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
- UL approved file E78996
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
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^2s
	60 Hz	325	660	920	
$I^2\sqrt{t}$		3650	7240	10 130	$A^2\sqrt{s}$
V_{RRM}		1600			V
T_{Stg}	Range	- 40 to + 150			°C
T_J		- 40 to + 150			

PATENT(S): www.vishay.com/patents
This Vishay product is protected by one or more United States and international patents.

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ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE REVERSE VOLTAGE V	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK V	I_{RRM} MAXIMUM AT T_J = 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_O	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_{FSM}	t = 10 ms	No voltage reapplied	Initial $T_J = T_J$ maximum	270	380	450	A
		t = 8.3 ms			280	398	470	
		t = 10 ms	100 % V_{RRM} reapplied		225	320	380	
		t = 8.3 ms			240	335	400	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		365	724	1013	A^2s
		t = 8.3 ms			325	660	920	
		t = 10 ms	100 % V_{RRM} reapplied		253	512	600	
		t = 8.3 ms			240	467	665	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			3650	7240	10 130	$A^2\sqrt{s}$
Value of threshold voltage	$V_{F(TO)}$	T_J maximum			0.78	0.82	0.75	V
Slope resistance	r_t				14.8	9.5	8.1	mΩ
Maximum forward voltage drop	V_{FM}	T_J = 25 °C; t_p = 400 µs single junction (40MT, I_{pk} = 40 A) (70MT, I_{pk} = 70 A) (100MT, I_{pk} = 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_{INS}	T_J = 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_J		- 40 to + 150			°C
Maximum storage temperature range	T_{Stg}		- 40 to + 150			
Maximum thermal resistance, junction to case	R_{thJC}	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_{thCS}	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

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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	

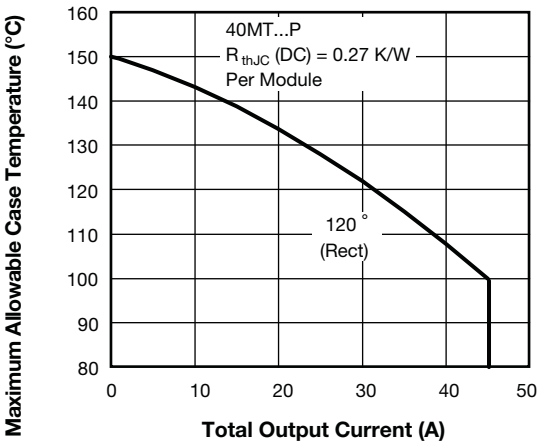


Fig. 1 - Current Rating Characteristics

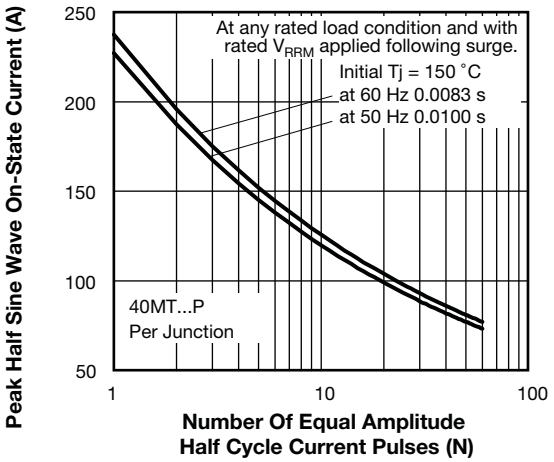


Fig. 3 - Maximum Non-Repetitive Surge Current

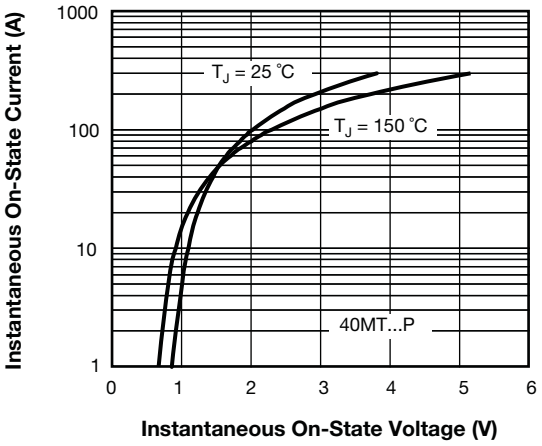


Fig. 2 - On-State Voltage Drop Characteristics

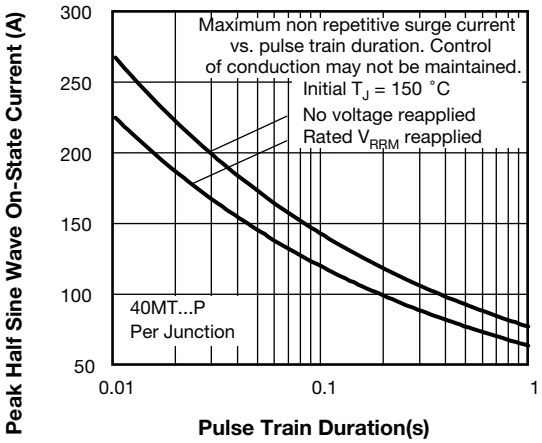


Fig. 4 - Maximum Non-Repetitive Surge Current

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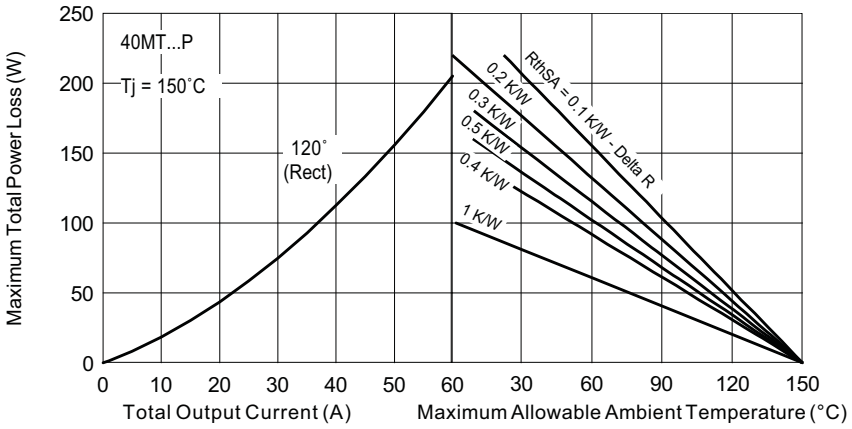


Fig. 5 - Current Rating Nomogram (1 Module Per Heatsink)

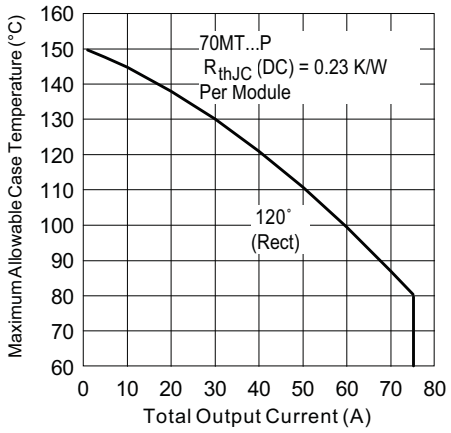


Fig. 6 - Current Rating Characteristics

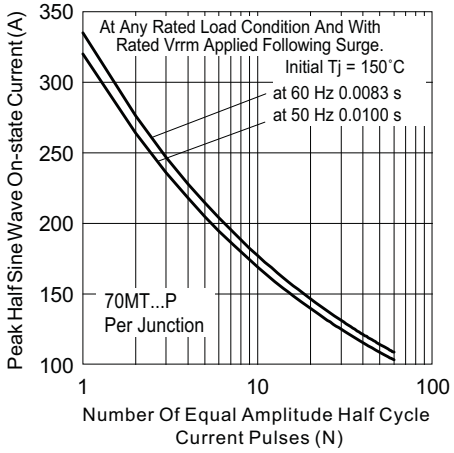


Fig. 8 - Maximum Non-Repetitive Surge Current

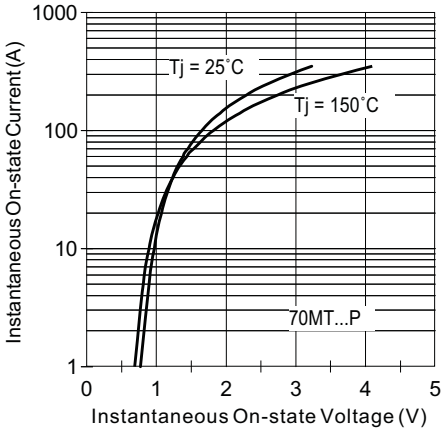


Fig. 7 - On-State Voltage Drop Characteristics

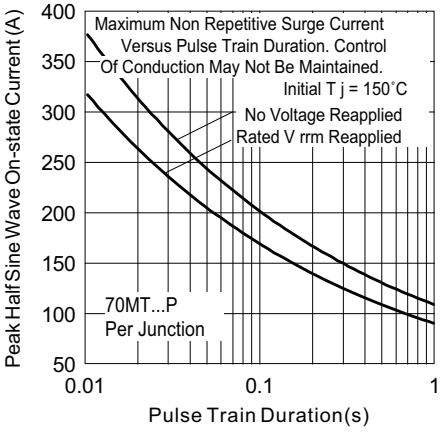


Fig. 9 - Maximum Non-Repetitive Surge Current

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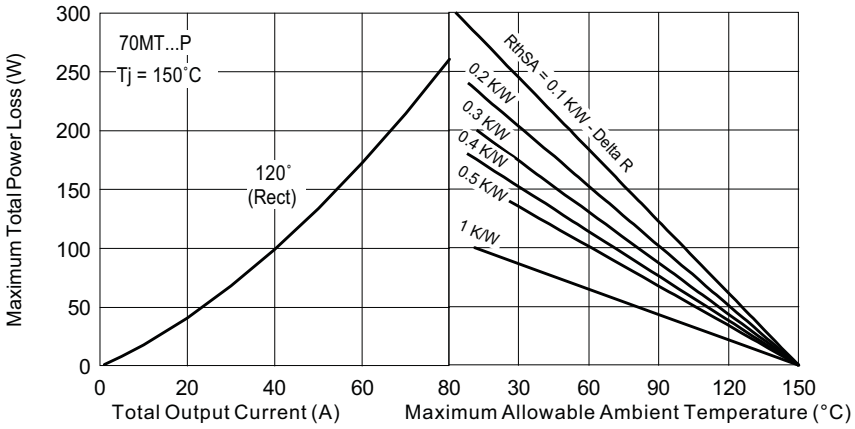


Fig. 10 - Current Rating Nomogram (1 Module Per Heatsink)

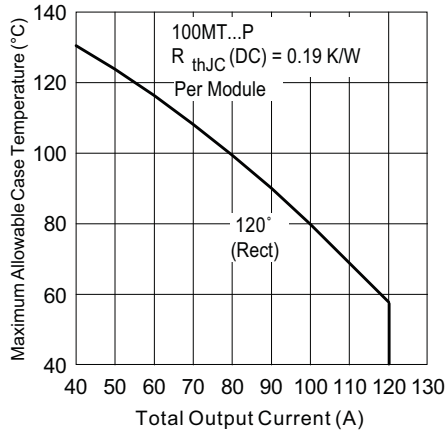


Fig. 11 - Current Rating Characteristics

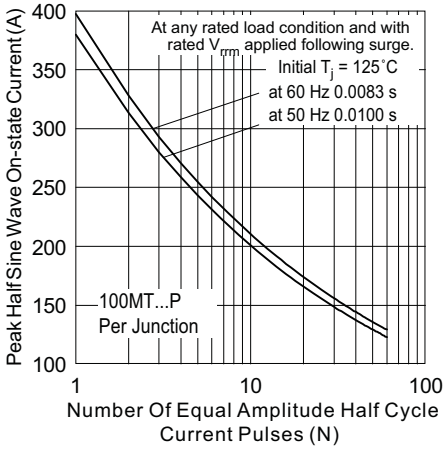


Fig. 13 - Maximum Non-Repetitive Surge Current

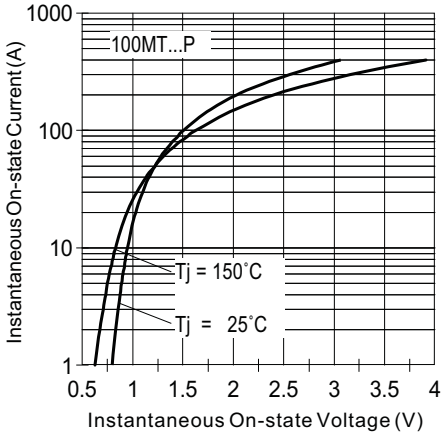


Fig. 12 - On-State Voltage Drop Characteristics

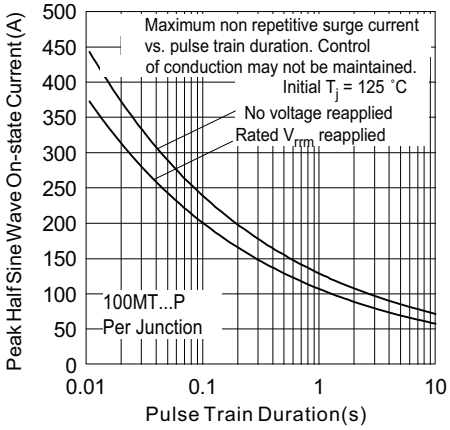


Fig. 14 - Maximum Non-Repetitive Surge Current

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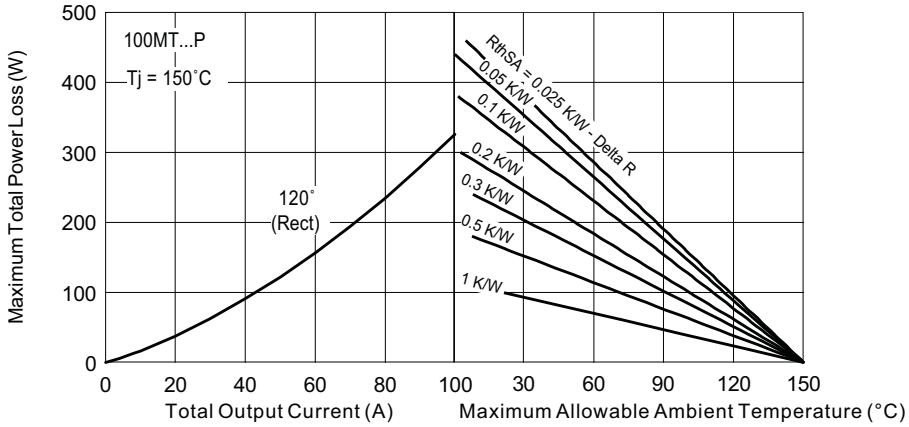


Fig. 15 - Current Rating Nomogram (1 Module Per Heatsink)

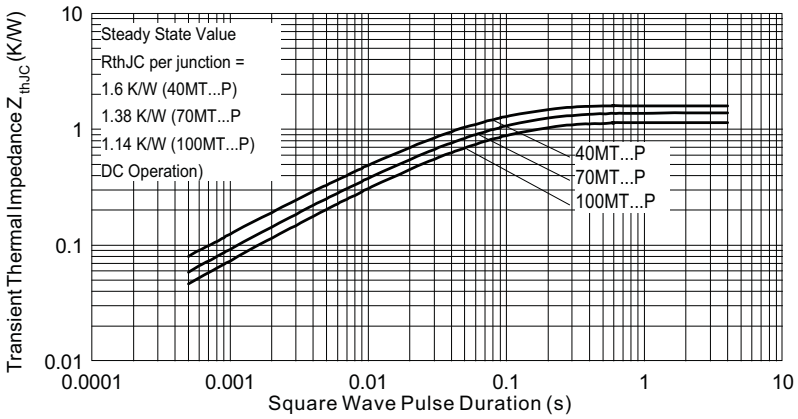


Fig. 16 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code

VS-	10	0	MT	160	P	-P
1	2	3	4	5		6

1 - Vishay Semiconductors product

2 - Current rating code

4 = 45 A
7 = 75 A
10 = 100 A

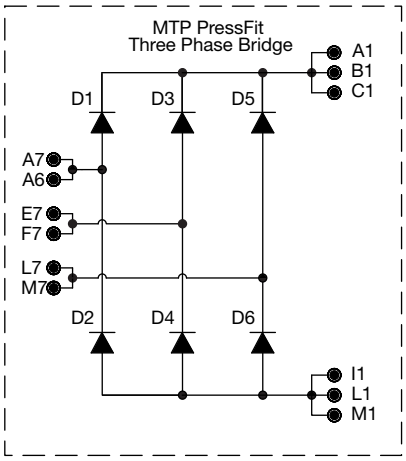
3 - Circuit configuration code: 0 = Three Phase Bridge

4 - Package indicator

5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

6 - Pinout code (PressFit pins)

CIRCUIT CONFIGURATION

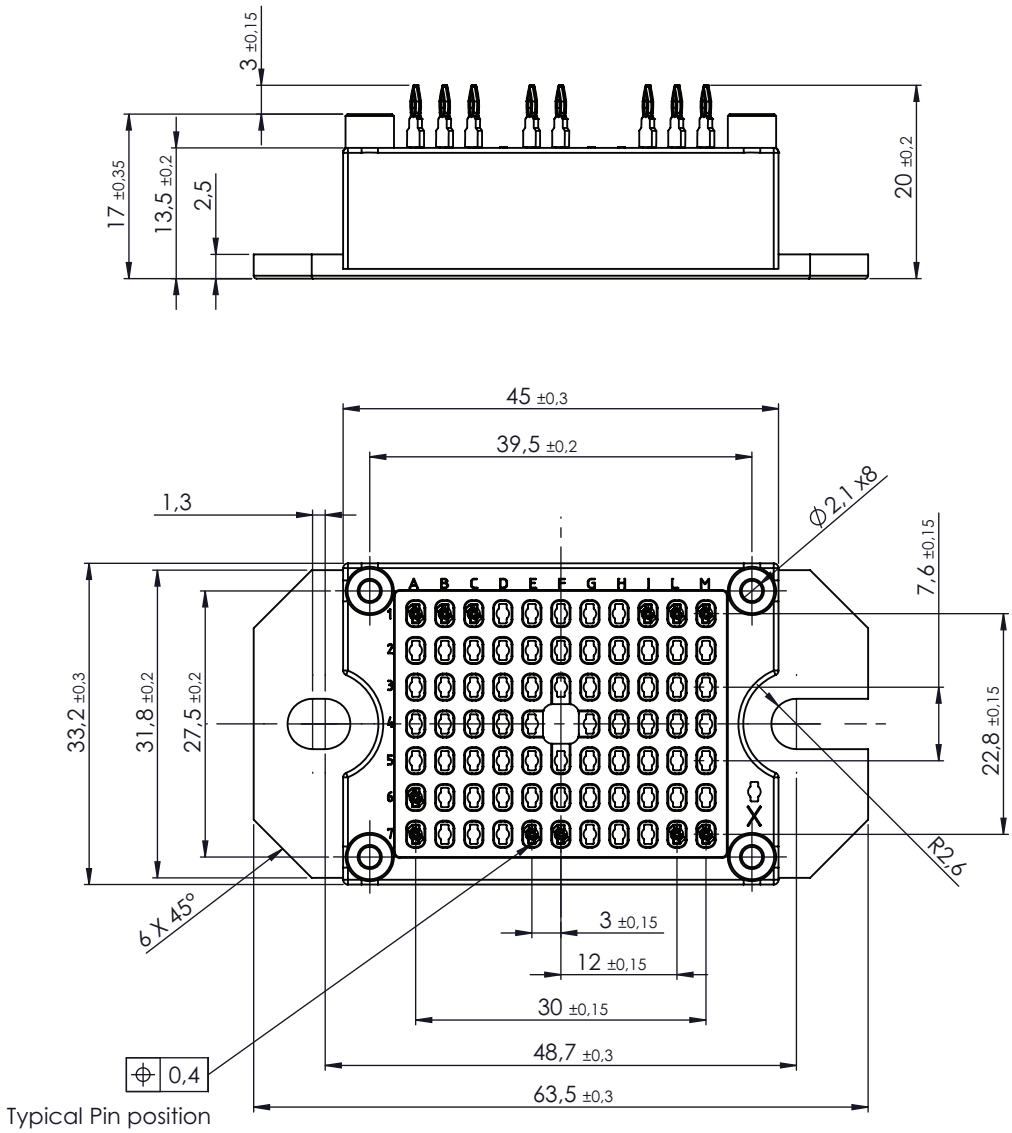


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Dimensions	www.vishay.com/doc?95595

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MTP Three Phase PressFit

DIMENSIONS in millimeters



Typical Pin position

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