

4R3TI20Y-080

DIODE & THYRISTOR MODULE

800V / 20A

DIODE & THYRISTOR MODULE

■ Features

- Glass Passivation Chip
- Easy Connection
- Insulated Type
- Large di/dt
- Large dv/dt

■ Applications

- Inverters
- Battery Chargers
- DC Motors
- General Purpose DC Power Supplies

■ Maximum ratings and characteristics

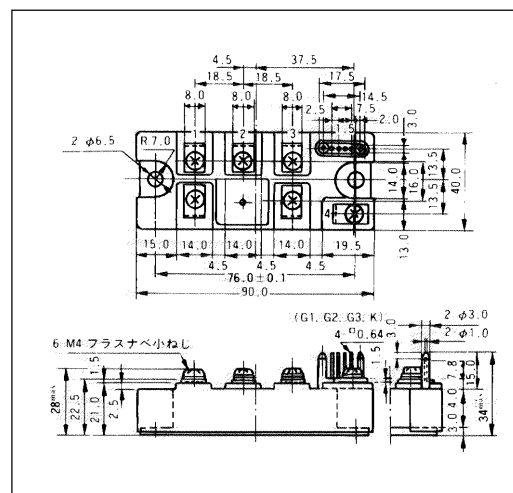
● Absolute maximum ratings

Item		Symbol	Conditions	Rating	Unit
	Repetitive peak reverse voltage	V_{RRM}		800	V
	Repetitive peak off voltage	V_{DRM}		800	V
	Non-repetitive peak reverse voltage	V_{RSM}		900	V
	Average output current	I_O	50/60Hz Sine wave, $T_c=93^{\circ}\text{C}$	20	A
	Surge current	I_{FSM}	From rated load, Sine wave 8.3ms	400	A
	I^2t	I^2t	From rated load, 8.3ms	660	A^2s
	Operating junction temperature	T_j		-40 to +125	$^{\circ}\text{C}$
	Storage temperature	T_{stg}		-40 to +125	$^{\circ}\text{C}$
	Isolation voltage	V_{is}	AC 1min.	2000	V
	Screw torque	Moumting	M5	3.0 *1	N·m
		Terminals	M4	1.7 *2	N·m
Thyristor		di/dt	$T_j=125^{\circ}\text{C}$, $f=50\text{Hz}$, $V_D=1/2V_{DRM}$ $I_{TM}=40\text{A}$, $I_{GM}=0.3\text{A}$, $di_G/dt=0.3\text{A}/\mu\text{s}$	100	$\text{A}/\mu\text{s}$
	Forward peak gate current	I_{FGM}	100 μs max	2	A
	Peak gate power	P_{GM}	100 μs max	5	W
	Average gate power	$P_{G(AV)}$		0.5	W
	Peak reverse gate voltage	V_{RGM}		5	V

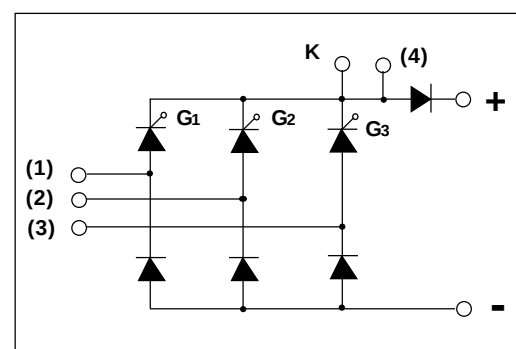
*1: Recommendable value : 2.0 to 3.0 N·m(M5)

*2: Recommendable value : 1.3 to 1.7 N·m(M4)

■ Outline Drawings, mm



■ Inner Circuit Schematic



●Electrical characteristics (Ta=25°C Unless otherwise specified)

	Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thyristor	Forward voltage drop	V_{FM}	$T_j=25^{\circ}\text{C}$, $I_{FM}=20\text{A}$			1.30	V
	Reverse current	I_{RRM}	$T_j=125^{\circ}\text{C}$, $V_R=V_{RRM}$			3	mA
	Off current	I_{DRM}	$T_j=125^{\circ}\text{C}$, $V_R=V_{DRM}$			3	mA
	Gate trigger current	I_{GT}	$T_j=25^{\circ}\text{C}$, $V_D=6\text{V}$ $I_T=1\text{A}$			80	mA
	Gate trigger voltage	V_{GT}				2.5	V
	Gate non-trigger voltage	V_{GD}	$T_j=125^{\circ}\text{C}$, $V_D=1/2V_{DRM}$	0.2			V
		I_H				120	mA
		dv/dt	$T_j=125^{\circ}\text{C}$, $V_D=2/3V_{DRM}$	500			V/ μs
	Turn-on time	t_{gt}	$T_j=25^{\circ}\text{C}$, $V_D=1/2V_{DRM}$ $I_{TM}=40\text{A}$ $I_{GM}=0.3\text{A}$ $diG/dt=0.3\text{A}/\mu\text{s}$		3		μs
	Turn-off time	T_q	$T_j=125^{\circ}\text{C}$, $I_{TM}=20\text{A}$ $-di/dt=5\text{A}/\mu\text{s}$ $V_R>50\text{V}$ $V_D=1/2V_{DRM}$		100		μs
Diode	Forward voltage drop	V_{FM}	$T_j=25^{\circ}\text{C}$, $I_{FM}=20\text{A}$	Rectifier diode		1.20	V
				Output diode		1.10	V
	Reverse current	I_{RRM}	$T_j=125^{\circ}\text{C}$, $V_R=V_{RRM}$	Rectifier diode		3	mA
				Output diode		6	mA

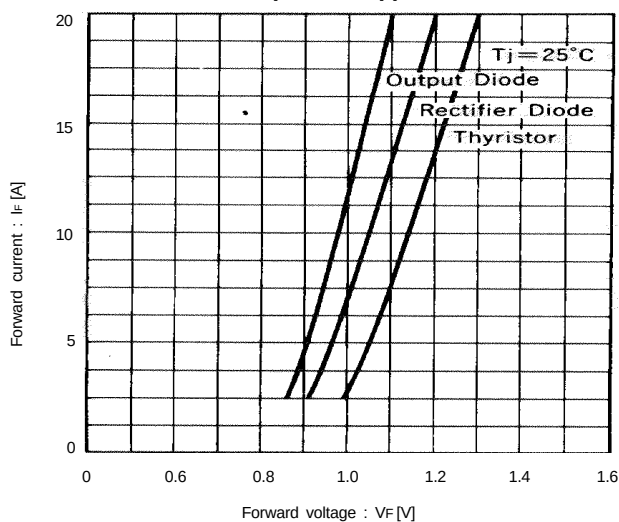
● Thermal Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance	$R_{th(j-c)}$	Junction to case 1 Chip	Thyristor		4.0	$^{\circ}\text{C}/\text{W}$
			Rectifier diode		4.4	
			Output diode		1.6	
	$R_{th(c-f)}$	the base to cooling fin *			0.06	$^{\circ}\text{C}/\text{W}$

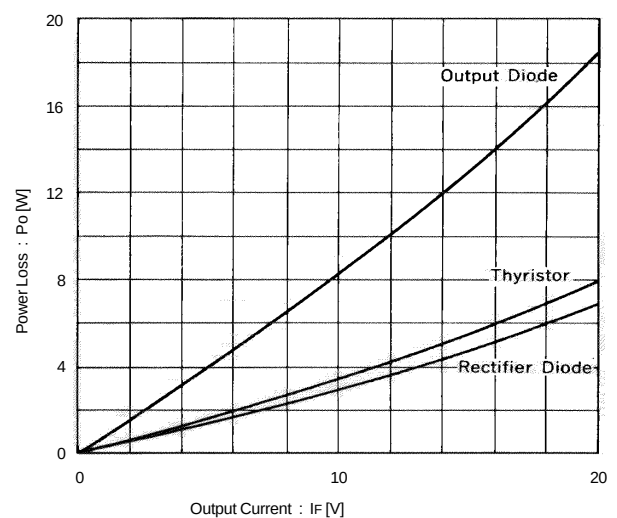
* : With Thermal Compound

■ Characteristics

Maximum On-State Voltage/Forward Voltage Characteristics (Per 1 chip)

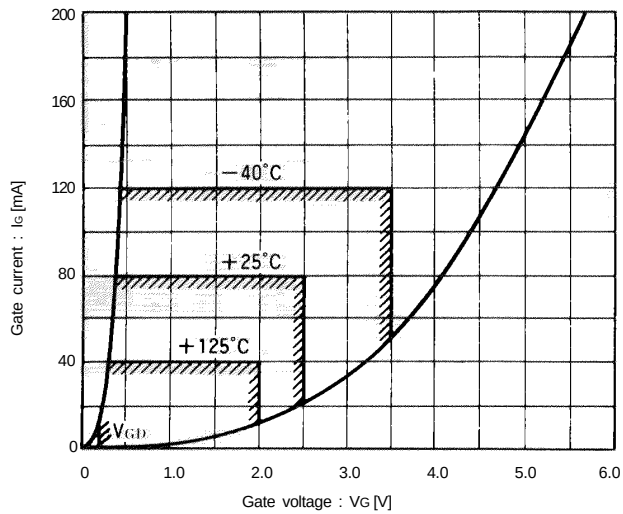


Output Current vs. Power Loss (Per 1 chip)

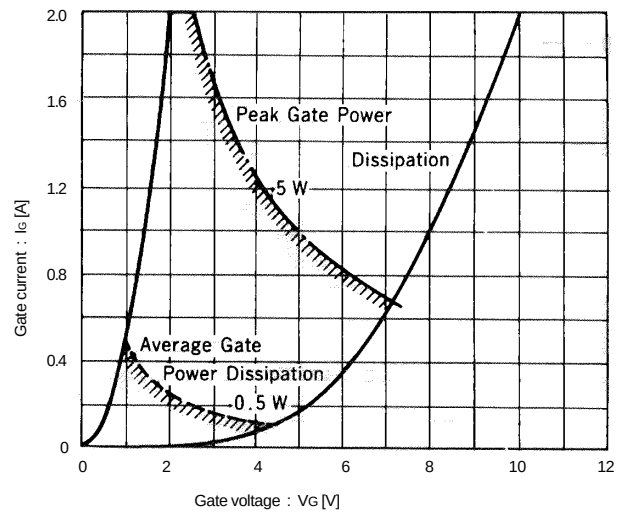


Characteristics

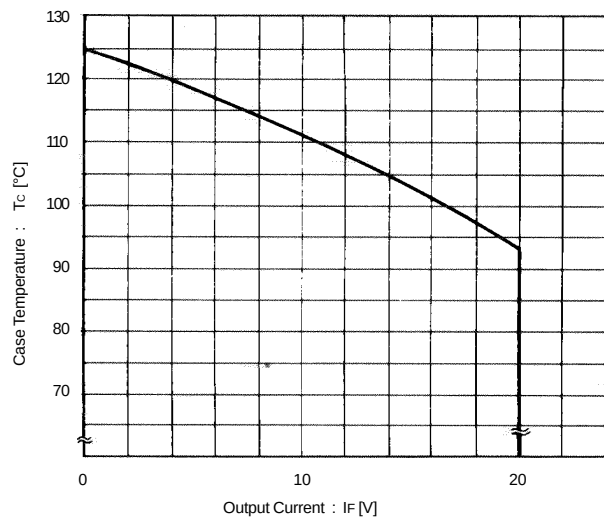
Gate Characteristics



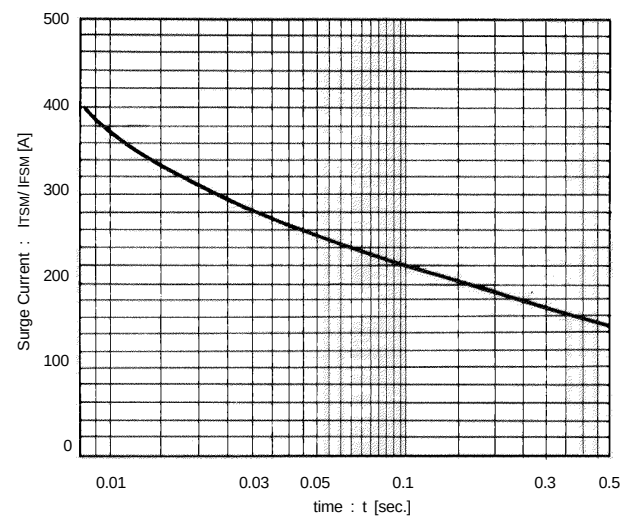
Gate Characteristics



Output Current vs. Case Temperature



Surge Current



Transient Thermal Impedance
(Per 1 chip, Junction to Case)

