MITSUBISHI ELECTRIC

<Diode Modules>

RM400DY-24S

HIGH POWER SWITCHING USE
INSULATED TYPE

dual (Half-Bridge)

Forward current I_F 400A
Repetitive peak reverse voltage V_{RRM} 1200V
Maximum junction temperature T_{jmax} ..... 150°C

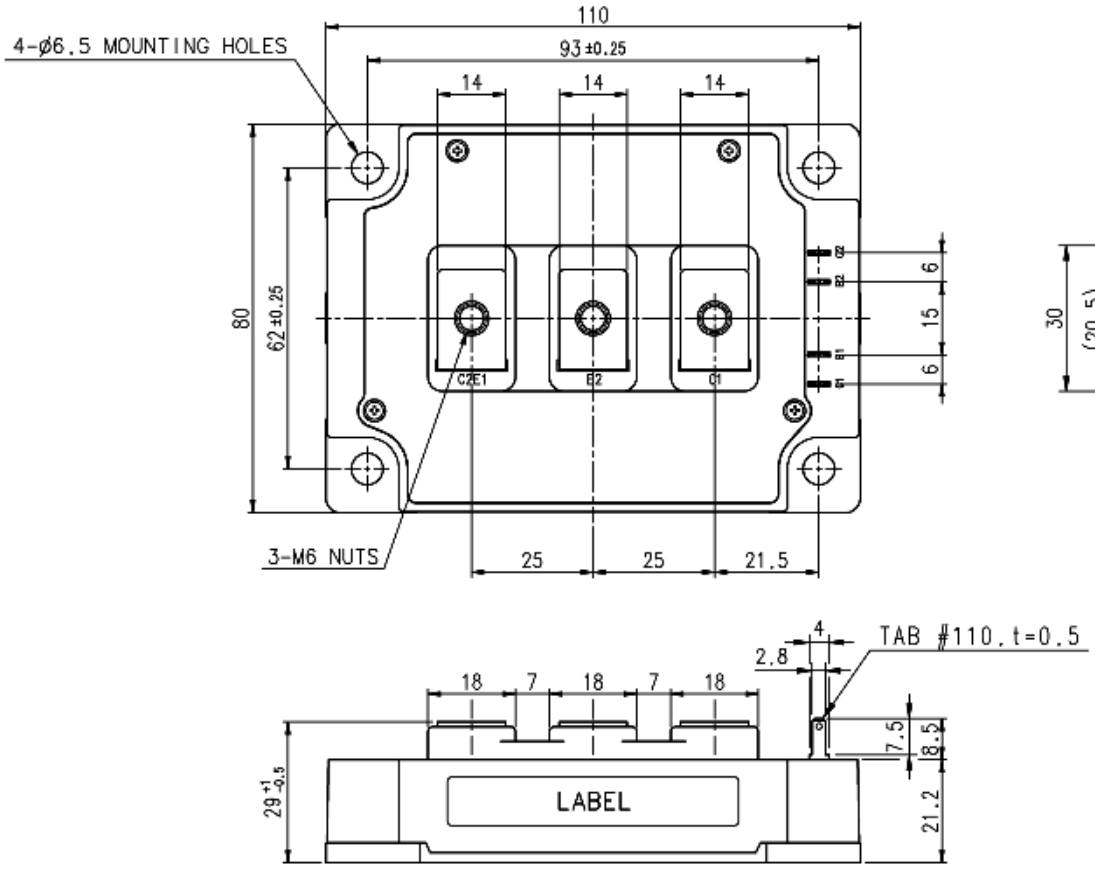
- Flat base Type
- Copper base plate
- RoHS Directive compliant
- Recognized under UL1557, File E323585

APPLICATION

AC Motor Control, Motion/Servo Control, Power supply, etc.

OUTLINE DRAWING & INTERNAL CONNECTION

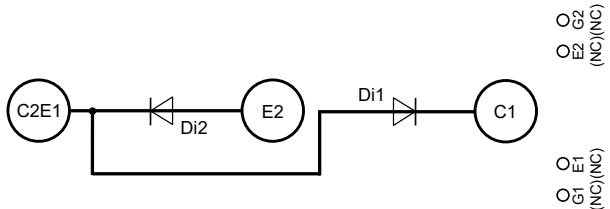
Dimension in mm



Tolerance otherwise specified

Division of Dimension	Tolerance
0.5 to 3	±0.2
over 3 to 6	±0.3
over 6 to 30	±0.5
over 30 to 120	±0.8
over 120 to 400	±1.2

INTERNAL CONNECTION



RM400DY-24S

HIGH POWER SWITCHING USE
INSULATED TYPE

MAXIMUM RATINGS (T_j=25 °C, unless otherwise specified)

Symbol	Item	Conditions	Rating	Unit
V_{RRM}	Repetitive peak reverse voltage	-	1200	V
V_{RSM}	Non-repetitive peak reverse voltage	-	1200	V
$V_{R(DC)}$	Reverse DC blocking voltage	-	960	V
I_{DC}	DC forward current	DC, T_C=68 °C (Note1, 2)	400	A
I_{FSM}	Surge non-repetitive forward current	1 cycle of half wave at 60Hz, peak value, T_j=25°C start, V_{RM}=0 V	2000	
I^2t	Current square time for fusing	t_w=8.3 ms, T_j=25 °C start, Value for one cycle of surge current	1.66×10^4	A^2s
V_{isol}	Isolation voltage	Terminals to base plate, RMS, f=60 Hz, AC 1 min	2500	V
T_j	Junction temperature	-	-40 ~ +150	°C
T_{stg}	Storage temperature	-	-40 ~ +125	

ELECTRICAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{RRM}	Reverse current	V_R=V_{RRM}, T_j=125 °C	-	-	10	mA
V_F	Forward voltage	I_F=400 A, T_j=25 °C (Note3)	-	2.6	3.3	V
t_{rr}	Reverse recovery time	V_R=600 V, I_F=400 A, T_j=25 °C, di/dt=-3500 A/μs, Inductive load	-	-	250	ns
Q_{rr}	Reverse recovery charge		-	16	-	μC
E_{rr}	Reverse recovery energy per pulse	T_j=125 °C, Inductive load	-	23.5	-	mJ
$R_{AA'-KK'}$	Internal lead resistance	Main terminal-chip, per Diode, T_C=25 °C	-	0.75	-	mΩ

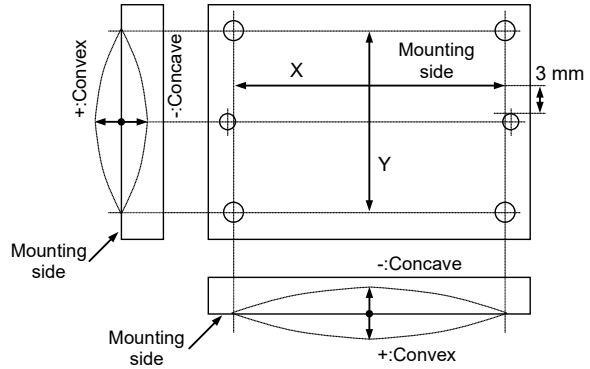
THERMAL RESISTANCE CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal resistance	Junction to case, per Diode (Note2)	-	-	62	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, per 1/2 module, Thermal grease applied (Note2, 4)	-	18	-	K/kW

MECHANICAL CHARACTERISTICS

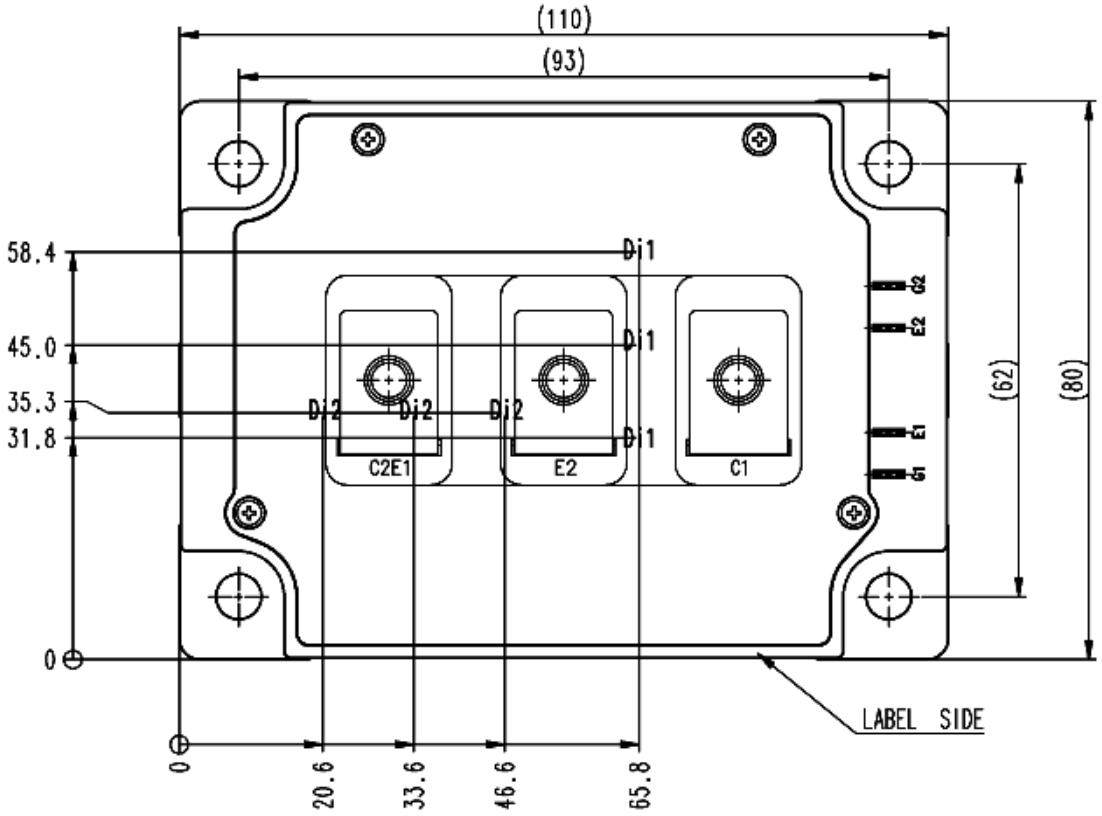
Symbol	Item	Conditions	Limits			Unit
			Min.	Typ.	Max.	
M_t	Mounting torque	Main terminals M 6 screw	3.5	4.0	4.5	N·m
M_s		Mounting to heat sink M 6 screw	3.5	4.0	4.5	N·m
m	mass	-	-	580	-	g
e_c	Flatness of base plate	On the centerline X, Y (Note5)	-100	-	+100	μm

Note1. Junction temperature (T_j) should not increase beyond T_{jmax} rating.
2. Case temperature (T_C) and heat sink temperature (T_s) are defined on the each surface (mounting side) of base plate and heat sink just under the chips. Refer to the figure of chip location.The heat sink thermal resistance should measure just under the chips.
3. Pulse width and repetition rate should be such as to cause negligible temperature rise.
4. Typical value is measured by using thermally conductive grease of λ=0.9 W/(m·K).
5. Base plate (mounting side) flatness measurement points (X, Y) are as follows of the following figure.



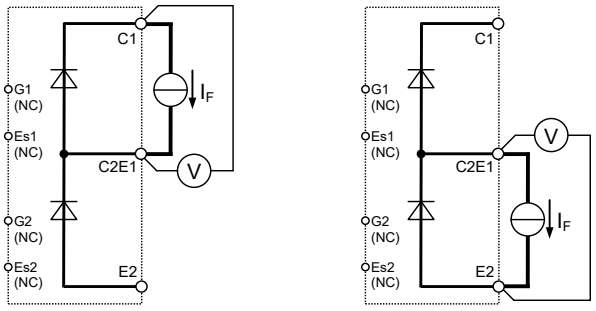
CHIP LOCATION (Top view)

Dimension in mm, tolerance: ±1 mm



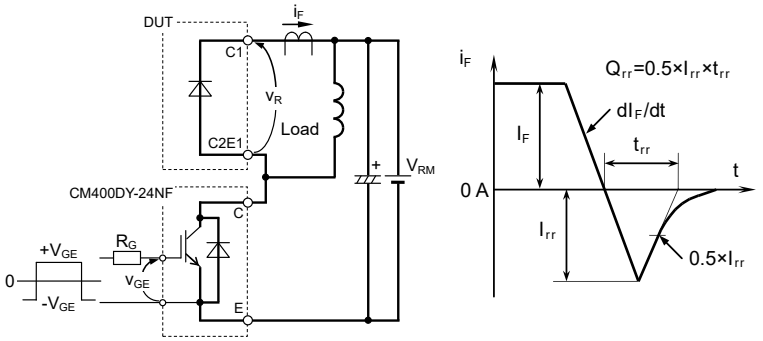
Di1/Di2: DIODE

TEST CIRCUIT

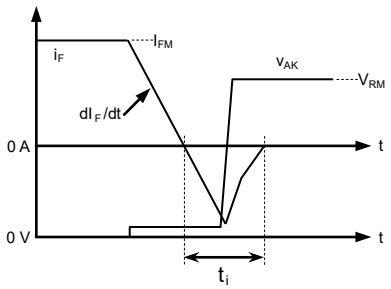


V_{EC} test circuit

TEST CIRCUIT AND WAVEFORMS



Reverse recovery characteristics test circuit and waveforms

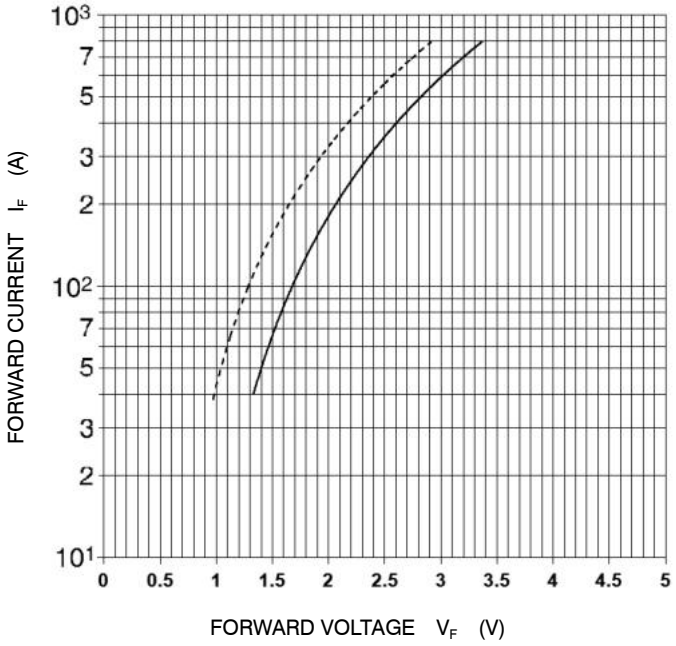


Reverse recovery energy test waveforms
(Integral time instruction drawing)

PERFORMANCE CURVES

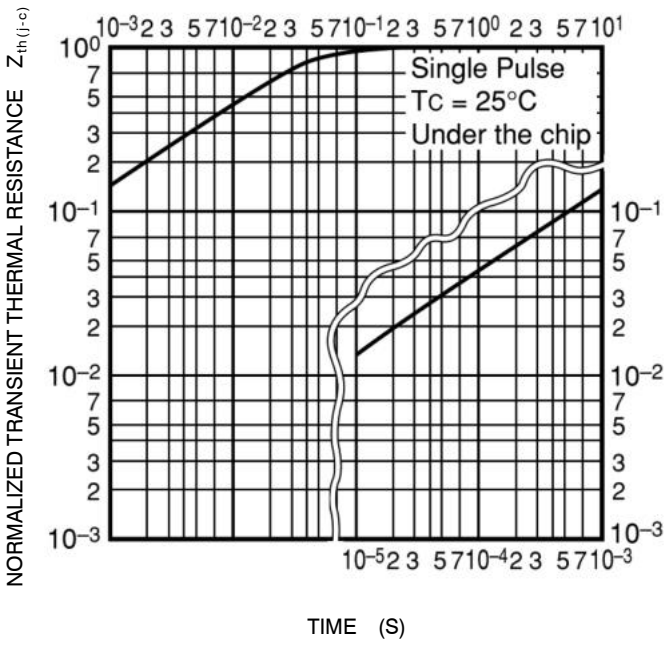
FORWARD CHARACTERISTICS
(TYPICAL)

——: T_j=25 °C, - - - - -: T_j=125 °C



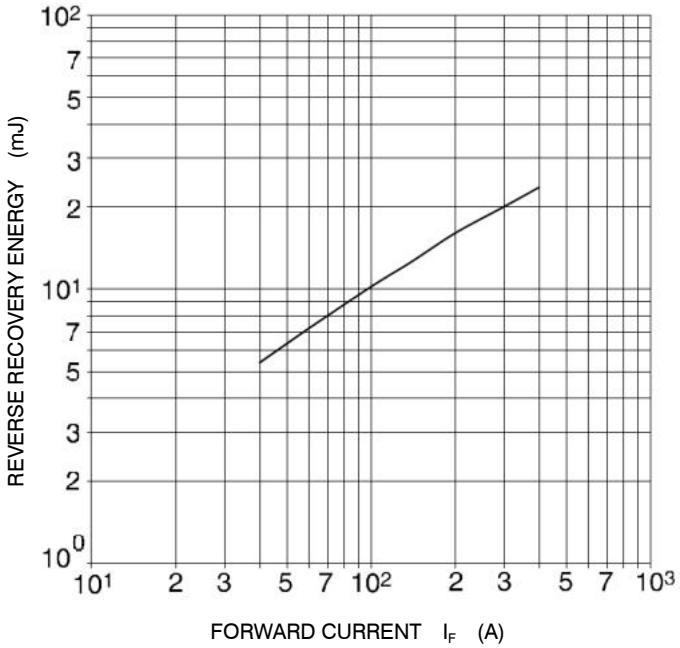
TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS
(MAXIMUM)

$R_{th(j-c)}$=62 K/kW



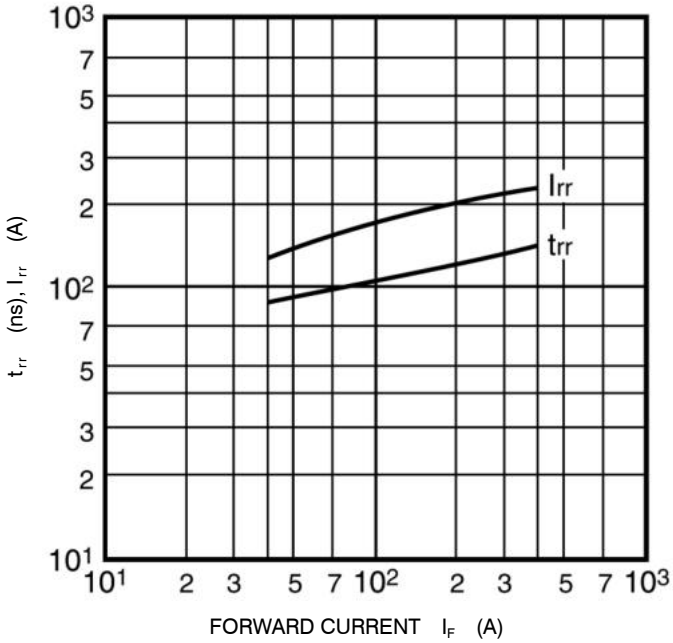
REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)

V_R=600 V, di/dt=-3500 A/μs, T_j=125 °C,
INDUCTIVE LOAD, PER PULSE



REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)

V_R=600 V, di/dt=-3500 A/μs, T_j=25 °C,
INDUCTIVE LOAD



Note: The characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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