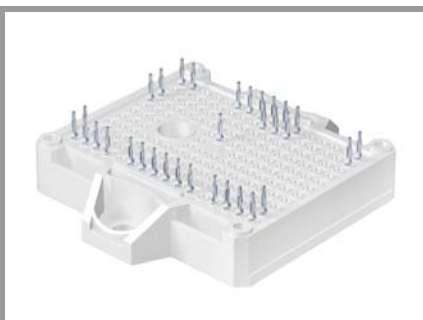


SK75GD12T4ETE2



SEMITOP®E2

IGBT module

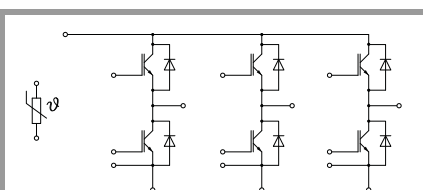
SK75GD12T4ETE2

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)
- Trench4 IGBT technology
- Robust and soft switching CAL4F diode technology
- Integrated NTC temperature sensor
- UL recognized file no. E 63 532

Typical Applications

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

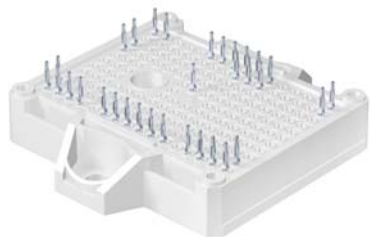


GD-ET

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
IGBT 1			
V_{CES}	$T_j = 25\text{ °C}$	1200	V
I_C	$\lambda_{paste}=0.8\text{ W/(mK)}$	$T_s = 25\text{ °C}$	88
	$T_j = 175\text{ °C}$	$T_s = 70\text{ °C}$	71
I_C	$\lambda_{paste}=2.5\text{ W/(mK)}$	$T_s = 25\text{ °C}$	113
	$T_j = 175\text{ °C}$	$T_s = 70\text{ °C}$	92
I_{Cnom}		75	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	225	A
V_{GES}		-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150\text{ °C}$	10
T_j		-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Diode 1			
V_{RRM}	$T_j = 25\text{ °C}$	1200	V
I_F	$\lambda_{paste}=0.8\text{ W/(mK)}$	$T_s = 25\text{ °C}$	79
	$T_j = 175\text{ °C}$	$T_s = 70\text{ °C}$	62
I_F	$\lambda_{paste}=2.5\text{ W/(mK)}$	$T_s = 25\text{ °C}$	101
	$T_j = 175\text{ °C}$	$T_s = 70\text{ °C}$	81
I_{Fnom}		75	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150	A
I_{FSM}	10 ms	$T_j = 25\text{ °C}$	430
	sin 180°	$T_j = 150\text{ °C}$	430
T_j		-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$	$\Delta T_{terminal}$ at PCB joint = 30 K, per pin	30	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min	2500	V



SEMITOP®E2

IGBT module

SK75GD12T4ETE2

Features*

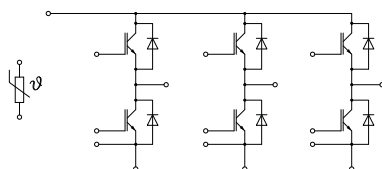
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Typical Applications

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

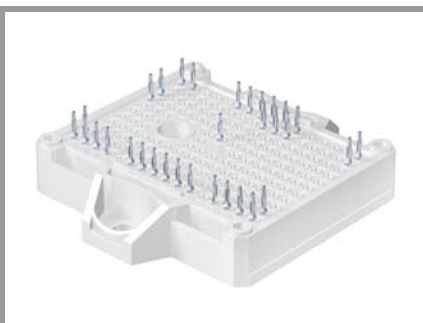
Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	$I_C = 75\text{ A}$ $V_{GE} = 15\text{ V}$ chipllevel	$T_j = 25\text{ °C}$		1.85	2.10	V
		$T_j = 150\text{ °C}$		2.25	2.45	V
V_{CE0}	chipllevel	$T_j = 25\text{ °C}$		0.80	0.90	V
		$T_j = 150\text{ °C}$		0.70	0.80	V
r_{CE}	$V_{GE} = 15\text{ V}$ chipllevel	$T_j = 25\text{ °C}$		14	16	mΩ
		$T_j = 150\text{ °C}$		21	22	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3\text{ mA}$		5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = 1200\text{ V}, T_j = 25\text{ °C}$				1	mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		4.4		nF
C_{oes}		$f = 1\text{ MHz}$		0.29		nF
C_{res}		$f = 1\text{ MHz}$		0.235		nF
Q_G	$V_{GE} = -15\text{ V} \dots +15\text{ V}$			553		nC
R_{Gint}	$T_j = 25\text{ °C}$			10		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		129		ns
t_r	$I_C = 75\text{ A}$	$T_j = 150\text{ °C}$		42		ns
E_{on}	$V_{GE} = +15/-15\text{ V}$ $R_{G on} = 1.1\text{ Ω}$	$T_j = 150\text{ °C}$		6.62		mJ
$t_{d(off)}$	$R_{G off} = 1.1\text{ Ω}$	$T_j = 150\text{ °C}$		333		ns
t_f	$di/dt_{on} = 2410\text{ A/μs}$	$T_j = 150\text{ °C}$		65		ns
E_{off}	$di/dt_{off} = 593\text{ A/μs}$ $dv/dt = 4035\text{ V/μs}$	$T_j = 150\text{ °C}$		7.11		mJ
		$T_j = 150\text{ °C}$				
$R_{th(j-s)}$	per IGBT, $\lambda_{paste}=0.8\text{ W/(mK)}$			0.61		K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste}=2.5\text{ W/(mK)}$			0.39		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	$I_F = 75\text{ A}$ chipllevel	$T_j = 25\text{ °C}$		2.17	2.49	V
		$T_j = 150\text{ °C}$		2.11	2.42	V
V_{F0}	chipllevel	$T_j = 25\text{ °C}$		1.30	1.50	V
		$T_j = 150\text{ °C}$		0.90	1.10	V
r_F	chipllevel	$T_j = 25\text{ °C}$		12	13	mΩ
		$T_j = 150\text{ °C}$		16	18	mΩ
I_{RRM}	$I_F = 75\text{ A}$	$T_j = 150\text{ °C}$		114		A
Q_{rr}	$di/dt_{off} = 2410\text{ A/μs}$	$T_j = 150\text{ °C}$		11.22		μC
E_{rr}	$V_{GE} = -15\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		4.41		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8\text{ W/(mK)}$			0.82		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=2.5\text{ W/(mK)}$			0.55		K/W



GD-ET

SK75GD12T4ETE2



SEMITOP®E2

IGBT module

SK75GD12T4ETE2

Features*

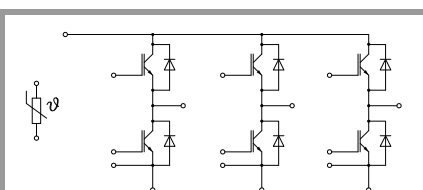
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Typical Applications

- Motor drives
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- Auxiliary Inverters
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
M_s	to heatsink	1.6		2.3	Nm
w	weight		35		g

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R_{100}	$T_r = 100\text{ °C}$		$493 \pm 5\%$		Ω
$B_{100/125}$	$R_{(T)} = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]$; T[K];		$3550 \pm 2\%$		K



GD-ET

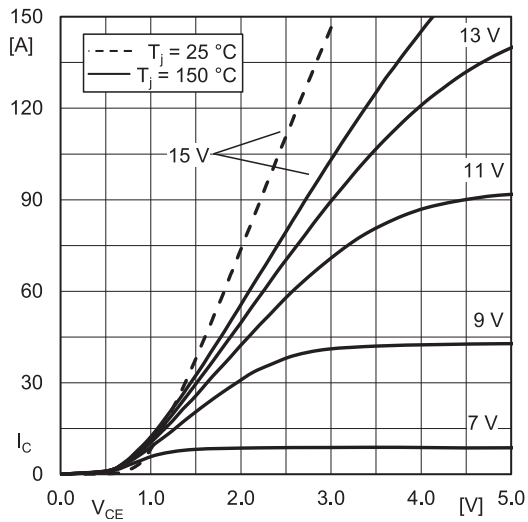


Fig. 1: Typ. IGBT output characteristic, incl. $R_{CC'+EE'}$

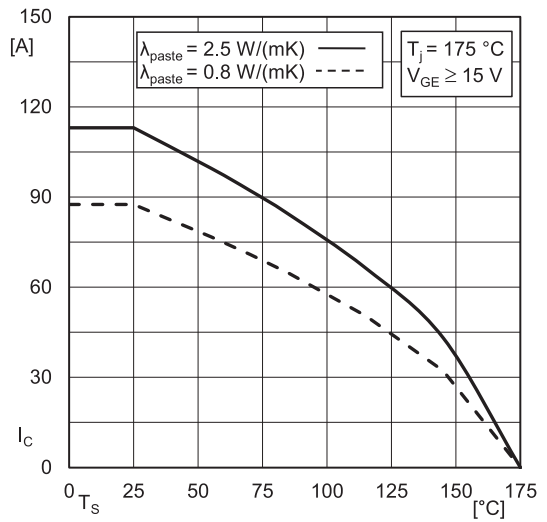


Fig. 2: IGBT rated current vs. temperature $I_c=f(T_s)$

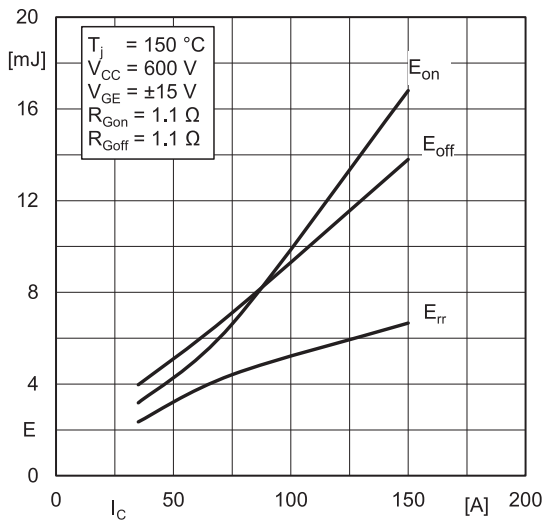


Fig. 3: Typ. turn-on /-off energy = $f(I_c)$

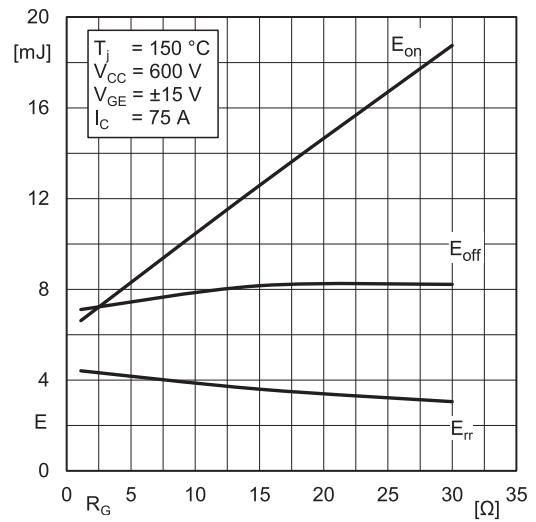


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

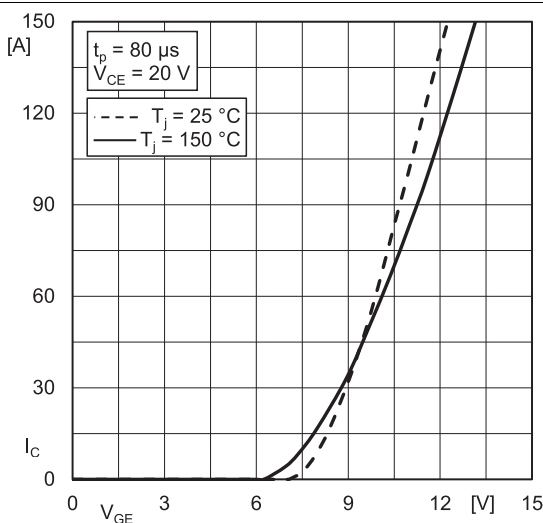


Fig. 5: Typ. IGBT transfer characteristic

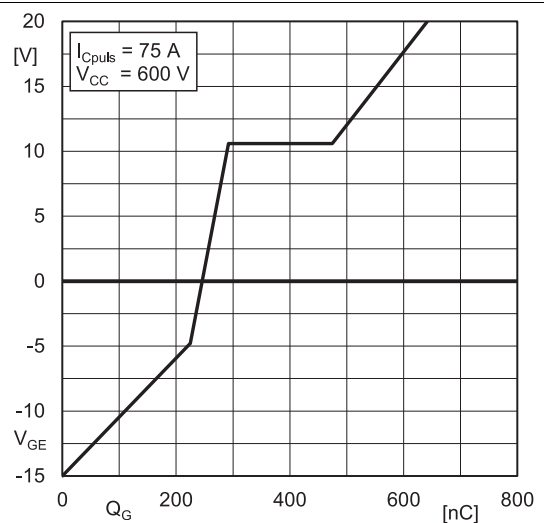


Fig. 6: Typ. IGBT gate charge characteristic

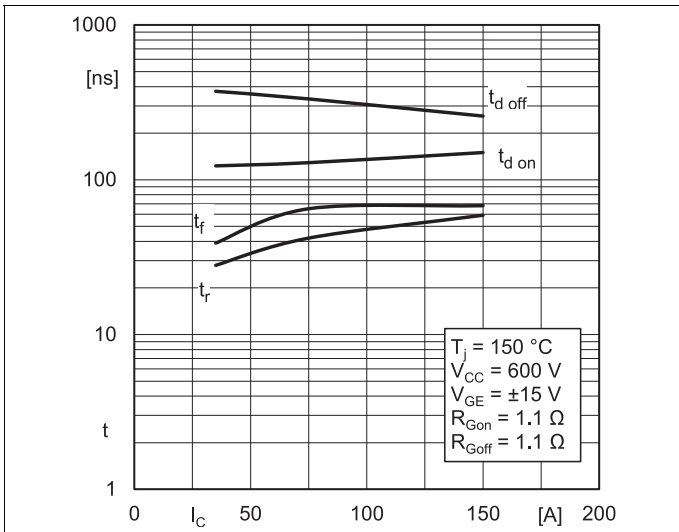


Fig. 7: Typ. switching times = $f(I_C)$

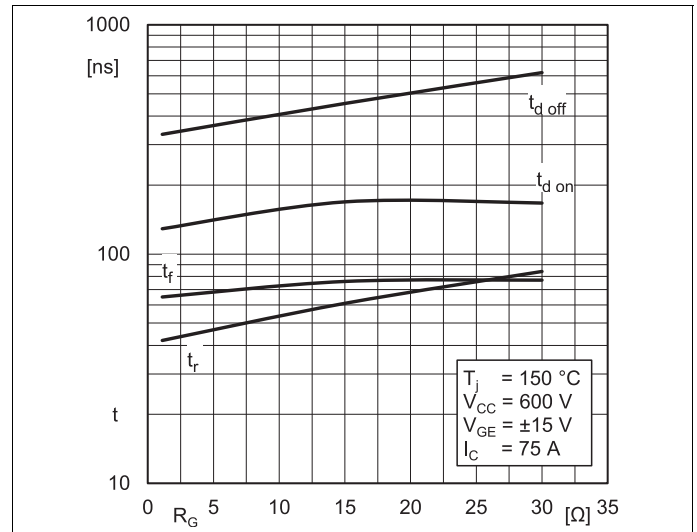


Fig. 8: Typ. switching times = $f(R_G)$

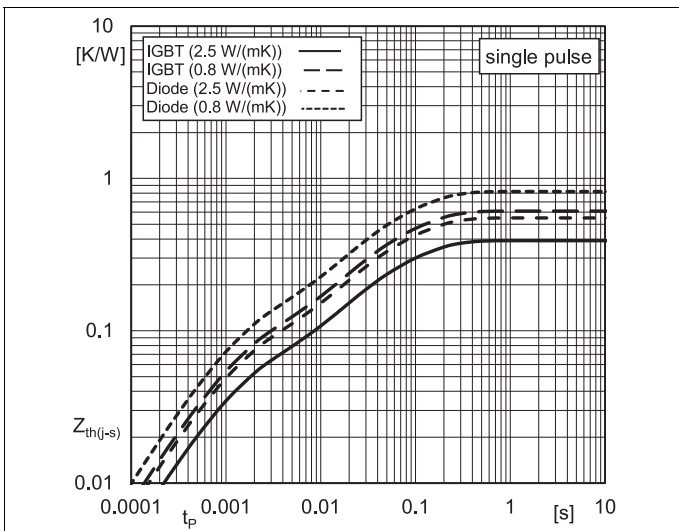


Fig. 9: Typ. transient thermal impedance

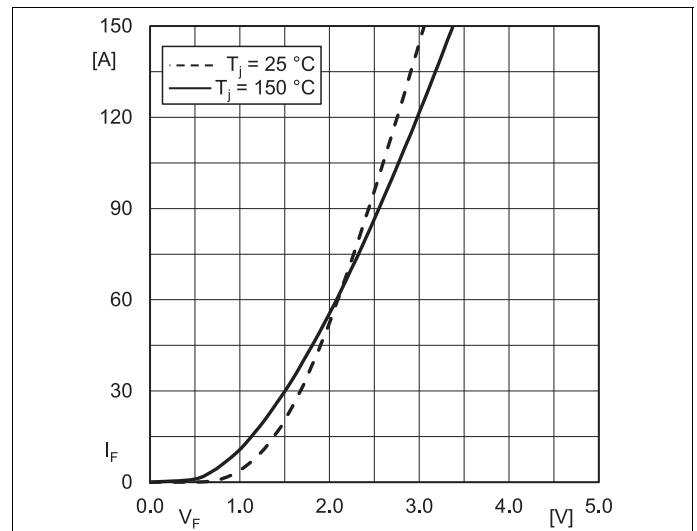


Fig. 10: Typ. Diode forward charact., incl. R_{CC+EE}

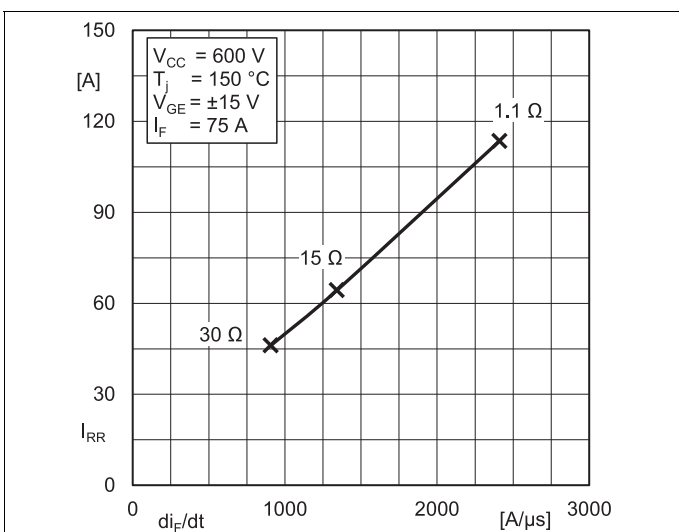


Fig. 11: Typ. Diode peak reverse recovery current

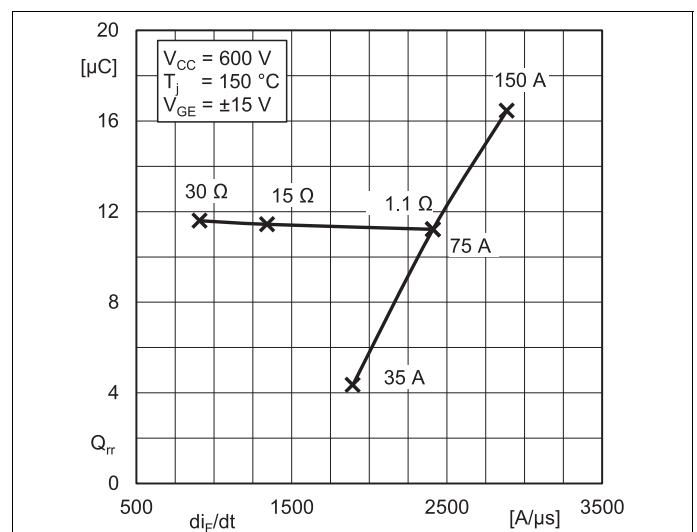
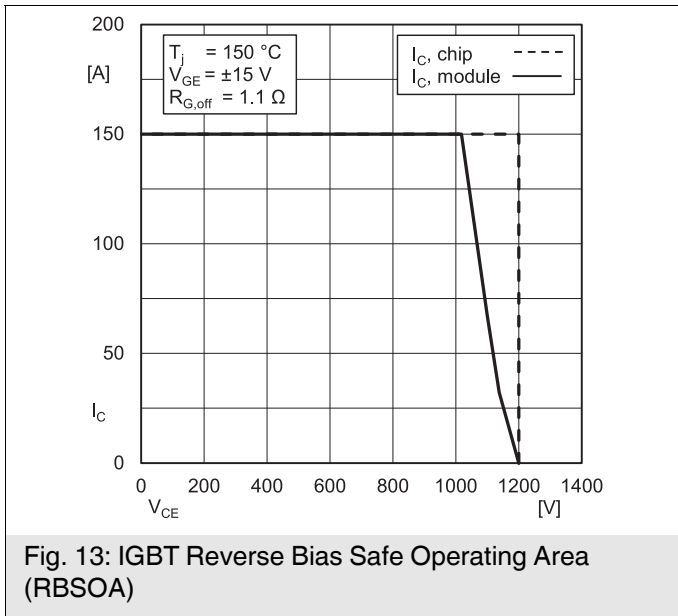
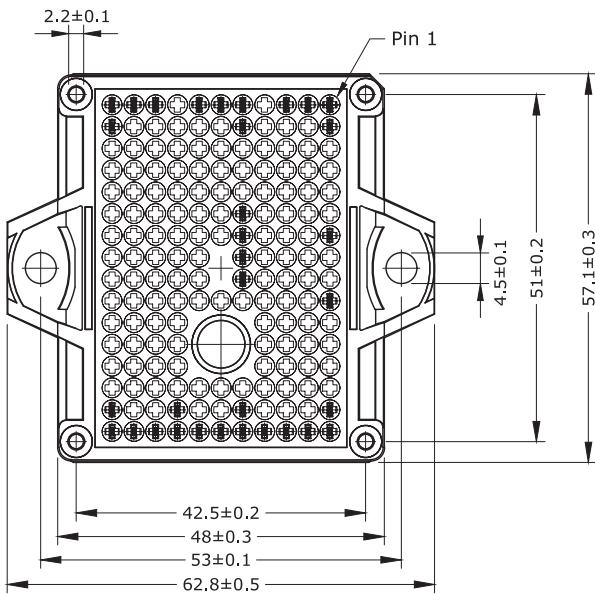
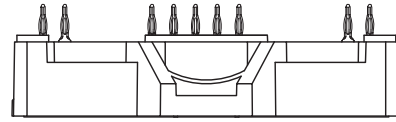
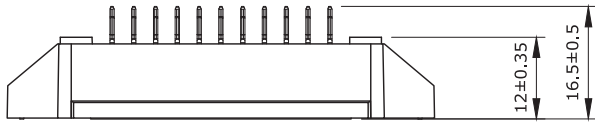


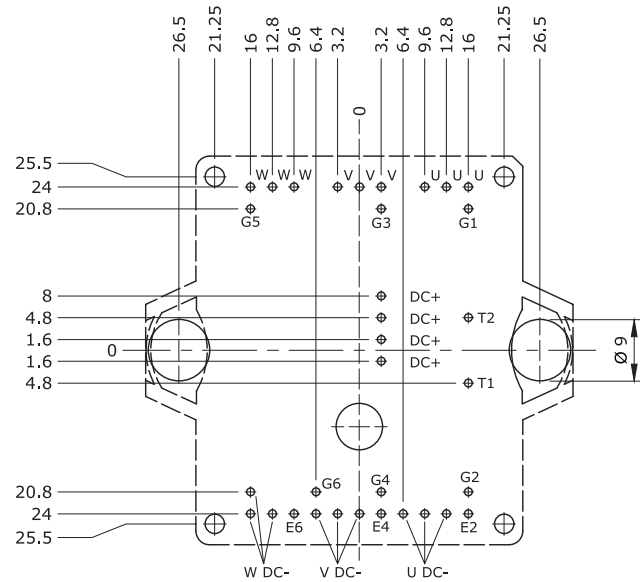
Fig. 12: Typ. Diode reverse recovery charge



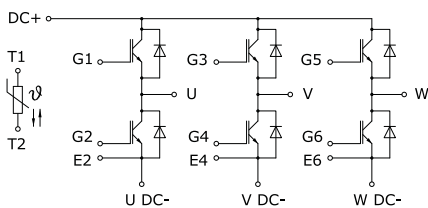
SK75GD12T4ETE2



- Pin-Grid 3.2 mm
- Tolerance of PCB hole pattern ± 0.025
- Diameters of drill $\varnothing 1.15\text{mm}$
- Copper thickness in hole 25 - 50 μm
- Hole specification for contacts: refer to SEMITOP E1, E2 mounting instructions



SEMITOP®E2



GD-ET

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

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