

SPECIFICATION

(TENTATIVE)

Device Name : IGBT

Type Name : 1MBH75D-060S

Spec. No. : MS5F 4623

Date : June-21-1999

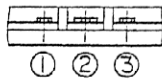
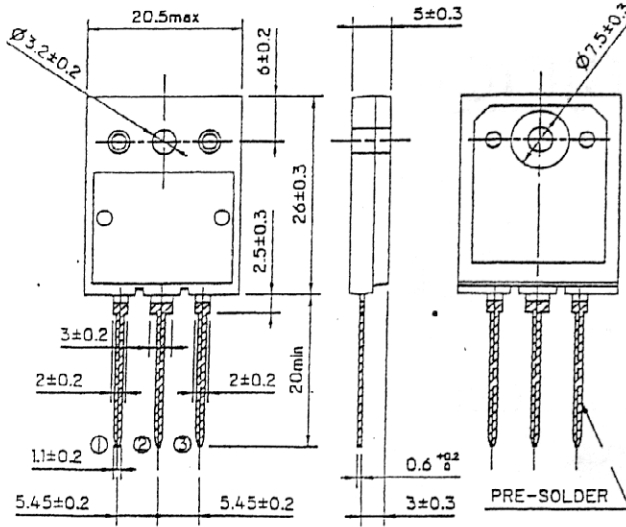
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Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.		
DRAWN	June-21-99	<i>[Signature]</i>		Dwg. NO	MS5F 4623	1/13
CHECKED	Jun-21-99	T. HOSEN	T. HOSEN			

1MBH75D-060S

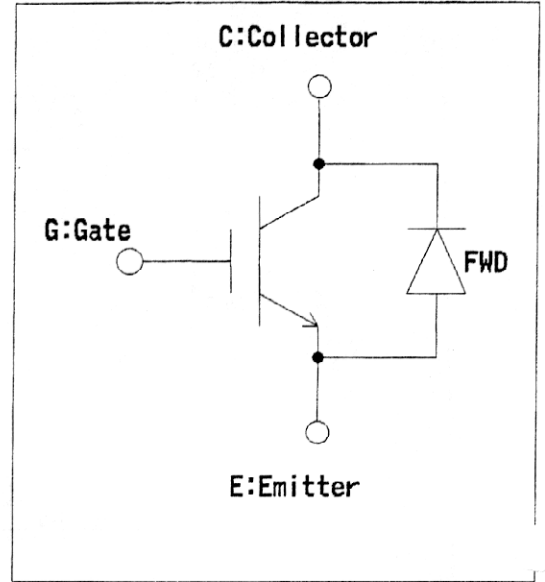
1. Outline Drawing



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)

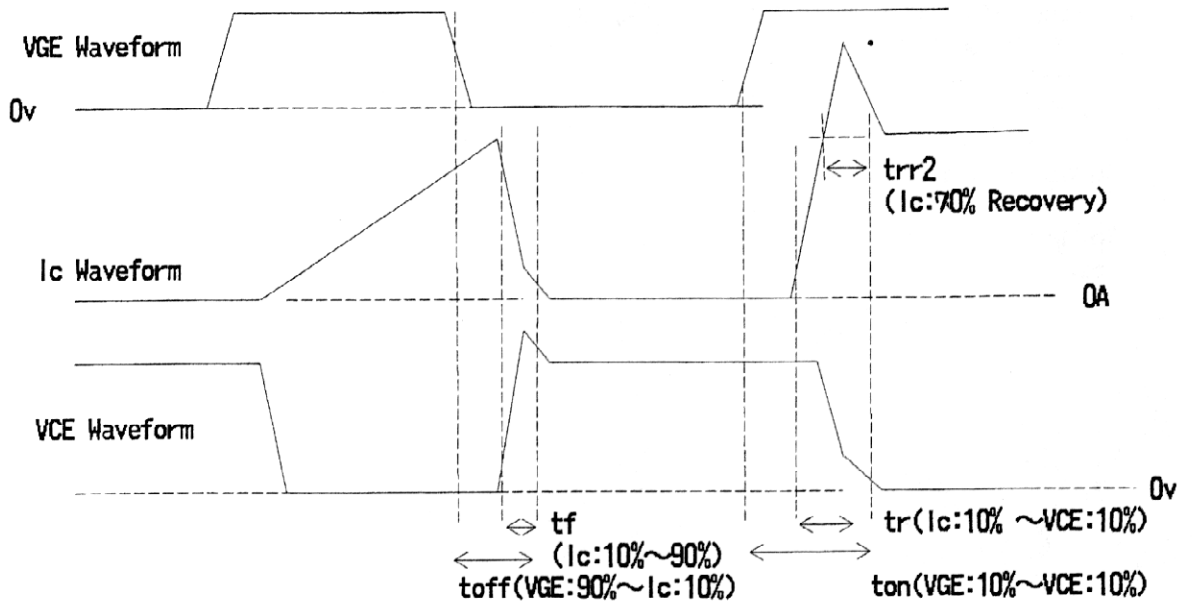
Items		Symbols	Characteristics			Conditions	Unit		
			min.	typ.	max.				
Zero gate voltage Collector Current		I_{CES}	—	—	1.0	$V_{GE} = 0V$ $V_{CE} = 600V$	mA		
Gate-Emitter leakage Current		I_{GES}	—	—	10	$V_{CE} = 0V$ $V_{GE} = \pm 30V$	μA		
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	4.0	5.0	6.0	$V_{CE} = 20V$ $I_c = 75mA$	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	$t_{on} *$	—	0.15	—	$V_{CC} = 300V$ $I_c = 75A$ $V_{GE} = \pm 15V$ $R_G = 24 \Omega$ (Half Bridge)	μS		
		$t_r *$	—	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	$t_{on} *$	—	0.15	—			$V_{CC} = 300V$ $I_c = 75A$ $V_{GE} = +15V$ $R_G = 6.0 \Omega$ (Half Bridge)	μS
			$t_r *$	—	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	$I_F=75A, V_{GE}=0V$		
Reverse recovery time		t_{rr}	—	0.06	0.10	$I_F=75A, V_{GE}=-10V$ $V_R=300V,$ $dv/dt=100A/\mu S$	μS		

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

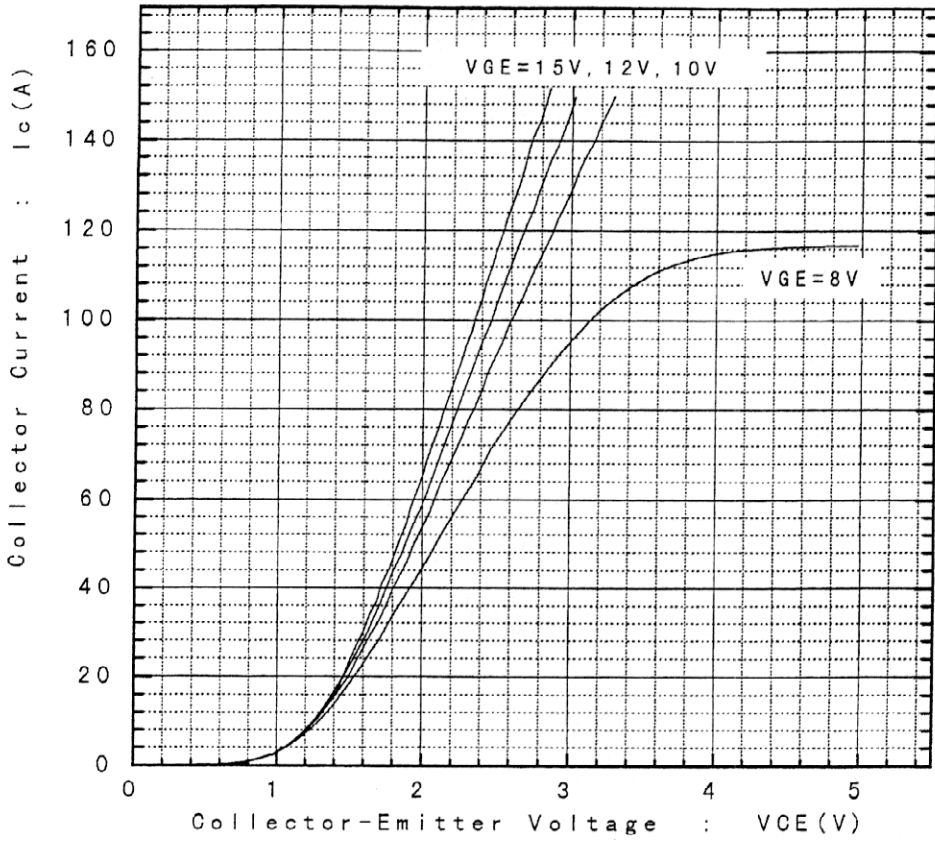
5. Thermal resistance characteristics

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

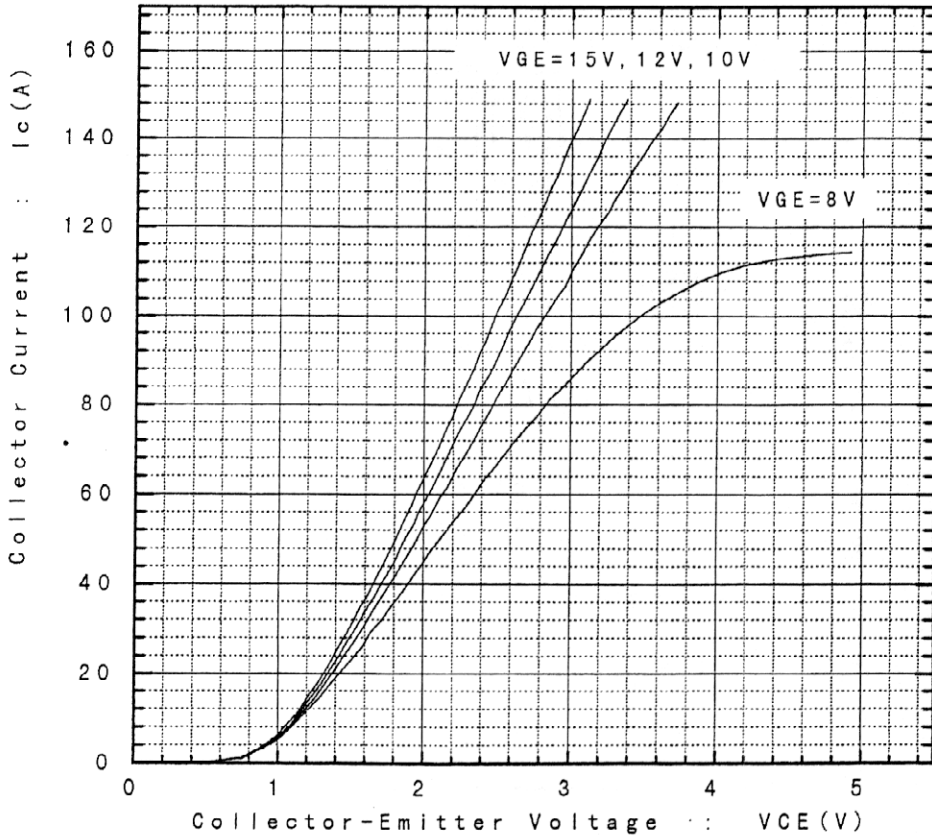
6. Switching waveform



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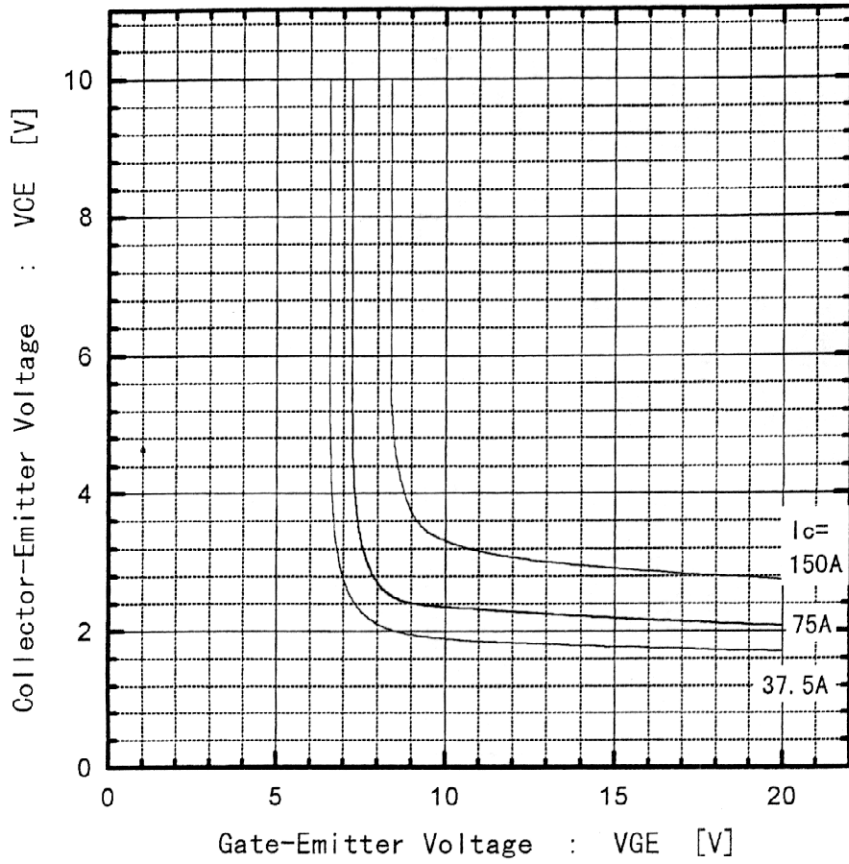
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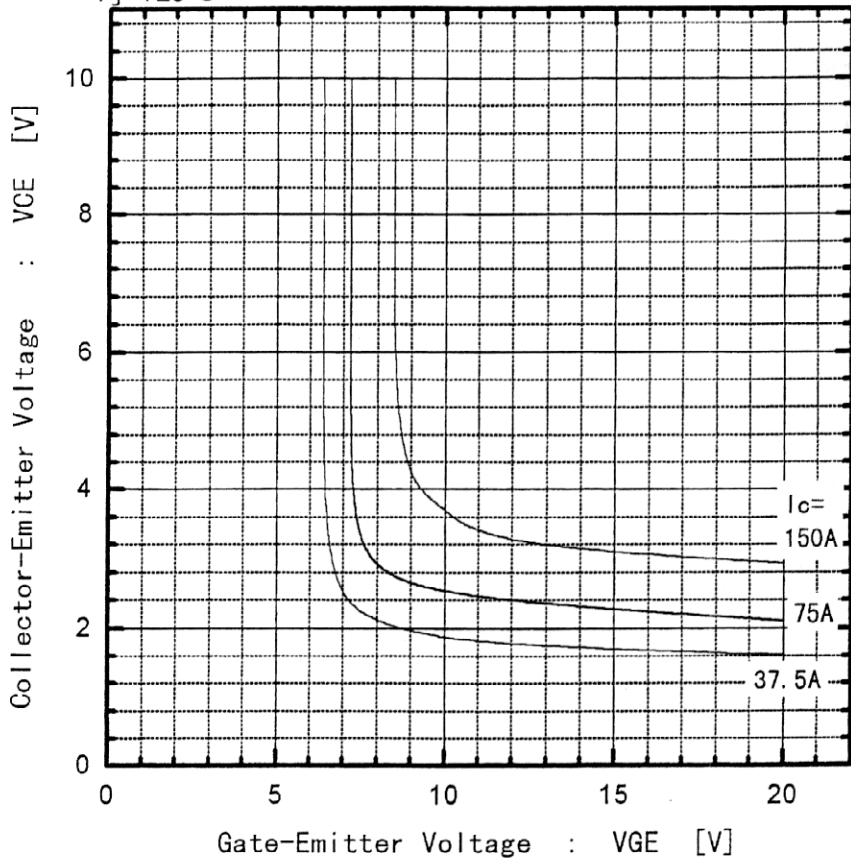
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Collector-Emitter Voltage vs Gate-Emitter Voltage
 $T_j=25^\circ\text{C}$



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

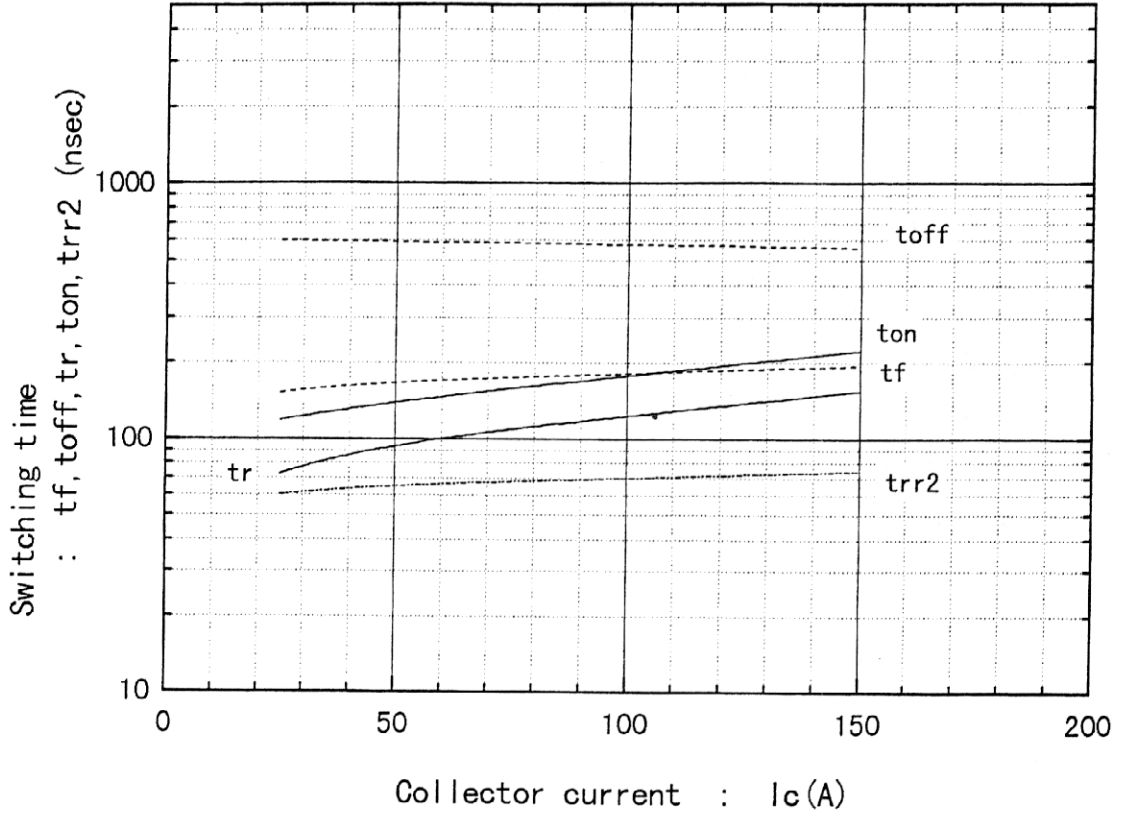


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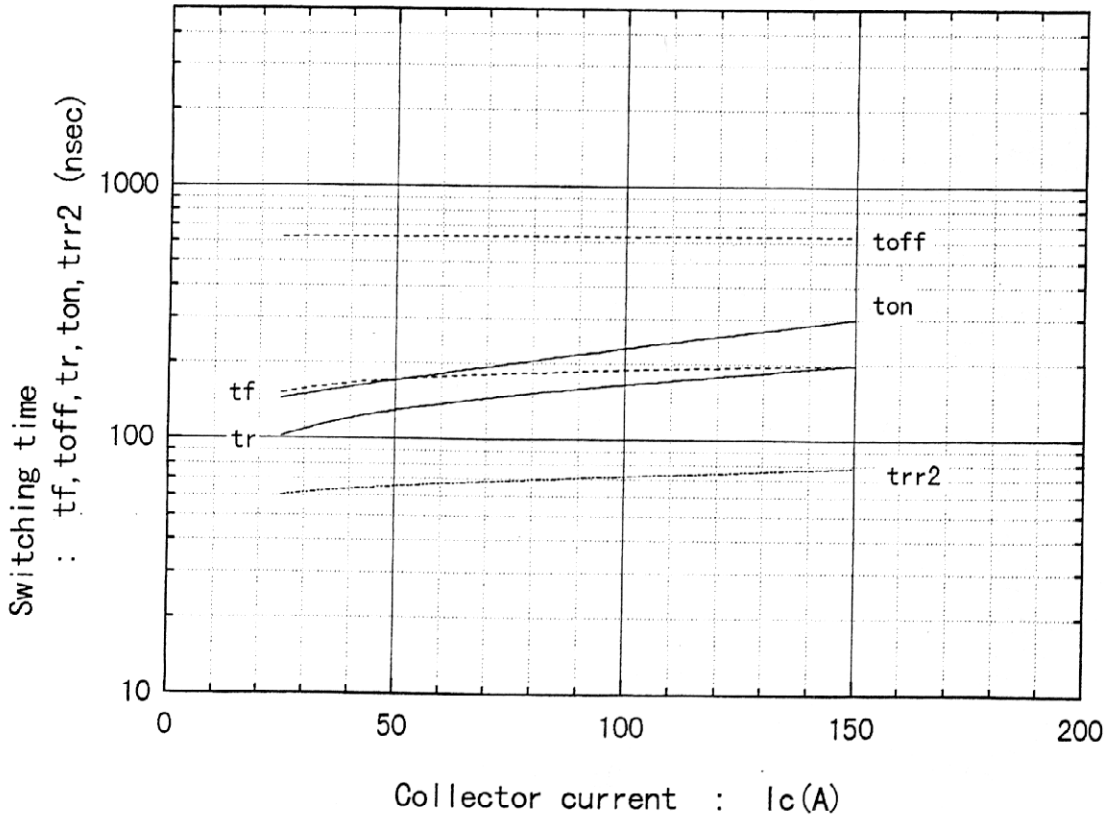
Switching time vs Collector current

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



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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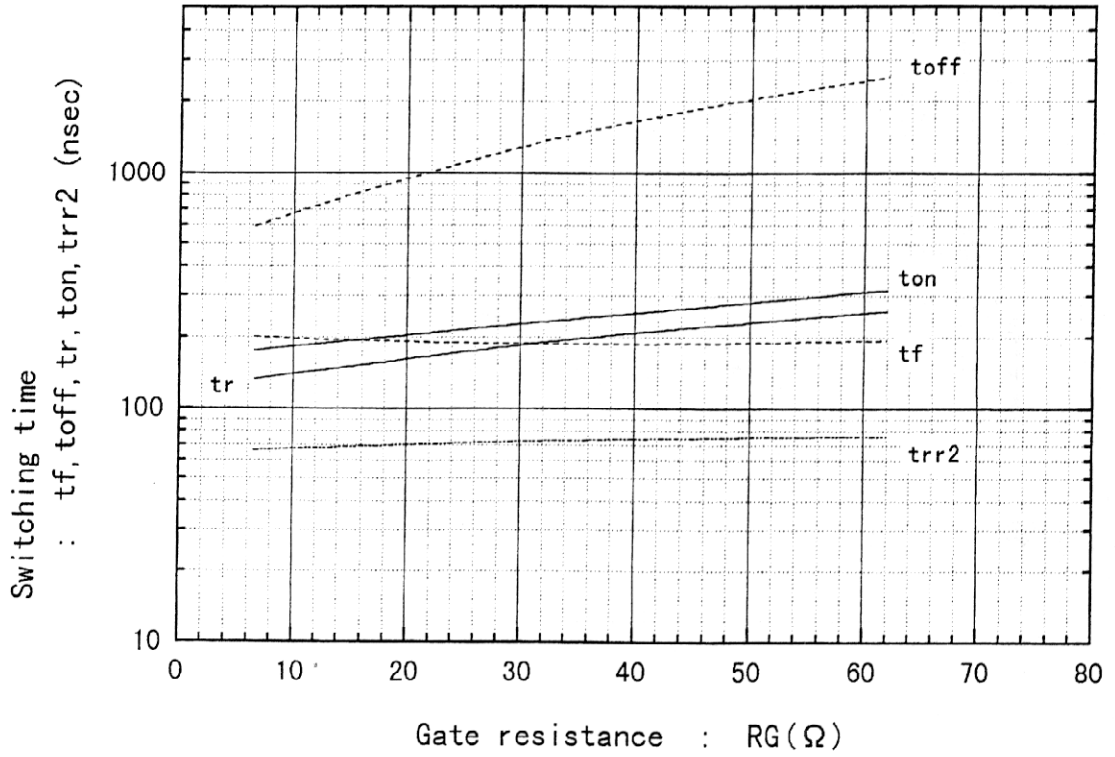
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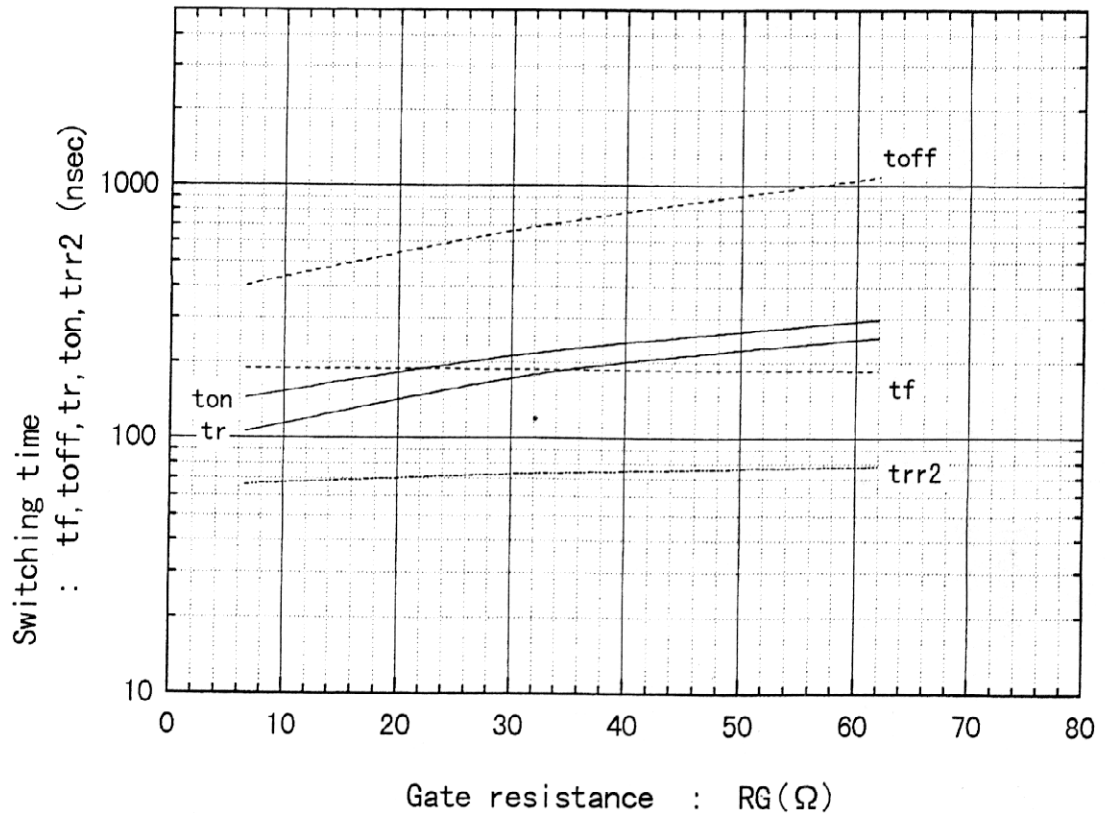
Switching time vs RG

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

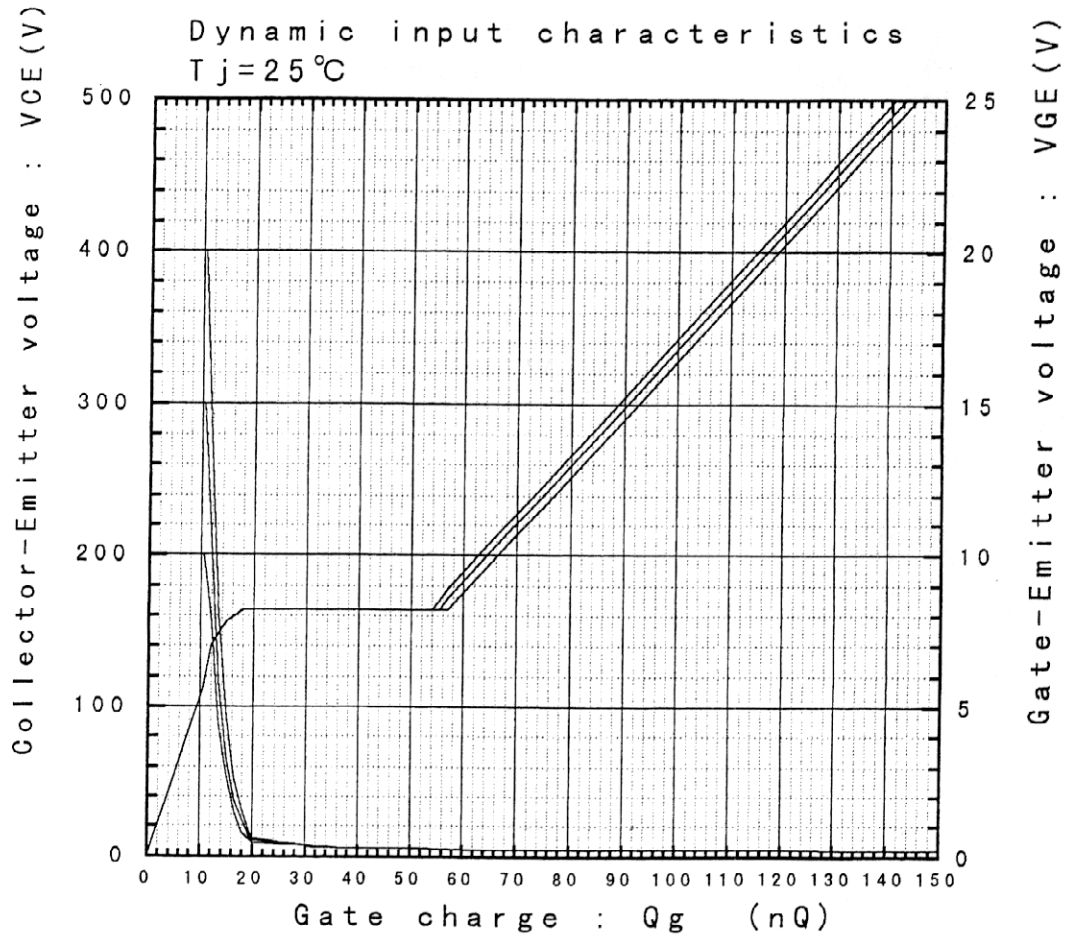


Switching time vs RG

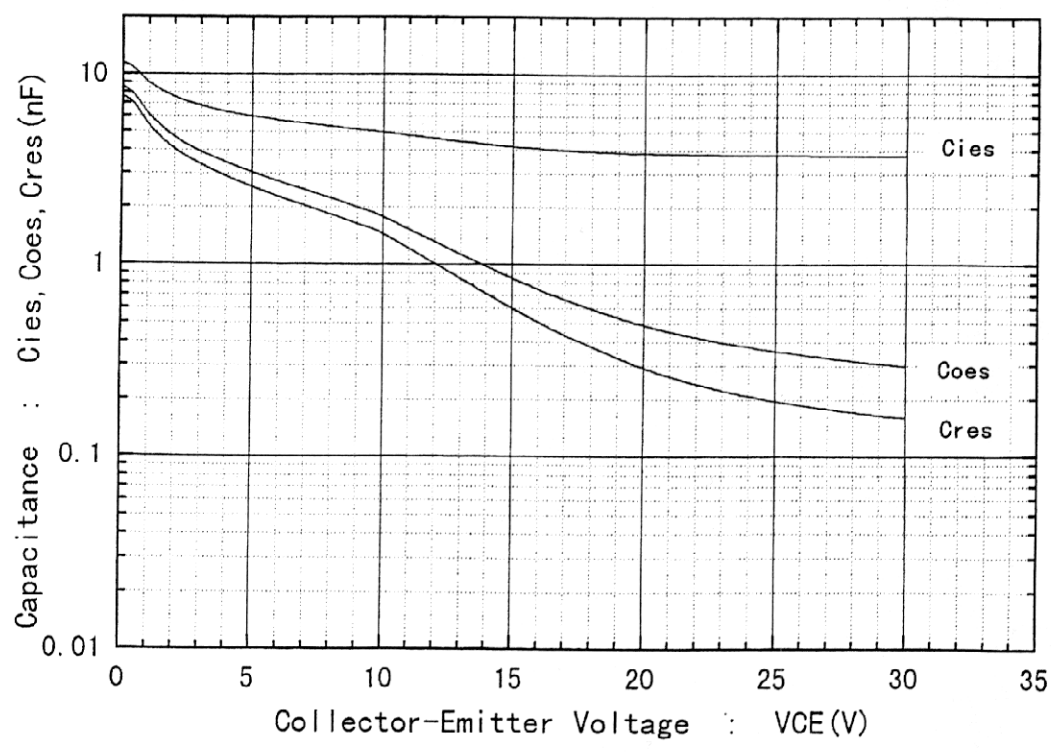
$V_{cc}=300V, I_c=75A, V_{GE}=\pm 15V, T_j=125^{\circ}C$



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



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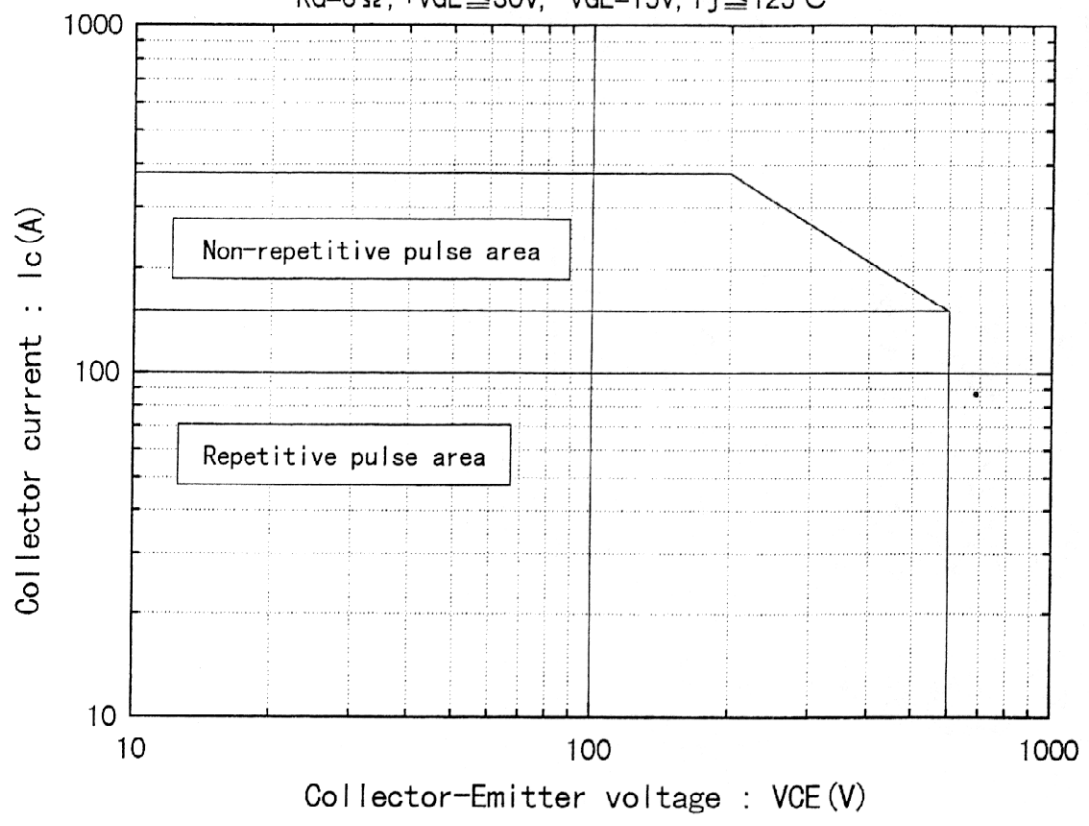
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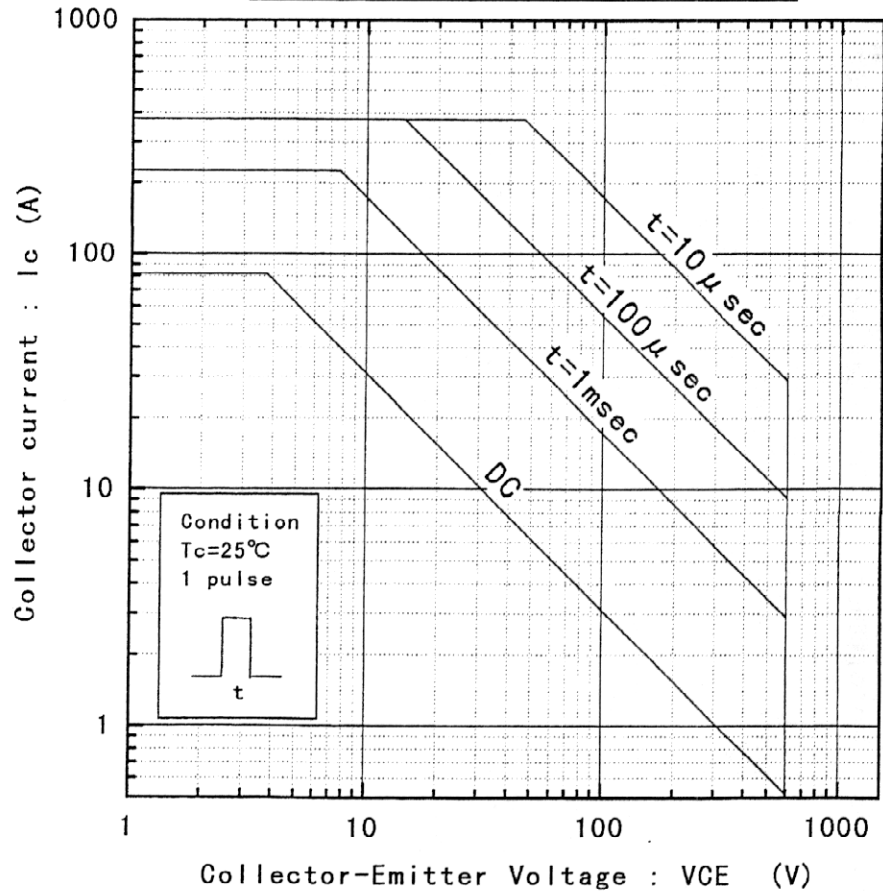
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1MBH75D-060S
 Reverse Biased Safe Operating Area
 $R_G=6\ \Omega$, $+V_{GE}\leq 30V$, $-V_{GE}=15V$, $T_j\leq 125^\circ C$



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 Forward Bias Safe Operating Area



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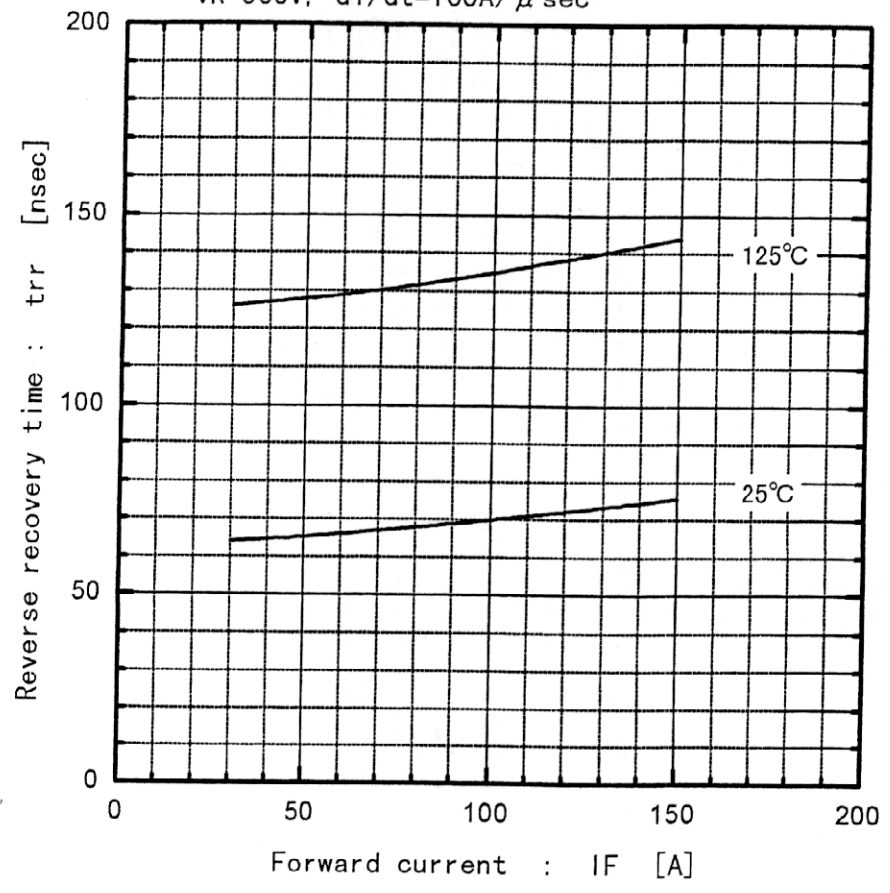
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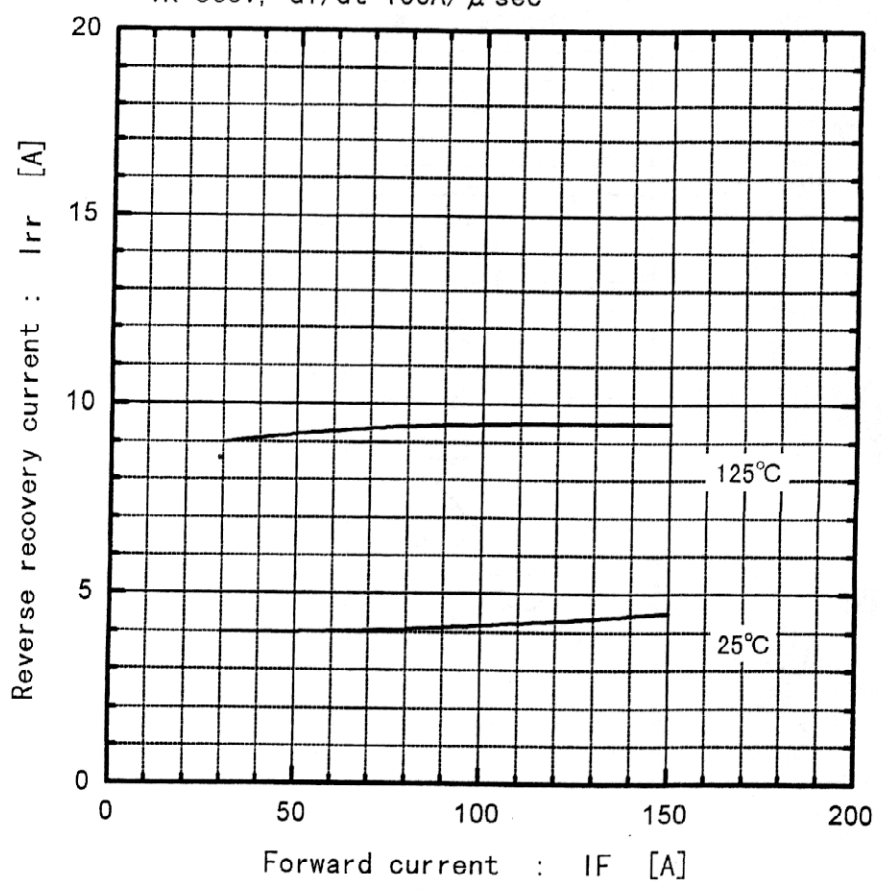
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Reverse recovery time vs. Forward current
VR=300V, -di/dt=100A/ μ sec

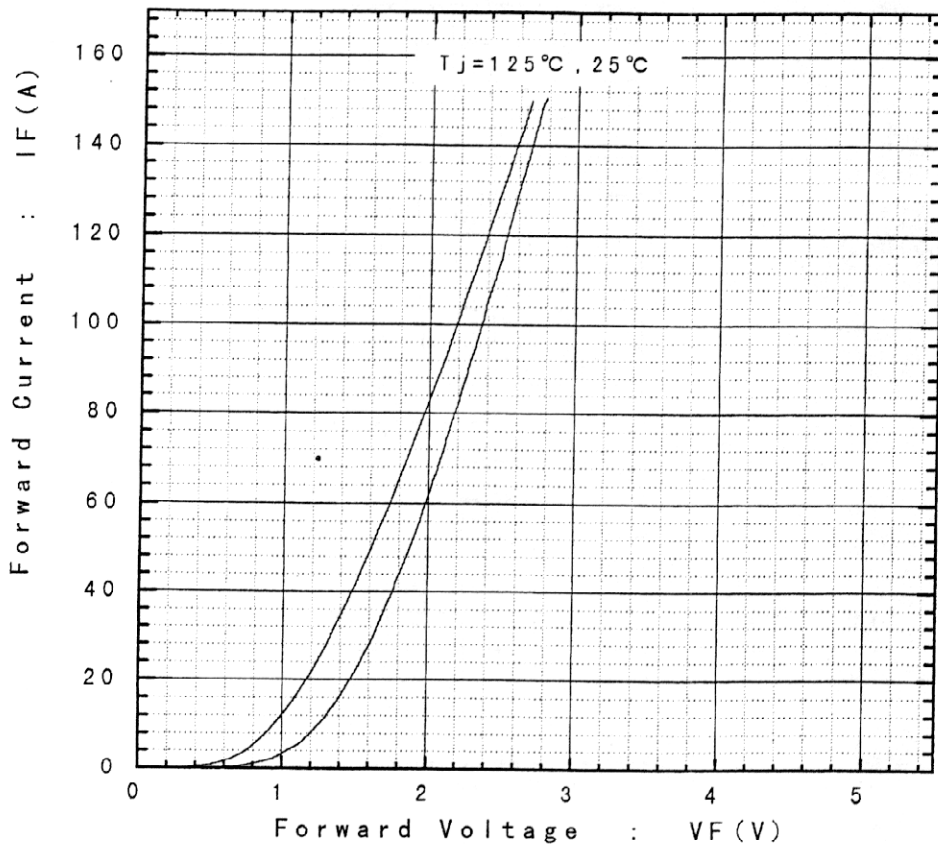


Reverse recovery current vs. Forward current
VR=300V, -di/dt=100A/ μ sec

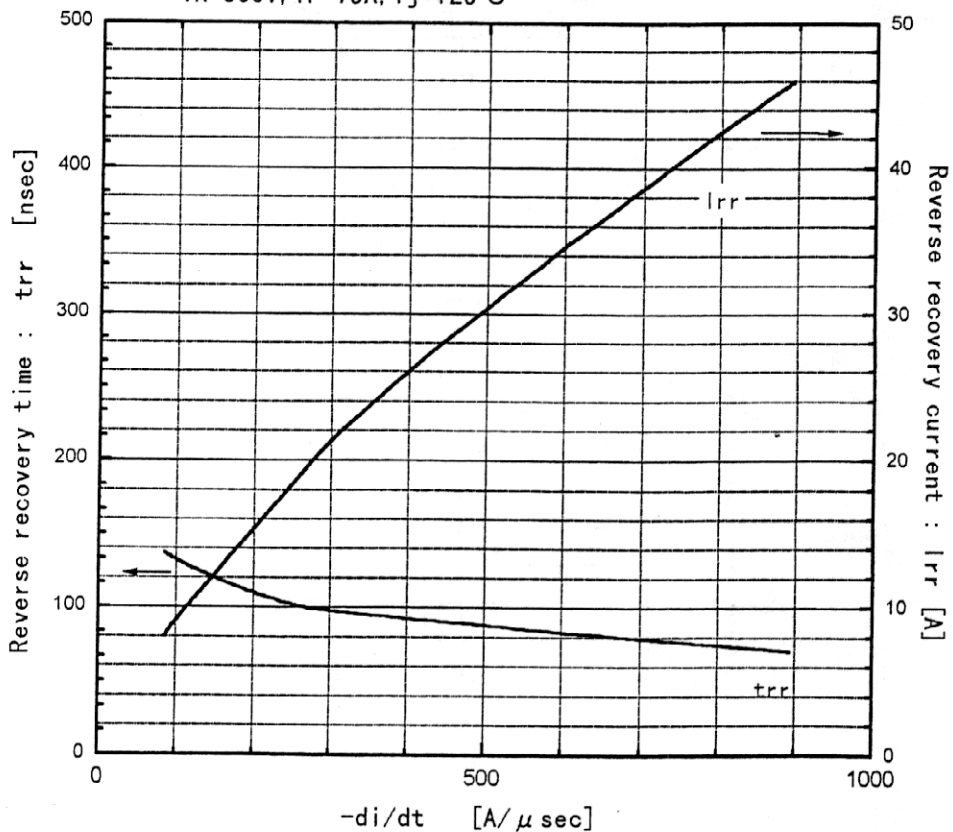


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Forward Voltage vs. Forward current



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



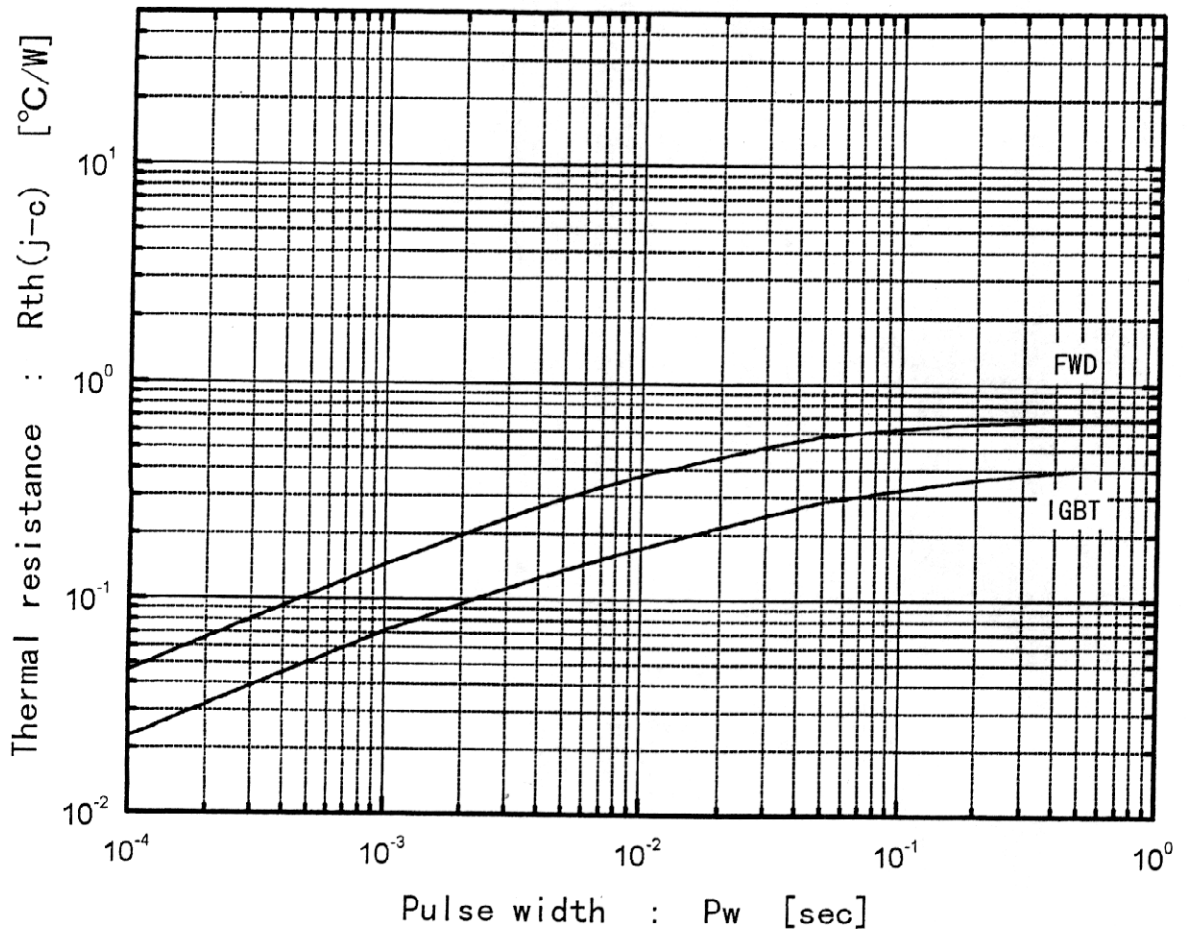
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FIG. NO.

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Transient thermal resistance



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