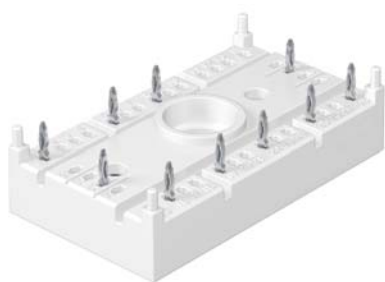


SK25GD12F4ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

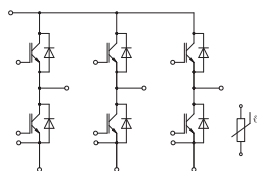
SK25GD12F4ETp

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

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



GD-ET

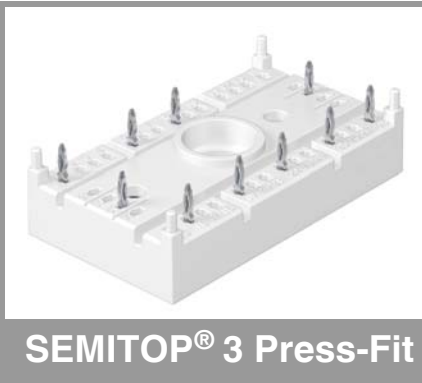
Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	P12	T _s = 70 °C	25	A
	T _j = 175 °C	T _s = 100 °C	20	A
I _C	HPTP	T _s = 70 °C	29	A
	T _j = 175 °C	T _s = 100 °C	23	A
I _{Cnom}			25	A
I _{CRM}			75	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 800 V V _{GE} ≤ 15 V V _{CES} ≤ 1200 V	T _j = 150 °C	10	µs
T _j			-40 ... 175	°C
Inverse - Diode				
V _{RRM}	T _j = 25 °C		1200	V
I _F	P12	T _s = 70 °C	18	A
	T _j = 175 °C	T _s = 100 °C	14	A
I _F	HPTP	T _s = 70 °C	19	A
	T _j = 175 °C	T _s = 100 °C	16	A
I _{FRM}			30	A
I _{FSM}	t _p = 10 ms, sin 180°, T _j = 150 °C		65	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	, ΔT _{terminal} at PCB joint = 30 K, per pin		35	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					
$V_{CE(sat)}$	$I_C = 25\text{ A}$ $V_{GE} = 15\text{ V}$ chiplevel	$T_j = 25\text{ °C}$	2.05	2.42	V
		$T_j = 150\text{ °C}$	2.59		V
V_{CE0}	chiplevel	$T_j = 25\text{ °C}$	1.10	1.28	V
		$T_j = 150\text{ °C}$	0.95		V
r_{CE}	$V_{GE} = 15\text{ V}$ chiplevel	$T_j = 25\text{ °C}$	38	46	m Ω
		$T_j = 150\text{ °C}$	66		m Ω
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.85\text{ mA}$	5.2	5.8	6.4	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = 1200\text{ V}, T_j = 25\text{ °C}$			1	mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	1.4		nF
C_{oes}		$f = 1\text{ MHz}$	0.12		nF
C_{res}		$f = 1\text{ MHz}$	0.09		nF
Q_G	$V_{GE} = -15\text{ V}...+15\text{ V}$		201		nC
R_{Gint}	$T_j = 25\text{ °C}$		0		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$	9		ns
t_r	$I_C = 25\text{ A}$ $R_{Gon} = 8.2\text{ }\Omega$ $R_{Goff} = 8.2\text{ }\Omega$	$T_j = 150\text{ °C}$	18.1		ns
		$T_j = 150\text{ °C}$	1.6		mJ
E_{on}	$di/dt_{on} = 1100\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$	223		ns
$t_{d(off)}$	$di/dt_{off} = 330\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$	60		ns
t_f	$dv/dt = 5029\text{ V}/\mu\text{s}$	$T_j = 150\text{ °C}$			
E_{off}	$V_{GE} = +15/-15\text{ V}$	$T_j = 150\text{ °C}$	1.76		mJ
$R_{th(j-s)}$	per IGBT, P12 (Reference)		1.4		K/W
$R_{th(j-s)}$	per IGBT, HPTP		1.1		K/W

SK25GD12F4ETp



Sixpack Open Emitter

SK25GD12F4ETp

Features*

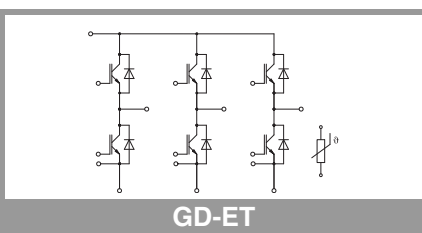
- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMISTOP® Press-Fit types
- Trench4 IGBT technology
- CAL4F technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

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

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 15 A	T _j = 25 °C		2.38	2.71	V
	chipelevel	T _j = 150 °C		2.44		V
V _{F0}	chipelevel	T _j = 25 °C		1.30	1.50	V
		T _j = 150 °C		0.90		V
r _F	chipelevel	T _j = 25 °C		72	81	mΩ
		T _j = 150 °C		103		mΩ
I _{RRM}	I _F = 25 A	T _j = 150 °C		18.8		A
Q _{rr}	V _{GE} = -15 V V _{CC} = 600 V	T _j = 150 °C		4.1		μC
E _{rr}	di/dt _{off} = 1100 A/μs	T _j = 150 °C		1.6		mJ
R _{th(j-s)}	per Diode, P12 (Reference)			2.1		K/W
R _{th(j-s)}	per Diode, HPTP			1.8		K/W
Module						
L _{CE}				-		nH
M _s	to heatsink		2.25		2.5	Nm
w				30		g

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



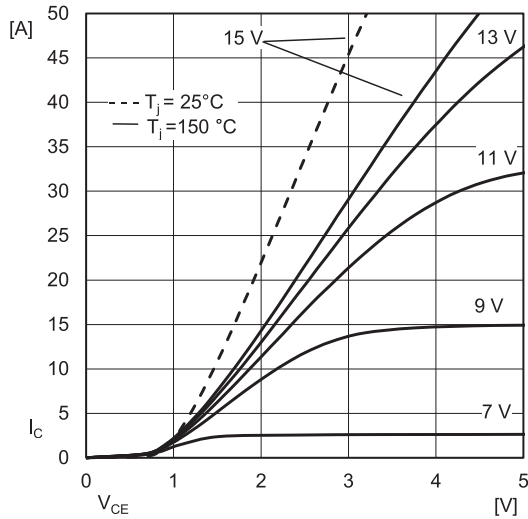


Fig. 1: Typ. IGBT output characteristic, incl. $R_{CC+EE'}$

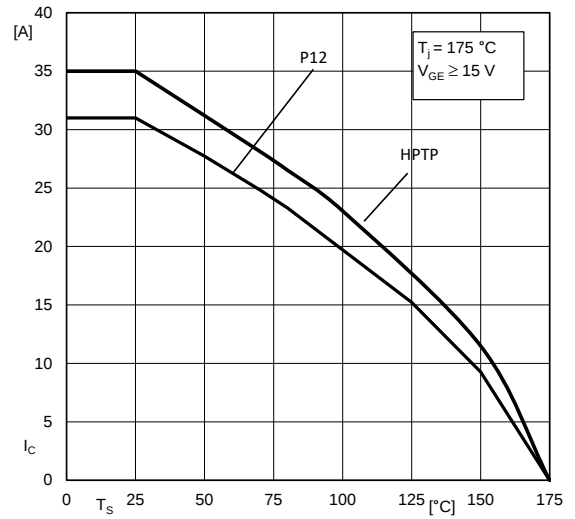


Fig. 2: IGBT rated current vs. Temperature $I_C=f(T_s)$

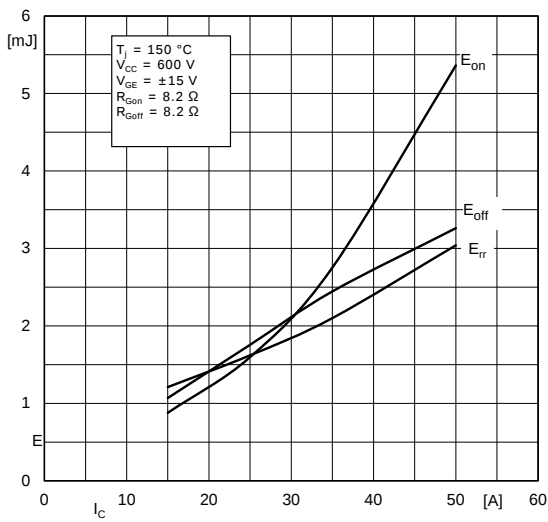


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

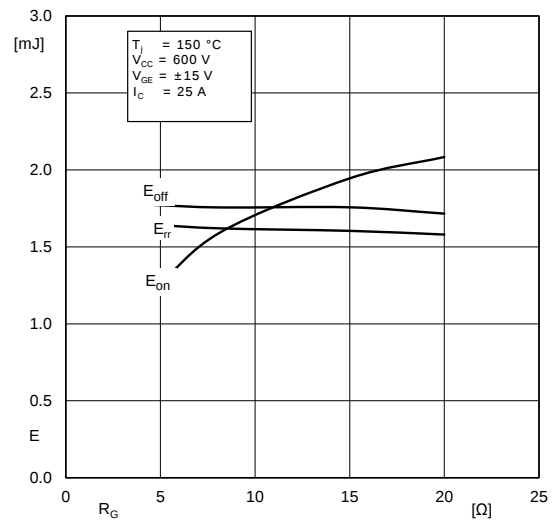


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

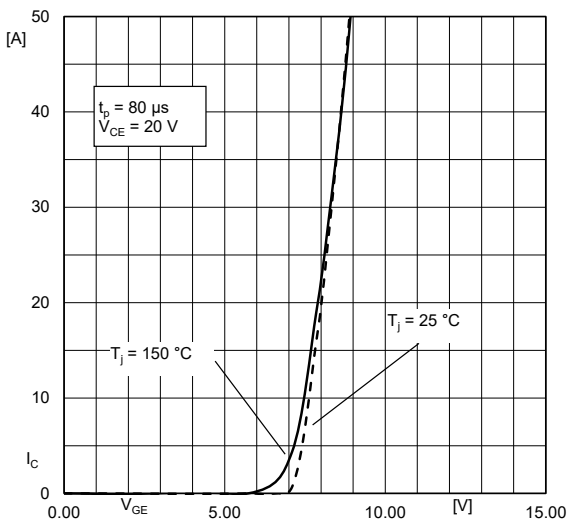


Fig. 5: Typ. IGBT transfer characteristic

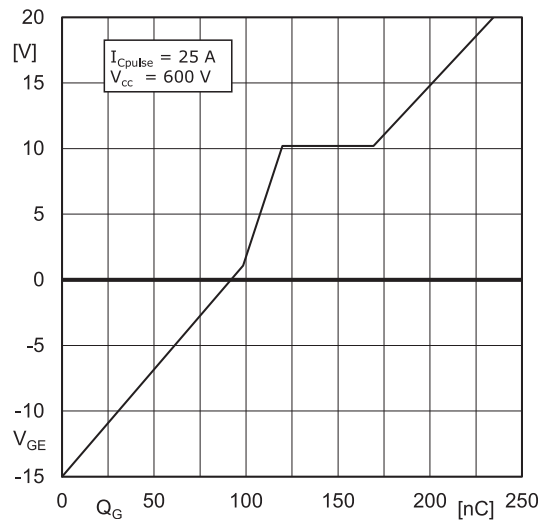


Fig. 6: Typ. IGBT gate charge characteristic

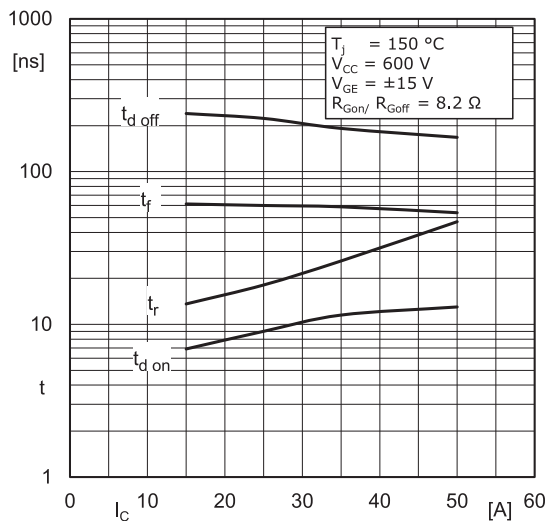


Fig. 7: Typ. switching times = f (I_C)

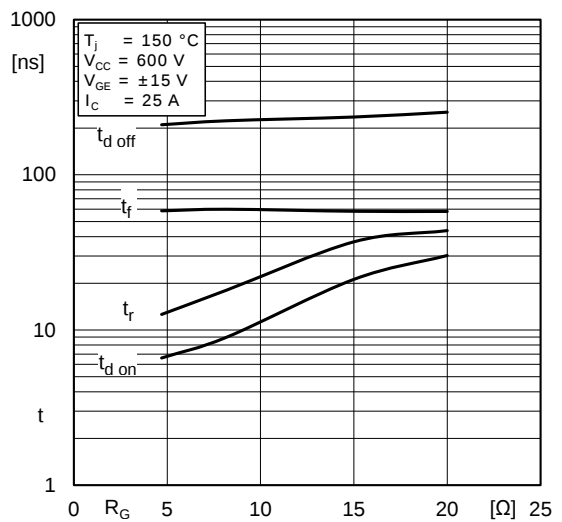


Fig. 8: Typ. switching times = f (R_G)

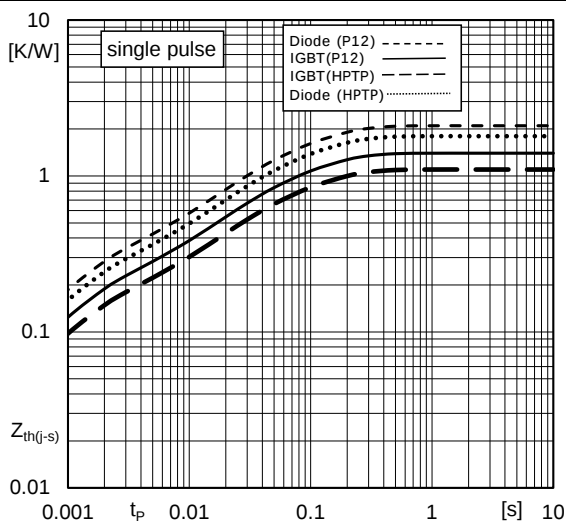


Fig. 9: Typ. transient thermal impedance

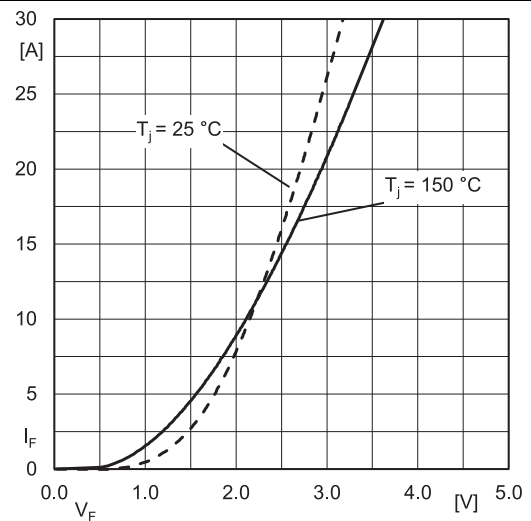


Fig. 10: Typ. Inv. diode forward charact., incl. R_{CC}+EE'

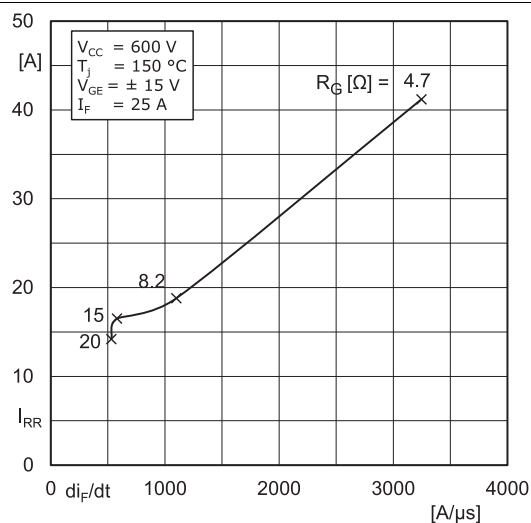


Fig. 11: Typ. Inv. diode peak reverse recovery current

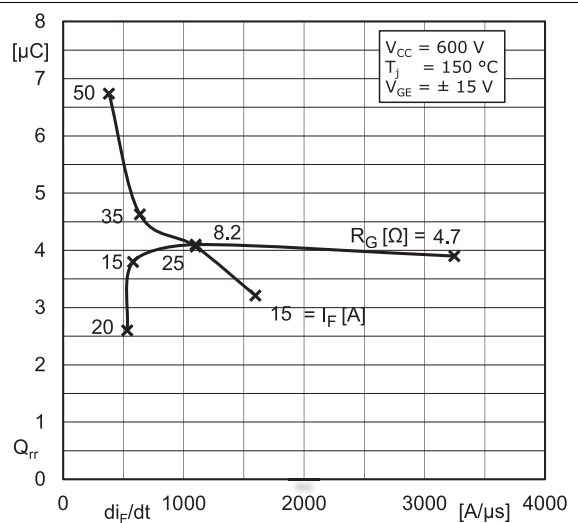
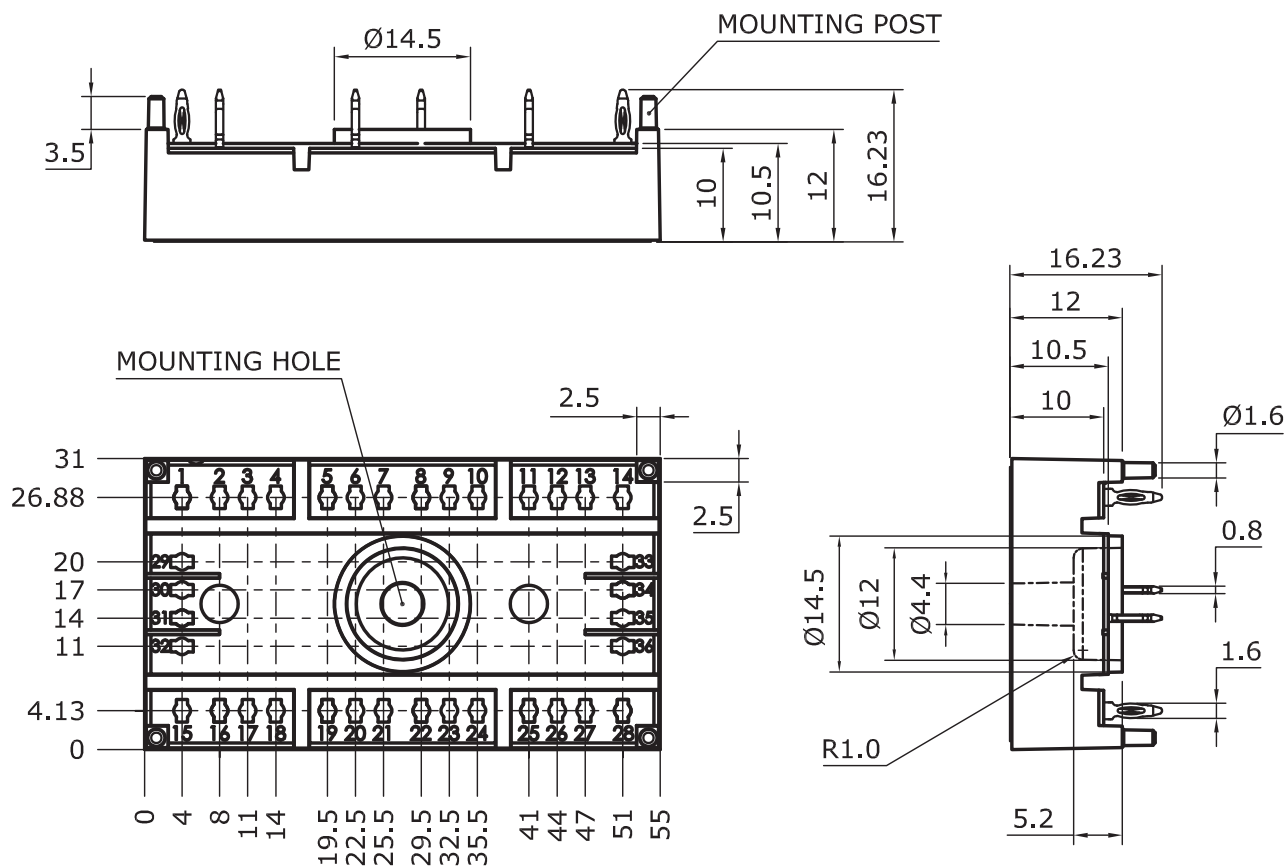


Fig. 12: Typ. Inv. diode reverse recovery charge

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Dimensions: mm

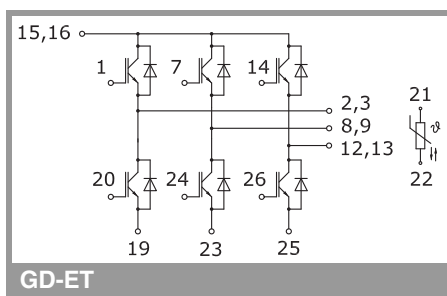
Tolerance system: ISO 2768-m



Suggested drilled hole diameter for terminal pins in the circuit board:
- refer Mounting Instruction SEMITOP® Classic

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SEMITOP 3 Press-Fit



GD-ET

IMPORTANT INFORMATION AND WARNINGS

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

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