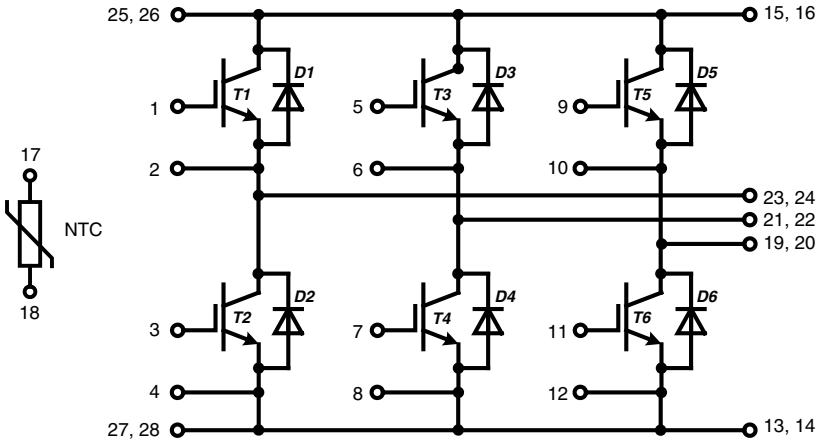
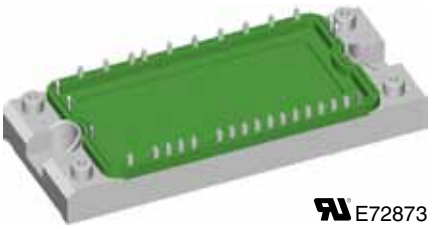
Six-Pack
Trench IGBT

I_{C25} = 110 A
V_{CES} = 1200 V
$V_{CE(sat)\ typ.}$ = 1.7 V

Part name (Marking on product)

MWI 75-12T7T





Pin configuration see outlines.

Features:

- Trench IGBT technology
- low saturation voltage
- low switching losses
- square RBSOA, no latch up
- high short circuit capability
- positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- ultra fast free wheeling diodes
- solderable pins for PCB mounting
- package with copper base plate

Application:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies

Package:

- "E2-Pack" standard outline
- Insulated copper base plate
- Soldering pins for PCB mounting
- Temperature sense included

Output Inverter T1 - T6

Symbol	Definitions	Conditions		min.	Ratings typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES}	*max. DC gate voltage*	continuous				±20	V
V_{GEM}	*max. transient collector gate voltage*	transient				±30	V
I_{C25}	*collector current*		T_C = 25°C			110	A
I_{C80}			T_C = 80°C			75	A
I_{CM}	*max. pulsed collector current*	t_p = 1 ms	T_C = 80°C			150	A
P_{tot}	*total power dissipation*		T_C = 25°C			355	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 75 A; V_{GE} = 15 V	T_{VJ} = 25°C		1.7	2.15	V
		on chip level	T_{VJ} = 125°C		2.0		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 3 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5	5.8	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			4	mA
			T_{VJ} = 125°C		tbd		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				400	nA
C_{ies}	*input capacitance*	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz			5350		pF
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = ±15 V; I_C = 75 A			700		nC
$t_{d(on)}$	*turn-on delay time*	inductive load V_{CE} = 600 V; I_C = 75 A V_{GE} = ±15 V; R_G = 4.7 Ω	T_{VJ} = 125°C		290		ns
t_r	*current rise time*				50		ns
$t_{d(off)}$	*turn-off delay time*				520		ns
t_f	*current fall time*				90		ns
E_{on}	*turn-on energy per pulse*				7		mJ
E_{off}	*turn-off energy per pulse*				9.5		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 4.7 Ω	T_{VJ} = 125°C V_{CEK} = 1150 V			100	A
SCSOA	*short circuit safe operating area*						
t_{SC}	*short circuit duration*	V_{CE} = 900 V; V_{GE} = ±15 V;	T_{VJ} = 125°C			10	µs
I_{SC}	*short circuit current*	R_G = 4.7 Ω; non-repetitive			300		A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.35	K/W

Output Inverter D1 - D6

Symbol	Definitions	Conditions		min.	Ratings typ.	max.	Unit
V_{RRM}	*max. repetitve reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25}	*forward current*		T_C = 25°C			135	A
I_{F80}			T_C = 80°C			90	A
V_F	*forward voltage*	I_F = 100 A; V_{GE} = 0 V	T_{VJ} = 25°C		1.95	2.2	V
			T_{VJ} = 125°C		1.95		V
Q_{rr}	*reverse recovery charge*	V_R = 600 V di_F/dt = -1600 A/µs I_F = 100 A; V_{GE} = 0 V	T_{VJ} = 125°C		12.5		µC
I_{RM}	*max. reverse recovery current*				100		A
t_{rr}	*reverse recovery time*				350		ns
E_{rec}	*reverse recovery energy*				4		mJ
R_{thJC}	*thermal resistance junction to case*	(per diode)				0.4	K/W

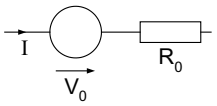
Temperature Sensor NTC

Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
R_{25}	*resistance*		T_C = 25°C	4.75	5.0	5.25	kΩ
$B_{25/50}$					3375		K

Module

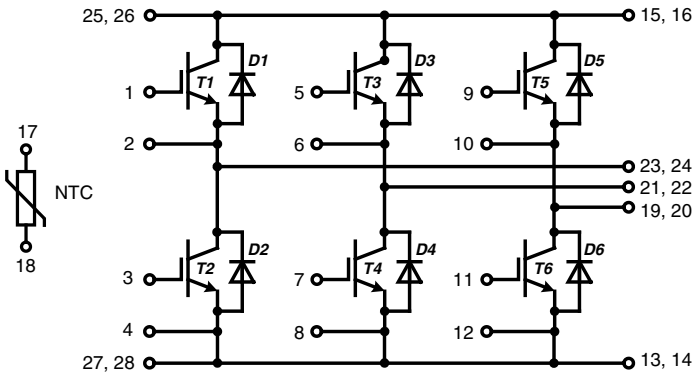
Symbol	Definitions	Conditions	Ratings min.	typ.	max.	Unit
T_{VJ}	*operating temperature*		-40		125	°C
T_{VJM}	*max. virtual junction temperature*				150	°C
T_{stg}	*storage temperature*		-40		125	°C
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq$ 1 mA; 50/60 Hz			2500	V~
CTI	*comparative tracking index*				200	
M_d	*mounting torque (M5)*		2.7		3.3	Nm
d_S	*creep distance on surface*		6			mm
d_A	*strike distance through air*		6			mm
$R_{pin\text{-}chip}$	*resistance pin to chip*			2.5		mΩ
R_{thCH}	*thermal resistance case to heatsink*	with heatsink compound		0.02		K/W
Weight				180		g

Equivalent Circuits for Simulation



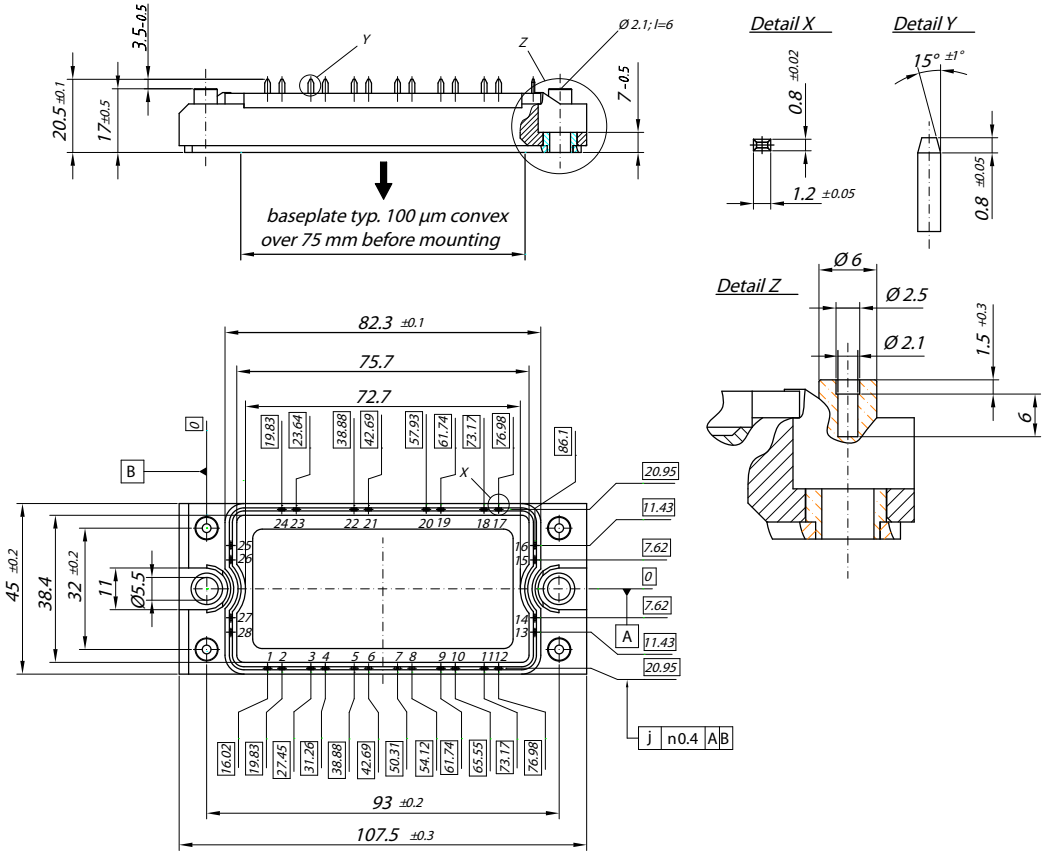
Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
V_0	*IGBT*	T1 - T6	T_{VJ} = 125°C		1.0		V
R_0					13.3		mΩ
V_0	*Diode*	D1 - D6	T_{VJ} = 150°C		1.09		V
R_0					9.1		mΩ

Circuit Diagram

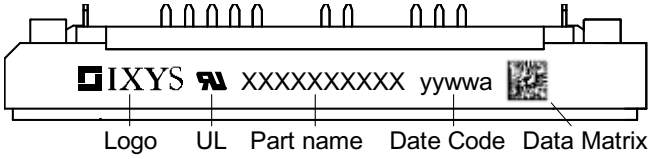


Outline Drawing

Dimensions in mm (1 mm = 0.0394“)



Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MWI 75-12T7T	MWI75-12T7T	Box	6	501979

IXYS reserves the right to change limits, test conditions and dimensions.

20100910e

Inverter T1 - T6

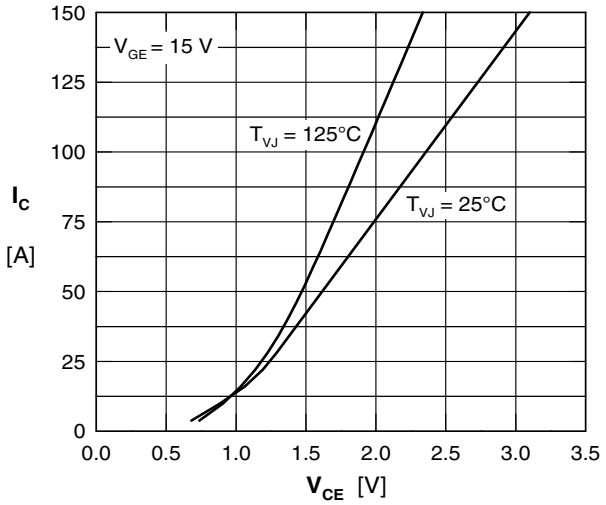


Fig. 1 Typ. output characteristic

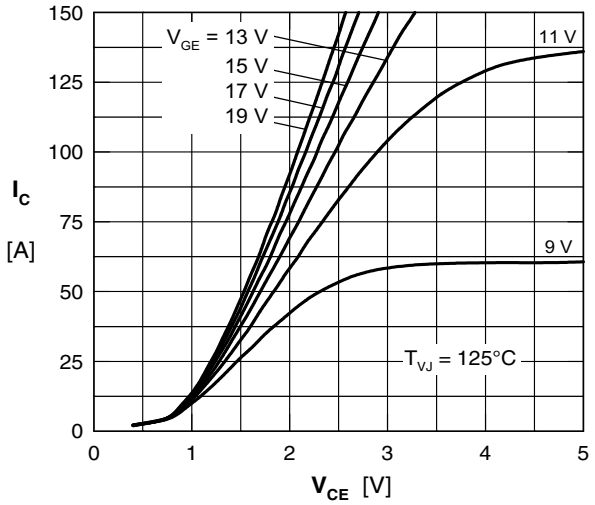


Fig. 2 Typ. output characteristic

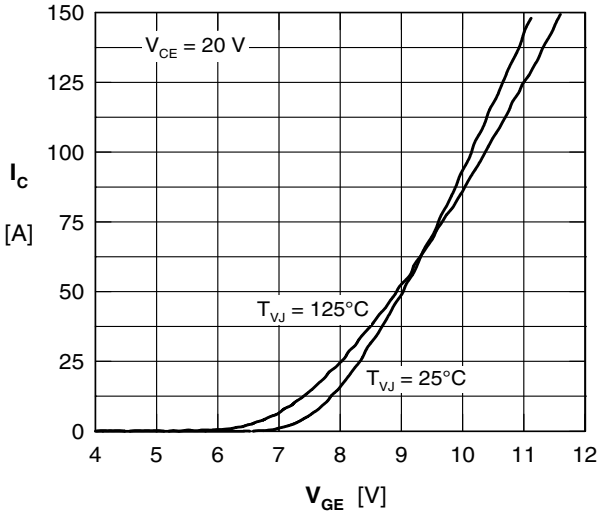


Fig. 3 Typ. transfer characteristic

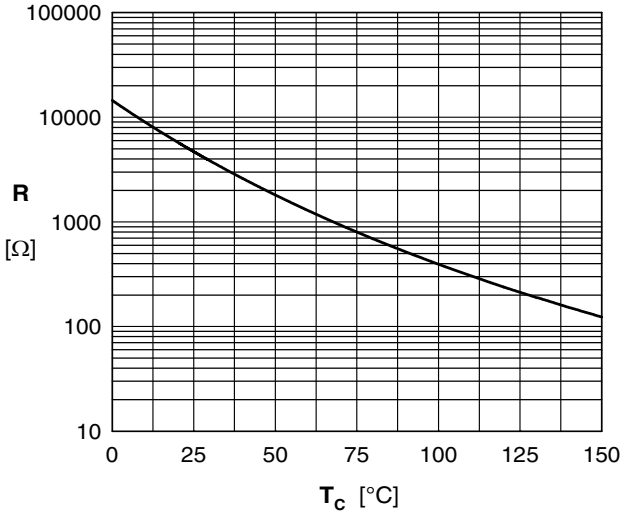


Fig. 4 Typ. NTC resistance versus temperature

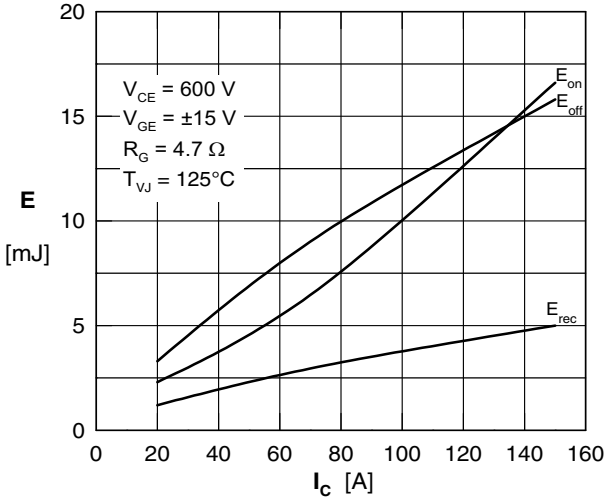


Fig. 5 Typ.switching losses versus collector current impedance

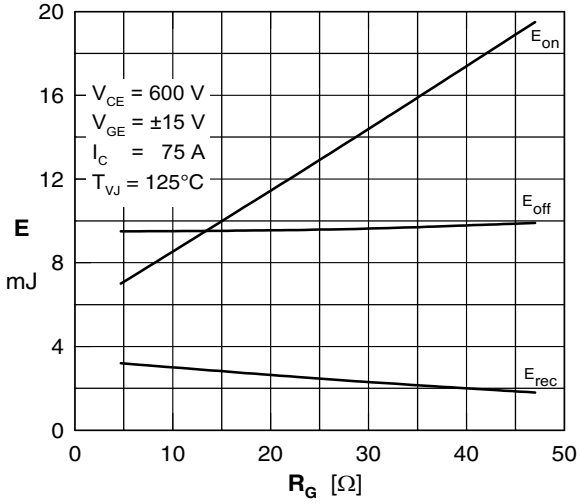


Fig. 6 Typ.switching losses vs. gate resistance

Inverter D1 - D6

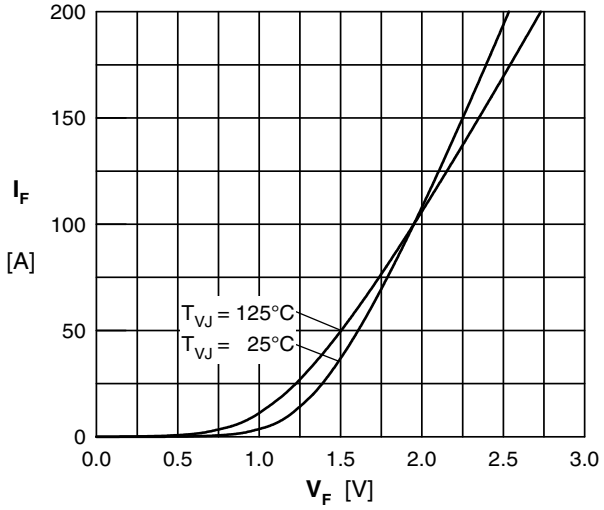


Fig. 7 Typ. Forward current versus V_F

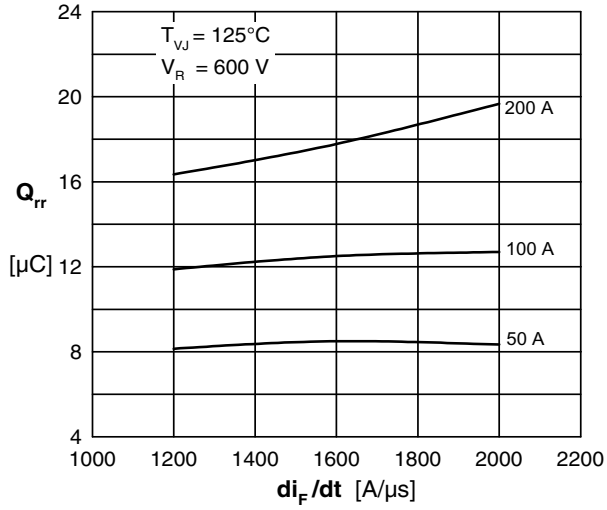


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

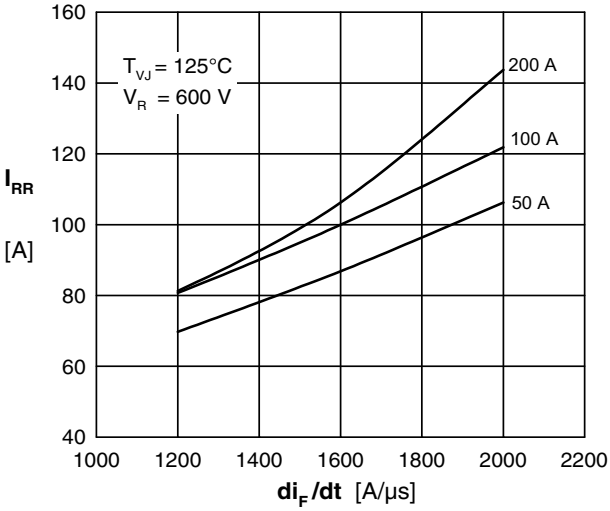


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

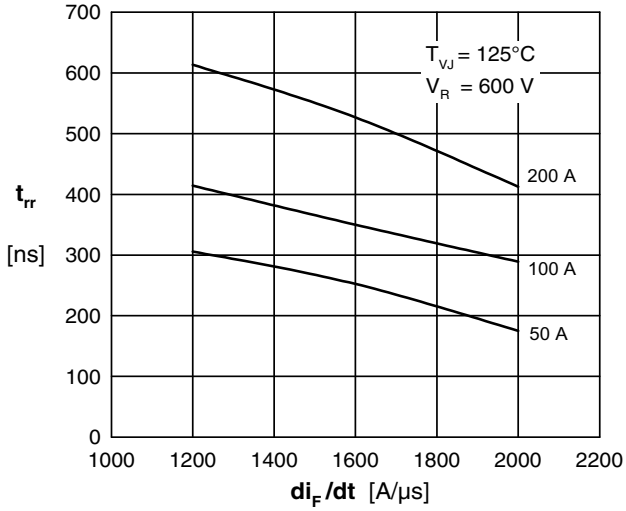


Fig. 10 Typ. recovery time t_{rr} versus di/dt

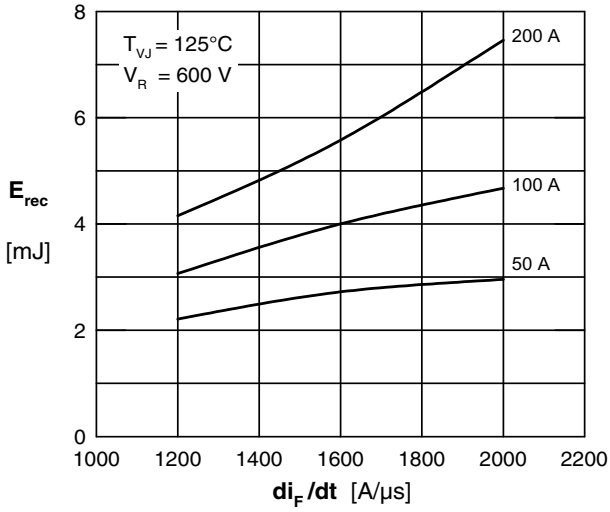


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

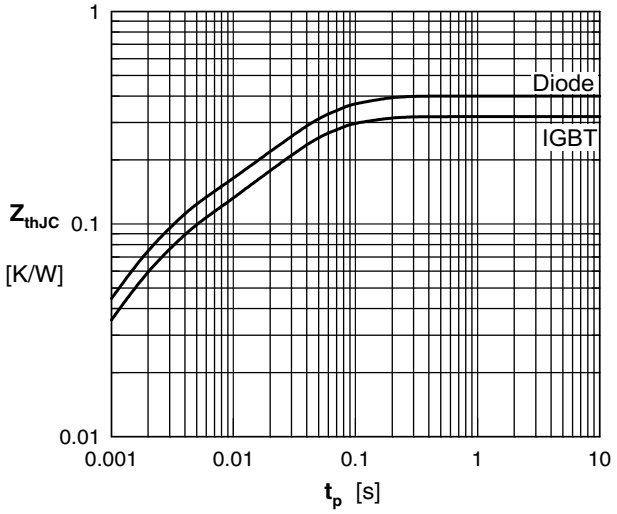


Fig. 12 Typ. transient thermal impedance