




## MTP PressFit Power Module Three Phase Bridge, 45 A to 100 A



MTP PressFit

### FEATURES

- Low  $V_F$
- Low profile package
- Direct mounting to heatsink
- PressFit pins technology
- Low junction to case thermal resistance
- 3500  $V_{RMS}$  insulation voltage
- Designed and qualified for industrial level
- PressFit pins locking technology  
PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)
- UL approved file E78996 
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

PRIMARY CHARACTERISTICS	
$I_O$	45 A to 100 A
$V_{RRM}$	1600 V
Package	MTP PressFit
Circuit configuration	Three phase bridge

### APPLICATIONS

- Power conversion machines
- Welding
- UPS
- SMPS
- Motor drives
- General purpose and heavy duty application

### DESCRIPTION

The new MTP module is easy to use thanks to solder less method for contacting PressFit pins to the PCB. The low profile package has been specifically conceived to maximize space saving and optimize the electrical layout of the application specific power supplies.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES 40MT	VALUES 70MT	VALUES 100MT	UNITS
$I_O$		45	75	100	A
	$T_C$	100	80	80	°C
$I_{FSM}$	50 Hz	270	380	450	A
	60 Hz	280	398	470	
$I^2t$	50 Hz	365	724	1013	A <sup>2</sup> s
	60 Hz	325	660	920	
$I^2\sqrt{t}$		3650	7240	10 130	A <sup>2</sup> √s
$V_{RRM}$		1600			V
$T_{Stg}$	Range	- 40 to + 150			°C
$T_J$		- 40 to + 150			

PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

This Vishay product is protected by one or more United States and international patents.



## ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE REVERSE VOLTAGE V	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK V	I <sub>RRM</sub> MAXIMUM AT T <sub>J</sub> = 150 °C mA
VS-40MT160P-P, VS-70MT160P-P, VS-100MT160P-P	160	1600	1700	5

FORWARD CONDUCTION								
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES 40MT	VALUES 70MT	VALUES 100MT	UNITS	
Maximum DC output current at case temperature	I <sub>O</sub>	120° rect. to conduction angle		45	75	100	A	
				100	80	80	°C	
Maximum peak, one cycle forward, non-repetitive on state surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	Initial T <sub>J</sub> = T <sub>J</sub> maximum	270	380	450	A
		t = 8.3 ms			280	398	470	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		225	320	380	
		t = 8.3 ms			240	335	400	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied	Initial T <sub>J</sub> = T <sub>J</sub> maximum	365	724	1013	A <sup>2</sup> s
		t = 8.3 ms			325	660	920	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		253	512	600	
		t = 8.3 ms			240	467	665	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied		3650	7240	10 130	A <sup>2</sup> √s	
Value of threshold voltage	V <sub>F(TO)</sub>	T <sub>J</sub> maximum		0.78	0.82	0.75	V	
Slope resistance	r <sub>t</sub>			14.8	9.5	8.1	mΩ	
Maximum forward voltage drop	V <sub>FM</sub>	T <sub>J</sub> = 25 °C; t <sub>p</sub> = 400 μs single junction (40MT, I <sub>pk</sub> = 40 A) (70MT, I <sub>pk</sub> = 70 A) (100MT, I <sub>pk</sub> = 100 A)		1.45	1.45	1.51	V	

INSULATION TABLE							
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES 40MT	VALUES 70MT	VALUES 100MT	UNITS
RMS insulation voltage	V <sub>INS</sub>	T <sub>J</sub> = 25 °C, all terminal shorted, f = 50 Hz, t = 1 s		3500			V

THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES 40MT	VALUES 70MT	VALUES 100MT	UNITS
Maximum junction operating temperature range	T <sub>J</sub>			- 40 to + 150			°C
Maximum storage temperature range	T <sub>Stg</sub>			- 40 to + 150			
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation per module		0.27	0.23	0.19	K/W
		DC operation per junction		1.6	1.38	1.14	
		120° rect. conduction angle per module		0.38	0.29	0.22	
		120° rect. conduction angle per junction		2.25	1.76	1.29	
Maximum thermal resistance, case to heatsink per module	R <sub>thCS</sub>	Mounting surface smooth, flat and greased heatsink compound thermal conductivity = 0.42 W/mK		0.1			
Mounting torque to heatsink ± 10 %		A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound. Lubricated threads		4			Nm
Approximate weight				65			g



CLEARANCE AND CREEPAGE DISTANCES			
PARAMETER	TEST CONDITIONS	MTP PressFit	UNITS
Clearance	External shortest distances in air between terminals which are not internally short circuited together	10.2	mm
Creepage distance	Shortest distance along external surface of the insulating material between terminals which are not internally short circuited together	13	

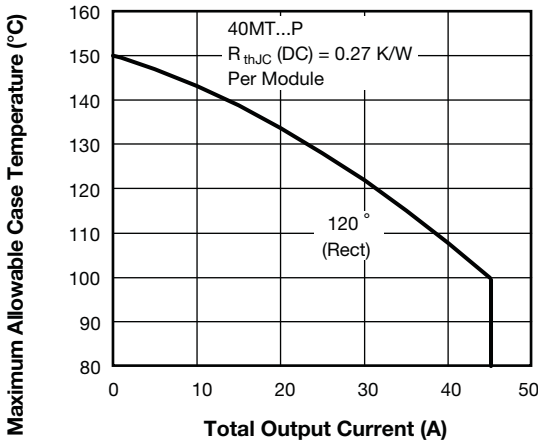


Fig. 1 - Current Rating Characteristics

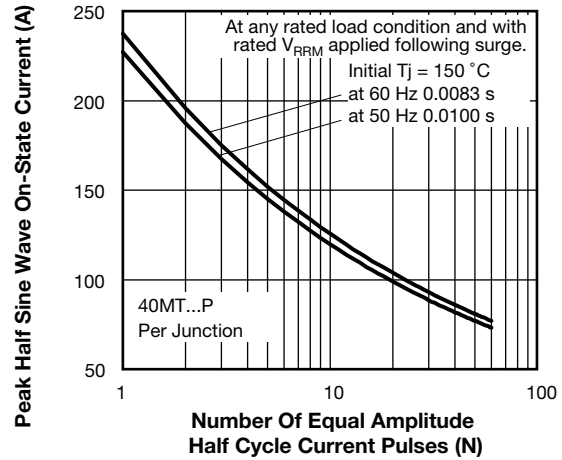


Fig. 3 - Maximum Non-Repetitive Surge Current

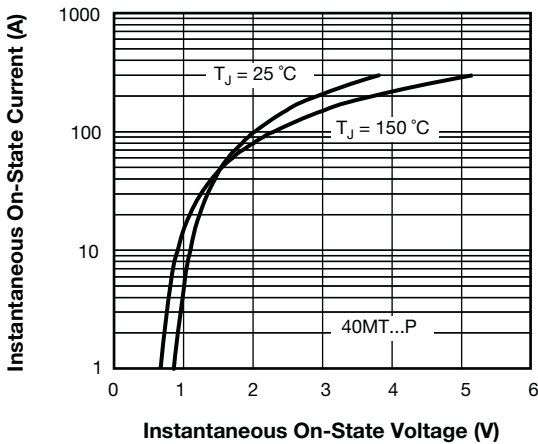


Fig. 2 - On-State Voltage Drop Characteristics

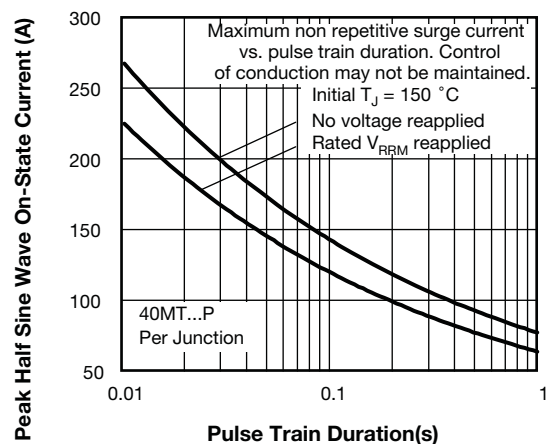


Fig. 4 - Maximum Non-Repetitive Surge Current

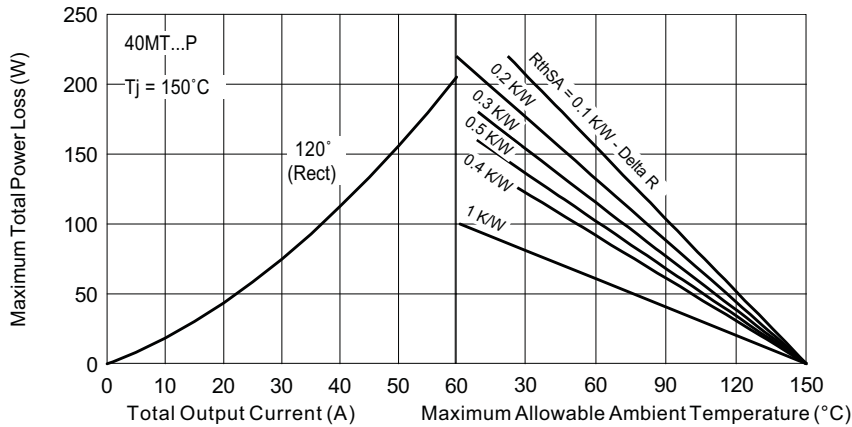


Fig. 5 - Current Rating Nomogram (1 Module Per Heatsink)

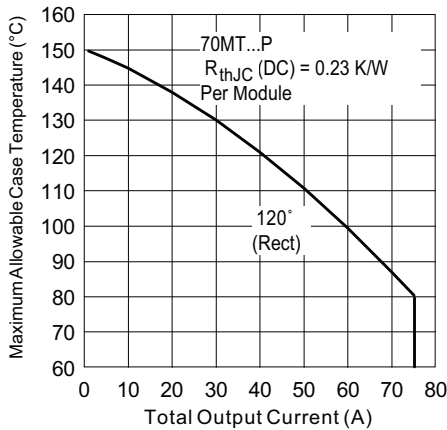


Fig. 6 - Current Rating Characteristics

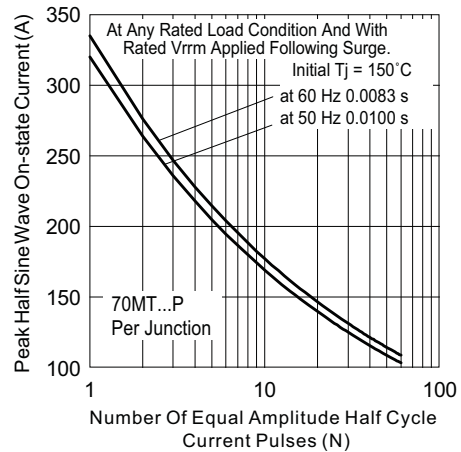


Fig. 8 - Maximum Non-Repetitive Surge Current

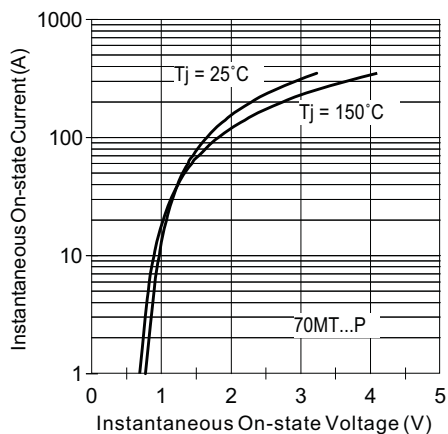


Fig. 7 - On-State Voltage Drop Characteristics

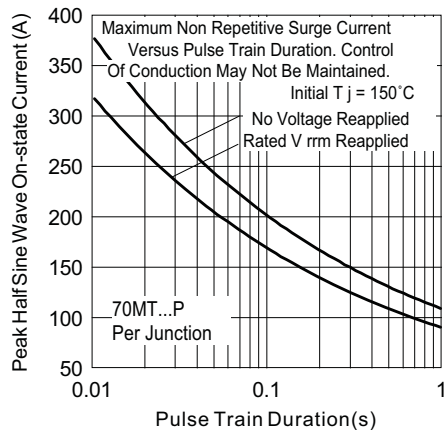


Fig. 9 - Maximum Non-Repetitive Surge Current

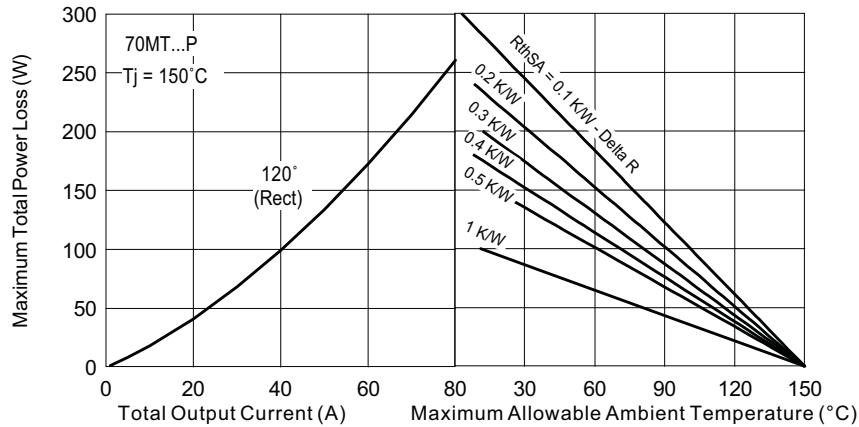


Fig. 10 - Current Rating Nomogram (1 Module Per Heatsink)

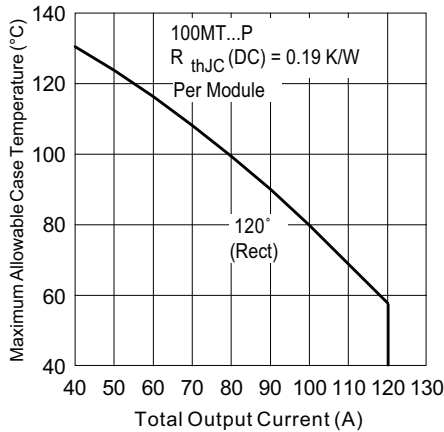


Fig. 11 - Current Rating Characteristics

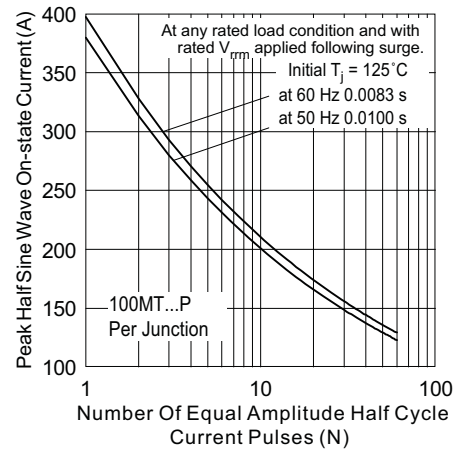


Fig. 13 - Maximum Non-Repetitive Surge Current

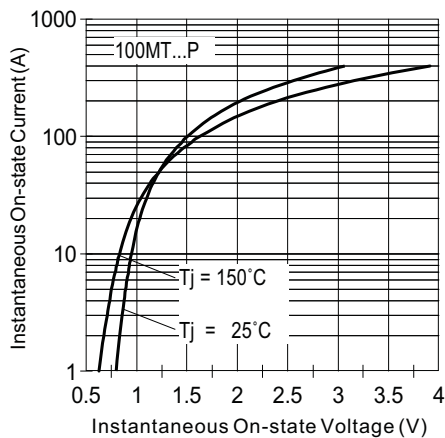


Fig. 12 - On-State Voltage Drop Characteristics

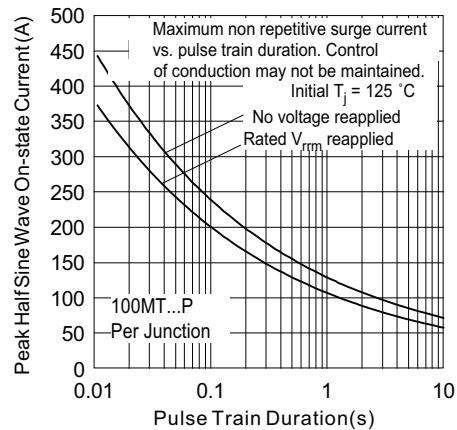


Fig. 14 - Maximum Non-Repetitive Surge Current

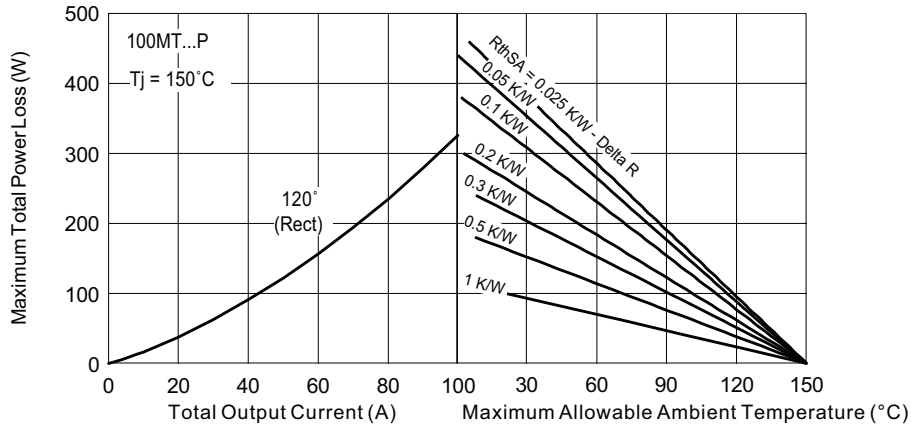


Fig. 15 - Current Rating Nomogram (1 Module Per Heatsink)

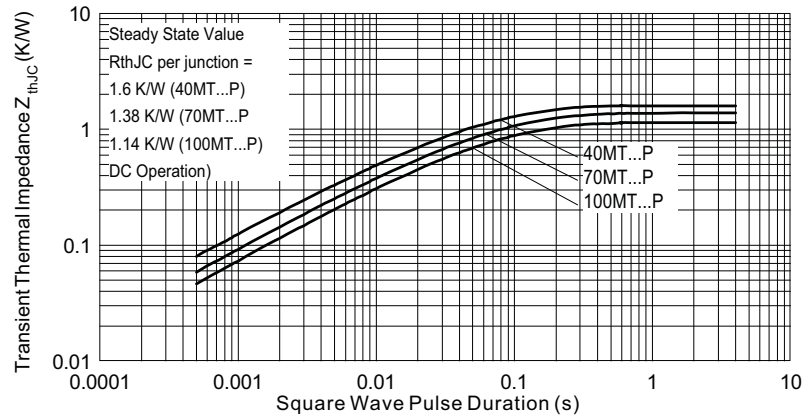
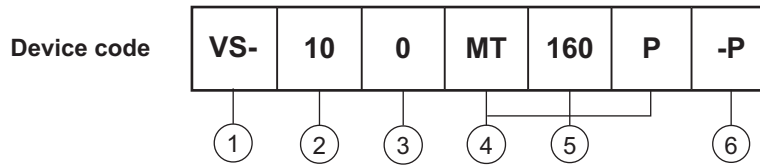
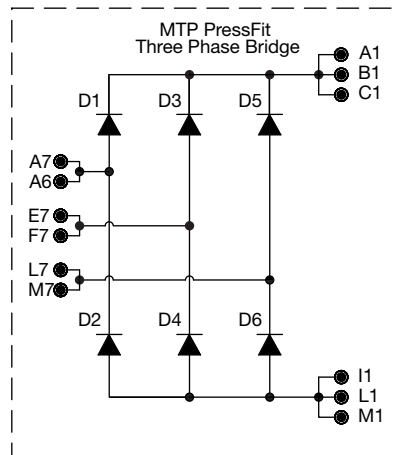


Fig. 16 - Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**


- 1** - Vishay Semiconductors product
- 2** - Current rating code
 

4 = 45 A
7 = 75 A
10 = 100 A
- 3** - Circuit configuration code: 0 = Three Phase Bridge
- 4** - Package indicator
- 5** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** - Pinout code (PressFit pins)

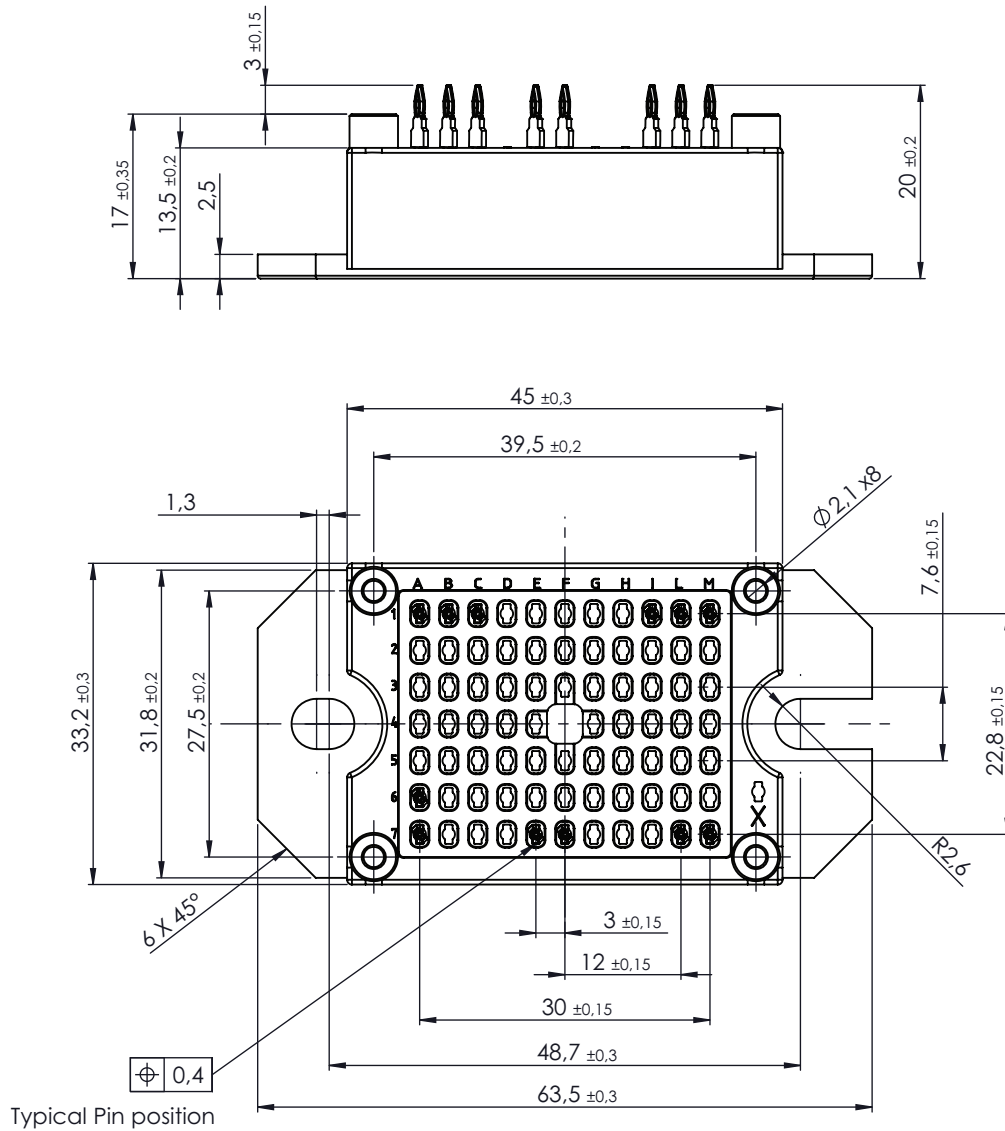
**CIRCUIT CONFIGURATION**

**LINKS TO RELATED DOCUMENTS**

Dimensions	<a href="http://www.vishay.com/doc?95595">www.vishay.com/doc?95595</a>
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## MTP Three Phase PressFit

**DIMENSIONS** in millimeters







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