

# SKM 75GB063D



**SEMITRANS<sup>®</sup> 2**

## Superfast NPT-IGBT Modules

**SKM 75GB063D**

**SKM 75GAR063D**

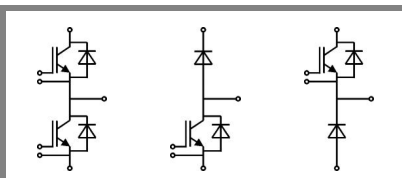
**SKM 75GAL063D**

### Features

- N channel, homogeneous Si-structure (NPT-Non punch-through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of  $V_{CEsat}$
- Very low  $C_{ies}$ ,  $C_{oes}$ ,  $C_{res}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DBC Direct Copper Bonding Technology without hard mould
- Large clearance (10 mm) and creepage distances (20 mm)

### Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also > 10kHz



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	600		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	100	A
		$T_{case} = 75^\circ\text{C}$	75	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	150		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 300\text{V}; V_{GE} \leq 20\text{V}; T_j = 125^\circ\text{C}$ $V_{CES} < 600\text{V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	75	A
		$T_{case} = 80^\circ\text{C}$	50	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	150		A
$I_{FSM}$	$t_p = 10\text{ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	440	A
<b>Freewheeling Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	100	A
		$T_c = 80^\circ\text{C}$	75	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	200		A
$I_{FSM}$	$t_p = 10\text{ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	720	A
<b>Module</b>				
$I_{t(RMS)}$		200		A
$T_{vj}$		- 40 ... + 150		$^\circ\text{C}$
$T_{stg}$		- 40 ... + 125		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500		V

Characteristics		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1\text{mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0\text{V}, V_{CE} = V_{CES}$		0,1	0,3	mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1,05		V
		$T_j = 125^\circ\text{C}$	1		V
$r_{CE}$	$V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}$	14		m $\Omega$
		$T_j = 125^\circ\text{C}$	18,7		m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 75\text{A}, V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2,1	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,4	2,8	V
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$	$f = 1\text{MHz}$	4,2		nF
$C_{oes}$			0,5		nF
$C_{res}$			0,3		nF
$Q_G$	$V_{GE} = 0\text{V} \dots +15\text{V}$	180		nC	
$R_{Gint}$	$T_j = ^\circ\text{C}$	0		$\Omega$	
$t_{d(on)}$	$R_{Gon} = 15\ \Omega$	$V_{CC} = 300\text{V}$ $I_{Cnom} = 75\text{A}$	60		ns
$t_r$			50		ns
$E_{on}$	$R_{Goff} = 15\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$	3		mJ
$t_{d(off)}$			350		ns
$t_f$			35		ns
$E_{off}$	per IGBT		2,5		mJ
$R_{th(j-c)}$			0,35		K/W



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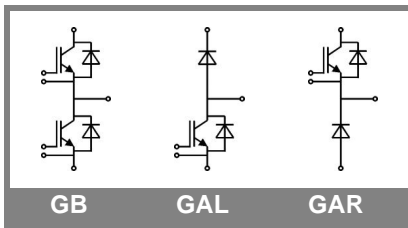
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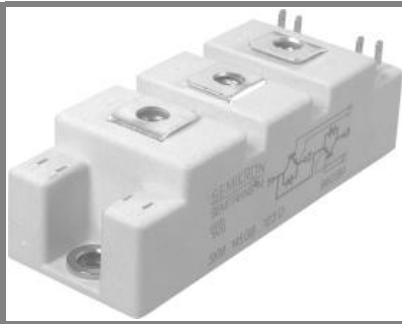
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,55		V
$V_{F0}$		$T_j = 125 \text{ }^\circ\text{C}$		0,9	V
$r_F$		$T_j = 125 \text{ }^\circ\text{C}$	10	13,3	m $\Omega$
$I_{RRM}$	$I_{Fnom} = 75 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	30		A
$Q_{rr}$	$di/dt = 800 \text{ A}/\mu\text{s}$		3,7		$\mu\text{C}$
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,72	K/W
<b>Freewheeling Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,55		V
$V_{F0}$		$T_j = 125 \text{ }^\circ\text{C}$		0,9	V
$r_F$		$T_j = 125 \text{ }^\circ\text{C}$	8	10	V
$I_{RRM}$	$I_{Fnom} = 100 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	44		A
$Q_{rr}$	$di/dt = 0 \text{ A}/\mu\text{s}$		6		$\mu\text{C}$
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,6	K/W
<b>Module</b>					
$L_{CE}$				30	nH
$R_{CC+EE}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,75		m $\Omega$
		$T_{case} = 125 \text{ }^\circ\text{C}$	1		m $\Omega$
$R_{th(c-s)}$	per module			0,05	K/W
$M_s$	to heat sink M6		3	5	Nm
$M_t$	to terminals M5		2,5	5	Nm
w				160	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.

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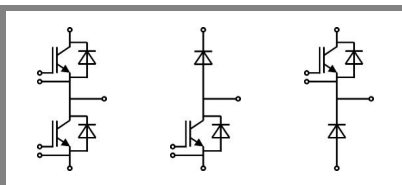
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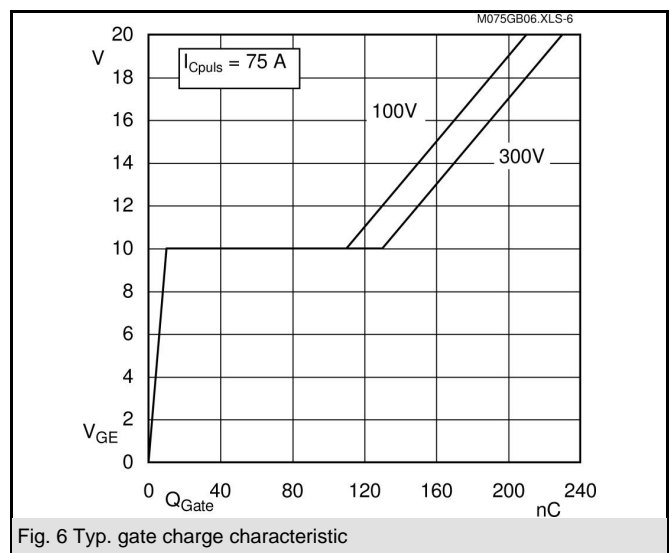
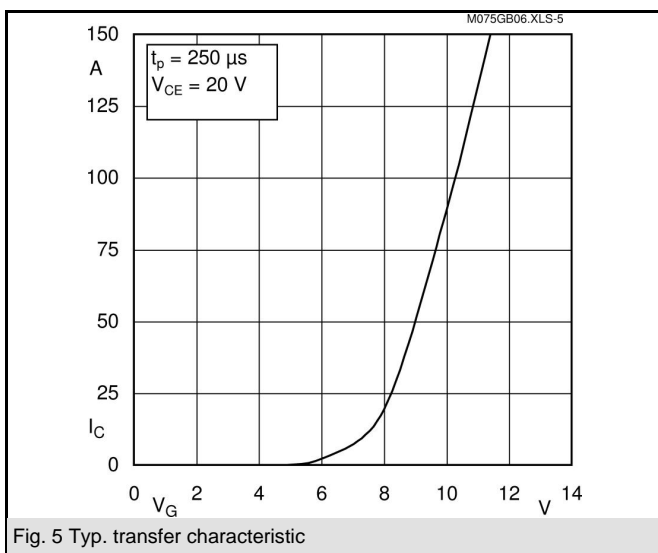
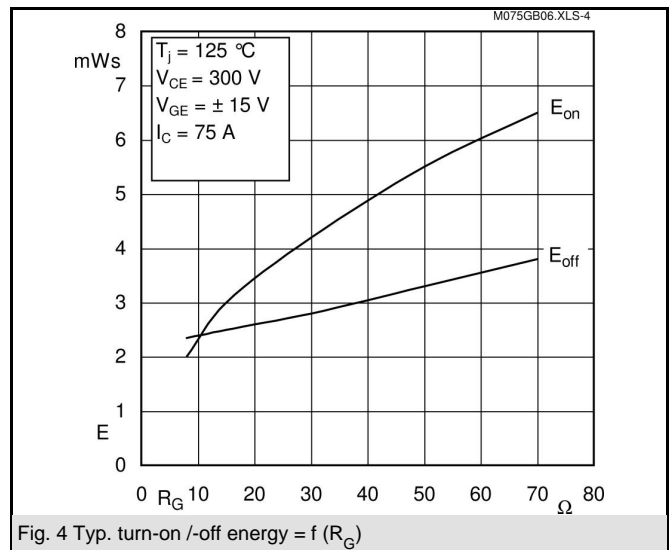
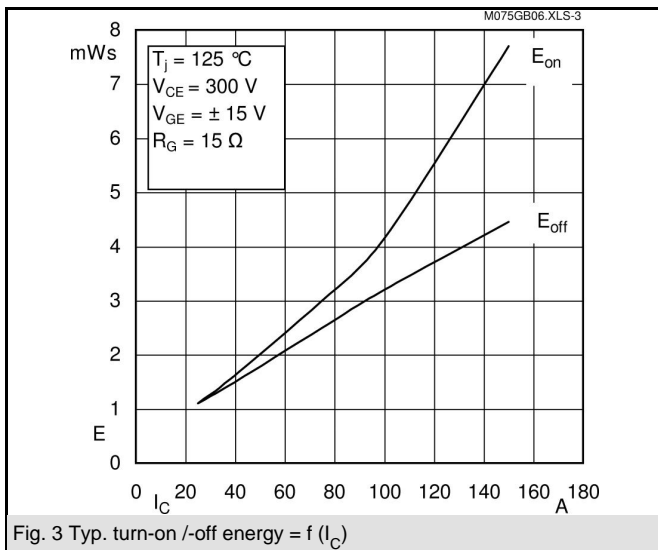
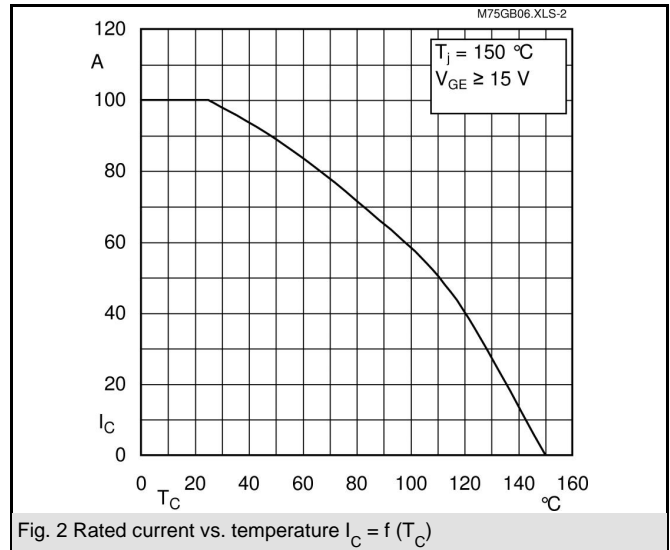
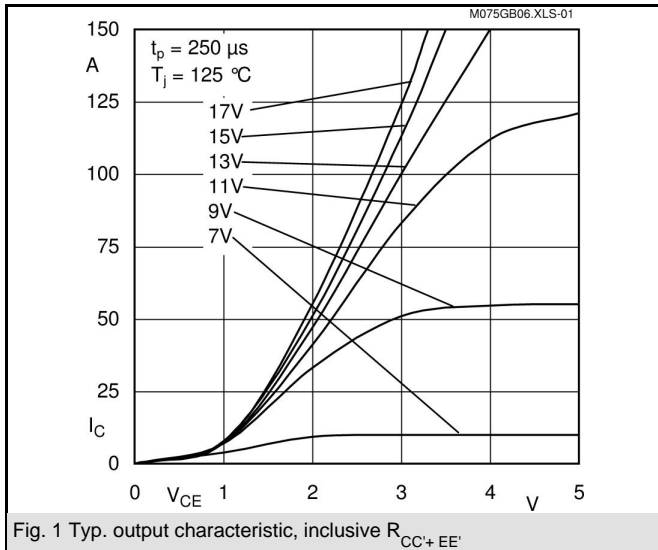
$Z_{th}$		Values	Units
Symbol	Conditions		
$Z_{th(j-c)}$			
$R_{\theta}$	$i = 1$	250	mk/W
$R_{\theta}$	$i = 2$	70	mk/W
$R_{\theta}$	$i = 3$	25	mk/W
$R_{\theta}$	$i = 4$	5	mk/W
$\tau_{\theta}$	$i = 1$	0,0874	s
$\tau_{\theta}$	$i = 2$	0,0078	s
$\tau_{\theta}$	$i = 3$	0,0017	s
$\tau_{\theta}$	$i = 4$	0,0001	s
$Z_{th(j-c)D}$			
$R_{\theta}$	$i = 1$	550	mk/W
$R_{\theta}$	$i = 2$	340	mk/W
$R_{\theta}$	$i = 3$	92	mk/W
$R_{\theta}$	$i = 4$	18	mk/W
$\tau_{\theta}$	$i = 1$	0,0761	s
$\tau_{\theta}$	$i = 2$	0,0045	s
$\tau_{\theta}$	$i = 3$	0,011	s
$\tau_{\theta}$	$i = 4$	0,0002	s

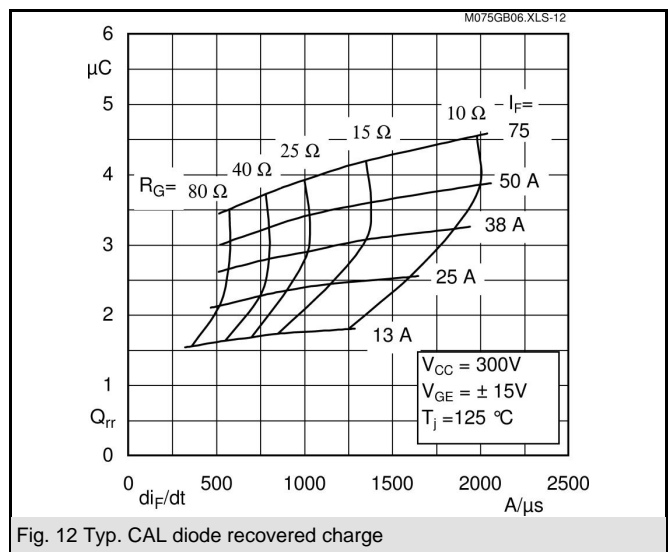
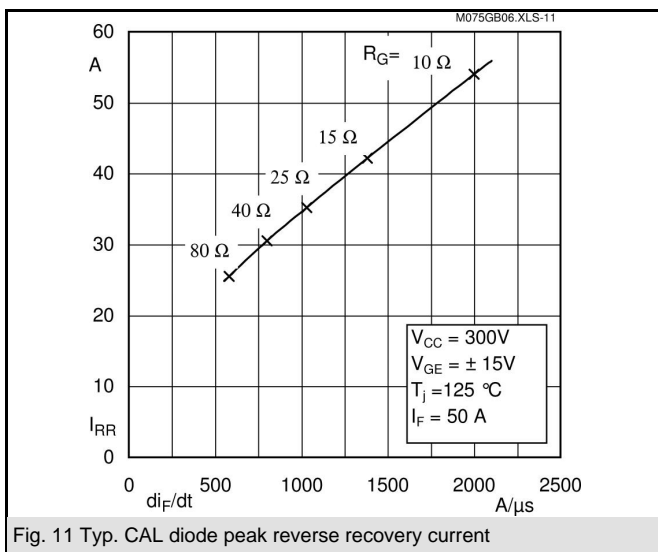
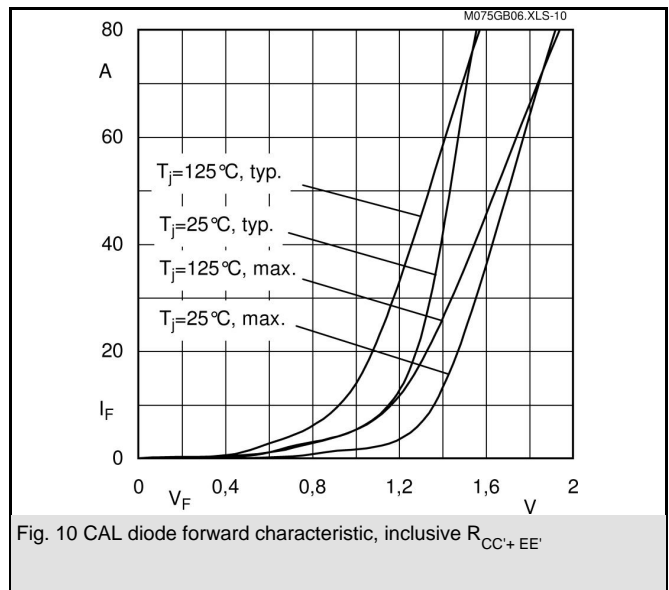
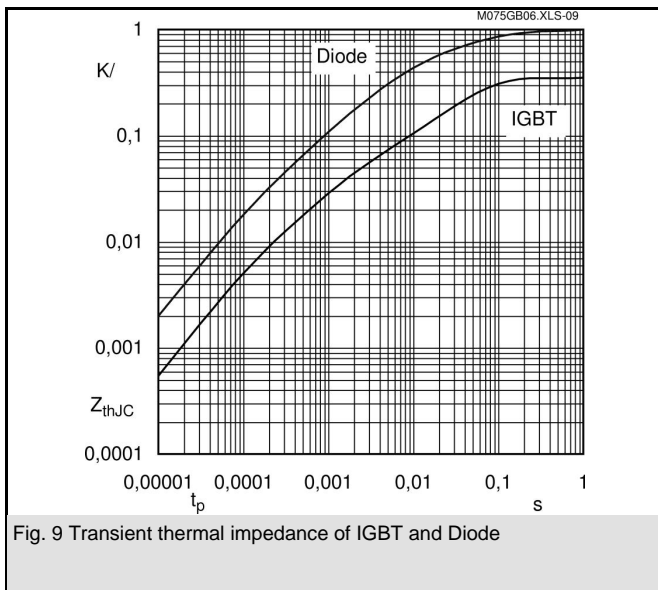
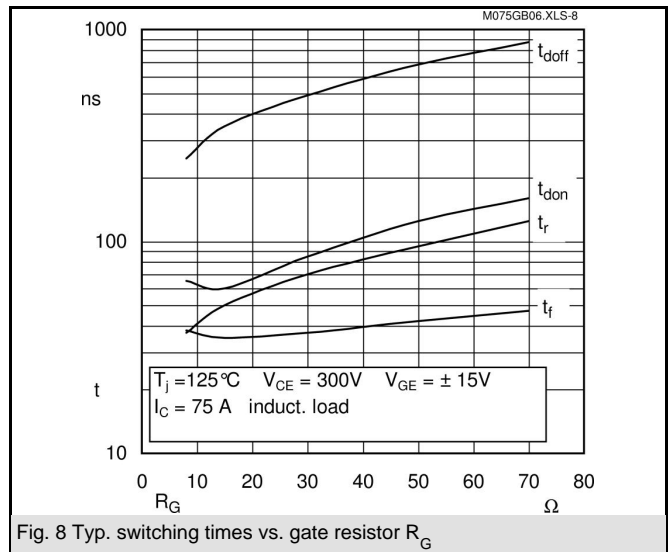
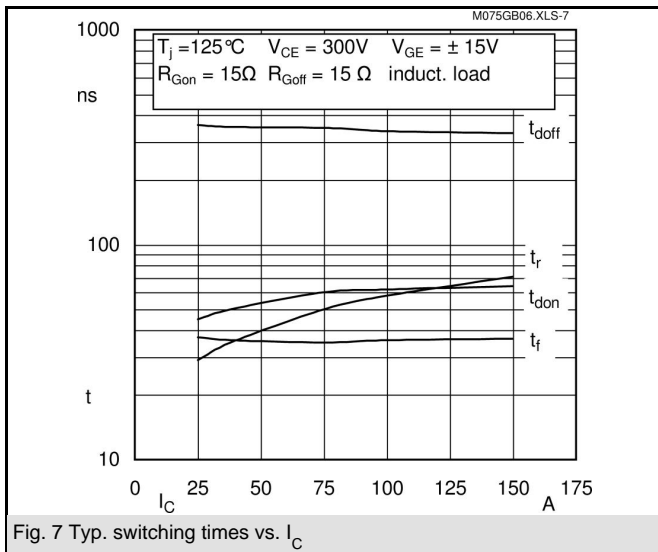


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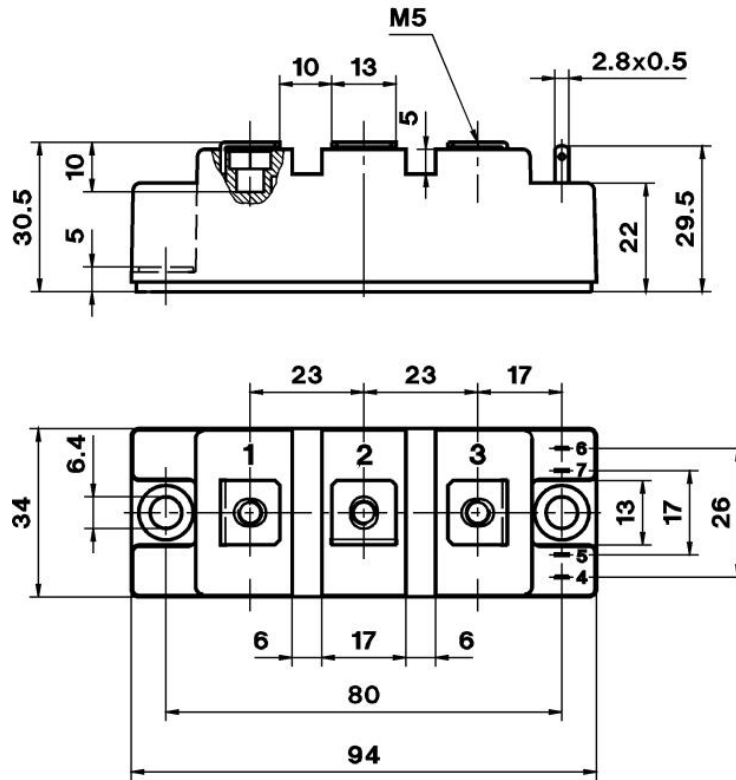


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UL recognized

CASED61

File no. E 63 532



Case D 61

