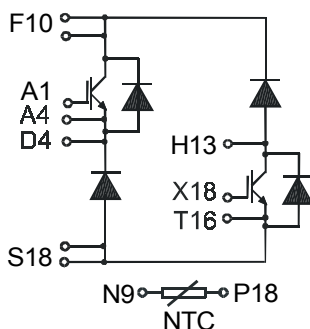


### IGBT Module PSHI 50D/06\*

Preliminary Data Sheet

Short Circuit SOA Capability  
Square RBSOA



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



PSHI 50D/06\*

### IGBTs

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	42.5	A
$I_{C80}$	$T_C = 80^\circ\text{C}$	29	A
$I_{CM}$ $V_{CEK}$	$V_{GE} = \pm 15 \text{ V}; R_G = 33 \Omega; T_{VJ} = 125^\circ\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	60	A
		$V_{CES}$	
$t_{SC}$ (SCSOA)	$V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 33 \Omega; T_{VJ} = 125^\circ\text{C}$ non-repetitive	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	130	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 paralleling
- 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

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

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

### Reverse diodes (FRED)

Symbol	Conditions	Maximum Ratings	
$I_{F25}$	$T_C = 25^\circ\text{C}$	56	A
$I_{F80}$	$T_C = 80^\circ\text{C}$	35	A

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

### Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{25}$	$T = 25^\circ\text{C}$	455	470	485 k $\Omega$
$B_{25/50}$			3474	K

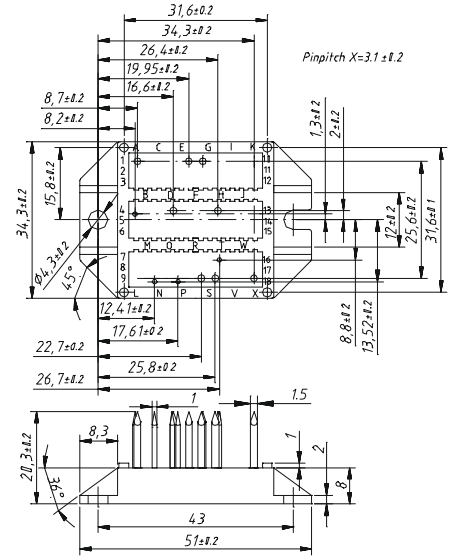
### Module

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-40...+150	$^\circ\text{C}$
$T_{stg}$		-40...+150	$^\circ\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	3000	V~
$M_d$	Mounting torque (M4)	1.5 - 2.0	Nm
		14 - 18	lb.in.
<b>a</b>	Max. allowable acceleration	50	$\text{m/s}^2$

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
<b>Weight</b>		24		g

### Package style and outline

Dimensions in mm (1mm = 0.0394")



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