

# TM60SZ-M

MEDIUM POWER GENERAL USE  
NON-INSULATED TYPE

## TM60SZ-M



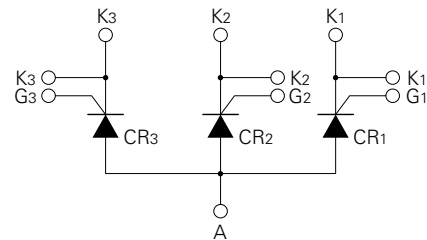
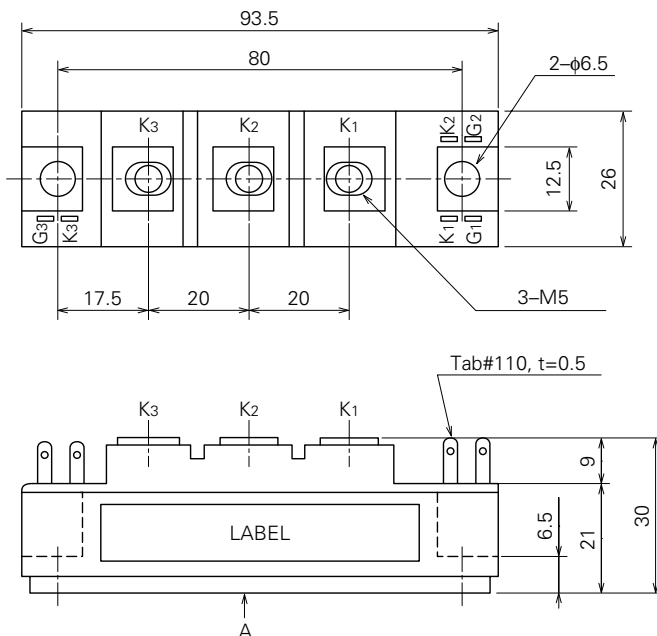
- **IT (AV)** Average on-state current ..... **60A**
- **VRRM** Repetitive peak reverse voltage ..... **400V**
- **VDRM** Repetitive peak off-state voltage ..... **400V**
- **TRIPLE ARMS**
- **Non-Insulated Type**

## APPLICATION

Welders

## OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
			M	
VRRM	Repetitive peak reverse voltage		400	V
VRSM	Non-repetitive peak reverse voltage		480	V
VR (DC)	DC reverse voltage		320	V
VDRM	Repetitive peak off-state voltage		400	V
VDSM	Non-repetitive peak off-state voltage		480	V
VD (DC)	DC off-state voltage		320	V

Symbol	Parameter	Conditions	Ratings	Unit
IT (RMS)	RMS on-state current		95	A
IT (AV)	Average on-state current	Three-phase, half-wave, Tc=125°C	60	A
ITSM	Surge (non-repetitive) on-state current	One half cycle at 60Hz, peak value	1200	A
I <sup>2</sup> t	I <sup>2</sup> t for fusing	Value for one cycle of surge current	6.0 × 10 <sup>3</sup>	A <sup>2</sup> s
di/dt	Critical rate of rise of on-state current	V <sub>D</sub> =1/2V <sub>DRM</sub> , I <sub>G</sub> =1.0A, T <sub>j</sub> =150°C	50	A/μs
PGM	Peak gate power dissipation		5.0	W
PG (AV)	Average gate power dissipation		0.5	W
VFGM	Peak gate forward voltage		10	V
VRGM	Peak gate reverse voltage		5.0	V
IFGM	Peak gate forward current		2.0	A
T <sub>j</sub>	Junction temperature		-40~+150	°C
T <sub>stg</sub>	Storage temperature		-40~+125	°C
—	Mounting torque	Main terminal screw M5	1.47~1.96	N·m
			15~20	kg·cm
		Mounting screw M6	1.96~2.94	N·m
			20~30	kg·cm
—	Weight	Typical value	160	g

## ELECTRICAL CHARACTERISTICS

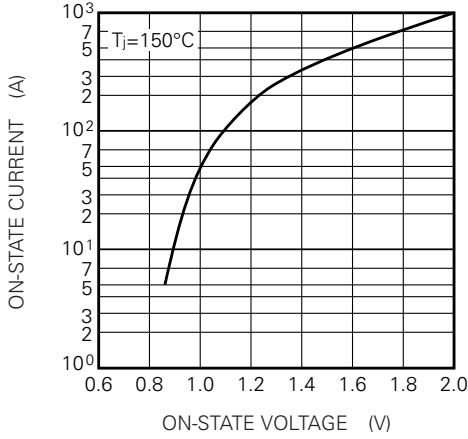
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IRRM	Repetitive peak reverse current	T <sub>j</sub> =150°C, VRRM applied	—	—	25	mA
IDRM	Repetitive peak off-state current	T <sub>j</sub> =150°C, VDRM applied	—	—	25	mA
VTM	On-state voltage	T <sub>j</sub> =150°C, I <sub>TM</sub> =180A, instantaneous meas.	—	—	1.2	V
dv/dt	Critical rate of rise of off-state voltage	T <sub>j</sub> =150°C, V <sub>D</sub> =2/3V <sub>DRM</sub>	200	—	—	V/μs
VGT	Gate trigger voltage	T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω	—	—	3.0	V
VGD	Gate non-trigger voltage	T <sub>j</sub> =150°C, V <sub>D</sub> =1/2V <sub>DRM</sub>	0.25	—	—	V
IGT	Gate trigger current	T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω	15	—	100	mA
R <sub>th (j-c)</sub>	Thermal resistance	Junction to case (per 1/3 module)	—	—	0.3	°C/W
R <sub>th (c-f)</sub>	Contact thermal resistance	Case to fin, conductive grease applied (per 1/3 module)	—	—	0.3	°C/W

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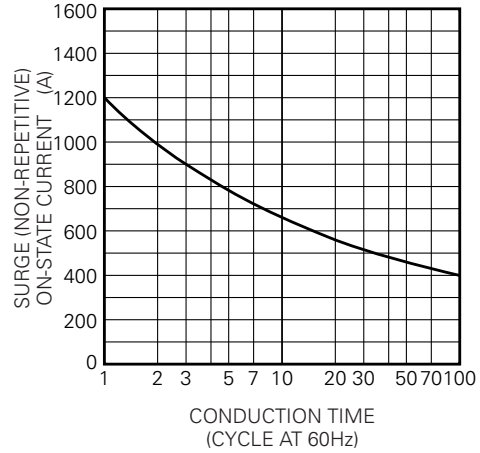
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## PERFORMANCE CURVES

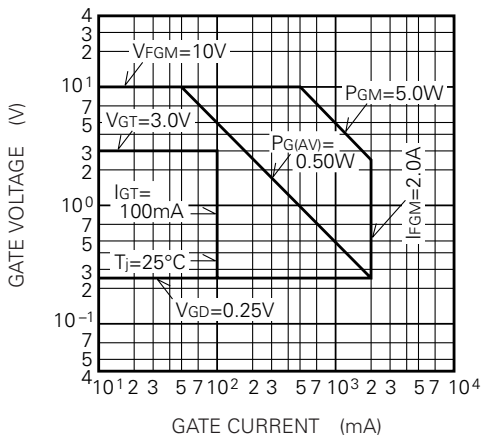
**MAXIMUM ON-STATE CHARACTERISTIC**



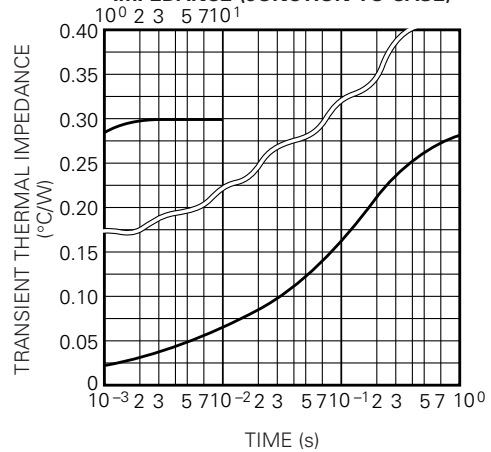
**RATED SURGE (NON-REPETITIVE) ON-STATE CURRENT**



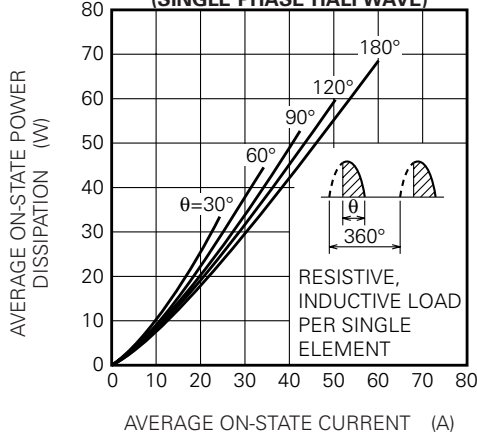
**GATE CHARACTERISTICS**



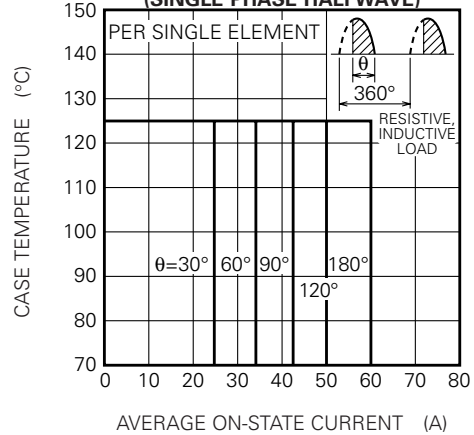
**MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)**



**MAXIMUM AVERAGE ON-STATE POWER DISSIPATION (SINGLE PHASE HALFWAVE)**



**LIMITING VALUE OF THE AVERAGE ON-STATE CURRENT (SINGLE PHASE HALFWAVE)**



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