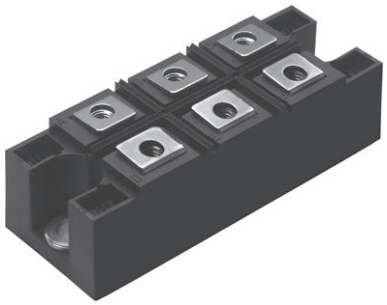
Three Phase Bridge (Power Modules), 40 A



MTK

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
- 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.

PRIMARY CHARACTERISTICS	
I_O	40 A
V_{RRM}	1600 V
Package	MTK
Circuit configuration	Three phase bridge

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I_O		40 (50)	A
	T_C	85 (60)	°C
I_{FSM}	50 Hz	270	A
	60 Hz	280	
I^2t	50 Hz	365	kA^2s
	60 Hz	325	
$I^2\sqrt{t}$		3650	$kA^2\sqrt{s}$
V_{RRM}		1600	V
T_{Stg}	Range	-40 to +150	°C
T_J			

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
40MT..K	160	1600	1700	10

FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNITS**
Maximum DC output current at case temperature	I_O	120° rect. conduction angle			40 (50)	A
					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	270	A
		t = 8.3 ms			280	
		t = 10 ms	100 % V_{RRM} reapplied		225	
		t = 8.3 ms			240	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		365	kA^2s
		t = 8.3 ms			325	
		t = 10 ms	100 % V_{RRM} reapplied		253	
		t = 8.3 ms			240	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			3650	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J maximum			0.78	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), T_J maximum			0.9	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J maximum			15	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), T_J maximum			14.1	
Maximum forward voltage drop	V_{FM}	I_{pk} = 100 A, T_J = 25 °C, t_p = 400 µs single junction			2.02	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**	**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	0.41	K/W
			DC operation per junction	2.46	
			120° rect. conduction angle per module	0.45	
			120° rect. conduction angle per junction	2.7	
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 hours to allow for the spread of the compound. Lubricated threads.	4 to 6	Nm
	to terminal			3 to 4	
Approximate weight				176	g

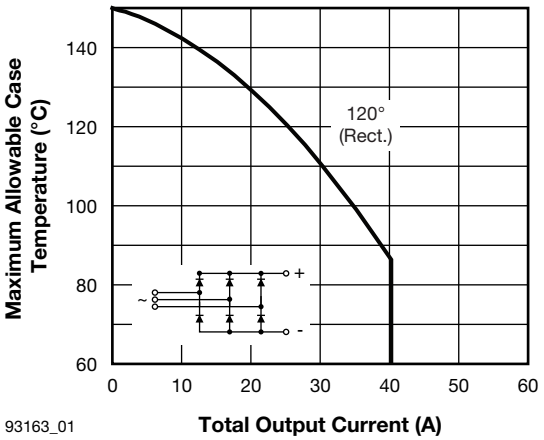


Fig. 1 - Current Ratings Characteristics

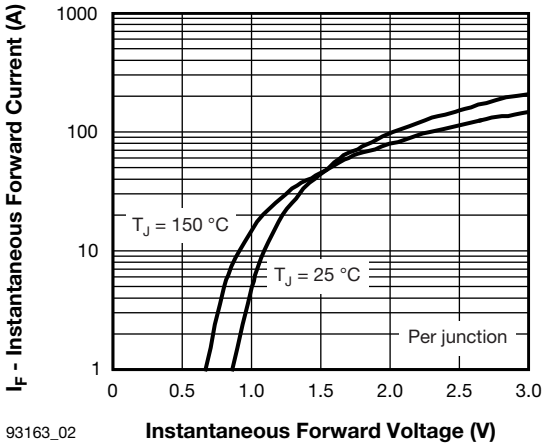
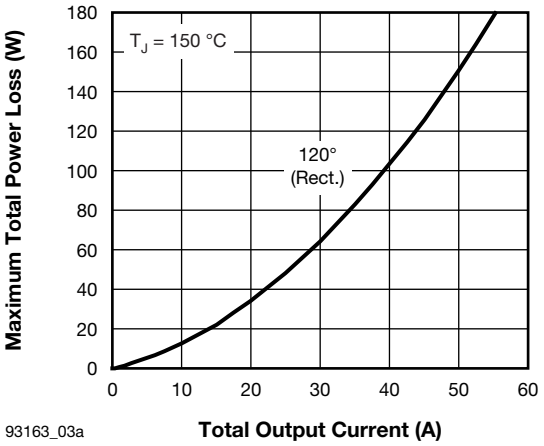


Fig. 2 - Forward Voltage Drop Characteristics



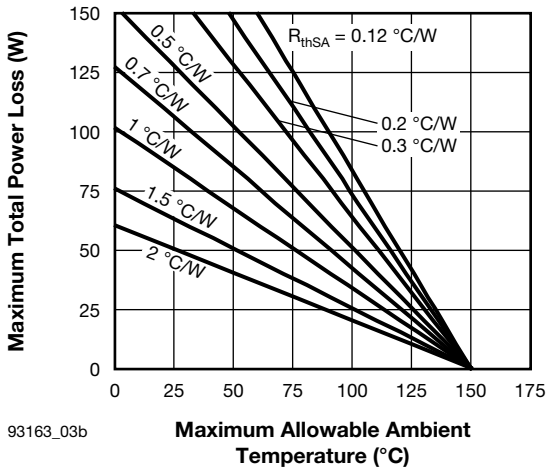


Fig. 3 - Total Power Loss Characteristics

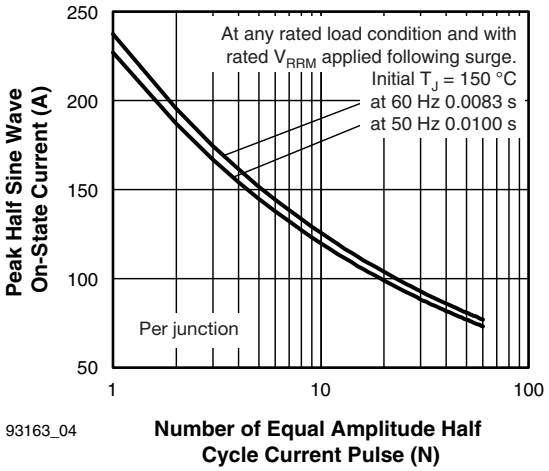


Fig. 4 - Maximum Non-Repetitive Surge Current

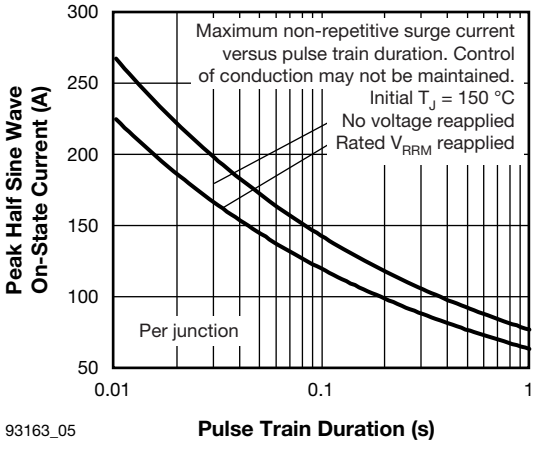


Fig. 5 - Maximum Non-Repetitive Surge Current

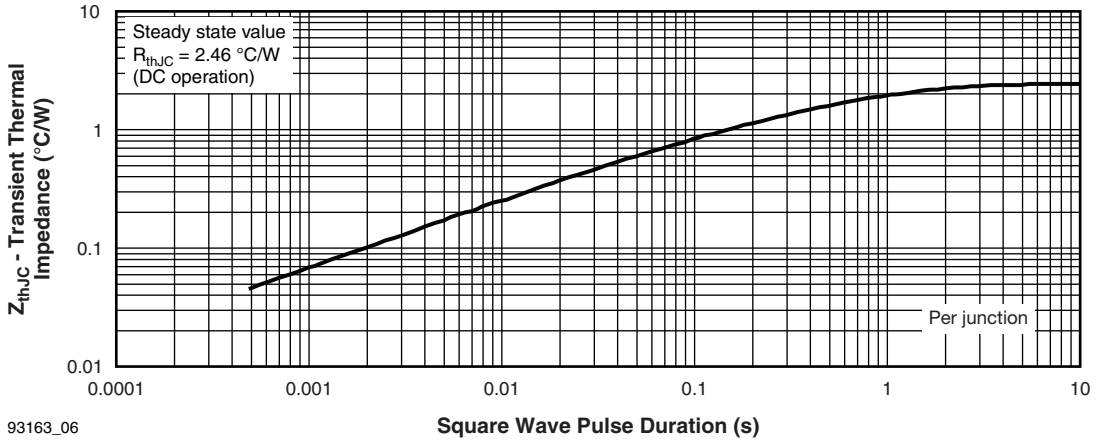


Fig. 6 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

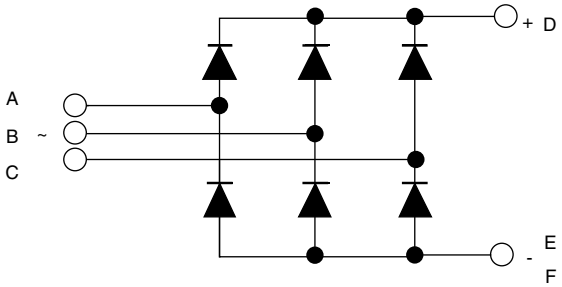
Device code	VS-	4	0	MT	160	K	PbF
	1	2	3	5	6		7

1 - Vishay Semiconductors product
2 - Current rating code: 4 = 40 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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