

SKM 300GB125D



SEMITRANS® 3

Ultra Fast IGBT Module

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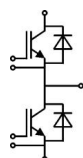
Preliminary Data

Features

- NPT - Non punch-through IGBT
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

- Switched mode power supplies at $f_{sw} > 20$ kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- UPS Uninterruptable power supplies at $f_{sw} > 20$ kHz
- Electronic welders at $f_{sw} > 20$ kHz

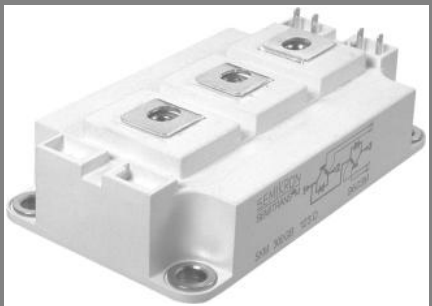


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Absolute Maximum Ratings		T _c = 25 °C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _{case} = 25 °C	300	A
		T _{case} = 80 °C	210	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		400	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	µs
Inverse Diode				
I _F	T _j = 150 °C	T _{case} = 25 °C	260	A
		T _{case} = 80 °C	180	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		400	A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C		1800	A
Module				
I _{t(RMS)}			500	A
T _{vj}			- 40...+ 150	°C
T _{stg}			- 40...+ 125	°C
V _{isol}	AC, 1 min.		4000	V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA
V_{CE0}			$T_j = 25^\circ\text{C}$	1,5	V
			$T_j = 125^\circ\text{C}$	1,7	V
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25^\circ\text{C}$	9	$\text{m}\Omega$
			$T_j = 125^\circ\text{C}$	11,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$		$T_j = ^\circ\text{C}_{chiplev.}$	3,3	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		18	nF
C_{oes}				2,5	nF
C_{res}				1	nF
Q_G	$V_{GE} = 0\text{ V} - +20\text{ V}$			2000	nC
R_{Gint}	$T_j = ^\circ\text{C}$			2,5	Ω
$t_{d(on)}$	$R_{Gon} = 3\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 200\text{ A}$		130	ns
t_r				40	ns
E_{on}				16	mJ
$t_{d(off)}$	$R_{Goff} = 3\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$		460	ns
t_f				30	ns
E_{off}					mJ
$R_{th(j-c)}$	per IGBT			0,075	K/W

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 200 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.} T _j = 125 °C _{chiplev.}		2 1,8	2,5	V V
V _{F0}		T _j = 25 °C T _j = 125 °C		1,1 1,2	1,2	V V
r _F		T _j = 25 °C T _j = 125 °C		4,5 6,5	6,5	mΩ mΩ
I _{RRM} Q _{rr} E _{rr}	I _F = 200 A di/dt = 8000 A/μs V _{GE} = 0 V; V _{CC} = 600 V	T _j = 125 °C		340 46		A μC mJ
R _{th(j-c)D}	per diode				0,18	K/W
Module						
L _{CE}				15	20	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C T _{case} = 125 °C		0,35 0,5		mΩ 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.

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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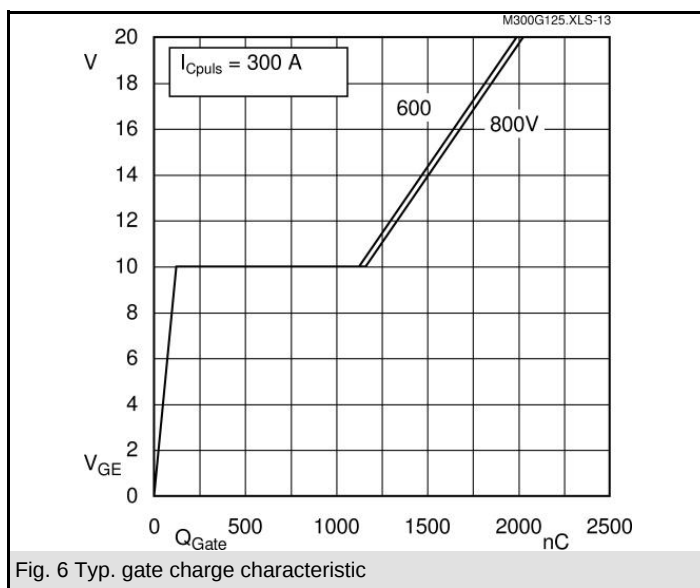
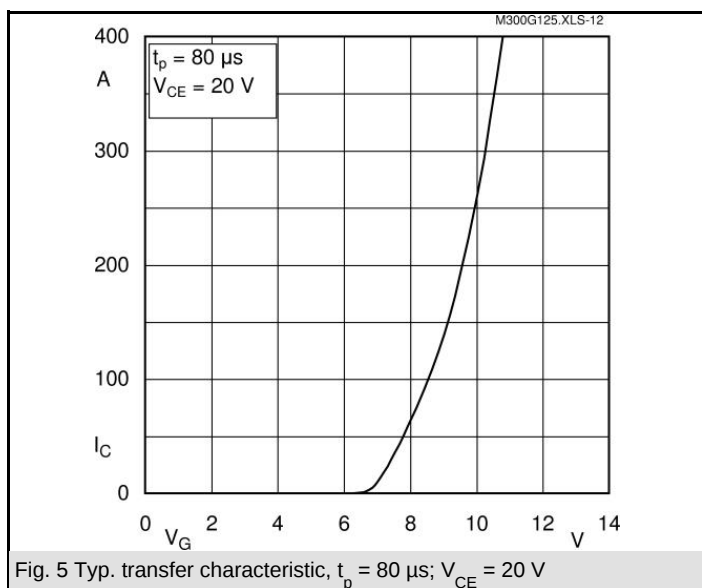
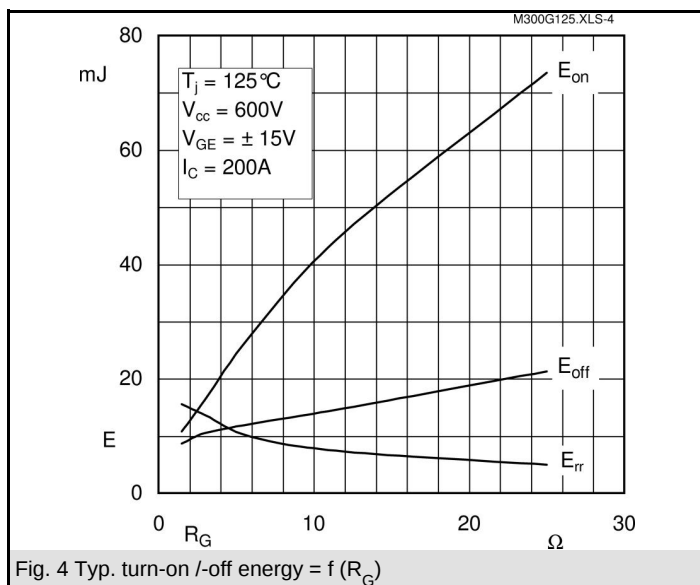
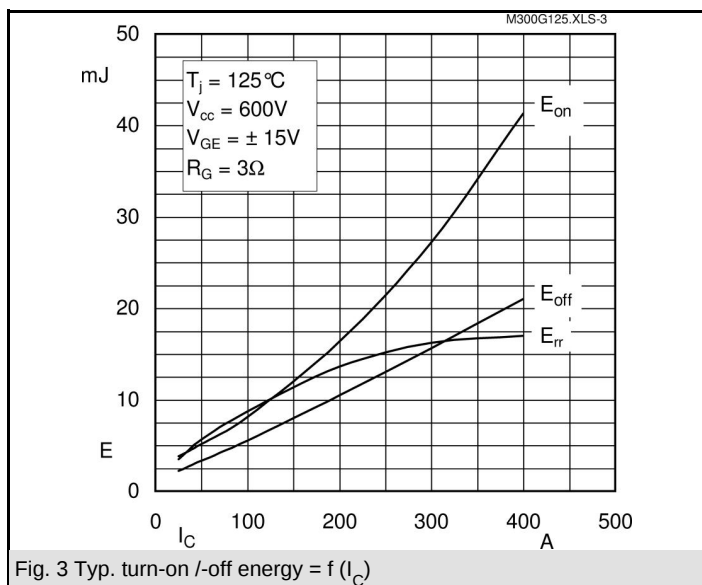
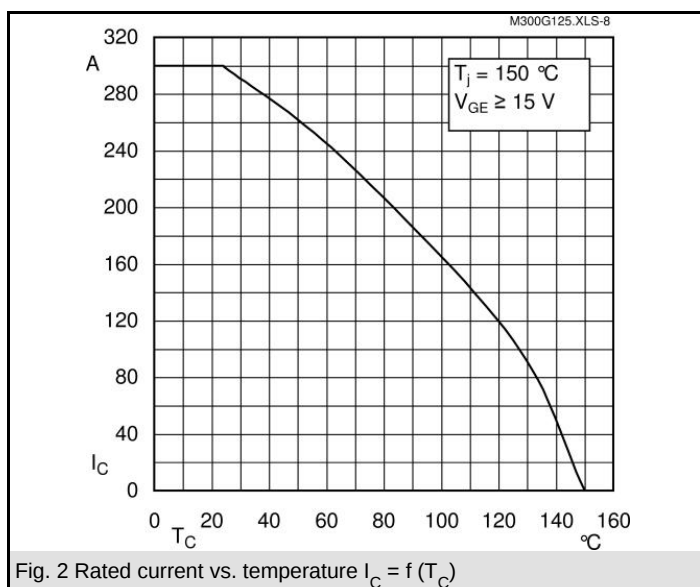
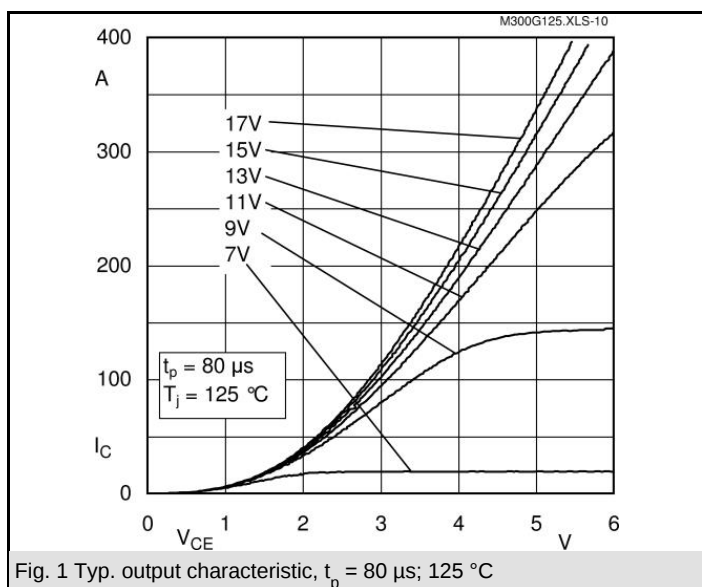
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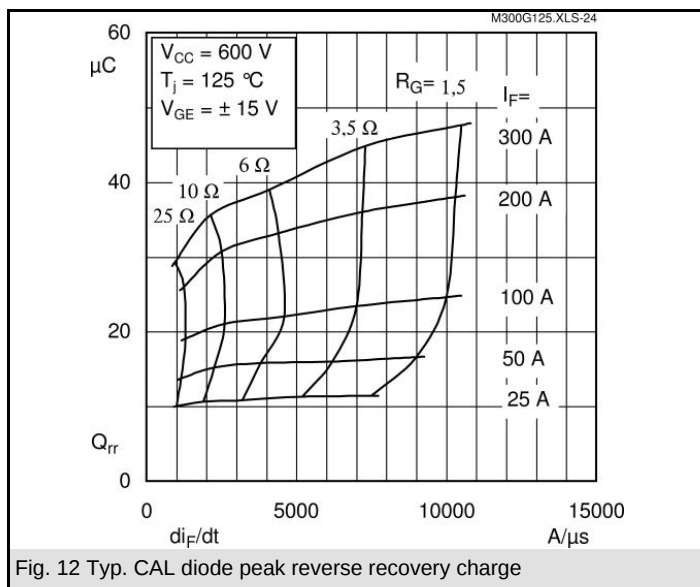
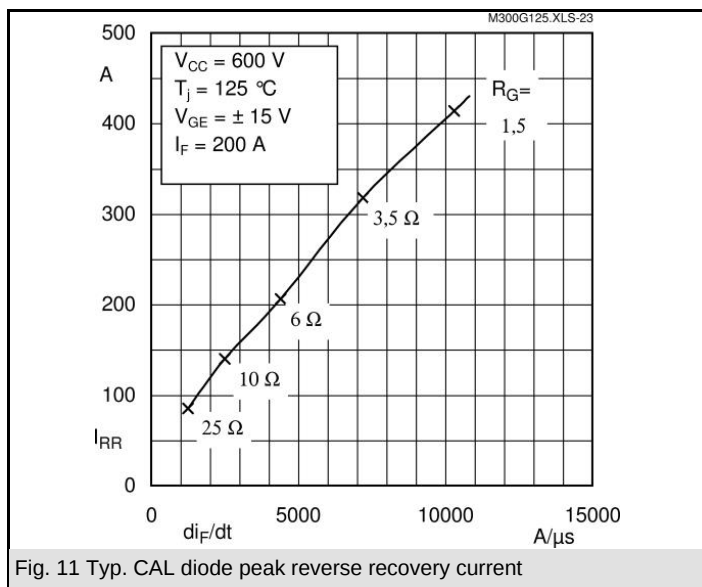
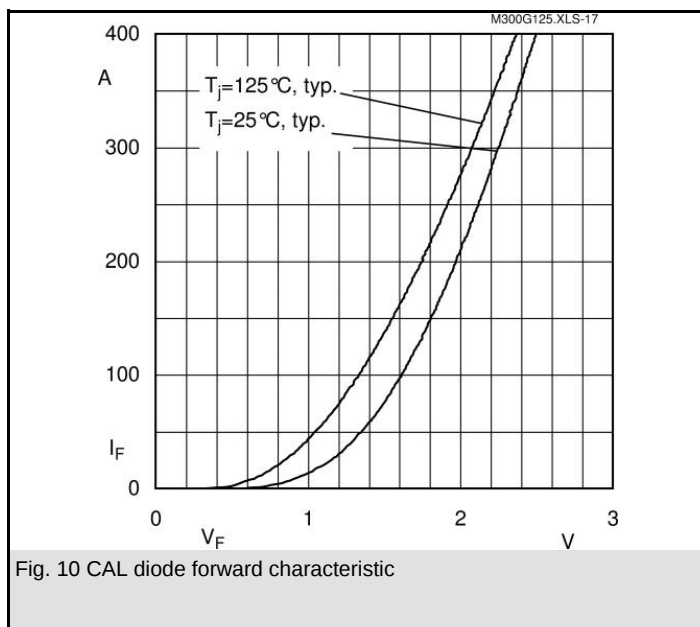
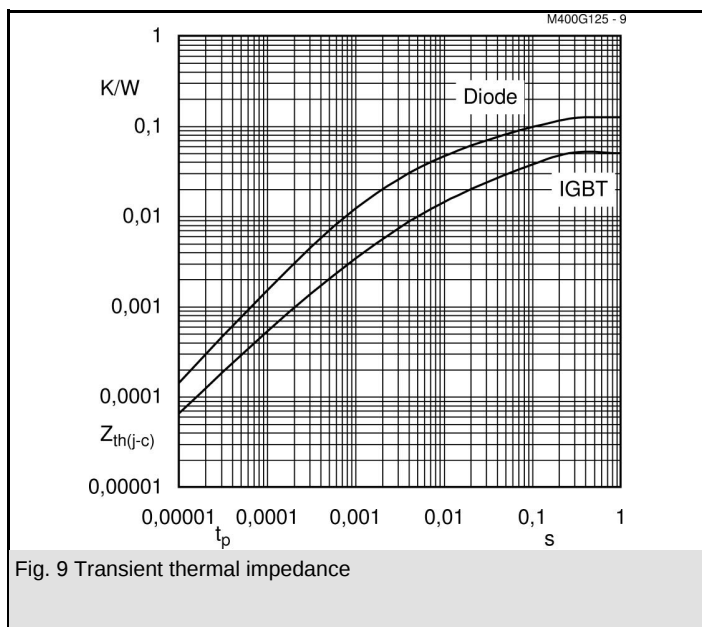
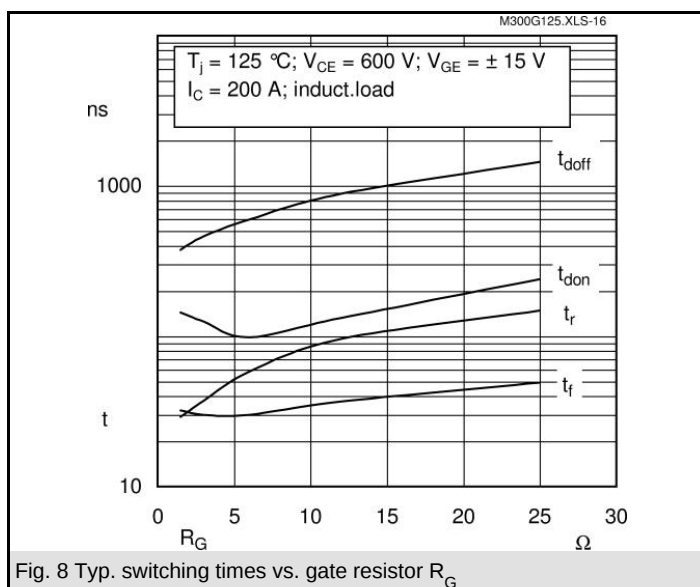
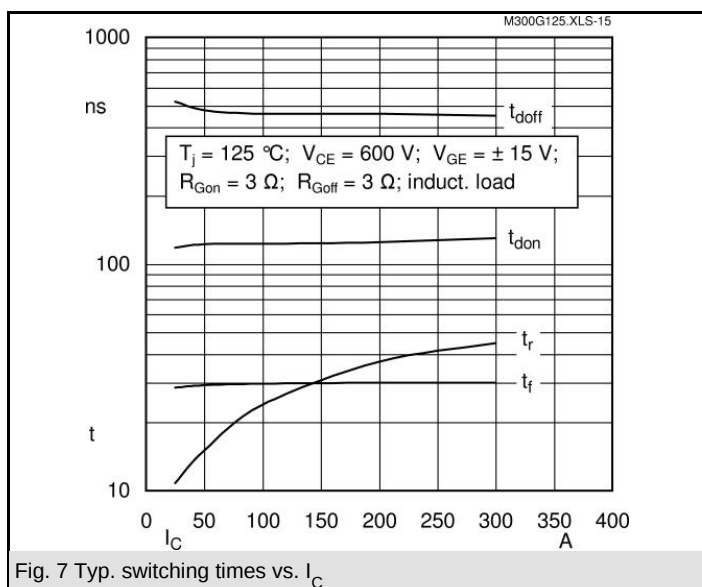
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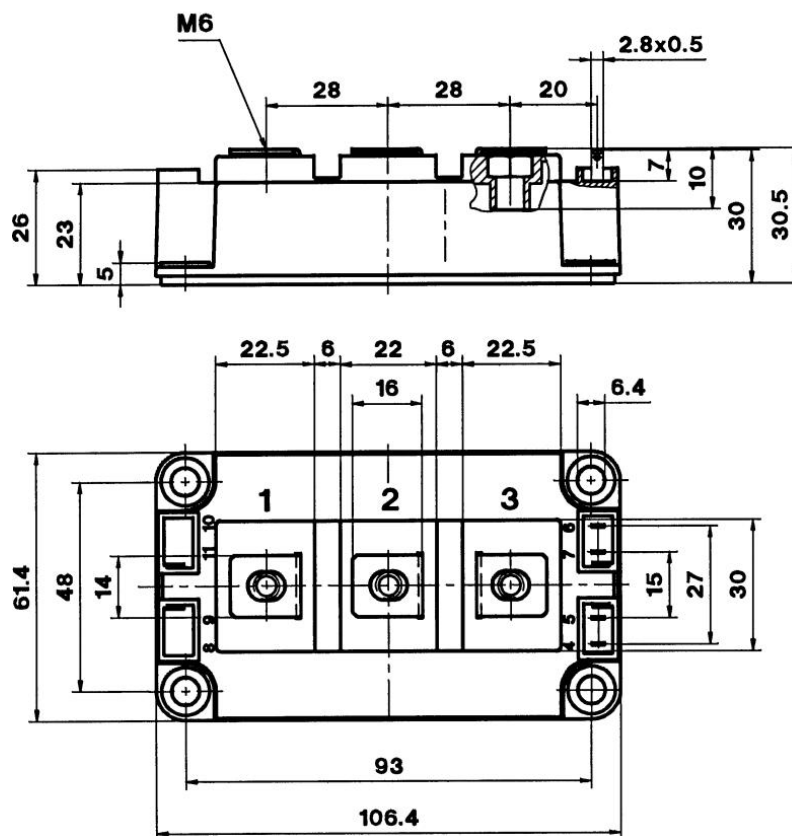


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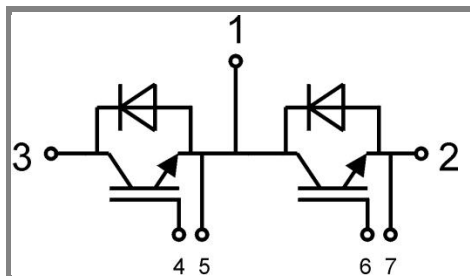
Z_{th}	Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$				
R_i		$i = 1$	53	mk/W
R_i		$i = 2$	18,5	mk/W
R_i		$i = 3$	3,1	mk/W
R_i		$i = 4$	4	mk/W
τ_{ui}		$i = 1$	0,04	s
τ_{ui}		$i = 2$	0,0189	s
τ_{ui}		$i = 3$	0,0017	s
τ_{ui}		$i = 4$	0,003	s
$Z_{th(j-c)D}$				
R_i		$i = 1$	115	mk/W
R_i		$i = 2$	52	mk/W
R_i		$i = 3$	11	mk/W
R_i		$i = 4$	2	mk/W
τ_{ui}		$i = 1$	0,0366	s
τ_{ui}		$i = 2$	0,0113	s
τ_{ui}		$i = 3$	0,003	s
τ_{ui}		$i = 4$	0,0002	s







Case D 56



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Case D 56