

# FGC800A-130DS

HIGH POWER INVERTER USE  
PRESS PACK TYPE

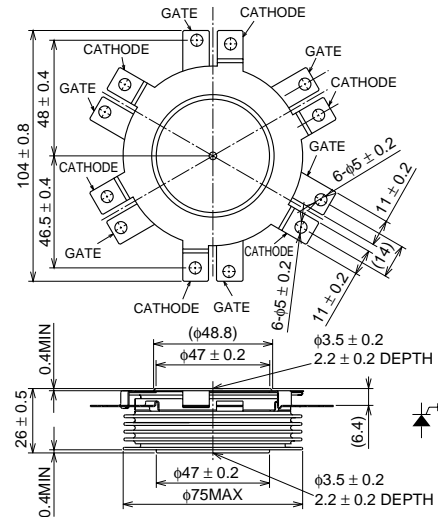
**FGC800A-130DS**



- Symmetrical GCT
- ITQRM Repetitive controllable on-state current ..... 800A
- IT(AV) Average on-state current ..... 330A
- VDRM Repetitive peak off-state voltage ..... 6500V

**OUTLINE DRAWING**

Dimensions in mm



## APPLICATION

Inverters, DC choppers, Induction heaters, DC to DC converters.

## MAXIMUM RATINGS

Symbol	Parameter	Conditions	Voltage class	Unit
VRRM	Repetitive peak reverse voltage	—	6500	V
VRSM	Non-repetitive peak reverse voltage	—	6500	V
VDRM	Repetitive peak off-state voltage	VGK = -2V	6500	V
VDSM	Non-repetitive peak off-state voltage	VGK = -2V	6500	V
VLDS	Long term DC stability voltage	VGK = -2V, λ = 100 Fit	3600	V

Symbol	Parameter	Conditions	Ratings	Unit
ITQRM	Repetitive controllable on-state current	VDM = 3/4 VDRM, VD = 3000V, LC = 0.3μH, VRG = 20V Tj = 25/115°C, With GU-D08 (see Fig. 1, 3)	800	A
IT(RMS)	RMS on-state current	Applied for all conduction angles	520	A
IT(AV)	Average on-state current	f = 60Hz, sinewave θ = 180°, Tf = 55°C	330	A
ITSM	Surge on-state current	One half cycle at 60Hz, Tj = 115°C Start	4.8	kA
i <sup>2</sup> t	Current-squared, time integration		9.6 × 10 <sup>4</sup>	A <sup>2</sup> s
diT/dt	Critical rate of rise of on-state current	Vd = 3000V, It = 800A, Cs = 0.1μF, Rs = 10Ω Tj = 25/115°C, f = 60Hz, With GU-D08 (see Fig. 1,2)	1000	A/μs
VFGM	Peak forward gate voltage		10	V
VRGM	Peak reverse gate voltage		21	V
IFGM	Peak forward gate current		500	A
IRGM	Peak reverse gate current		800	A
PFGM	Peak forward gate power dissipation		5	kW
PRGM	Peak reverse gate power dissipation		17	kW
PFG(AV)	Average forward gate power dissipation		100	W
PRG(AV)	Average reverse gate power dissipation		120	W
Tj	Junction temperature		-20 ~ +115	°C
Tstg	Storage temperature		-20 ~ +150	°C
—	Mounting force required	(Recommended value 13kN)	11.1 ~ 15.8	kN
—	Weight	Typical value	530	g

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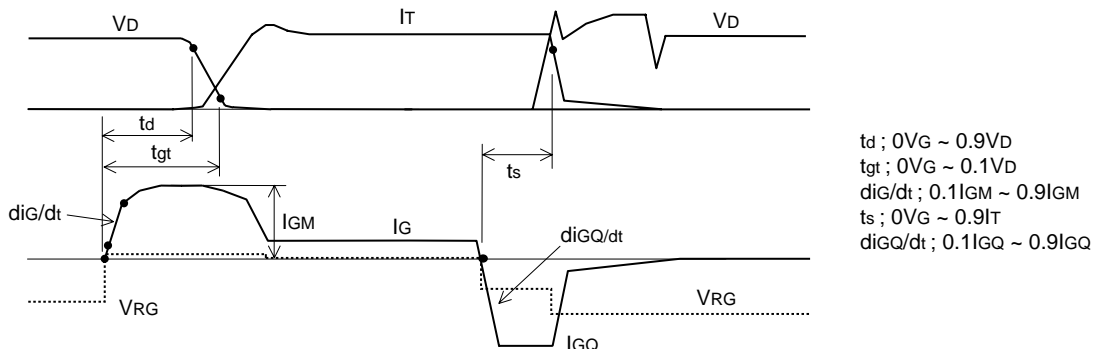
**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V <sub>TM</sub>	On-state voltage	I <sub>T</sub> = 800A, T <sub>j</sub> = 115°C	—	—	6.8	V
I <sub>RRM</sub>	Repetitive peak reverse current	V <sub>RM</sub> = 6500V, T <sub>j</sub> = 115°C	—	—	150	mA
I <sub>DRM</sub>	Repetitive peak off-state current	V <sub>DM</sub> = 6500V, V <sub>GK</sub> = -2V, T <sub>j</sub> = 115°C	—	—	100	mA
I <sub>GRM</sub>	Reverse gate current	V <sub>RG</sub> = 21V, T <sub>j</sub> = 115°C	—	—	50	mA
dv/dt	Critical rate of rise of off-state voltage	V <sub>D</sub> = 3000V, V <sub>GK</sub> = -2V, T <sub>j</sub> = 115°C (Expo. wave) (see Fig. 4)	3000	—	—	V/μs
t <sub>gt</sub>	Turn-on time	I <sub>T</sub> = 800A, V <sub>D</sub> = 3000V, di/dt = 1000A/μs, T <sub>j</sub> = 115°C	—	—	5.0	μs
t <sub>d</sub>	Delay time	C <sub>S</sub> = 0.1μF, R <sub>S</sub> = 10Ω	—	—	1.0	μs
E <sub>on</sub>	Turn-on switching energy	With GU-D08 (see Fig. 1, 2)	—	—	1.6	J/P
t <sub>s</sub>	Storage time	I <sub>T</sub> = 800A, V <sub>DM</sub> = 3/4 V <sub>DRM</sub> , V <sub>D</sub> = 3000V C <sub>S</sub> = 0.1μF, R <sub>S</sub> = 10Ω, V <sub>RG</sub> = 20V, T <sub>j</sub> = 115°C	—	—	3.0	μs
E <sub>off</sub>	Turn-off switching energy	With GU-D08 (see Fig. 1, 5)	—	—	6.0	J/P
Q <sub>RR</sub>	Reverse recovery charge	V <sub>R</sub> = 3000V, I <sub>T</sub> = 800A, di/dt = 1000A/μs	—	—	1650	μC
E <sub>rec</sub>	Reverse recovery energy	C <sub>S</sub> = 0.1μF, R <sub>S</sub> = 10Ω, T <sub>j</sub> = 115°C (see Fig. 5, 6)	—	—	5.0	J/P
I <sub>GT</sub>	Gate trigger current	DC METHOD : V <sub>D</sub> = 24V, R <sub>L</sub> = 0.1Ω, T <sub>j</sub> = 25°C	—	—	0.5	A
V <sub>GT</sub>	Gate trigger voltage	DC METHOD : V <sub>D</sub> = 24V, R <sub>L</sub> = 0.1Ω, T <sub>j</sub> = 25°C	—	—	1.5	V
R <sub>th(j-f)</sub>	Thermal resistance	Junction to fin	—	—	0.025	°C/W

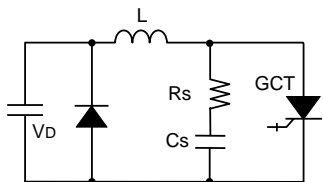
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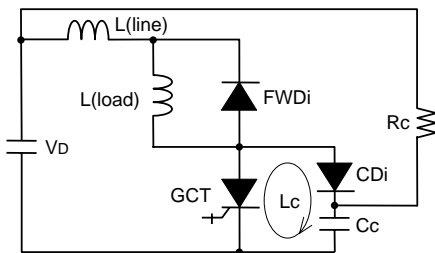
**Fig. 1 Turn-on and Turn-off waveform**



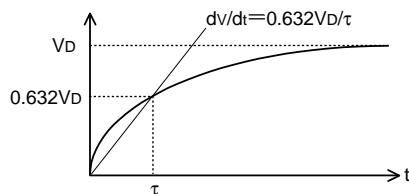
**Fig. 2 Turn-on test circuit**



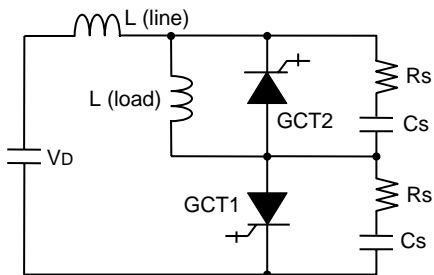
**Fig. 3 Turn-off test circuit (With clamp circuit)**



**Fig. 4 dv/dt test waveform**

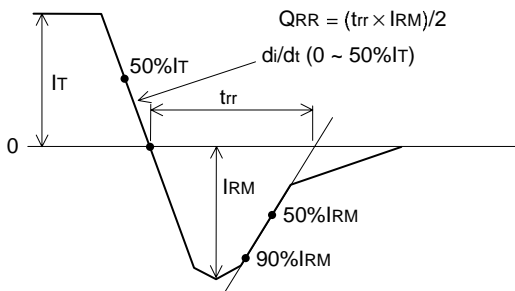


**Fig. 5 Turn-off and Recovery test circuit**



GCT1 : For turn-off test  
GCT2 : For Recovery test

**Fig. 6 Reverse recovery waveform**

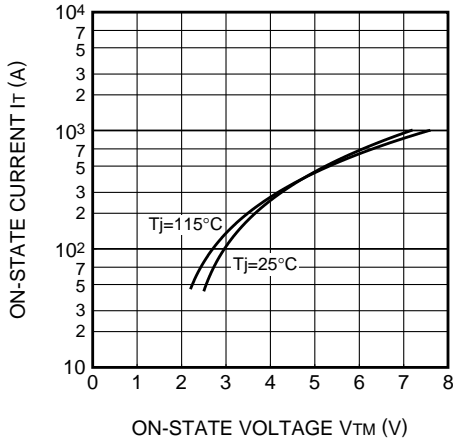


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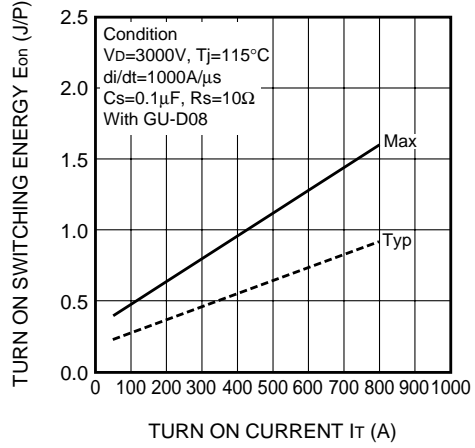
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## PERFORMANCE CURVES

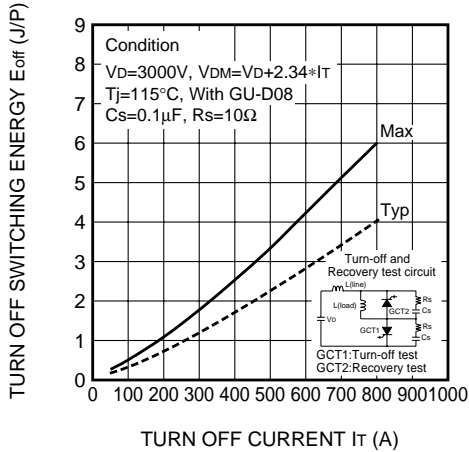
MAXIMUM ON-STATE CHARACTERISTIC



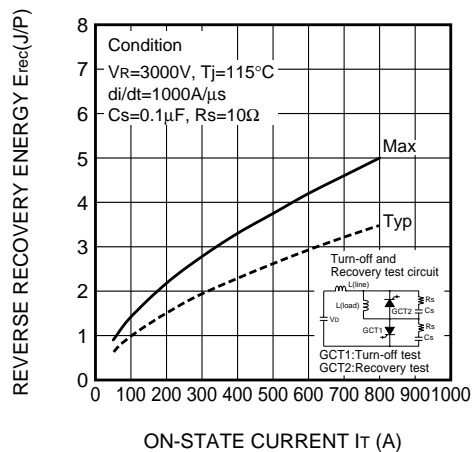
$E_{on}$  VS  $I_T$



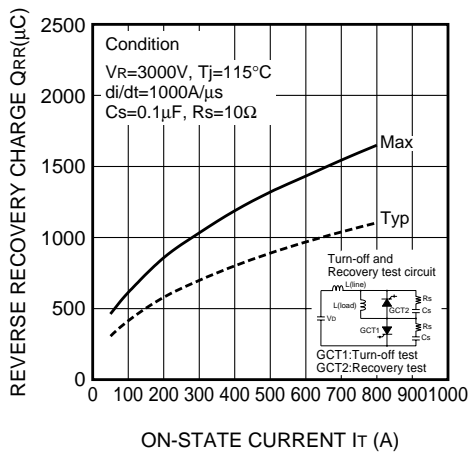
$E_{off}$  VS  $I_T$



$E_{rec}$  VS  $I_T$



$Q_{RR}$  VS  $I_T$



MAXIMUM THERMAL IMPEDANCE CHARACTERISTIC (JUNCTION TO FIN)

