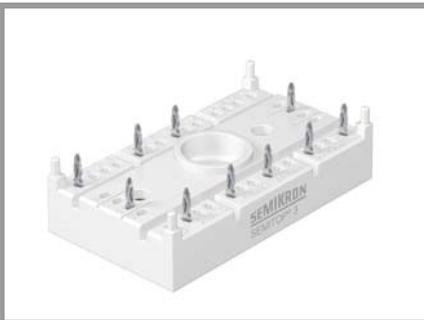


SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

IGBT module

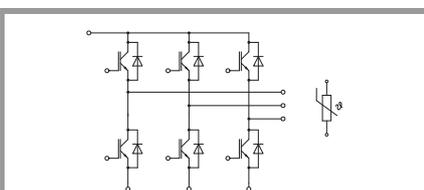
Engineering Sample SK 25 GD 12T4 ETp

Features

- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® Press-Fit types
- Trench4 IGBT technology
- CAL4F technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter



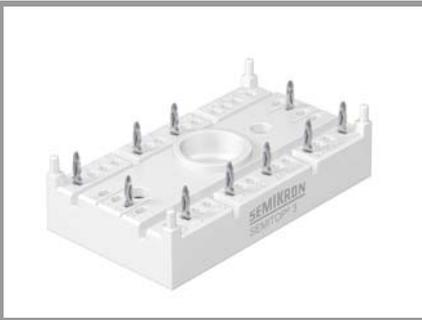
GD-ET

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
IGBT 1			
V_{CES}	$T_j = 25\text{ °C}$	1200	V
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	32
		$T_s = 70\text{ °C}$	25
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	35
		$T_s = 70\text{ °C}$	29
I_{Cnom}		25	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	75	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	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	25
		$T_s = 70\text{ °C}$	19
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	28
		$T_s = 70\text{ °C}$	22
I_{Fnom}		25	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	50	A
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	100	A
T_j		-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$	$T_{terminal} = 100\text{ °C}$, $T_s = 60\text{ °C}$, per pin	40	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min	2500	V

SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

IGBT module

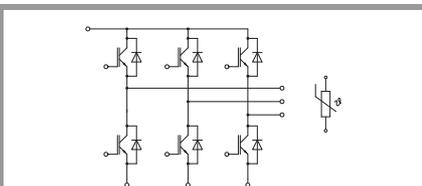
Engineering Sample SK 25 GD 12T4 ETp

Features

- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® Press-Fit types
- Trench4 IGBT technology
- CAL4F technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter



GD-ET

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	$I_C = 25\text{ A}$ $V_{GE} = 15\text{ V}$ 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	$T_j = 25\text{ °C}$		42	48	mΩ
		$T_j = 150\text{ °C}$		62	66	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.85\text{ mA}$		5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25\text{ °C}$			0.67	mA
					-	mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		1.43		nF
C_{oes}		$f = 1\text{ MHz}$		0.115		nF
C_{res}		$f = 1\text{ MHz}$		0.085		nF
Q_G	$V_{GE} = -7V...+15V$			142		nC
R_{Gint}	$T_j = 25\text{ °C}$			0		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		22		ns
t_r	$I_C = 25\text{ A}$	$T_j = 150\text{ °C}$		19.5		ns
E_{on}	$R_{G\ on} = 19\text{ Ω}$ $R_{G\ off} = 19\text{ Ω}$	$T_j = 150\text{ °C}$		2.27		mJ
$t_{d(off)}$	$di/dt_{on} = 2825\text{ A/μs}$	$T_j = 150\text{ °C}$		288		ns
t_f	$di/dt_{off} = 2825\text{ A/μs}$	$T_j = 150\text{ °C}$		77.5		ns
E_{off}	$V_{GE\ neg} = -7\text{ V}$ $V_{GE\ pos} = 15\text{ V}$	$T_j = 150\text{ °C}$		2.7		mJ
$R_{th(j-s)}$	per IGBT			1.31		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	$I_F = 25\text{ A}$ chipllevel	$T_j = 25\text{ °C}$		2.41	2.74	V
		$T_j = 150\text{ °C}$		2.45	2.79	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	$T_j = 25\text{ °C}$		44	50	mΩ
		$T_j = 150\text{ °C}$		62	68	mΩ
I_{RRM}	$I_F = 25\text{ A}$	$T_j = 150\text{ °C}$		31.5		A
Q_{rr}	$di/dt_{off} = 2825\text{ A/μs}$ $V_{GE} = -7\text{ V}$	$T_j = 150\text{ °C}$		1.15		μC
E_{rr}	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		1.28		mJ
$R_{th(j-s)}$	per diode			1.91		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Module						
M_s	to heatsink		2.25		2.5	Nm
w	weight			30		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

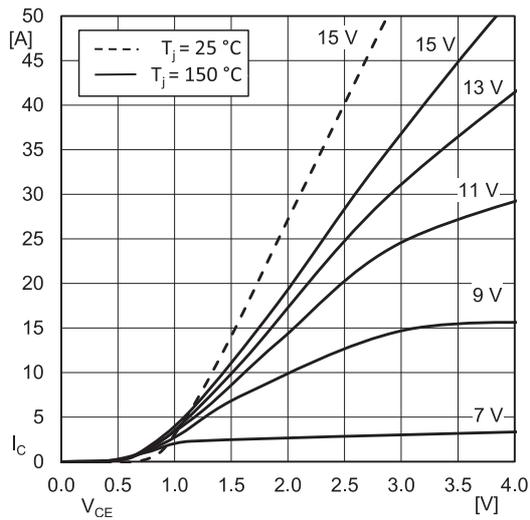


Fig. 1: Typ. IGBT1 output characteristic, incl. $R_{CC'+EE'}$

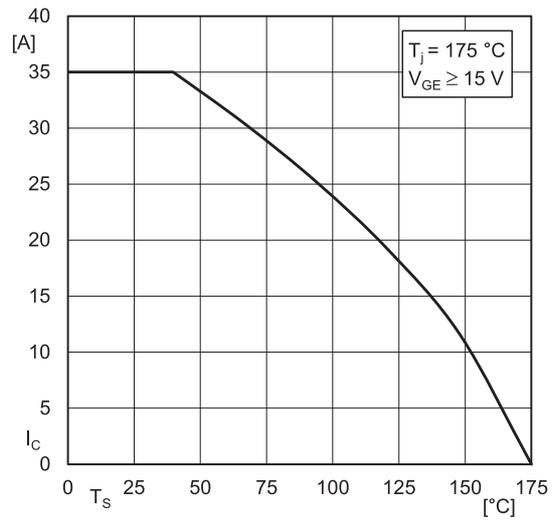


Fig. 2: Typ. rated current vs. temperature $I_C = f(T_s)$

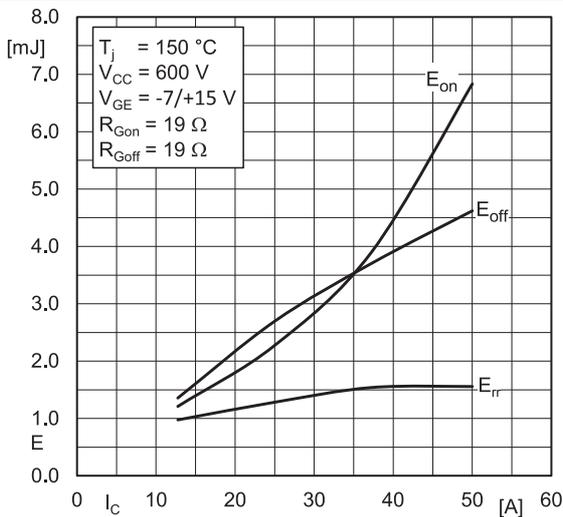


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

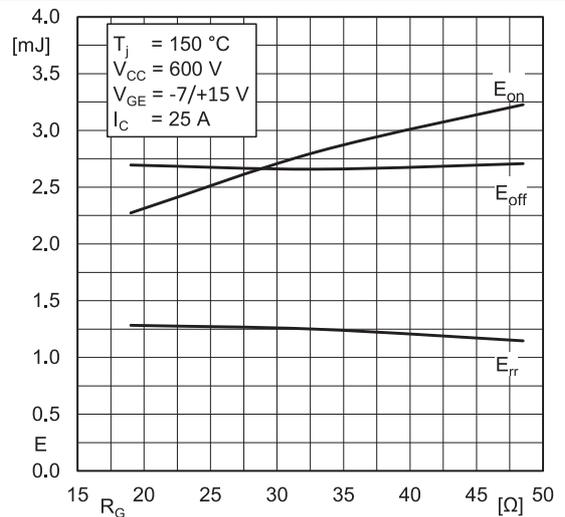


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

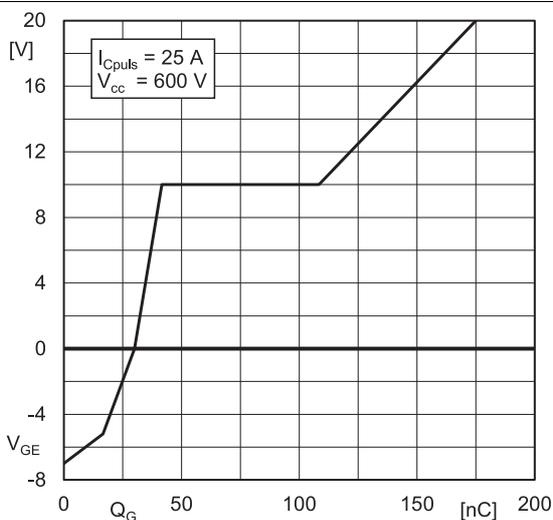


Fig. 6: Typ. gate charge characteristic

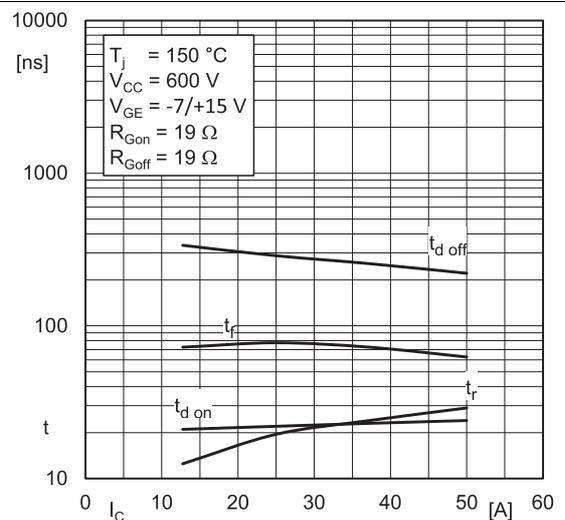


Fig. 7: Typ. switching times vs. I_C

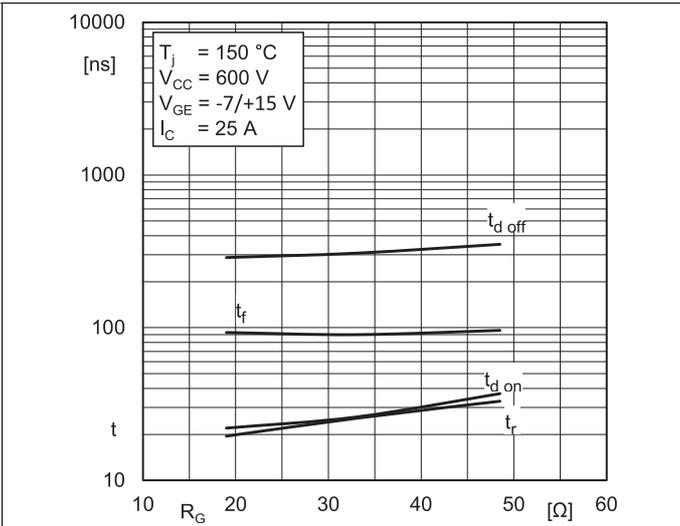


Fig. 8: Typ. switching times vs. gate resistor R_G

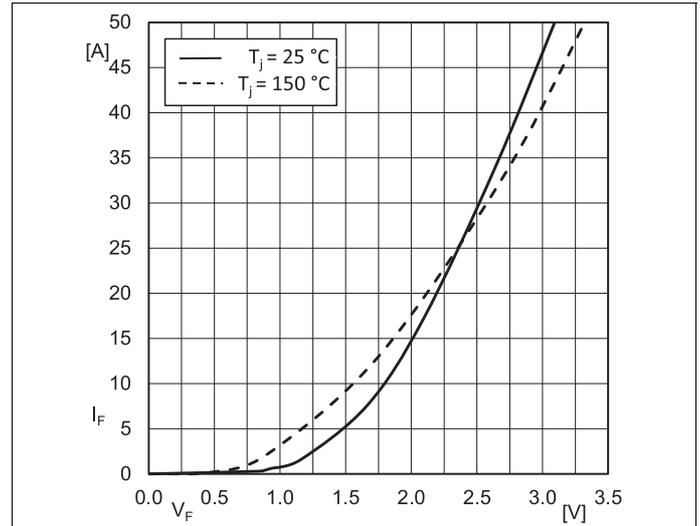
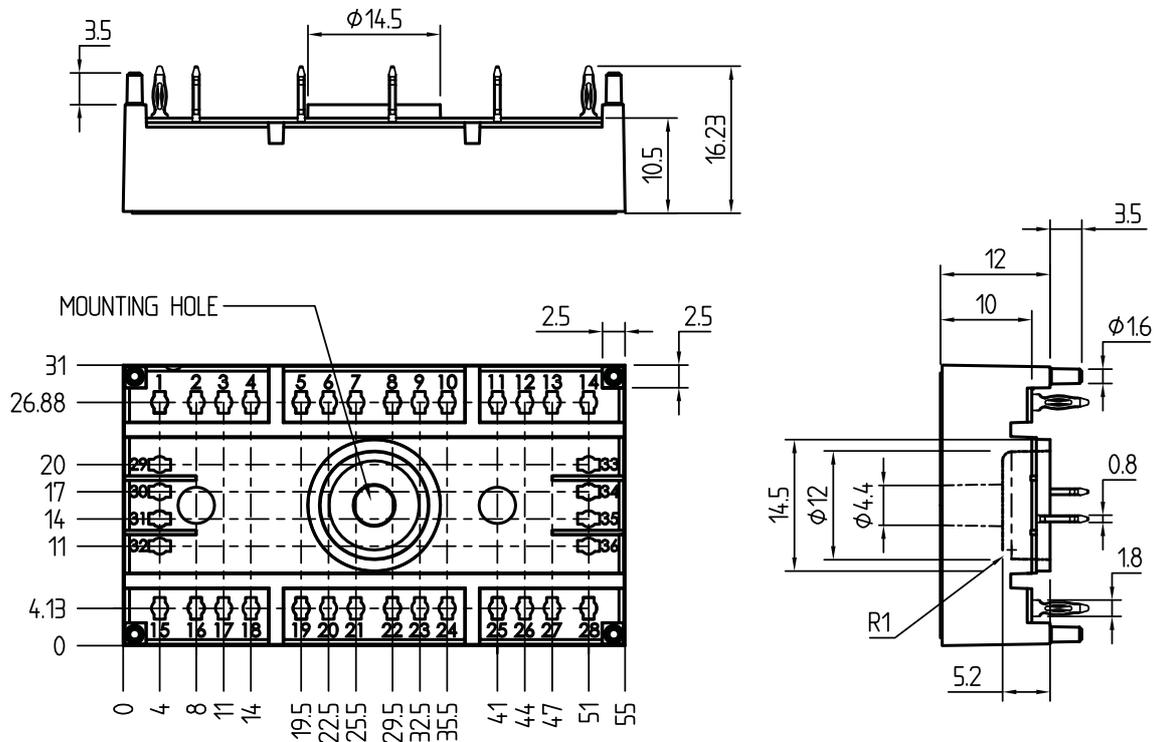


Fig. 10: Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$

SK 25 GD 12T4 ETp

dimensions in mm
tolerance system: ISO 2768-m



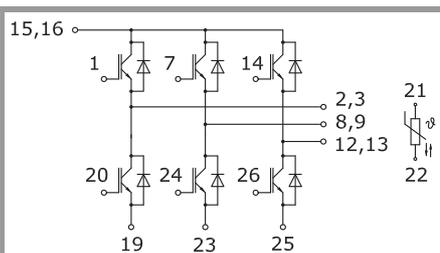
Suggested drilled hole diameter for terminal pins in the circuit board:

- minimum: 1.575mm
- typical: 1.6mm
- maximum: 1.625mm

Suggested hole diameter for the mounting pins in the circuit board: 2mm

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SEMITOP 3 Press-Fit



GD-ET

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

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