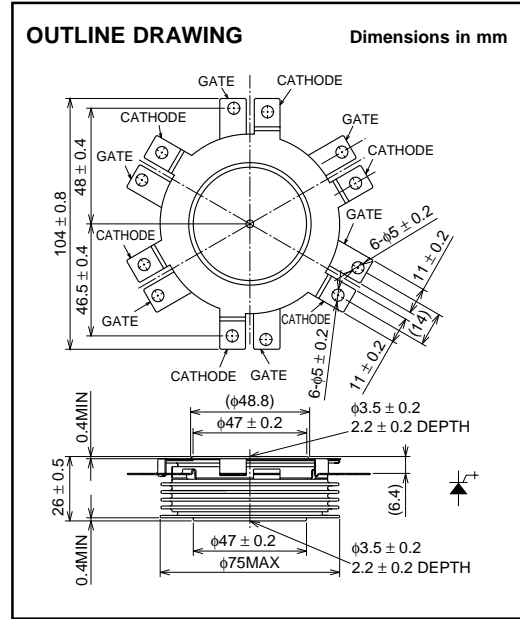
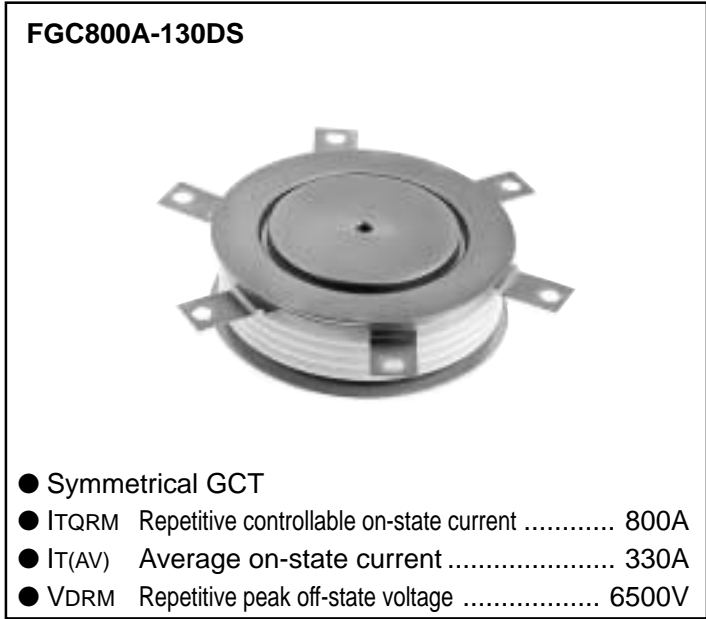


FGC800A-130DS

HIGH POWER INVERTER USE
PRESS PACK TYPE



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 ² t	Current-squared, time integration		9.6 × 10 ⁴	A ² 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

FGC800A-130DS

HIGH POWER INVERTER USE
PRESS PACK TYPE

ELECTRICAL CHARACTERISTICS

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

FGC800A-130DS

HIGH POWER INVERTER USE
PRESS PACK TYPE

Fig. 1 Turn-on and Turn-off waveform

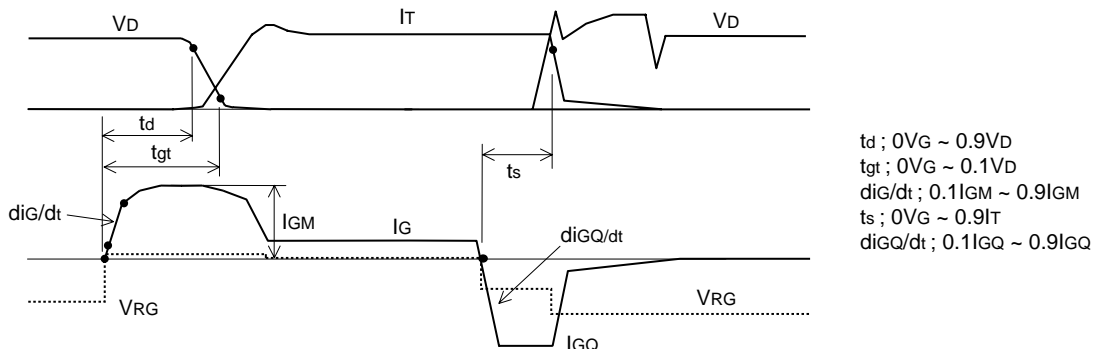


Fig. 2 Turn-on test circuit

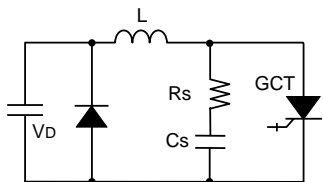


Fig. 3 Turn-off test circuit (With clamp circuit)

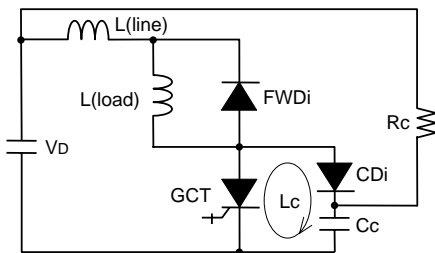


Fig. 4 dv/dt test waveform

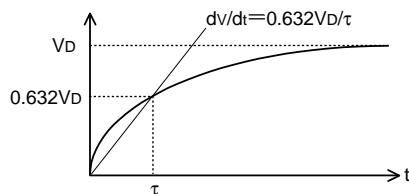
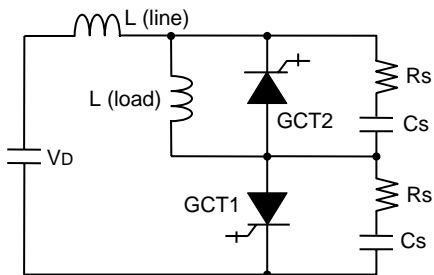
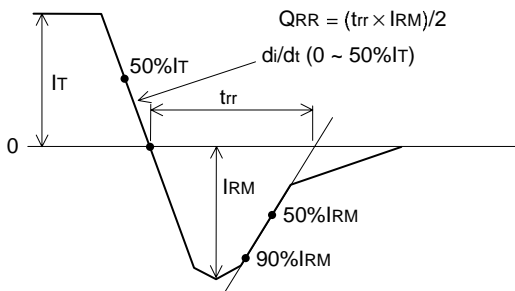


Fig. 5 Turn-off and Recovery test circuit



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

Fig. 6 Reverse recovery waveform

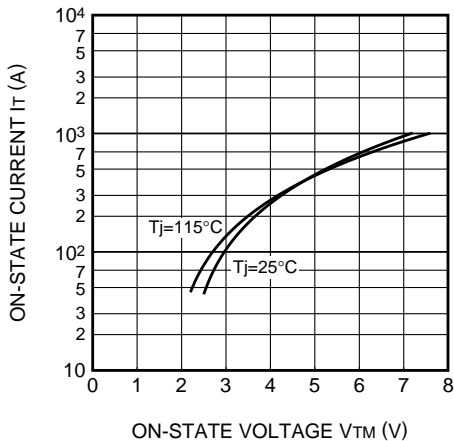


FGC800A-130DS

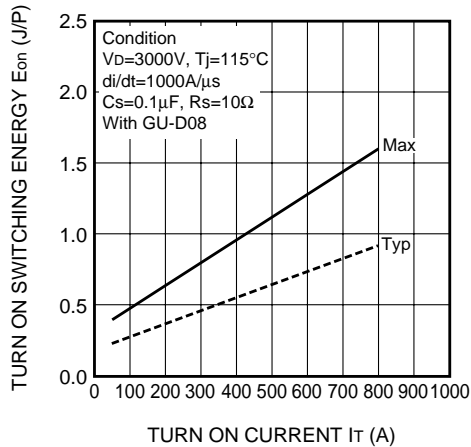
HIGH POWER INVERTER USE
PRESS PACK TYPE

PERFORMANCE CURVES

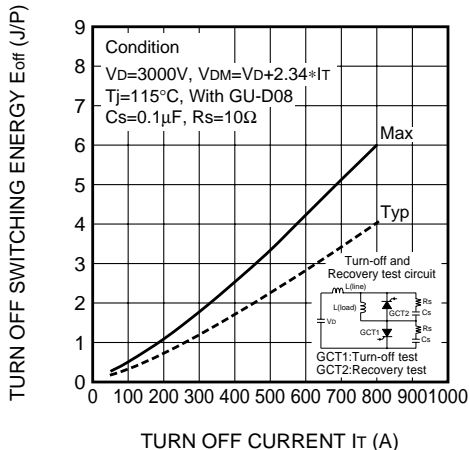
MAXIMUM ON-STATE CHARACTERISTIC



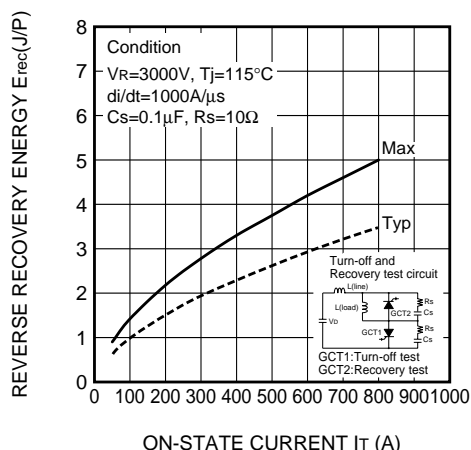
E_{on} VS I_T



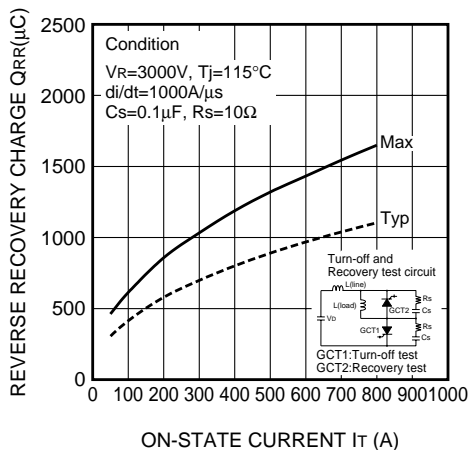
E_{off} VS I_T



E_{rec} VS I_T



Q_{RR} VS I_T



MAXIMUM THERMAL IMPEDANCE CHARACTERISTIC (JUNCTION TO FIN)

