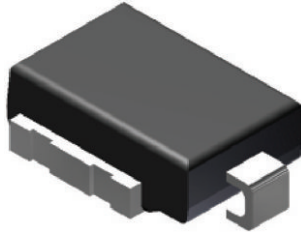


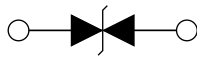


Surface Mount XClampR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
V_{WM}	33 V to 85 V
V_{BR}	36.7 V to 104 V
P_{PPM} (10/1000 μ s)	11 000 W ⁽¹⁾
T_J max.	175 °C
Polarity	Bidirectional
Package	DO-218AC

Note

⁽¹⁾ Equivalent I_{PPM} with conventional 11 kW TVS

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning, especially for automotive load dump protection application.

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with 10/1000 μ s waveform	P_{PPM}	11 000 ⁽¹⁾	W
Peak pulse current with a 10/1000 μ s waveform	I_{PPM} ⁽²⁾	See next table	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	°C

Notes

⁽¹⁾ The peak pulse power at equivalent I_{PPM} with conventional TVS

⁽²⁾ Non-repetitive current pulse and derated above $T_A = 25\text{ °C}$

FEATURES

- XClampR® flat clamping voltage
- Superior 8/20 μ s surge capability with low dynamic resistance
- $T_J = 175\text{ °C}$ capability suitable for high reliability and automotive requirement
- Stable clamping voltage and breakdown voltage over wide temperature range
- Bidirectional
- Low leakage current
- AEC-Q101 qualified
 - Automotive ordering code: base P/NHM3
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

MECHANICAL DATA

Case: DO-218AC

Molding compound meets UL 94 V-0 flammability rating

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HM3 suffix meet JESD 201 class 2 whisker test

Polarity: no cathode marking on bidirectional types



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)												
DEVICE TYPE	BREAKDOWN VOLTAGE V _{BR} (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 = 175 °C I _R (µA)	CLAMPING VOLTAGE V _C AT I _{PPM} 10/1000 µs WAVEFORM			MAXIMUM CLAMPING VOLTAGE V _C AT I _{PPM} 8/20 µs WAVEFORM	
	MIN.	NOM.	MAX.					I _{PPM} (A)	V _C MIN.	V _C MAX.	I _{PPM} (A)	V _C
XFD11K33CA	36.7	38.7	40.6	5.0	33.0	10	150	207.1	33.8	40.6	2140	65.4
XFD11K36CA	40.0	42.1	44.2	5.0	36.0	10	150	190.4	36.8	44.2	2035	68.8
XFD11K40CA	44.4	46.8	49.1	5.0	40.0	10	150	170.3	40.9	49.1	1910	73.3
XFD11K43CA	47.8	50.3	52.8	5.0	43.0	10	150	158.8	43.9	52.8	1826	76.7
XFD11K45CA	50.0	52.7	55.3	5.0	45.0	10	150	151.6	46.0	55.3	1773	78.9
XFD11K48CA	53.3	56.1	58.9	5.0	48.0	10	150	142.5	49.0	58.9	1701	82.3
XFD11K51CA	56.7	59.7	62.7	5.0	51.0	10	150	133.8	52.2	62.7	1634	85.7
XFD11K54CA	60.0	63.2	66.3	5.0	54.0	10	150	126.6	55.2	66.3	1572	89.1
XFD11K58CA	64.4	67.8	71.2	5.0	58.0	10	150	117.7	59.2	71.2	1496	93.6
XFD11K60CA	66.7	70.2	73.7	5.0	60.0	10	150	113.9	61.3	73.7	1461	95.8
XFD11K64CA	71.1	74.9	78.6	5.0	64.0	10	150	107.0	65.4	78.6	1395	100.3
XFD11K70CA	77.8	81.9	86.0	5.0	70.0	10	150	97.5	71.5	86.0	1027	107.1
XFD11K75CA	83.3	87.7	92.1	5.0	75.0	10	150	91.0	76.6	92.1	976	112.7
XFD11K78CA	86.7	91.3	95.8	5.0	78.0	10	150	87.5	79.8	95.8	947	116.1
XFD11K85CA	94.4	99.2	104	5.0	85.0	10	150	80.5	86.7	104.0	887	124.0

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	TYP.	UNIT
Thermal resistance	R _{θJA} ⁽¹⁾	55	°C/W
	R _{θJM} ⁽²⁾	0.35	

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)

ORDERING INFORMATION TABLE

Device code	X	F	D	11K	xx	CA	H	M3
	①	②	③	④	⑤	⑥	⑦	⑧

- 1** - Vishay XClampR® TVS product
- 2** - Flat clamping
- 3** - Package type (D = SMD package)
- 4** - Peak pulse power rating (11K = Equivalent I_{PPM} with conventional 11 kW)
- 5** - Stand-off voltage
- 6** - Breakdown voltage tolerance and polarity (CA ± 5 %, bidirectional)
- 7** - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)
- 8** - Material / Environment category (M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)

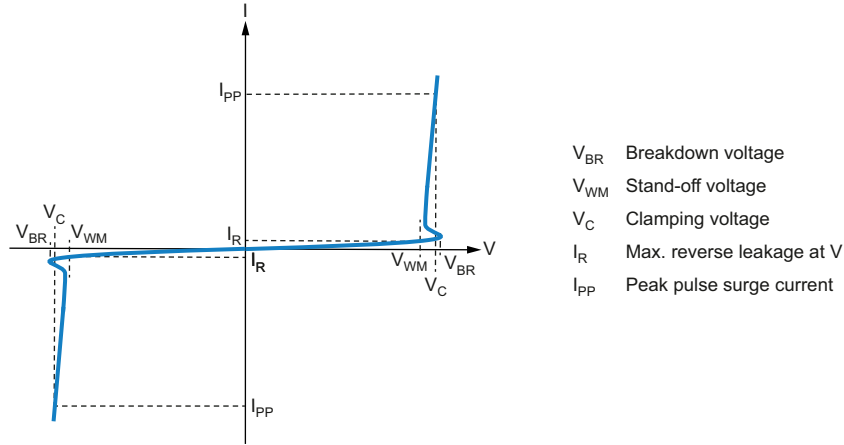
ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
XFD11K33CAHM3/I ⁽¹⁾	2.750	I	750	13" diameter plastic tape and reel
XFD11K33CA-M3/I	2.750	I	750	13" diameter plastic tape and reel

Note

- ⁽¹⁾ AEC-Q101 qualified



I - V CURVE CHARACTERISTICS



- V_{BR} Breakdown voltage
- V_{WM} Stand-off voltage
- V_C Clamping voltage
- I_R Max. reverse leakage at V_C
- I_{PP} Peak pulse surge current

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

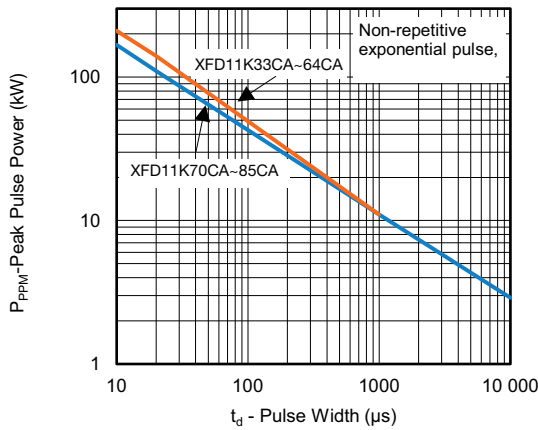


Fig. 1 - Peak Pulse Power Derating Curve

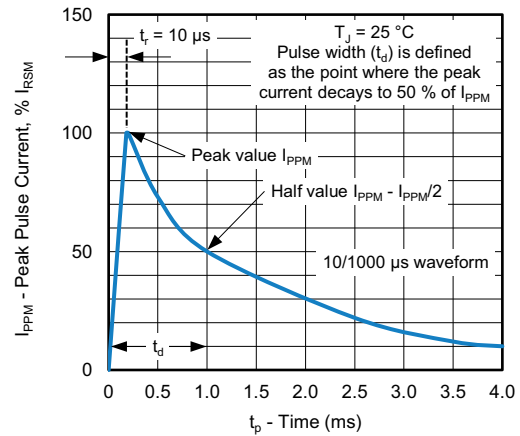


Fig. 3 - 10/1000 μs Pulse Waveform

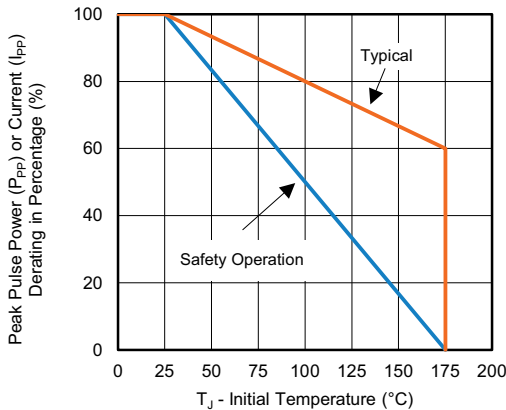


Fig. 2 - Peak Pulse Current vs. Initial Junction Temperature

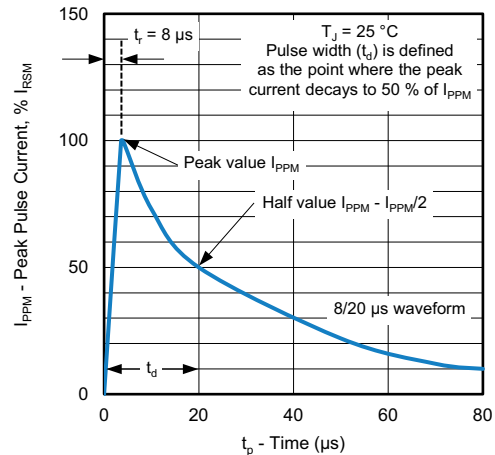


Fig. 4 - 8/20 μs Pulse Waveform

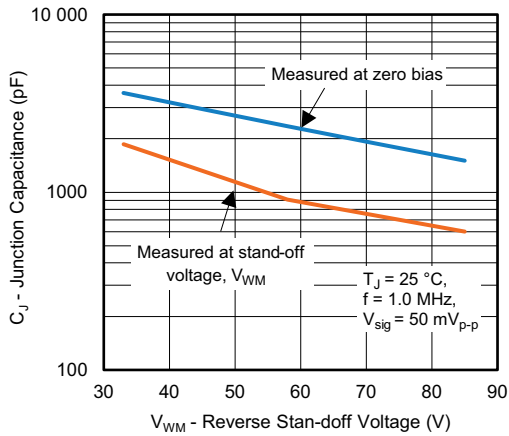


Fig. 5 - Typical Junction Capacitance

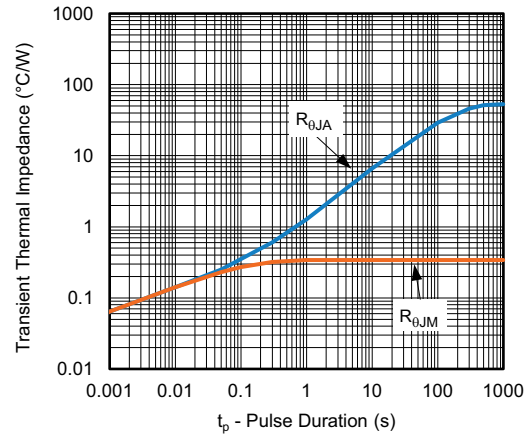
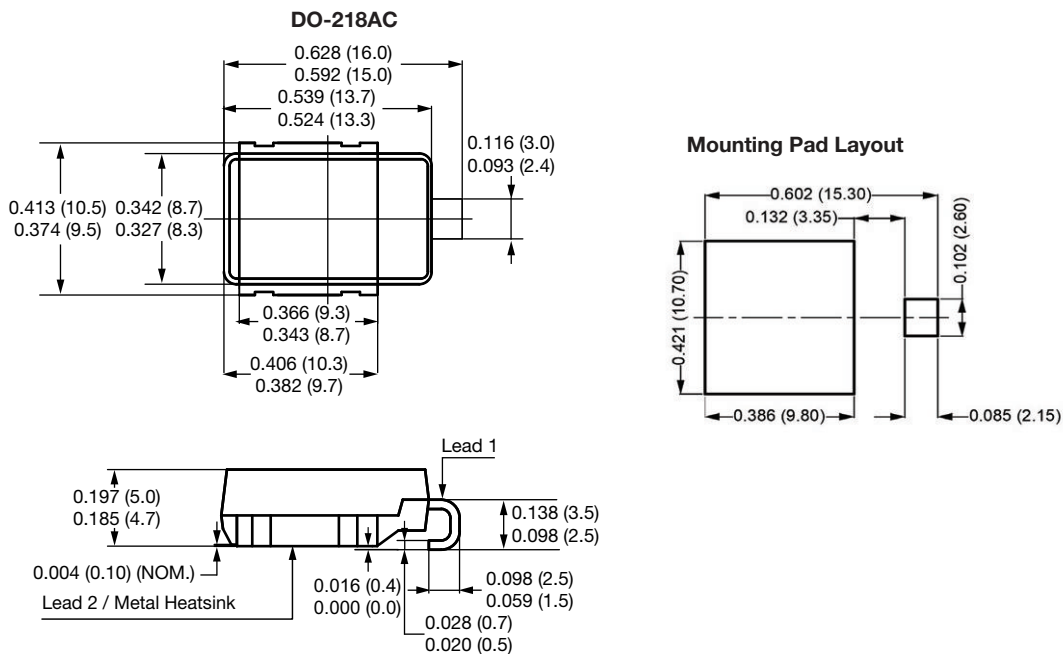


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Note

- Footprint in accordance with IPC 7351 standard



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