

SKM 600GA125D



SEMITRANS® 4

Ultra Fast IGBT Modules

SKM 600GA125D

Preliminary Data

Features

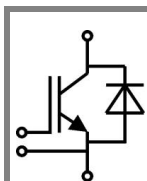
- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit self limiting to $6 \times I_C$
- Corresponds to standards: IEC 60721-3-3 (humidity) class 3K3/IEC 68T.1 climate 40/125/56

Typical Applications

- Resonant inverters upto 100 kHz
- Inductive heating
- Electronic welders at $f_{SW} > 20$ kHz

Remarks

- $I_{DC} \leq 500A$ limited by terminals
- Take care of over-voltage caused by stray inductances.



GA

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	580	A
		$T_{case} = 80^\circ\text{C}$	400	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	800		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600\text{V}; V_{GE} \leq 20\text{V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{V}$	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	500	A
		$T_{case} = 80^\circ\text{C}$	350	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	800		A
I_{FSM}	$t_p = 10\text{ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	3600	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40 ... + 150 (125)		$^\circ\text{C}$
T_{stg}		125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 16\text{mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{V}, V_{CE} = V_{CES}$		0,15	0,45	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1,5	1,75	V
		$T_j = 125^\circ\text{C}$	1,7		V
r_{CE}	$V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}$	4,5	5,3	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	6		$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 400\text{A}, V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	3,3	3,85	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	4		V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{V}$	$f = 1\text{MHz}$	36		nF
C_{oes}			3,8		nF
C_{res}			3,5		nF
Q_G	$V_{GE} = -8\text{V} - +20\text{V}$	4400		nC	
R_{Gint}	$T_j = ^\circ\text{C}$	1,25		Ω	
$t_{d(on)}$	$R_{Gon} = 2,5\ \Omega$	$V_{CC} = 600\text{V}$ $I_{Cnom} = 400\text{A}$	80		ns
t_r			70		ns
E_{on}	$R_{Goff} = 2,5\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$	30		mJ
$t_{d(off)}$			570		ns
t_f			60		ns
E_{off}					mJ
$R_{th(j-c)}$	per IGBT			0,041	K/W



SEMITRANS® 4

Ultra Fast IGBT Modules

SKM 600GA125D

Preliminary Data

Features

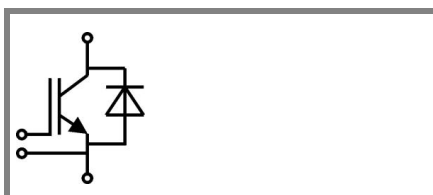
- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit self limiting to $6 \times I_c$
- Corresponds to standards: IEC 60721-3-3 (humidity) class 3K3/IEC 68T.1 climate 40/125/56

Typical Applications

- Resonant inverters upto 100 kHz
- Inductive heating
- Electronic welders at $f_{SW} > 20$ kHz

Remarks

- $I_{DC} \leq 500A$ limited by terminals
- Take care of over-voltage caused by stray inductances.



GA

Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400 A; V_{GE} = 0 V$		2	2,5	V
	$T_j = 25 ^\circ C_{chiplev.}$				V
	$T_j = 125 ^\circ C_{chiplev.}$		1,8		V
V_{F0}			1,1	1,2	V
	$T_j = 25 ^\circ C$				V
	$T_j = 125 ^\circ C$				V
r_F			2,3	3,3	mΩ
	$T_j = 25 ^\circ C$				mΩ
	$T_j = 125 ^\circ C$				mΩ
I_{RRM}	$I_{Fnom} = 400 A$		460		A
Q_{rr}			65		μC
E_{rr}	$V_{GE} = 0 V; V_{CC} = 600 V$				mJ
$R_{th(j-c)D}$	per diode			0,09	K/W
Module					
L_{CE}			15	20	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = ^\circ C$	0,18		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink		3	5	Nm
M_t	to terminals		2,5 (1,1)	5 (2)	Nm
w				330	g

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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

SKM 600GA125D



SEMITRANS® 4

Ultra Fast IGBT Modules

SKM 600GA125D

Preliminary Data

Features

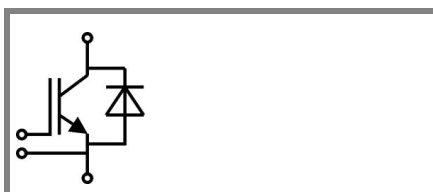
- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit self limiting to $6 \times I_c$
- Corresponds to standards: IEC 60721-3-3 (humidity) class 3K3/IEC 68T.1 climate 40/125/56

Typical Applications

- Resonant inverters upto 100 kHz
- Inductive heating
- Electronic welders at $f_{SW} > 20$ kHz

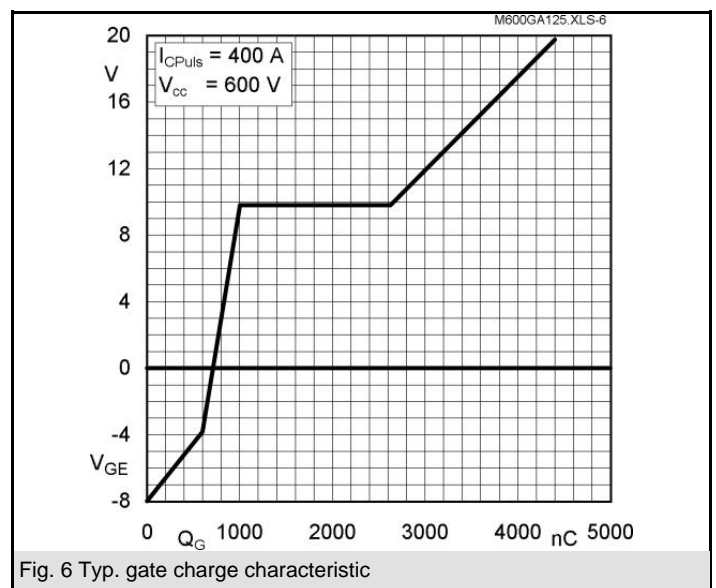
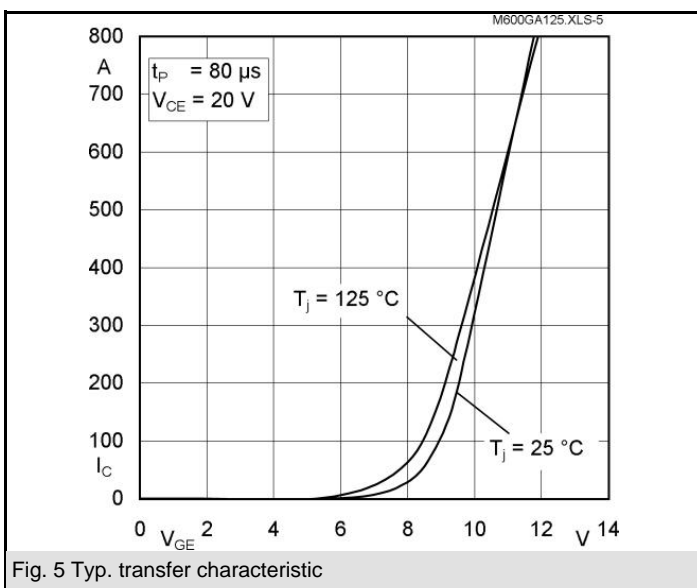
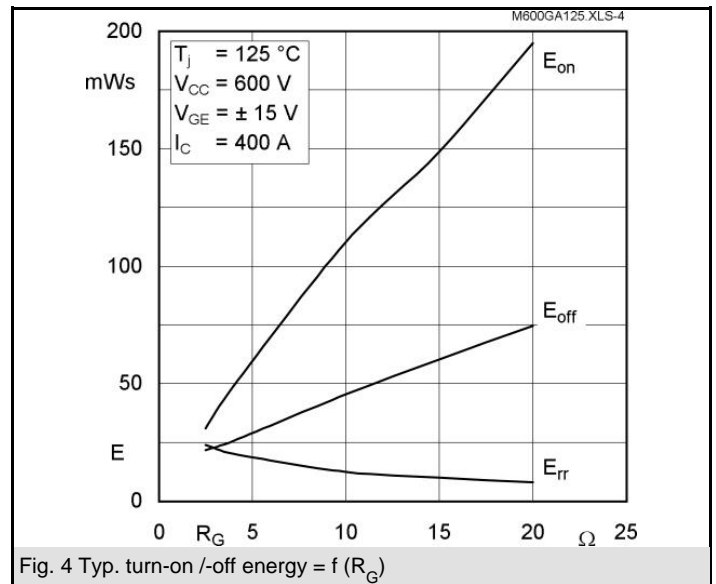
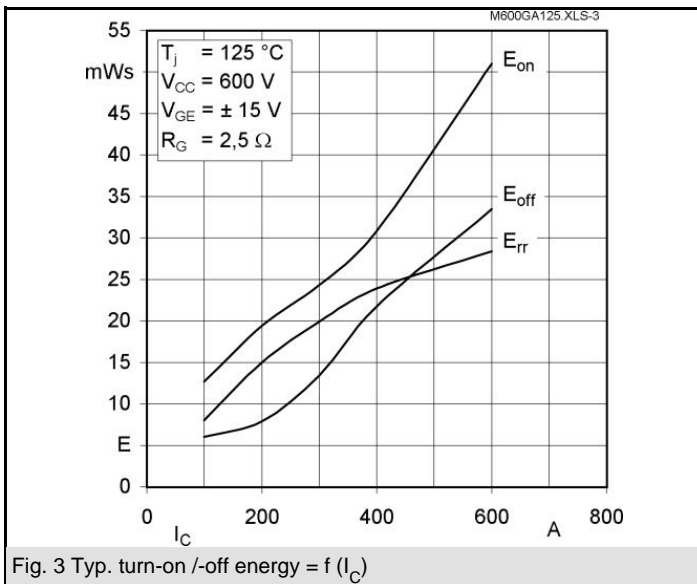
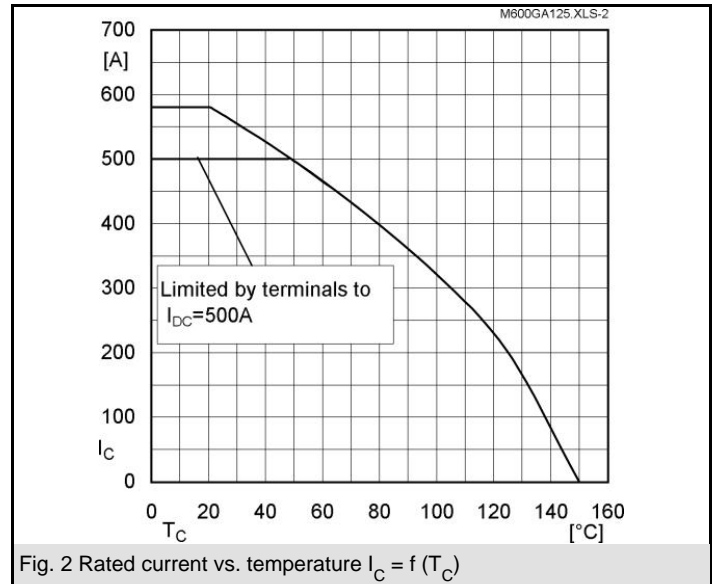
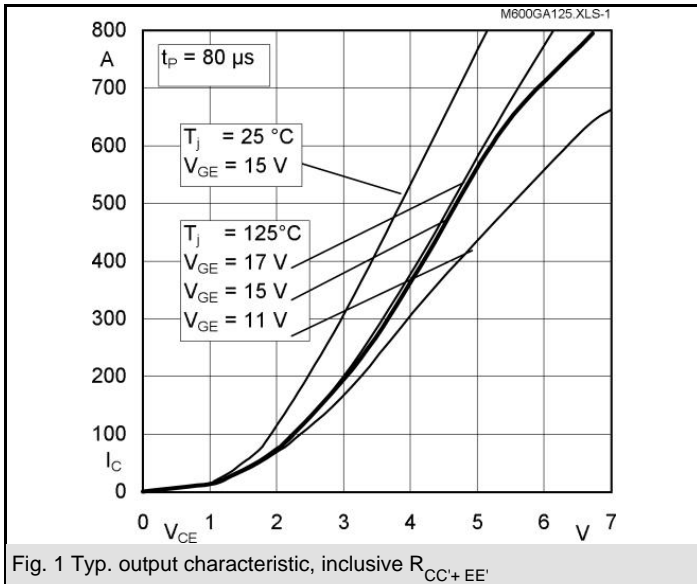
Remarks

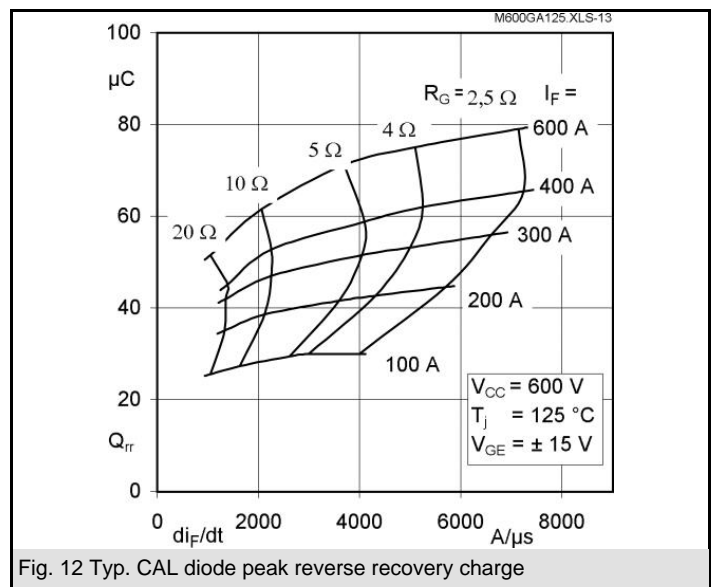
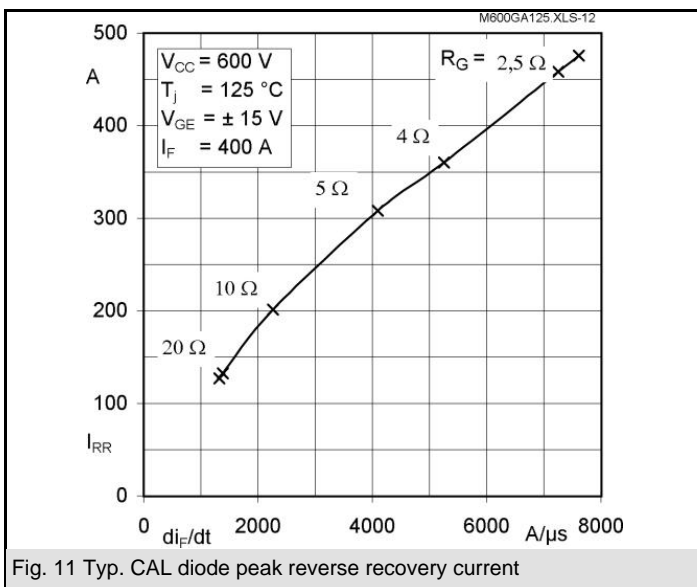
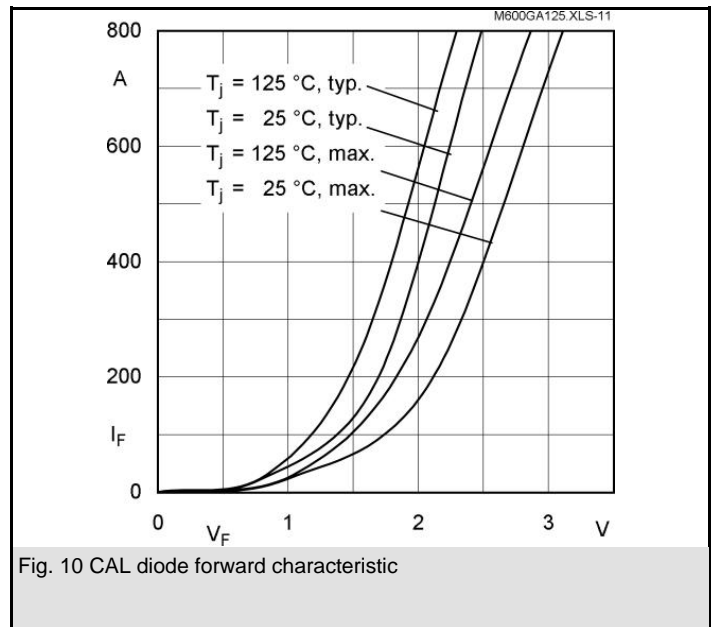
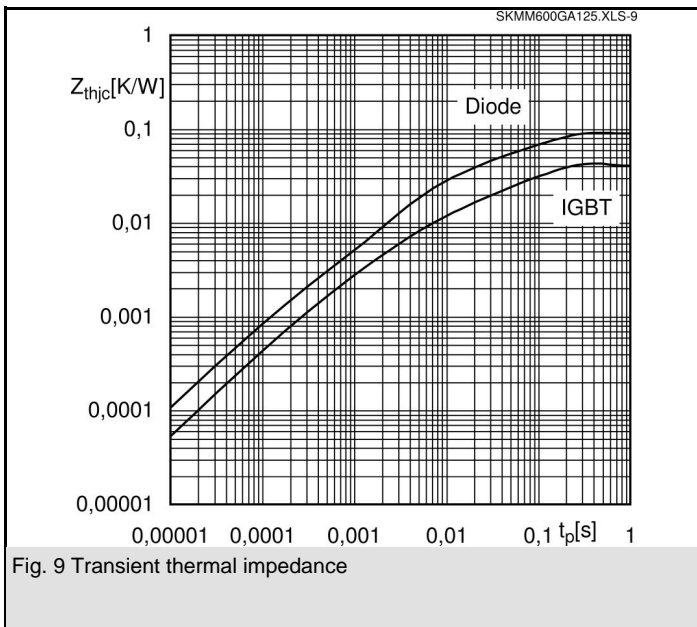
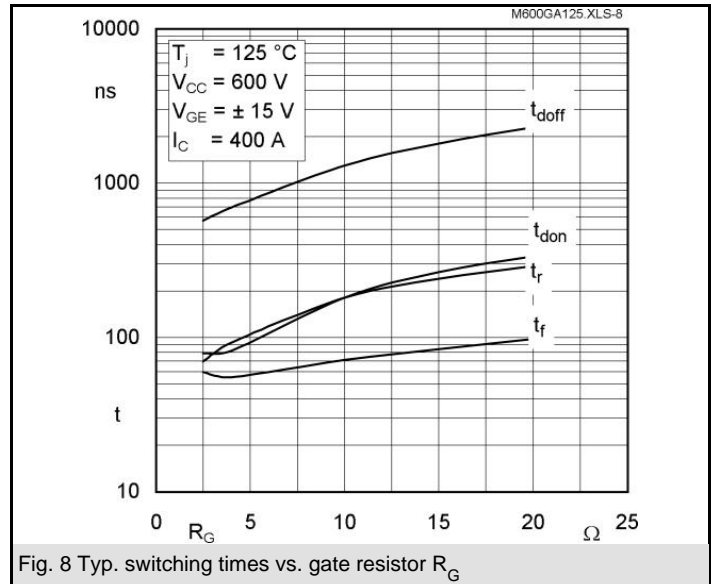
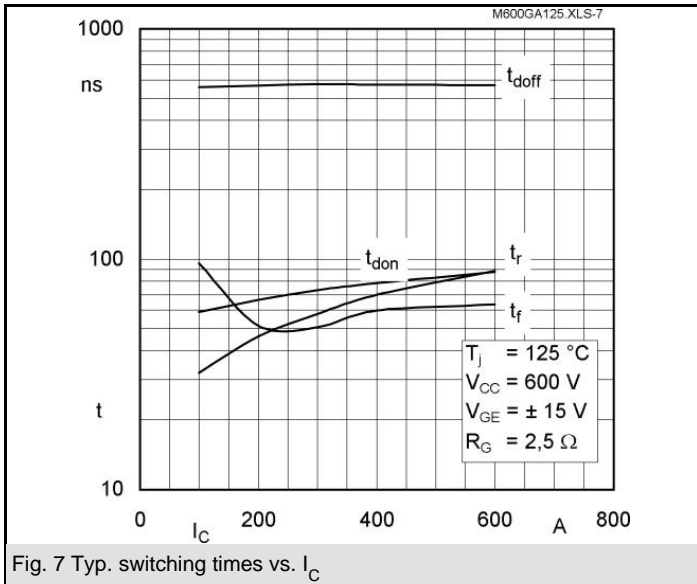
- $I_{DC} \leq 500A$ limited by terminals
- Take care of over-voltage caused by stray inductances.



GA

Z_{th}		Values	Units
Symbol	Conditions		
$Z_{th(j-c)I}$			
$R_{\theta j-c}$	$i = 1$	29	mk/W
$R_{\theta j-c}$	$i = 2$	9	mk/W
$R_{\theta j-c}$	$i = 3$	2,6	mk/W
$R_{\theta j-c}$	$i = 4$	0,4	mk/W
$\tau_{\theta j-c}$	$i = 1$	0,1043	s
$\tau_{\theta j-c}$	$i = 2$	0,009	s
$\tau_{\theta j-c}$	$i = 3$	0,001	s
$\tau_{\theta j-c}$	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_{\theta j-c}$	$i = 1$	62	mk/W
$R_{\theta j-c}$	$i = 2$	23	mk/W
$R_{\theta j-c}$	$i = 3$	4,2	mk/W
$R_{\theta j-c}$	$i = 4$	0,8	mk/W
$\tau_{\theta j-c}$	$i = 1$	0,0566	s
$\tau_{\theta j-c}$	$i = 2$	0,0166	s
$\tau_{\theta j-c}$	$i = 3$	0,0015	s
$\tau_{\theta j-c}$	$i = 4$	0,0002	s



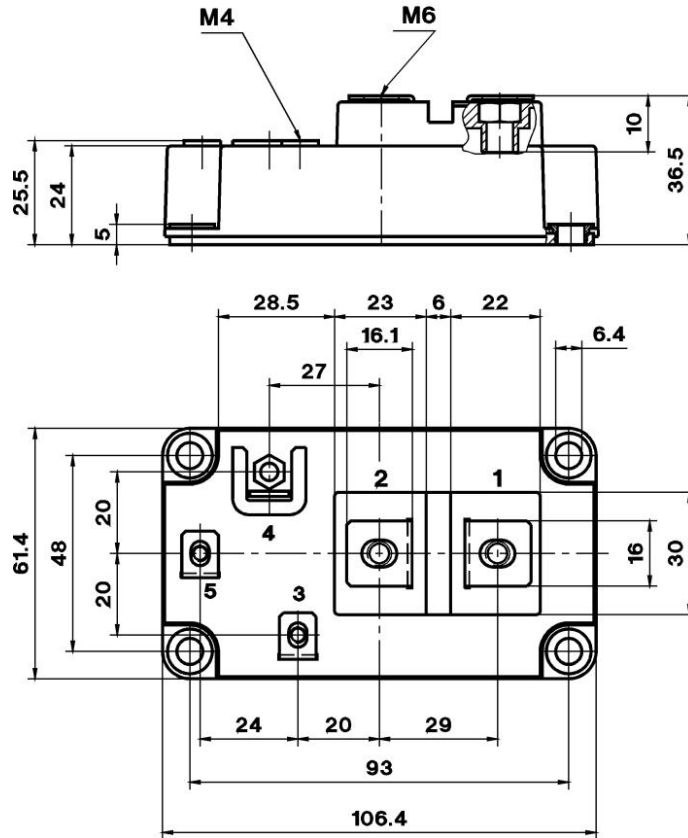


SKM 600GA125D

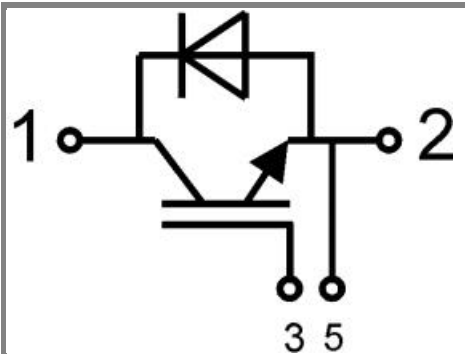
UL Recognized

CASED59

File 63 532



Case D 59



Case D59

GA