MMK100T160UX

1600V 100A thyristor Module

RoHS Compliant

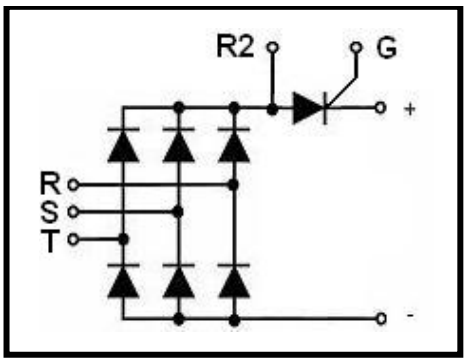
March 2011 **PRELIMINARY**

Features

· Isolated Module Package
· Isolation voltage 3000 V
· Three Phase Bridge and a Thyristor

Applications

- Current Stabilized Power Supply
- Switching Power Supply
- Inverter For AC or 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, moudle	100	A
I_{FSM}	Non-Repetitive Surge Forward Current	T_J=45°C, t=10ms, 50Hz, Sine	1250	A
		T_J=45°C,t=8.3ms, 60Hz, Sine	1350	A
I^2t	I^2t (For Fusing)	T_J=45°C, t=10ms, 50Hz, Sine	7.8	kA^2s
		T_J=45°C,t=8.3ms, 60Hz, Sine	7.5	kA^2s
T_J	Junction Temperature		-40 to +150	°C
T_{STG}	Storage Temperature Range		-40 to +125	°C
V_{isol}	Insulation Test Voltage	AC, 50Hz, t=1min	3000	V
Weight			332	g

ELECTRICAL AND THERMAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{RM}	Reverse Leakage Current	V_R=1600V	--	--	500	μA
		V_R=1600V, T_J=125°C	--	--	5	mA
V_F	Forward Voltage	I_F=100A	--	1.15	--	V
		I_F=100A, T_J=125°C	--	1.1	--	V
$R_{\theta JC}$	Thermal Resistance Junction-to-Case	per diode	--	--	0.84	°C /W
		per module	--	--	0.14	°C /W
$R_{\theta CS}$	Thermal Resistance Case -to-Sink	per diode	--	--	0.39	°C /W
		per module	--	--	0.065	°C /W

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■ Thyristor

ABSOLUTE MAXIMUM RATINGS

T_C=25°C unless otherwise specified

Symbol	Test Condition	Value	Unit
V_{RRM}		1600	V
$I_{T(AV)}$	T_C=90℃, 180° conduction, half sine wave;	100	A
I_{TSM}	T_J=45℃, t=10ms (50Hz), sine, V_R=V_{RRM};	1550	A
	T_J=45℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	1650	
I^2t	T_J=45℃, t=10ms (50Hz), sine, V_R=V_{RRM};	12.0	kA^2s
	T_J=45℃, t=8.3 ms (60Hz), sine, V_R= V_{RRM};	11.3	
dV/dt	T_J=125℃, exponential to 67% rated V_{DRM}	1000	V/us
dI/dt	T_J=125℃, I_{TM}=300A rated V_{DRM}	150	A/us
V_{ISOL}	50Hz, all terminals shorted, t=1s, I_{ISOL}≤1mA ;	3000	V~
T_J	Max. junction operating temperature range	-40～125	℃
T_{STG}	Max. storage temperature range	-40～125	℃
	Mounting torque(M6)	3 to 5	N·m
	Terminal connection torque(M6)	3 to 5	N·m
	Terminal connection torque(M4)	1 to 2	N·m

ELECTRICAL AND THERMAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Test Condition	Min.	Typ.	Max.	Unit
I_{DRM}/I_{RRM}	T_J=125℃, V_D=V_R=1600V;			20	mA
V_{TM}	I_{TM}=314A, t_d=10 ms, half sine;		1.54		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;			200	mA
	V_A=6V, R_A=1Ω;			150	
	V_A=6V, R_A=1Ω, Tj=125°C;			80	
P_{GM}	tp≤5ms, Tj=125°C;			12	W
$P_{GM(AV)}$	f=50Hz, Tj=125°C;			3	W
R_{thjc}	Thermal Resistance , Junction-to-Case			0.24	K/W
R_{THCS}	Thermal Resistance, Case -to-Sink			0.12	K/W

Characteristic curves

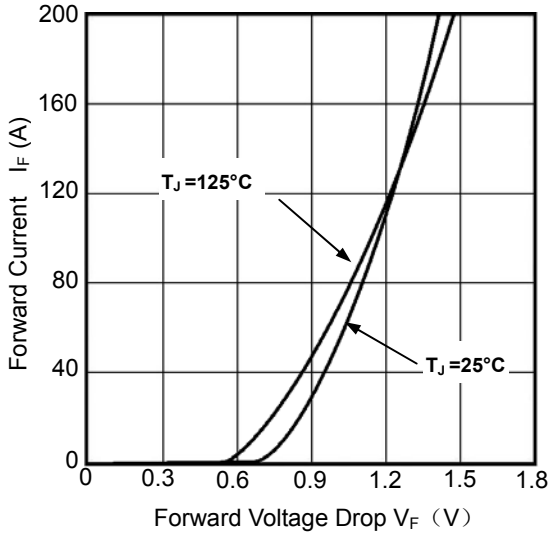

Figure1. Diode Forward Voltage Drop vs Forward Current

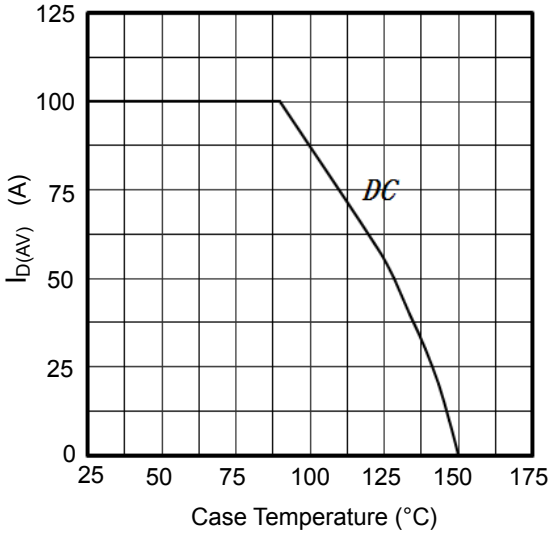

Figure 2. Diode $I_{D(AV)}$ vs Case Temperature

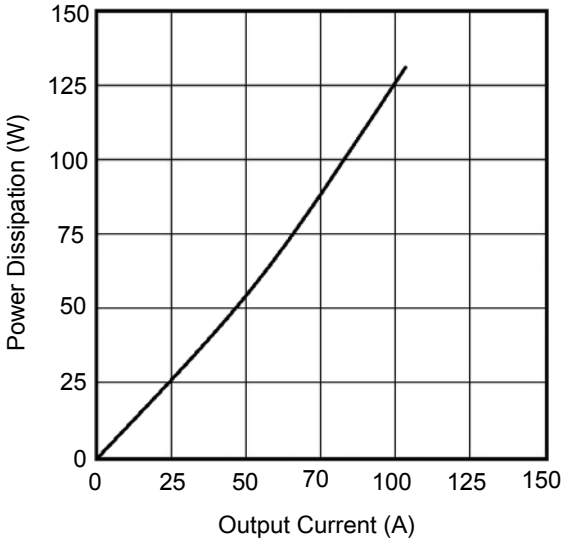

Figure 3. SCR Output Current vs Power Dissipation

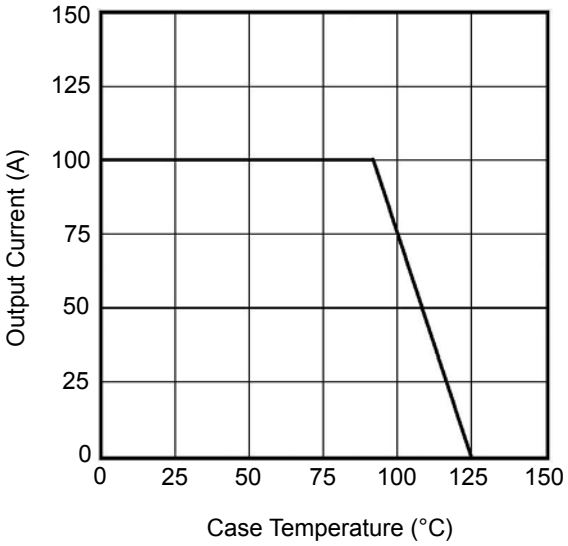

Figure 4. SCR Output Current vs Case Temperature

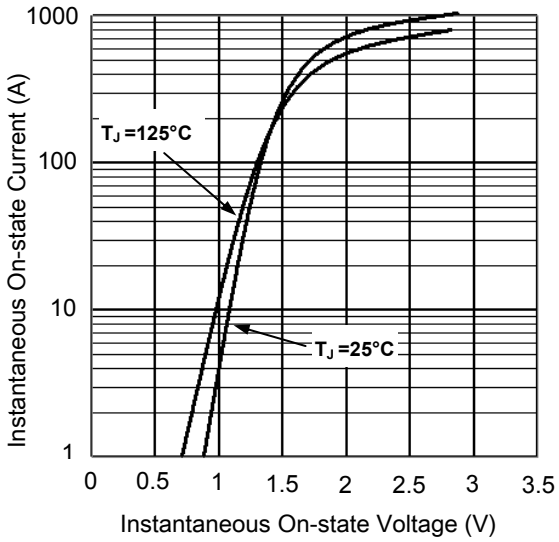

Figure 5. SCR On State Voltage Drop

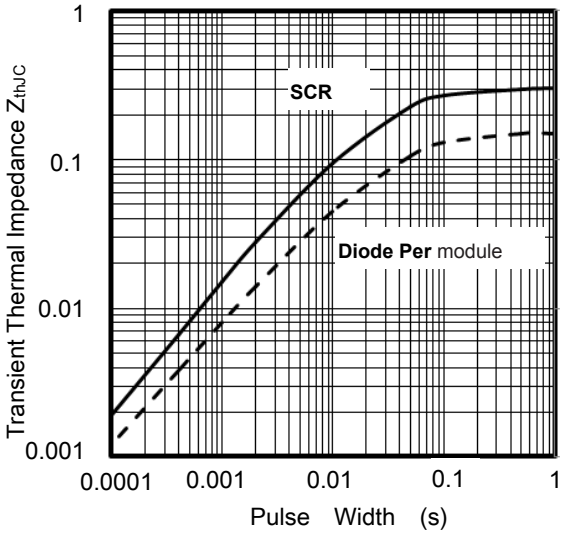

Figure 6. Diode and SCR Thermal Impedance Z_{thJC}

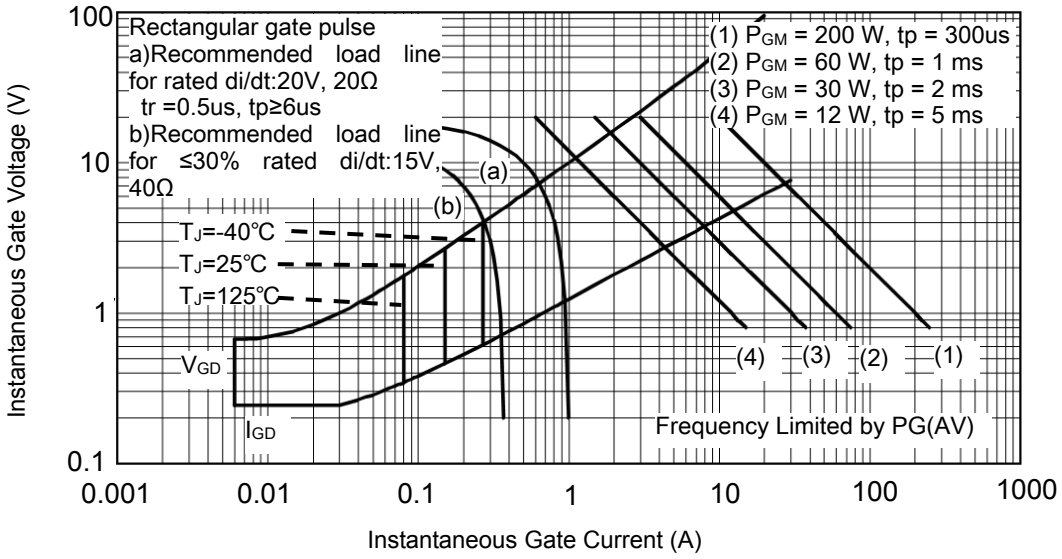

Figure 7. Gate Characteristics

Package Outline (Dimensions in mm)