

## Single Phase Half Controlled Bridges

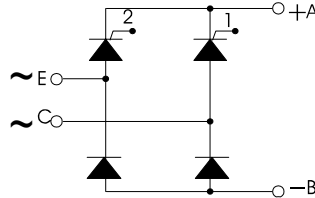
### PSBH 50

$I_{dAV}$  = 53 A  
 $V_{RRM}$  = 400-1600 V

Preliminary Data Sheet

$V_{RSM}$ $V_{DSM}$	$V_{RRM}$ $V_{DRM}$	Type
500	400	PSBH 50/04
900	800	PSBH 50/08
1300	1200	PSBH 50/12
1500	1400	PSBH 50/14
*1700	*1600	PSBH 50/16

\* Delivery on request



### Features

- Package with fast-on terminals
- Isolation voltage 3000 V~
- Planar glasspassivated chips
- Low forward voltage drop
- UL registered E 148688

### Applications

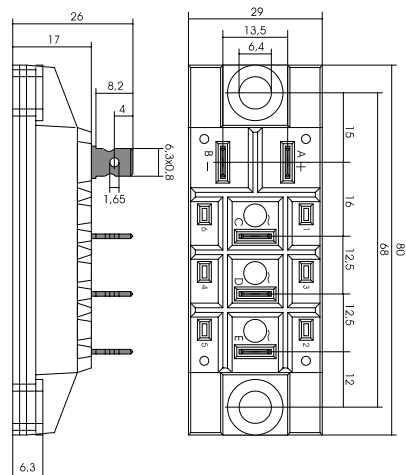
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Motor control
- Power converter

### Advantages

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

### Package, style and outline

Dimensions in mm (1mm = 0.0394")



Symbol	Test Conditions	Maximum Ratings
$I_{dAV}$	$T_C = 85^\circ\text{C}$ 180° sine, per module	53 A
$I_{TSM}, I_{FSM}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$ $t = 10\text{ ms}$ (50 Hz), sine	550 A
	$t = 8.3\text{ ms}$ (60 Hz), sine	600 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$ $t = 10\text{ ms}$ (50 Hz), sine	500 A
	$t = 8.3\text{ ms}$ (60 Hz), sine	550 A
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$ $t = 10\text{ ms}$ (50 Hz), sine	1520 A <sup>2</sup> s
	$t = 8.3\text{ ms}$ (60 Hz), sine	1520 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}$ $V_R = 0$ $t = 10\text{ ms}$ (50 Hz), sine	1250 A <sup>2</sup> s
	$t = 8.3\text{ ms}$ (60 Hz), sine	1250 A <sup>2</sup> s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ repetitive, $I_T = 50\text{ A}$ $f = 50\text{ Hz}$ , $t_p = 200\mu\text{s}$ $V_D = 2/3 V_{DRM}$	150 A/ $\mu\text{s}$
	$I_G = 0.3\text{ A}$ $di_G/dt = 0.3\text{ A}/\mu\text{s}$ non repetitive, $I_T = 1/2 \cdot I_{dAV}$	500 A/ $\mu\text{s}$
	$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$ $V_{DR} = 2/3 V_{DRM}$ $R_{GK} = \infty$ , method 1 (linear voltage rise)
$P_{GM}$	$T_{VJ} = T_{VJM}$ $t_p = 30\mu\text{s}$	$\leq 10\text{ W}$
	$I_T = I_{TAVM}$ $t_p = 500\mu\text{s}$	$\leq 5\text{ W}$
$P_{GAVM}$		0.5 W
$V_{RGM}$		10 V
$T_{VJ}$		-40 ... + 125 °C
$T_{VJM}$		125 °C
$T_{stg}$		-40 ... + 125 °C
$V_{ISOL}$	50/60 HZ, RMS $t = 1\text{ min}$	2500 V ~
	$I_{ISOL} \leq 1\text{ mA}$ $t = 1\text{ s}$	3000 V ~
$M_d$	Mounting torque (M5)	2 - 2.5 Nm
Weight	typ.	100 g

Symbol	Test Conditions	Characteristic Value			
$I_D, I_R$	$T_{VJ} = T_{VJM}, V_R = V_{RRM}, V_D = V_{DRM}$	$\leq$	5	mA	
$V_T, V_F$	$I_T, I_F = 80A, T_{VJ} = 25^\circ C$	$\leq$	1.64	V	
$V_{TO}$	For power-loss calculations only ( $T_{VJ} = T_{VJM}$ )		0.85	V	
$r_T$			11	m $\Omega$	
$V_{GT}$	$V_D = 6V$	$T_{VJ} = 25^\circ C$	$\leq$	1.5	V
		$T_{VJ} = -40^\circ C$	$\leq$	1.6	V
$I_{GT}$	$V_D = 6V$	$T_{VJ} = 25^\circ C$	$\leq$	100	mA
		$T_{VJ} = -40^\circ C$	$\leq$	200	mA
$V_{GD}$	$T_{VJ} = T_{VJM}, V_D = 2/3 V_{DRM}$	$\leq$	0.2	V	
$I_{GD}$	$T_{VJ} = T_{VJM}, V_D = 2/3 V_{DRM}$	$\leq$	5	mA	
$I_L$	$T_{VJ} = 25^\circ C, t_p = 10\mu s$	$\leq$	450	mA	
	$I_G = 0.45A, di_G/dt = 0.45A/\mu s$				
$I_H$	$T_{VJ} = 25^\circ C, V_D = 6V, R_{GK} = \infty$	$\leq$	200	mA	
$t_{gd}$	$T_{VJ} = 25^\circ C, V_D = 1/2 V_{DRM}$	$\leq$	2	$\mu s$	
	$I_G = 0.45A, di_G/dt = 0.45A/\mu s$				
$t_q$	$T_{VJ} = T_{VJM}, I_T = 20A, t_p = 200\mu s, V_R = 100V$		250	$\mu s$	
	$-di/dt = 10A/\mu s, dv/dt = 15V/\mu s, V_D = 2/3 V_{DRM}$				
$R_{thJC}$	per thyristor/Diode; DC		0.9	K/W	
	per module		0.225	K/W	
$R_{thJK}$	per thyristor/Diode; DC		1.1	K/W	
	per module		0.275	K/W	
$d_s$	Creeping distance on surface		16.1	mm	
$d_A$	Creeping distance in air		7.1	mm	
$a$	Max. allowable acceleration		50	m/s <sup>2</sup>	

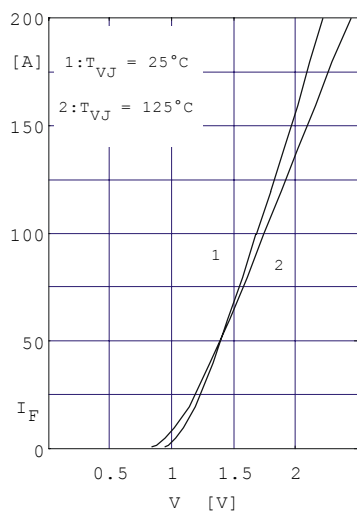


Fig. 1 Forward current vs. voltage drop per diode or thyristor

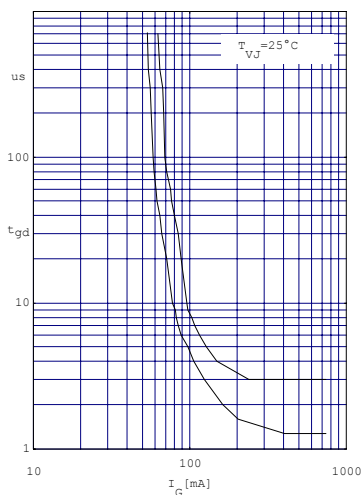


Fig. 2 Gate trigger delay time

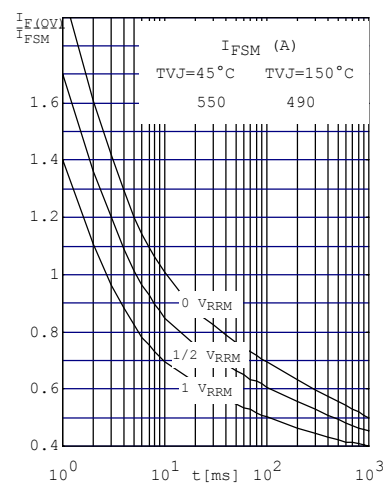


Fig. 3 Surge overload current per diode (or thyristor)  $I_{FSM}$ ,  $I_{TSM}$ : Crest value t: duration

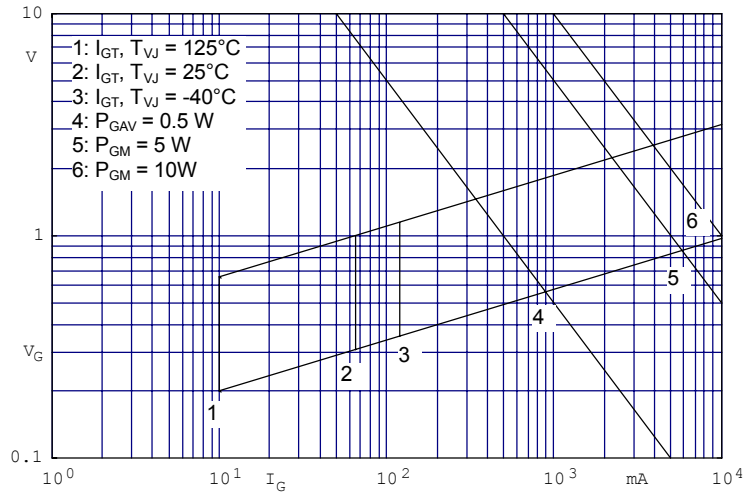


Fig.4 Gate trigger characteristic

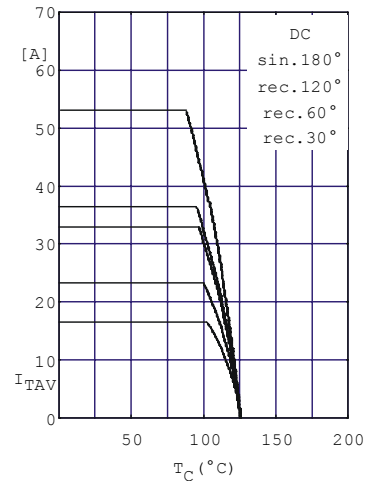


Fig.5 Maximum forward current at case temperature

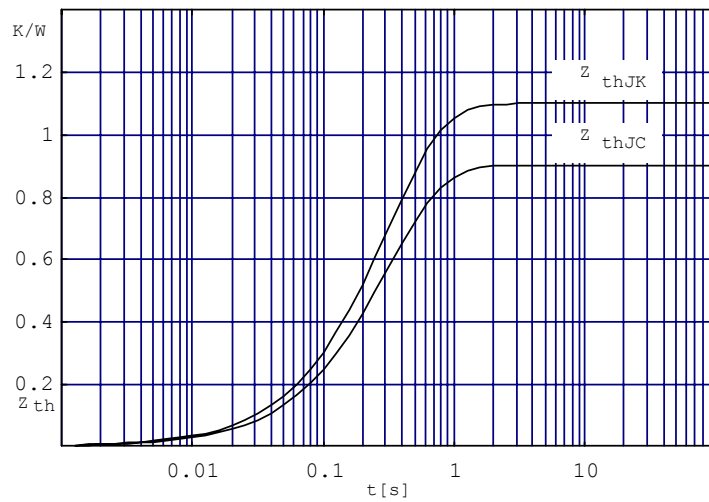


Fig.6 Transient thermal impedance per thyristor or diode (calculated)

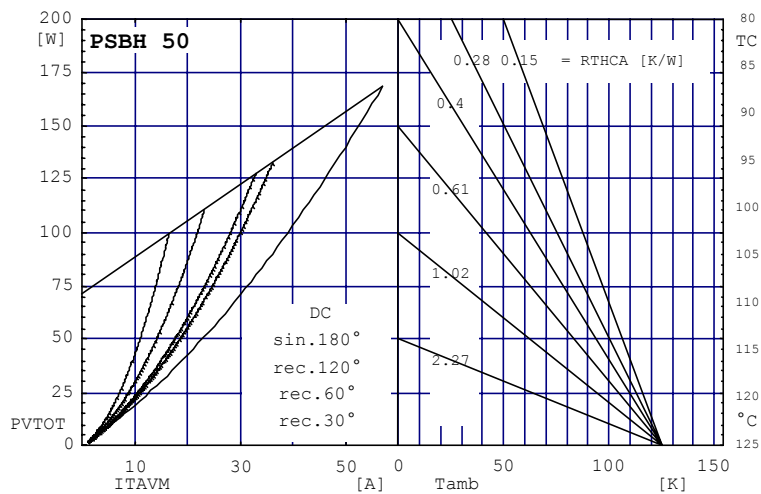


Fig. 7 Power dissipation vs. direct output current and ambient temperature