



SEMITRANS® 2

SPT IGBT Module

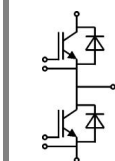
SKM 100GB128D

Features

- SPT = Soft-Punch-Through 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 at f_{sw} up to 20 kHz



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Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_c = 25\text{ }^{\circ}\text{C}$	145	A
		$T_c = 80\text{ }^{\circ}\text{C}$	105	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		150	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	95	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	65	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		150	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	720	A
Module				
$I_{t(RMS)}$			200	A
T_{vj}			- 40... + 150	$^{\circ}\text{C}$
T_{stg}			- 40... + 125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.		4000	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 3 mA		4,5	5,5	6,45	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	1,15	V
	T _j = 125 °C			0,9	1,05	V
r _{CE}	V _{GE} = 15 V			13	16	mΩ
	T _j = 125°C			16	20	mΩ
V _{CE(sat)}	I _{Cnom} = 75 A, V _{GE} = 15 V			1,9	2,35	V
	T _j = 25°C _{chiplev.}					
	T _j = 125°C _{chiplev.}			2,1	2,55	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		6,2			nF
C _{oes}			0,74			nF
C _{res}			0,71			nF
Q _G	V _{GE} = -8V - +20V		860			nC
R _{Gint}	T _j = 25 °C		5			Ω
t _{d(on)}	R _{Gon} = 4,7 Ω	V _{CC} = 600V I _{Cnom} = 75A	175			ns
t _r			38			ns
E _{on}			9			mJ
t _{d(off)}	R _{Goff} = 4,7 Ω	T _j = 125 °C V _{GE} = ±15V	370			ns
t _f			65			ns
E _{off}			7,5			mJ
R _{th(j-c)}	per IGBT				0,21	K/W

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 75 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		2	2,5	V
		T _j = 125 °C _{chiplev.}		1,8		V
V _{F0}		T _j = 25 °C		1,1	1,2	V
r _F		T _j = 25 °C		12	17,3	mΩ
I _{RRM}	I _{Fnom} = 75 A di/dt = 2800 A/μs V _{GE} = -15 V; V _{CC} = 600 V	T _j = 125 °C		88		A
Q _{rr}				13		μC
E _{rr}				3,9		mJ
R _{th(j-c)D}	per diode				0,5	K/W
Module						
L _{CE}					30	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C		0,75		mΩ
		T _{case} = 125 °C		1		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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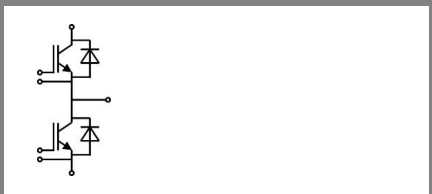
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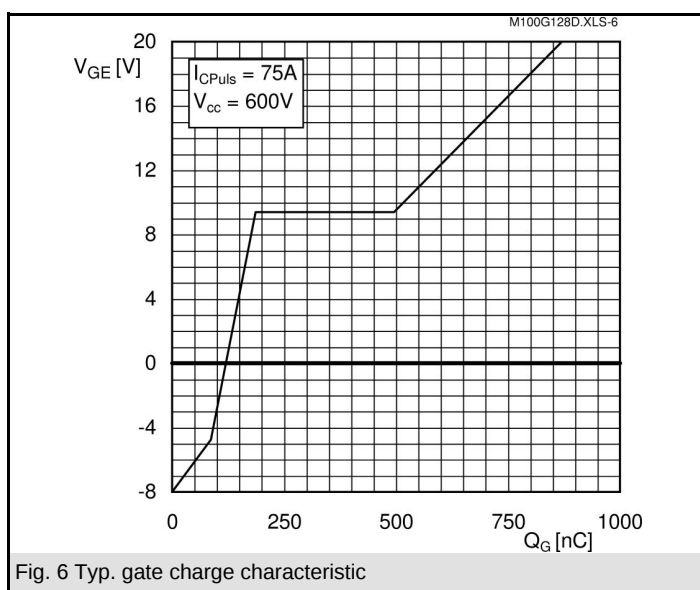
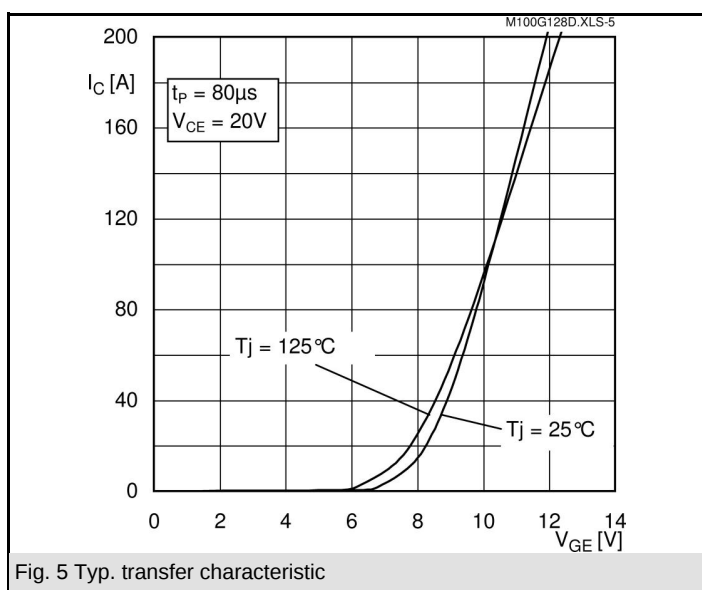
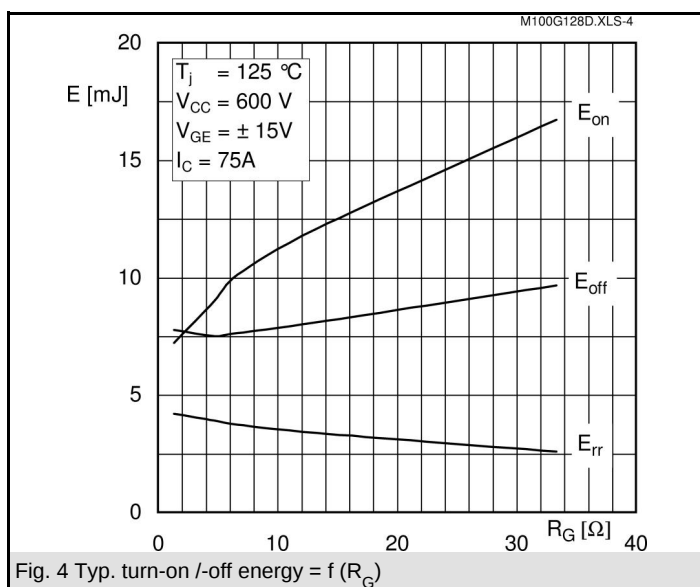
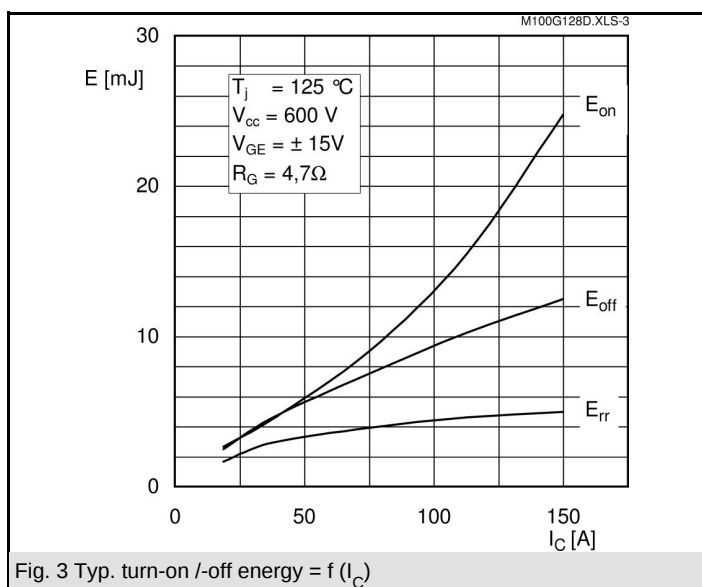
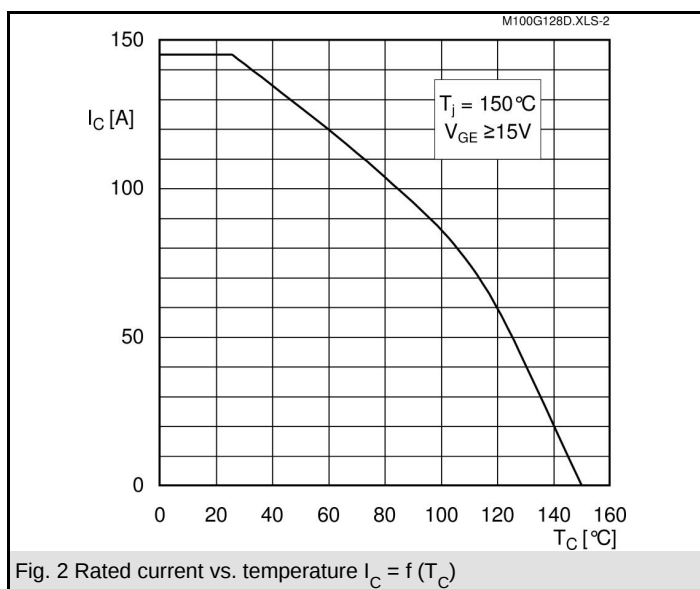
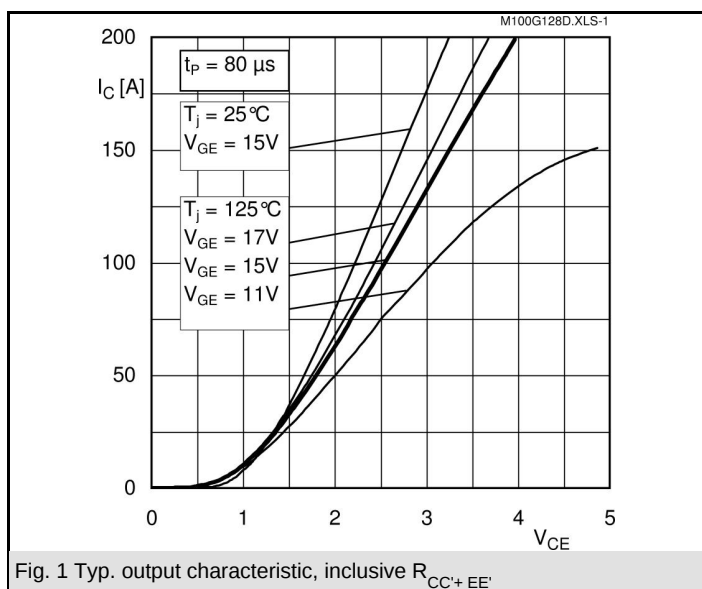
Typical Applications

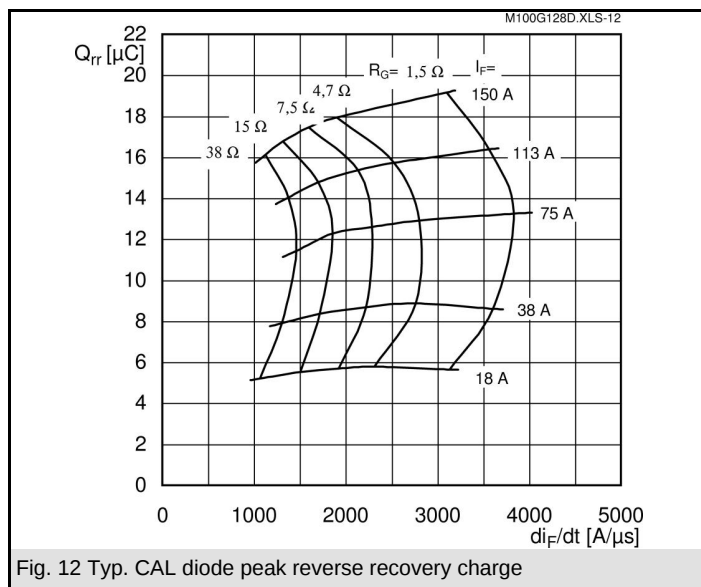
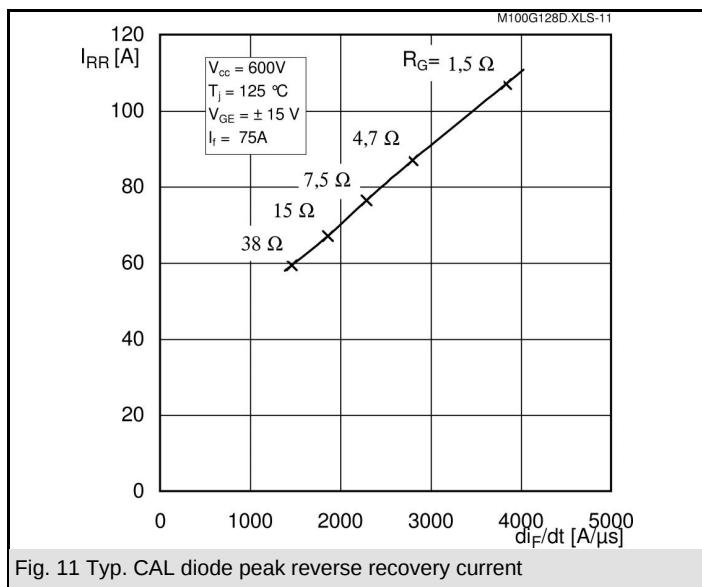
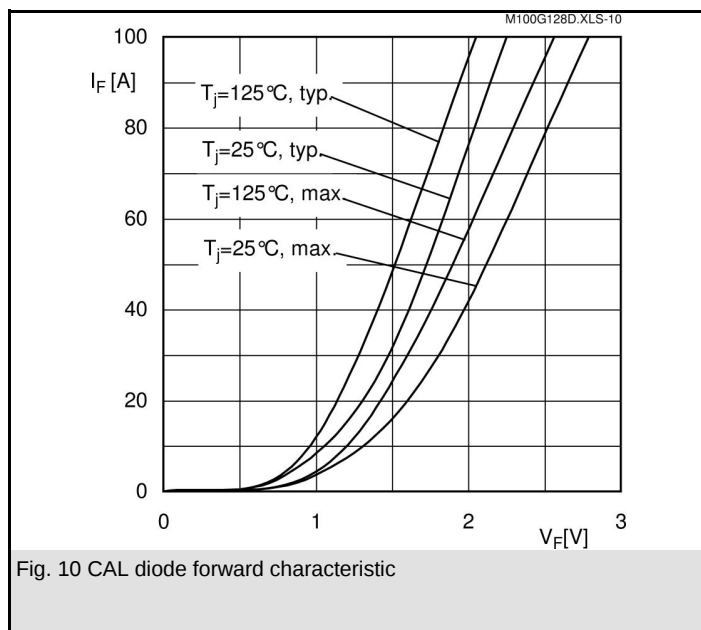
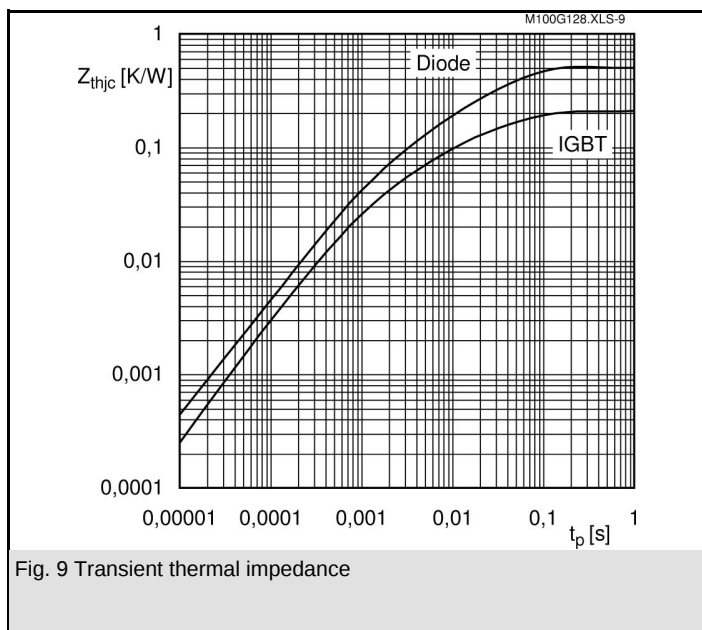
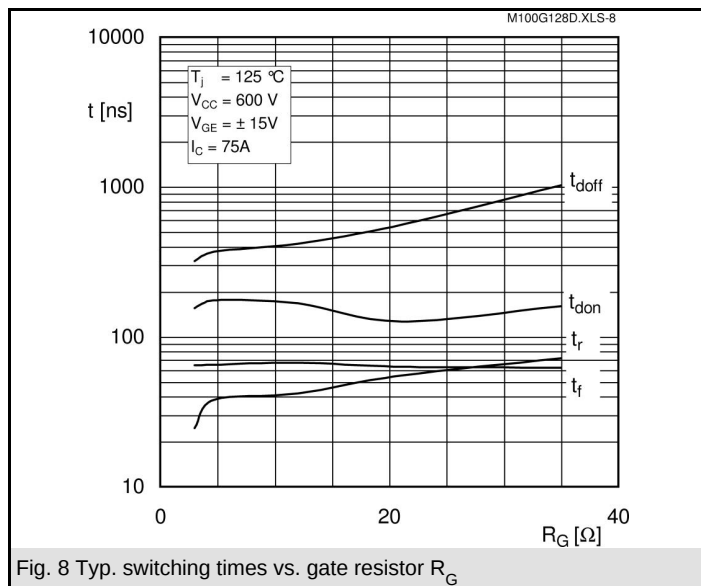
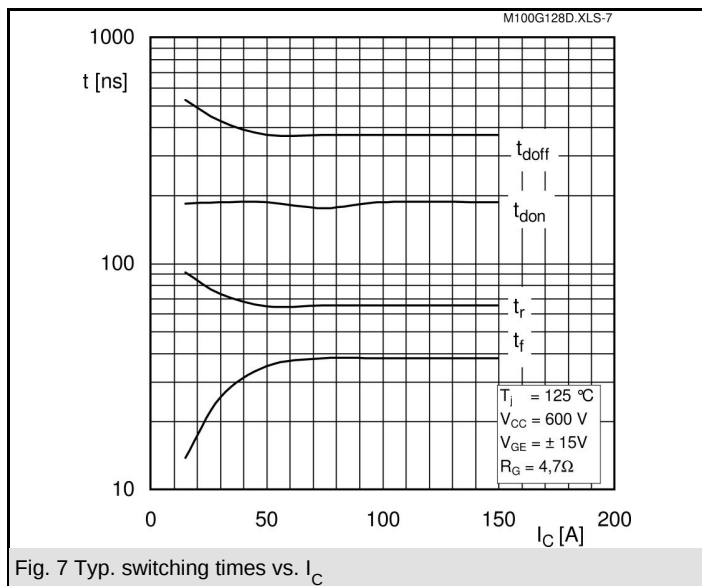
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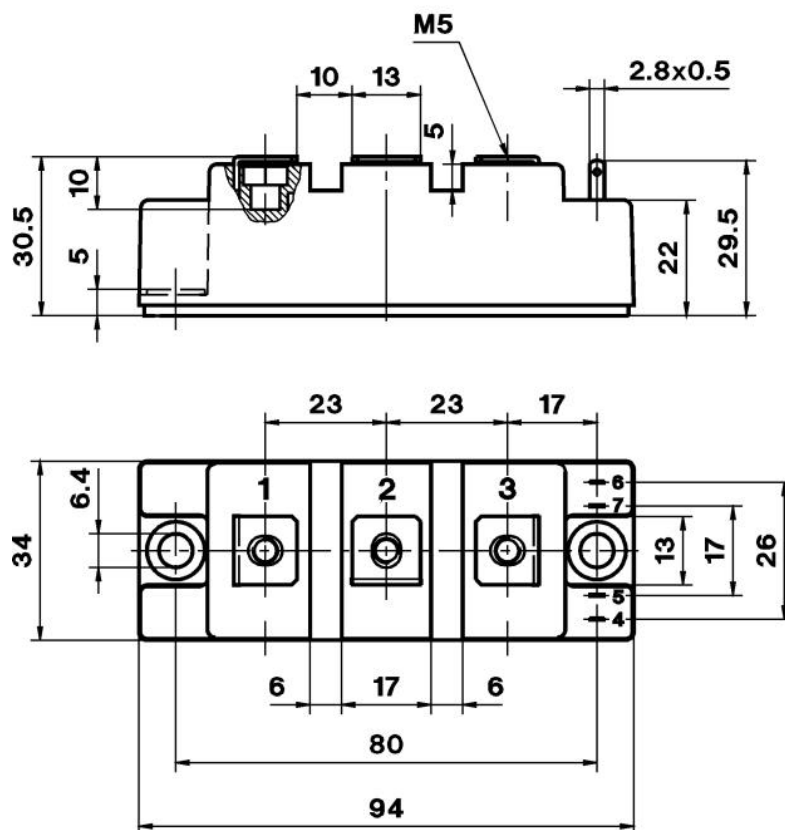


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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	114	mk/W
R_i	$i = 2$	71	mk/W
R_i	$i = 3$	22	mk/W
R_i	$i = 4$	3	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,0115	s
τ_{u_i}	$i = 3$	0,0012	s
τ_{u_i}	$i = 4$	0,001	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	300	mk/W
R_i	$i = 2$	160	mk/W
R_i	$i = 3$	35,5	mk/W
R_i	$i = 4$	4,5	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,0071	s
τ_{u_i}	$i = 3$	0,0017	s
τ_{u_i}	$i = 4$	0,005	s







Case D 61

