POWERSEM

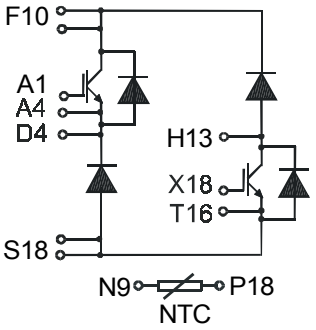
**ECO-PAC™ 2**

# IGBT Module PSHI 50D/06*

$I_{C25}$ = 42.5 A
$V_{CES}$ = 600 V
$V_{CE(sat)typ.}$ = 2.4 V

Preliminary Data Sheet

Short Circuit SOA Capability
Square RBSOA




**PSHI 50D/06***

## 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 | 42.5 | A |
| $I_{C80}$ | $T_C$ = 80°C | 29 | A |
| $I_{CM}$ | $V_{GE}$ = ±15 V; $R_G$ = 33 Ω; $T_{VJ}$ = 125°C | 60 | A |
| $V_{CEK}$ | RBSOA, Clamped inductive load; L = 100 µH | $V_{CES}$ | |
| $t_{SC}$ (SCSOA) | $V_{CE}$ = $V_{CES}$; $V_{GE}$ = ±15 V; $R_G$ = 33 Ω; $T_{VJ}$ = 125°C non-repetitive | 10 | µs |
| $P_{tot}$ | $T_C$ = 25°C | 130 | W |

| Symbol | Conditions | Characteristic Values ($T_{VJ}$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_{CE(sat)}$ | $I_C$ = 50 A; $V_{GE}$ = 15 V; $T_{VJ}$ = 25°C | | 2.4 | 2.9 | V |
| | $T_{VJ}$ = 125°C | | 2.9 | | V |
| $V_{GE(th)}$ | $I_C$ = 0.7 mA; $V_{GE}$ = $V_{CE}$ | 4.5 | | 6.5 | V |
| $I_{CES}$ | $V_{CE}$ = $V_{CES}$; $V_{GE}$ = 0 V; $T_{VJ}$ = 25°C | | | 0.6 | mA |
| | $T_{VJ}$ = 125°C | | | 1.7 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V; $V_{GE}$ = ± 20 V | | | 100 | nA |
| $t_{d(on)}$ | Inductive load, $T_{VJ}$ = 125°C | | 50 | | ns |
| $t_r$ | $V_{CE}$ = 300 V; $I_C$ = 30 A | | 50 | | ns |
| $t_{d(off)}$ | $V_{GE}$ = 15/0 V; $R_G$ = 33 Ω | | 270 | | ns |
| $t_f$ | | | 40 | | ns |
| $E_{on}$ | | | 1.4 | | mJ |
| $E_{off}$ | | | 1.0 | | mJ |
| $C_{ies}$ | $V_{CE}$ = 25 V; $V_{GE}$ = 0 V; f = 1 MHz | | 16 | | nF |
| $R_{thJC}$ | (per IGBT) | | | 0.96 | K/W |
| $R_{thJH}$ | with heatsink compound (0.42 K/m.K; 50 µm) | | 1.92 | | K/W |

*NTC optional

### Features

- NPT 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
- Isolation voltage 3000 V~
- UL registered, E 148688

### Advantages

- space and weight savings
- reduced protection circuits
- package designed for wave soldering
- High power density
- Easy to mount with two screws

### Typical Applications

- motor control
  - DC motor armature winding
  - DC motor excitation winding
  - synchronous motor excitation winding
- supply of transformer primary winding
  - power supplies
  - welding
  - X-ray
  - UPS
  - battery charger

**Caution:** These Devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

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## Reverse diodes (FRED)

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $I_{F25}$ | $T_C$ = 25°C | 56 | A |
| $I_{F80}$ | $T_C$ = 80°C | 35 | A |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_F$ | $I_F$ = 40 A; $T_{VJ}$ = 25°C | | 2.32 | 2.59 | V |
| | $T_{VJ}$ = 125°C | | 1.58 | | V |
| $I_{RM}$ | $I_F$ = 30 A; $di_F/dt$ = 500 A/µs; $T_{VJ}$ = 125°C | | 15 | | A |
| $t_{rr}$ | $V_R$ = 300 V; $V_{GE}$ = 0 V | | 70 | | ns |
| $R_{thJC}$ | | | | 1.3 | K/W |
| $R_{thJH}$ | with heatsink compound (0.42 K/m.K; 50 µm) | | 2.6 | | K/W |

## Temperature Sensor NTC

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $R_{25}$ | T = 25°C | 455 | 470 | 485 | kΩ |
| $B_{25/50}$ | | | 3474 | | K |

## Module

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{stg}$ | | -40...+150 | °C |
| $V_{ISOL}$ | $I_{ISOL} \leq$ 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 |

**Package style and outline**
Dimensions in mm (1mm = 0.0394“)