MMK100T160UX

1600V 100A thyristor Module

RoHS Compliant

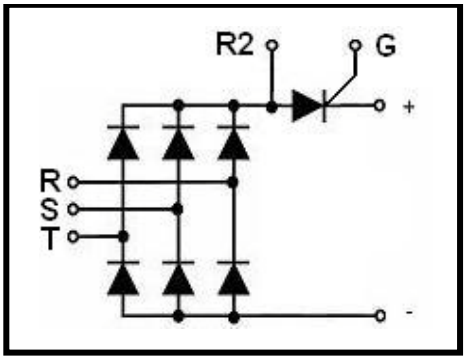
March 2011 **PRELIMINARY**

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, module	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	7812	A^2s
		T_J=45°C,t=8.3ms, 60Hz, Sine	9112	A^2s
T_J	Junction Temperature		-40~150	°C
T_{STG}	Storage Temperature Range		-40~125	°C
V_{isol}	Insulation Test Voltage	50Hz, all terminals shorted, t=5s, I_{ISOL}≤1mA ;	3500	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	--	--	4	mA
V_F	Forward Voltage	I_F=100A	--	1.15	1.4	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=8.3ms (60Hz), sine, V_R= V_{RRM};	1650	
I^2t	T_J=45℃, t=10ms (50Hz), sine, V_R=V_{RRM};	12012	A^2s
	T_J=45℃, t=8.3ms (60Hz), sine, V_R= V_{RRM};	13612	
dv/dt	T_J =125℃, linear to 0.67V_{DRM}	1000	V/us
di/dt	T_J =125℃, I_{TM}=314A, from 0.67V_{DRM}	150	A/us
V_{ISOL}	50Hz, all terminals shorted, t=5s, I_{ISOL}≤1mA ;	3500	V~
T_J	Max. junction operating temperature range	-40～125	℃
T_{STG}	Max. storage temperature range	-40～125	℃
M_d	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}	V_D=V_R=1600V;			500	μA
I_{DRM}/I_{RRM}	T_J=125℃, V_D=V_R=1600V;			21	mA
V_{TM}	I_{TM}=150A, t_d=10 ms, half sine;			1.5	V
V_{GT}	V_A=6V, R_A=1Ω, Tj=-40°C;			4	V
	V_A=6V, R_A=1Ω;			3.2	
	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;			140	
	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			0.06	K/W

Characteristic curves

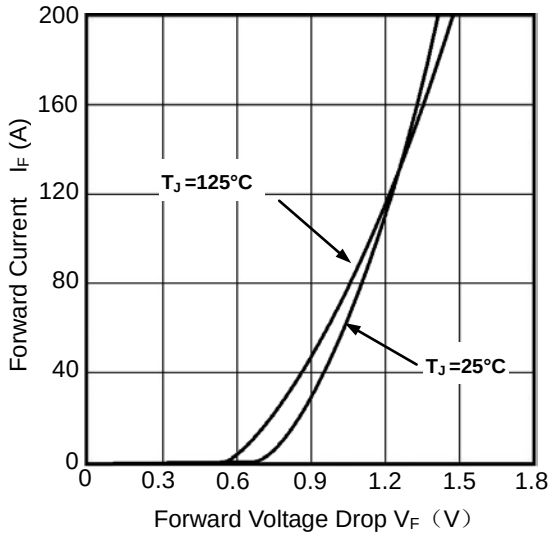

Figure1. Diode Forward Voltage Drop vs Forward Current

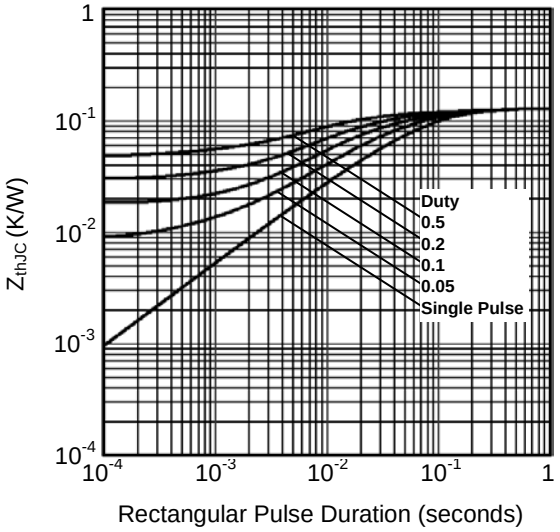

Figure 2. Diode Thermal Impedance Z_{thJC}

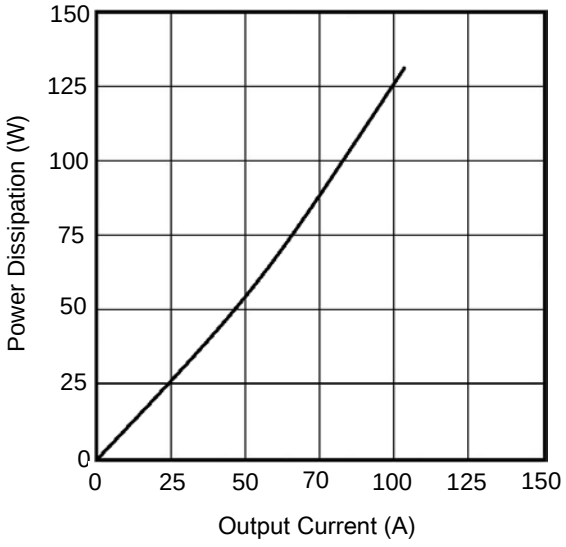

Figure 3. SCR Output Current vs Power Dissipation

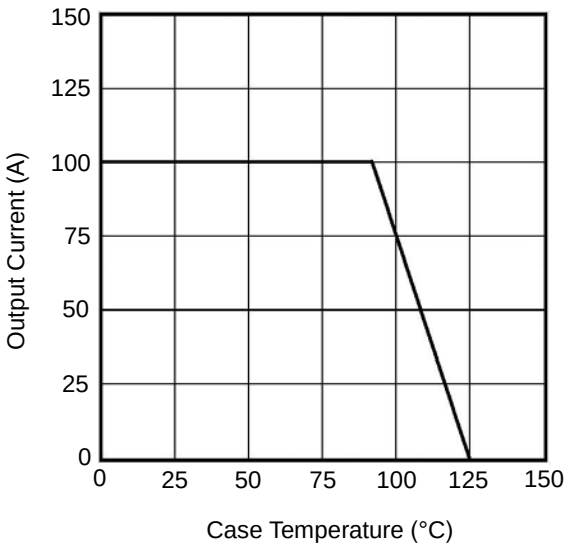

Figure 4. SCR Output Current vs Case Temperature

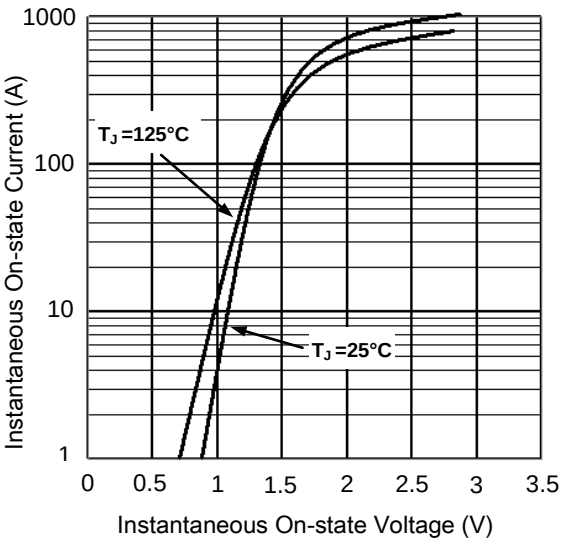

Figure 5. SCR On State Voltage Drop

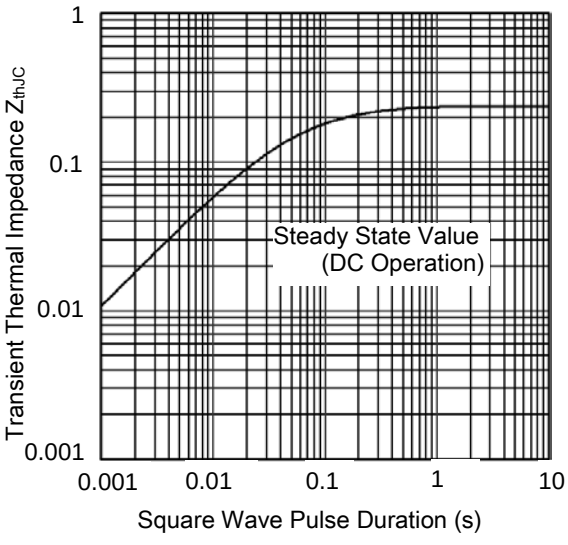

Figure 6. SCR Thermal Impedance Z_{thJC}

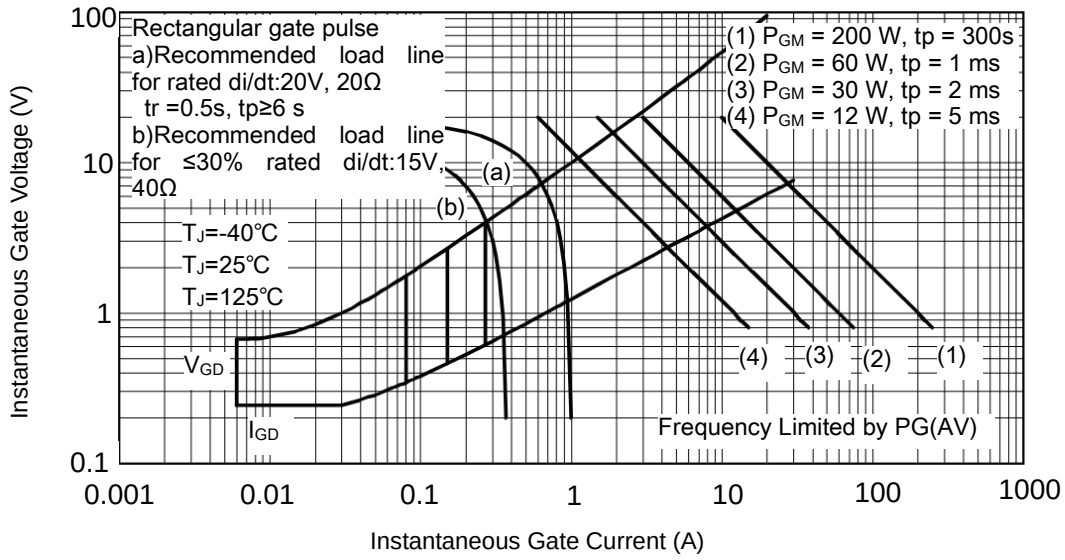

Figure 7. Gate Characteristics

Package Outline (Dimensions in mm)