

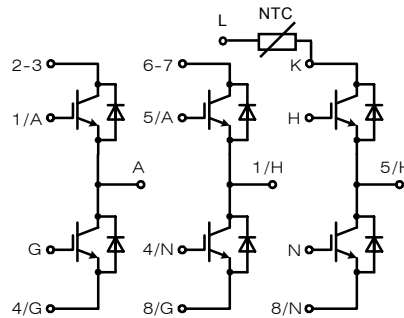
## IGBT Module PSII 3x10/06 Sixpack

Preliminary Data Sheet

$$I_{C25} = 19 \text{ A}$$

$$V_{CES} = 600 \text{ V}$$

$$V_{CE(sat)typ.} = 1.9 \text{ V}$$



### 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
$I_{C25}$	$T_C = 25^{\circ}\text{C}$	19	A
$I_{C80}$	$T_C = 80^{\circ}\text{C}$	14	A
$I_{CM}$ $V_{CEK}$	$V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	20	A
		$V_{CES}$	
$t_{SC}$ (SCSOA)	$V_{CE} = 720 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^{\circ}\text{C}$	73	W

### PSII 3x10/06

#### 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
- UL registered, E 148688

#### Applications

- AC drives
- power supplies with power factor correction

#### Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- High power density
- Small and light weight

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

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 10 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		1.9 2.2	V V	
$V_{GE(th)}$	$I_C = 0.35 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V	
$I_{CES}$	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.7	0.6 mA 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, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 300 \text{ V}; I_C = 10 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega$		35 35 230 30	ns ns ns ns	
			0.4 0.3	mJ mJ	
$C_{ies}$		$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		600	pF
$Q_{Gon}$		$V_{CE} = 300 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 10 \text{ A}$		39	nC
$R_{thJC}$		(per IGBT)			1.7 K/W
$R_{thJH}$		with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )	3.4		K/W

### Diodes

Symbol	Conditions	Maximum Ratings	
$I_{F25}$	$T_C = 25^\circ\text{C}$	21	A
$I_{F80}$	$T_C = 80^\circ\text{C}$	14	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 10\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		1.9 1.4	V V
$I_{RM}$ $t_{rr}$	$I_F = 10\text{ A}; di_F/dt = -400\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 300\text{ V}; V_{GE} = 0\text{ V}$		11	A
			80	ns
$R_{thJC}$ $R_{thJH}$	with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )		7.0	3.5 K/W K/W

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

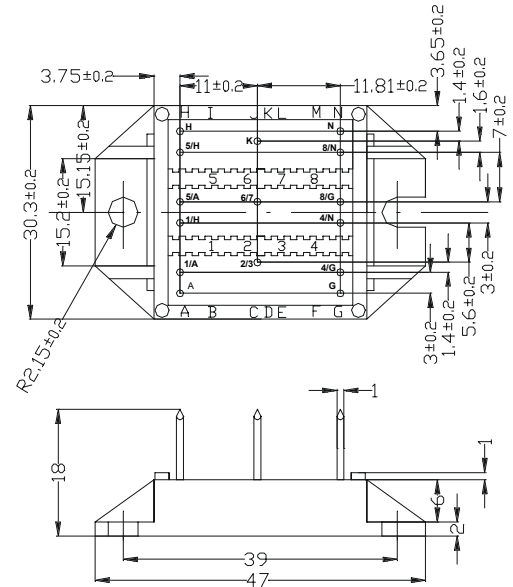
### Component

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-40...+150	$^\circ\text{C}$
$T_{stg}$		-40...+125	$^\circ\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}; t = 1\text{ s}$	3600	V~
$M_d$	Mounting torque (M4)	1.5 - 1.8	Nm lb.in.
$a$	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
Weight			18	g

### Package style and outline

Dimensions in mm (1mm = 0.0394")



### Temperature Sensor NTC

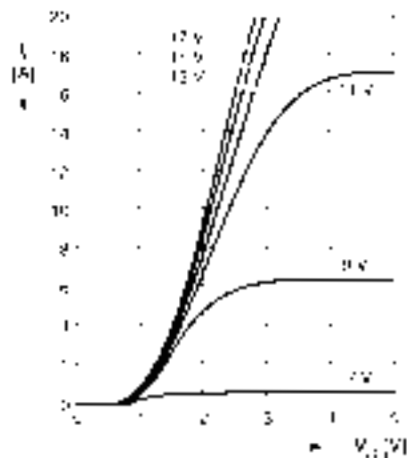
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{25}$	$T = 25^\circ\text{C}$	455	470	485 k $\Omega$
$B_{25/50}$			3474	K

### IGBT

Typ. output characteristics

$$V_{CE} = +10V$$

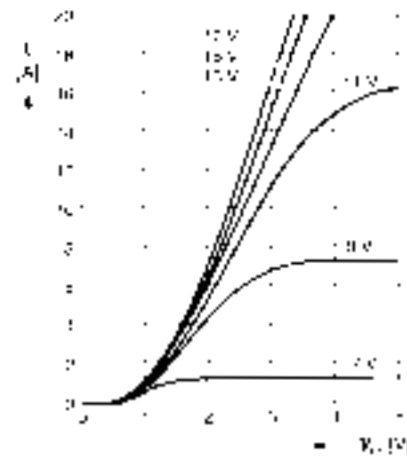
parameter  $t_r = 250 \mu s$ ,  $T_c = 25^\circ C$



Typ. output characteristics

$$I_C = +10A$$

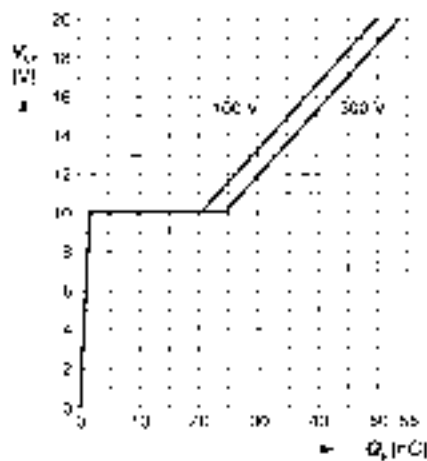
parameter  $t_r = 250 \mu s$ ,  $T_c = 175^\circ C$



Typ. gate charge

$$V_{CE} = +10V$$

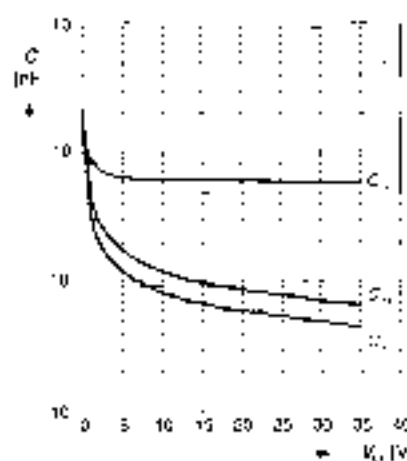
parameter  $V_{GE} = 10V$



Typ. capacitances

$$Q = 10 \mu C$$

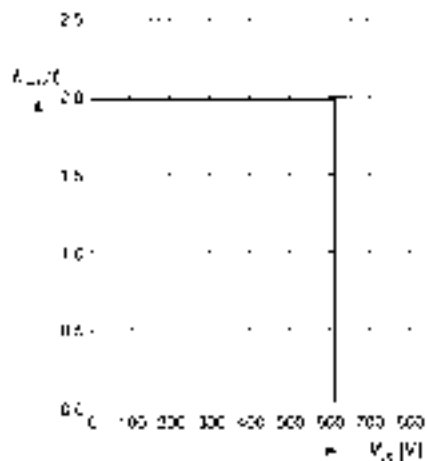
parameter  $V_{CE} = 0V$ ,  $f = 1 \text{ MHz}$



Reverse biased safe operating area

$$V_{CE} = +10V, T_c = 150^\circ C$$

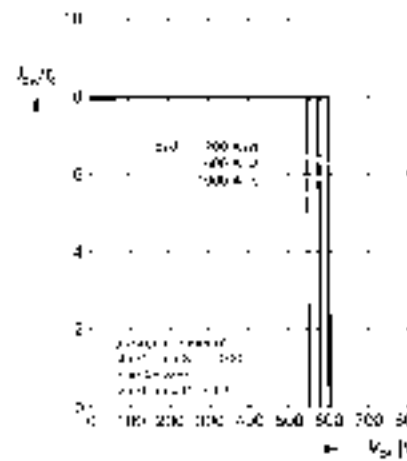
parameter  $V_{GE} = 15V$



Short circuit safe operating area

$$I_{CE} = +10A, T_c = 150^\circ C$$

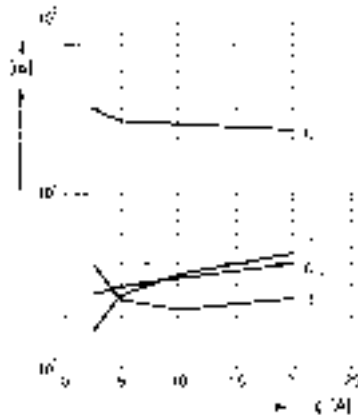
parameter  $V_{CE} = \pm 15V$ ,  $t_{sc} = 10 \mu s$ ,  $f = 60 \text{ kHz}$



### IGBT

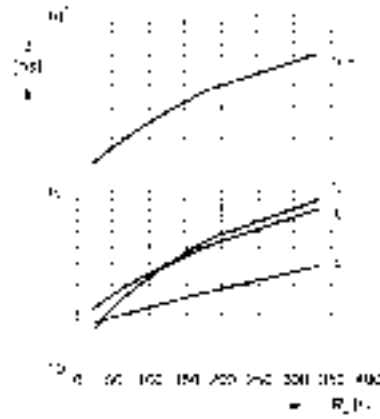
**$t_{sp}$  switching time**

$E = 100 \mu\text{s}$  inductive load,  $T = 125^\circ\text{C}$   
 parameter:  $V_{ce} = 300\text{V}$ ,  $V_{ge} = 15\text{V}$ ,  $R_{th} = 100\text{s}$



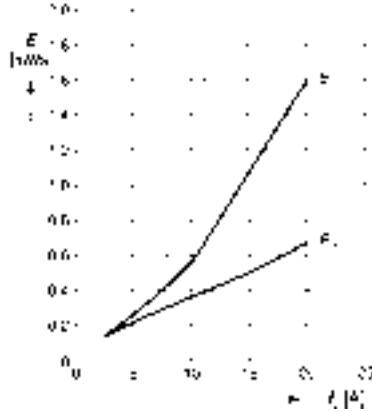
**$t_{yb}$  switching time**

$E = 100 \mu\text{s}$  inductive load,  $T = 125^\circ\text{C}$   
 parameter:  $V_{ce} = 300\text{V}$ ,  $V_{ge} = 15\text{V}$ ,  $I_{C1} = 10\text{A}$



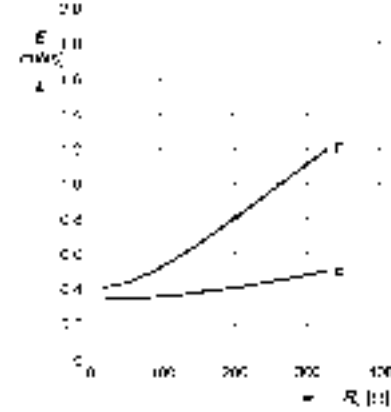
**$t_{sp}$  switching losses**

$E = 100 \mu\text{s}$  inductive load,  $T = 125^\circ\text{C}$   
 parameter:  $V_{ce} = 300\text{V}$ ,  $V_{ge} = 15\text{V}$ ,  $R_{th} = 100\text{s}$

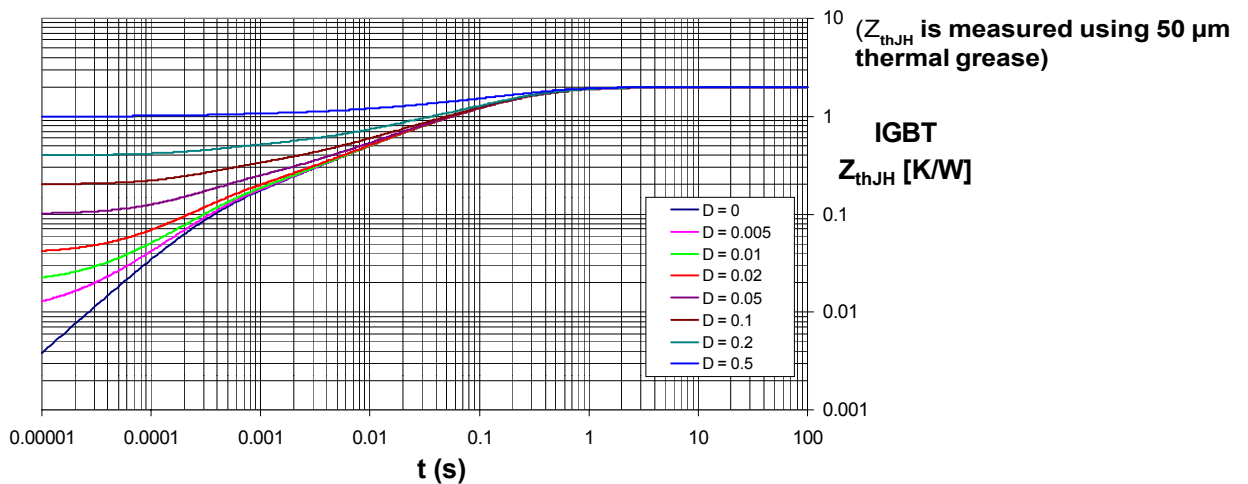


**$t_{yb}$  switching losses**

$E = 100 \mu\text{s}$  inductive load,  $T = 125^\circ\text{C}$   
 parameter:  $V_{ce} = 300\text{V}$ ,  $V_{ge} = 15\text{V}$ ,  $I_{C1} = 10\text{A}$



Transient thermal resistance junction to heatsink



### Diode

