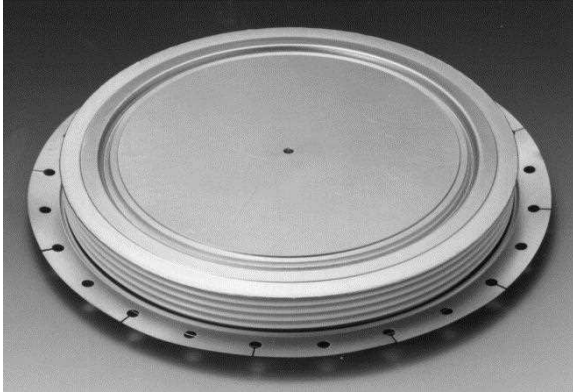




CSG60K6000 Gate Turn-off Thyristor



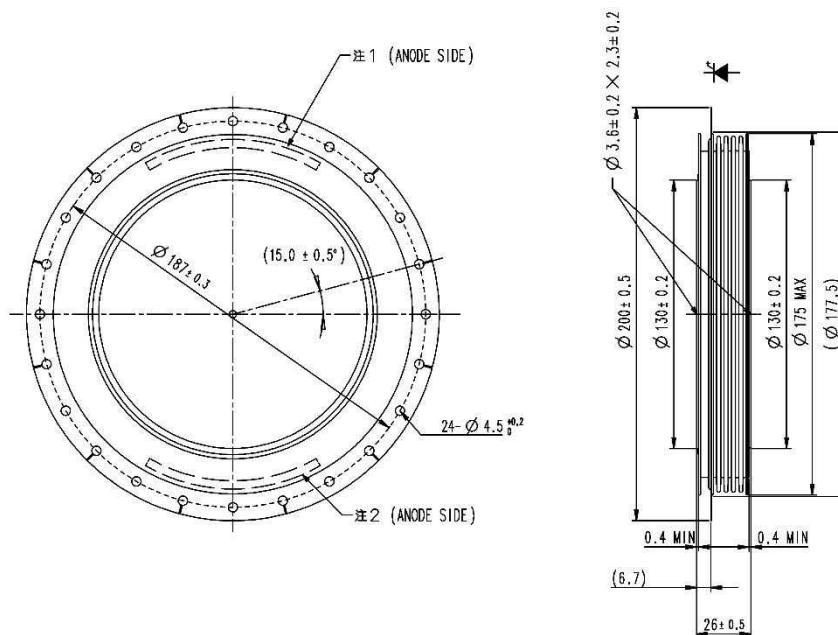
- Asymmetric capsule type thyristor
- I_{TQRM} : Repetitive controllible on state current....6000A
- $I_{T(AV)}$: Average on-state current.....2000A
- V_{DRM} : Repetitive peak off state voltage.....6000V
- V_{RRM} : Repetitive peak reverse voltage..... 22V

APPLICATION

High Voltage Inverter / DC Chopper / Induction Heating / DC - DC Converter

OUTLINE AND DIMENSION

Dimensions in mm





GTO CHARACTERISTICS

Symbol	Parameter	Test Conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	-	22	V
V_{RSM}	Non-repetitive peak reverse voltage	-	22	V
V_{DRM}	Repetitive peak off state voltage	$V_{GK}=-2V$	6000	V
V_{DSM}	Non-repetitive peak off state voltage	$V_{GK}=-2V$	6000	V
V_{LTDS}	Long term DC stability voltage	$V_{GK}=-2V, \lambda=100Fit$	3200	V

Symbol	Parameter	Test Conditions	Value	Unit
I_{TQRM}	Repetitive controllable on state current	$V_{DM}=5500V, V_D=3000V, T_j=25/125\text{ }^{\circ}C$ $C_c=6\mu F, L_c=0.4\mu H, V_{RG}=21V$ $di_{GQ}/dt=10000A/\mu s$ (See Fig.1,2)	6000	A
$I_{T(RMS)}$	RMS on-state current	Applied for all condition angles	3100	A
$I_{T(AV)}$	Average on-state current	$f=60Hz, \text{sinewave } \theta=180^{\circ}, T_f=88\text{ }^{\circ}C$	2000	A
I_{TSM}	Surge on-state current	One half cycle at 60Hz, $T_j=125\text{ }^{\circ}C$ Start	50	kA
I^2t	Current-squared, time integration		10.4×10^6	A^2s
di_T/dt	Critical rate of rise of on state current	$I_T=6000A, V_D=3000V, I_{GM}=300A$ $di_G/dt=200A/\mu s, T_j=25/125\text{ }^{\circ}C$ (See Fig.1,2)	1000	$A/\mu s$
V_{FGM}	Peak forward gate voltage		10	V
V_{RGM}	peak reverse gate voltage		22	V
I_{FGM}	Peak forward gate current		1500	A
I_{RGM}	Peak reverse gate current		6000	A
P_{FGM}	Peak forward gate power dissipation		15	kW
P_{RGM}	Peak reverse gate power dissipation		180	kW
$P_{FG(AV)}$	Average forward gate power dissipation		300	W
$P_{RG(AV)}$	Average reverse gate power dissipation		900	W
T_j	Operation junction temperature		$-40 \sim 125$	$^{\circ}C$
T_{stg}	Storage temperature		$-40 \sim 150$	$^{\circ}C$
—	Mounting force required	(Recommended value 108 kN)	98 ~ 118	kN
—	Weight	Typical value 3700g	—	g

Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typ	Max	
V_{TM}	On-state voltage	$I_T=6000A, T_j=125\text{ }^{\circ}C$	—	—	4	V
I_{RRM}	Repetitive peak reverse current	$V_{RM}=22V, T_j=125\text{ }^{\circ}C$	—	—	100	mA
I_{DRM}	Repetitive peak off state current	$V_{DM}=6000V, V_{GK}=-2V, T_j=125\text{ }^{\circ}C$	—	—	150	mA
I_{GRM}	Reverse gate current	$V_{RG}=22V, T_j=125\text{ }^{\circ}C$	—	—	100	mA
dv/dt	Critical rate of rise of off state voltage	$V_D=3000V, V_{GK}=-2V, T_j=125\text{ }^{\circ}C$ (Expo. wave)	3000	—	—	$V/\mu s$
t_{gt}	Turn-on time	$I_T=6000A, V_D=3000V, di/dt=1000A/\mu s$	—	—	3	μs
t_d	Turn-on delay time	$I_{GM}=300A, di_G/dt=200A/\mu s, T_j=125\text{ }^{\circ}C$ (See Fig.1,2)	—	—	1	μs
E_{on}	Turn-on switching energy	$I_T=2800A, V_D=3000V, di/dt=1000A/\mu s$ $I_{GM}=300A, di_G/dt=200A/\mu s, T_j=125\text{ }^{\circ}C$ (See Fig.1,2)	—	—	2.0	J/P
t_s	Storage time	$I_T=6000A, V_{DM}=5500V, V_D=3000V$ $T_j=125\text{ }^{\circ}C, C_c=6\mu F, L_c=0.4\mu H, V_{RG}=21V$ $di_{GQ}/dt=10000A/\mu s$ (See Fig.1,2)	—	—	3	μs
E_{off}	Turn-off switching energy	$I_T=2800A, V_{DM}=4300V, V_D=3000V$ $T_j=125\text{ }^{\circ}C, C_c=6\mu F, L_c=0.4\mu H, V_{RG}=21V$ $di_{GQ}/dt=10000A/\mu s$ (See Fig.1,2)	—	—	20	J/P
I_{GT}	Gate trigger current	$V_D=24V, R_L=0.1\Omega, T_j=25\text{ }^{\circ}C$	—	—	8	A
V_{GT}	Gate trigger voltage	DC method	—	—	1.5	V
$R_{th(j-f)}$	Thermal resistance	Junction to Fin	—	—	0.0044	K/W

CURVES

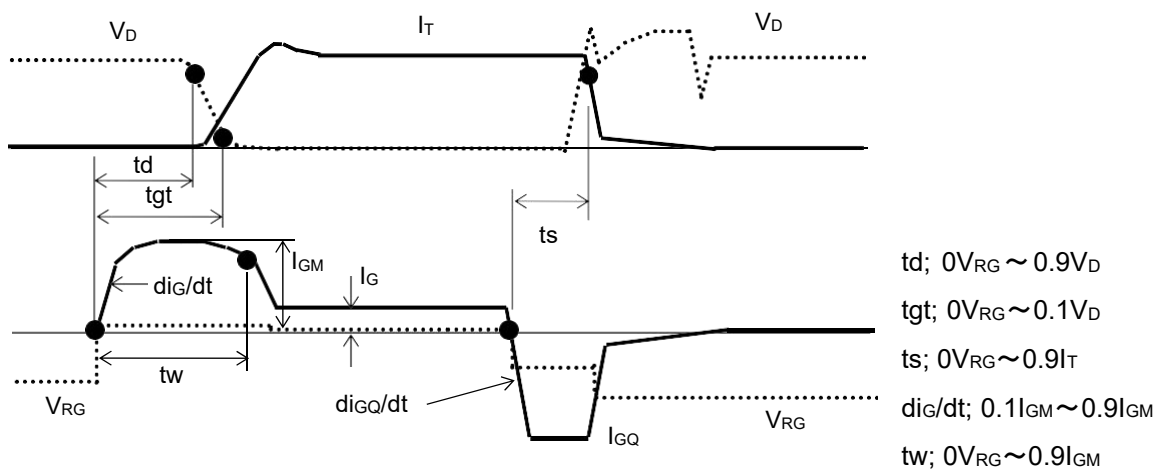


Fig.1:Turn on and turn off waveform

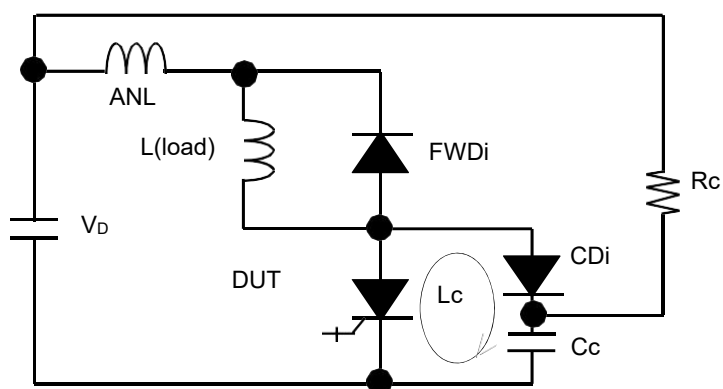
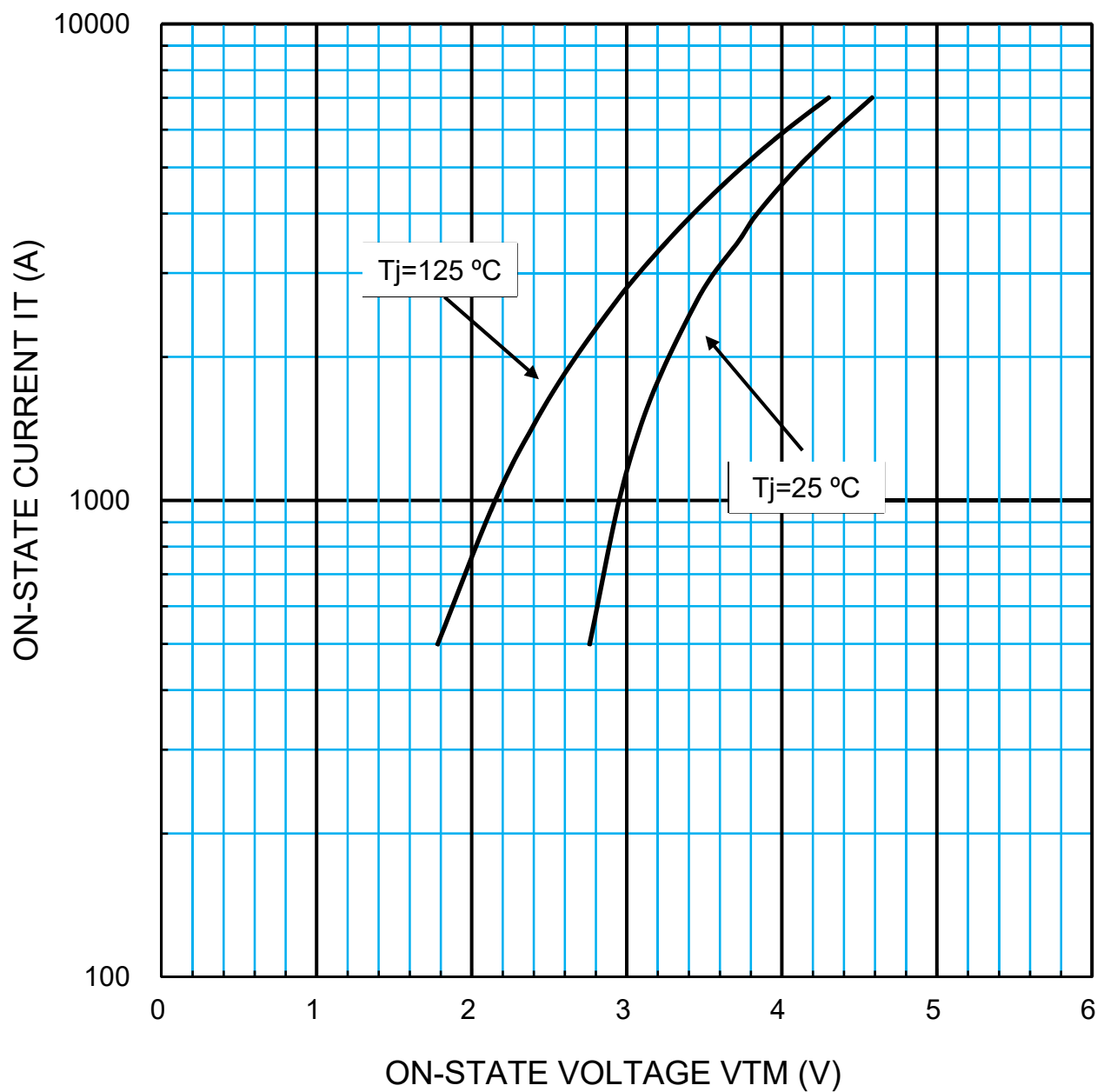


Fig.2:Turn-on and turn-off test circuit (With clamp circuit)



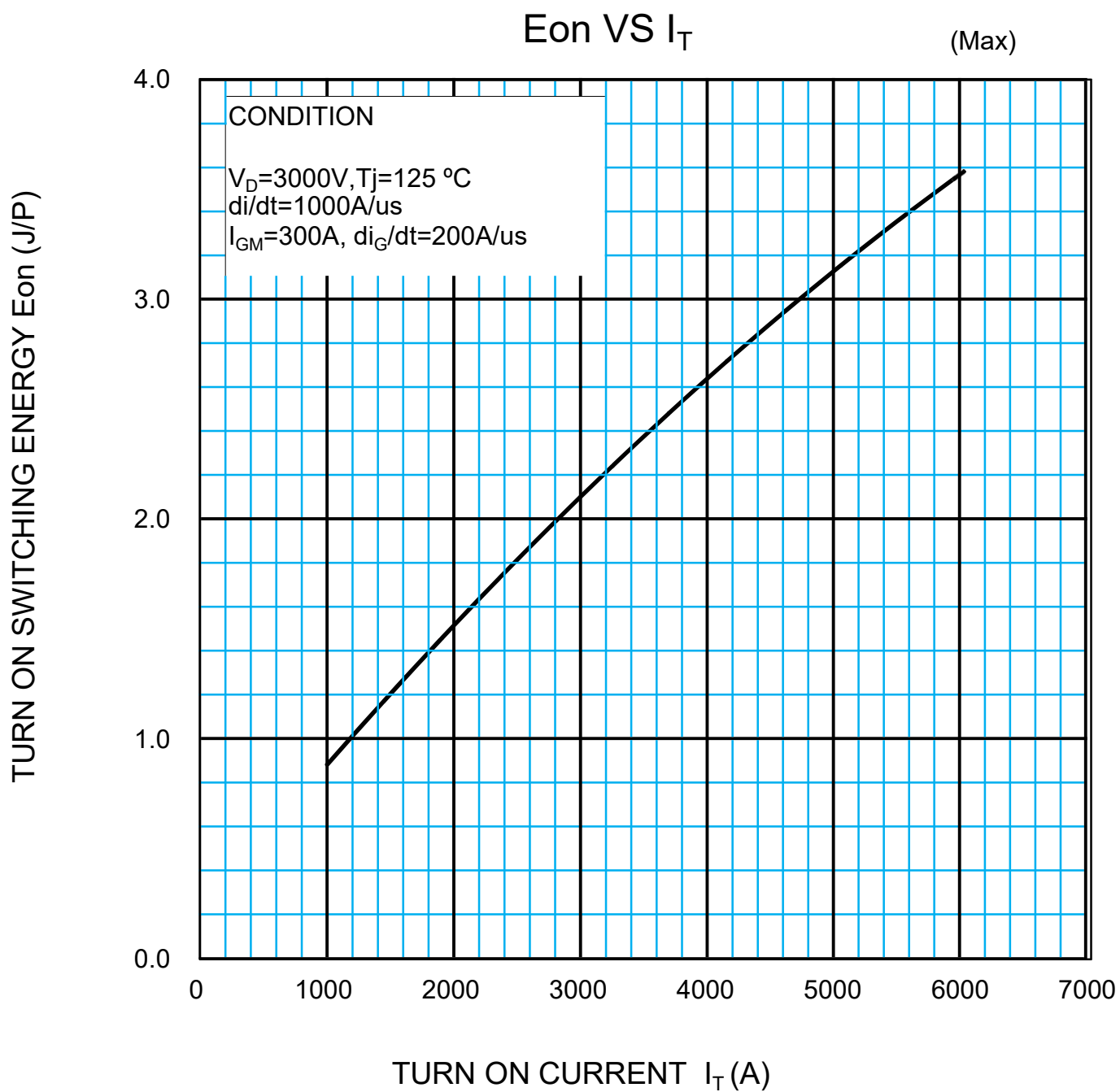
CURVES

MAXIMUM ON STATE CHARACTERISTIC



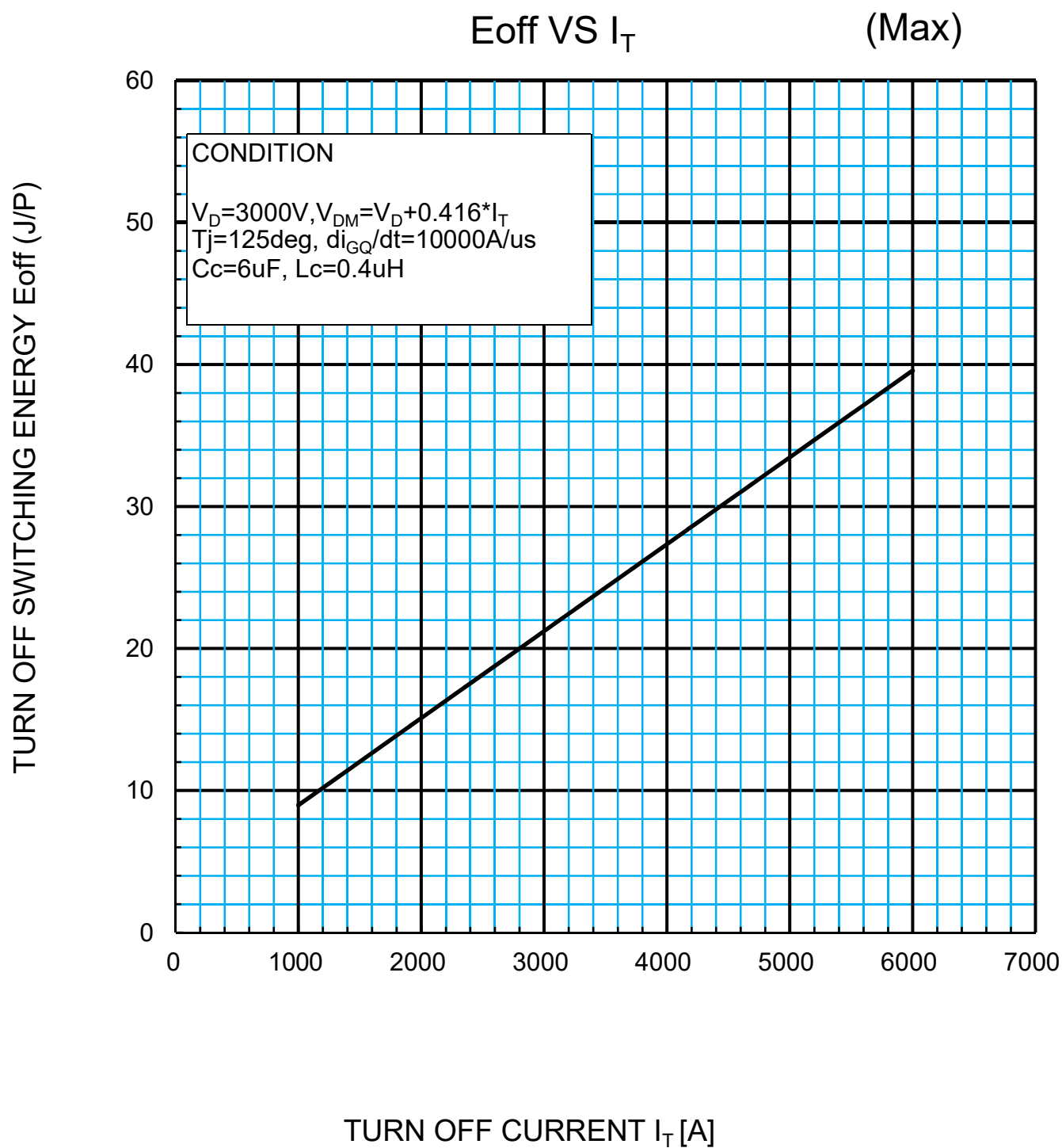


CURVES





CURVES





CURVES

