

Varistors with Thermal Decoupler - VTDM - Match Series

Description

The VTDM(S) - Match Series Varistors with Thermal Decoupler use special-shape metal oxide varistors equipped with a thermal decoupling device. They are widely used in TVSS products, AC/DC power supplies, AC panel protection modules, AC line power supplies, surge protected strip connectors, AC power meters, UPS (Uninterruptible Power Supplies), inverters, white goods, GFCIs (Ground Fault Current Interrupters). The advantages of the VTDM(S) - Match Series Varistors with Thermal Decoupler are: terminals construction for PCB mounting, a thermal decoupling device which protects VTDM(S) - Match Series against varistor failure in the event of abnormal overvoltage and can withstand 16Amps (for one decoupler), the VTDM(S) - Match Series also has the remote signalization capability. They can have different voltage values (see VTD-MV) or they can be matched and therefore rated for higher currents or a combination of these new abilities.

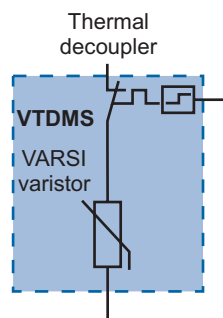
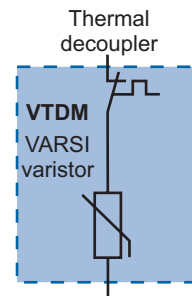
Main Features

Wide Operating Voltage Range V_{RMS}	75 V to 440 V
Very Good Protection Level U_P (at U_{OC}/I_{SC})	400 V to 1800 V
High Max. Discharge Current Capability I_{max} (8/20 μs)	40000 A to 160000 A
Wire Terminals for PCB Mounting	
Option with Decoupling Device with VTDMS Signalization	
Option with Matched Varistors for Higher Current Ratings (up to 160000 A)	
Options with Different Voltage Ratings in One Bulk (up to 8 different ratings)	
Options with Different Voltage Ratings and Different Current Ratings in One Bulk	

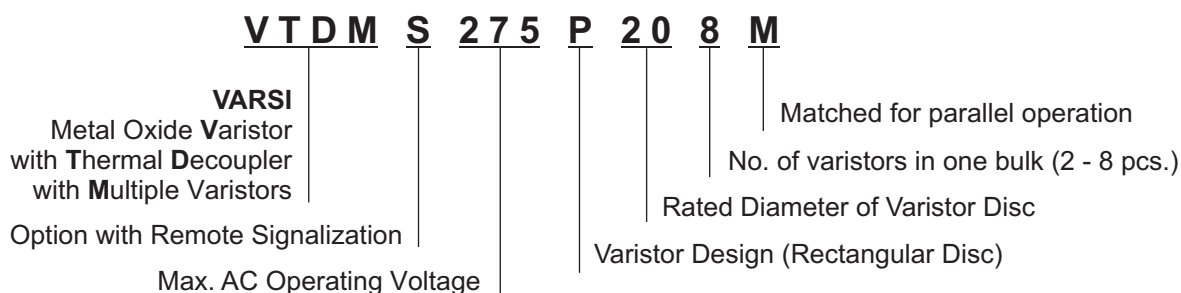


General Technical Data

Tested in accordance with	IEC 61643-1, IEC 61051-1 and UL 1449
Category IEC / VDE	III / D
Operating Temperature	-40 ... +80°C
Response Time	< 25 ns
Mounting	on Printed Circuit Board



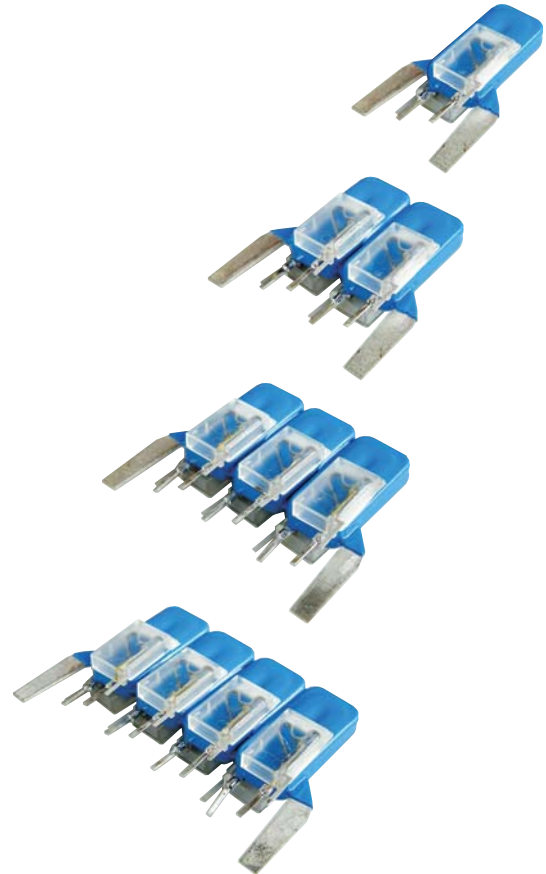
Type Designation



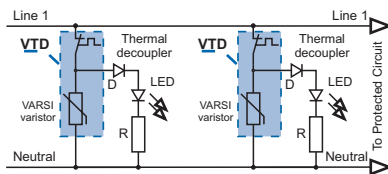
Applications

The VTDM - Match Series Varistors can be used in all the applications represented in the VTD series. For the VTDM series you just need to establish connection of all the varistors (in the product you choose) in parallel and you achieve higher current rating than with the usual VTD product.

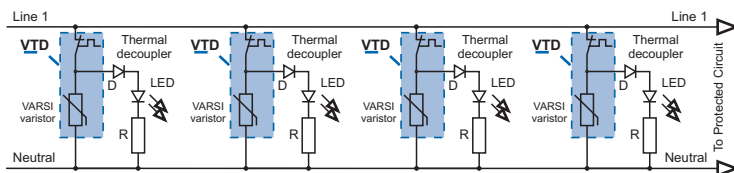
As you can see in the drawing for the application of P202, you connect both (2) varistors in parallel and you put the lights (LED) signalization on each of them. Now you can monitor the protection device. If all the lights (LED) are ON, the protection is 100%, but if one LED switches from ON to OFF, this means that the protection still works, but it is not 100%. In this case you have only one (1) varistor, which means that the protection device works at 50% of its abilities. The same principle can be used with other VTDMs.



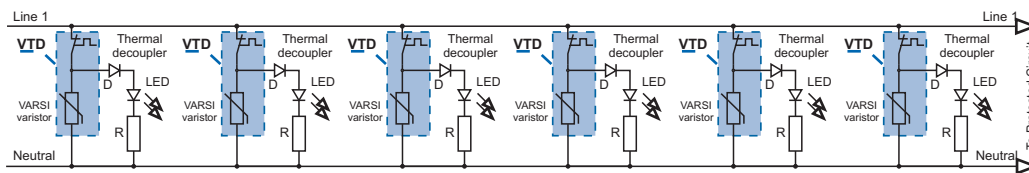
VTDMsxxxP202M



VTDMsxxxP204M



VTDMsxxxP206M



VTDMsxxxP208M

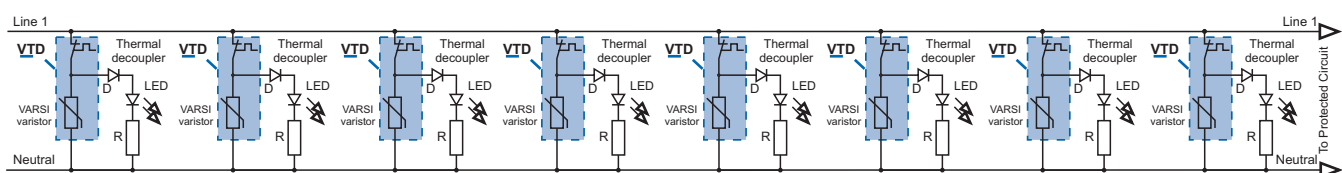


Table of Standard Values

Part Number	Maximum Ratings $T_A = +80^\circ\text{C}$			Characteristics $T_A = +25^\circ\text{C}$							V - I Characteristic Page	Pulse Rating Page
	Operating Voltage		Max. Discharge Current (8/20 μs) I_{max} (kA)	Protection Level at $U_{\text{oc}}/I_{\text{sc}}$ Test Current (8/20 μs)		Varistor Voltage (1 mA)		Maximum Clamping Voltage at Test Current (8/20 μs)		Typical Capacitance $f=1\text{kHz}$ C (pF)		
	RMS Voltage V_{RMS} (V)	DC Voltage V_{DC} (V)		U_{p} (V)	$U_{\text{oc}}/I_{\text{sc}}$ (kV/kA)	V_{N} (V)	V_{N} ($\pm\%$)	V_{C} (V)	I (A)			
VTDM75P202M	75	100	40	580	20/10	120	10	200	150	12000	7	7
VTDM75P204M	75	100	80	580	20/10	120	10	200	150	24000	7	7
VTDM75P206M	75	100	120	580	20/10	120	10	200	150	36000	7	7
VTDM75P208M	75	100	160	580	20/10	120	10	200	150	48000	7	7
VTDM95P202M	95	125	40	650	20/10	150	10	250	150	7400	7	7
VTDM95P204M	95	125	80	650	20/10	150	10	250	150	14800	7	7
VTDM95P206M	95	125	120	650	20/10	150	10	250	150	22200	7	7
VTDM95P208M	95	125	160	650	20/10	150	10	250	150	29600	7	7
VTDM115P202M	115	150	40	730	20/10	180	10	300	150	6000	7	7
VTDM115P204M	115	150	80	730	20/10	180	10	300	150	12000	7	7
VTDM115P206M	115	150	120	730	20/10	180	10	300	150	18000	7	7
VTDM115P208M	115	150	160	730	20/10	180	10	300	150	24000	7	7
VTDM130P202M	130	170	40	760	20/10	205	10	340	150	5800	7	7
VTDM130P204M	130	170	80	760	20/10	205	10	340	150	11600	7	7
VTDM130P206M	130	170	120	760	20/10	205	10	340	150	17400	7	7
VTDM130P208M	130	170	160	760	20/10	205	10	340	150	23200	7	7
VTDM140P202M	140	180	40	775	20/10	220	10	360	150	5400	7	7
VTDM140P204M	140	180	80	775	20/10	220	10	360	150	10800	7	7
VTDM140P206M	140	180	120	775	20/10	220	10	360	150	16200	7	7
VTDM140P208M	140	180	160	775	20/10	220	10	360	150	21600	7	7
VTDM150P202M	150	200	40	790	20/10	240	10	395	150	5000	7	7
VTDM150P204M	150	200	80	790	20/10	240	10	395	150	10000	7	7
VTDM150P206M	150	200	120	790	20/10	240	10	395	150	15000	7	7
VTDM150P208M	150	200	160	790	20/10	240	10	395	150	20000	7	7
VTDM175P202M	175	225	40	850	20/10	270	10	455	150	4200	7	7
VTDM175P204M	175	225	80	850	20/10	270	10	455	150	8400	7	7
VTDM175P206M	175	225	120	850	20/10	270	10	455	150	12600	7	7
VTDM175P208M	175	225	160	850	20/10	270	10	455	150	16800	7	7
VTDM230P202M	230	300	40	1100	20/10	360	10	595	150	3400	7	7
VTDM230P204M	230	300	80	1100	20/10	360	10	595	150	6800	7	7
VTDM230P206M	230	300	120	1100	20/10	360	10	595	150	10200	7	7
VTDM230P208M	230	300	160	1100	20/10	360	10	595	150	13600	7	7
VTDM250P202M	250	320	40	1140	20/10	390	10	650	150	3200	7	7
VTDM250P204M	250	320	80	1140	20/10	390	10	650	150	6400	7	7
VTDM250P206M	250	320	120	1140	20/10	390	10	650	150	8600	7	7
VTDM250P208M	250	320	160	1140	20/10	390	10	650	150	12800	7	7
VTDM275P202M	275	350	40	1210	20/10	430	10	710	150	2900	7	7
VTDM275P204M	275	350	80	1210	20/10	430	10	710	150	5800	7	7
VTDM275P206M	275	350	120	1210	20/10	430	10	710	150	8700	7	7
VTDM275P208M	275	350	160	1210	20/10	430	10	710	150	11600	7	7
VTDM300P202M	300	385	40	1320	20/10	470	10	775	150	2700	7	7
VTDM300P204M	300	385	80	1320	20/10	470	10	775	150	5400	7	7
VTDM300P206M	300	385	120	1320	20/10	470	10	775	150	8100	7	7
VTDM300P208M	300	385	160	1320	20/10	470	10	775	150	10800	7	7
VTDM320P202M	320	420	40	1430	20/10	510	10	840	150	2400	7	7
VTDM320P204M	320	420	80	1430	20/10	510	10	840	150	4800	7	7
VTDM320P206M	320	420	120	1430	20/10	510	10	840	150	7200	7	7
VTDM320P208M	320	420	160	1430	20/10	510	10	840	150	9600	7	7

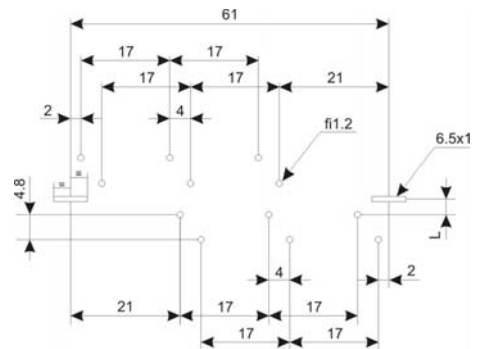
Table of Standard Values

Part Number	Maximum Ratings TA =+80°C			Characteristics TA = +25°C							V - I Characteristic Page	Pulse Rating Page
	Operating Voltage		Max. Discharge Current (8/20 μs) I _{max} (kA)	Protection Level at U _{oc} /I _{sc} Test Current (8/20 μs)		Varistor Voltage (1 mA)		Maximum Clamping Voltage at Test Current (8/20 μs)		Typical Capacitance f=1kHz C (pF)		
	RMS Voltage V _{RMS} (V)	DC Voltage V _{DC} (V)		U _p (V)	U _{oc} /I _{sc} (kV/kA)	V _N (V)	V _N (±%)	V _C (V)	I (A)			
VTDM350P202M	350	460	40	1560	20/10	560	10	925	150	2200	7	7
VTDM350P204M	350	460	80	1560	20/10	560	10	925	150	4400	7	7
VTDM350P206M	350	460	120	1560	20/10	560	10	925	150	6600	7	7
VTDM350P208M	350	460	160	1560	20/10	560	10	925	150	8800	7	7
VTDM385P202M	385	505	40	1730	20/10	620	10	1025	150	2000	7	7
VTDM385P204M	385	505	80	1730	20/10	620	10	1025	150	4000	7	7
VTDM385P206M	385	505	120	1730	20/10	620	10	1025	150	6000	7	7
VTDM385P208M	385	505	160	1730	20/10	620	10	1025	150	8000	7	7
VTDM420P202M	420	560	40	1880	20/10	680	10	1120	150	1900	7	7
VTDM420P204M	420	560	80	1880	20/10	680	10	1025	150	3800	7	7
VTDM420P206M	420	560	120	1880	20/10	680	10	1025	150	5700	7	7
VTDM420P208M	420	560	160	1880	20/10	680	10	1025	150	7600	7	7
VTDM440P202M	440	585	40	1970	20/10	715	10	1180	150	1800	7	7
VTDM440P204M	440	585	80	1970	20/10	715	10	1180	150	3600	7	7
VTDM440P206M	440	585	120	1970	20/10	715	10	1180	150	5400	7	7
VTDM440P208M	440	585	160	1970	20/10	715	10	1180	150	7200	7	7

Dimensions					Part Number	VTDMSxxxP202M	
T _{max} (mm)	W (mm)	L (mm)	D1 (mm)	D1 (mm)			
9.8	13.7	2.0	1.2x0.5	5x0.5	VTDM75P202M		
10.0	13.7	2.2	1.2x0.5	5x0.5	VTDM95P202M		
10.1	13.7	2.3	1.2x0.5	5x0.5	VTDM115P202M		
10.2	13.7	2.5	1.2x0.5	5x0.5	VTDM130P202M		
10.3	13.7	2.6	1.2x0.5	5x0.5	VTDM140P202M		
10.4	13.7	2.7	1.2x0.5	5x0.5	VTDM150P202M		
10.5	13.7	2.9	1.2x0.5	5x0.5	VTDM175P202M		
10.6	13.7	3.0	1.2x0.5	5x0.5	VTDM230P202M		
10.7	13.7	3.1	1.2x0.5	5x0.5	VTDM250P202M		
10.8	13.7	3.2	1.2x0.5	5x0.5	VTDM275P202M		
10.9	13.7	3.3	1.2x0.5	5x0.5	VTDM300P202M		
11.1	13.7	3.4	1.2x0.5	5x0.5	VTDM320P202M		
11.3	13.7	3.6	1.2x0.5	5x0.5	VTDM350P202M		
11.5	13.7	3.8	1.2x0.5	5x0.5	VTDM385P202M		
11.7	13.7	4.0	1.2x0.5	5x0.5	VTDM420P202M		
11.8	13.7	4.1	1.2x0.5	5x0.5	VTDM440P202M		
Dimensions					Part Number		VTDMSxxxP204M
T _{max} (mm)	W (mm)	L (mm)	D1 (mm)	D1 (mm)			
9.8	13.7	2.0	1.2x0.5	5x0.5	VTDM75P204M		
10.0	13.7	2.2	1.2x0.5	5x0.5	VTDM95P204M		
10.1	13.7	2.3	1.2x0.5	5x0.5	VTDM115P204M		
10.2	13.7	2.5	1.2x0.5	5x0.5	VTDM130P204M		
10.3	13.7	2.6	1.2x0.5	5x0.5	VTDM140P204M		
10.4	13.7	2.7	1.2x0.5	5x0.5	VTDM150P204M		
10.5	13.7	2.9	1.2x0.5	5x0.5	VTDM175P204M		
10.6	13.7	3.0	1.2x0.5	5x0.5	VTDM230P204M		
10.7	13.7	3.1	1.2x0.5	5x0.5	VTDM250P204M		
10.8	13.7	3.2	1.2x0.5	5x0.5	VTDM275P204M		
10.9	13.7	3.3	1.2x0.5	5x0.5	VTDM300P204M		
11.1	13.7	3.4	1.2x0.5	5x0.5	VTDM320P204M		
11.3	13.7	3.6	1.2x0.5	5x0.5	VTDM350P204M		
11.5	13.7	3.8	1.2x0.5	5x0.5	VTDM385P204M		
11.7	13.7	4.0	1.2x0.5	5x0.5	VTDM420P204M		
11.8	13.7	4.1	1.2x0.5	5x0.5	VTDM440P204M		

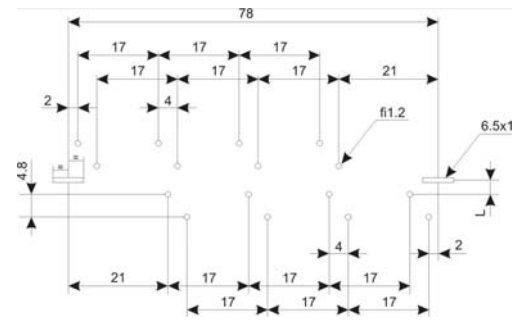
Dimensions					Part Number	VTDM5xxxP206M
T _{max} (mm)	W (mm)	L (mm)	D1 (mm)	D1 (mm)		
9.8	13.7	2.0	1.2x0.5	5x0.5	VTDM75P206M	
10.0	13.7	2.2	1.2x0.5	5x0.5	VTDM95P206M	
10.1	13.7	2.3	1.2x0.5	5x0.5	VTDM115P206M	
10.2	13.7	2.5	1.2x0.5	5x0.5	VTDM130P206M	
10.3	13.7	2.6	1.2x0.5	5x0.5	VTDM140P206M	
10.4	13.7	2.7	1.2x0.5	5x0.5	VTDM150P206M	
10.5	13.7	2.9	1.2x0.5	5x0.5	VTDM175P206M	
10.6	13.7	3.0	1.2x0.5	5x0.5	VTDM230P206M	
10.7	13.7	3.1	1.2x0.5	5x0.5	VTDM250P206M	
10.8	13.7	3.2	1.2x0.5	5x0.5	VTDM275P206M	
10.9	13.7	3.3	1.2x0.5	5x0.5	VTDM300P206M	
11.1	13.7	3.4	1.2x0.5	5x0.5	VTDM320P206M	
11.3	13.7	3.6	1.2x0.5	5x0.5	VTDM350P206M	
11.5	13.7	3.8	1.2x0.5	5x0.5	VTDM385P206M	
11.7	13.7	4.0	1.2x0.5	5x0.5	VTDM420P206M	
11.8	13.7	4.1	1.2x0.5	5x0.5	VTDM440P206M	

Footprint



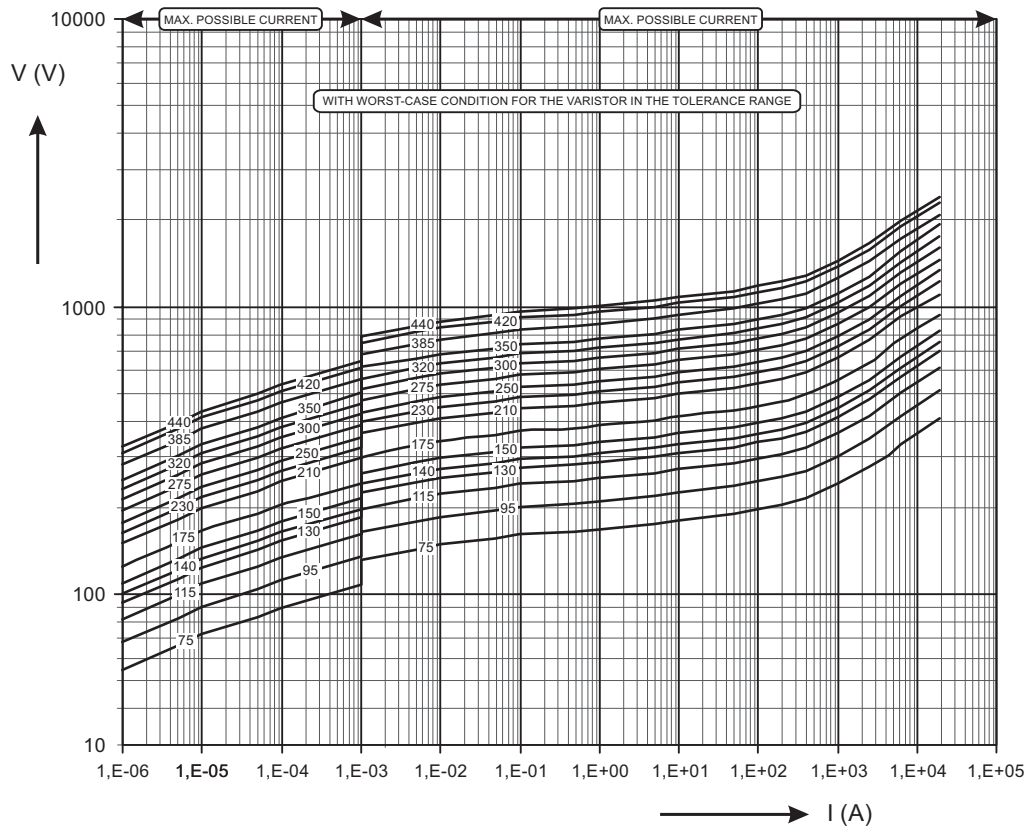
Dimensions					Part Number	VTDM5xxxP208M
T _{max} (mm)	W (mm)	L (mm)	D1 (mm)	D1 (mm)		
9.8	13.7	2.0	1.2x0.5	5x0.5	VTDM75P208M	
10.0	13.7	2.2	1.2x0.5	5x0.5	VTDM95P208M	
10.1	13.7	2.3	1.2x0.5	5x0.5	VTDM115P208M	
10.2	13.7	2.5	1.2x0.5	5x0.5	VTDM130P208M	
10.3	13.7	2.6	1.2x0.5	5x0.5	VTDM140P208M	
10.4	13.7	2.7	1.2x0.5	5x0.5	VTDM150P208M	
10.5	13.7	2.9	1.2x0.5	5x0.5	VTDM175P208M	
10.6	13.7	3.0	1.2x0.5	5x0.5	VTDM230P208M	
10.7	13.7	3.1	1.2x0.5	5x0.5	VTDM250P208M	
10.8	13.7	3.2	1.2x0.5	5x0.5	VTDM275P208M	
10.9	13.7	3.3	1.2x0.5	5x0.5	VTDM300P208M	
11.1	13.7	3.4	1.2x0.5	5x0.5	VTDM320P208M	
11.3	13.7	3.6	1.2x0.5	5x0.5	VTDM350P208M	
11.5	13.7	3.8	1.2x0.5	5x0.5	VTDM385P208M	
11.7	13.7	4.0	1.2x0.5	5x0.5	VTDM420P208M	
11.8	13.7	4.1	1.2x0.5	5x0.5	VTDM440P208M	

Footprint



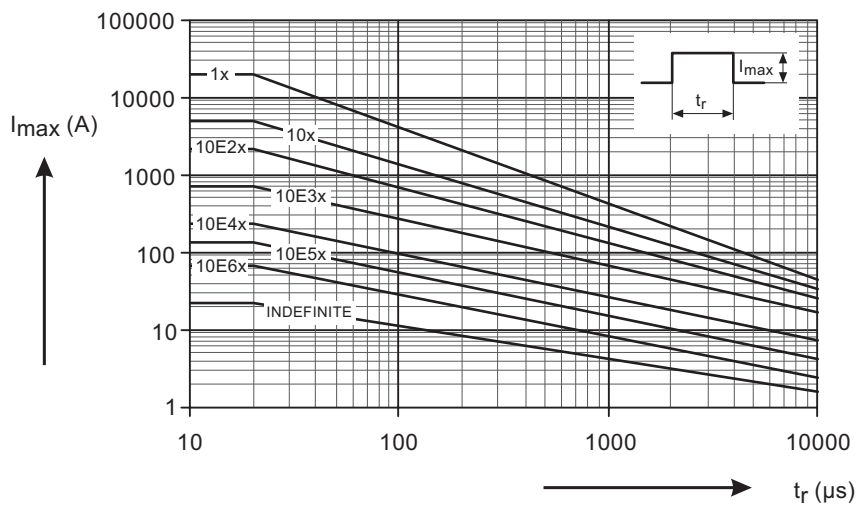
V-I Characteristics

VTDM75P202M-VTDM440P202M (Single disc)



Pulse Ratings

VTDM75P202M-VTDM440P202M (Single disc)



Why should we use VTDs instead of varistors?

Under normal operating conditions, the AC voltage applied to an MOV is not expected to exceed the MOV's Maximum ACRMS Voltage Rating. Occasionally, overvoltage transients may occur that exceed these limits. If, unlike a short-duration transient, an MOV is subjected to a sustained abnormal overvoltage, limited current condition (as required by IEC 61643 and UL1449), the MOV may go into thermal runaway resulting in overheating, smoke, and potential fire. If there are devices or fuses tied to the AC line that limit the current flow, the MOV can overheat and potentially cause the protected device to overheat, which results in smoke and eventually fire, so some level of protection must be supplied to the MOV to prevent this failure mode. A thermal fuse has traditionally provided such protection, but in our case it is a thermal disconnect, and the product's name is

VTD - VARISTOR with THERMAL DECOUPLER



VARSI, d.o.o. Varistor and Couplings Manufacturing Company

Stegne 35, SI - 1521 Ljubljana, Slovenia

Tel.: + 386 1 500 31 80

Fax: + 386 1 500 32 37

E-mail: info@varsi.si

Web: www.varsi.si

VARSI reserves the right to modify the specifications and designs at any time under its policy of constant product improvement.

The brochure is intended to clearly present comprehensive product data and provide technical information that will help the user with design applications. However, due to the possibility of certain inaccuracies, no responsibility is assumed.

Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or constant. It has been carefully checked and is believed to be accurate and reliable and may be changed without prior notice. No liability will be accepted by the publisher for any consequence of its use.

Once a product has been selected, it should be tested by the user in all possible applications.

This brochure replaces the previous edition.