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SPECIFICATION

(TENTATIVE)

Device Name : IGBT

Type Name : 1MBH75D-060S

Spec. No. : MS5F 4623

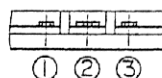
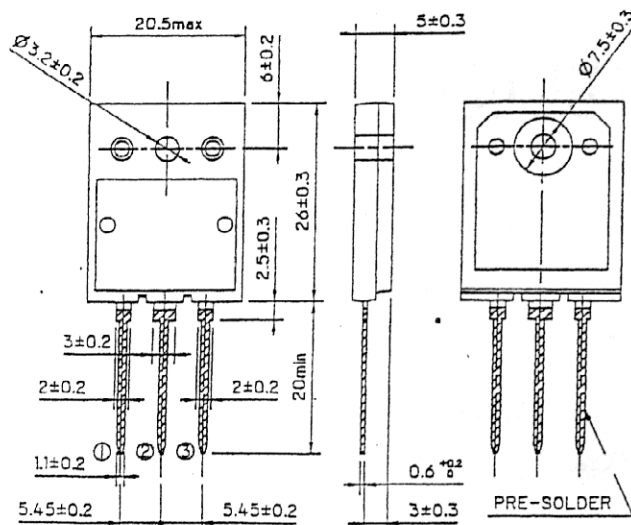
Date : June-21-1999

Fuji Electric Co.,Ltd.
Matsumoto Factory

		DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.		
DRAWN		June-21-99	T. Hosen		MS5F 4623	1/13	
CHECKED		Jun-21-99	T. HOSEN				
				T. HOSEN			

1MBH75D-060S

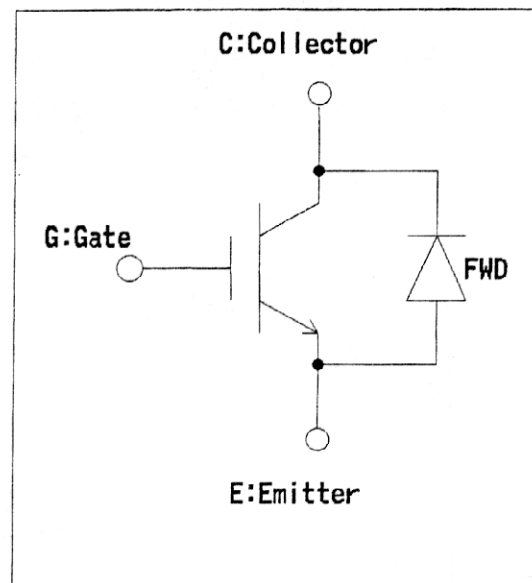
1. Outline Drawing



CONNECTION

- ① GATE
② COLLECTOR
③ EMITTER

2. Equivalent circuit



3. Absolute maximum ratings (Tc=25°C)

Items			Symbols	Ratings	Units
Collector-Emitter Voltage			V_{CES}	600	V
Gate-Emitter Voltage			V_{GES}	± 30	V
Collector Current	DC	Tc=25 °C	I_{C25}	82	A
		Tc=100°C	I_{C100}	75	A
	1ms	Tc=25 °C	I_{cp}	225	A
IGBT Max. Power Dissipation			P_c	310	W
FWD Max. Power Dissipation			P_c	180	W
Operating Temperature			T_j	+ 150	°C
Storage Temperature			T_{stg}	-40 ~ +150	°C
Mounting Screw Torque			—	70	N · cm

4. Electrical Characteristics (at Tc=25°C unless otherwise specified)

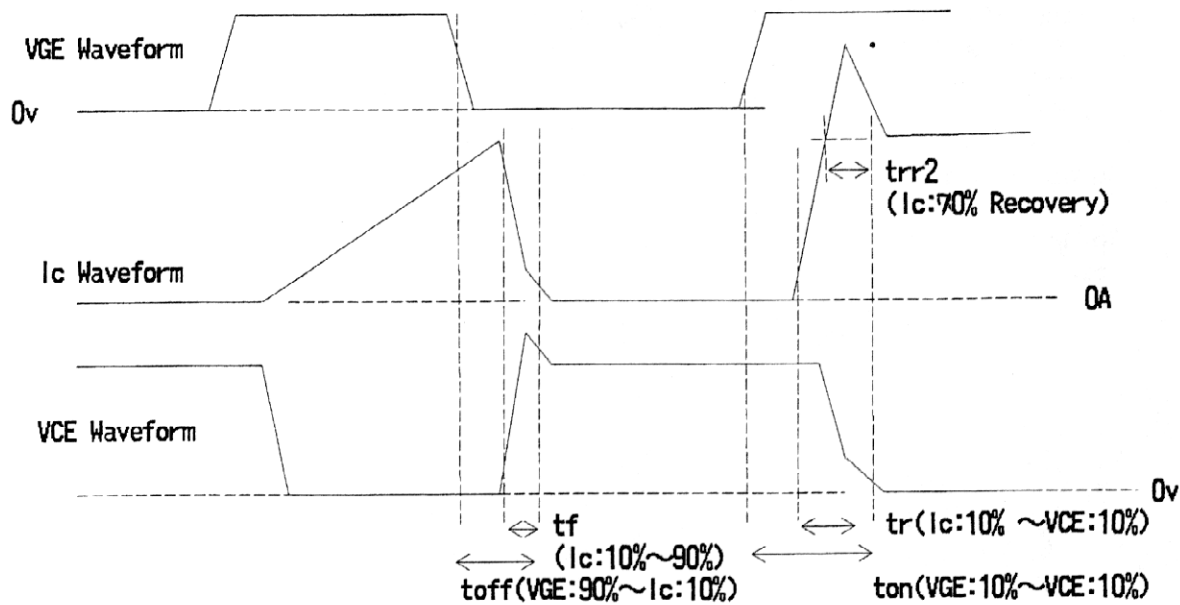
Items		Symbols	Characteristics			Conditions	Unit
			min.	typ.	max.		
Zero gate voltage Collector Current		I_{CES}	—	—	1.0	$V_{GE} = 0V$ $V_{CE} = 600V$	mA
Gate-Emitter leakage Current		I_{GES}	—	—	10	$V_{CE} = 0V$ $V_{GE} = \pm 30V$	μA
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	4.0	5.0	6.0	$V_{CE} = 20V$ $I_C = 75mA$	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	2.4	2.9	$V_{GE} = 15V$ $I_C = 75A$	V
Input capacitance		C_{ies}	—	3700	—	$V_{GE} = 0V$	pF
Output capacitance		C_{oes}	—	350	—	$V_{CE} = 25V$	
Reverse transfer capacitance		C_{res}	—	190	—	$f = 1MHz$	
Switching Time	Turn-on time	$t_{on} \times$	—	0.15	—	$V_{CC} = 300V$ $I_C = 75A$ $V_{GE} = \pm 15V$ $R_G = 24 \Omega$ (Half Bridge)	μs
		$t_r \times$	—	0.09	—		
		t_{rr2}	—	0.03	—		
	Turn-off time	t_{off}	—	0.50	0.62	Inductance Load	
		t_f	—	0.10	0.17		
	Turn-on time	$t_{on} \times$	—	0.15	—	$V_{CC} = 300V$ $I_C = 75A$ $V_{GE} = +15V$ $R_G = 6.0 \Omega$ (Half Bridge)	
		$t_r \times$	—	0.09	—		
		t_{rr2}	—	0.03	—		
	Turn-off time	t_{off}	—	0.50	0.62	Inductance Load	
		t_f	—	0.10	0.17		
FWD forward voltage		V_F	—	2.0	2.5	$I_F = 75A, V_{GE} = 0V$	μs
Reverse recovery time		t_{rr}	—	0.06	0.10	$I_F = 75A, V_{GE} = -10V$ $V_R = 300V,$ $dv/dt = 100A/\mu s$	

※ Turn-on characteristics include t_{rr2} . See figure.A in next page.

5. Thermal resistance characteristics

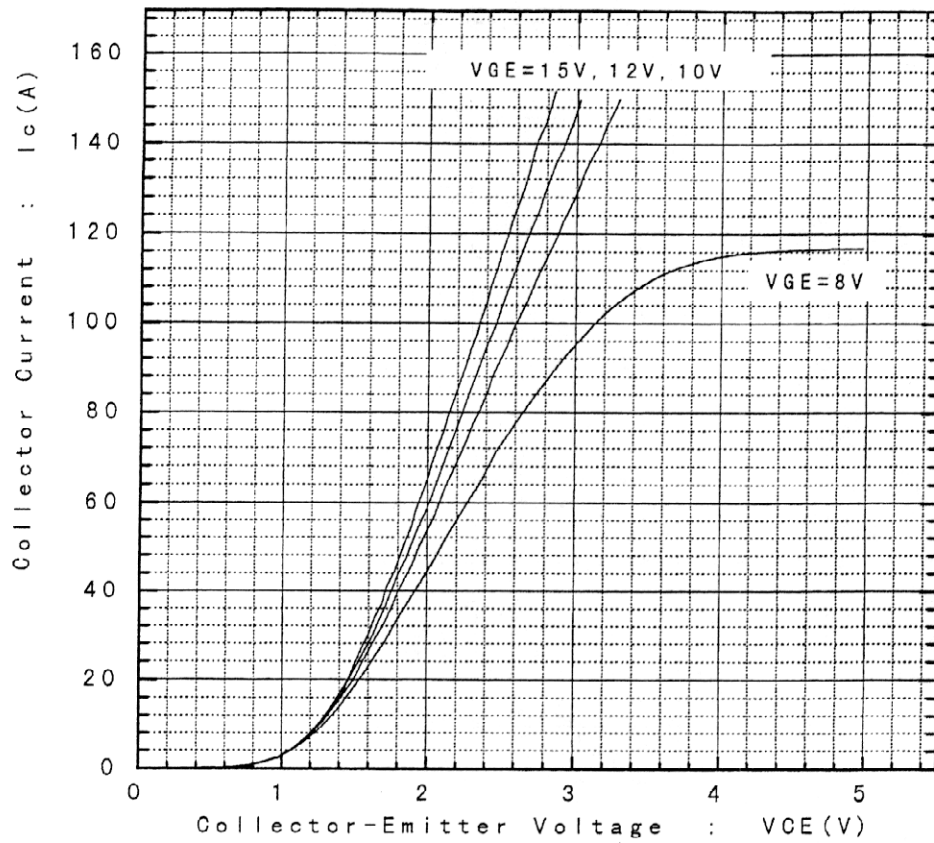
Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Thermal resistance	Rth(j-c)	—	—	0.40	IGBT	°C/W
	Rth(j-c)	—	—	0.69	FWD	

6. Switching waveform

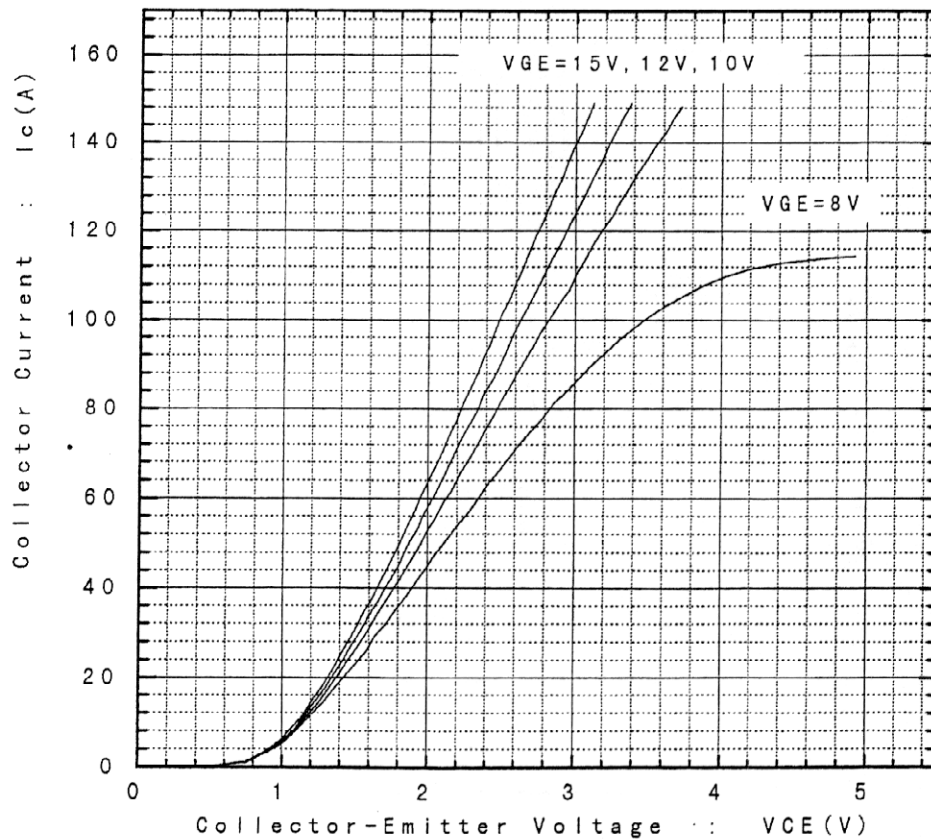


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Collector Current vs. Collector-Emitter Voltage
 $T_j = 25^\circ\text{C}$

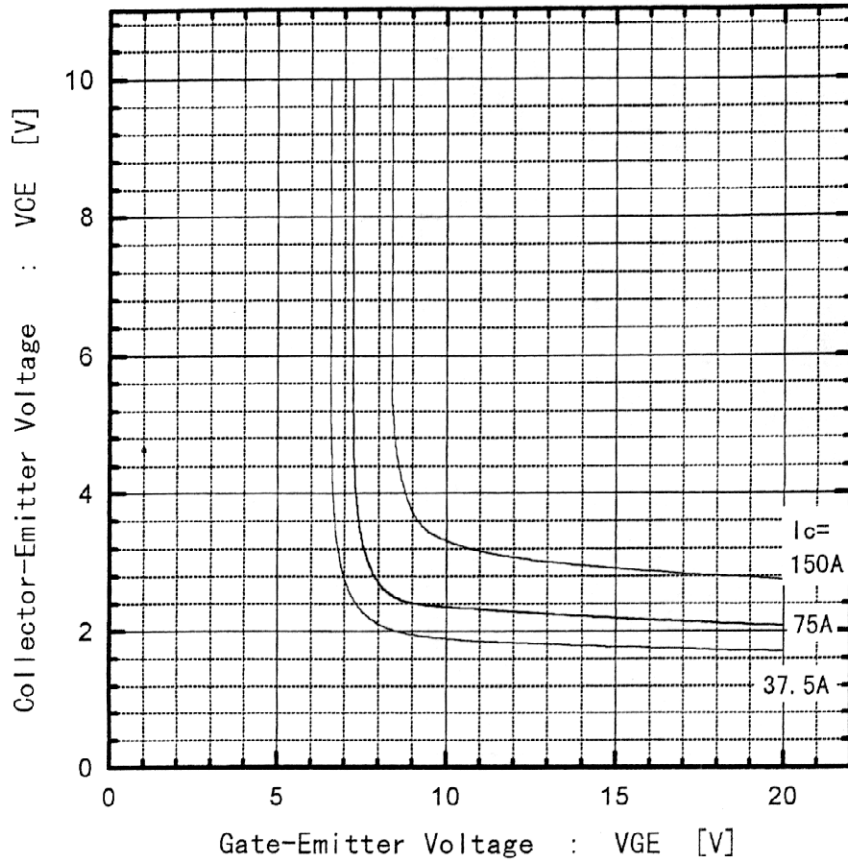


Collector Current vs. Collector-Emitter Voltage
 $T_j = 125^\circ\text{C}$

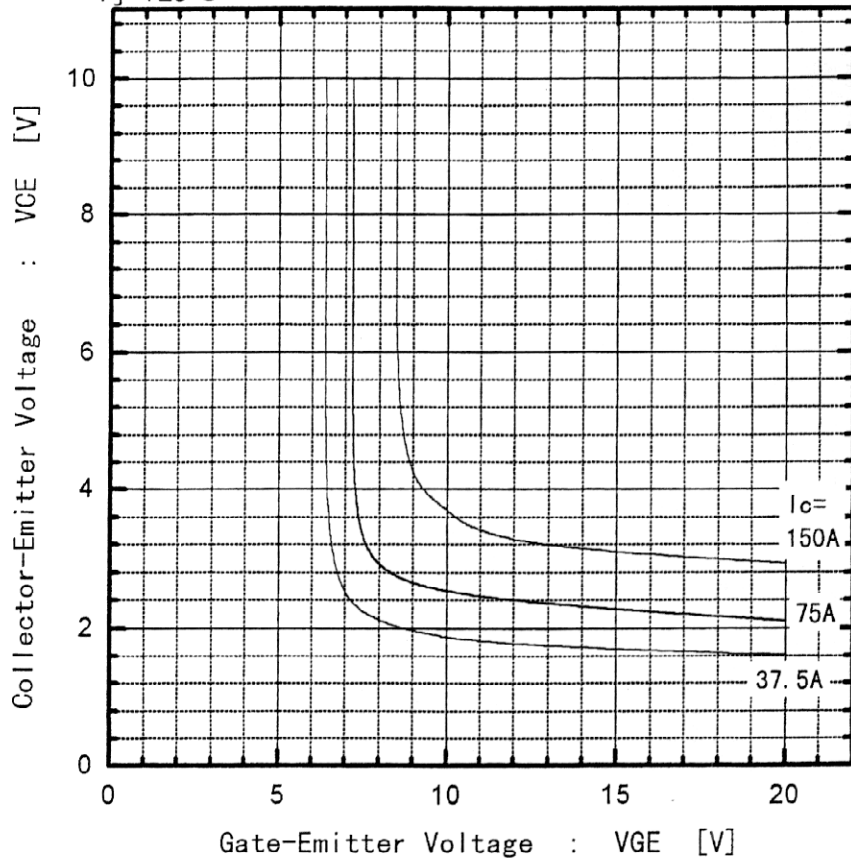


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Collector-Emitter Voltage vs Gate-Emitter Voltage
 $T_j=25^{\circ}\text{C}$

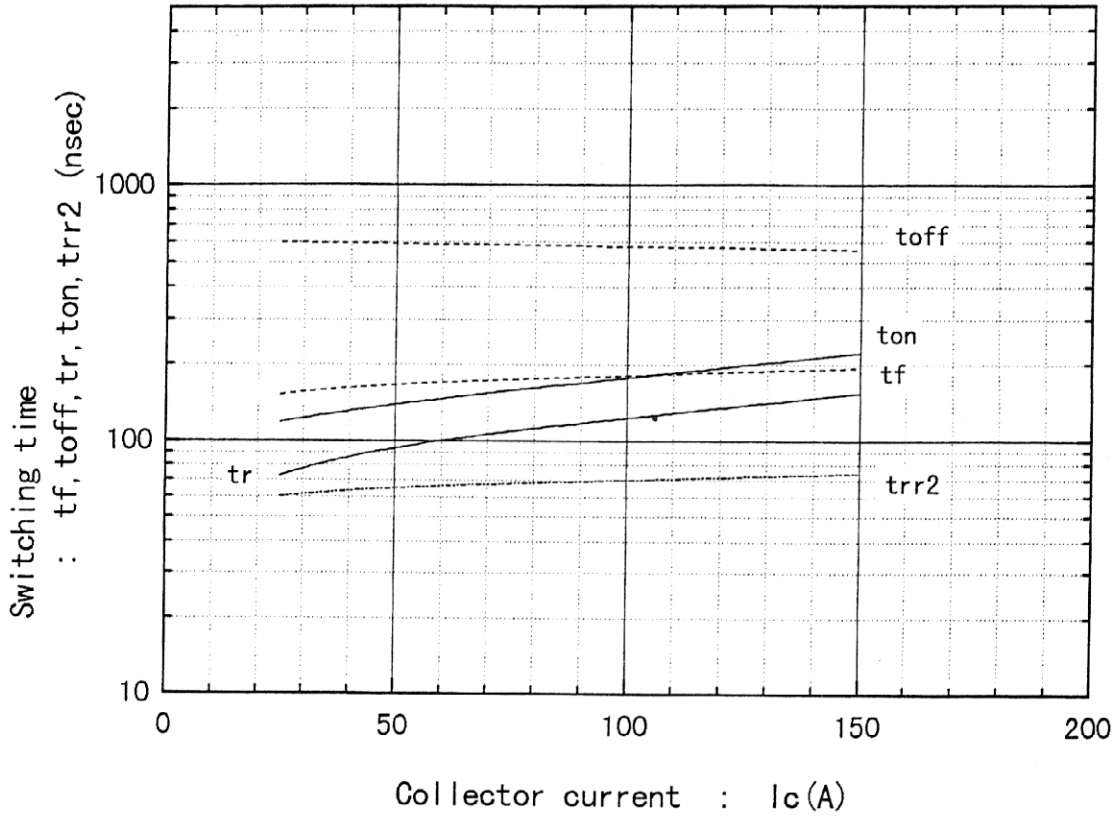


Collector-Emitter Voltage vs Gate-Emitter Voltage
 $T_j=125^{\circ}\text{C}$

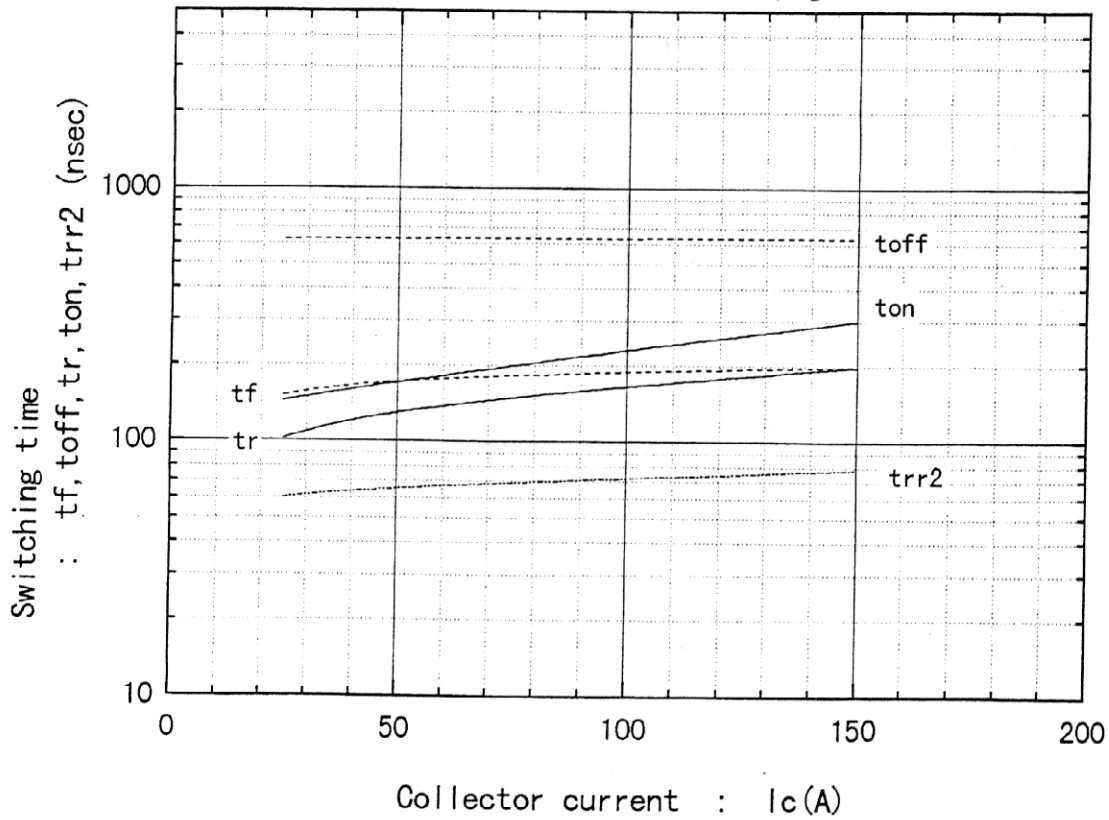


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Switching time vs Collector current
 $V_{cc}=300V, R_G=6\Omega, V_{GE}=+15V, T_j=125^\circ C$



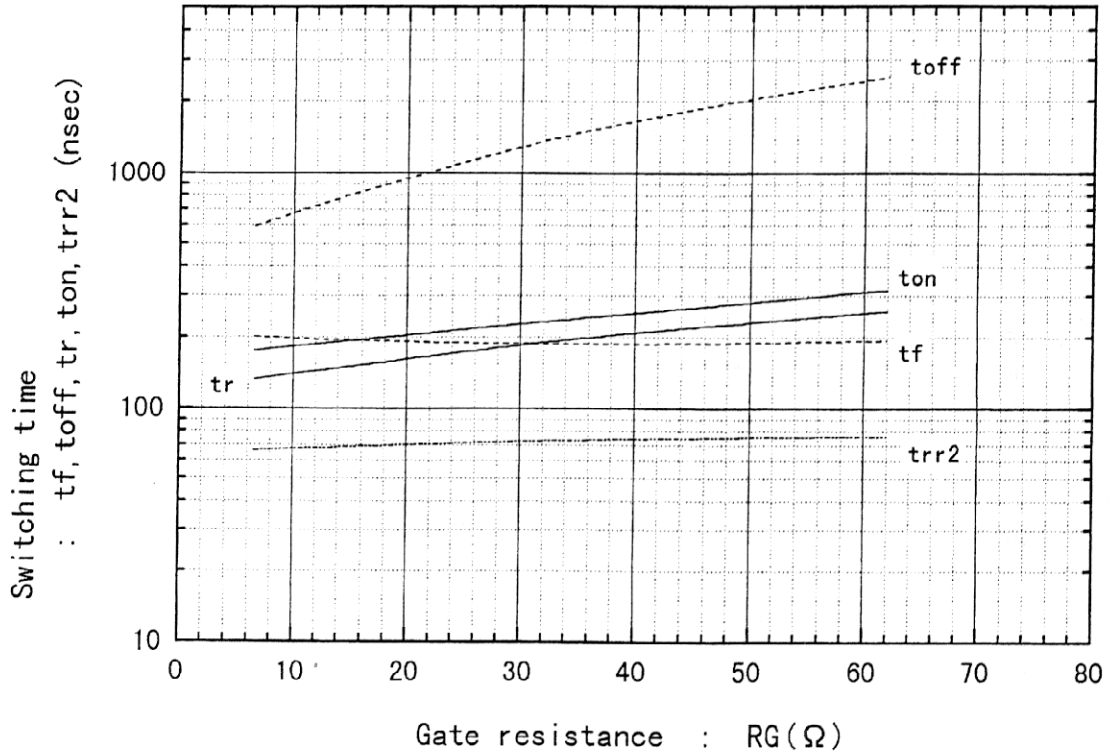
Switching time vs Collector current
 $V_{cc}=300V, R_G=24\Omega, V_{GE}=\pm 15V, T_j=125^\circ C$



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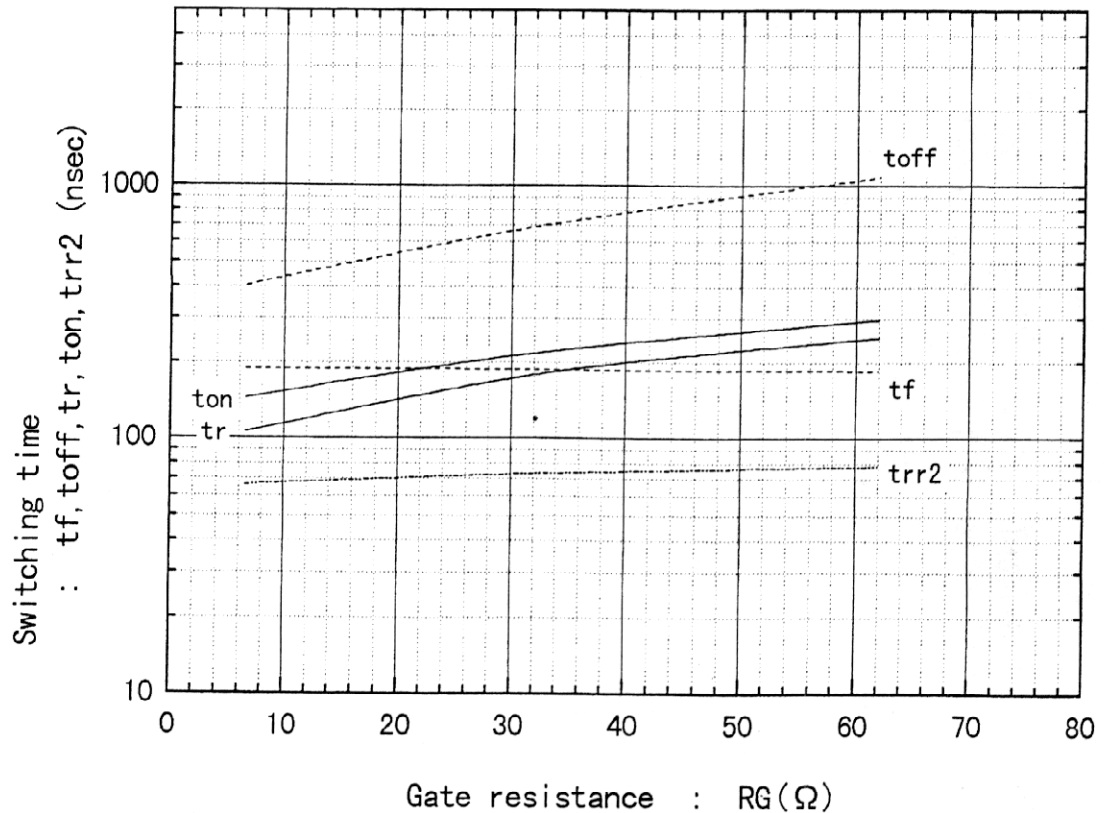
Switching time vs RG

$V_{cc}=300V$, $I_c=75A$, $V_{GE}=+15V$, $T_j=125^\circ C$

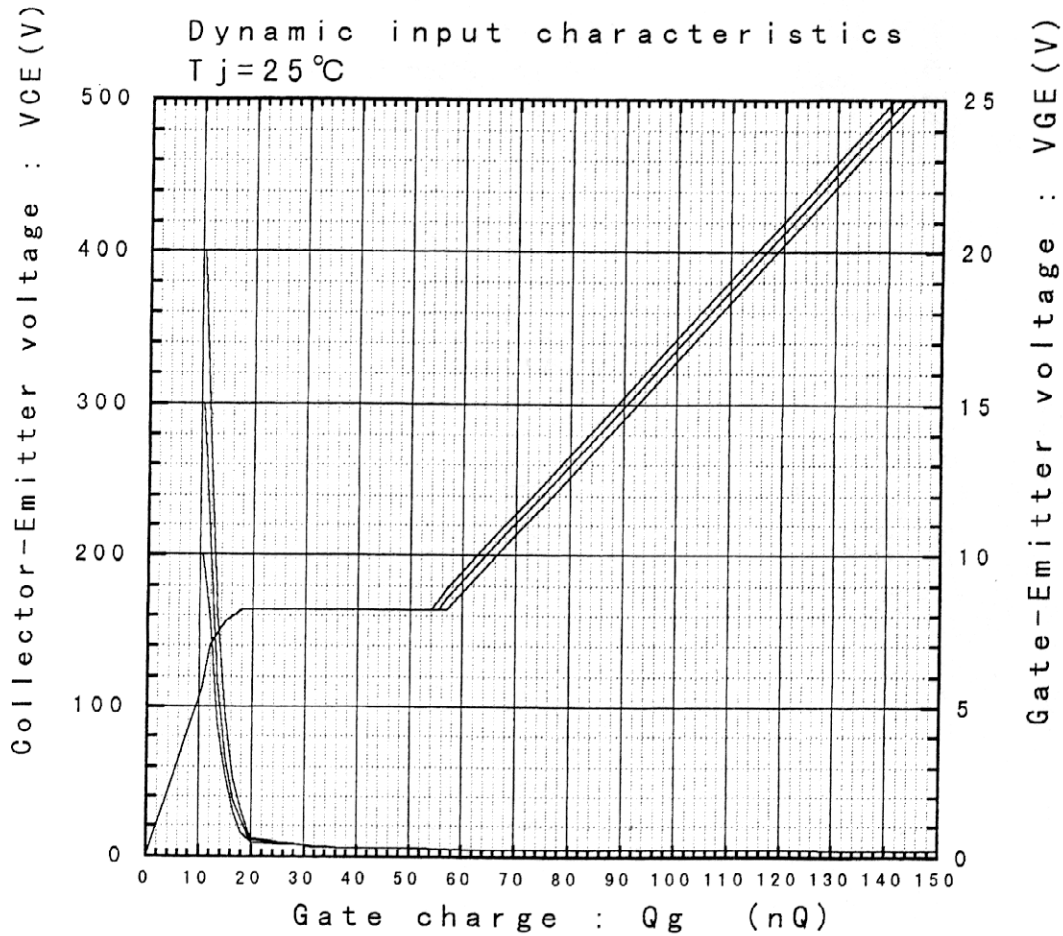


Switching time vs RG

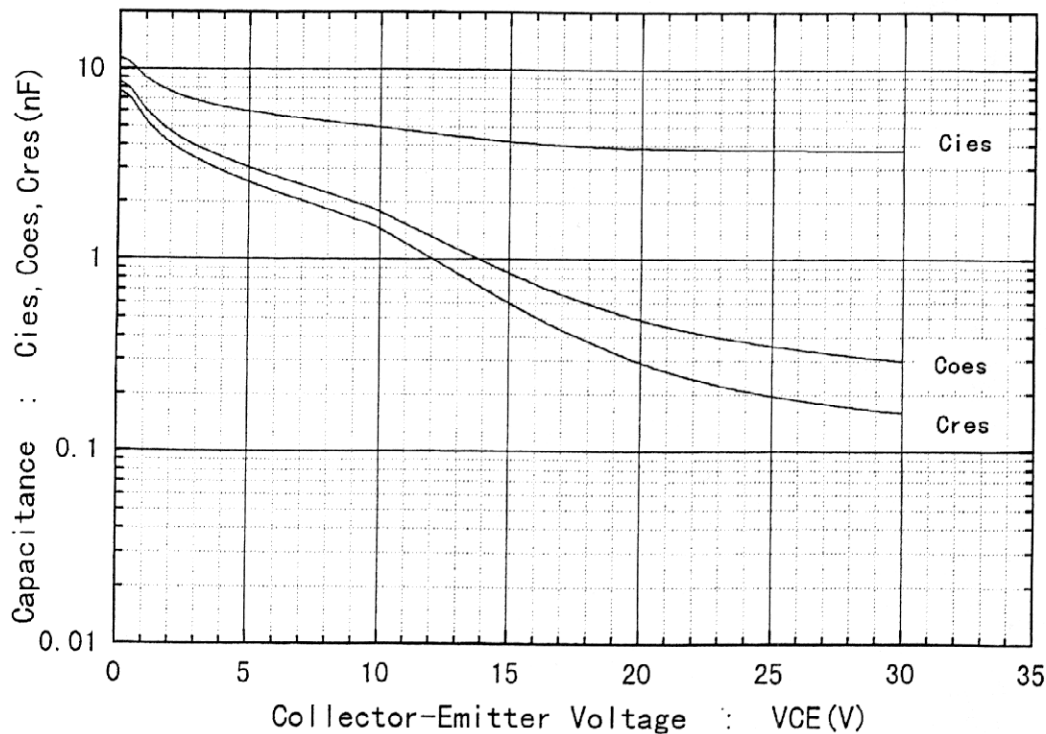
$V_{cc}=300V$, $I_c=75A$, $V_{GE}=\pm 15V$, $T_j=125^\circ C$



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Capacitance vs. Collector-Emitter Voltage
 $T_j = 25^\circ\text{C}$

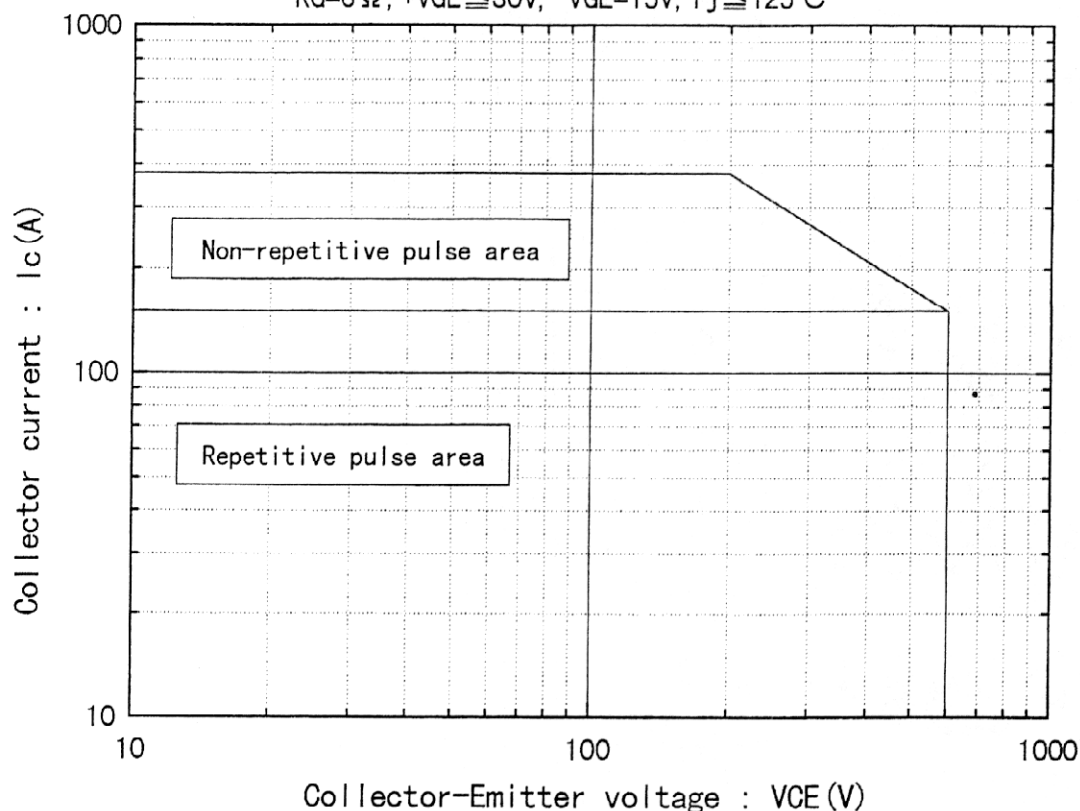


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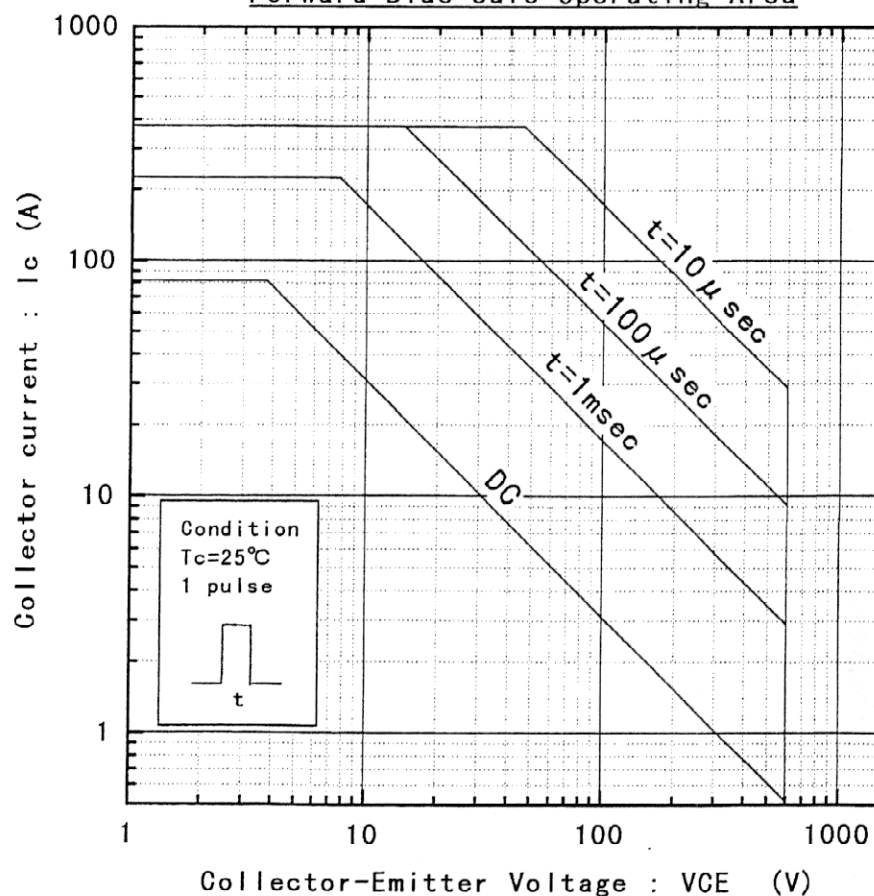
Reverse Biased Safe Operating Area

$R_G=6\Omega$, $+V_{GE}\leq 30V$, $-V_{GE}=15V$, $T_J\leq 125^\circ C$



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Forward Bias Safe Operating Area



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FIG. NO.

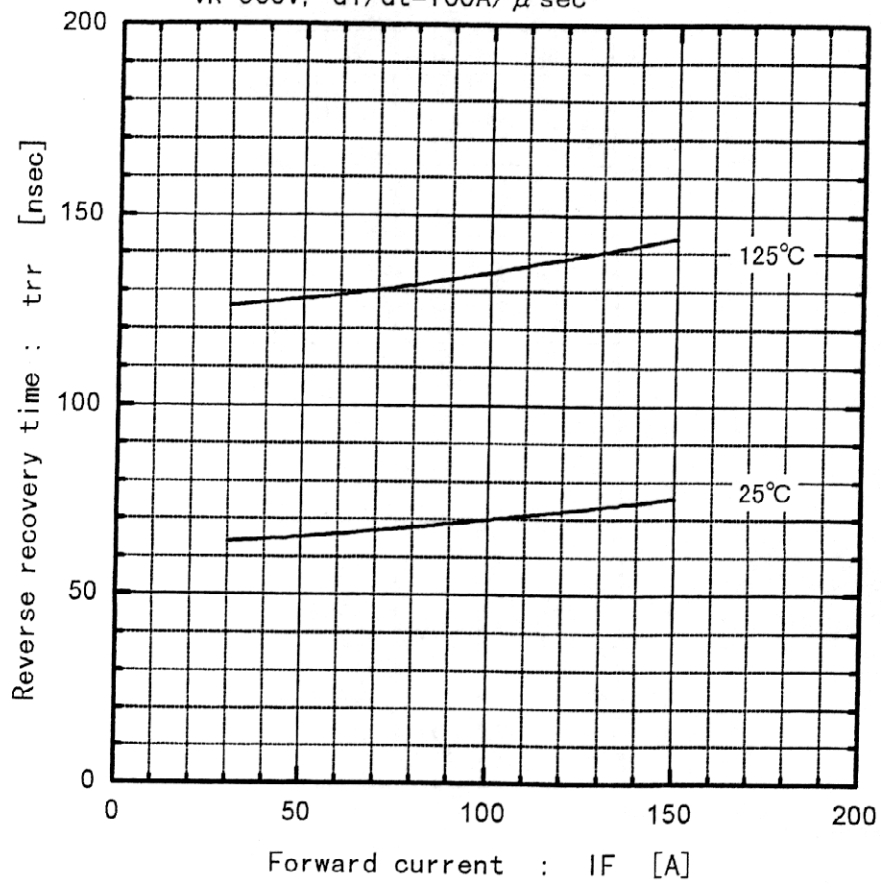
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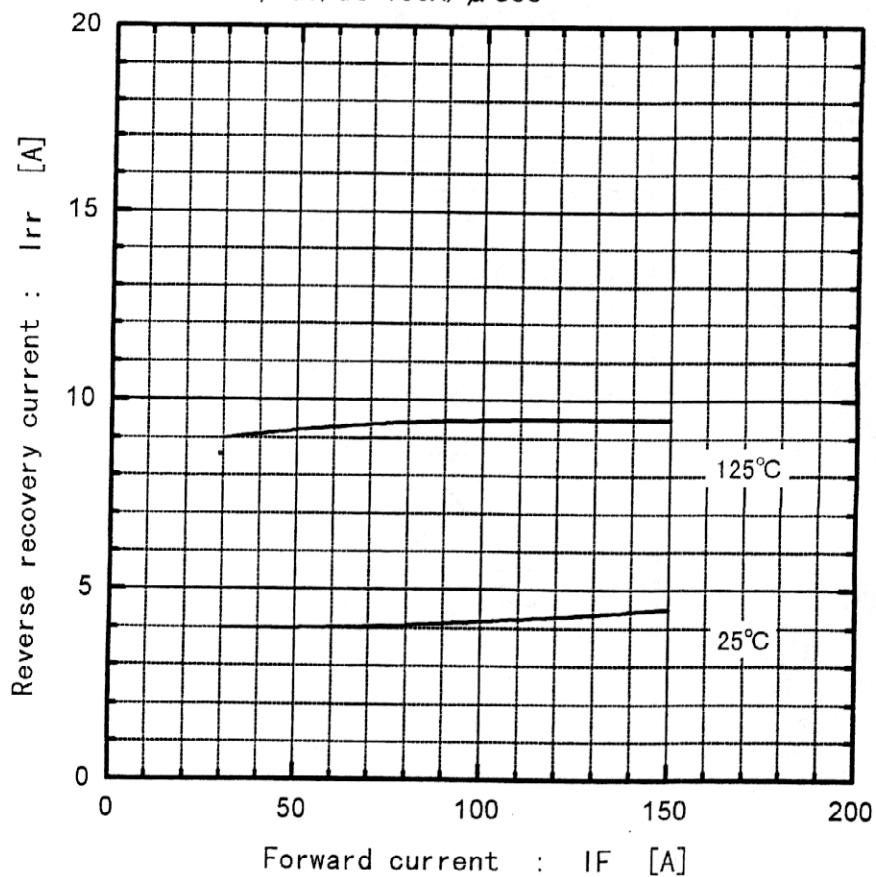
H04-004-03

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Reverse recovery time vs. Forward current
 $V_R=300V, -di/dt=100A/\mu sec$

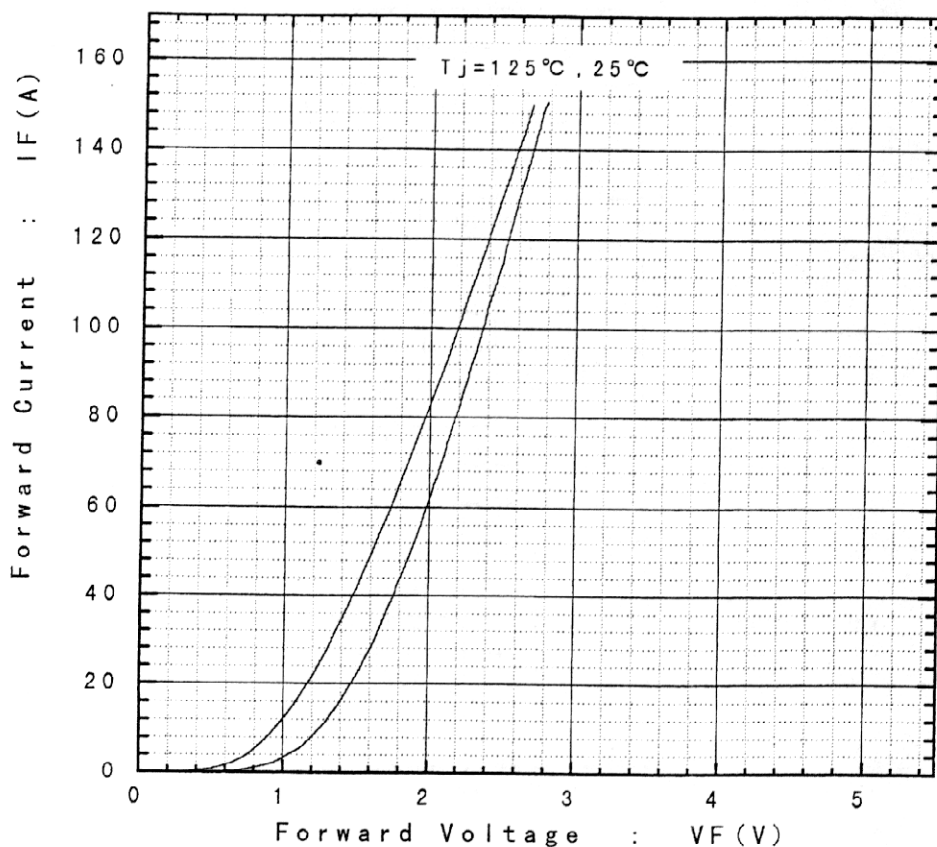


Reverse recovery current vs. Forward current
 $V_R=300V, -di/dt=100A/\mu sec$

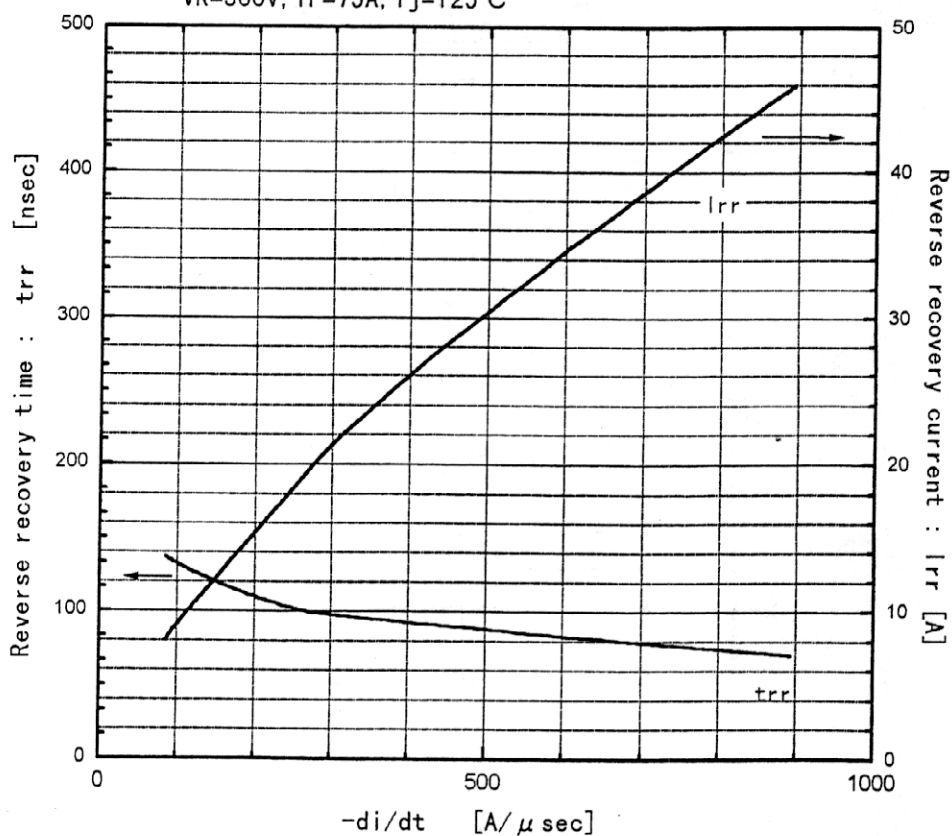


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Forward Voltage vs. Forward current



Reverse recovery characteristics vs. $-di/dt$
 $V_R=300\text{V}$, $I_F=75\text{A}$, $T_j=125^\circ\text{C}$



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