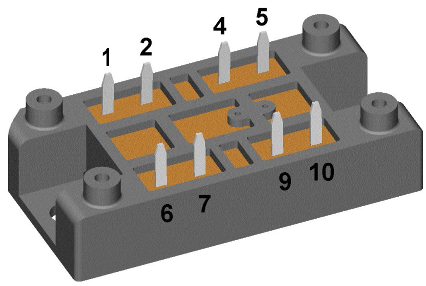
XPT IGBT Module

V_{CES} = 1200 V
I_{C25} = 120 A
$V_{CE(sat)}$ = 1,9 V

Boost Chopper

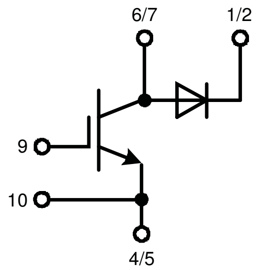
Part number

MIXA80R1200VA



Backside: isolated

E72873



Features / Advantages:

- Easy paralleling due to the positive temperature coefficient of the on-state voltage
- Rugged XPT design (Xtreme light Punch Through) results in:
  - short circuit rated for 10 µsec.
  - very low gate charge
  - low EMI
  - square RBSOA @ 3x Ic
- Thin wafer technology combined with the XPT design results in a competitive low VCE(sat)
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Applications:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies
- Inductive heating, cookers
- Pumps, Fans

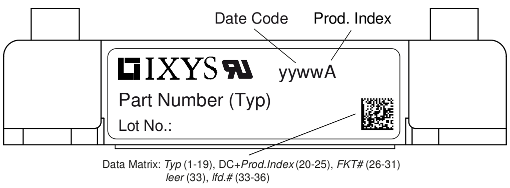
Package: V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

IGBT				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES}	*max. DC gate voltage*					±20	V
V_{GEM}	*max. transient gate emitter voltage*					±30	V
I_{C25}	*collector current*		T_C = 25°C			120	A
I_{C80}			T_C = 80°C			84	A
P_{tot}	*total power dissipation*		T_C = 25°C			390	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 75 A; V_{GE} = 15 V	T_{VJ} = 25°C		1,9	2,2	V
			T_{VJ} = 125°C		2,2		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 6 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5,4	5,9	6,5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			0,2	mA
			T_{VJ} = 125°C		0,6		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				500	nA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 75 A			230		nC
$t_{d(on)}$	*turn-on delay time*	inductive load	T_{VJ} = 125°C		70		ns
t_r	*current rise time*	V_{CE} = 600 V; I_C = 75 A			40		ns
$t_{d(off)}$	*turn-off delay time*	V_{GE} = ±15 V; R_G = 10 Ω			250		ns
t_f	*current fall time*				100		ns
E_{on}	*turn-on energy per pulse*				6,8		mJ
E_{off}	*turn-off energy per pulse*				8,3		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 10 Ω	T_{VJ} = 125°C				
I_{CM}		V_{CEmax} = 1200 V				225	A
SCSOA	*short circuit safe operating area*	V_{CEmax} = 1200 V					
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 = 10 Ω; non-repetitive			300		A
R_{thJC}	*thermal resistance junction to case*					0,32	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,20		K/W

Diode							
V_{RRM}	*max. repetitive 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	T_{VJ} = 25°C			2,30	V
			T_{VJ} = 125°C		2,10		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			0,3	mA
			T_{VJ} = 125°C		0,8		mA
Q_{rr}	*reverse recovery charge*	V_R = 600 V			12,5		µC
I_{RM}	*max. reverse recovery current*	$-di_F/dt$ = 1600 A/µs	T_{VJ} = 125°C		105		A
t_{rr}	*reverse recovery time*	I_F = 100 A; V_{GE} = 0 V			350		ns
E_{rec}	*reverse recovery energy*				4		mJ
R_{thJC}	*thermal resistance junction to case*					0,4	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,20		K/W

Package V1-A-Pack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					37		g
M_D	*mounting torque*			2		2,5	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6,0			mm
$d_{Spb/Apb}$			*terminal to backside*	12,0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \le 1$ mA	3600			V
		t = 1 minute		3000			V



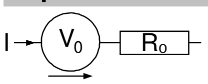
Part description

- M = Module
- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 80 = Current Rating [A]
- R = Boost Chopper
- 1200 = Reverse Voltage [V]
- VA = V1-A-Pack

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MIXA80R1200VA	MIXA80R1200VA	Blister	24	510585

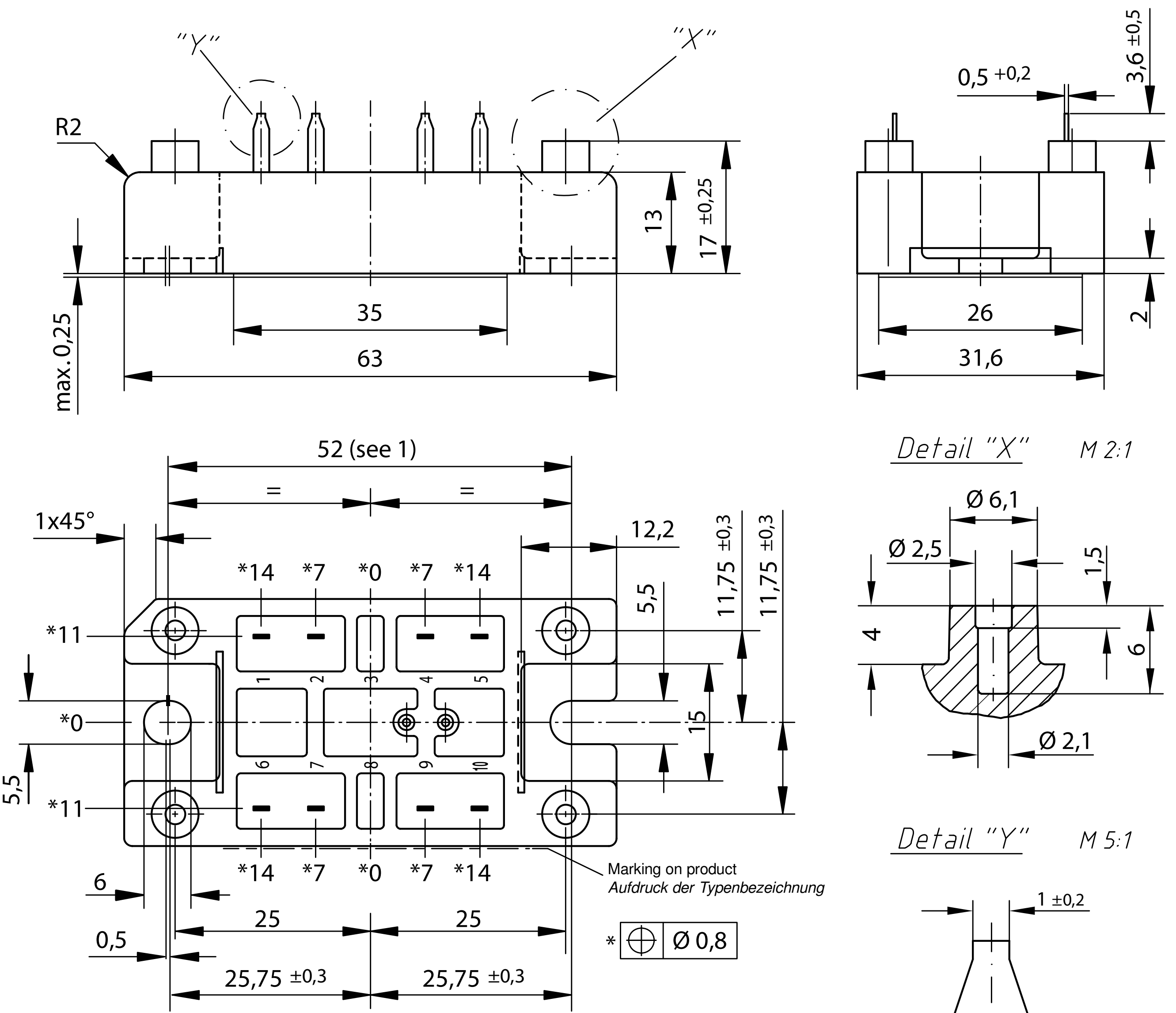
Equivalent Circuits for Simulation

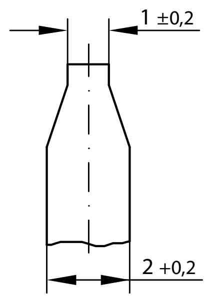
* on die level $T_{VJ} = 150\,°C$



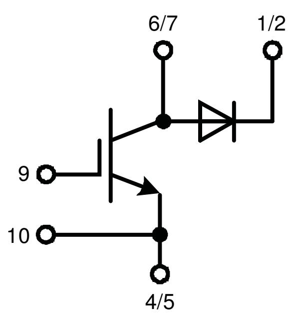
		IGBT	Diode	
$V_{0\,max}$	*threshold voltage*	1,1	1,09	V
$R_{0\,max}$	*slope resistance **	17,9	9,1	mΩ

Outlines V1-A-Pack





Remarks / ***Bemerkungen:***
1. Nominal distance mounting screws on heat sink: 52 mm / *Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm*
2. General tolerance / *Allgemeintoleranz*: DIN ISO 2768 -T1-c
3. Surface treatment of pins: tin plated (Sn) in hot dip / *Oberflächenbehandlung der Pins: verzinnt (Sn) im Tauchbad*



IGBT

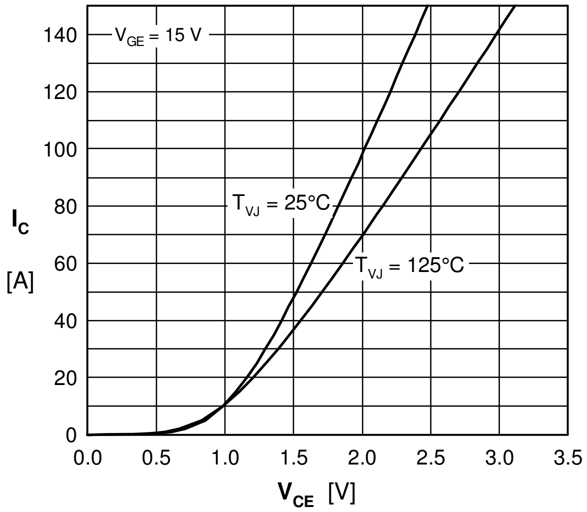


Fig. 1 Typ. output characteristics

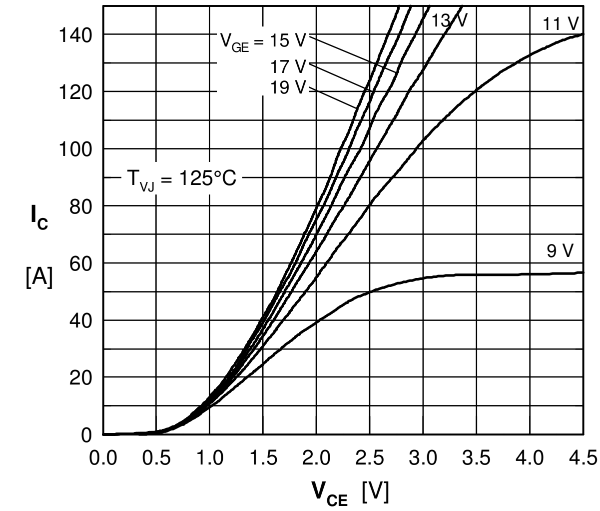


Fig. 2 Typ. output characteristics

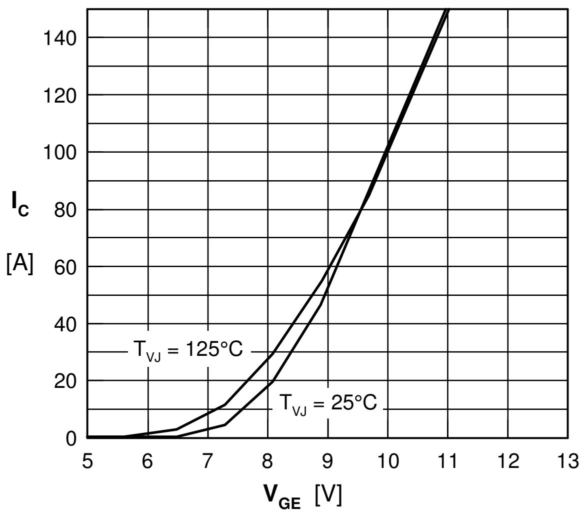


Fig. 3 Typ. tranfer characteristics

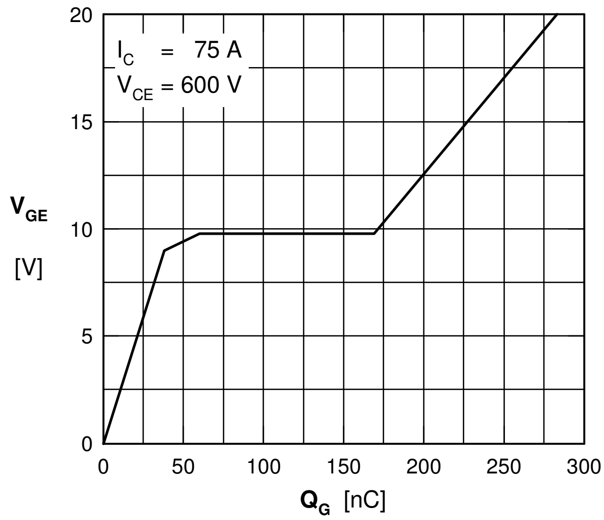


Fig. 4 Typ. turn-on gate charge

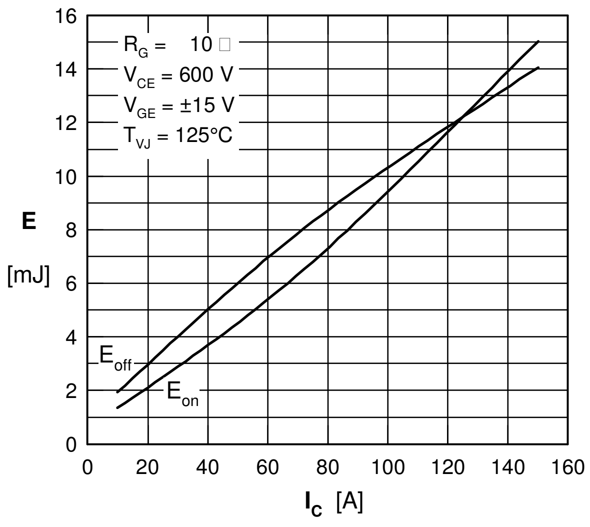


Fig. 5 Typ. switching energy vs. collector current

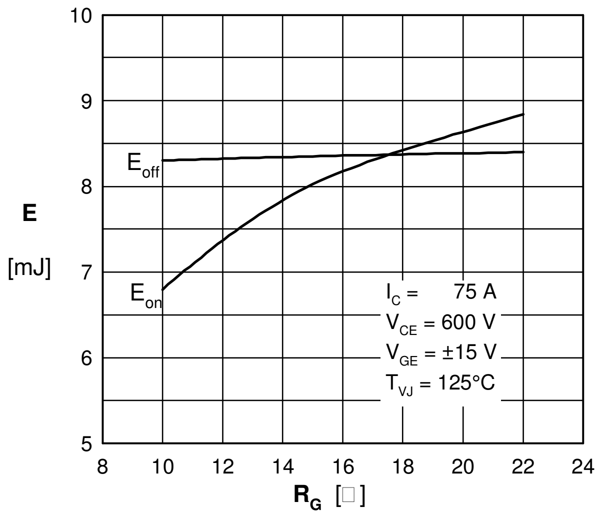


Fig. 6 Typ. switching energy vs. gate resistance

Diode

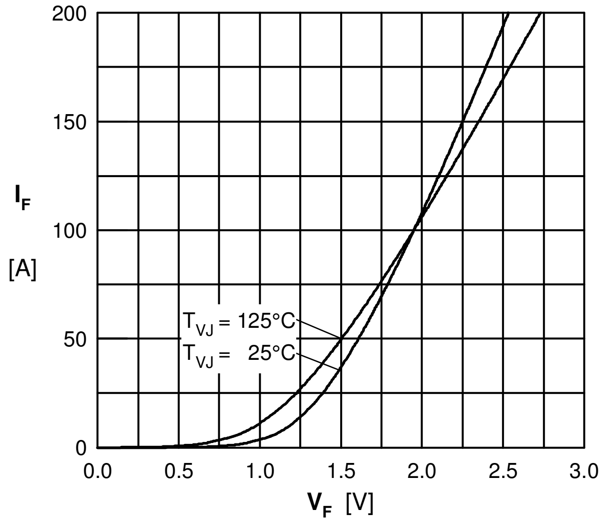


Fig. 7 Typ. Forward current versus V_F

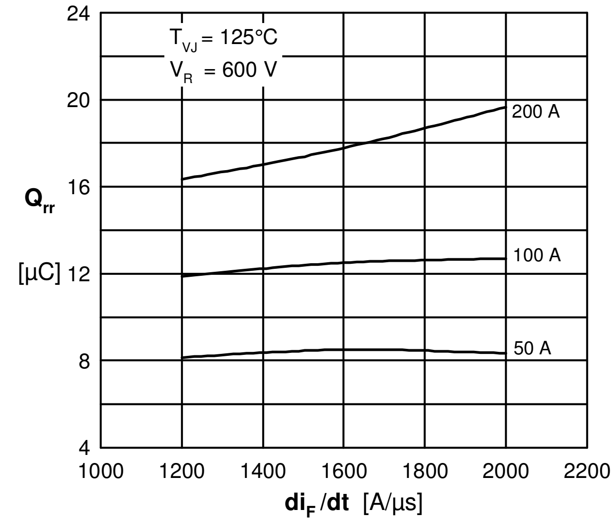


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

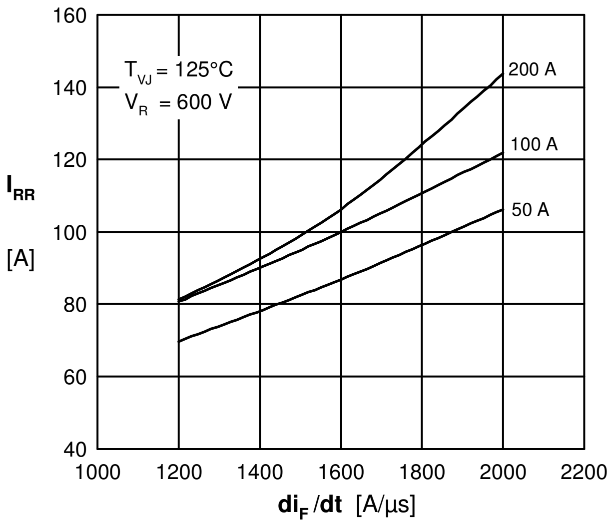


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

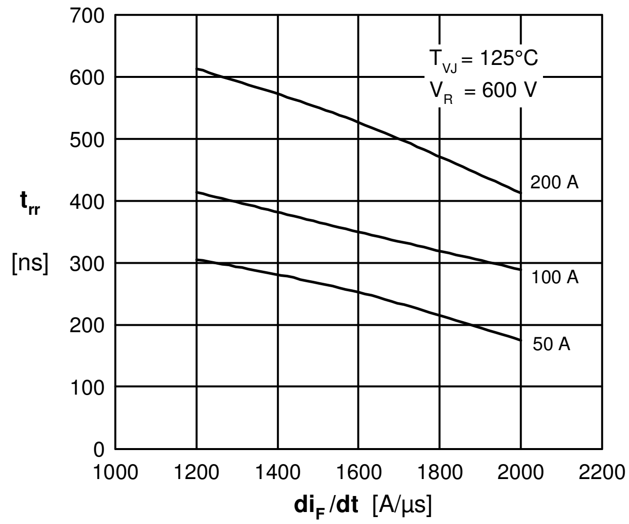


Fig. 10 Typ. recovery time t_{rr} versus di/dt

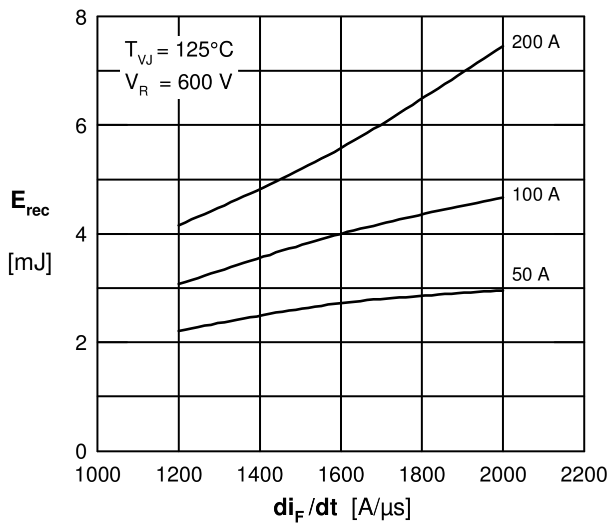


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

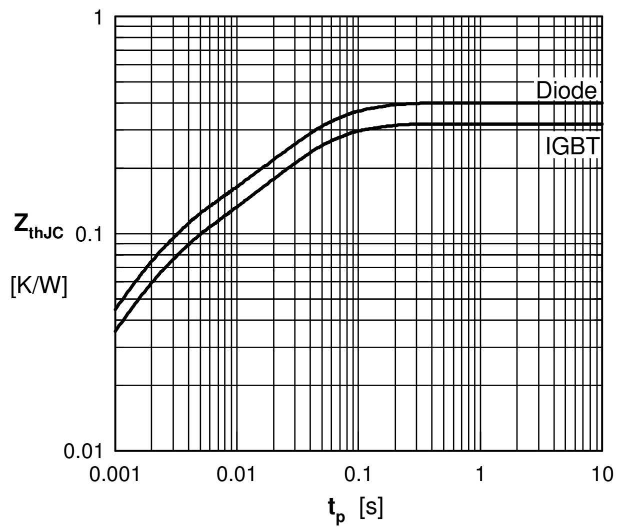


Fig. 12 Typ. transient thermal impedance