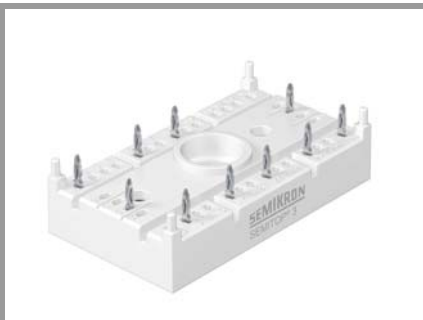


SK50BGLL07F3TUFBPp



SEMITOP® 3 Press-Fit

IGBT module

SK50BGLL07F3TUFBPp

Features

- Compact design
- 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
- 650V Fast Trench IGBT technology
- Ultrafast technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

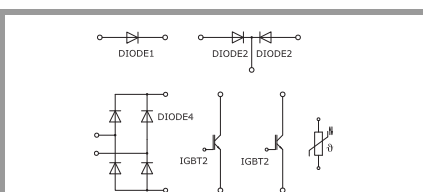
Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplier
- UPS

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
IGBT 2				
V_{CES}	$T_j = 25\text{ °C}$	650	V	
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	46	A
		$T_s = 70\text{ °C}$	34	A
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	51	A
		$T_s = 70\text{ °C}$	41	A
I_{Cnom}		50	A	
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	150	A	
V_{GES}		-20 ... 20	V	
t_{psc}	$V_{CC} = 400\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 650\text{ V}$	$T_j = 150\text{ °C}$	5	μs
T_j		-40 ... 175	$^{\circ}\text{C}$	

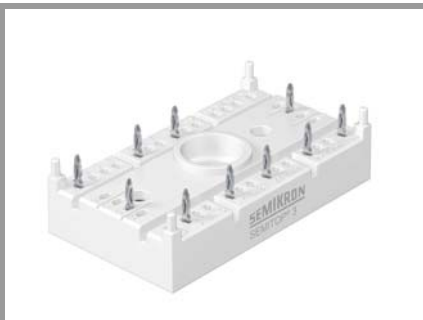
Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Diode 1				
V_{RRM}	$T_j = 25\text{ °C}$	1600	V	
I_F	$T_j = 125\text{ °C}$	$T_s = 25\text{ °C}$	30	A
		$T_s = 70\text{ °C}$	20	A
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	35	A
		$T_s = 70\text{ °C}$	26	A
I_{Fnom}		25	A	
I_{FSM}	10 ms sin 180°	$T_j = 25\text{ °C}$	220	A
		$T_j = 150\text{ °C}$	200	A
i^2t	10 ms, sin 180°, $T_j = 150\text{ °C}$	200	A^2s	
T_j		-40 ... 150	$^{\circ}\text{C}$	

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Diode 2				
V_{RRM}	$T_j = 25\text{ °C}$	600	V	
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	60	A
		$T_s = 70\text{ °C}$	42	A
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	69	A
		$T_s = 70\text{ °C}$	52	A
I_{Fnom}		30	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	60	A	
I_{FSM}	10 ms sin 180°	$T_j = 25\text{ °C}$	300	A
		$T_j = 175\text{ °C}$	300	A
T_j		-40 ... 175	$^{\circ}\text{C}$	



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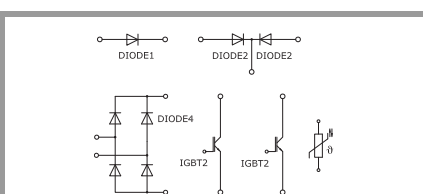
Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplier
- UPS

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Diode 4				
V_{RRM}			1600	V
I_F	$T_j = 125\text{ °C}$	$T_s = 25\text{ °C}$	44	A
		$T_s = 70\text{ °C}$	29	A
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	51	A
		$T_s = 70\text{ °C}$	38	A
I_{Fnom}			35	A
I_{FSM}	10 ms sin 180°	$T_j = 25\text{ °C}$	370	A
		$T_j = 150\text{ °C}$	270	A
I^2t	10 ms, sin 180°, $T_j = 150\text{ °C}$		365	A ² s
T_j			-40 ... 150	°C

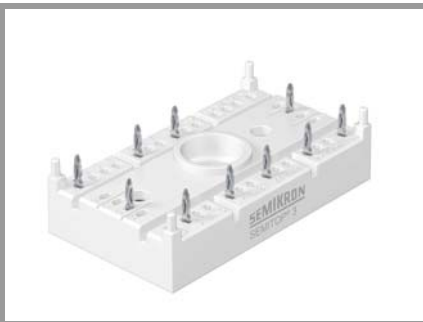
Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Module				
$I_{t(RMS)}$	$T_{terminal} = 100\text{ °C}$, $T_s = 60\text{ °C}$, per pin		40	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min		2500	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 2						
$V_{CE(sat)}$	$I_C = 50\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	1.85	2.22		V
		$T_j = 150\text{ °C}$	2.18	2.55		V
V_{CE0}	chipelevel	$T_j = 25\text{ °C}$	1.10	1.20		V
		$T_j = 150\text{ °C}$	1.00	1.10		V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	15	20		mΩ
		$T_j = 150\text{ °C}$	24	29		mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}\text{ V}$, $I_C = 0.8\text{ mA}$		4.2	5.1	5.6	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 650\text{ V}$	$T_j = 25\text{ °C}$			0.005	mA
		$T_j = 150\text{ °C}$			-	mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		3.1		nF
C_{oes}		$f = 1\text{ MHz}$		0.116		nF
C_{res}		$f = 1\text{ MHz}$		0.09		nF
Q_G	$V_{GE} = -8\text{ V...} + 15\text{ V}$			185		nC
R_{Gint}	$T_j = 25\text{ °C}$			0		Ω
$t_{d(on)}$	$V_{CC} = 300\text{ V}$	$T_j = 150\text{ °C}$		169		ns
t_r	$I_C = 50\text{ A}$ $R_{Gon} = 16\text{ Ω}$ $R_{Goff} = 16\text{ Ω}$	$T_j = 150\text{ °C}$		81		ns
		$T_j = 150\text{ °C}$		2.79		mJ
E_{on}				2.79		mJ
$t_{d(off)}$	$di/dt_{on} = 3077\text{ A/μs}$	$T_j = 150\text{ °C}$		431		ns
t_f	$di/dt_{off} = 3636\text{ A/μs}$	$T_j = 150\text{ °C}$		28		ns
E_{off}	$V_{GE\ neg} = -15\text{ V}$ $V_{GE\ pos} = 15\text{ V}$	$T_j = 150\text{ °C}$		1.03		mJ
$R_{th(j-s)}$	per IGBT			1.1		K/W



BGLL_TBP

SK50BGLL07F3TUFBPp



SEMITOP® 3 Press-Fit

IGBT module

SK50BGLL07F3TUFBPp

Features

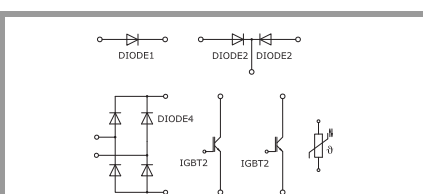
- Compact design
- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® Press-Fit types
- Improved thermal performances by aluminium oxide substrate
- 650V Fast Trench IGBT technology
- Ultrafast technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplier
- UPS

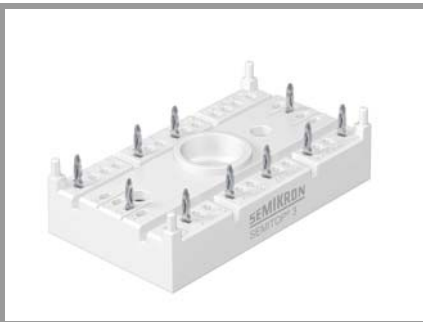
Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	$I_F = 25\text{ A}$	$T_j = 25\text{ °C}$		1.26	1.70	V
	chipelevel	$T_j = 125\text{ °C}$		1.26	1.67	V
V_{F0}	chipelevel	$T_j = 25\text{ °C}$		0.88	0.98	V
		$T_j = 125\text{ °C}$		0.73	0.83	V
r_F	chip	$T_j = 25\text{ °C}$		15	29	mΩ
		$T_j = 125\text{ °C}$		21	34	mΩ
I_{RRM}	$I_F = 25\text{ A}$			-		A
Q_{rr}				-		μC
E_{rr}				-		mJ
$R_{th(j-s)}$				1.8		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 2						
V_F	$I_F = 30\text{ A}$	$T_j = 25\text{ °C}$		1.85	2.35	V
	chipelevel	$T_j = 150\text{ °C}$		1.10	1.40	V
V_{F0}		$T_j = 25\text{ °C}$		1.55	2.05	V
		$T_j = 150\text{ °C}$		0.90	1.20	V
r_F	chipelevel	$T_j = 25\text{ °C}$		10	10	mΩ
		$T_j = 150\text{ °C}$		6.7	6.7	mΩ
I_{RRM}	$I_F = 50\text{ A}$	$T_j = 150\text{ °C}$		58		A
Q_{rr}	$di/dt_{off} = 3077\text{ A/μs}$	$T_j = 150\text{ °C}$		1.8		μC
E_{rr}	$V_{GE} = -15\text{ V}$ $V_{CC} = 300\text{ V}$	$T_j = 150\text{ °C}$		0.46		mJ
$R_{th(j-s)}$	per Diode			1.5		K/W



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SK50BGLL07F3TUFBPp



SEMITOP® 3 Press-Fit

IGBT module

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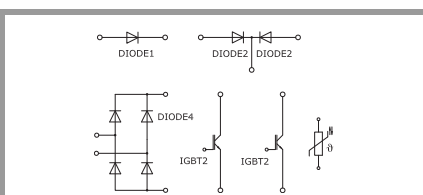
Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplier
- UPS

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 4						
V_F	$I_F = 35\text{ A}$	$T_j = 25\text{ °C}$		1.20	1.60	V
		chipelevel	$T_j = 125\text{ °C}$	1.19	1.56	V
V_{F0}	chip	$T_j = 25\text{ °C}$		0.88	0.98	V
		$T_j = 125\text{ °C}$		0.73	0.83	V
r_F	chipelevel	$T_j = 25\text{ °C}$		13	18	mΩ
		$T_j = 125\text{ °C}$		13	21	mΩ
I_{RRM}				-		A
Q_{rr}				-		μC
E_{rr}				-		mJ
$R_{th(j-s)}$	per Diode			1.3		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



BGLL_TBP

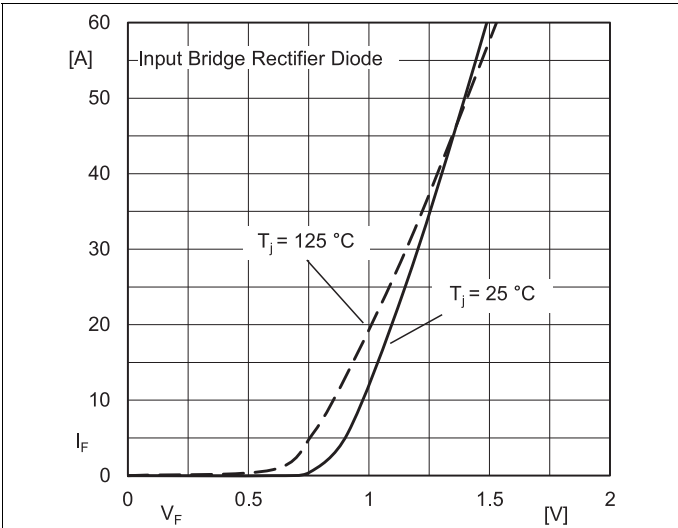


Fig. 1: Typ. Diode4 forward characteristic, incl. R_{CC+EE}

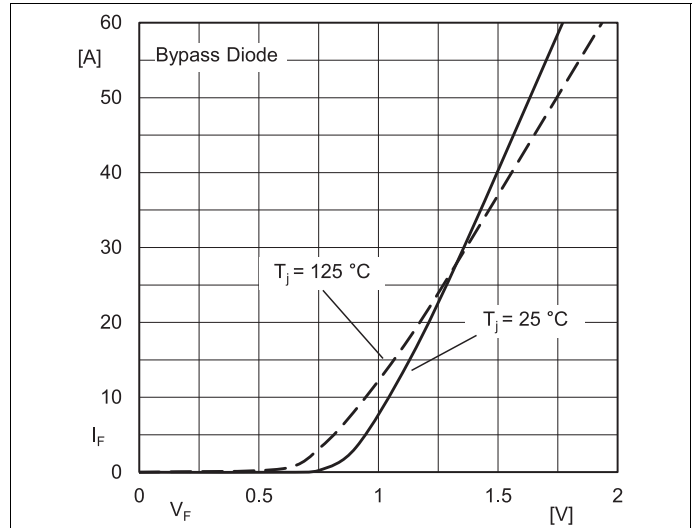


Fig. 2: Typ. Diode1 forward characteristic, incl. R_{CC+EE}

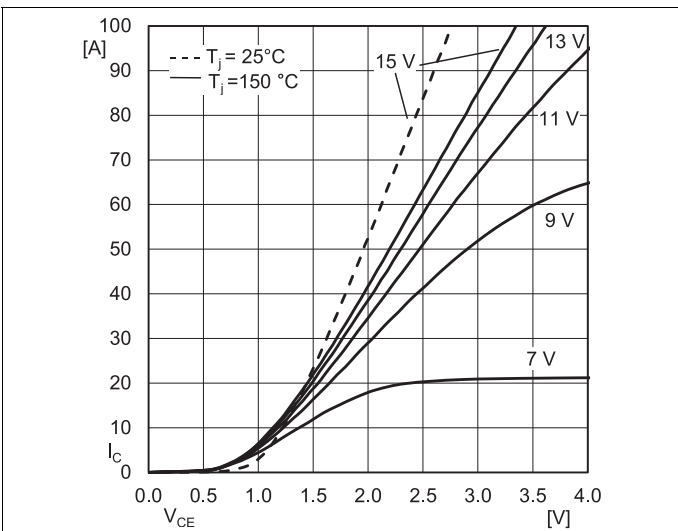


Fig. 3: Typ. IGBT output characteristic, inclusive R_{CC+EE}

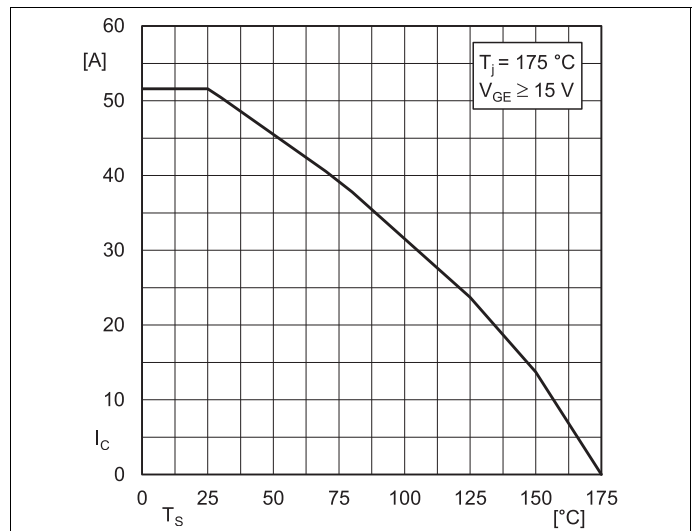


Fig. 4: Rated IGBT current vs. temperature $I_C = f(T_s)$

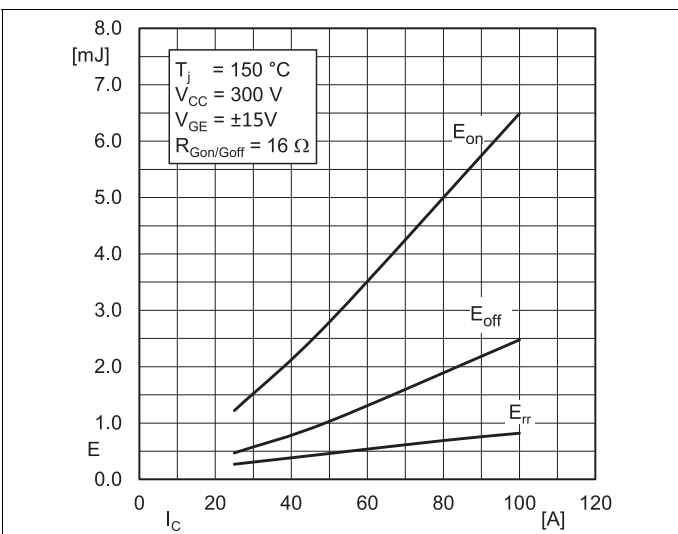


Fig. 5: Typ. turn-on /-off energy = $f(I_C)$

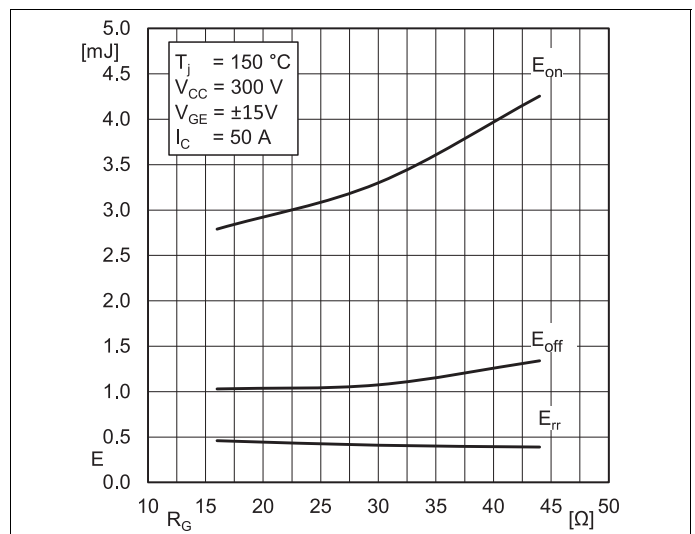


Fig. 6: Typ. turn-on /-off energy = $f(R_G)$

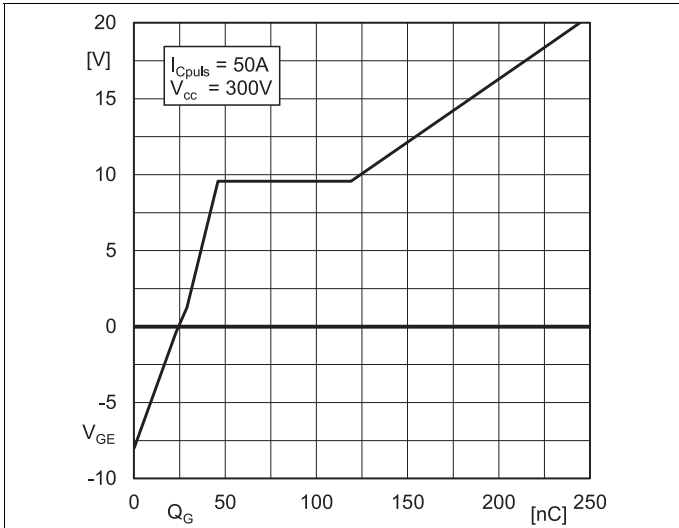


Fig. 7: Typ. gate charge characteristic

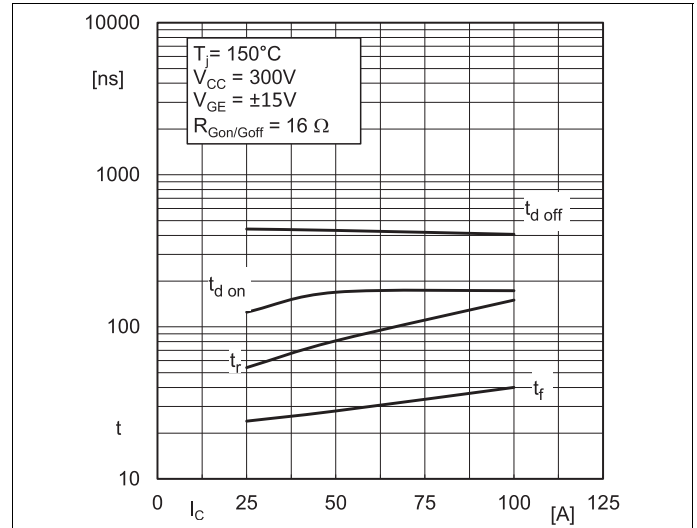


Fig. 8: Typ. switching times vs. I_C

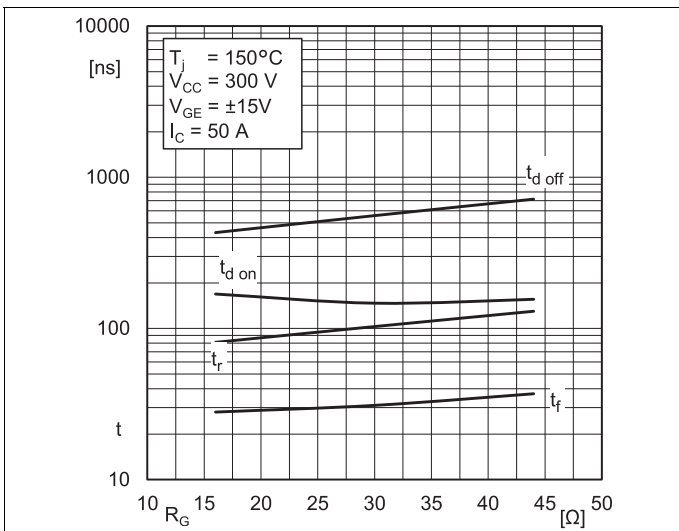


Fig. 9: Typ. switching times vs. gate resistor R_G

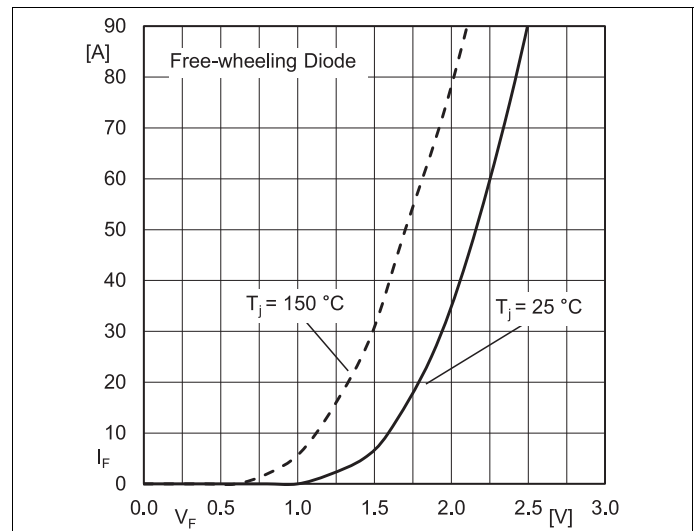
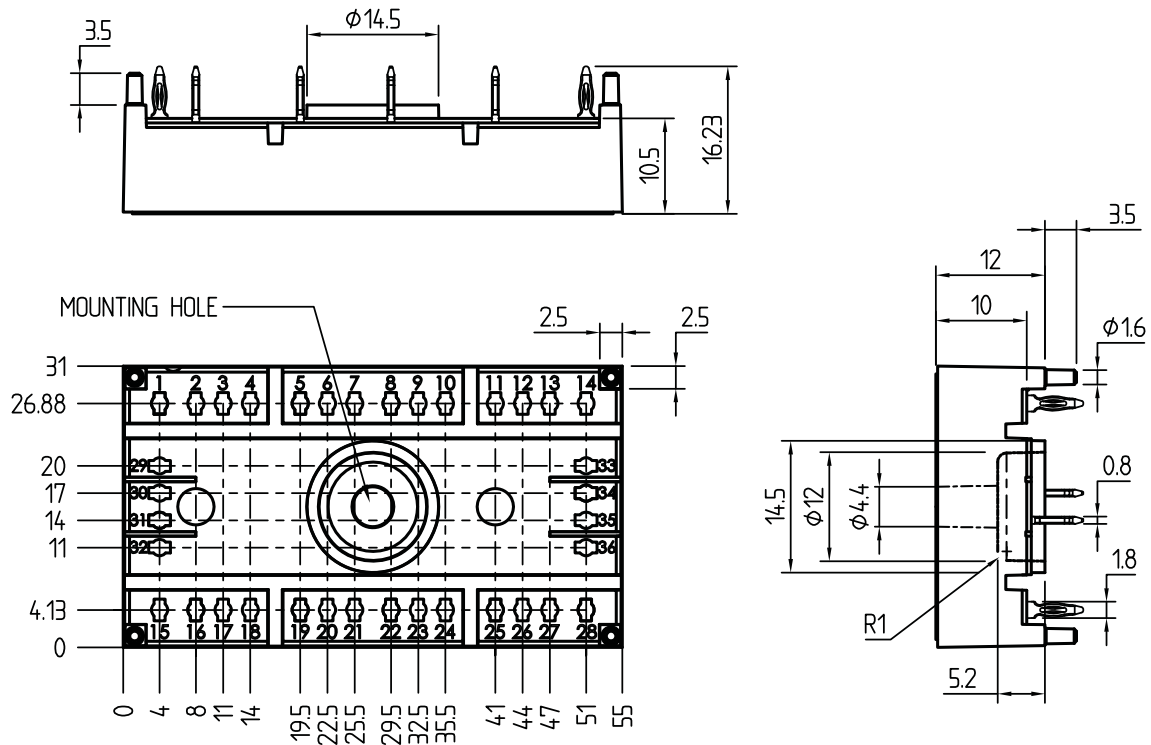


Fig. 10: Typ. Diode2 forward characteristic, incl. $R_{CC+EE'}$

SK50BGLL07F3TUFBPp

dimensions in mm
tolerance system: ISO 2768-m



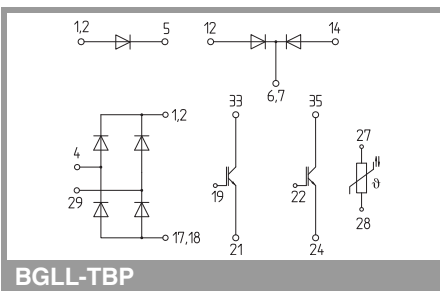
Suggested drilled hole diameter for terminal pins in the circuit board:

- 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



BGLL-TBP

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

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