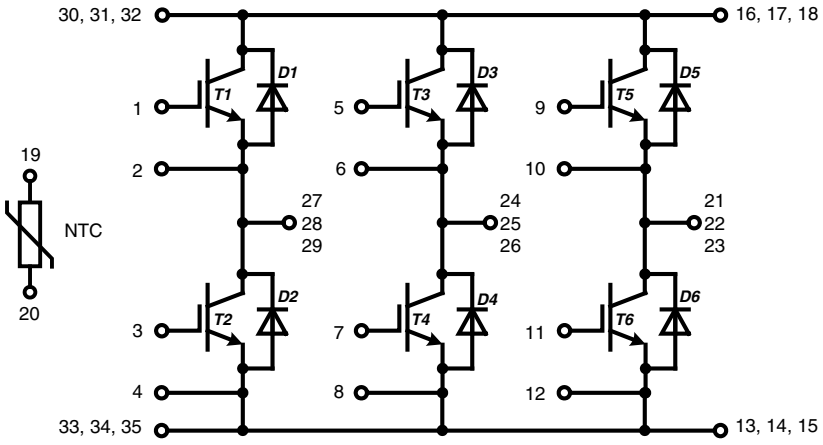
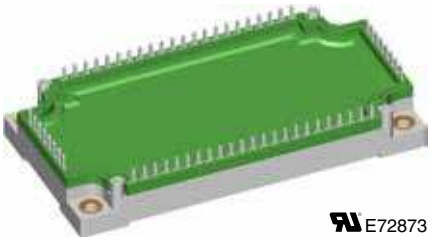
Six-Pack
SPT+ IGBT

V_{CES} = 1200 V
I_{C25} = 183 A
$V_{CE(sat)}$ = 1.8 V

Part name (Marking on product)

MIEB100W1200TEH





Pin configuration see outlines.

Features:

- SPT+ 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
- SONIC™ free wheeling diode
  - fast and soft revere recovery
  - low operation forward voltage
- 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:

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

Ouput Inverter T1 - T6

Symbol	Definitions	Conditions		Ratings min.	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			183	A
I_{C80}			T_C = 80°C			128	A
P_{tot}	*total power dissipation*		T_C = 25°C			630	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 100 A; V_{GE} = 15 V	T_{VJ} = 25°C		1.8	2.2	V
	(on chip level) ①		T_{VJ} = 125°C		2.0	2.4	V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 4 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5	6	7	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		0.9	3	mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				200	nA
C_{ies}	*input capacitance*	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz			7430		pF
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 100 A			750		nC
$t_{d(on)}$	*turn-on delay time*	inductive load V_{CE} = 600 V; I_C = 100 A V_{GE} = ±15 V; R_G = 10 Ω L_S = 70 nH	T_{VJ} = 125°C		120		ns
t_r	*current rise time*				55		ns
$t_{d(off)}$	*turn-off delay time*				460		ns
t_f	*current fall time*				240		ns
E_{on}	*turn-on energy per pulse*				9.5		mJ
E_{off}	*turn-off energy per pulse*				9.7		mJ
$E_{rec(off)}$	*reverse recovery losses at turn-off*				4.2		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 10 Ω;	T_{VJ} = 125°C V_{CEK} = 1200 V			200	A
SCSOA	*short circuit safe operating area*						
t_{SC}	*short circuit duration*	V_{CE} = 900 V; V_{GE} = ±10 V;	T_{VJ} = 125°C			10	µs
	short circuit current	R_G = 3.9 Ω; non-repetitive					
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.2	K/W

Output Inverter D1 - D6

Symbol	Definitions	Conditions		Ratings min.	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		2.00	2.20	V
	(on chip level) ①		T_{VJ} = 125°C		1.95	2.25	V
I_{rr}	*max. reverse recovery current*	inductive load V_{CE} = 600 V; I_C = 100 A V_{GE} = ±15 V; R_G = 10 Ω L_S = 70 nH	T_{VJ} = 125°C		120		A
t_{rr}	*reverse recovery time*				330		ns
Q_{rr}					12.5		µC
E_{rec}					4.2		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
$B_{25/50}$					3510		K

Module

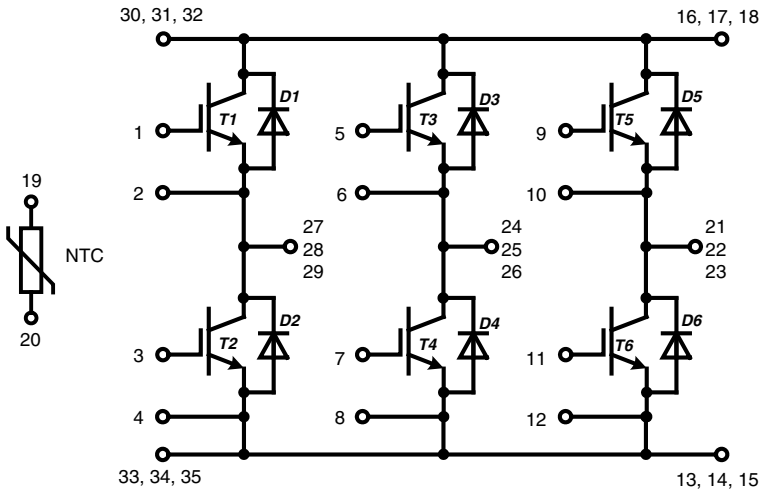
Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
T_{VJ}	*operating temperature*			-40		125	°C
T_{VJM}	*max. virtual junction temperature*					150	°C
T_{stg}	*storage temperature*			-40		125	°C
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq$ 1 mA; 50/60 Hz	t = 1 min			3000	V~
			t = 1 s			3600	V~
CTI	*comparative tracking index*					200	
M_d	*mounting torque (M5)*			3		6	Nm
$R_{pin\ to\ chip}$	*see* ①				1.8		mΩ
d_S	*creep distance on surface*			12.7			mm
d_A	*strike distance through air*			9.6			mm
R_{thCH}	*thermal resistance case to heatsink*	with heatsink compound			0.1		K/W
Weight					300		g

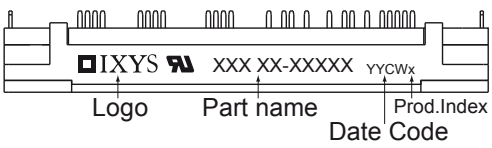
① $V_{CE} = V_{CE(sat)} + 2x\ R_{pin\ to\ chip} \cdot I_C$

T_C = 25°C unless otherwise stated

Curves are measured on modul level except Fig. 14 to Fig. 17

Circuit Diagram



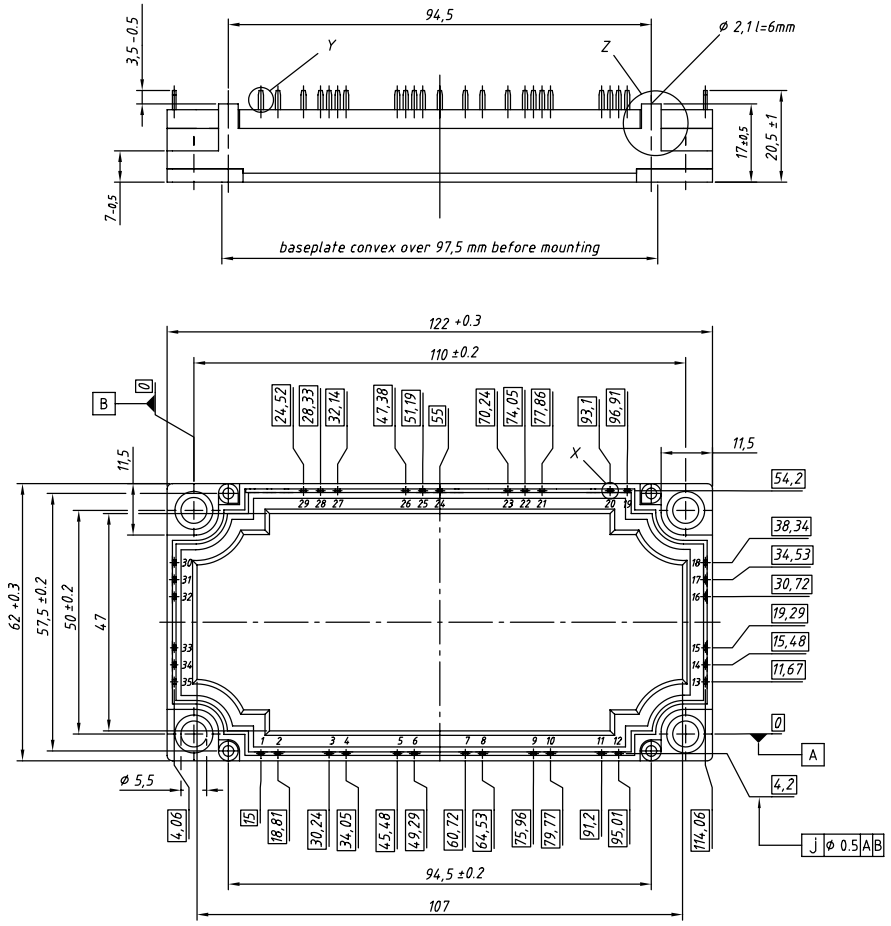


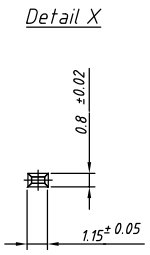
Part number

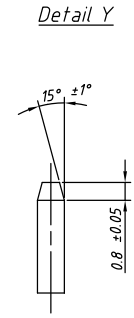
M = Module
I = IGBT
E = NPT
B = 2nd Generation
100 = Current Rating [A]
W = Six-Pack
1200 = Reverse Voltage [V]
T = NTC
EH = E3-Pack

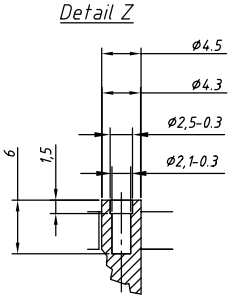
Outline Drawing

Dimensions in mm (1 mm = 0.0394“)









Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIEB100W1200TEH	MIEB100W1200TEH	Box	5	510118

Transistor T1 - T6

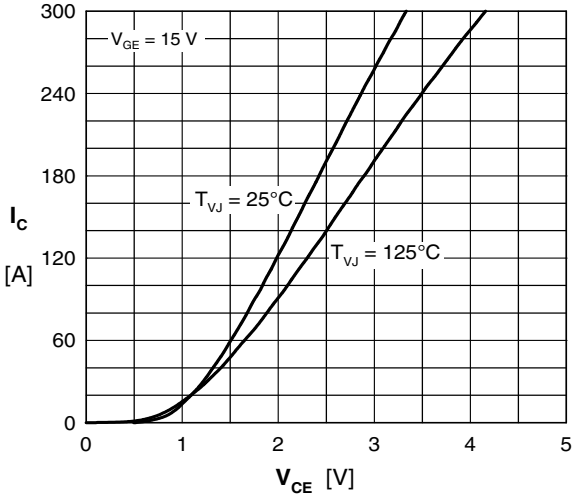


Fig. 1 Typ. output characteristics

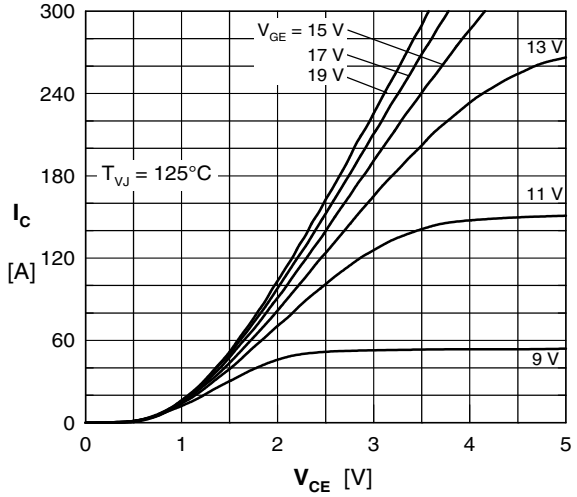


Fig. 2 Typ. output characteristics

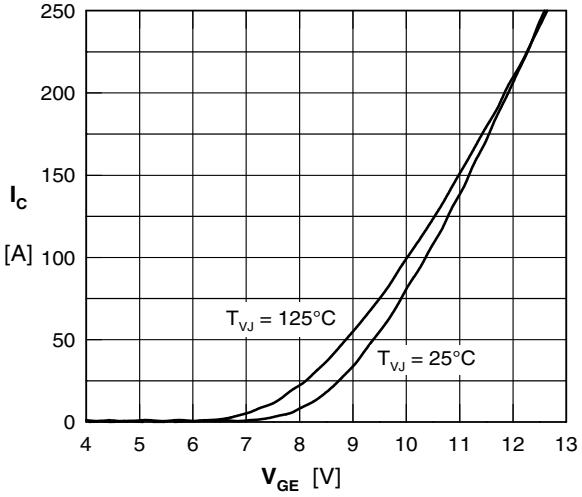


Fig. 3 Typ. tranfer characteristics

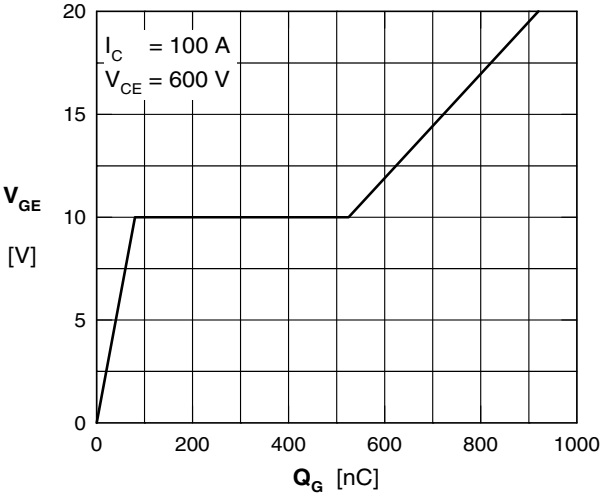


Fig. 4 Typ. turn-on gate charge

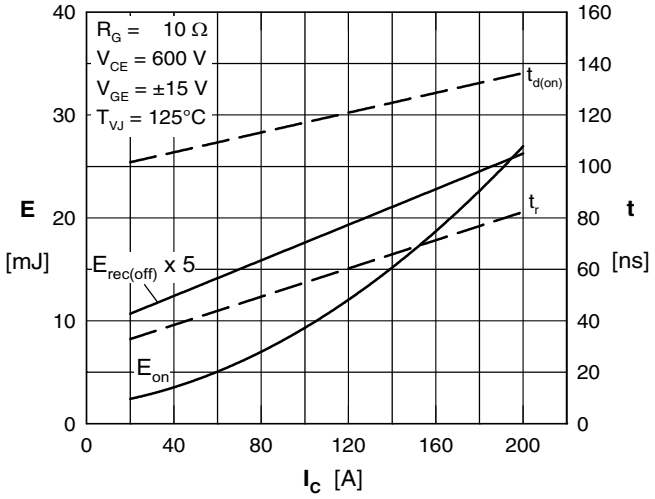


Fig. 5 Typ. turn-on energy & switching times versus collector current

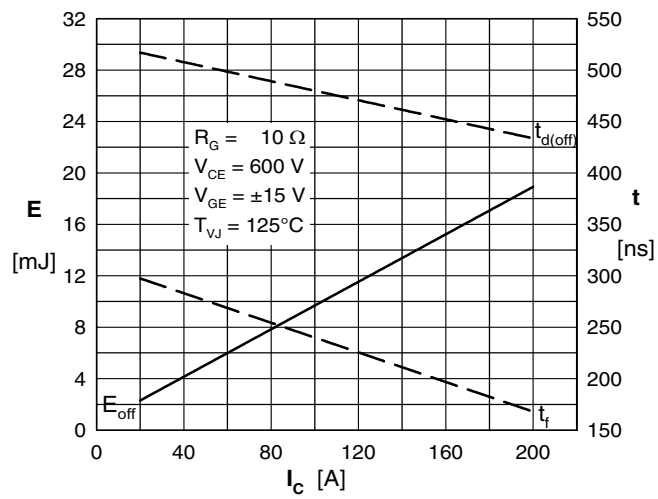


Fig. 6 Typ. turn-off energy & switching times versus collector current

Transistor T1 - T6

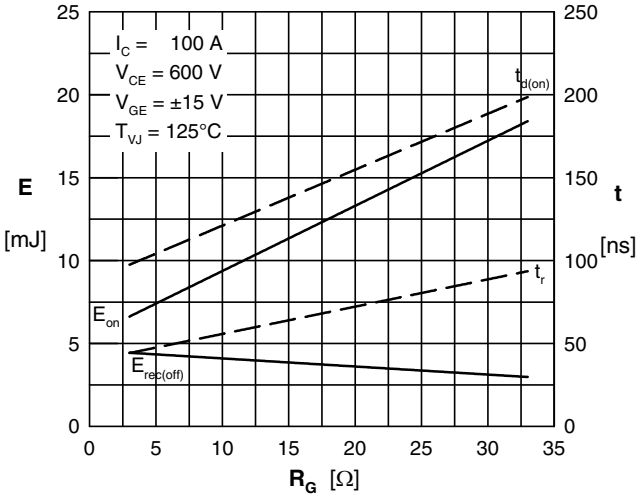


Fig. 7 Typ. turn on energy & switching times versus gate resistor

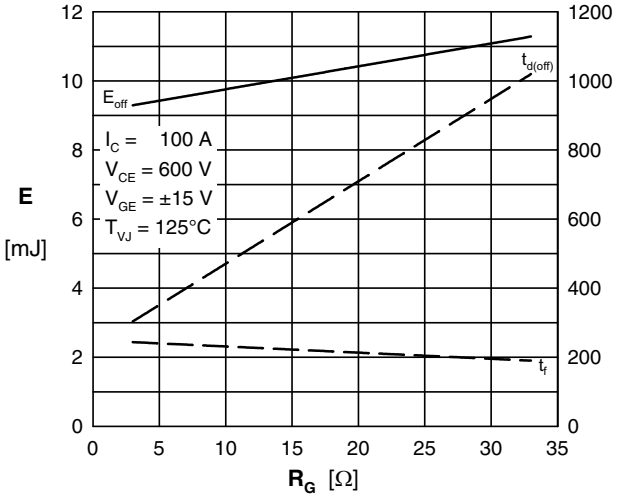


Fig. 8 Typ. turn off energy & switching times versus gate resistor

Diode D1 - D6 & NTC

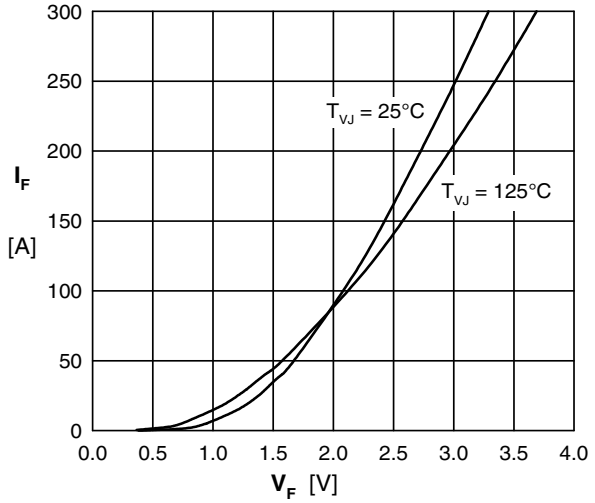


Fig. 9 Typ. forward characteristics

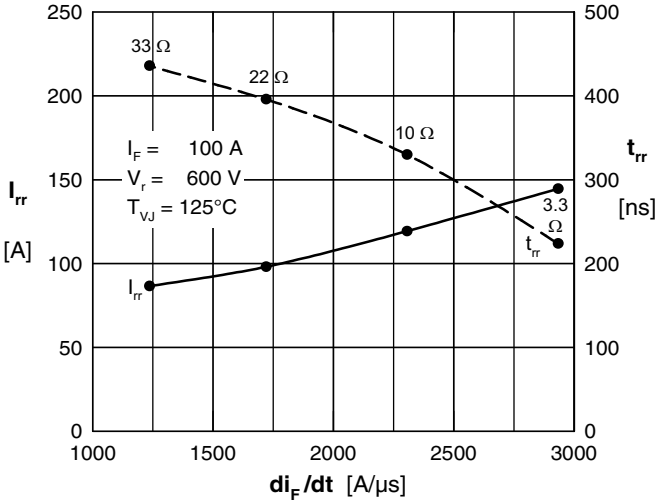


Fig. 10 Typ. reverse recovery characteristics

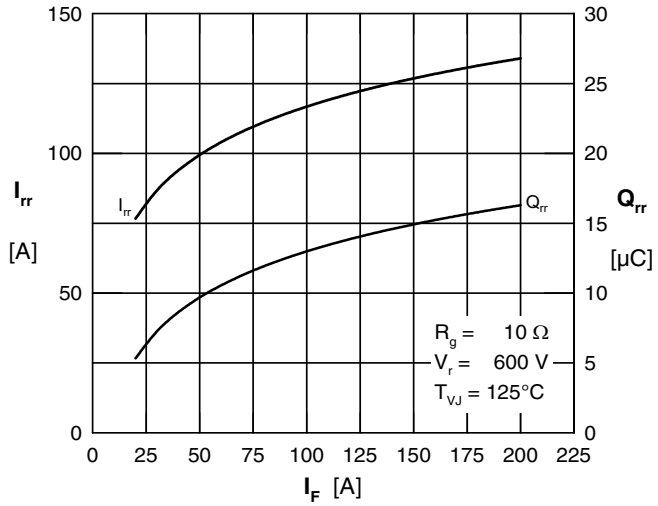


Fig. 11 Typ. reverse recovery characteristics

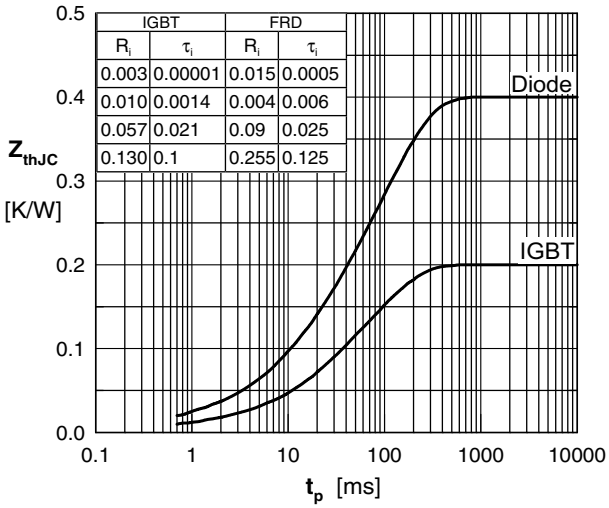


Fig. 12 Typ. transient thermal impedance

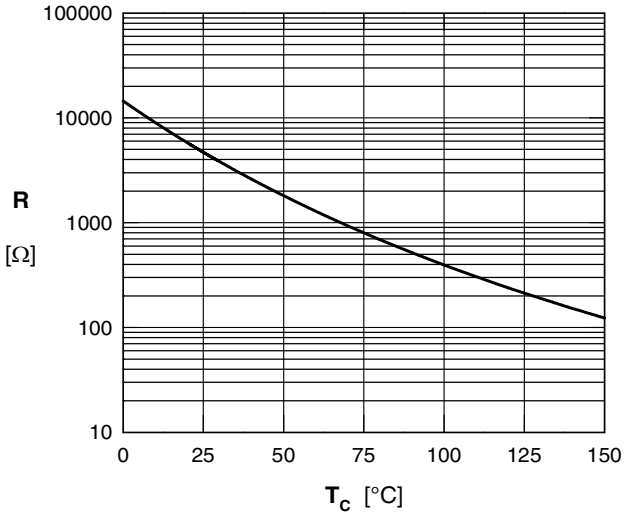


Fig.13 Typ. NTC resistance vs. temperature

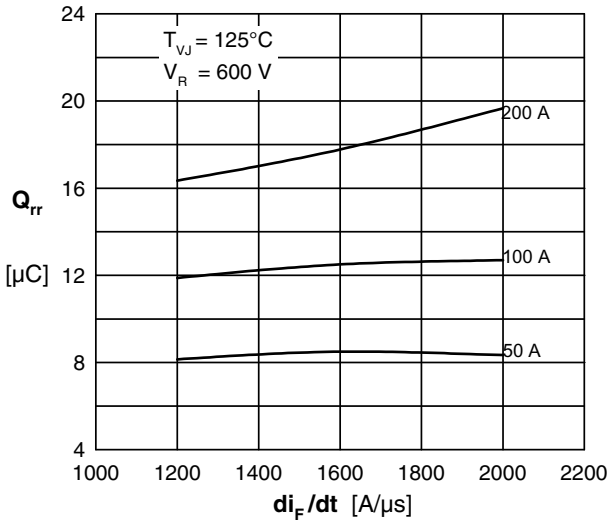


Fig. 14 Typ. reverse recov.charge Q_{rr} vs. di/dt

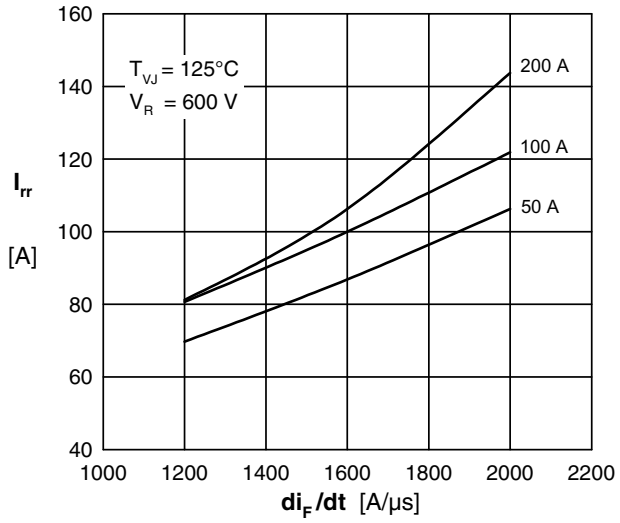


Fig. 15 Typ. peak reverse current I_{RM} vs. di/dt

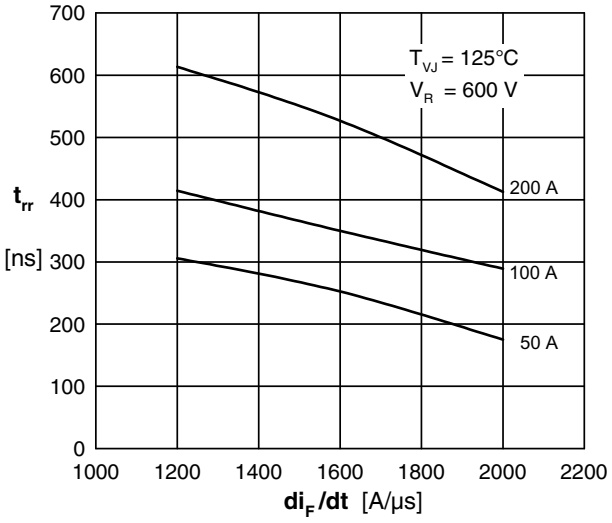


Fig. 16 Typ. recovery time t_{rr} versus di/dt

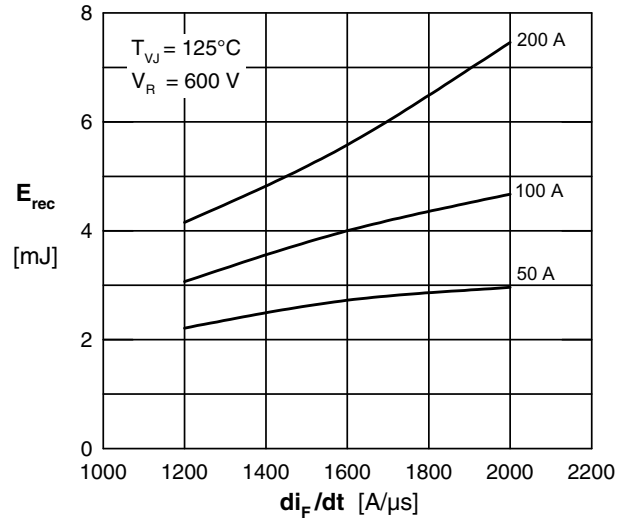


Fig. 17 Typ. recovery energy E_{rec} versus di/dt