MITSUBISHI THYRISTOR MODULES

TM55RZ/EZ-24,-2H

HIGH VOLTAGE MEDIUM POWER GENERAL USE
INSULATED TYPE

TM55RZ/EZ-24,-2H



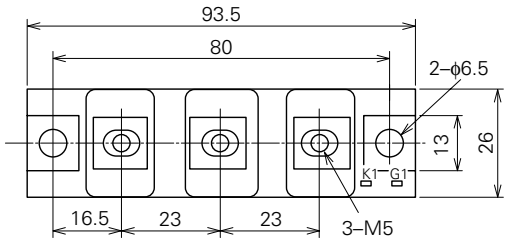
- **$I_{T\ (AV)}$** Average on-state current **55A**
- **$I_{F\ (AV)}$** Average forward current **55A**
- **V_{RRM}** Repetitive peak reverse voltage **1200/1600V**
- **V_{DRM}** Repetitive peak off-state voltage **1200/1600V**
- **MIX DOUBLE ARMS**
- **Insulated Type**
- **UL Recognized**
  Yellow Card No. E80276 (N)
  File No. E80271

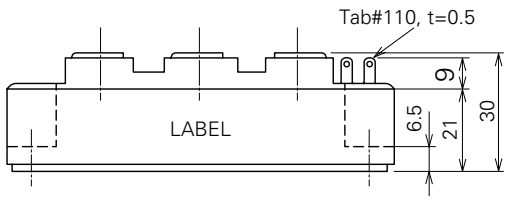
APPLICATION

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

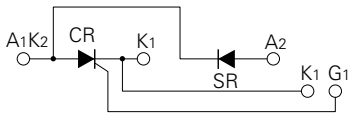
OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm

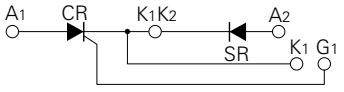




(RZ)



(EZ)



MITSUBISHI ELECTRIC

TM55RZ/EZ-24,-2H

HIGH VOLTAGE MEDIUM POWER GENERAL USE
INSULATED TYPE

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		24	2H	
V_{RRM}	Repetitive peak reverse voltage	1200	1600	V
V_{RSM}	Non-repetitive peak reverse voltage	1350	1700	V
$V_{R\ (DC)}$	DC reverse voltage	960	1280	V
V_{DRM}	Repetitive peak off-state voltage	1200	1600	V
V_{DSM}	Non-repetitive peak off-state voltage	1350	1700	V
$V_{D\ (DC)}$	DC off-state voltage	960	1280	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T\ (RMS)}$, $I_{F\ (RMS)}$	RMS current		86	A
$I_{T\ (AV)}$, $I_{F\ (AV)}$	Average current	Single-phase, half-wave 180° conduction, T_C=81°C	55	A
I_{TSM}, I_{FSM}	Surge (non-repetitive) current	One half cycle at 60Hz, peak value	1100	A
I^2t	I^2t for fusing	Value for one cycle of surge current	5.0×10^3	A^2s
di/dt	Critical rate of rise of on-state current	V_D=1/2V_{DRM}, I_G=1.0A, 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 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.	
I_{RRM}	Repetitive peak reverse current	T_j=125°C, V_{RRM} applied	—	—	10	mA
I_{DRM}	Repetitive peak off-state current	T_j=125°C, V_{DRM} applied	—	—	10	mA
V_{TM}, V_{FM}	Forward voltage	T_j=125°C, I_{TM}=I_{FM}=165A, instantaneous meas.	—	—	1.5	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	15	—	100	mA
$R_{th\ (j-c)}$	Thermal resistance	Junction to case (per 1/2 module)	—	—	0.5	°C/W
$R_{th\ (c-f)}$	Contact thermal resistance	Case to fin, conductive grease applied (per 1/2 module)	—	—	0.2	°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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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	○	○	○	—	—	—	○	○	○	○	—

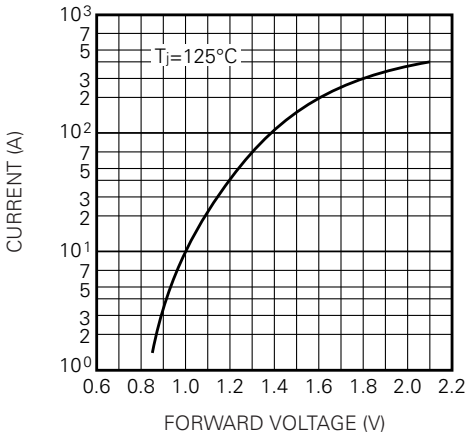
Item	P_{GM}	$P_{G\ (AV)}$	V_{FGM}	I_{FGM}	T_j	T_{stg}
Thyristor	○	○	○	○	○	○
Diode	—	—	—	—	○	○

ELECTRICAL CHARACTERISTICS

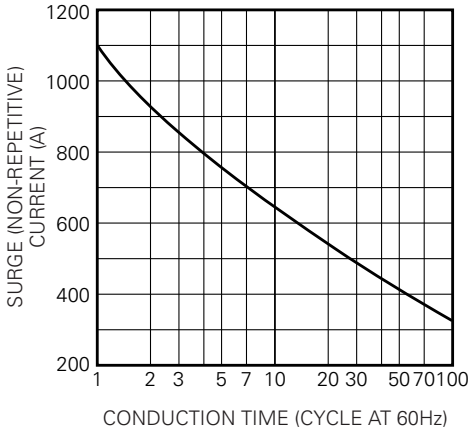
Item	I_{RRM}	I_{DRM}	V_{TM} / V_{FM}	dv/dt	V_{GT}	V_{GD}	I_{GT}	$R_{th\ (j-c)}$	$R_{th\ (c-f)}$
Thyristor	○	○	○	○	○	○	○	○	○
Diode	○	—	○	—	—	—	—	○	○

PERFORMANCE CURVES

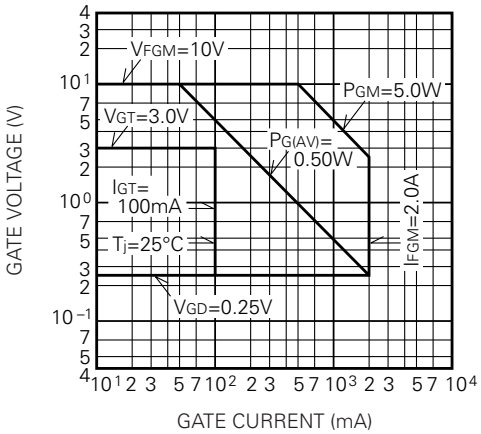
MAXIMUM FORWARD CHARACTERISTIC



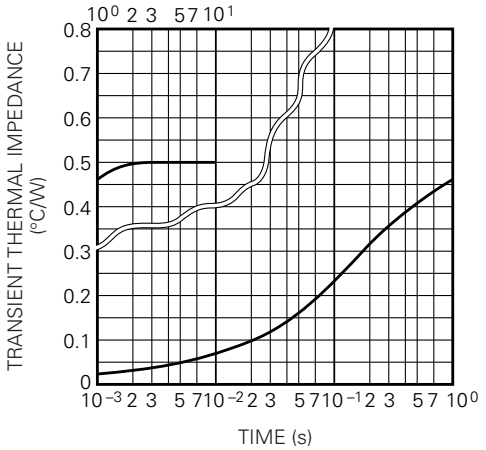
RATED SURGE (NON-REPETITIVE) CURRENT



GATE CHARACTERISTICS

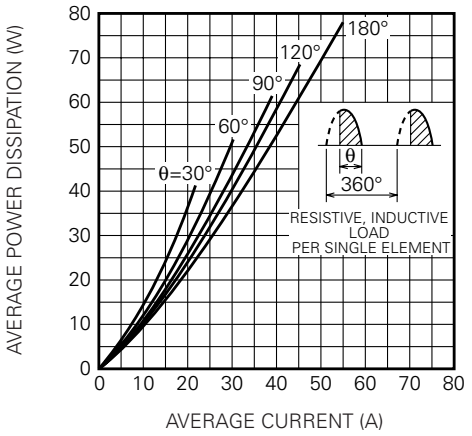


MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)

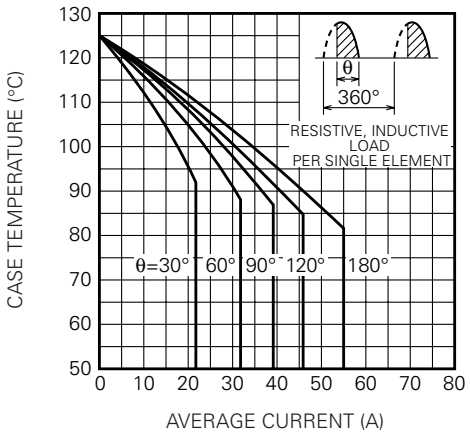


MITSUBISHI ELECTRIC

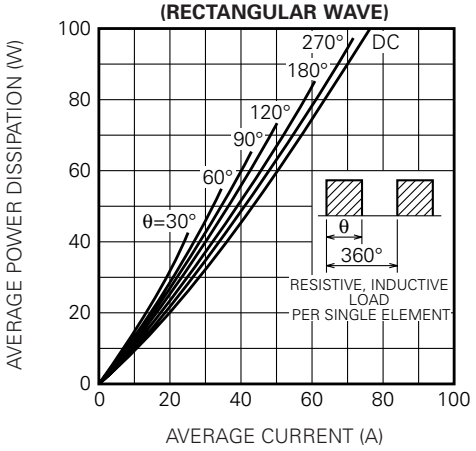
MAXIMUM AVERAGE POWER DISSIPATION (SINGLE PHASE HALFWAVE)



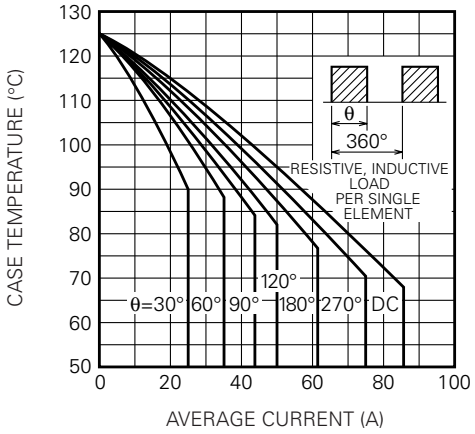
LIMITING VALUE OF THE AVERAGE CURRENT (SINGLE PHASE HALFWAVE)



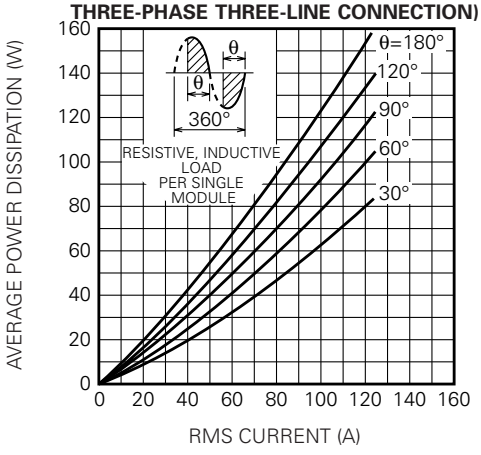
MAXIMUM AVERAGE POWER DISSIPATION (RECTANGULAR WAVE)



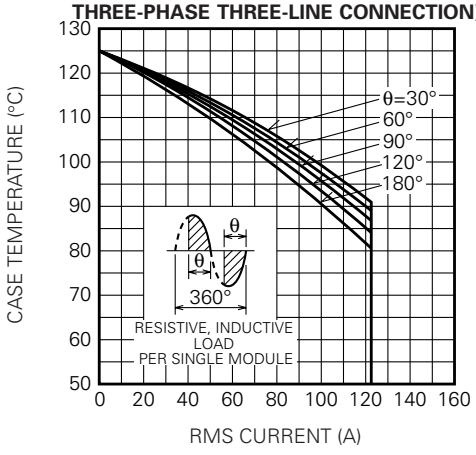
LIMITING VALUE OF THE AVERAGE CURRENT (RECTANGULAR WAVE)



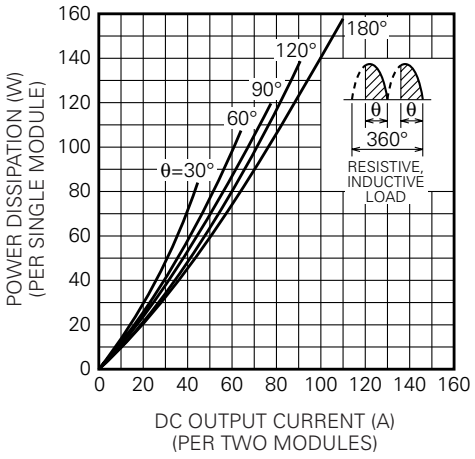
MAXIMUM AVERAGE POWER DISSIPATION (REVERSE-PARALLEL CONNECTION, THREE-PHASE THREE-LINE CONNECTION)



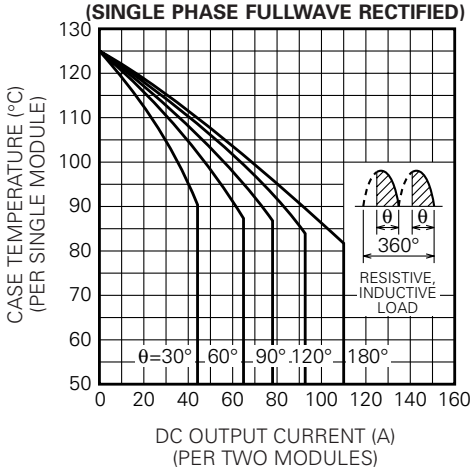
LIMITING VALUE OF THE RMS CURRENT (REVERSE-PARALLEL CONNECTION, THREE-PHASE THREE-LINE CONNECTION)



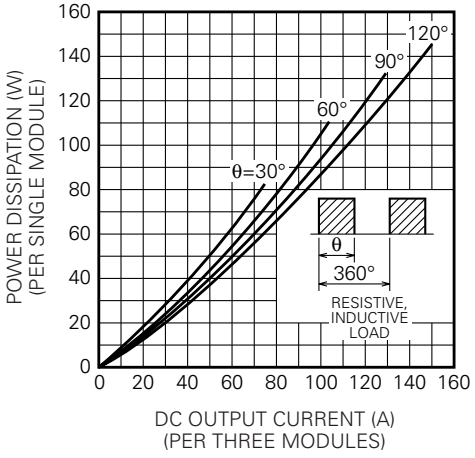
MAXIMUM POWER DISSIPATION (SINGLE PHASE FULLWAVE RECTIFIED)



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



MAXIMUM POWER DISSIPATION (THREE-PHASE FULLWAVE RECTIFIED)



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

