

< GCT(Gate Commutated Turn-off) Thyristor Unit >

GCU08CB-130

HIGH POWER INVERTER USE
PRESS PACK TYPE

GCU08CB-130



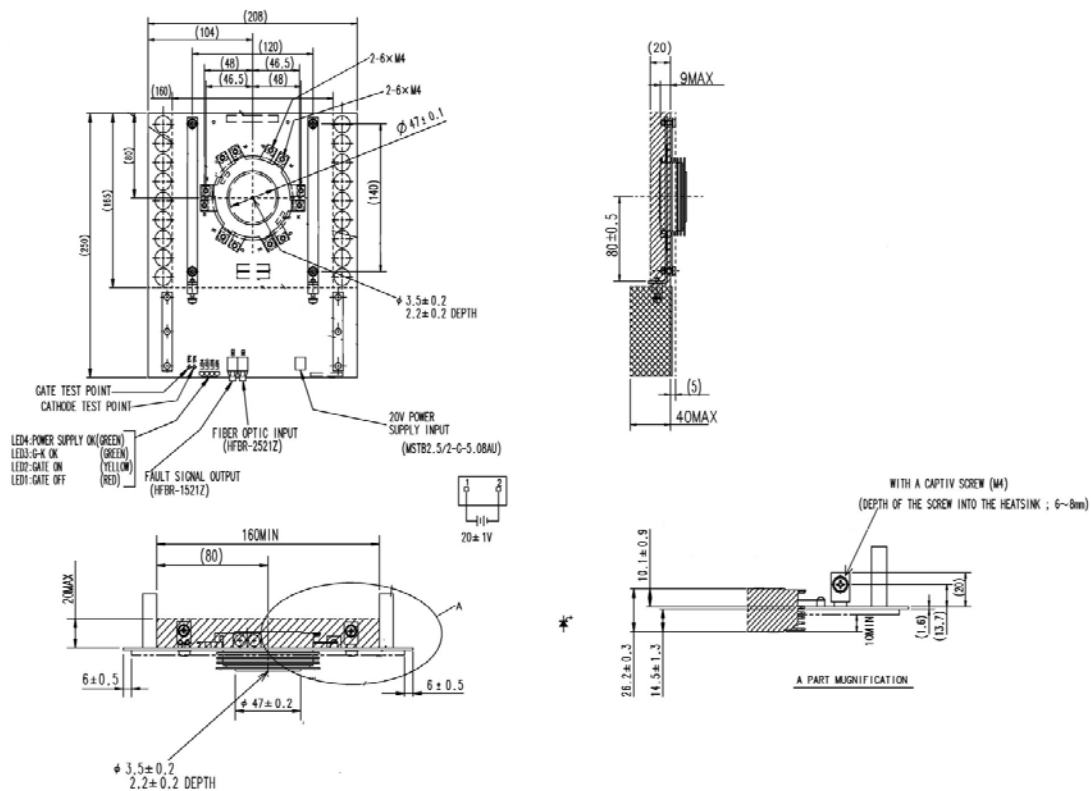
- Symmetrical GCT unit
- GCT and gate driver are connected
- I_{TQRM} 800A
- $I_{T(AV)}$ 330A
- V_{DRM} 6500V
- V_{RRM} 6500V
- T_j 125 °C

APPLICATION

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

OUTLINE DRAWING

Dimensions in mm



GCU08CB-130**HIGH POWER INVERTER USE
PRESS PACK TYPE****GCT PART****MAXIMUM RATINGS**

Symbol	Parameter	Condition	Voltage	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	Gate driver energized	6500	V
V _{DSM}	Non-repetitive peak off-state voltage	Gate driver energized	6500	V
V _(LTDS)	Long term DC stability voltage	Gate driver energized $\lambda=100\text{Fit}$	3600	V

Symbol	Parameter	Condition	Ratings	Unit
I _{T(RMS)}	RMS on-state current	Applied for all condition angles f=60Hz, sinewave $\theta=180^\circ$, T _f =62 °C	800	A
I _{T(AV)}	Average on-state current		520	A
I _{TQRM}	Repetitive controllable on state current	V _{DM} =3/4V _{DRM} , V _D =3000V, T _j =25/125 °C L _C =0.3 μ H (See Fig.1,3)	330	A
I _{TSM}	Surge on-state current	One half cycle at 60Hz, T _j =125 °C start	4.8	kA
I ² t	Current-squared, time integration		9.6 $\times 10^4$	A ² s
di _T /dt	Critical rate of rise of on state current	I _T =800A, V _D =3000V, T _j =25/125 °C C _s =0.1 μ F, R _s =10 Ω , f=60Hz (See Fig.1,2)	1000	A/ μ s
di _R /dt	Critical rate of rise of reverse recovery current	I _T =800A, V _R =3000V, T _j =25/125 °C C _s =0.1 μ F, R _s =10 Ω (See Fig.3,4)	1000	A/ μ s
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
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

GCU08CB-130HIGH POWER INVERTER USE
PRESS PACK TYPE**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Condition	Limits			Unit
			Min	Typ	Max	
V_{TM}	On-state voltage	$I_T=400A, T_j=125\text{ }^\circ\text{C}$	—	—	5.5	V
I_{RRM}	Repetitive peak reverse current	$V_{RM}=6500V, T_j=125\text{ }^\circ\text{C}$	—	—	250	mA
I_{DRM}	Repetitive peak off state current	$V_{DM}=6500V, T_j=125\text{ }^\circ\text{C}$ Gate driver energized	—	—	100	mA
I_{GRM}	Reverse gate current	$V_{RG}=21V, T_j=125\text{ }^\circ\text{C}$	—	—	40	mA
dv/dt	Critical rate of rise of off state voltage	$V_D=3000V, T_j=125\text{ }^\circ\text{C}$ Gate driver energized	3000	—	—	V/ μs
tgt	Turn-on time	$I_T=800A, V_D=3000V, di/dt=1000A/\mu\text{s}$ $C_s=0.1\mu\text{F}, R_s=10\Omega, T_j=125\text{ }^\circ\text{C}$	—	—	5	μs
td	Turn-on delay time	(See Fig.1,2)	—	—	1	μs
Eon	Turn-on switching energy	$I_T=400A, V_D=3000V, di/dt=1000A/\mu\text{s}$ $C_s=0.1\mu\text{F}, R_s=10\Omega, T_j=125\text{ }^\circ\text{C}$ (See Fig.1,2)	—	—	0.6	J/P
ts	Storage time	$I_T=800A, V_{DM}=3/4V_{DRM}, V_D=3000V$ $C_s=0.1\mu\text{F}, R_s=10\Omega, T_j=125\text{ }^\circ\text{C}$ (See Fig.1,3)	—	—	3	μs
Eoff	Turn-off switching energy	$I_T=400A, V_{DM}=4000V, V_D=3000V$ $C_s=0.1\mu\text{F}, R_s=10\Omega, T_j=125\text{ }^\circ\text{C}$ (See Fig.1,3)	—	—	2.3	J/P
QRR	Reverse recovery charge	$I_T=400A, V_R=3000V, di/dt=1000A/\mu\text{s}$ $C_s=0.1\mu\text{F}, R_s=10\Omega, T_j=125\text{ }^\circ\text{C}$	—	—	1800	μC
Erec	Reverse recovery energy	(See Fig.3,4)	—	—	4.4	J/P
I_{GT}	Gate trigger current	$V_D=24V, R_L=0.1\Omega, T_j=25\text{ }^\circ\text{C}$ DC method	—	—	0.5	A
V_{GT}	Gate trigger voltage		—	—	1.5	V

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PRESS PACK TYPE**GATE DRIVER PART**

Symbol	Parameter	Condition	Limits			UNIT
			Min	Typ	Max	
V _{GIN}	Power supply voltage	DC power supply	19	20	21	V
P _{GIN}	Gate power consumption	I _T =420Arms, f=780Hz duty=0.33	—	—	35	W
t _{fd}	Delay time of on gate current	T _a =25 °C	—	—	3	μs
t _{rd}	Delay time of off gate current	T _a =25 °C	—	—	3	μs
—	Control signal	Optical fiber data link Transmitter: HFBR-1521Z (BROADCOM) Receiver: HFBR-2521Z (BROADCOM)	—	—	—	—
—	Power supply connector	Phoenix contact Type name :MSTB25/2-G-508AU	—	—	—	—
—	Status signal	— (Note 1)	—	—	—	—

MECHANICAL DATA

Symbol	Parameter	Condition	Limits			UNIT
			Min	Typ	Max	
F _M	Mounting force	—	11.1	13	15.8	kN
—	Weight	—	—	1060	—	g
—	Pole piece diameter(GCT device)	±0.2mm	—	47	—	mm
—	Housing thickness(GCT device)	±0.5mm	—	26	—	mm

THERMAL DATA

Symbol	Parameter	Condition	Limits			UNIT
			Min	Typ	Max	
T _j	Junction operating temperature	—	-20	—	125	°C
T _{stg}	Storage temperature	—	-40	—	60	°C
T _a	Ambient operation temperature	Recommend:≤40 °C	-10	—	60	°C
R _{t(j-f)}	Thermal resistance	Junction to Fin	—	—	0.025	K /W

GCU08CB-130

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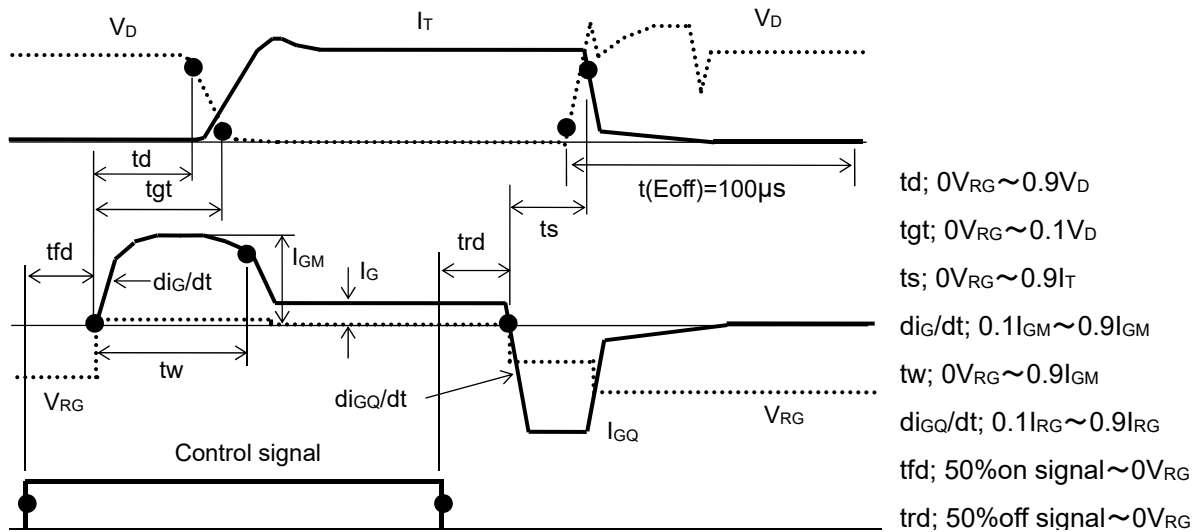


Fig.1 Turn on and turn off waveform

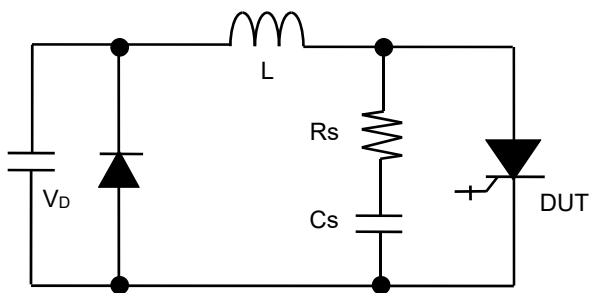


Fig.2 Turn-on test circuit

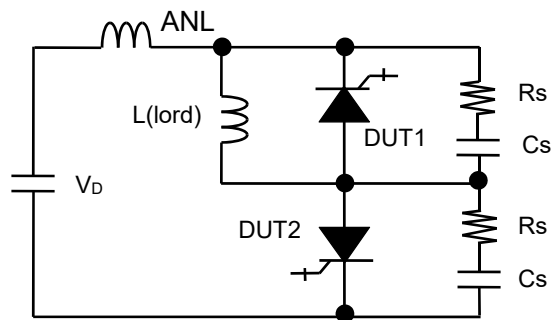


Fig.3 Turn off and Reverse recovery test circuit

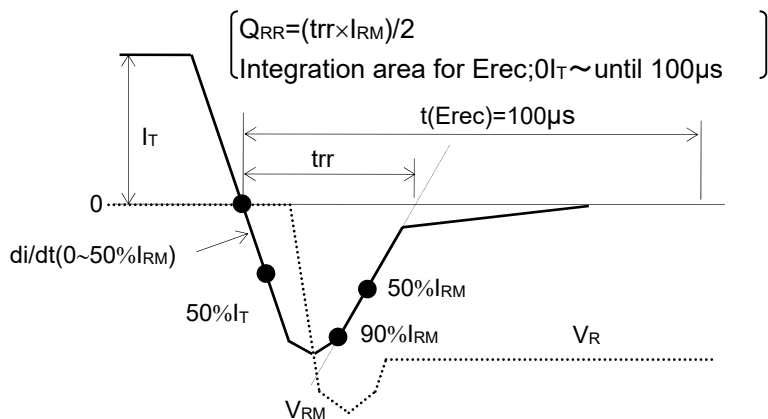


Fig.4 Reverse recovery waveform

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(Note 1): Status signal

1. Status signal from LED

(1) Status signal

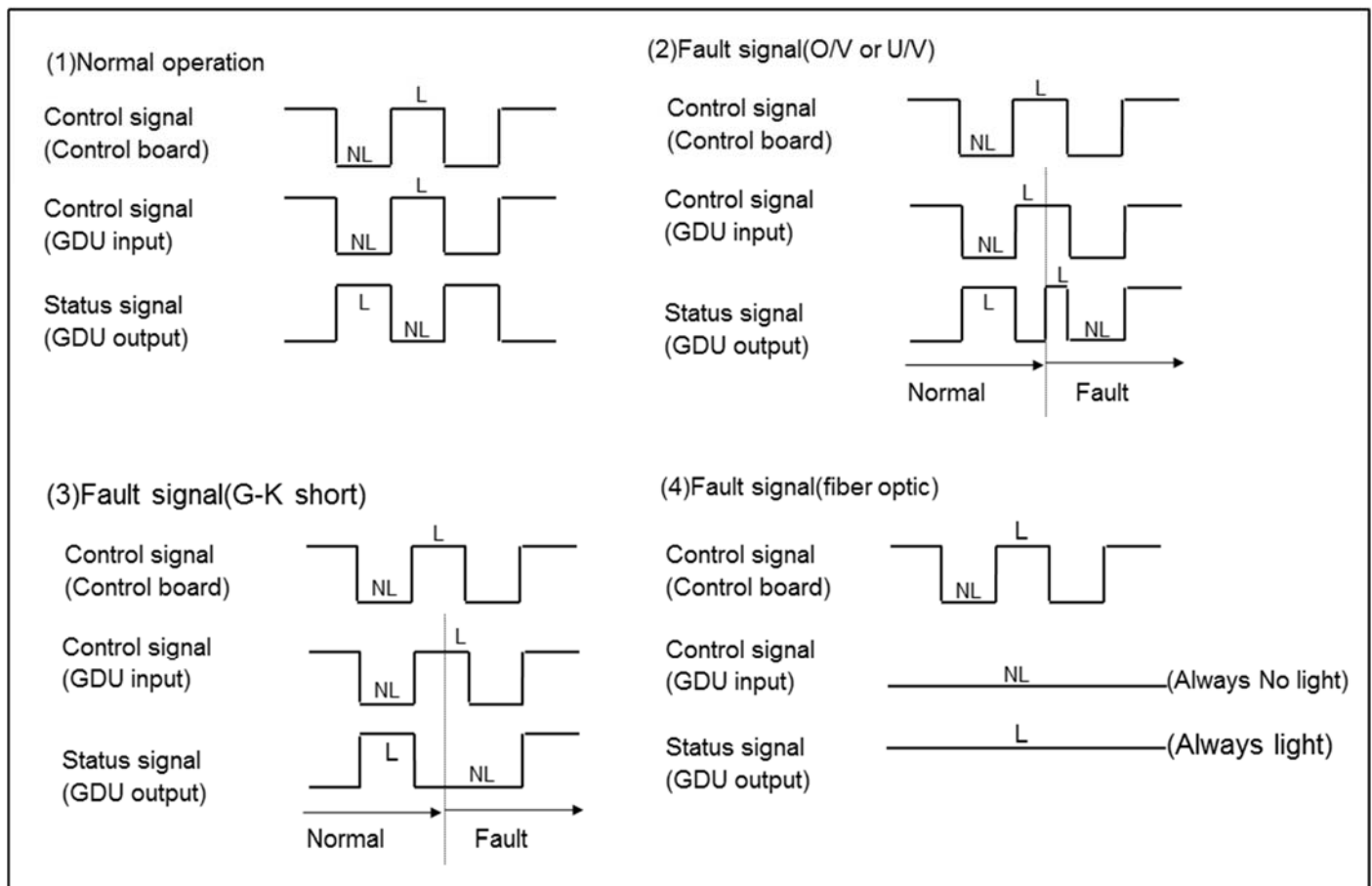
Status of GCT	LED 1 (Red)	LED 2 (Yellow)
On state	OFF	ON
Off state	ON	OFF

(2) Fault signal

Status	G-K	Power Supply	G-K LED (LED 3) (Green)	PS LED (LED 4) (Green)
Normal	Normal	20±1V	On	On
Fault	Normal	Voltage down	Off	Off
Fault	G-K short	20±1V	Off	On
Fault	G-K short	Voltage down	Off	Off

2. Status signal from Transmitter

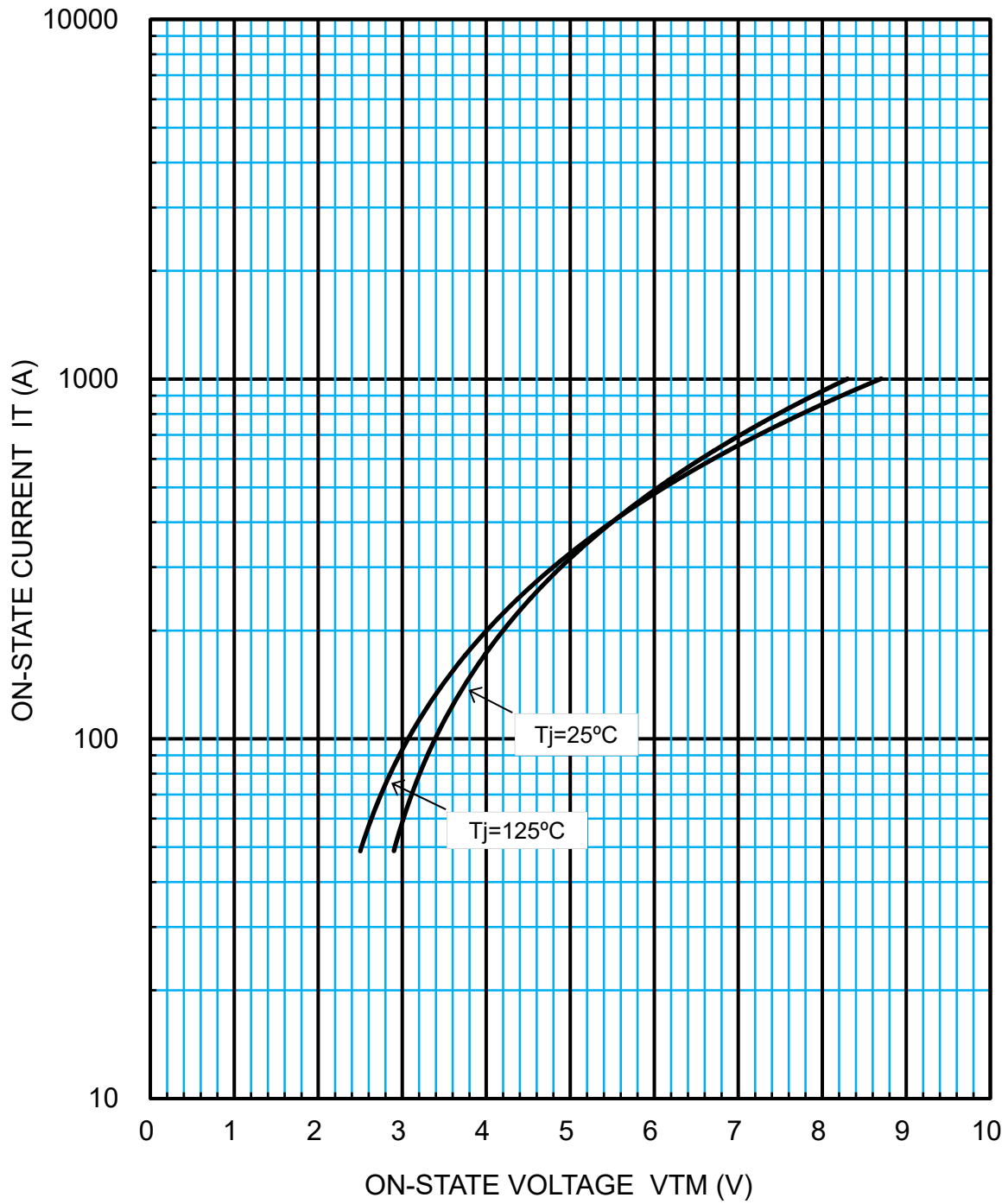
(L: Light NL: No light)



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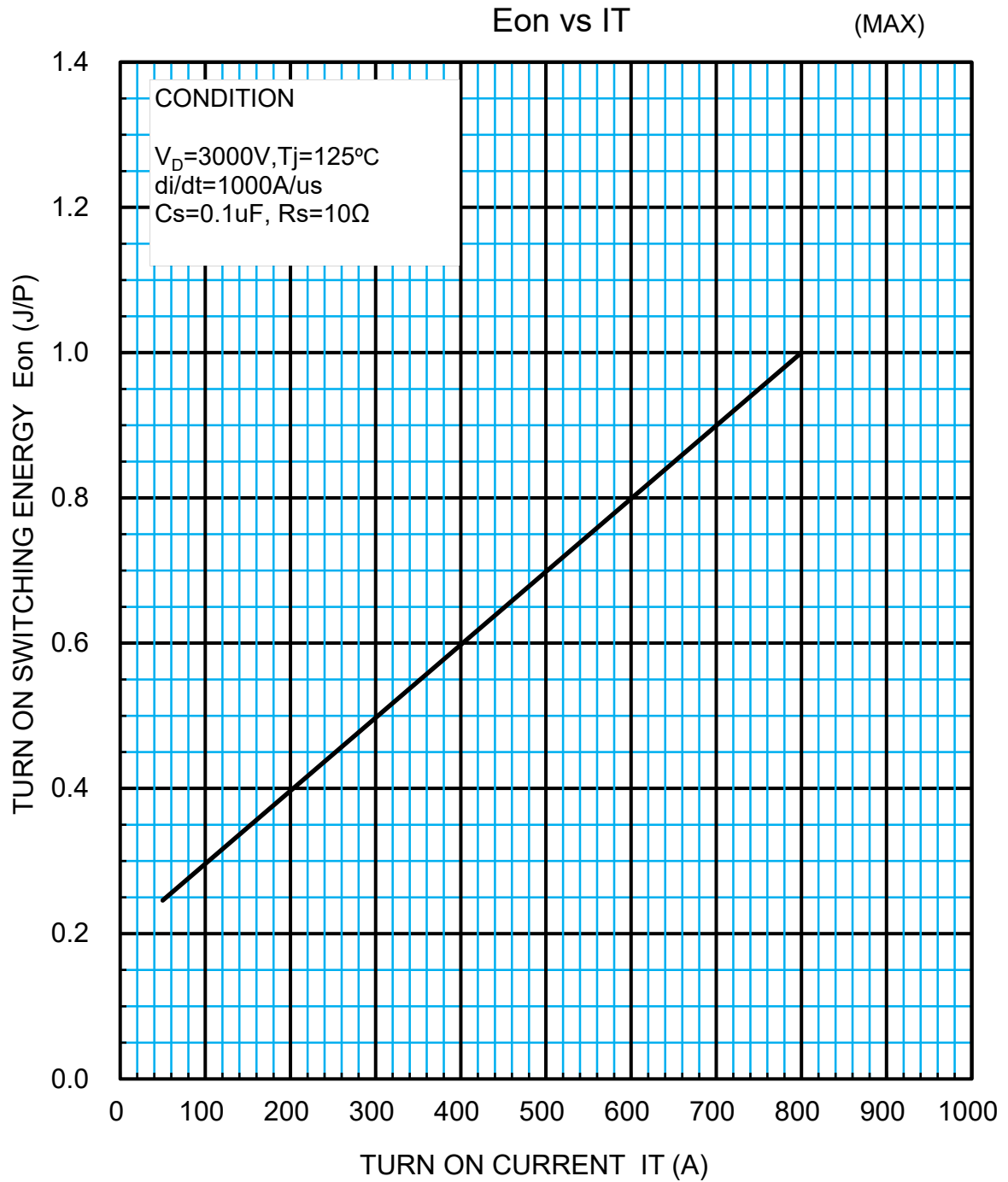
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MAXIMUM ON STATE CHARACTERISTIC



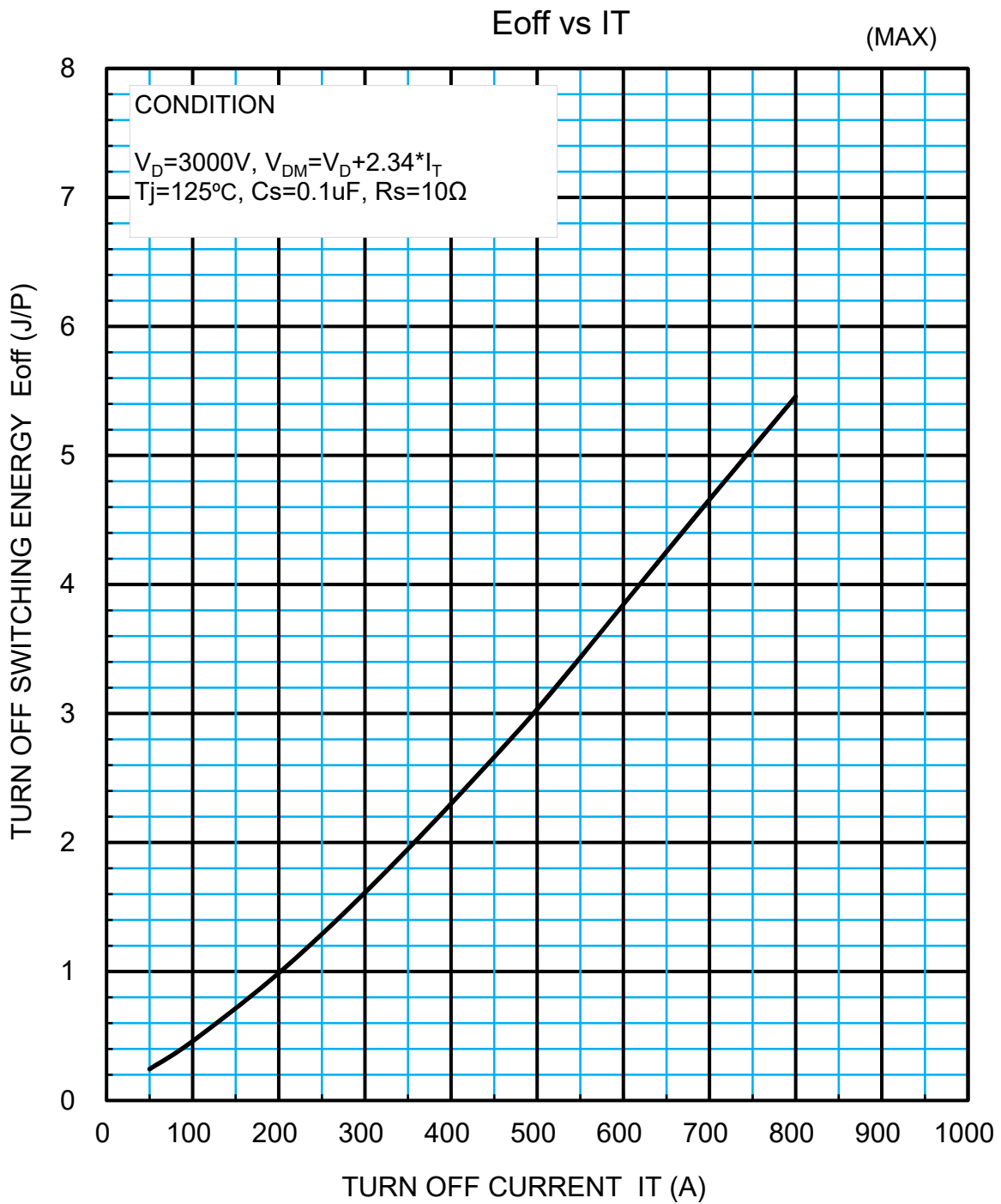
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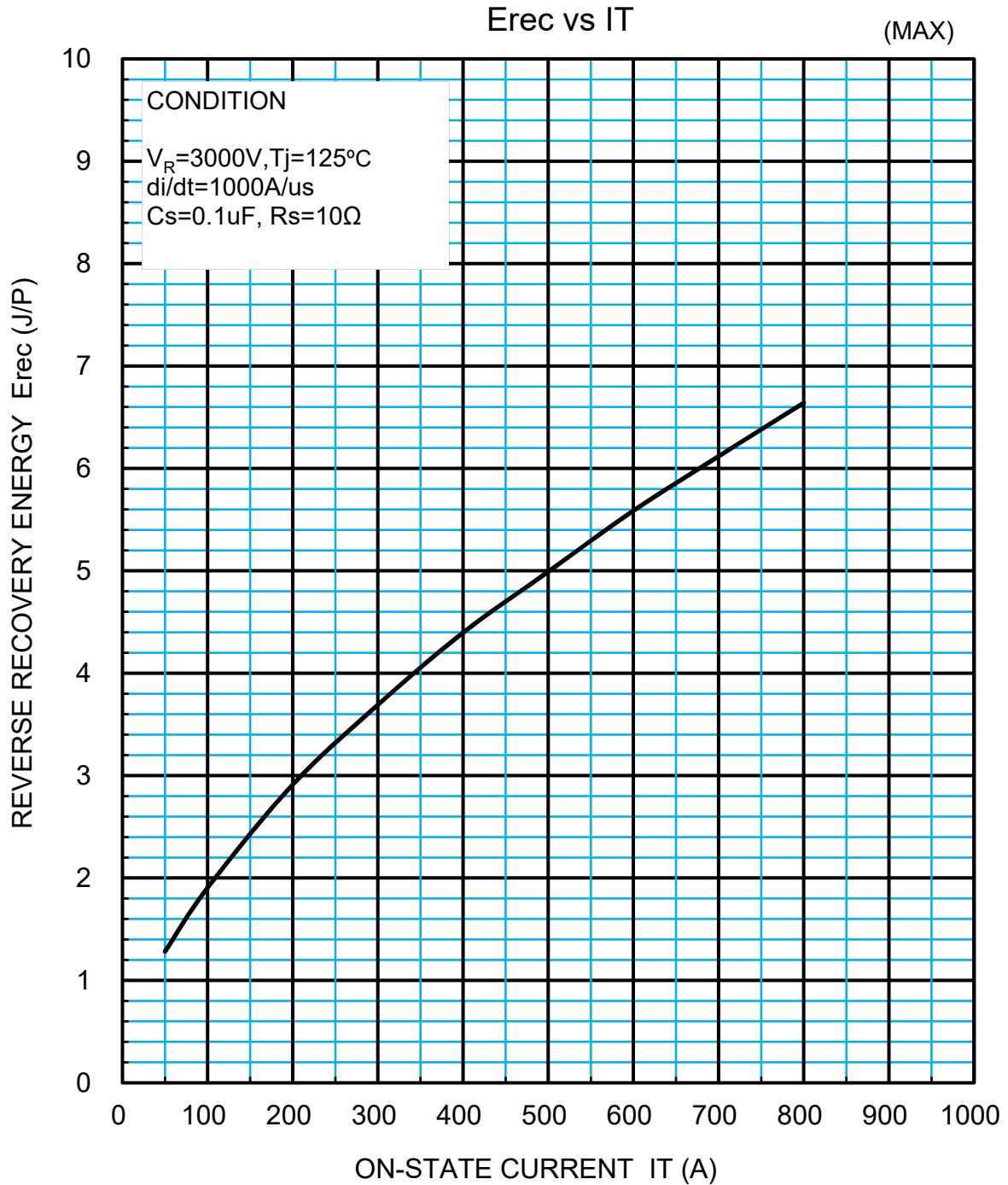
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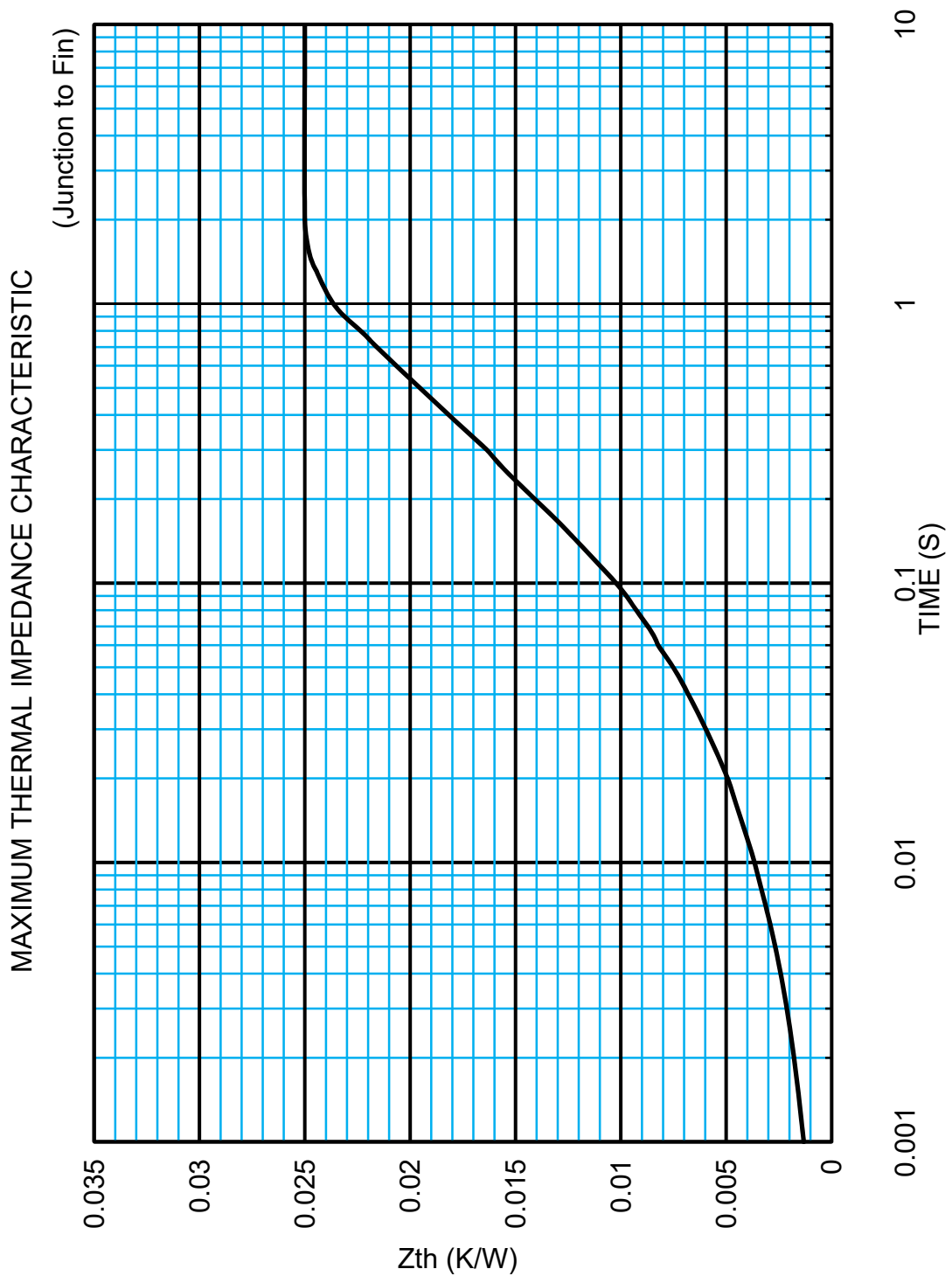
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