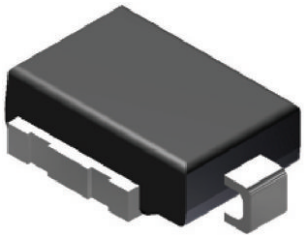
Surface Mount XClampR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

LINKS TO ADDITIONAL RESOURCES

Related Documents | Packages | Marking

PRIMARY CHARACTERISTICS	
V_{WM}	33 V to 85 V
V_{BR}	36.7 V to 104 V
P_{PPM} (10/1000 µs)	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.

FEATURES

- XClampR® flat clamping voltage
- Superior 8/20 µs surge capability with low dynamic resistance
- T_J = 175 °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

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power dissipation with 10/1000 µs waveform	P_{PPM}	11 000 (1)	W
Peak pulse current with a 10/1000 µs 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 °C

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	2317	60.4
XFD11K36CA	40.0	42.1	44.2	5.0	36.0	10	150	190.4	36.8	44.2	2194	63.8
XFD11K40CA	44.4	46.8	49.1	5.0	40.0	10	150	170.3	40.9	49.1	2049	68.3
XFD11K43CA	47.8	50.3	52.8	5.0	43.0	10	150	158.8	43.9	52.8	1953	71.7
XFD11K45CA	50.0	52.7	55.3	5.0	45.0	10	150	151.6	46.0	55.3	1893	73.9
XFD11K48CA	53.3	56.1	58.9	5.0	48.0	10	150	142.5	49.0	58.9	1811	77.3
XFD11K51CA	56.7	59.7	62.7	5.0	51.0	10	150	133.8	52.2	62.7	1735	80.7
XFD11K54CA	60.0	63.2	66.3	5.0	54.0	10	150	126.6	55.2	66.3	1665	84.1
XFD11K58CA	64.4	67.8	71.2	5.0	58.0	10	150	117.7	59.2	71.2	1580	88.6
XFD11K60CA	66.7	70.2	73.7	5.0	60.0	10	150	113.9	61.3	73.7	1541	90.8
XFD11K64CA	71.1	74.9	78.6	5.0	64.0	10	150	107.0	65.4	78.6	1468	95.3
XFD11K70CA	77.8	81.9	86.0	5.0	70.0	10	150	97.5	71.5	86.0	1077	102.1
XFD11K75CA	83.3	87.7	92.1	5.0	75.0	10	150	91.0	76.6	92.1	1021	107.7
XFD11K78CA	86.7	91.3	95.8	5.0	78.0	10	150	87.5	79.8	95.8	990	111.1
XFD11K85CA	94.4	99.2	104	5.0	85.0	10	150	80.5	86.7	104.0	925	119.0

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)

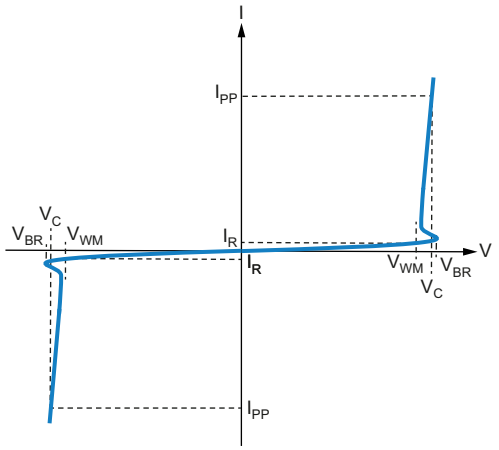
8 - Material / Environment category
(M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)

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
I_{PP}	Peak pulse surge current

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

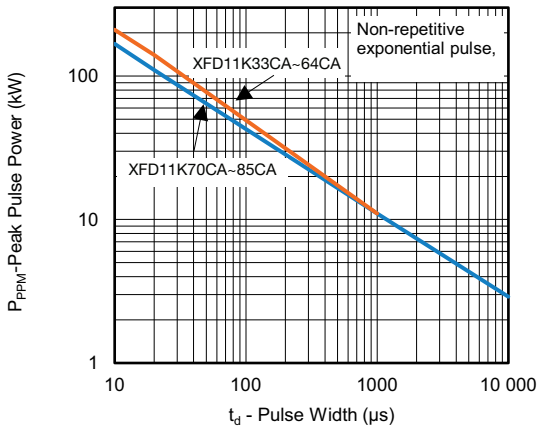


Fig. 1 - Peak Pulse Power Derating Curve

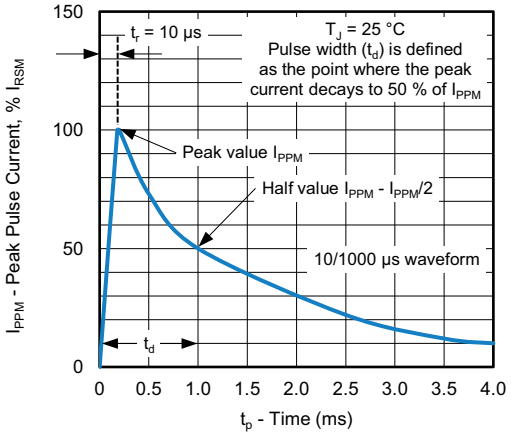


Fig. 3 - 10/1000 µs Pulse Waveform

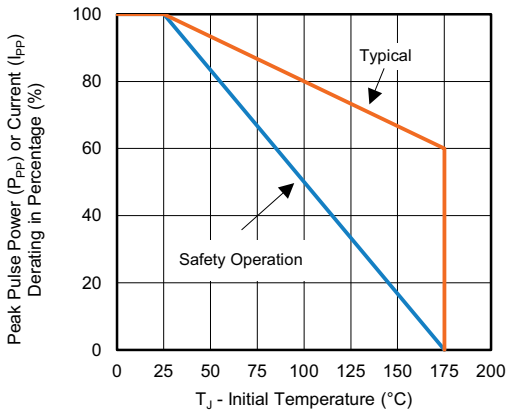


Fig. 2 - Peak Pulse Current vs. Initial Junction Temperature

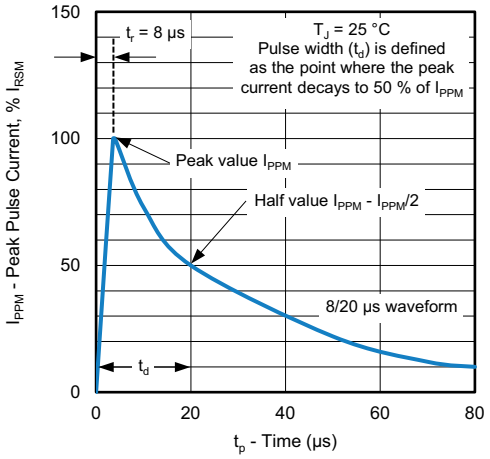


Fig. 4 - 8/20 µs Pulse Waveform

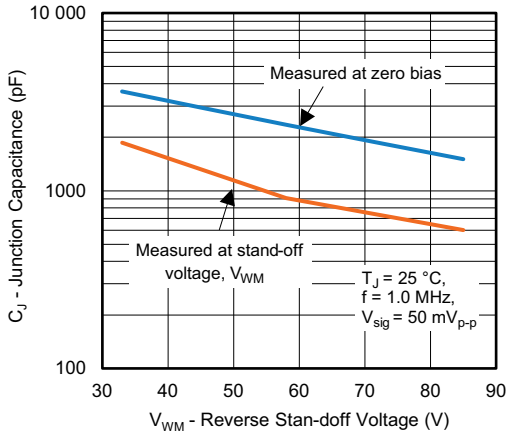
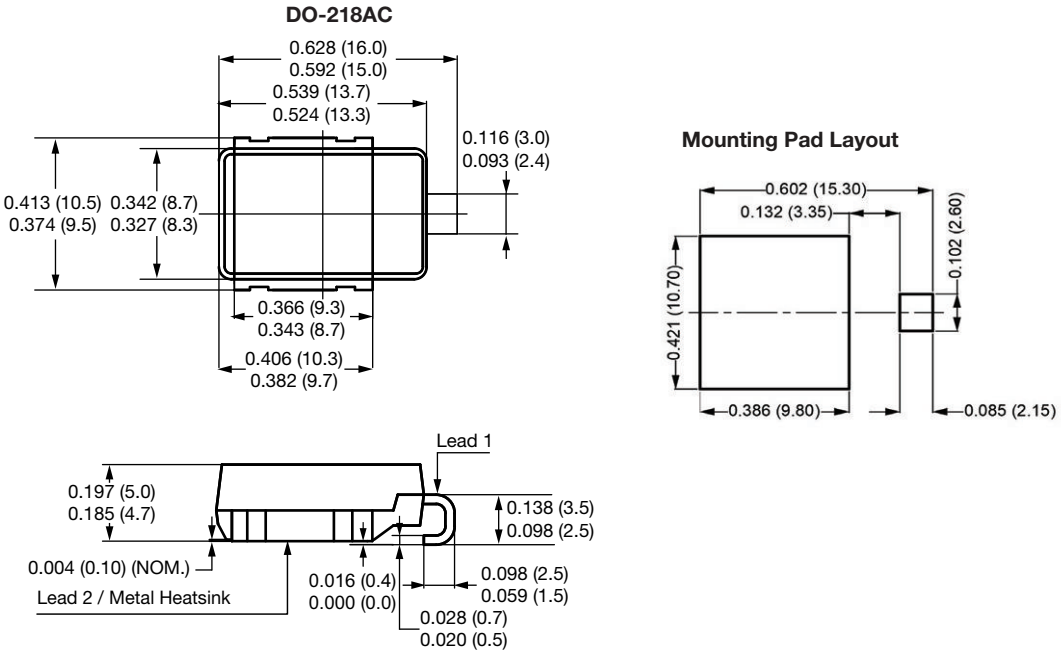


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Note

- Footprint in accordance with IPC 7351 standard

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