



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB126D

SKM 200GAL126D

Features

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

Typical Applications*

- Electronic welders
- AC inverter drives
- UPS



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Absolute Maximum Ratings		$T_{case} = 25^\circ C$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ C$	1200		V
I_C	$T_j = 150^\circ C$	$T_c = 25^\circ C$	260	
		$T_c = 80^\circ C$	190	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	300		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	$T_j = 150^\circ C$	$T_c = 25^\circ C$	200	
		$T_c = 80^\circ C$	140	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 150^\circ C$	1100	
Freewheeling Diode				
I_F	$T_j = 150^\circ C$	$T_c = 25^\circ C$	200	
		$T_c = 80^\circ C$	140	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 150^\circ C$	1100	
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		$T_{case} = 25^\circ C$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6 mA$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$	$T_j = 25^\circ C$	0,1		mA
		$T_j = 125^\circ C$	0,3		
V_{CE0}		$T_j = 25^\circ C$	1		V
		$T_j = 125^\circ C$	0,9		
r_{CE}	$V_{GE} = 15 V$	$T_j = 25^\circ C$	4,7		$m\Omega$
		$T_j = 125^\circ C$	7,3		
$V_{CE(sat)}$	$I_{Cnom} = 150 A$, $V_{GE} = 15 V$	$T_j = 25^\circ C_{chiplev.}$	1,7		V
		$T_j = 125^\circ C_{chiplev.}$	2		
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0 V$	$f = 1 MHz$	10,8		nF
C_{oes}			0,9		nF
C_{res}			0,9		nF
Q_G	$V_{GE} = -8V - +20V$	1530		nC	
R_{Gint}	$T_j = 25^\circ C$	5		Ω	
$t_{d(on)}$	$R_{Gon} = 1,5 \Omega$	$V_{CC} = 600V$ $I_C = 150A$	260		ns
			$T_j = 125^\circ C$	40	
t_r	$R_{Goff} = 1,5 \Omega$	$V_{GE} = \pm 15V$	18		mJ
E_{on}			540		ns
$t_{d(off)}$	$R_{Goff} = 1,5 \Omega$	$V_{GE} = \pm 15V$	110		ns
t_f			110		mJ
E_{off}	per IGBT		0,13		K/W



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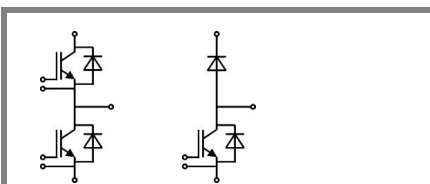
Typical Applications*

- Electronic welders
- AC inverter drives
- UPS

Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
Inverse diode						
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		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		$T_j = 25 \text{ }^\circ\text{C}$		4	4,7	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$		5,3	6	mΩ
I_{RRM}	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		240		A
Q_{rr}	$di/dt = 5000 \text{ A}/\mu\text{s}$			42		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$					mJ
$R_{th(j-c)D}$	per diode				0,3	K/W
FWD						
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		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		$T_j = 25 \text{ }^\circ\text{C}$		4	4,7	V
		$T_j = 125 \text{ }^\circ\text{C}$		5,3	6	V
I_{RRM}	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		240		A
Q_{rr}	$di/dt = 5000 \text{ A}/\mu\text{s}$			42		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$					mJ
$R_{th(j-c)FD}$	per diode				0,3	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 M5			2,5	5	Nm
w					325	g

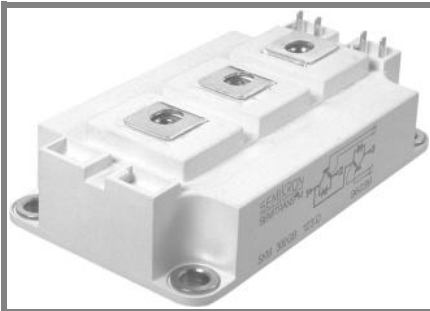
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* 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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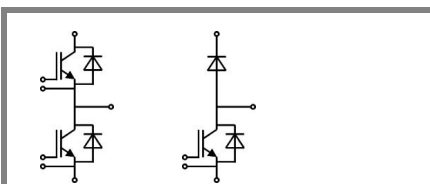
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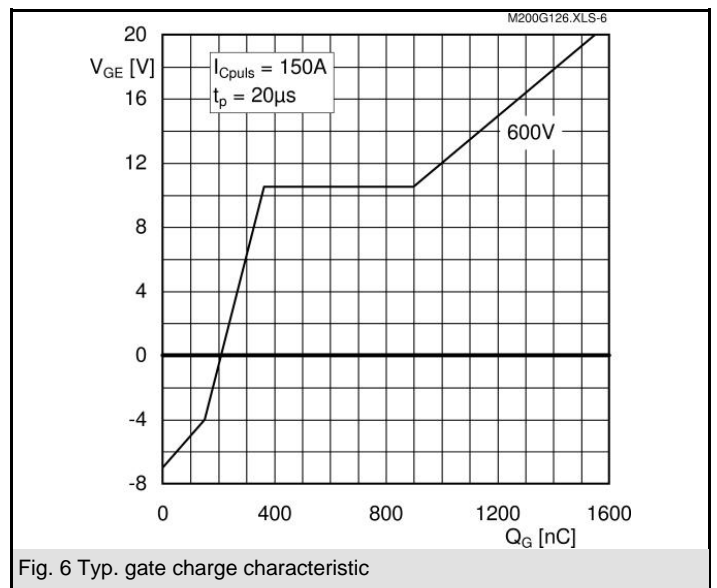
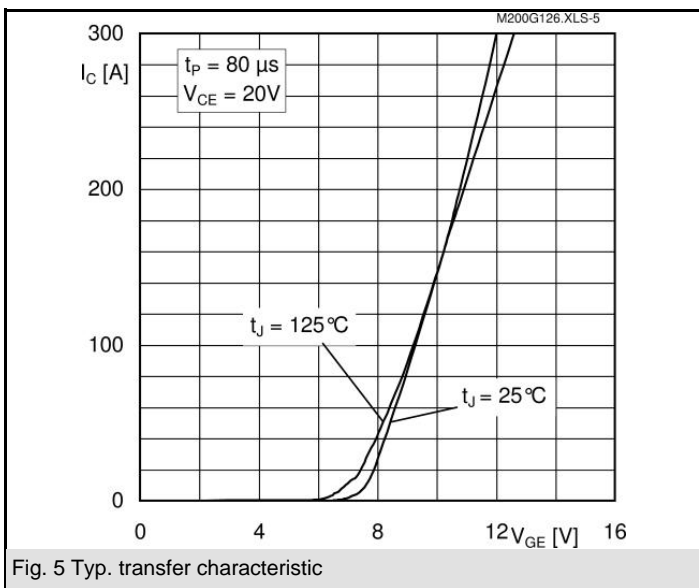
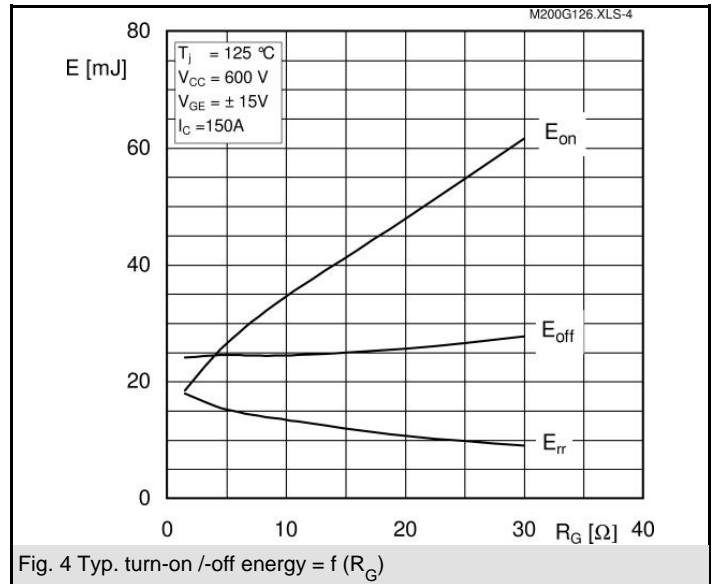
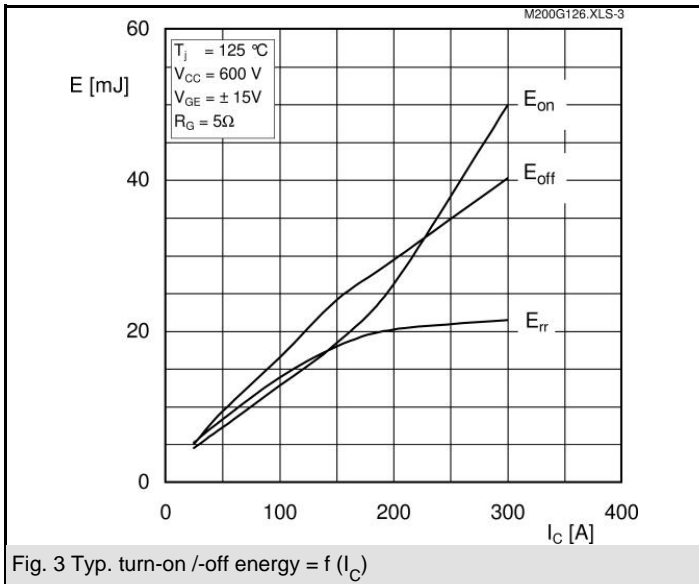
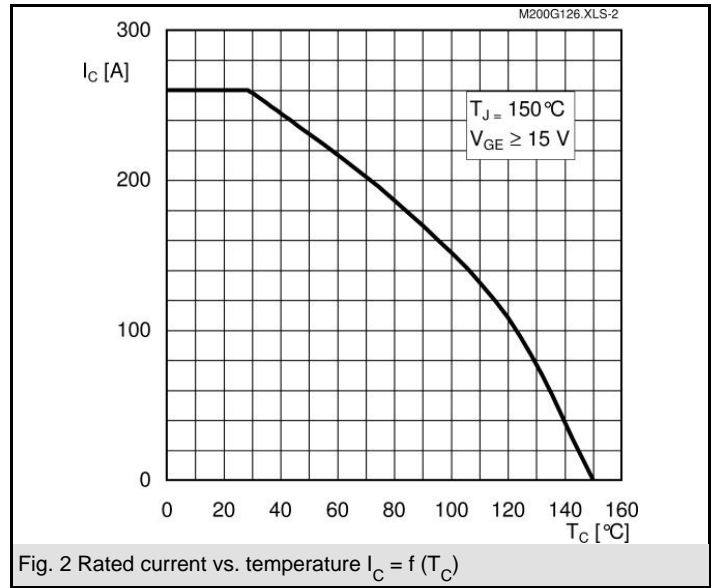
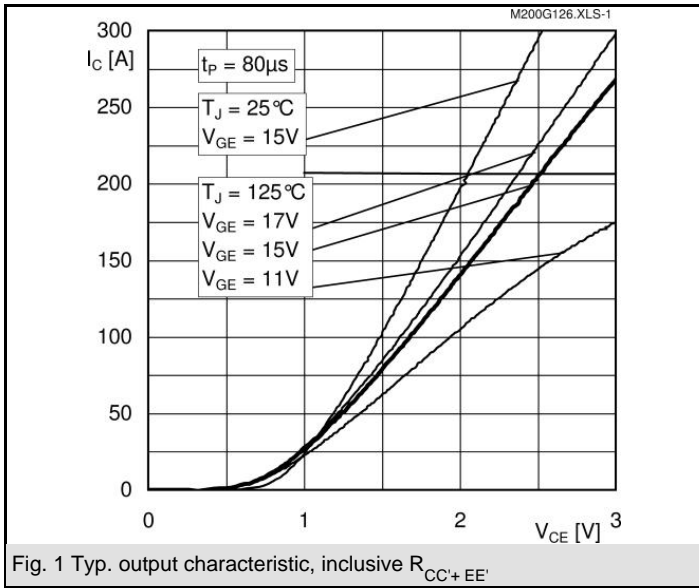
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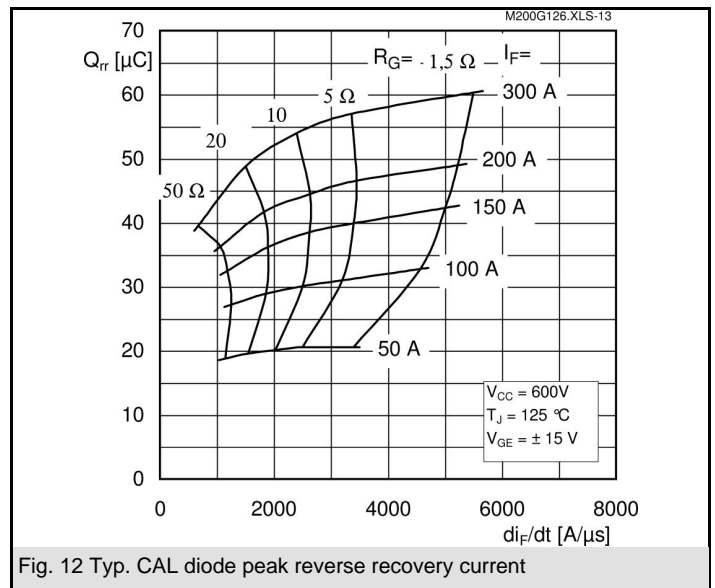
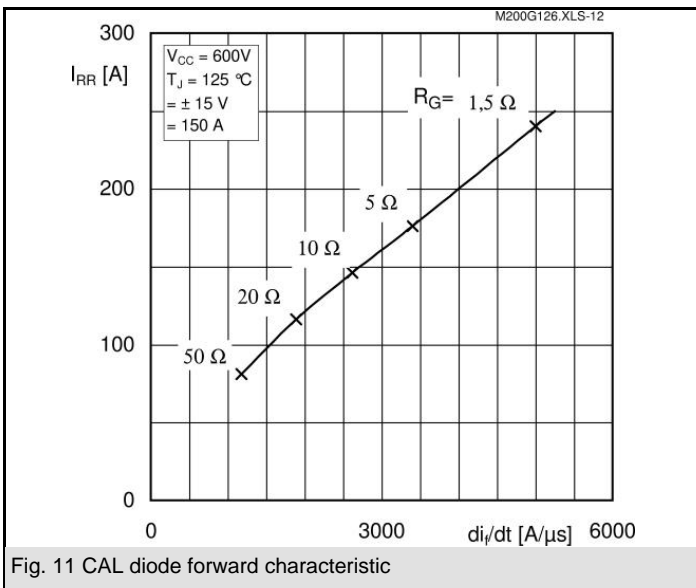
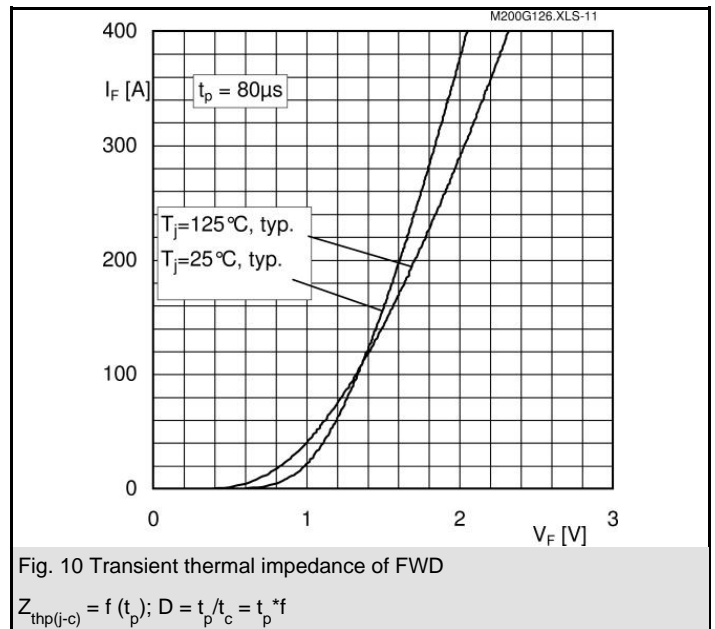
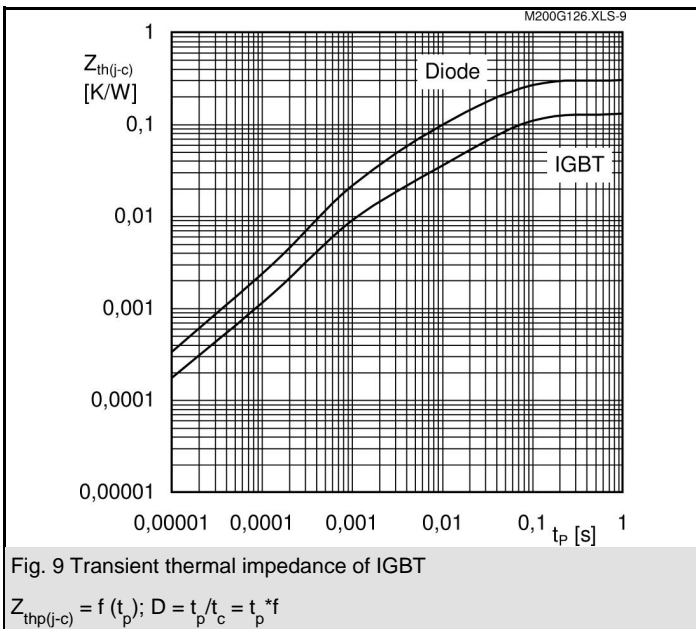
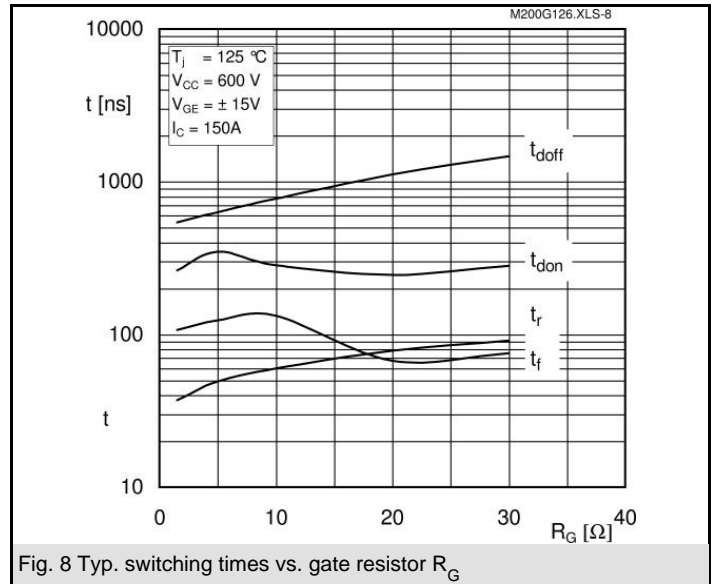
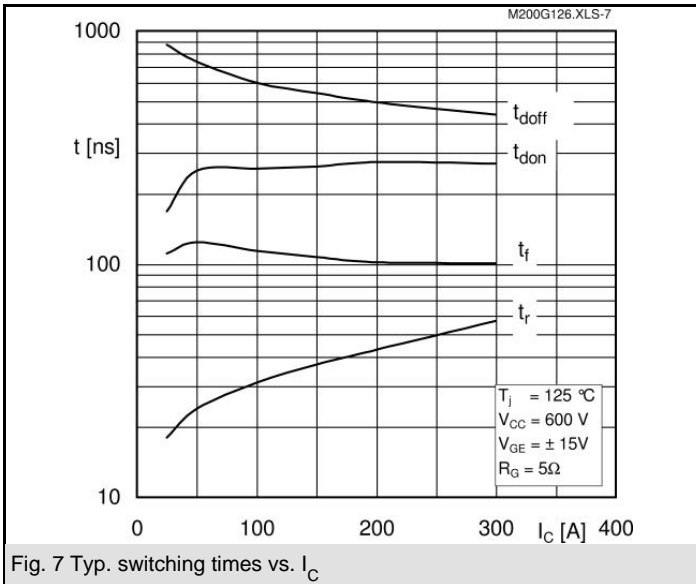
Z_{th}		Conditions	Values	Units
Symbol				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		$i = 1$	95	mk/W
$R_{\theta j-c}$		$i = 2$	27	mk/W
$R_{\theta j-c}$		$i = 3$	6,7	mk/W
$R_{\theta j-c}$		$i = 4$	1,3	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0744	s
$\tau_{th(j-c)}$		$i = 2$	0,0087	s
$\tau_{th(j-c)}$		$i = 3$	0,002	s
$\tau_{th(j-c)}$		$i = 4$	0,0001	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$		$i = 1$	200	mk/W
$R_{\theta j-c}$		$i = 2$	80	mk/W
$R_{\theta j-c}$		$i = 3$	17	mk/W
$R_{\theta j-c}$		$i = 4$	3	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0536	s
$\tau_{th(j-c)}$		$i = 2$	0,0056	s
$\tau_{th(j-c)}$		$i = 3$	0,09	s
$\tau_{th(j-c)}$		$i = 4$	0,0002	s



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Case D 56



Case D56

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Case D57

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