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

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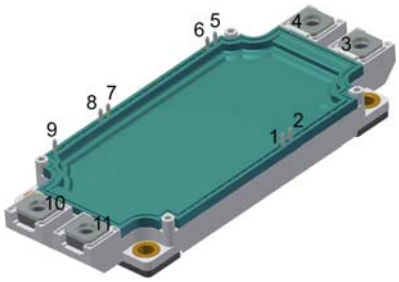
XPT IGBT Module

V_{CES} = 2x 650V
I_{C25} = 720A
$V_{CE(sat)}$ = 1.65V

Phase leg + free wheeling Diodes + NTC

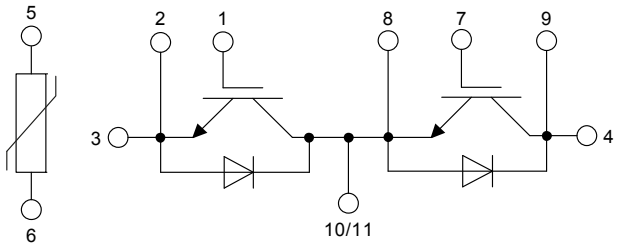
Part number

MIXA600PF650TSF



Backside: isolated

E72873



Features / Advantages:

- High level of integration - only one power semiconductor module required for the whole drive
- Rugged XPT design (Xtreme light Punch Through) results in:
  - short circuit rated for 10 µsec.
  - very low gate charge
  - low EMI
  - square RBSOA @ 3x Ic
- Thin wafer technology combined with the XPT design results in a competitive low VCE(sat)
- Temperature sense included
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Applications:

- AC motor drives
- Pumps, Fans
- Air-conditioning system
- Inverter and power supplies
- UPS

Package: SimBus F

- Isolation Voltage: 3000V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling

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IGBT				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			650	V
V_{GES}	*max. DC gate voltage*					±20	V
V_{GEM}	*max. transient gate emitter voltage*					±30	V
I_{C25}	*collector current*		T_C = 25°C			720	A
I_{C80}			T_C = 80°C			490	A
P_{tot}	*total power dissipation*		T_C = 25°C			1750	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 600A; V_{GE} = 15 V	T_{VJ} = 25°C		1.65	1.8	V
			T_{VJ} = 150°C		1.85		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 9.6mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	4	4.8	5.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			1.8	mA
			T_{VJ} = 150°C		2		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				1.5	µA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 300 V; V_{GE} = 15 V; I_C = 600 A			840		nC
$t_{d(on)}$	*turn-on delay time*				30		ns
t_r	*current rise time*				50		ns
$t_{d(off)}$	*turn-off delay time*	inductive load	T_{VJ} = 150°C		100		ns
t_f	*current fall time*	V_{CE} = 300 V; I_C = 600 A			40		ns
E_{on}	*turn-on energy per pulse*	V_{GE} = ±15 V; R_G = 1.3 Ω			6		mJ
E_{off}	*turn-off energy per pulse*				22.8		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 1.3 Ω	T_{VJ} = 150°C				
I_{CM}		V_{CEmax} = 650 V				1200	A
SCSOA	*short circuit safe operating area*	V_{CEmax} = 650 V					
t_{SC}	*short circuit duration*	V_{CE} = 360 V; V_{GE} = ±15 V	T_{VJ} = 150°C			10	µs
I_{SC}	*short circuit current*	R_G = 1.3 Ω; non-repetitive			2400		A
R_{thJC}	*thermal resistance junction to case*					0.085	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.05		K/W

Diode							
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			650	V
I_{F25}	*forward current*		T_C = 25°C			490	A
I_{F80}			T_C = 80°C			340	A
V_F	*forward voltage*	I_F = 600A	T_{VJ} = 25°C			1.90	V
			T_{VJ} = 125°C		1.70		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			*	mA
	* not applicable, see Ices value above		T_{VJ} = 125°C		*		mA
Q_{rr}	*reverse recovery charge*	V_R = 300 V			tbd		µC
I_{RM}	*max. reverse recovery current*	-di_F/dt = 0 A/µs	T_{VJ} = 125°C		tbd		A
t_{rr}	*reverse recovery time*	I_F = 600A; V_{GE} = 0 V			tbd		ns
E_{rec}	*reverse recovery energy*				tbd		mJ
R_{thJC}	*thermal resistance junction to case*					0.095	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.04		K/W

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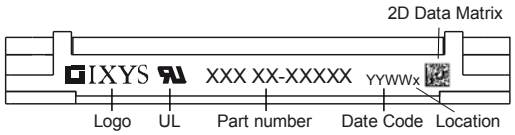
Package SimBus F				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					A
T_{stg}	*storage temperature*			-40		125	°C
T_{VJ}	*virtual junction temperature*			-40		175	°C
Weight					350		g
M_D	*mounting torque*			3		6	Nm
M_T	*terminal torque*			3		6	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	12.7			mm
$d_{Spb/Apb}$			*terminal to backside*	10.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V
$R_{pin-chip}$	*resistance pin to chip*	$V = V_{CEsat} + 2 \cdot R \cdot I_C$ resp. $V = V_F + 2 \cdot R \cdot I_F$			0.65		mΩ



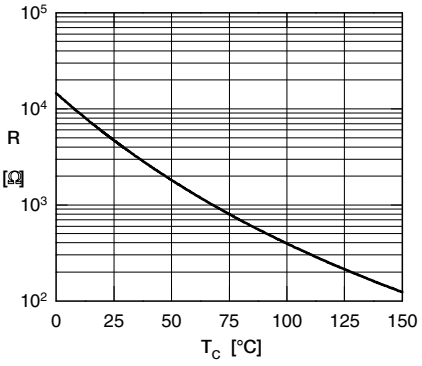
Part number

M = Module
I = IGBT
X = XPT IGBT
A = Gen 1 / std
600 = Current Rating [A]
PF = Phase leg + free wheeling Diodes
650 = Reverse Voltage [V]
T = Thermistor \ Temperature sensor
SF = SimBus F

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MIXA600PF650TSF	MIXA600PF650TSF	Box	3	513794

Temperature Sensor NTC

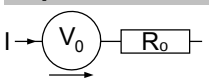
Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	*resistance*	T_{VJ} = 25°	4.75	5	5.25	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K



Typ. NTC resistance vs. temperature

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 175 °C



		IGBT	Diode	
$V_{0\,max}$	*threshold voltage*	1.1	1.21	V
$R_{0\,max}$	*slope resistance **	1.8	1	mΩ

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Outlines SimBus F