

Boost / Brake Module

XPT IGBT

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

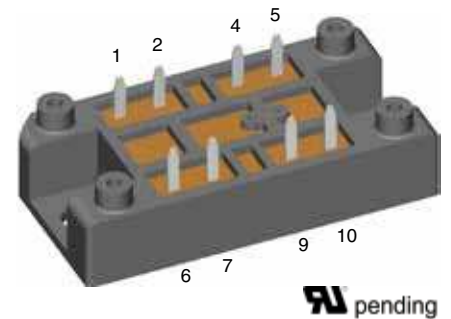
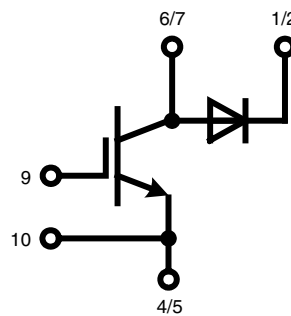
$$I_{C25} = 120 \text{ A}$$

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

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		$T_{VJ} = 25^{\circ}\text{C}$		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		$T_C = 25^{\circ}\text{C}$		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	
$V_{GE(th)}$	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 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	
RBSOA	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	
SCSOA	short circuit safe operating area		$T_{VJ} = 125^{\circ}\text{C}$		10	μs	
t_{SC}	short circuit duration	$V_{CE} = 900\text{ V}; V_{GE} = \pm 15\text{ V};$			300	A	
I_{SC}	short circuit current	$R_G = 10\ \Omega;$ 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 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	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				0.4	K/W

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

Module				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	Unit
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>	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$			3000 3600	V~ V~
		$t = 1 \text{ min.}$ $t = 1 \text{ s}$				
M_d	<i>mounting torque (M5)</i>		2		2.5	Nm
a	<i>allowable acceleration</i>				50	m/s ²
R_{thCH}	<i>thermal resistance case to heatsink</i>			0.3		K/W
Weight				35		g

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

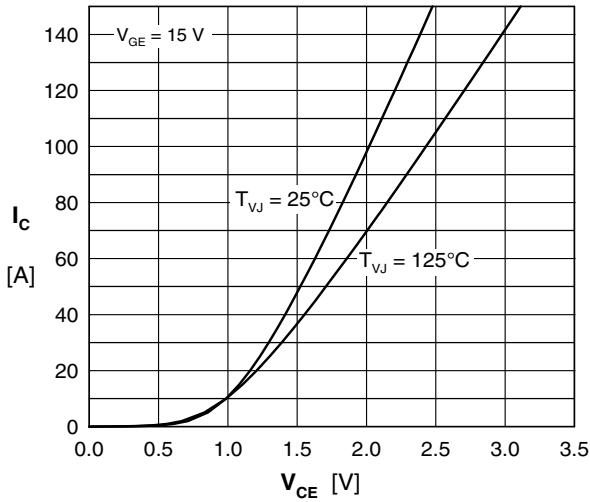
IGBT


Fig. 1 Typ. output characteristics

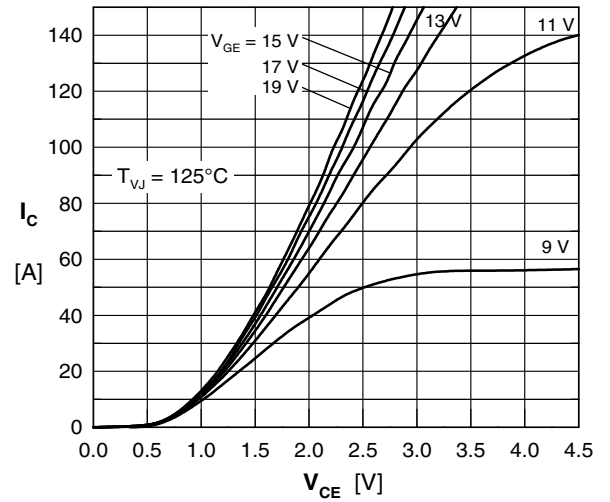


Fig. 2 Typ. output characteristics

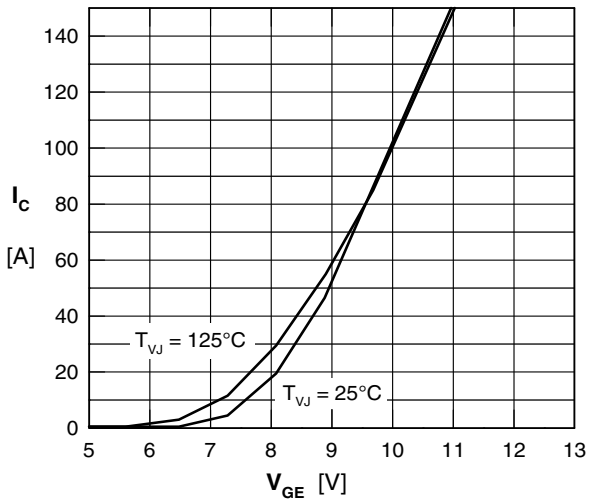


Fig. 3 Typ. transfer characteristics

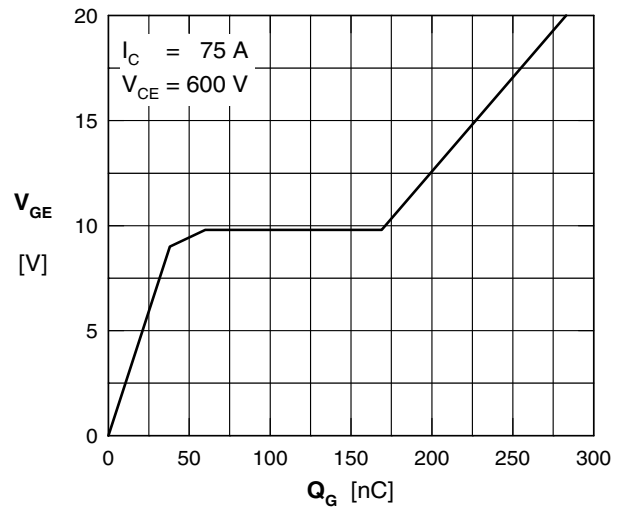


Fig. 4 Typ. turn-on gate charge

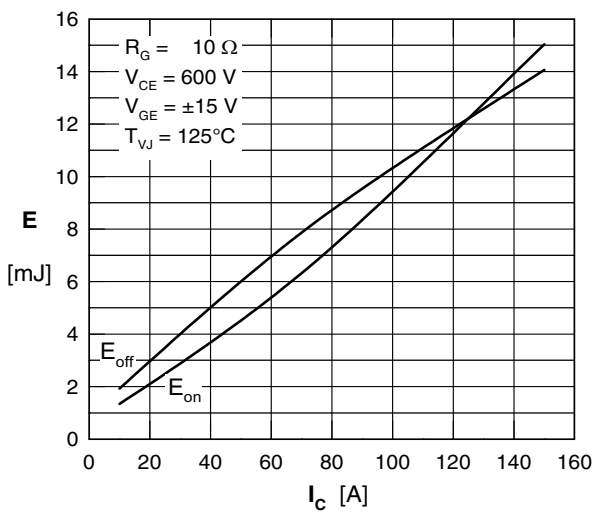


Fig. 5 Typ. switching energy vs. collector current

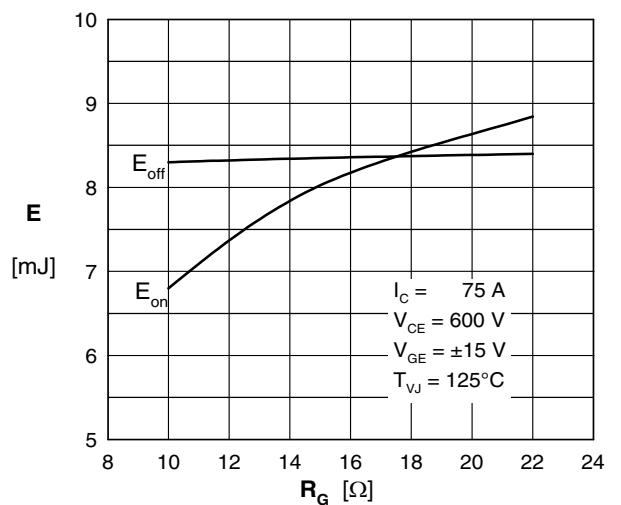


Fig. 6 Typ. switching energy vs. gate resistance

Diode

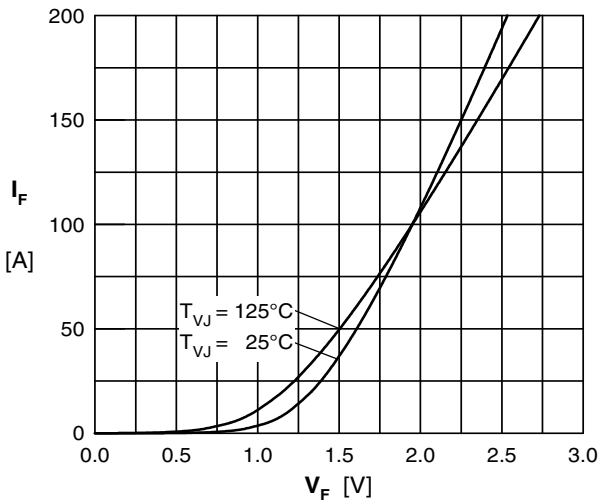


Fig. 7 Typ. Forward current versus V_F

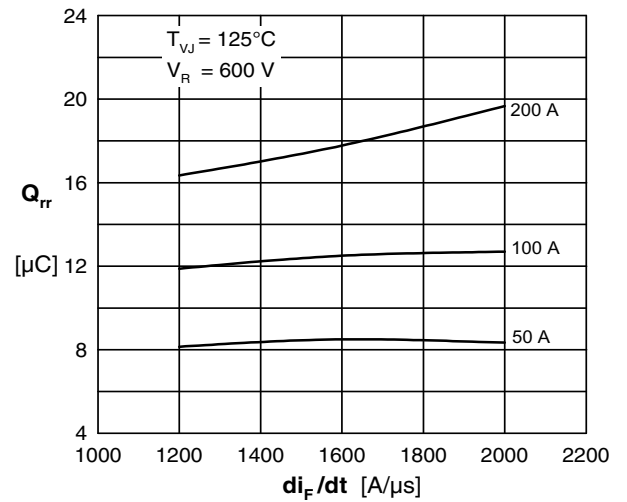


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

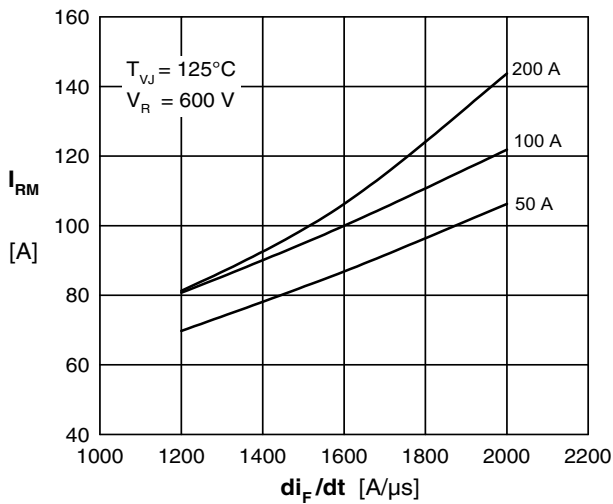


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

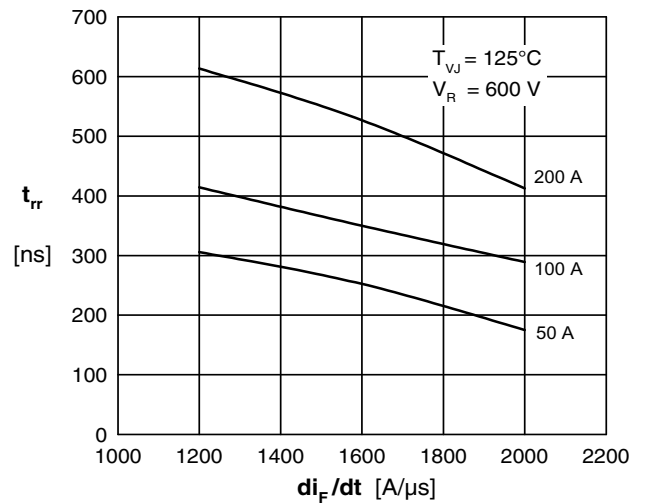


Fig. 10 Typ. recovery time t_{rr} versus di/dt

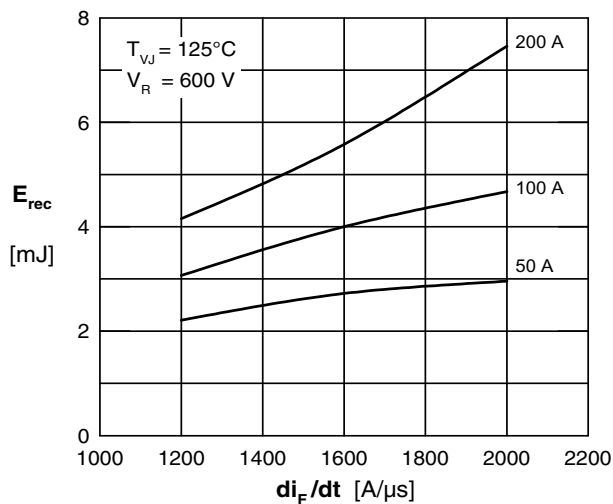


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

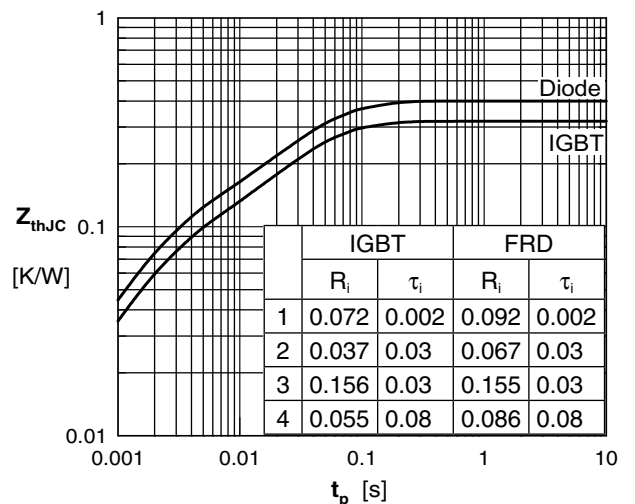


Fig. 12 Typ. transient thermal impedance