

# SPECIFICATION

Device Name : IGBT Module

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Type Name : 7MBR25SA140-01

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Spec. No. : MS6M 0550

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Date : Jun. - 02 - 2000

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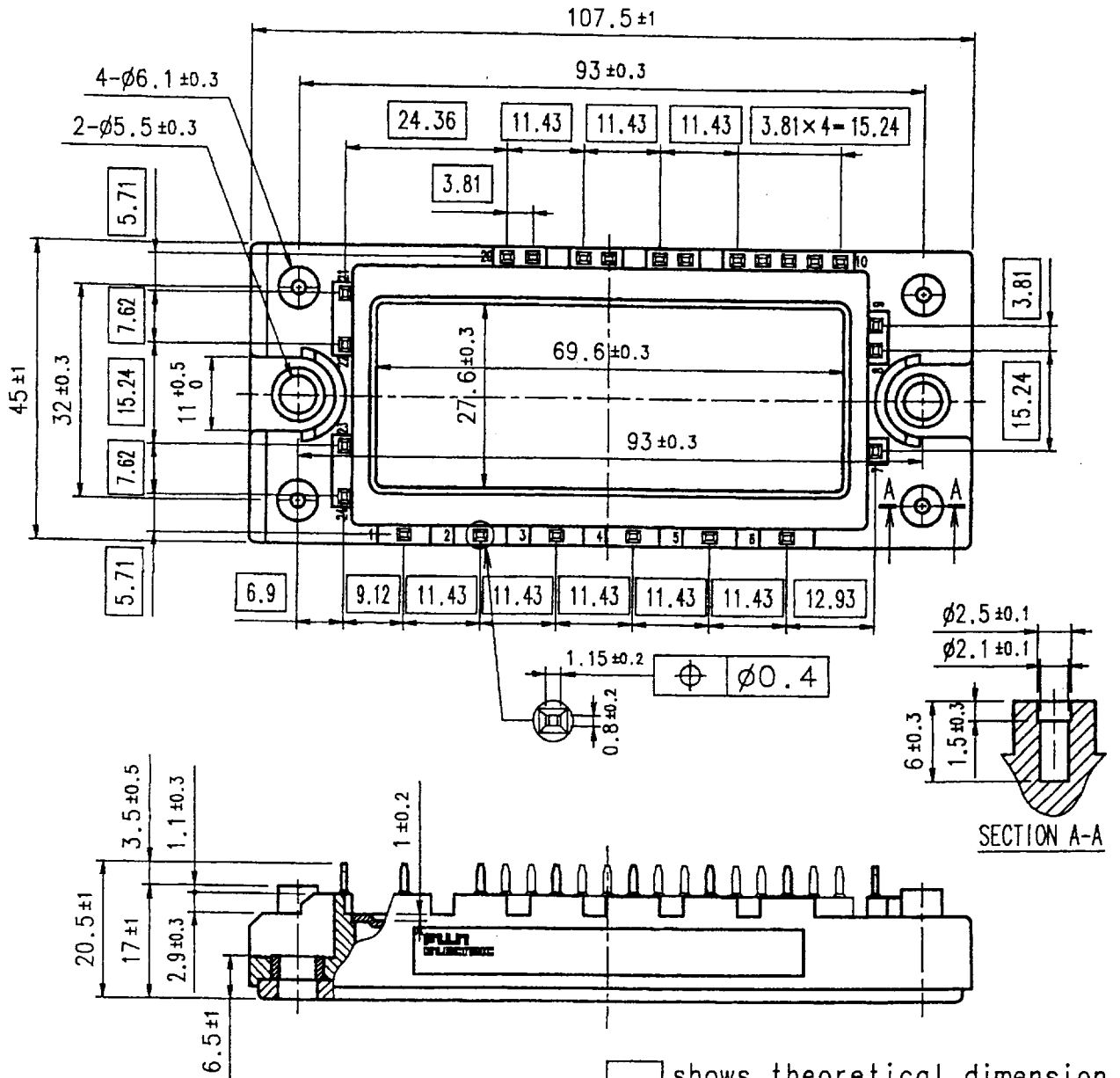
Fuji Electric Co., Ltd.  
Matsumoto Factory

	DATE	NAME	APPROVED	<b>Fuji Electric Co., Ltd.</b>		
DRAWN	Jun. - 2 - '00	<i>T. Kikuyasu</i>	<i>T. Kikuyasu</i>	DWG. NO.	MS6M 0550	1 / 10
CHECKED	June - 2 - 00	<i>D. Nishida</i>				



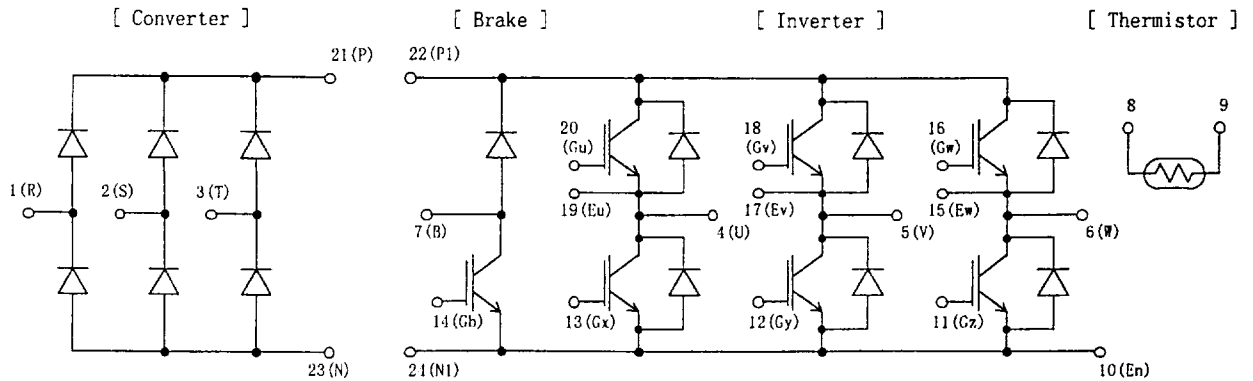
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1. Outline Drawing ( Unit : mm )



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2. Equivalent circuit



3. Absolute Maximum Ratings ( at Tc= 25C unless otherwise specified )

Items		Symbols	Conditions	Maximum Ratings	Units	
Inverter	Collector-Emitter voltage	VCES		1400	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	35	A
				Tc=75C	25	
		Icp	1ms	Tc=25C	70	A
				Tc=75C	50	
-Ic			25	A		
Collector Power Dissipation	Pc	1 device	180	W		
Brake	Collector-Emitter voltage	VCES		1400	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	25	A
				Tc=75C	15	
		Icp	1ms	Tc=25C	50	A
				Tc=75C	30	
Collector Power Dissipation	Pc	1 device	110	W		
Repetitive peak reverse Voltage(Diode)	VRRM		1400	V		
Converter	Repetitive peak reverse Voltage	VRRM		1600	V	
	Average Output Current	Io	50Hz/60Hz sine wave	25	A	
	Surge Current (Non-Repetitive)	IFSM	Tj=150C,10ms	260	A	
	I <sup>2</sup> t (Non-Repetitive)	I <sup>2</sup> t	half sine wave	338	A <sup>2</sup> s	
Junction temperature	Tj		150	C		
Storage temperature	Tstg		-40~ +125	C		
Isolation voltage	between terminal and copper base <sup>(*1)</sup>	Viso	AC : 1min.	2500	V	
	between thermistor and others <sup>(*2)</sup>			2500	V	
Mounting Screw Torque <sup>(*3)</sup>				3.5	Nm	

(\*1) All terminals should be connected together when isolation test will be done.

(\*2) Terminal 8 and 9 should be connected together. Terminal 1 to 7 and 10 to 24 should be connected together and shorted to copper base.

(\*3) Recommendable Value : 2.5~3.5 Nm (M5)

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4. Electrical characteristics ( at Tj= 25C unless otherwise specified)

Items	Symbols	Conditions	Characteristics			Units		
			min.	typ.	Max.			
Inverter	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE <sup>①</sup> = 1400 V			1.0	mA	
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE +20 V			200	nA	
	Gate-Emitter threshold voltage	VGE(th)	VCE = 20 V, Ic = 25 mA	5.5	7.2	8.5	V	
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip		2.2			V
			Ic = 25 A, terminal		2.3	2.7		
	Input capacitance	Cies	VGE = 0 V, VCE = 10 V f = 1 MHz		3000			pF
	Turn-on time	ton	Vcc = 800 V		0.35	1.2		us
		tr	Ic = 25 A		0.25	0.6		
		tr(0)	VGE +-15 V		0.1			
	Turn-off time	toff	RG = 51 ohm		0.45	1.0		
tf				0.08	0.3			
Forward on voltage	VF	IF = 25 A, chip		2.4			V	
		terminal		2.5	3.3			
Reverse recovery time	trr	IF = 25 A				350	ns	
Brake	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE <sup>①</sup> = 1400 V			1.0	mA	
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE +20 V			200	nA	
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip		2.2			V
			Ic = 15 A, terminal		2.3	2.7		
	Turn-on time	ton	Vcc = 800 V		0.35	1.2		us
		tr	Ic = 15 A		0.25	0.6		
	Turn-off time	toff	VGE +-15 V		0.45	1.0		
		tf	RG = 82 ohm		0.08	0.3		
Reverse current	IRRM	VR = 1400 V				1.0	mA	
Converter	Forward on voltage	VFM	IF = 25 A, chip		1.1		V	
			terminal		1.2	1.5		
Reverse current	IRRM	VR = 1600 V				1.0	mA	
Thermistor	Resistance	R	T = 25C		5000		ohm	
			T = 100C	465	495	520		
	B value	B	T = 25/50C	3305	3375	3450	K	

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5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			0.69	C/W
		Inverter FWD			1.30	
		Brake IGBT			1.14	
		Converter Diode			0.90	
Contact Thermal resistance	Rth(c-f)	with Thermal Compound (*)		0.05		C/W

\* This is the value which is defined mounting on the additional cooling fin with thermal compound.

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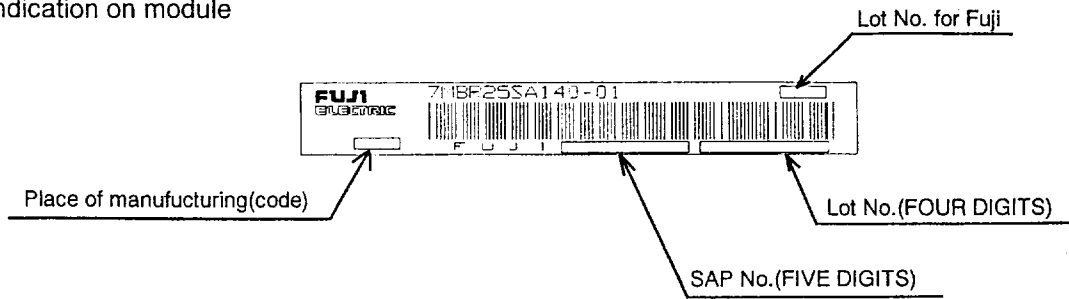
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## 6. Indication on module



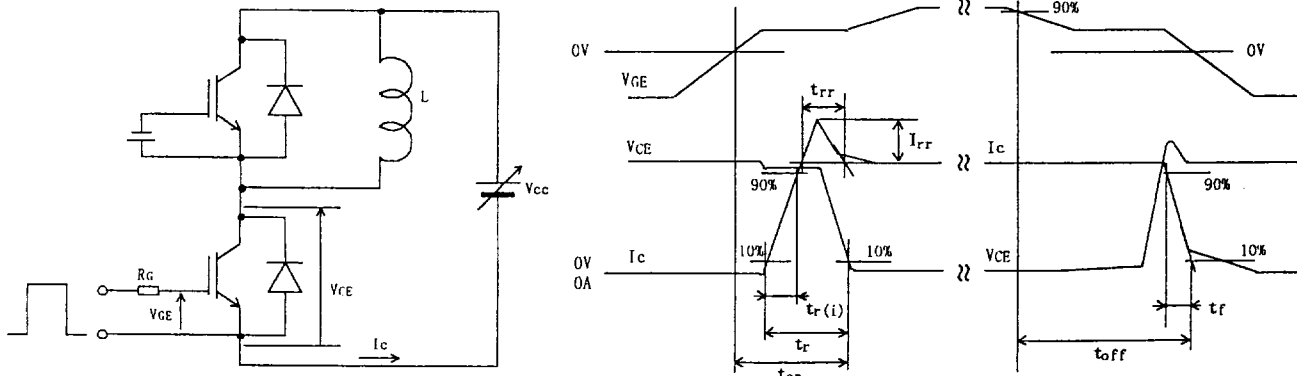
## 7. Applicable category

This specification is applied to Power Integrated Module named 7MBR25SA140-01 .

## 8. Storage and transportation notes

- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- Store modules with unprocessed terminals.
- Do not drop or otherwise shock the modules when transporting.
- Please connect adequate fuse or protector of circuit between three-phase line and this product to prevent the equipment from causing secondary destruction.

## 9. Definitions of switching time



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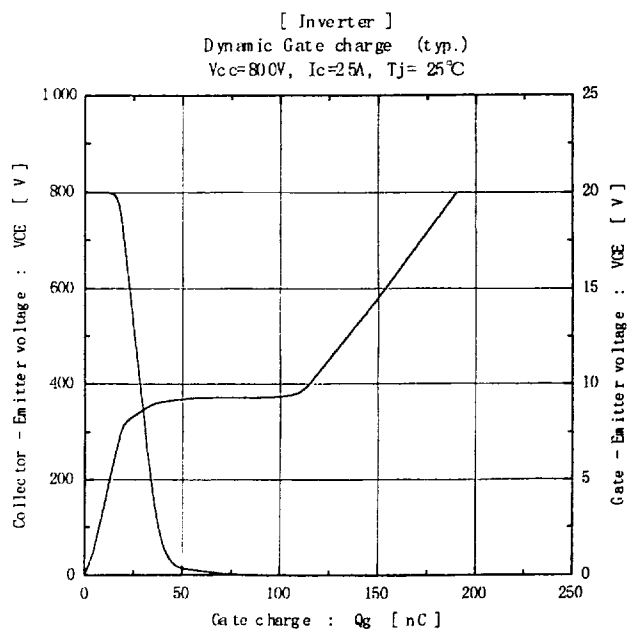
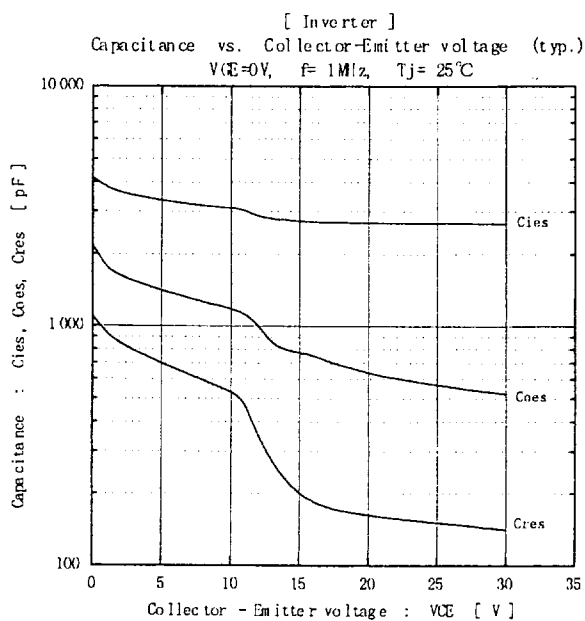
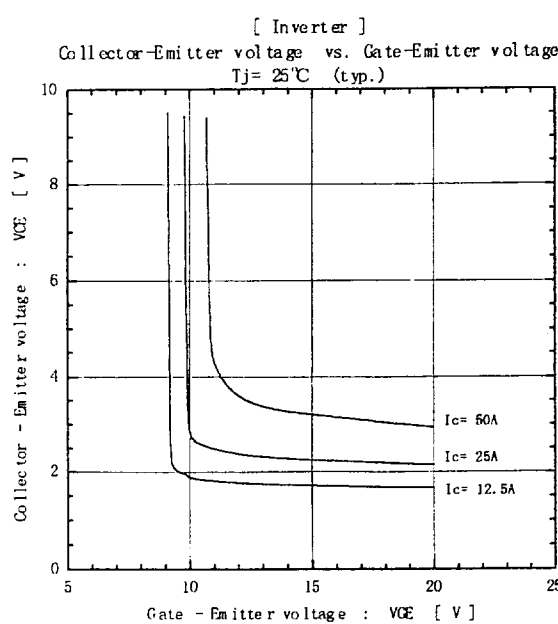
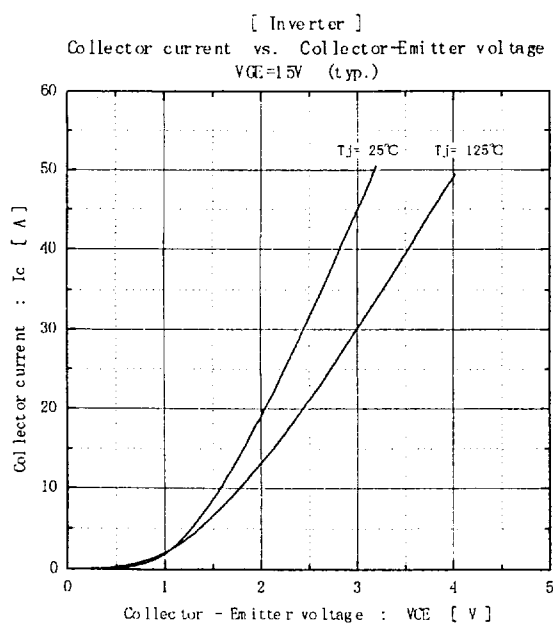
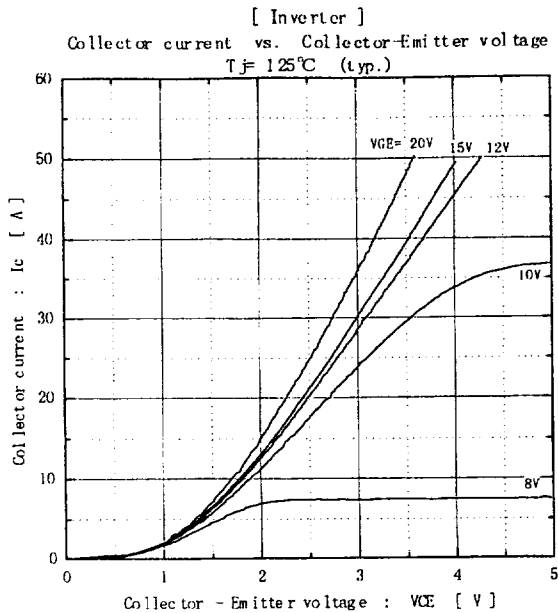
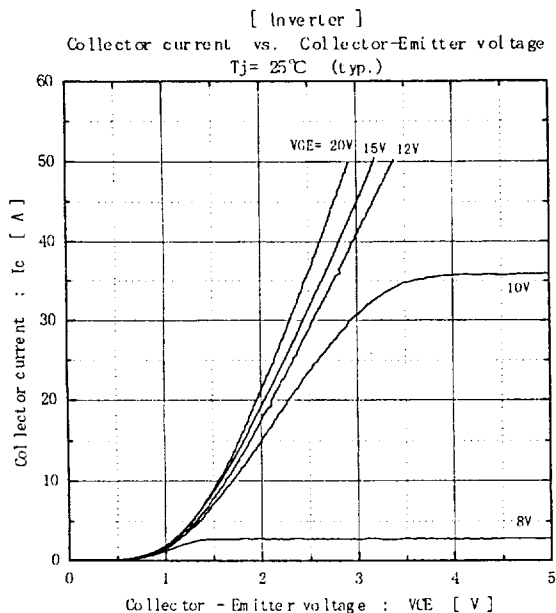
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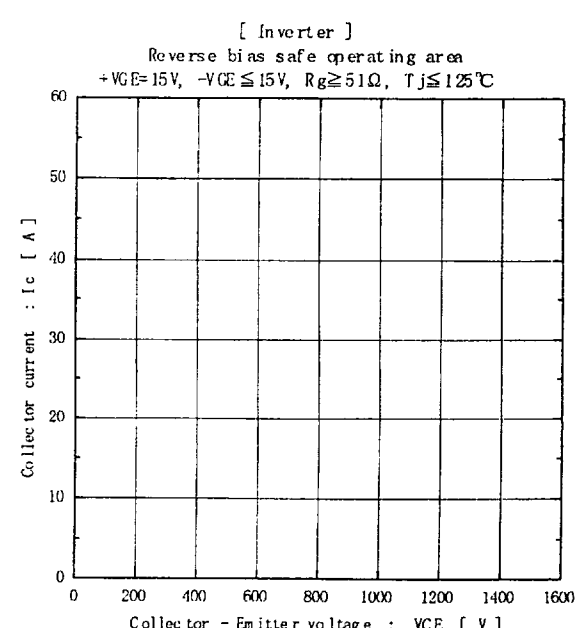
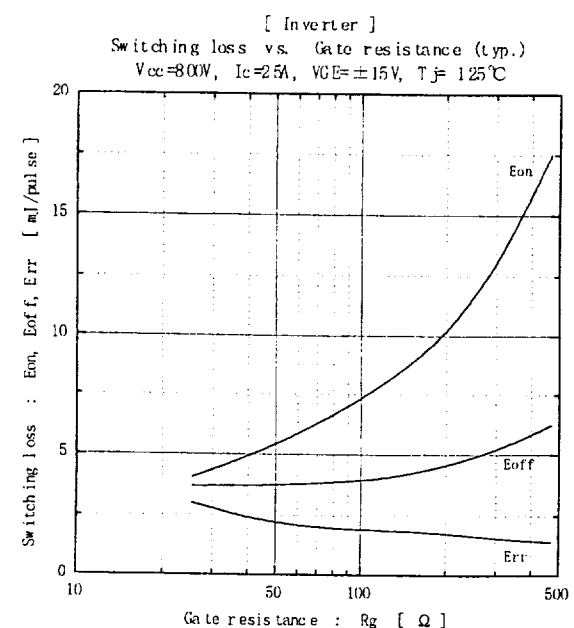
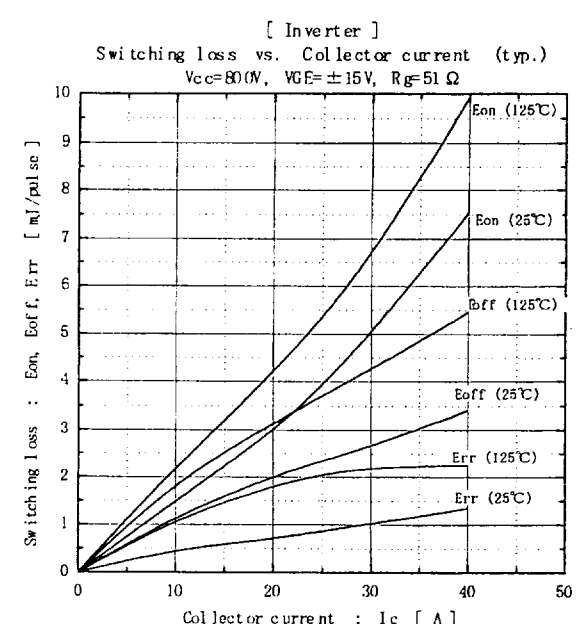
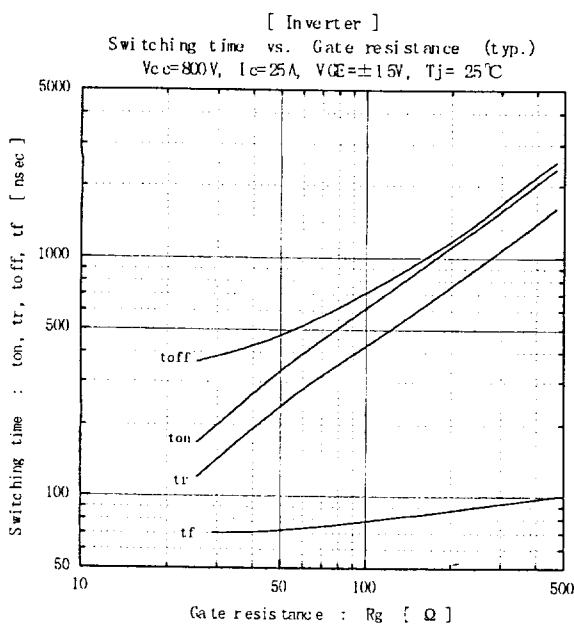
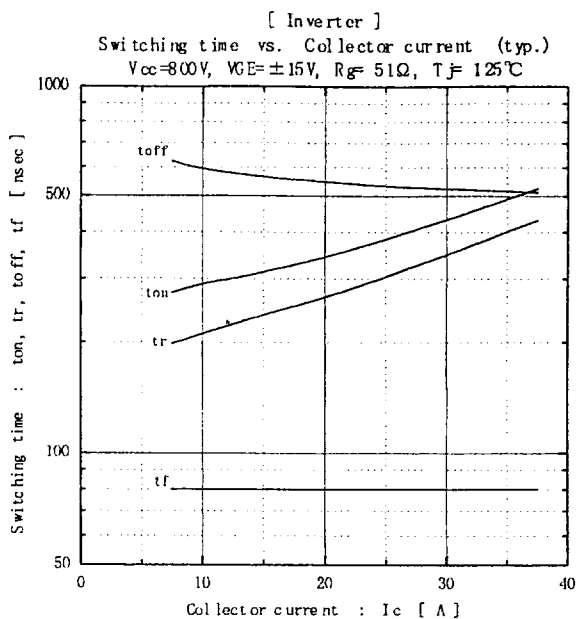
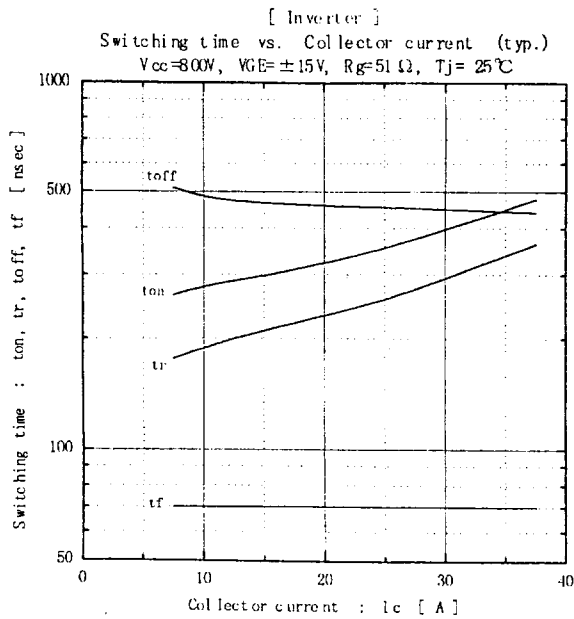
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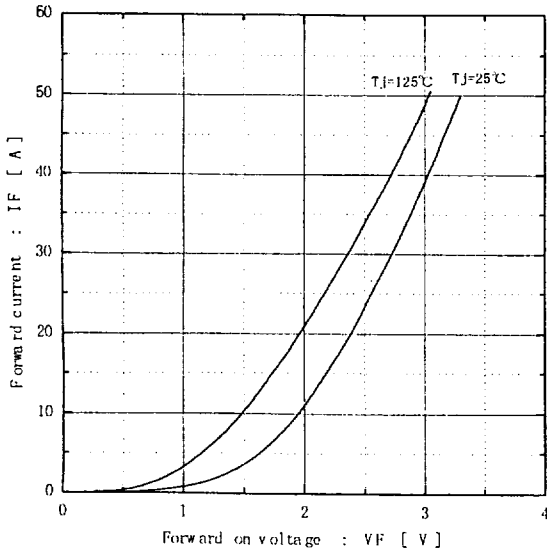
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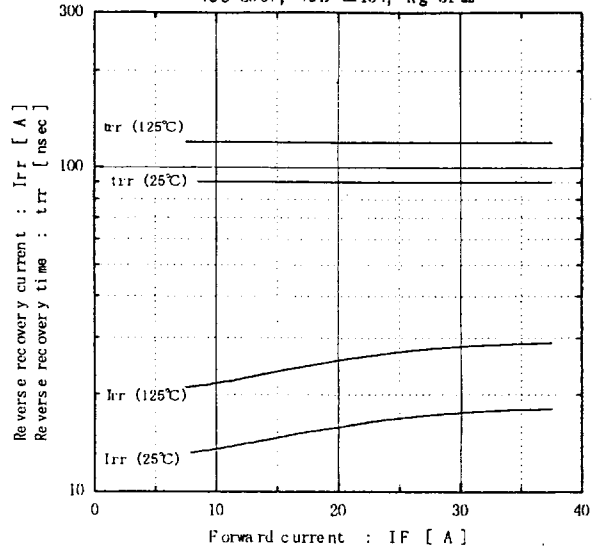
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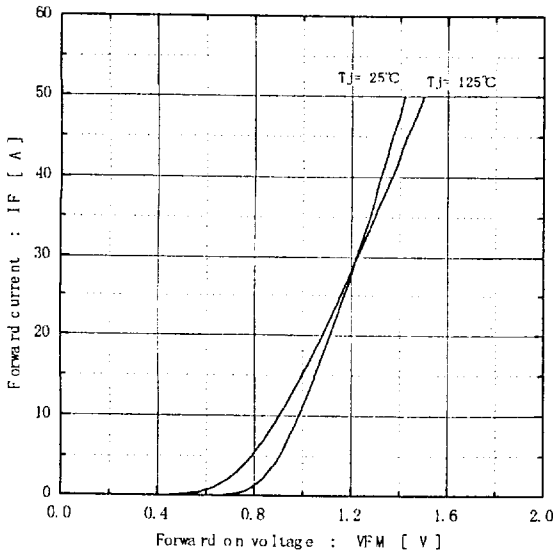
[ Inverter ]  
Forward current vs. Forward on voltage (typ.)



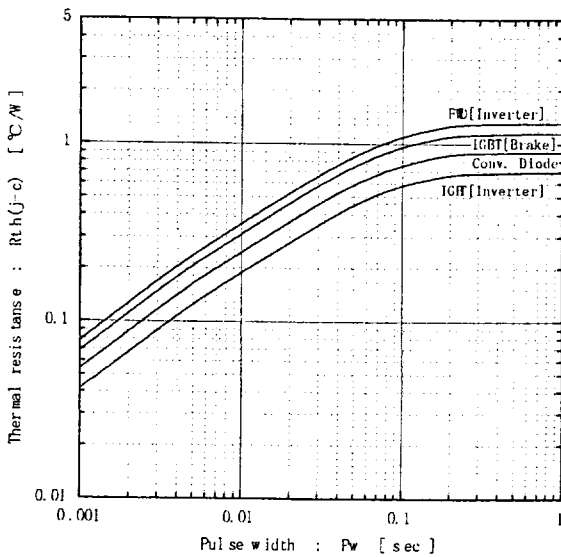
[ Inverter ]  
Reverse recovery characteristics (typ.)  
 $V_C = 80V, V_{GE} = \pm 15V, R_g = 51 \Omega$



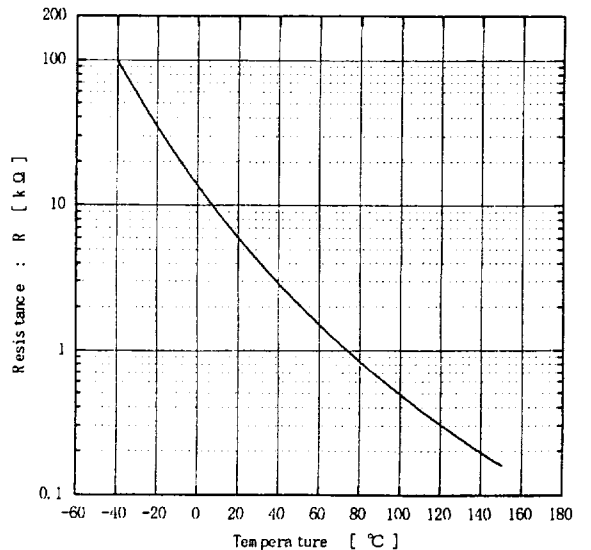
[ Converter ]  
Forward current vs. Forward on voltage (typ.)



Transient thermal resistance



[ Thermistor ]  
Temperature characteristic (typ.)



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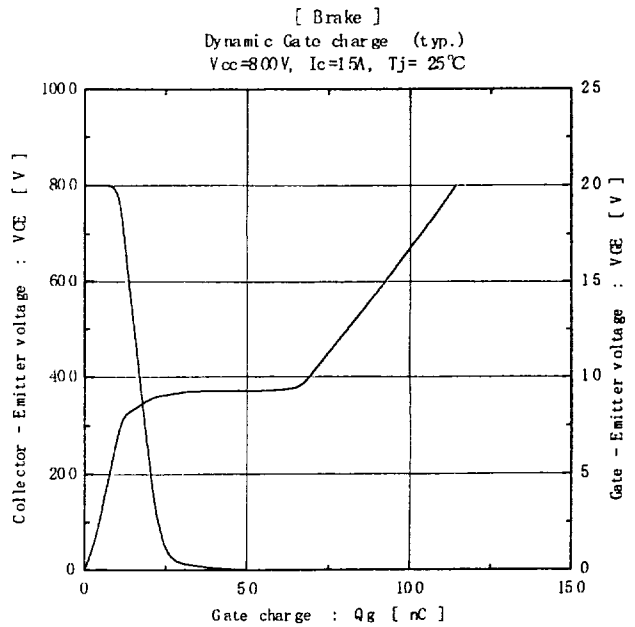
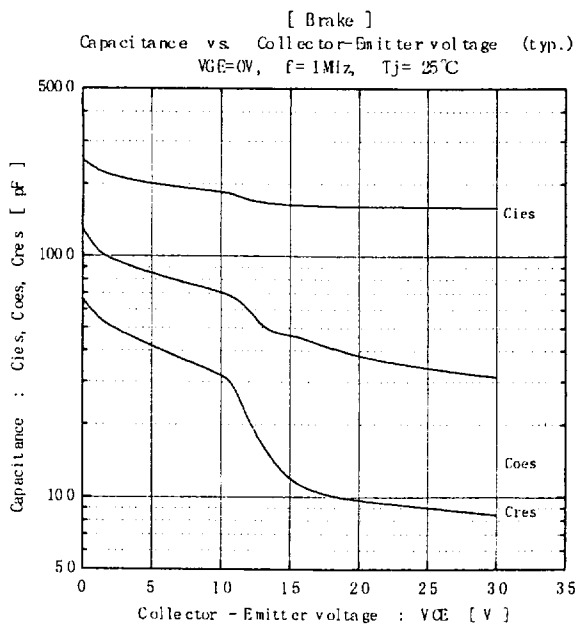
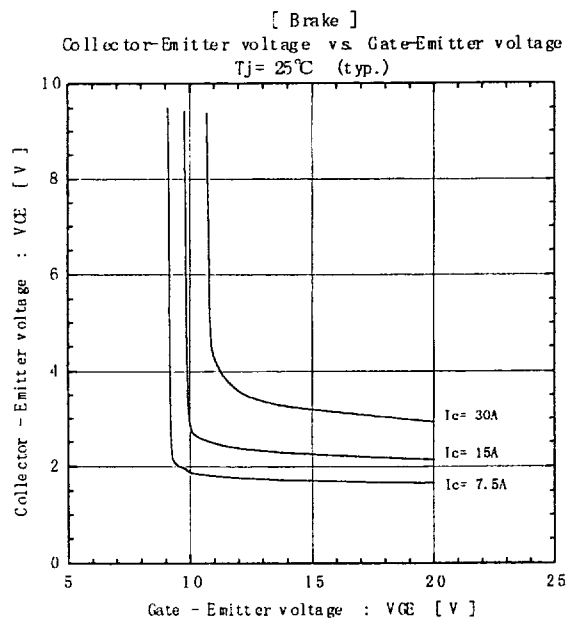
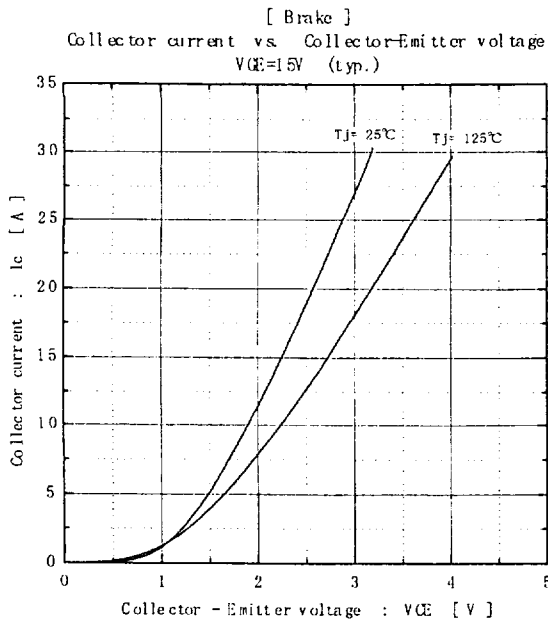
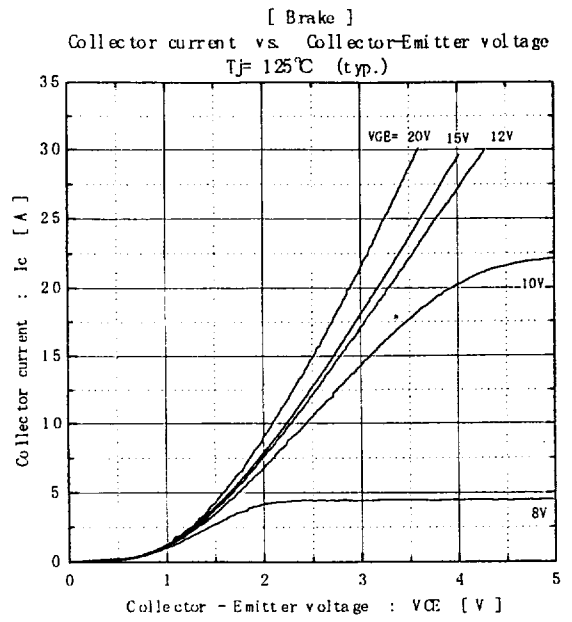
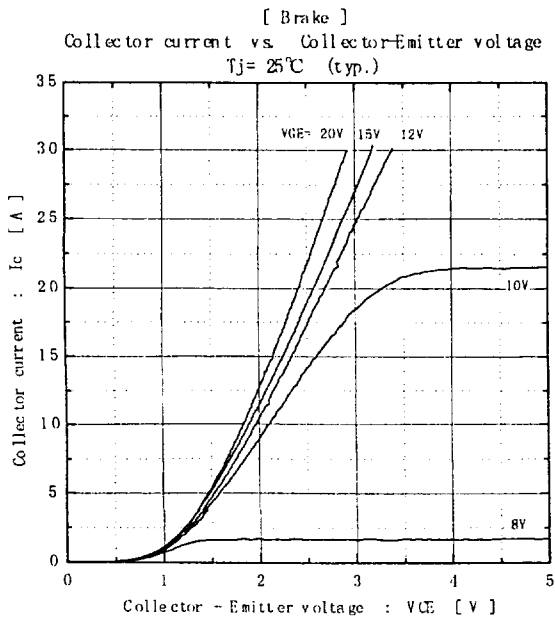
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