

# XPT IGBT Module

preliminary

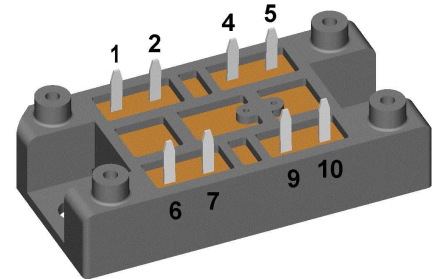
$$V_{CES} = 1200 \text{ V}$$

$$I_{C25} = 250 \text{ A}$$

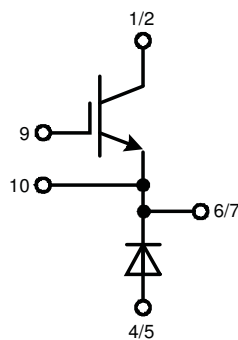
$$V_{CE(sat)} = 1.7 \text{ V}$$

## Buck Chopper

### Part number

**MIXA150Q1200VA**


Backside: isolated



### 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 your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

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

- to perform joint risk and quality assessments;

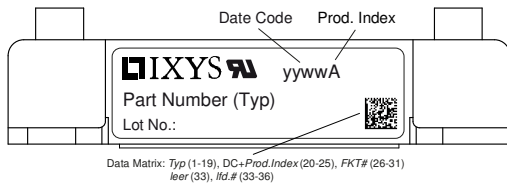
- the conclusion of quality agreements;

- 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	$T_{VJ} = 25^{\circ}\text{C}$			1200	V
$V_{GES}$	max. DC gate voltage				$\pm 20$	V
$V_{GEM}$	max. transient gate emitter voltage				$\pm 30$	V
$I_{C25}$	collector current	$T_C = 25^{\circ}\text{C}$			250	A
$I_{C80}$		$T_C = 80^{\circ}\text{C}$			175	A
$P_{tot}$	total power dissipation	$T_C = 25^{\circ}\text{C}$			695	W
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 150\text{A}; V_{GE} = 15\text{V}$			1.7	V
					1.9	V
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 6\text{mA}; V_{GE} = V_{CE}$	6	6.8	7.5	V
$I_{CES}$	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{V}$			0.1	mA
					0.1	mA
$I_{GES}$	gate emitter leakage current	$V_{GE} = \pm 20\text{V}$			500	nA
$Q_{G(on)}$	total gate charge	$V_{CE} = 600\text{V}; V_{GE} = 15\text{V}; I_C = 150\text{A}$		510		nC
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600\text{V}; I_C = 150\text{A}$ $V_{GE} = \pm 15\text{V}; R_G = 1.2\ \Omega$		220		ns
$t_r$	current rise time			100		ns
$t_{d(off)}$	turn-off delay time			400		ns
$t_f$	current fall time			220		ns
$E_{on}$	turn-on energy per pulse			21.5		mJ
$E_{off}$	turn-off energy per pulse			17		mJ
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = \pm 15\text{V}; R_G = 1.2\ \Omega$				
$I_{CM}$		$V_{CEmax} = 1200\text{V}$			450	A
<b>SCSOA</b>	short circuit safe operating area	$V_{CEmax} = 1200\text{V}$				
$t_{SC}$	short circuit duration	$V_{CE} = 900\text{V}; V_{GE} = \pm 15\text{V}$			10	$\mu\text{s}$
$I_{SC}$	short circuit current	$R_G = 1.2\ \Omega; \text{non-repetitive}$		650		A
$R_{thJC}$	thermal resistance junction to case				0.16	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.10		K/W
<b>Diode</b>						
$V_{RRM}$	max. repetitive reverse voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V
$I_{F25}$	forward current	$T_C = 25^{\circ}\text{C}$			190	A
$I_{F80}$		$T_C = 80^{\circ}\text{C}$			130	A
$V_F$	forward voltage	$I_F = 150\text{A}$			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	$V_R = 600\text{V}$ $-di_F/dt = 2500\text{A}/\mu\text{s}$ $I_F = 150\text{A}; V_{GE} = 0\text{V}$		20		$\mu\text{C}$
$I_{RM}$	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



## IGBT

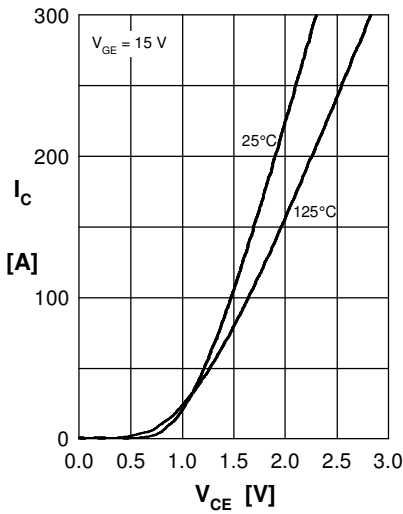


Fig.1 Output characteristics IGBT

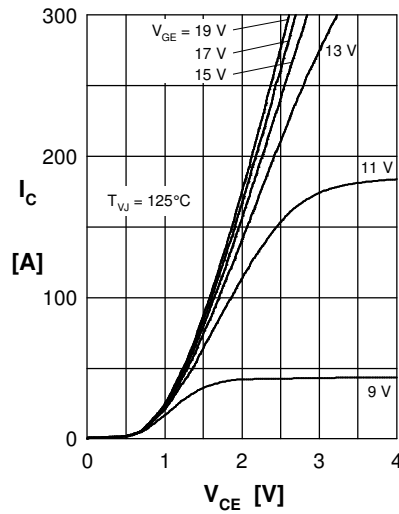


Fig.2 Typ. output characteristics IGBT

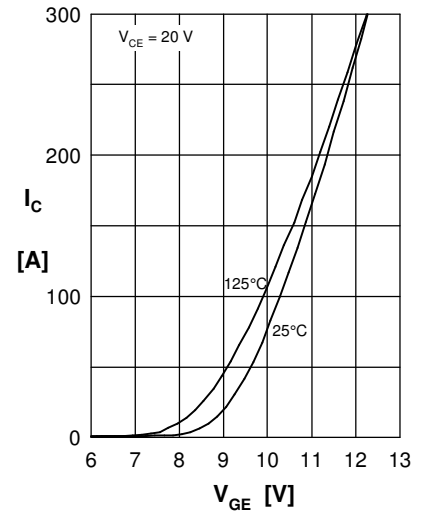


Fig.3 Typ. transfer charact. IGBT

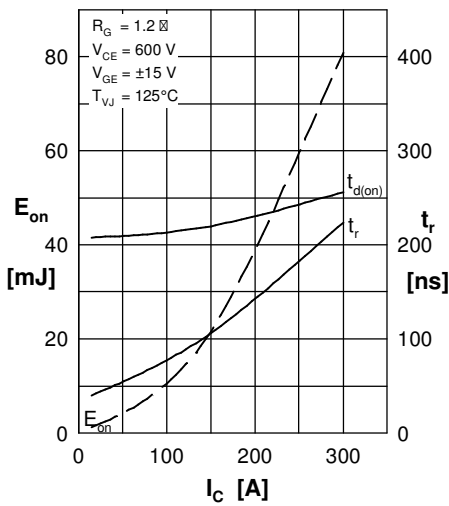


Fig.4 Typ. turn-on energy & switch. times vs. collector current

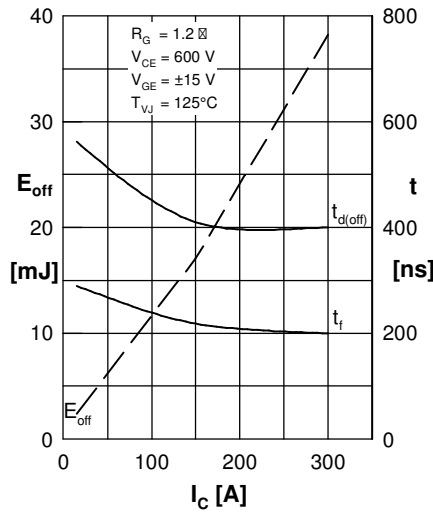


Fig.5 Typ. turn-off energy & switch. times vs. collector current

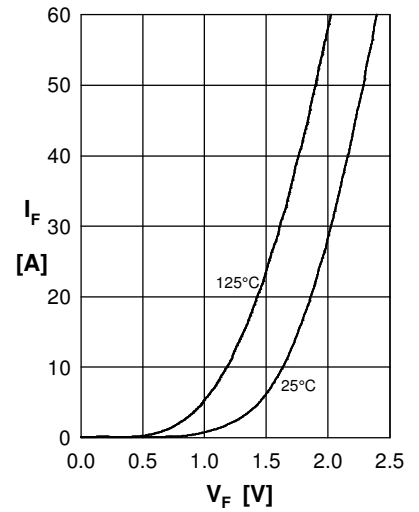


Fig.6 Typ. forward characteristics Diode

Fig.7 Typ. reverse recovery characteristics Diode

Fig.8 Typ. reverse recovery characteristics Diode

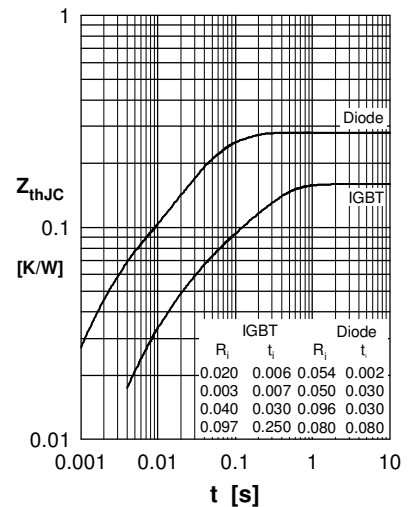


Fig.9 Transient thermal resistance junction to case



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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