SK35GD12T4ETE1

SEMITOP®E1

IGBT module

Engineering Sample

SK35GD12T4ETE1

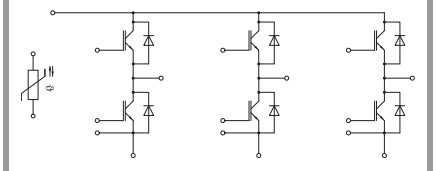
Target Data

Features

- Low inductive design
- Press-Fit contact technology
- Rugged mounting due to integrated mounting clamps
- Heat transfer and insulation through direct copper bonded aluminium oxide ceramic (DBC)
- 1200V Trench4 IGBT technology
- CAL4F diode technology
- UL recognized file no. E 63 532
- Integrated NTC temperature sensor

Typical Applications*

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



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Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_s = 25 °C	43	A
		T_s = 70 °C	35	A
I_{Cnom}			35	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		105	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j = 150 °C	10	µs
T_j			-40 ... 175	°C
Inverse - Diode				
V_{RRM}	T_j = 25 °C		1200	V
I_F	T_j = 175 °C	T_s = 25 °C	38	A
		T_s = 70 °C	30	A
I_{Fnom}			35	A
I_{FRM}	I_{FRM} = 3 x I_{Fnom}		105	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		170	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 100 °C, T_S = 60°C, per pin		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 = 35 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.85	2.10	V
		T_j = 150 °C		2.25	2.45	V
V_{CE0}	chiplevel	T_j = 25 °C		0.80	0.90	V
		T_j = 150 °C		0.70	0.80	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		30	34	mΩ
		T_j = 150 °C		44	47	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1.2 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = 1200 V, T_j = 25 °C				0.06	mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		1.95		nF
C_{oes}		f = 1 MHz		0.155		nF
C_{res}		f = 1 MHz		0.115		nF
Q_G	- 8 V...+ 15 V			270		nC
R_{Gint}	T_j = 25 °C			0		Ω
$t_{d(on)}$	V_{CC} = 600 V	T_j = 150 °C		-		ns
t_r	I_C = 35 A	T_j = 150 °C		-		ns
E_{on}	$R_{G\ on}$ = 12 Ω	T_j = 150 °C		3.15		mJ
$t_{d(off)}$	$R_{G\ off}$ = 12 Ω	T_j = 150 °C		-		ns
t_f		T_j = 150 °C		-		ns
E_{off}	V_{GE} = +15/-7 V	T_j = 150 °C		3.2		mJ
$R_{th(j-s)}$	per IGBT			1.2		K/W

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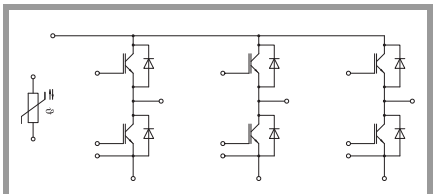
Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	I_F = 35 A	T_j = 25 °C		2.30	2.62	V
	chiplevel	T_j = 150 °C		2.29	2.62	V
V_{F0}	chiplevel	T_j = 25 °C		1.30	1.50	V
		T_j = 150 °C		0.90	1.10	V
r_F	chiplevel	T_j = 25 °C		29	32	mΩ
		T_j = 150 °C		40	43	mΩ
I_{RRM}	I_F = 35 A	T_j = 150 °C		-		A
Q_{rr}	V_{GE} = -7 V	T_j = 150 °C		-		µC
E_{rr}	V_{CC} = 600 V	T_j = 150 °C		2.6		mJ
$R_{th(j-s)}$	per Diode			1.55		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



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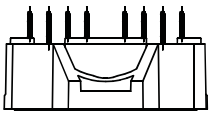
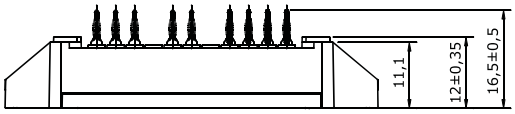
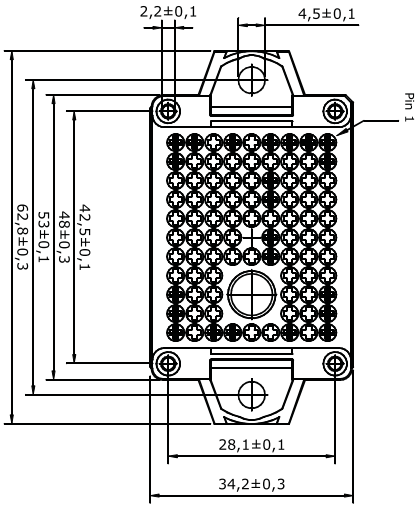
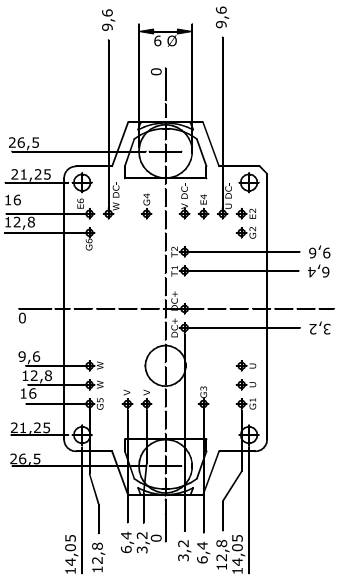






- Pin-Grid 3.2 mm
- Tolerance of PCB hole pattern ⌖ 0.025
- Diameters of drill ∅ 1.15mm
- Copper thickness in hole 25 - 50 µm
- Hole specification for contacts: refer to SEMITOP E1, E2 mounting instruction



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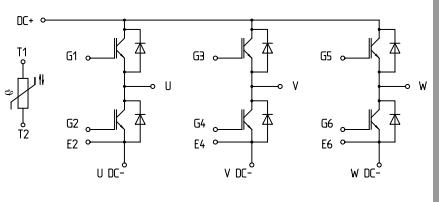

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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, chapter IX.

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