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

DFN3820A

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)	600 W
T_J max.	185 °C
Polarity	Bidirectional
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
- Bidirectional
- 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: 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}	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_R (µA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)
		MIN.	NOM.	MAX.						
T6N12CA	ABP	11.4	12.0	12.6	1.0	10.2	2.0	6.0	35.9	16.7
T6N13CA	ABQ	12.4	13.0	13.7	1.0	11.1	2.0	5.0	33.0	18.2
T6N15CA	ABR	14.3	15.0	15.8	1.0	12.8	1.0	5.0	28.3	21.2
T6N16CA	ABS	15.2	16.0	16.8	1.0	13.6	1.0	5.0	26.7	22.5
T6N18CA	ABT	17.1	18.0	18.9	1.0	15.3	1.0	5.0	23.5	25.5
T6N20CA	ABV	19.0	20.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7
T6N22CA	ABW	20.9	22.0	23.1	1.0	18.8	1.0	5.0	19.6	30.6
T6N24CA	ABY	22.8	24.0	25.2	1.0	20.5	1.0	5.0	18.1	33.2
T6N27CA	ABZ	25.7	27.0	28.4	1.0	23.1	1.0	5.0	16.0	37.5
T6N30CA	ACF	28.5	30.0	31.5	1.0	25.6	1.0	5.0	14.5	41.4
T6N33CA	ACG	31.4	33.0	34.7	1.0	28.2	1.0	5.0	13.1	45.7
T6N36CA	ACH	34.2	36.0	37.8	1.0	30.8	1.0	5.0	12.0	49.9
T6N39CA	ACL	37.1	39.0	41.0	1.0	33.3	1.0	5.0	11.1	53.9
T6N43CA	ACM	40.9	43.0	45.2	1.0	36.8	1.0	5.0	10.1	59.3
T6N47CA	ACN	44.7	47.0	49.4	1.0	40.2	1.0	10.0	9.3	64.8
T6N51CA	ACP	48.5	51.0	53.6	1.0	43.6	1.0	10.0	8.6	70.1
T6N56CA	ACQ	53.2	56.0	58.8	1.0	47.8	1.0	10.0	7.8	77.0
T6N62CA	ACR	58.9	62.0	65.1	1.0	53.0	1.0	10.0	7.1	85.0
T6N68CA	ACS	64.6	68.0	71.4	1.0	58.1	1.0	10.0	6.5	92.0
T6N75CA	ACT	71.3	75.0	78.8	1.0	64.1	1.0	10.0	5.8	104
T6N82CA	ACU	77.9	82.0	86.1	1.0	70.1	1.0	10.0	5.3	113
T6N91CA	ACV	86.5	91.0	95.5	1.0	77.8	1.0	10.0	4.8	125
T6N100CA	ACW	95.0	100	105	1.0	85.5	1.0	10.0	4.4	137

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) Surge current waveform per fig. 3 and derated per fig. 2

(3) 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

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

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 (CA ± 5 %, bidirectional)

6 - Quality grade (H = AEC-Q101 qualified, - = 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
T6N12CAHM3/H [1]	0.023	H	3500	7" diameter plastic tape and reel
T6N12CAHM3/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)

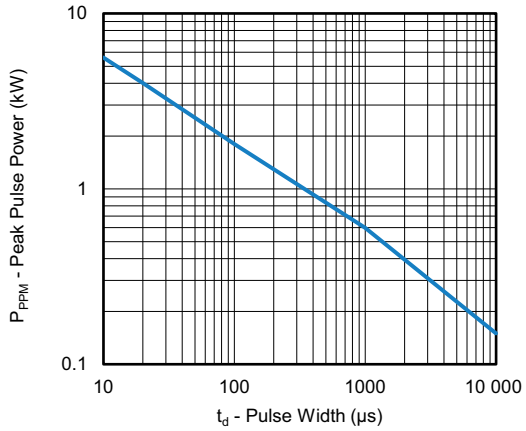


Fig. 1 - Peak Pulse Power Rating Curve

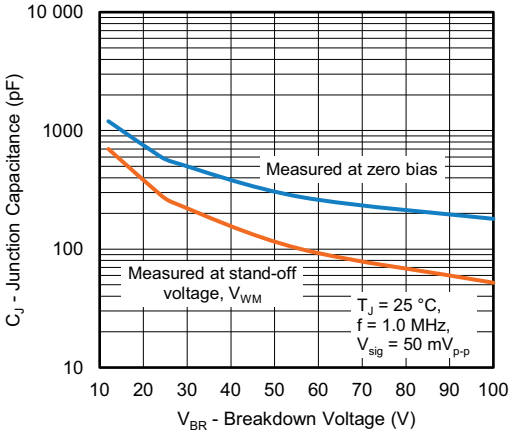


Fig. 4 - Typical Junction Capacitance

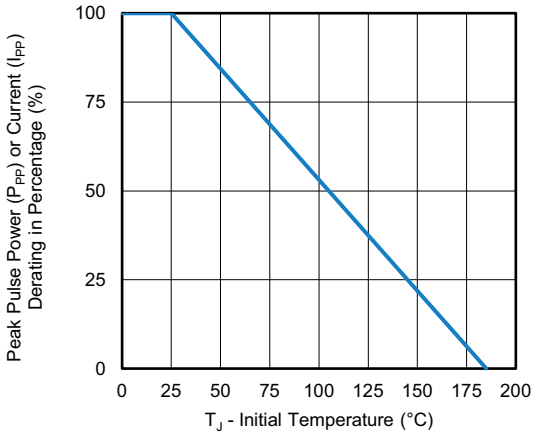


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

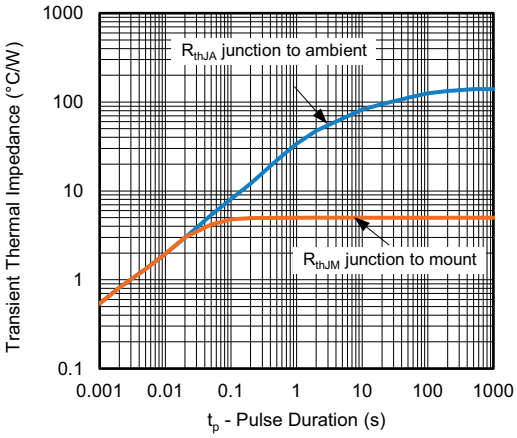


Fig. 5 - Typical Transient Thermal Impedance

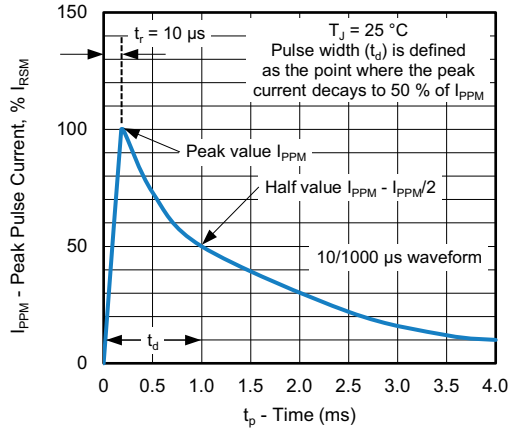


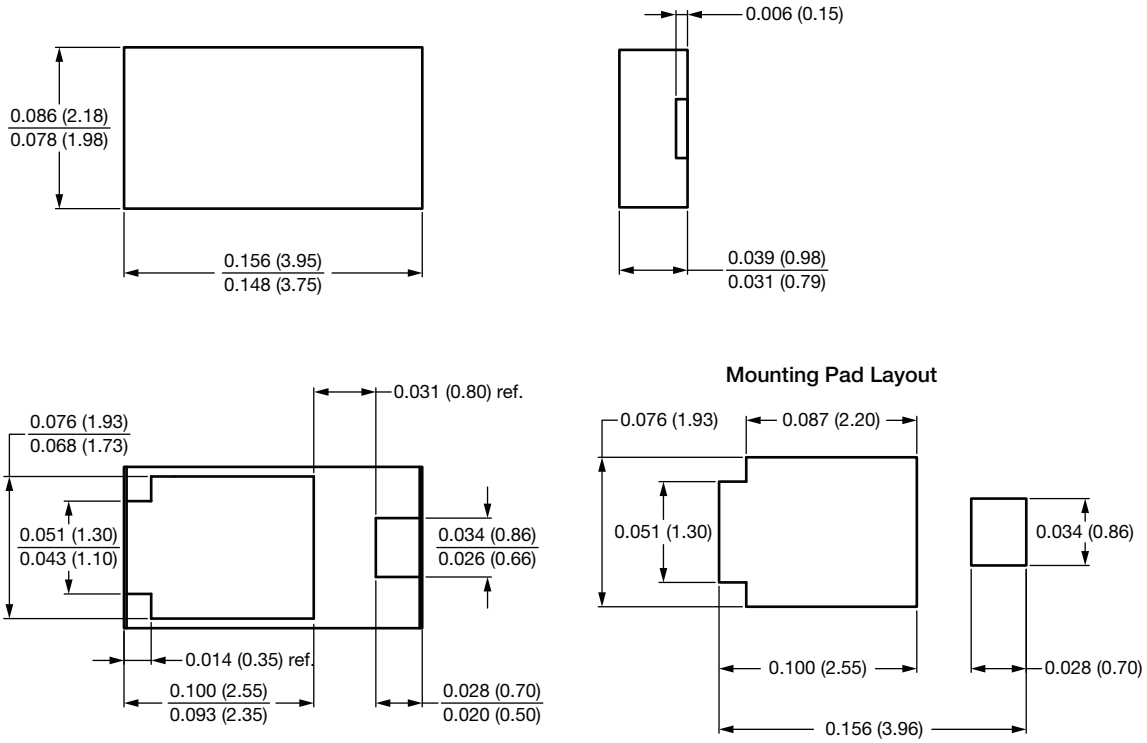
Fig. 3 - Pulse Waveform

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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