



SEMITRANS® 3

Trench IGBT Module

SKM 600GB126D

SKM 600GAL126D

Features

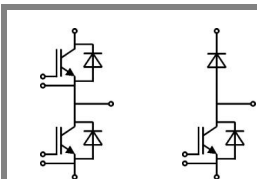
- Trench = Trenchgate technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications*

- AC inverter drives
- UPS
- Electronic welders

Remarks

- $I_{DC} \leq 500A$ for $T_{Terminal} = 100^\circ C$

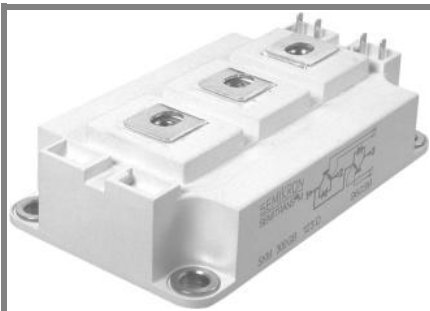


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Absolute Maximum Ratings		$T_c = 25^\circ C$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25^\circ C$	1200	V
I_C	$T_j = 150^\circ C$	$T_c = 25^\circ C$	660
		$T_c = 80^\circ C$	460
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	800	A
V_{GES}		± 20	V
t_{psc}	$V_{CC} = 600 V$; $V_{GE} \leq 20 V$; $T_j = 125^\circ C$ $V_{CES} < 1200 V$	10	μs
Inverse Diode			
I_F	$T_j = 150^\circ C$	$T_c = 25^\circ C$	490
		$T_c = 80^\circ C$	340
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	800	A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 150^\circ C$	2880
Freewheeling Diode			
I_F	$T_j = 150^\circ C$	$T_c = 25^\circ C$	490
		$T_c = 80^\circ C$	340
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	800	A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 150^\circ C$	2880
Module			
$I_{t(RMS)}$		500	A
T_{vj}		- 40 ... + 150	$^\circ C$
T_{stg}		- 40 ... + 125	$^\circ C$
V_{isol}	AC, 1 min.	4000	V

Characteristics		$T_c = 25^\circ C$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 16 mA$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$	$T_j = 25^\circ C$	0,2	0,6	mA
		$T_j = 125^\circ C$			mA
V_{CE0}		$T_j = 25^\circ C$	1	1,2	V
		$T_j = 125^\circ C$	0,9	1,1	V
r_{CE}	$V_{GE} = 15 V$	$T_j = 25^\circ C$	1,8	2,4	$m\Omega$
		$T_j = 125^\circ C$	2,8	3,4	$m\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 400 A$, $V_{GE} = 15 V$	$T_j = 25^\circ C_{chiplev.}$	1,7	2,15	V
		$T_j = 125^\circ C_{chiplev.}$	2	2,45	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0 V$	$f = 1 MHz$	32		nF
C_{oes}			11		nF
C_{res}			2,2		nF
Q_G	$V_{GE} = -8V - +20V$		3600		nC
R_{Gint}	$T_j = ^\circ C$		1,88		Ω
$t_{d(on)}$	$R_{Gon} = 2 \Omega$	$V_{CC} = 600V$ $I_C = 400A$	290		ns
t_r			60		ns
E_{on}			39		mJ
$t_{d(off)}$	$R_{Goff} = 2 \Omega$	$T_j = 125^\circ C$ $V_{GE} = \pm 15V$	670		ns
t_f			80		ns
E_{off}			64		mJ
$R_{th(j-c)}$	per IGBT			0,055	K/W



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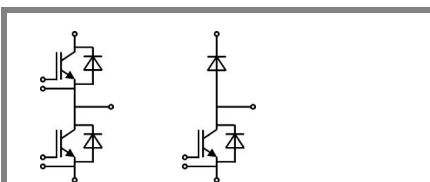
Remarks

- $I_{DC} \leq 500A$ for $T_{Terminal} = 100\text{ }^\circ\text{C}$

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,6	1,8	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	1,6	1,8	V
V_{F0}		$T_j = 25\text{ }^\circ\text{C}$	1	1,1	V
		$T_j = 125\text{ }^\circ\text{C}$	0,8	0,9	V
r_F		$T_j = 25\text{ }^\circ\text{C}$	1,5	1,8	mΩ
		$T_j = 125\text{ }^\circ\text{C}$	2	2,3	mΩ
I_{RRM}	$I_F = 400\text{ A}$	$T_j = 125\text{ }^\circ\text{C}$	475		A
Q_{rr}	$di/dt = 7600\text{ A}/\mu\text{s}$		96		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		41		mJ
$R_{th(j-c)D}$	per diode			0,125	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,6	1,8	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	1,6	1,8	V
V_{F0}		$T_j = 25\text{ }^\circ\text{C}$	1	1,1	V
		$T_j = 125\text{ }^\circ\text{C}$	0,8	0,9	V
r_F		$T_j = 25\text{ }^\circ\text{C}$	1,5	1,8	V
		$T_j = 125\text{ }^\circ\text{C}$	2	2,3	V
I_{RRM}	$I_F = 400\text{ A}$	$T_j = 125\text{ }^\circ\text{C}$	475		A
Q_{rr}	$di/dt = 7600\text{ A}/\mu\text{s}$		96		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		41		mJ
$R_{th(j-c)FD}$	per diode			0,125	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25\text{ }^\circ\text{C}$	0,35		mΩ
		$T_{case} = 125\text{ }^\circ\text{C}$	0,5		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M6		2,5	5	Nm
w				325	g

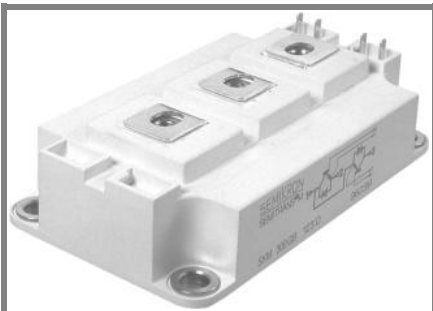
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.



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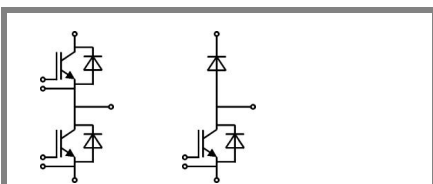
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Remarks

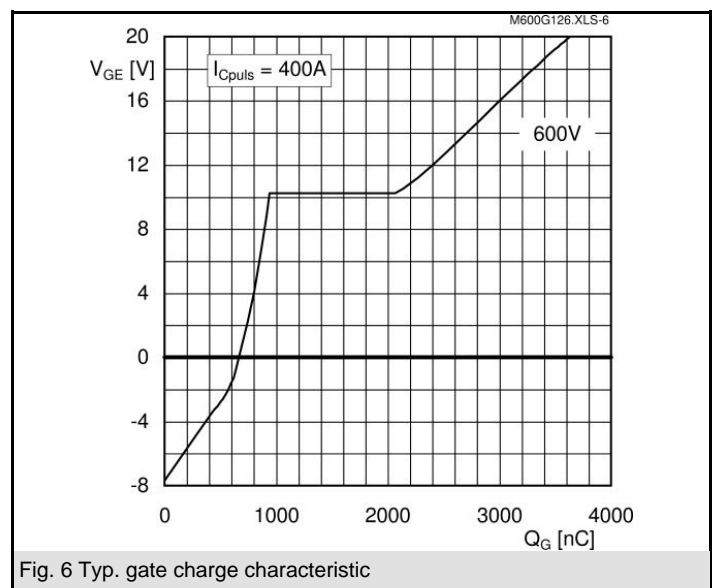
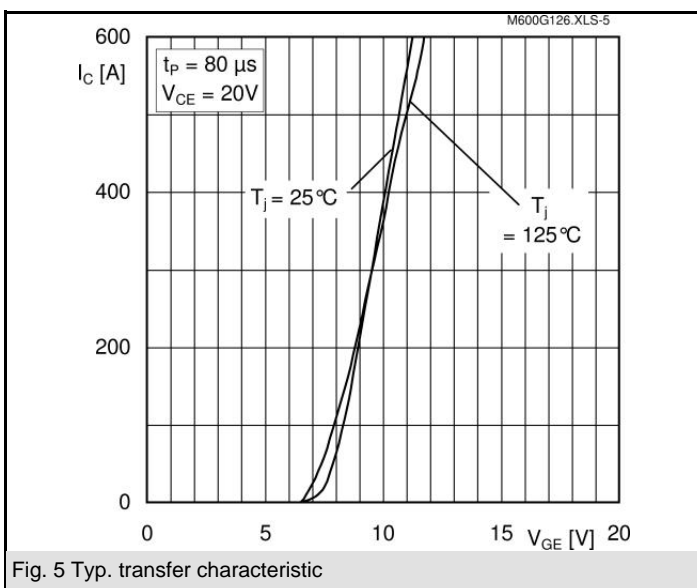
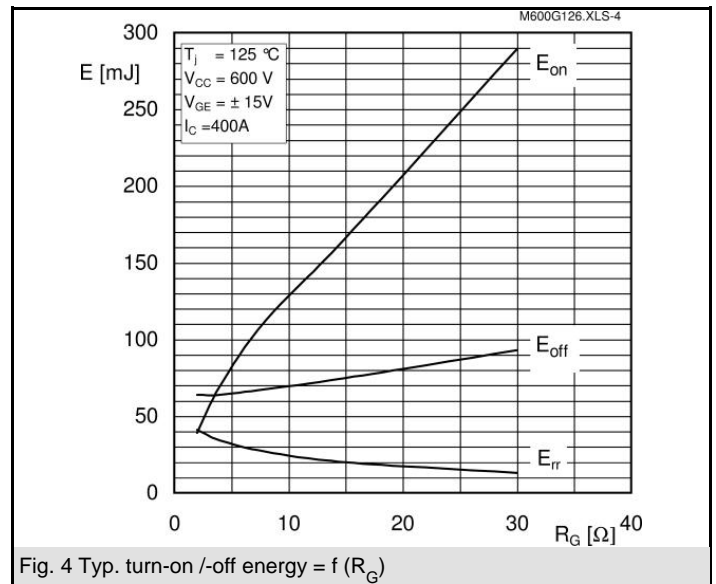
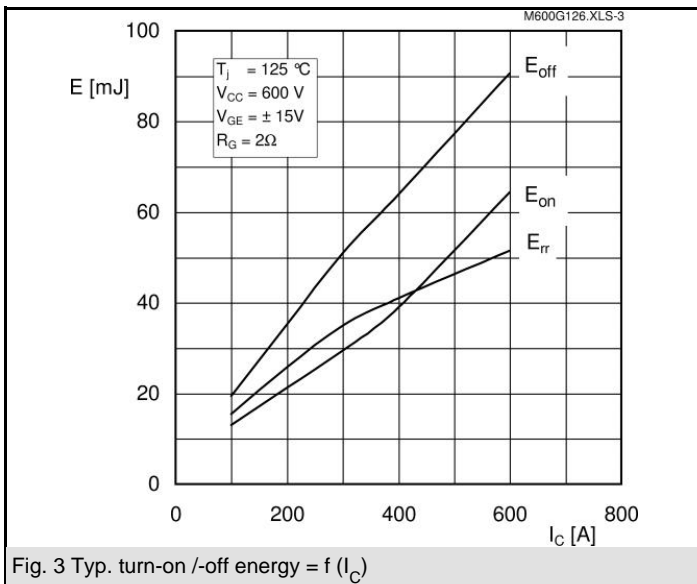
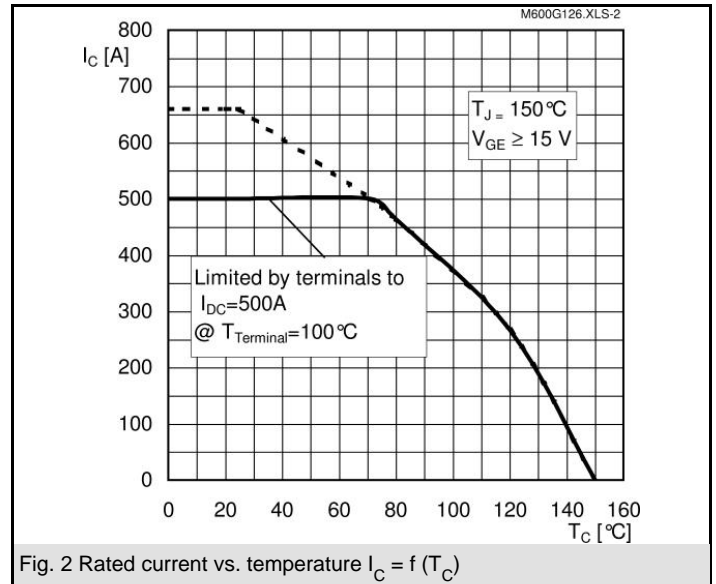
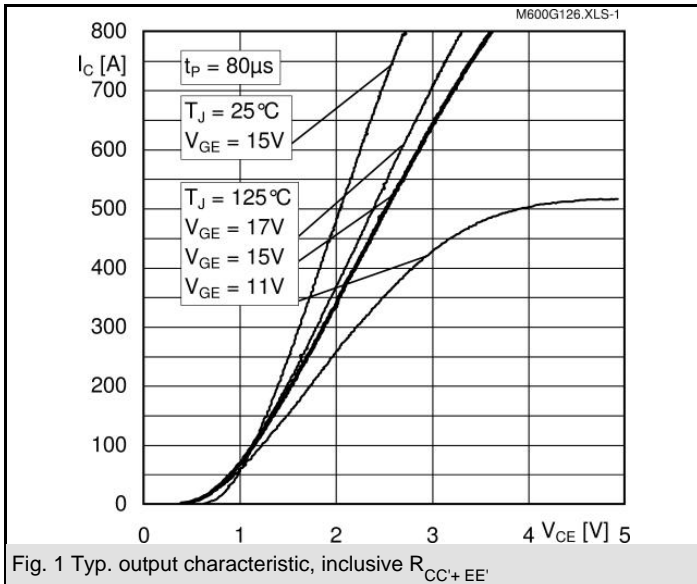
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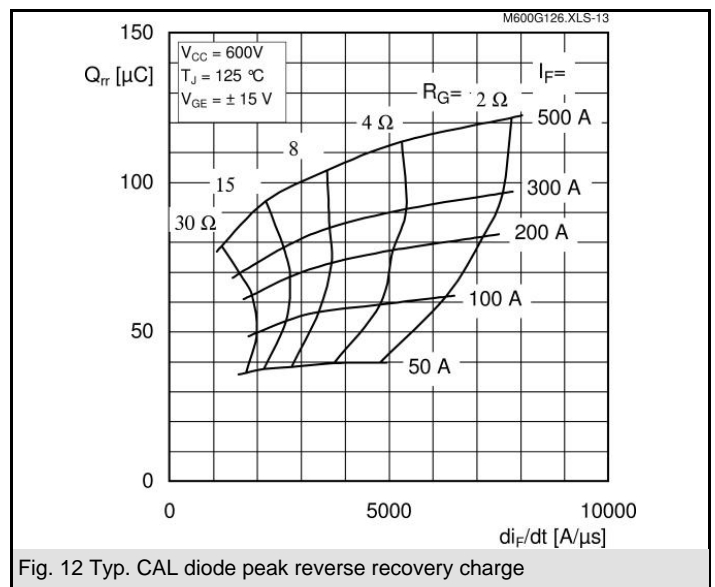
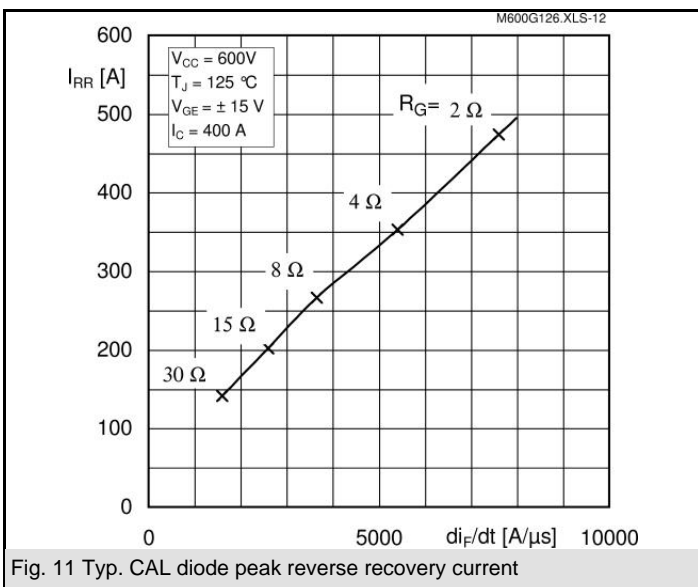
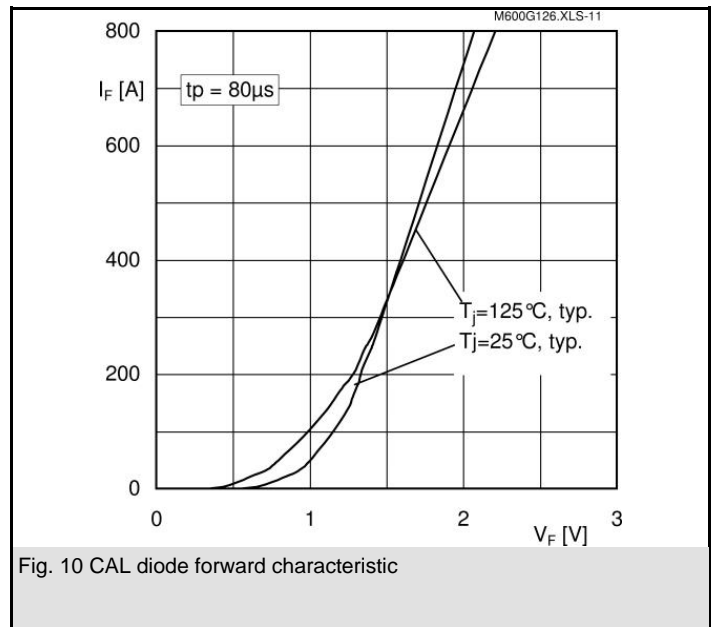
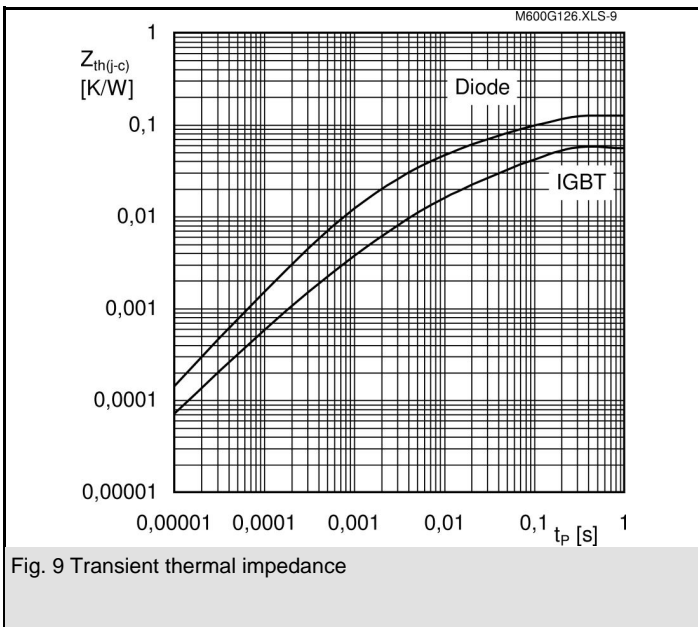
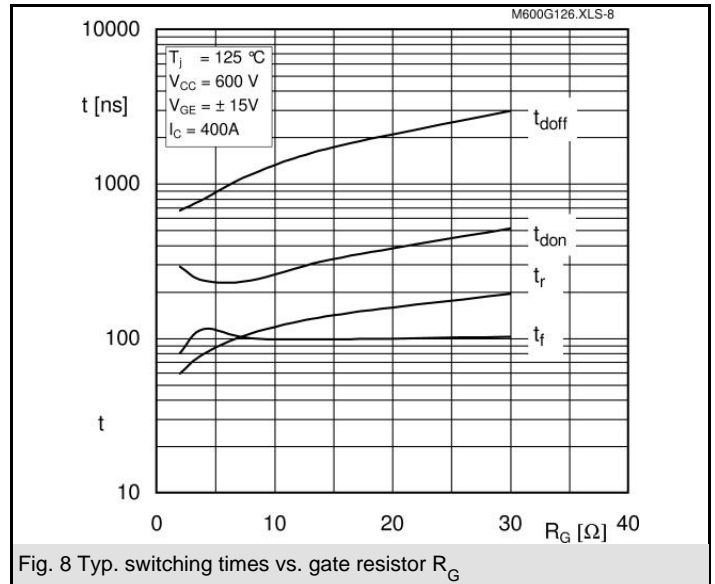
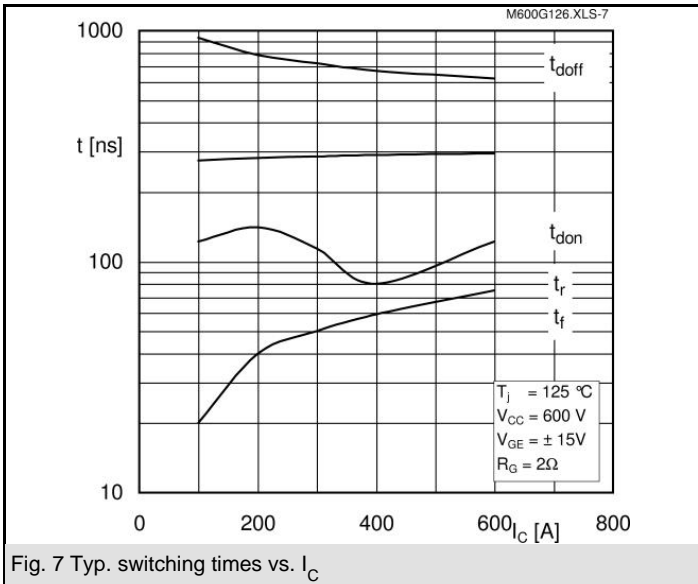
Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
R_f	$i = 1$		38	mk/W
R_f	$i = 2$		13	mk/W
R_f	$i = 3$		3,4	mk/W
R_f	$i = 4$		0,6	mk/W
τ_{u_i}	$i = 1$		0,0836	s
τ_{u_i}	$i = 2$		0,009	s
τ_{u_i}	$i = 3$		0,0024	s
τ_{u_i}	$i = 4$		0,0002	s
$Z_{th(j-c)D}$				
R_f	$i = 1$		75	mk/W
R_f	$i = 2$		39	mk/W
R_f	$i = 3$		9,5	mk/W
R_f	$i = 4$		1,5	mk/W
τ_{u_i}	$i = 1$		0,0327	s
τ_{u_i}	$i = 2$		0,0101	s
τ_{u_i}	$i = 3$		0,002	s
τ_{u_i}	$i = 4$		0,0003	s



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Case D 56



GB Case D 56



GAL Case D 57