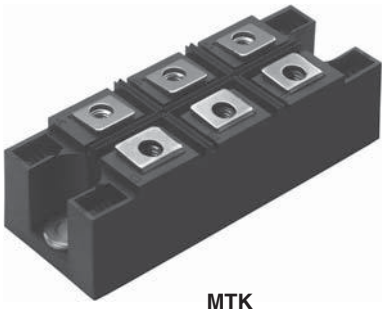
Three Phase Bridge, 130 A to 160 A (Power Modules)



MTK

PRIMARY CHARACTERISTICS	
I_O	130 A to 160 A
V_{RRM}	800 V to 1600 V
Package	MTK
Circuit configuration	Three phase bridge

FEATURES

- Package fully compatible with the industry standard INT-A-PAK power modules series
- High thermal conductivity package, electrically insulated case
- Excellent power volume ratio
- 4000 V_{RMS} isolating voltage
- UL E78996 approved
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

DESCRIPTION

A range of extremely compact, encapsulated three phase bridge rectifiers offering efficient and reliable operation. They are intended for use in general purpose and heavy duty applications.

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUES 130MT.K	VALUES 160MT.K	UNITS
I_O		130 (160)	160 (200)	A
	T_C	85 (62)	85 (60)	°C
I_{FSM}	50 Hz	1130	1430	A
	60 Hz	1180	1500	
I^2t	50 Hz	6400	10 200	A^2s
	60 Hz	5800	9300	
$I^2\sqrt{t}$		64 000	102 000	$A^2\sqrt{s}$
V_{RRM}	Range	800 to 1600		V
T_{Stg}	Range	-40 to 150		°C
T_J		-40 to 150		

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT T_J = MAXIMUM mA
VS-130MT.K VS-160MT.K	80	800	900	10
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES 130MT.K	VALUES 160MT.K	UNITS
Maximum DC output current at case temperature	I_O	120° rect. conduction angle			130 (160)	160 (200)	A
					85 (62)	85 (60)	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Initial $T_J = T_J$ maximum	1130	1430	A
		t = 8.3 ms			1180	1500	
		t = 10 ms	100 % V_{RRM} reapplied		950	1200	
		t = 8.3 ms			1000	1260	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		6400	10 200	A^2s
		t = 8.3 ms			5800	9300	
		t = 10 ms	100 % V_{RRM} reapplied		4500	7200	
		t = 8.3 ms			4100	6600	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			64 000	102 000	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{T(TO)1}$	(16.7 % x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$), T_J maximum			0.78	0.81	V
High level value of threshold voltage	$V_{T(TO)2}$	(I > π x $I_{T(AV)}$), T_J maximum			0.99	1.04	
Low level value of forward slope resistance	r_{f1}	16.7 % x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$), T_J maximum			4.59	3.52	mΩ
High level of forward slope resistance	r_{f2}	(I > π x $I_{T(AV)}$), T_J maximum			4.17	3.13	
Maximum forward voltage drop	V_{FM}	I_{pk} = 200 A, T_J = 25 °C, t_p = 400 µs single junction			1.63	1.49	V
RMS isolation voltage	V_{ISOL}	T_J = 25 °C, all terminal shorted f = 50 Hz, t = 1 s			4000		

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES 130MT.K	VALUES 160MT.K	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}		-40 to 150		°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation per module	0.16	0.12	K/W
		DC operation per junction	0.93	0.73	
		120° rect. conduction angle per module	0.18	0.15	
		120° rect. conduction angle per junction	1.08	0.88	
Maximum thermal resistance, case to heatsink	R_{thCS}	Per module Mounting surface smooth, flat and greased	0.03		
Mounting torque ± 10 % to heatsink		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 to 6		Nm
Mounting torque ± 10 % to terminal			3 to 4		
Approximate weight			176		g

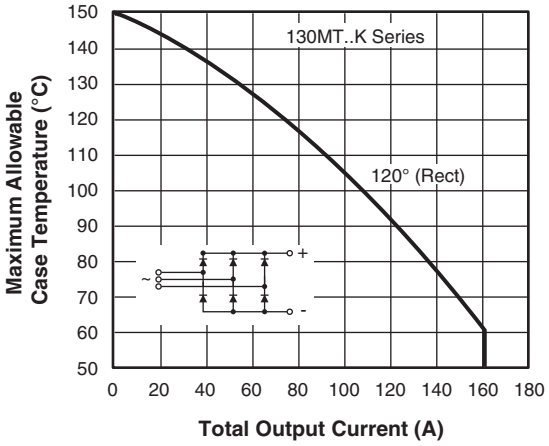


Fig. 1 - Current Rating Characteristics

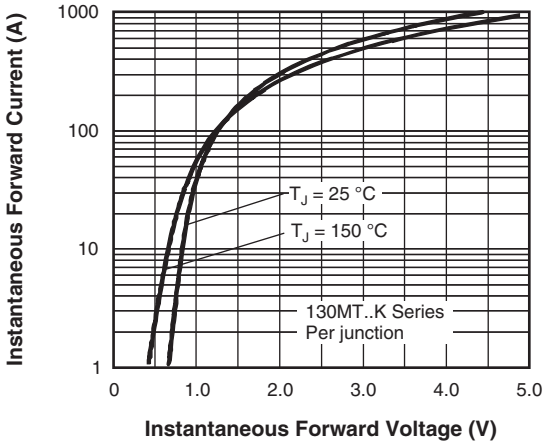
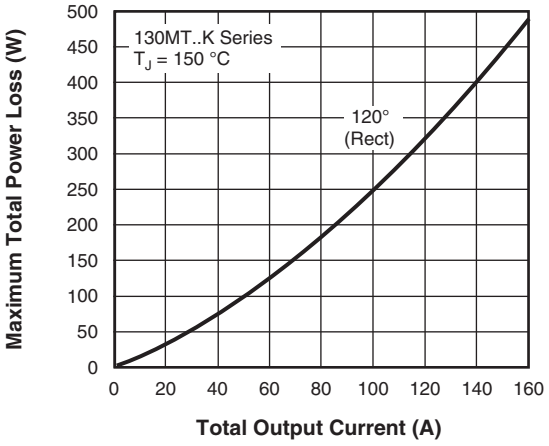


Fig. 2 - Forward Voltage Drop Characteristics



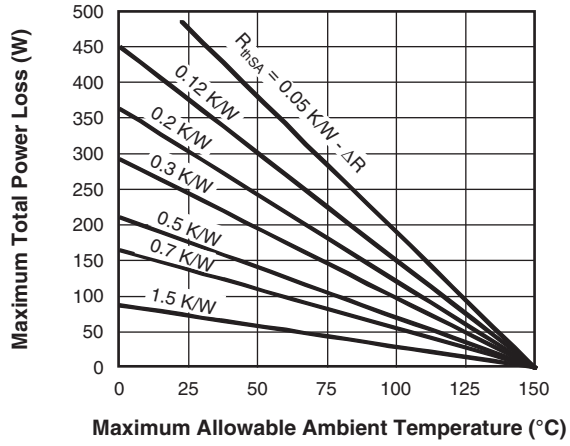


Fig. 3 - Total Power Loss Characteristics

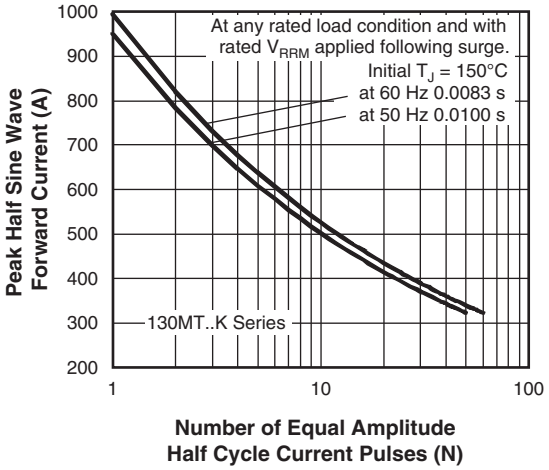


Fig. 4 - Maximum Non-Repetitive Surge Current

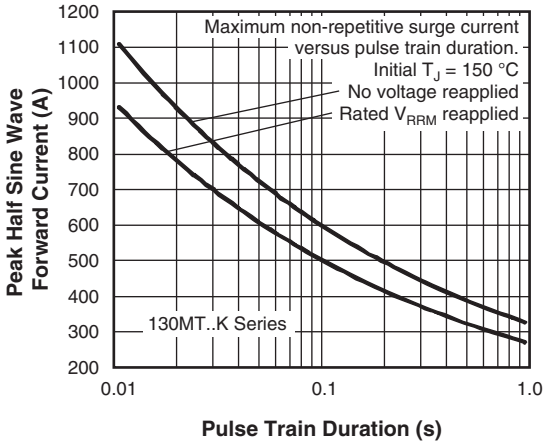


Fig. 5 - Maximum Non-Repetitive Surge Current

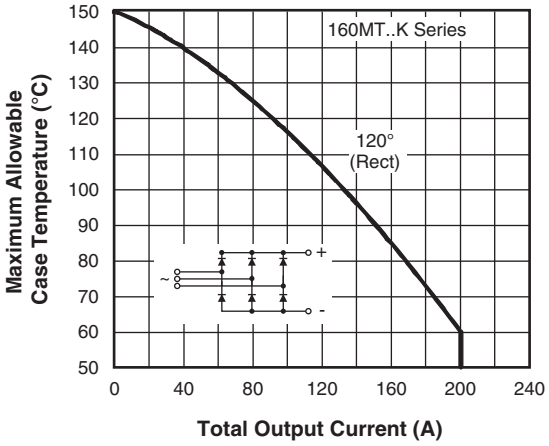


Fig. 6 - Current Ratings Characteristic

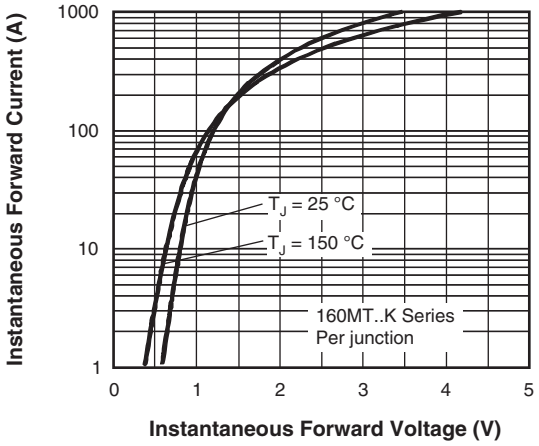
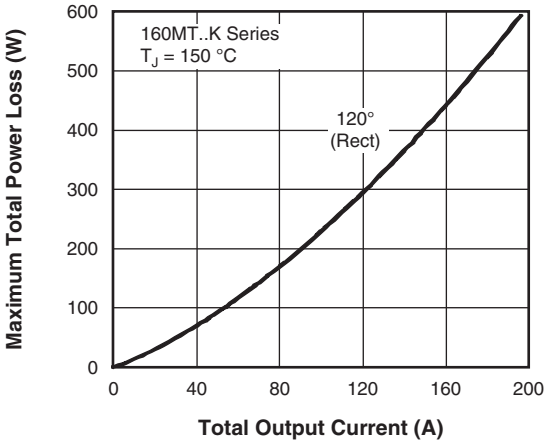


Fig. 7 - Forward Voltage Drop Characteristics



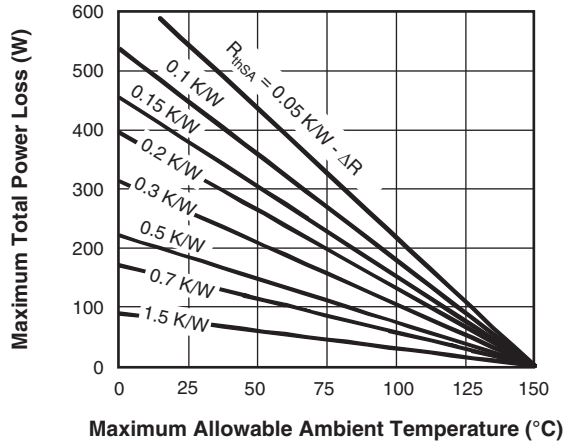


Fig. 8 - Total Power Loss Characteristics

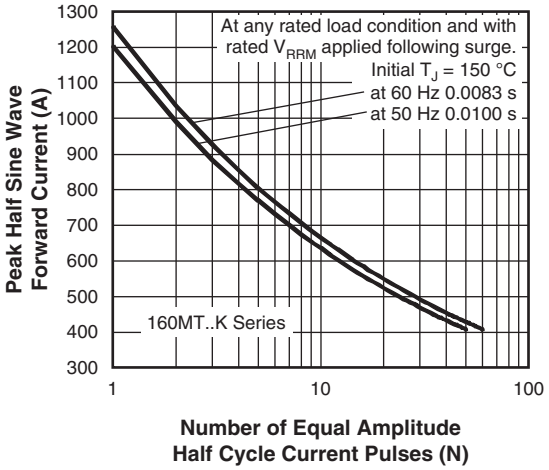


Fig. 9 - Maximum Non-Repetitive Surge Current

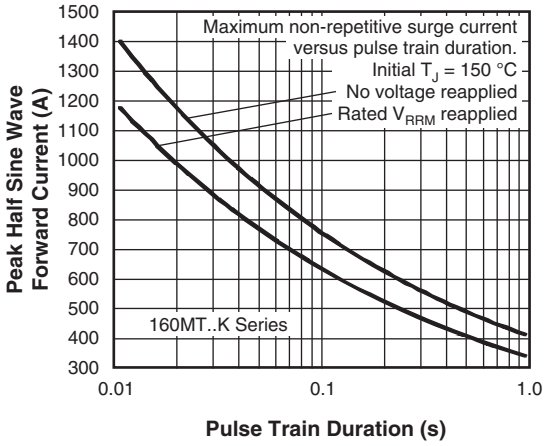


Fig. 10 - Maximum Non-Repetitive Surge Current

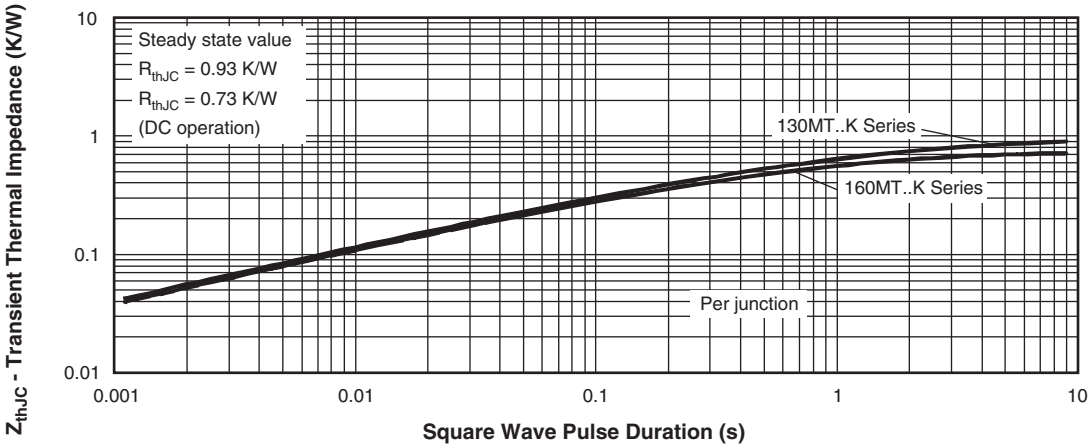


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

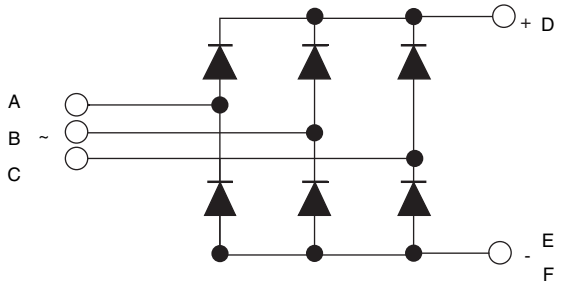
VS-	16	0	MT	160	K	PbF
1	2	3	4	5		6

- 1 - Vishay Semiconductors product
- 2 - Current rating code: 13 = 130 A (average)
  16 = 160 A (average)
- 3 - Three phase diodes bridge
- 4 - Essential part number
- 5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)
- 6 - PbF = Lead (Pb)-free

Note

- To order the optional hardware go to: www.vishay.com/doc?95172

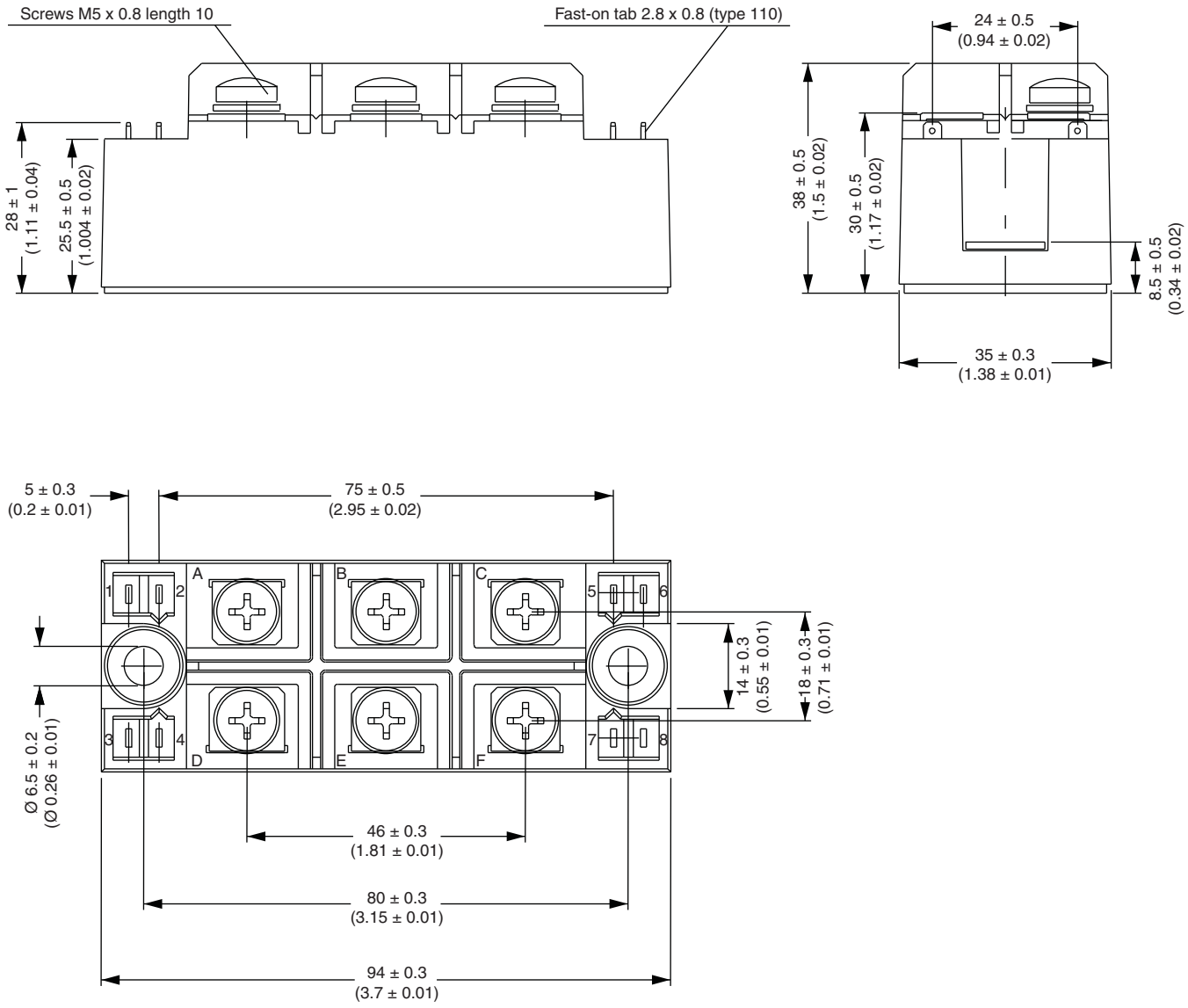
CIRCUIT CONFIGURATION



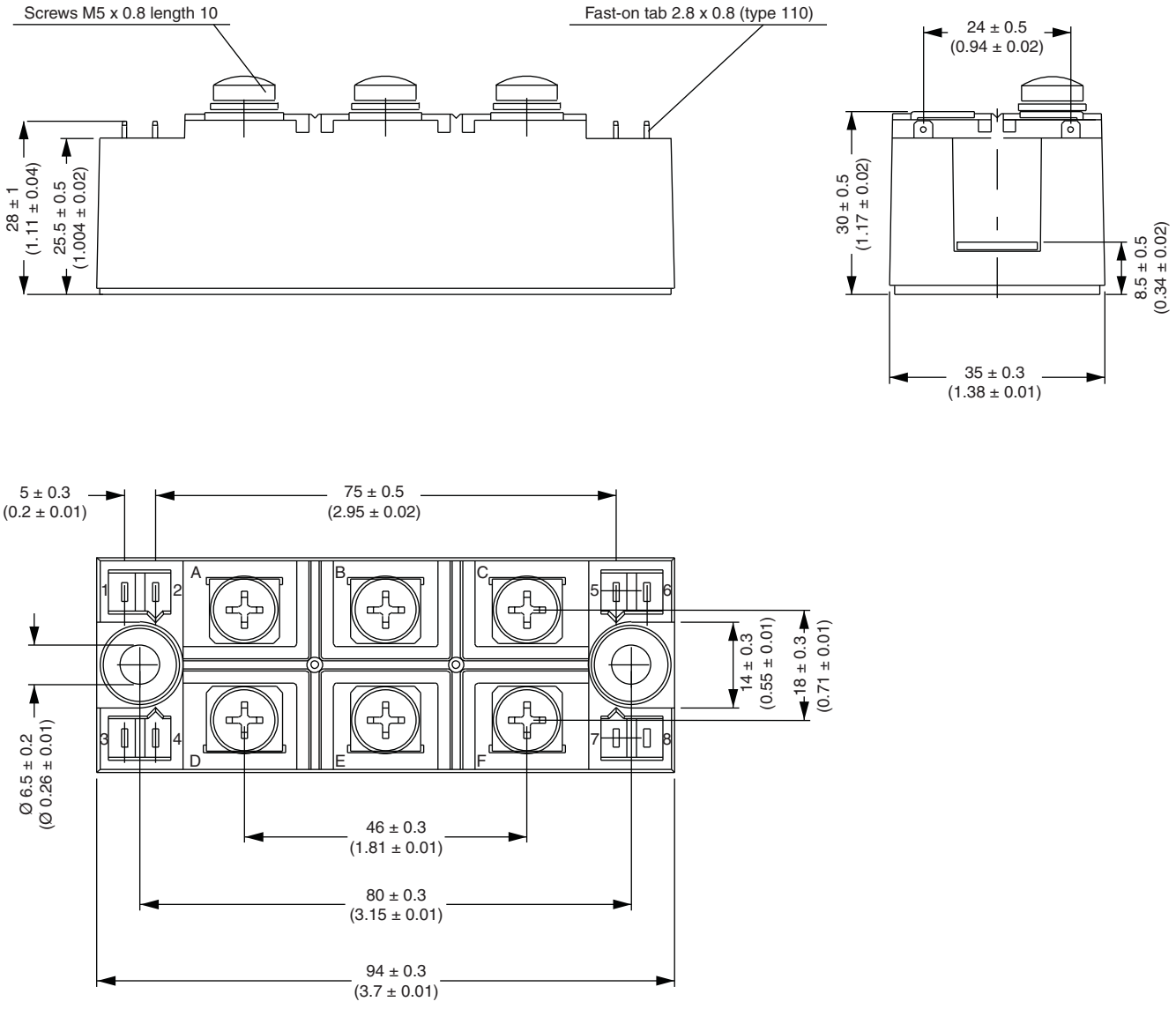
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95004

MTK (with and without optional barrier)

DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)



DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)



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