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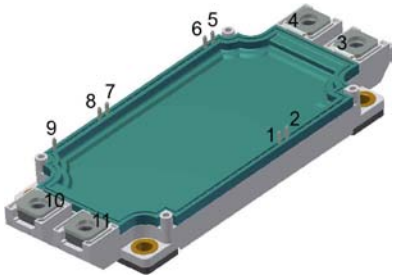
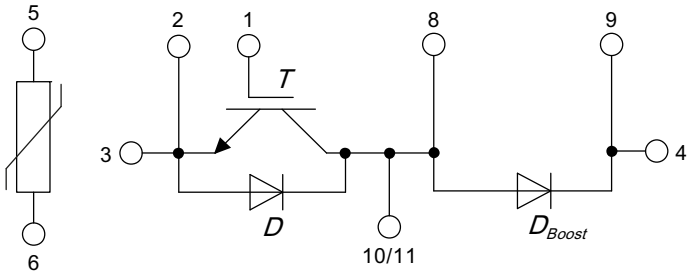
XPT IGBT Module

V_{CES} = 1200 V
I_{C25} = 360 A
$V_{CE(sat)}$ = 1.8 V

Boost chopper + free wheeling Diodes + NTC

Part number
MIXA225RF1200TSF





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 $V_{CE(sat)}$
- Temperature sense included
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Applications:

- Brake for AC motor drives
- Boost chopper
- Switch reluctance drives

Package: SimBus F

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

IGBT *T*				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C to 125°C			1200	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			360	A
I_{C80}			T_C = 80°C			250	A
P_{tot}	*total power dissipation*		T_C = 25°C			1100	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 225 A; V_{GE} = 15 V	T_{VJ} = 25°C		1.8	2.1	V
			T_{VJ} = 125°C		2.1		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 9 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.4		6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			0.3	mA
			T_{VJ} = 125°C		0.3		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V; V_{CE} = 0 V				1.5	µA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 225 A			690		nC
$t_{d(on)}$	*turn-on delay time*	inductive load V_{CE} = 600 V; I_C = 225 A V_{GE} = ±15 V; R_G = 3.3 Ω	T_{VJ} = 125°C		60		ns
t_r	*current rise time*				70		ns
$t_{d(off)}$	*turn-off delay time*				280		ns
t_f	*current fall time*				310		ns
E_{on}	*turn-on energy per pulse*				20		mJ
E_{off}	*turn-off energy per pulse*				27		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 3.3 Ω	T_{VJ} = 125°C				
I_{CM}		V_{CEmax} = 1200 V				500	A
SCSOA	*short circuit safe operating area*	V_{CEmax} = 1200 V					
t_{SC}	*short circuit duration*	V_{CE} = 900 V; V_{GE} = ±15 V;	T_{VJ} = 125°C			10	µs
I_{SC}	*short circuit current*	R_G = 3.3 Ω; non-repetitive			900		A
R_{thJC}	*thermal resistance junction to case*					0.115	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.045		K/W

Diode D_{Boost}							
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25}	*forward current*		T_C = 25°C			265	A
I_{F80}			T_C = 80°C			185	A
V_F	*forward voltage*	I_F = 225 A; V_{GE} = 0 V	T_{VJ} = 25°C		1.80	2.10	V
			T_{VJ} = 125°C		1.70		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			0.3	mA
			T_{VJ} = 125°C		0.3		mA
Q_{rr}	*reverse recovery charge*	V_R = 600 V $-di_F/dt$ = 3300 A/µs I_F = 225 A; V_{GE} = 0 V	T_{VJ} = 125°C		32		µC
I_{RM}	*max. reverse recovery current*				250		A
t_{rr}	*reverse recovery time*				340		ns
E_{rec}	*reverse recovery energy*				11.7		mJ
R_{thJC}	*thermal resistance junction to case*					0.145	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.05		K/W

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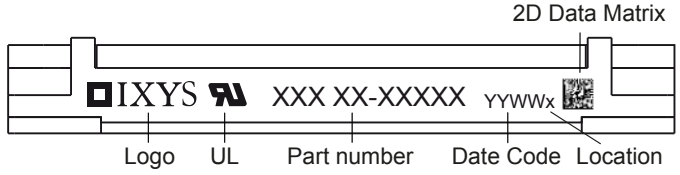
Diode *D*				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25}	*forward current*		T_C = 25°C			65	A
I_{F80}			T_C = 80°C			45	A
V_F	*forward voltage*	I_F = 60 A; V_{GE} = 0 V	T_{VJ} = 25°C		2.0	2.2	V
			T_{VJ} = 125°C		2.0		V
I_R	*reverse current*	$V_R = V_{RRM}$	T_{VJ} = 25°C			*	mA
	* not applicable, see Ices value of IGBT T		T_{VJ} = 125°C		*		mA
R_{thJC}	*thermal resistance junction to case*					0.5	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.2		K/W

Package SimBus F				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal					A
T_{stg}	*storage temperature*			-40		125	°C
T_{VJM}	*virtual junction temperature*			-40		150	°C
Weight					350		g
		$I_{ISOL} \leq$ 1 mA; 50/60 Hz				3400	V~
M_D	*mounting torque (M5)*			3		6	Nm
M_T	*terminal torque (M6)*			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, $I_{ISOL} \leq$ 1 mA	3000			V
		t = 1 minute		2500			V
$R_{term-chip}$	*resistance terminal to chip*	$V = V_{CEsat} + 2x\ R_{term-chip} \cdot I_C$ resp. $V = V_F + 2x\ R \cdot I_F$			0.65		mΩ



Part number

M = Module
I = IGBT
X = XPT
A = standard
225 = Current Rating [A]
RF = Boost / brake chopper + free wheeling diode
1200 = Reverse Voltage [V]
T = NTC
EH = E3-Pack

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA225RF1200TSF	MIXA225RF1200TSF	Box	3	511581

Temperature Sensor NTC			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
R_{25}	*resistance*	T_C = 25°C	4.75	5.0	5.25	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K

Outlines SimBus F