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.

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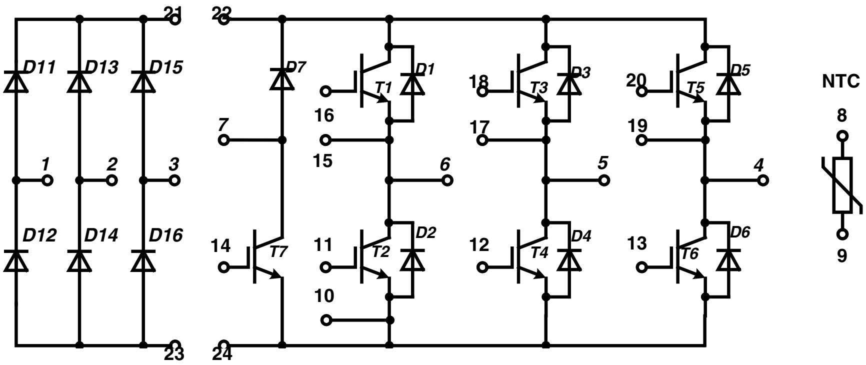
Converter - Brake - Inverter Module
XPT IGBT

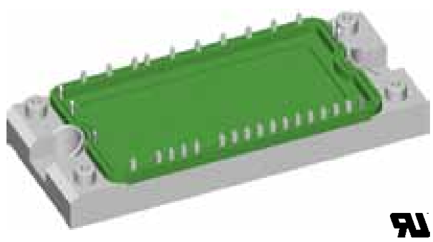
Three Phase Rectifier	Brake Chopper	Three Phase Inverter
V_{RRM} = 1600 V	V_{CES} = 1200 V	V_{CES} = 1200 V
I_{DAVM} = 105 A	I_{C25} = 17 A	I_{C25} = 17 A
I_{FSM} = 320 A	$V_{CE(sat)}$ = 1.8 V	$V_{CE(sat)}$ = 1.8 V

Preliminary data

Part name (Marking on product)

MIXA10WB1200TED





E 72873

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
  - 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:

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

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

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Ouput Inverter T1 - T6

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES} V_{GEM}	*max. DC gate voltage* *max. transient collector gate voltage*	continuous transient				±20 ±30	V V
I_{C25} I_{C80}	*collector current*		T_C = 25°C T_C = 80°C			17 12	A A
P_{tot}	*total power dissipation*		T_C = 25°C			60	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 9 A; V_{GE} = 15 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.8 2.1	2.1	V V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 0.3 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.5	6.0	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		0.01 0.1	0.7	mA 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 = 10 A			27		nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	*turn-on delay time* *current rise time* *turn-off delay time* *current fall time* *turn-on energy per pulse* *turn-off energy per pulse*	inductive load V_{CE} = 600 V; I_C = 10 A V_{GE} = ±15 V; R_G = 100 Ω	T_{VJ} = 125°C		70 40 250 100 1.1 1.1		ns ns ns ns mJ mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 100 Ω;	T_{VJ} = 125°C V_{CEK} = 1200 V			30	A
SCSOA t_{SC} I_{SC}	*short circuit safe operating area* *short circuit duration* *short circuit current*	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 100 Ω; non-repetitive	T_{VJ} = 125°C		 40	10	μs A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				2.0	K/W

Output Inverter D1 - D6

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitve reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25} I_{F80}	*forward current*		T_C = 25°C T_C = 80°C			19 13	A A
V_F	*forward voltage*	I_F = 10 A; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.95 1.85	2.2	V V
Q_{rr} I_{RM} t_{rr} E_{rec}	*reverse recovery charge* *max. reverse recovery current* *reverse recovery time* *reverse recovery energy*	V_R = 600 V di_F/dt = - A/μs I_F = 10 A; V_{GE} = 0 V	T_{VJ} = 125°C		tbd tbd tbd tbd		μC A ns mJ
R_{thJC}	*thermal resistance junction to case*	(per diode)				2.4	K/W

T_C = 25°C unless otherwise stated

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Brake T7

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
				Ratings			
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES} V_{GEM}	*max. DC gate voltage* *max. transient collector gate voltage*	continuous transient				±20 ±30	V V
I_{C25} I_{C80}	*collector current*		T_C = 25°C T_C = 80°C			17 12	A A
P_{tot}	*total power dissipation*		T_C = 25°C			60	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 9 A; V_{GE} = 15 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.8 2.1	2.1	V V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 0.3 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.5	6.0	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		 0.1	0.1	mA 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 = 10 A			27		nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	*turn-on delay time* *current rise time* *turn-off delay time* *current fall time* *turn-on energy per pulse* *turn-off energy per pulse*	inductive load V_{CE} = 600 V; I_C = 10 A V_{GE} = ±15 V; R_G = 100 Ω	T_{VJ} = 125°C		70 40 250 100 1.1 1.1		ns ns ns ns mJ mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 100 Ω;	T_{VJ} = 125°C V_{CEK} = 1200 V			30	A
SCSOA t_{SC} I_{SC}	*short circuit safe operating area* *short circuit duration* *short circuit current*	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 100 Ω; non-repetitive	T_{VJ} = 125°C		 40	 10	 µs A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				2.0	K/W

Brake Chopper D7

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
				Ratings			
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25} I_{F80}	*forward current*		T_C = 25°C T_C = 80°C			12 8	A A
V_F	*forward voltage*	I_F = 5 A; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.95 1.85	2.2	V V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C T_{VJ} = 125°C		 0.5	0.5	mA mA
Q_{rr} I_{RM} t_{rr} E_{rec}	*reverse recovery charge* *max. reverse recovery current* *reverse recovery time* *reverse recovery energy*	V_R = 600 V di_F/dt = tbd A/µs I_F = 10 A; V_{GE} = 0 V	T_{VJ} = 125°C		tbd tbd tbd tbd		µC A ns µJ
R_{thJC}	*thermal resistance junction to case*	(per diode)				3.4	K/W

T_C = 25°C unless otherwise stated

Input Rectifier Bridge D11 - D16

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
					Ratings		
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1600	V
I_{FAV} I_{DAVM}	*average forward current* *max. average DC output current*	sine 180° rect.; d = $^1/_3$	T_C = 80°C T_C = 80°C			37 105	A A
I_{FSM}	*max. forward surge current*	t = 10 ms; sine 50 Hz	T_{VJ} = 25°C T_{VJ} = 125°C			320 280	A A
I^2t	*I^2t value for fusing*	t = 10 ms; sine 50 Hz	T_{VJ} = 25°C T_{VJ} = 125°C			510 390	A^2s A^2s
P_{tot}	*total power dissipation*		T_C = 25°C			110	W
V_F	*forward voltage*	I_F = 50 A	T_{VJ} = 25°C T_{VJ} = 125°C		1.34 1.34	1.7	V V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C T_{VJ} = 125°C		 0.2	0.02	mA mA
R_{thJC}	*thermal resistance junction to case*	(per diode)				1.1	K/W

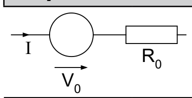
Temperature Sensor NTC

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

Module

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
				Ratings		
T_{VJ} T_{VJM} T_{stg}	*operating temperature* *max. virtual junction temperature* *storage temperature*		-40 -40		125 150 125	°C °C °C
V_{ISOL}	*isolation voltage*	I_{ISOL} ≤ 1 mA; 50/60 Hz			2500	V~
CTI	*comparative tracking index*				-	
M_d	*mounting torque (M5)*		3		6	Nm
d_S d_A	*creep distance on surface* *strike distance through air*		6 6			mm mm
$R_{pin-chip}$	*resistance pin to chip*			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		min.	typ.	max.	Unit
					Ratings		
V_0 R_0	*rectifier diode*	D8 - D13	T_{VJ} = 150°C			0.88 9	V mΩ
V_0 R_0	*IGBT*	T1 - T6	T_{VJ} = 150°C			1.1 153	V mΩ
V_0 R_0	*free wheeling diode*	D1 - D6	T_{VJ} = 150°C			1.1 90	V mΩ
V_0 R_0	*IGBT*	T7	T_{VJ} = 150°C			1.1 153	V mΩ
V_0 R_0	*free wheeling diode*	D7	T_{VJ} = 150°C			1.15 170	V mΩ

T_C = 25°C unless otherwise stated

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

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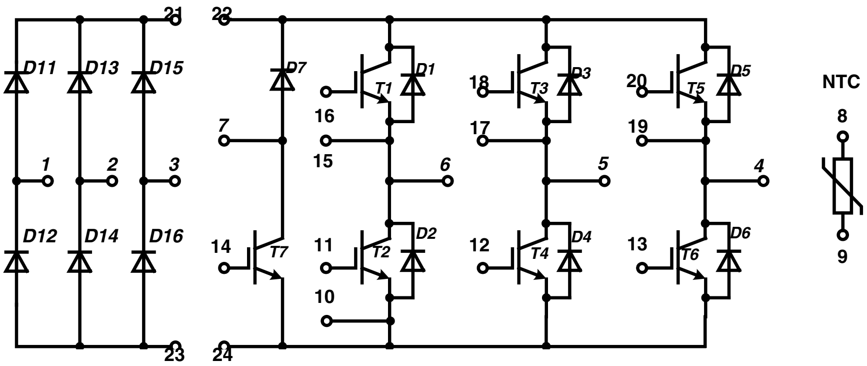
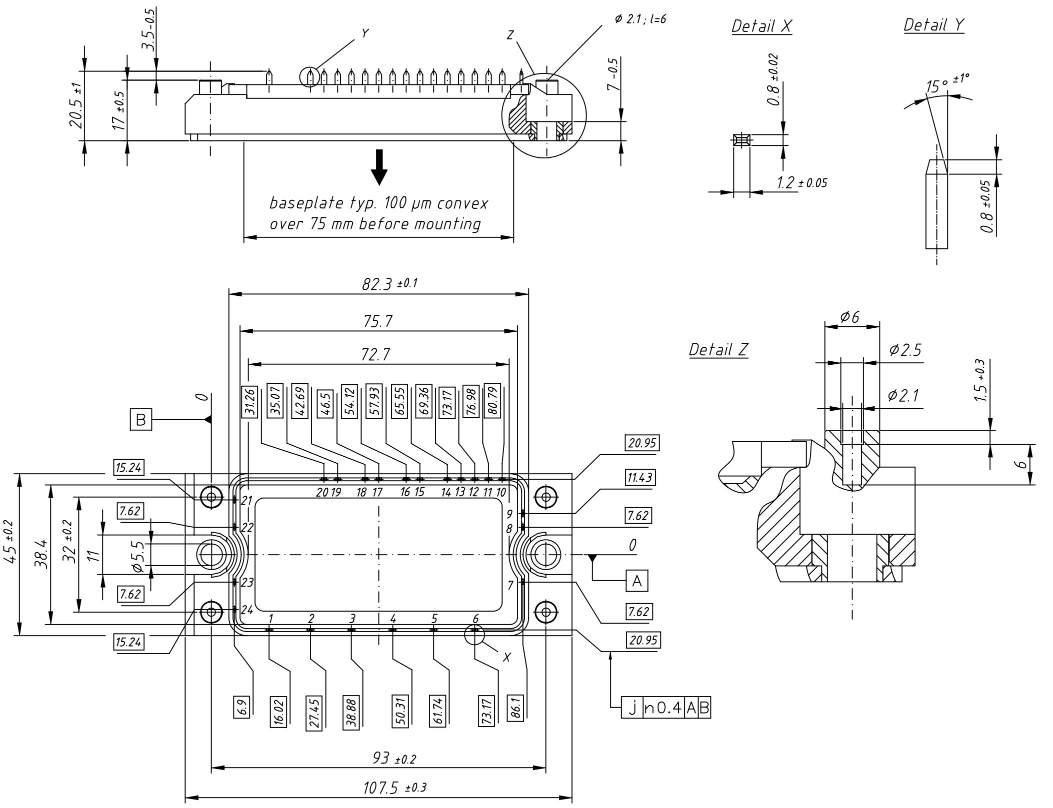
Circuit Diagram

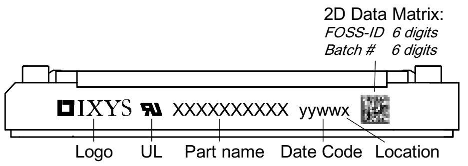


Outline Drawing

Dimensions in mm (1 mm = 0.0394")



Product Marking



Part number

M = Module
I = IGBT
A = MPT
X = Parallel Legs
10 = Current Rating [A]
WB = 6-Pack + 3~ Rectifier Bridge & Brake Unit
1200 = Reverse Voltage [V]
T = NTC
ED = E2-Pack

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA10WB1200 TED	MIXA10WB1200TED	Box	6	508061

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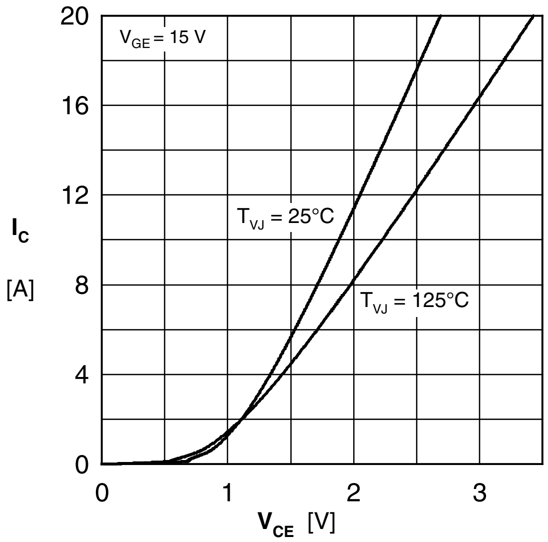


Fig. 1 Typ. output characteristics

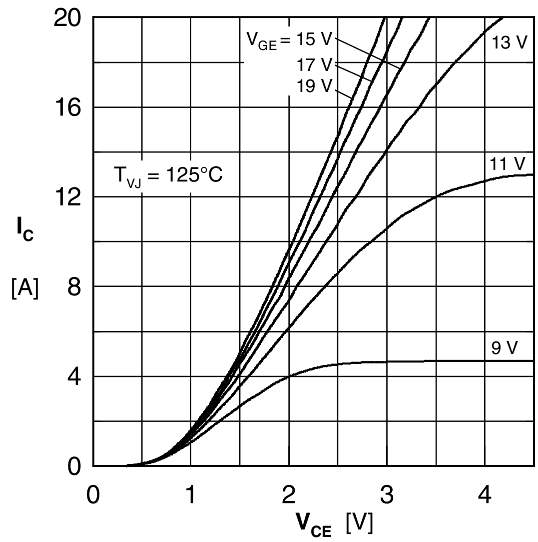


Fig. 2 Typ. output characteristics

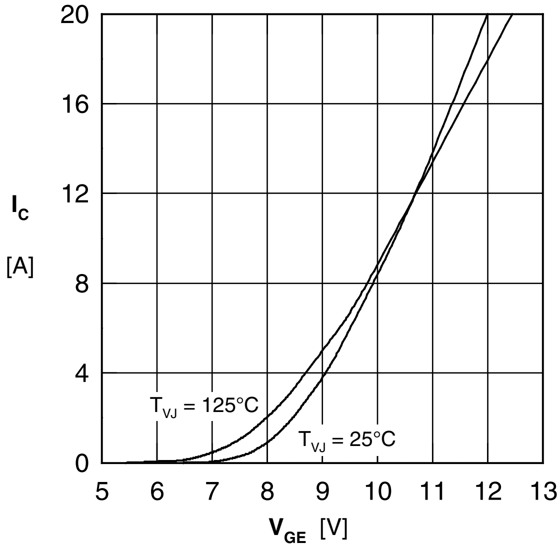


Fig. 3 Typ. tranfer characteristics

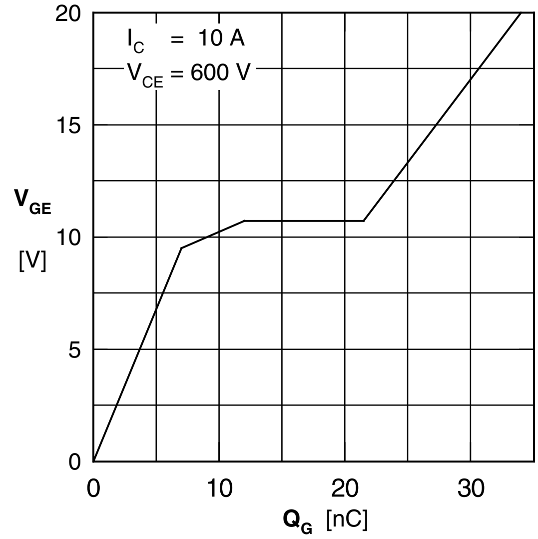


Fig. 4 Typ. turn-on gate charge

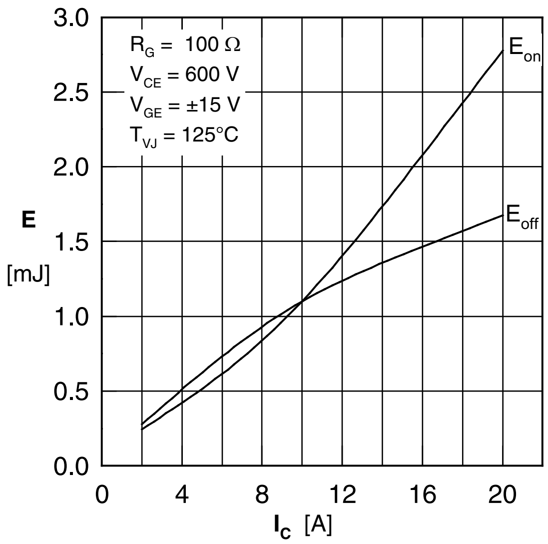


Fig. 5 Typ. switching energy vs. collector current

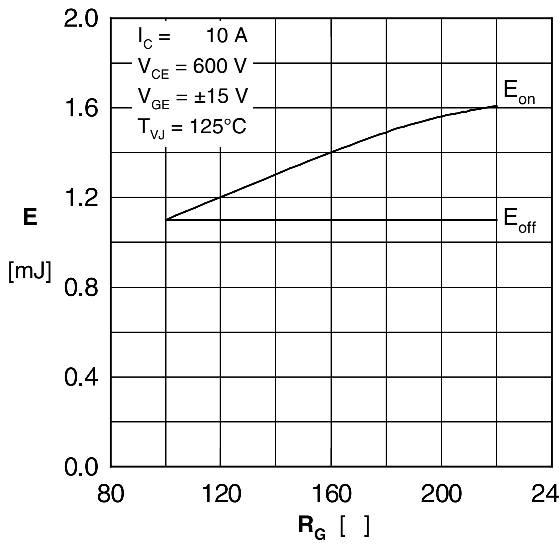


Fig. 6 Typ. switching energy vs. gate resistance

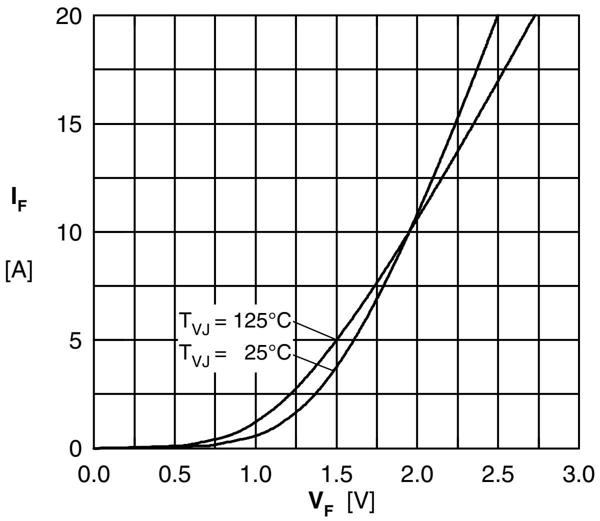


Fig. 7 Typ. forward characteristics

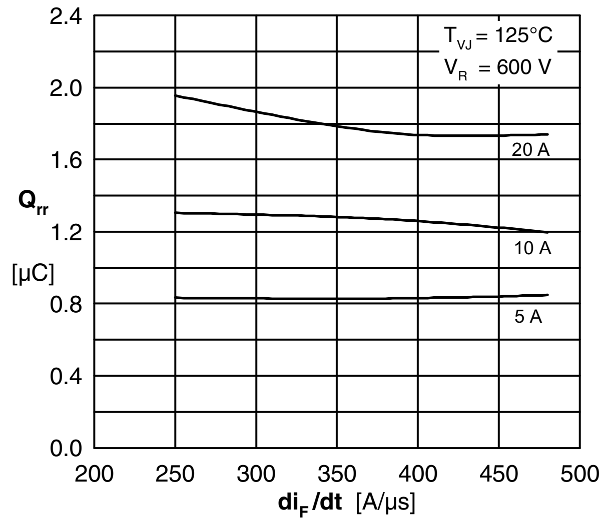


Fig. 8 Typical reverse recovery charge Q_{rr} versus. di_F/dt (125°C)

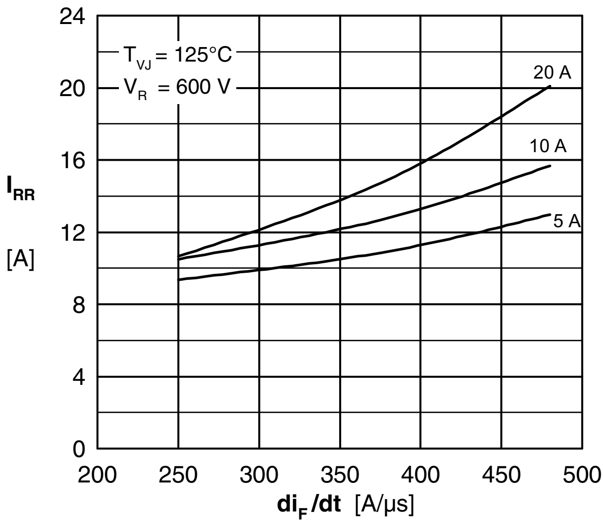


Fig. 9 Typical peak reverse current I_{RR} versus di_F/dt (125°C)

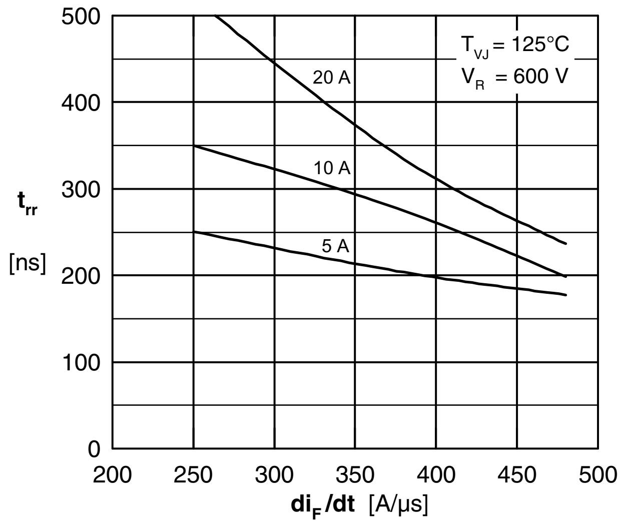


Fig. 10 Typ. recovery time t_{rr} vs. di/dt (125°C)

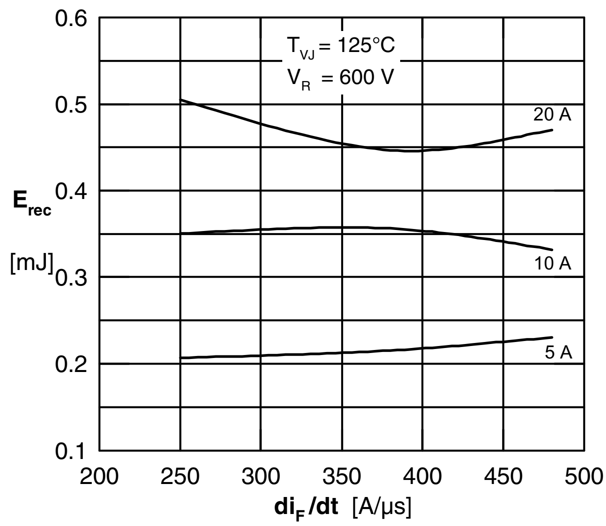
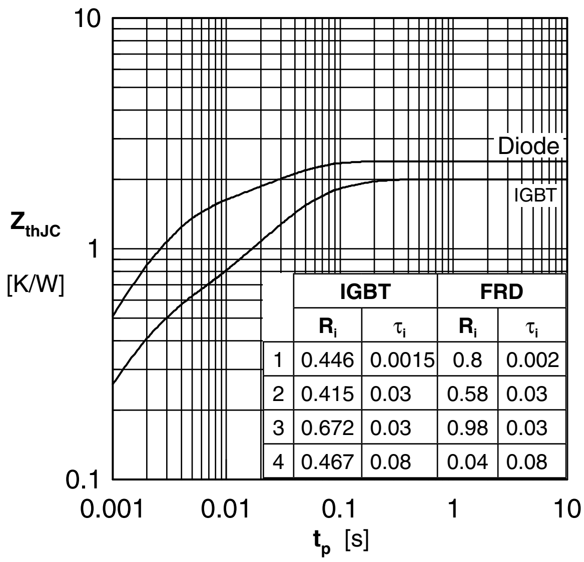


Fig. 11 Typ. recovery energy E_{rec} vs. di_F/dt (125°C)



	IGBT		FRD	
	R_i	τ_i	R_i	τ_i
1	0.446	0.0015	0.8	0.002
2	0.415	0.03	0.58	0.03
3	0.672	0.03	0.98	0.03
4	0.467	0.08	0.04	0.08

Fig. 8 Transient thermal impedance