

# SK30GD066ETp

**SEMITOP® 3 Press-Fit**

## Sixpack Open Emitter

## SK30GD066ETp

### Features\*

- One screw mounting module
- Low inductive design
- Press-Fit contact technology
- Fully compatible with other SEMITOP® Press-Fit types
- 600V Trench IGBT3 technology
- Robust and soft switching CAL HD diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

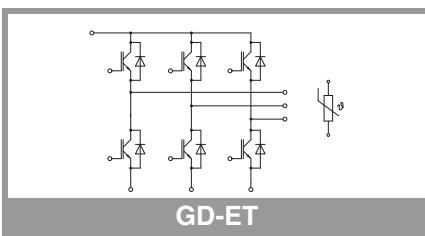
### Typical Applications

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

<b>Absolute Maximum Ratings</b>		<b>Values</b>	<b>Unit</b>
<b>Symbol</b>	<b>Conditions</b>		
<b>IGBT 1</b>			
$V_{CES}$	$T_j = 25 \text{ }^\circ\text{C}$	600	V
$I_c$	$T_j = 150 \text{ }^\circ\text{C}$	33	A
	$T_s = 25 \text{ }^\circ\text{C}$	25	A
$I_c$	$T_j = 175 \text{ }^\circ\text{C}$	40	A
	$T_s = 70 \text{ }^\circ\text{C}$	31	A
$I_{Cnom}$		30	A
$I_{CRM}$		60	A
$V_{GES}$		-20 ... 20	V
$t_{psc}$	$V_{CC} = 360 \text{ V}$ $V_{GE} \leq 15 \text{ V}$ $V_{CES} \leq 600 \text{ V}$	6	$\mu\text{s}$
$T_j$		-40 ... 175	$^\circ\text{C}$

<b>Absolute Maximum Ratings</b>		<b>Values</b>	<b>Unit</b>
<b>Symbol</b>	<b>Conditions</b>		
<b>Diode 1</b>			
$V_{RRM}$	$T_j = 25 \text{ }^\circ\text{C}$	600	V
$I_F$	$T_j = 150 \text{ }^\circ\text{C}$	32	A
	$T_s = 25 \text{ }^\circ\text{C}$	24	A
$I_F$	$T_j = 175 \text{ }^\circ\text{C}$	36	A
	$T_s = 70 \text{ }^\circ\text{C}$	28	A
$I_{FRM}$		60	A
$I_{FSM}$	$10 \text{ ms, sin } 180^\circ, T_j = 150 \text{ }^\circ\text{C}$	160	A
$T_j$		-40 ... 175	$^\circ\text{C}$

<b>Absolute Maximum Ratings</b>		<b>Values</b>	<b>Unit</b>
<b>Symbol</b>	<b>Conditions</b>		
<b>Module</b>			
$I_{t(RMS)}$	$\Delta T_{\text{terminal}} \text{ at PCB joint} = 30 \text{ K, per pin}$	35	A
$T_{stg}$		-40 ... 125	$^\circ\text{C}$
$V_{isol}$	AC, sinusoidal, $t = 1 \text{ min}$	2500	V





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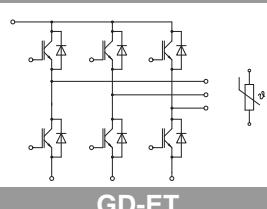
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Characteristics		Conditions	min.	typ.	max.	Unit
Symbol						
<b>IGBT 1</b>						
$V_{CE(sat)}$	$I_C = 30 \text{ A}$	$T_j = 25 \text{ }^\circ\text{C}$		1.45	1.85	V
	$V_{GE} = 15 \text{ V}$ chiplevel	$T_j = 150 \text{ }^\circ\text{C}$		1.65	2.05	V
$V_{CE0}$	chiplevel	$T_j = 25 \text{ }^\circ\text{C}$	0.90	1.10	V	
		$T_j = 150 \text{ }^\circ\text{C}$	0.80	1.00	V	
$r_{CE}$	$V_{GE} = 15 \text{ V}$ chiplevel	$T_j = 25 \text{ }^\circ\text{C}$	18	25		$\text{m}\Omega$
		$T_j = 150 \text{ }^\circ\text{C}$	28	35		$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.43 \text{ mA}$		5	5.8	6.5	V
$I_{CES}$	$V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}$		0.01		$\text{mA}$
	$V_{CE} = 600 \text{ V}$			-		$\text{mA}$
$C_{ies}$		$f = 1 \text{ MHz}$		1.63		$\text{nF}$
$C_{oes}$	$V_{CE} = 25 \text{ V}$	$f = 1 \text{ MHz}$		0.108		$\text{nF}$
$C_{res}$	$V_{GE} = 0 \text{ V}$	$f = 1 \text{ MHz}$		0.05		$\text{nF}$
$Q_G$	$V_{GE} = -7 \text{ V} \dots +15 \text{ V}$			275		$\text{nC}$
$R_{Gint}$	$T_j = 25 \text{ }^\circ\text{C}$			0		$\Omega$
$t_{d(on)}$	$V_{CC} = 300 \text{ V}$	$T_j = 150 \text{ }^\circ\text{C}$		24		ns
$t_r$	$I_C = 30 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$		27		ns
$E_{on}$	$V_{GE \text{ neg}} = -7 \text{ V}$	$T_j = 150 \text{ }^\circ\text{C}$		0.97		$\text{mJ}$
$t_{d(off)}$	$V_{GE \text{ pos}} = 15 \text{ V}$	$T_j = 150 \text{ }^\circ\text{C}$		328		ns
$t_f$	$R_{G \text{ on}} = 25 \Omega$	$T_j = 150 \text{ }^\circ\text{C}$		54		ns
	$R_{G \text{ off}} = 25 \Omega$	$T_j = 150 \text{ }^\circ\text{C}$				
$E_{off}$	$di/dt_{on} = 2335 \text{ A}/\mu\text{s}$	$T_j = 150 \text{ }^\circ\text{C}$		1.77		$\text{mJ}$
	$di/dt_{off} = 2335 \text{ A}/\mu\text{s}$					
$R_{th(j-s)}$	per IGBT, $\lambda_{\text{paste}} = 0.8 \text{ W}/(\text{mK})$			1.65		K/W

Characteristics		Conditions	min.	typ.	max.	Unit
Symbol						
<b>Diode 1</b>						
$V_F$	$I_F = 30 \text{ A}$	$T_j = 25 \text{ }^\circ\text{C}$		1.45	1.99	V
	chiplevel	$T_j = 150 \text{ }^\circ\text{C}$		1.61	1.92	V
$V_{FO}$	chiplevel	$T_j = 25 \text{ }^\circ\text{C}$	0.99	1.10	V	
		$T_j = 150 \text{ }^\circ\text{C}$	0.80	0.89	V	
$r_F$	chiplevel	$T_j = 25 \text{ }^\circ\text{C}$	18	30		$\text{m}\Omega$
		$T_j = 150 \text{ }^\circ\text{C}$	27	34		$\text{m}\Omega$
$I_{RRM}$	$I_F = 30 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$		30		A
$Q_{rr}$	$di/dt_{off} = 2335 \text{ A}/\mu\text{s}$	$T_j = 150 \text{ }^\circ\text{C}$		1.6		$\mu\text{C}$
$E_{rr}$	$V_{GE} = -7 \text{ V}$	$T_j = 150 \text{ }^\circ\text{C}$		0.26		$\text{mJ}$
$R_{th(j-s)}$	per Diode			2.1		K/W



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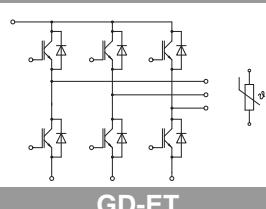
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Characteristics		min.	typ.	max.	Unit
Symbol	Conditions				
<b>Module</b>					
M <sub>s</sub>	to heatsink	2.25		2.5	Nm
w	weight		30		g

Characteristics		min.	typ.	max.	Unit
Symbol	Conditions				
<b>Temperature Sensor</b>					
R <sub>100</sub>	T <sub>r</sub> = 100 °C		493 ± 5%		Ω
B <sub>100/125</sub>	R <sub>(T)</sub> =R <sub>100</sub> exp[B <sub>100/125</sub> (1/T-1/T <sub>100</sub> )]; T[K];		3550 ±2%		K



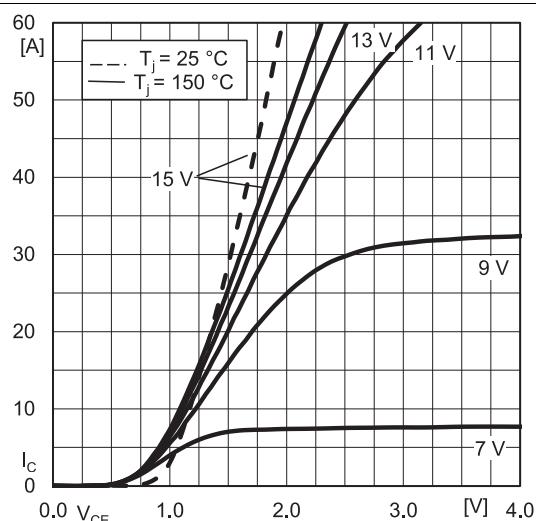


Fig. 1: Typ. IGBT output characteristic, incl.  $R_{CC+EE}'$

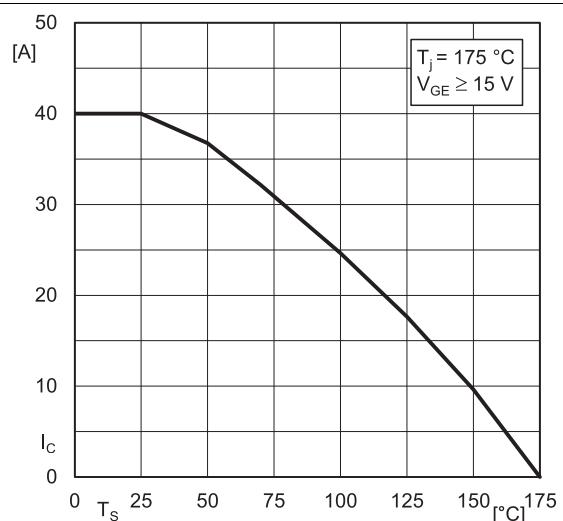


Fig. 2: IGBT rated current vs. temperature  $I_c=f(T_s)$

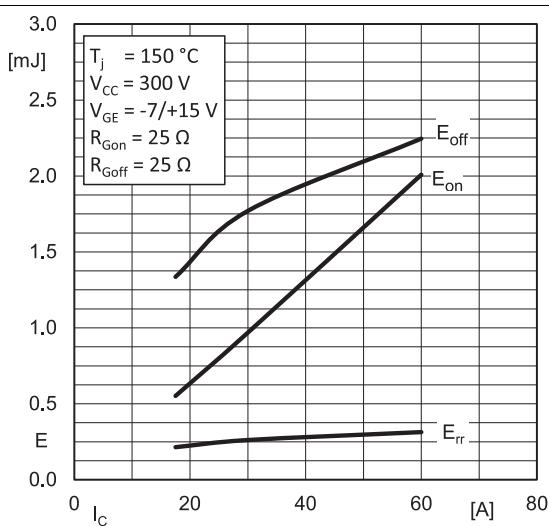


Fig. 3: Typ. turn-on /-off energy =  $f (I_c)$

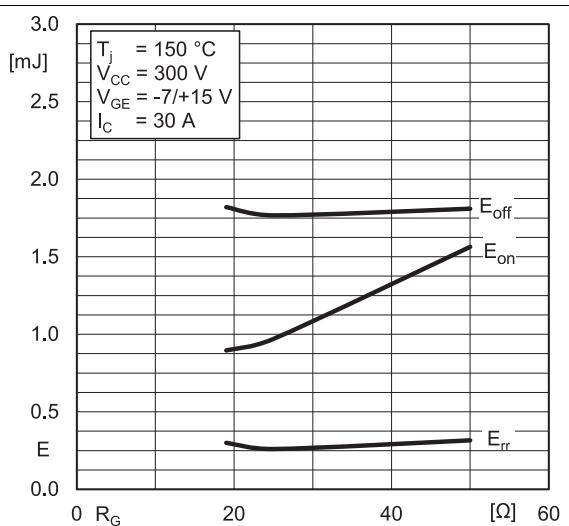


Fig. 4: Typ. turn-on /-off energy =  $f (R_G)$

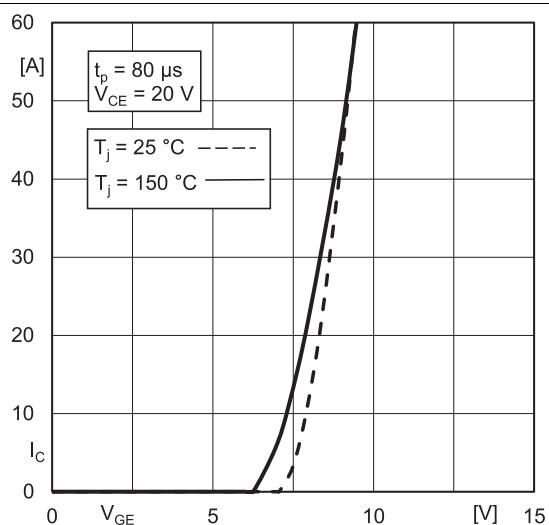


Fig. 5: Typ. IGBT transfer characteristic

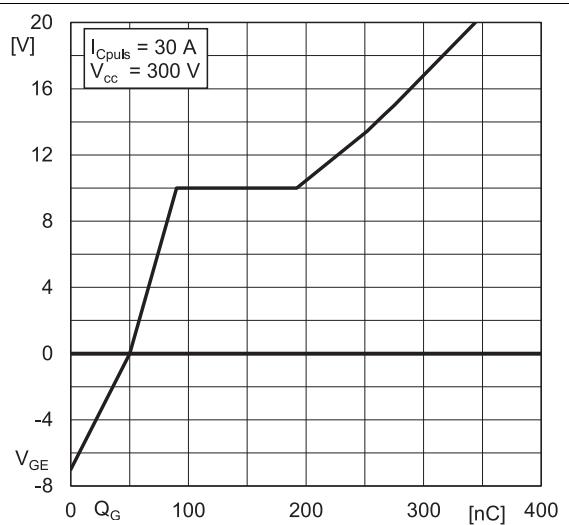


Fig. 6: Typ. IGBT gate charge characteristic

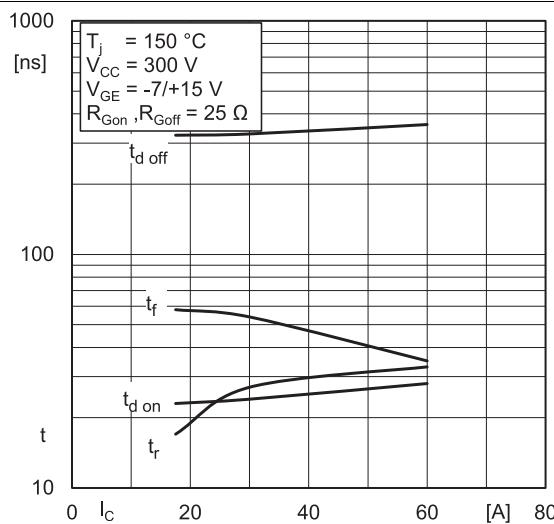


Fig. 7: Typ. switching times = f ( $I_C$ )

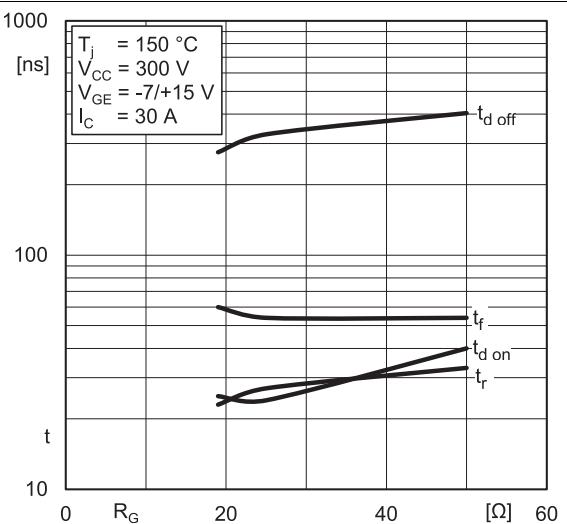


Fig. 8: Typ. switching times = f ( $R_G$ )

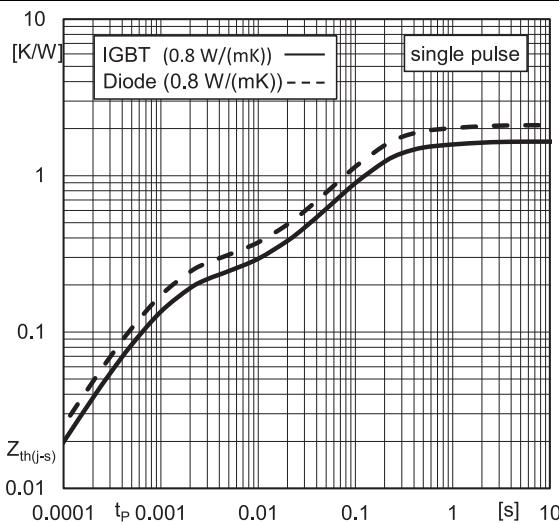


Fig. 9: Typ. transient thermal impedance

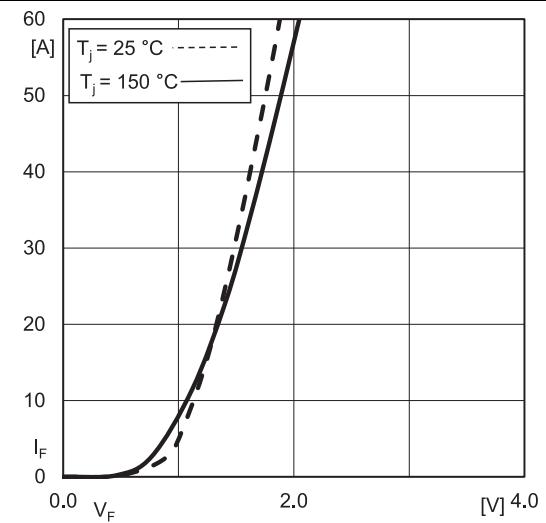
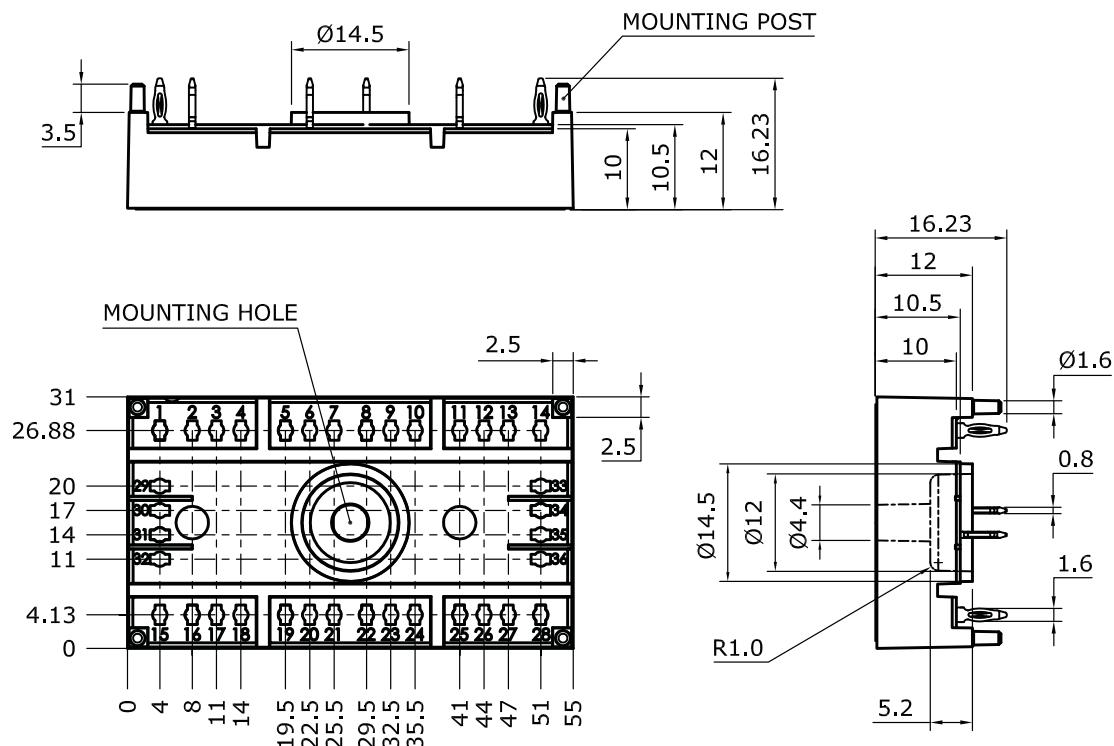


Fig. 10: Typ. Diode forward charact., incl.  $R_{CC'} + EE'$

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Dimensions: mm

Tolerance system: ISO 2768-m



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

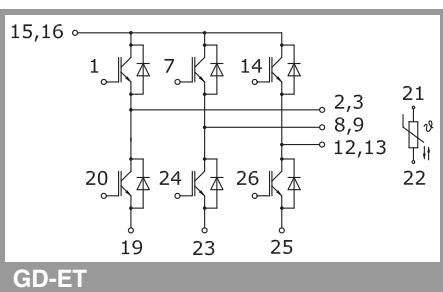
- minimum: 1.575 mm
- typical: 1.6 mm
- maximum: 1.625 mm

Suggested hole diameter for the mounting post in the circuit board:

- 2 mm

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SEMITOP 3 Press-Fit



GD-ET

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

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