

## Boost / Brake Module

### XPT IGBT

$$V_{CES} = 1200 \text{ V}$$

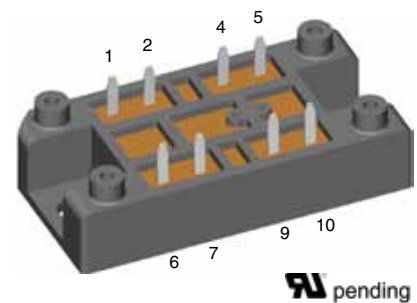
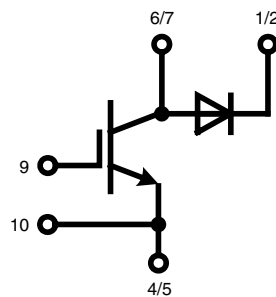
$$I_{C25} = 120 \text{ A}$$

$$V_{CE(sat)} = 2.2 \text{ V}$$

**Part name** (Marking on product)

MIXA80R1200VA

Preliminary data



#### Features:

- Isolation voltage 3600 V~
- Planar passivated chips
- Blocking voltage up to 1800 V
- Low forward voltage drop
- Improved temperature & power cycling

#### Application:

- Power Factor Correction
- Boost Converter
- Brake Unit

#### Package:

- DCB ceramic base plate
- Easy to mount with 2 screws
- Space and weight savings
- UL pending E 72873

## Boost/Brake IGBT

Symbol	Definitions	Conditions	Ratings			Unit	
			min.	typ.	max.		
$V_{CES}$	collector emitter voltage				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		$T_C = 25^\circ\text{C}$		120	A	
$I_{C80}$			$T_C = 80^\circ\text{C}$		84	A	
$P_{tot}$	total power dissipation		$T_C = 25^\circ\text{C}$		390	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 77\text{ A}; V_{GE} = 15\text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	1.9 2.2	2.2	V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 3\text{ mA}; V_{GE} = V_{CE}$	$T_{VJ} = 25^\circ\text{C}$	5.4	6.0	6.5	V
$I_{CES}$	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	0.03	0.2	0.6	mA
$I_{GES}$	gate emitter leakage current	$V_{GE} = \pm 20\text{ V}$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600\text{ V}; V_{GE} = 15\text{ V}; I_C = 75\text{ A}$		230		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600\text{ V}; I_C = 75\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 10\ \Omega$	$T_{VJ} = 125^\circ\text{C}$	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	
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = \pm 15\text{ V}; R_G = 10\ \Omega;$	$T_{VJ} = 125^\circ\text{C}$ $V_{CEK} = 1200\text{ V}$		225	A	
<b>SCSOA</b>	short circuit safe operating area		$T_{VJ} = 125^\circ\text{C}$		10	$\mu\text{s}$	
$t_{SC}$	short circuit duration	$V_{CE} = 900\text{ V}; V_{GE} = \pm 15\text{ V};$		300		A	
$I_{SC}$	short circuit current	$R_G = 10\ \Omega; \text{non-repetitive}$					
$R_{thJC}$	thermal resistance junction to case				0.32	K/W	

## Boost/Brake Diode

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
$V_{RRM}$	max. repetitive reverse voltage		$T_{VJ} = 25^\circ\text{C}$		1200	V
$I_{F25}$	forward current		$T_C = 25^\circ\text{C}$		135	A
$I_{F80}$			$T_C = 80^\circ\text{C}$		90	A
$V_F$	forward voltage	$I_F = 100\text{ A}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.0 2.1	2.3 2.4	V
$Q_{rr}$	reverse recovery charge	$V_R = 600\text{ V}$ $di_F/dt = -1600\text{ A}/\mu\text{s}$ $I_F = 100\text{ A}$	$T_{VJ} = 125^\circ\text{C}$	12.5		$\mu\text{C}$
$I_{RM}$	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				0.4	K/W

$T_C = 25^\circ\text{C}$  unless otherwise stated

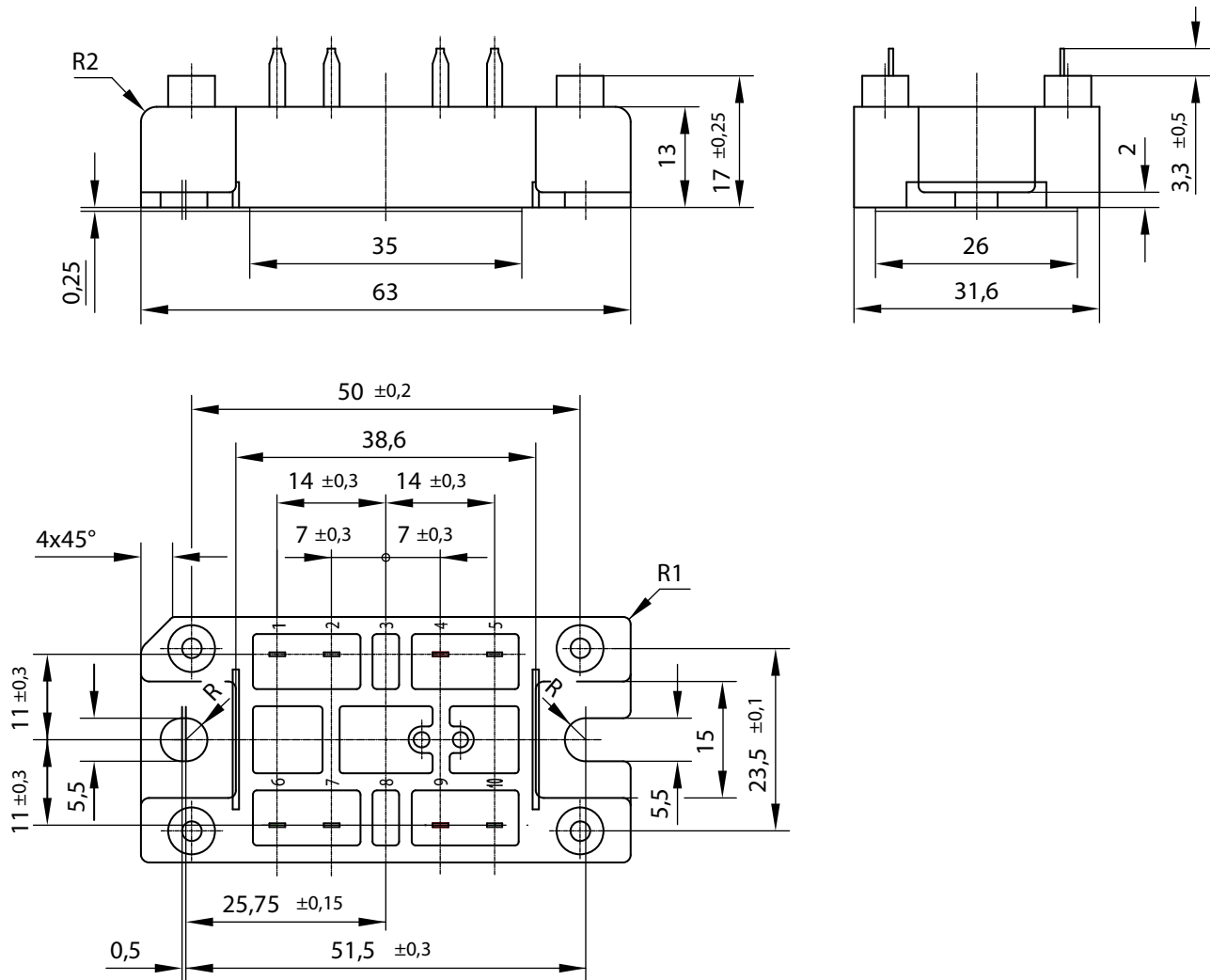
## Module

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
$T_{VJ}$	<i>operating temperature</i>		-40		125	°C
$T_{VJM}$	<i>max. virtual junction temperature</i>				150	°C
$T_{stg}$	<i>storage temperature</i>		-40		125	°C
$V_{ISOL}$	<i>isolation voltage</i>	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$ $t = 1 \text{ min.}$ $t = 1 \text{ s}$			3000 3600	V~ V~
$M_d$	<i>mounting torque (M5)</i>		2		2.5	Nm
$a$	<i>allowable acceleration</i>				50	m/s <sup>2</sup>
$R_{thCH}$	<i>thermal resistance case to heatsink</i>			0.3		K/W
<b>Weight</b>				35		g

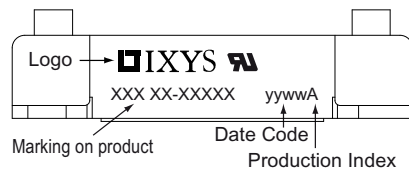
$T_c = 25^\circ\text{C}$  unless otherwise stated

## Outline Drawing

Dimensions in mm (1 mm = 0.0394")



## Product Marking



### Part number

- M = Module
- I = IGBT
- XA = XPT standard
- 80 = Current Rating [A]
- R = Boost/Brake Chopper
- 1200 = Reverse Voltage [V]
- VA = V1-A-Pack

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA80R1200VA	MIXA80R1200VA	Box	10	510585

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

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## IGBT

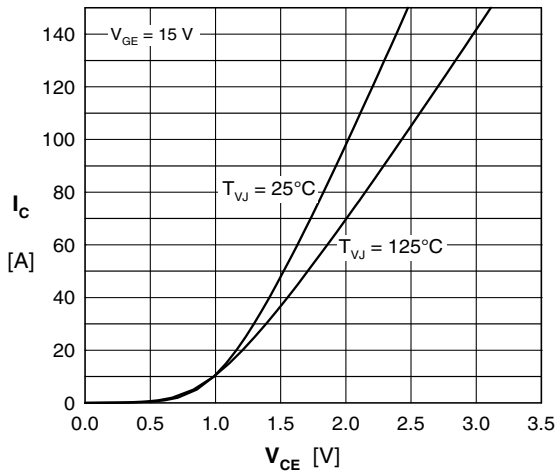


Fig. 1 Typ. output characteristics

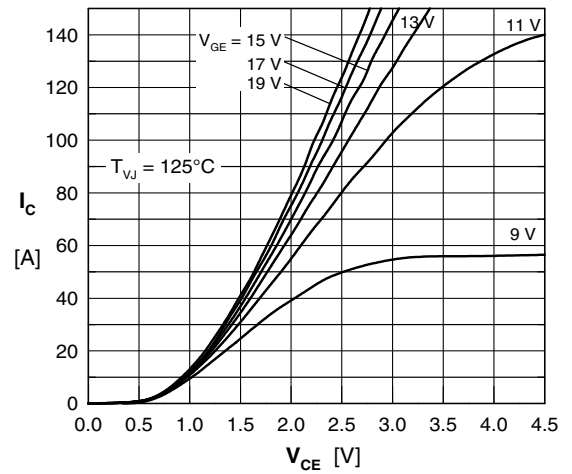


Fig. 2 Typ. output characteristics

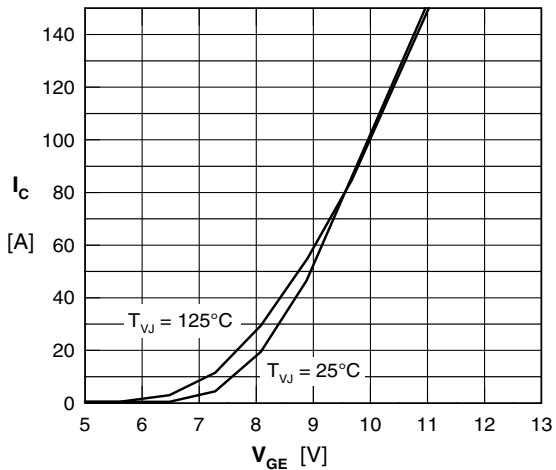


Fig. 3 Typ. transfer characteristics

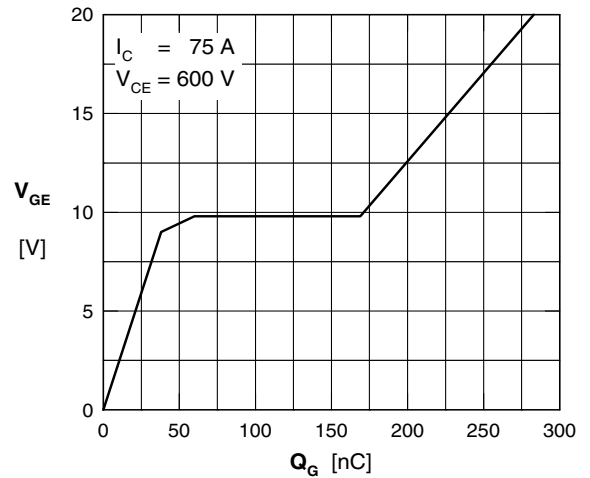


Fig. 4 Typ. turn-on gate charge

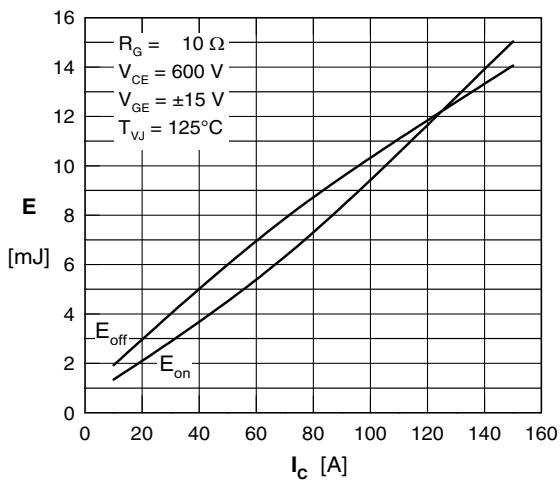


Fig. 5 Typ. switching energy vs. collector current

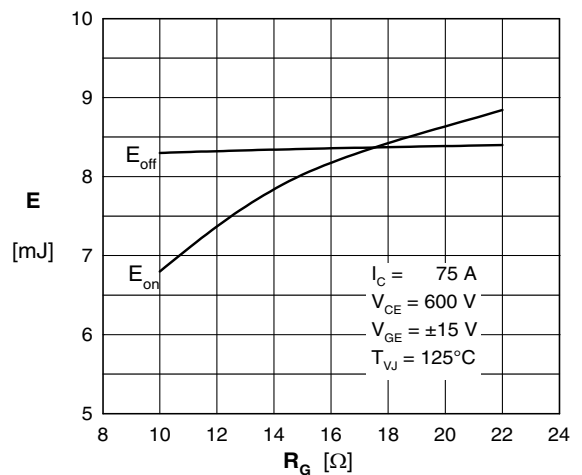


Fig. 6 Typ. switching energy vs. gate resistance

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## Diode

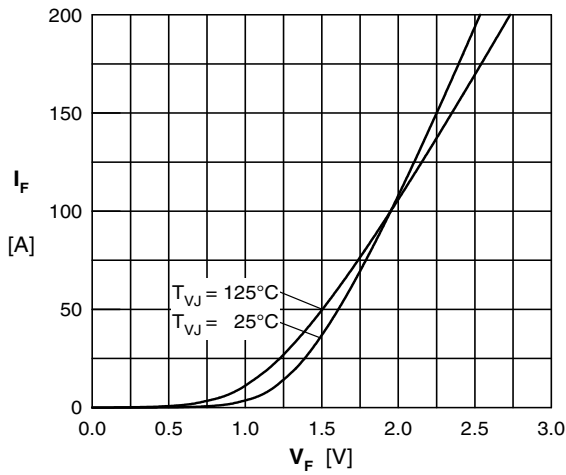


Fig. 7 Typ. Forward current versus  $V_F$

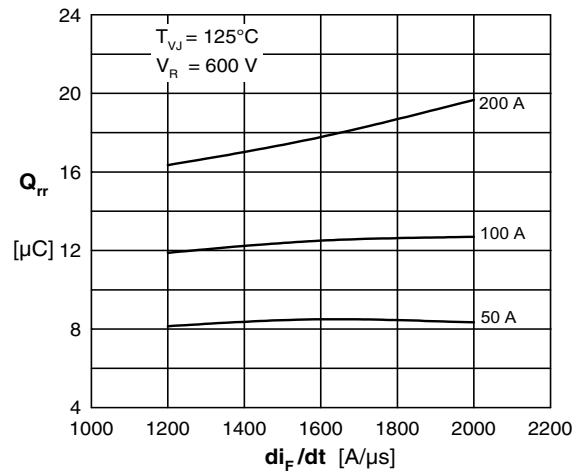


Fig. 8 Typ. reverse recov.charge  $Q_{rr}$  vs.  $di/dt$

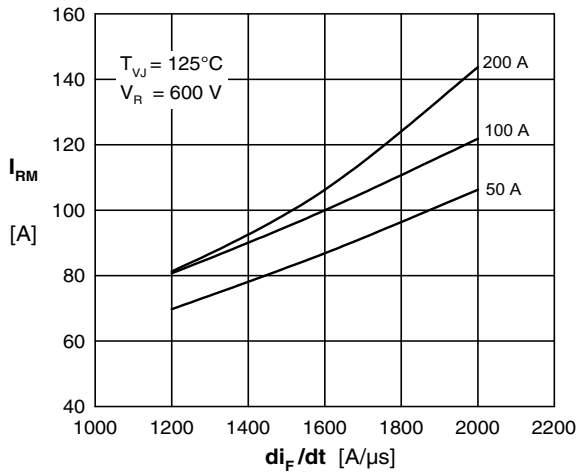


Fig. 9 Typ. peak reverse current  $I_{RM}$  vs.  $di/dt$

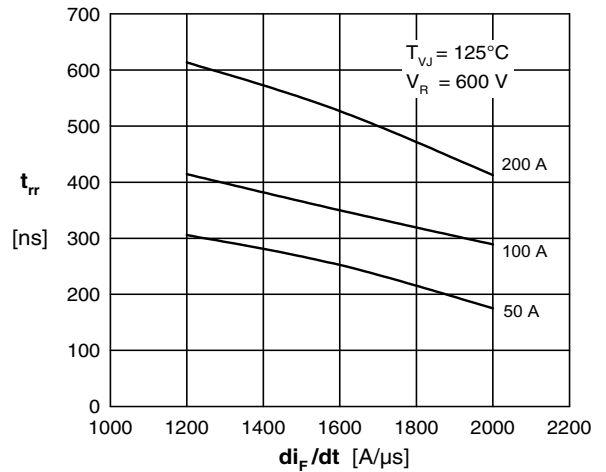


Fig. 10 Typ. recovery time  $t_{rr}$  versus  $di/dt$

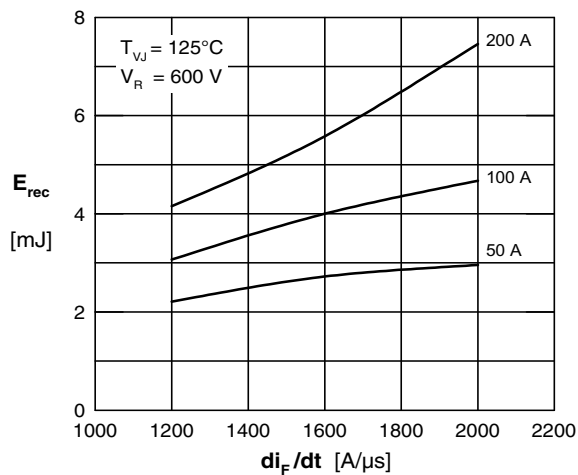


Fig. 11 Typ. recovery energy  $E_{rec}$  versus  $di/dt$

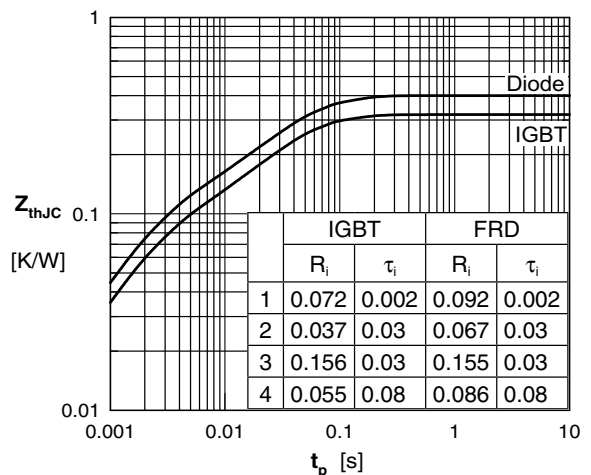


Fig. 12 Typ. transient thermal impedance