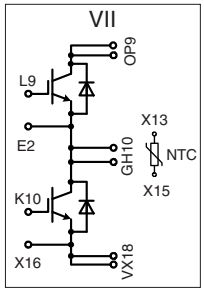
# IGBT Modules in ECO-PAC 2

Short Circuit SOA Capability
Square RBSOA

Preliminary data sheet

$I_{C25}$ = 121 A
$V_{CES}$ = 600 V
$V_{CE(sat)\ typ.}$ = 2.3 V




Pin arangement see outlines

## IGBTs

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{CES}$ | $T_{VJ}$ = 25°C to 150°C | 600 | V |
| $V_{GES}$ | | ± 20 | V |
| $I_{C25}$ | $T_C$ = 25°C | 121 | A |
| $I_{C80}$ | $T_C$ = 80°C | 83 | A |
| $I_{CM}$ | $V_{GE}$ = ±15 V; $R_G$ = 2.2 Ω; $T_{VJ}$ = 125°C | 200 | A |
| $V_{CEK}$ | RBSOA, Clamped inductive load; L = 100 µH | 360 | V |
| $t_{SC}$ (SCSOA) | $V_{CE}$ = $V_{CES}$; $V_{GE}$ = ±15 V; $R_G$ = 2.2 Ω; $T_{VJ}$ = 125°C non-repetitive | 10 | µs |
| $P_{tot}$ | $T_C$ = 25°C | 379 | W |

| Symbol | Conditions | Characteristic Values ($T_{VJ}$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_{CE(sat)}$ | $I_C$ = 130 A; $V_{GE}$ = 15 V; $T_{VJ}$ = 25°C | | 2.3 | 2.9 | V |
| | $T_{VJ}$ = 125°C | | 2.6 | | V |
| $V_{GE(th)}$ | $I_C$ = 1.5 mA; $V_{GE}$ = $V_{CE}$ | 4.5 | | 6.5 | V |
| $I_{CES}$ | $V_{CE}$ = $V_{CES}$; $V_{GE}$ = 0 V; $T_{VJ}$ = 25°C | | | 1.2 | mA |
| | $T_{VJ}$ = 125°C | | | 7.5 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V; $V_{GE}$ = ± 20 V | | | 400 | nA |
| $t_{d(on)}$ | Inductive load, $T_{VJ}$ = 125°C | | 25 | | ns |
| $t_r$ | $V_{CE}$ = 300 V; $I_C$ = 80 A | | 11 | | ns |
| $t_{d(off)}$ | $V_{GE}$ = 15/0 V; $R_G$ = 2.2 Ω | | 150 | | ns |
| $t_f$ | | | 30 | | ns |
| $E_{on}$ | | | 0.8 | | mJ |
| $E_{off}$ | | | 2.3 | | mJ |
| $C_{ies}$ | $V_{CE}$ = 25 V; $V_{GE}$ = 0 V; f = 1 MHz | | 4.2 | | nF |
| $R_{thJC}$ | (per IGBT) | | | 0.33 | K/W |
| $R_{thJH}$ | with heatsink compound (0.42 K/m.K; 50 µm) | | 0.66 | | K/W |

### Features

- NPT IGBT's
  - positive temperature coefficient of saturation voltage
  - fast switching
- FRED diodes
  - fast reverse recovery
  - low forward voltage
- Industry Standard Package
  - solderable pins for PCB mounting
  - isolated DCB ceramic base plate

### Advantages

- space and weight savings
- reduced protection circuits
- leads with expansion bend for stress relief

### Typical Applications

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

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

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## Reverse diodes (FRED)

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $I_{F25}$ | $T_C$ = 25°C | 134.0 | A |
| $I_{F80}$ | $T_C$ = 80°C | 82.3 | A |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_F$ | $I_F$ = 80 A; $T_{VJ}$ = 25°C | | 1.85 | 2.06 | V |
| | $T_{VJ}$ = 125°C | | 1.40 | | V |
| $I_{RM}$ | $I_F$ = 60 A; $di_F/dt$ = 500 A/µs; $T_{VJ}$ = 125°C | | 28 | | A |
| $t_{rr}$ | $V_R$ = 300 V; $V_{GE}$ = 0 V | | 100 | | ns |
| $R_{thJC}$ | | | | 0.66 | K/W |
| $R_{thJH}$ | with heatsink compound (0.42 K/m.K; 50 µm) | | 1.32 | | 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 | |
|---|---|---|---|
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{stg}$ | | -40...+150 | °C |
| $V_{ISOL}$ | $I_{ISOL}$ ≤ 1 mA; 50/60 Hz | 3000 | V~ |
| $M_d$ | mounting torque (M4) | 1.5 - 2.0 | Nm |
| | | 14 - 18 | lb.in. |
| a | Max. allowable acceleration | 50 | $m/s^2$ |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $d_S$ | Creepage distance on surface (Pin to heatsink) | 11.2 | | | mm |
| $d_A$ | Strike distance in air (Pin to heatsink) | 11.2 | | | mm |
| Weight | | | 24 | | g |

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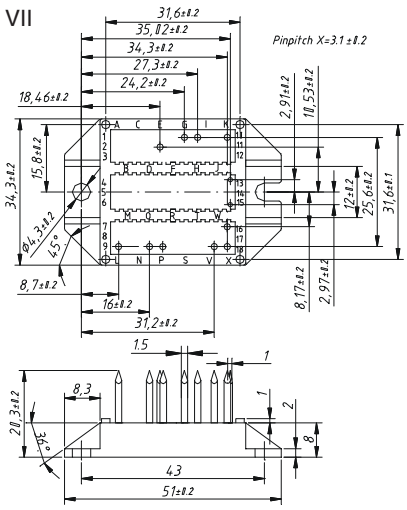


Data according to IEC 60747 and refer to a single transistor or diode unless otherwise stated.
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