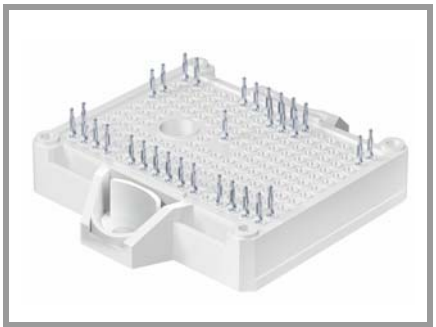
SK75GD06E3ETE2



SEMITOP®E2

Sixpack Open Emitter

SK75GD06E3ETE2

Features*

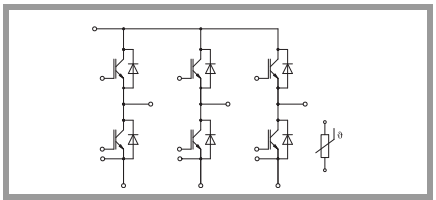
- Optimized design for superior thermal performance
- Low inductive design
- Press-Fit contact technology
- 650V Trench IGBT3 (E3)
- Robust and soft switching CAL HD diode technology
- Integrated NTC temperature sensor
- UL recognized file no. E 63 532

Typical Applications

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

Remarks

- Recommended $T_{j,op}$=-40 ...+150 °C



GD-ET

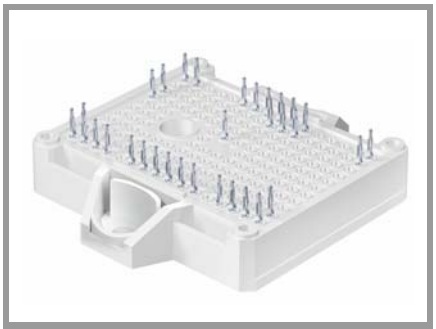
Absolute Maximum Ratings

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 $V_{GE} \leq$ 15 V $V_{CES} \leq$ 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				
$I_{t(RMS)}$	, $\Delta T_{terminal}$ 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 V_{GE} = 15 V chiplevel	T_j = 25 °C		1.45	1.77	V
		T_j = 150 °C		1.70	2.15	V
V_{CE0}	chiplevel	T_j = 25 °C		0.75	0.90	V
		T_j = 150 °C		0.68	0.83	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		9.3	12	mΩ
		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 I_C = 75 A $R_{G\ on}$ = 5.6 Ω $R_{G\ off}$ = 5.6 Ω di/dt_{on} = 2400 A/µs di/dt_{off} = 1500 A/µs dv/dt = 4200 V/µs V_{GE} = +15/-15 V	T_j = 150 °C		17		ns
t_r		T_j = 150 °C		26		ns
E_{on}		T_j = 150 °C		2.55		mJ
$t_{d(off)}$		T_j = 150 °C		194		ns
t_f		T_j = 150 °C		42		ns
E_{off}		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

SK75GD06E3ETE2



SEMITOP®E2

Sixpack Open Emitter

SK75GD06E3ETE2

Features*

- Optimized design for superior thermal performance
- Low inductive design
- Press-Fit contact technology
- 650V Trench IGBT3 (E3)
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- UL recognized file no. E 63 532

Typical Applications

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

Remarks

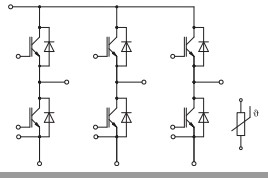
- Recommended $T_{j,op}$=-40 ...+150 °C

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 V_{GE} = -15 V V_{CC} = 300 V di/dt$_{off}$ = 2200 A/µs	T_j = 150 °C		57		A
Q_{rr}		T_j = 150 °C		6.7		µC
E_{rr}		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°C (R_{25}=5 kΩ)		493 ± 5%		Ω
$B_{25/85}$	$R_{(T)}=R_{25}*\exp[B_{25/85}*(1/T-1/298)]$, T[K]		3420		K



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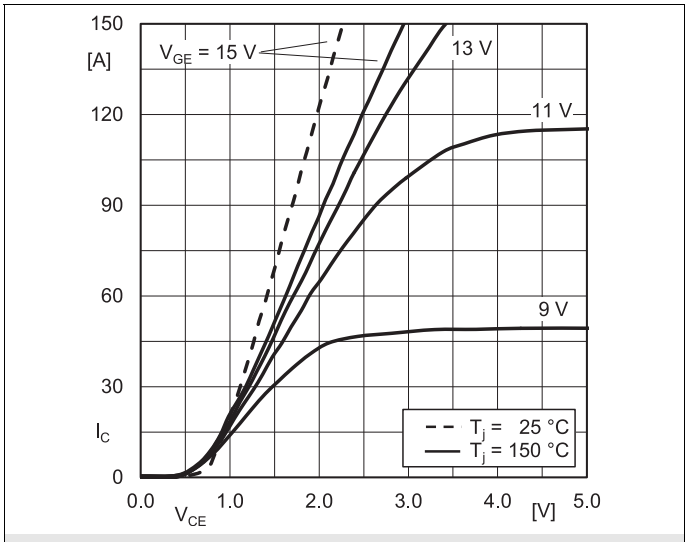


Fig. 1: Typ. IGBT output characteristic, incl. $R_{CC+ EE'}$

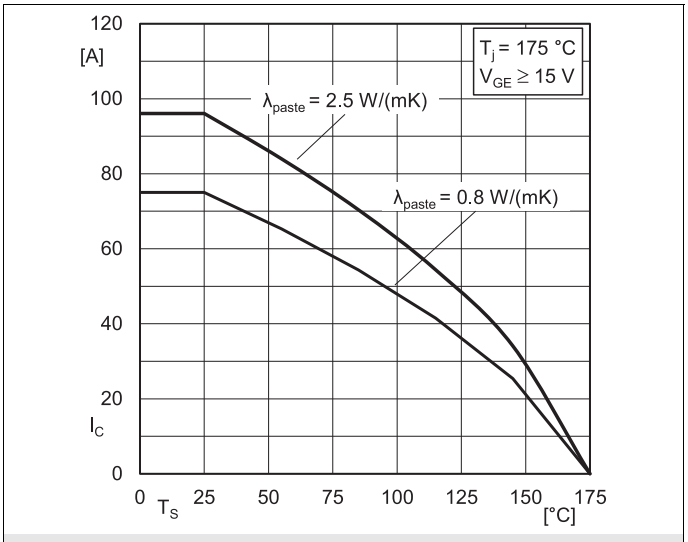


Fig. 2: IGBT rated current vs. temperature $I_c=f(T_s)$

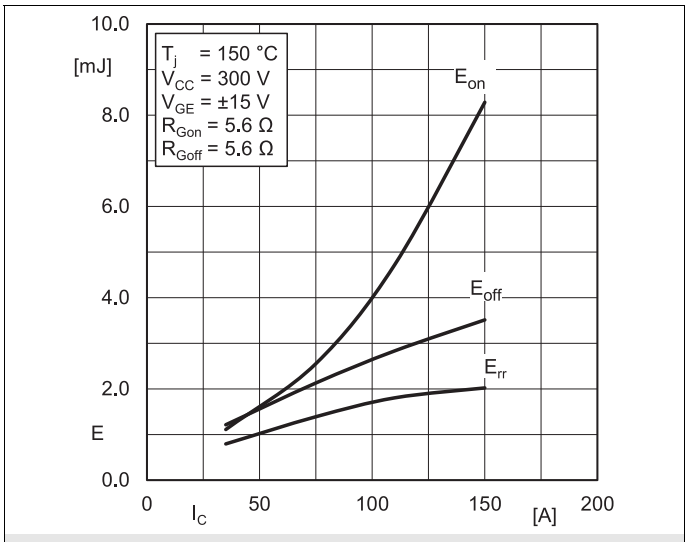


Fig. 3: Typ. turn-on /-off energy = f (I_C)

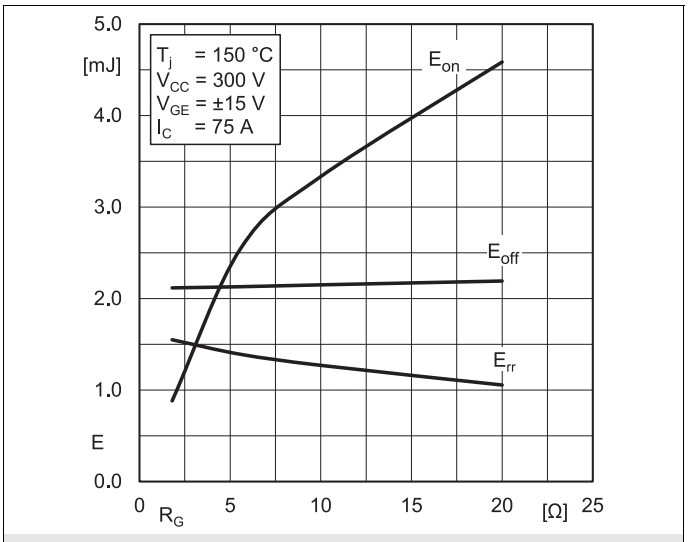


Fig. 4: Typ. turn-on /-off energy = f (R_G)

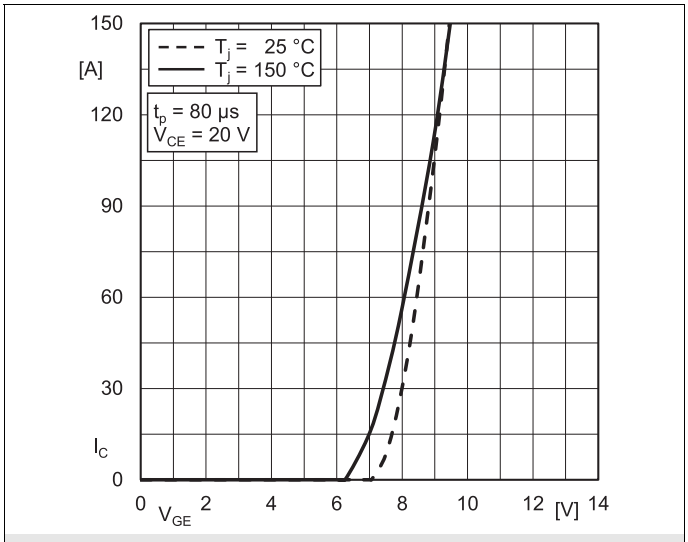


Fig. 5: Typ. IGBT transfer characteristic

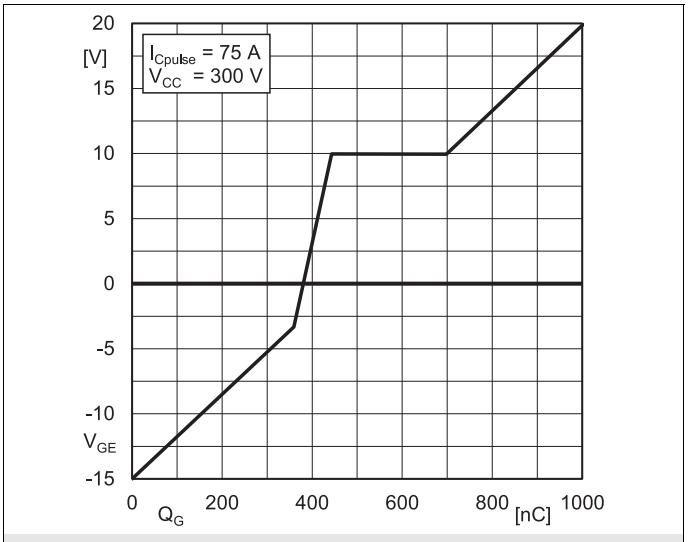


Fig. 6: Typ. IGBT gate charge characteristic

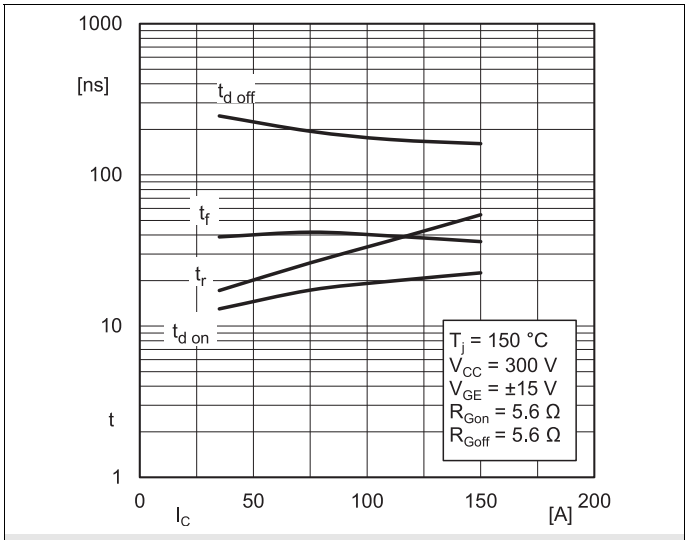


Fig. 7: Typ. switching times = f (I_C)

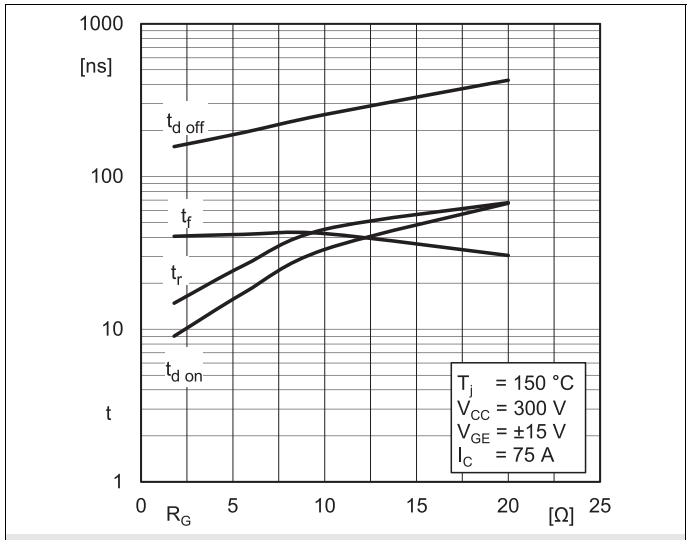


Fig. 8: Typ. switching times = f (R_G)

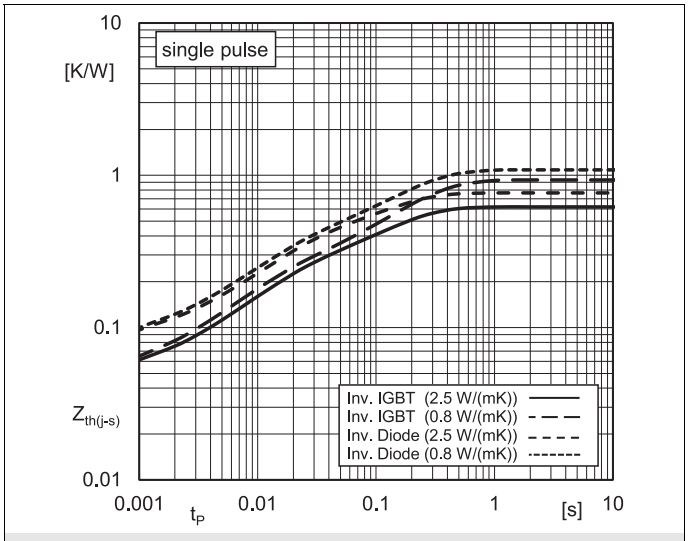


Fig. 9: Typ. transient thermal impedance

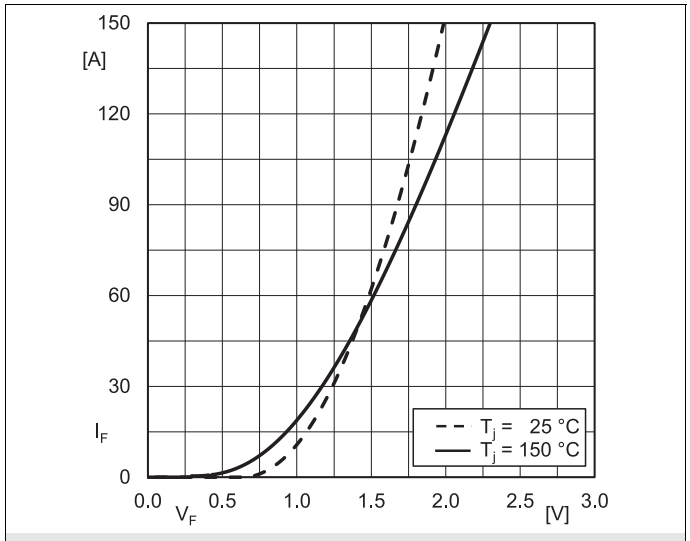


Fig. 10: Typ. Inv. diode forward charact., incl. $R_{CC'+EE'}$

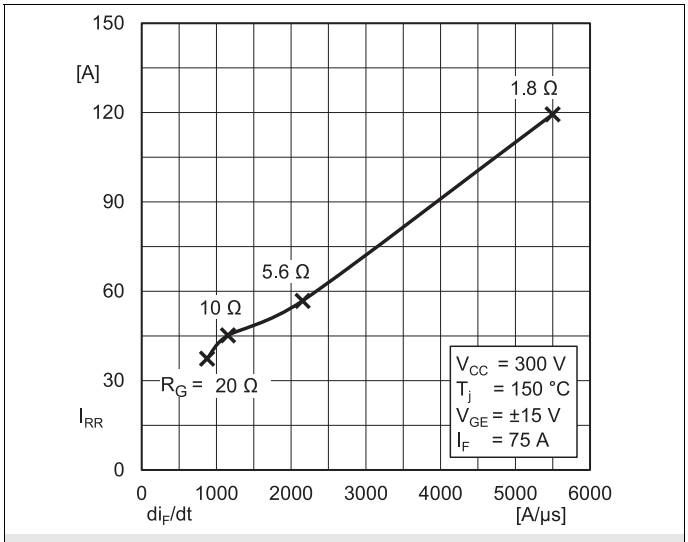


Fig. 11: Typ. Inv. diode peak reverse recovery current

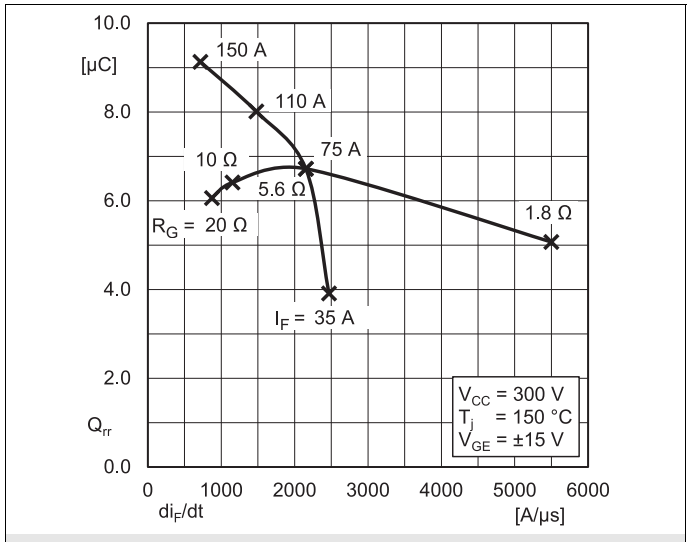


Fig. 12: Typ. Inv. diode reverse recovery charge

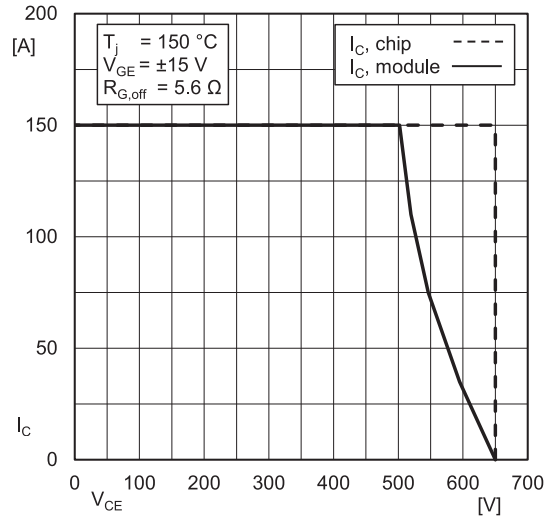
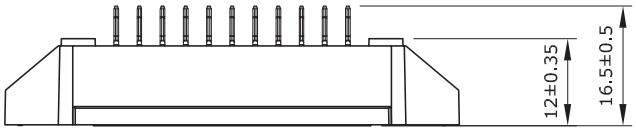
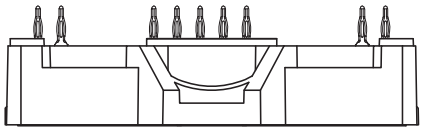
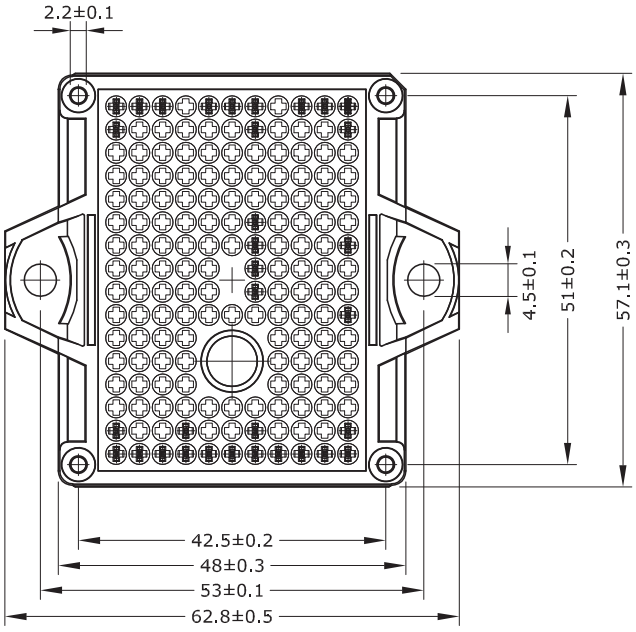
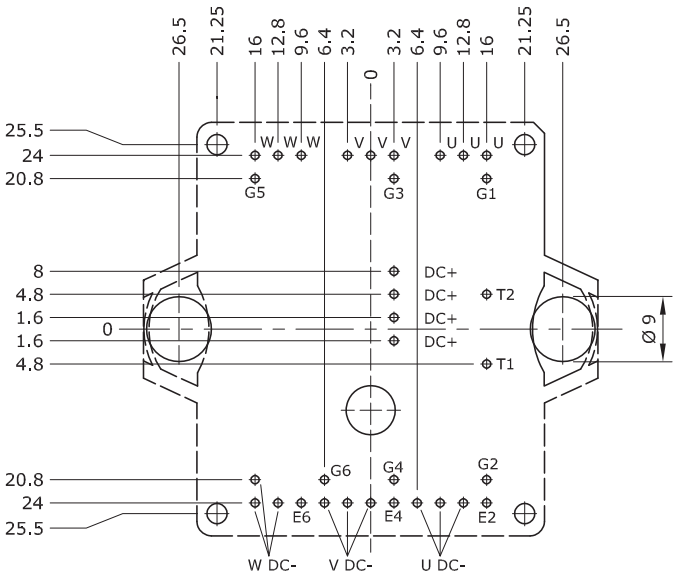


Fig. 13: IGBT Reverse Bias Safe Operating Area (RBSOA)



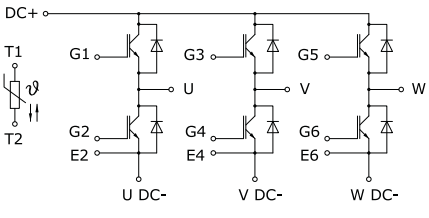






- Pin-Grid 3.2 mm
- Tolerance of PCB hole pattern ⌖ Ø0.1
- Diameters of drill ∅ 1.15mm
- Copper thickness in hole 25 - 50 µm
- Hole specification for contacts:
  refer to SEMITOP E1/E2 Mounting Instruction

SEMITOP®E2



GD-ET

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

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