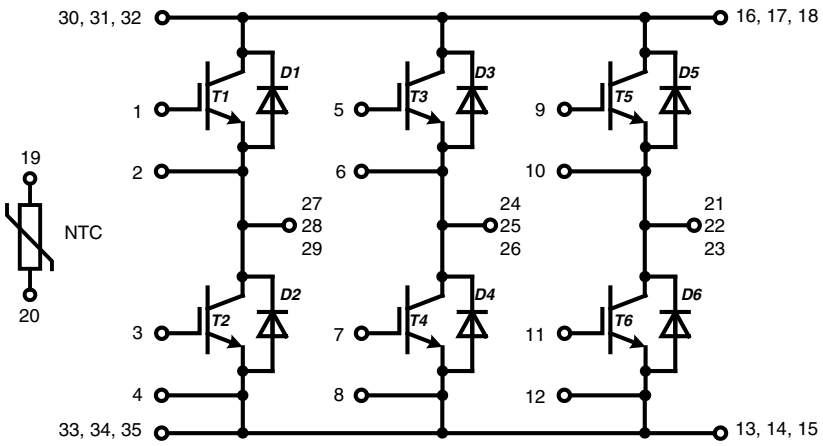
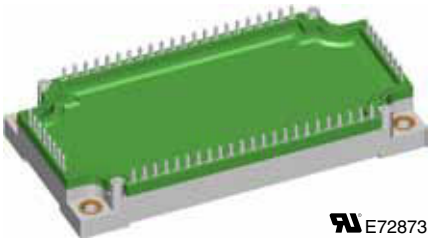
Six-Pack
XPT IGBT

V_{CES} = 1200 V
I_{C25} = 120 A
$V_{CE(sat)}$ = 1.8 V

Part name (Marking on product)

MIXA80W1200TEH





Pin configuration see outlines.

Features:

- 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
  - square RBSOA @ 3x I_C
  - low EMI
- Thin wafer technology combined with the XPT design results in a competitive low $V_{CE(sat)}$
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Application:

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

Package:

- "E3-Pack" standard outline
- Insulated copper base plate
- Soldering pins for PCB mounting
- Temperature sense included
- Optimizes pin layout

Ouput 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			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 = 77 A; 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 = 3 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.4	6.0	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C		0.03	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 V_{CE} = 600 V; I_C = 75 A V_{GE} = ±15 V; R_G = 10 Ω	T_{VJ} = 125°C		70		ns
t_r	*current rise time*				40		ns
$t_{d(off)}$	*turn-off delay time*				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 V_{CEK} = 1200 V			225	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 = 10 Ω; non-repetitive			300		A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.32	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

T_C = 25°C unless otherwise stated

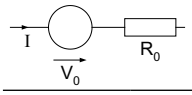
Temperature Sensor NTC

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				3000	V~
CTI	*comparative tracking index*					200	
M_d	*mounting torque (M5)*			3		6	Nm
d_S	*creep distance on surface*			10			mm
d_A	*strike distance through air*			7.5			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					300		g

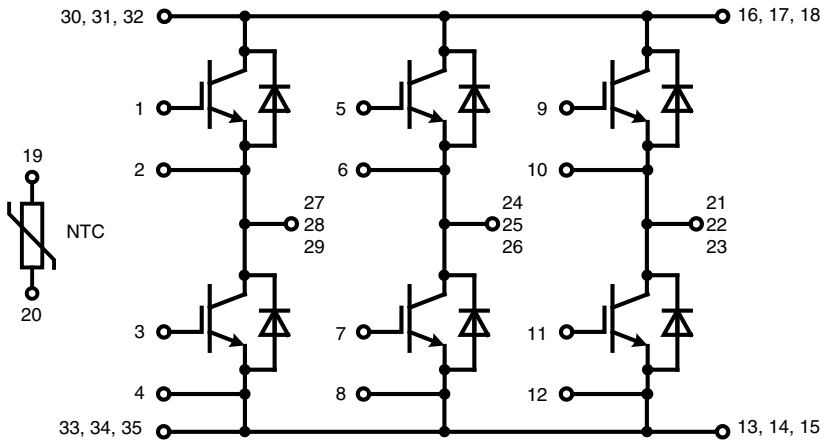
Equivalent Circuits for Simulation

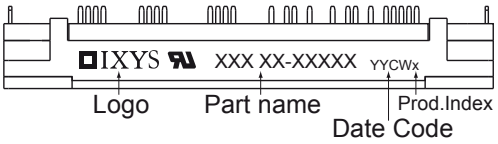


Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
V_0	*IGBT*	T1 - T6	T_{VJ} = 150°C		1.1		V
R_0					17.9		mΩ
V_0	*free wheeling diode*	D1 - D6	T_{VJ} = 150°C		1.09		V
R_0					9.1		mΩ

T_C = 25°C unless otherwise stated

Circuit Diagram



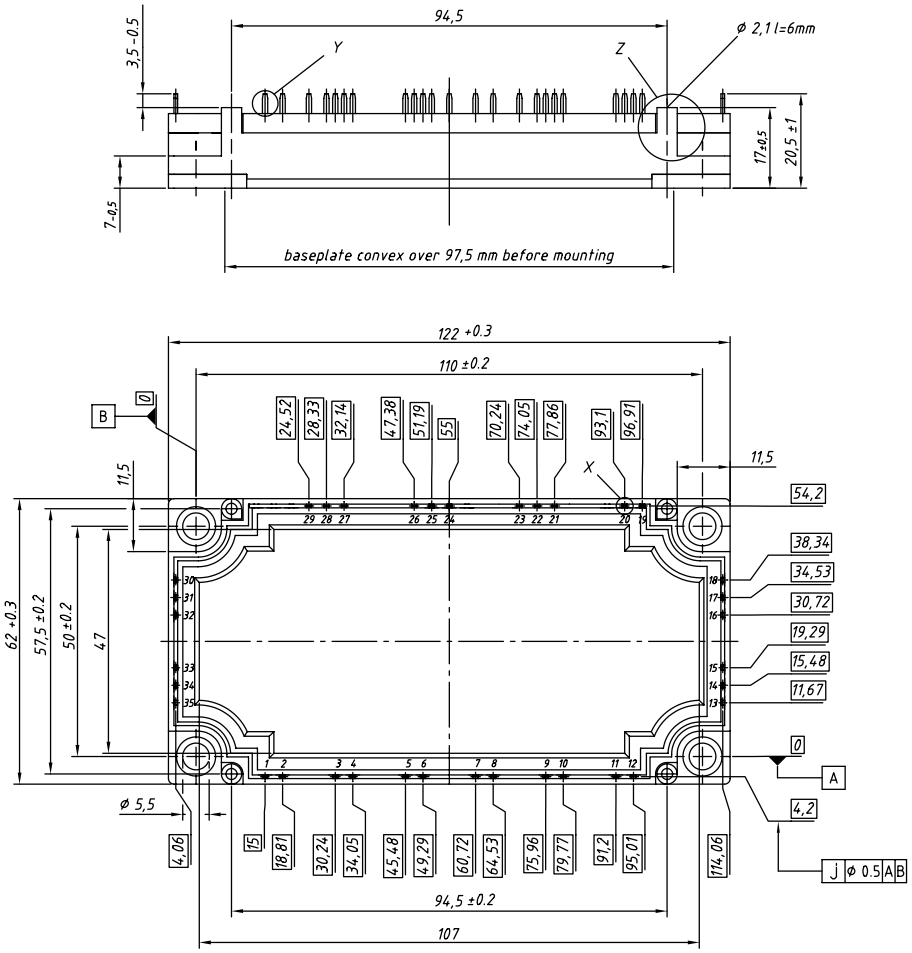


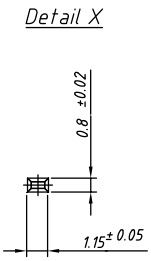
Part number

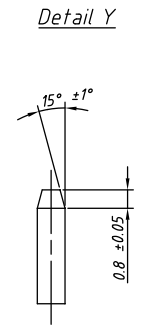
M = Module
I = IGBT
X = XPT
A = standard
80 = Current Rating [A]
W = Six-Pack
1200 = Reverse Voltage [V]
T = NTC
EH = E3-Pack

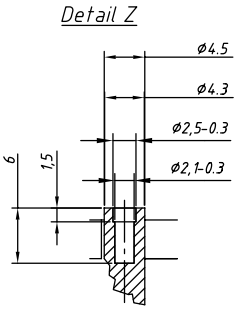
Outline Drawing

Dimensions in mm (1 mm = 0.0394“)









Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA80W1200 TEH	MIXA80W1200TEH	Box	5	508628

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

20100924a

Transistor T1 - T6

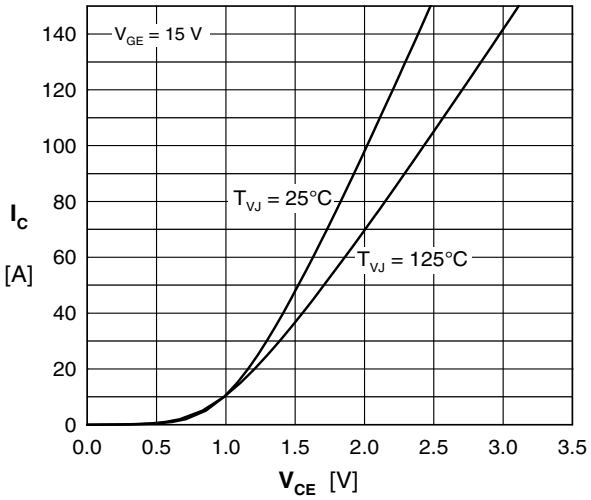


Fig. 1 Typ. output characteristics

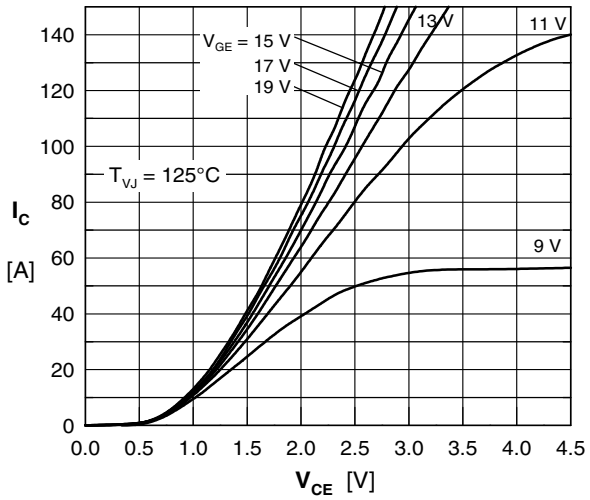


Fig. 2 Typ. output characteristics

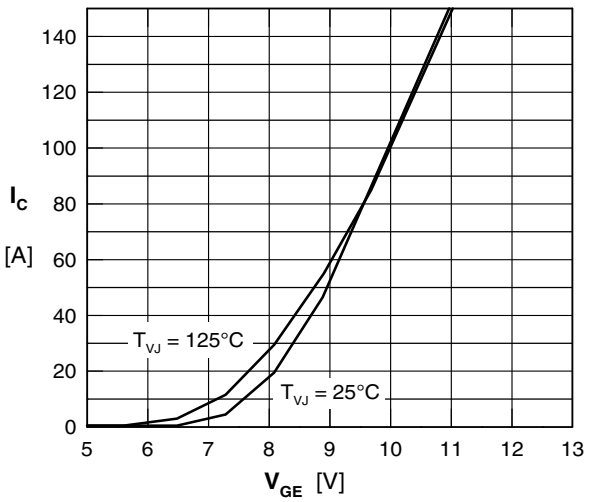


Fig. 3 Typ. tranfer characteristics

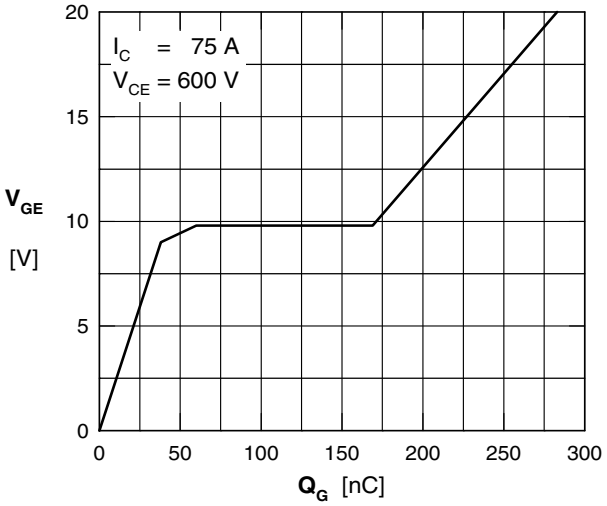


Fig. 4 Typ. turn-on gate charge

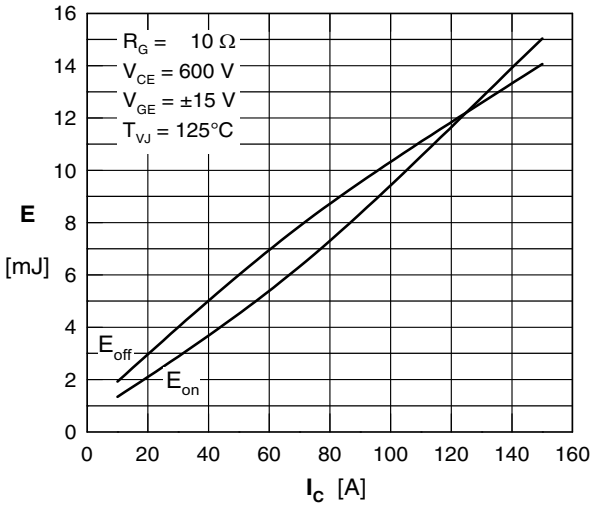


Fig. 5 Typ. switching energy vs. collector current

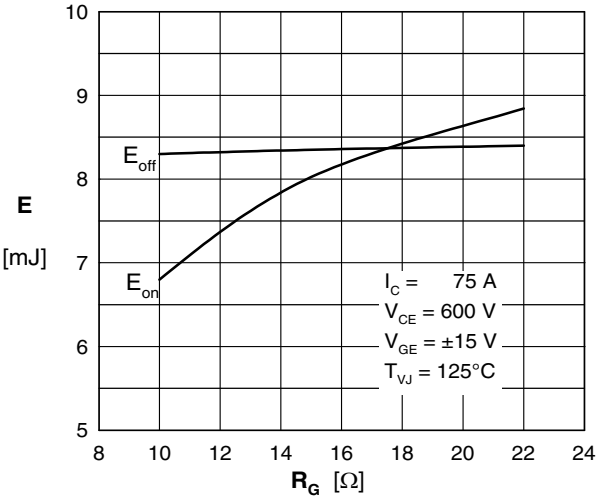


Fig. 6 Typ. switching energy vs. gate resistance

Inverter D1 - D6

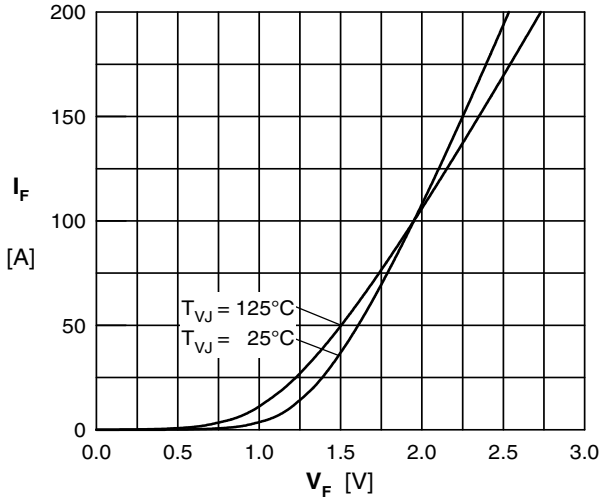


Fig. 7 Typ. Forward current versus V_F

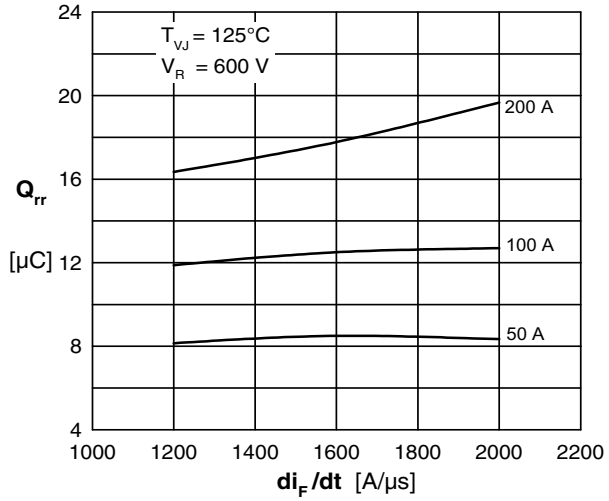


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

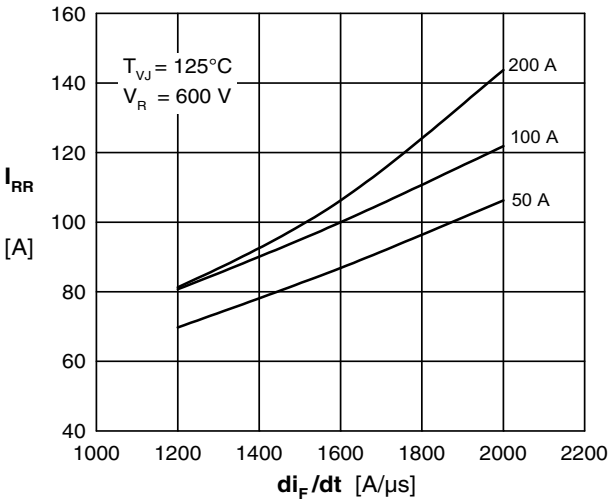


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

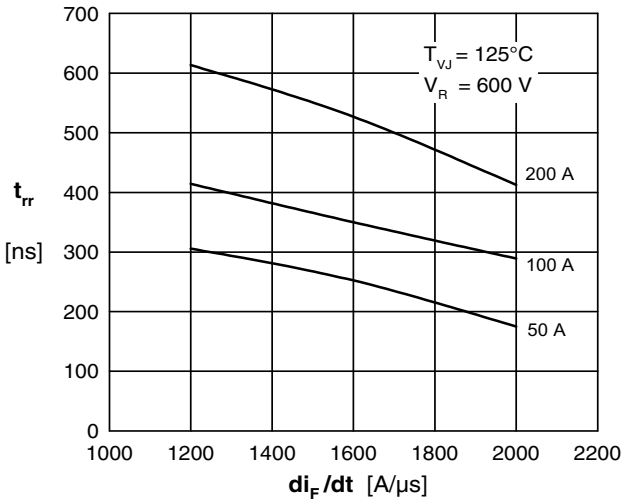


Fig. 10 Typ. recovery time t_{rr} versus di/dt

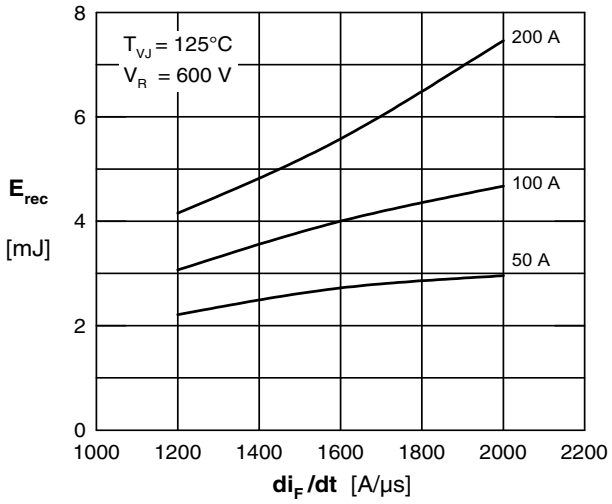
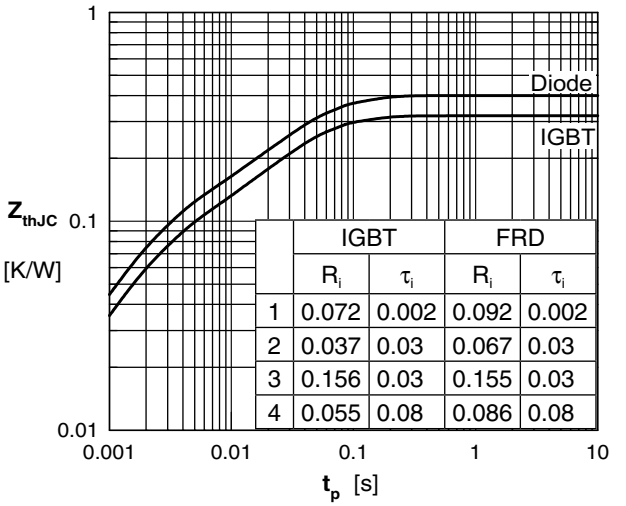


Fig. 11 Typ. recovery energy E_{rec} versus di/dt



	IGBT		FRD	
	R_i	τ_i	R_i	τ_i
1	0.072	0.002	0.092	0.002
2	0.037	0.03	0.067	0.03
3	0.156	0.03	0.155	0.03
4	0.055	0.08	0.086	0.08

Fig. 12 Typ. transient thermal impedance

NTC

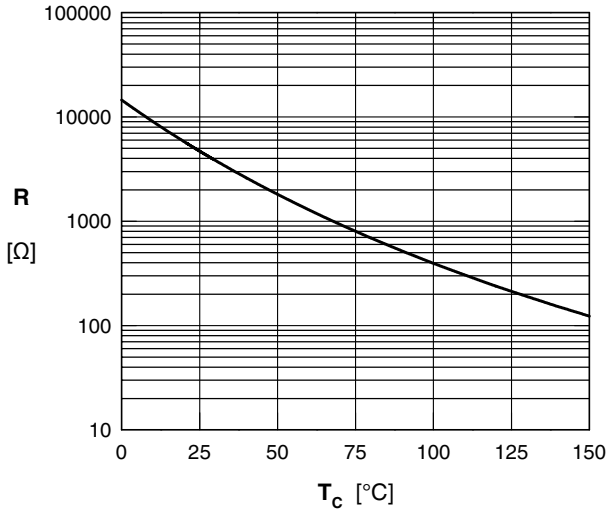


Fig.13 Typ. NTC resistance vs. temperature