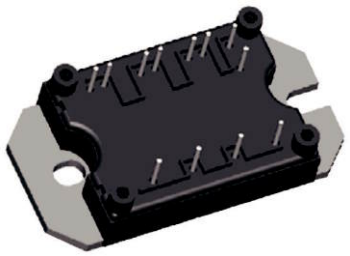
"Half Bridge" IGBT MTP (Warp Speed IGBT), 114 A



MTP

FEATURES

- Generation 4 warp speed IGBT technology
- HEXFRED® antiparallel diodes with ultrasoft reverse recovery
- Very low conduction and switching losses
- Optional SMD thermistor (NTC)
- Very low junction to case thermal resistance
- UL approved file E78996
- Speed 60 kHz to 100 kHz
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

Pb-free
RoHS COMPLIANT

PRODUCT SUMMARY	
V_{CES}	600 V
$V_{CE(on)}$ typical at V_{GE} = 15 V	2.3 V
I_C at T_C = 25 °C	114 A

BENEFITS

- Optimized for welding, UPS and SMPS applications
- Low EMI, requires less snubbing
- Direct mounting to heatsink
- PCB solderable terminals
- Very low stray inductance design for high speed operation

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Collector to emitter voltage	V_{CES}		600	V
Continuous collector current	I_C	T_C = 25 °C	114	A
		T_C = 109 °C	50	
Pulsed collector current	I_{CM}		350	
Peak switching current	I_{LM}		350	
Diode continuous forward current	I_F	T_C = 109 °C	34	
Peak diode forward current	I_{FM}		200	
Gate to emitter voltage	V_{GE}		± 20	V
RMS isolation voltage	V_{ISOL}	Any terminal to case, t = 1 minute	2500	
Maximum power dissipation	P_D	T_C = 25 °C	658	W
		T_C = 100 °C	263	

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Collector to emitter breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0 V, I_C = 500 µA	600	-	-	V
Collector to emitter voltage	$V_{CE(on)}$	V_{GE} = 15 V, I_C = 50 A	-	2.3	3.15	V
		V_{GE} = 15 V, I_C = 100 A	-	2.5	3.2	
		V_{GE} = 15 V, I_C = 50 A, T_J = 150 °C	-	1.72	2.17	
Gate threshold voltage	$V_{GE(th)}$	I_C = 0.5 mA	3	-	6	
Collector to emitter leaking current	I_{CES}	V_{GE} = 0 V, I_C = 600 A	-	-	0.4	mA
		V_{GE} = 0 V, I_C = 600 A, T_J = 150 °C	-	-	10	
Diode forward voltage drop	V_{FM}	I_F = 50 A, V_{GE} = 0 V	-	1.58	1.80	V
		I_F = 50 A, V_{GE} = 0 V, T_J = 150 °C	-	1.49	1.68	
		I_F = 100 A, V_{GE} = 0 V, T_J = 25 °C	-	1.9	2.17	
Gate to emitter leakage current	I_{GES}	V_{GE} = ± 20 V	-	-	± 250	nA

SWITCHING CHARACTERISTICS (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Total gate charge (turn-on)	Q_g	I_C = 52 A V_{CC} = 400 V V_{GE} = 15 V	-	331	385	nC
Gate to emitter charge (turn-on)	Q_{ge}		-	44	52	
Gate to collector charge (turn-on)	Q_{gc}		-	133	176	
Turn-on switching loss	E_{on}	Internal gate resistors (see electrical diagram) I_C = 50 A, V_{CC} = 480 V, V_{GE} = 15 V, L = 200 µH Energy losses include tail and diode reverse recovery, T_J = 25 °C	-	0.26	-	mJ
Turn-off switching loss	E_{off}		-	1.2	-	
Total switching loss	E_{ts}		-	1.46	-	
Turn-on switching loss	E_{on}	Internal gate resistors (see electrical diagram) I_C = 50 A, V_{CC} = 480 V, V_{GE} = 15 V, L = 200 µH Energy losses include tail and diode reverse recovery, T_J = 150 °C	-	0.73	-	mJ
Turn-off switching loss	E_{off}		-	1.66	-	
Total switching loss	E_{ts}		-	2.39	-	
Input capacitance	C_{ies}	V_{GE} = 0 V V_{CC} = 30 V f = 1.0 MHz	-	7100	-	pF
Output capacitance	C_{oes}		-	510	-	
Reverse transfer capacitance	C_{res}		-	140	-	
Diode reverse recovery time	t_{rr}	V_{CC} = 200 V, I_C = 50 A dI/dt = 200 A/µs	-	82	97	ns
Diode peak reverse current	I_{rr}		-	8.3	10.6	A
Diode recovery charge	Q_{rr}		-	340	514	nC
Diode reverse recovery time	t_{rr}	V_{CC} = 200 V, I_C = 50 A dI/dt = 200 A/µs T_J = 125 °C	-	137	153	ns
Diode peak reverse current	I_{rr}		-	12.7	14.8	A
Diode recovery charge	Q_{rr}		-	870	1132	nC

THERMISTOR SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Resistance	R_0 (1)	T_0 = 25 °C	-	30	-	kΩ
Sensitivity index of the thermistor material	β (1)(2)	T_0 = 25 °C T_1 = 85 °C	-	4000	-	K

Notes

(1) T_0, T_1 are thermistor´s temperatures

(2) $\frac{R_0}{R_1} = \exp\left[\beta\left(\frac{1}{T_0} - \frac{1}{T_1}\right)\right]$, temperature in Kelvin

THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER		**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Operating junction temperature range	IGBT, Diode	T_J		- 40	-	150	°C
	Thermistor			- 40	-	125	
Storage temperature range		T_{Stg}		- 40	-	125	
Junction to case	IGBT	R_{thJC}		-	-	0.38	°C/W
	Diode			-	-	0.8	
Case to sink per module		R_{thCS}	Heatsink compound thermal conductivity = 1 W/mK	-	0.06	-	
Clearance (1)			External shortest distance in air between 2 terminals	5.5	-	-	mm
Creepage (1)			Shortest distance along the external surface of the insulating material between 2 terminals	8	-	-	
Mounting torque to heatsink			A mounting compound is recommended and the torque should be checked after 3 hours to allow for the spread of the compound. Lubricated threads.	3 ± 10 %			Nm
Weight				66			g

Note

(1) Standard version only i.e. without optional thermistor

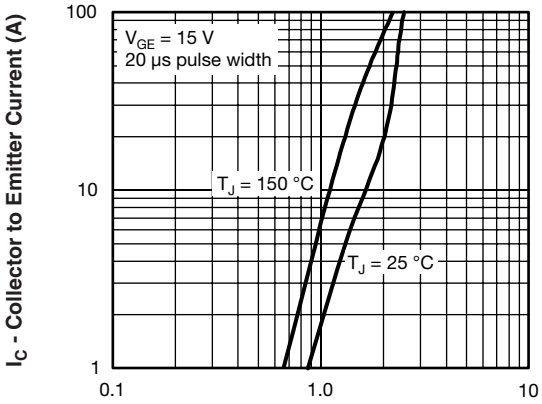


Fig. 1 - Typical Output Characteristics

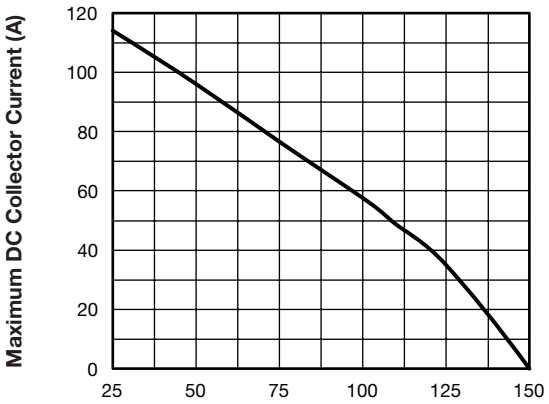


Fig. 2 - Maximum Collector Current vs. Case Temperature

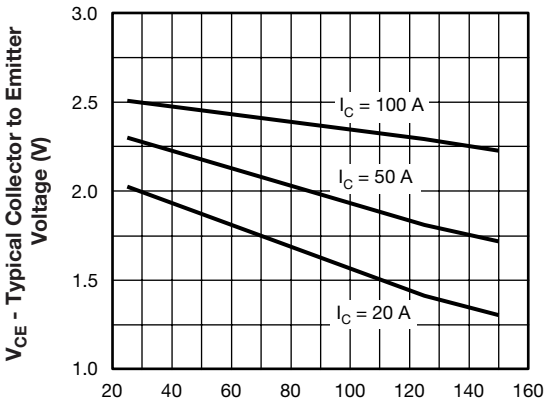


Fig. 3 - Typical Collector to Emitter Voltage vs. Junction Temperature

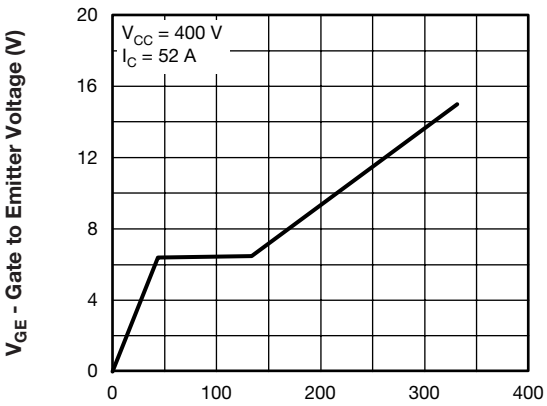


Fig. 4 - Typical Gate Charge vs. Gate to Emitter Votlage

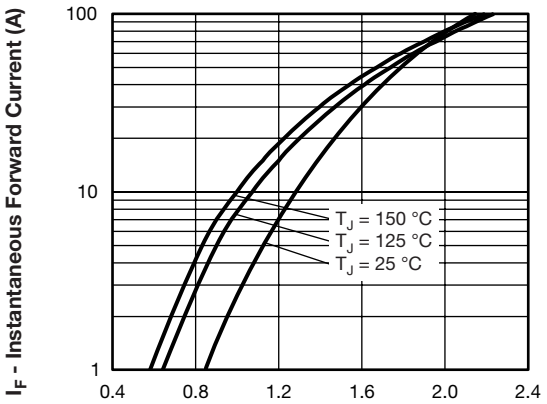


Fig. 5 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

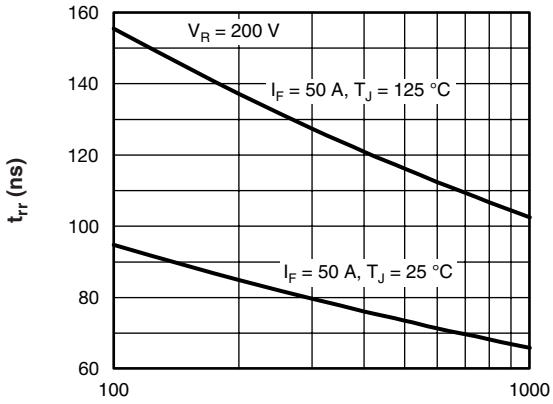


Fig. 6 - Typical Reverse Recovery Time vs. dI_F/dt

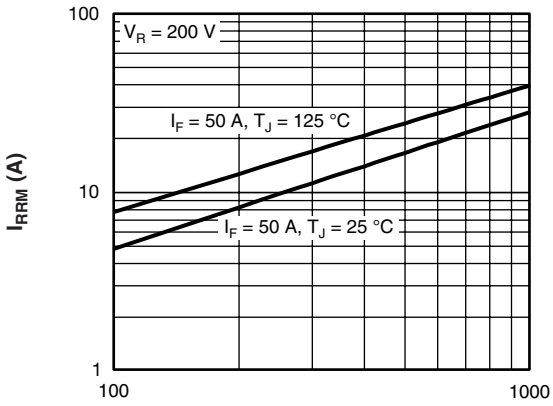


Fig. 7 - Typical Reverse Recovery Current vs. dI_F/dt

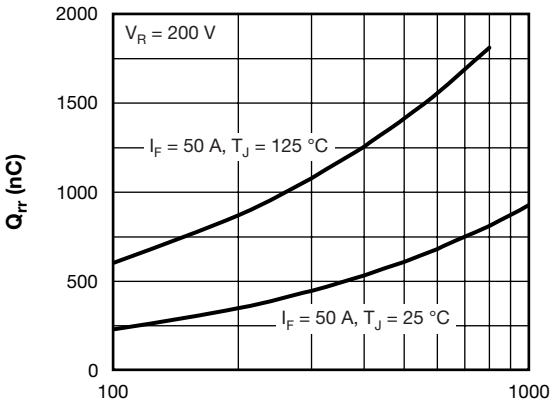


Fig. 8 - Typical Stored Charge vs. dI_F/dt

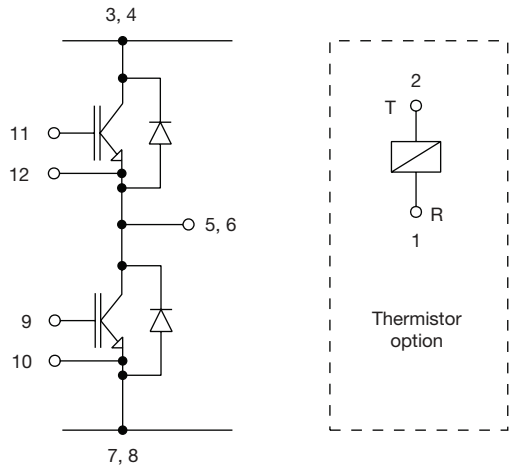


Fig. 9 - Functional Diagram

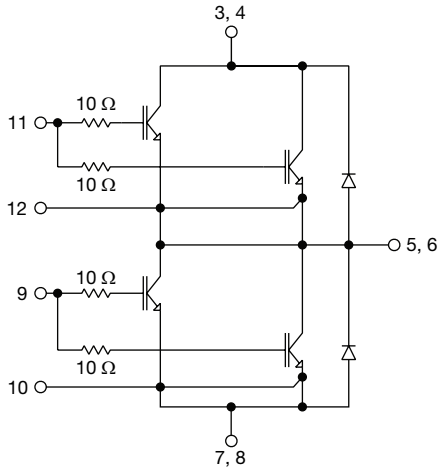


Fig. 10 - Electrical Diagram

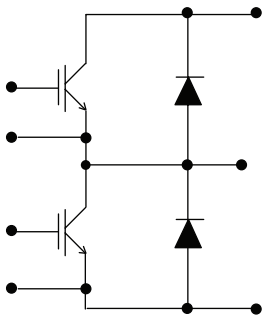
ORDERING INFORMATION TABLE

Device code

50	MT	060	W	H	T	A	PbF
1	2	3	4	5	6	7	8

1	-	Current rating (50 = 50 A)
2	-	Essential part number
3	-	Voltage rating (060 = 600 V)
4	-	Speed/type (W = Warp IGBT)
5	-	Circuit configuration (H = Half bridge)
6	-	T = Thermistor
7	-	A = Al_2O_3 substrate
8	-	Lead (Pb)-free

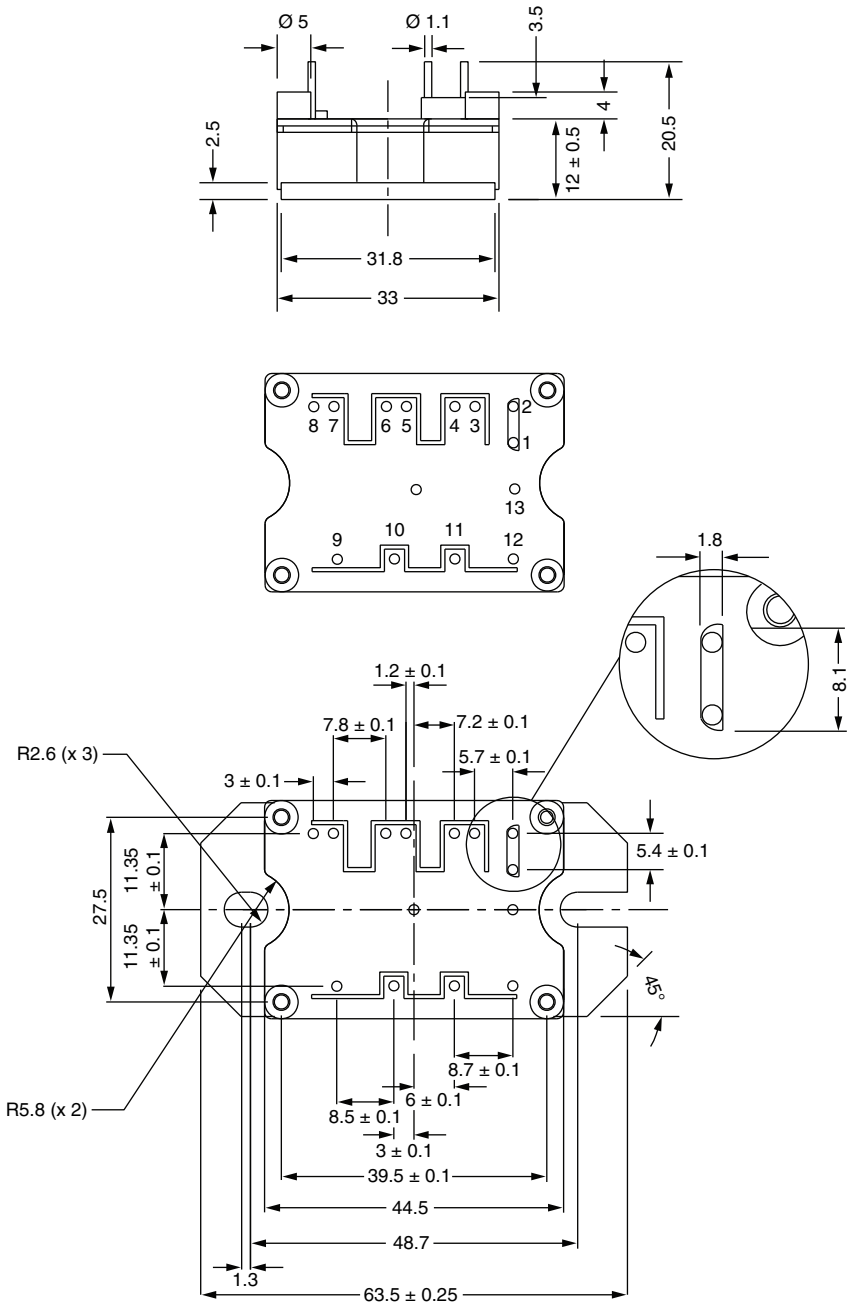
CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95175

MTP

DIMENSIONS in millimeters



Note

- Unused terminals are not assembled in the package

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9