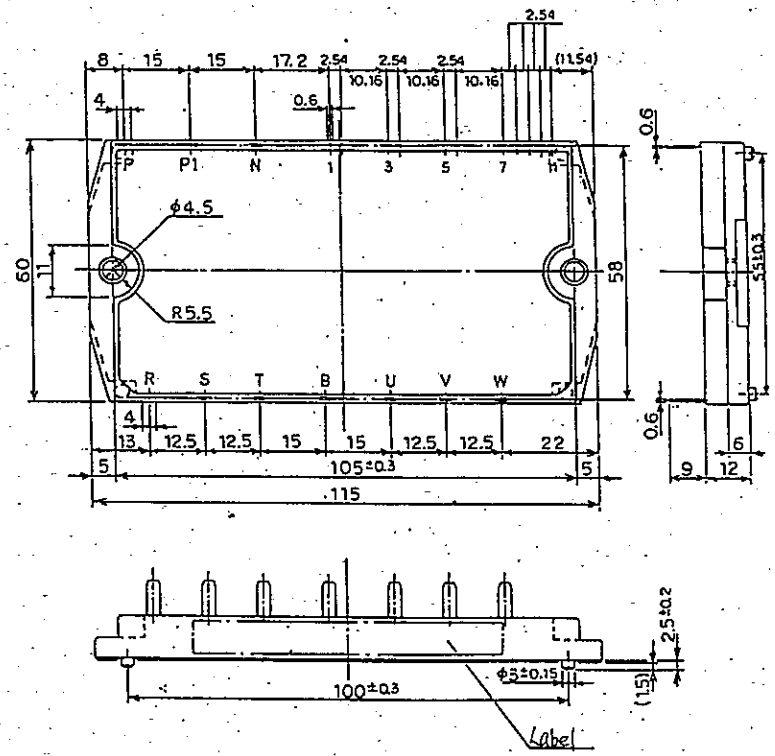
Ratings and Characteristics of Fuji Inverter Module

7MBR25LC120 (TENTATIVE)

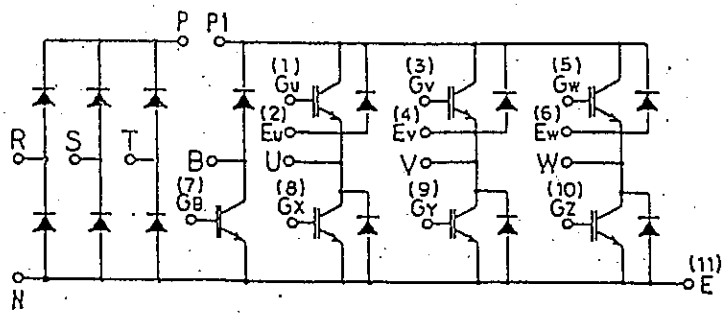
1. Outline Drawing

Unit : mm

* Isolation Voltage (Terminal to Case) : AC 2500V 1 minute



2. Equivalent Circuit of Module



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3. Absolute Maximum Ratings (Tj=25°C unless without specified)

	Item		Symbol	Condition	Maximum Ratings	Unit
Inverter	Collector-Emitter Voltage		V_{CES}		1200	V
	Gate-Emitter Voltage		V_{GES}		±20	V
	Collector Current	DC	I_C		25	A
		1ms	I_{CP}		50	A
		DC	$-I_C$		25	A
	Collector Power Dissipation	One	P_C		150	W
Brake	Collector-Emitter Voltage		V_{CES}		1200	V
	Gate-Emitter Voltage		V_{GES}		±20	V
	Collector Current	DC	I_C		15	A
		1ms	I_{CP}		30	A
	Collector Power Dissipation	One	P_C		90	W
Snubber	Repetitive peak Reverse Voltage				1200	V
	Average Forward Current		$I_{F(AV)}$		1	A
	Surge Current		I_{FSM}	10ms	50	A
Converter	Repetitive Peak Reverse Voltage		V_{RRM}		1600	V
	Non-Repetitive Peak Reverse Voltage		V_{RSM}		1700	V
	Average Output Current		I_O	50Hz/60Hz sine wave	25	A
	Surge Current (Non-Repetitive)		I_{FSM}	Tj=150°C, 10ms	320	A
	I^2t (Non-Repetitive)			Tj=150°C, 10ms	512	A^2s
	Operating Junction Temperature		Tj		+ 150	°C
	Storage Temperature		Tstg		-30 ~ +125	°C
	Isolation Voltage		Viso	AC : 1 minute	AC 2500	V
	Mounting Screw Torque				*1 1.67	N · m

*1 Recommendable Value M4 : 1.27 ~ 1.67 N · m

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4. Electrical Characteristics (Tj=25°C unless without specified)

	Characteristics	Symbol	Conditions		min.	max.	Unit
Inverter	Zero gate voltage collector current	I_{CES}	Tj=25°C V_{CE}=1200V V_{GE}= 0V			1.0	mA
	Gate-emitter leakage current	I_{GES}	V_{CE}= 0V V_{GE}=±20V			100	nA
	Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE}=20V Ic =25mA		3.0	6.0	V
	Collector-emitter saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V Ic =25A	Chip		3.5	V
				Terminal		3.6	
	Collector-Emitter Voltage	$-V_{CE}$	-Ic = 25 A	Chip		2.5	
				Terminal		2.6	
	Input capacitance	Cies	V_{GE}=0V V_{CE}=10V f=1MHz		4500 (typ.)		PF
	Switching Time	ton	V_{CC}= 600V Ic = 25A V_{GE}=±15V R_G = 50 Ω			0.8	μs
		toff				1.5	
		tf				0.5	
	Reverse Recovery Time of FRD	trr	I_F =25A V_{GE}=-10V -di/dt= 75A/μs			350	ns
Brake	Zero gate voltage collector current	I_{CES}	V_{CES}=1200V V_{GE} = 0V			1.0	mA
	Gate-emitter leakage current	I_{GES}	V_{CE}= 0V V_{GE}=±20V			100	nA
	Collector-emitter Saturation Voltage	$V_{CE(sat)}$	Ic = 15A V_{GE}=15V	Chip		3.5	V
				Terminal		3.6	
	Switching Time	ton	V_{CC}= 600V Ic = 15 A V_{GE}=±15V R_G = 82Ω			0.8	μs
		toff				1.5	
		tf				0.5	

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Characteristics		Symbol	Conditions		min.	max.	Unit
Snubber	Reverse Current	I_{RRM}	$V_R = V_{RRM}$			1	mA
	Reverse Recovery Time	trr				600	ns
Converter	Forward Voltage	V_{FM}	I_F = 25A	Chip		1.30	V
				Terminal		1.40	
	Reverse Current	I_{RRM}	$V_R = V_{RRM}$			1	mA

5. Thermal Characteristics

Characteristics	Symbol	Conditions	min.	max.	Unit
Thermal Resistance (1 chip)	Rth(j-c)	Inverter IGBT		0.84	°C/W
		Inverter FRD		1.25	
		Brake IGBT		1.39	
		Converter Diode		3.40	
Contact Thermal Resistance	Rth(c-f)	With Thermal Compound	(typ)	0.05	

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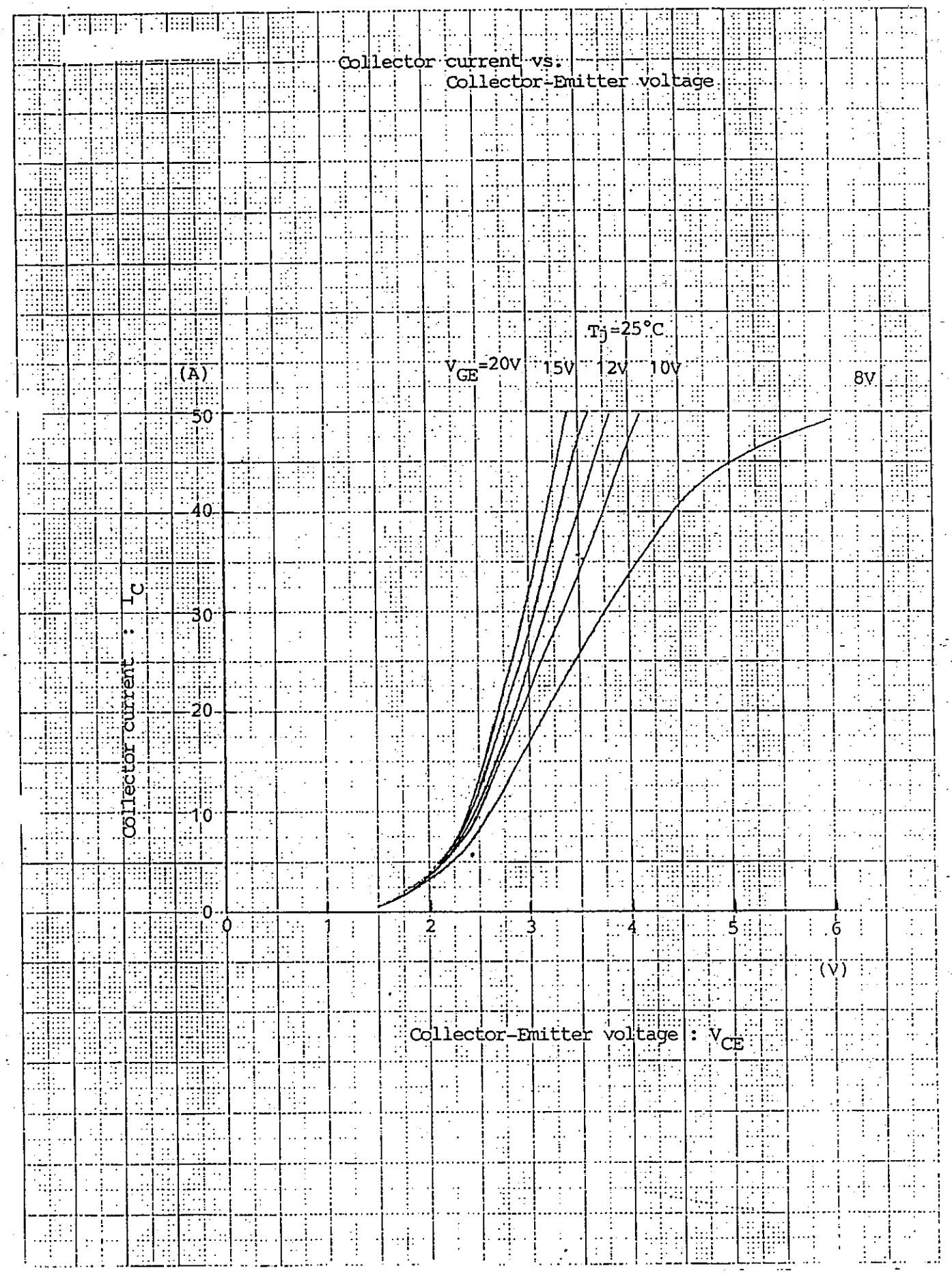
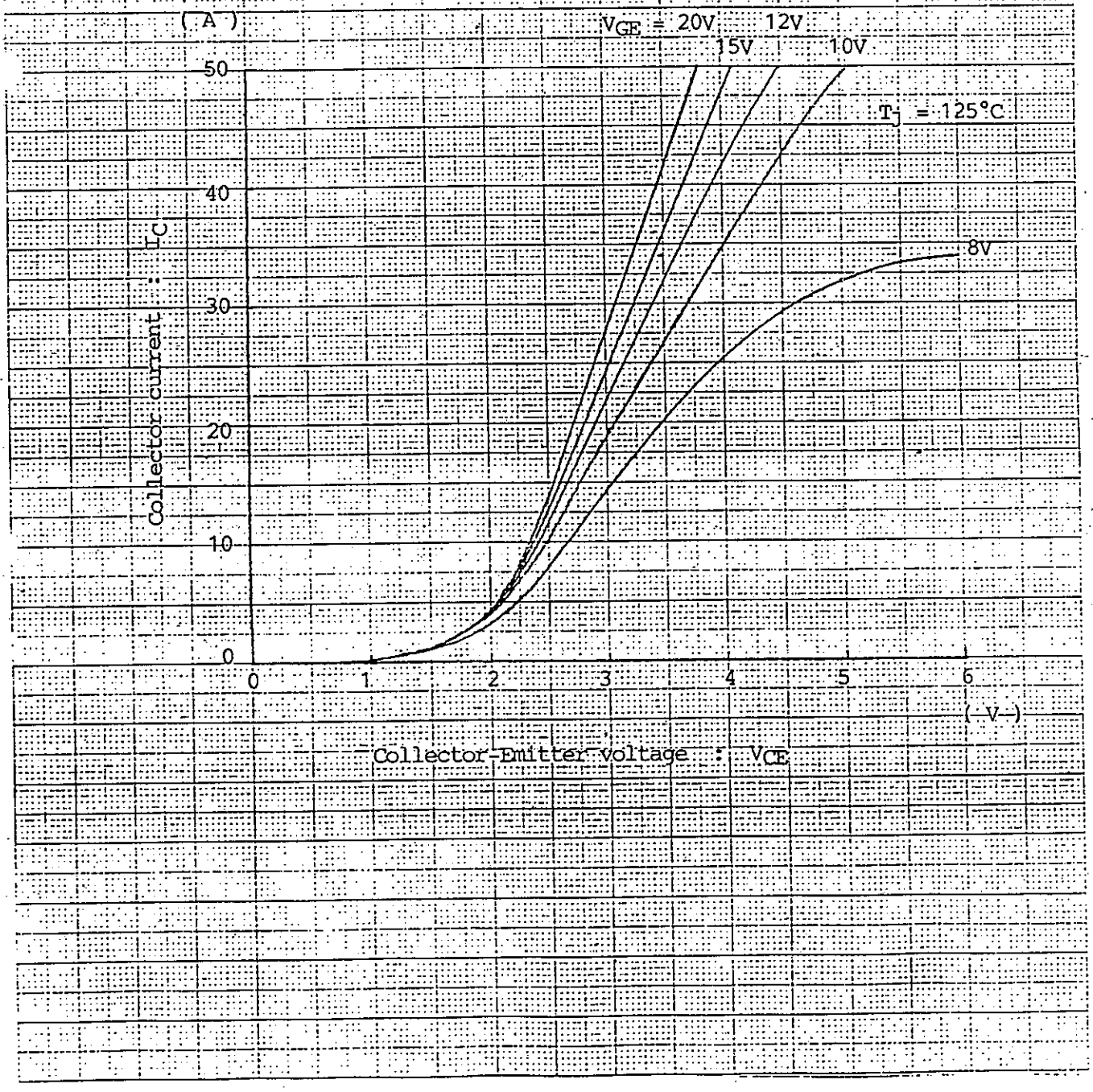
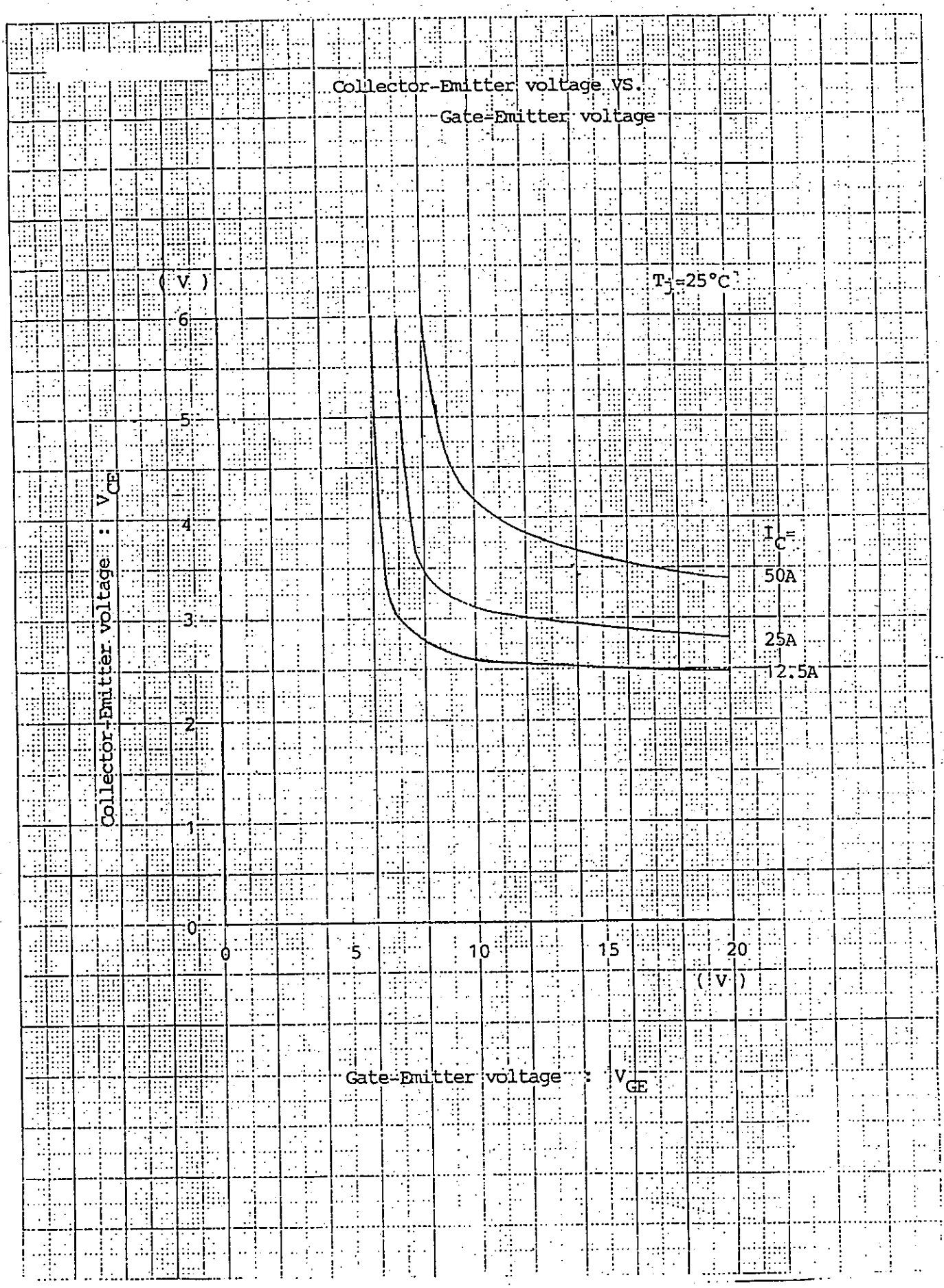
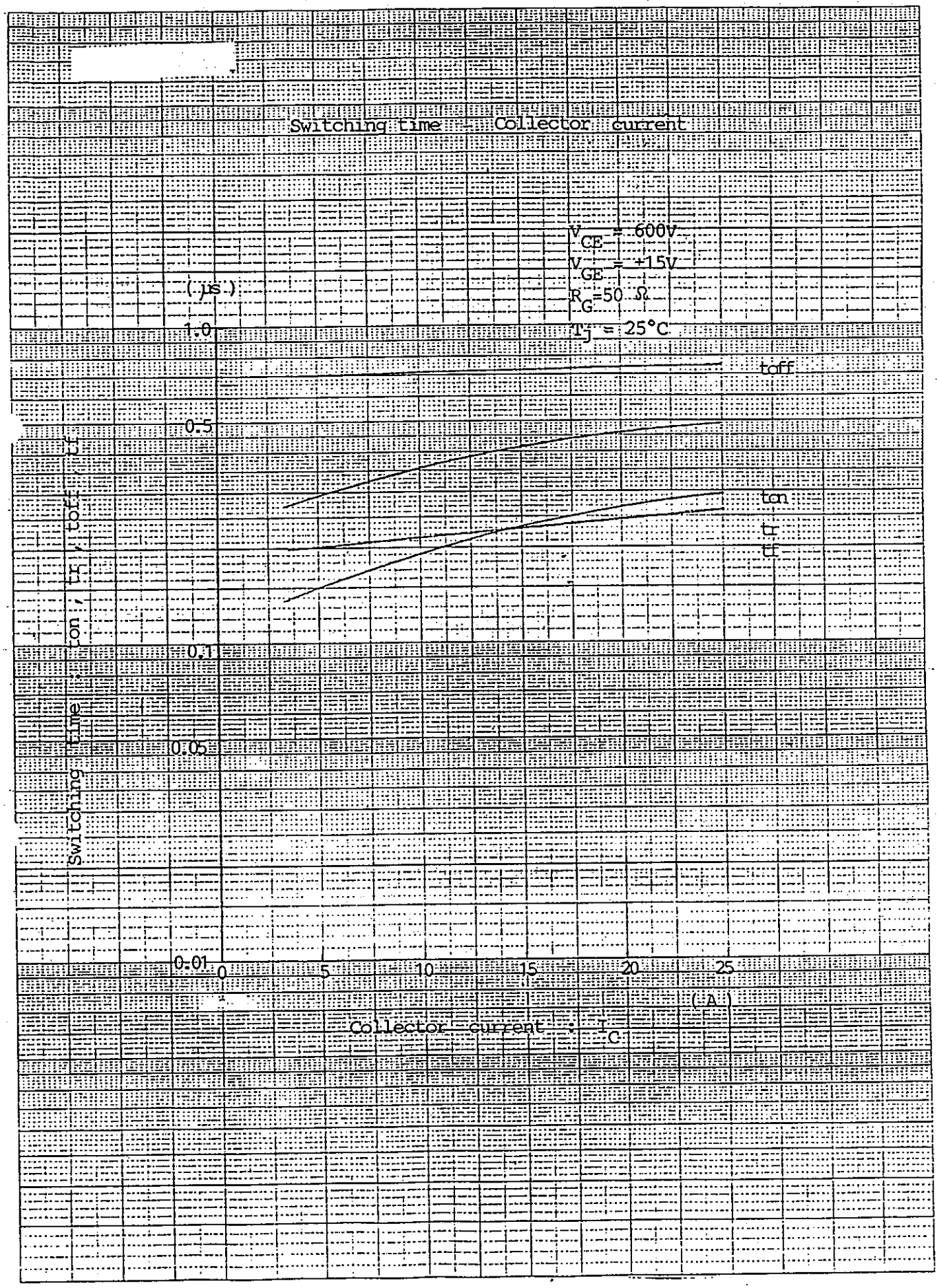


Collector current vs. Collector-Emitter voltage



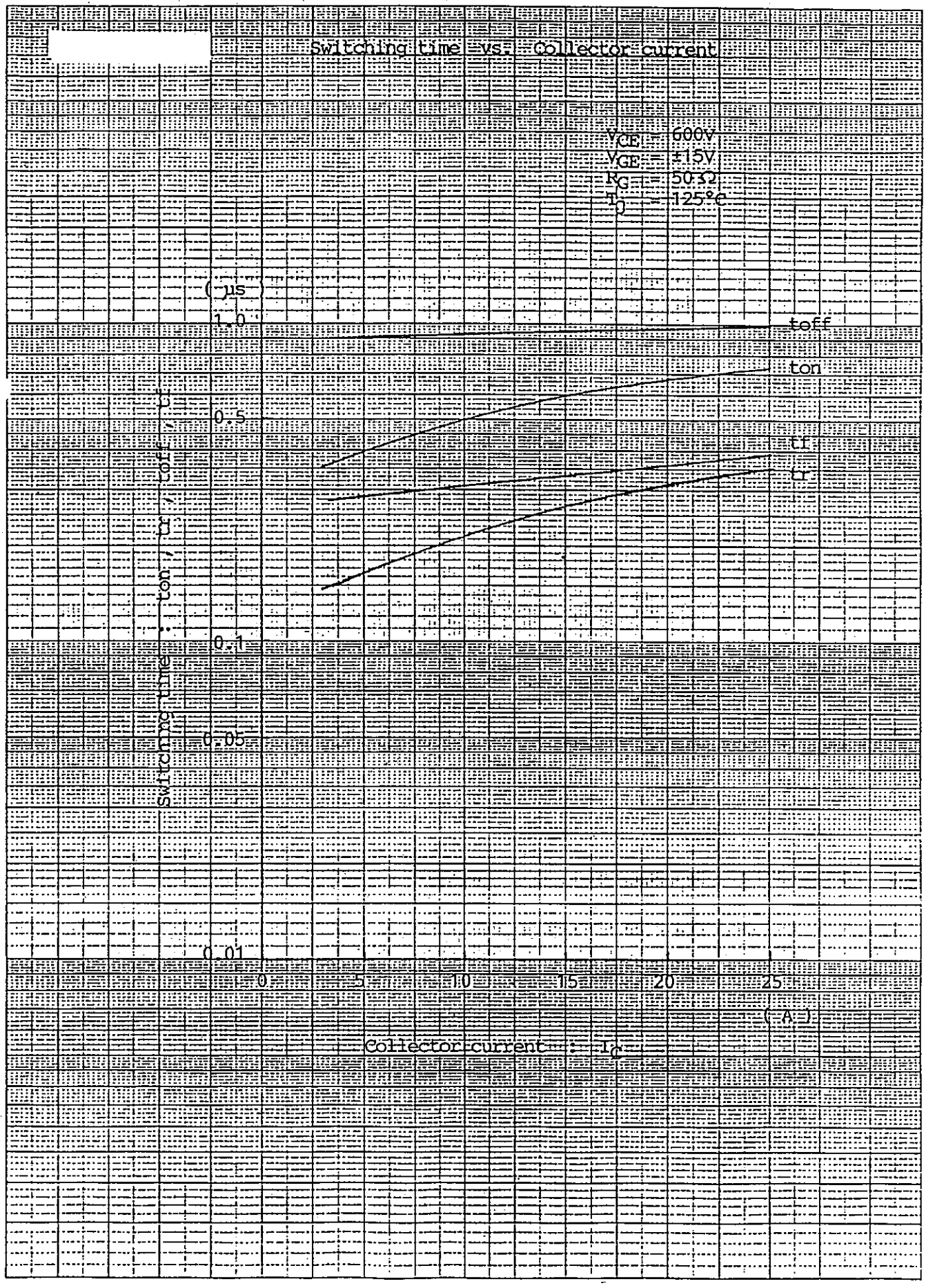


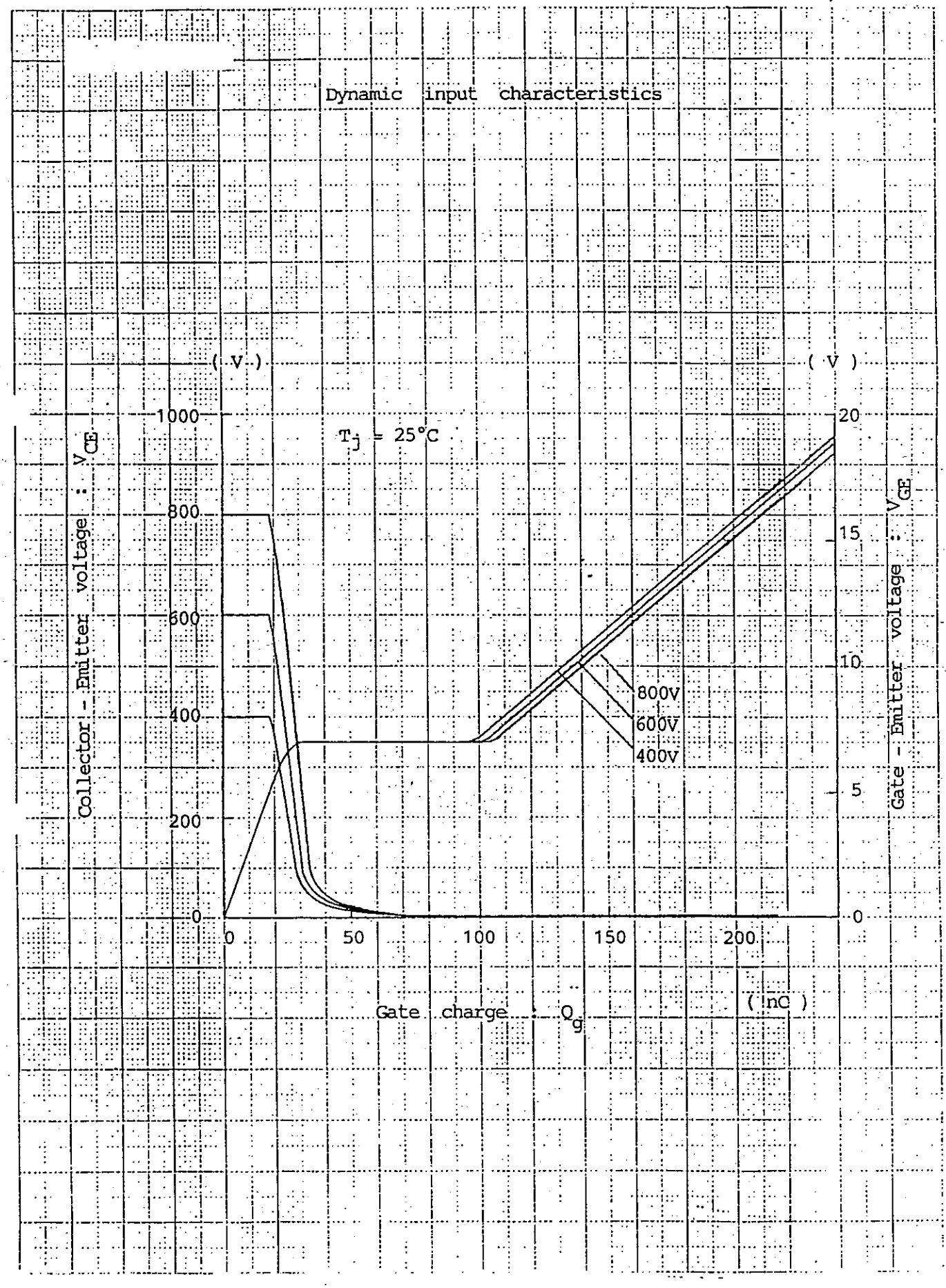
Switching time – Collector current

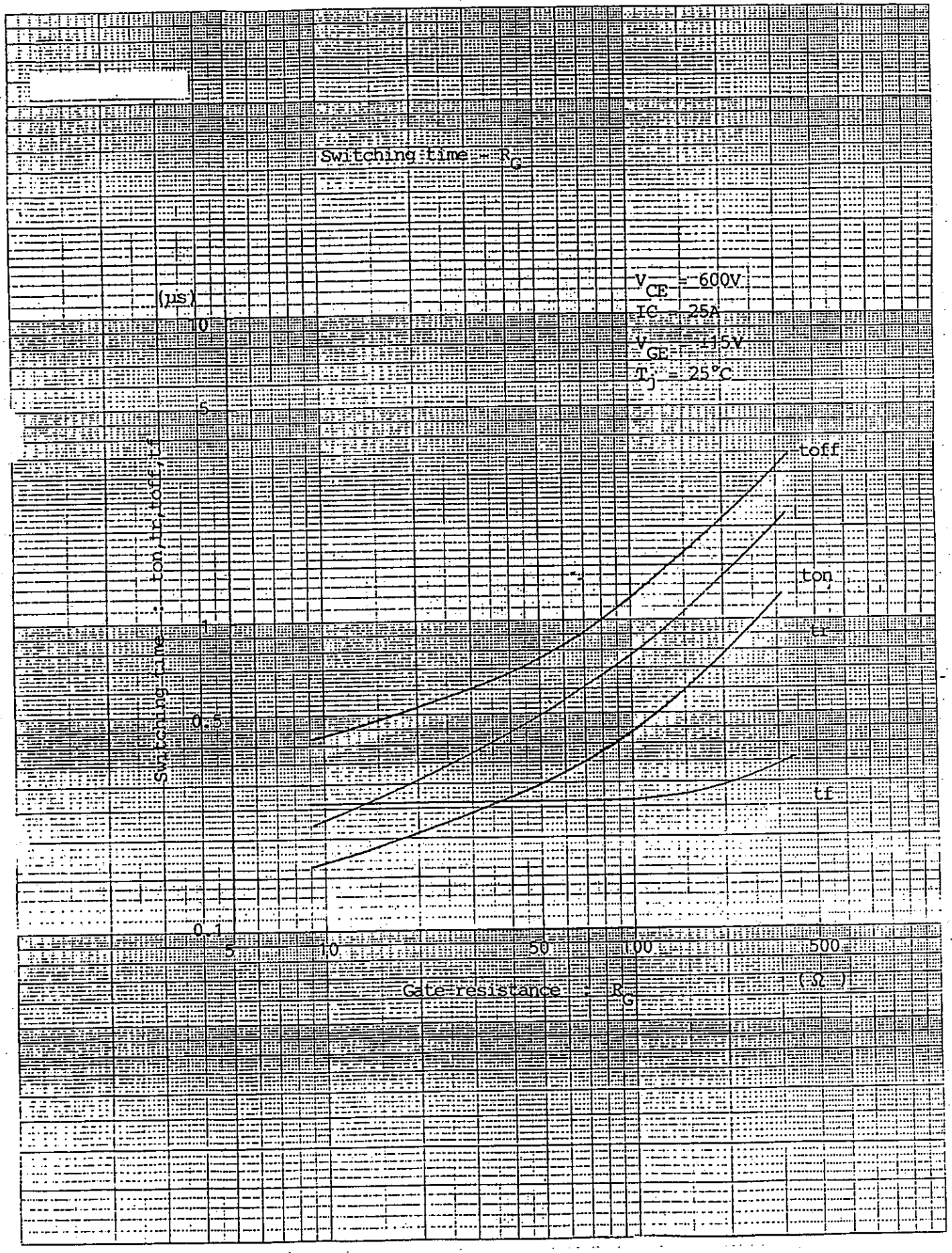


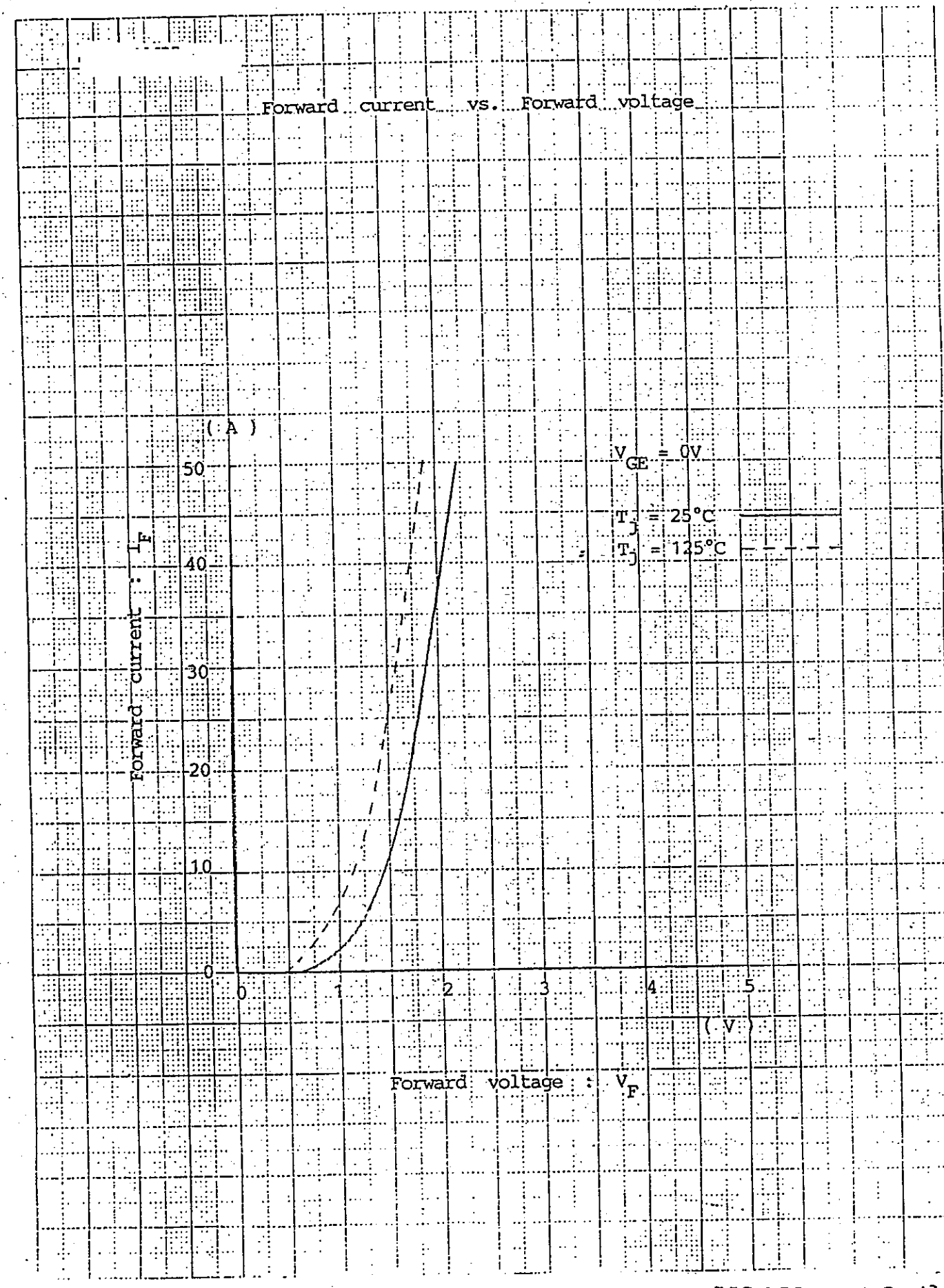
Switching time vs. Collector current

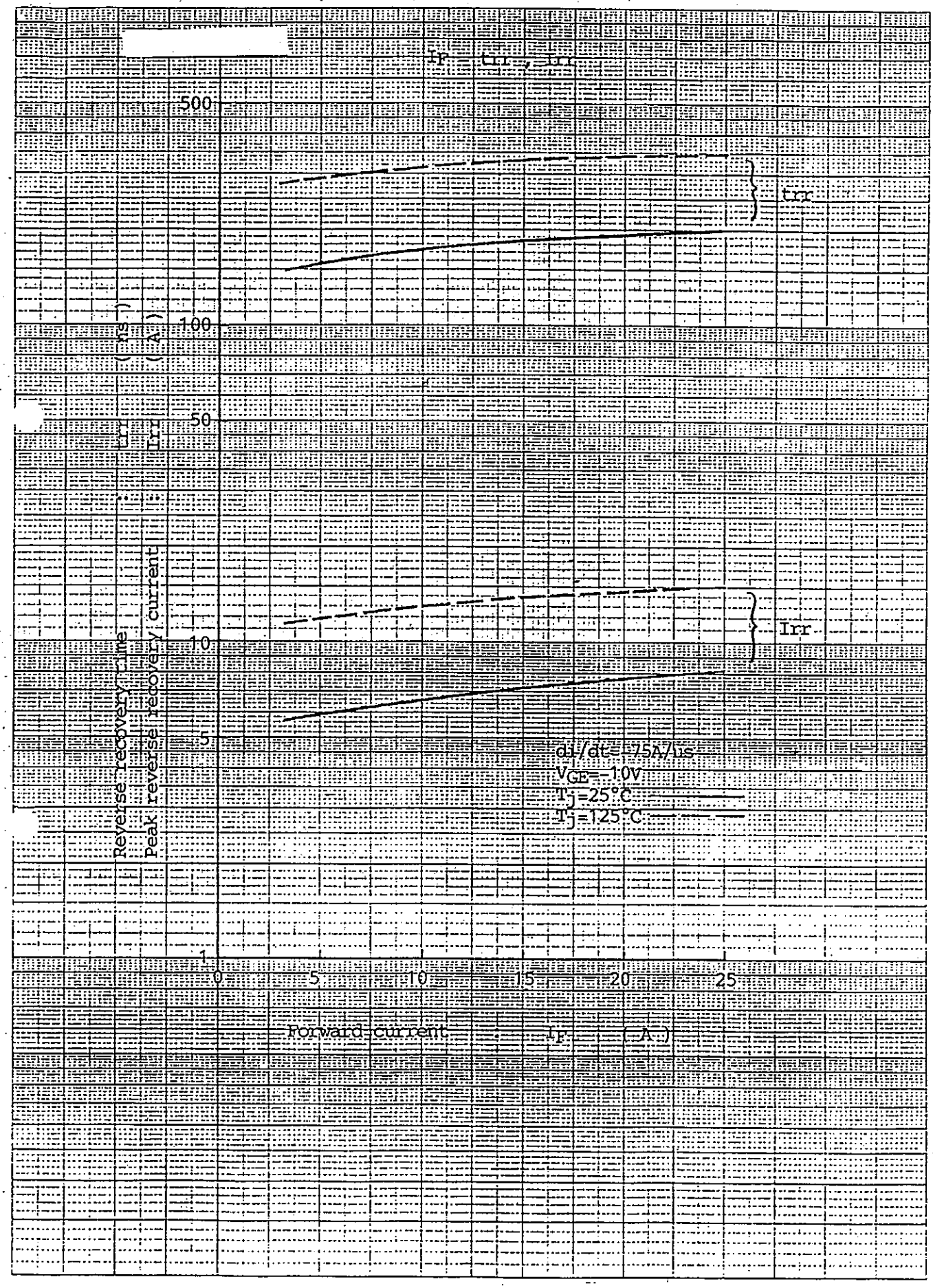
V_{CE} = 600V
V_{GE} = ±15V
R_G = 50Ω
T_j = 125°C





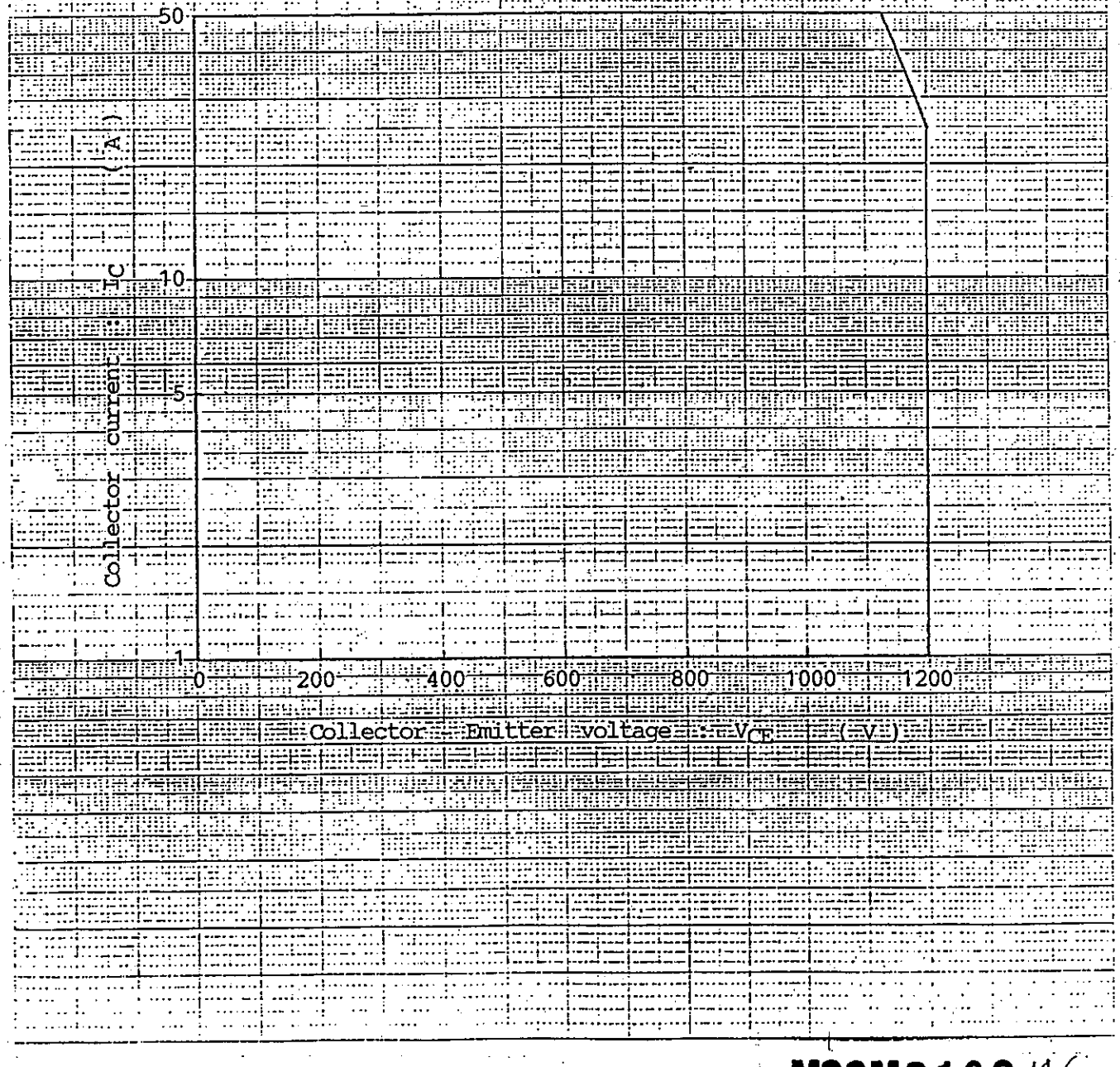


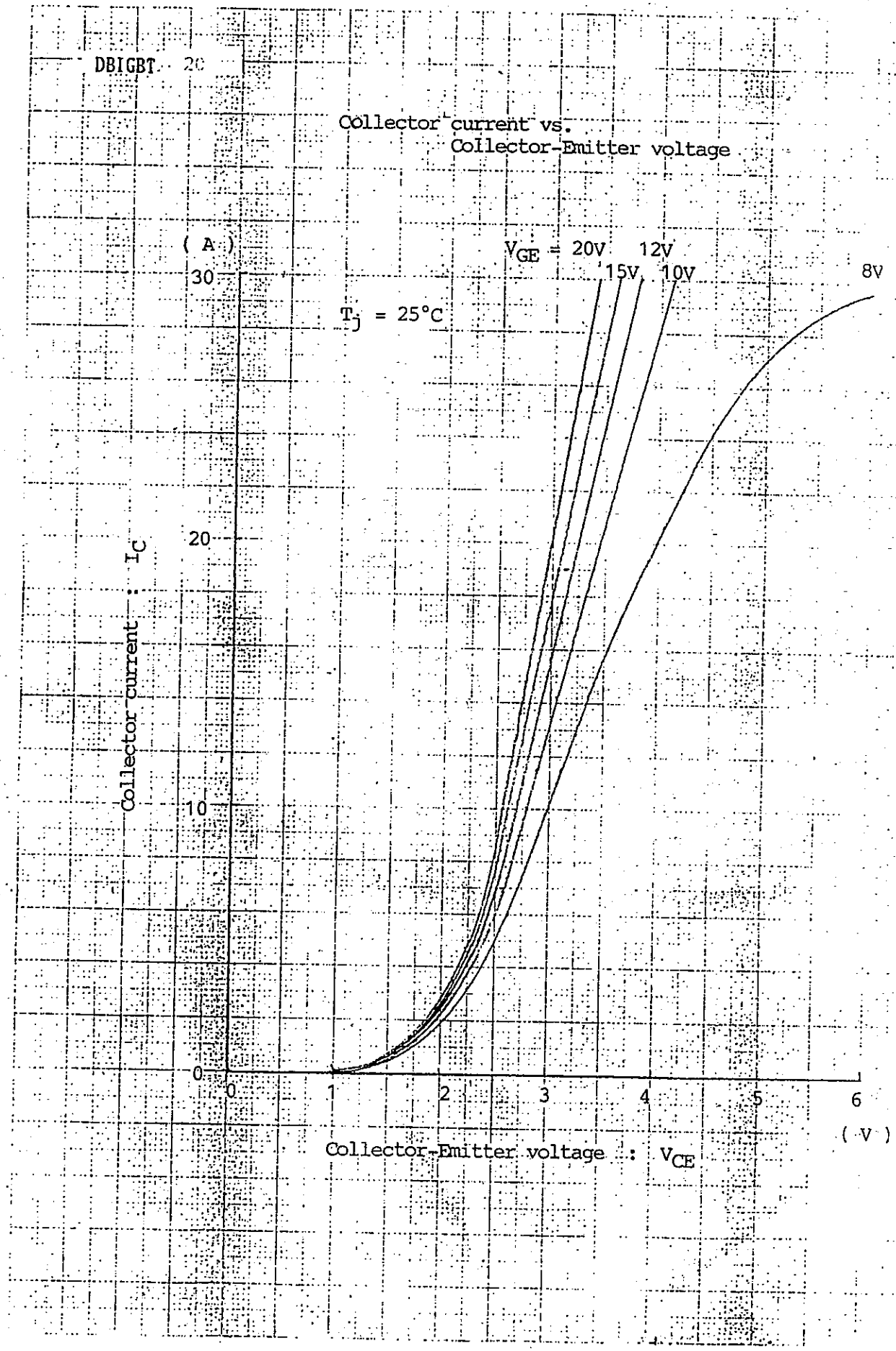




Reverse biased safe operating area

T_j=25°C
$+V_{GE}$=15V
$-V_{GE}$=15V
R_G=50Ω





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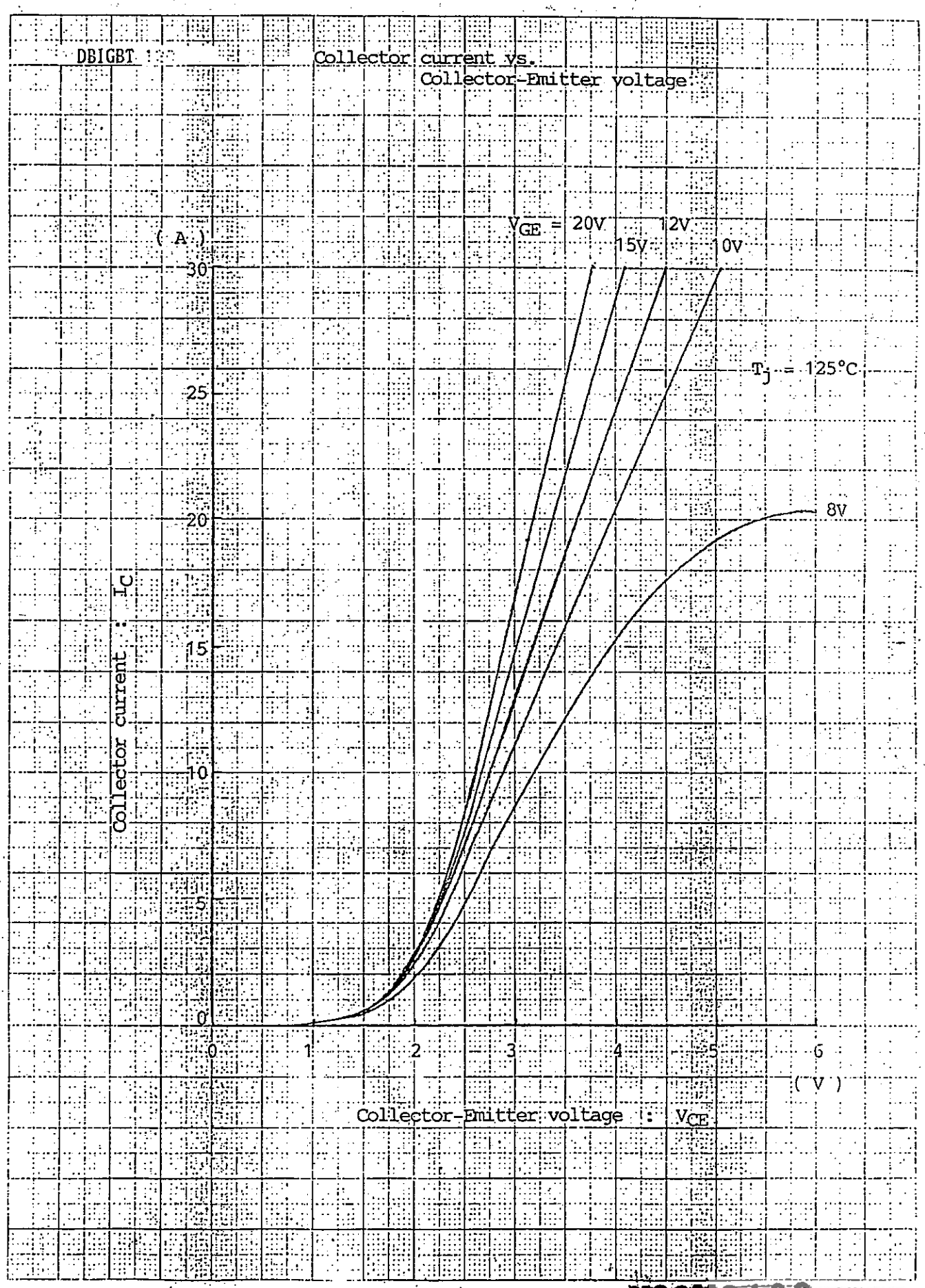
Collector current vs.
Collector-Emitter voltage



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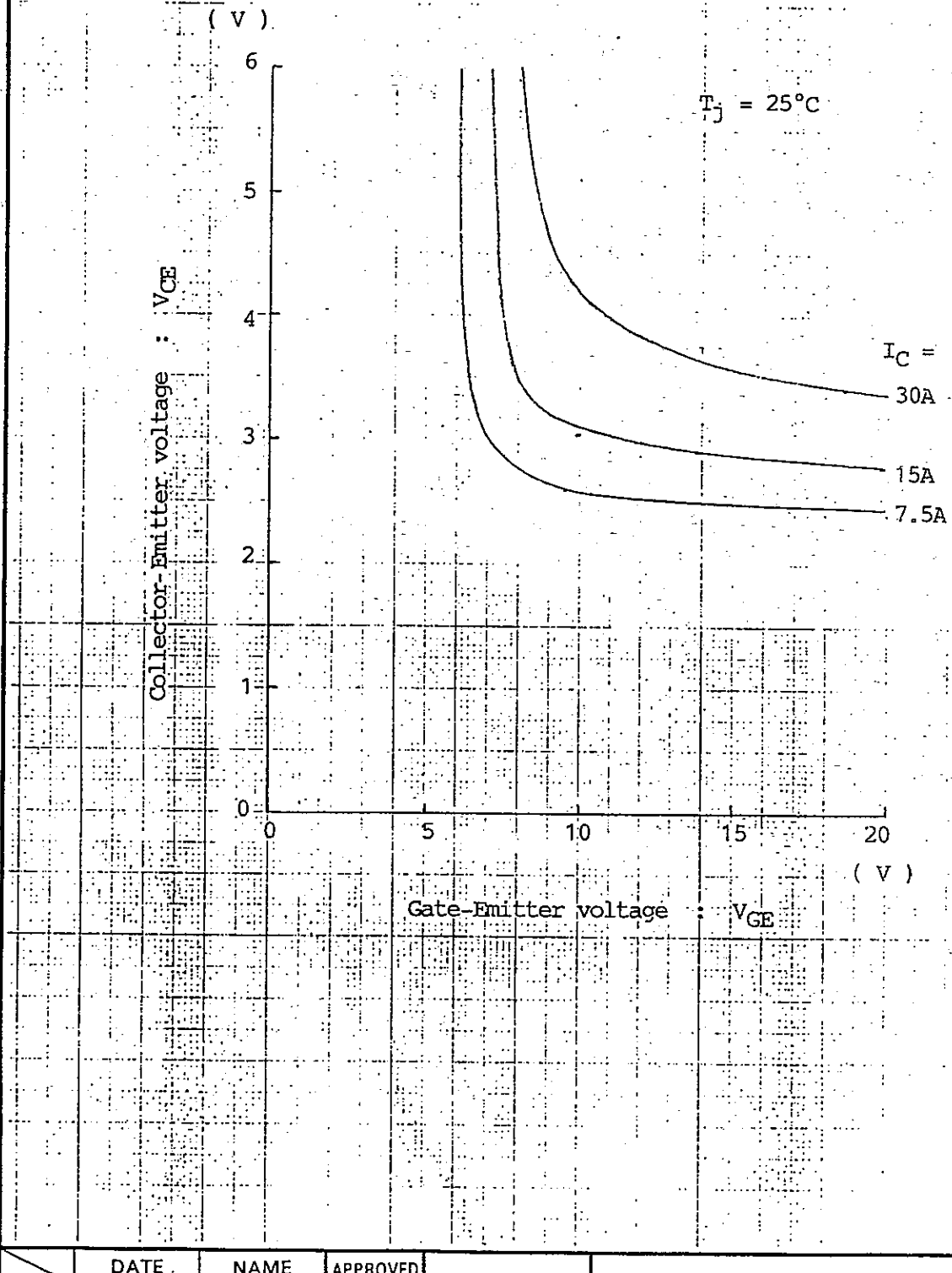
Collector-Emitter voltage vs.
Gate-Emitter voltage



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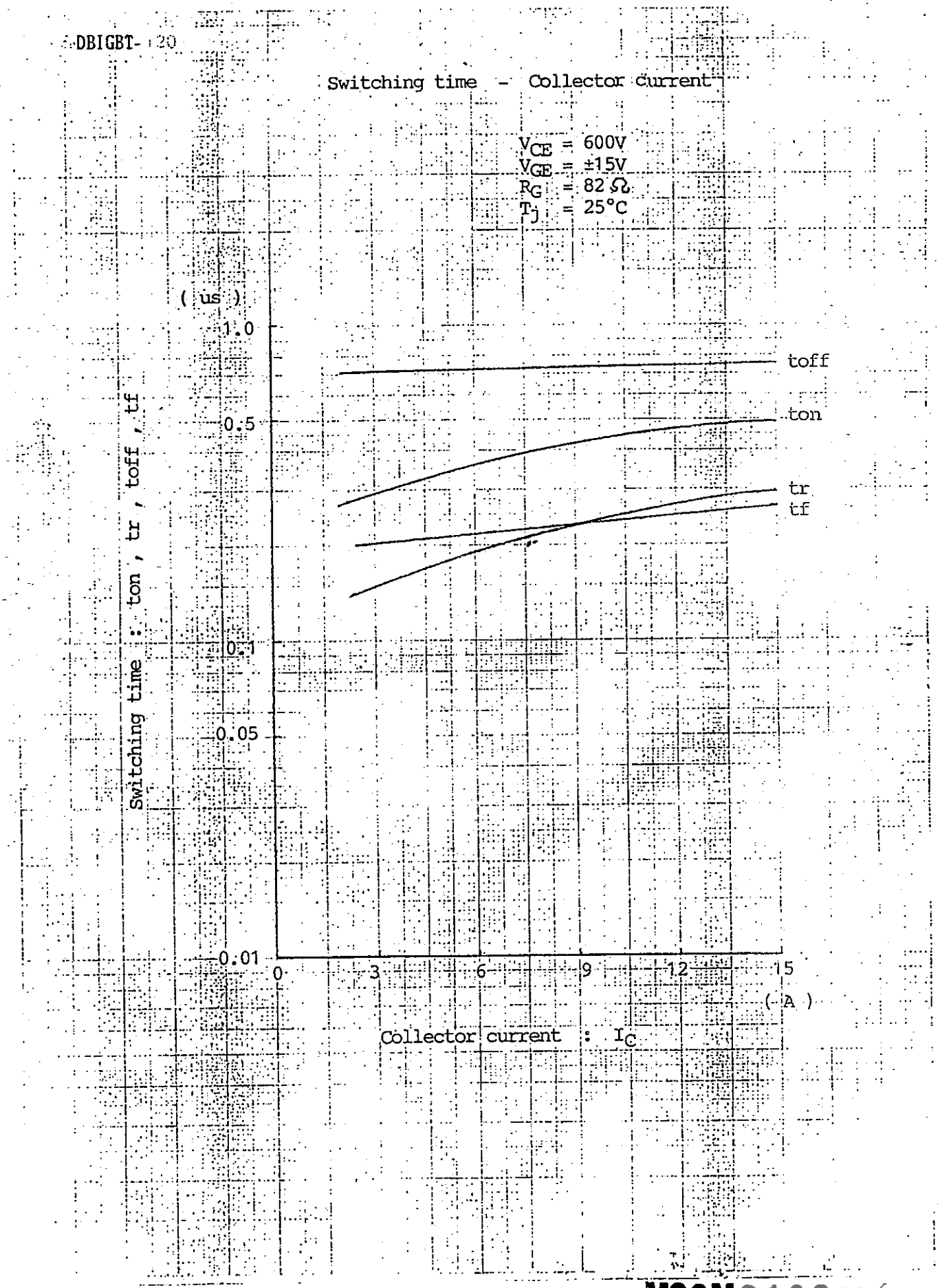
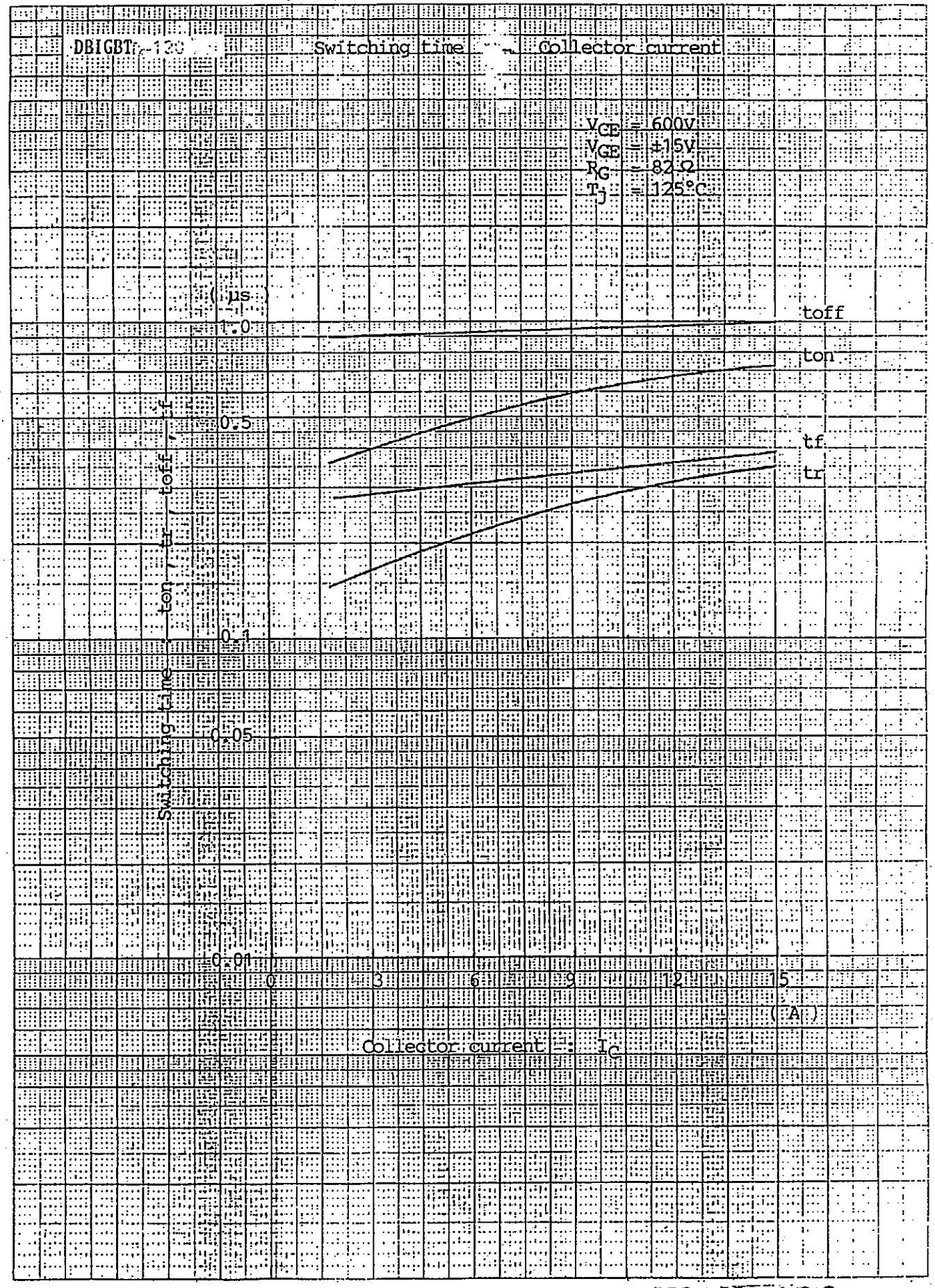


DBIGBT-120

Switching time — Collector current

V_{CE} = 600V
V_{GE} = ±15V
R_G = 82Ω
T_j = 125°C



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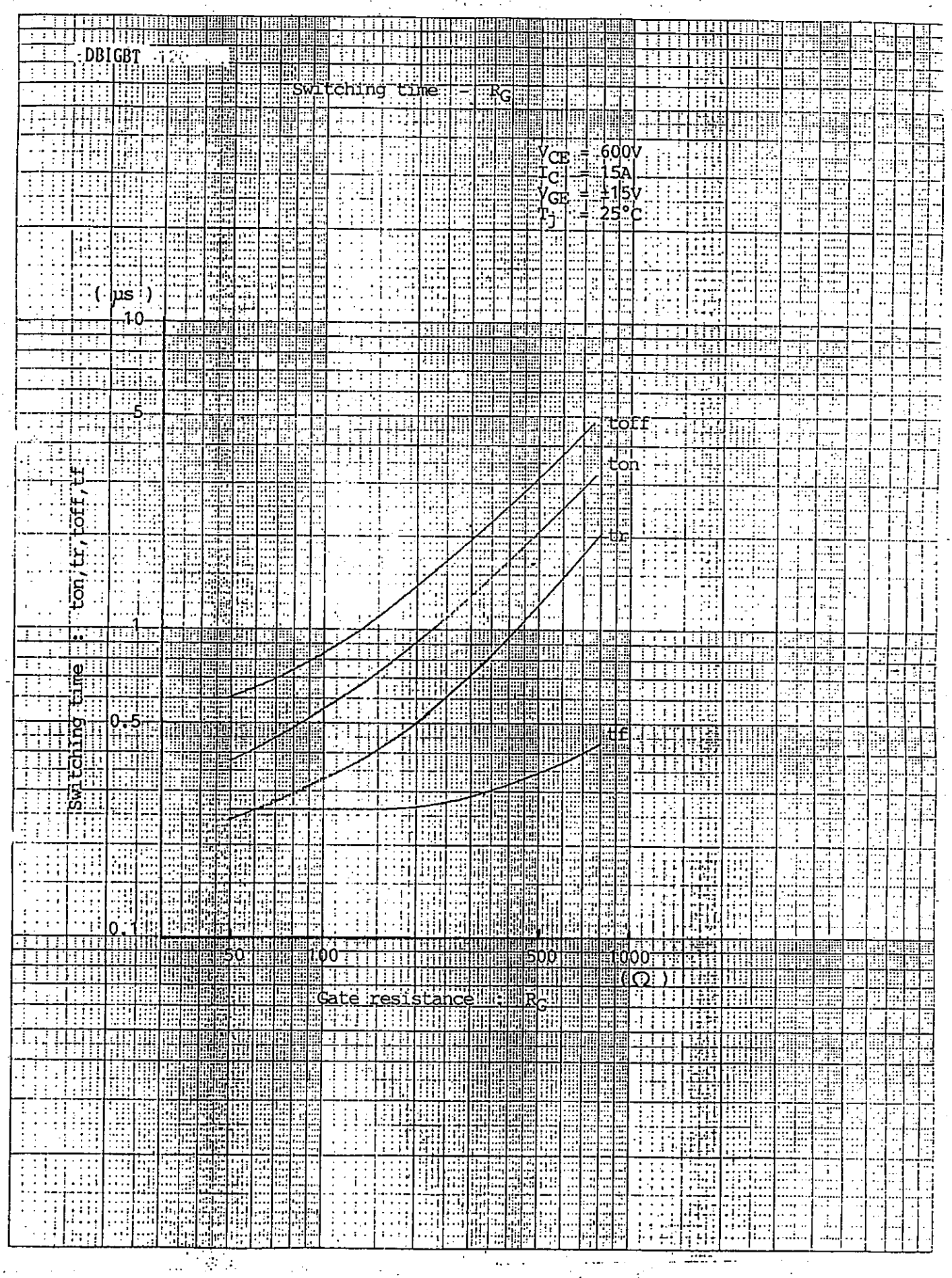
Switching time – R_G

V_{CE} = 600V
I_C = 15A
V_{GE} = ±15V
T_j = 25°C



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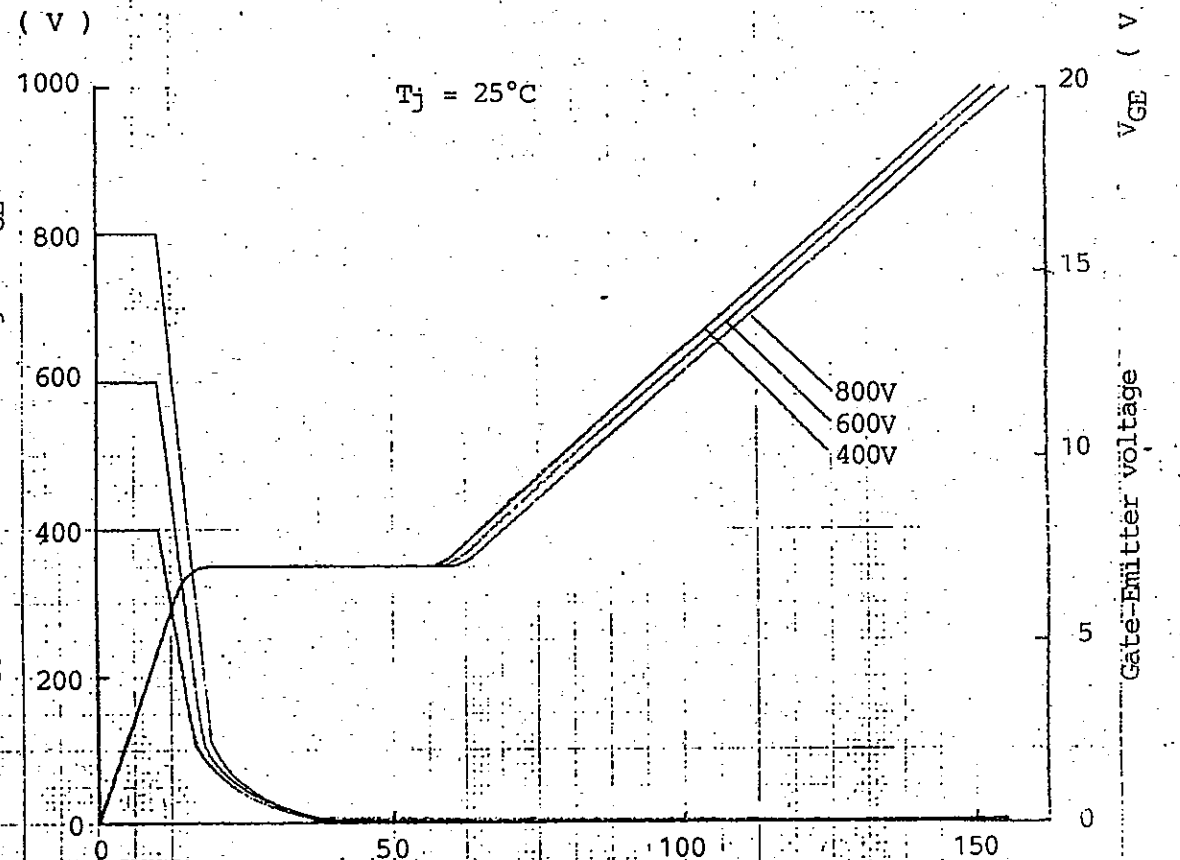
Dynamic input characteristics



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Reverse biased safe operating area

T_j = 25°C
+VGE = 15V
-VGE ≤ 15V
R_G = 82Ω