

## Single Phase Half Controlled Bridges with freewheeling diode

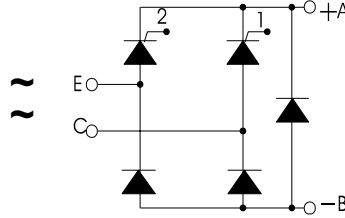
### PSCH 50

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

Preliminary Data Sheet

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

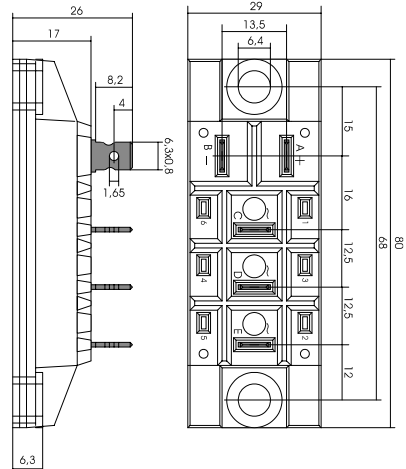
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Motor control
- Power converter

### 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	
$I_{dAV}$	$T_C = 85^\circ C$	180° sine, per module	53	A
$I_{TSM}, I_{FSM}$	$T_{VJ} = 45^\circ C$	$t = 10 \text{ ms}$ (50 Hz), sine	550	A
	$V_R = 0$	$t = 8.3 \text{ ms}$ (60 Hz), sine	600	A
	$T_{VJ} = T_{VJM}$	$t = 10 \text{ ms}$ (50 Hz), sine	500	A
	$V_R = 0$	$t = 8.3 \text{ ms}$ (60 Hz), sine	550	A
$\int i^2 dt$	$T_{VJ} = 45^\circ C$	$t = 10 \text{ ms}$ (50 Hz), sine	1520	$A^2 s$
	$V_R = 0$	$t = 8.3 \text{ ms}$ (60 Hz), sine	1520	$A^2 s$
	$T_{VJ} = T_{VJM}$	$t = 10 \text{ ms}$ (50 Hz), sine	1250	$A^2 s$
	$V_R = 0$	$t = 8.3 \text{ ms}$ (60 Hz), sine	1250	$A^2 s$
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$	repetitive, $I_T = 50 \text{ A}$	150	$A/\mu s$
	$f = 50 \text{ Hz}, t_p = 200 \mu s$			
	$V_D = 2/3 V_{DRM}$			
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$	$V_{DR} = 2/3 V_{DRM}$	1000	$V/\mu s$
	$R_{GK} = \infty$ , method 1 (linear voltage rise)			
$P_{GM}$	$T_{VJ} = T_{VJM}$	$t_p = 30 \mu s$	$\leq 10$	W
	$I_T = I_{TAVM}$	$t_p = 500 \mu s$	$\leq 5$	W
$P_{GAVM}$			0.5	W
$V_{RGM}$			10	V
$T_{VJ}$			-40 ... + 125	$^\circ C$
$T_{VJM}$			125	$^\circ C$
$T_{stg}$			-40 ... + 125	$^\circ C$
$V_{ISOL}$	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	
$V_T, V_F$	$I_T, I_F = 80 \text{ A}, T_{VJ} = 25^\circ\text{C}$	$\leq$	1.64	V	
$V_{TO}$	For power-loss calculations only ( $T_{VJ} = T_{VJM}$ )		0.85	V	
$r_T$			11	m $\Omega$	
$V_{GT}$	$V_D = 6\text{V}$	$T_{VJ} = 25^\circ\text{C}$	$\leq$	1.5	V
		$T_{VJ} = -40^\circ\text{C}$	$\leq$	1.6	V
$I_{GT}$	$V_D = 6\text{V}$	$T_{VJ} = 25^\circ\text{C}$	$\leq$	100	mA
		$T_{VJ} = -40^\circ\text{C}$	$\leq$	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	
$I_L$	$T_{VJ} = 25^\circ\text{C}, t_p = 10\mu\text{s}$	$\leq$	450	mA	
	$I_G = 0.45\text{A}, di_G/dt = 0.45\text{A}/\mu\text{s}$				
$I_H$	$T_{VJ} = 25^\circ\text{C}, V_D = 6\text{V}, R_{GK} = \infty$	$\leq$	200	mA	
$t_{gd}$	$T_{VJ} = 25^\circ\text{C}, V_D = 1/2 V_{DRM}$	$\leq$	2	$\mu\text{s}$	
	$I_G = 0.45\text{A}, di_G/dt = 0.45\text{A}/\mu\text{s}$				
$t_q$	$T_{VJ} = T_{VJM}, I_T = 20\text{A}, t_p = 200\mu\text{s}, V_R = 100\text{V}$		250	$\mu\text{s}$	
	$di/dt = -10\text{A}/\mu\text{s}, dv/dt = 15\text{V}/\mu\text{s}, V_D = 2/3 V_{DRM}$				
$R_{thJC}$	per thyristor; sine $180^\circ\text{el}$		0.9	K/W	
	per module		0.18	K/W	
$R_{thJK}$	per thyristor; sine $180^\circ\text{el}$		1.1	K/W	
	per module		0.22	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	$\text{m/s}^2$	

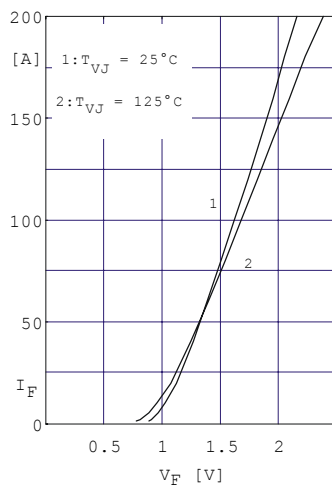


Fig. 1 Forward current vs. voltage drop per diode or thyristor

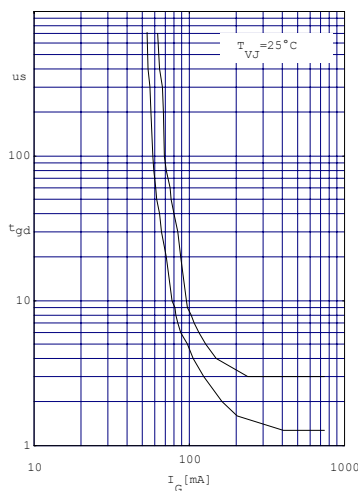


Fig. 2 Gate trigger delay time

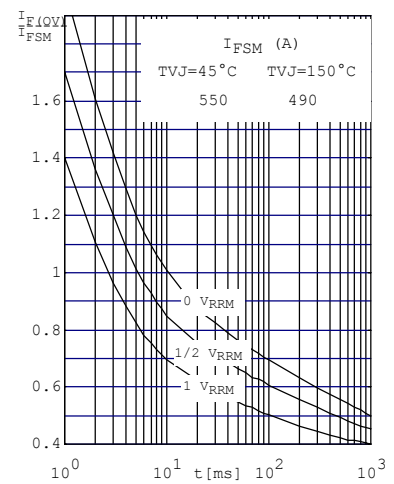


Fig. 3 Surge overload current per diode (or thyristor)  $I_{FSM}$ ,  $I_{TSM}$ : Crest value t: duration

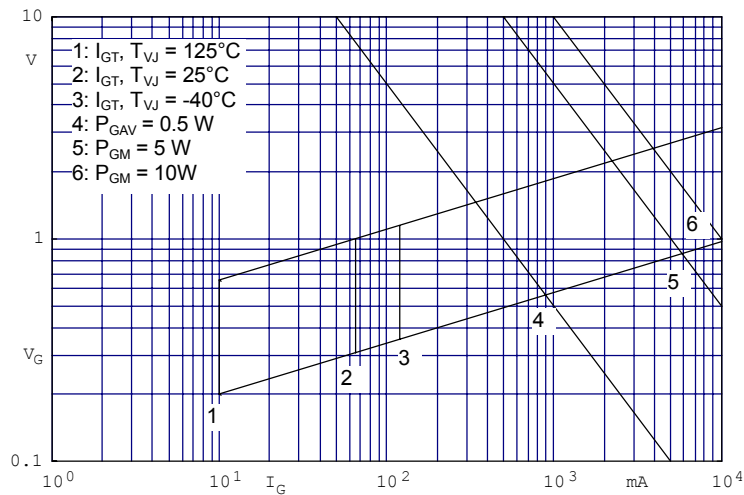


Fig.4 Gate trigger characteristic

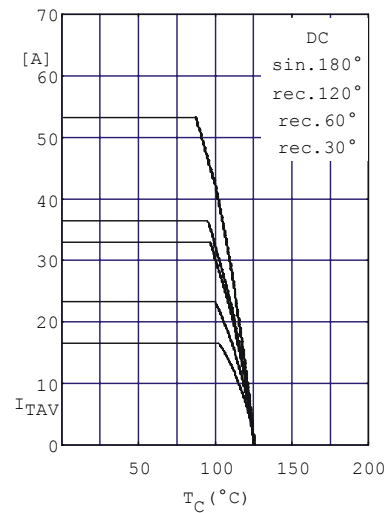


Fig.5 Maximum forward current at case temperature

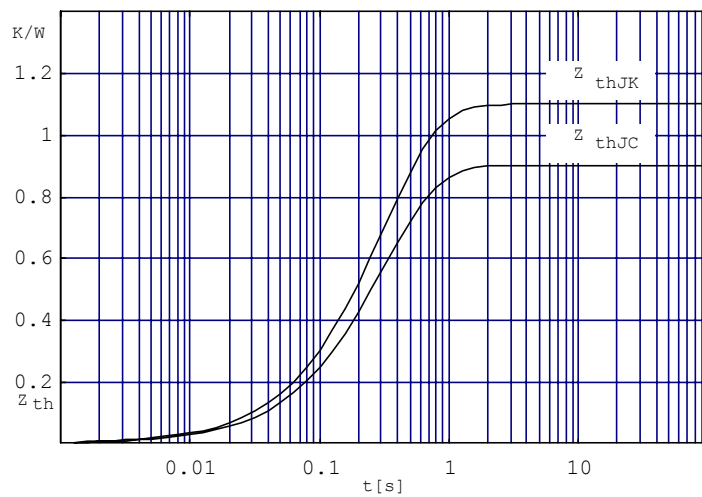


Fig.6 Transient thermal impedance per thyristor or diode (calculated)

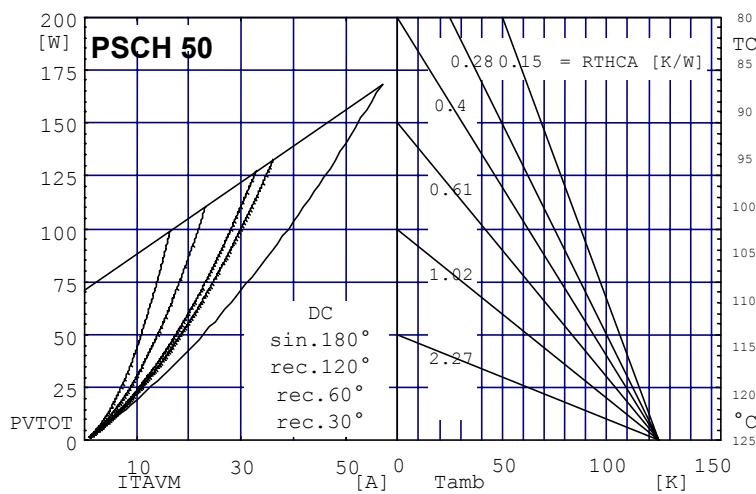


Fig. 7 Power dissipation vs. direct output current and ambient temperature