

# SKM 500GA174D



SEMITRANS™ 4

## Low Loss IGBT Modules

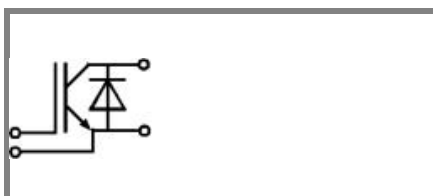
### SKM 500GA174D

#### Features

- N channel, homogeneous Silicon structure (NPT - Non punch-through IGBT)
- Low inductance case
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes
- Without hard mould
- Large clearance (13 mm) and creepage distances (20 mm)

#### Typical Applications

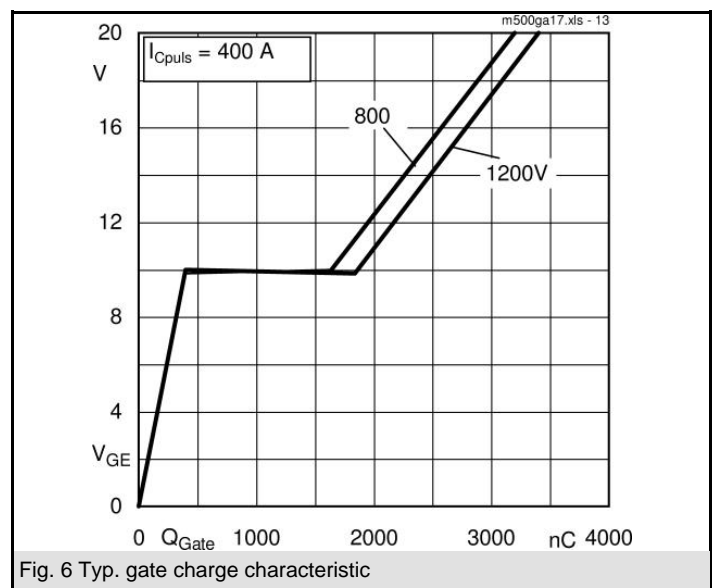
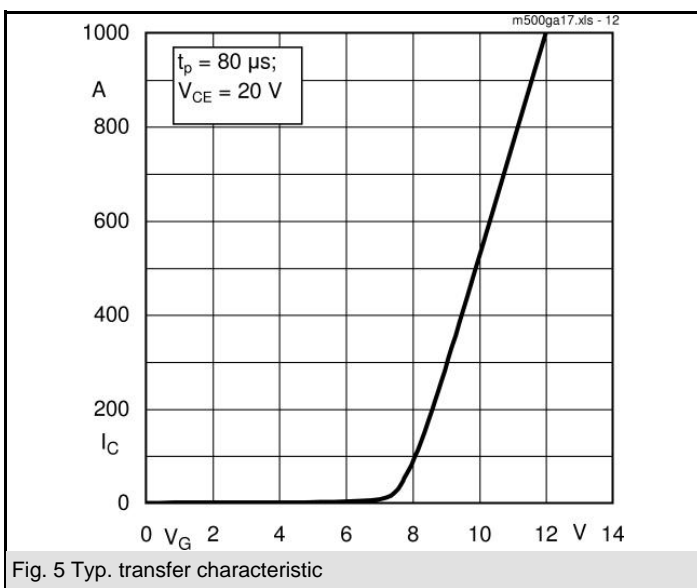
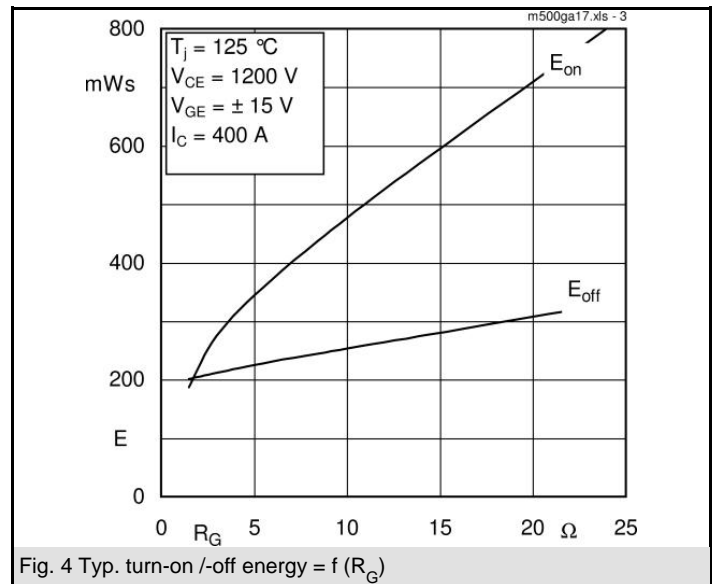
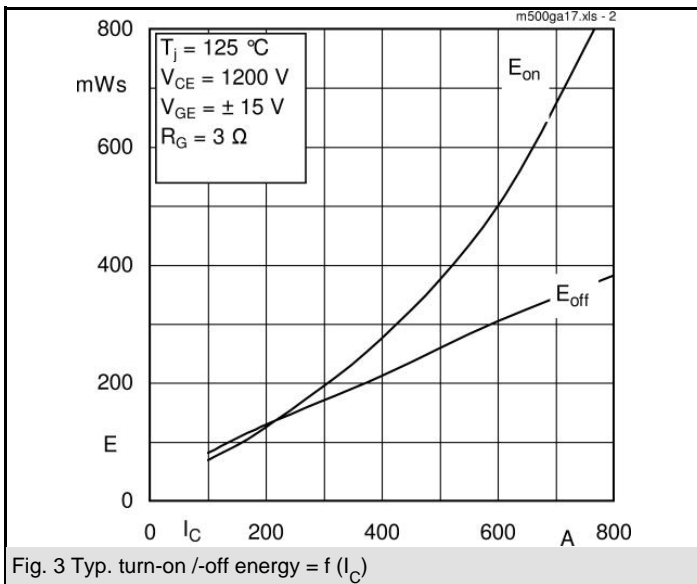
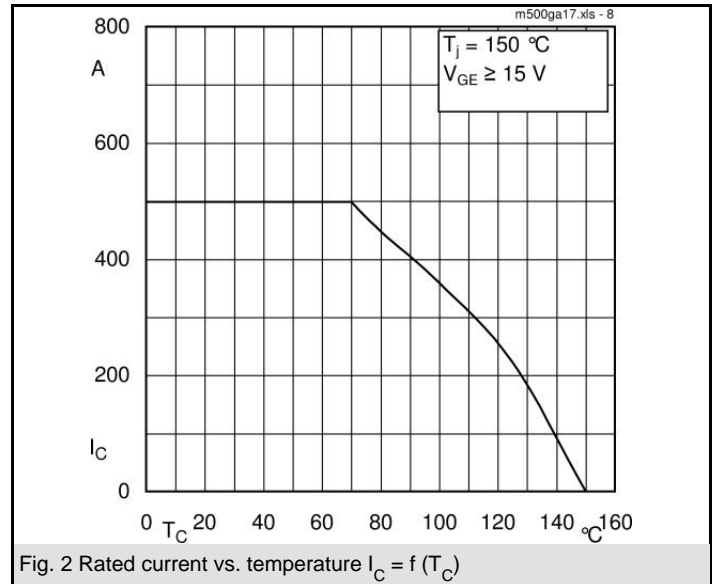
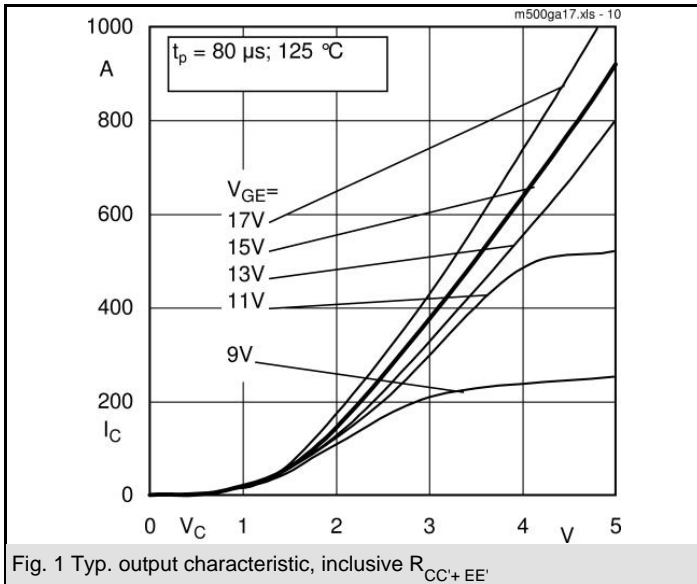
- AC inverter drives on mains 575 - 750 V<sub>AC</sub>
- DC bus voltage 750 - 1200 V<sub>DC</sub>
- Public transport (auxiliary syst.)
- Switching (not for linear use)

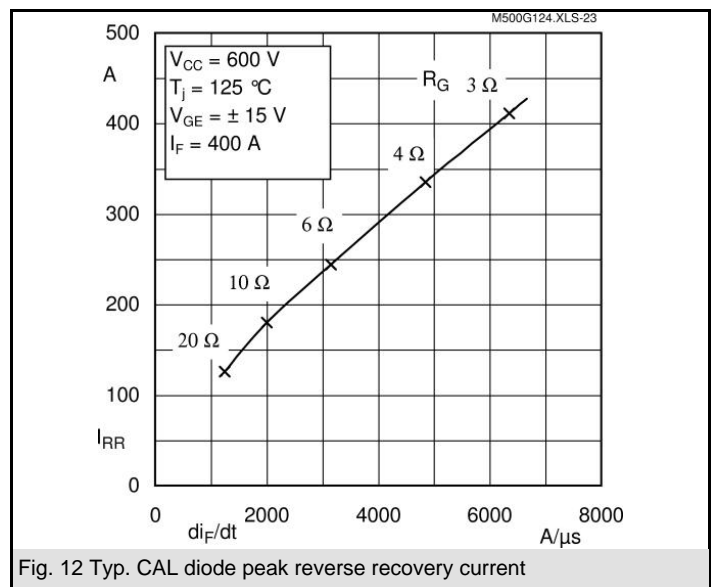
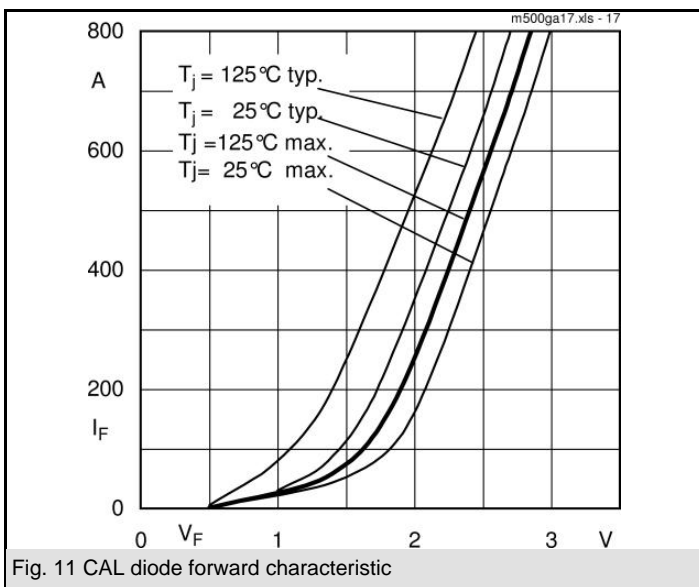
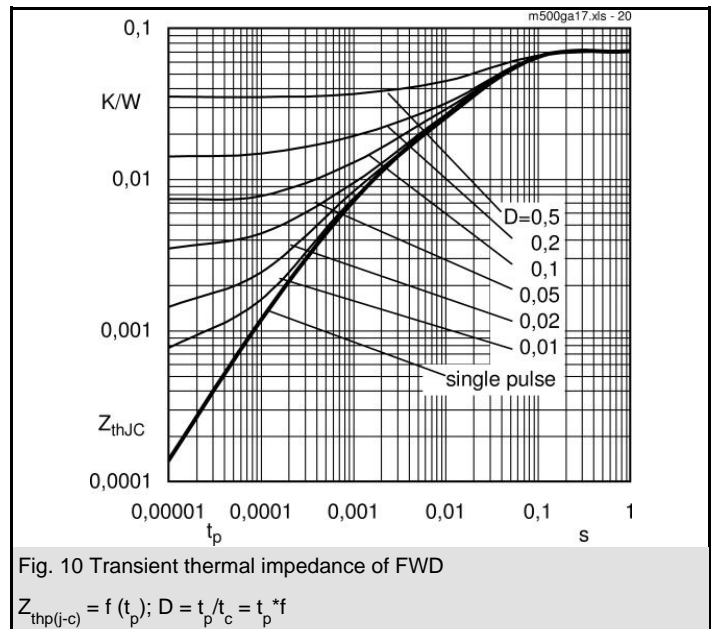
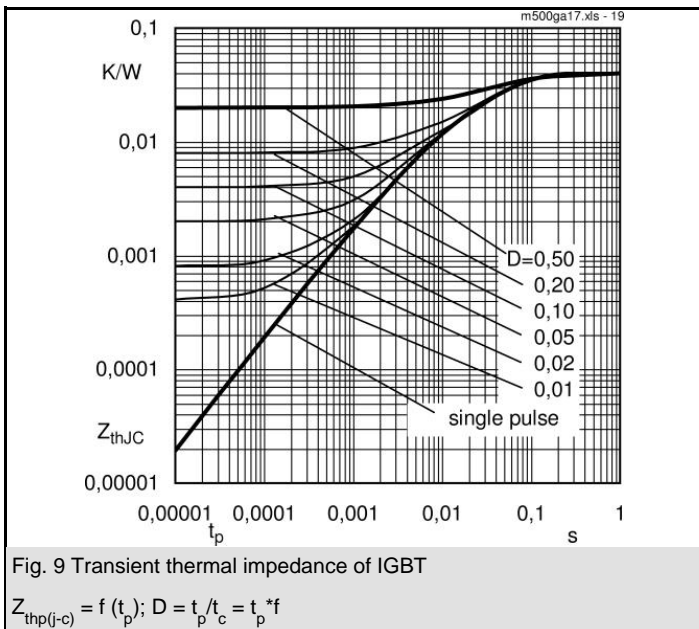
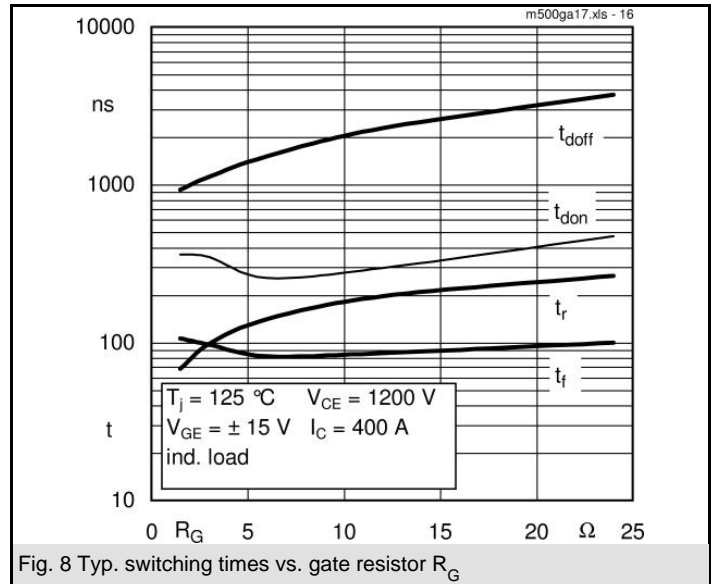
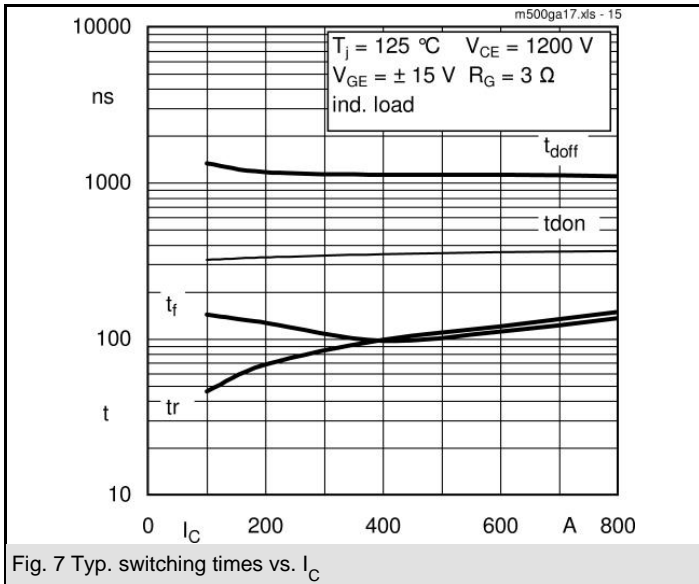


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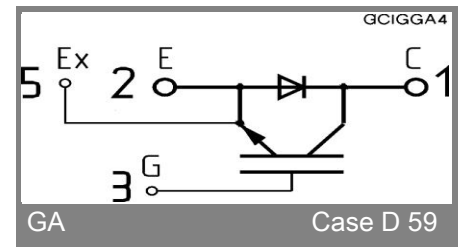
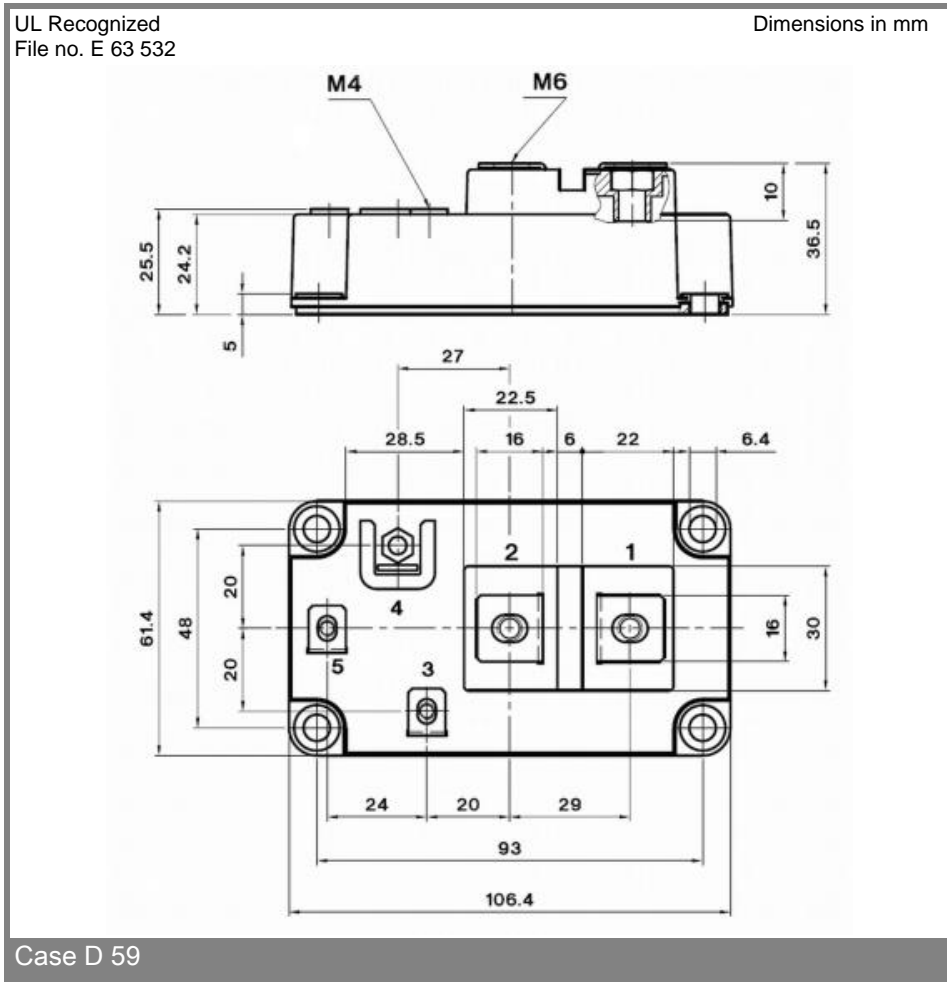
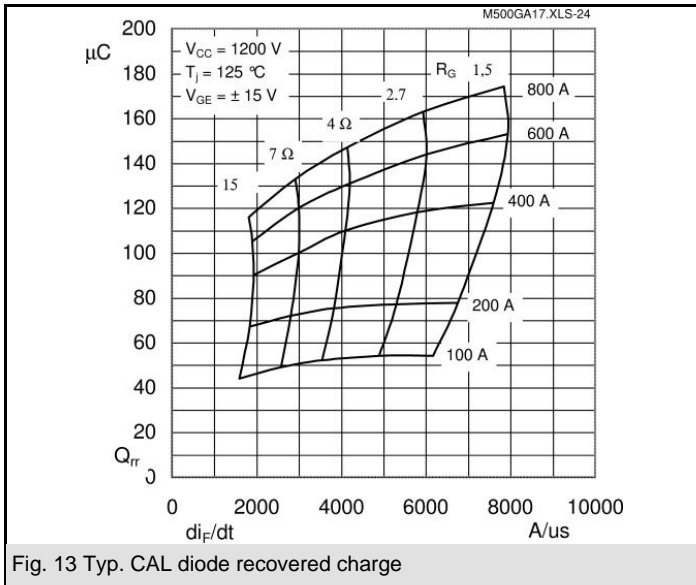
Absolute Maximum Ratings		T <sub>c</sub> = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
V <sub>CES</sub>		1700	V
I <sub>C</sub>	T <sub>c</sub> = 25 (80) °C	600 (440)	A
I <sub>CRM</sub>	t <sub>p</sub> = 1 ms	800	A
V <sub>GES</sub>		± 20	V
T <sub>vj</sub> ' (T <sub>stg</sub> )	T <sub>OPERATION</sub> ≤ T <sub>stg</sub>	- 40 ... + 150 (125)	°C
V <sub>isol</sub>	AC, 1 min.	3400	V
<b>Inverse diode</b>			
I <sub>F</sub>	T <sub>c</sub> = 25 (80) °C	600 (440)	A
I <sub>FRM</sub>	t <sub>p</sub> = 1 ms	800	A
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; sin.; T <sub>j</sub> = 150 °C	4400	A

Characteristics		T <sub>c</sub> = 25 °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
V <sub>GE(th)</sub>	V <sub>GE</sub> = V <sub>CE</sub> ; I <sub>C</sub> = 18 mA	4,5	5,5	6,5	V
I <sub>CES</sub>	V <sub>GE</sub> = 0, V <sub>CE</sub> = V <sub>CES</sub> ; T <sub>j</sub> = 25 (125) °C		0,1	0,3	mA
V <sub>CE(TO)</sub>	T <sub>j</sub> = 25 (125) °C		1,35 (1,5)	1,65 (1,8)	V
r <sub>CE</sub>	V <sub>GE</sub> = 20 V, T <sub>j</sub> = 25 (125) °C		3,625 (4,25)	4,125 (4,5)	mΩ
V <sub>CE(sat)</sub>	I <sub>Cnom</sub> = 400 A, V <sub>GE</sub> = 15 V, chip level		2,8 (3,2)	3,3 (3,6)	V
C <sub>ies</sub>	under following conditions		27		nF
C <sub>oes</sub>	V <sub>GE</sub> = 0, V <sub>CE</sub> = 25 V, f = 1 MHz		3,8		nF
C <sub>res</sub>			1,3		nF
L <sub>CE</sub>				20	nH
R <sub>CC'+EE'</sub>	res., terminal-chip T <sub>c</sub> = 25 (125) °C		0,18 (0,22)		mΩ
t <sub>d(on)</sub>	V <sub>CC</sub> = 1200 V, I <sub>Cnom</sub> = 400 A		350		ns
t <sub>r</sub>	R <sub>Gon</sub> = R <sub>Goff</sub> = 3 Ω, T <sub>j</sub> = 125 °C		100		ns
t <sub>d(off)</sub>	V <sub>GE</sub> = ± 15 V		1100		ns
t <sub>f</sub>			100		ns
E <sub>on</sub> (E <sub>off</sub> )			300 (210)		mJ
<b>Inverse diode</b>					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>Fnom</sub> = 400 A; V <sub>GE</sub> = 0 V; T <sub>j</sub> = 25 (125)		2,15 (1,8)	2,4 (2,2)	V
V <sub>(TO)</sub>	T <sub>j</sub> = 125 ( ) °C		1,3	1,5	V
r <sub>T</sub>	T <sub>j</sub> = 125 ( ) °C		1,6	2,1	mΩ
I <sub>RRM</sub>	I <sub>Fnom</sub> = 400 A; T <sub>j</sub> = 25 ( 125 ) °C		270 (550)		A
Q <sub>rr</sub>	di/dt = 400 A/μs		70 (117)		μC
E <sub>rr</sub>	V <sub>GE</sub> = V				mJ
<b>Thermal characteristics</b>					
R <sub>th(j-c)</sub>	per IGBT			0,04	K/W
R <sub>th(j-c)D</sub>	per Inverse Diode			0,07	K/W
R <sub>th(c-s)</sub>	per module			0,038	K/W
<b>Mechanical data</b>					
M <sub>s</sub>	to heatsink M6	3		5	Nm
M <sub>t</sub>	to terminals M6 (M4)	2,5 (1,1)		5 (2)	Nm
w				330	g





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

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