

# 4R3TI30Y-080

## DIODE & THYRISTOR MODULE

800V / 30A

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

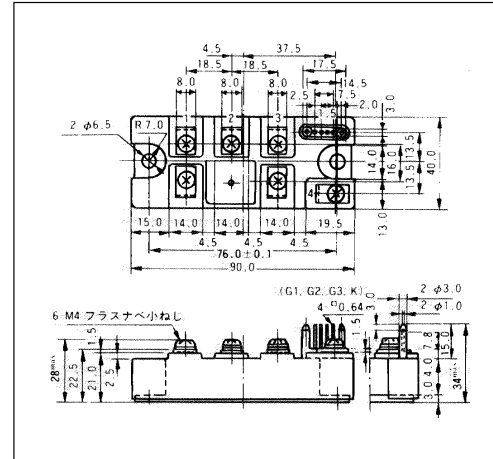
#### Absolute maximum ratings

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, $T_c=93^\circ\text{C}$	30	A	
Surge current	$I_{FSM}$	From rated load, Sine wave 8.3ms	600	A	
$I^2t$	$I^2t$	From rated load, 8.3ms	1490	$\text{A}^2\text{s}$	
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	$T_j=125^\circ\text{C}$ , $f=50\text{Hz}$ , $V_D=1/2V_{DRM}$ $I_{TM}=60\text{A}$ , $I_{GM}=0.3\text{A}$ , $di_G/dt=0.3\text{A}/\mu\text{s}$	100	$\text{A}/\mu\text{s}$	
	Forward peak gate current	$I_{FGM}$	100 $\mu\text{s}$ max	A	
	Peak gate power	$P_{GM}$	100 $\mu\text{s}$ max	W	
	Average gate power	$P_{G(AV)}$		0.5	W
	Peak reverse gate voltage	$V_{RGM}$		5	V

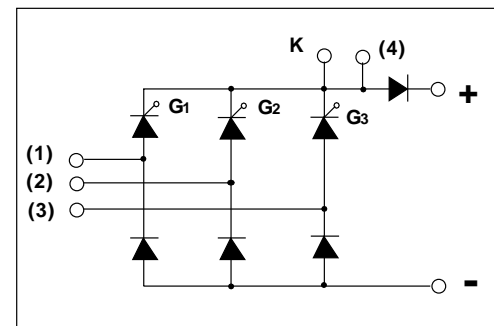
\*1: Recommendable value : 2.0 to 3.0 N·m(M5)

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

### Outline Drawings, mm



### Inner Curcuit Schematic



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

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit
Thyristor	Forward voltage drop	$V_{FM}$	$T_j=25^\circ\text{C}$ , $I_{FM}=30\text{A}$			1.40	V
	Reverse current	$I_{RRM}$	$T_j=125^\circ\text{C}$ , $V_R=V_{RRM}$			4	mA
	Off current	$I_{DRM}$	$T_j=125^\circ\text{C}$ , $V_R=V_{DRM}$			4	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
		$I_H$				150	mA
		$dv/dt$	$T_j=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$	500			V/ $\mu\text{s}$
	Turn-on time	$t_{gt}$	$T_j=25^\circ\text{C}$ , $V_D=1/2V_{DRM}$ $I_{TM}=60\text{A}$ $I_{GM}=0.3\text{A}$ $diG/dt=0.3\text{A}/\mu\text{s}$		3		$\mu\text{s}$
	Turn-off time	$T_q$	$T_j=125^\circ\text{C}$ , $I_{TM}=30\text{A}$ $-di/dt=5\text{A}/\mu\text{s}$ $V_R \Rightarrow 50\text{V}$ $V_D=1/2V_{DRM}$		100		$\mu\text{s}$
Diode	Forward voltage drop	$V_{FM}$	$T_j=25^\circ\text{C}$ , $I_{FM}=30\text{A}$	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		10	mA

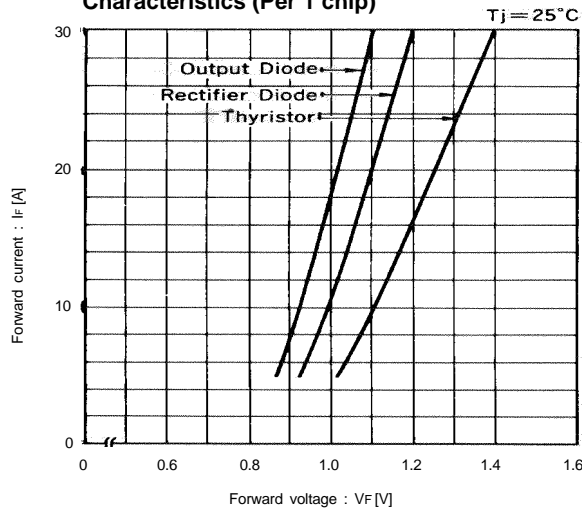
● Thermal Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Thermal resistance	$R_{th(j-c)}$	Junction to case 1 Chip	Thyristor			2.5	$^\circ\text{C}/\text{W}$
			Rectifier diode			3.0	
			Output diode			1.0	
	$R_{th(c-f)}$	the base to cooling fin *			0.06	$^\circ\text{C}/\text{W}$	

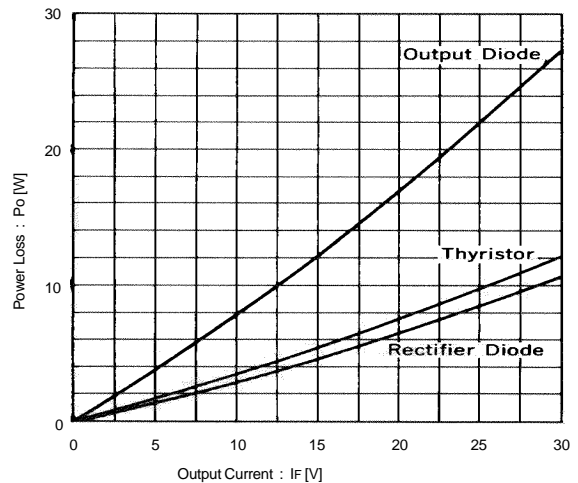
\* : With Thermal Compound

■ Characteristics

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

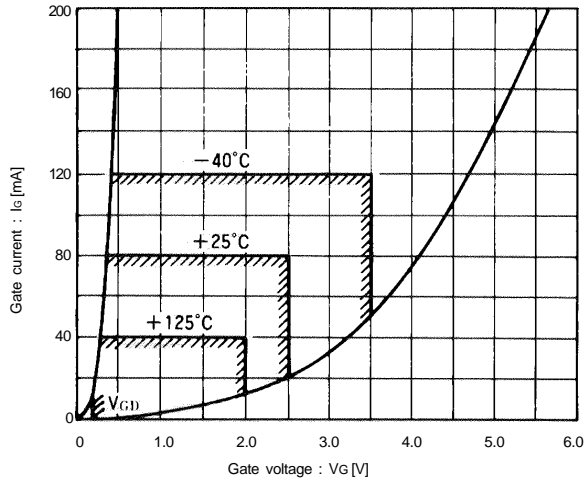


Output Current vs. Power Loss (Per 1 chip)

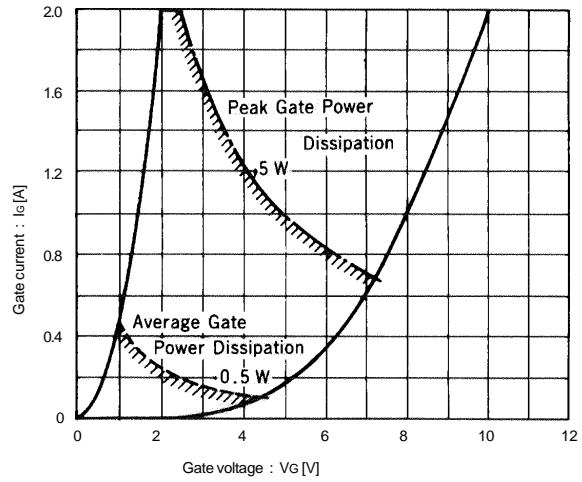


■ Characteristics

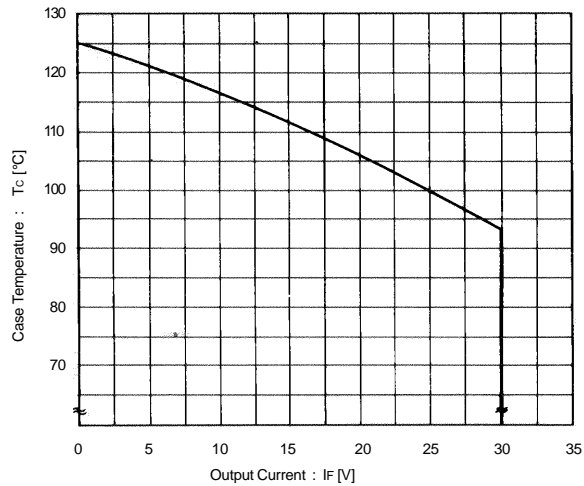
Gate Characteristics



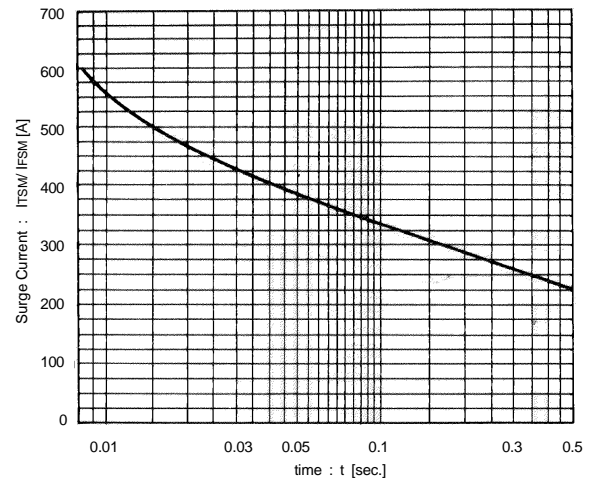
Gate Characteristics



Output Current vs. Case Temperature



Surge Current



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

