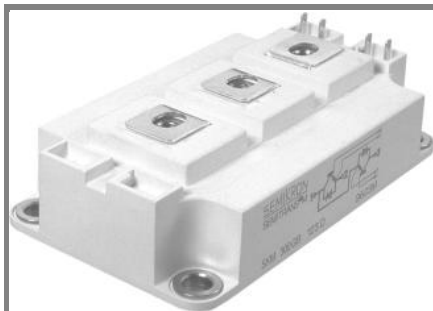


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SEMITRANS™ 3

SPT IGBT Module

SKM 400GB128D

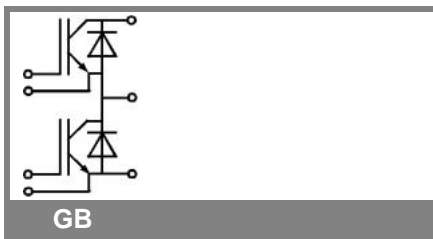
Preliminary Data

Features

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

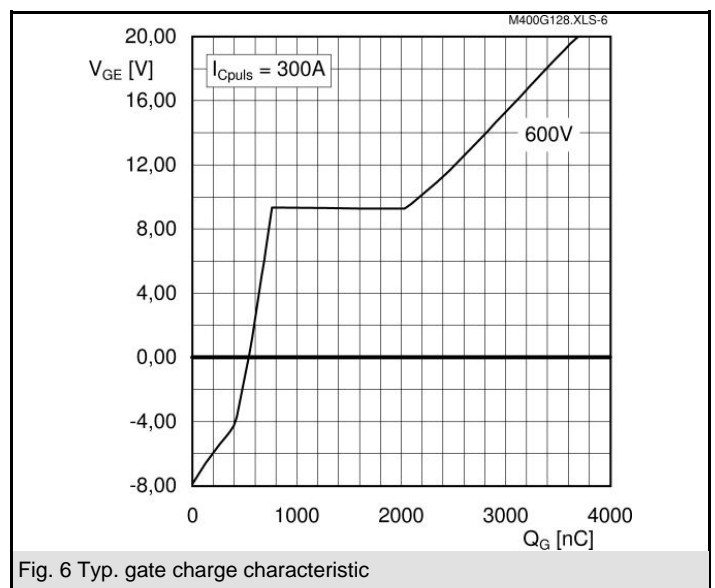
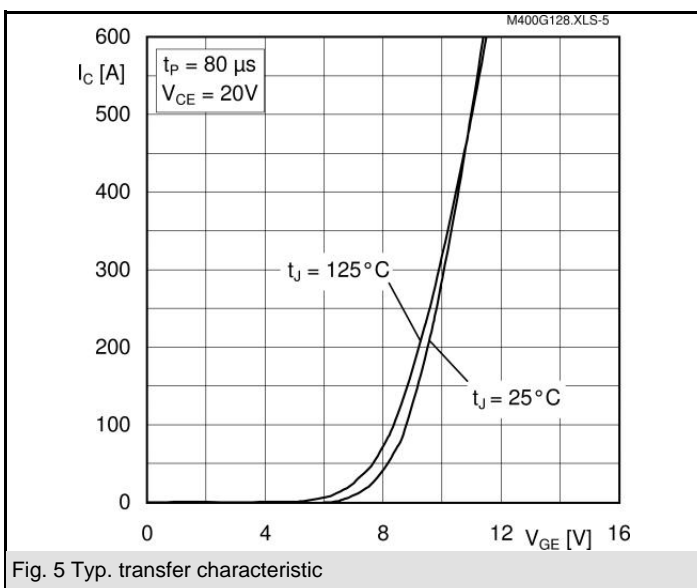
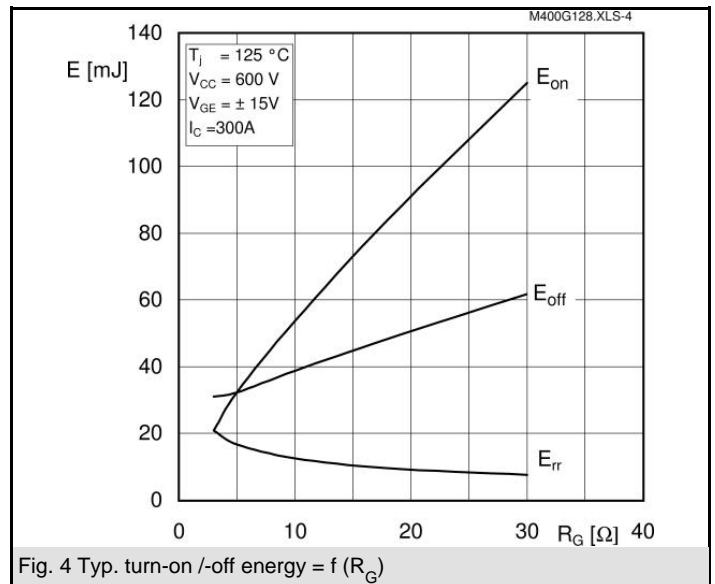
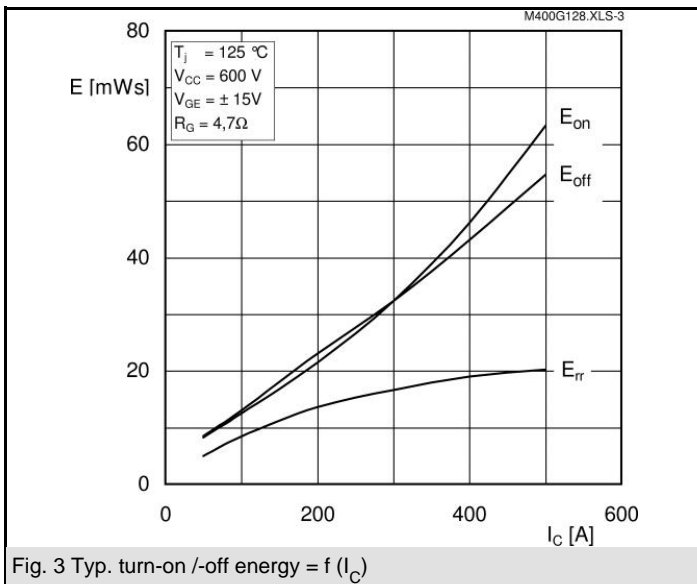
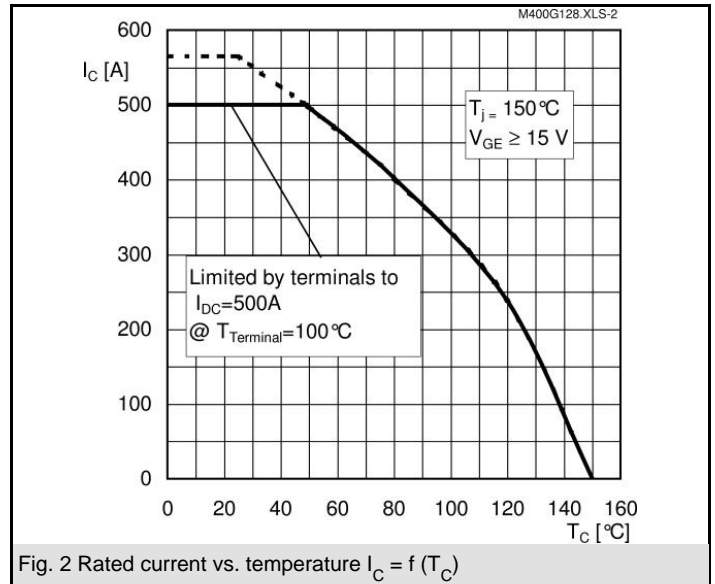
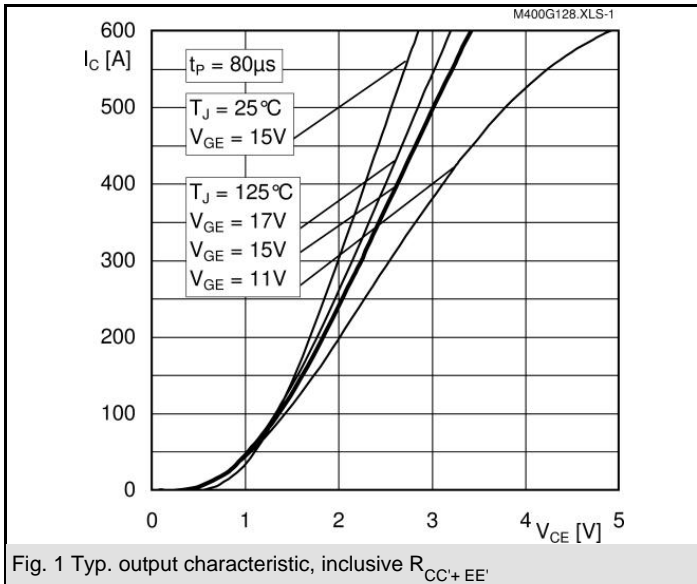
Typical Applications

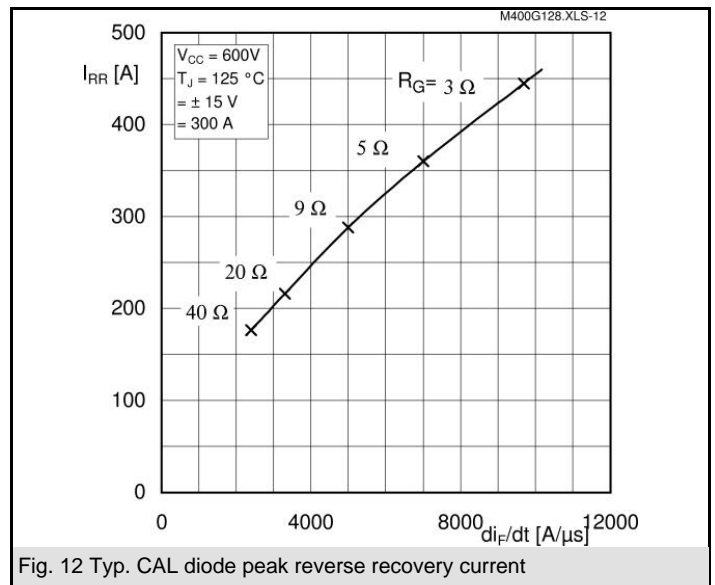
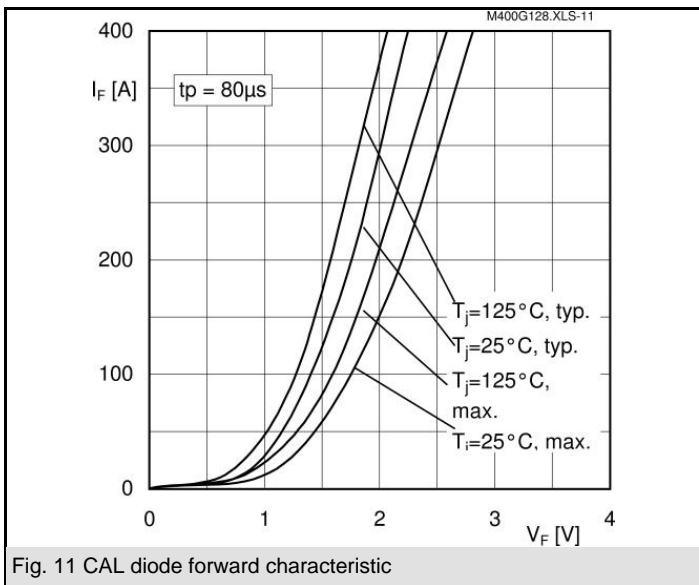
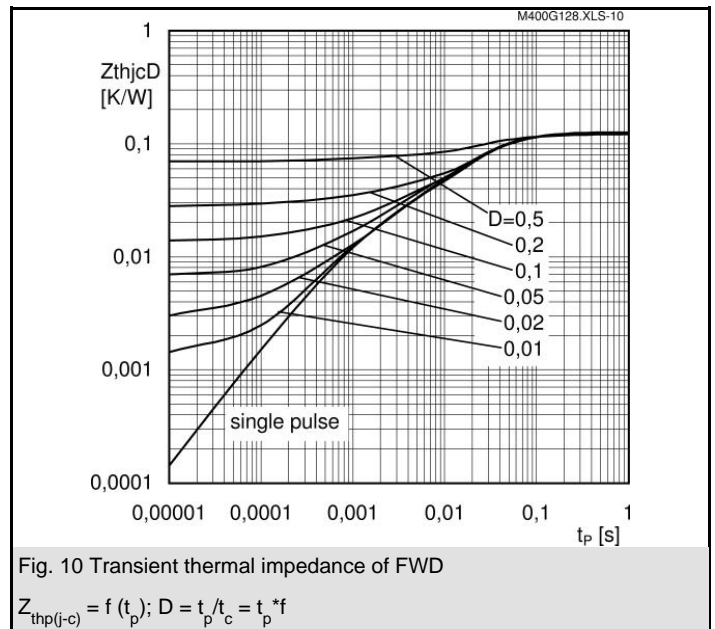
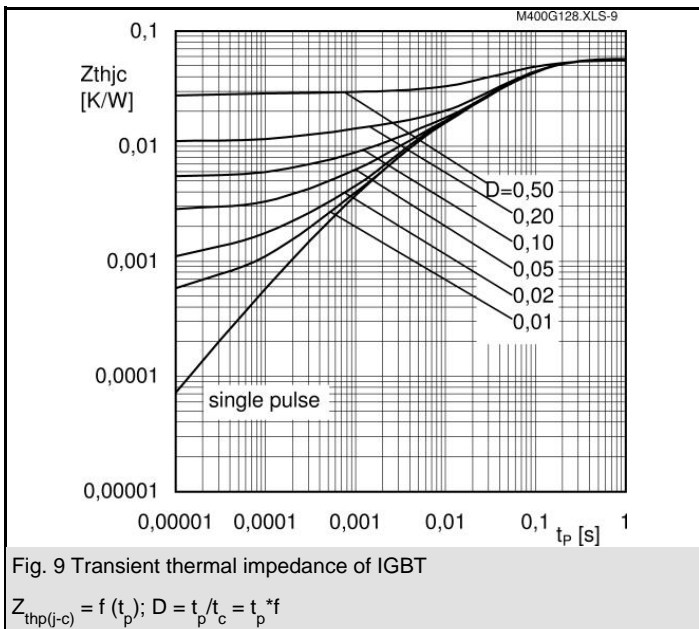
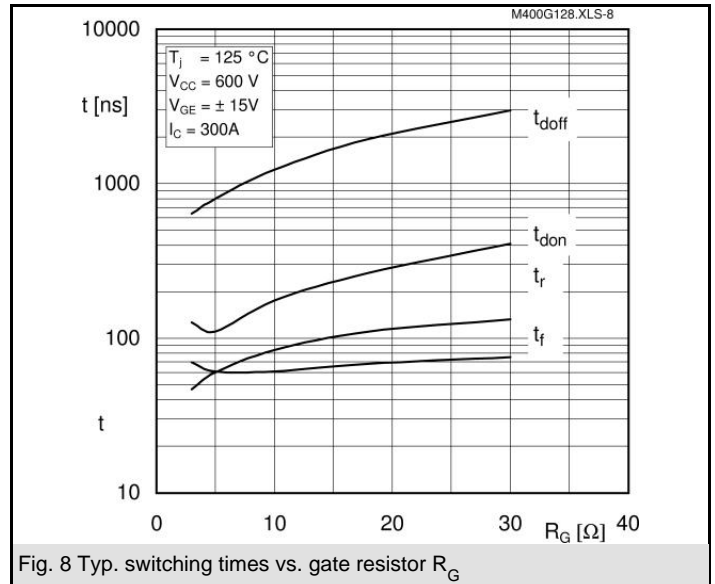
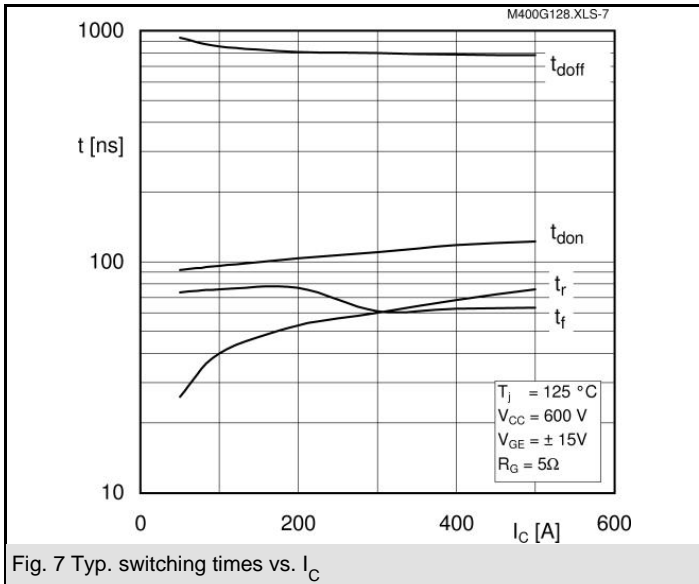
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20kHz



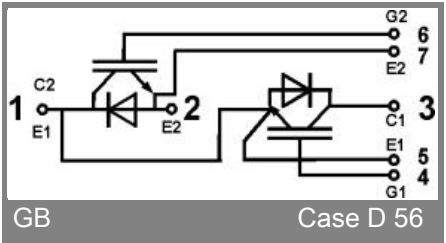
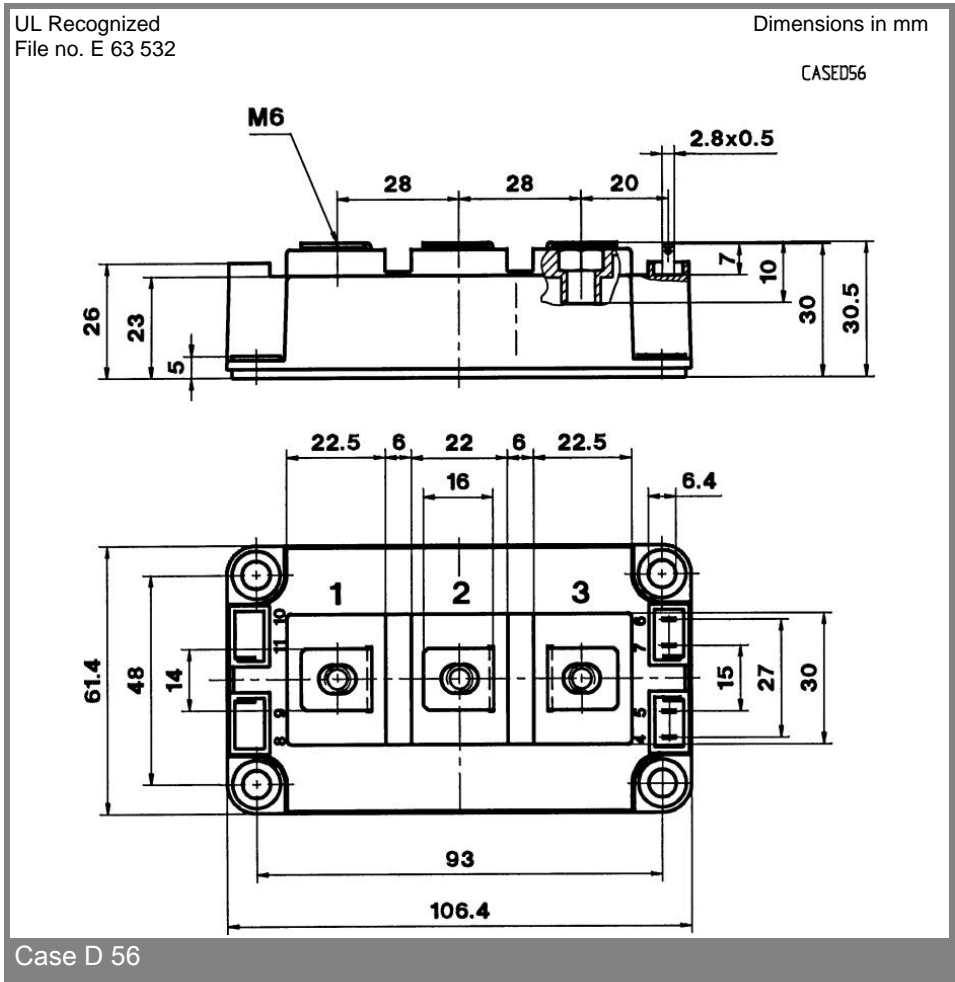
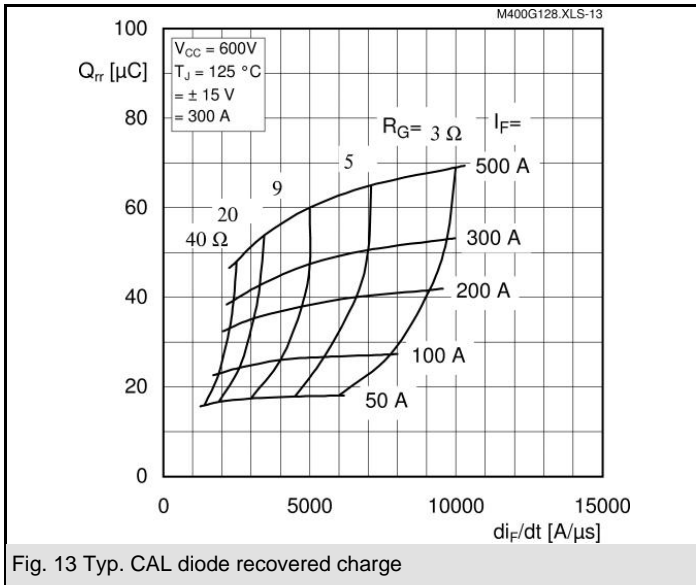
Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25\text{ (80) }^\circ\text{C}$	565 (400)	A
I_{CRM}	$T_c = 25\text{ (80) }^\circ\text{C}$, $t_p = 1\text{ ms}$	1130 (800)	A
V_{GES}		± 20	V
T_{vj} (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
$I_F = -I_C$	$T_c = 25\text{ (80) }^\circ\text{C}$	390 (260)	A
I_{FRM}	$T_c = 25\text{ (80) }^\circ\text{C}$, $t_p = 1\text{ ms}$	1130 (800)	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}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25\text{ () }^\circ\text{C}$		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25\text{ () }^\circ\text{C}$		1 (0,9)	1,15 (1,05)	V
r_{CE}	$V_{GE} = 15\text{ V}$, $T_j = 25\text{ (125) }^\circ\text{C}$		3 (4)	4 (5)	m Ω
$V_{CE(sat)}$	$I_C = 300\text{ A}$, $V_{GE} = 15\text{ V}$, 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 $T_c = 25\text{ (125) }^\circ\text{C}$		0,35 (0,5)		m Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$, $I_C = 300\text{ A}$		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					
$V_F = V_{EC}$	$I_F = 300\text{ A}$; $V_{GE} = 0\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1	1,2	V
r_T	$T_j = 25\text{ (125) }^\circ\text{C}$		3	4,3	m Ω
I_{RRM}	$I_F = 300\text{ A}$; $T_j = 125\text{ () }^\circ\text{C}$		176		A
Q_{rr}	$di/dt = 2400\text{ A}/\mu\text{s}$		40		μC
E_{rr}	$V_{GE} = 0\text{ V}$		6		mJ
Thermal characteristics					
$R_{th(j-c)}$	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					
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.