

SEMITOP®E2

Sixpack Open Emitter

SK75GD06E3ETE2

Features*

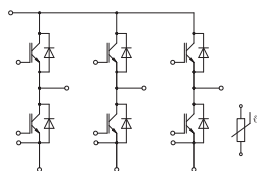
- Optimized design for superior thermal performance
- Low inductive design
- Press-Fit contact technology
- 650V Trench IGBT3 (E3)
- Robust and soft switching CAL HD diode technology
- Integrated NTC temperature sensor
- UL recognized file no. E 63 532

Typical Applications

- Motor drives
- Servo drives
- Air conditioning
- Auxiliary Inverters
- UPS

Remarks

- Recommended $T_{j,op} = -40 \dots +150 \text{ °C}$



GD-ET

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V _{CES}	T _j = 25 °C		650	V
I _C	λ _{paste} =0.8 W/(mK)	T _s = 70 °C	58	A
	T _j = 175 °C	T _s = 100 °C	47	A
I _C	λ _{paste} =2.5 W/(mK)	T _s = 70 °C	75	A
	T _j = 175 °C	T _s = 100 °C	61	A
I _{Cnom}			75	A
I _{CRM}			150	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 360 V V _{GE} ≤ 15 V V _{CES} ≤ 650 V	T _j = 150 °C	6	μs
T _j			-40 ... 175	°C
Inverse - Diode				
V _{RRM}	T _j = 25 °C		600	V
I _F	λ _{paste} =0.8 W/(mK)	T _s = 70 °C	44	A
	T _j = 175 °C	T _s = 100 °C	36	A
I _F	λ _{paste} =2.5 W/(mK)	T _s = 70 °C	55	A
	T _j = 175 °C	T _s = 100 °C	45	A
I _{FRM}			150	A
I _{FSM}	t _p = 10 ms, sin 180°, T _j = 150 °C		395	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	, ΔT _{terminal} at PCB joint = 30 K, per pin		30	A
T _{stg}	module without TIM		-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 = 75 A	T _J = 25 °C		1.45	1.77	V
	V _{GE} = 15 V chipelevel	T _J = 150 °C		1.70	2.15	V
V _{CE0}	chipelevel	T _J = 25 °C		0.75	0.90	V
		T _J = 150 °C		0.68	0.83	V
r _{CE}	V _{GE} = 15 V	T _J = 25 °C		9.3	12	mΩ
	chipelevel	T _J = 150 °C		14	18	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} = 600 V, T _J = 25 °C				1	mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		4.62		nF
C _{oes}		f = 1 MHz		0.29		nF
C _{res}		f = 1 MHz		0.14		nF
Q _G	V _{GE} = -15 V ... +15 V			850		nC
R _{Gint}	T _J = 25 °C			0		Ω
t _{d(on)}	V _{CC} = 300 V	T _J = 150 °C		17		ns
t _r	I _C = 75 A	T _J = 150 °C		26		ns
E _{on}	R _{G on} = 5.6 Ω R _{G off} = 5.6 Ω	T _J = 150 °C		2.55		mJ
t _{d(off)}	di/dt _{on} = 2400 A/μs	T _J = 150 °C		194		ns
t _f	di/dt _{off} = 1500 A/μs	T _J = 150 °C		42		ns
E _{off}	dv/dt = 4200 V/μs V _{GE} = +15/-15 V	T _J = 150 °C		2.13		mJ
R _{th(j-s)}	per IGBT, λ _{paste} =0.8 W/(mK)			0.93		K/W
R _{th(j-s)}	per IGBT, λ _{paste} =2.5 W/(mK)			0.62		K/W



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Typical Applications

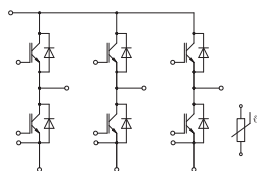
- Motor drives
- Servo drives
- Air conditioning
- Auxiliary Inverters
- UPS

Remarks

- Recommended $T_{j,op} = -40 \dots +150 \text{ }^{\circ}\text{C}$

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 75 A	T _j = 25 °C		1.50	1.73	V
	chiplevel	T _j = 150 °C		1.54	1.76	V
V _{F0}	chiplevel	T _j = 25 °C		1.00	1.10	V
		T _j = 150 °C		0.85	0.95	V
r _F	chiplevel	T _j = 25 °C		6.7	8.3	mΩ
		T _j = 150 °C		9.2	11	mΩ
I _{RRM}	I _F = 75 A	T _j = 150 °C		57		A
Q _{rr}	V _{GE} = -15 V V _{CC} = 300 V	T _j = 150 °C		6.7		μC
E _{rr}	di/dt _{off} = 2200 A/μs	T _j = 150 °C		1.39		mJ
R _{th(j-s)}	per Diode, λ _{paste} =0.8 W/(mK)			1.09		K/W
R _{th(j-s)}	per Diode, λ _{paste} =2.5 W/(mK)			0.77		K/W
Module						
L _{CE}				40		nH
M _s	to heatsink		1.6		2.3	Nm
w				35		g

Characteristics				
Symbol	Conditions	min.	typ.	max. Unit
Temperature Sensor				
R_{100}	$T_c = 100^{\circ}\text{C}$ ($R_{25} = 5 \text{ k}\Omega$)		$493 \pm 5\%$	Ω
$B_{25/85}$	$R_{(T)} = R_{25} \cdot \exp[B_{25/85} \cdot (1/T - 1/298)]$, $T[K]$		3420	K



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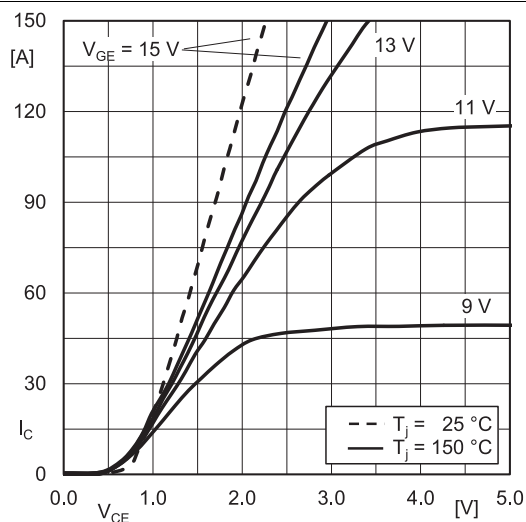


Fig. 1: Typ. IGBT output characteristic, incl. $R_{CC+EE'}$

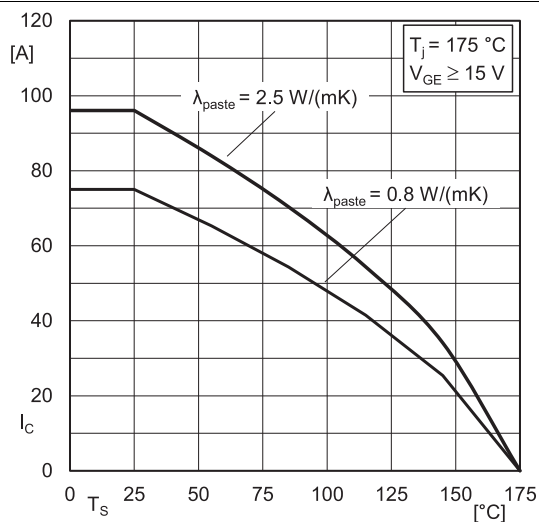


Fig. 2: IGBT rated current vs. temperature $I_C=f(T_s)$

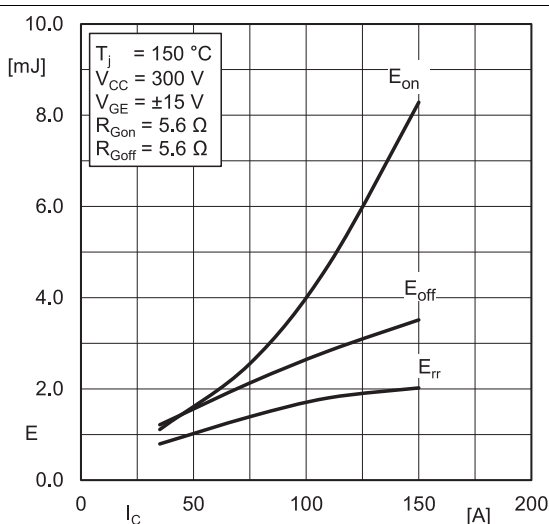


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

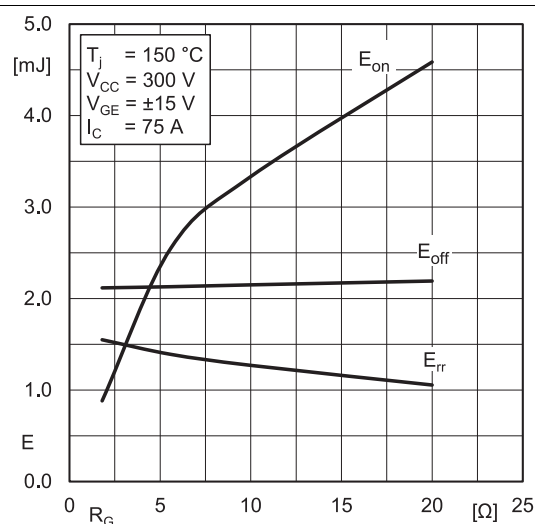


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

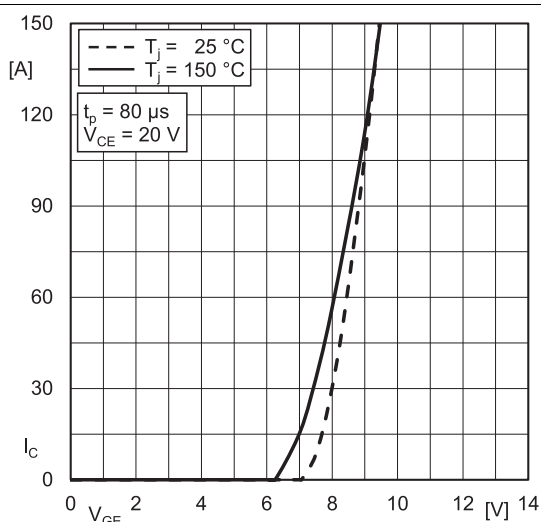


Fig. 5: Typ. IGBT transfer characteristic

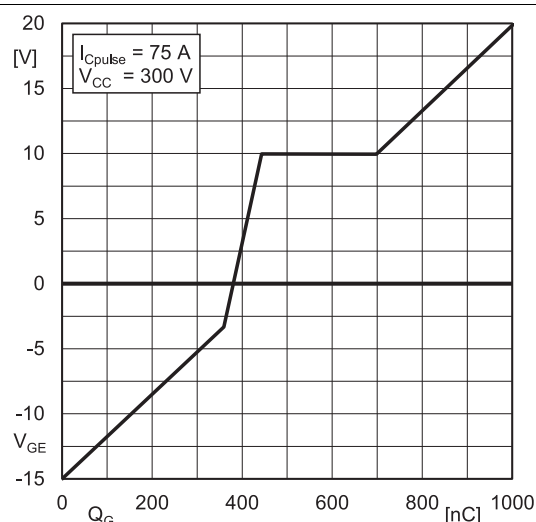


Fig. 6: Typ. IGBT gate charge characteristic

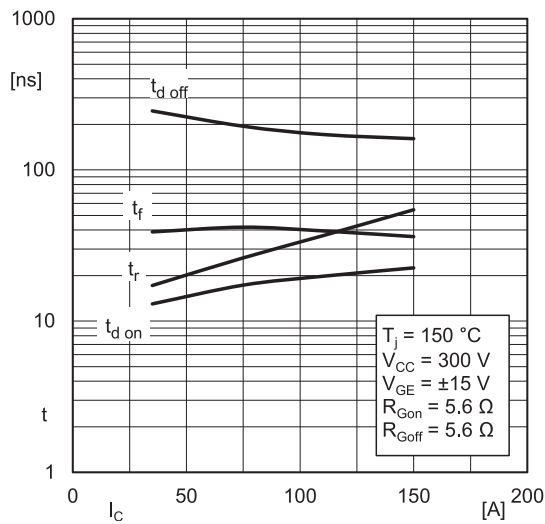


Fig. 7: Typ. switching times = $f(I_C)$

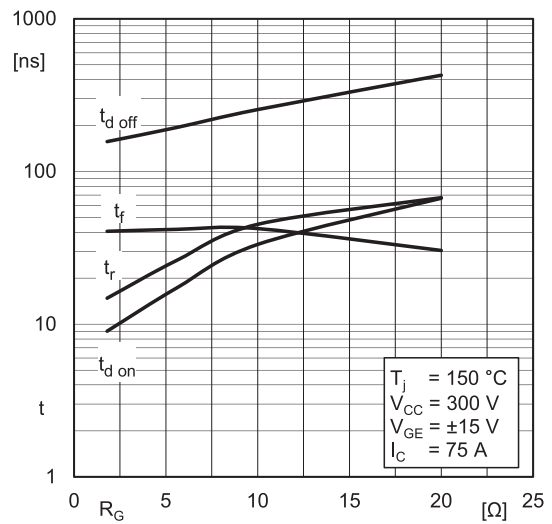


Fig. 8: Typ. switching times = $f(R_G)$

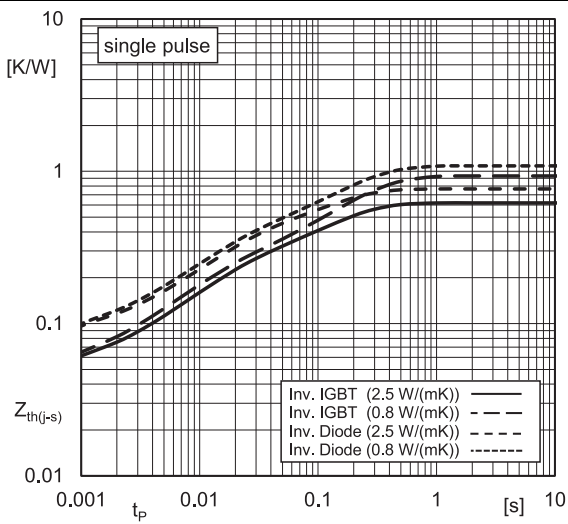


Fig. 9: Typ. transient thermal impedance

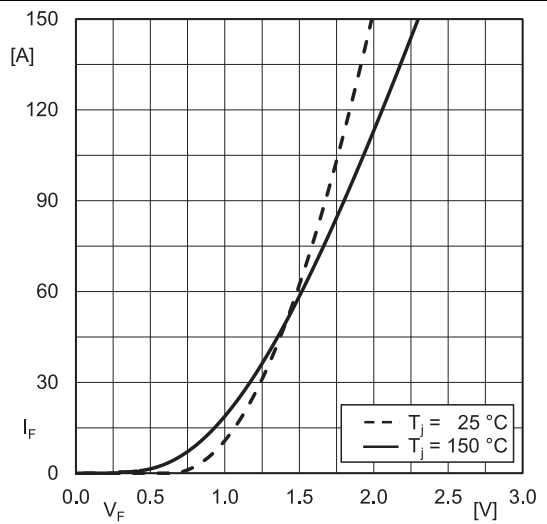


Fig. 10: Typ. Inv. diode forward charact., incl. $R_{CC'} + EE'$

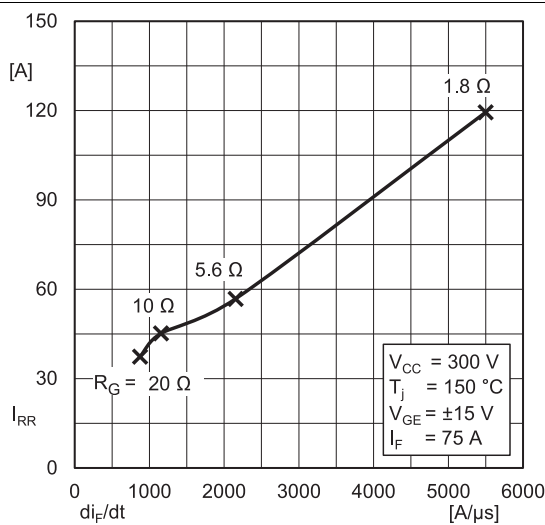


Fig. 11: Typ. Inv. diode peak reverse recovery current

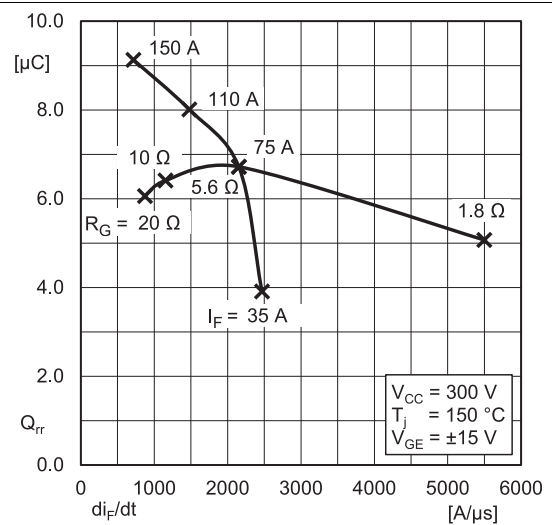


Fig. 12: Typ. Inv. diode reverse recovery charge

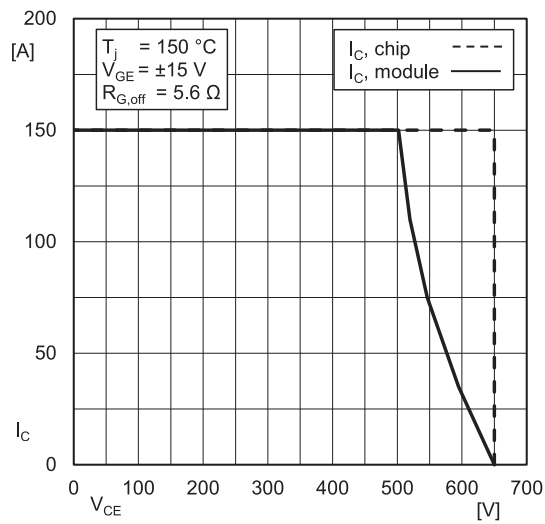
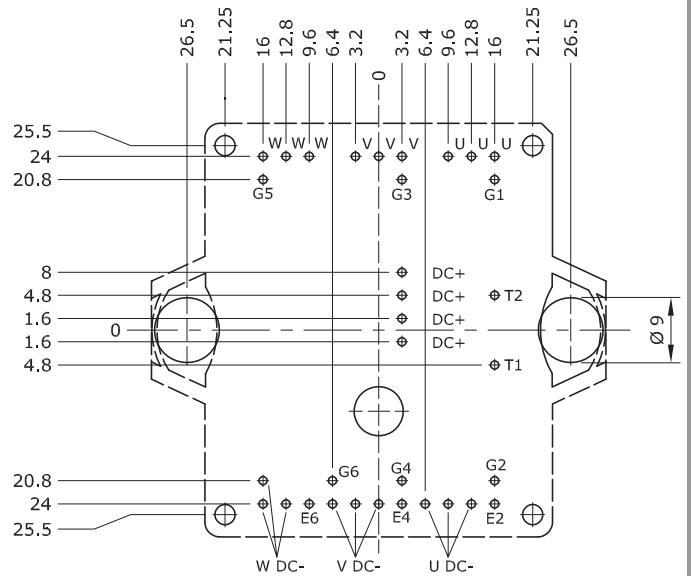
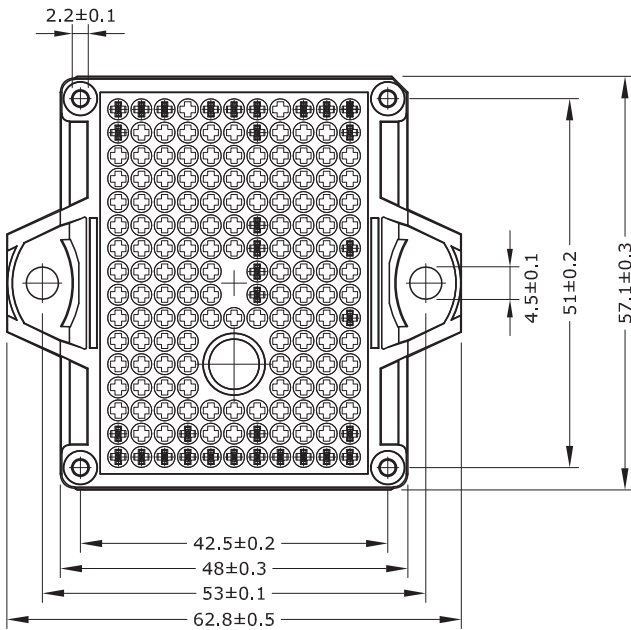
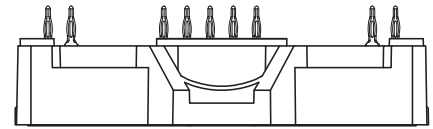
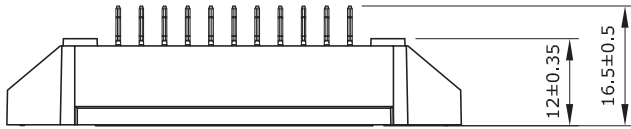
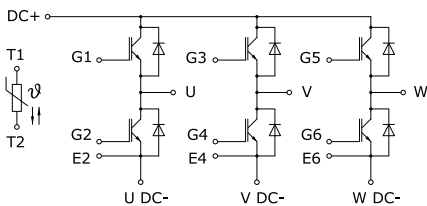


Fig. 13: IGBT Reverse Bias Safe Operating Area (RBSOA)



- Pin-Grid 3.2 mm
- Tolerance of PCB hole pattern $\Phi \pm 0.1$
- Diameters of drill $\Phi 1.15\text{mm}$
- Copper thickness in hole 25 - 50 μm
- Hole specification for contacts:
refer to SEMITOP E1/E2 Mounting Instruction

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This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

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