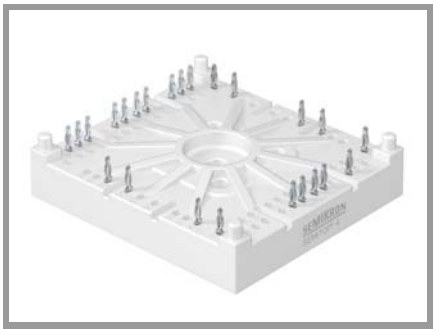
SK150GAH12T4Tp



SEMITOP® 4 Press-Fit

IGBT module

Engineering Sample

SK150GAH12T4Tp

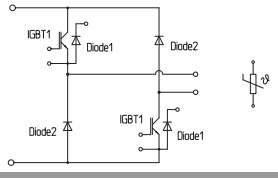
Target Data

Features

- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® 2 and 3 Press-Fit
- Improved thermal performances by aluminum oxide substrate
- Trench4 IGBT technology
- CAL4F diode technology
- Integrated PTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- Switching SR Drives
- Inverter
- Switched mode power supplies
- UPS



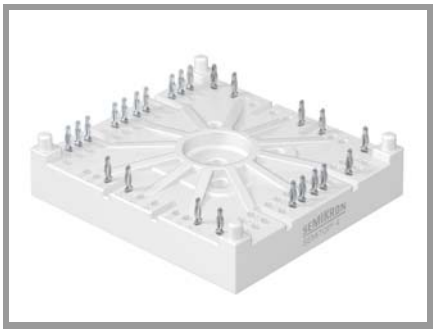
GAH-T

Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
IGBT 1				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_s = 25 °C	167	A
		T_s = 70 °C	135	A
I_{Cnom}			150	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		450	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V $V_{GE} \leq$ 15 V $V_{CES} \leq$ 1200 V	T_j = 150 °C	10	µs
T_j			-40 ... 175	°C

Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
Diode 1				
V_{RRM}	T_j = 25 °C		1200	V
I_F	T_j = 175 °C	T_s = 25 °C	33	A
		T_s = 70 °C	27	A
I_{Fnom}			16	A
I_{FRM}	I_{FRM} = 3 x I_{Fnom}		48	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		65	A
T_j			-40 ... 175	°C

Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
Diode 2				
V_{RRM}	T_j = 25 °C		1200	V
I_F	T_j = 175 °C	T_s = 25 °C	155	A
		T_s = 70 °C	123	A
I_{Fnom}			150	A
I_{FRM}	I_{FRM} = 3 x I_{Fnom}		450	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		774	A
T_j			-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	**Conditions**	**Values**	**Unit**
Module			
$I_{t(RMS)}$	$T_{terminal}$ = 100 °C, T_S = 60°C	40	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, 50Hz, t = 1 min	2500	V



SEMITOP® 4 Press-Fit

IGBT module

Engineering Sample

SK150GAH12T4Tp

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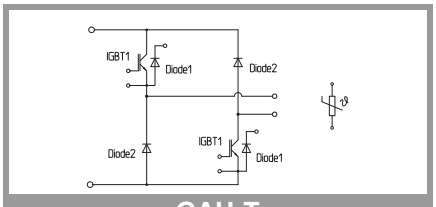
- Switched mode power supplies
- UPS



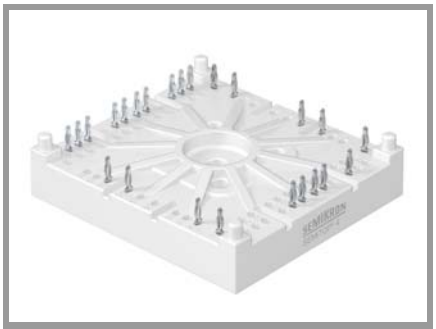
GAH-T

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	I_C = 150 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.85	2.10	V
		T_j = 150 °C		2.25	2.45	V
V_{CE0}	chiplevel	T_j = 25 °C		0.80	0.90	V
		T_j = 150 °C		0.70	0.80	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		7.0	8.0	mΩ
		T_j = 150 °C		10	11	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1200 V	T_j = 25 °C			2	mA
				-		mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		8.8		nF
C_{oes}		f = 1 MHz		0.58		nF
C_{res}		f = 1 MHz		0.47		nF
Q_G	- 8 V...+ 15 V			850		nC
R_{Gint}	T_j = 25 °C			5.0		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C = 150 A $R_{G\ on}$ = 2 Ω $R_{G\ off}$ = 2 Ω	T_j = 150 °C				ns
t_r		T_j = 150 °C				ns
E_{on}		T_j = 150 °C		10.8		mJ
$t_{d(off)}$		T_j = 150 °C				ns
t_f		T_j = 150 °C				ns
E_{off}	$V_{GE\ neg}$ = -15 V $V_{GE\ pos}$ = 15 V	T_j = 150 °C		15.6		mJ
$R_{th(j-s)}$	per IGBT			0.33		K/W

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	I_F = 16 A	T_j = 25 °C		2.33	2.65	V
	chiplevel	T_j = 150 °C		2.35	2.68	V
V_{F0}	chiplevel	T_j = 25 °C		1.30	1.50	V
		T_j = 150 °C		0.90	1.10	V
r_F	chiplevel	T_j = 25 °C		64	72	mΩ
		T_j = 150 °C		91	99	mΩ
I_{RRM}	I_F = 16 A	T_j = 150 °C		-		A
Q_{rr}	V_{GE} = -15 V V_{CC} = 600 V	T_j = 150 °C		-		µC
E_{rr}		T_j = 150 °C		0.82		mJ
$R_{th(j-s)}$	per Diode			1.1		K/W



SEMITOP® 4 Press-Fit

IGBT module

Engineering Sample

SK150GAH12T4Tp

Target Data

Features

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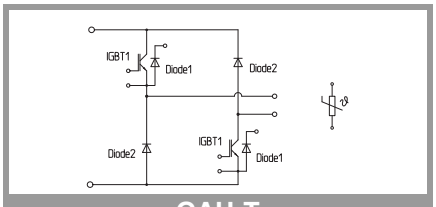


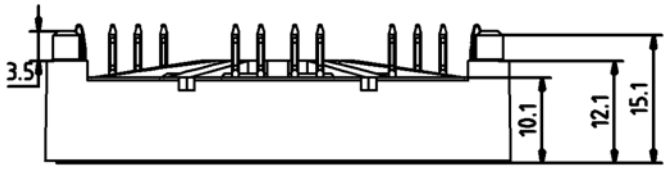
GAH-T

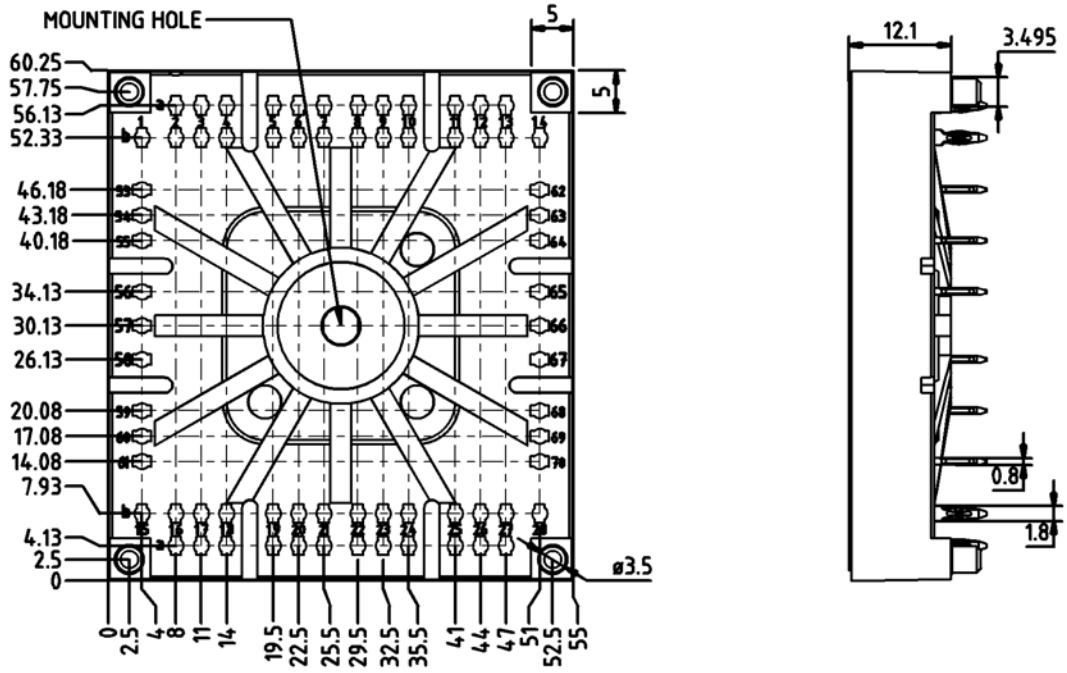
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Diode 2						
V_F	I_F = 150 A	T_j = 25 °C		2.17	2.49	V
	chiplevel	T_j = 150 °C		2.11	2.42	V
V_{F0}	chiplevel	T_j = 25 °C		1.30	1.50	V
		T_j = 150 °C		0.90	1.10	V
r_F	chiplevel	T_j = 25 °C		5.8	6.6	mΩ
		T_j = 150 °C		8.1	8.8	mΩ
I_{RRM}	I_F = 150 A	T_j = 150 °C				A
Q_{rr}	V_{GE} = -15 V	T_j = 150 °C				µC
E_{rr}	V_{CC} = 600 V	T_j = 150 °C		10.3		mJ
$R_{th(j-s)}$	per Diode			0.42		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°C (R_{25}=1000Ω)		1670 ± 3%		Ω
R(T)	$R(T)=1000\Omega[1+A(T-25°C)+B(T-25°C)^2]$, $A = 7.635*10^{-3}$ °C^{-1}, $B = 1.731*10^{-5}$ °C^{-2}				

dimensions in mm
tolerance system: ISO 2768-m

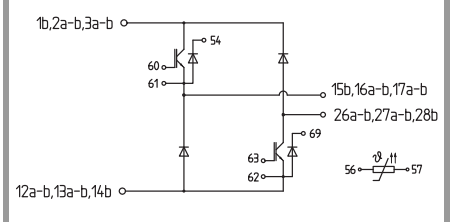




Suggested drilled hole diameter for terminal pins in the circuit board:
•minimum:1,575mm
•typical: 1,6mm
•maximum: 1,625mm

Suggested hole diameter for the mounting pins in the circuit board: 3,6mm

SEMITOP 4 Press-Fit



GAH-T

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

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