

SKM 100GB176D



SEMITRANS® 2

Trench IGBT Modules

SKM 100GB176D

Preliminary Data

Features

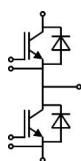
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.

Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1700	V
I _C	T _j = 150 °C	T _c = 25 °C	125	A
		T _c = 80 °C	90	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		150	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 1200 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1700 V		10	μs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	100	A
		T _c = 80 °C	70	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		150	A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C		720	A
Module				
I _{t(RMS)}			200	A
T _{vj}			- 40 ... +150	°C
T _{stg}			- 40 ... +125	°C
V _{isol}	AC, 1 min.		4000	V

Characteristics			T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 3 mA		5,2	5,8	6,4	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1	1,2	V
		T _j = 125 °C		0,9	1,1	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		13	16,7	mΩ
		T _j = 125°C		20	24	mΩ
V _{CE(sat)}	I _{Cnom} = 75 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}		2	2,45	V
		T _j = 125°C _{chiplev.}		2,4	2,9	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		5,7		nF
C _{oes}				0,28		nF
C _{res}				0,22		nF
Q _G	V _{GE} = -8V/+15V			620		nC
R _{Gint}	T _j = 25 °C			8,5		Ω
t _{d(on)}	R _{Gon} = 4,2 Ω di/dt = 1680 A/μs	V _{CC} = 1200V I _{Cnom} = 75A T _j = 125 °C V _{GE} = -15V L _s = 20 nH		280		ns
t _r				40		ns
E _{on}				44		mJ
t _{d(off)}	R _{Goff} = 4,2 Ω			680		ns
t _f	di/dt = 490 A/μs			140		ns
E _{off}				28,5		mJ
R _{th(j-c)}	per IGBT				0,24	K/W



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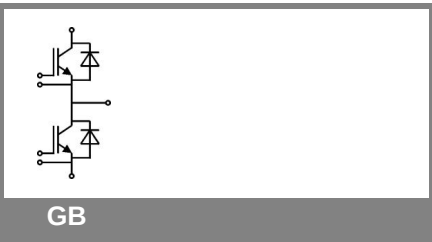
Typical Applications

- AC inverter drives mains 575 - 750 V AC
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Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75\text{ A}; V_{GE} = 0\text{ V}$ $T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$ $T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,6 1,6	1,9 1,9	V V
V_{F0}	$T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$		1,1 0,9	1,3 1,1	V V
r_F	$T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$		6,7 9,3	8 11	mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 75\text{ A}$ $di/dt = 1650\text{ A}/\mu\text{s}$ $V_{GE} = -15\text{ V}; V_{CC} = 1200\text{ V}$ $T_j = 125\text{ }^{\circ}\text{C}$ $L_S = 20\text{ nH}$		78,5 29,6 21,4		A μC mJ
$R_{th(j-c)D}$	per diode			0,45	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_{case} = 25\text{ }^{\circ}\text{C}$ $T_{case} = 125\text{ }^{\circ}\text{C}$		0,75 1		mΩ mΩ
$R_{th(c-s)}$	per module			0,05	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M5		2,5	5	Nm
w				160	g

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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.



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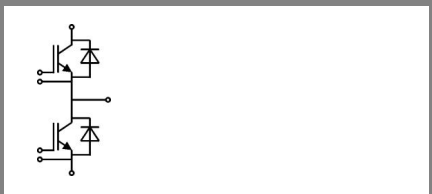
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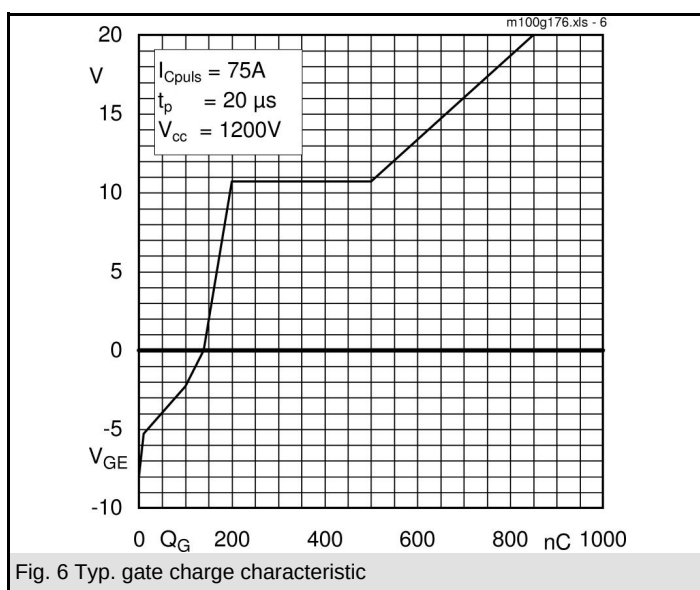
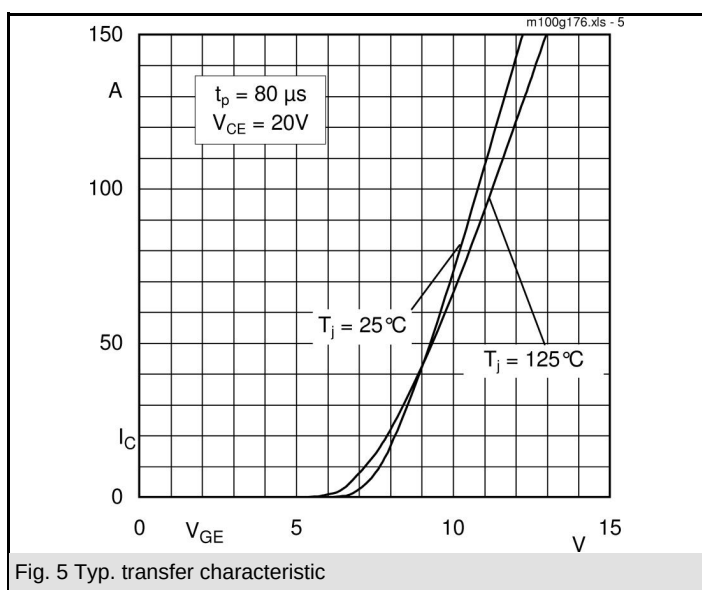
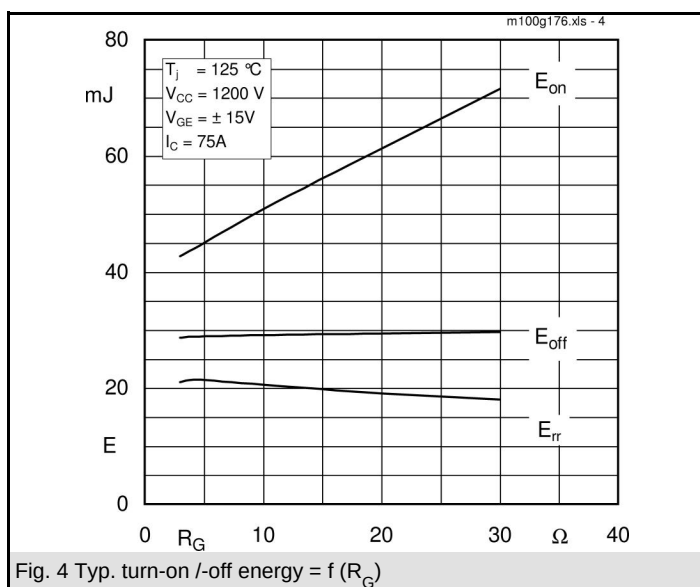
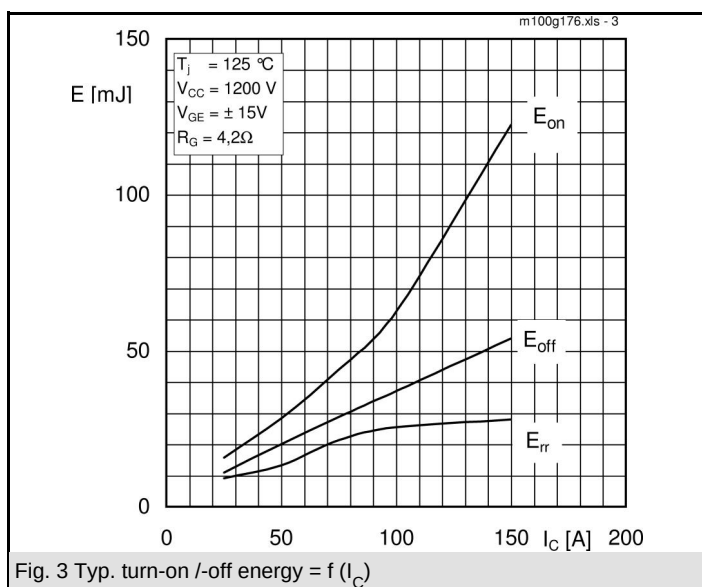
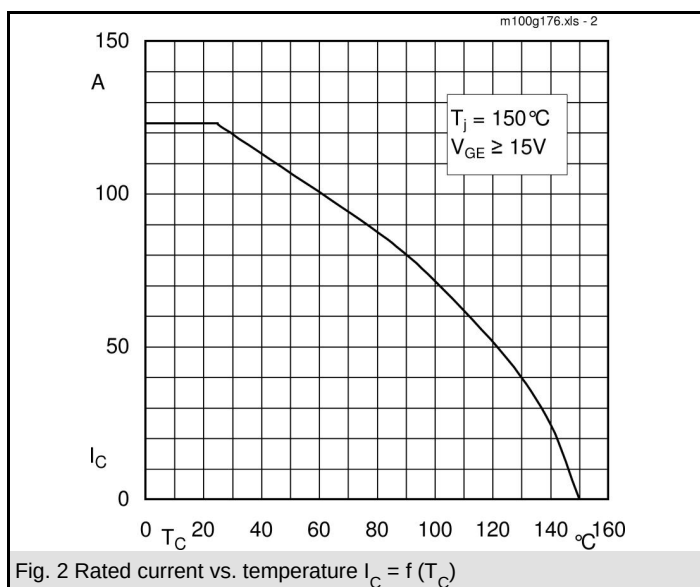
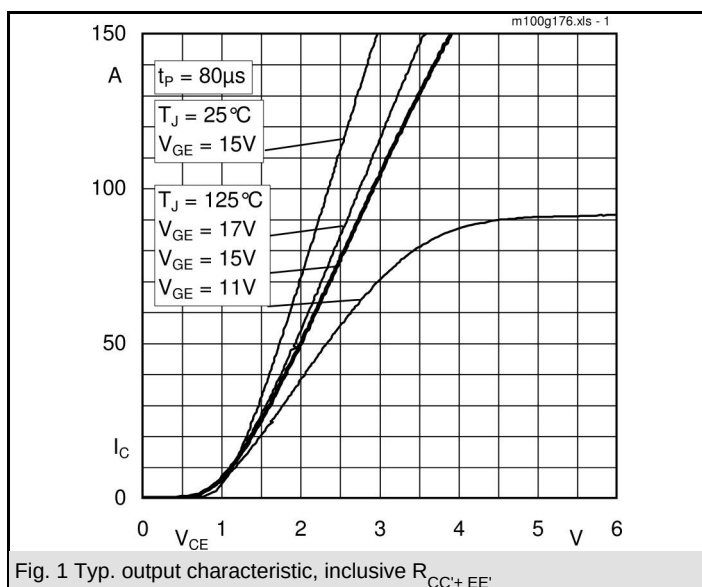
Typical Applications

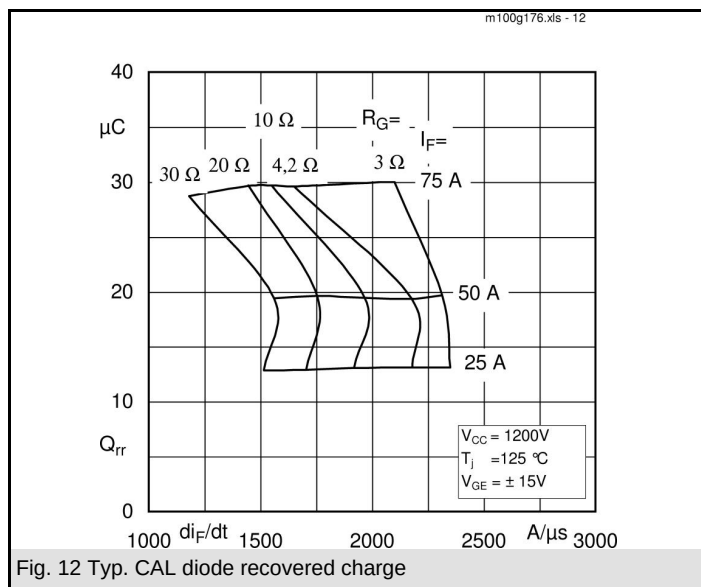
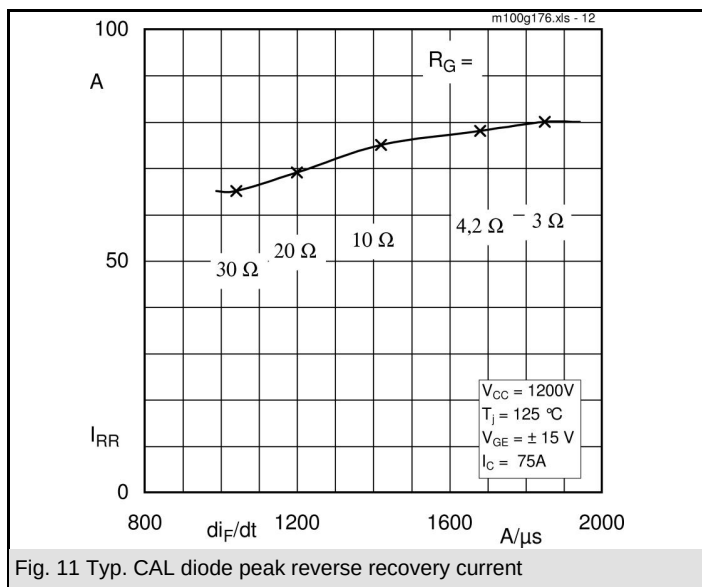
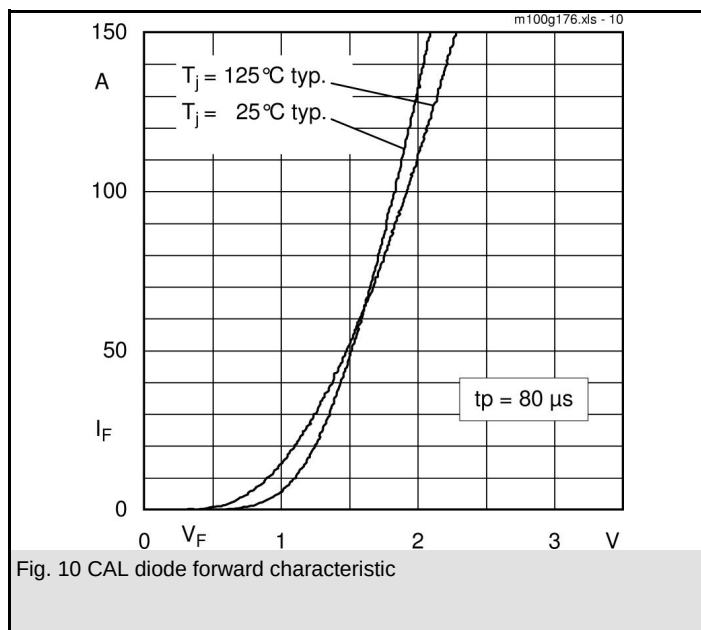
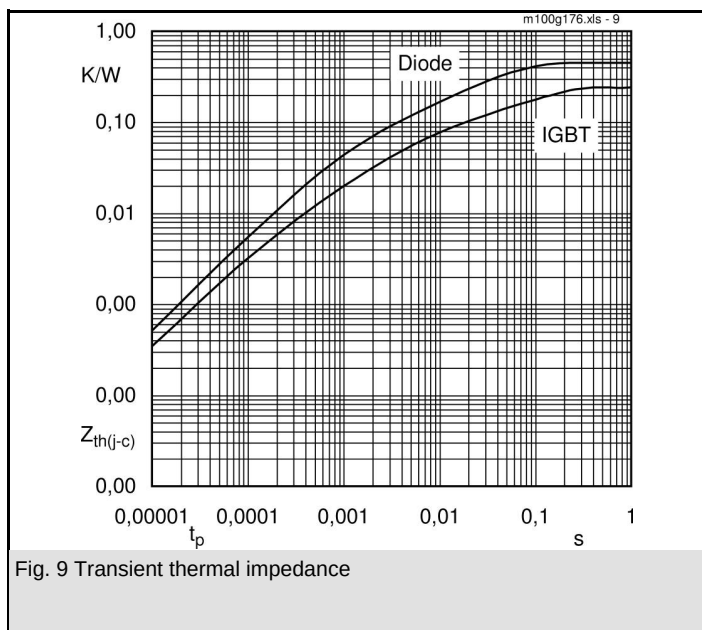
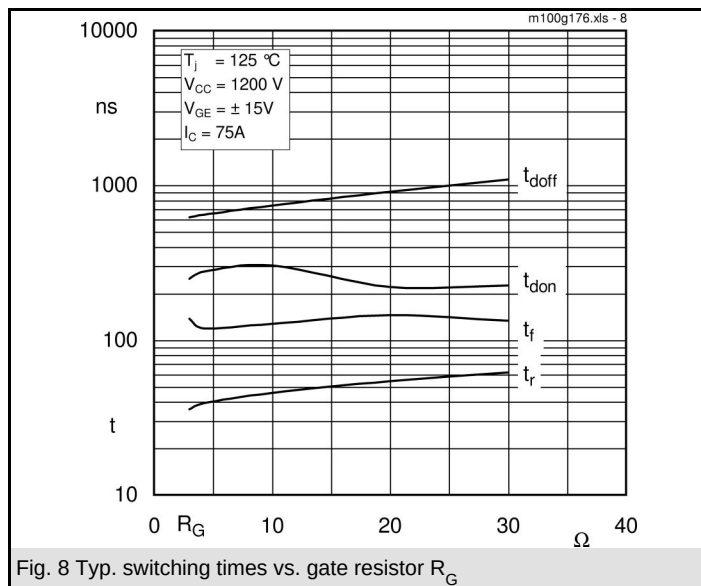
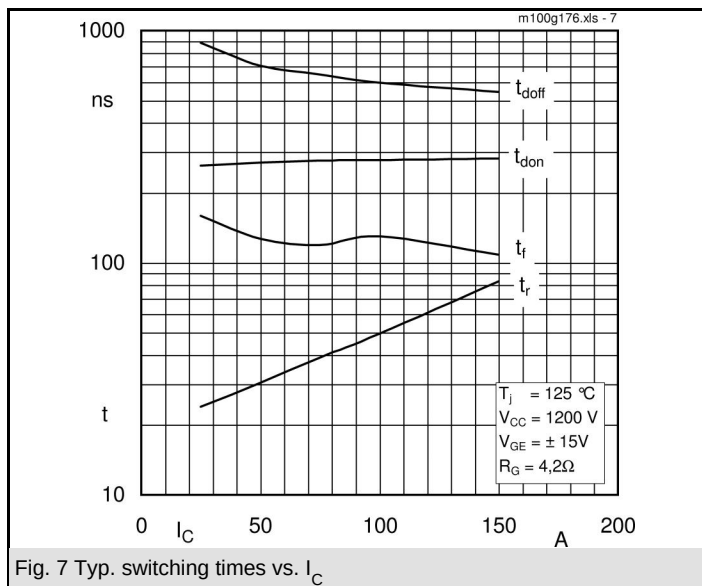
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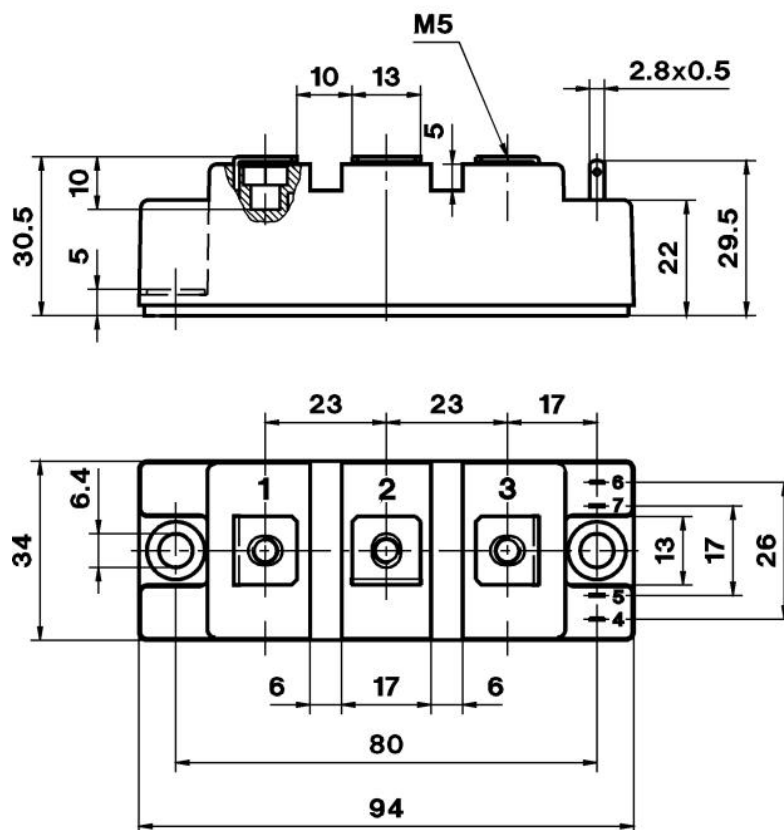
Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	160	mk/W
R_i	$i = 2$	60	mk/W
R_i	$i = 3$	16,5	mk/W
R_i	$i = 4$	3,5	mk/W
τ_{u_i}	$i = 1$	0,1056	s
τ_{u_i}	$i = 2$	0,009	s
τ_{u_i}	$i = 3$	0,0011	s
τ_{u_i}	$i = 4$	0,0005	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	270	mk/W
R_i	$i = 2$	139	mk/W
R_i	$i = 3$	37	mk/W
R_i	$i = 4$	4	mk/W
τ_{u_i}	$i = 1$	0,0475	s
τ_{u_i}	$i = 2$	0,0104	s
τ_{u_i}	$i = 3$	0,0011	s
τ_{u_i}	$i = 4$	0,0003	s



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Case D 61

