SK50GD07E3ETE1

SEMITOP®E1

IGBT module

Engineering Sample

SK50GD07E3ETE1

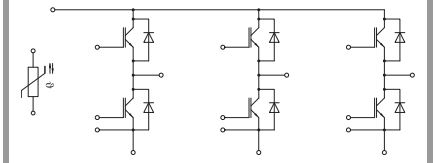
Target Data

Features

- Low inductive design
- Press-Fit contact technology
- Rugged mounting due to integrated mounting clamps
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DBC)
- 650V Trench IGBT technology
- Robust and soft freewheeling diode CAL technology
- UL recognized file no. E 63 532
- Integrated NTC temperature sensor

Typical Applications*

- Inverter up to 33kVA
- Typical motor power 15kW



GD-ET

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	T_j = 25 °C		650	V
I_C	T_j = 175 °C	T_s = 25 °C	49	A
		T_s = 70 °C	39	A
I_{Cnom}			50	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		150	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 360 V $V_{GE} \leq$ 15 V $V_{CES} \leq$ 650 V	T_j = 150 °C	6	µs
T_j			-40 ... 175	°C
Inverse - Diode				
I_F	T_j = 175 °C	T_s = 25 °C	57	A
		T_s = 70 °C	45	A
I_{Fnom}			50	A
I_{FRM}	I_{FRM} = 2 x I_{Fnom}		100	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		460	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	, $T_{terminal}$ = 100 °C, T_S = 60°C		t.b.d.	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min		2500	V

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverter - IGBT						
$V_{CE(sat)}$	I_C = 50 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.45	1.85	V
		T_j = 150 °C		1.70	2.10	V
V_{CE0}	chiplevel	T_j = 25 °C		0.90	1.00	V
		T_j = 150 °C		0.82	0.90	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		11	17	mΩ
		T_j = 150 °C		18	24	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0.8 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 650 V	T_j = 25 °C			-	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		3.14		nF
C_{oes}		f = 1 MHz		0.2		nF
C_{res}		f = 1 MHz		0.093		nF
Q_G	- 8 V...+ 15 V			460		nC
R_{Gint}	T_j = 25 °C			0		Ω
$t_{d(on)}$	V_{CC} = 300 V	T_j = 150 °C				ns
t_r	I_C = 50 A	T_j = 150 °C				ns
E_{on}	$R_{G\ on}$ = 6.8 Ω	T_j = 150 °C		0.64		mJ
$t_{d(off)}$	$R_{G\ off}$ = 6.8 Ω	T_j = 150 °C				ns
t_f		T_j = 150 °C				ns
E_{off}	V_{GE} = +15/-8 V	T_j = 150 °C		1.7		mJ
$R_{th(j-s)}$	per IGBT			1.45		K/W

SK50GD07E3ETE1

SEMITOP®E1

IGBT module

Engineering Sample

SK50GD07E3ETE1

Target Data

Features

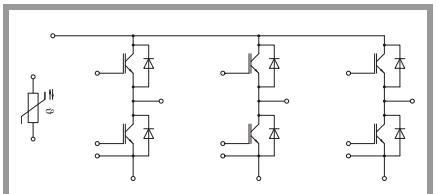
- Low inductive design
- Press-Fit contact technology
- Rugged mounting due to integrated mounting clamps
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DBC)
- 650V Trench IGBT technology
- Robust and soft freewheeling diode CAL technology
- UL recognized file no. E 63 532
- Integrated NTC temperature sensor

Typical Applications*

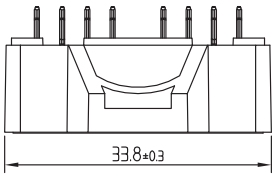
- Inverter up to 33kVA
- Typical motor power 15kW

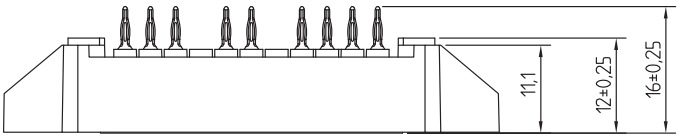
Characteristics

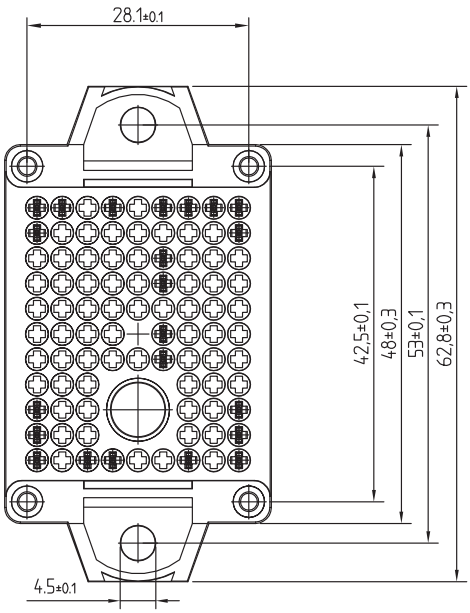
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	I_F = 50 A	T_j = 25 °C		1.37	1.73	V
	chiplevel	T_j = 150 °C		1.35	1.72	V
V_{F0}	chiplevel	T_j = 25 °C	0.95	1.04	1.24	V
		T_j = 150 °C		0.85	0.99	V
r_F	chiplevel	T_j = 25 °C	4.6	6.7	9.8	mΩ
		T_j = 150 °C		10	15	mΩ
I_{RRM}	I_F = 50 A	T_j = 150 °C		-		A
Q_{rr}	V_{GE} = -8 V	T_j = 150 °C		-		µC
E_{rr}	V_{CC} = 300 V	T_j = 150 °C		0.85		mJ
$R_{th(j-s)}$	per Diode			1.5		K/W
Module						
L_{CE}				t.b.d.		nH
M_s	to heatsink		2		2.1	Nm
w				24		g
Temperature Sensor						
R_{100}	T_c=100°C (R_{25}=5 kΩ)			493 ± 5%		Ω
$B_{100/125}$	$R_{(T)}=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; T[K];			3550 ±2%		K

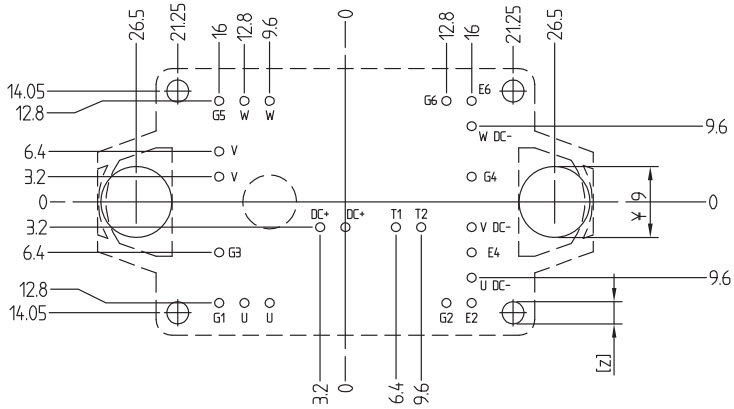


GD-ET



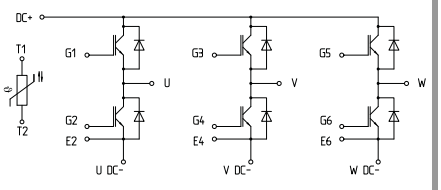






PCB Hole pattern

-Pin-Grid 3.2 mm
-Tolerance of PCB hole pattern ⌖ Ø0.15 26x
-Hole specification for contatcs see application note Semitop E1
-Diameters of drill Ø1.15
and copper thickness in hole 25 - 75 µm
-[Z] raccomended diameter of PCB positioning guiding holes Ø2.8



GD-ET

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, chapter IX.

***IMPORTANT INFORMATION AND WARNINGS**

The specifications of SEMIKRON products may not be considered as guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of SEMIKRON products describe only the usual characteristics of products to be expected in typical applications, which may still vary depending on the specific application. Therefore, products must be tested for the respective application in advance. Application adjustments may be necessary. The user of SEMIKRON products is responsible for the safety of their applications embedding SEMIKRON products and must take adequate safety measures to prevent the applications from causing a physical injury, fire or other problem if any of SEMIKRON products become faulty. The user is responsible to make sure that the application design is compliant with all applicable laws, regulations, norms and standards. Except as otherwise explicitly approved by SEMIKRON in a written document signed by authorized representatives of SEMIKRON, SEMIKRON products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury. No representation or warranty is given and no liability is assumed with respect to the accuracy, completeness and/or use of any information herein, including without limitation, warranties of non-infringement of intellectual property rights of any third party. SEMIKRON does not assume any liability arising out of the applications or use of any product; neither does it convey any license under its patent rights, copyrights, trade secrets or other intellectual property rights, nor the rights of others. SEMIKRON makes no representation or warranty of non-infringement or alleged non-infringement of intellectual property rights of any third party which may arise from applications. Due to technical requirements our products may contain dangerous substances. For information on the types in question please contact the nearest SEMIKRON sales office. This document supersedes and replaces all information previously supplied and may be superseded by updates. SEMIKRON reserves the right to make changes.

In accordance with the quality guidelines of SEMIKRON, we would like to point out that the products are engineering samples. These engineering samples are not yet produced under quality conditions approaching those of series production, and are at the present time not included in the SEMIKRON quality monitoring and control process. Neither the product nor the production process has to date gone completely through the SEMIKRON internal authorization procedure. SEMIKRON may make any amendments without any prior notification. SEMIKRON cannot and shall not promise or commit itself to release and/or make available a final version or series product after the development phase. SEMIKRON cannot and will not assume any responsibility with regard to freedom from defects, functionality, and adaptation to and interaction with possible applications of the user or with regard to any other potential risks resulting from the use of engineering samples. Therefore SEMIKRON explicitly excludes any warranty and liability; as far as legally possible. The customer shall fully indemnify and hold harmless SEMIKRON from any and all risks, damages, losses, expenses and costs directly or indirectly resulting out of or in connection with the commissioning, operation, system integration, sale, dissemination or any other kind of use of engineering samples by the customer and/or any third party, which has come into possession of engineering samples through or because of the customer. All know-how and all registerable and non-registerable copyrights and industrial property rights arising from or in connection with these engineering samples remain the exclusive property of SEMIKRON.