

# THYRISTOR MODULE (SINGLE PHASE BRIDGE TYPE)

## FSD20A30/60

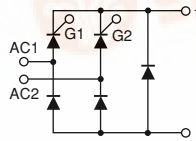
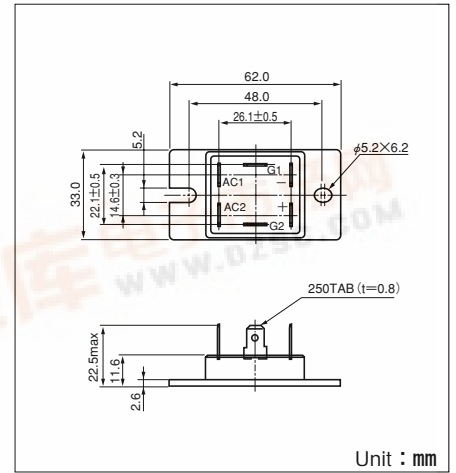
UL:E76102 (M)

FSD20A is a single phase bridge module consist of thyristors and diodes

- $I_D=20A$ ,  $V_{RRM}=600V$
- Easy Construction
- Highly reliable glass passivated chips

(Applications)

Rectification (Bridge)  
Motor Drive



Maximum Ratings

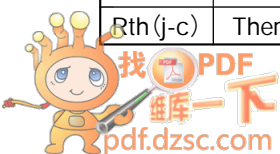
(T<sub>j</sub>=25°C unless otherwise specified)

Symbol	Item	Ratings		Unit
		FSD20A30	FSD20A60	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	300	600	V
V <sub>DRM</sub>	Repetitive Peak Off-State Voltage	300	600	V

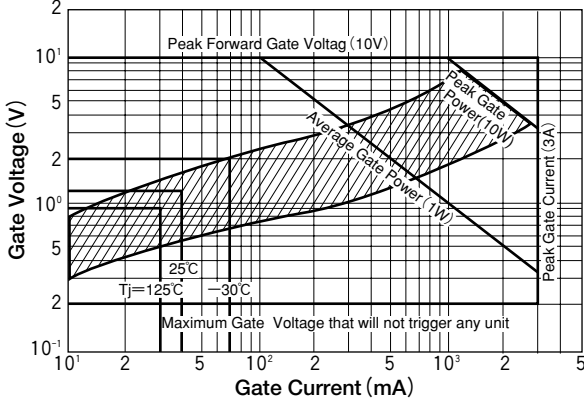
Symbol	Item	Conditions	Ratings	Unit
I <sub>T(AV)</sub>	Average On-State Current	Single phase, half wave, 180° conduction, T <sub>c</sub> : 65°C	20	A
I <sub>TSM</sub>	Surge On-State Current	1/2 cycle, 50Hz/60Hz, peak value, non-repetitive	180/200	A
I <sup>2</sup> t	I <sup>2</sup> t		165	A <sup>2</sup> S
P <sub>GM</sub>	Peak Gate Power Dissipation		10	W
P <sub>G(AV)</sub>	Average Gate Power Dissipation		1	W
I <sub>FGM</sub>	Peak Gate Current		3	A
V <sub>FGM</sub>	Peak Gate Voltage (Forward)		10	V
V <sub>RGM</sub>	Peak Gate Voltage (Reverse)		5	V
di/dt	Critical Rate of On-State Current	I <sub>G</sub> =100mA, T <sub>j</sub> =25°C, V <sub>D</sub> =1/2V <sub>DRM</sub> , di <sub>G</sub> /dt=1A/μs	100	A/μs
V <sub>ISO</sub>	Isolation Breakdown Voltage (R.M.S.)	A.C. 1minute	2500	V
T <sub>j</sub>	Operating Junction Temperature		-30 to +125	°C
T <sub>stg</sub>	Storage Temperature		-30 to +125	°C
	Mounting Torque (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
	Mass		66	g

Electrical Characteristics

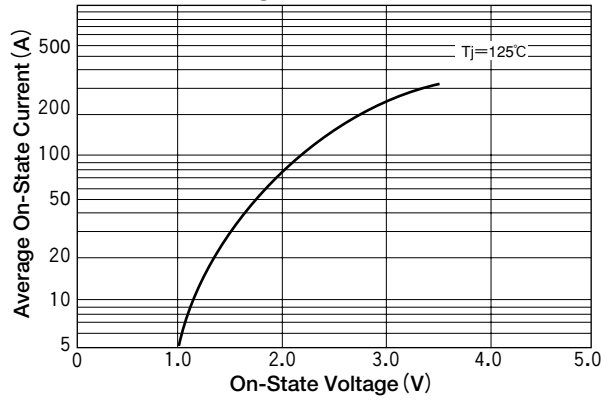
Symbol	Item	Conditions	Ratings	Unit
I <sub>DRM</sub>	Repetitive Peak Off-State Current, max.	at V <sub>DRM</sub> , single phase, half wave, T <sub>j</sub> =125°C	5	mA
I <sub>RRM</sub>	Repetitive Peak Reverse Current, max.	at V <sub>DRM</sub> , single phase, half wave, T <sub>j</sub> =125°C	5	mA
V <sub>TM</sub>	Peak On-State Voltage, max.	On-State Current 30A, T <sub>j</sub> =25°C Inst. measurement	1.5	V
I <sub>GT</sub> /V <sub>GT</sub>	Gate Trigger Current/Voltage, max.	T <sub>j</sub> =25°C, I <sub>T</sub> =1A, V <sub>D</sub> =6V	40/1.2	mA/V
V <sub>GD</sub>	Non-Trigger Gate, Voltage. min.	T <sub>j</sub> =125°C, V <sub>D</sub> =1/2V <sub>DRM</sub>	0.2	V
t <sub>gt</sub>	Turn On Time, max.	I <sub>T</sub> =10A, I <sub>G</sub> =100mA, T <sub>j</sub> =25°C, V <sub>D</sub> =1/2V <sub>DRM</sub> , di <sub>G</sub> /dt=1A/μs	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	T <sub>j</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub> , Exponential wave.	50	V/μs
I <sub>H</sub>	Holding Current, typ.	T <sub>j</sub> =25°C	30	mA
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to case	1.0	°C/W



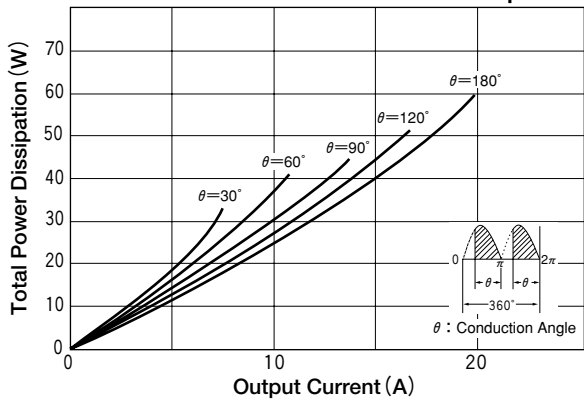
**Gate Characteristics**



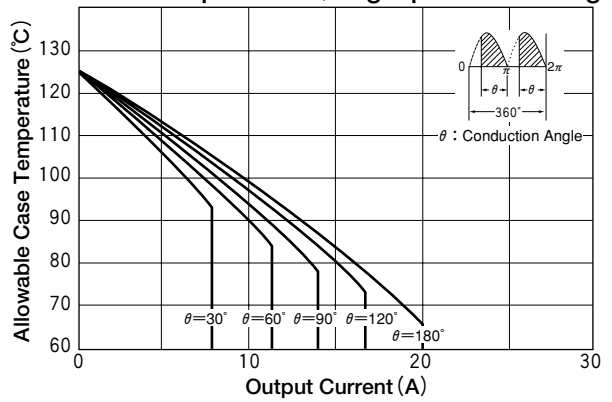
**On-State Voltage max**



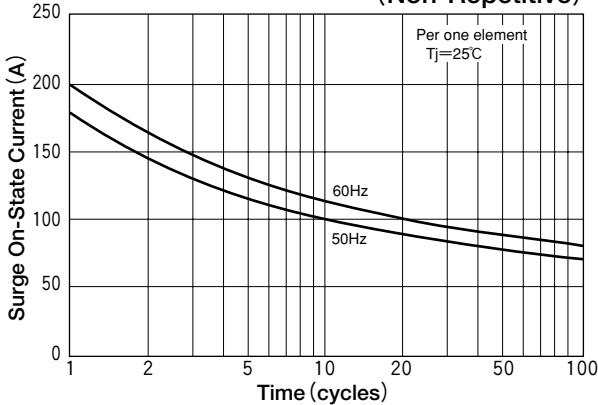
**Output Current Current Vs Total Power Dissipation**



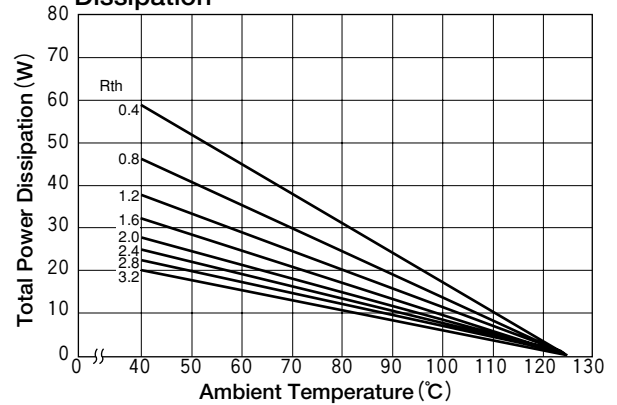
**Output Current Vs Maximum Allowable Case Temperature (Single phase full bridge)**



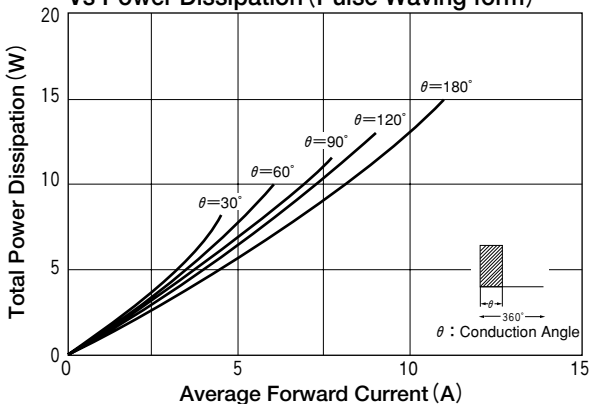
**Surge On-State Current Rating (Non-Repetitive)**



**Ambient Temperature Vs Total Power Dissipation**



**Free Wheeling Diode Average On-State Current Vs Power Dissipation (Pulse Waving form)**



**Free Wheeling Diode Average On-State Current Vs Maximum Allowable Case Temperature (Pulse Waving form)**

