MITSUBISHI THYRISTOR MODULES

TM10T3B-M,-H

MEDIUM POWER GENERAL USE
INSULATED TYPE

TM10T3B-M,-H

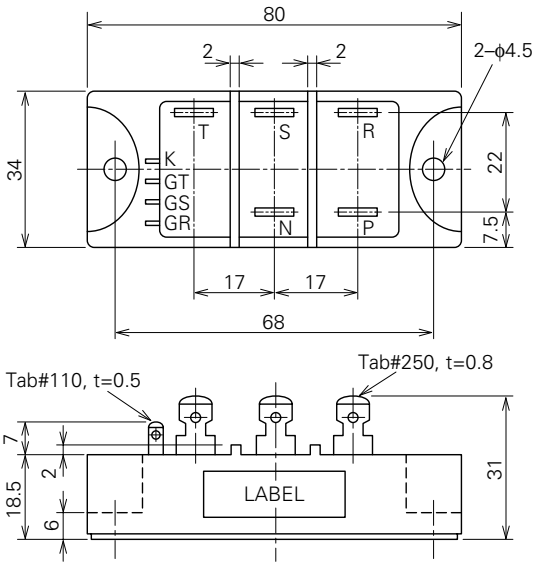


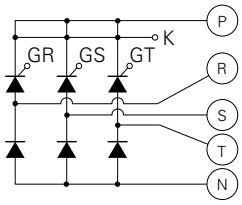
- **Io** DC output current **20A**
- **VRRM** Repetitive peak reverse voltage **400/800V**
- **VDRM** Repetitive peak off-state voltage **400/800V**
- **3 Phase Mix Bridge**
- **Insulated Type**
- **UL Recognized**
  Yellow Card No. E80276 (N)
  File No. E80271

APPLICATION

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

OUTLINE DRAWING & CIRCUIT DIAGRAM Dimensions in mm





MITSUBISHI ELECTRIC

TM10T3B-M,-H

MEDIUM POWER GENERAL USE
INSULATED TYPE

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=79°C	20	A
I_{TSM}, I_{FSM}	Surge (non-repetitive) current	One half cycle at 60Hz, peak value	200	A
I^2t	I^2t for fusing	Value for one cycle of surge current	1.7×10^2	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	50	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	Mounting screw M4	0.98~1.47	N·m
			10~15	kg·cm
—	Weight	Typical value	130	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 off-state current	T_j=125°C, V_{DRM} applied	—	—	4.0	mA
V_{TM}, V_{FM}	Forward voltage	T_j=125°C, I_{TM}=I_{FM}=20A, instantaneous meas.	—	—	1.3	V
dv/dt	Critical rate of rise of off-state voltage	T_j=125°C, V_D=2/3V_{DRM}	500	—	—	V/μs
V_{GT}	Gate trigger voltage	T_j=25°C, V_D=6V, R_L=2Ω	—	—	2.0	V
V_{GD}	Gate non-trigger voltage	T_j=125°C, V_D=1/2V_{DRM}	0.25	—	—	V
I_{GT}	Gate trigger current	T_j=25°C, V_D=6V, R_L=2Ω	10	—	50	mA
$R_{th\ (j-c)}$	Thermal resistance	Junction to case (per 1/6 module)	—	—	4.5	°C/W
$R_{th\ (c-f)}$	Contact thermal resistance	Case to fin, Conductive grease applied (per 1/6 module)	—	—	0.6	°C/W
—	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	○	○	○	—	—	—	○	○	○	○	—

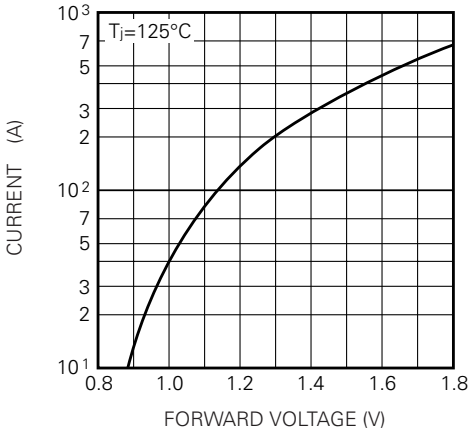
Item	P_{GM}	$P_{G\ (AV)}$	V_{FGM}	I_{FGM}	T_j	T_{stg}
Thyristor	○	○	○	○	○	○
Diode	—	—	—	—	○	○

ELECTRICAL CHARACTERISTICS

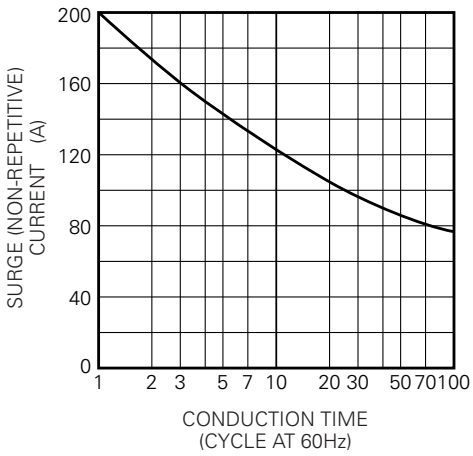
Item	I_{RRM}	I_{DRM}	V_{TM} / V_{FM}	dv/dt	V_{GT}	V_{GD}	I_{GT}	$R_{th\ (j-c)}$	$R_{th\ (c-f)}$
Thyristor	○	○	○	○	○	○	○	○	○
Diode	○	—	○	—	—	—	—	○	○

PERFORMANCE CURVES

MAXIMUM FORWARD CHARACTERISTIC

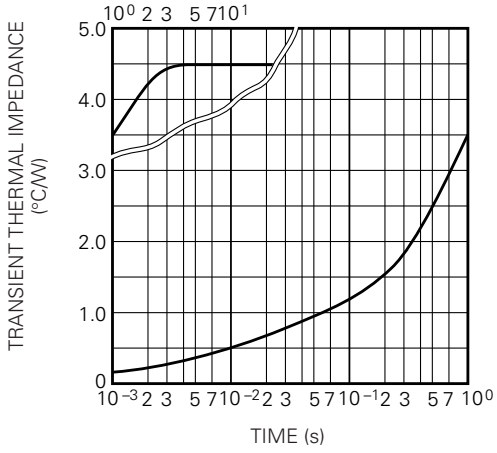


RATED SURGE (NON-REPETITIVE) CURRENT

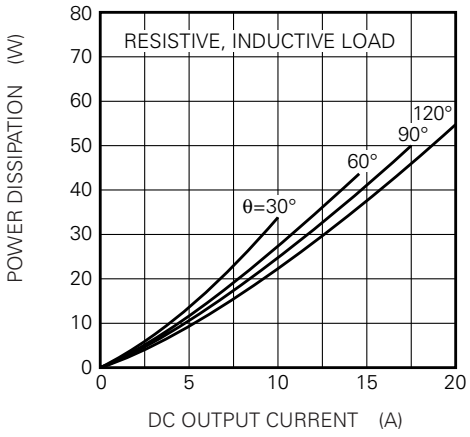


MITSUBISHI ELECTRIC

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)

