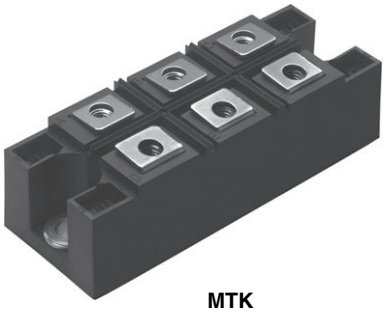
Three Phase Bridge (Power Modules), 60/70 A



MTK

PRIMARY CHARACTERISTICS	
I_O	60 A to 70 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, outline for easy connections to power transistor and IGBT modules
- 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 60MT..K	VALUES 70MT..K	UNITS
I_O		60 (75)	70 (90)	A
	T_C	85 (61)	85 (57)	°C
I_{FSM}	50 Hz	420	480	A
	60 Hz	440	500	
I^2t	50 Hz	870	1150	kA^2s
	60 Hz	790	1050	
$I^2\sqrt{t}$		8700	11 500	$kA^2\sqrt{s}$
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-60MT..K VS-70MT..K	80	800	900	10
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	

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FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES 60MT..K	VALUES 70MT..K	UNITS
Maximum DC output current at case temperature	I_O	120° rect. conduction angle			60 (75)	70 (90)	A
					85 (61)	85 (57)	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Initial $T_J = T_J$ maximum	420	480	A
		t = 8.3 ms			440	500	
		t = 10 ms	100 % V_{RRM} reapplied		350	400	
		t = 8.3 ms			370	420	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		870	1150	kA^2s
		t = 8.3 ms			790	1050	
		t = 10 ms	100 % V_{RRM} reapplied		610	800	
		t = 8.3 ms			560	730	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			8700	11 300	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π · $I_{F(AV)}$), T_J maximum			0.85	0.86	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), T_J maximum			1.07	1.08	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π · $I_{F(AV)}$), T_J maximum			8.04	7.35	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), T_J maximum			7.08	6.53	
Maximum forward voltage drop	V_{FM}	I_{pk} = 100 A, T_J = 25 °C, t_p = 400 µs single junction			1.75	1.55	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 60MT..K	VALUES 70MT..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	0.37	0.29	K/W
			DC operation per junction	2.22	1.75	
			120° rect. conduction angle per module	0.40	0.34	
			120° rect. conduction angle per junction	2.42	2.01	
Maximum thermal resistance, case to heatsink per module		R_{thCS}	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 h to allow for the spread of the compound. Lubricated threads.	4 to 6		Nm
	to terminal			3 to 4		
Approximate weight				176		g

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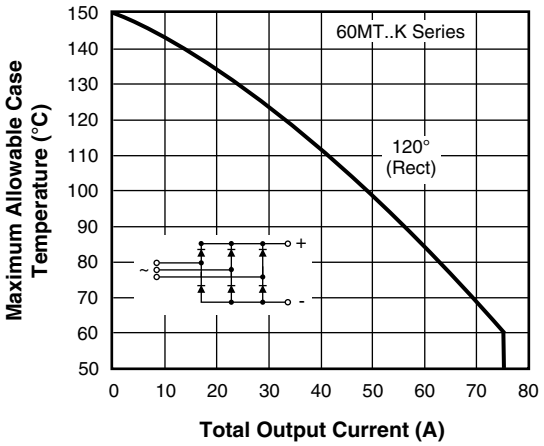


Fig. 1 - Current Ratings Characteristics

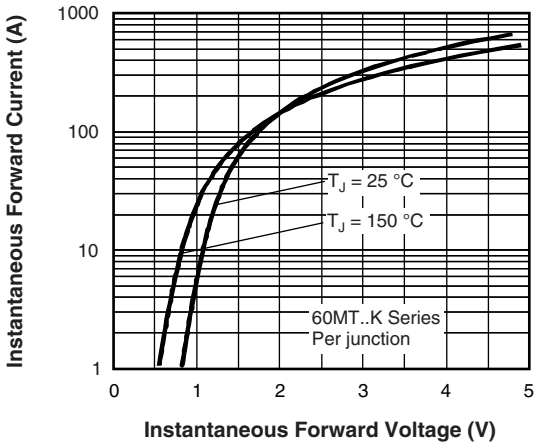
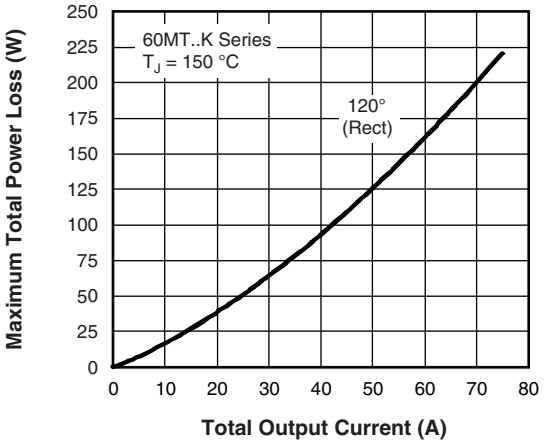


Fig. 2 - Forward Voltage Drop Characteristics



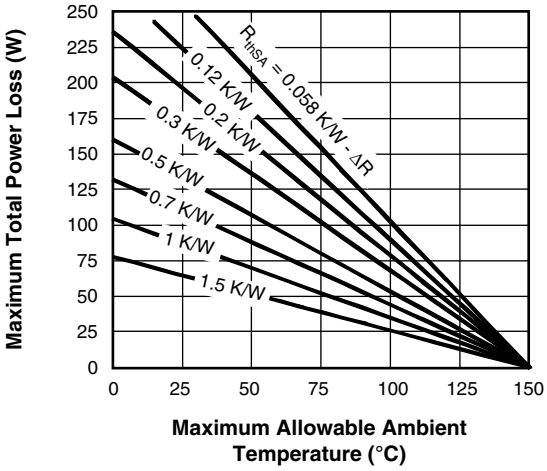


Fig. 3 - Total Power Loss Characteristics

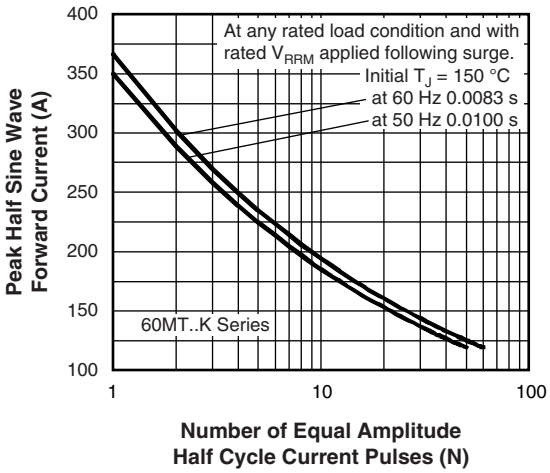


Fig. 4 - Maximum Non-Repetitive Surge Current

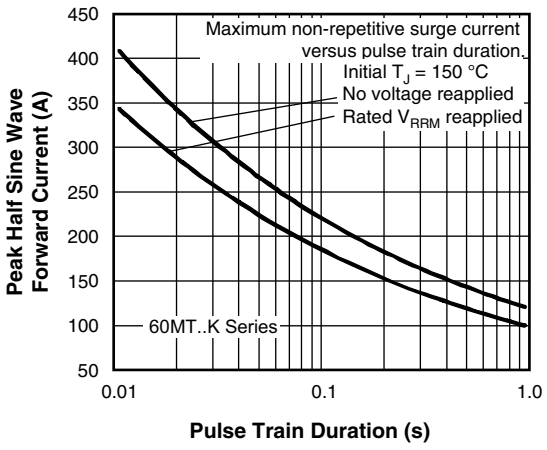


Fig. 5 - Maximum Non-Repetitive Surge Current

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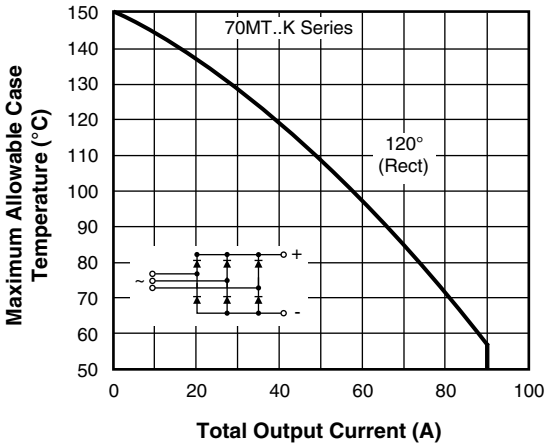


Fig. 6 - Current Ratings Characteristics

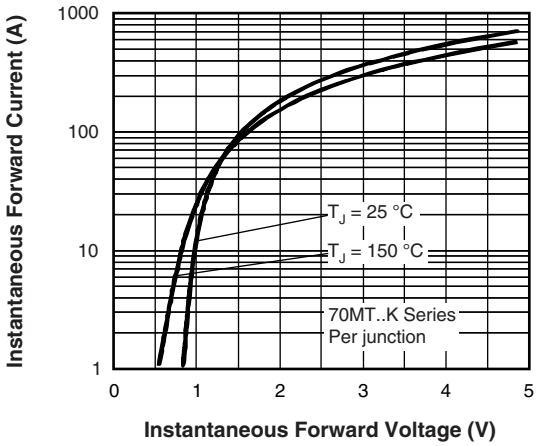
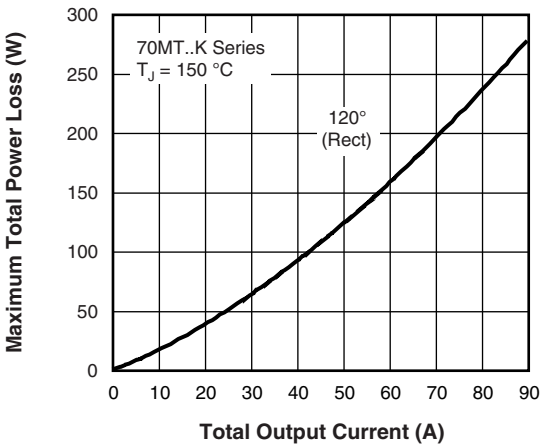


Fig. 7 - Forward Voltage Drop Characteristics



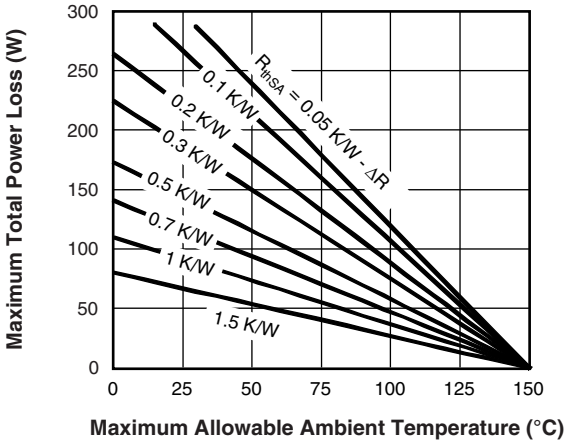


Fig. 8 - Total Power Loss Characteristics

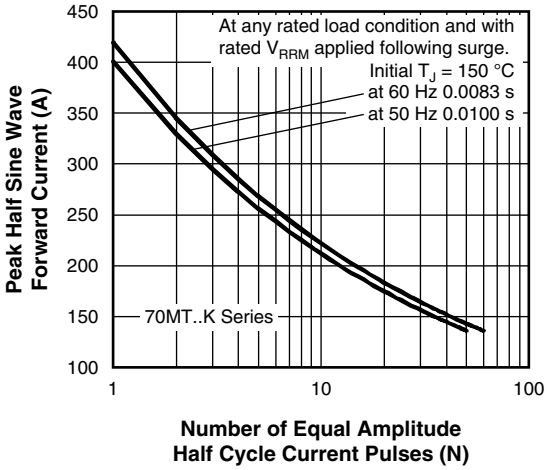


Fig. 9 - Maximum Non-Repetitive Surge Current

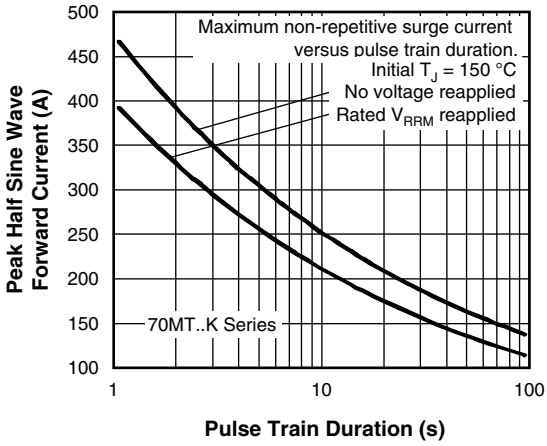


Fig. 10 - Maximum Non-Repetitive Surge Current

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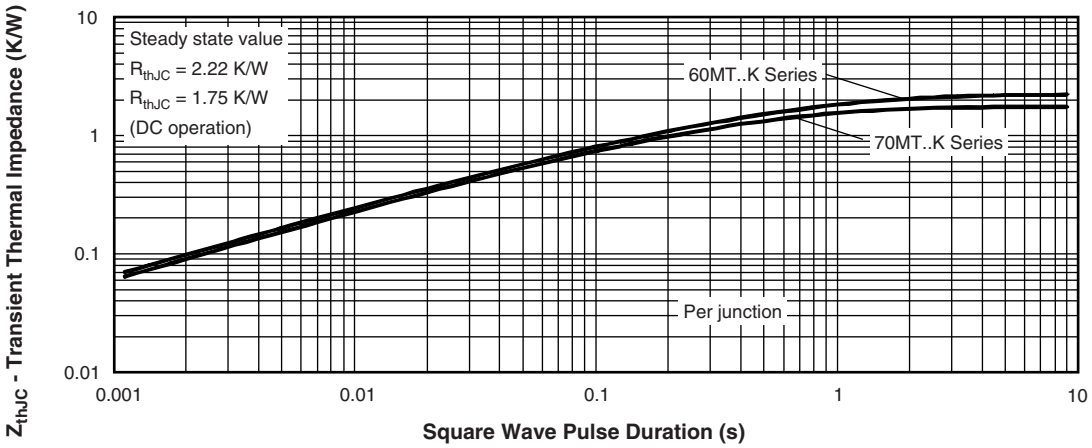


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

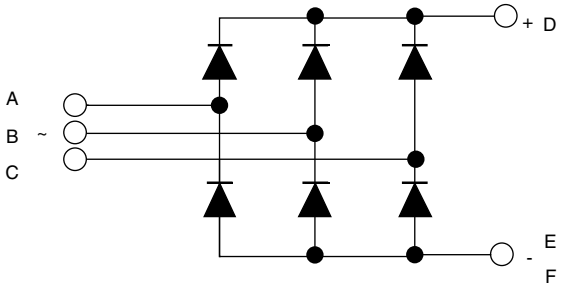
VS-	7	0	MT	160	K	PbF
1	2	3	4	5		6

1	-	Vishay Semiconductors product
2	-	Current rating code: 6 = 60 A (average) 7 = 70 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

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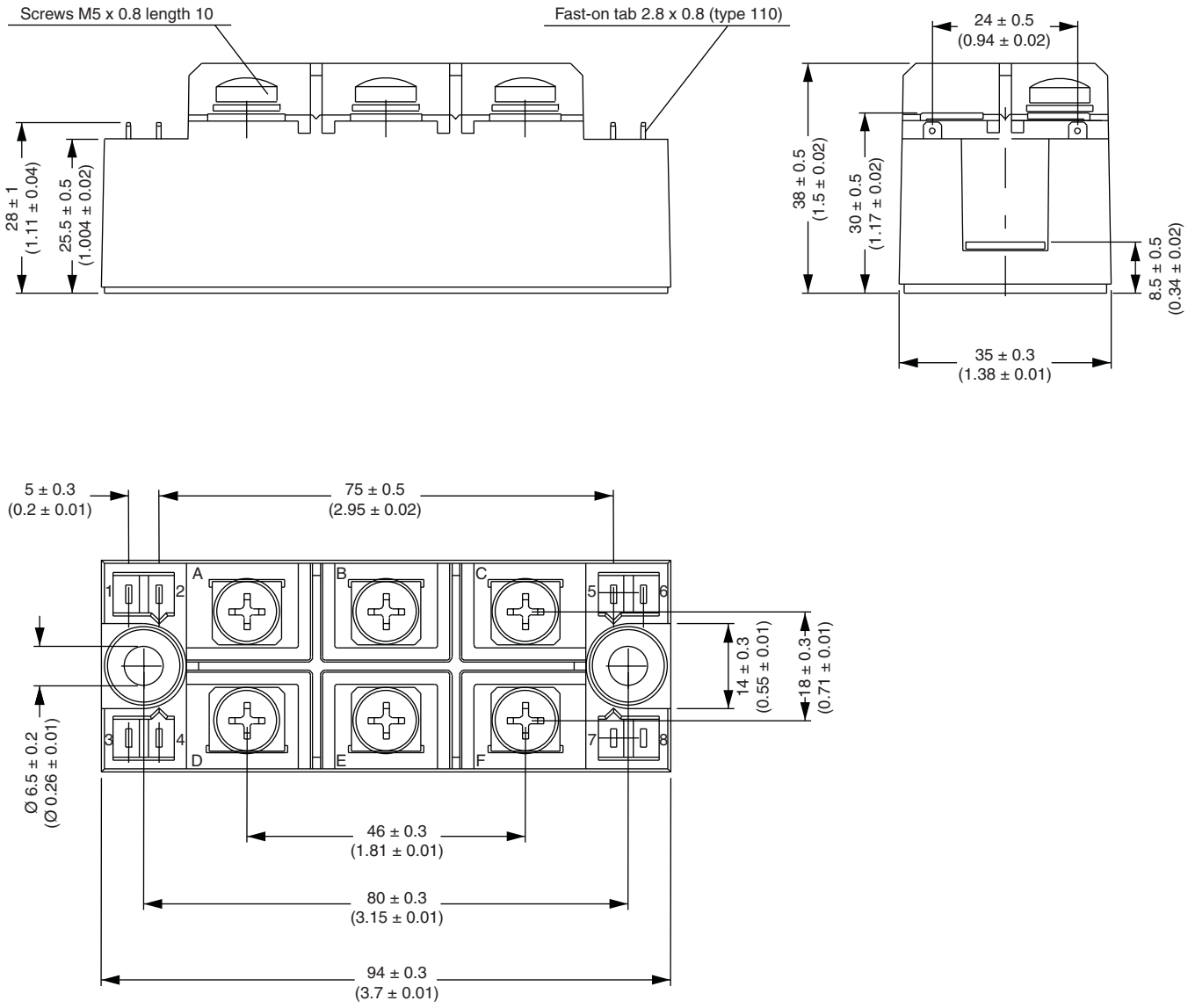
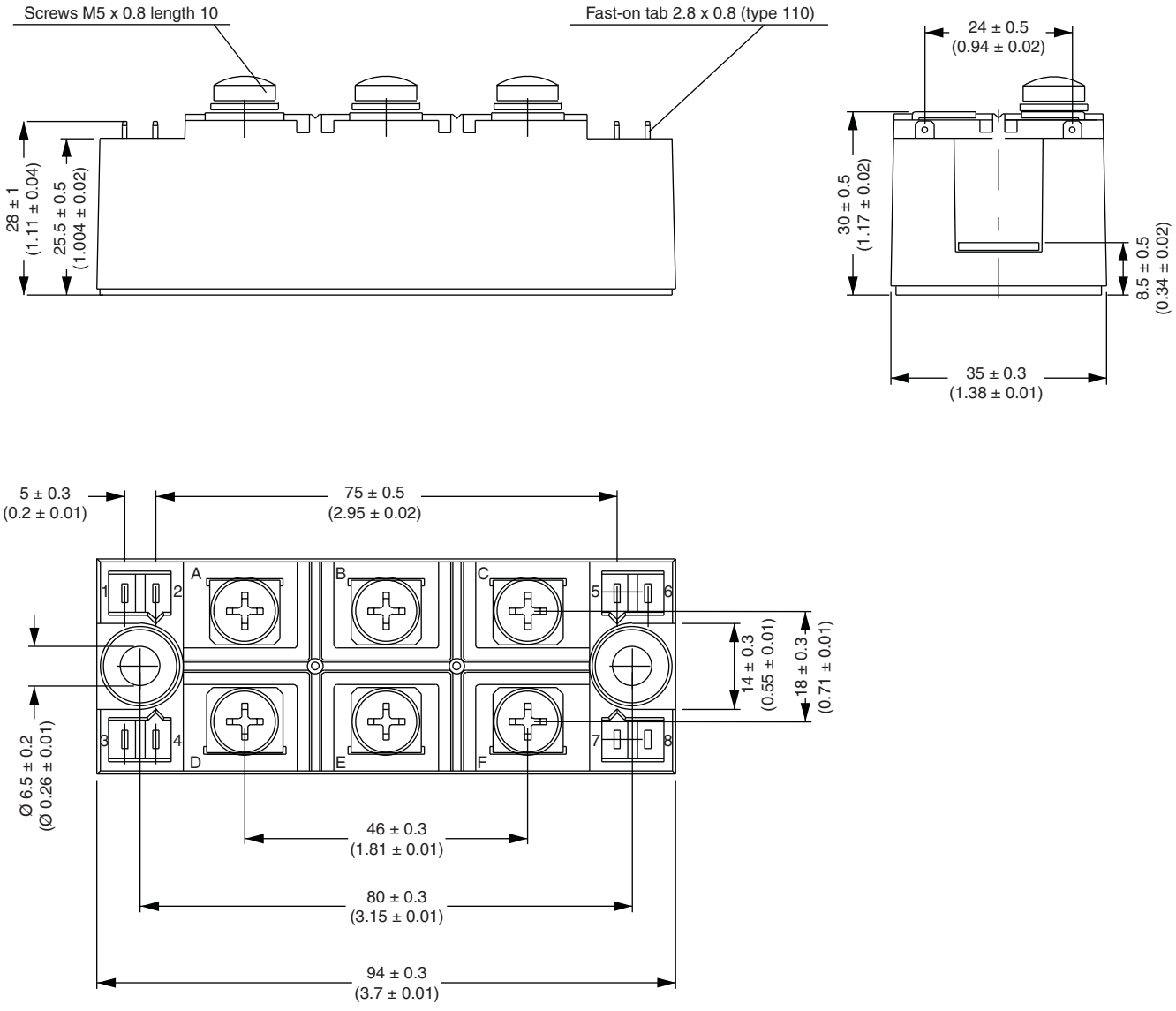
MTK (with and without optional barrier)

DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)



DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)



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