Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

preliminary

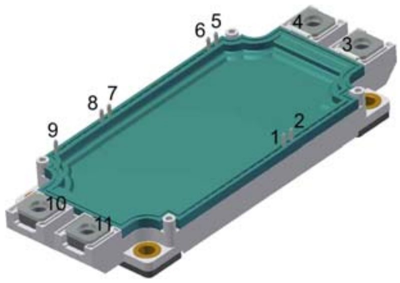
XPT IGBT Module

V_{CES}	=	2x 1200 V
I_{C25}	=	360 A
$V_{CE(sat)}$	=	1.8 V

Phase leg + free wheeling Diodes + NTC

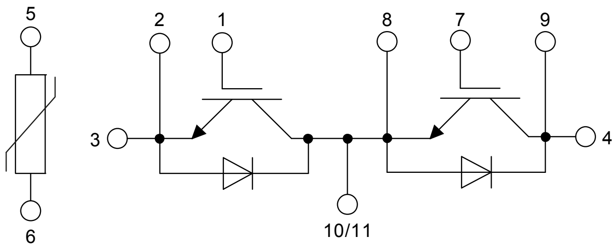
Part number

MIXA225PF1200TSF



Backside: isolated

E72873



Features / Advantages:

- High level of integration - only one power semiconductor module required for the whole drive
- 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)
- Temperature sense included
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Applications:

- AC motor drives
- Pumps, Fans
- Air-conditioning system
- Inverter and power supplies
- UPS

Package: SimBus F

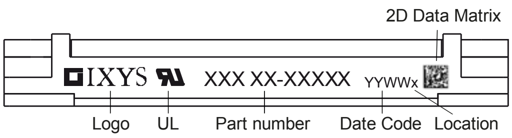
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling

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			360	A
I_{C80}			T_C = 80°C			250	A
P_{tot}	total power dissipation		T_C = 25°C			1100	W
$V_{CE(sat)}$	collector emitter saturation voltage	I_C = 225A; V_{GE} = 15 V	T_{VJ} = 25°C		1.8	2.1	V
			T_{VJ} = 125°C		2.1		V
$V_{GE(th)}$	gate emitter threshold voltage	I_C = 9mA; 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			0.3	mA
			T_{VJ} = 125°C		0.3		mA
I_{GES}	gate emitter leakage current	V_{GE} = ±20 V				1.5	µA
$Q_{G(on)}$	total gate charge	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 225 A			690		nC
$t_{d(on)}$	turn-on delay time	inductive load	T_{VJ} = 125°C		60		ns
t_r	current rise time	V_{CE} = 600V; I_C = 225A			70		ns
$t_{d(off)}$	turn-off delay time	V_{GE} = ±15 V; R_G = 3.3 Ω			280		ns
t_f	current fall time				310		ns
E_{on}	turn-on energy per pulse				20		mJ
E_{off}	turn-off energy per pulse				27		mJ
RBSOA	reverse bias safe operating area	V_{GE} = ±15 V; R_G = 3.3 Ω	T_{VJ} = 125°C				
I_{CM}		V_{CEmax} = 1200V				500	A
SCSOA	short circuit safe operating area	V_{CEmax} = 1200 V					
t_{SC}	short circuit duration	V_{CE} = 900V; V_{GE} = ±15 V	T_{VJ} = 125°C			10	µs
I_{SC}	short circuit current	R_G = 3.3 Ω; non-repetitive			900		A
R_{thJC}	thermal resistance junction to case					0.115	K/W
R_{thCH}	thermal resistance case to heatsink				0.05		K/W

Diode				min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage		T_{VJ} = 25°C			1200	V
I_{F25}	forward current		T_C = 25°C			265	A
I_{F80}			T_C = 80°C			185	A
V_F	forward voltage	I_F = 225A	T_{VJ} = 25°C			2.10	V
			T_{VJ} = 125°C		1.70		V
I_R	reverse current	V_R = V_{RRM}	T_{VJ} = 25°C			*	mA
	* not applicable, see Ices value above		T_{VJ} = 125°C		*		mA
Q_{rr}	reverse recovery charge	V_R = 600 V			32		µC
I_{RM}	max. reverse recovery current	$-di_F/dt$ = 3300 A/µs	T_{VJ} = 125°C		250		A
t_{rr}	reverse recovery time	I_F = 225A; V_{GE} = 0 V			340		ns
E_{rec}	reverse recovery energy				11.7		mJ
R_{thJC}	thermal resistance junction to case					0.145	K/W
R_{thCH}	thermal resistance case to heatsink				0.05		K/W

preliminary

Package SimBus F				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal					A
T_{stg}	*storage temperature*			-40		125	°C
T_{VJ}	*virtual junction temperature*			-40		150	°C
Weight					350		g
M_D	*mounting torque*			3		6	Nm
M_T	*terminal torque*			3		6	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	12.7			mm
$d_{Spb/Apb}$			*terminal to backside*	10.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \le 1$ mA	3000			V
		t = 1 minute		2500			V
$R_{pin-chip}$	*resistance pin to chip*	$V = V_{CEsat} + 2 \cdot R \cdot I_C$ resp. $V = V_F + 2 \cdot R \cdot I_F$			0.65		mΩ



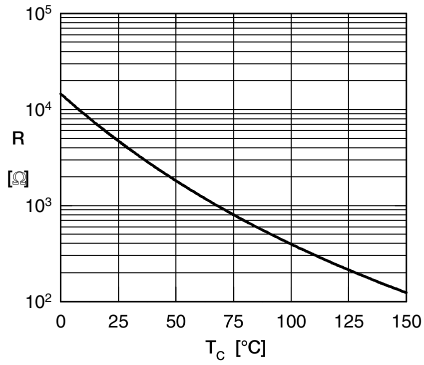
Part number

M = Module
I = IGBT
X = XPT IGBT
A = Gen 1 / std
225 = Current Rating [A]
PF = Phase leg + free wheeling Diodes
1200 = Reverse Voltage [V]
T = Thermistor \ Temperature sensor
SF = SimBus F

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MIXA225PF1200TSF	MIXA225PF1200TSF	Box	3	512257

Temperature Sensor NTC

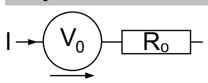
Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	*resistance*	T_{VJ} = 25°	4.75	5	5.25	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K



Typ. NTC resistance vs. temperature

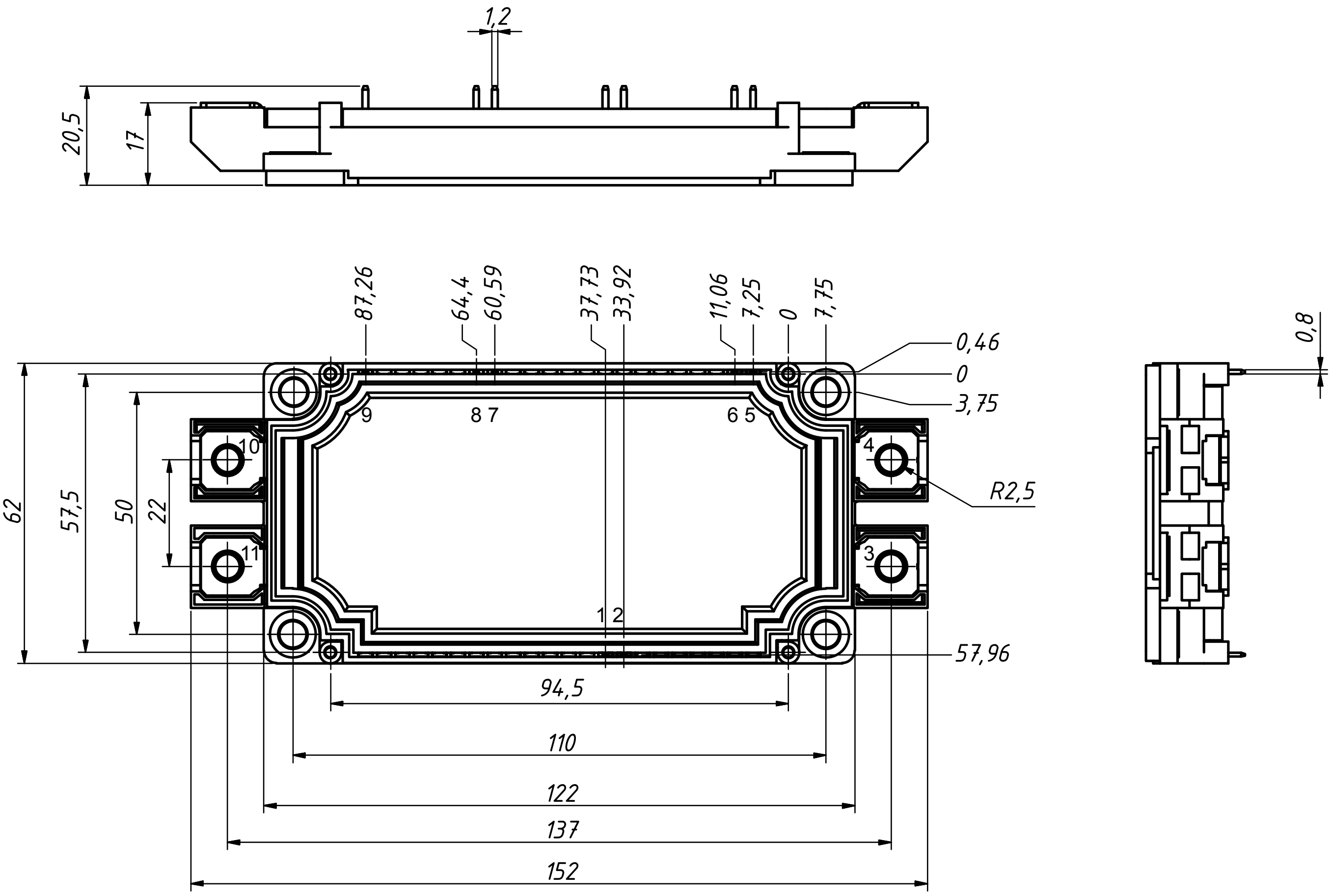
Equivalent Circuits for Simulation

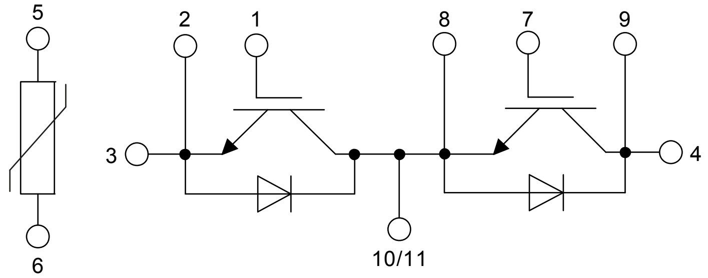
** on die level* $T_{VJ} = 150\,°C$



		IGBT	Diode	
$V_{0\,max}$	*threshold voltage*	1.1	1.19	V
$R_{0\,max}$	*slope resistance **	6	8.9	mΩ

Outlines SimBus F





IGBT

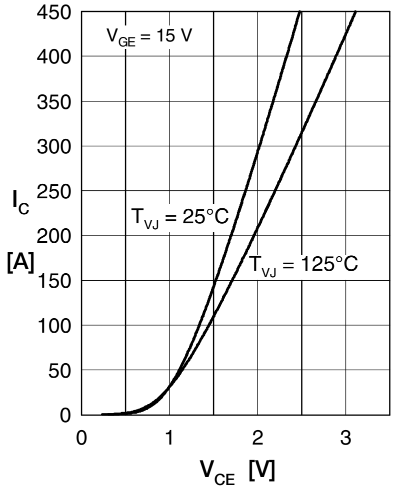


Fig. 1 Typ. output characteristics

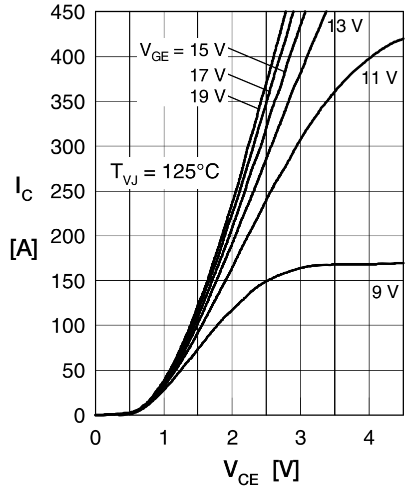


Fig. 2 Typ. output characteristics

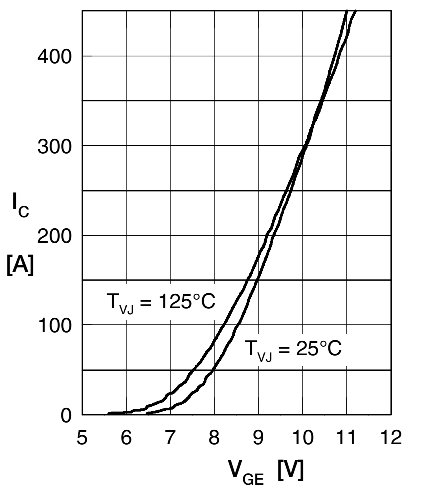


Fig. 3 Typ. transfer characteristics

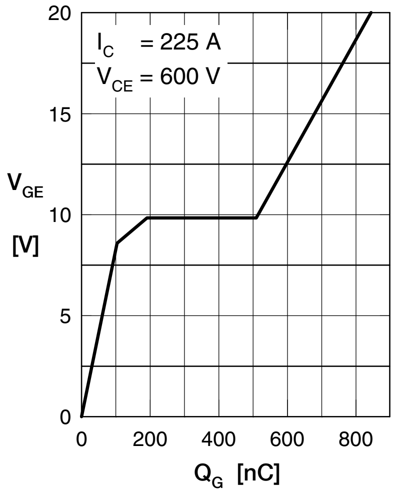


Fig. 4 Typ. turn-on gate charge

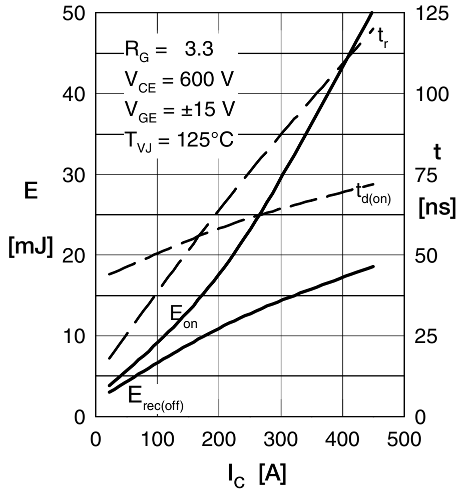


Fig. 5 Typ. switching energy versus collector current

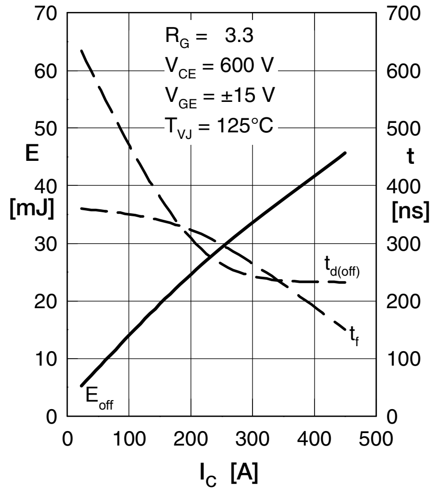


Fig. 6 Typ. switching energy versus collector current

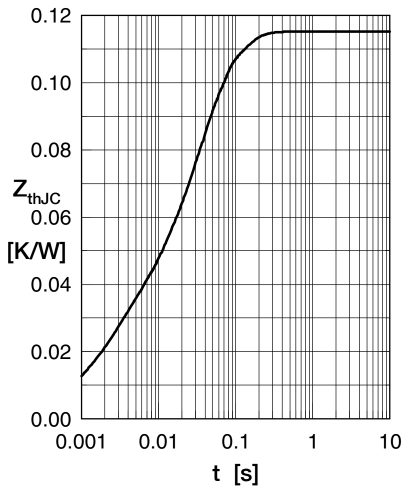


Fig. 7 Typical transient thermal impedance junction to case

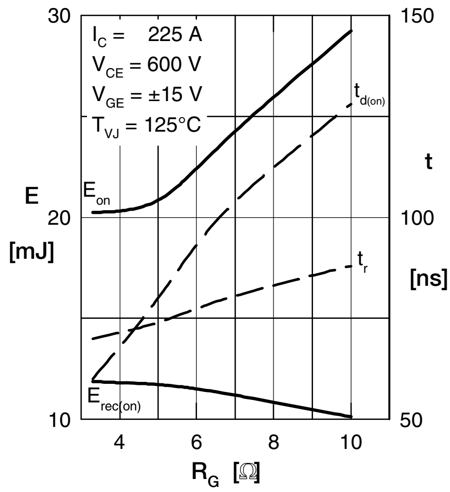


Fig. 8 Typ. switching energy versus gate resistance

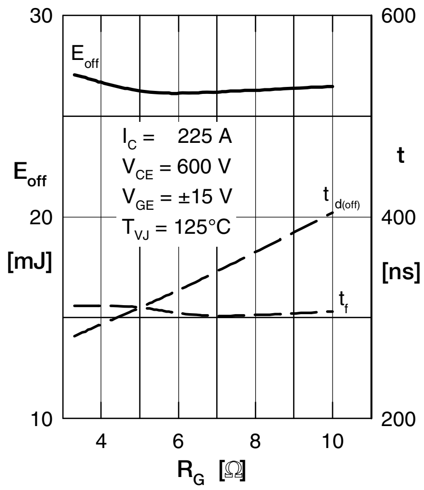


Fig. 9 Typ. switching energy versus gate resistance

preliminary

Diode

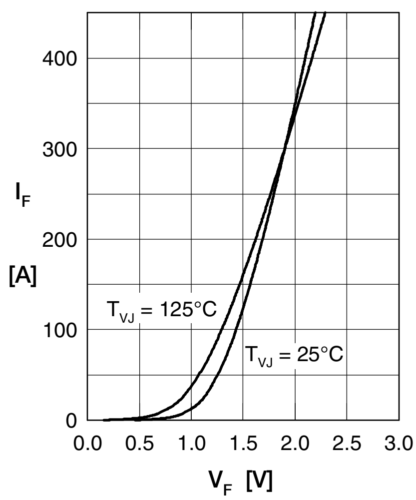


Fig. 1 Typ. forward current versus V_F

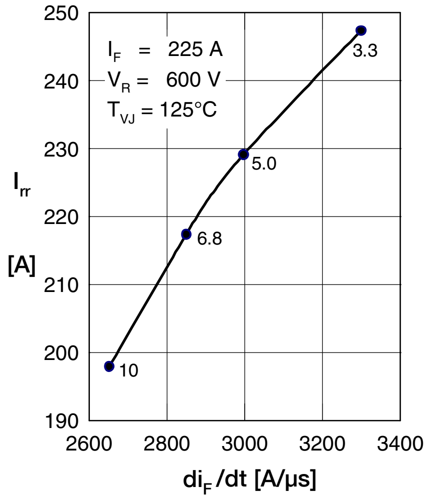


Fig. 2 Typ. reverse recovery characteristics

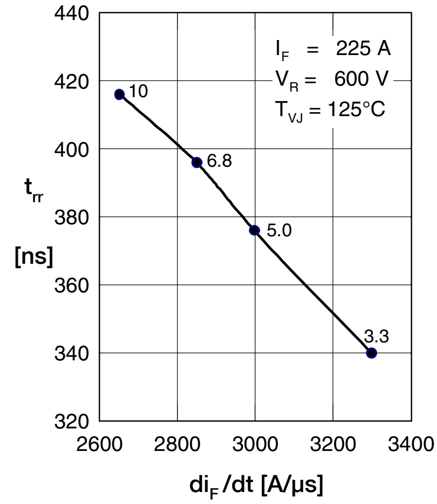


Fig. 3 Typ. reverse recovery characteristics

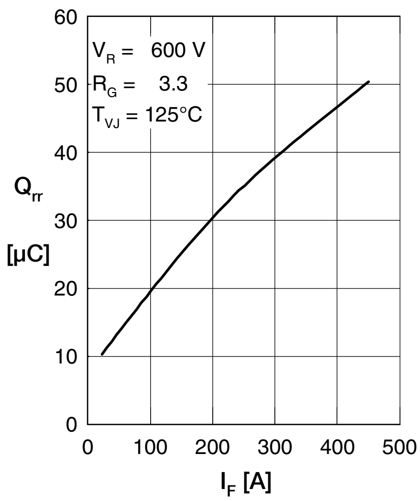


Fig. 4 Typ. reverse recovery characteristics

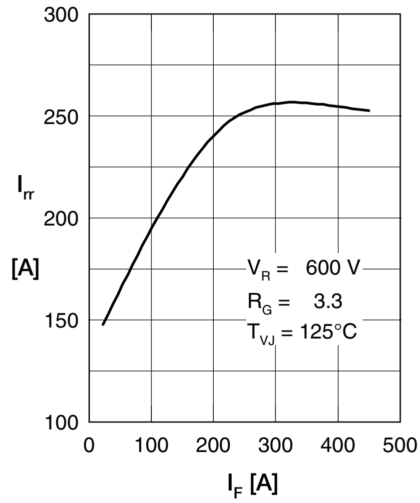


Fig. 3 Typ. reverse recovery characteristics

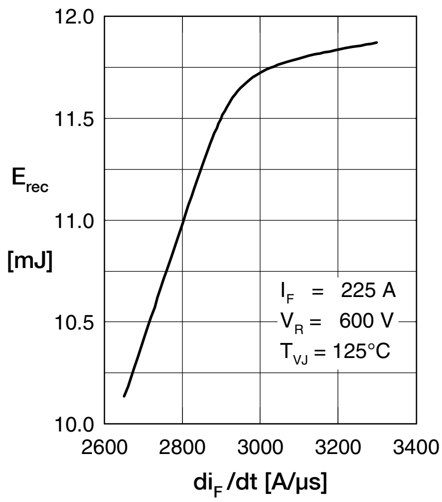


Fig. 6 Typ. recovery energy E_{rec} versus di_F/dt

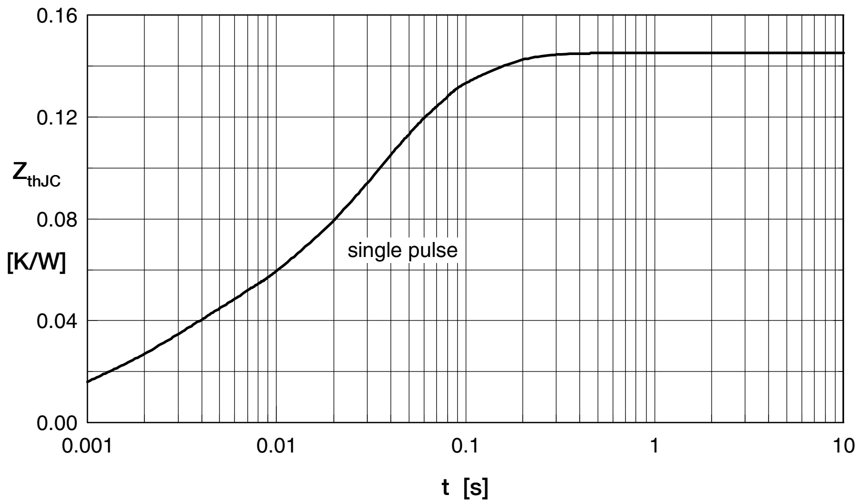


Fig. 7 Typ. transient thermal impedance junction to case