

SK75GAL12T4



SEMITOP® 2

IGBT Module

SK75GAL12T4

SK75GAR12T4

Target Data

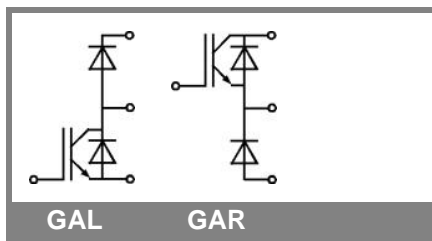
Features

- One screw mounting module
- Trench4 IGBT technology
- CAL4 technology FWD

Typical Applications

Remarks

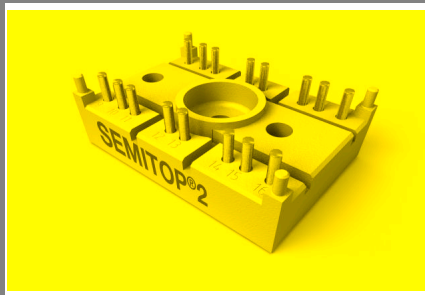
- $V_{CE,sat}$, V_F = chip level value



Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25\text{ °C}$	1200		V
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	80	A
		$T_s = 70\text{ °C}$	65	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	225		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 800\text{ V}$; $V_{GE} \leq 15\text{ V}$; $T_j = 150\text{ °C}$ $V_{CES} < 1200\text{ V}$	10		µs
Inverse Diode				
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	20	A
		$T_s = 70\text{ °C}$	16	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	45		A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ °C}$	90		A
Freewheeling Diode				
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	70	A
		$T_s = 70\text{ °C}$	55	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	225		A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ °C}$	425		A
Module				
$I_{t(RMS)}$				A
T_{vj}		-40 ... +175		°C
T_{stg}		-40 ... +125		°C
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$	0,01		mA
		$T_j = 150\text{ °C}$			mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$	$T_j = 25\text{ °C}$	600		nA
		$T_j = 150\text{ °C}$			nA
V_{CE0}		$T_j = 25\text{ °C}$	1,1	1,3	V
		$T_j = 150\text{ °C}$	1	1,2	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	10		mΩ
		$T_j = 150\text{ °C}$	16		mΩ
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	1,85	2,05	V
		$T_j = 150\text{ °C}_{chiplev.}$	2,25	2,45	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	4,4		nF
C_{oes}			0,29		nF
C_{res}			0,235		nF
Q_G	$V_{GE} = -7\text{ V} \dots +15\text{ V}$	570		nC	
R_{Gint}	$T_j = 25\text{ °C}$	10		Ω	
$t_{d(on)}$	$R_{Gon} = 24\text{ Ω}$ $di/dt = 1360\text{ A/μs}$	$V_{CC} = 600\text{ V}$ $I_C = 75\text{ A}$	63		ns
t_r			65		ns
E_{on}			13,6		mJ
$t_{d(off)}$	$R_{Goff} = 24\text{ Ω}$	$T_j = 150\text{ °C}$ $V_{GE} = -7/+15\text{ V}$	521		ns
t_f			80		ns
E_{off}			8,2		mJ
$R_{th(j-s)}$	per IGBT	0,74		K/W	

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Typical Applications

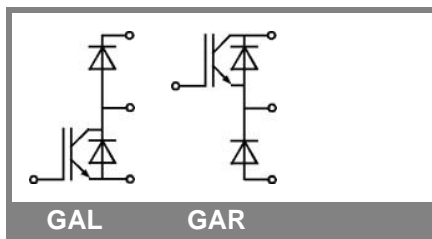
Remarks

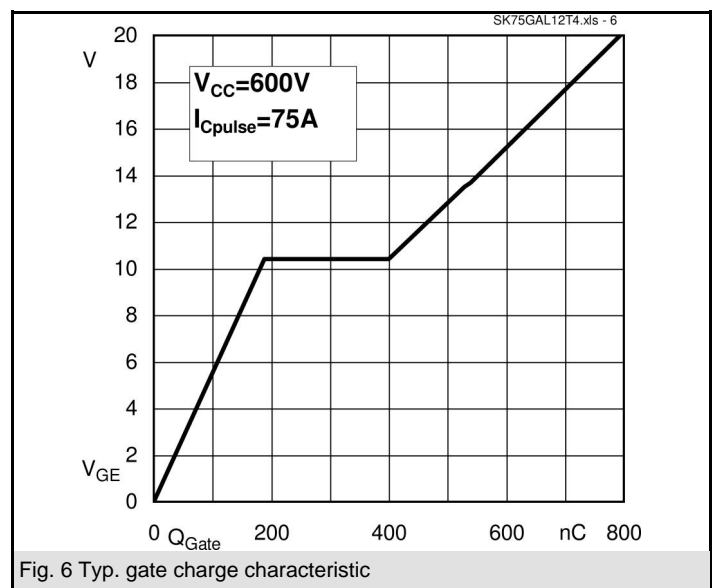
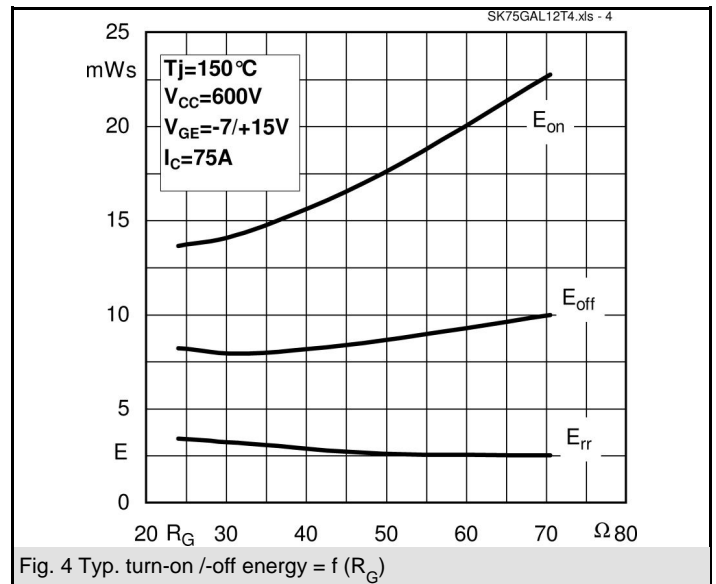
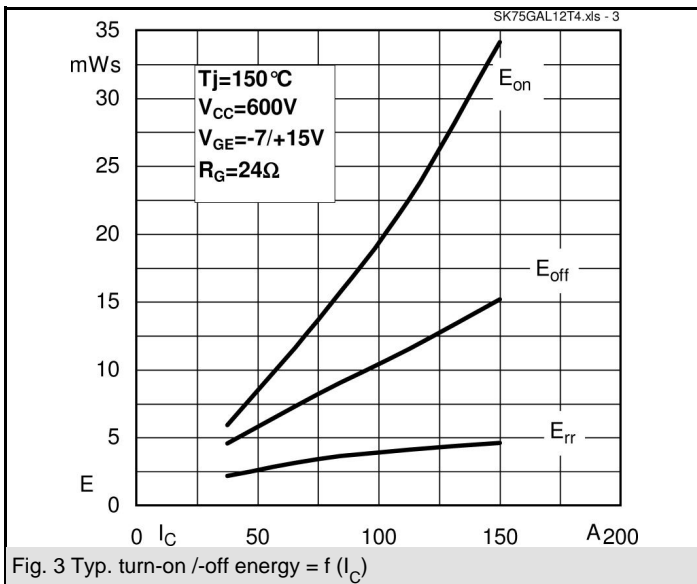
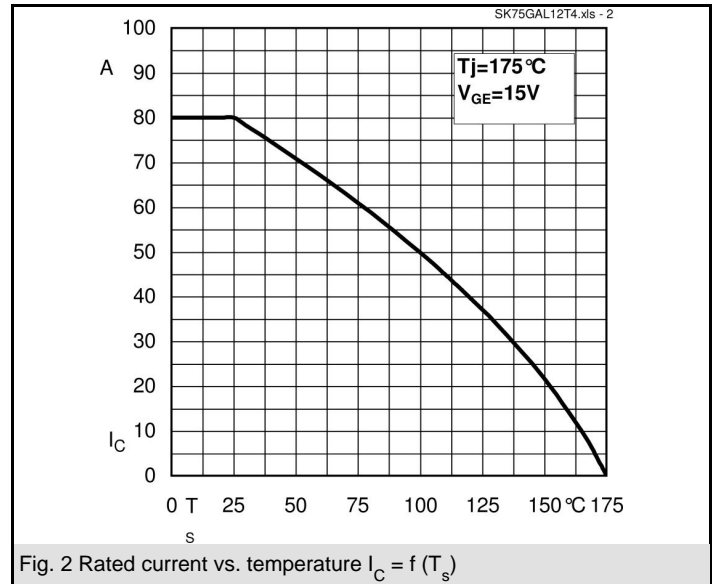
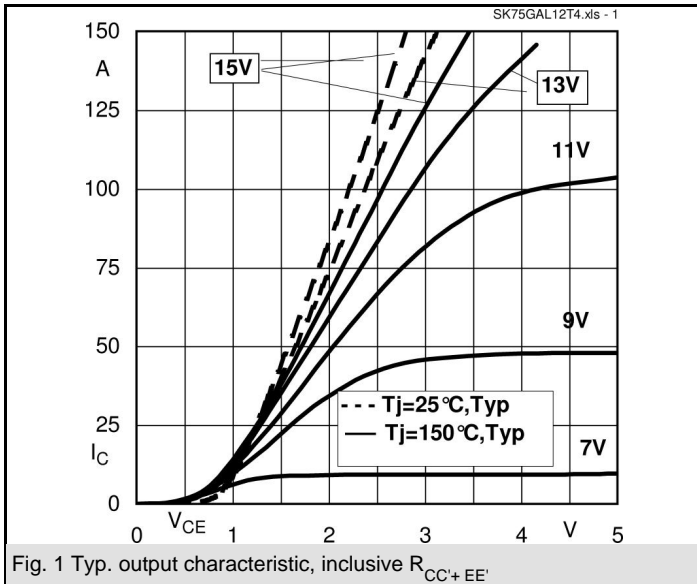
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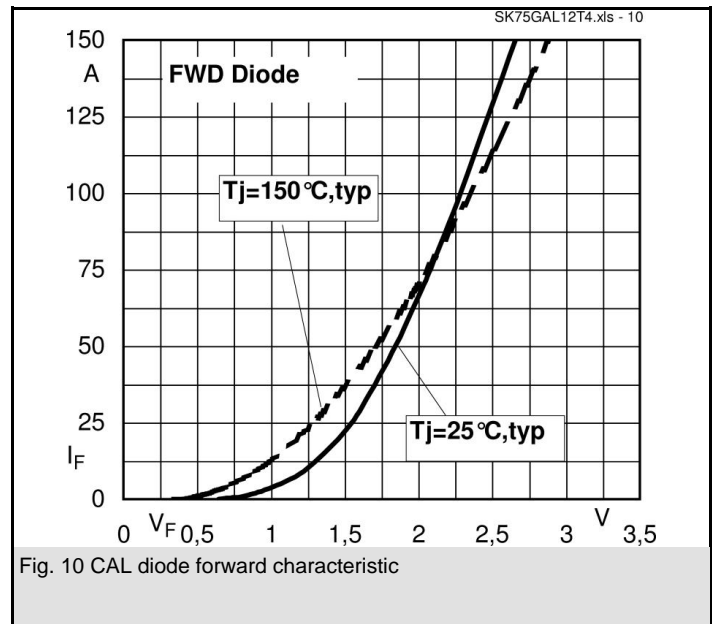
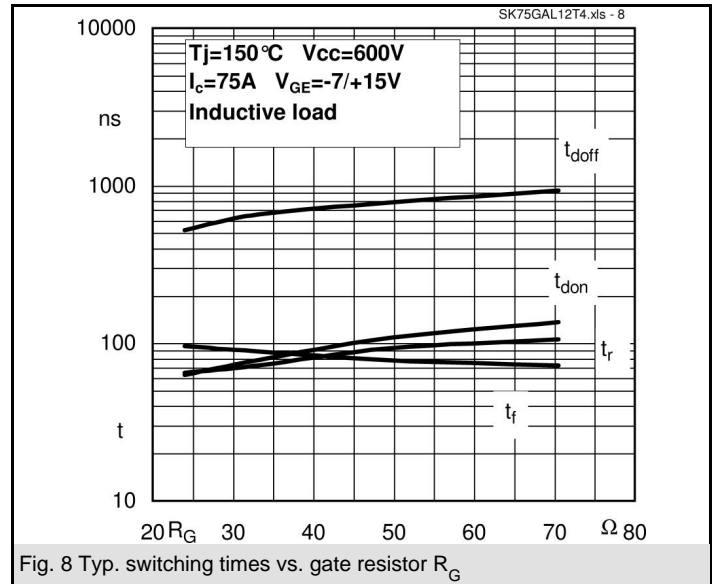
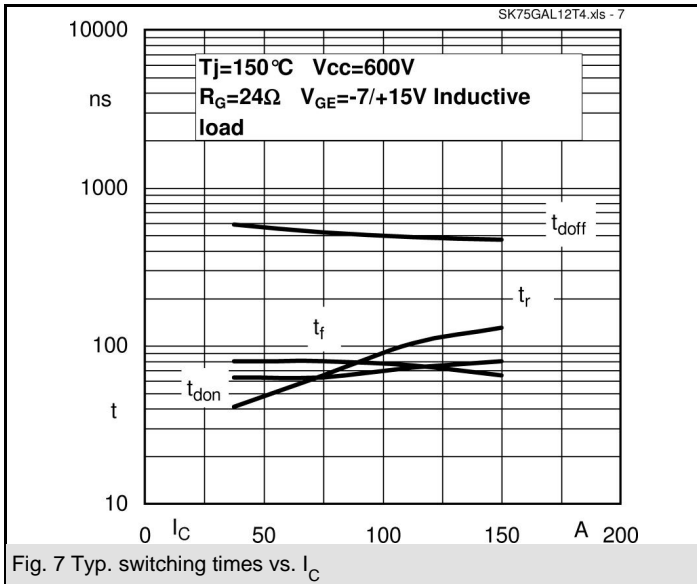
Characteristics				min.	typ.	max.	Units
Symbol	Conditions						
Inverse Diode							
$V_F = V_{EC}$	$I_{Fnom} = 15 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2,38	2,71		V
		$T_j = 150 \text{ }^\circ\text{C}_{chiplev.}$		2,44	2,77		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1,3	1,5		V
		$T_j = 150 \text{ }^\circ\text{C}$		0,9	1,1		V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		72	80,7		m Ω
		$T_j = 150 \text{ }^\circ\text{C}$		102,8	111,6		m Ω
I_{RRM}	$I_F = \text{A}$	$T_j = 150 \text{ }^\circ\text{C}$					A
Q_{rr}							μC
E_{rr}	$V_{CC} = 600\text{V}$						mJ
$R_{th(j-s)D}$	per diode			2,34			K/W
Freewheeling Diode							
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2,1	2,5		V
		$T_j = 150 \text{ }^\circ\text{C}_{chiplev.}$		2,4	2,5		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1,3	1,5		V
		$T_j = 150 \text{ }^\circ\text{C}$		0,9	1,1		V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		12	13,3		V
		$T_j = 150 \text{ }^\circ\text{C}$		16	17,3		V
I_{RRM}	$I_F = 75 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$		41			A
Q_{rr}	$di/dt = 1360 \text{ A}/\mu\text{s}$			10,6			μC
E_{rr}	$V_{CC} = 600\text{V}$			3,39			mJ
$R_{th(j-s)FD}$	per diode			0,97			K/W
M_s	to heat sink				2,5		Nm
w				30			g
Temperature sensor							
R_{100}	$T_s = 100^\circ\text{C}$ ($R_{25} = 5\text{k}\Omega$)			493 \pm 5%			Ω

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

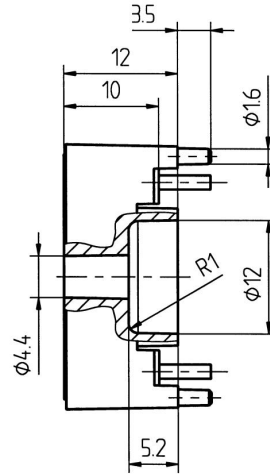
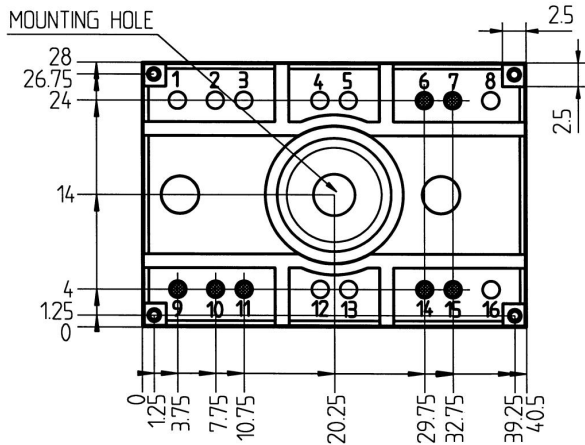
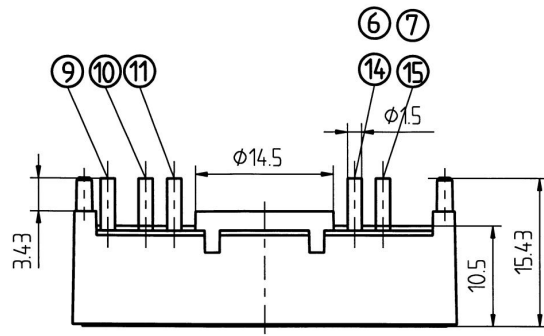
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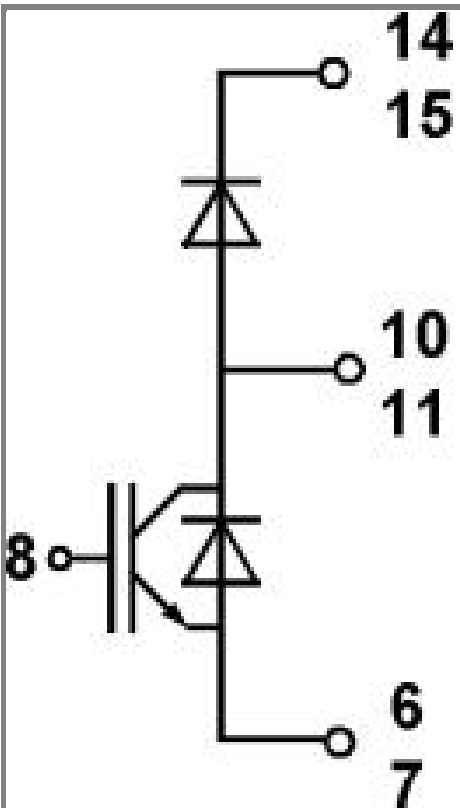




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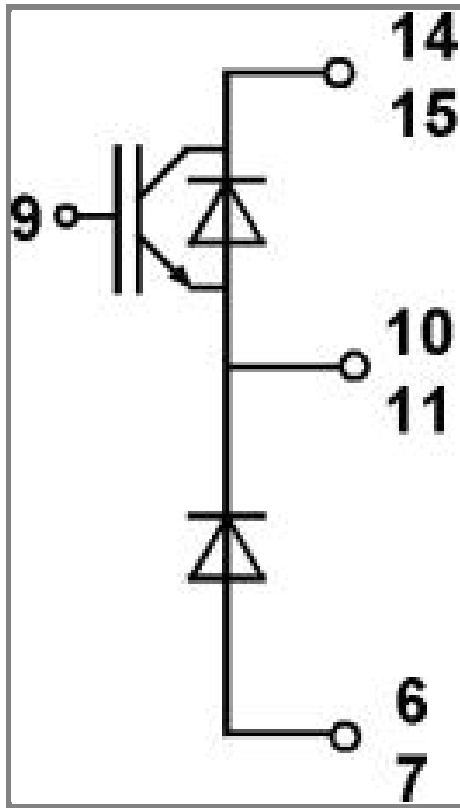


Case T18 (Suggested hole diameter for the solder pins and mounting plastic pins: 2mm)



Case T18

GAL



Case T18

GAR