

SPECIFICATION

DEVICE NAME : IGBT

TYPE NAME : 1MBH65D-090A

SPEC. No. : MS 5 F 2 6 7 0

DATE : Jan. -20-1994

F u j i E l e c t r i c C o . , L t d .

This Specification is subject to change without notice.

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	Jan. - 20 - '94	T. Igarashi			
CHECKED	Jan. - 26 - '94	T. Igarashi		DWG. NO.	MS5F 2670 1/15

Ratings and characteristics of Fuji IGBT

1MBH65D-090A

1. Absolute maximum ratings (Tc=25°C)

1-1) IGBT

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V_{CES}	900	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	Continuous	I_C	65	A
	Pulse-50 μ s	$I_{C \text{ pulse}}$	195	A
Max. Power Dissipation		P_C	300	W
Operating Temperature		T_j	+ 150	°C
Storage Temperature		T_{stg}	-40 ~ +150	°C

1-2) Diode

Items		Symbols	Ratings	Units
Reverse Voltage		V_{RRM}	1000	V
Foward current		I_F	15	A
	$P_W = 10 \mu s$	I_{FP}	120	A
Max. Power Dissipation		P_D	60	W
Operating Temperature		T_j	+ 150	°C
Storage Temperature		T_{stg}	-40 ~ +150	°C

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

2-1) IGBT

Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Collector-Emitter Breakdown Voltage	BV_{CES}	900			$I_C = 1mA$ $V_{GE} = 0V$	V
Zero gate voltage Collector Current	I_{CES}			1.0	$V_{CE} = 0V$ $V_{CE} = 900V$	mA
Gate-Emitter leakage Current	I_{GES}			100	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	2.0		6.0	$V_{CE} = 10V$ $I_C = 10mA$	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			3.2	$V_{GE} = 15V$ $I_C = 65A$	V

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2-2) Dynamic ratings

Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Input capacitance	Cies		2600		V _{GE} = 0V V _{CE} = 25V f = 1MHz	pF
Turn-on time	ton		0.30	—	V _{CC} = 200V I _C = 65A V _{GE} = +15V R _G = 6.6 Ω R _L = 3.0 Ω	μs
	tr		0.25	—		
Turn-off time	toff		0.85	—		
	tf		0.55	0.80		

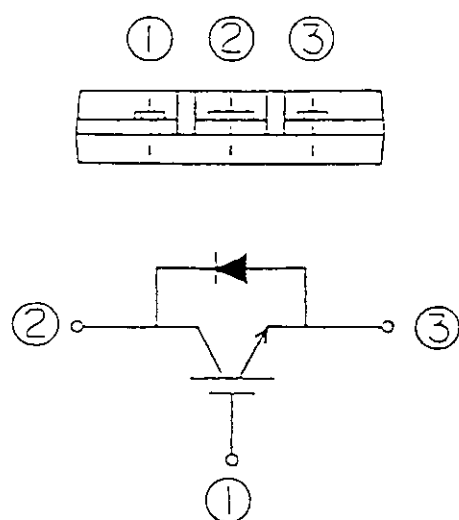
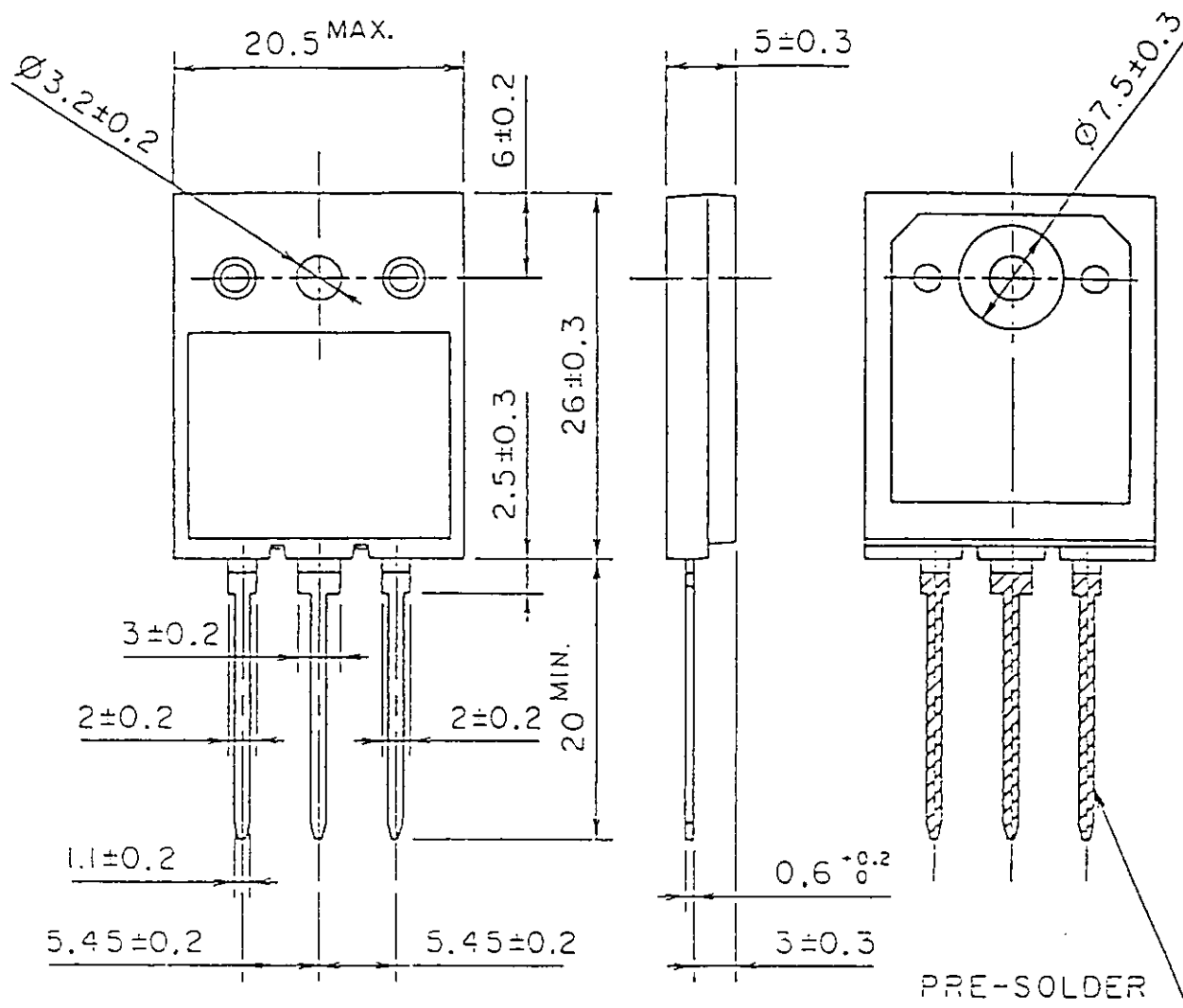
2-3) Diode

Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Avalanche Breakdown Voltage	V _{av}	1000			I _R = 1mA	V
Foward Voltage	V _F			2.5	I _F = 60A	V
Reverse recovery time	trr			3.0	I _F = 0.1A I _R = 0.5A	μs

3. Thermal resistance characteristics

Items		Symbols	Characteristics			Conditions	Unit
			min.	typ.	max.		
Thermal resistance	IGBT	Rth(j-c)			0.417		°C/W
	Diode	Rth(j-c)			2.08		

4. Outline Drawing



CONNECTION

- ① GATE
- ② COLLECTOR
- ③ EMITTER

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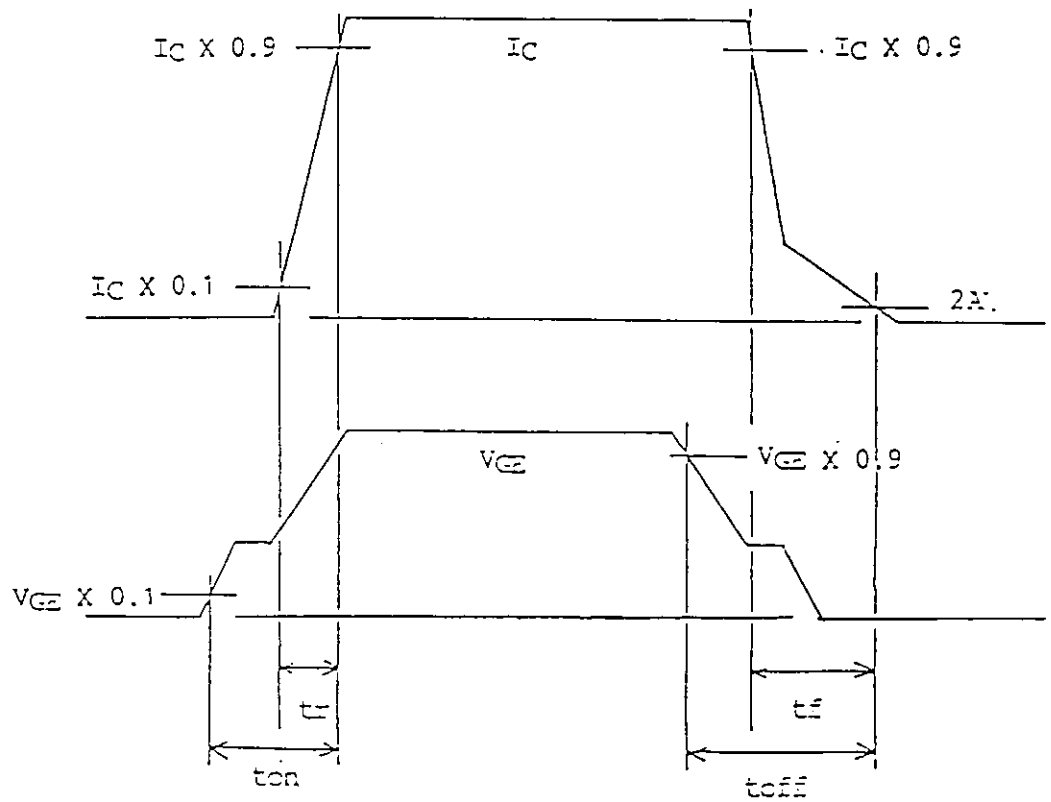
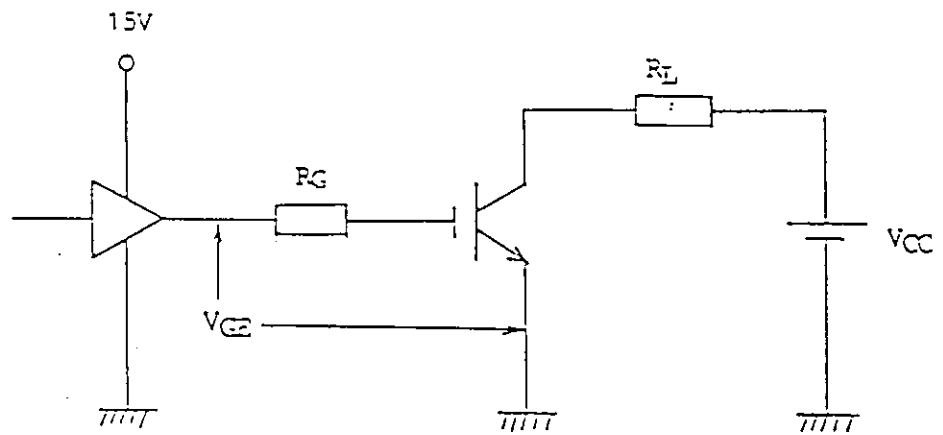
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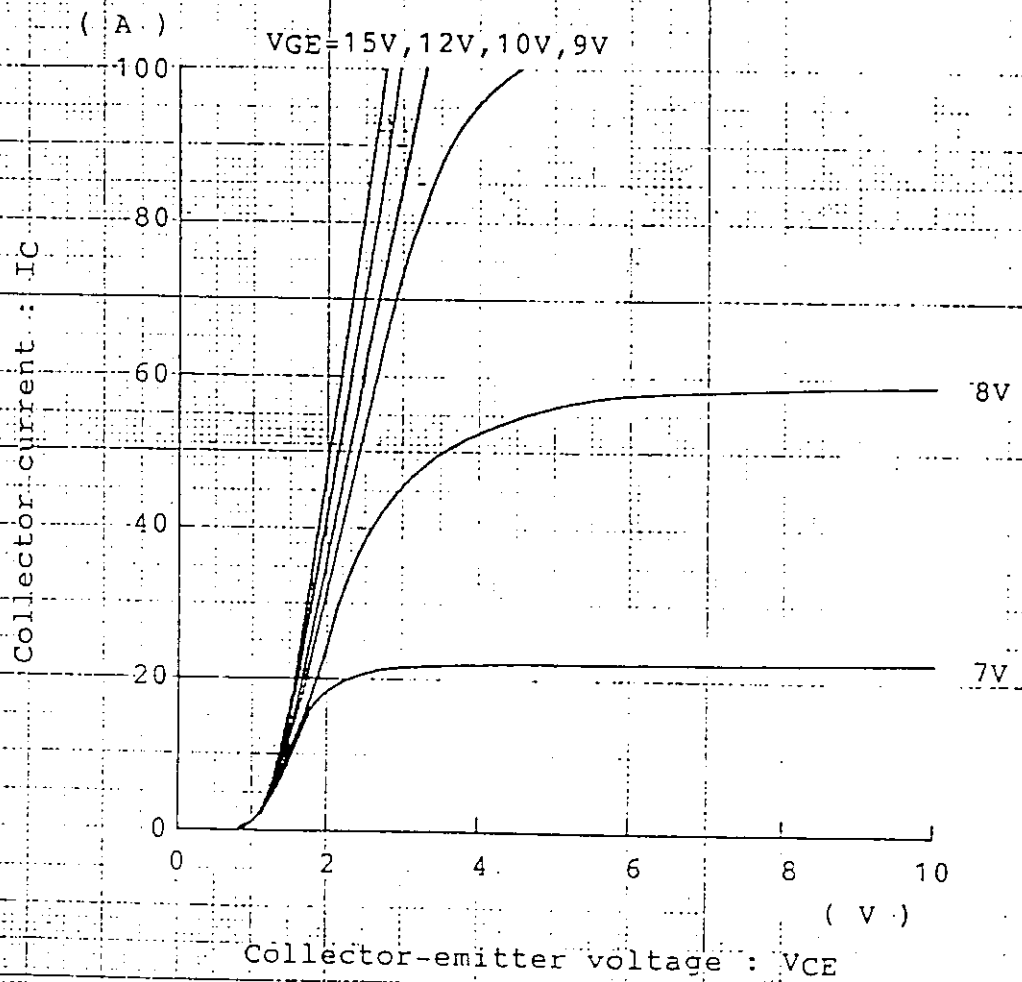
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Fig.1 Test circuit of switching characteristics



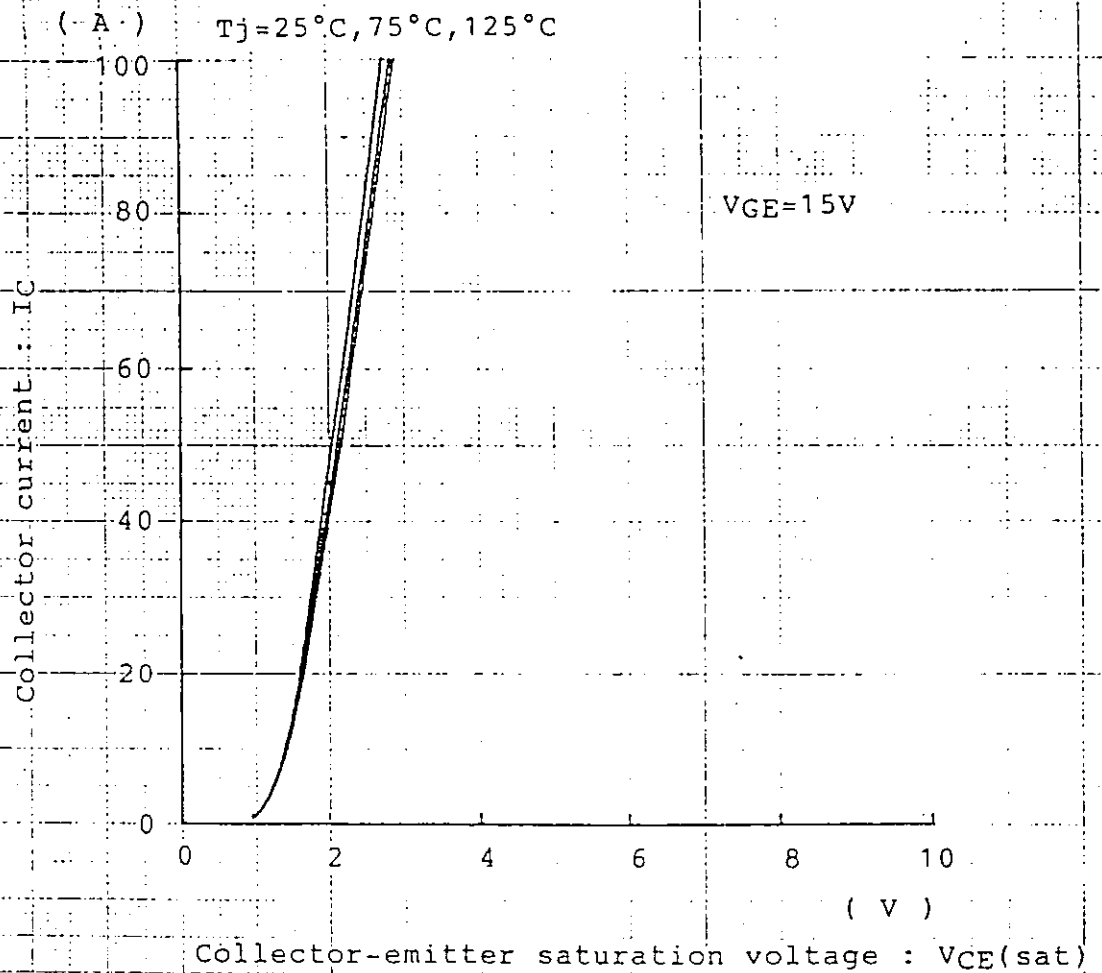
Typical output characteristics

$T_j = 25^\circ\text{C}$

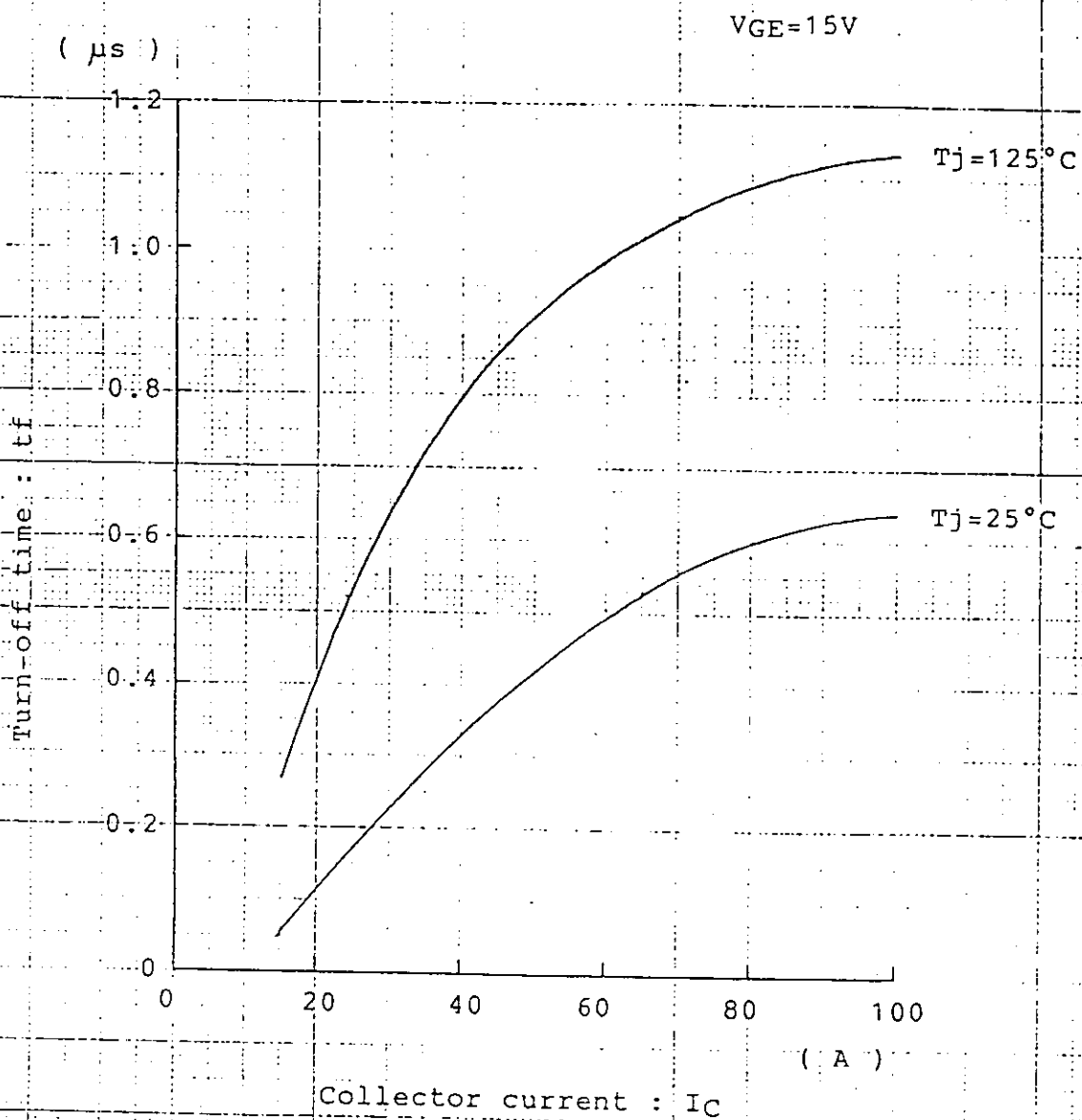


Collector current vs.

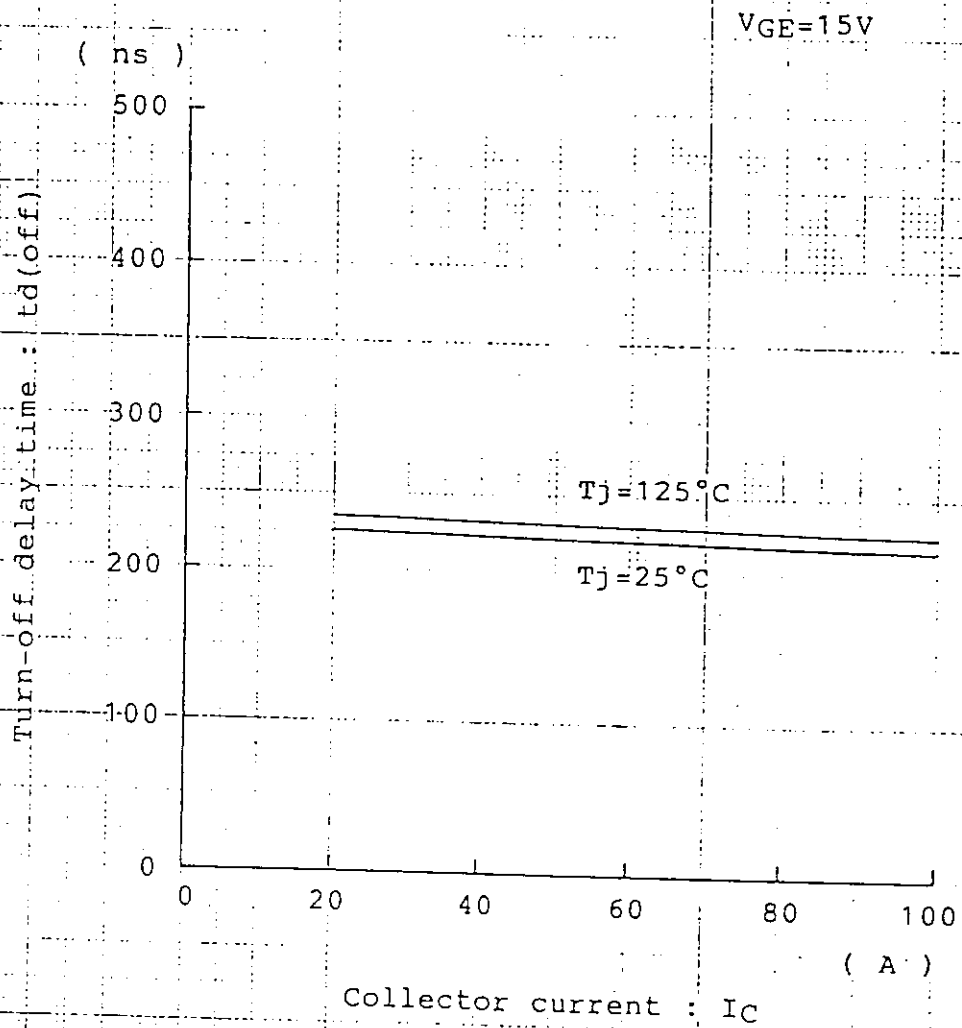
Collector-emitter saturation voltage



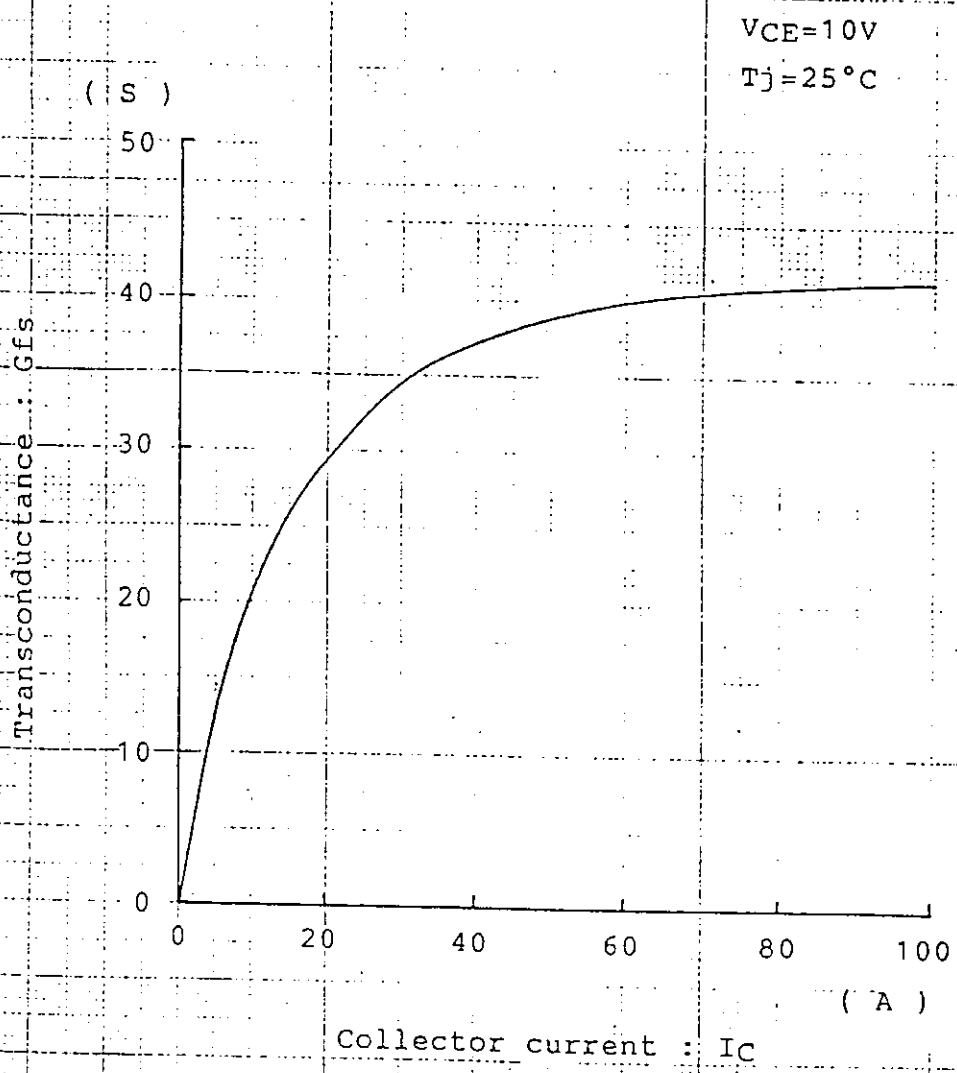
Typical t_f vs. Collector current



Typical turn-off delaytime
vs. Collector current



Typical transconductance



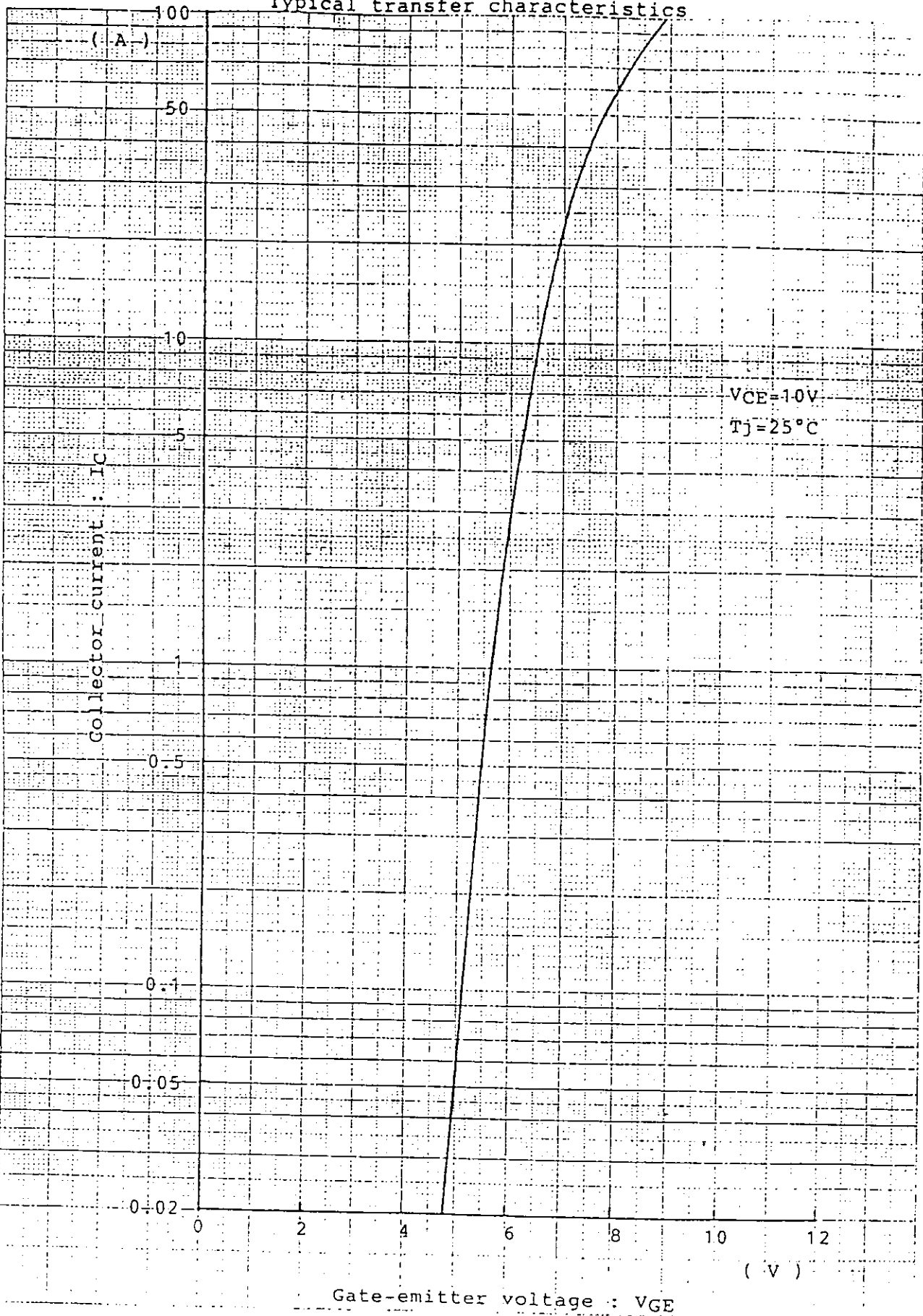
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Typical transfer characteristics



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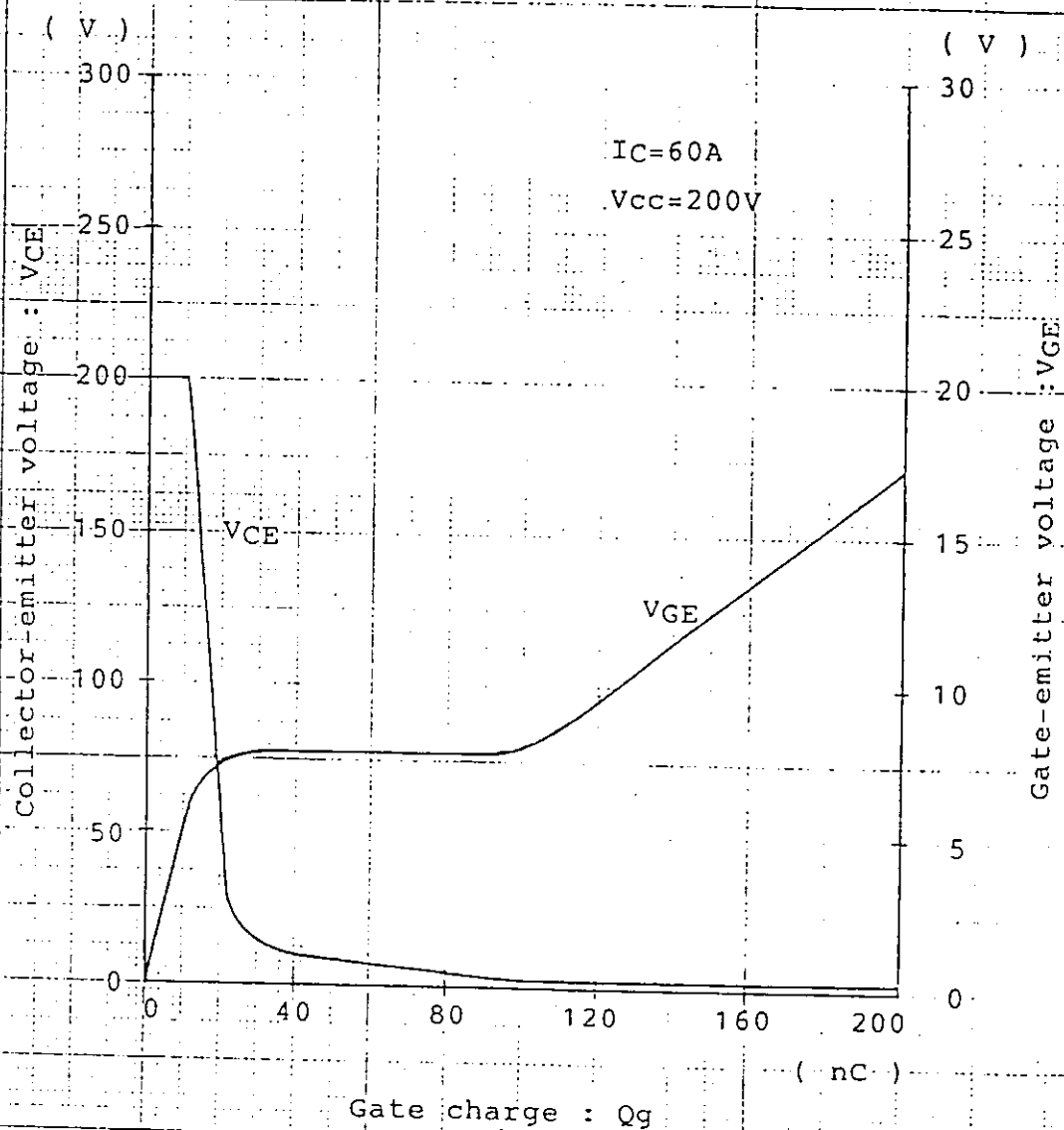
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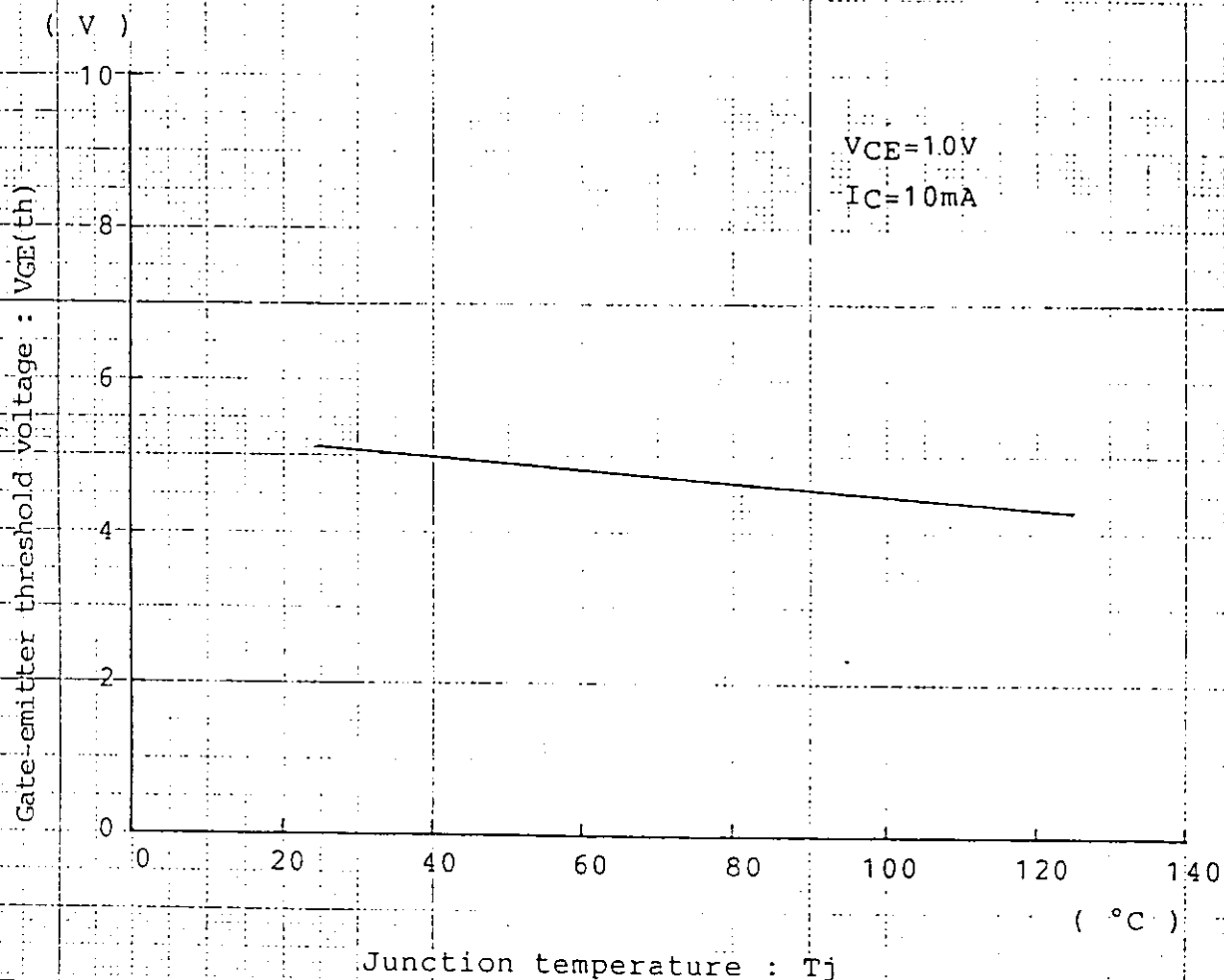
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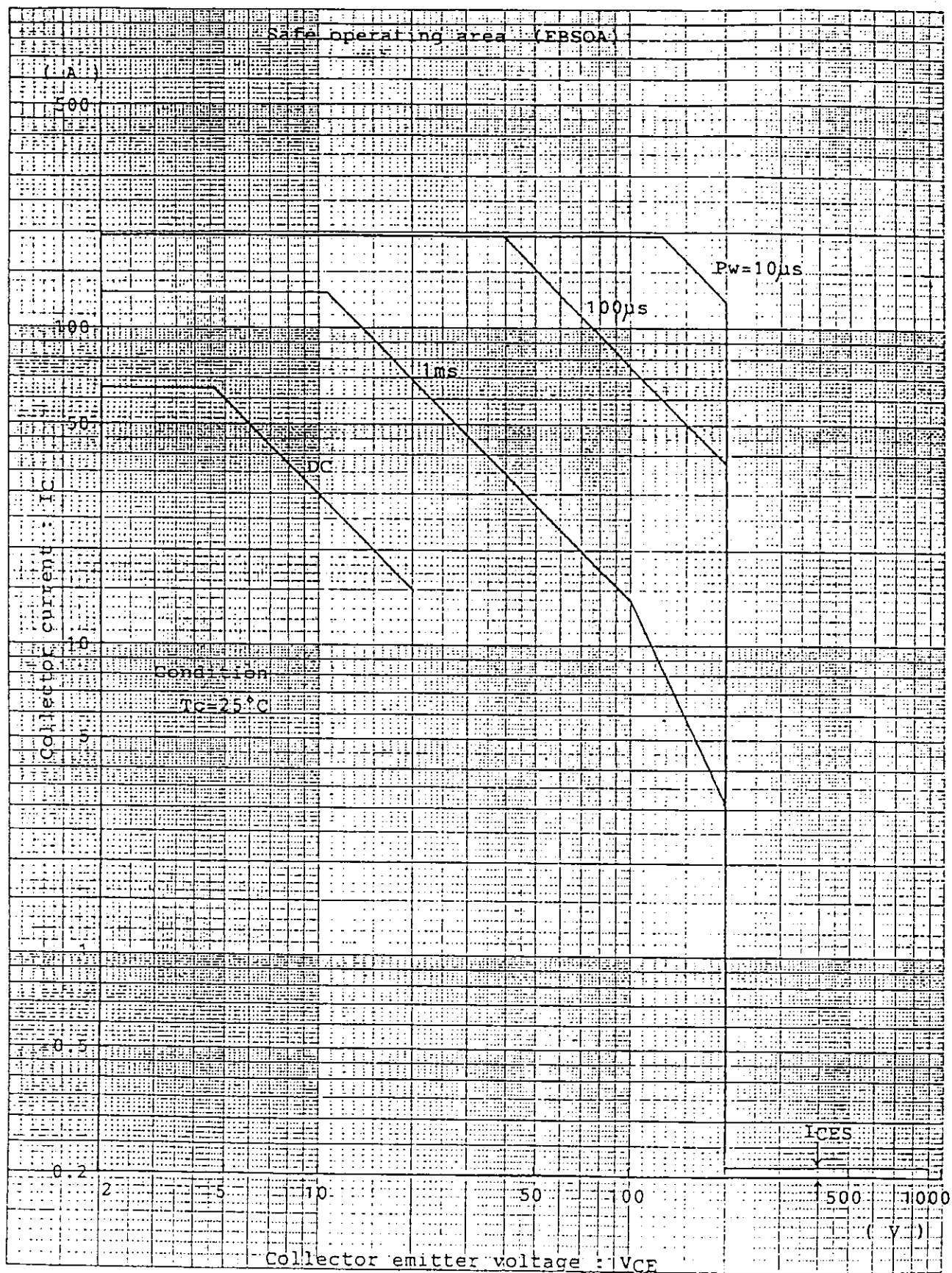
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Dynamic input characteristics



Typical threshold voltage
vs. Junction temperature





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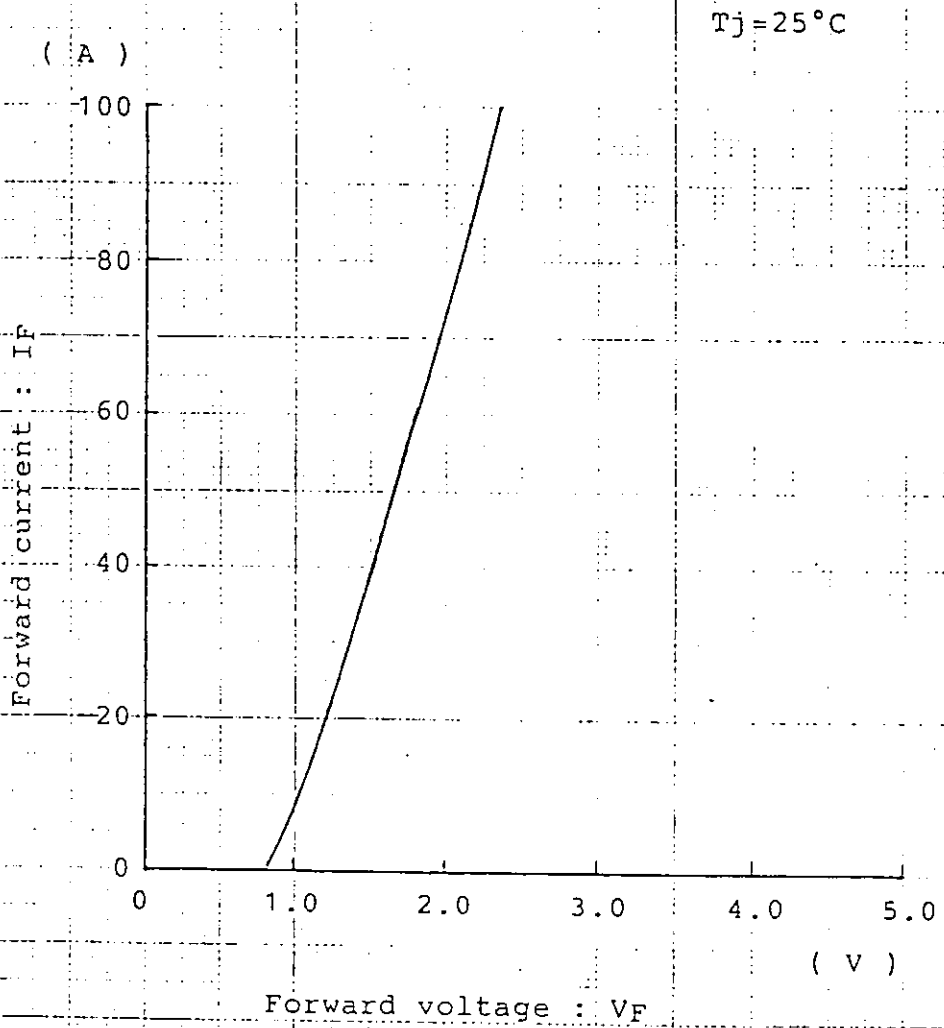
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Typical forward characteristics
of freewheeling diode



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