MMK25LB160HB

Half Controlled Single Phase Rectifier Bridge

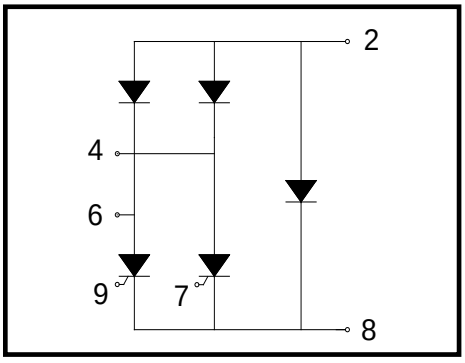
JUNE 2011 PRELIMINARY RoHS Compliant

Features

- Isolated Module Package
- Isolation voltage 3500 V
- 1/4″ fast-on terminals

Applications

- Supply for DC power Equipment
- DC Motor Control



■ Diode

ABSOLUTE MAXIMUM RATINGS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Max.	Unit
V_{RRM}	Repetitive Reverse Voltage		1600	V
$I_{D(AV)}$	Average Forward Current	T_C=90°C, module	35	A
I_{FSM}	Non-Repetitive Surge Forward Current	T_J=45°C, t=10ms, 50Hz, Sine	250	A
		T_J=45°C, t=8.3ms, 60Hz, Sine	300	A
I^2t	I^2t (For Fusing)	T_J=45°C, t=10ms, 50Hz, Sine	312	A^2s
		T_J=45°C, t=8.3ms, 60Hz, Sine	374	A^2s
I_{FSM}	Non-Repetitive Surge Forward Current	T_J=125°C, t=10ms, 50Hz, Sine	220	A
		T_J=125°C, t=8.3ms, 60Hz, Sine	260	A
I^2t	I^2t (For Fusing)	T_J=125°C, t=10ms, 50Hz, Sine	242	A^2s
		T_J=125°C, t=8.3ms, 60Hz, Sine	281	A^2s

ELECTRICAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{RM}	Reverse Leakage Current	V_R=1600V	--	--	300	μA
		V_R=1600V, T_J=125°C	--	--	5	mA
V_F	Forward Voltage	I_F=25A	--	0.98	--	V
		I_F=25A, T_J=125°C	--	0.9	--	V

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■ Thyristor

ABSOLUTE MAXIMUM RATINGS

T_C=25°C unless otherwise specified

Symbol	Test Condition	Value	Unit
V_{RRM}		1600	V
V_{DRM}	gate open circuit	1600	V
V_{RSM}		1700	V
$I_{T(AV)}$	T_C=90℃, 180° conduction, half sine wave;	25	A
I_{TSM}	T_J=45℃, t=10ms (50Hz), sine, V_R=V_{RRM};	300	A
	T_J=45℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	350	
I_{TSM}	T_J=125℃, t=10ms (50Hz), sine, V_R=V_{RRM};	220	A
	T_J=125℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	260	
I^2t	T_J=45℃, t=10ms (50Hz), sine, V_R=V_{RRM};	450	A^2s
	T_J=45℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	508	
I^2t	T_J=125℃, t=10ms (50Hz), sine, V_R=V_{RRM};	242	A^2s
	T_J=125℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	281	
dv/dt	T_J =125℃, Linear to 0.67V_{DRM}	1000	V/us

ELECTRICAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Test Condition	Min.	Typ.	Max.	Unit
I_{DRM}/I_{RRM}	V_D=V_R=1600V;			0.3	mA
I_{DRM}/I_{RRM}	T_J=125℃, V_D=V_R=1600V;			5	mA
-V_{GM}				10	V
V_{TM}	I_{TM}=110A, t_d=10 ms, half sine;		1.7		V
V_{GT}	V_A=6V, R_A=1Ω, Tj=-40°C;			4	V
	V_A=6V, R_A=1Ω;			2.5	
	V_A=6V, R_A=1Ω, Tj=125°C;			1.7	
I_{GT}	V_A=6V, R_A=1Ω, Tj=-40°C;			80	mA
	V_A=6V, R_A=1Ω;			60	
	V_A=6V, R_A=1Ω, Tj=125°C;			45	
I_H	V_A=6V, R_A=1Ω,gate open circuit;			200	mA
I_L	V_A=6V, R_A=1Ω;			400	mA
V_{GD}	T_J =125°C, V_D=1600V			0.25	V
I_{GD}	T_J =125°C, V_D=1600V			6	mA
V_{TO}	T_J =125°C, 16.7% x π x I_{AV} < I < π x I_{AV}			0.88	V
V_{TO}	T_J =125°C, I > π x I_{AV}			0.91	V
r_T	T_J =125°C, 16.7% x π x I_{AV} < I < π x I_{AV}			5.90	mΩ
r_T	T_J =125°C, I > π x I_{AV}			5.74	mΩ
P_{GM}	tp≤5ms, T_J =125°C;			10	W
$P_{GM(AV)}$	f=50Hz, T_J =125°C;			2.5	W

MODULE AND THERMAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-to-Case	per diode, thyristor	--	--	1.20	°C /W
		per module	--	--	0.24	°C /W
$R_{\theta CS}$	Thermal Resistance Case -to-Sink	per diode, thyristor	--	--	0.85	°C /W
		per module	--	--	0.17	°C /W
T_J	Junction Temperature		-40		150	°C
T_{STG}	Storage Temperature Range		-40		125	°C
V_{isol}	Insulation Test Voltage	AC, 50Hz, t=1min			3000	V
M_d	Mounting torque(M5)		3		5	N·m
Weight				95		g

Characteristic curves

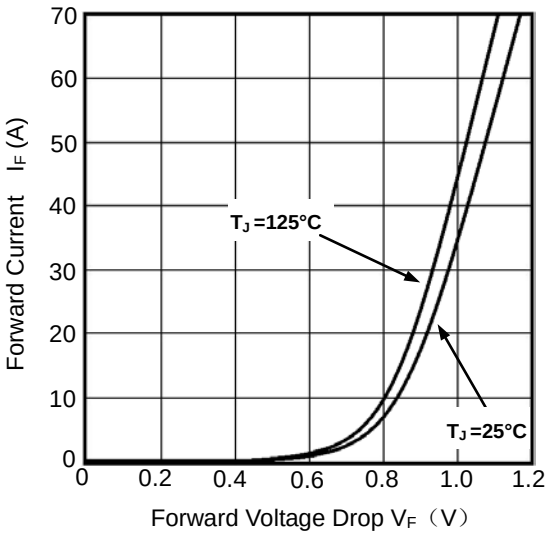

Figure1. Diode Forward Voltage Drop vs Forward Current

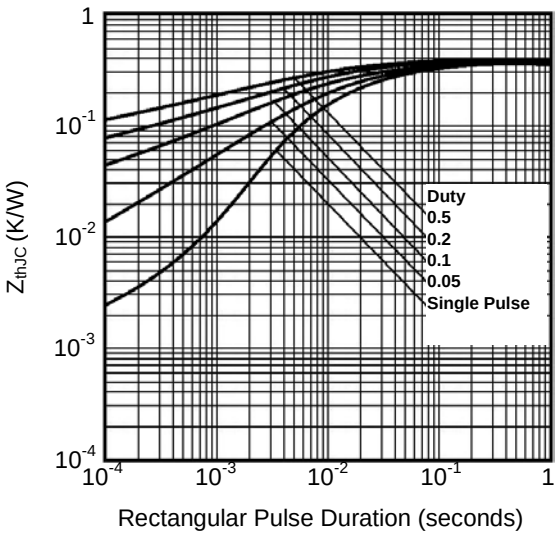

Figure 2. Diode Thermal Impedance Z_{thJC}

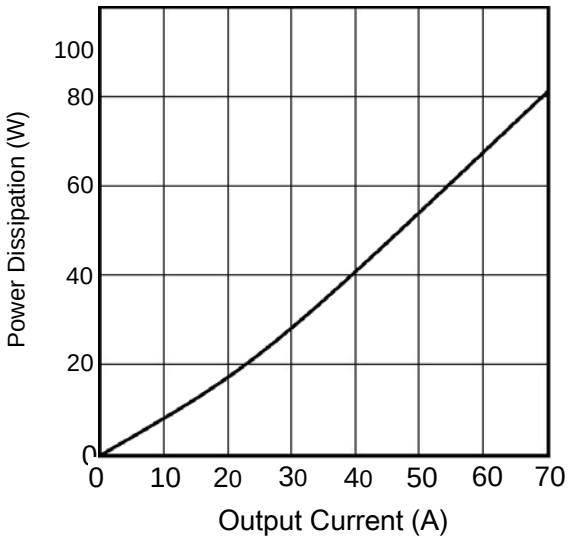

Figure 3. SCR Output Current vs Power Dissipation

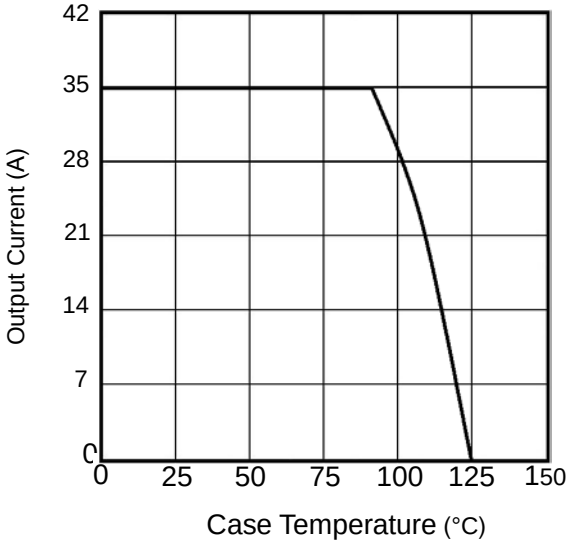

Figure 4. SCR Output Current vs Case Temperature

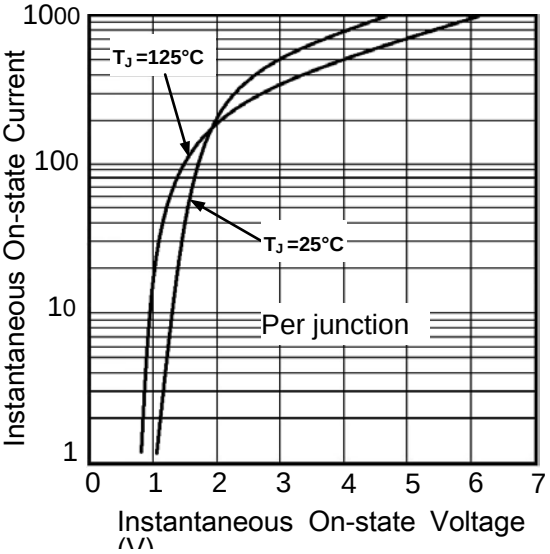

Figure 5. SCR On State Voltage Drop

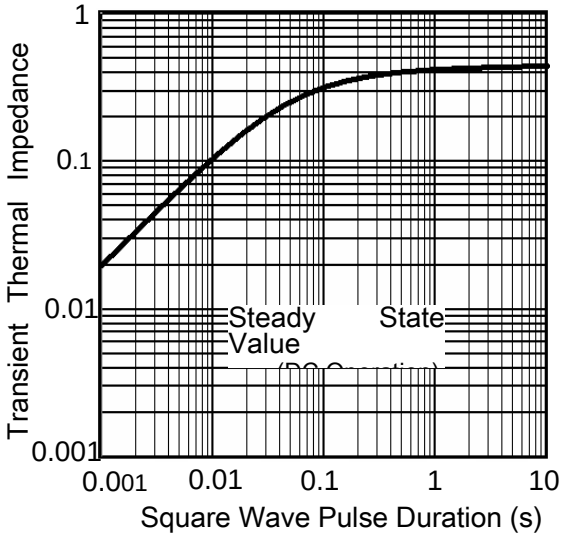

Figure 6. SCR Thermal Impedance Z_{thJC}

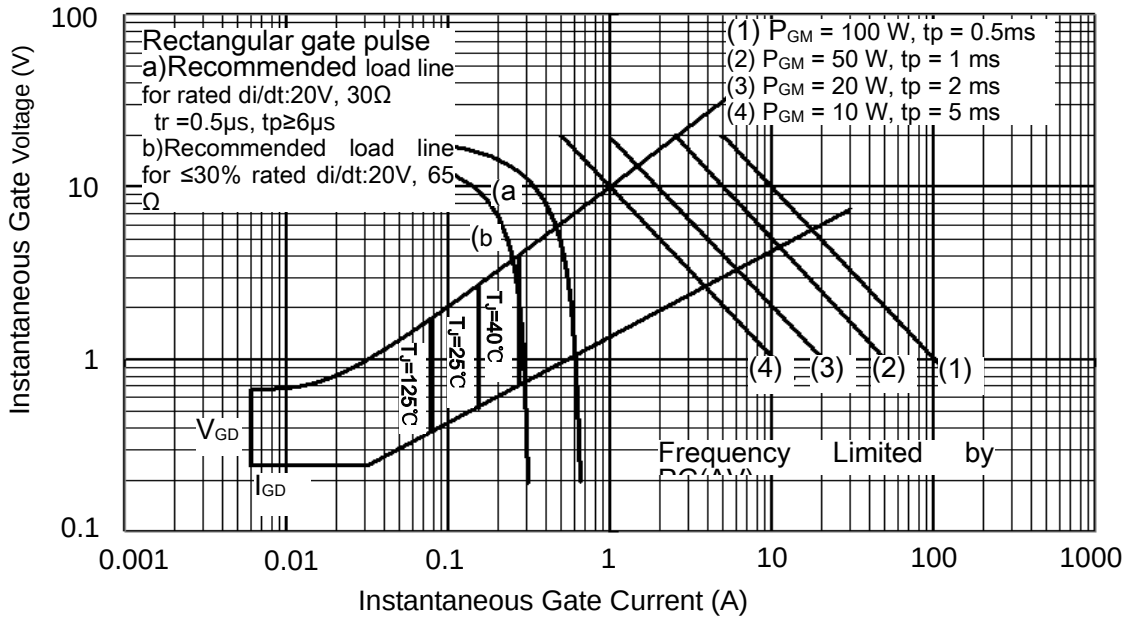

Figure 7. Gate Characteristics

Package Outline (Dimensions in mm)