

# SKM 300GB063D



**SEMITRANS™ 3**

## Superfast IGBT Modules

SKM 300GB063D

SKM 300GAR063D

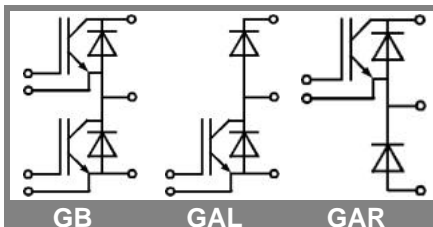
SKM 300GAL063D

### Features

- N channel, homogeneous Silicon 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  $V_{CEsat}$
- 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)

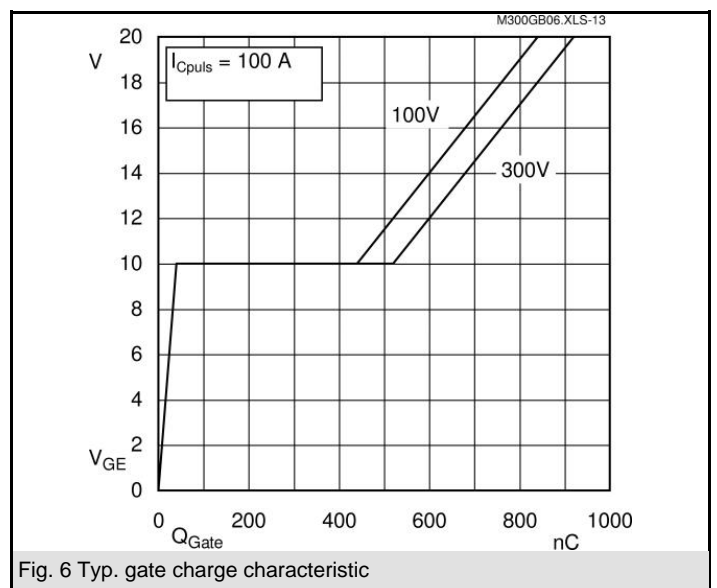
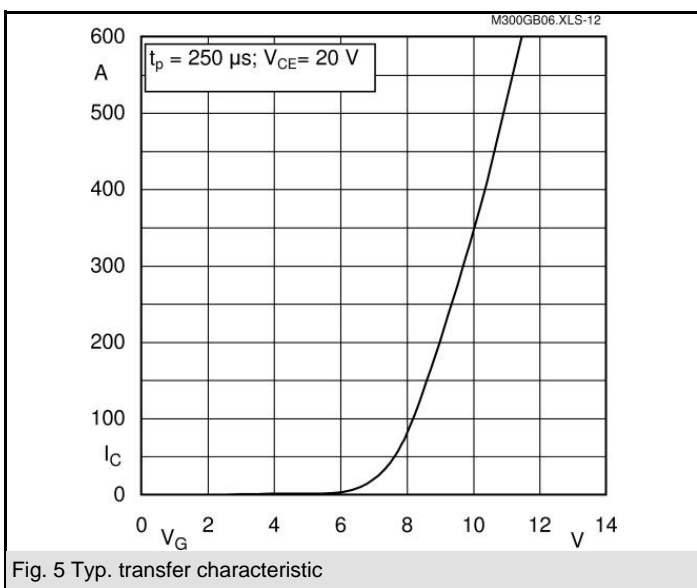
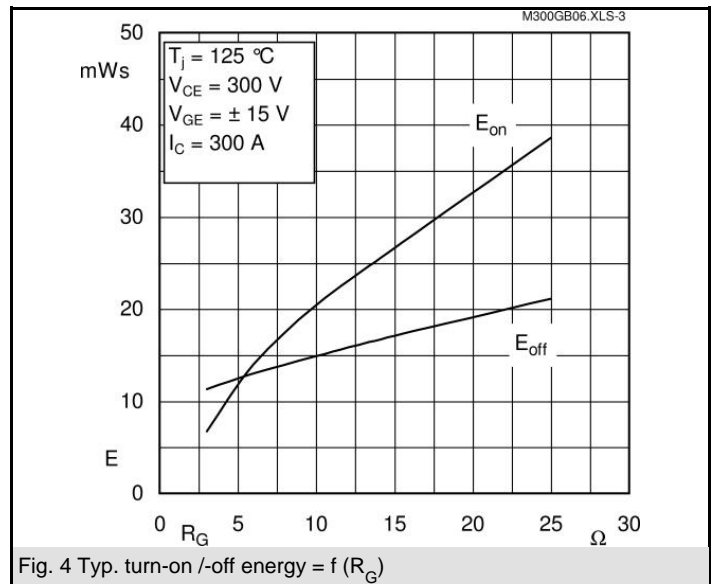
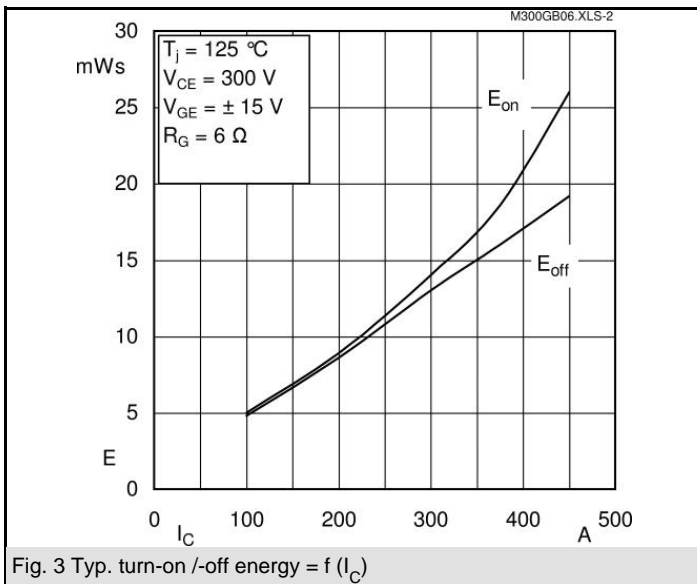
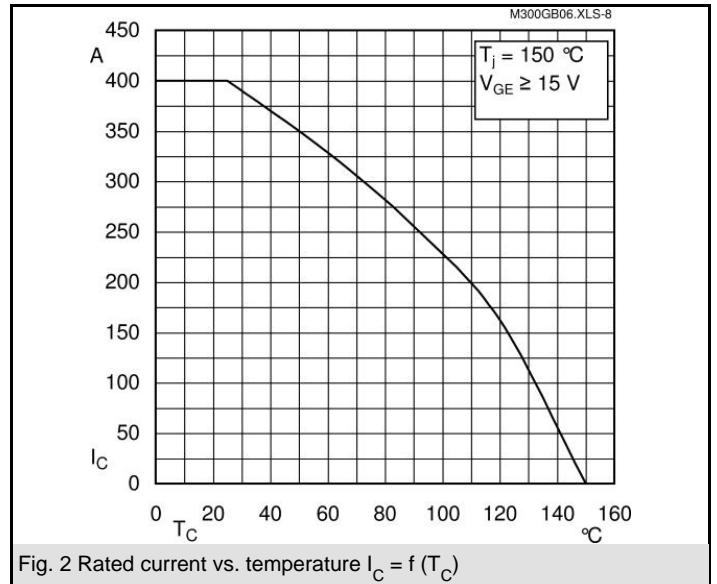
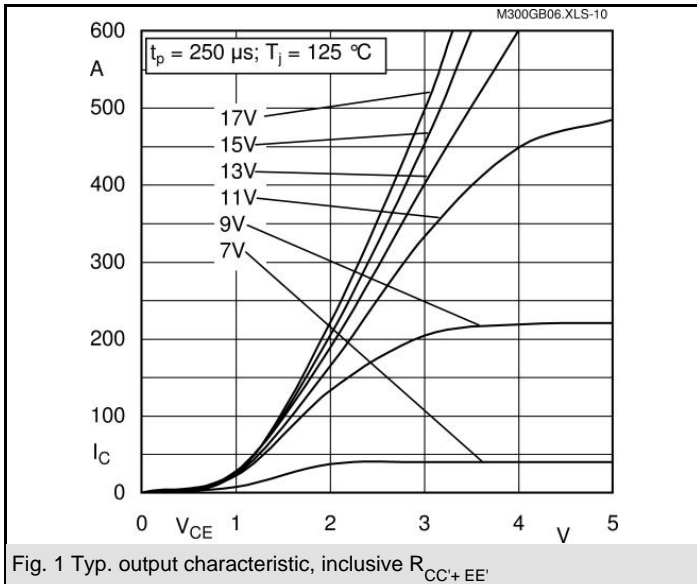
### Typical Applications

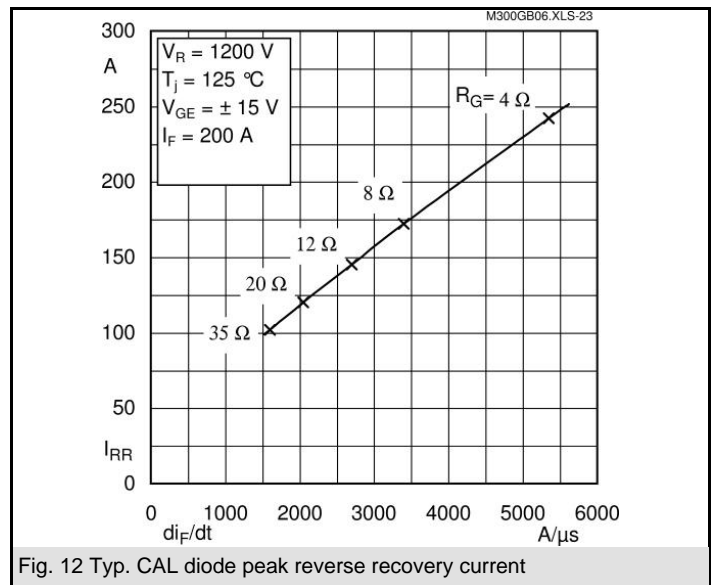
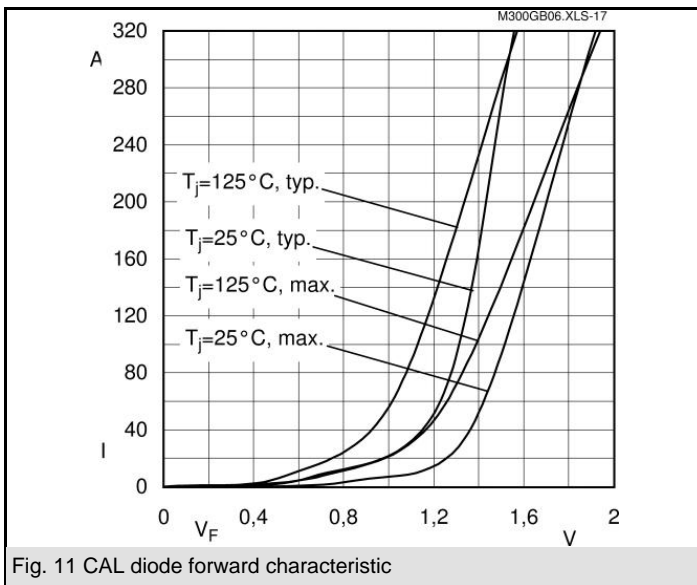
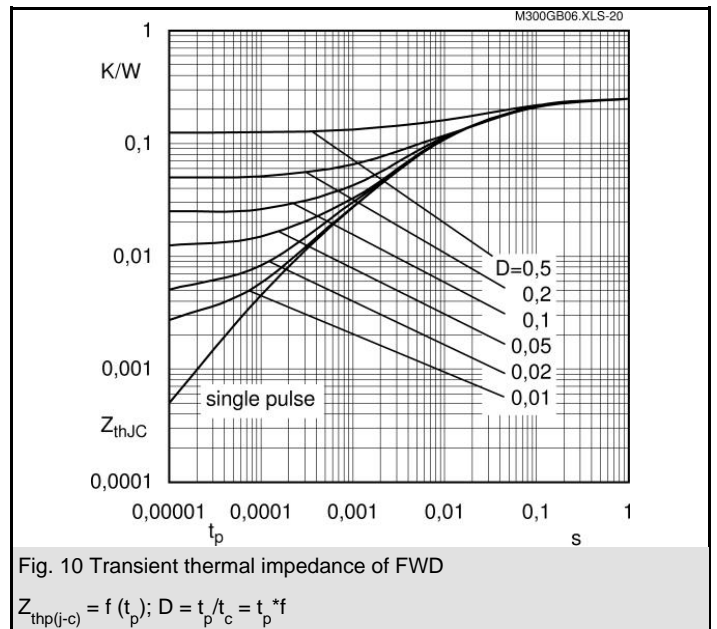
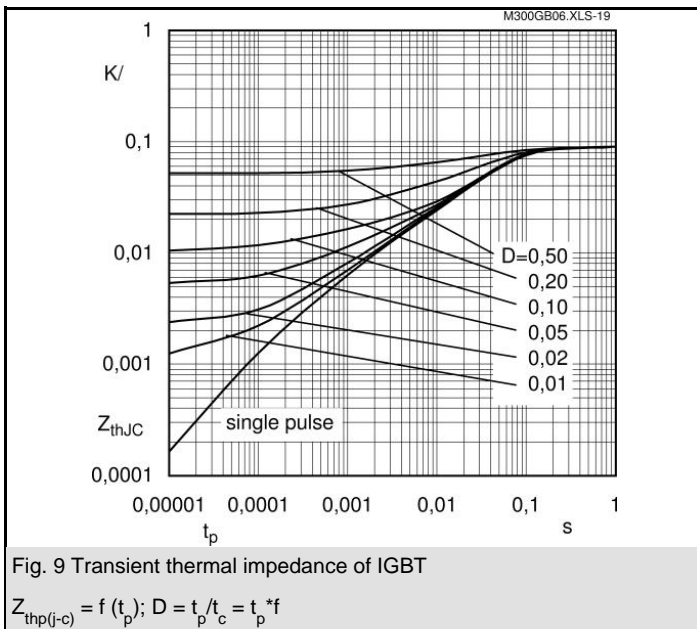
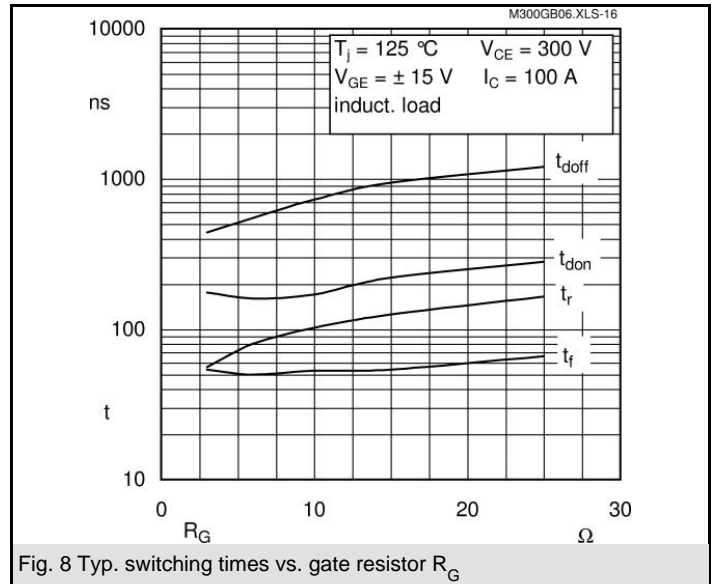
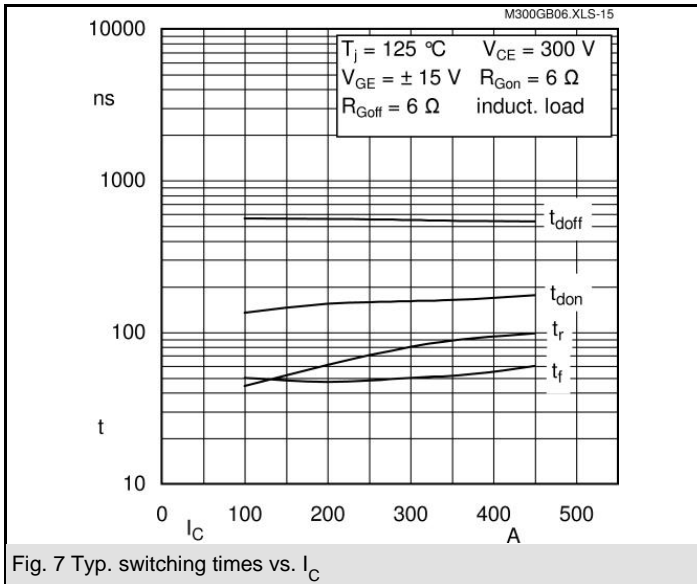
- Switching (not for linear use)
- Switched mode power supplies
- AC inverter servo drives
- UPS uninterruptable power supplies
- Welding inverters



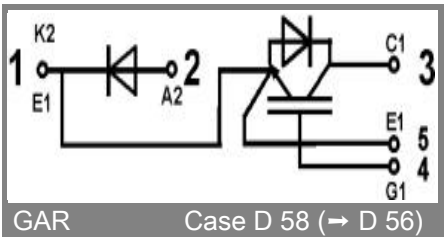
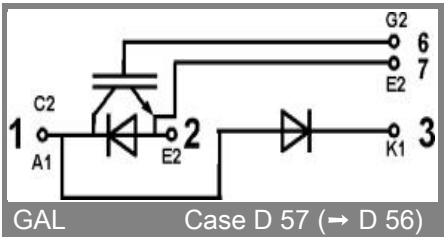
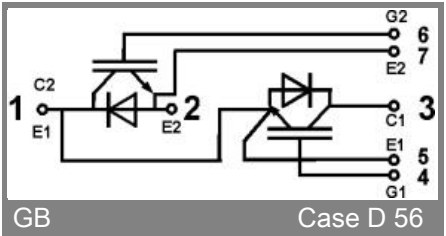
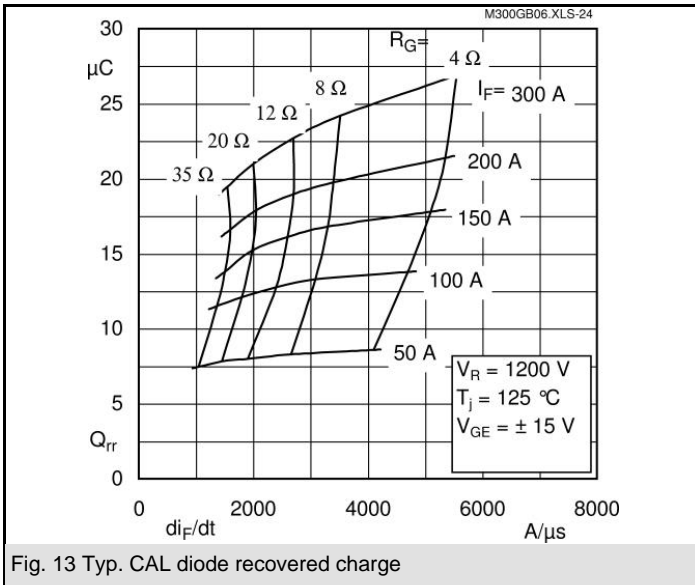
Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		600	V
$I_C$	$T_c = 25\text{ (70) °C}$	400 (300)	A
$I_{CRM}$	$t_p = 1\text{ ms}$	600	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	°C
$V_{isol}$	AC, 1 min.	2500	V
<b>Inverse diode</b>			
$I_F$	$T_c = 25\text{ (80) °C}$	250 (170)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	600	A
$I_{FSM}$	$t_p = 10\text{ ms}$ ; sin.; $T_j = 150\text{ °C}$	1600	A
<b>Freewheeling diode</b>			
$I_F$	$T_c = 25\text{ (80) °C}$	400 (270)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	800	A
$I_{FSM}$	$t_p = 10\text{ ms}$ ; sin.; $T_j = 150\text{ °C}$	2800	A

Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			Units
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 6\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0$ , $V_{CE} = V_{CES}$ , $T_j = 25\text{ (125) °C}$		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1,05 (1)		V
$r_{CE}$	$V_{GE} = 15\text{ V}$ , $T_j = 25\text{ (125) °C}$		3,2 (4,7)		mΩ
$V_{CE(sat)}$	$I_{Cnom} = 300\text{ A}$ , $V_{GE} = 15\text{ V}$ , chip level		2,1 (2,4)	2,5 (2,8)	V
$C_{ies}$	under following conditions		17		nF
$C_{oes}$	$V_{GE} = 0$ , $V_{CE} = 25\text{ V}$ , $f = 1\text{ MHz}$		2		nF
$C_{res}$			1,2		nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25\text{ (125) °C}$		0,35 (0,5)		mΩ
$t_{d(on)}$	$V_{CC} = 300\text{ V}$ , $I_{Cnom} = 300\text{ A}$		160		ns
$t_r$	$R_{Gon} = R_{Goff} = 6\text{ Ω}$ , $T_j = 125\text{ °C}$		80		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		550		ns
$t_f$			50		ns
$E_{on}$ ( $E_{off}$ )			14 (13)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}$ ; $V_{GE} = 0\text{ V}$ ; $T_j = 25\text{ (125) °C}$		1,65 (1,65)	2 (2)	V
$V_{(TO)}$	$T_j = 25\text{ (125) °C}$			(0,9)	V
$r_T$	$T_j = 25\text{ (125) °C}$		(3)	(3,7)	mΩ
$I_{RRM}$	$I_{Fnom} = 300\text{ A}$ ; $T_j = 125\text{ ( ) °C}$		120		A
$Q_{rr}$	$di/dt = \text{A}/\mu\text{s}$		18		μC
$E_{rr}$	$V_{GE} = \text{V}$				mJ
<b>FWD</b>					
$V_F = V_{EC}$	$I_F = 400\text{ A}$ ; $V_{GE} = 0\text{ V}$ , $T_j = 25\text{ (125) °C}$		1,65 (1,65)	2 (2)	V
$V_{(TO)}$	$T_j = 125\text{ ( ) °C}$			0,9	V
$r_T$	$T_j = 125\text{ ( ) °C}$			(3)	mΩ
$I_{RRM}$	$I_F = 300\text{ A}$ ; $T_j = 125\text{ ( ) °C}$		130		A
$Q_{rr}$	$di/dt = \text{A}/\mu\text{s}$		23		μC
$E_{rr}$	$V_{GE} = \text{V}$				mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,09	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,25	K/W
$R_{th(j-c)FD}$	per FWD			0,15	K/W
$R_{th(c-s)}$	per module			0,038	K/W
<b>Mechanical data</b>					
$M_s$	to heatsink M6	3		5	Nm
$M_t$	to terminals M6	2,5		5	Nm
w				325	g





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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.