MMK110A160DA/DK

110A Thyristor Module

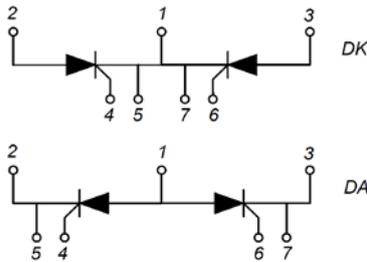January 2015   Version 02   **RoHS Compliant**

FEATURES

☐ Electrically Isolated by DBC Ceramic

☐ High Surge Current Capability

☐ Low Inductance Package

APPLICATIONS

☐ DC Motor Control and Drives

☐ Battery Charges ,Heater controls, Light dimmers

☐ Static switches

ABSOLUTE MAXIMUM RATINGS

T_C=25°C unless otherwise specified

Symbol	Parameter/Test Conditions	Values		Unit
		MMK110A160DA	MMK110A160DK	
V_{DRM}	Repetitive Peak Off-State Voltage	1600	1600	
V_{RRM}	Repetitive Peak Reverse Voltage	1600	1600	**V**
V_{RSM}	Non-Repetitive Peak Reverse Voltage	1700	1700	

Symbol	Parameter	Test Conditions	Values	Unit
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180°conduction, Tc=80°C	110	A
$I_{T(RMS)}$	R.M.S. On-State Current		170	
I_{TSM}	Non-Repetitive Surge On-State Current	1/2 cycle, 50HZ, peak value Tc =45°C	2000	
		1/2 cycle, 60HZ, peak value Tc =45°C	2200	
I^2t	I^2t (For Fusing)	1/2 cycle, 50HZ, peak value Tc =45°C	20	KA^2s
		1/2 cycle, 60HZ, peak value Tc =45°C	20	KA^2s
T_J	Junction Temperature		-40 to +125	°C
T_{STG}	Storage Temperature Range		-40 to +125	°C
V_{ISO}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
Torque	Module-to-Sink	Recommended（M5）	2.5～5	N.m
Torque	Module Electrodes	Recommended（M5）	2.5～5	N.m
$R_{th (J-C)}$	Junction-to-Case Thermal Resistance		0.24	K /W
Weight			110	g

ELECTRICAL AND THERMAL 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°C			15	mA
I_{RRM}	Maximum Peak Reverse Current	$V_R = V_{RRM}$, T_J=125°C			15	
V_{TM}	Maximum on-state voltage drop	I_{TM}=345A ,td=10 ms, half sine			1.8	V
V_{T0}	For power-loss calculations only				0.88	V
r_T	T_J=125°C				3.1.	mΩ
V_{GT}	Max. required DC gate voltage to trigger	V_A=6V, R_A=1Ω,T_J = -40°C			4	V
		V_A=6V, R_A=1Ω			2.5	
		V_A=6V, R_A=1Ω,T_J = 125°C			1.7	
I_{GT}	Max. required DC gate current to trigger	V_A=6V, R_A=1Ω,T_J = -40°C			270	mA
		V_A=6V, R_A=1Ω			150	
		V_A=6V, R_A=1Ω,T_J = 125°C			80	
V_{GD}	Max. required DC gate voltage not to trigger,$V_D = V_{DRM}$, T_J = 125°C				0.25	V
I_{GD}	Max. required DC gate current not to trigger,$V_D = V_{DRM}$, T_J = 125°C				10	mA
I_H	Maximum holding current			125	250	
I_L	Maximum latching current			250	500	
P_{GM}	Maximum peak gate power				10	W
$P_{G(AV)}$	Maximum average gate power				2.5	W
I_{GM}	Maximum peak gate current				2.5	A
$-V_{GM}$	Maximum peak negative gate voltage				10	V
dv/dt	Critical Rate of Rise of Off-State Voltage,T_J=125°C,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°C				150	A/μs
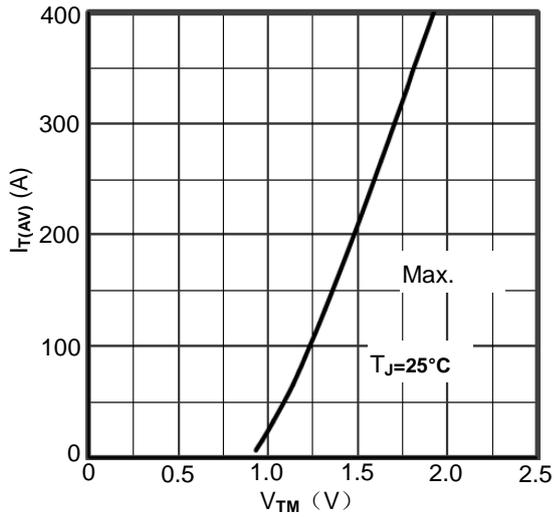
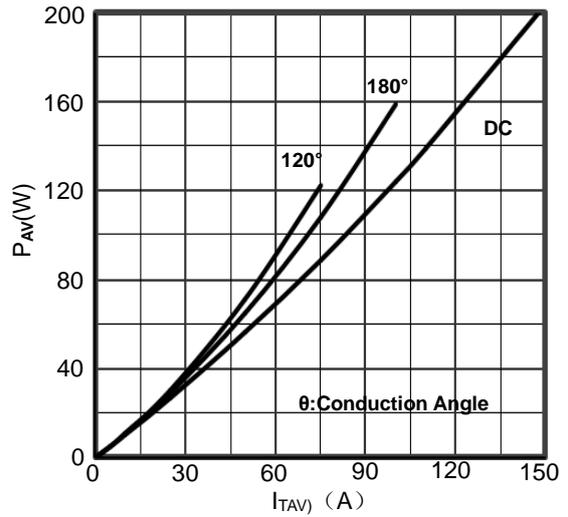Figure1. SCR Average On-State Current
vs. Forward Voltage

Figure2. SCR Power dissipation vs. I$_{T(AV)}$
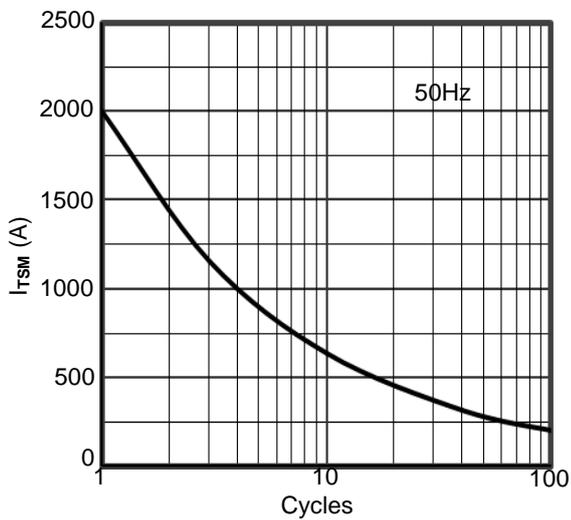
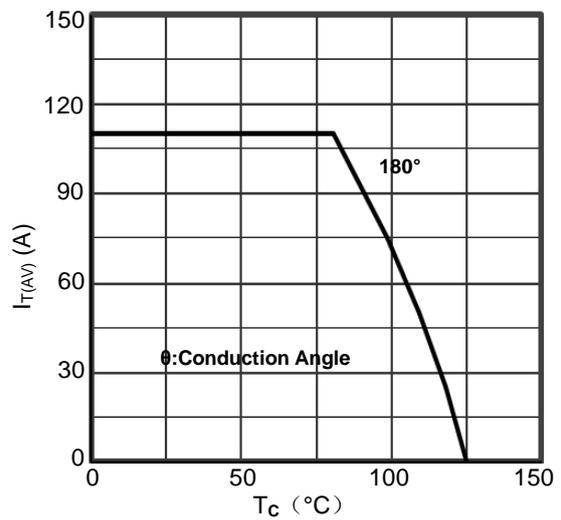Figure3. Max Non-Repetitive Surge On-State Current
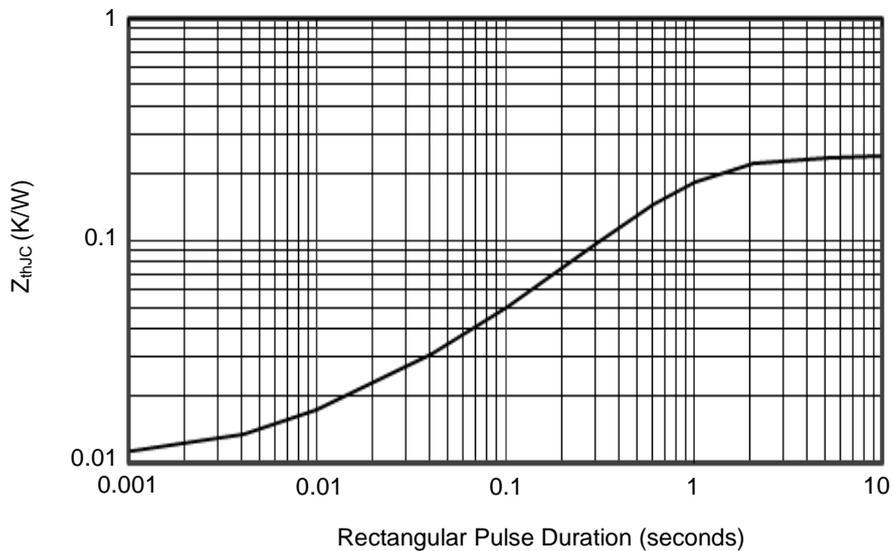
Figure4. On-State current vs.Case temperature

Rectangular Pulse Duration (seconds)
Figure5. Transient Thermal Impedance
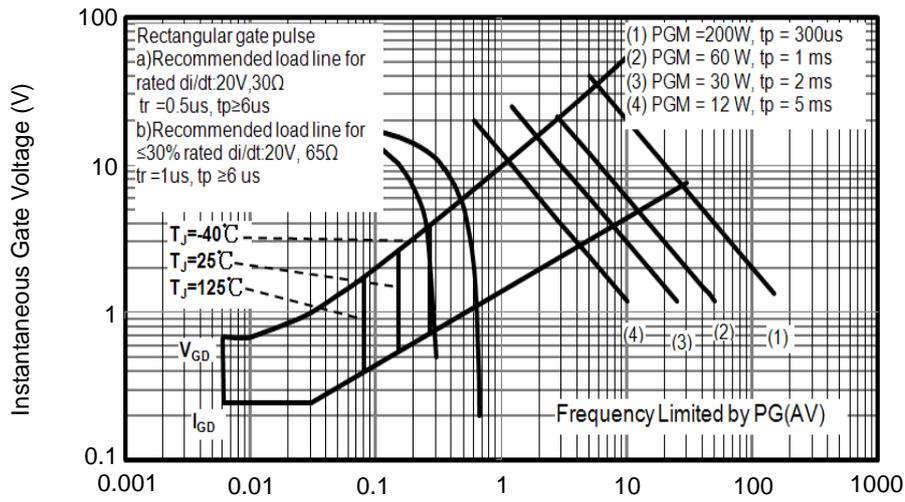
Figure6. Gate Characteristics

Text within Figure 6:

- Instantaneous Gate Voltage (V)
- Rectangular gate pulse
- a)Recommended load line for rated di/dt:20V,30Ω tr =0.5us, tp≥6us
- b)Recommended load line for ≤30% rated di/dt:20V, 65Ω tr =1us, tp ≥6 us
- (1) PGM =200W, tp = 300us
- (2) PGM = 60 W, tp = 1 ms
- (3) PGM = 30 W, tp = 2 ms
- (4) PGM = 12 W, tp = 5 ms
- T_J=-40℃
- T_J=25℃
- T_J=125℃
- V_{GD}
- I_{GD}
- Frequency Limited by PG(AV)
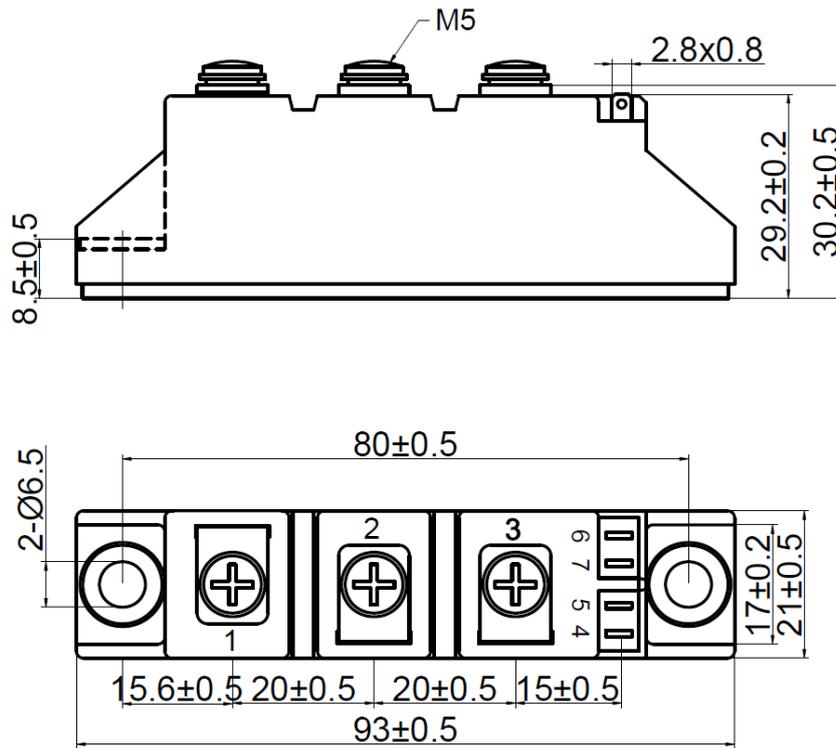
Dimensions in Millimeters
Figure7. Package Outline