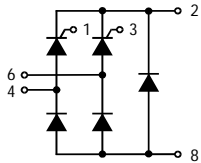


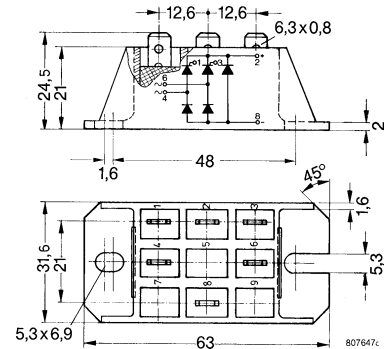
S1PHB15

Single Phase Half Controlled Bridge With Free Wheeling Diode



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
S1PHB15-08	900	800
S1PHB15-12	1300	1200
S1PHB15-14	1500	1400
S1PHB15-16	1700	1600
S1PHB15-18	1900	1800

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions	Maximum Ratings	Unit	
I_{dAV} I_{dAVM} I_{FRMS}, I_{TRMS}	$T_K=85^{\circ}C$, module module per leg	15 21 15	A	
I_{TSM}, I_{FSM}	$T_{VJ}=45^{\circ}C$ $V_R=0$ t=10ms (50Hz), sine t=8.3ms (60Hz), sine	190 210	A	
	$T_{VJ}=T_{VJM}$ $V_R=0$ t=10ms(50Hz), sine t=8.3ms(60Hz), sine	170 190		
I^2t	$T_{VJ}=45^{\circ}C$ $V_R=0$ t=10ms (50Hz), sine t=8.3ms (60Hz), sine	160 180	A ² s	
	$T_{VJ}=T_{VJM}$ $V_R=0$ t=10ms(50Hz), sine t=8.3ms(60Hz), sine	140 145		
$(di/dt)_{cr}$	$T_{VJ}=125^{\circ}C$ f=50Hz, $t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=0.3A$ dig/dt=0.3A/us	repetitive, $I_T=50A$ non repetitive, $I_T=1/2I_{dAV}$	150 500	A/us
	$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; method 1 (linear voltage rise)	$V_{DR}=2/3V_{DRM}$ 1000	
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$	$t_p=30\mu s$ $t_p=500\mu s$	10 5	W
P_{GAVM}			0.5	W
V_{RGM}			10	V
T_{VJ} T_{VJM} T_{stg}			-40...+125 125 -40...+125	$^{\circ}C$
V_{ISOL}	50/60Hz, RMS $I_{ISOL}\leq 1mA$	t=1min t=1s	3000 3600	V~
M_d	Mounting torque (M5) (10-32 UNF)		2-2.5 18-22	Nm lb.in.
Weight			50	g

S1PHB15

Single Phase Half Controlled Bridge With Free Wheeling Diode

Symbol	Test Conditions	Characteristic Values	Unit
I_R, I_D	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$ $T_{VJ}=25^\circ\text{C}$	5 0.3	mA
V_T, V_F	$I_T, I_F=45\text{A}; T_{VJ}=25^\circ\text{C}$	2.8	V
V_{TO}	For power-loss calculations only ($T_{VJ}=125^\circ\text{C}$)	1.0	V
r_T		40	$\text{m}\Omega$
V_{GT}	$V_D=6\text{V};$ $T_{VJ}=25^\circ\text{C}$ $T_{VJ}=-40^\circ\text{C}$	1.0 1.2	V
I_{GT}	$V_D=6\text{V};$ $T_{VJ}=25^\circ\text{C}$ $T_{VJ}=-40^\circ\text{C}$ $T_{VJ}=125^\circ\text{C}$	65 80 50	mA
V_{GD}	$T_{VJ}=T_{VJM};$ $V_D=2/3V_{DRM}$	0.2	V
I_{GD}	$T_{VJ}=T_{VJM};$ $V_D=2/3V_{DRM}$	5	mA
I_L	$t_G=30\mu\text{s}; I_G=0.3\text{A};$ $di_G/dt=0.3\text{A}/\mu\text{s}$ $T_{VJ}=25^\circ\text{C}$ $T_{VJ}=-40^\circ\text{C}$ $T_{VJ}=125^\circ\text{C}$	150 200 100	mA
I_H	$T_{VJ}=25^\circ\text{C}; V_D=6\text{V}; R_{GK}=\infty$	100	mA
t_{gd}	$T_{VJ}=25^\circ\text{C}; V_D=1/2V_{DRM}$ $I_G=0.3\text{A}; di_G/dt=0.3\text{A}/\mu\text{s}$	2	μs
t_q	$T_{VJ}=125^\circ\text{C}; I_T=15\text{A}; t_p=300\mu\text{s}; V_R=100\text{V}$	typ. 150	μs
Q_r	$V_D=2/3V_{DRM}; dv/dt=20\text{V}/\mu\text{s}; di/dt=-10\text{A}/\mu\text{s}$	75	μC
R_{thJC}	per thyristor(diode); DC current per module	2.4 0.6	K/W
R_{thJK}	per thyristor(diode); DC current per module	3.0 0.75	K/W
d_s	Creepage distance on surface	12.6	mm
d_A	Creepage distance in air	6.3	mm
a	Maximum allowable acceleration	50	m/s^2

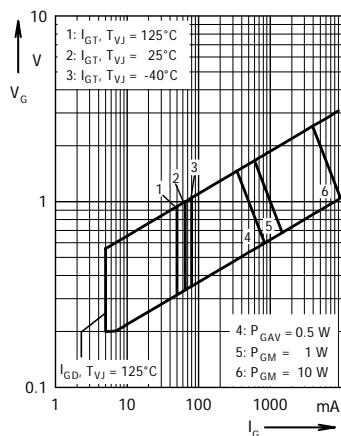


Fig. 1 Gate trigger range

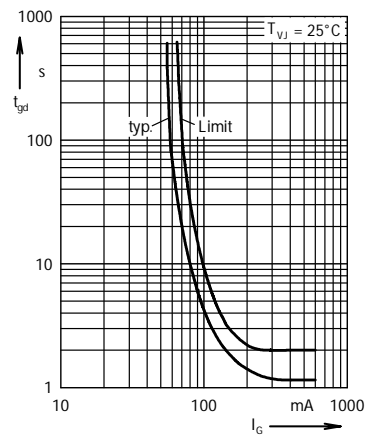


Fig. 2 Gate controlled delay time t_{gd}

S1PHB15

Single Phase Half Controlled Bridge With Free Wheeling Diode

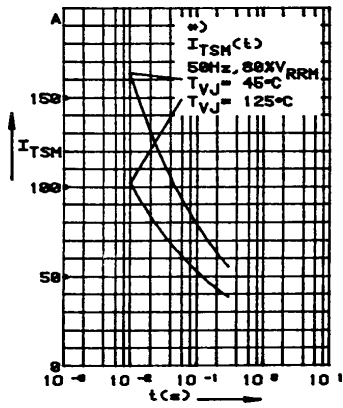


Fig. 3 Surge overload current per chip I_{TSM} . Crest value, t : duration

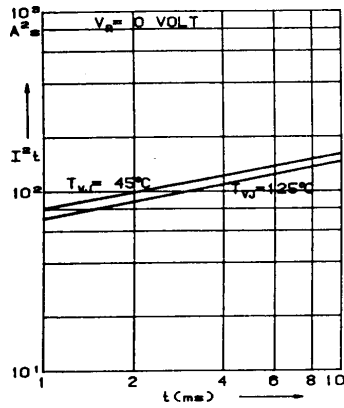


Fig. 4 I^2t versus time (1-10 ms) per chip

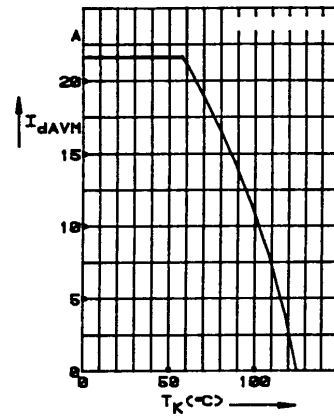


Fig. 5 Max. forward current at heatsink temperature

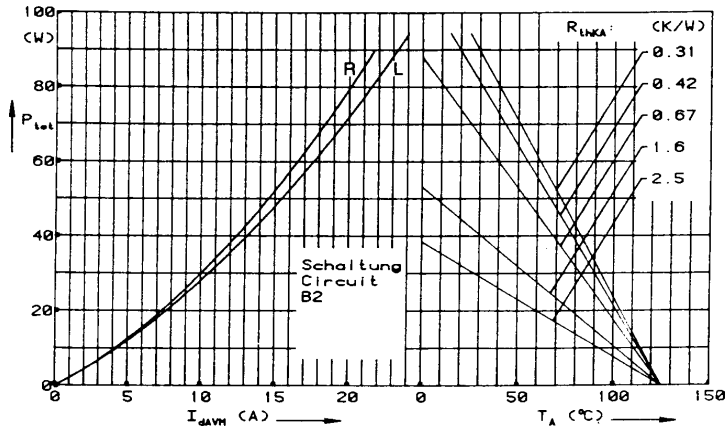


Fig. 6 Power dissipation versus direct output current and ambient temperature

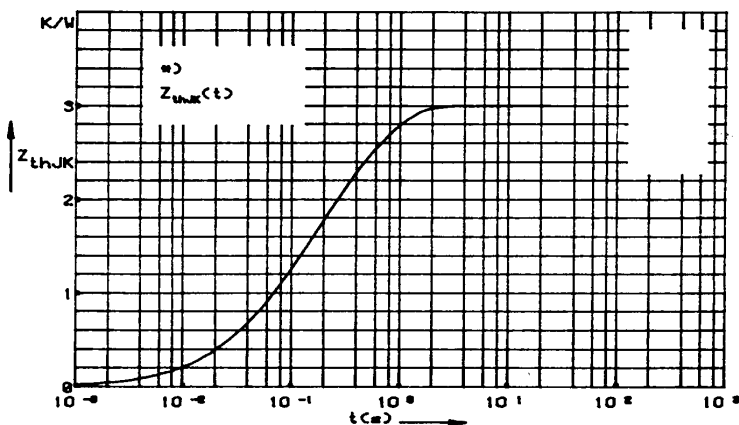


Fig. 7 Transient thermal impedance junction to heatsink per chip

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.34	0.0344
2	1.16	0.12
3	1.5	0.5