

MITSUBISHI THYRISTOR MODULES

# TM15T3A-M,-H

MEDIUM POWER GENERAL USE  
INSULATED TYPE

TM15T3A-M,-H



- **I<sub>o</sub>** DC output current ..... **30A**
- **V<sub>RRM</sub>** Repetitive peak reverse voltage ..... **400/800V**
- **V<sub>DRM</sub>** Repetitive peak off-state voltage ..... **400/800V**
- **3 Phase Mix Bridge**
- **Insulated Type**
- **UL Recognized**

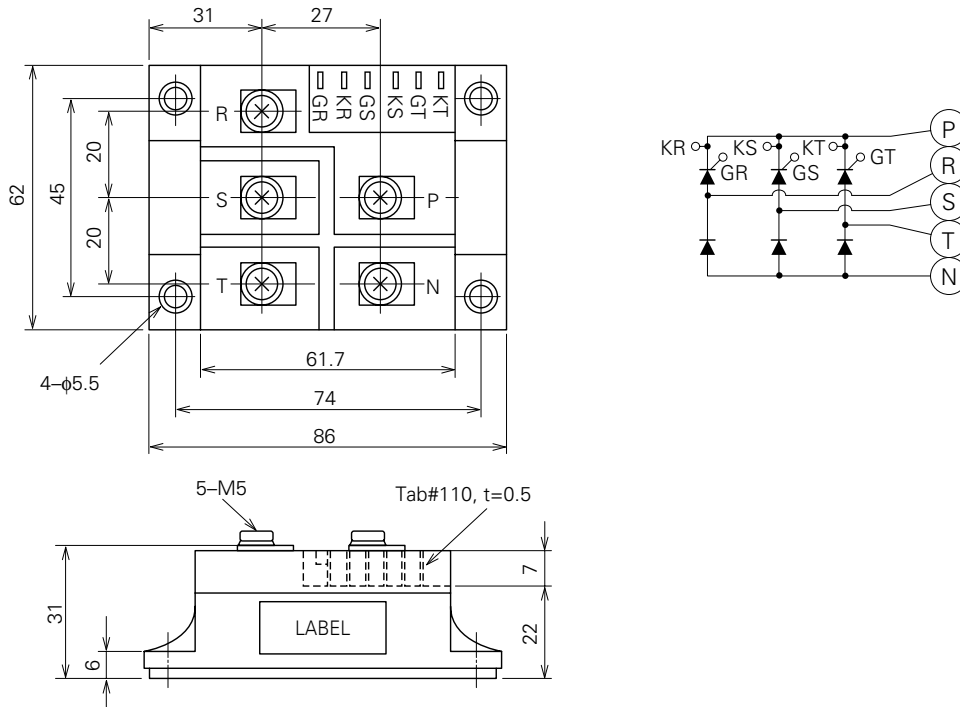
Yellow Card No. E80276 (N)  
File No. E80271

## APPLICATION

DC motor control, NC equipment, AC motor control, contactless switches, electric furnace temperature control, light dimmers

## OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		M	H	
VRRM	Repetitive peak reverse voltage	400	800	V
VRSM	Non-repetitive peak reverse voltage	480	960	V
VR (DC)	DC reverse voltage	320	640	V
VDRM	Repetitive peak off-state voltage	400	800	V
VDSM	Non-repetitive peak off-state voltage	480	960	V
VD (DC)	DC off-state voltage	320	640	V

Symbol	Parameter	Conditions	Ratings	Unit
Io	DC output current	3-phase fullwave rectified, TC=104°C	30	A
ITSM, IFSM	Surge (non-repetitive) current	One half cycle at 60Hz, peak value	300	A
I <sup>2</sup> t	I <sup>2</sup> t for fusing	Value for one cycle of surge current	3.8 × 10 <sup>2</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> =0.5A, T <sub>j</sub> =125°C	100	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		-40~125	°C
T <sub>stg</sub>	Storage temperature		-40~125	°C
V <sub>iso</sub>	Isolation voltage	Charged part to case	2500	V
—	Mounting torque	Main terminal screw M5	1.47~1.96	N·m
			15~20	kg·cm
		Mounting screw M5	1.47~1.96	N·m
			15~20	kg·cm
—	Weight	Typical value	310	g

## ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I <sub>RRM</sub>	Repetitive peak reverse current	T <sub>j</sub> =125°C, V <sub>RRM</sub> applied	—	—	4.0	mA
I <sub>DRM</sub>	Repetitive peak of off-state	T <sub>j</sub> =125°C, V <sub>DRM</sub> applied	—	—	4.0	mA
V <sub>TM</sub> , V <sub>FM</sub>	current	T <sub>j</sub> =125°C, I <sub>TM</sub> =I <sub>FM</sub> =75A, instantaneous meas.	—	—	1.5	V
dv/dt	Forward voltage	T <sub>j</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>	500	—	—	V/μs
V <sub>GT</sub>	Critical rate of rise of off-state voltage	T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω	—	—	2.0	V
V <sub>GD</sub>	Gate trigger voltage	T <sub>j</sub> =125°C, V <sub>D</sub> =1/2V <sub>DRM</sub>	0.25	—	—	V
I <sub>GT</sub>	Gate non-trigger voltage	T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω	10	—	50	mA
R <sub>th (j-c)</sub>	Gate trigger current	Junction to case (per 1/6 module)	—	—	1.8	°C/W
R <sub>th (c-f)</sub>	Thermal resistance	Case to fin, Conductive grease applied (per 1/6 module)	—	—	0.36	°C/W
—	Contact thermal resistance Insulation resistance	Measured with a 500V megohmmeter between main terminal and case	10	—	—	MΩ

Note: Items of the above table applies to the Thyristor part and the Diode part as circled in the following tables.

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## MAXIMUM RATINGS

Item	VRRM	VRSM	VR (DC)	VDRM	VD SM	VD (DC)	IT (RMS)	IT (AV)	ITSM	$i^2t$	di/dt
							IF (RMS)	IF (AV)	IFSM		
Thyristor	○	○	○	○	○	○	○	○	○	○	○
Diode	○	○	○	—	—	—	○	○	○	○	—

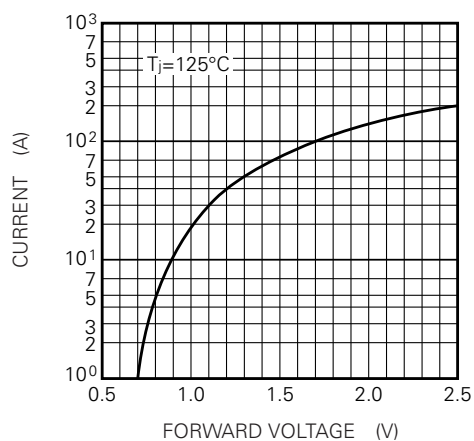
Item	PGM	PG (AV)	VFGM	IFGM	T <sub>j</sub>	T <sub>stg</sub>
Thyristor	○	○	○	○	○	○
Diode	—	—	—	—	○	○

## ELECTRICAL CHARACTERISTICS

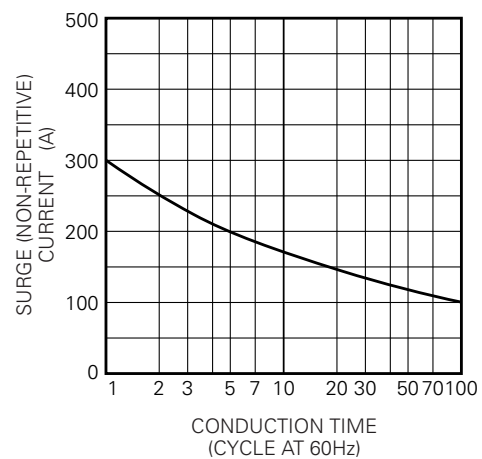
Item	IRR M	IDRM	V <sub>TM</sub>	dv/dt	V <sub>GT</sub>	V <sub>GD</sub>	I <sub>GT</sub>	R <sub>th (j-c)</sub>	R <sub>th (c-f)</sub>
			V <sub>FM</sub>						
Thyristor	○	○	○	○	○	○	○	○	○
Diode	○	—	○	—	—	—	—	○	○

## PERFORMANCE CURVES

MAXIMUM FORWARD CHARACTERISTIC



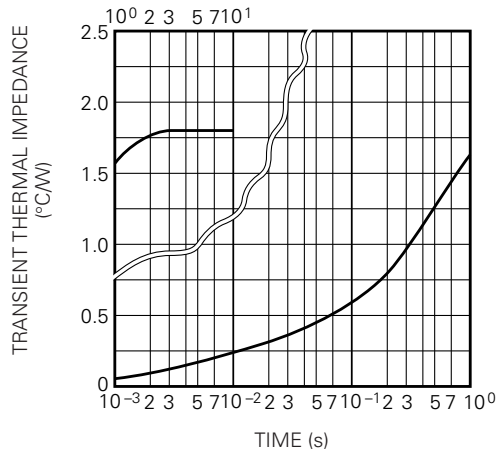
RATED SURGE (NON-REPETITIVE) CURRENT



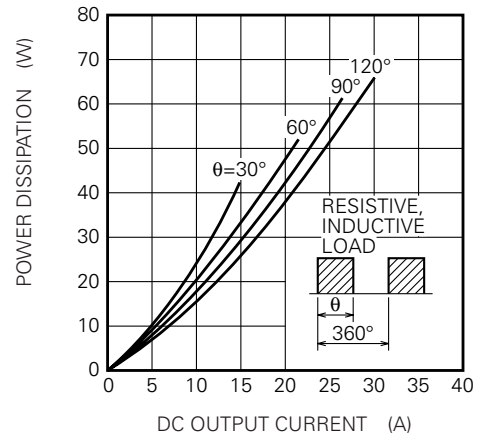
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**MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE) (PER SINGLE ELEMENT)**



**MAXIMUM POWER DISSIPATION (THREE PHASE FULLWAVE RECTIFIED)**



**LIMITING VALUE OF THE DC OUTPUT CURRENT (THREE PHASE FULLWAVE RECTIFIED)**

