MMK200T160UX

1600V 200A Three Phase Bridge and a Thyristor Module

March 2018 Version 02 RoHS Compliant

PRODUCT FEATURES

☐ Isolated Module Package

☐ Isolation Voltage 3000 V

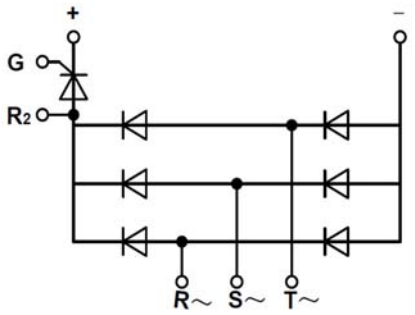
☐ Three Phase Bridge and a Thyristor

APPLICATIONS

☐ Current Stabilized Power Supply

☐ Switching Power Supply

☐ Inverter For AC or DC Motor Control



Thyristor -ABSOLUTE MAXIMUM RATING (T_C=25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1600	V
V_{DRM}	Repetitive Peak Off-State Voltage		1600	
V_{RSM}	Non-Repetitive Peak Reverse Voltage		1700	
$I_{T(AV)}$	Average On State Current	Single phase, half wave, 180°conduction, Tc=85℃	200	A
$I_{T(RMS)}$	R.M.S. On State Current		314	
I_{TSM}	Non-Repetitive Surge On-State Current	1/2 cycle, 50/60HZ, peak value, T_J =45℃	3600/3960	
I^2t	For Fusing	1/2 cycle, 50/60HZ, peak value ,T_J =45℃	64.8/65	KA^2S
T_J	Junction Temperature(Thyristor)		-40 to +125	℃

Three Phase Bridge -ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1600	V
V_{RSM}	Non-Repetitive Peak Reverse Voltage		1700	
I_D	Output Current(D.C.)	Three phase, half wave, Tc= 95°C	200	A
I_{FSM}	Non-Repetitive Surge Forward Current	1/2 cycle, 50/60HZ, peak value, T_J =45℃	2000/2200	
I^2t	For Fusing	1/2 cycle, 50/60HZ, peak value ,T_J =45℃	20/20.1	KA^2S
T_J	Junction Temperature(Diode)		-40 to +150	℃

MacMic Science & Technology Co., Ltd.

Add：#18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R .of China

Tel.：+86-519-85163708 Fax：+86-519-85162291 Post Code：213022 Website：www.macmicst.com

Thyristor -ELECTRICAL CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{DRM}	Maximum Peak Off-State Current	$V_D = V_{DRM}$, T_J = 125℃			25	mA
I_{RRM}	Maximum Peak Reverse Current	$V_R = V_{RRM}$, T_J = 125℃			25	
V_{TM}	Maximum on-state voltage drop	I_{TM}=500A,td=10 ms, half sine			1.60	V
V_{TO}	For power-loss calculations only	T_J = 125℃			0.85	V
r_T					1.6	mΩ
V_{GT}	Max. required DC gate voltage to trigger	V_A=6V, R_A=1Ω,T_J = -40℃			4.0	V
		V_A=6V, R_A=1Ω		1.0	2.5	
		V_A=6V, R_A=1Ω,T_J = 125℃			1.7	
I_{GT}	Max. required DC gate current to trigger	V_A=6V, R_A=1Ω,T_J = -40℃			270	mA
		V_A=6V, R_A=1Ω		75	150	
		V_A=6V, R_A=1Ω,T_J = 125℃			80	
V_{GD}	Max. required DC gate voltage not to trigger,$V_D = V_{DRM}$, T_J = 125℃				0.25	V
I_{GD}	Max. required DC gate current not to trigger,$V_D = V_{DRM}$, T_J = 125℃				6	mA
I_H	Maximum holding current			100	200	mA
I_L	Maximum latching current			200	400	mA
P_{GM}	Maximum peak gate power				12	W
$P_{G(AV)}$	Maximum average gate power				3.0	
I_{GM}	Maximum peak gate current				3.0	A
$-V_{GM}$	Maximum peak negative gate voltage				10	V
dv/dt	Critical Rate of Rise of Off-State Voltage,T_J=125℃,exponential to 67% rated V_{DRM}				1000	V/μs
di/dt	V_D = 2/3V_{DRM},I_G = 0.3A, dig/dt=0.3A/μs, T_J = 125℃				150	A/μs
$R_{th(J-C)}$	Junction-to-Case Thermal Resistance(Thyristor)				0.13	K /W

Three Phase Bridge -ELECTRICAL CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{RM}	Maximum Reverse Leakage Current	$V_R = V_{RRM}$			0.5	mA
		$V_R = V_{RRM}$, T_J = 125℃			10	
V_F	Forward Voltage Drop	I_F=200A			1.35	V
V_{TO}	For power-loss calculations only , T_J = 125°C				0.85	V
r_T					2.5	mΩ
$R_{th(J-C)}$	Junction-to-Case Thermal Resistance	per diode			0.6	K /W
		per module			0.1	

MODULE CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

T_{JOP}	Operating Temperature		-40 to +125	℃
T_{STG}	Storage Temperature Range		-40 to +125	℃
V_{ISO}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
Torque	to heatsink	Recommended（M6）	3～5	Nm
	to terminal	Recommended（M6）	3～5	Nm
	to terminal	Recommended（M4）	1～2	Nm
Weight			350	g

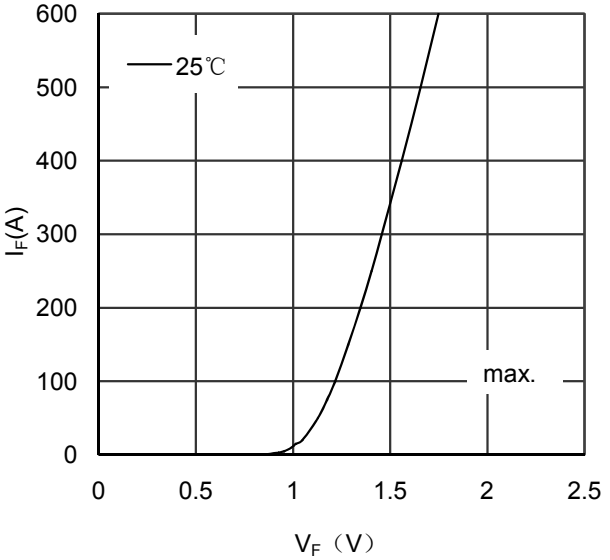


Figure 1. Diode Forward Voltage Drop vs Forward Current

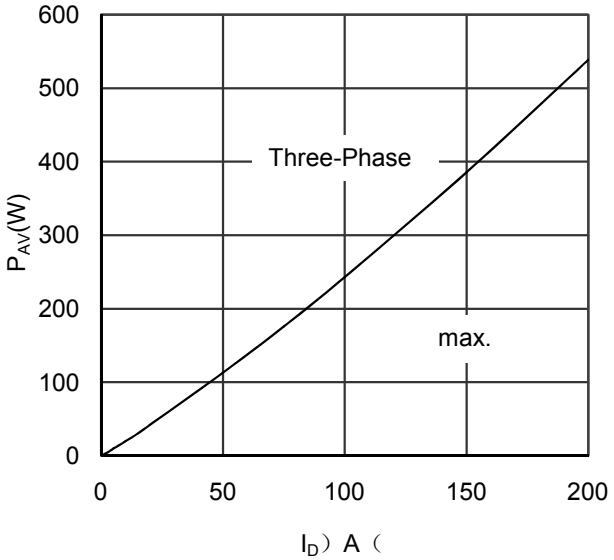


Figure 2. Diode Power dissipation vs Output Current

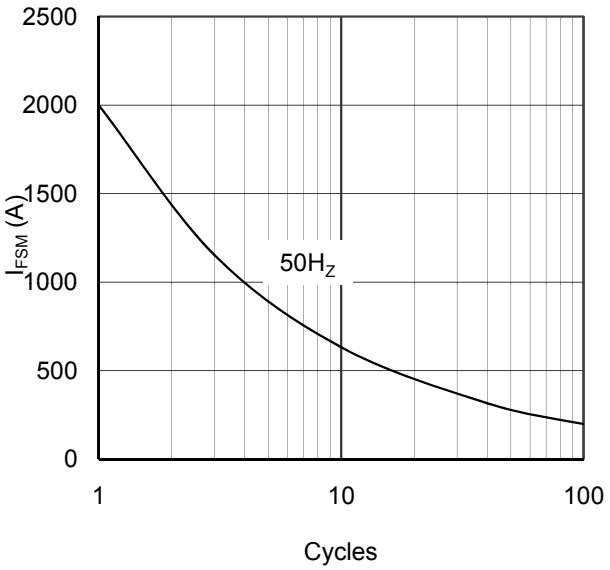


Figure 3. Diode Max Non-Repetitive Forward Surge Current

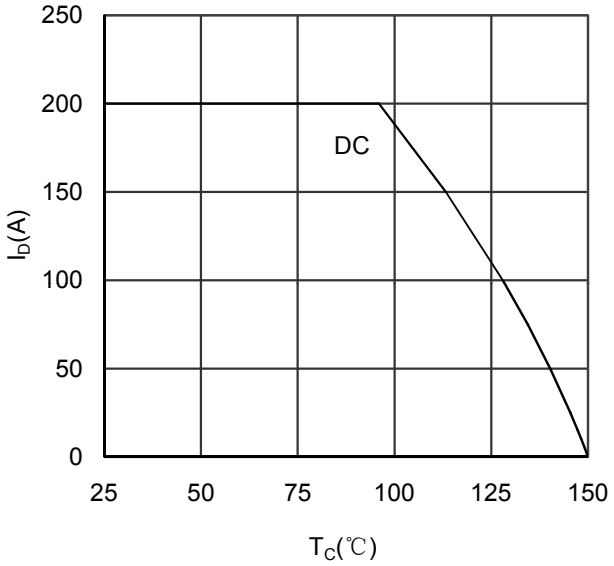


Figure 4. Diode Output current vs Case temperature

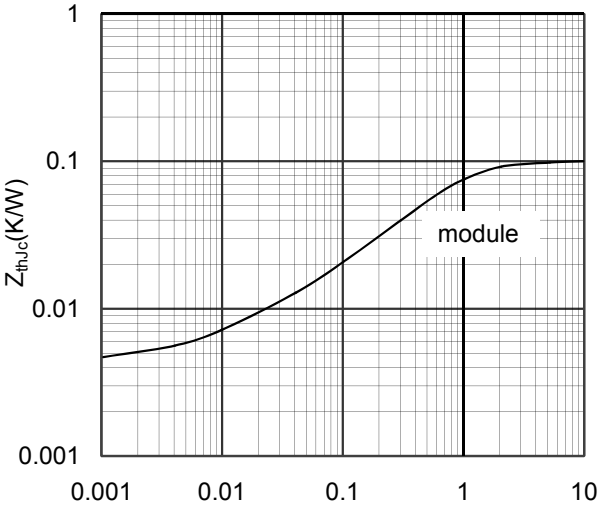


Figure 5. Transient Thermal Impedance-Diode

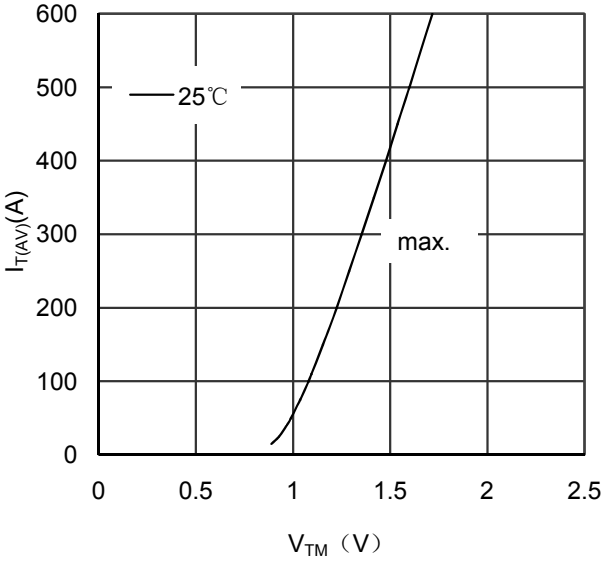


Figure 6. SCR Average On State Current vs Forward Voltage

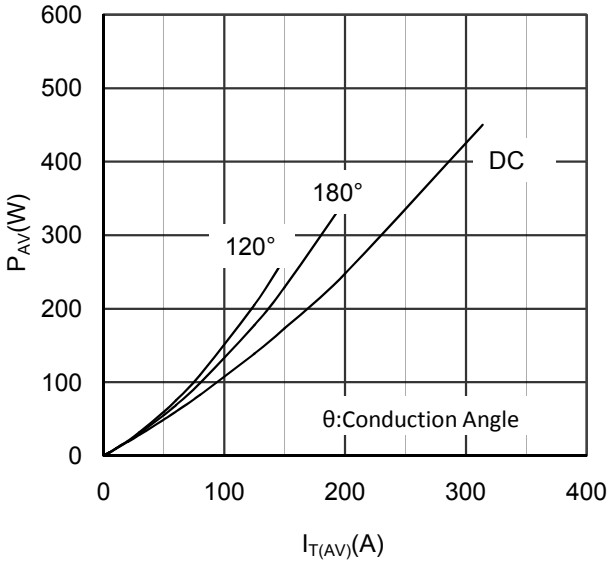


Figure 7. SCR Power dissipation vs $I_{T(AV)}$

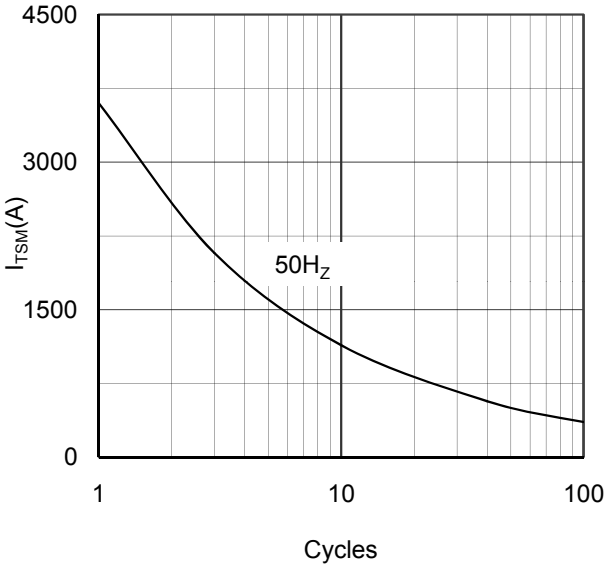


Figure 8. SCR Max Non Repetitive Surge On State Current

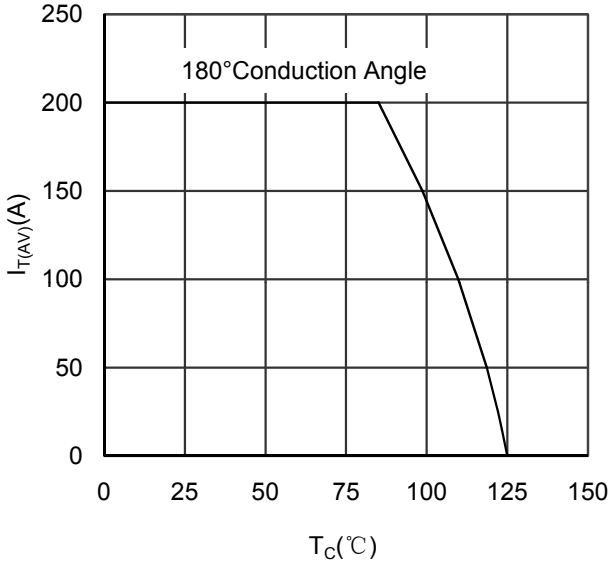


Figure 9. SCR On State current vs Case temperaturer

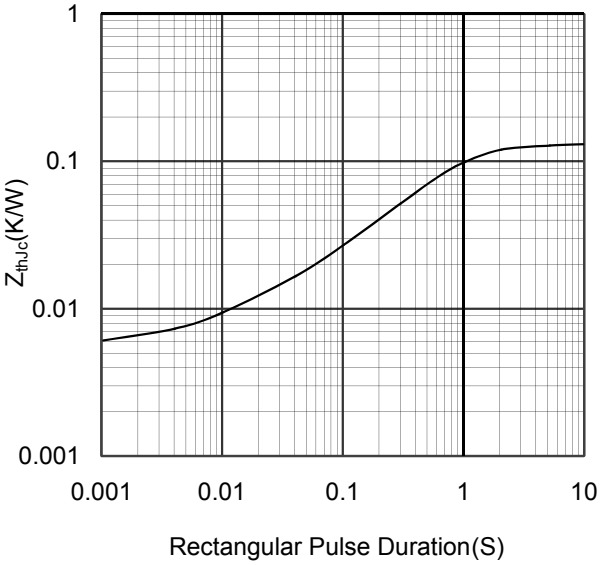


Figure 10. Transient Thermal Impedance-Thyristor

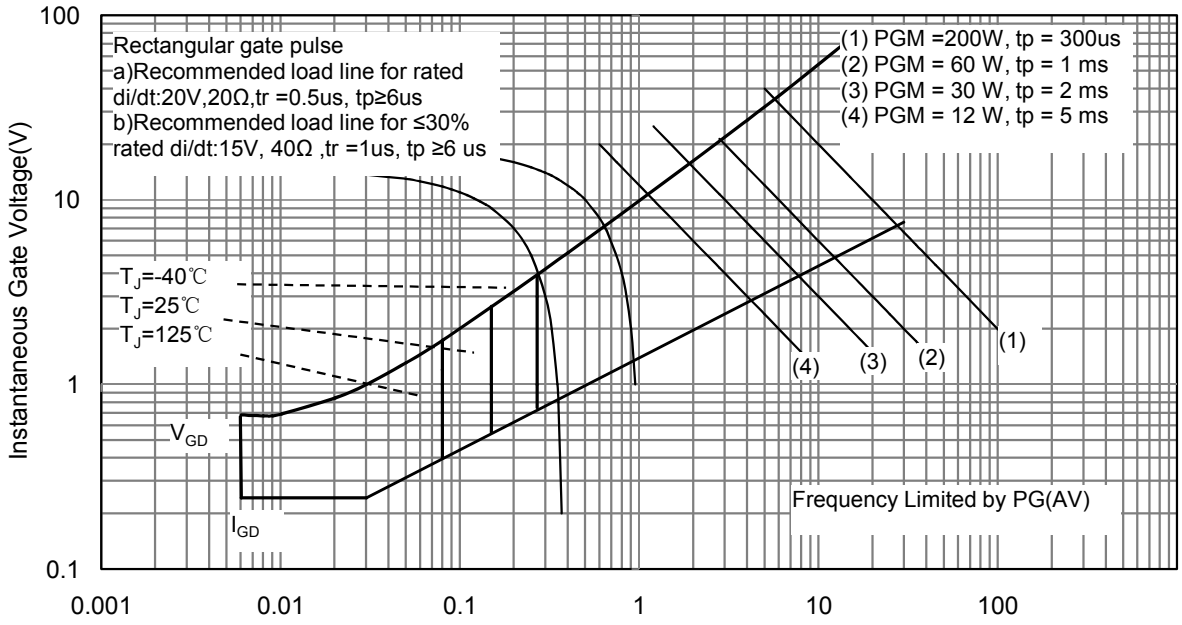
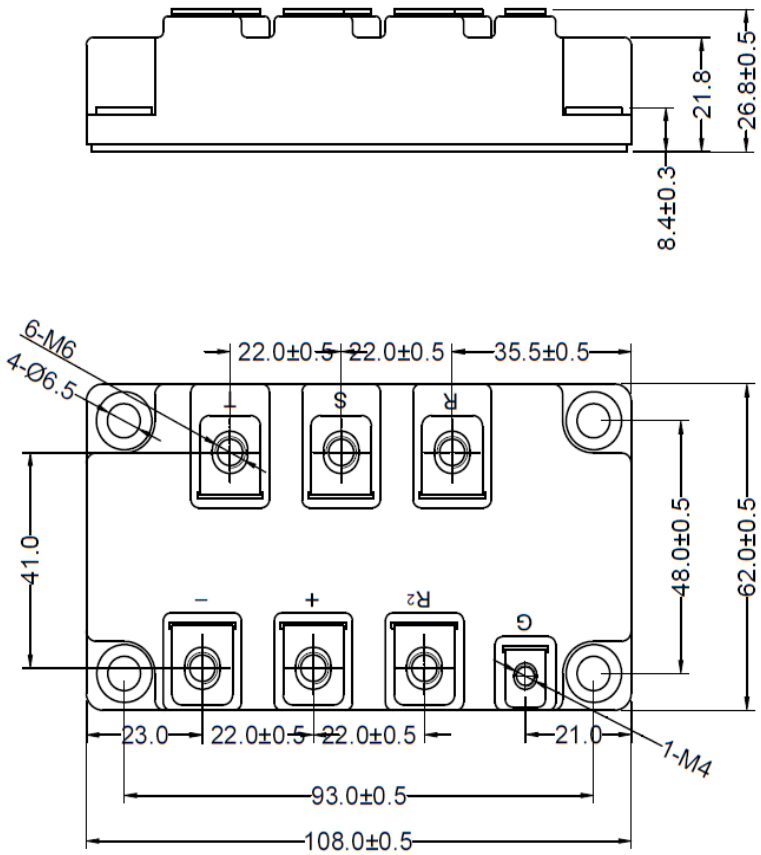


Figure 11. SCR Gate Characteristics



Dimensions in (mm)

Figure 12. Package Outline