



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		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V	
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	260	A
		$T_c = 80^\circ\text{C}$	190	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	300	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	μs	
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	140	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300	A	
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	1100	A
Freewheeling Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	140	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300	A	
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	1100	A
Module				
$I_{t(RMS)}$		500	A	
T_{vj}		- 40 ... + 150	$^\circ\text{C}$	
T_{stg}		- 40 ... + 125	$^\circ\text{C}$	
V_{isol}	AC, 1 min.	4000	V	

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 6\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,1	0,3	mA
		$T_j = 125^\circ\text{C}$			mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1	1,2	V
		$T_j = 125^\circ\text{C}$	0,9	1,1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	4,7	6,3	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	7,3	9	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,7	2,15	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2	2,45	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	10,8		nF
C_{oes}			0,9		nF
C_{res}			0,9		nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		1530		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		5		Ω
$t_{d(on)}$	$R_{Gon} = 1,5\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 150\text{ A}$	260		ns
			40		ns
t_r	$R_{Goff} = 1,5\ \Omega$	$T_j = 125^\circ\text{C}$	18		mJ
			540		ns
E_{on}		$V_{GE} = \pm 15\text{ V}$	110		ns
					mJ
$R_{th(j-c)}$	per IGBT			0,13	K/W



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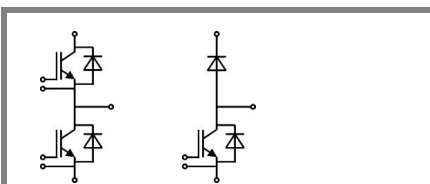
Typical Applications*

- Electronic welders
- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
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

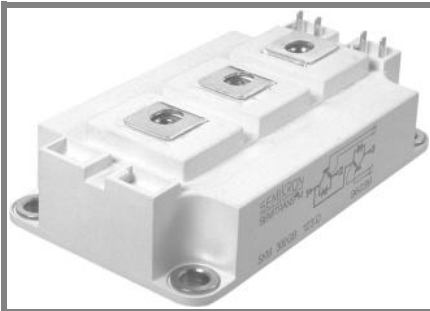
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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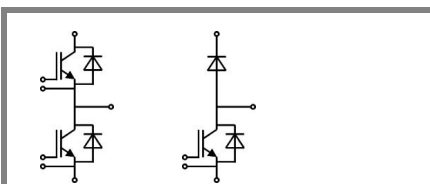
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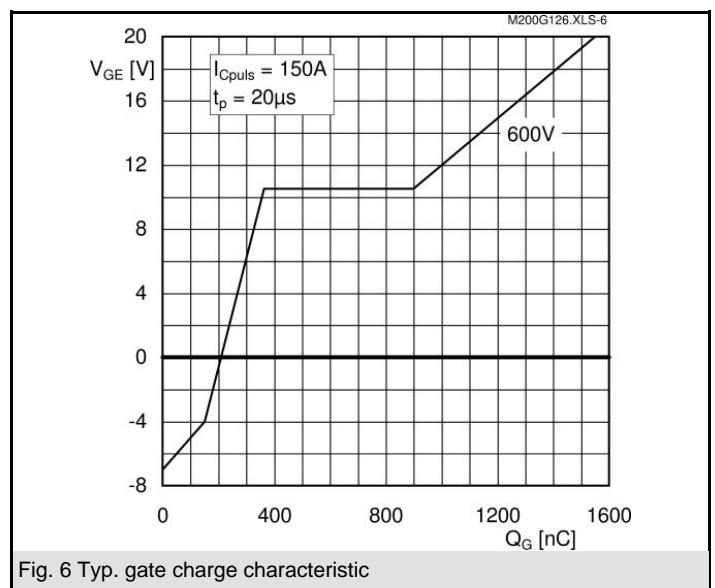
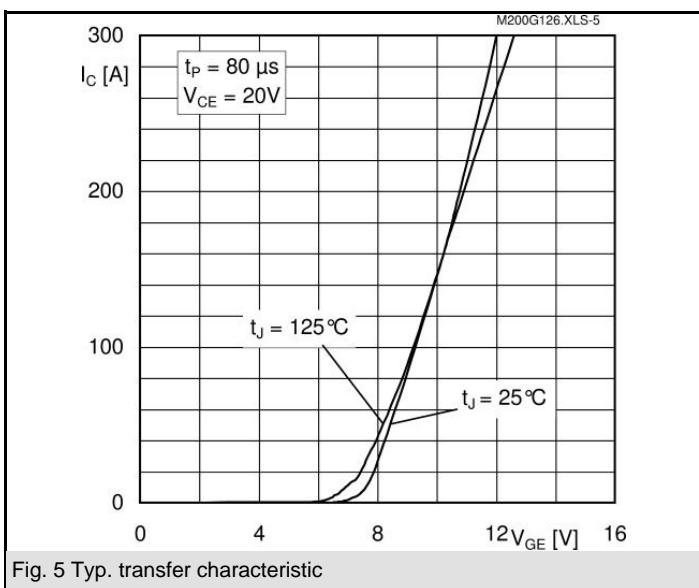
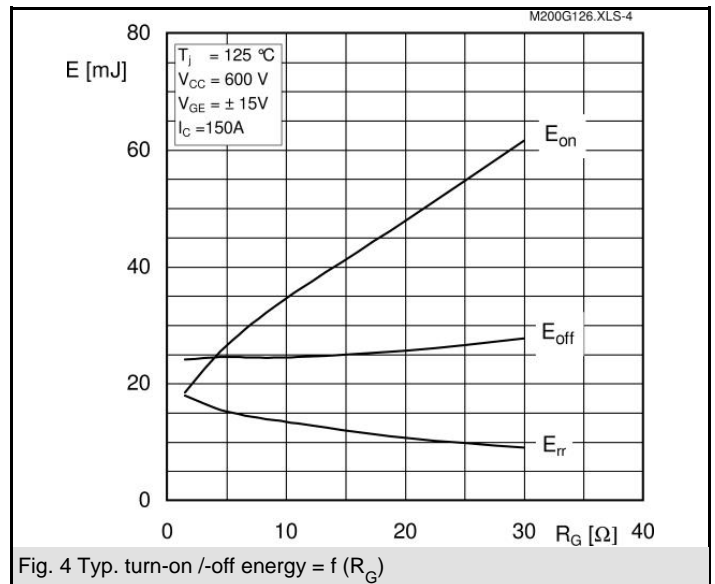
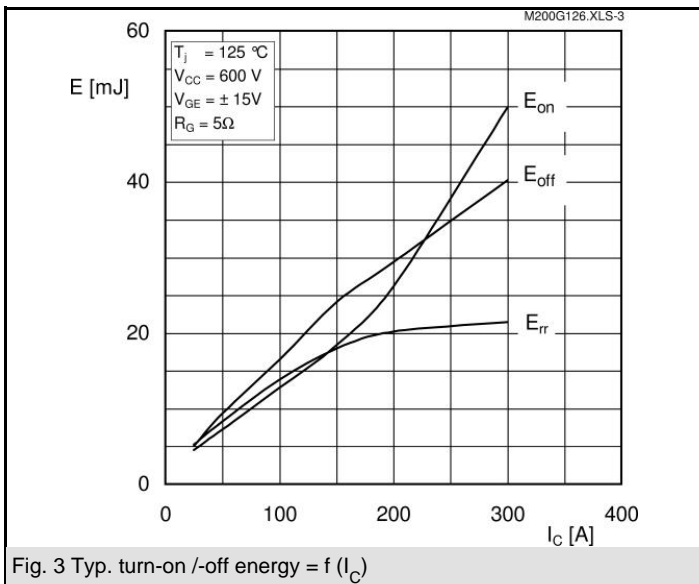
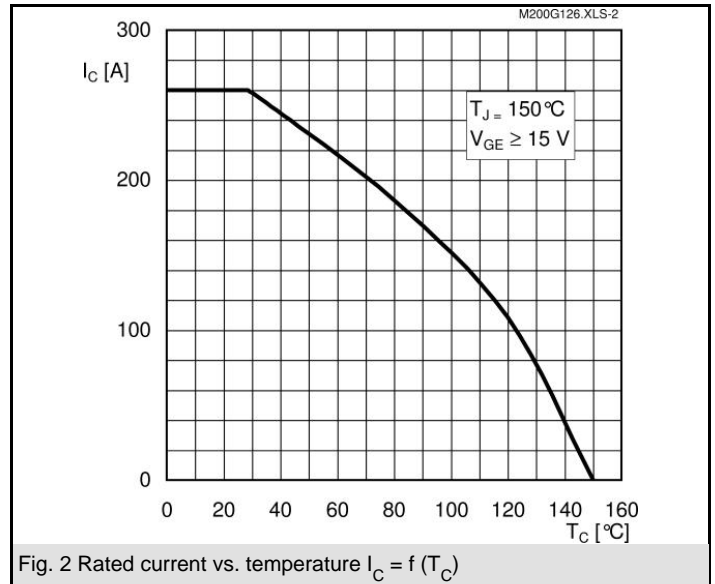
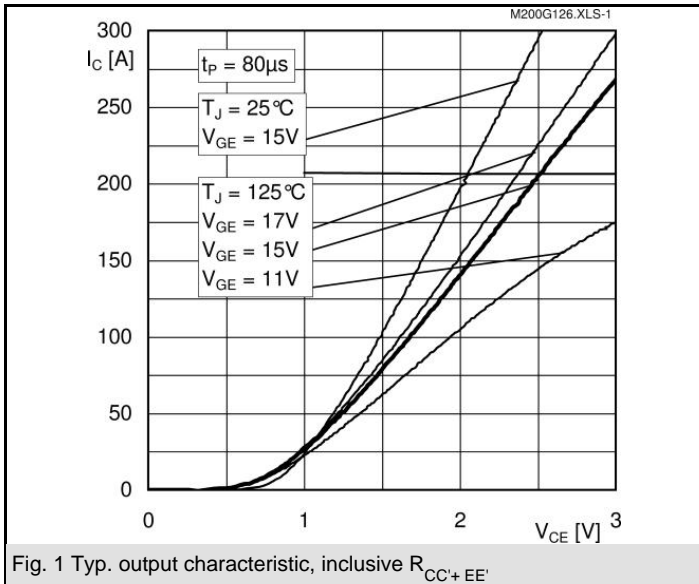
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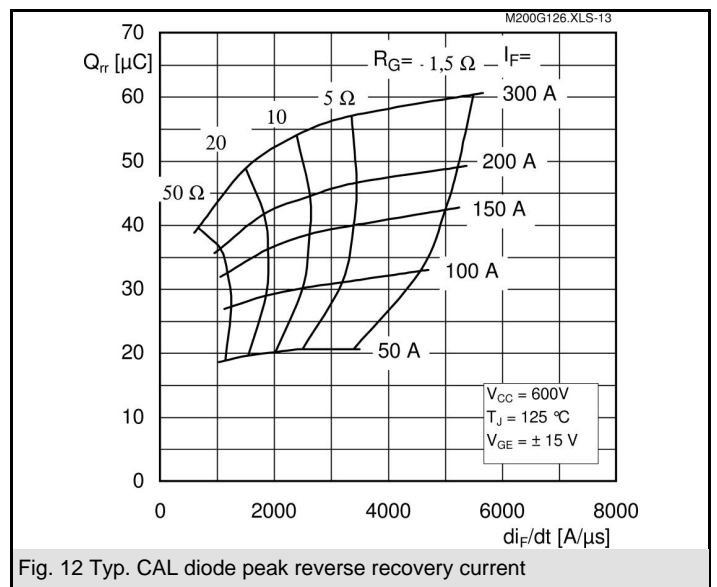
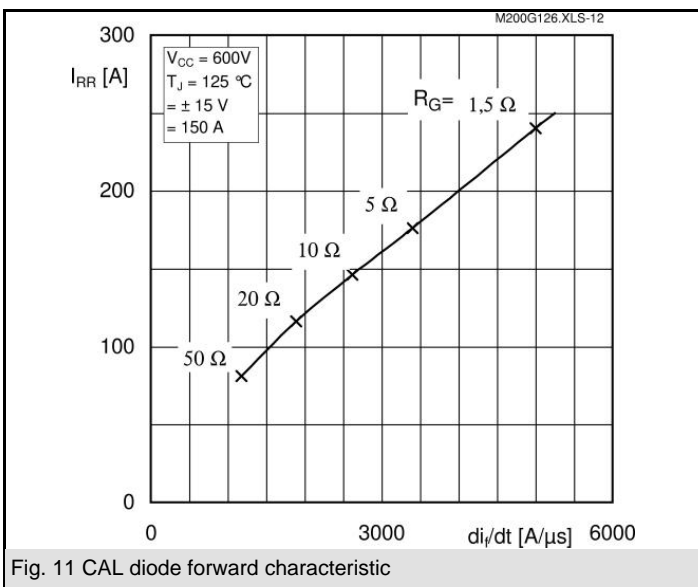
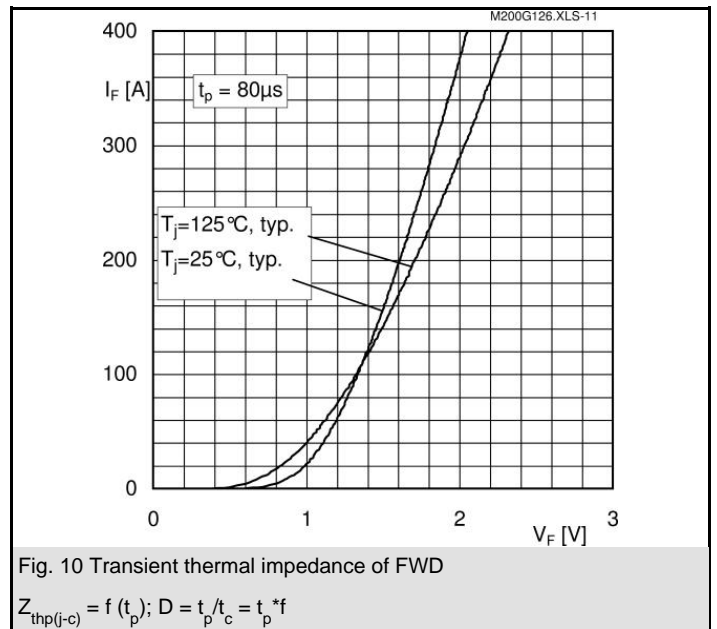
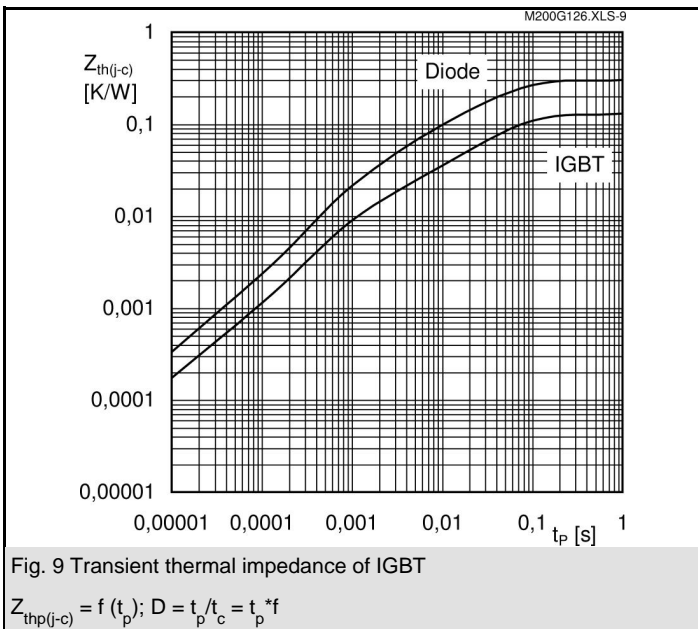
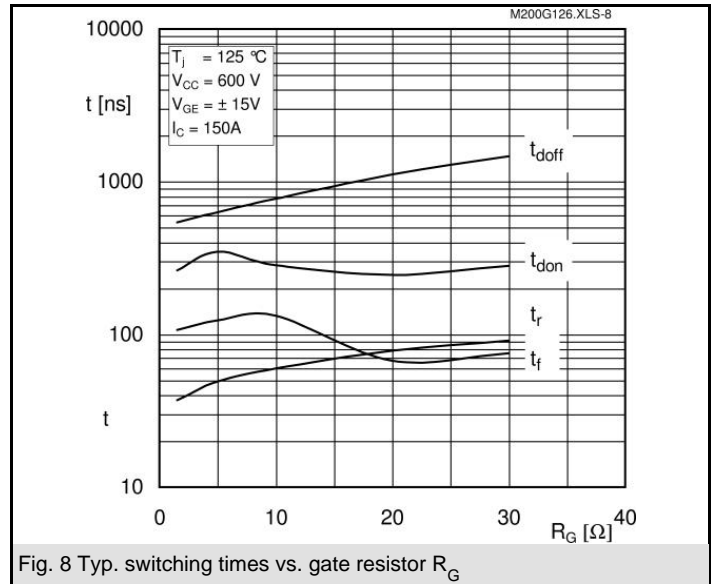
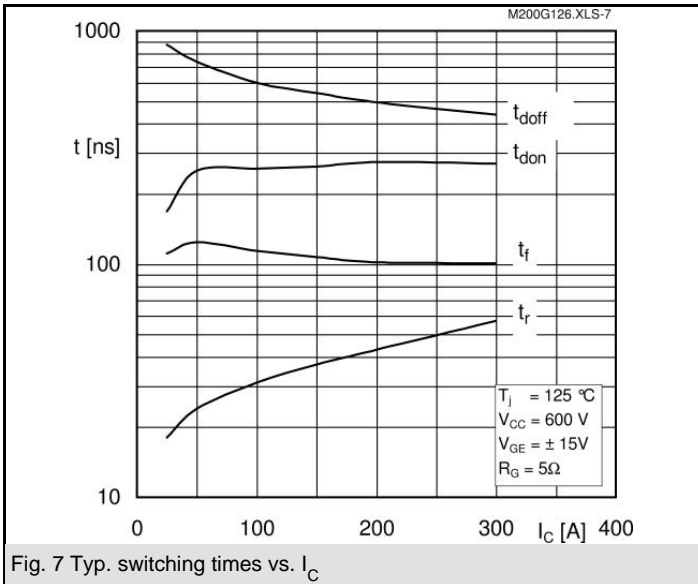
Z_{th}		Conditions	Values	Units
Symbol				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		95	mk/W
$R_{\theta j-c}$	$i = 2$		27	mk/W
$R_{\theta j-c}$	$i = 3$		6,7	mk/W
$R_{\theta j-c}$	$i = 4$		1,3	mk/W
$\tau_{th(j-c)}$	$i = 1$		0,0744	s
$\tau_{th(j-c)}$	$i = 2$		0,0087	s
$\tau_{th(j-c)}$	$i = 3$		0,002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