



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.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# XPT IGBT Module

preliminary

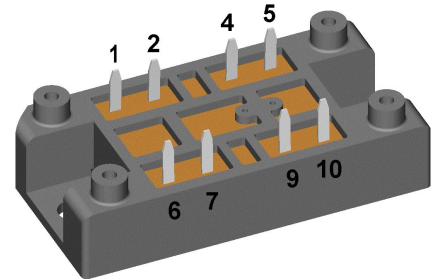
$$V_{CES} = 1200 \text{ V}$$

$$I_{C25} = 220 \text{ A}$$

$$V_{CE(sat)} = 1,8 \text{ V}$$

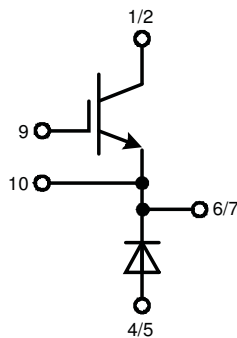
## Buck Chopper

### Part number

**MIXA150Q1200VA**


Backside: isolated

E72873



### Features / Advantages:

- 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  $\mu$ sec.
  - very low gate charge
  - low EMI
  - square RBSOA @ 3x  $I_c$
- 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

### Applications:

- Switched-mode power supplies
- Switched reluctance motor drive

### Package: V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

### Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

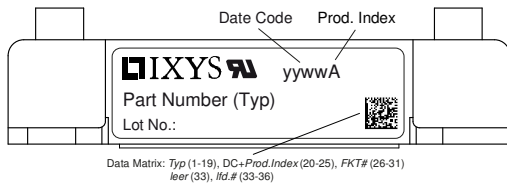
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IGBT				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{CES}$	collector emitter voltage				1200	V	
$V_{GES}$	max. DC gate voltage				±20	V	
$V_{GEM}$	max. transient gate emitter voltage				±30	V	
$I_{C25}$	collector current				220	A	
$I_{C80}$					150	A	
$P_{tot}$	total power dissipation				695	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 150A; V_{GE} = 15V$			1,8	V	
					2,1	V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 6mA; V_{GE} = V_{CE}$	5,4	5,9	6,5	V	
$I_{CES}$	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0V$			0,1	mA	
					0,1	mA	
$I_{GES}$	gate emitter leakage current	$V_{GE} = ±20V$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600V; V_{GE} = 15V; I_C = 150A$		470		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600V; I_C = 150A$ $V_{GE} = ±15V; R_G = 4,7Ω$		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			14		mJ	
$E_{off}$	turn-off energy per pulse			16		mJ	
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = ±15V; R_G = 4,7Ω$					
$I_{CM}$		$V_{CEma} = 1200V$			450	A	
<b>SCSOA</b>	short circuit safe operating area	$V_{CEma} = 1200V$					
$t_{SC}$	short circuit duration	$V_{CE} = 900V; V_{GE} = ±15V$			10	μs	
$I_{SC}$	short circuit current	$R_G = 4,7Ω; \text{non-repetitive}$		600		A	
$R_{thJC}$	thermal resistance junction to case				0,18	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0,20		K/W	
<b>Diode</b>							
$V_{RRM}$	max. repetitive reverse voltage				1200	V	
$I_{F25}$	forward current				190	A	
$I_{F80}$					130	A	
$V_F$	forward voltage	$I_F = 150A$			2,20	V	
					1,95	V	
$I_R$	reverse current	$V_R = V_{RRM}$			0,3	mA	
					0,8	mA	
$Q_{rr}$	reverse recovery charge	$V_R = 600V$ $-di_F/dt = 2500A/μs$ $I_F = 150A; V_{GE} = 0V$		20		μC	
$I_{RM}$	max. reverse recovery current			175		A	
$t_{rr}$	reverse recovery time			350		ns	
$E_{rec}$	reverse recovery energy			10		mJ	
$R_{thJC}$	thermal resistance junction to case				0,28	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0,20		K/W	

preliminary

Package V1-A-Pack		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			100	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage temperature		-40		125	°C
<b>Weight</b>				37		g
$M_D$	mounting torque		2		2,5	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6,0			mm
$d_{Spb/Apb}$		terminal to backside	12,0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V



### Part description

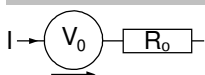
- M = Module
- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 150 = Current Rating [A]
- Q = Buck Chopper
- 1200 = Reverse Voltage [V]
- VA = V1-A-Pack

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MIXA150Q1200VA	MIXA150Q1200VA	Blister	24	512328

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 150\text{ °C}$

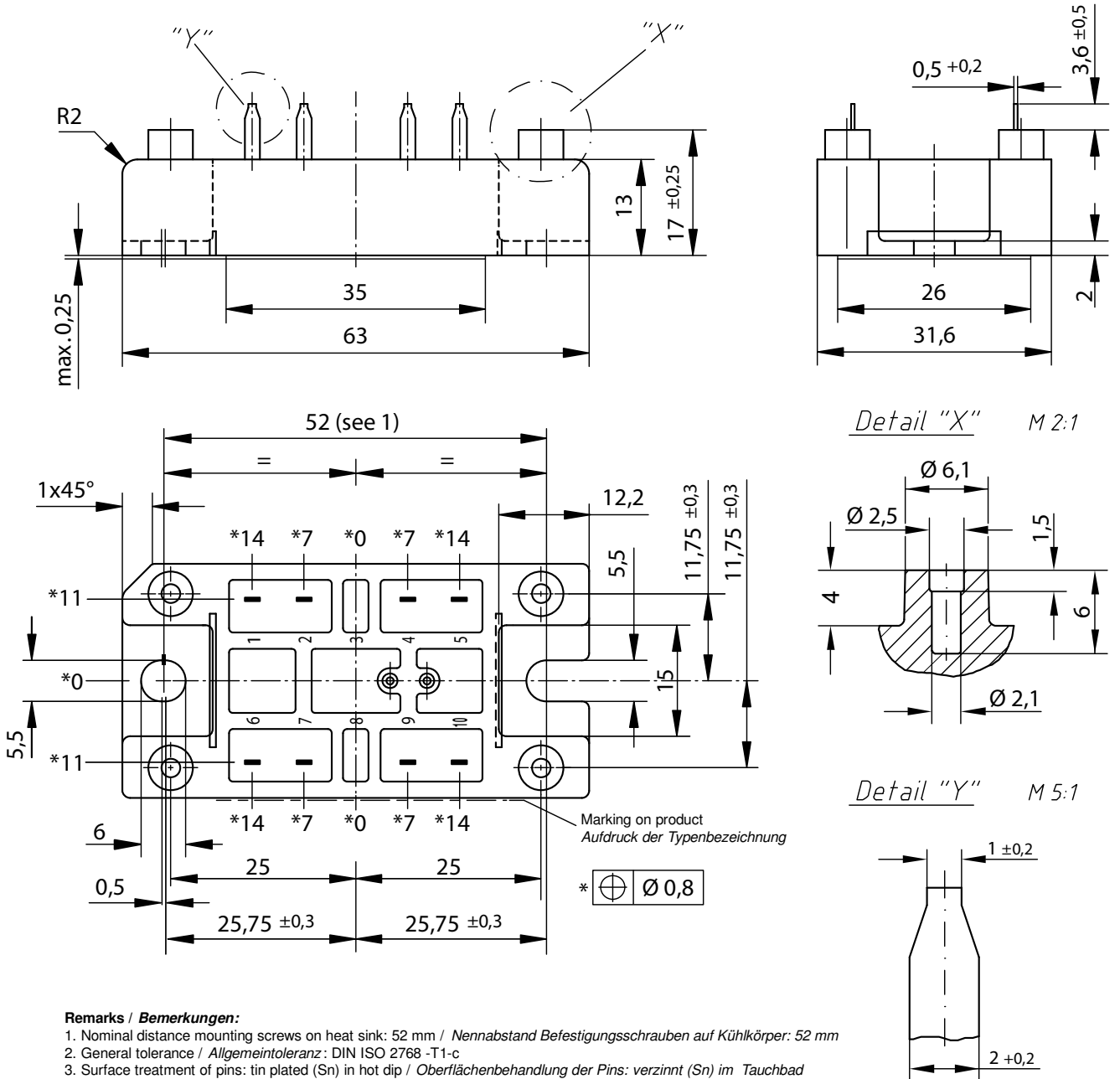


$V_{0\ max}$  threshold voltage

$R_{0\ max}$  slope resistance \*

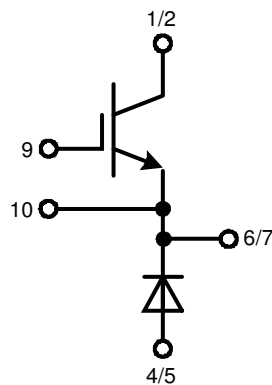
	IGBT	Diode	
$V_{0\ max}$	1,1	1,25	V
$R_{0\ max}$	9,2	5,7	mΩ

## Outlines V1-A-Pack



**Remarks / Bemerkungen:**

1. Nominal distance mounting screws on heat sink: 52 mm / Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm
2. General tolerance / Allgemeintoleranz: DIN ISO 2768 -T1-c
3. Surface treatment of pins: tin plated (Sn) in hot dip / Oberflächenbehandlung der Pins: verzinkt (Sn) im Tauchbad



## IGBT

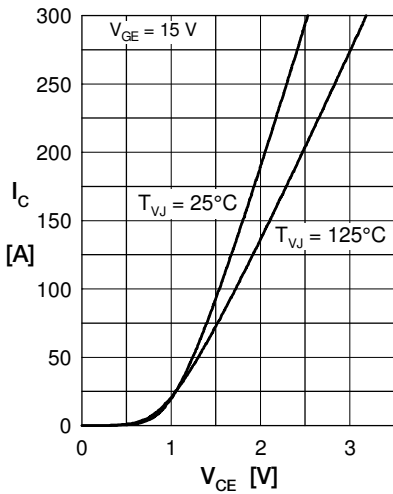


Fig. 1 Typ. output characteristics

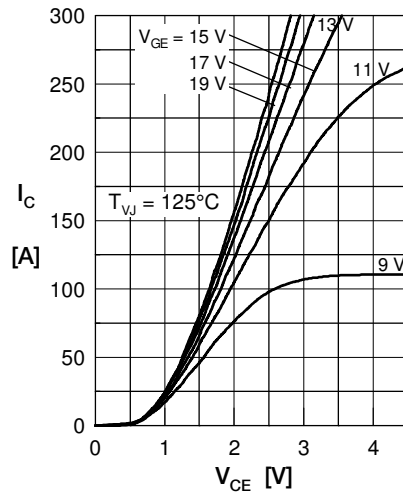


Fig. 2 Typ. output characteristics

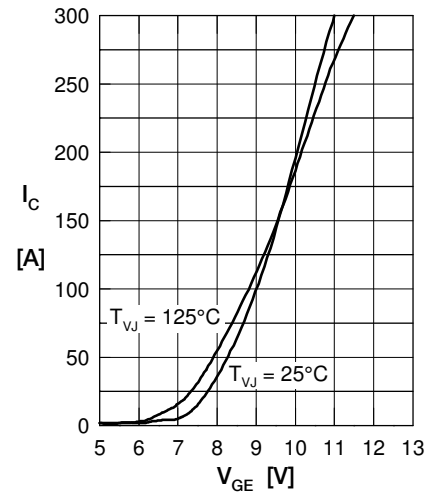


Fig. 3 Typ. transfer characteristics

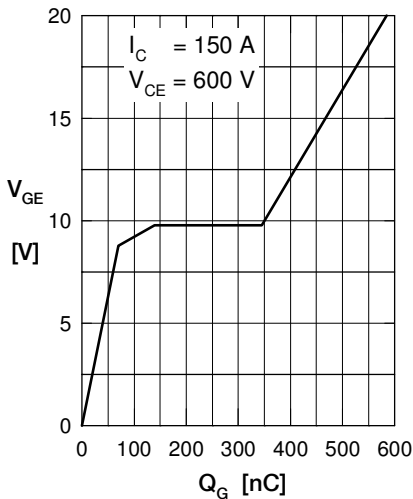


Fig. 4 Typ. turn-on gate charge

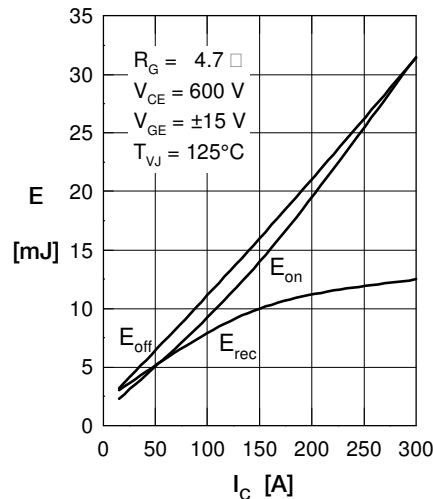


Fig. 5 Typ. switching energy versus collector current

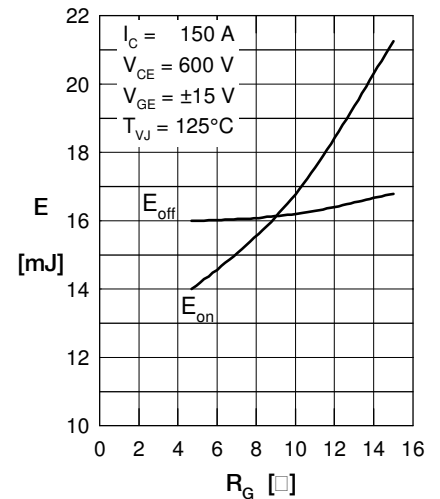


Fig. 6 Typ. switching energy versus gate resistance

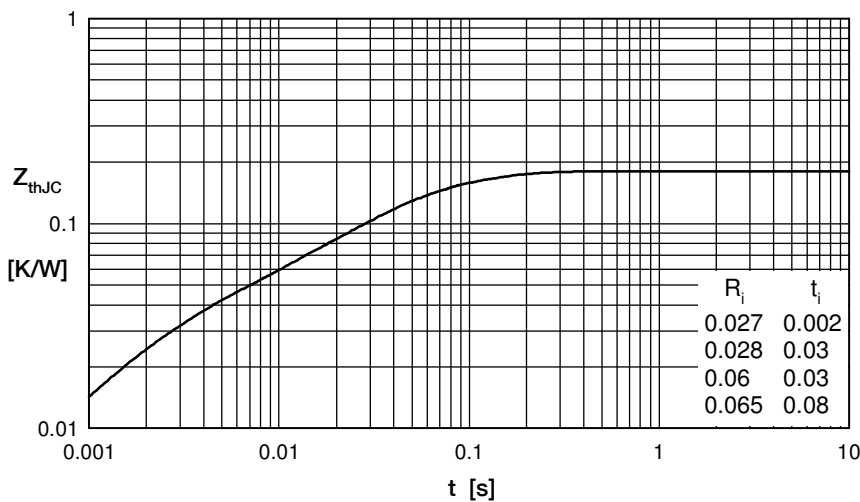


Fig. 7 Typ. transient thermal impedance

**Diode**

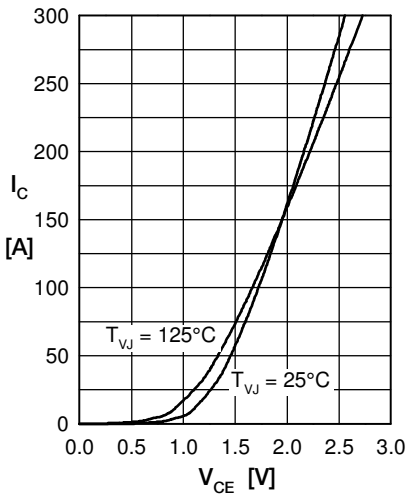


Fig. 1 Typ. Forward current versus  $V_F$

Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $di/dt$

Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $di/dt$

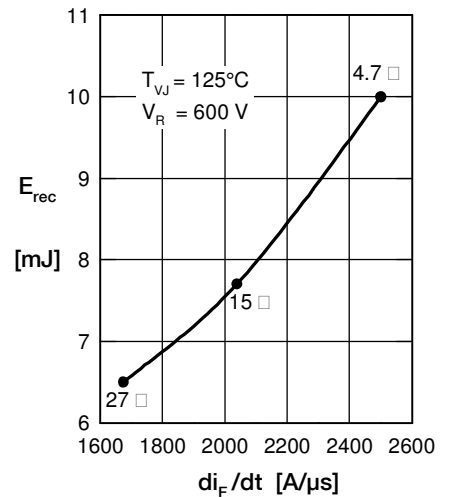


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

Fig. 6 Typ. recovery energy  $E_{rec}$  versus  $-di/dt$

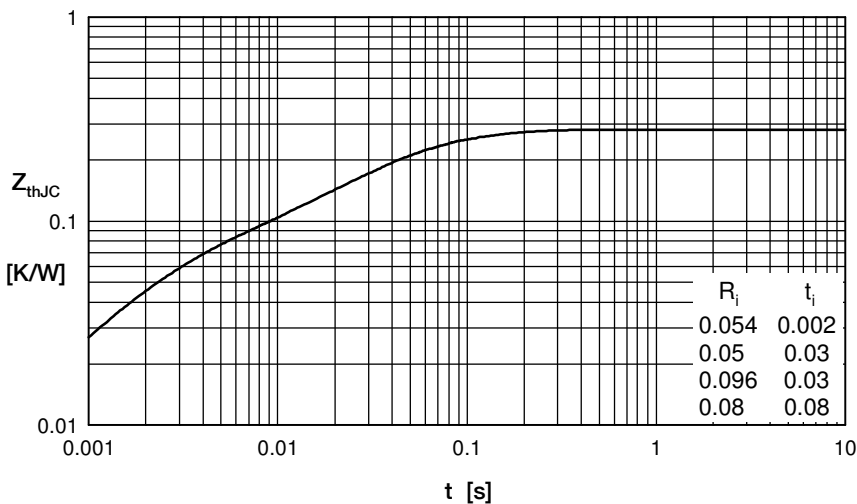


Fig. 7 Transient thermal impedance junction to case