"Half Bridge" Low $V_{CE(on)}$ IGBT INT-A-PAK, 100 A



INT-A-PAK IGBT

FEATURES

- Trench IGBT technology
- Gen 4 FRED Pt® technology anti-parallel diodes with ultra soft reverse recovery characteristics
- Very low conduction losses
- Al_2O_3 DBC
- UL approved file E78996
- Designed for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

BENEFITS

- Optimized for high current inverter stages (AC TIG welding machines)
- Direct mounting to heatsink
- Very low junction to case thermal resistance
- Low EMI

PRIMARY CHARACTERISTICS	
V_{CES}	650 V
I_C DC, T_C = 80 °C	199 A
$V_{CE(on)}$ at 100 A, 25 °C	1.05 V
Chip level $V_{CE(on)}$ at 100 A, 25 °C	0.98 V
Speed	DC to 1 kHz
Package	INT-A-PAK
Circuit configuration	Half bridge

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Collector to emitter voltage	V_{CES}		650	V
Continuous collector current	I_C	T_C = 25 °C	264	A
		T_C = 80 °C	199	
Pulsed collector current	I_{CM}	T_C = 175 °C, t_p = 6 ms, V_{GE} = 15 V	660	
Peak switching current	I_{LM}		320	
Diode continuous forward current	I_F	T_C = 25 °C	57	
		T_C = 80 °C	43	
Maximum non-repetitive peak current	I_{FSM}	10 ms sine or 6 ms rectangular pulse, T_J = 25 °C	270	
Gate to emitter voltage	V_{GE}		± 20	V
RMS isolation voltage	V_{ISOL}	Any terminal to case, t = 1 min	2500	
Maximum power dissipation (IGBT)	P_D	T_C = 25 °C	577	W
		T_C = 80 °C	365	
Maximum power dissipation (Diode)	P_D	T_C = 25 °C	150	W
		T_C = 80 °C	95	
Operating junction temperature range	T_J		-40 to +175	°C
Storage temperature range	T_{Stg}		-40 to +150	°C

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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 = 400 µA	650	-	-	V
Collector to emitter voltage	$V_{CE(on)}$	V_{GE} = 15 V, I_C = 100 A	-	1.05	1.32	
		V_{GE} = 15 V, I_C = 200 A	-	1.24	-	
		V_{GE} = 15 V, I_C = 100 A, T_J = 125 °C	-	1.02	-	
Gate threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE}, I_C = 2 mA	4.0	4.8	6.0	
Temperature coefficient of threshold voltage	$\Delta V_{GE(th)}/\Delta T_J$	V_{CE} = V_{GE}, I_C = 2 mA, (25 °C to 125 °C)	-	-14	-	mV/°C
Forward transconductance	g_{fe}	V_{CE} = 20 V, I_C = 100 A	-	102	-	S
Transfer characteristics	V_{GE}	V_{CE} = 20 V, I_C = 100 A	-	6.4	-	V
Collector to emitter leakage current	I_{CES}	V_{GE} = 0 V, V_{CE} = 650 V	-	0.5	100	µA
		V_{GE} = 0 V, V_{CE} = 650 V, T_J = 125 °C	-	0.2	-	
Diode forward voltage drop	V_{FM}	I_C = 50 A, V_{GE} = 0 V	-	2.0	2.9	V
		I_C = 50 A, V_{GE} = 0 V, T_J = 125 °C	-	1.6	-	
Gate to emitter leakage current	I_{GES}	V_{GE} = ± 20 V	-	-	± 240	nA

SWITCHING CHARACTERISTICS (T_J = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Total gate charge	Q_g	I_C = 100 A, V_{CC} = 520 V, V_{GE} = 15 V	-	894	-	nC
Gate to emitter charge	Q_{ge}		-	146	-	
Gate to collector charge	Q_{gc}		-	249	-	
Turn-on switching energy	E_{on}	I_C = 100 A, V_{CC} = 325 V, V_{GE} = 15 V, L = 500 µH, R_g = 4.7 Ω, T_J = 25 °C	-	0.4	-	mJ
Turn-off switching energy	E_{off}		-	4.5	-	
Total switching energy	E_{ts}		-	4.9	-	
Turn-on delay time	$t_{d(on)}$		-	23	-	ns
Rise time	t_r		-	24	-	
Turn-off delay time	$t_{d(off)}$		-	367	-	
Fall time	t_f		-	113	-	
Turn-on switching energy	E_{on}	I_C = 100 A, V_{CC} = 325 V, V_{GE} = 15 V, L = 500 µH, R_g = 4.7 Ω, T_J = 125 °C	-	0.5	-	mJ
Turn-off switching energy	E_{off}		-	6.5	-	
Total switching energy	E_{ts}		-	7	-	
Turn-on delay time	$t_{d(on)}$		-	20	-	ns
Rise time	t_r		-	25	-	
Turn-off delay time	$t_{d(off)}$		-	420	-	
Fall time	t_f		-	152	-	
Reverse bias safe operating area	RBSOA	T_J = 175 °C, I_C = 320 A, V_{CC} = 325 V, V_p = 650 V, R_g = 4.7 Ω, V_{GE} = 15 V to 0 V, L = 500 µH	Fullsquare			
Diode reverse recovery time	t_{rr}	I_F = 50 A, dI_F/dt = 500 A/µs, V_{rr} = 200 V	-	79	-	ns
Diode peak reverse current	I_{rr}		-	10.5	-	A
Diode recovery charge	Q_{rr}		-	409	-	nC
Diode reverse recovery time	t_{rr}	I_F = 50 A, dI_F/dt = 500 A/µs, V_{rr} = 200 V, T_J = 125 °C	-	141	-	ns
Diode peak reverse current	I_{rr}		-	19	-	A
Diode recovery charge	Q_{rr}		-	1336	-	nC

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS
Junction to case	per switch	R_{thJC}	-	-	0.26	°C/W
	per diode		-	-	1.00	
Case to sink per module		R_{thCS}	-	0.1	-	
Mounting torque	case to heatsink		-	-	4	Nm
	case to terminal 1, 2, 3		-	-	3	
Weight			-	185	-	g

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

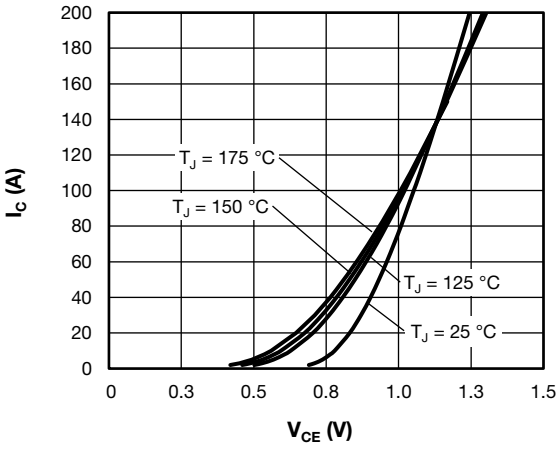


Fig. 1 - Typical Trench IGBT Output Characteristics, V_{GE} = 15 V

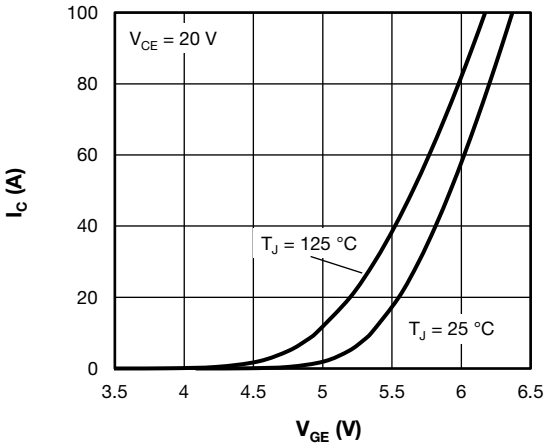


Fig. 4 - Typical Trench IGBT Transfer Characteristics

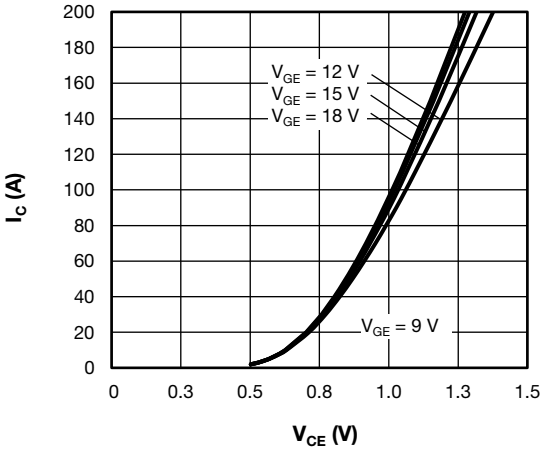


Fig. 2 - Typical Trench IGBT Output Characteristics, T_J = 125 °C

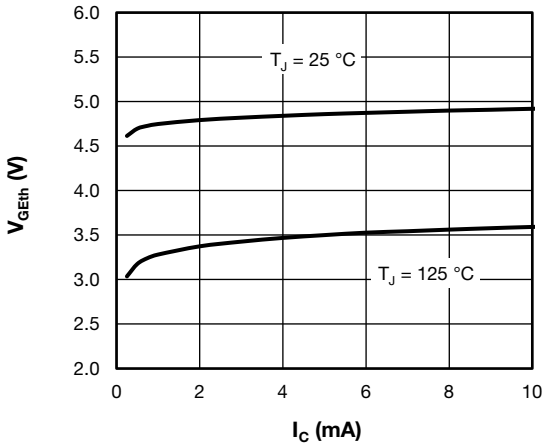


Fig. 5 - Typical Trench IGBT Gate Threshold Voltage

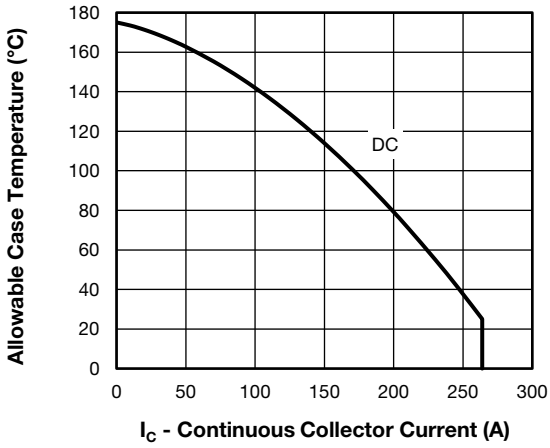


Fig. 3 - Maximum Trench IGBT Continuous Collector Current vs. Case Temperature

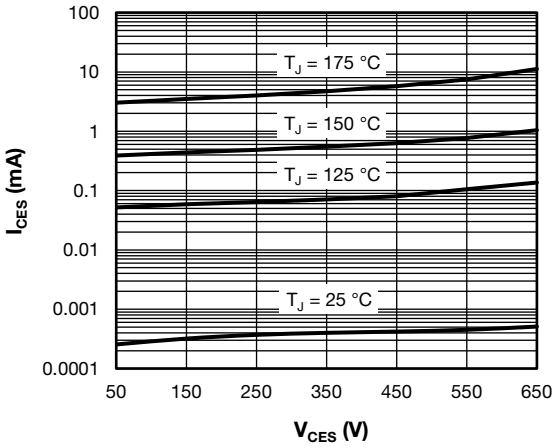


Fig. 6 - Typical Trench IGBT Zero Gate Voltage Collector Current

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

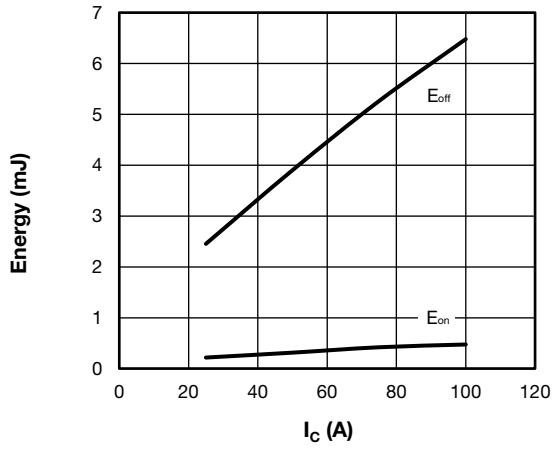


Fig. 7 - Typical Trench IGBT Energy Loss vs. I_C
(with Antiparallel Diode)
T_J = 125 °C, V_{CC} = 325 V, R_g = 4.7 Ω, V_{GE} = +15 V/-15 V, L = 500 µH

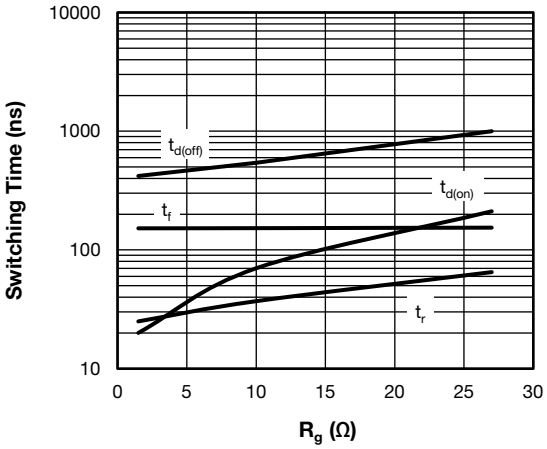


Fig. 10 - Typical Trench IGBT Switching Time vs. R_g
(with Antiparallel Diode)
T_J = 125 °C, V_{CC} = 325 V, I_C = 100 A, V_{GE} = +15 V/-15 V, L = 500 µH

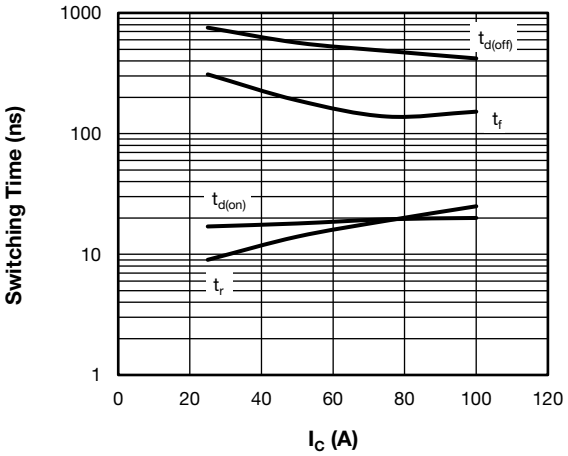


Fig. 8 - Typical Trench IGBT Switching Time vs. I_C
(with Antiparallel Diode)
T_J = 125 °C, V_{CC} = 325 V, R_g = 4.7 Ω, V_{GE} = +15 V/-15 V, L = 500 µH

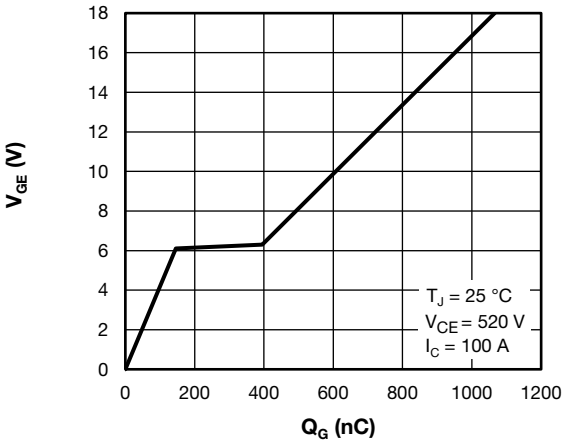


Fig. 11 - Typical Trench IGBT Gate Charge vs.
Gate to Collector Voltage

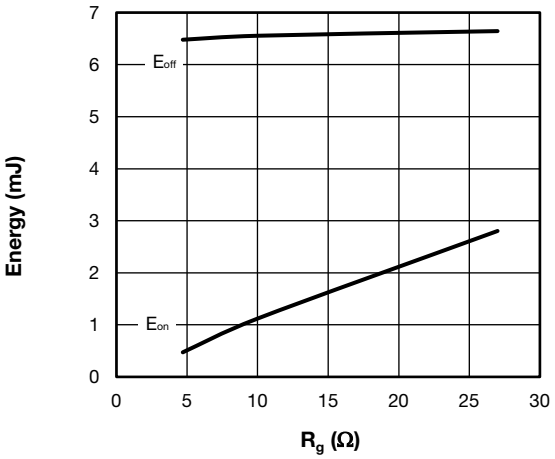


Fig. 9 - Typical Trench IGBT Energy Loss vs. R_g
(with Antiparallel Diode)
T_J = 125 °C, V_{CC} = 325 V, I_C = 100 A, V_{GE} = +15 V/-15 V, L = 500 µH

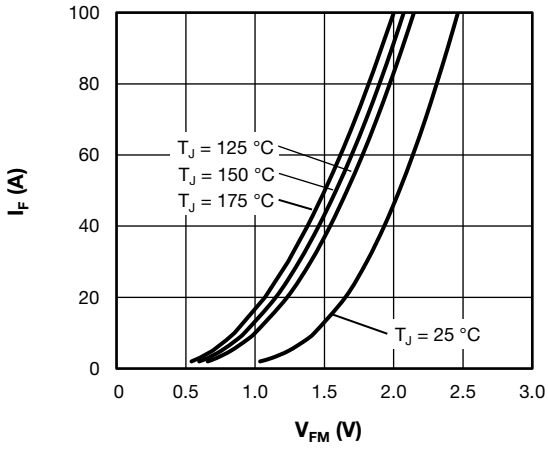


Fig. 12 - Typical Antiparallel Diode Forward Characteristics

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

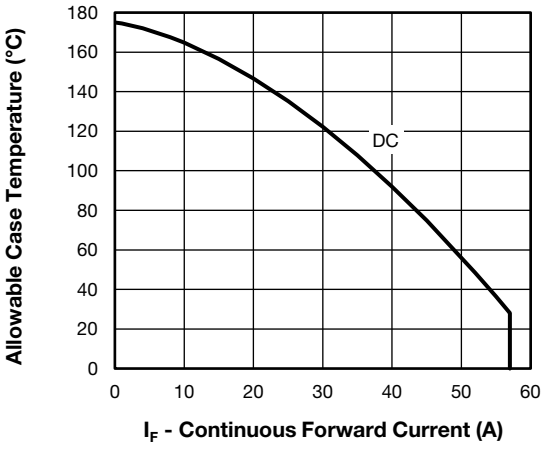


Fig. 13 - Maximum Antiparallel Diode Continuous Forward Current vs. Case Temperature

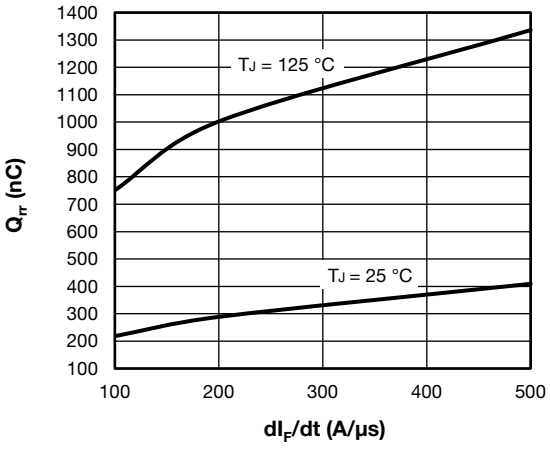


Fig. 16 - Typical Antiparallel Diode Reverse Recovery Charge vs. $dI_F dt$
I_F = 50 A, V_{CC} = 200 V

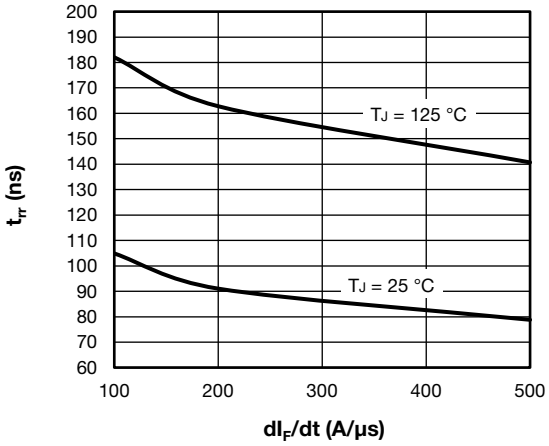


Fig. 14 - Typical Antiparallel Diode Reverse Recovery Time vs. $dI_F dt$
I_F = 50 A, V_{CC} = 200 V

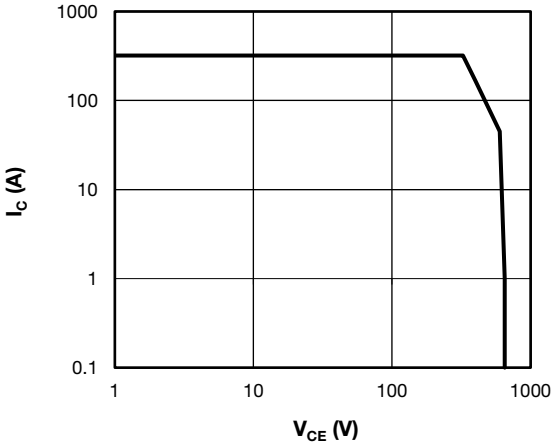


Fig. 17 - Trench IGBT Reverse BIAS SOA
T_J = 175 °C, V_{GE} = 15 V

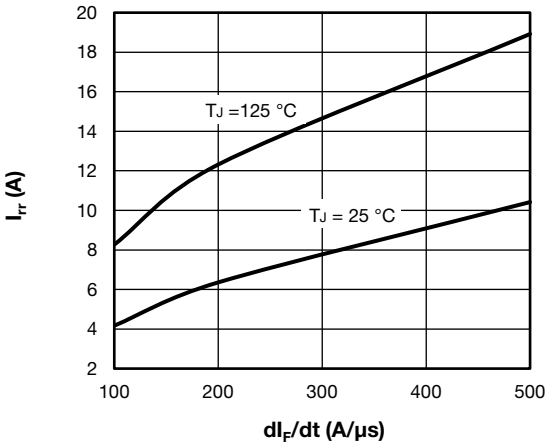


Fig. 15 - Typical Antiparallel Diode Reverse Recovery Current vs. $dI_F dt$
I_F = 50 A, V_{CC} = 200 V

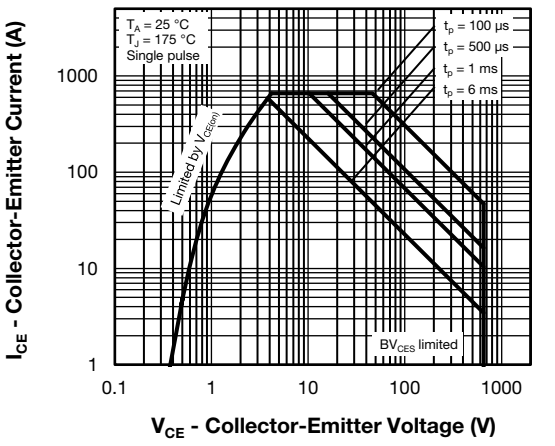


Fig. 18 - Trench IGBT Safe Operating Area

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

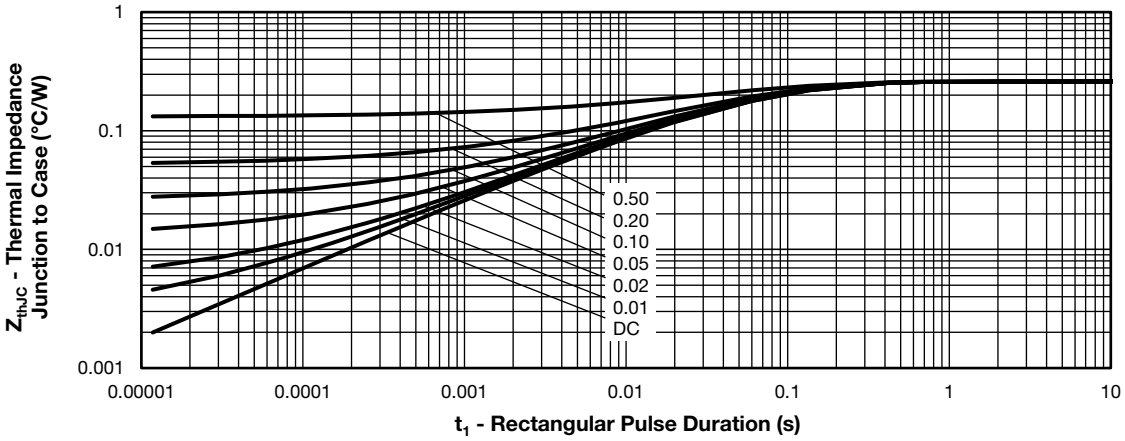


Fig. 19 - Maximum Trench IGBT Thermal Impedance Z_{thJC} Characteristics

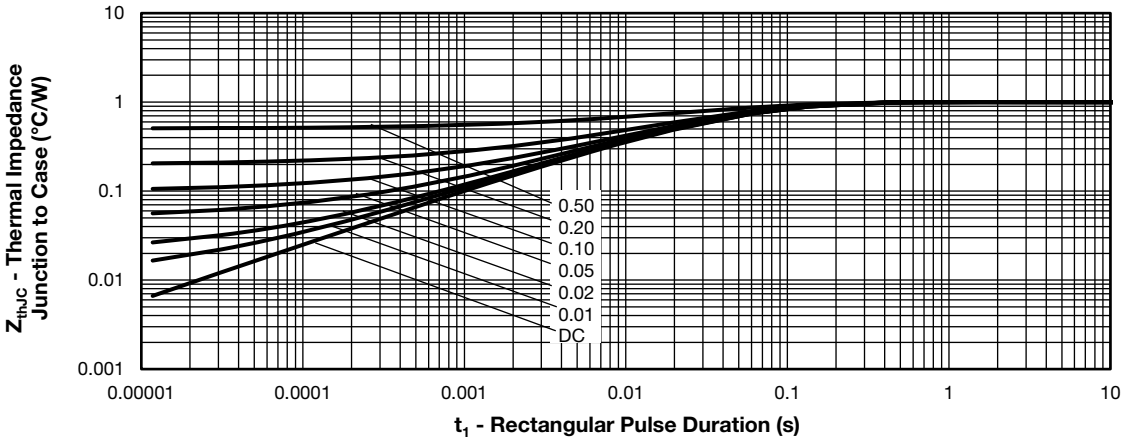


Fig. 20 - Maximum Antiparallel Diode Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

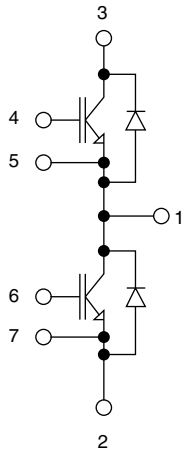
Device code

VS-	GT	100	T	S	065	S
1	2	3	4	5	6	7

1	-	Vishay Semiconductors product
2	-	IGBT die technology (GT = trench)
3	-	Current rating (100 = 100 A)
4	-	Circuit configuration (T = half bridge)
5	-	Package indicator (S = INT-A-PAK)
6	-	Voltage code (065 = 650 V)
7	-	Speed/type (S = standard speed IGBT)

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

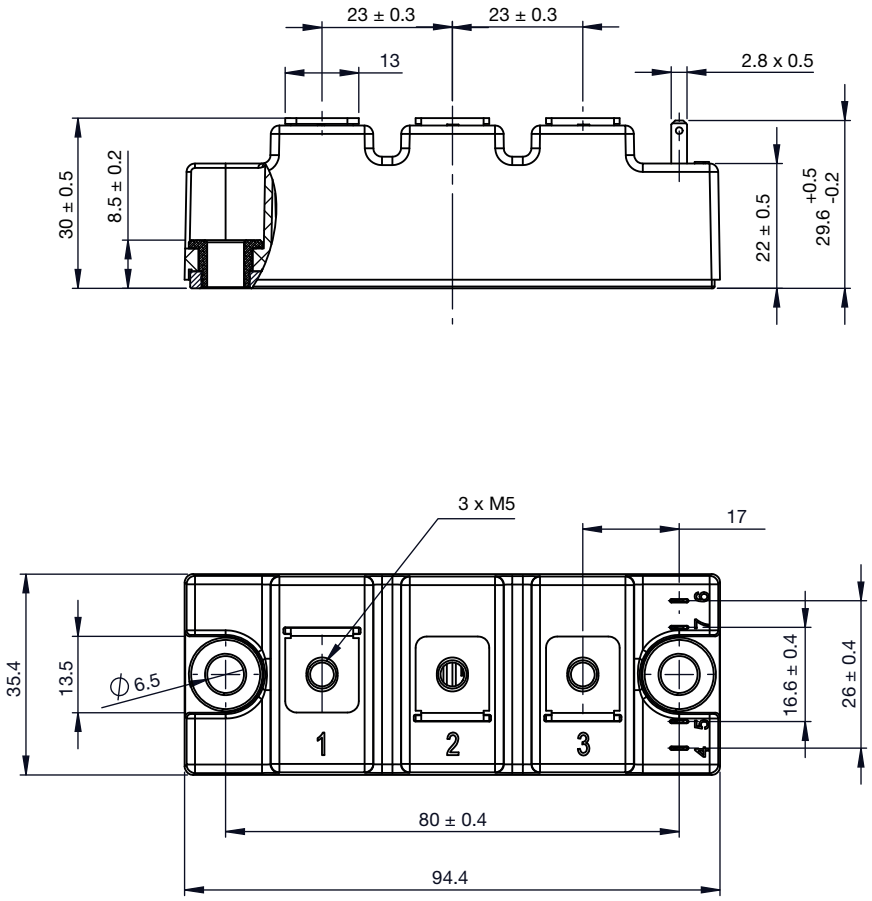
CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95173

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

DIMENSIONS in millimeters (inches)



General tolerance ± 0.5 mm

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. 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.

© 2026 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.