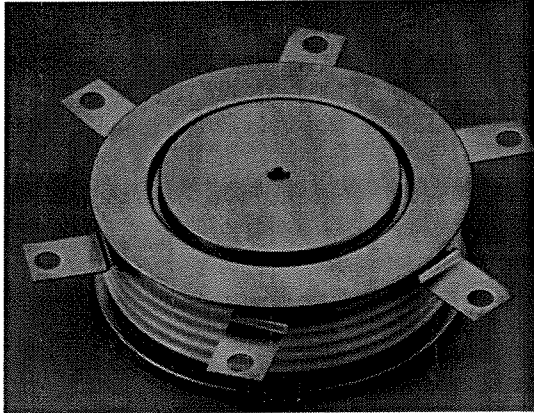


MITSUBISHI GCT(Gate Commutated Turn-off) THYRISTOR

FGC800B-130DS

HIGH POWER INVERTER USE
PRESS PACK TYPE

FGC800B-130DS



- Symmetrical GCT Thyristor
- I_{TQRM} : Repetitive controllable on state current.....800A
- $I_{T(AV)}$: Average on-state current.....330A
- V_{DRM} : Repetitive peak off state voltage6500V
- V_{RRM} : Repetitive peak reverse voltage6500V
- T_j : Operation junction temperature.....125deg

APPLICATION

Current source inverters, DC choppers, Induction heaters, DC to DC converter

Symbol	Parameter	Condition	Voltage class	Unit
V_{RRM}	Repetitive peak reverse voltage	-	6500	V
V_{RSM}	Non-repetitive peak reverse voltage	-	6500	V
V_{DRM}	Repetitive peak off state voltage	$V_{GK}=-2V$	6500	V
V_{DSM}	Non-repetitive peak off state voltage	$V_{GK}=-2V$	6500	V
V_{LTDS}	Long term DC stability voltage	$V_{GK}=-2V, \lambda=100Fit$	3600	V

Symbol	Parameter	Condition	Ratings	Unit
I_{TQRM}	Repetitive controllable on state current	$V_{DM}=3/4V_{DRM}, V_D=3000V, T_j=25/125deg$ $L_c=0.3\mu H, V_{RG}=20V, di_{GQ}/dt=1200A/\mu s$ (See Fig.1,3)	800	A
$I_{T(RMS)}$	RMS on-state current	Applied for all condition angles	520	A
$I_{T(AV)}$	Average on-state current	$f=60Hz, \text{sinewave } \theta=180^\circ, T_f=62deg$	330	A
I_{TSM}	Surge on-state current	One half cycle at 60Hz, $T_j=125deg$ start	4.8	kA
I^2t	Current-squared, time integration		9.6×10^4	A ² s
di_T/dt	Critical rate of rise of on state current	$I_T=800A, V_D=3000V, T_j=25/125deg$ $C_s=0.1\mu F, R_s=10ohm, f=60Hz$ $I_{GM}=90A, di_G/dt=50A/\mu s$ (See Fig.1,2)	1000	A/ μs
di_R/dt	Critical rate of rise of reverse recovery current	$I_T=800A, V_R=3000V, T_j=25/125deg$ $C_s=0.1\mu F, R_s=10ohm$ (See Fig.4,5)	1000	A/ μs
V_{FGM}	Peak forward gate voltage		10	V
V_{RGM}	peak reverse gate voltage		21	V
I_{FGM}	Peak forward gate current		500	A
I_{RGM}	Peak reverse gate current		800	A
P_{FGM}	Peak forward gate power dissipation		5	kW
P_{RGM}	Peak reverse gate power dissipation		17	kW
$P_{FG(AV)}$	Average forward gate power dissipation		100	W
$P_{RG(AV)}$	Average reverse gate power dissipation		120	W
T_j	Operation junction temperature		-20~125	°C
T_{stg}	Storage temperature		-20~150	°C
-	Mounting force required	(Recommended value 13 kN)	11.1 ~ 15.8	kN
-	Weight	Typical value 530g	-	g



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Symbol	Parameter	Condition	Limits			Unit
			Min	Typ	Max	
V_{TM}	On-state voltage	$I_T=400A, T_j=125deg$	—	—	5.5	V
I_{RRM}	Repetitive peak reverse current	$V_{RM}=6500V, T_j=125deg$	—	—	250	mA
I_{DRM}	Repetitive peak off state current	$V_{DM}=6500V, V_{GK}=-2V, T_j=125deg$	—	—	100	mA
I_{GRM}	Reverse gate current	$V_{RG}=21V, T_j=125deg$	—	—	40	mA
dv/dt	Critical rate of rise of off state voltage	$V_D=3000V, V_{GK}=-2V, T_j=125deg$ (Expo. wave)	3000	—	—	V/ μs
tgt	Turn-on time	$I_T=800A, V_D=3000V, di/dt=1000A/\mu s$	—	—	5	μs
td	Turn-on delay time	$C_S=0.1\mu F, R_S=10ohm, T_j=125deg$ $I_{GM}=90A, di_G/dt=50A/\mu s$ (See Fig.1,2)	—	—	1	μs
Eon	Turn-on switching energy	$I_T=400A, V_D=3000V, di/dt=1000A/\mu s$ $C_S=0.1\mu F, R_S=10ohm, T_j=125deg$ $I_{GM}=90A, di_G/dt=50A/\mu s$ (See Fig.1,2)	—	—	0.6	J/P
ts	Storage time	$I_T=800A, V_{DM}=3/4V_{DRM}, V_D=3000V$ $C_S=0.1\mu F, R_S=10ohm, T_j=125deg$ $V_{RG}=20V, di_{GQ}/dt=1200A/\mu s$ (See Fig.1,5)	—	—	3	μs
Eoff	Turn-off switching energy	$I_T=400A, V_{DM}=4000V, V_D=3000V$ $C_S=0.1\mu F, R_S=10ohm, T_j=125deg$ $V_{RG}=20V, di_{GQ}/dt=1200A/\mu s$ (See Fig.1,5)	—	—	2.3	J/P
Q_{RR}	Reverse recovery charge	$I_T=400A, V_R=3000V, di/dt=1000A/\mu s$	—	—	1800	μC
Erec	Reverse recovery energy	$C_S=0.1\mu F, R_S=10ohm, T_j=125deg$ (See Fig.4,5)	—	—	4.4	J/P
I_{GT}	Gate trigger current	$V_D=24V, R_L=0.1ohm, T_j=25deg$	—	—	0.5	A
V_{GT}	Gate trigger voltage	DC method.	—	—	1.5	V
Rth(j- ϕ)	Thermal resistance	Junction to Fin	—	—	0.025	K/W



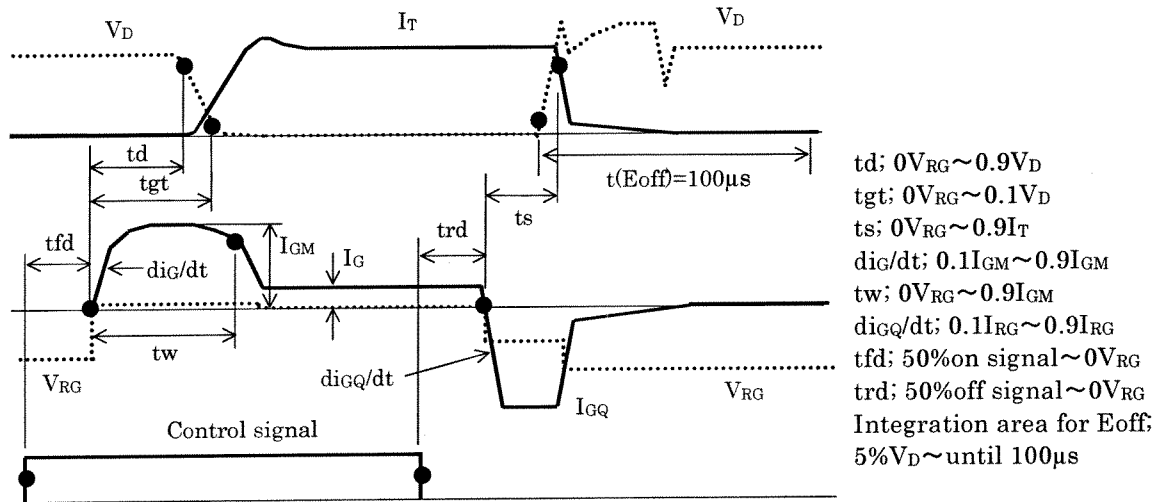


Fig.1:Turn on and turn off waveform

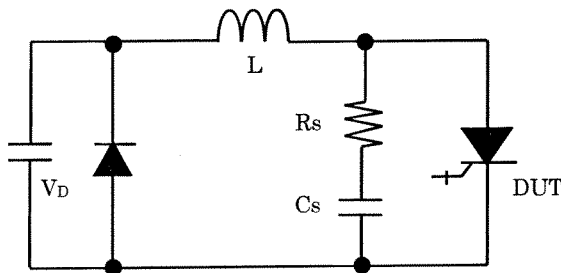


Fig.2:Turn-on test circuit

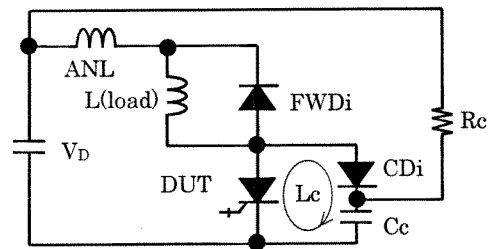


Fig.3:Turn-off test circuit (With clamp circuit)

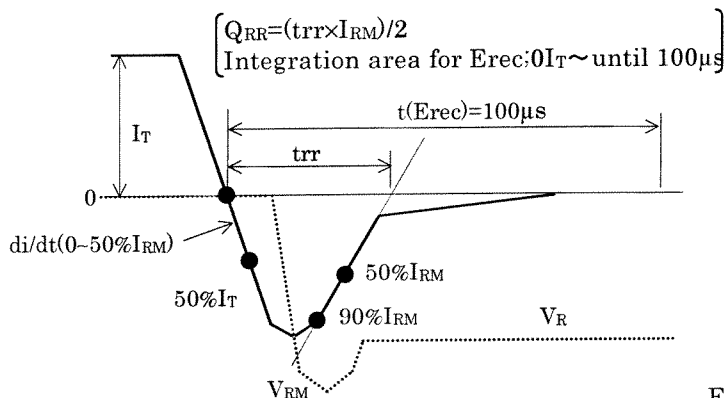


Fig.4:Reverse recovery waveform

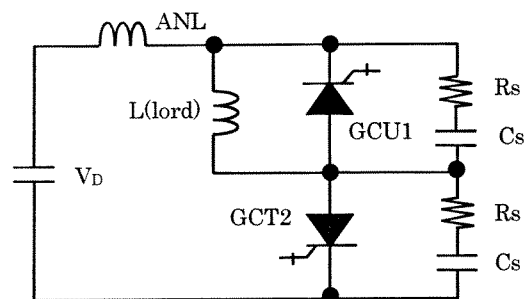
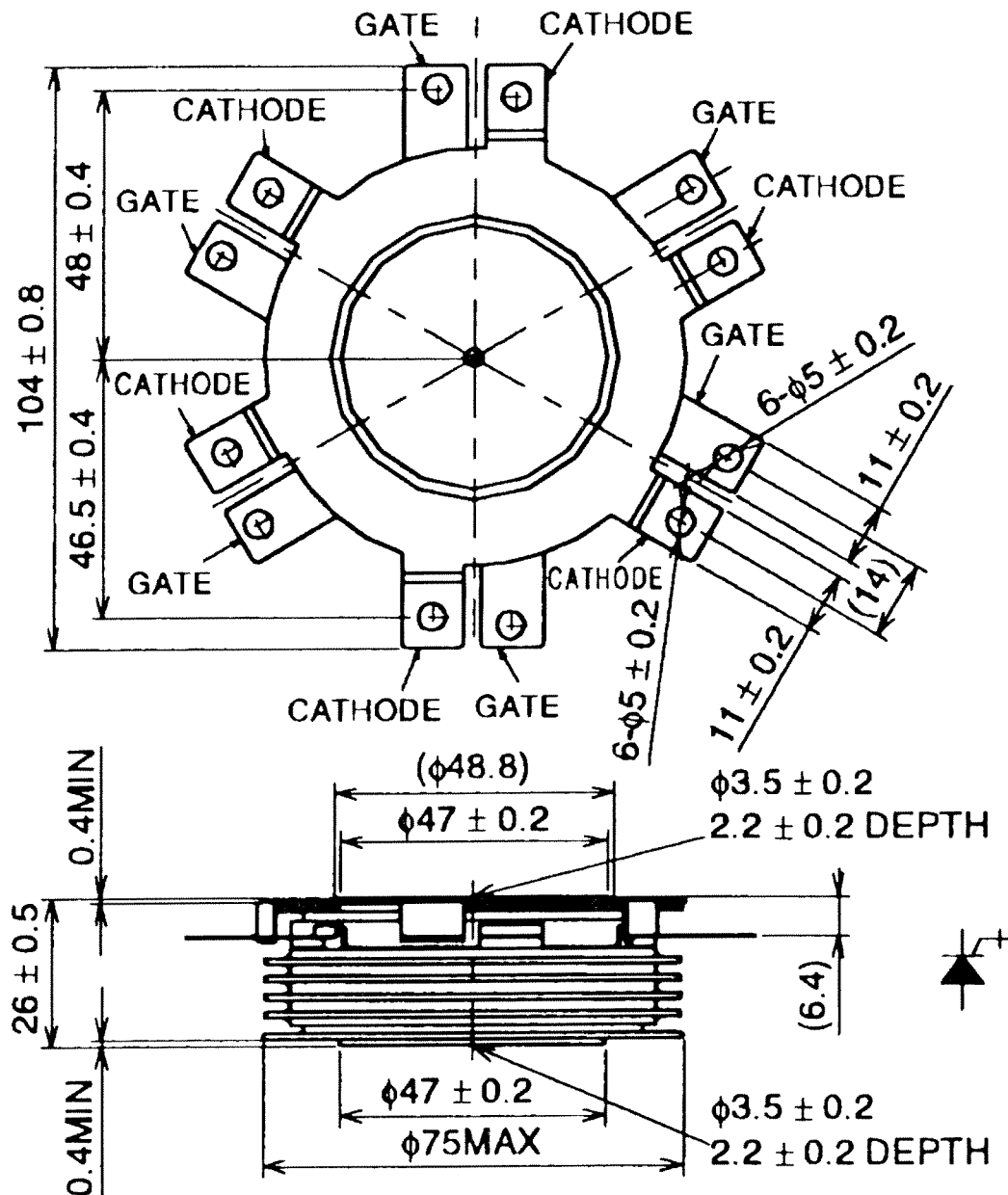


Fig.5:Turn off and Reverse recovery test circuit

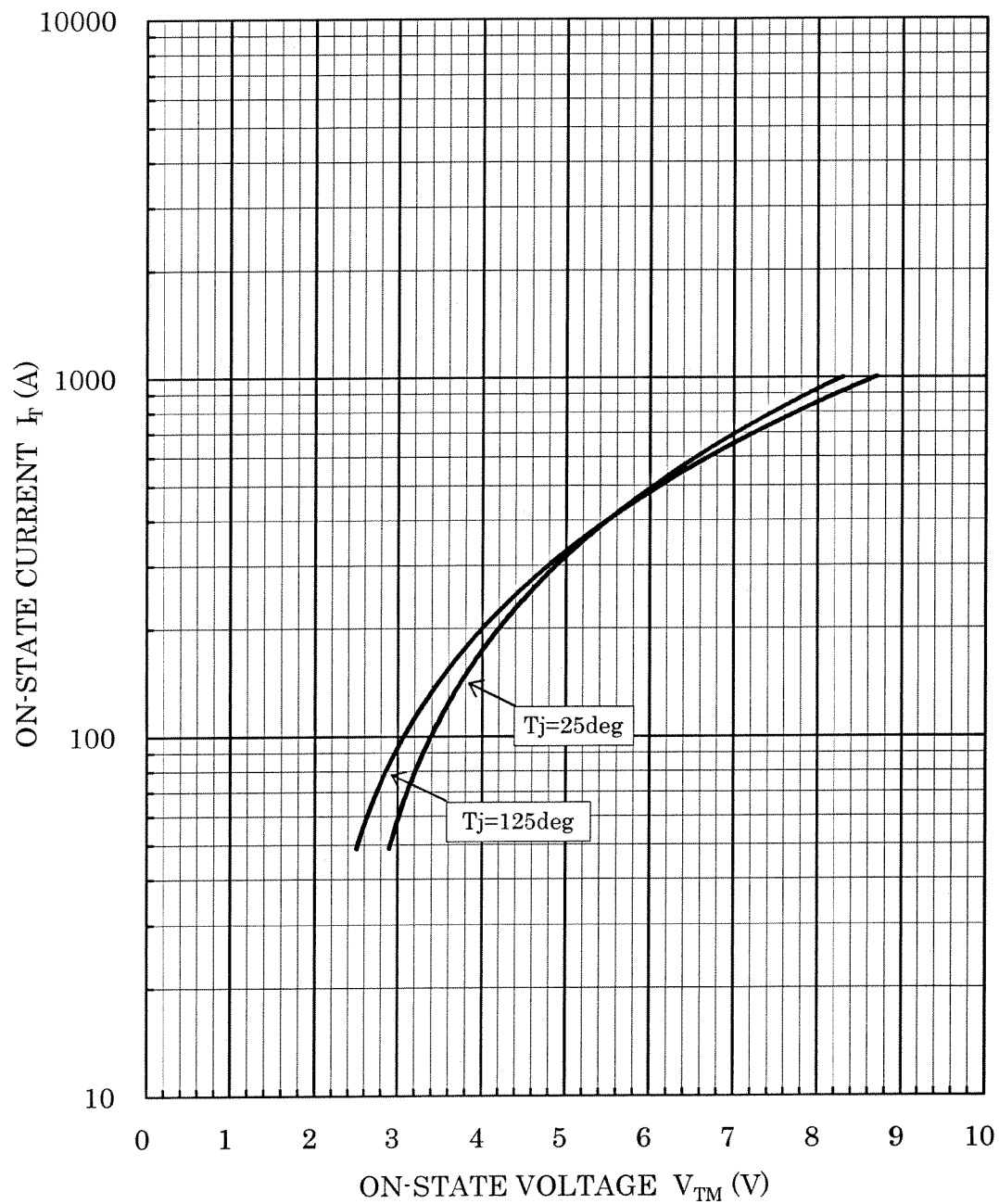
[Without the GDU and $I_G = 0.5A$ (DC) is supplied to GCT 1 at reverse recovery test.]

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Dimensions in mm



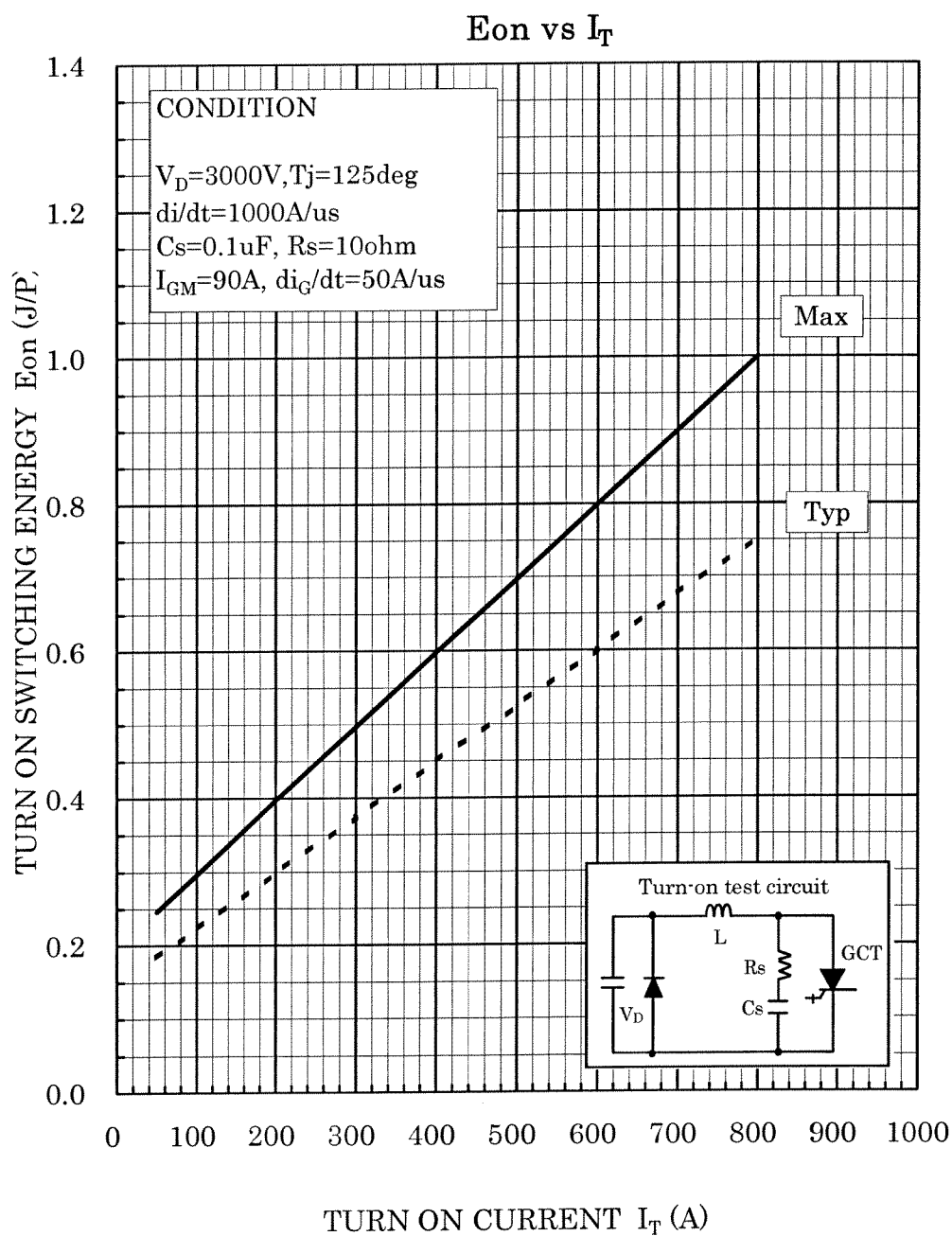
MAXIMUM ON STATE CHARACTERISTIC

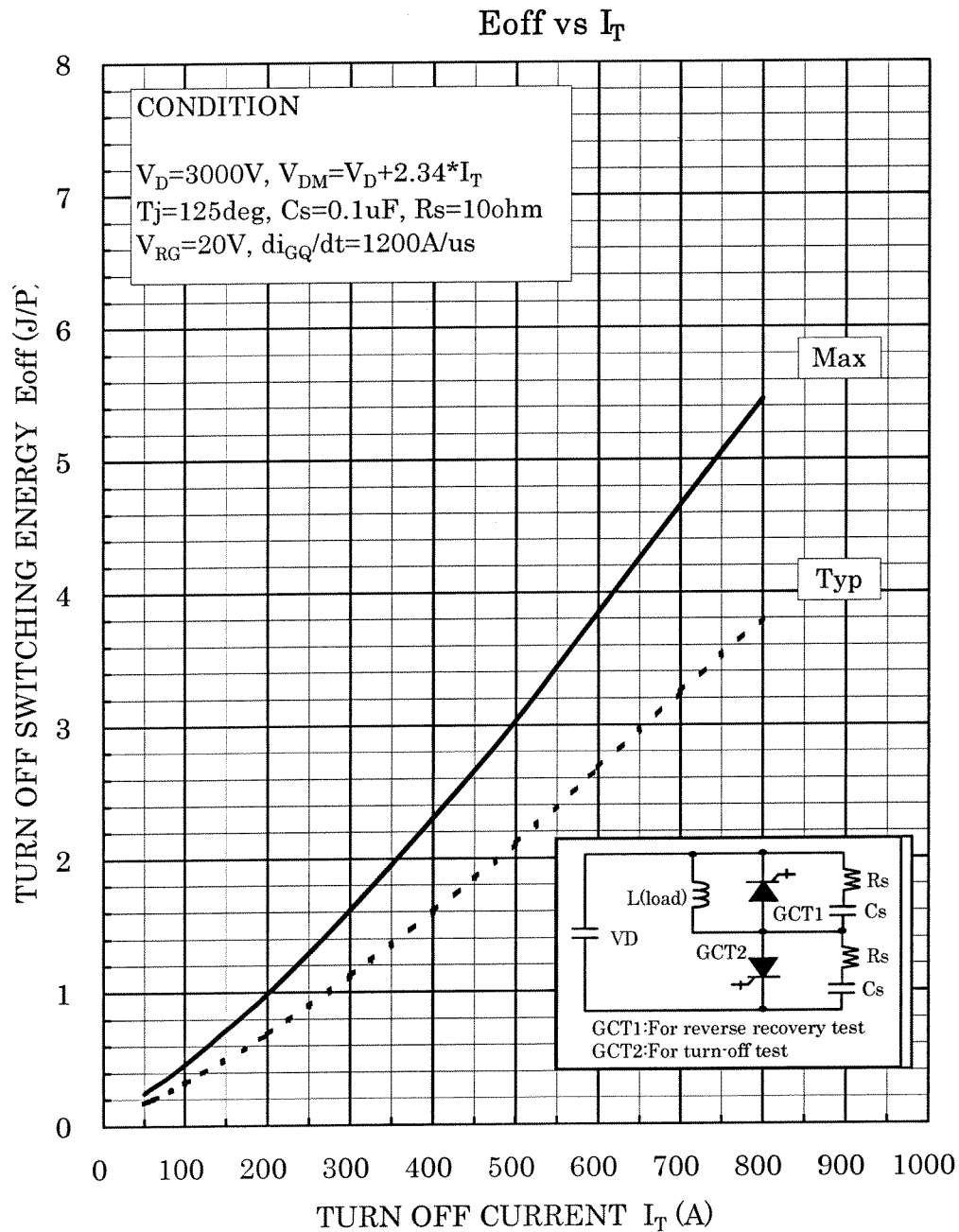


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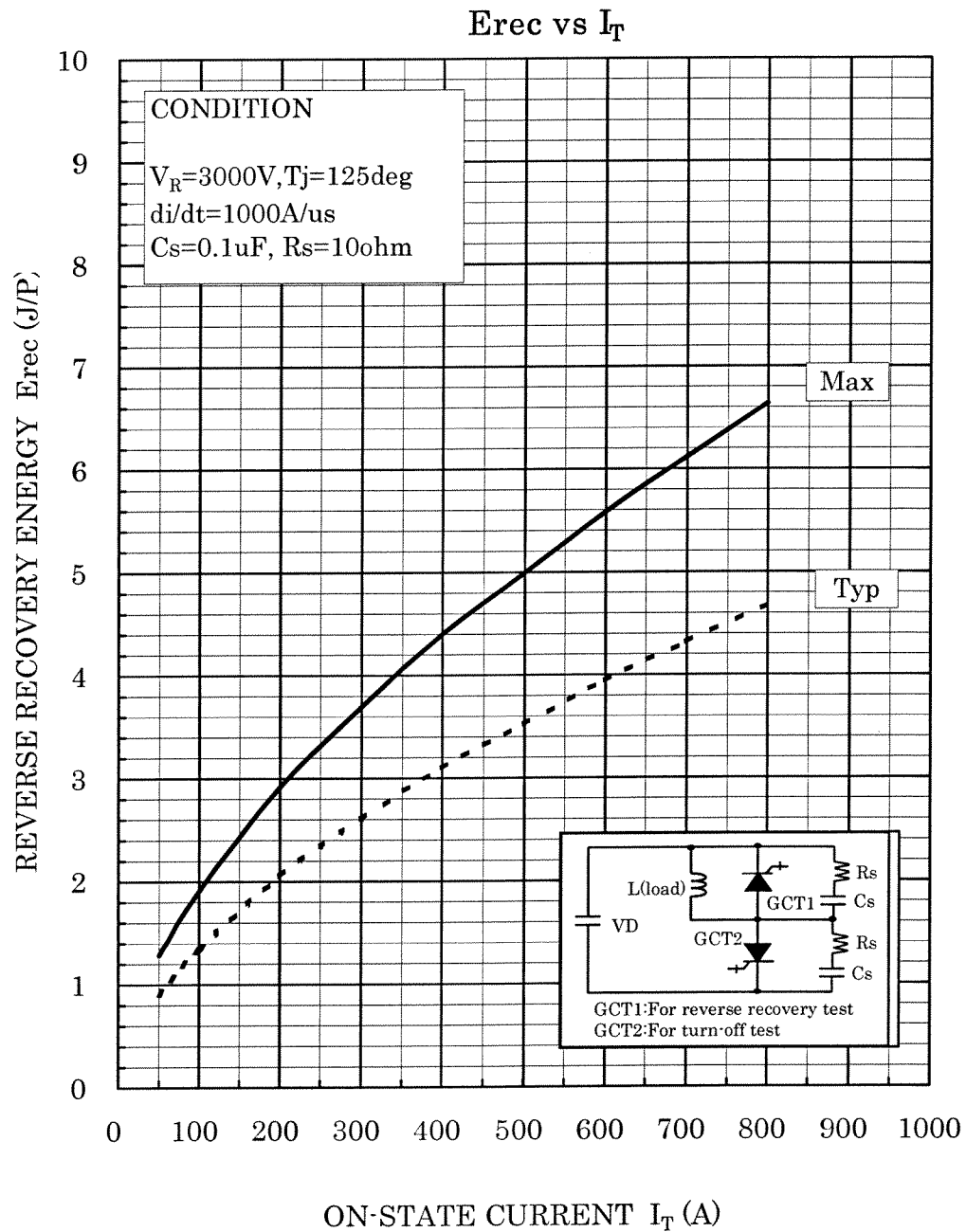




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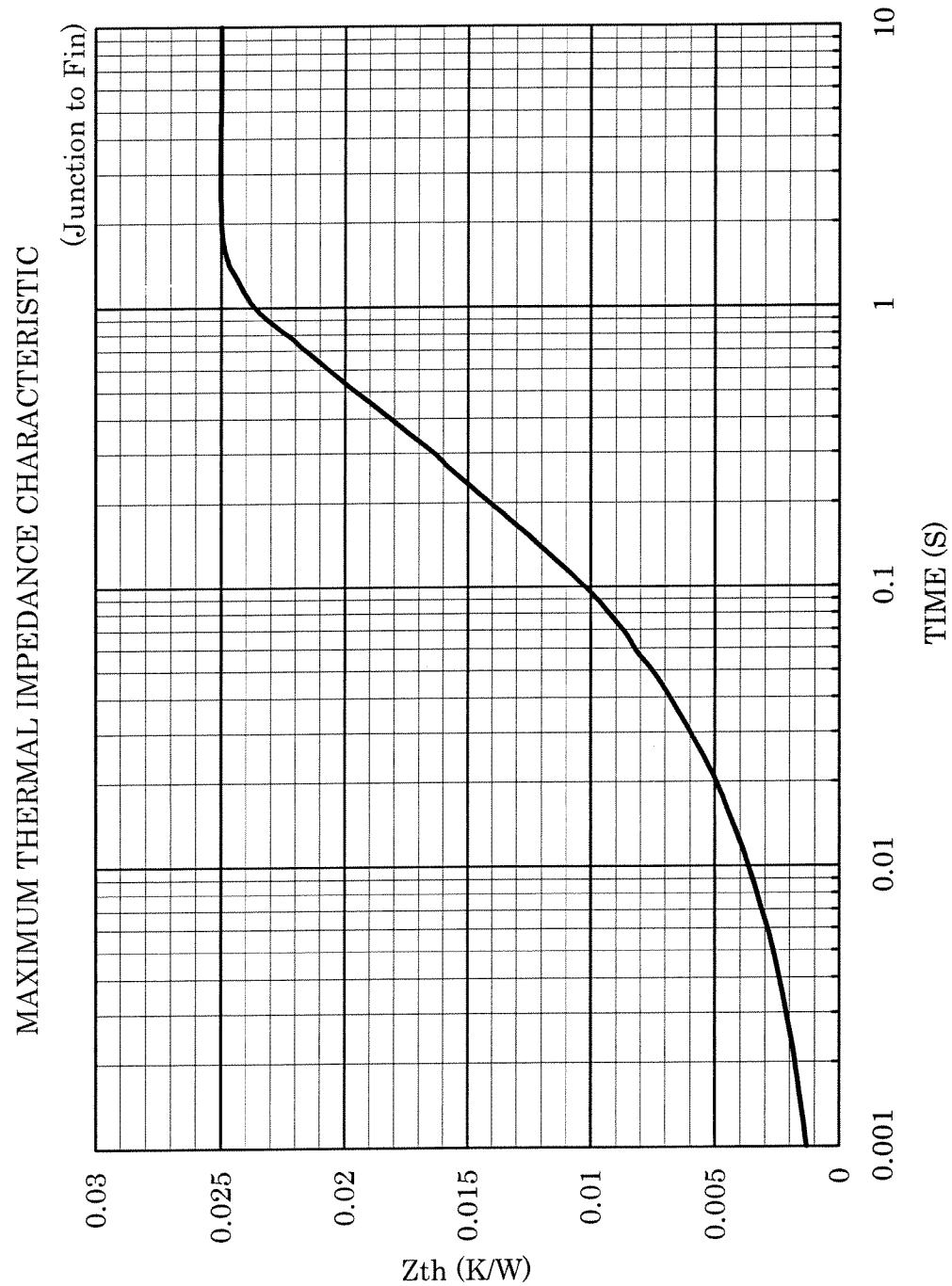
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MITSUBISHI GCT(Gate Commutated Turn-off) THYRISTOR

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HIGH POWER INVERTER USE
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