

SKM 300GB063D



SEMITRANS® 3

Superfast IGBT Modules

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SKM 300GAR063D

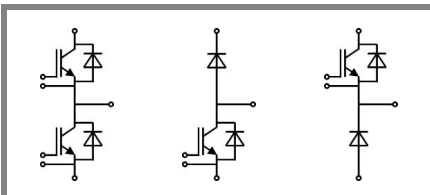
SKM 300GAL063D

Features

- 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}
- 50 % less turn off losses
- 30 % less short circuit current
- Very low C_{ies} , C_{oes} , C_{res}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology without hard mould
- Large clearance (13 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- AC inverter servo drives
- UPS uninterruptable power supplies
- Welding inverters



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Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	600		V
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	400	A
		$T_{case} = 70\text{ }^\circ\text{C}$	300	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	600		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 300\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 600\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	250	A
		$T_{case} = 80\text{ }^\circ\text{C}$	170	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	600		A
I_{FSM}	$t_p = 10\text{ ms}$; sin.	$T_j = 150\text{ }^\circ\text{C}$	1600	A
Freewheeling Diode				
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_c = 25\text{ }^\circ\text{C}$	400	A
		$T_c = 80\text{ }^\circ\text{C}$	270	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	800		A
I_{FSM}	$t_p = 10\text{ ms}$; sin.	$T_j = 150\text{ }^\circ\text{C}$	2800	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40 ... + 150		$^\circ\text{C}$
T_{stg}		- 40 ... + 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6\text{ mA}$	4,5	5,5	6,5	V	
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$		$T_j = 25\text{ }^\circ\text{C}$ 0,2	0,6	mA	
V_{CE0}			$T_j = 25\text{ }^\circ\text{C}$	1,05	V	
			$T_j = 125\text{ }^\circ\text{C}$	1	V	
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}$	3,2	$\text{m}\Omega$	
			$T_j = 125\text{ }^\circ\text{C}$	4,7	$\text{m}\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 300\text{ A}$, $V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,5	V
			$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,4	2,8	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		17	nF	
C_{oes}				2	nF	
C_{res}				1,2	nF	
Q_G	$V_{GE} = 0\text{ V} \dots 15\text{ V}$		720		nC	
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		0		Ω	
$t_{d(on)}$	$R_{Gon} = 6\text{ }\Omega$	$V_{CC} = 300\text{ V}$ $I_C = 300\text{ A}$		160	ns	
t_r				80	ns	
E_{on}	$R_{Goff} = 6\text{ }\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$		14	mJ	
$t_{d(off)}$				550	ns	
t_f				50	ns	
E_{off}				13	mJ	
$R_{th(j-c)}$	per IGBT			0,09	K/W	



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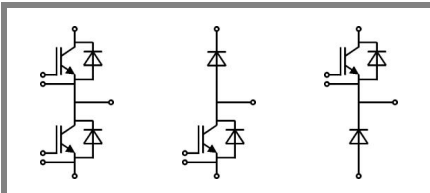
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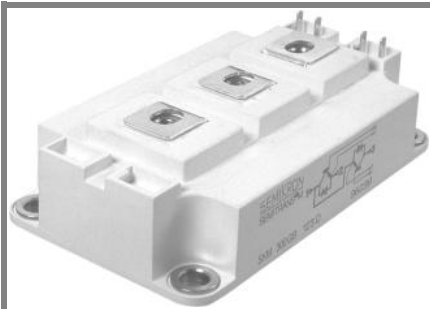
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,65	2	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	1,65	2	V
V_{F0}		$T_j = 125\text{ }^\circ\text{C}$		0,9	V
r_F		$T_j = 125\text{ }^\circ\text{C}$	3	3,7	mΩ
I_{RRM}	$I_F = 300\text{ A}$	$T_j = 125\text{ }^\circ\text{C}$	120		A
Q_{rr}			18		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 300\text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,25	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,65	2	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	1,65	2	V
V_{F0}		$T_j = 125\text{ }^\circ\text{C}$		0,9	V
r_F		$T_j = 125\text{ }^\circ\text{C}$		3	V
I_{RRM}	$I_F = 300\text{ A}$	$T_j = 125\text{ }^\circ\text{C}$	130		A
Q_{rr}			23		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 300\text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,15	K/W
Module					
L_{CE}			15	20	nH
$R_{CC+EE'}$	res., terminal-chip	$T_{case} = 25\text{ }^\circ\text{C}$	0,35		mΩ
		$T_{case} = 125\text{ }^\circ\text{C}$	0,5		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M6		2,5	5	Nm
w				325	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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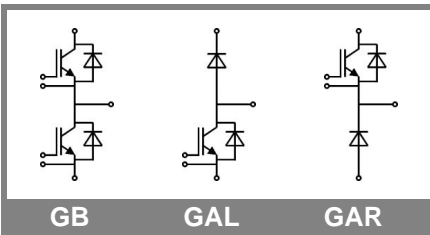
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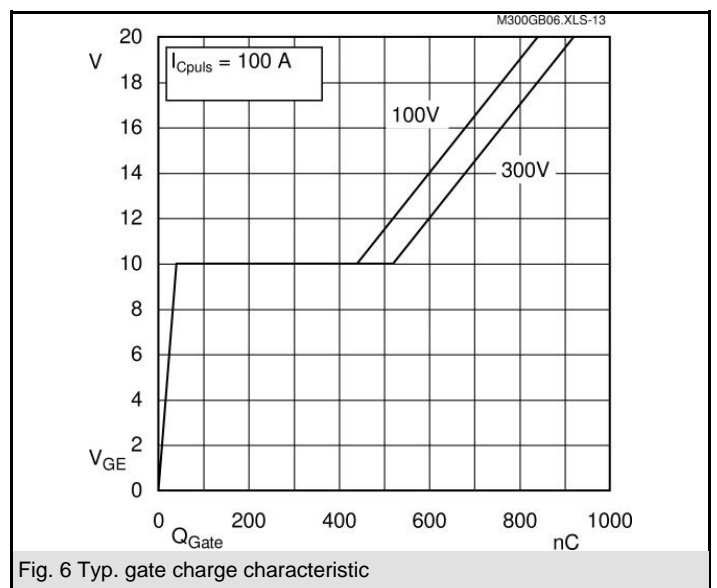
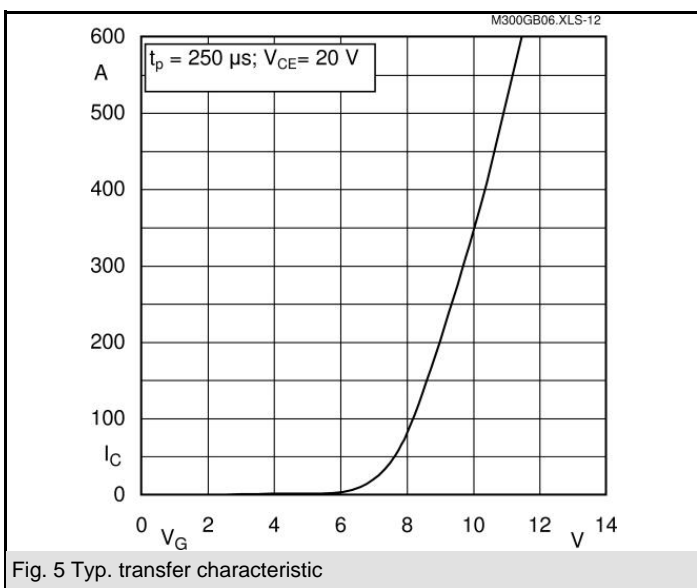
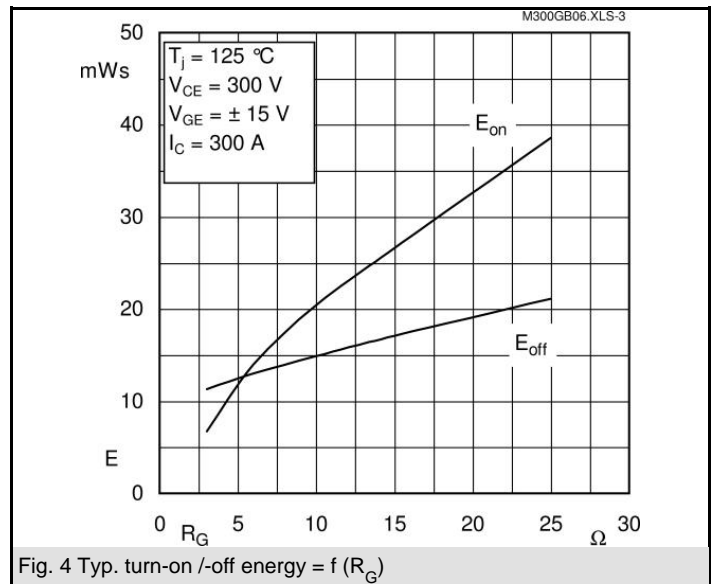
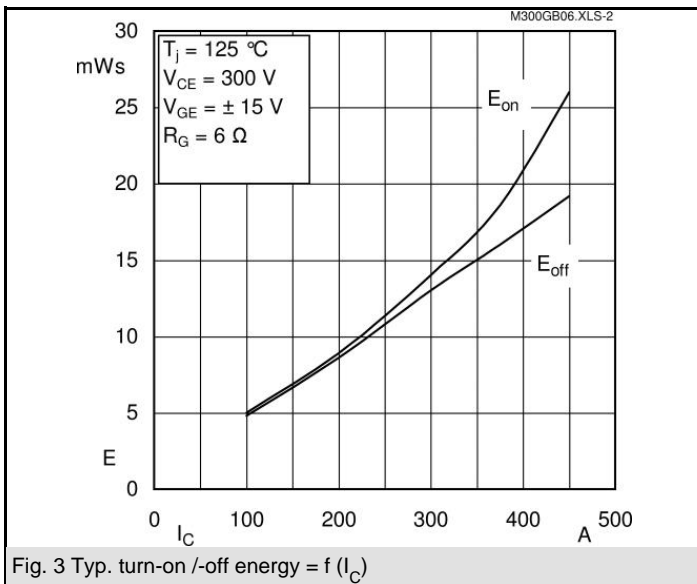
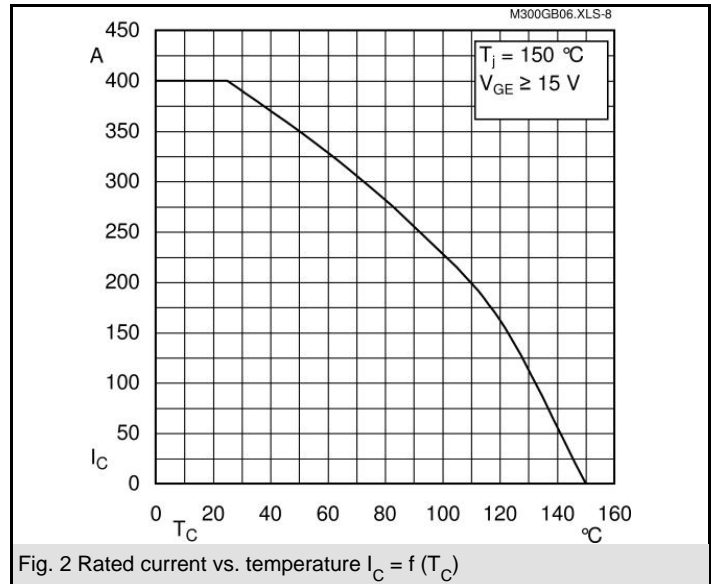
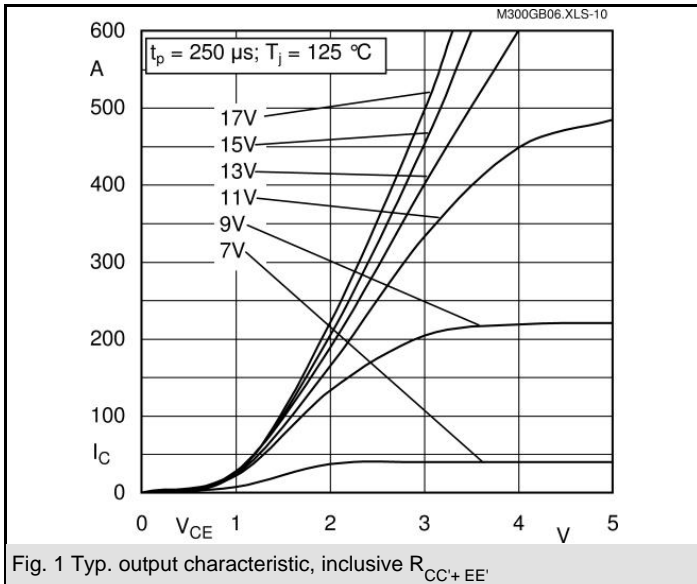
Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		i = 1	65	mk/W
$R_{\theta j-c}$		i = 2	19	mk/W
$R_{\theta j-c}$		i = 3	4,7	mk/W
$R_{\theta j-c}$		i = 4	1,3	mk/W
$\tau_{th(j-c)}$		i = 1	0,0518	s
$\tau_{th(j-c)}$		i = 2	0,0241	s
$\tau_{th(j-c)}$		i = 3	0,0021	s
$\tau_{th(j-c)}$		i = 4	0,0001	s
$Z_{th(j-c)D}$				
$R_{\theta j-cD}$		i = 1	140	mk/W
$R_{\theta j-cD}$		i = 2	85	mk/W
$R_{\theta j-cD}$		i = 3	20,55	mk/W
$R_{\theta j-cD}$		i = 4	4,45	mk/W
$\tau_{th(j-c)D}$		i = 1	0,0613	s
$\tau_{th(j-c)D}$		i = 2	0,0041	s
$\tau_{th(j-c)D}$		i = 3	0,0045	s
$\tau_{th(j-c)D}$		i = 4	0,0003	s

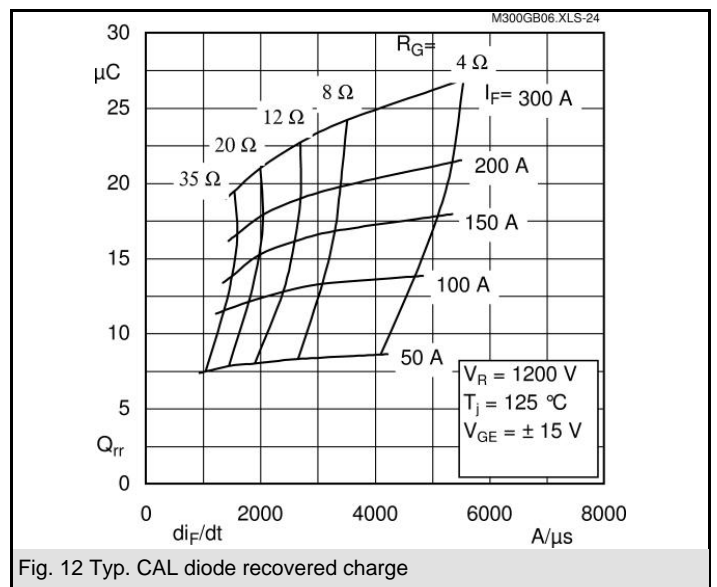
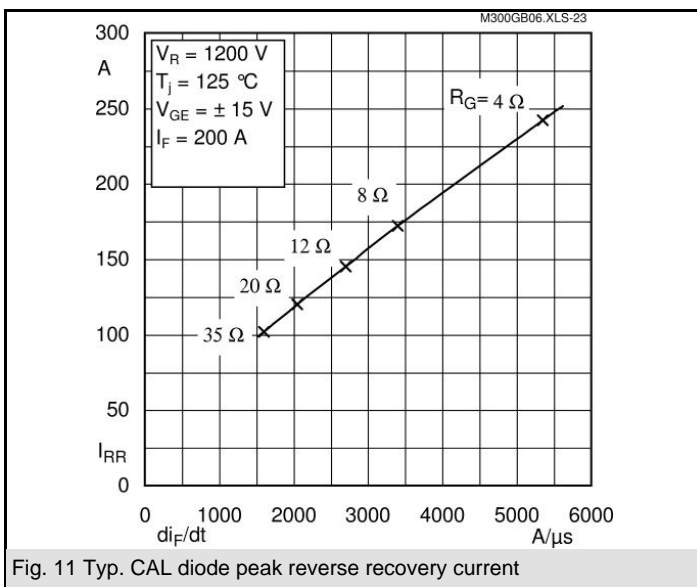
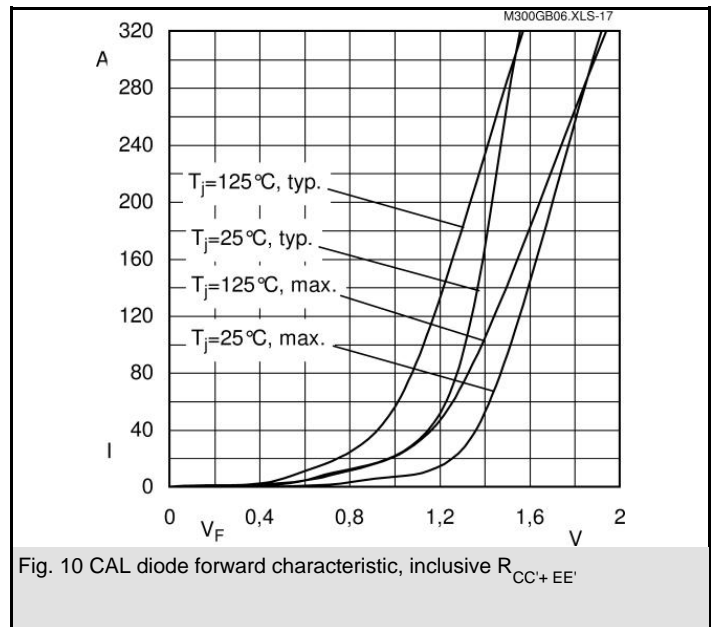
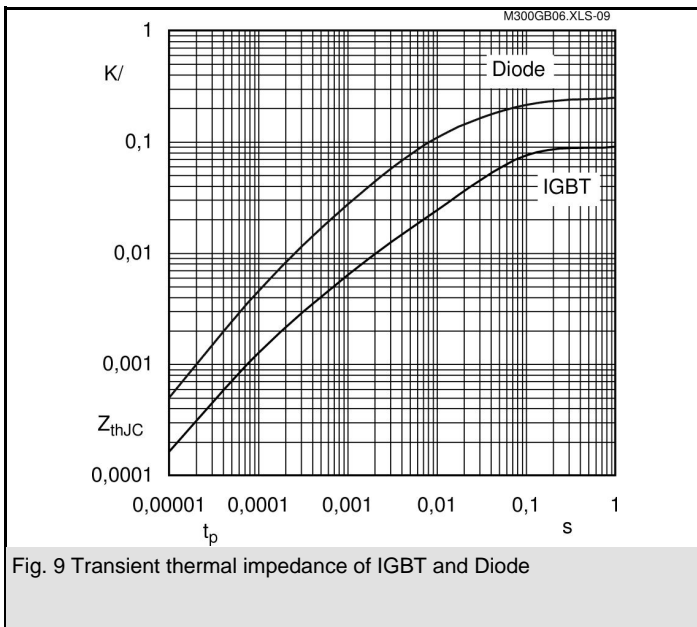
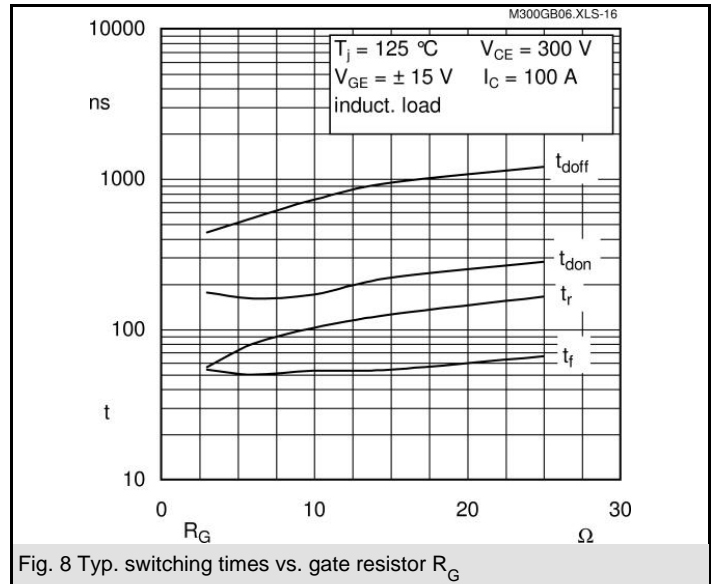
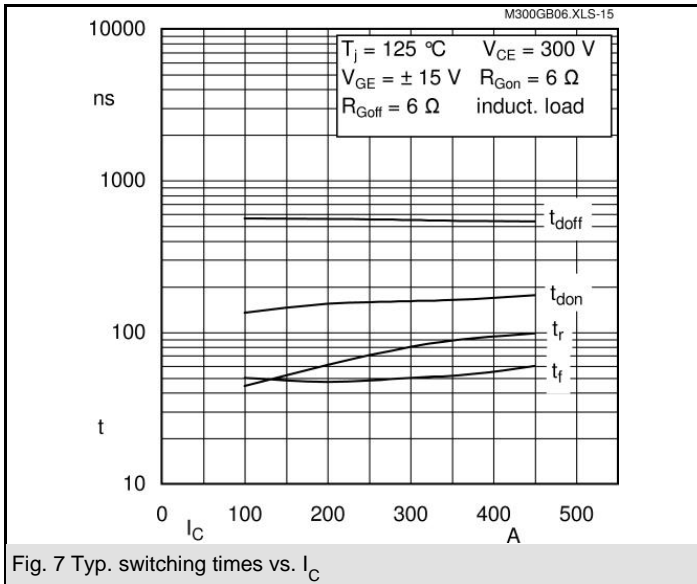


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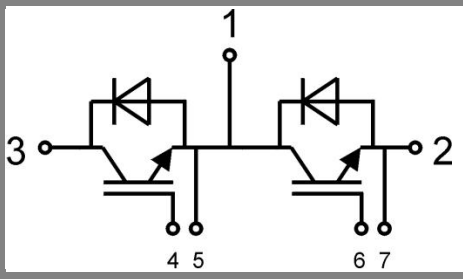
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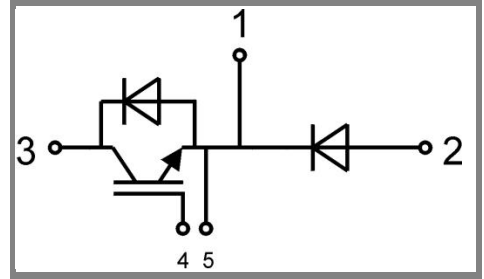
Case D 56



GB Case D 56



GAL Case D 57 (→ D 56)



GAR Case D 58 (→ D 56)