MITSUBISHI THYRISTOR MODULES

TM15T3A-M,-H

MEDIUM POWER GENERAL USE
INSULATED TYPE

TM15T3A-M,-H

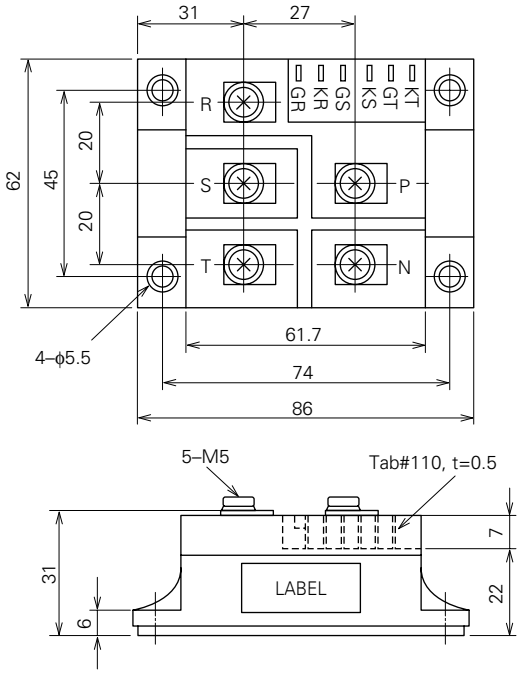
- **Io** DC output current **30A**
- **VRRM** Repetitive peak reverse voltage **400/800V**
- **VDRM** Repetitive peak off-state voltage **400/800V**
- **3 Phase Mix Bridge**
- **Insulated Type**
- **UL Recognized**
  Yellow Card No. E80276 (N)
  File No. E80271

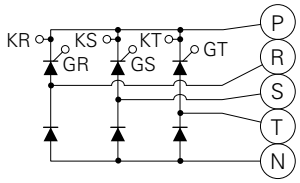
APPLICATION

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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MITSUBISHI ELECTRIC

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		M	H	
V_{RRM}	Repetitive peak reverse voltage	400	800	V
V_{RSM}	Non-repetitive peak reverse voltage	480	960	V
$V_{R\ (DC)}$	DC reverse voltage	320	640	V
V_{DRM}	Repetitive peak off-state voltage	400	800	V
V_{DSM}	Non-repetitive peak off-state voltage	480	960	V
$V_{D\ (DC)}$	DC off-state voltage	320	640	V

Symbol	Parameter	Conditions	Ratings	Unit
I_O	DC output current	3-phase fullwave rectified, TC=104°C	30	A
I_{TSM}, I_{FSM}	Surge (non-repetitive) current	One half cycle at 60Hz, peak value	300	A
I^2t	I^2t for fusing	Value for one cycle of surge current	3.8×10^2	A^2s
di/dt	Critical rate of rise of on-state current	V_D=1/2V_{DRM}, I_G=0.5A, T_j=125°C	100	A/μs
P_{GM}	Peak gate power dissipation		5.0	W
$P_{G\ (AV)}$	Average gate power dissipation		0.5	W
V_{FGM}	Peak gate forward voltage		10	V
V_{RGM}	Peak gate reverse voltage		5.0	V
I_{FGM}	Peak gate forward current		2.0	A
T_j	Junction temperature		–40~125	°C
T_{stg}	Storage temperature		–40~125	°C
V_{iso}	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_{RRM}	Repetitive peak reverse current	T_j=125°C, V_{RRM} applied	—	—	4.0	mA
I_{DRM}	Repetitive peak of off-state	T_j=125°C, V_{DRM} applied	—	—	4.0	mA
V_{TM}, V_{FM}	current	T_j=125°C, I_{TM}=I_{FM}=75A, instantaneous meas.	—	—	1.5	V
dv/dt	Forward voltage	T_j=125°C, V_D=2/3V_{DRM}	500	—	—	V/μs
V_{GT}	Critical rate of rise of off-state voltage	T_j=25°C, V_D=6V, R_L=2Ω	—	—	2.0	V
V_{GD}	Gate trigger voltage	T_j=125°C, V_D=1/2V_{DRM}	0.25	—	—	V
I_{GT}	Gate non-trigger voltage	T_j=25°C, V_D=6V, R_L=2Ω	10	—	50	mA
$R_{th\ (j-c)}$	Gate trigger current	Junction to case (per 1/6 module)	—	—	1.8	°C/W
$R_{th\ (c-f)}$	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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MEDIUM POWER GENERAL USE
INSULATED TYPE

MAXIMUM RATINGS

Item	V_{RRM}	V_{RSM}	$V_{R\ (DC)}$	V_{DRM}	V_{DSM}	$V_{D\ (DC)}$	$I_{T\ (RMS)}$ / $I_{F\ (RMS)}$	$I_{T\ (AV)}$ / $I_{F\ (AV)}$	I_{TSM} / I_{FSM}	I^2t	di/dt
Thyristor	○	○	○	○	○	○	○	○	○	○	○
Diode	○	○	○	—	—	—	○	○	○	○	—

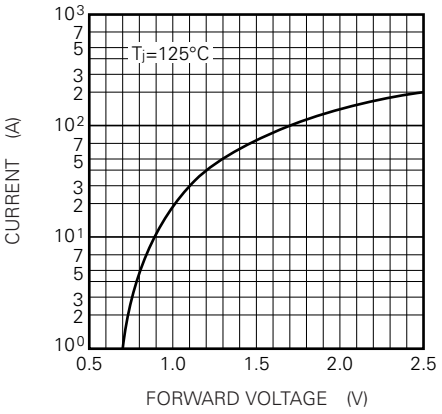
Item	P_{GM}	$P_{G\ (AV)}$	V_{FGM}	I_{FGM}	T_j	T_{stg}
Thyristor	○	○	○	○	○	○
Diode	—	—	—	—	○	○

ELECTRICAL CHARACTERISTICS

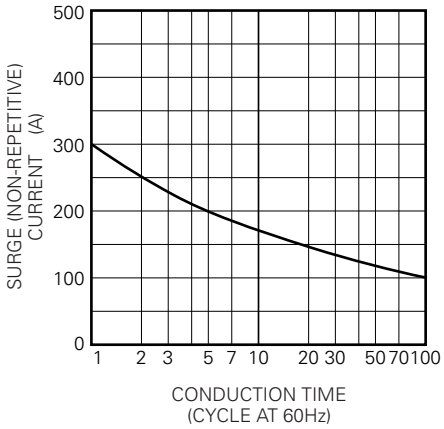
Item	I_{RRM}	I_{DRM}	V_{TM} / V_{FM}	dv/dt	V_{GT}	V_{GD}	I_{GT}	$R_{th\ (j\text{-}c)}$	$R_{th\ (c\text{-}f)}$
Thyristor	○	○	○	○	○	○	○	○	○
Diode	○	—	○	—	—	—	—	○	○

PERFORMANCE CURVES

MAXIMUM FORWARD CHARACTERISTIC



RATED SURGE (NON-REPETITIVE) CURRENT



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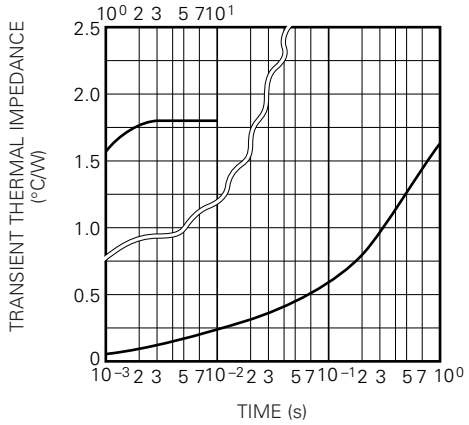
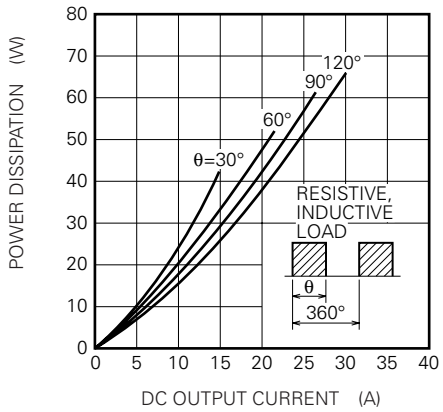
MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE) (PER SINGLE ELEMENT)



MAXIMUM POWER DISSIPATION (THREE PHASE FULLWAVE RECTIFIED)



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