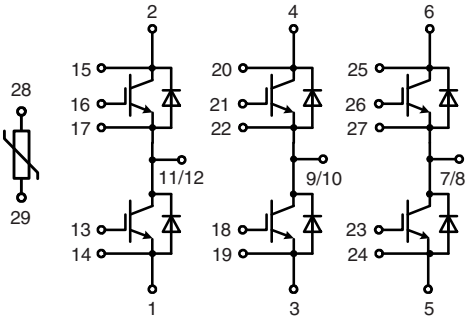
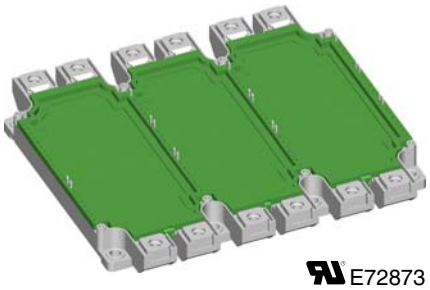
# IGBT Modules
## Sixpack

$I_{C60}$ = 475 A
$V_{CES}$ = 1700 V
$V_{CE(sat)\ typ}$ = 2.25 V

Preliminary data



E72873

See outline drawing for pin arrangement

### Features
- NPT³ 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

**Recommended replacement: MWI 450-17T9**

### IGBTs

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{CES}$ | $T_{VJ}$ = 25°C to 125°C | 1700 | V |
| $V_{GES}$ | | ± 20 | V |
| $I_{C25}$ | $T_C$ = 25°C | 580 | A |
| $I_{C60}$ | $T_C$ = 60°C | 475 | A |
| $I_{C80}$ | $T_C$ = 80°C | 405 | A |
| RBSOA | $R_G$ = 3.3 Ω; $T_{VJ}$ = 125°C<br>Clamped inductive load; L = 100 µH | $I_{CM}$ = 750<br>$V_{CEK} \le V_{CES}$ | A |
| $t_{SC}$ (SCSOA) | $V_{CE}$ = 1200 V; $V_{GE}$ = ±15 V; $R_G$ = 3.3 Ω;<br>$T_{VJ}$ = 125°C; non-repetitive; $V_{CEmax} \le V_{CES}$ | 10 | µs |
| $P_{tot}$ | $T_C$ = 25°C | 2.2 | kW |

| Symbol | Conditions | Characteristic Values ($T_{VJ}$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_{CE(sat)}$ | $I_C$ = 450 A; $V_{GE}$ = 15 V; $T_{VJ}$ = 25°C | | 2.25 | 2.65 | V |
| | $T_{VJ}$ = 125°C | | 2.65 | 3.0 | V |
| $V_{GE(th)}$ | $I_C$ = 30 mA; $V_{GE}$ = $V_{CE}$ | 5 | | 7 | V |
| $I_{CES}$ | $V_{CE}$ = $V_{CES}$; $V_{GE}$ = 0 V; $T_{VJ}$ = 25°C | | | 1 | mA |
| | $T_{VJ}$ = 125°C | | 9 | 26 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V; $V_{GE}$ = ± 20 V | | | 1.5 | µA |
| $t_{d(on)}$ | Inductive load, $T_{VJ}$ = 125°C | | 100 | | ns |
| $t_r$ | $V_{CE}$ = 900 V; $I_C$ = 450 A | | 90 | | ns |
| $t_{d(off)}$ | $V_{GE}$ = ±15 V; $R_G$ = 3.3 Ω | | 470 | | ns |
| $t_f$ | | | 400 | | ns |
| $E_{on}$ | | | 90 | | mJ |
| $E_{off}$ | | | 90 | | mJ |
| $C_{ies}$ | $V_{CE}$ = 25 V; $V_{GE}$ = 0 V; f = 1 MHz | | 33 | | nF |
| $Q_{Gon}$ | $V_{CE}$ = 900 V; $V_{GE}$ = 15 V; $I_C$ = 300 A | | 2.6 | | µC |
| $R_{thJC}$ | | | | 0.057 | K/W |

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## Diodes

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $I_{F80}$ | $T_C$ = 80°C | 450 | A |
| $I_{FRM}$ | $t_p$ = 1 ms | 900 | A |
| $I^2t$ | $T_{VJ}$ = 125°C; t = 10 ms; $V_R$ = 0 V | 35000 | $A^2s$ |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_F$ | $I_F$ = 450 A; $V_{GE}$ = 0 V; $T_{VJ}$ = 25°C | | | 2.2 | V |
| $I_{RM}$ | $I_F$ = 450 A; $di_F/dt$ = 3500 A/µs; $T_{VJ}$ = 125°C; $V_R$ = 1200 V | | 400 | | A |
| $R_{thJC}$ | | | 0.075 | | K/W |

## Temperature Sensor NTC

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $R_{25}$ | T = 25°C | 4.75 | 5.0 | 5.25 | kΩ |
| $B_{25/50}$ | | | 3375 | | K |

## Module

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $T_{VJ}$ | operating | -40...+125 | °C |
| $T_{JM}$ | | +150 | °C |
| $T_{stg}$ | | -40...+125 | °C |
| $V_{ISOL}$ | $I_{ISOL} \leq$ 1 mA; 50/60 Hz | 3400 | 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 | | mΩ |
| $d_S$ | Creepage distance on surface | 12.7 | | | mm |
| $d_A$ | Strike distance in air | 10 | | | mm |
| $R_{thCH}$ | with heatsink compound | | 0.01 | | K/W |
| **Weight** | | | 900 | | g |

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

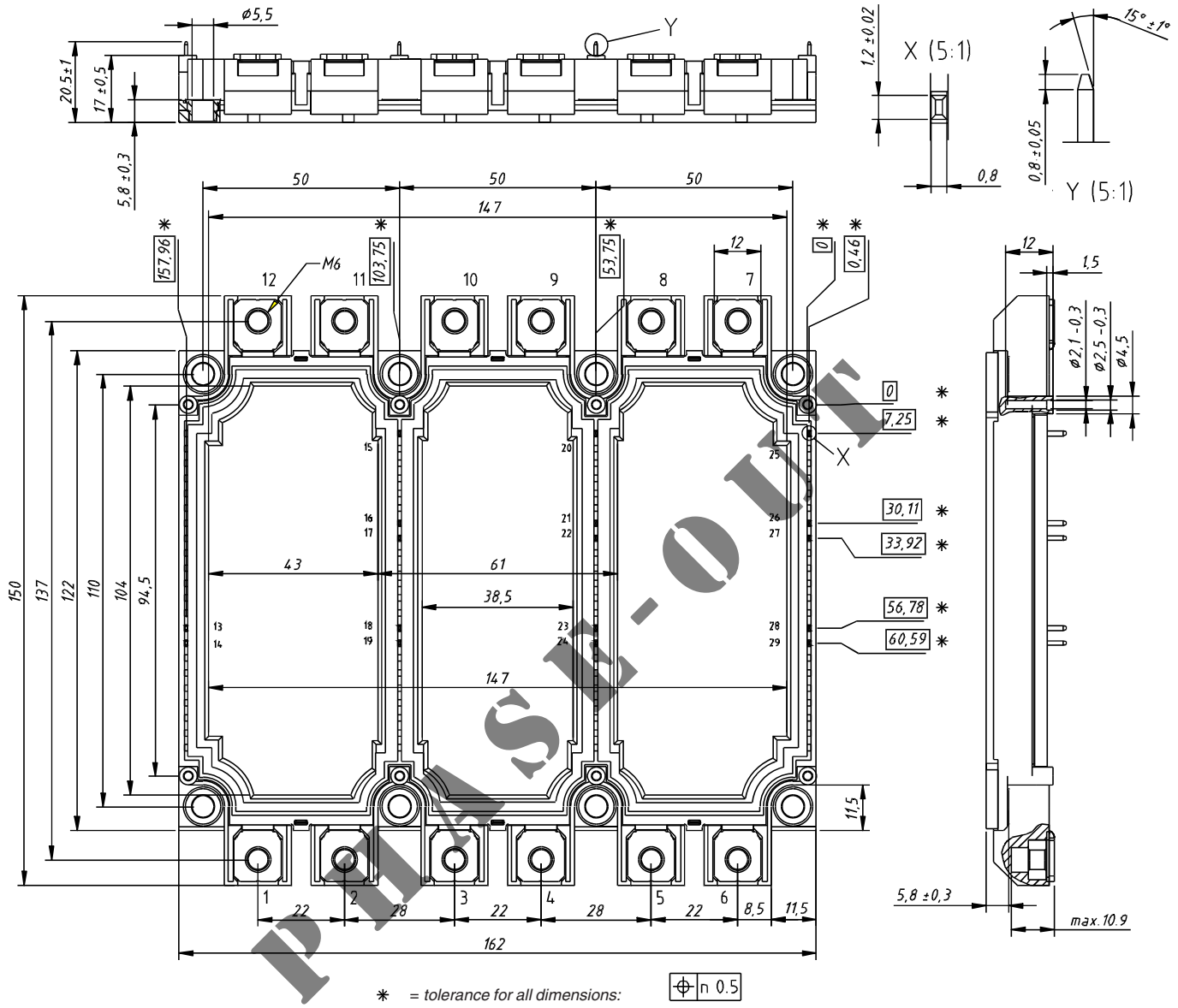
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**Dimensions in mm (1 mm = 0.0394")**




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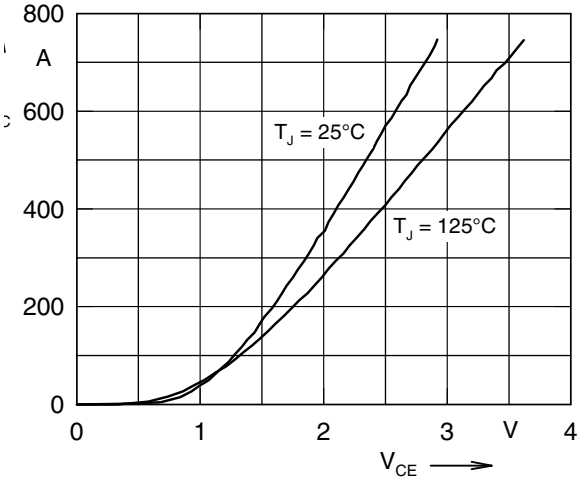



Fig. 1 Typ. output characteristics

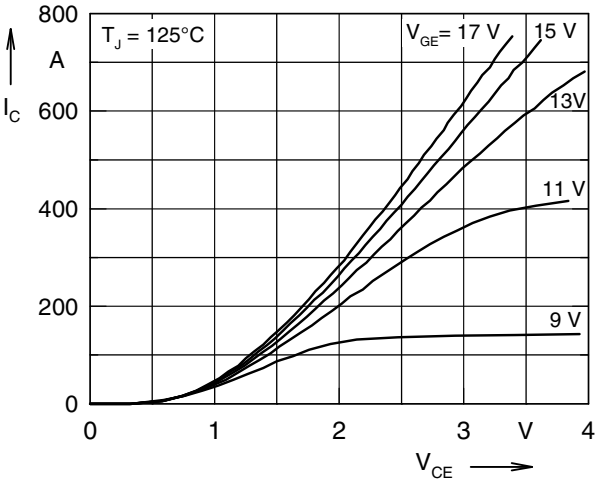



Fig. 2 Typ. output characteristics

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