

# IGBT Modules

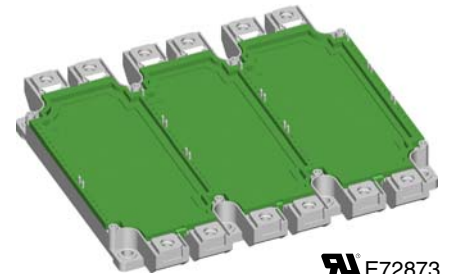
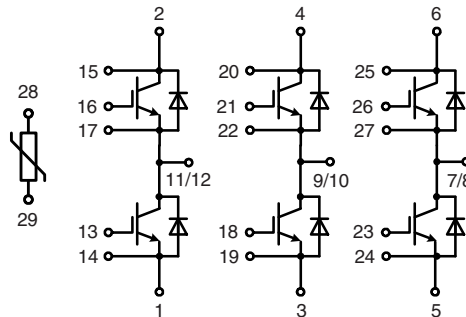
## Sixpack

 NPT<sup>3</sup> IGBT

$$I_{C80} = 235 \text{ A}$$

$$V_{CES} = 1700 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 2.5 \text{ V}$$



See outline drawing for pin arrangement

### IGBTs

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^{\circ}\text{C}$ to $125^{\circ}\text{C}$	1700	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^{\circ}\text{C}$	335	A
$I_{C80}$	$T_C = 80^{\circ}\text{C}$	235	A
<b>RBSOA</b>	$R_G = 5 \Omega$ ; $T_{VJ} = 125^{\circ}\text{C}$ Clamped inductive load; $L = 100 \mu\text{H}$	$I_{CM} = 470$ $V_{CEK} \leq V_{CES}$	A
<b><math>t_{SC}</math> (SCSOA)</b>	$V_{CE} = 1200 \text{ V}$ ; $V_{GE} = \pm 15 \text{ V}$ ; $R_G = 5 \Omega$ ; $T_{VJ} = 125^{\circ}\text{C}$ ; non-repetitive; $V_{CEmax} \leq V_{CES}$	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^{\circ}\text{C}$	1.4	kW

### Features

- €NPT<sup>3</sup> IGBT technology
- €low saturation voltage
- €low switching losses
- €square RBSOA, no latch up
- €high short circuit capability
- €positive temperature coefficient for easy parallelling
- €MOS input, voltage controlled
- €ultra fast free wheeling diodes
- €solderable pins for PCB mounting
- €package with copper base plate

### Advantages

- €space savings
- €reduced protection circuits
- €package designed for wave soldering

### Typical Applications

- €AC motor control
- €AC servo and robot drives
- €power supplies

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 225 \text{ A}$ ; $V_{GE} = 15 \text{ V}$ ; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.5 2.9	2.9 3.4 V
$V_{GE(th)}$	$I_C = 20 \text{ mA}$ ; $V_{GE} = V_{CE}$	4.5		6.5 V
$I_{CES}$	$V_{CE} = V_{CES}$ ; $V_{GE} = 0 \text{ V}$ ; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		4.4	0.6 mA mA
$I_{GES}$	$V_{CE} = 0 \text{ V}$ ; $V_{GE} = \pm 20 \text{ V}$			500 nA
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$ $E_{on}$ $E_{off}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 900 \text{ V}$ ; $I_C = 200 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$ ; $R_G = 5 \Omega$		180 110 500 110 66 54	ns ns ns ns mJ mJ
$C_{ies}$		$V_{CE} = 25 \text{ V}$ ; $V_{GE} = 0 \text{ V}$ ; $f = 1 \text{ MHz}$	22	nF
$Q_{Gon}$		$V_{CE} = 700 \text{ V}$ ; $V_{GE} = 15 \text{ V}$ ; $I_C = 200 \text{ A}$	1.72	$\mu\text{C}$
$R_{thJC}$				0.085 K/W

IXYS reserves the right to change limits, test conditions and dimensions.

**Diodes**

Symbol	Conditions	Maximum Ratings	
$I_{F80}$	$T_C = 80^\circ\text{C}$	200	A
$I_{FRM}$	$t_p = 1 \text{ ms}$	400	A
$I^2t$	$T_{VJ} = 125^\circ\text{C}; t = 10 \text{ ms}; V_R = 0 \text{ V}$	5800	$\text{A}^2\text{s}$

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 225 \text{ A}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$			2.4 V
$I_{RM}$	$I_F = 225 \text{ A}; di_F/dt = 1600 \text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}; V_R = 1150 \text{ V}$		160	A
$R_{thJC}$		0.165		K/W

**Temperature Sensor NTC**

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{25}$	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k $\Omega$
$B_{25/50}$			3375	K

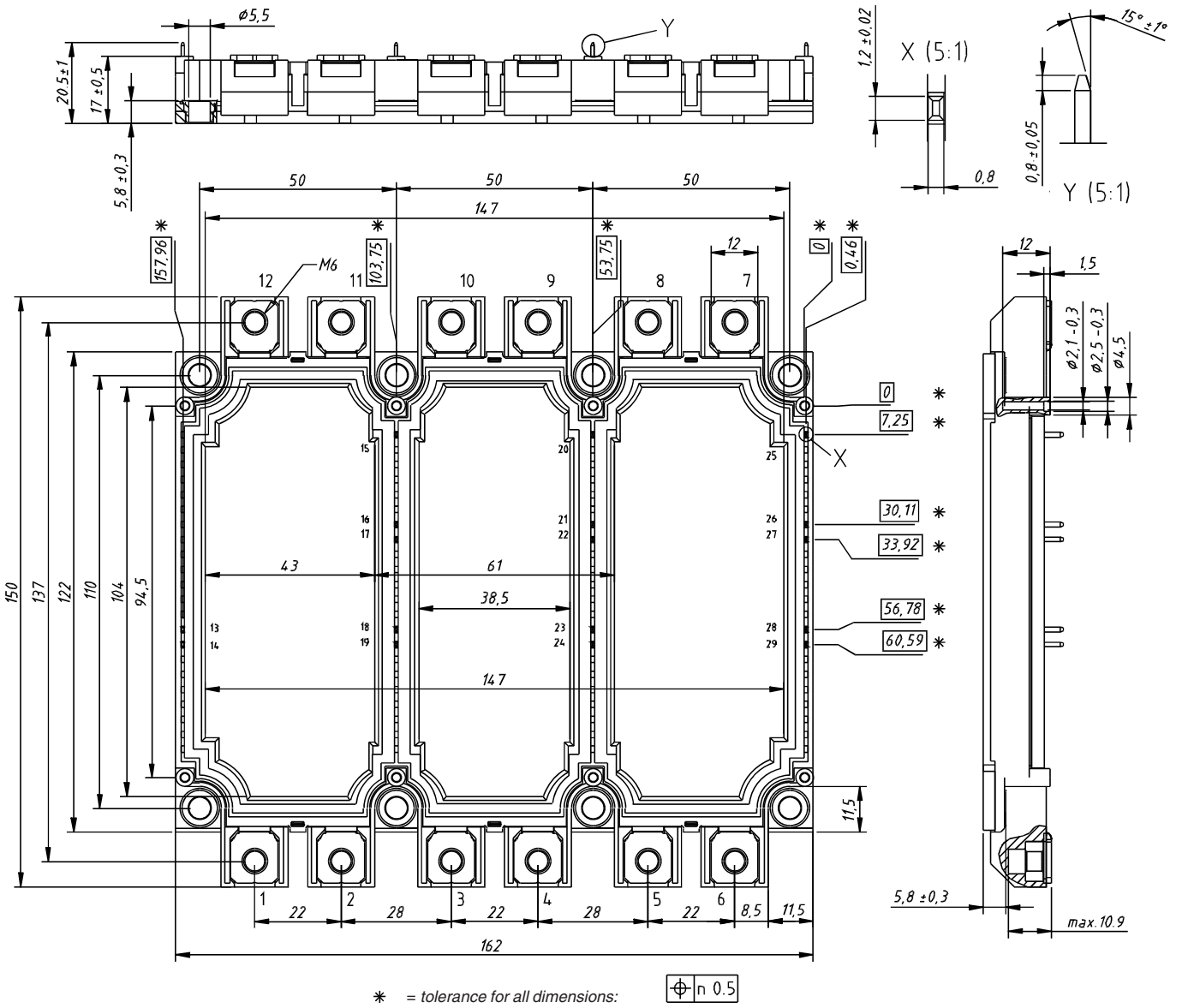
**Module**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$	operating	-40...+125	$^\circ\text{C}$
$T_{JM}$		+150	$^\circ\text{C}$
$T_{stg}$		-40...+125	$^\circ\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$	2500	V~
$M_d$	Mounting torque (M5)	3 - 6	Nm
	Terminal connection torque (M6)	3 - 6	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{term-chip}^{*)}$	Resistance terminal to chip		0.55	m $\Omega$
$d_S$	Creepage distance on surface	12.7		mm
$d_A$	Strike distance in air	10		mm
$R_{thCH}$	with heatsink compound		0.01	K/W
<b>Weight</b>			900	g

\*)  $V = V_{CE(sat)} + 2x R_{term-chip} \cdot I_C$  resp.  $V = V_F + 2x R_{term-chip} \cdot I_F$

Dimensions in mm (1 mm = 0.0394")



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