

SKM 40GD124D



Sixpack

Low Loss IGBT Modules

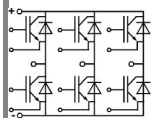
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Features

- MOS input (voltage controlled)
- N channel, homogeneous Si-structure (NPT - Non punch-through IGBT)
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft CAL diodes
- Isolated copper baseplate using DBC Direct Copper Bonding Technology
- Large clearance (9 mm) and creepage distances (13 mm)

Typical Applications

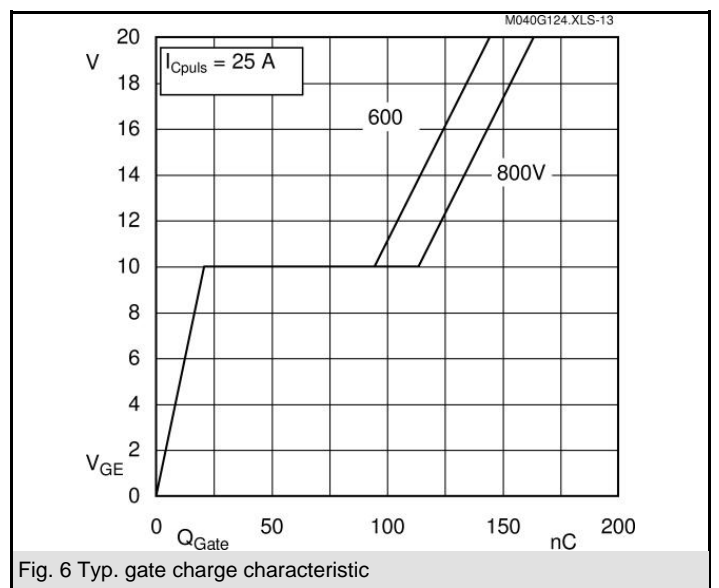
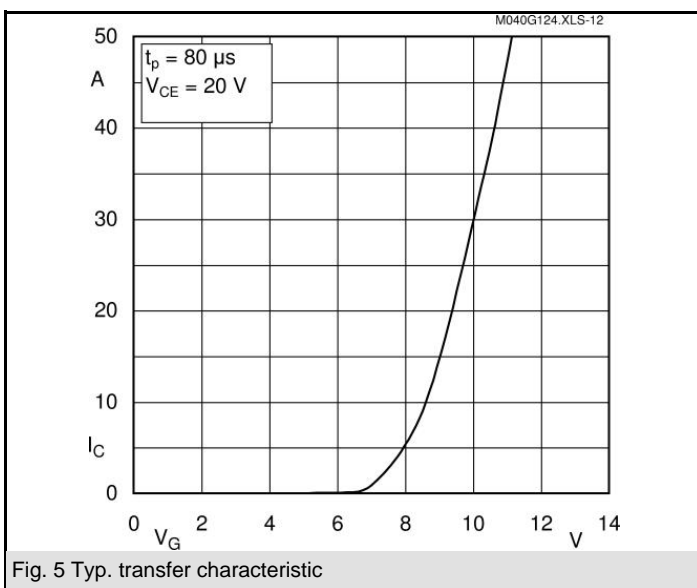
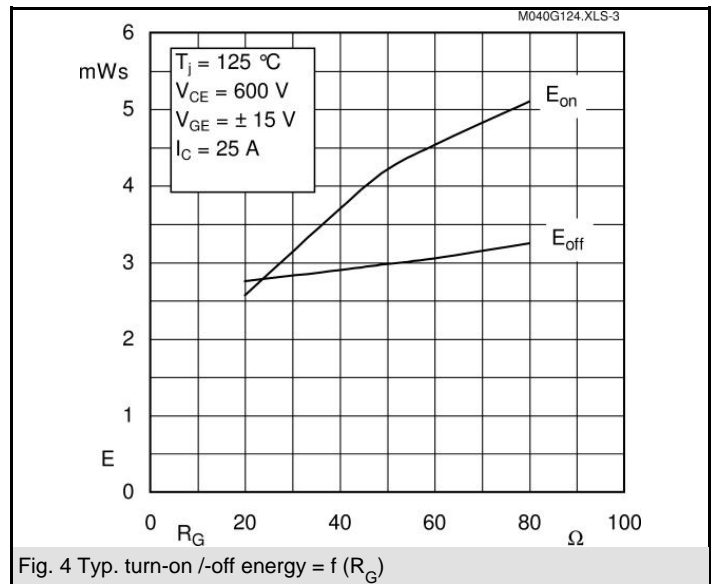
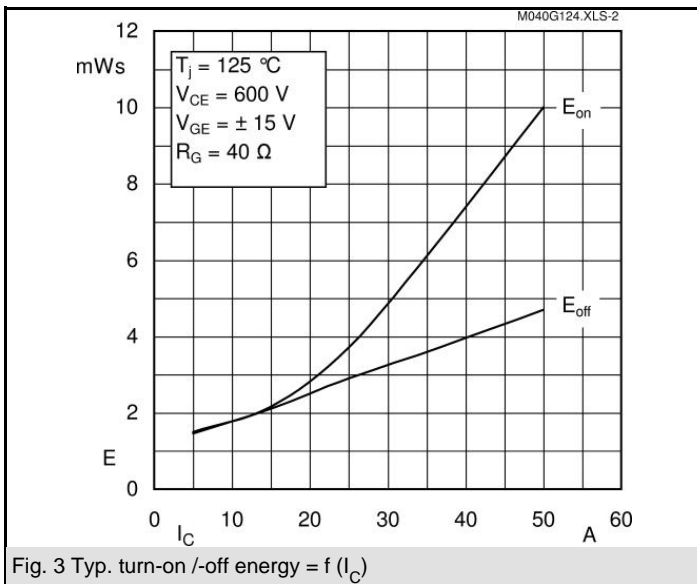
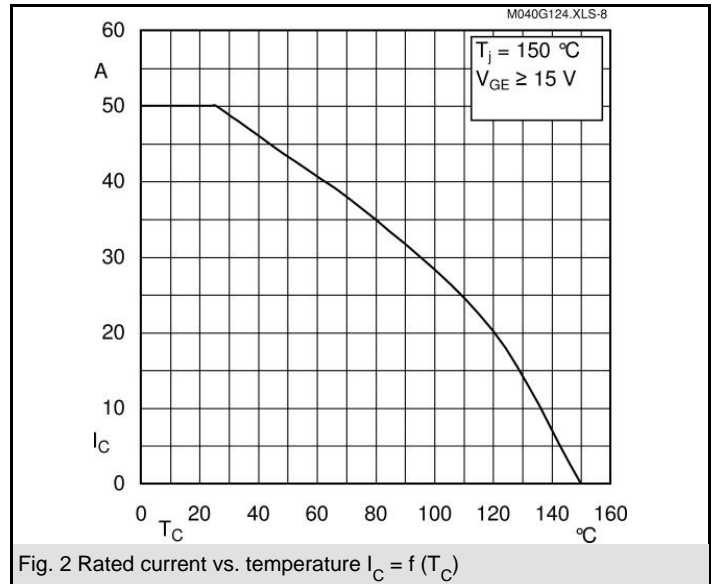
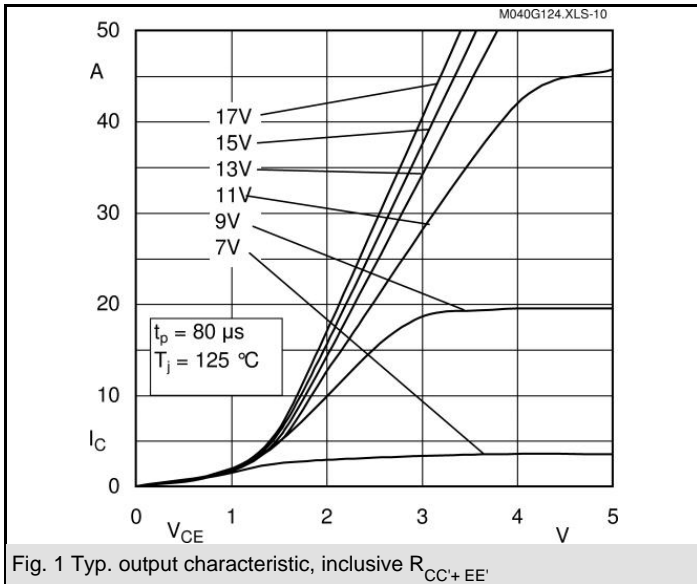
- Switched mode power supplies
- Three phase inverters for AC motor speed control

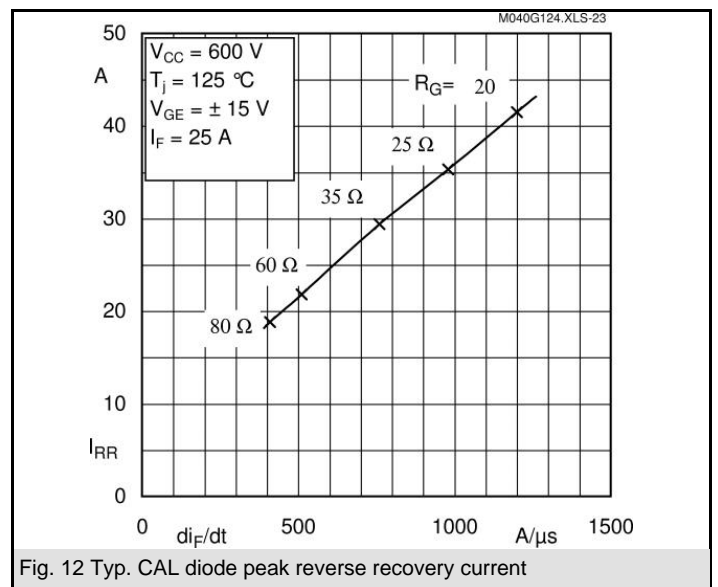
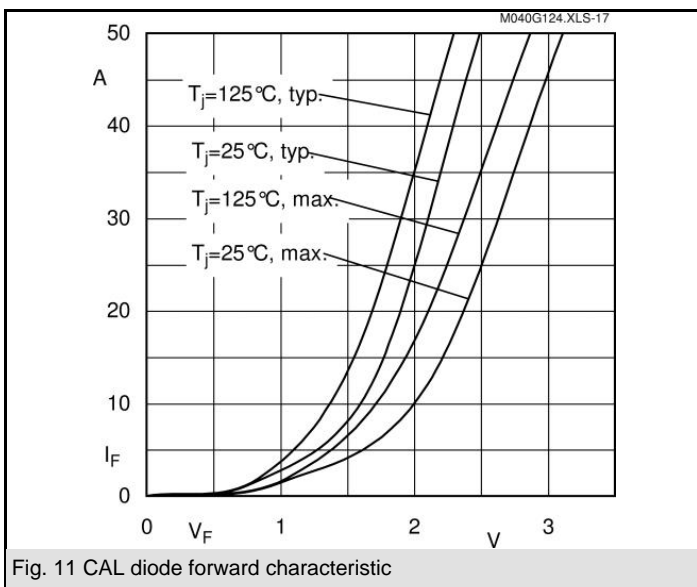
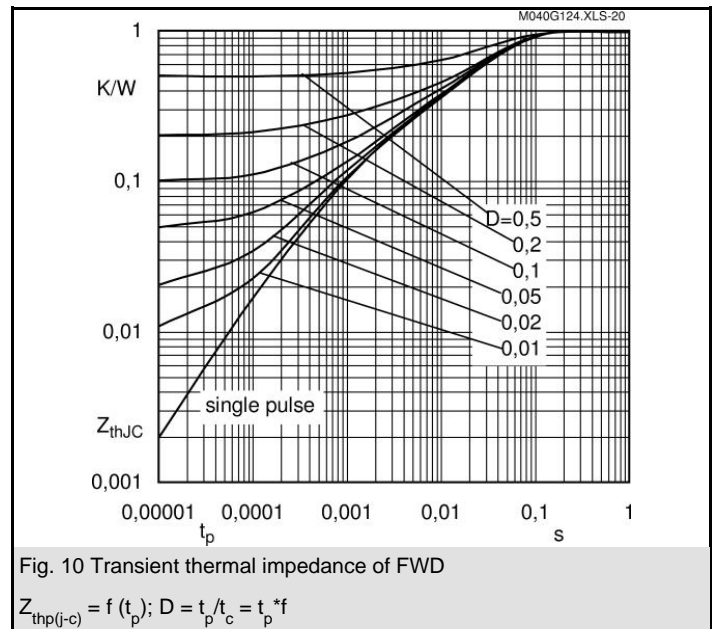
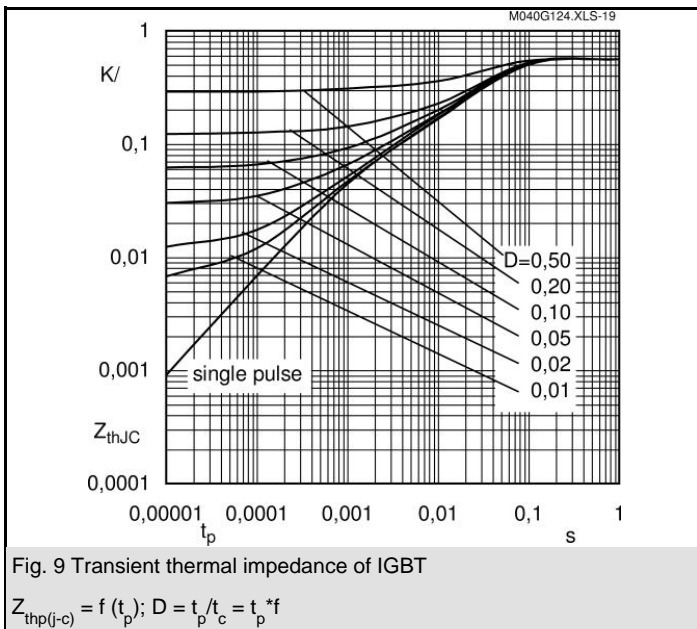
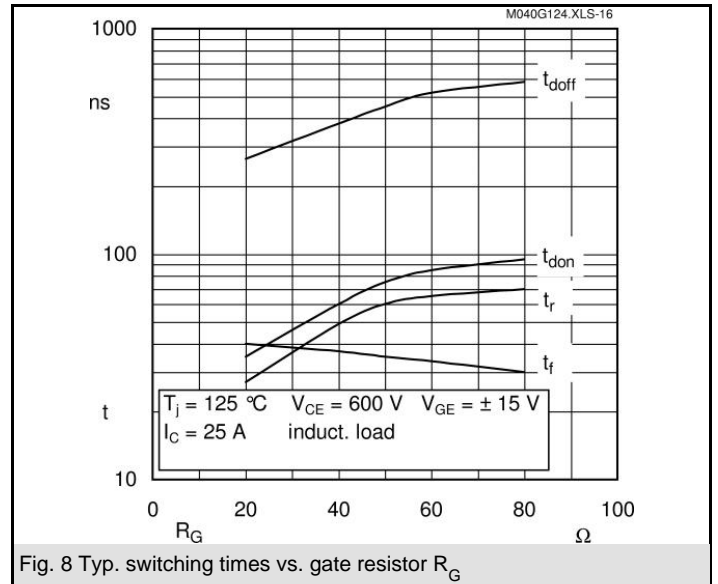
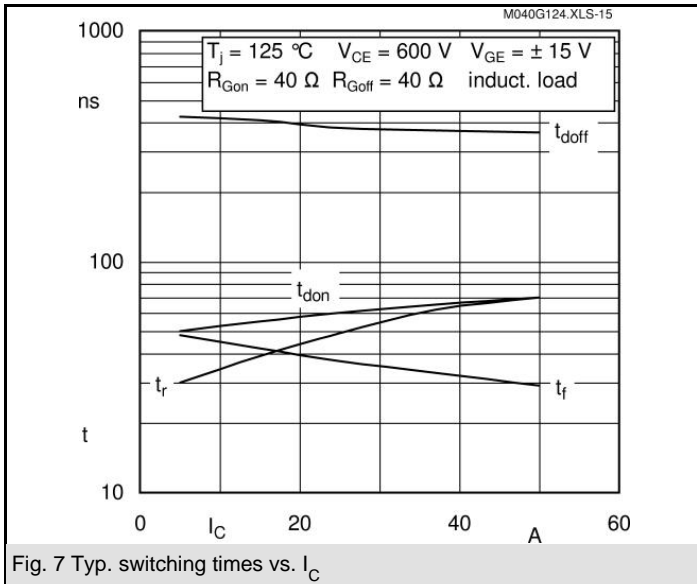


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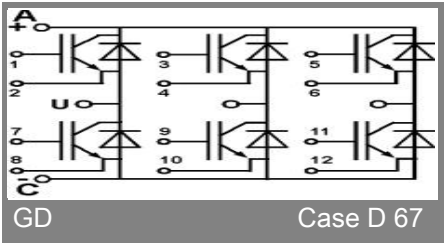
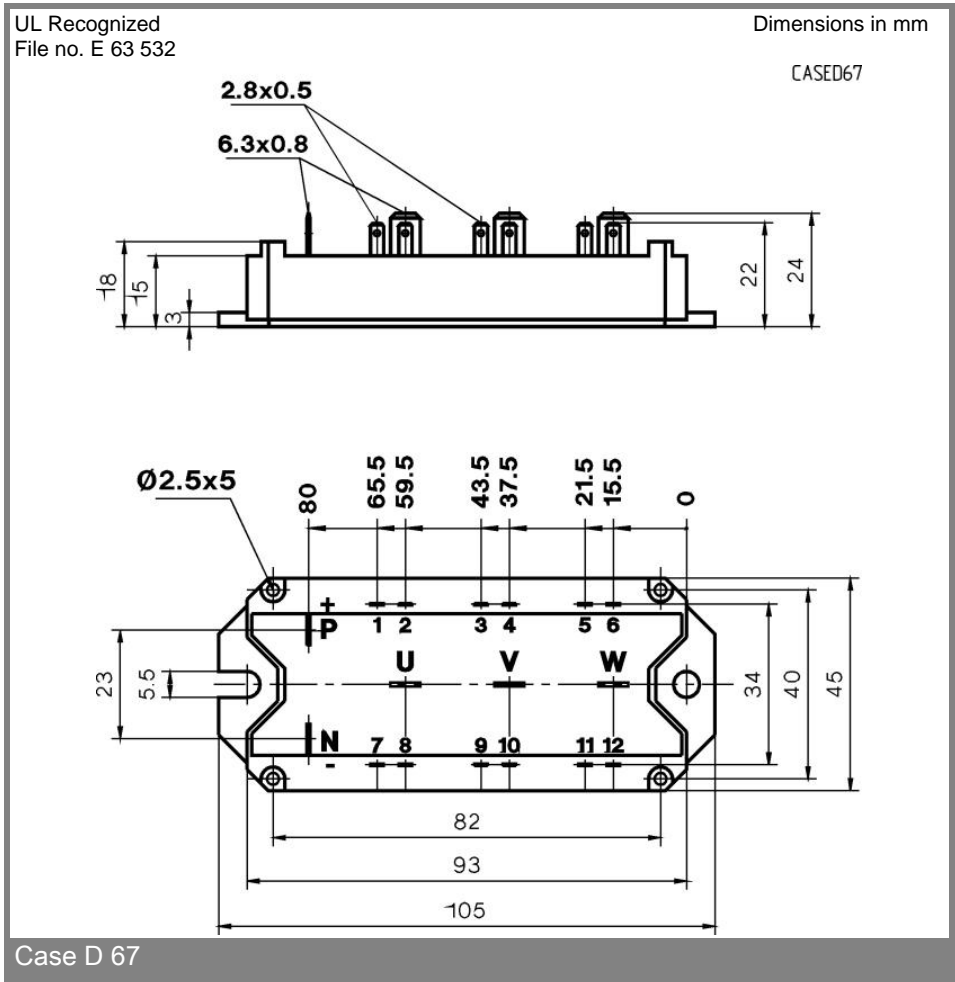
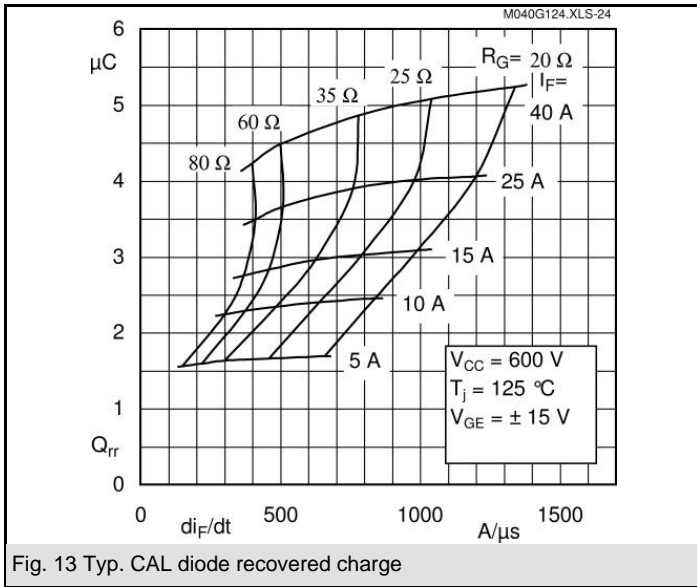
Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25 (65)^\circ\text{C}$	50 (40)	A
I_{CRM}	$t_p = 1 \text{ ms}$	50	A
V_{GES}		± 20	V
T_{vj} (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500	V
Inverse diode			
I_F	$T_c = 25 (80)^\circ\text{C}$	45 (30)	A
I_{FRM}	$t_p = 1 \text{ ms}$	50	A
I_{FSM}	$t_p = 10 \text{ ms}; \text{sin.}; T_j = 150^\circ\text{C}$	350	A

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 1 \text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25 (125)^\circ\text{C}$		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1,1 (1,1)	1,25 (1,25)	V
r_{CE}	$V_{GE} = 15 \text{ V}; T_j = 25 (125)^\circ\text{C}$		40 (5,2)	4,8 (6,4)	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 25 \text{ A}; V_{GE} = 15 \text{ V}$, chip level		2,1 (2,4)	2,45 (2,85)	V
C_{ies}	under following conditions		1,9	2,1	nF
C_{oes}	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		0,25	0,3	nF
C_{res}			0,11	0,15	nF
L_{CE}				60	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25 (125)^\circ\text{C}$				m Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}; I_{Cnom} = 25 \text{ A}$		60		ns
t_r	$R_{Gon} = R_{Goff} = 40 \Omega; T_j = 125^\circ\text{C}$		49		ns
$t_{d(off)}$	$V_{GE} = \pm 15 \text{ V}$		380		ns
t_f			37		ns
$E_{on} (E_{off})$			3,7 (2,9)		mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 25 \text{ A}; V_{GE} = 0 \text{ V}; T_j = 25 (125)^\circ\text{C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 125 ()^\circ\text{C}$		1,1	1,2	V
r_T	$T_j = 125 ()^\circ\text{C}$			44	m Ω
I_{RRM}	$I_{Fnom} = 25 \text{ A}; T_j = 125 ()^\circ\text{C}$		22		A
Q_{rr}	$di/dt = \text{A}/\mu\text{s}$		3,7		μC
E_{rr}	$V_{GE} = \text{V}$				mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,56	K/W
$R_{th(j-c)D}$	per Inverse Diode			1	K/W
$R_{th(c-s)}$	per module			0,05	K/W
Mechanical data					
M_s	to heatsink M5				Nm
M_t	to terminals	4		5	Nm
w				175	g





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

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