

MITSUBISHI THYRISTOR MODULES  
**TM55RZ/EZ-24,-2H**

HIGH VOLTAGE MEDIUM POWER GENERAL USE  
 INSULATED TYPE

TM55RZ/EZ-24,-2H



- **IT (AV)** Average on-state current ..... **55A**
- **IF (AV)** Average forward current ..... **55A**
- **VRRM** Repetitive peak reverse voltage  
 .... **1200/1600V**
- **VDRM** Repetitive peak off-state voltage  
 .... **1200/1600V**
- **MIX DOUBLE ARMS**
- **Insulated Type**
- **UL Recognized**

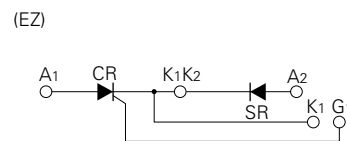
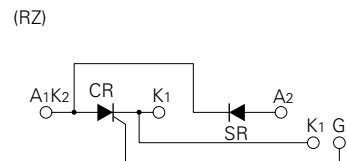
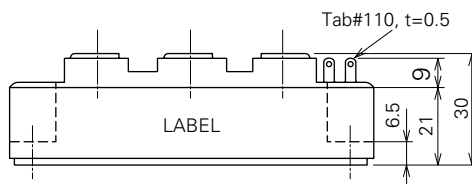
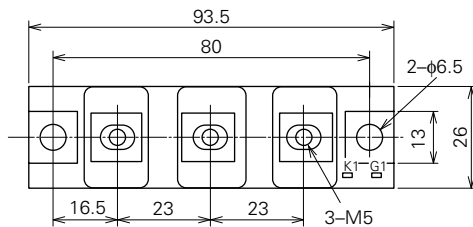
Yellow Card No. E80276 (N)  
 File No. E80271

**APPLICATION**

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

**OUTLINE DRAWING & CIRCUIT DIAGRAM**

Dimensions in mm



# TM55RZ/EZ-24,-2H

HIGH VOLTAGE MEDIUM POWER GENERAL USE  
INSULATED TYPE

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		24	2H	
VRRM	Repetitive peak reverse voltage	1200	1600	V
VRSM	Non-repetitive peak reverse voltage	1350	1700	V
VR (DC)	DC reverse voltage	960	1280	V
VDRM	Repetitive peak off-state voltage	1200	1600	V
VDSM	Non-repetitive peak off-state voltage	1350	1700	V
VD (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, $T_c=81^\circ\text{C}$	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	$5.0 \times 10^3$	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current	$V_D=1/2V_{DRM}$ , $I_G=1.0\text{A}$ , $T_j=125^\circ\text{C}$	100	$\text{A}/\mu\text{s}$
P <sub>GM</sub>	Peak gate power dissipation		5.0	W
P <sub>G (AV)</sub>	Average gate power dissipation		0.5	W
V <sub>FGM</sub>	Peak gate forward voltage		10	V
V <sub>RGM</sub>	Peak gate reverse voltage		5.0	V
I <sub>FGM</sub>	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 M6	1.96~2.94	N·m
—	Weight		20~30	kg·cm
		Typical value	160	g

## ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I <sub>RRM</sub>	Repetitive peak reverse current	$T_j=125^\circ\text{C}$ , $V_{RRM}$ applied	—	—	10	mA
I <sub>DRM</sub>	Repetitive peak off-state current	$T_j=125^\circ\text{C}$ , $V_{DRM}$ applied	—	—	10	mA
V <sub>TM</sub> , V <sub>FM</sub>	Forward voltage	$T_j=125^\circ\text{C}$ , $I_{TM}=I_{FM}=165\text{A}$ , instantaneous meas.	—	—	1.5	V
$dv/dt$	Critical rate of rise of off-state voltage	$T_j=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$	500	—	—	$\text{V}/\mu\text{s}$
V <sub>GT</sub>	Gate trigger voltage	$T_j=25^\circ\text{C}$ , $V_D=6\text{V}$ , $R_L=2\Omega$	—	—	2.0	V
V <sub>GD</sub>	Gate non-trigger voltage	$T_j=125^\circ\text{C}$ , $V_D=1/2V_{DRM}$	0.25	—	—	V
I <sub>GT</sub>	Gate trigger current	$T_j=25^\circ\text{C}$ , $V_D=6\text{V}$ , $R_L=2\Omega$	15	—	100	mA
R <sub>th (j-c)</sub>	Thermal resistance	Junction to case (per 1/2 module)	—	—	0.5	°C/W
R <sub>th (c-f)</sub>	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.

# TM55RZ/EZ-24,-2H

HIGH VOLTAGE MEDIUM POWER GENERAL USE  
INSULATED TYPE

## MAXIMUM RATINGS

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

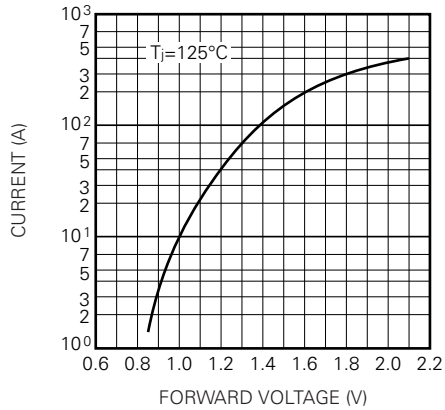
Item	PGM	PG (AV)	VFGM	IFGM	T <sub>j</sub>	T <sub>stg</sub>
Thyristor	○	○	○	○	○	○
Diode	—	—	—	—	○	○

## ELECTRICAL CHARACTERISTICS

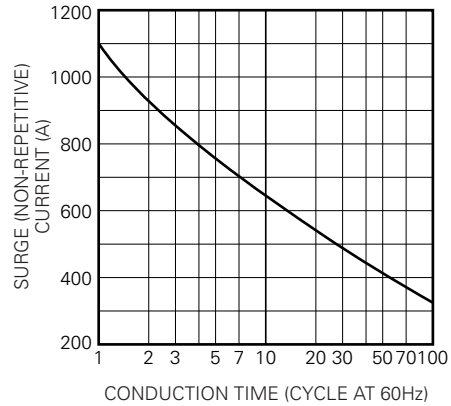
Item	IRRMS	IDRM	V <sub>TM</sub>	dv/dt	VGT	VGD	IGT	R <sub>th (j-c)</sub>	R <sub>th (c-f)</sub>
			V <sub>FM</sub>						
Thyristor	○	○	○	○	○	○	○	○	○
Diode	○	—	○	—	—	—	—	○	○

## PERFORMANCE CURVES

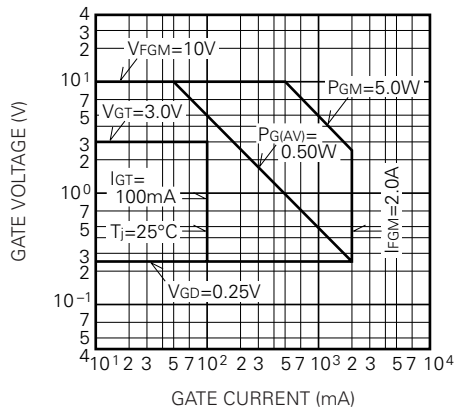
MAXIMUM FORWARD CHARACTERISTIC



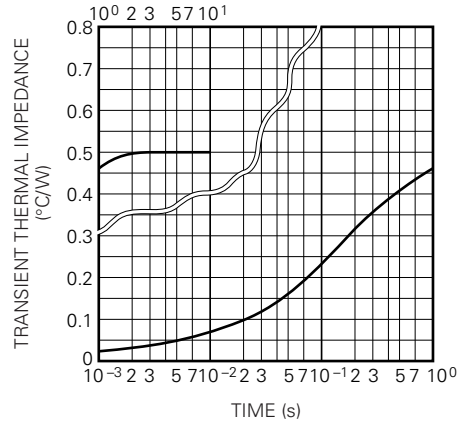
RATED SURGE (NON-REPETITIVE) CURRENT



GATE CHARACTERISTICS



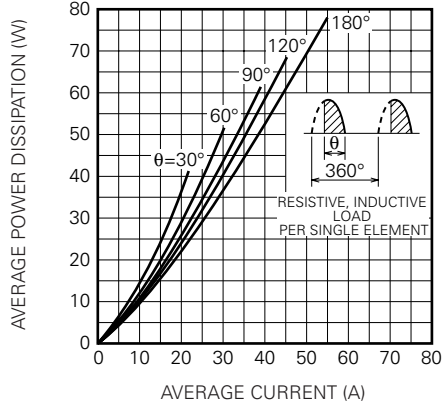
MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



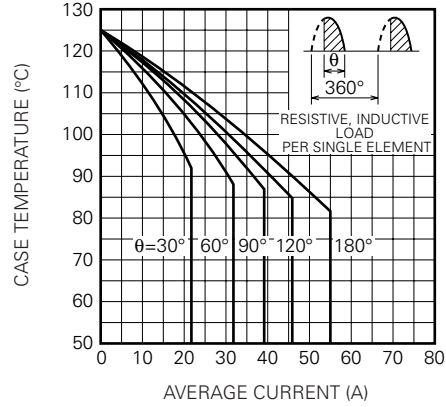
**TM55RZ/EZ-24,-2H**

**HIGH VOLTAGE MEDIUM POWER GENERAL USE  
INSULATED TYPE**

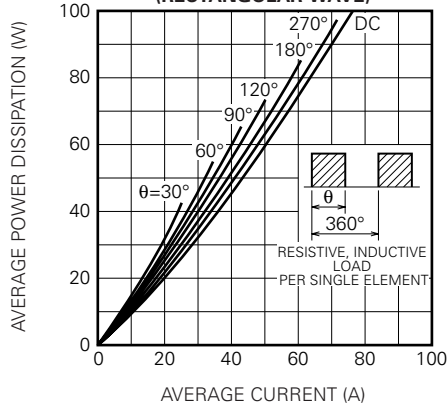
**MAXIMUM AVERAGE POWER DISSIPATION (SINGLE PHASE HALF WAVE)**



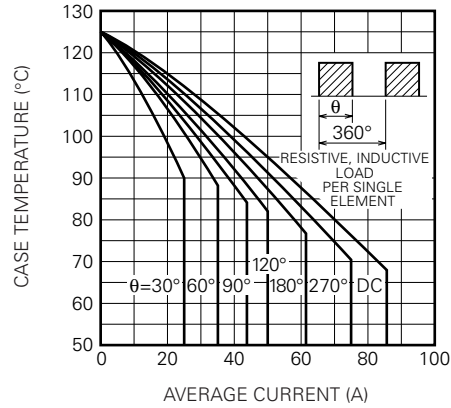
**LIMITING VALUE OF THE AVERAGE CURRENT (SINGLE PHASE HALF WAVE)**



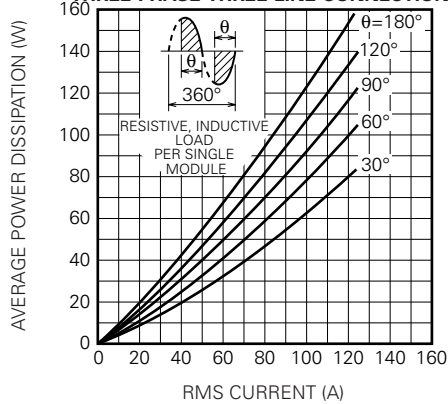
**MAXIMUM AVERAGE POWER DISSIPATION (RECTANGULAR WAVE)**



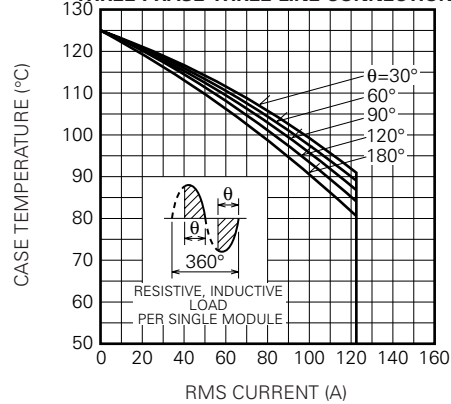
**LIMITING VALUE OF THE AVERAGE CURRENT (RECTANGULAR WAVE)**



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



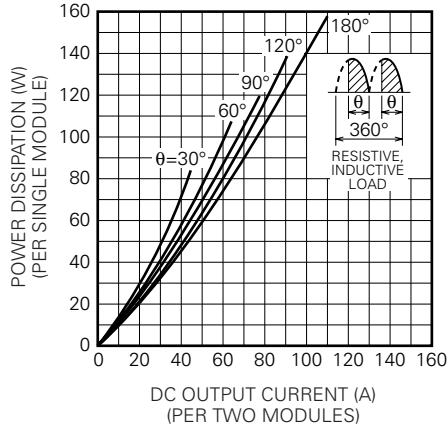
**LIMITING VALUE OF THE RMS CURRENT (REVERSE-PARALLEL CONNECTION, THREE-PHASE THREE-LINE CONNECTION)**



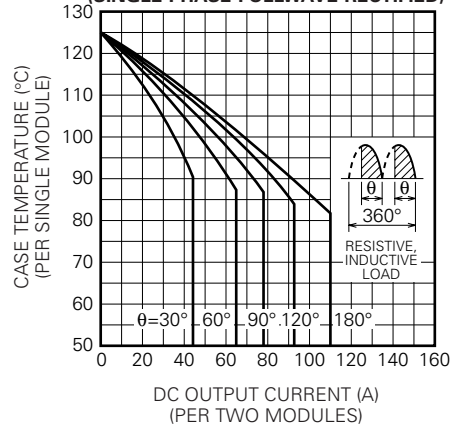
# TM55RZ/EZ-24,-2H

HIGH VOLTAGE MEDIUM POWER GENERAL USE  
INSULATED TYPE

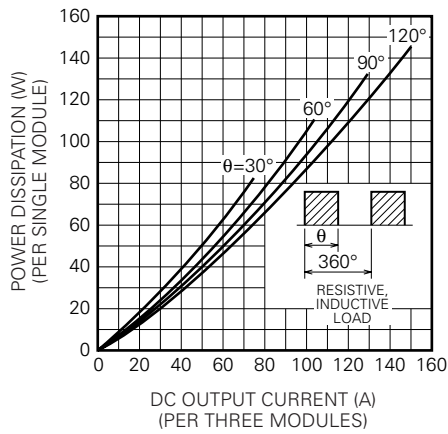
**MAXIMUM POWER DISSIPATION  
(SINGLE PHASE FULLWAVE RECTIFIED)**



**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)**

