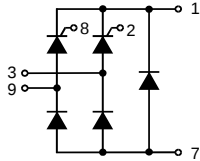


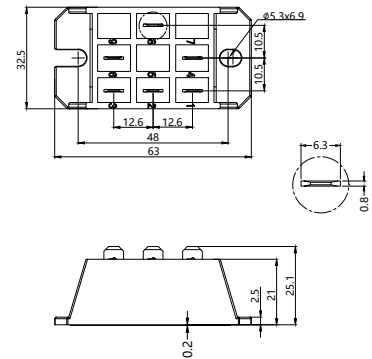
S1PHB40

Single Phase Half Controlled Bridge Modules With Free Wheeling Diode



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
S1PHB40G08	900	800
S1PHB40G12	1300	1200
S1PHB40G14	1500	1400
S1PHB40G16	1700	1600
S1PHB40G18	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		40 46 32	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^{\circ}C$ $V_R=0$	$t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	385 400	A
	$T_{VJ}=T_{VJM}$ $V_R=0$	$t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	300 330	
I^2t	$T_{VJ}=45^{\circ}C$ $V_R=0$	$t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	745 680	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$	$t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	530 480	
$(di/dt)_{cr}$	$T_{VJ}=125^{\circ}C$ $f=50Hz, t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=0.3A$ $di_G/dt=0.3A/\mu s$	repetitive, $I_T=50A$	200	A/ μs
		non repetitive, $I_T=1/2I_{dAV}$	500	
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; method 1 (linear voltage rise)	$V_{DR}=2/3V_{DRM}$	1000	V/ μs
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

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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	$I_T, I_F=62\text{A}; T_{VJ}=25^{\circ}\text{C}$	1.45	V
V_{TO}	For power-loss calculations only ($T_{VJ}=125^{\circ}\text{C}$)	0.85	V
r_T		13	m Ω
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	1.05 0.29	K/W
R_{thJK}	per thyristor(diode); DC current per module	1.55 0.39	K/W
d_s	Creeping distance on surface	12.6	mm
d_A	Creepage distance in air	6.3	mm
a	Maximum allowable acceleration	50	m/s^2

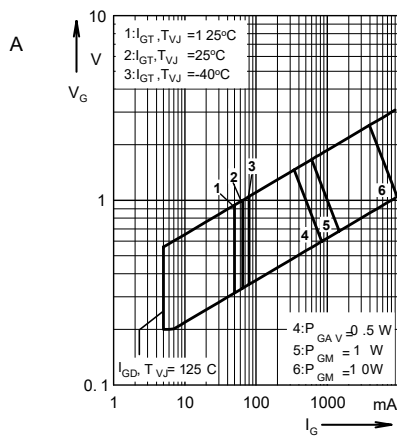


Fig. 1 Gate trigger range

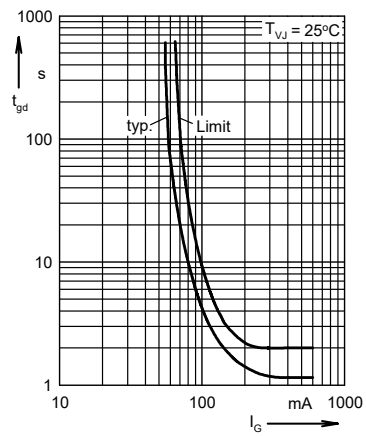


Fig. 2 Gate controlled delay time t_{gd}

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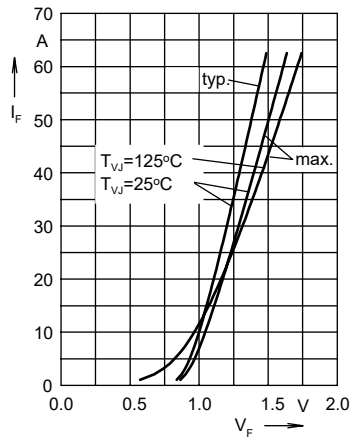


Fig. 3 Forward current versus voltage drop per diode

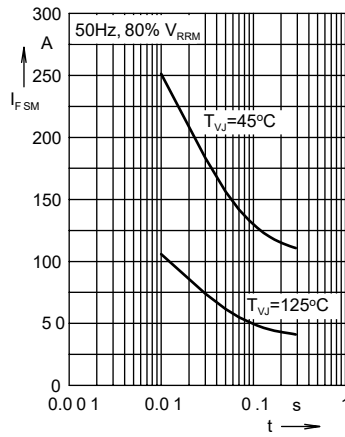


Fig. 4 Surge overload current

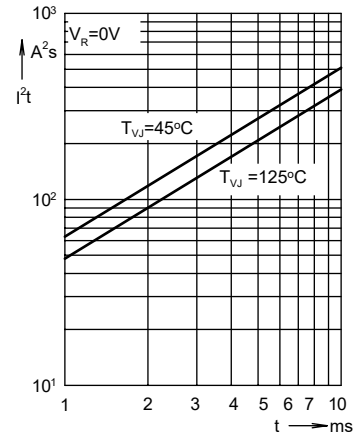


Fig. 5 I^2t versus time per diode

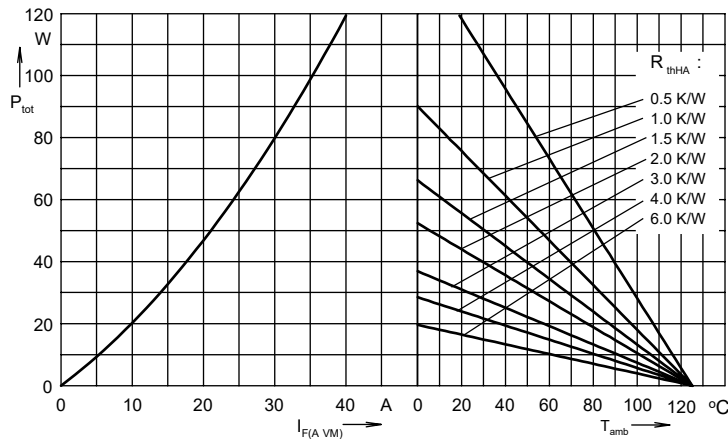


Fig. 6 Power dissipation versus direct output current and ambient temperature

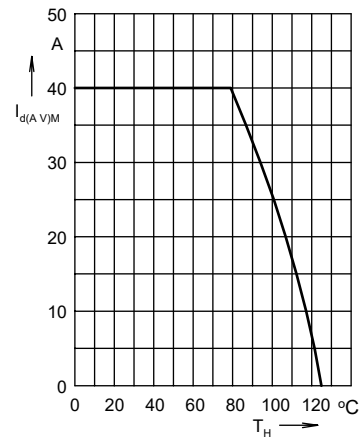


Fig. 7 Max. forward current versus heatsink temperature

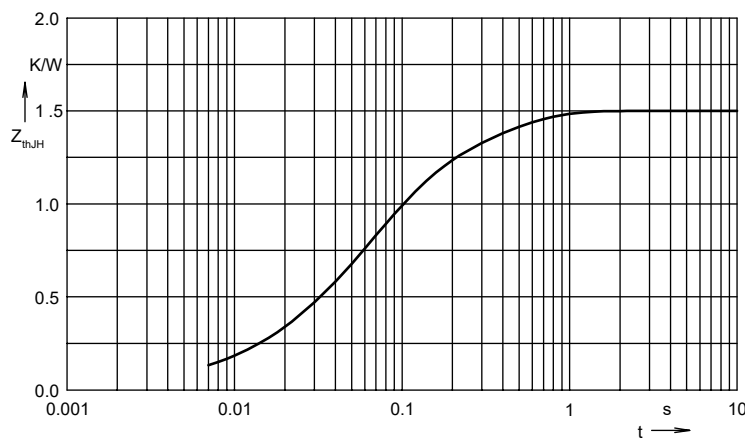


Fig. 8 Transient thermal impedance junction to heatsink



Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.005	0.008
2	0.2	0.05
3	0.875	0.06
4	0.47	0.25