

IGBT Modules

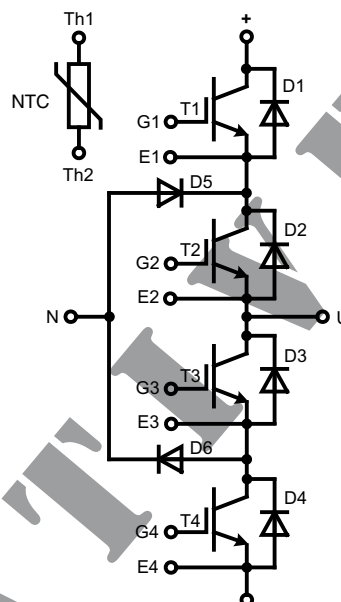
Multi Level

XPT

$I_{C80} = 100 \text{ A}$
 $V_{CES} = 600 \text{ V}$
 $V_{CE(sat) \text{ typ.}} = 1.6 \text{ V}$

Part name (Marking on product)

MIXA100PM600TMI



Features:

- 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 μ sec.
 - very low gate charge
 - square RBSOA @ $2 \times I_c$
 - low EMI
- 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

Application:

- AC motor control
- AC servo and robot drives
- UPS
- Solar

Package:

- Compatible to EASY2B package
- Pins for pressfit connection
- With DCB base

IGBTs T1 - T4

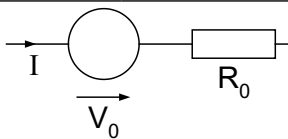
Symbol	Definitions	Conditions	Ratings				
			min.	typ.	max.	Unit	
V_{CES}	collector emitter voltage		$T_{VJ} = 25^{\circ}\text{C}$		650	V	
V_{GES}	max. DC gate voltage	continuous			± 20	V	
I_{C25}	collector current		$T_C = 25^{\circ}\text{C}$		150	A	
I_{C80}			$T_C = 80^{\circ}\text{C}$		100	A	
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$		330	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 100\text{ A}; V_{GE} = 15\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 150^{\circ}\text{C}$	1.6 1.85	1.8	V V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 1.6\text{ mA}; V_{GE} = V_{CE}$	$T_{VJ} = 25^{\circ}\text{C}$	4.0	4.8	5.5	V
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$		0.5	mA	
I_{GES}	gate emitter leakage current	$V_{CE} = 0\text{ V}; V_{GE} = \pm 20\text{ V}$			300	nA	
C_{ies}	input capacitance	$V_{CE} = 25\text{ V}; V_{GE} = 0\text{ V}; f = 1\text{ MHz}$		tbd		nF	
$Q_{G(on)}$	total gate charge	$V_{GE} = 0 \dots 15\text{ V}$		140		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 300\text{ V}; I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 8.2\ \Omega$	$T_{VJ} = 150^{\circ}\text{C}$	50		ns	
t_r	current rise time			70		ns	
$t_{d(off)}$	turn-off delay time			150		ns	
t_f	current fall time			80		ns	
E_{on}	turn-on energy per pulse			1.8		mJ	
E_{off}	turn-off energy per pulse			3.9		mJ	
$E_{rec(off)}$	reverse recovery losses at turn-off			tbd		mJ	
I_{CM}	reverse bias safe operating area	RBSOA; $V_{GE} = \pm 15\text{ V}; R_G = 8.2\ \Omega; L = 100\ \mu\text{H}$			100	A	
V_{CEK}		clamped inductive load;	$T_{VJ} = 150^{\circ}\text{C}$		V_{CES}	V	
t_{sc} (SCSOA)	short circuit safe operating area	$V_{CE} = 400\text{ V}; V_{GE} = \pm 15\text{ V}; R_G = 8.2\ \Omega$; non-repetitive	$T_{VJ} = 150^{\circ}\text{C}$	400	10	μs A	
R_{thJC}	thermal resistance junction to case	(per IGBT)			0.45	K/W	
R_{thCH}	thermal resistance case to heatsink	(per IGBT)		0.13		K/W	

Diodes D1 - D6

Symbol	Definitions	Conditions	Maximum Ratings			
			min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage				650	V
I_{F25}	forward current		$T_C = 25^{\circ}\text{C}$		130	A
I_{F80}			$T_C = 80^{\circ}\text{C}$		100	A
Symbol	Conditions	Characteristic Values				
V_F	forward voltage	$I_F = 100\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 150^{\circ}\text{C}$	1.6 1.7	1.85	V V
Q_{RR}	reverse recovery charge	$V_R = 300\text{ V}; I_F = 100\text{ A}$ $di_F/dt = -1600\text{ A}/\mu\text{s}$	$T_{VJ} = 150^{\circ}\text{C}$	7.5		μC
I_{RM}	max. reverse recovery current			90		A
t_{rr}	reverse recovery time			100		ns
$E_{rec(off)}$	reverse recovery losses at turn-off			1.7		mJ
R_{thJC}	thermal resistance junction to case	(per diode)			0.6	K/W
R_{thCH}	thermal resistance case to heatsink	(per diode)		0.2		K/W

Module

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
T_{VJ}	operating temperature		-40		150	°C
T_{VJM}	max. virtual junction temperature				175	°C
T_{stg}	storage temperature		-40		125	°C
V_{ISOL}	isolation voltage	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$			2500	V~
M_d	mounting torque	(M4)	2.0		2.2	Nm
d_S	creep distance on surface		11.5			mm
d_A	strike distance through air		10.0			mm
Weight				40		g

Equivalent Circuits for Simulation

Ratings

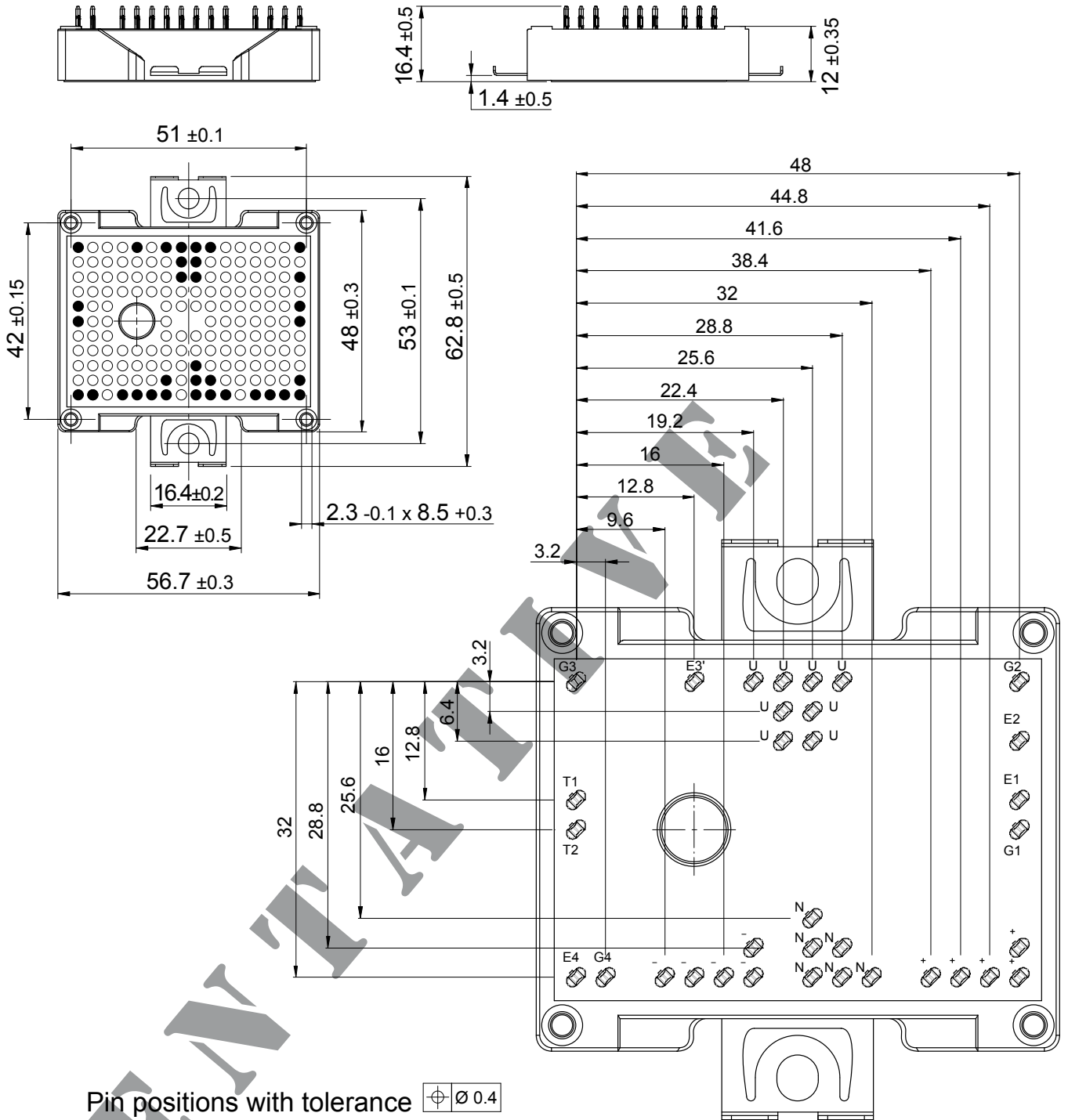
Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
V_0	IGBT	$T_{VJ} = 150^\circ\text{C}$		1.1		V
R_0				7		mΩ
V_0	free wheeling diode	$T_{VJ} = 150^\circ\text{C}$		1.2		V
R_0				6		mΩ

Temperature Sensor NTC

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
R_{25}	resistance	$T_C = 25^\circ\text{C}$	4.75	5.0	5.25	kΩ
$B_{25/50}$				3375		K

Outline Drawing

Dimensions in mm (1 mm = 0.0394")



Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA100PM600TMI	MIXA100PM600TMI	Box	tbd	tbd