

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

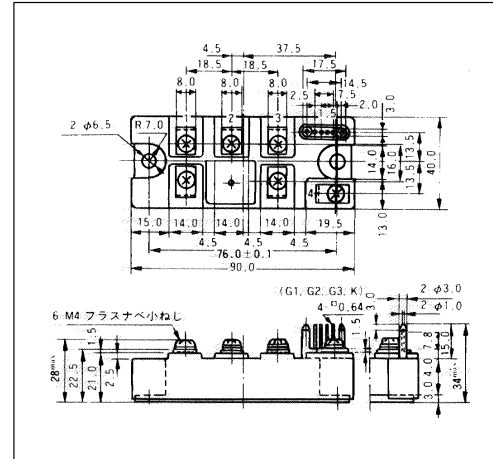
Absolute maximum ratings

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	A	
	Peak gate power	P_{GM}	100 μs max	W	
	Average gate power	$P_{G(AV)}$		0.5	W
	Peak reverse gate voltage	V_{RGM}		5	V

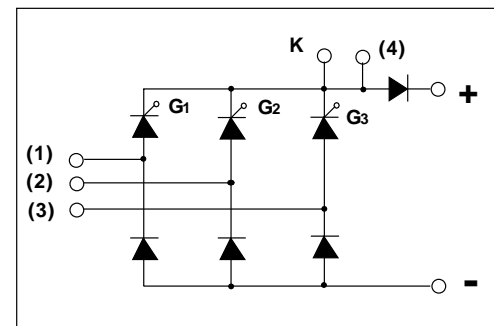
*1: Recommendable value : 2.0 to 3.0 N·m(M5)

*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°C, I _{FM} =20A			1.30	V
	Reverse current	I _{RRM}	T _j =125°C, V _R =V _{RRM}			3	mA
	Off current	I _{DRM}	T _j =125°C, V _R =V _{DRM}			3	mA
	Gate trigger current	I _{GT}	T _j =25°C, V _D =6V I _T =1A			80	mA
	Gate trigger voltage	V _{GT}				2.5	V
	Gate non-trigger voltage	V _{GD}	T _j =125°C, V _D =1/2V _{DRM}	0.2			V
		I _H				120	mA
		dv/dt	T _j =125°C, V _D =2/3V _{DRM}	500			V/μs
	Turn-on time	t _{gt}	T _j =25°C, V _D =1/2V _{DRM} I _{TM} =40A I _{GM} =0.3A diG/dt=0.3A/μs		3		μs
	Turn-off time	T _q	T _j =125°C, I _{TM} =20A -di/dt=5A/μs V _R =>50v V _D =1/2V _{DRM}		100		μs
Diode	Forward voltage drop	V _{FM}	T _j =25°C, I _{FM} =20A	Rectifier diode		1.20	V
				Output diode		1.10	V
	Reverse current	I _{RRM}	T _j =125°C, V _R =V _{RRM}	Rectifier diode		3	mA
				Output diode		6	mA

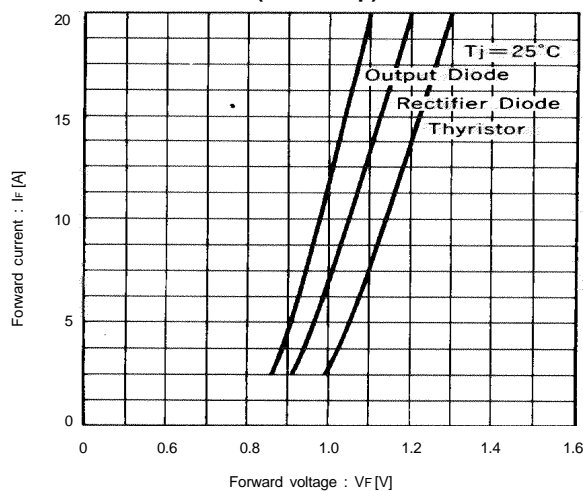
● Thermal Characteristics

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

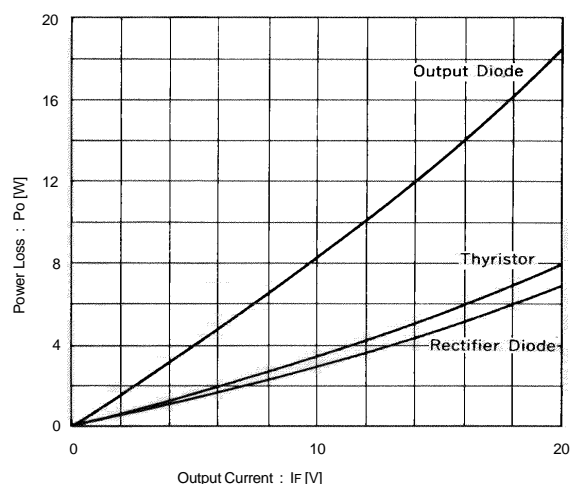
* : With Thermal Compound

■ Characteristics

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

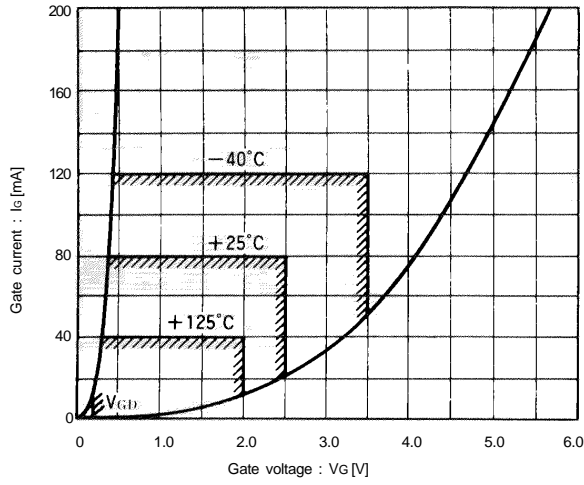


Output Current vs. Power Loss (Per 1 chip)

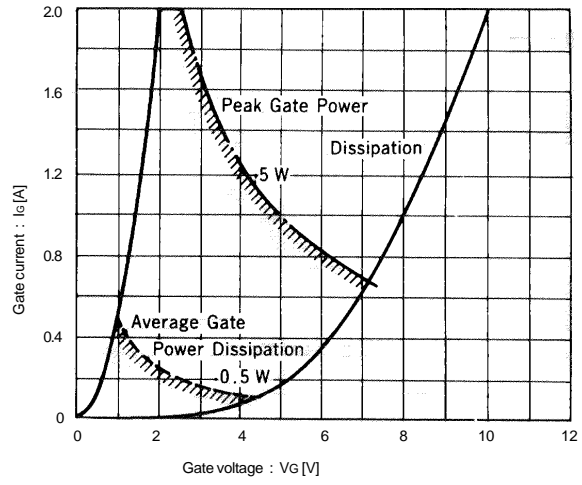


■ Characteristics

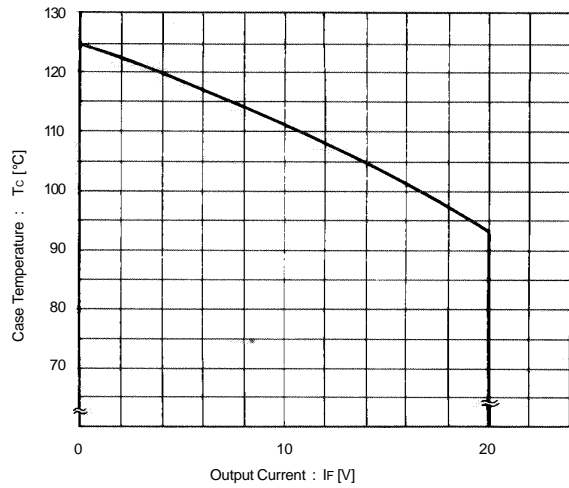
Gate Characteristics



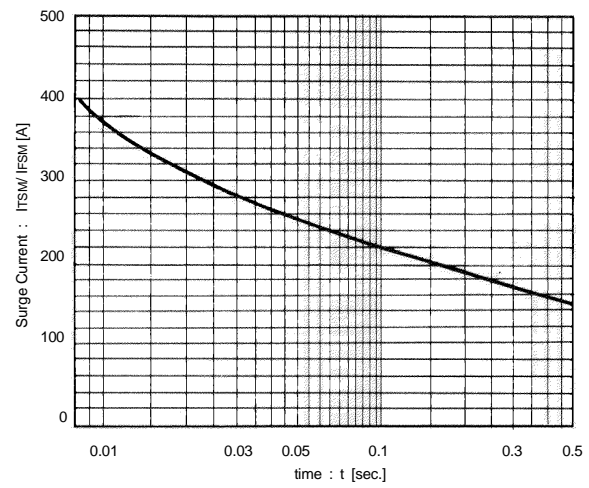
Gate Characteristics



Output Current vs. Case Temperature



Surge Current



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

