

SKM 400GB128D...



SEMITRANS™ 3

SPT IGBT Module

SKM 400GB128D

SKM 400GAL128D

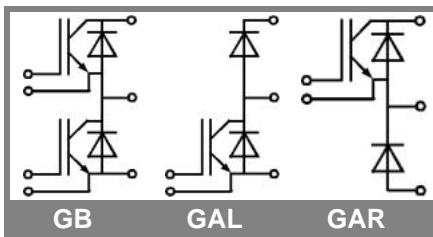
SKM 400GAR128D

Features

- Homogeneous Si
- SPT = Soft-Puch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_c$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20kHz



Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_c	$T_c = 25\text{ (}80\text{) }^\circ\text{C}$	565 (400)	A
I_{CRM}	$t_p = 1\text{ ms}$	600	A
V_{GES}		± 20	V
T_{vj} (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000	V

Inverse diode			
Symbol	Conditions	Values	Units
I_F	$T_c = 25\text{ (}80\text{) }^\circ\text{C}$	390 (260)	A
I_{FRM}	$t_p = 1\text{ ms}$	600	A
I_{FSM}	$t_p = 10\text{ ms; sin.; } T_j = 150\text{ }^\circ\text{C}$	2900	A

Freewheeling diode			
Symbol	Conditions	Values	Units
I_F	$T_c = 25\text{ (}80\text{) }^\circ\text{C}$	390 (260)	A
I_{FRM}	$t_p = 1\text{ ms}$	600	A
I_{FSM}	$t_p = 10\text{ ms; sin.; } T_j = 150\text{ }^\circ\text{C}$	2900	A

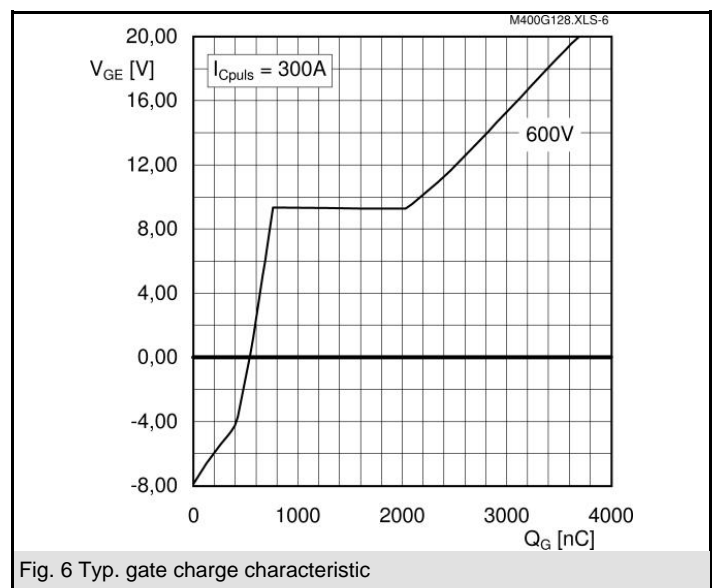
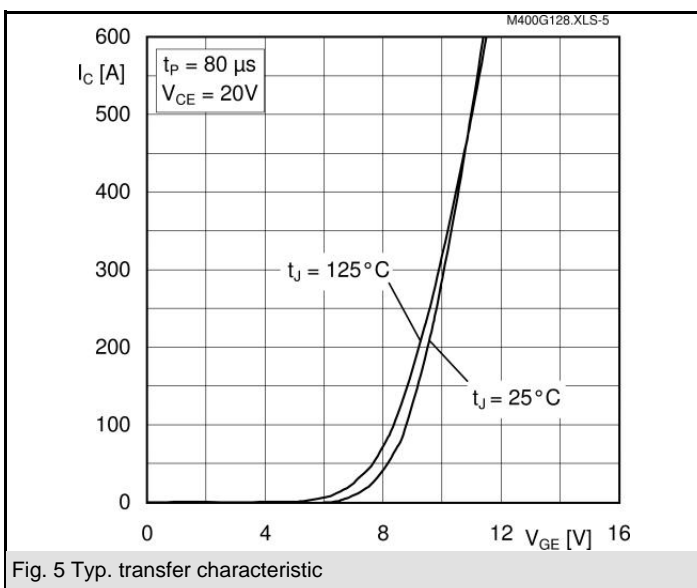
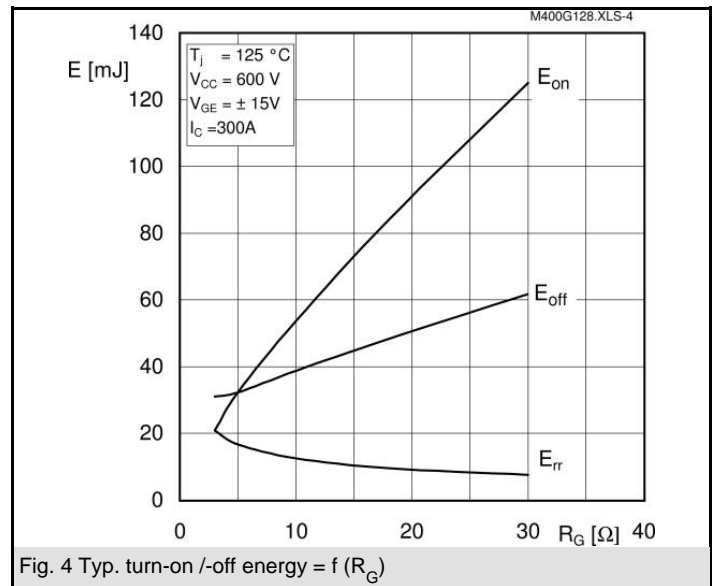
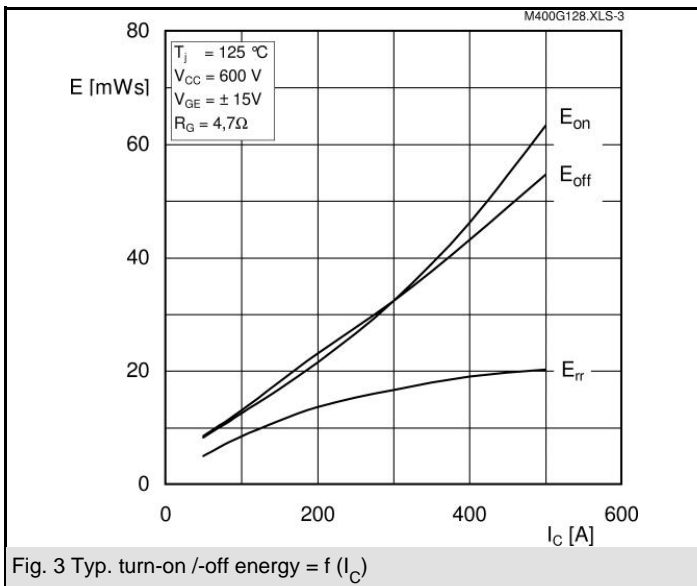
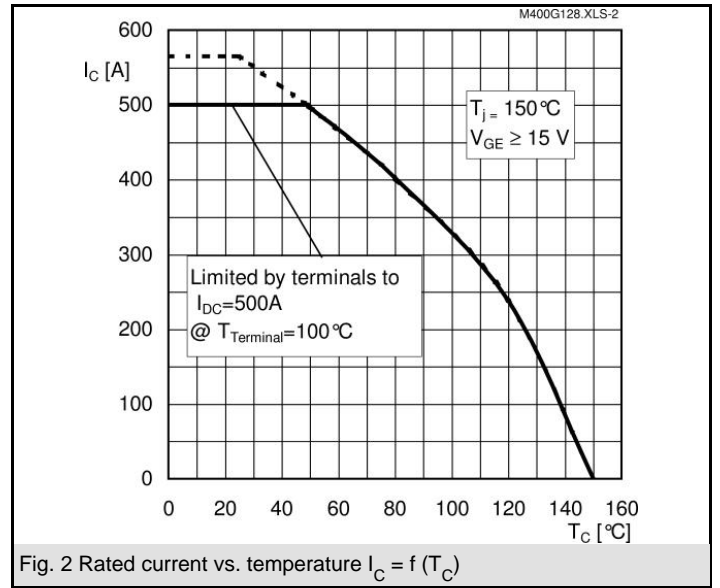
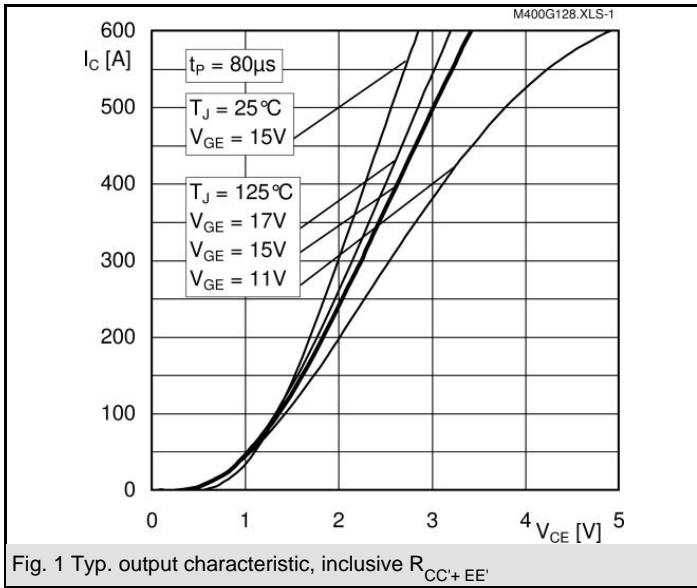
Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_c = 12\text{ mA}$	4,5	5,5	6,45	V
I_{CES}	$V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25\text{ (})\text{ }^\circ\text{C}$		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25\text{ (})\text{ }^\circ\text{C}$		1 (0,9)	1,15 (1,05)	V
r_{CE}	$V_{GE} = 15\text{ V}, T_j = 25\text{ (}125\text{) }^\circ\text{C}$		3 (4)	4 (5)	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 300\text{ A}, V_{GE} = 15\text{ V}$, chip level		1,9 (2,1)	2,35 (2,55)	V
C_{ies}	under following conditions		26		nF
C_{oes}	$V_{GE} = 0, V_{CE} = 25\text{ V}, f = 1\text{ MHz}$		3		nF
C_{res}			3		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25\text{ (}125\text{) }^\circ\text{C}$		0,35 (0,5)		m Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}, I_{Cnom} = 300\text{ A}$		110		ns
t_r	$R_{Gon} = R_{Goff} = 4,7\text{ }^\circ\Omega, T_j = 125\text{ }^\circ\text{C}$		60		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		800		ns
t_f			60		ns
$E_{on} (E_{off})$			32 (31)		mJ

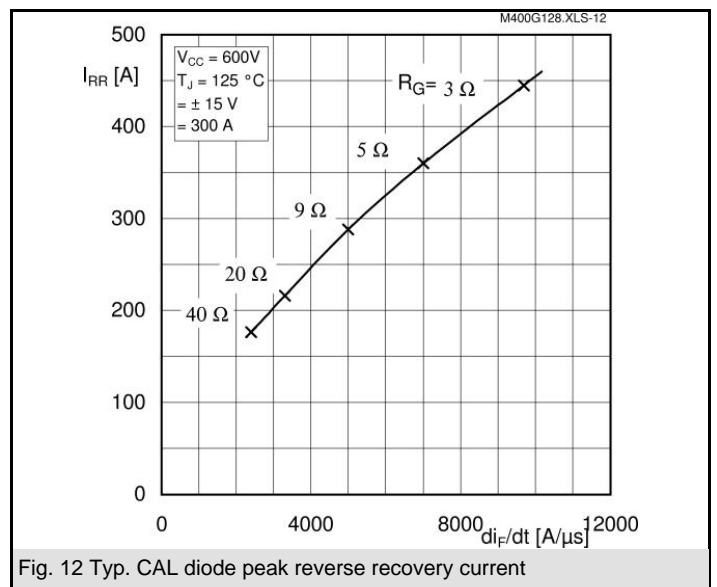
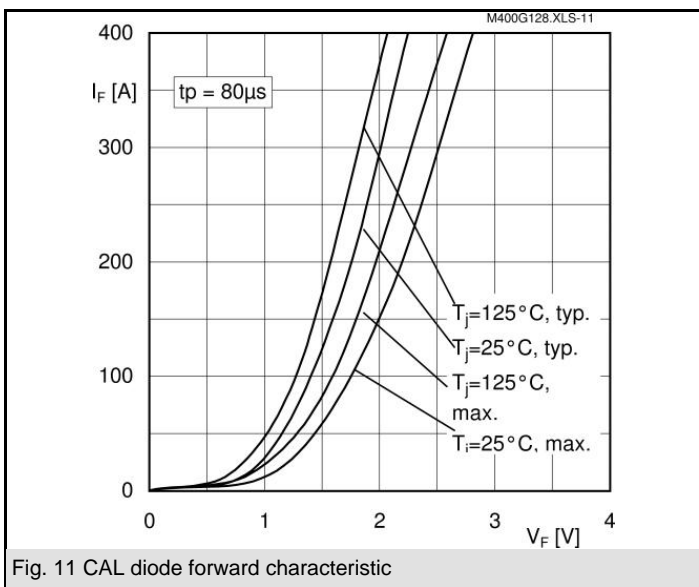
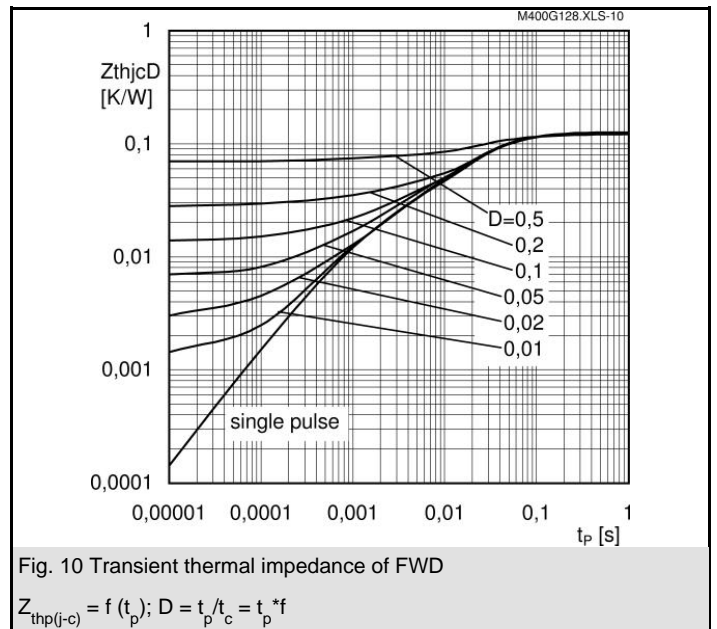
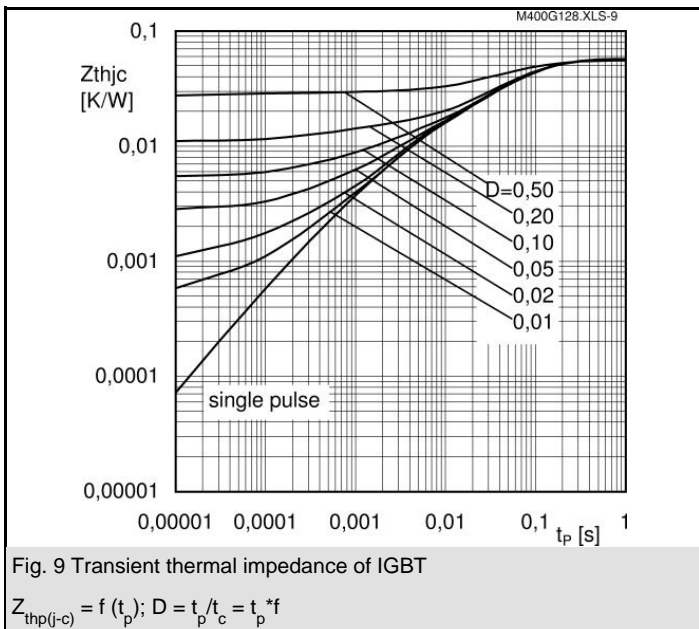
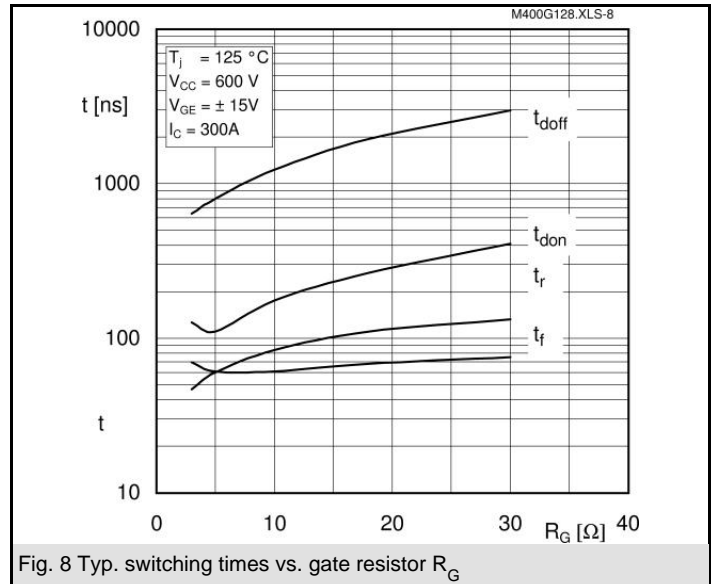
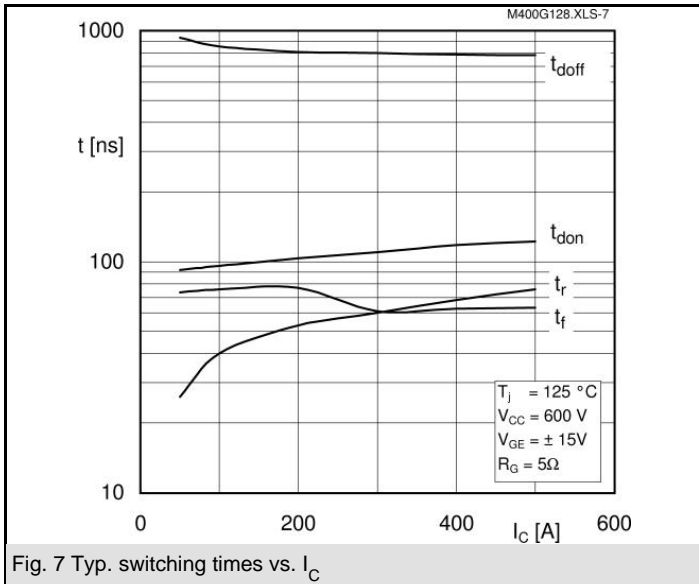
Inverse diode				
Symbol	Conditions	min.	max.	Units
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}; V_{GE} = 0\text{ V}; T_j = 25\text{ (}125\text{) }^\circ\text{C}$	2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (}125\text{) }^\circ\text{C}$	1,1	1,2	V
r_T	$T_j = 25\text{ (}125\text{) }^\circ\text{C}$	3	4,3	m Ω
I_{RRM}	$I_{Fnom} = 300\text{ A}; T_j = 125\text{ (})\text{ }^\circ\text{C}$	176		A
Q_{rr}	$di/dt = 2400\text{ A}/\mu\text{s}$	40		μC
E_{rr}	$V_{GE} = 0\text{ V}$	16		mJ

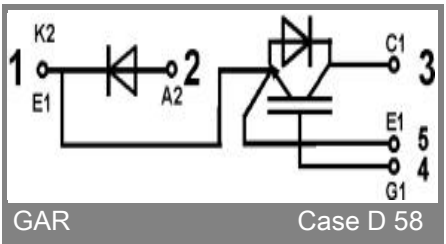
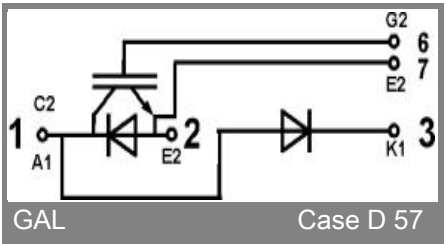
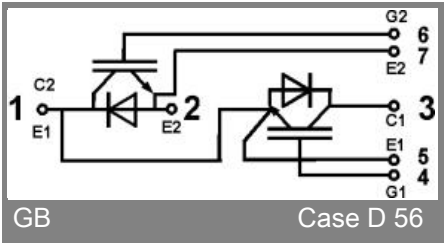
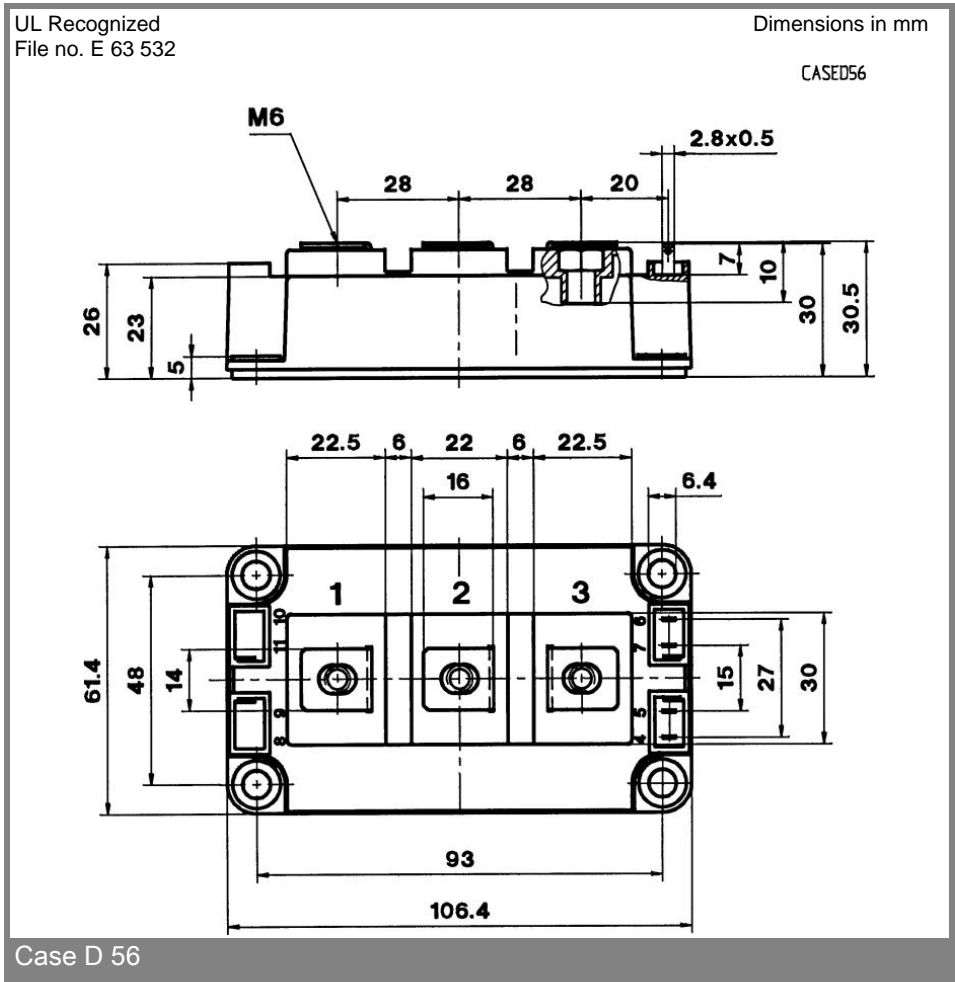
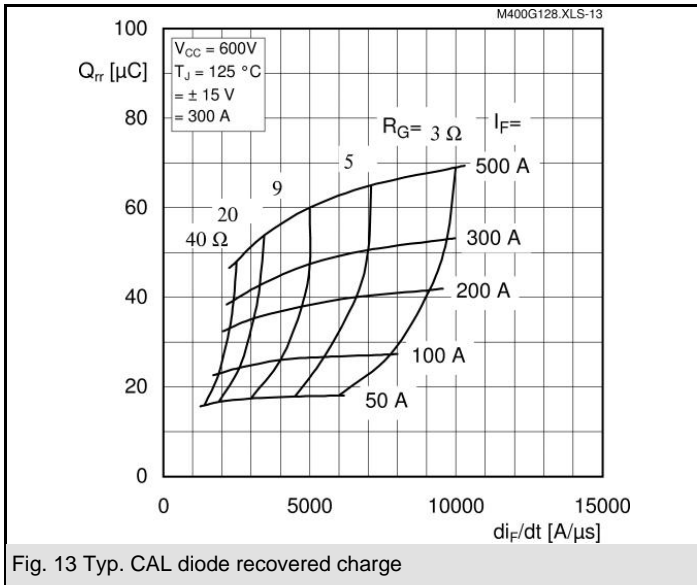
FWD				
Symbol	Conditions	min.	max.	Units
$V_F = V_{EC}$	$I_F = 300\text{ A}; V_{GE} = 0\text{ V}, T_j = 25\text{ (}125\text{) }^\circ\text{C}$	2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (}125\text{) }^\circ\text{C}$	1,1	1,2	V
r_T	$T_j = 25\text{ (}125\text{) }^\circ\text{C}$	3	4,3	m Ω
I_{RRM}	$I_F = 300\text{ A}; T_j = 125\text{ (})\text{ }^\circ\text{C}$	176		A
Q_{rr}	$di/dt = 0\text{ A}/\mu\text{s}$	40		μC
E_{rr}	$V_{GE} = 0\text{ V}$	16		mJ

Thermal characteristics			
Symbol	Conditions	Values	Units
$R_{th(j-c)}$	per IGBT	0,055	K/W
$R_{th(j-c)D}$	per Inverse Diode	0,125	K/W
$R_{th(c-s)}$	per module	0,038	K/W

Mechanical data			
Symbol	Conditions	Values	Units
M_s	to heatsink M6	3	Nm
M_t	to terminals M6	2,5	Nm
w			325 g







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

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