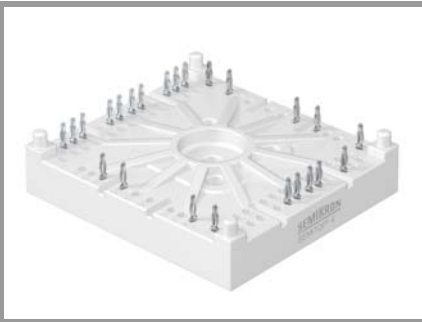


SK 75 GD 12T4 Tp



SEMITOP® 4 Press-Fit

IGBT module

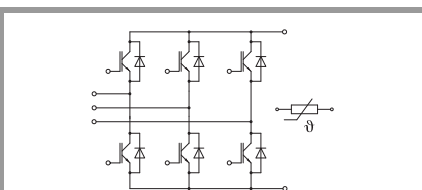
Engineering Sample SK 75 GD 12T4 Tp

Features

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

Typical Applications*

- Inverter up to 36kVA
- Typical motor power 22kW



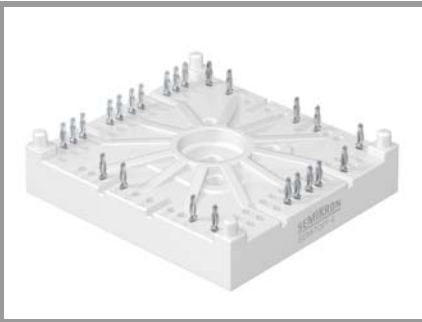
GD-T

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
IGBT 1			
V_{CES}	$T_j = 25\text{ °C}$	1200	V
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	87
		$T_s = 70\text{ °C}$	67
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	97
		$T_s = 70\text{ °C}$	79
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	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	74
		$T_s = 70\text{ °C}$	55
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	83
		$T_s = 70\text{ °C}$	66
I_{Fnom}		75	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150	A
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	430	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 75 GD 12T4 Tp



SEMISTOP® 4 Press-Fit

IGBT module

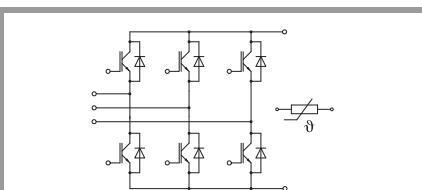
Engineering Sample SK 75 GD 12T4 Tp

Features

- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMISTOP® Press-Fit types
- Improved thermal performances by aluminium oxide substrate
- Trench4 IGBT technology
- CAL4F technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter up to 36kVA
- Typical motor power 22kW



GD-T

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	$I_C = 75\text{ A}$ $V_{GE} = 15\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		1.85	2.10	V
		$T_j = 150\text{ °C}$		2.25	2.45	V
V_{CE0}	chiplevel	$T_j = 25\text{ °C}$		0.80	0.90	V
		$T_j = 150\text{ °C}$		0.70	0.80	V
r_{CE}	$V_{GE} = 15\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		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}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25\text{ °C}$			0.87	mA
				-		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	$V_{GE} = -7V...+15V$			425		nC
R_{Gint}	$T_j = 25\text{ °C}$			10		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		63		ns
t_r	$I_C = 75\text{ A}$	$T_j = 150\text{ °C}$		65		ns
E_{on}	$R_{G\ on} = 24\text{ Ω}$ $R_{G\ off} = 24\text{ Ω}$	$T_j = 150\text{ °C}$		13.6		mJ
$t_{d(off)}$	$di/dt_{on} = 1360\text{ A/μs}$	$T_j = 150\text{ °C}$		521		ns
t_f	$di/dt_{off} = 1360\text{ A/μs}$	$T_j = 150\text{ °C}$		80		ns
E_{off}	$V_{GE\ neg} = -7\text{ V}$ $V_{GE\ pos} = 15\text{ V}$	$T_j = 150\text{ °C}$		8.2		mJ
$R_{th(j-s)}$	per IGBT			0.51		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	$I_F = 75\text{ A}$ chiplevel	$T_j = 25\text{ °C}$		2.17	2.49	V
		$T_j = 150\text{ °C}$		2.11	2.42	V
V_{F0}	chiplevel	$T_j = 25\text{ °C}$		1.30	1.50	V
		$T_j = 150\text{ °C}$		0.90	1.10	V
r_F	chiplevel	$T_j = 25\text{ °C}$		12	13	mΩ
		$T_j = 150\text{ °C}$		16	18	mΩ
I_{RRM}	$I_F = 75\text{ A}$	$T_j = 150\text{ °C}$		41		A
Q_{rr}	$di/dt_{off} = 1360\text{ A/μs}$	$T_j = 150\text{ °C}$		10.6		μC
E_{rr}	$V_{GE} = -7\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		3.38		mJ
$R_{th(j-s)}$	per diode			0.75		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Module						
M_s	to heatsink		2.5		2.75	Nm
w	weight			60		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

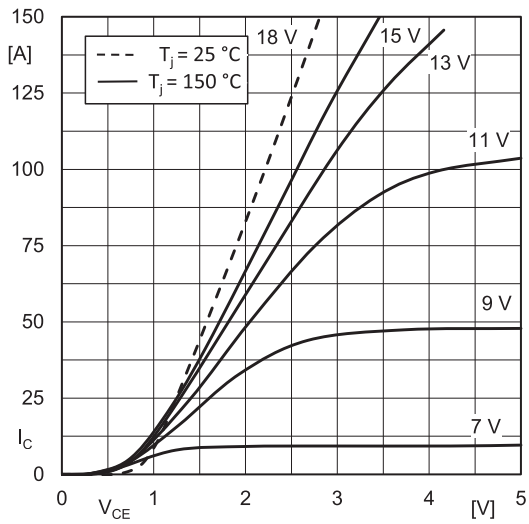


Fig. 1: Typ. IGBT1 output characteristic, incl. $R_{CC'+EE'}$

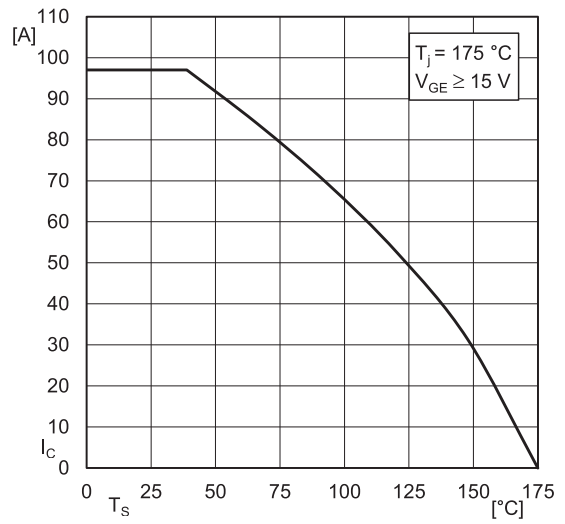


Fig. 2: Typ. rated current vs. temperature $I_C = f(T_s)$

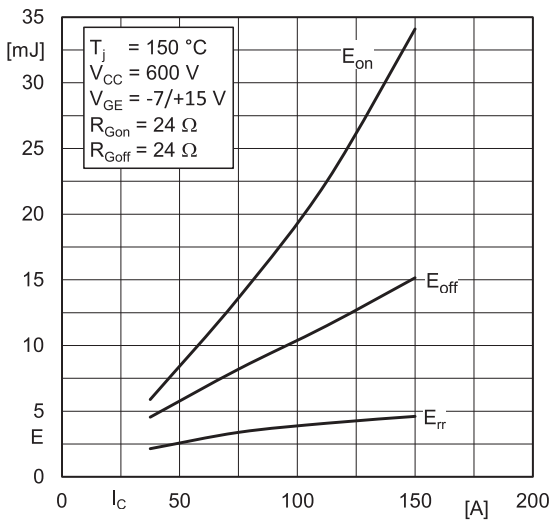


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

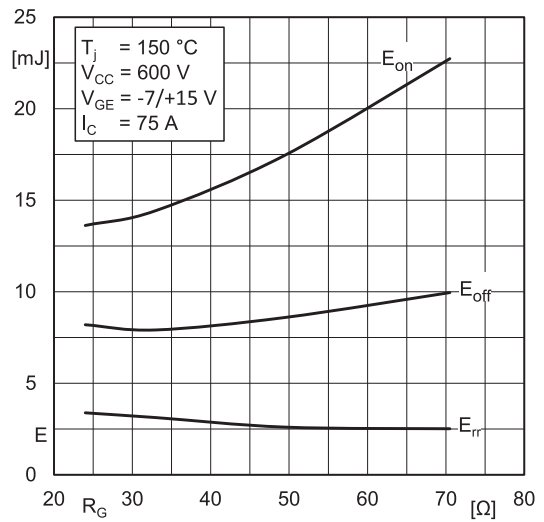


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

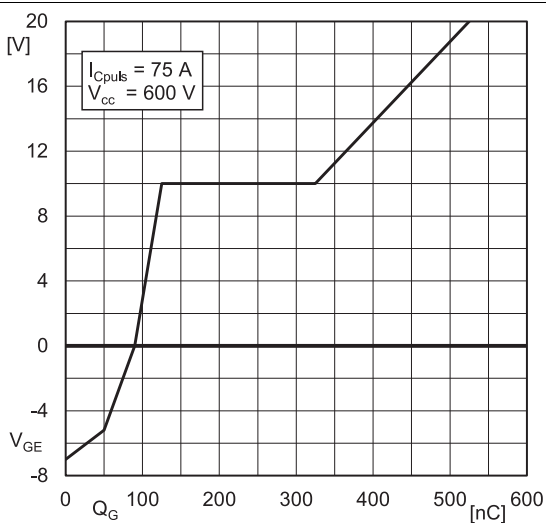


Fig. 6: Typ. gate charge characteristic

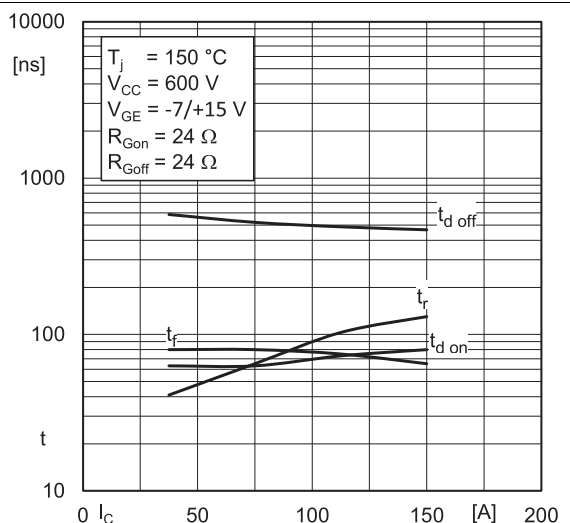


Fig. 7: Typ. switching times vs. I_C

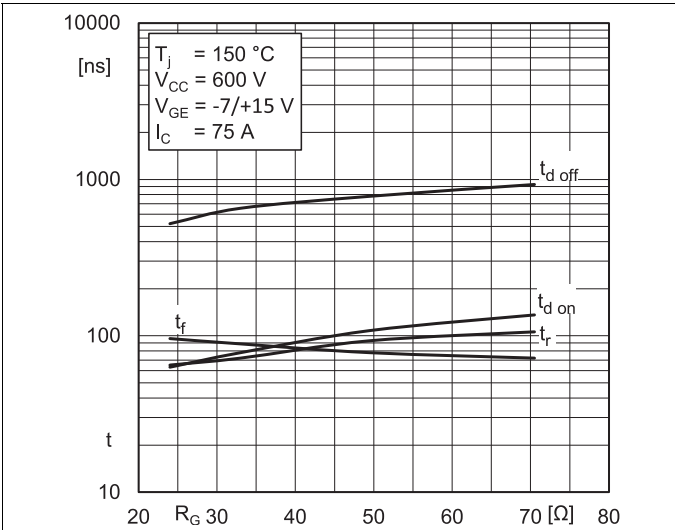


Fig. 8: Typ. switching times vs. gate resistor R_G

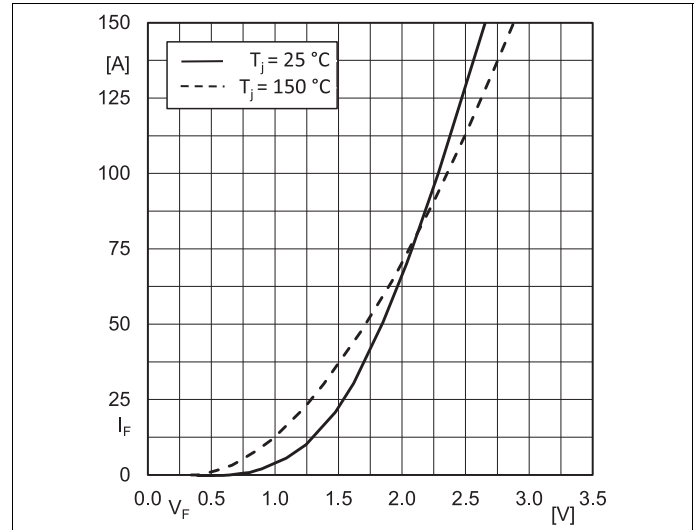
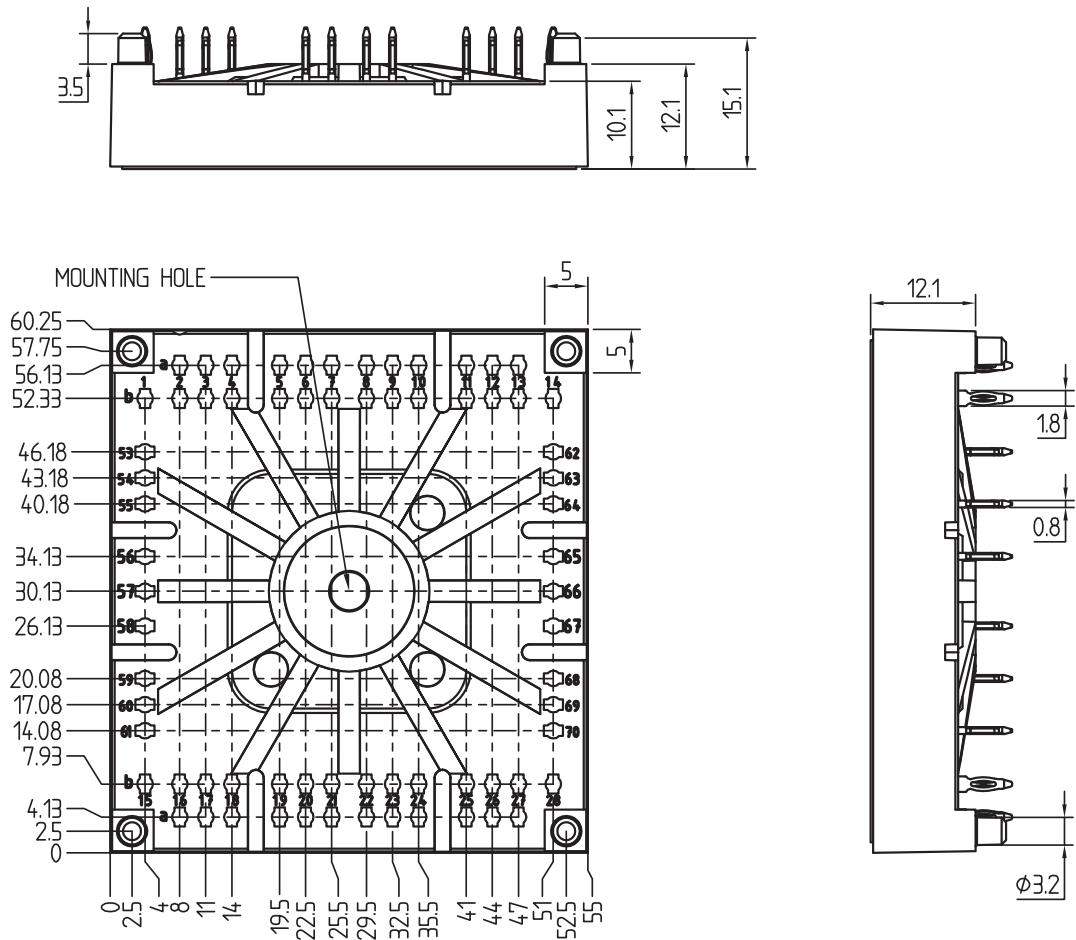


Fig. 10: Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$

SK 75 GD 12T4 Tp

dimensions in mm
tolerance system: ISO 2768-m



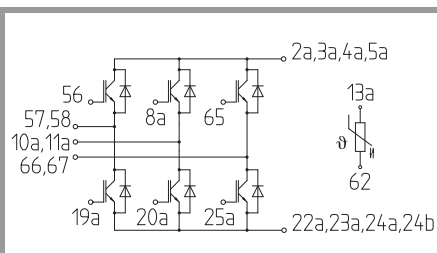
Suggested drilled hole diameter for terminal pins in the circuit board:

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

Suggested hole diameter for the mounting pins in the circuit board: 3.6mm

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SEMITOP 4 Press-Fit



GD-T

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

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