

# SPECIFICATION

Device Name : IGBT Module

Type Name : 7MBR15SA140E-01

Spec. No. : MS6M 0549

Date : Jun. - 02 - 2000

Fuji Electric Co., Ltd.  
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	Jun - 2 - '00	<i>T. Koyashi</i>	<i>[Signature]</i>	MS6M 0549	1 / 10
CHECKED	June - 2 - 00	<i>S. Naito</i>			

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# Revised Records

Date	Classi- fication	Ind.	Content	Applied date	Drawn	Checked	Approved
Jun. - 2 - '60	enactment	—	—	Issued date	—	S. M. H. A.	J. N. Yoshida

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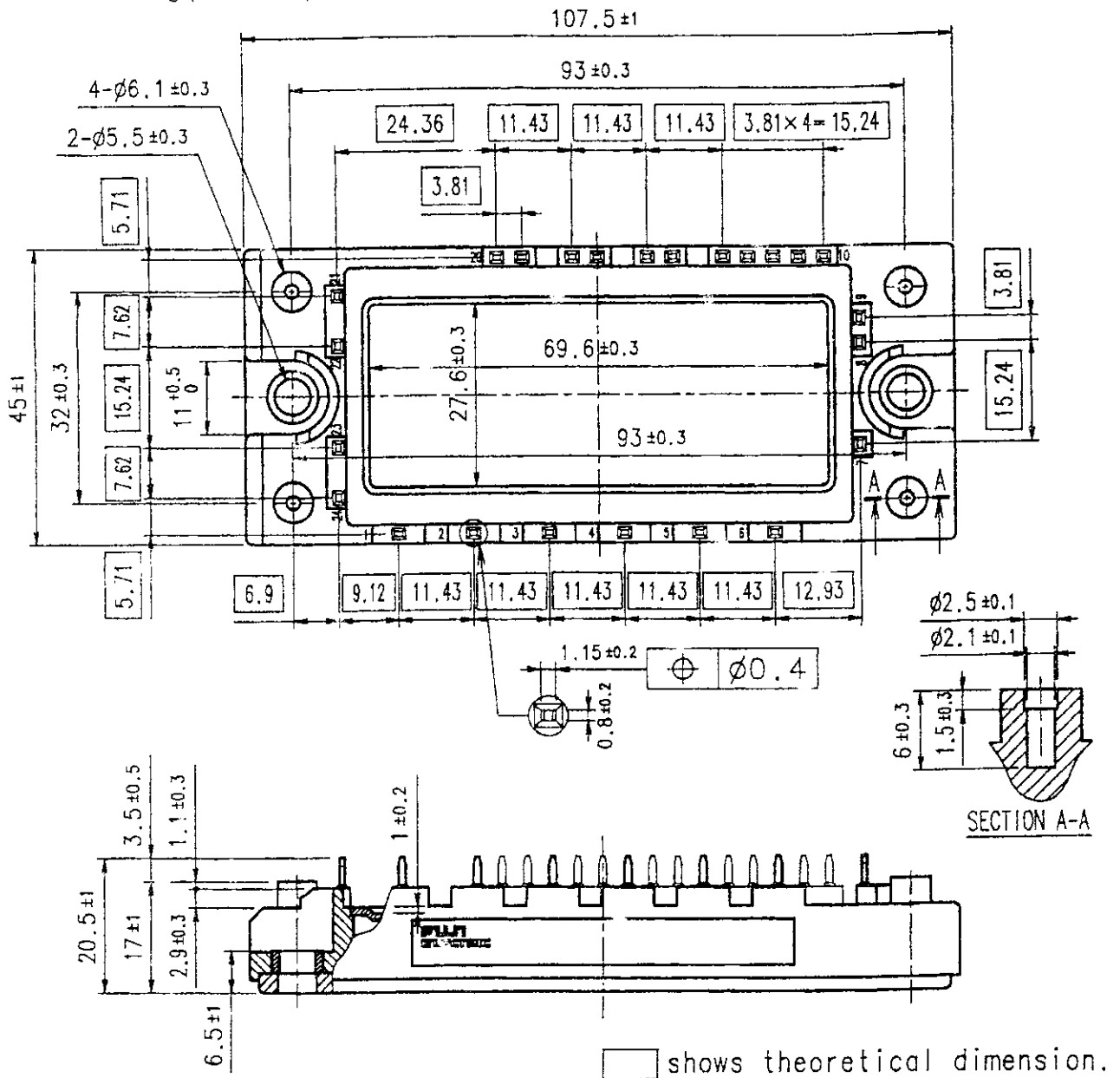
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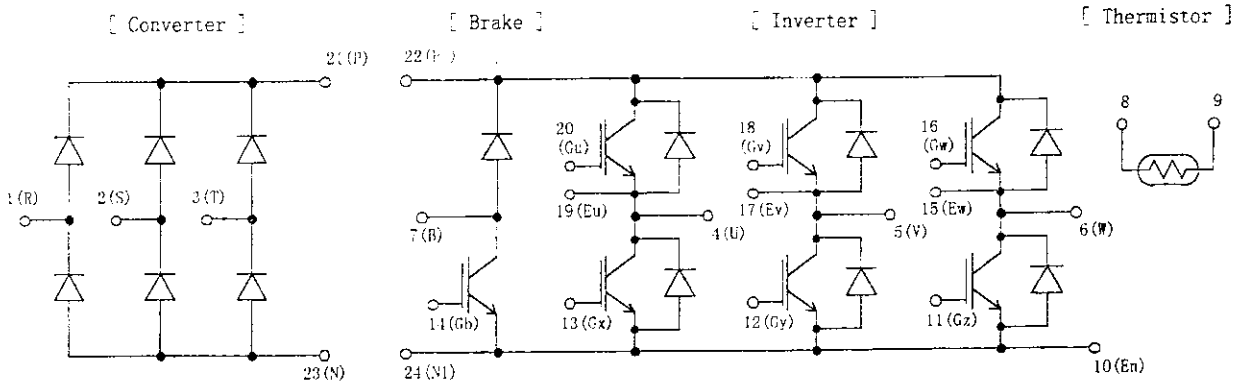
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# 7MBR15SA140E-01

1. Outline Drawing ( Unit : mm )



2. Equivalent circuit



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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	25	A
				Tc=75C	15	
		Icp	1ms	Tc=25C	50	A
				Tc=75C	30	
-Ic			15	A		
Collector Power Dissipation	Pc	1 device		110	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	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 =	15 mA	5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE	15 V, chip			2.2		V
			Ic =	15 A terminal			2.25	2.7	
	Input capacitance	Cies	VGE	0 V, VCE	10 V		1800		pF
	Turn-on time	ton	Vcc=	800 V			0.35	1.2	us
		tr	Ic =	15 A			0.25	0.6	
		tr(0)	VGE	+15 V			0.1		
	Turn-off time	toff	RG =	82 ohm			0.45	1.0	us
		tf					0.08	0.3	
	Forward on voltage	VF	IF =	15 A chip			2.4		V
terminal						2.45	3.3		
Reverse recovery time	trr	IF =	15 A				350	ns	
Brake	Zero gate voltage Collector current	ICES	VGE	0 V, VCE	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	
		toff	VGE	+15 V			0.45	1.0	
	Turn-off time	tf	RG =	82 ohm			0.08	0.3	us
	Reverse current	IRRM	VR =	1400 V				1.0	mA
	Forward on voltage	VFM	IF =	15 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

5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			1.14	C/W
		Inverter FWD			1.85	
		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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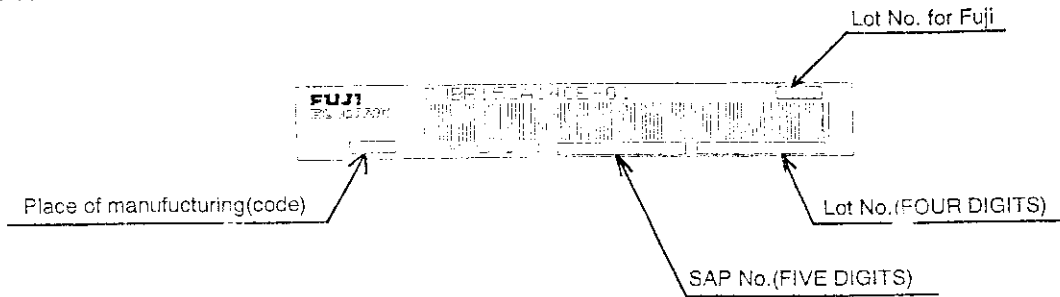
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6. Indication on module



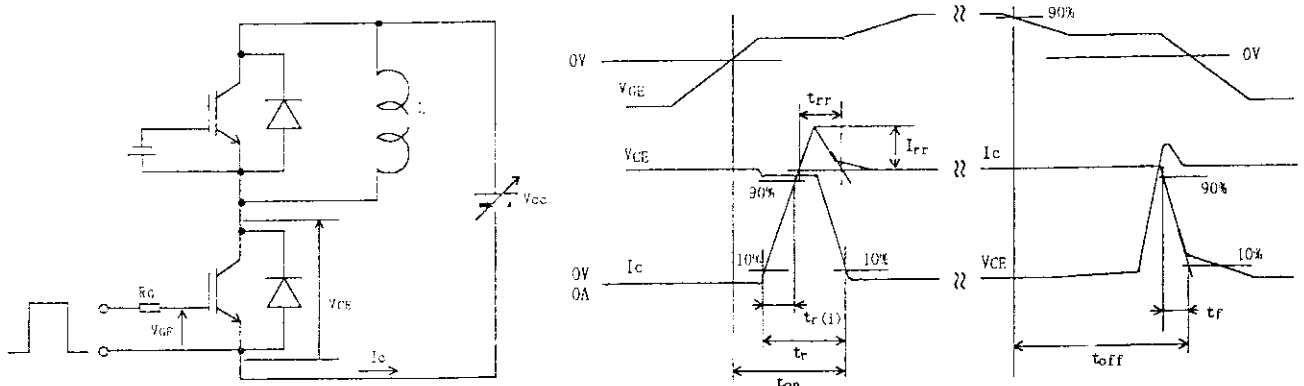
7. Applicable category

This specification is applied to Power Integrated Module named 7MBR15SA140E-01.

8. Storage and transportation notes (保管・運搬上の注意事項)

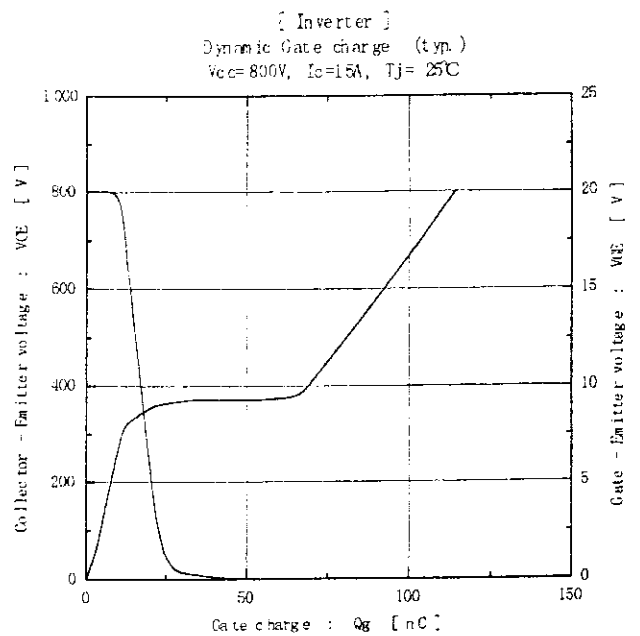
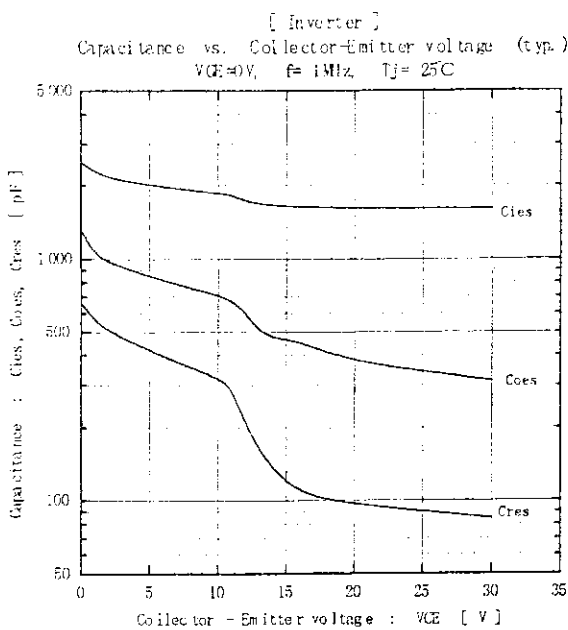
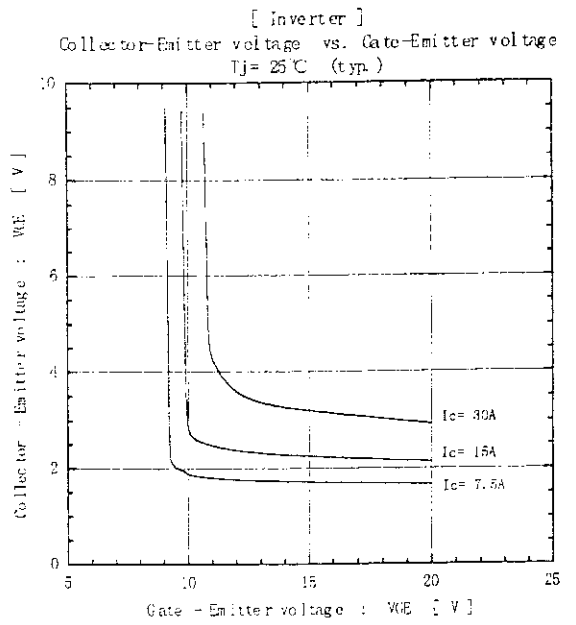
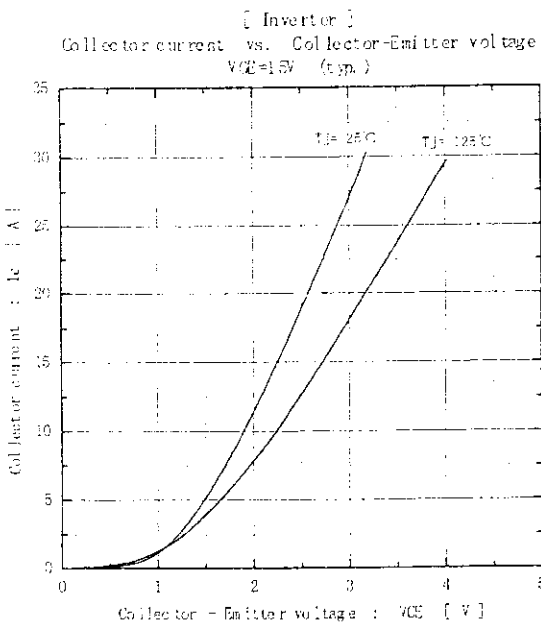
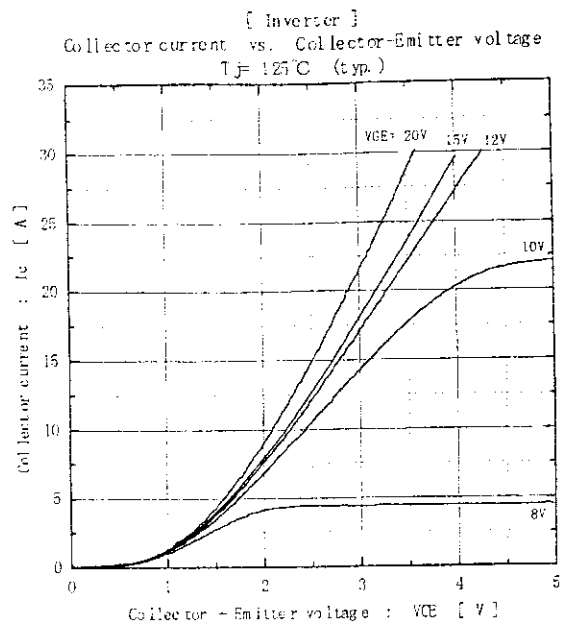
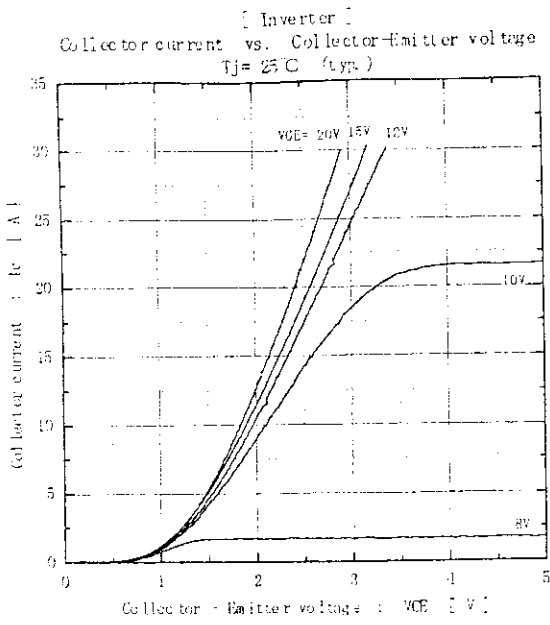
- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- 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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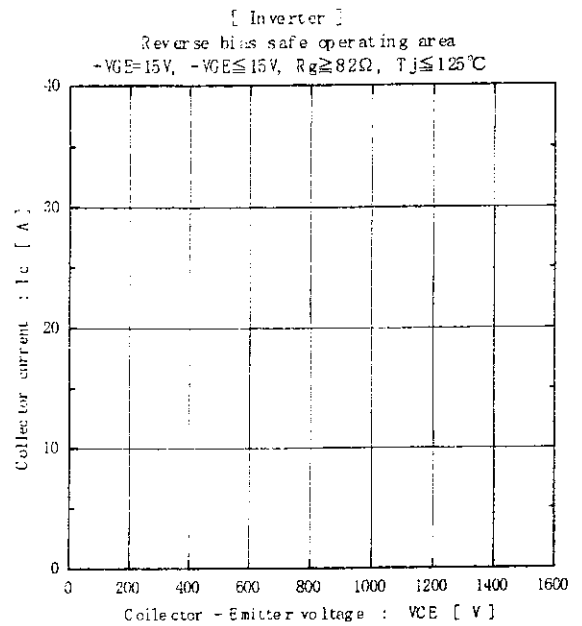
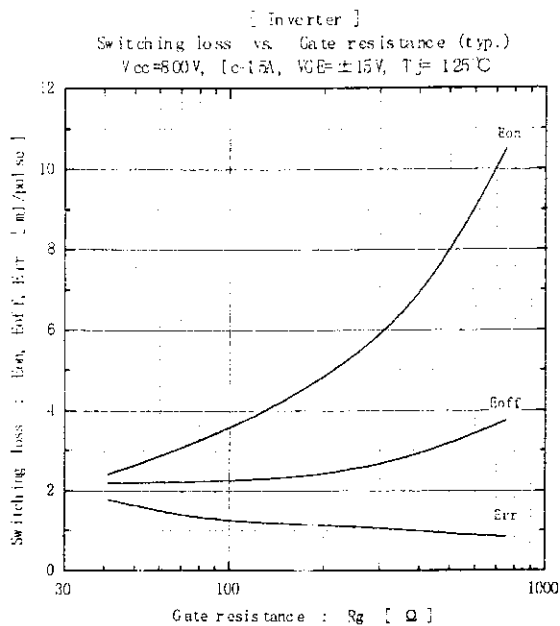
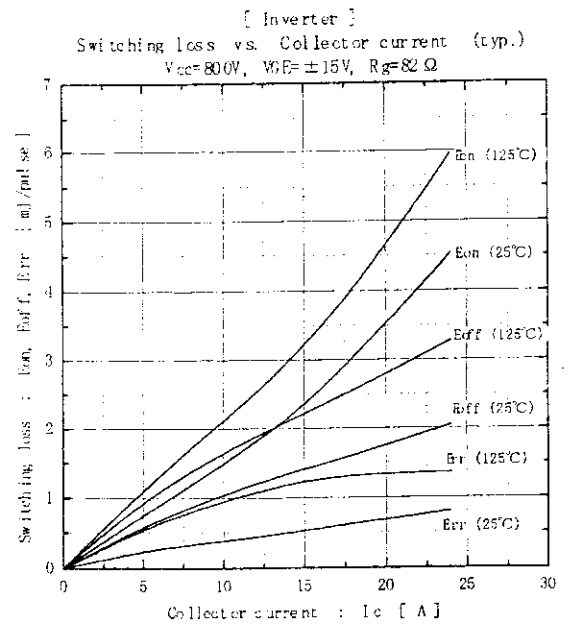
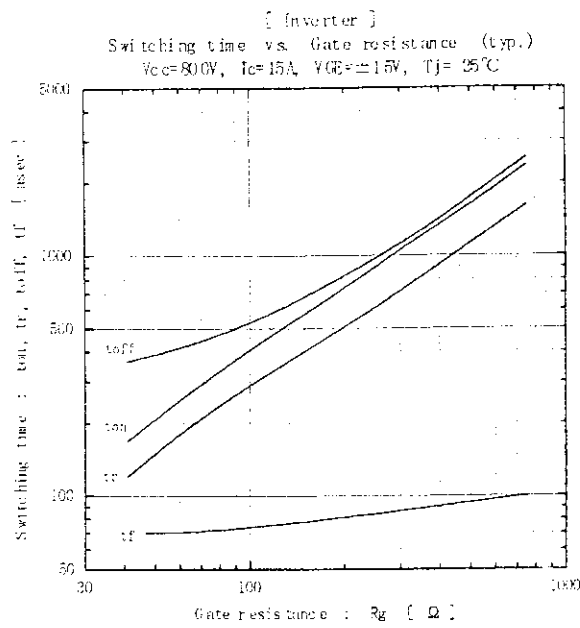
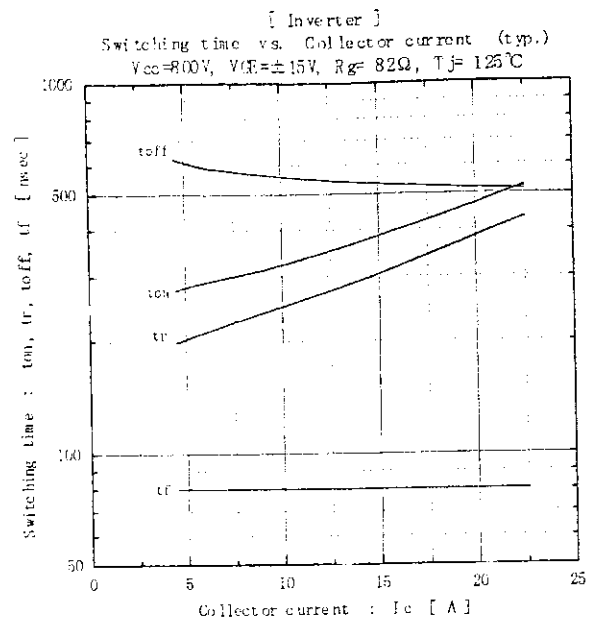
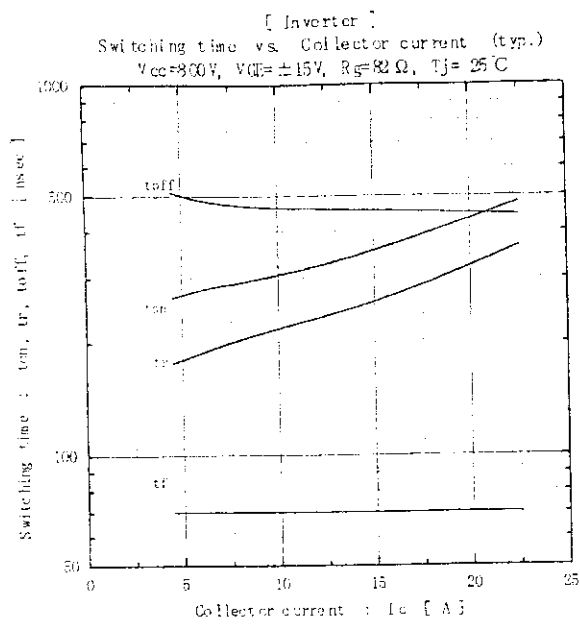
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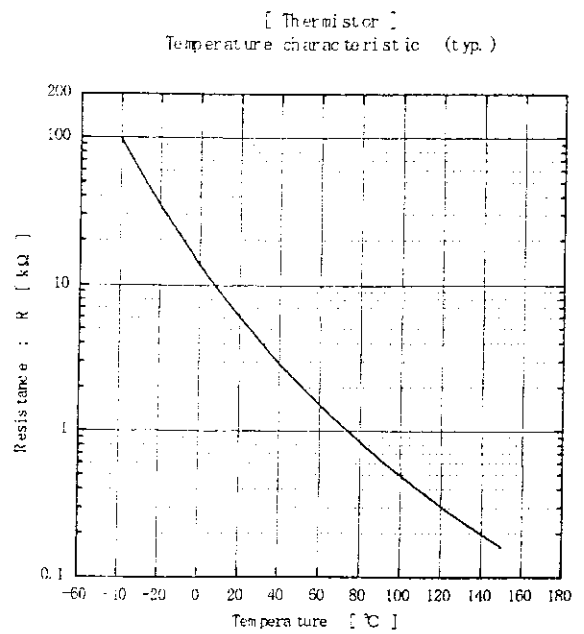
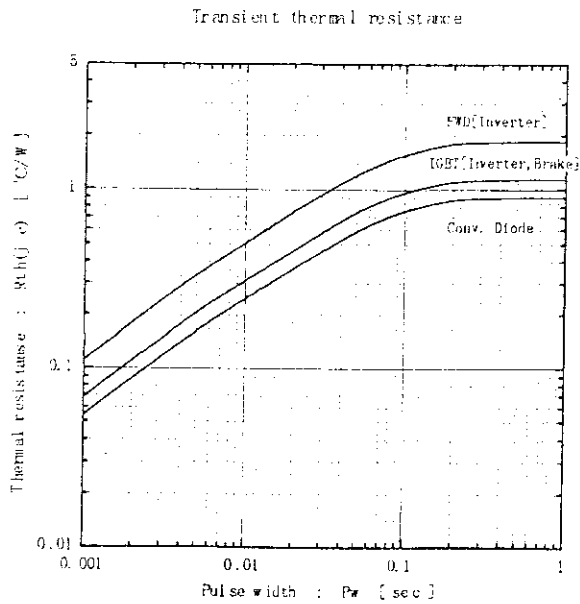
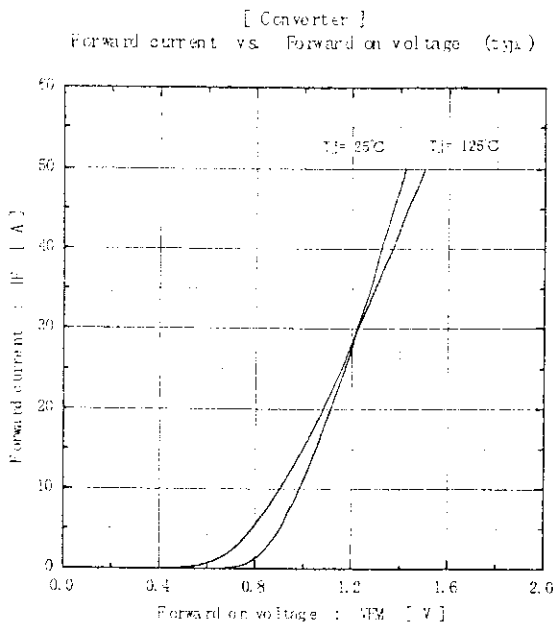
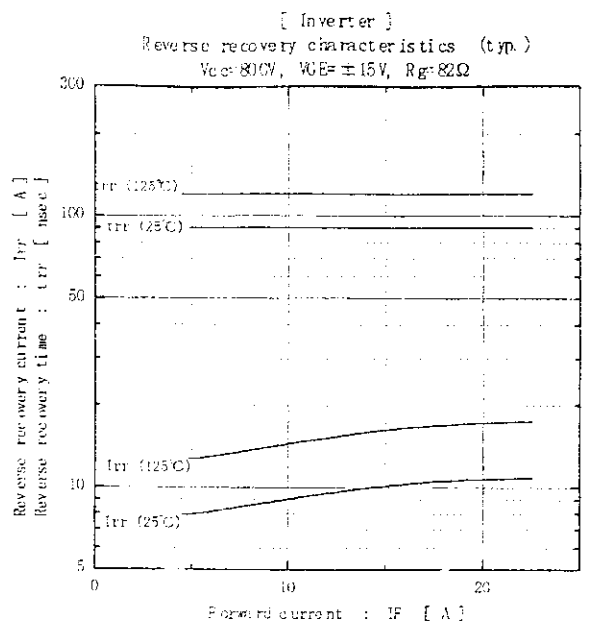
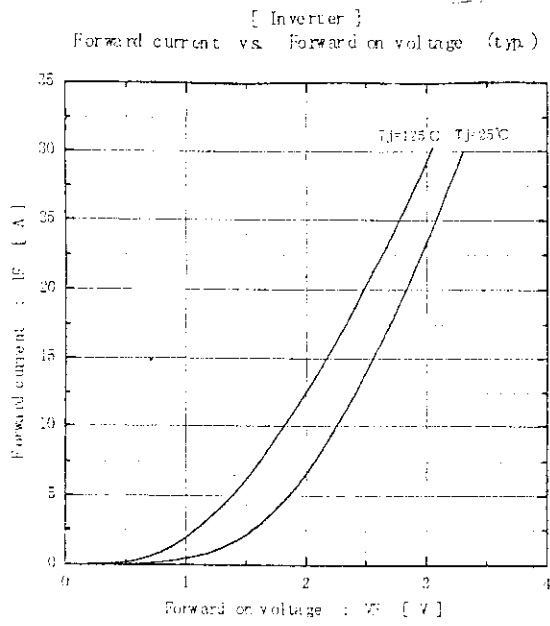
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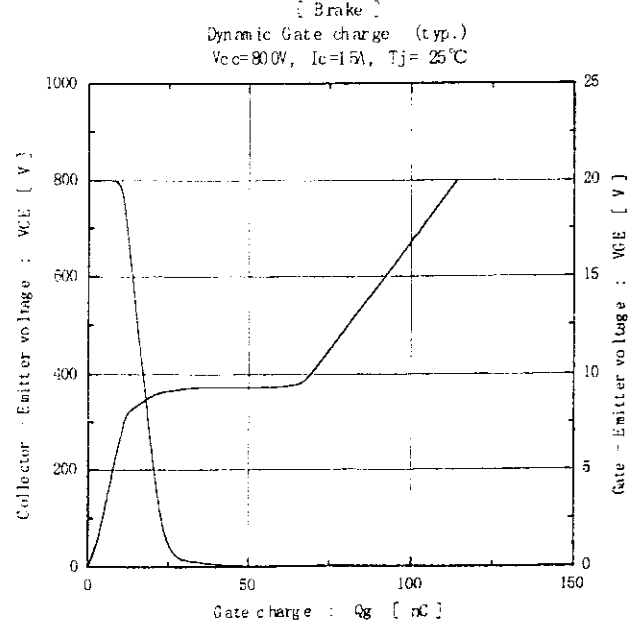
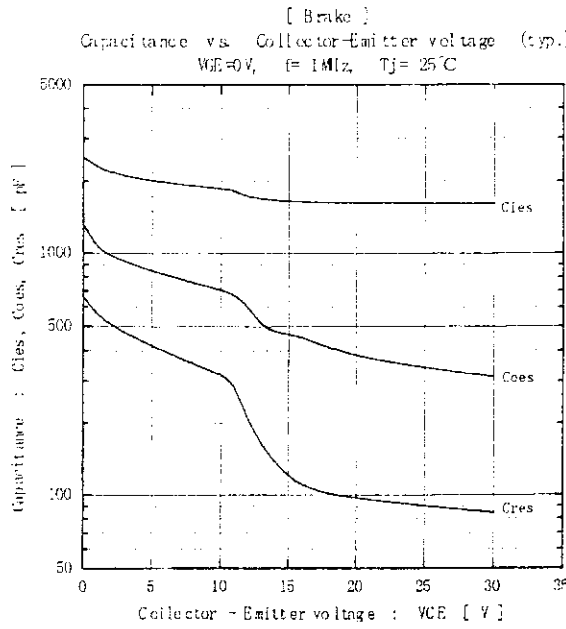
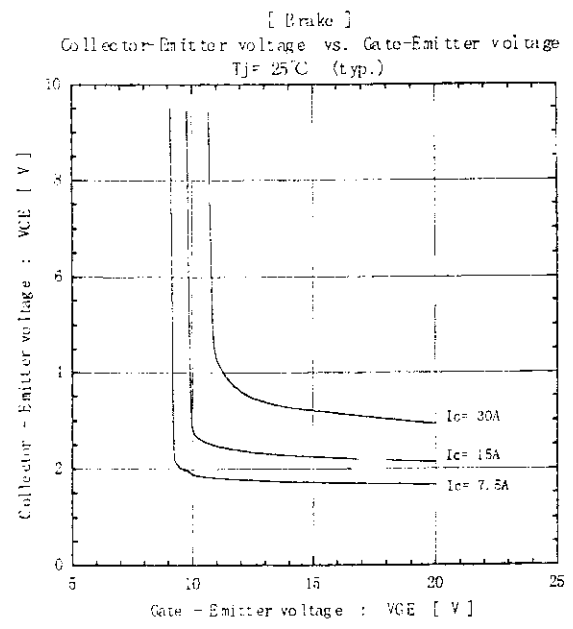
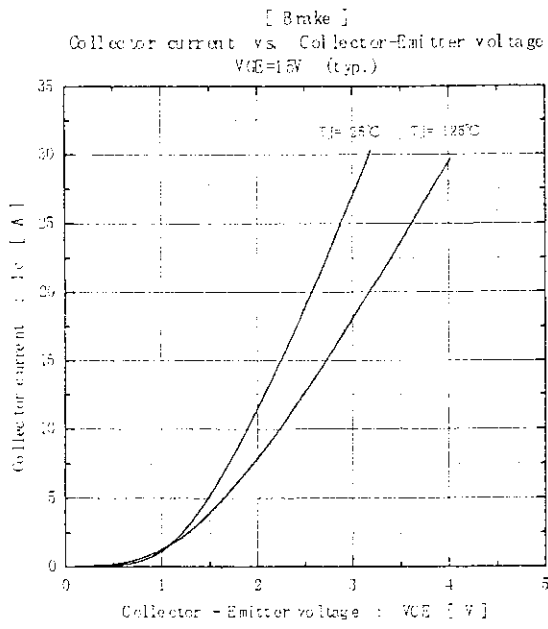
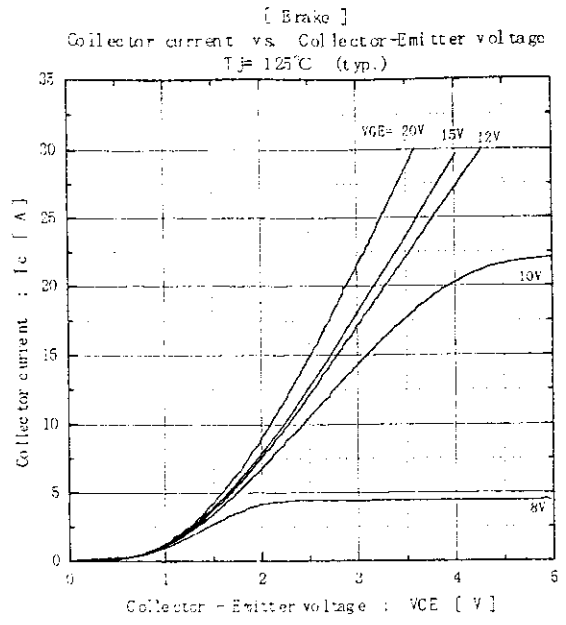
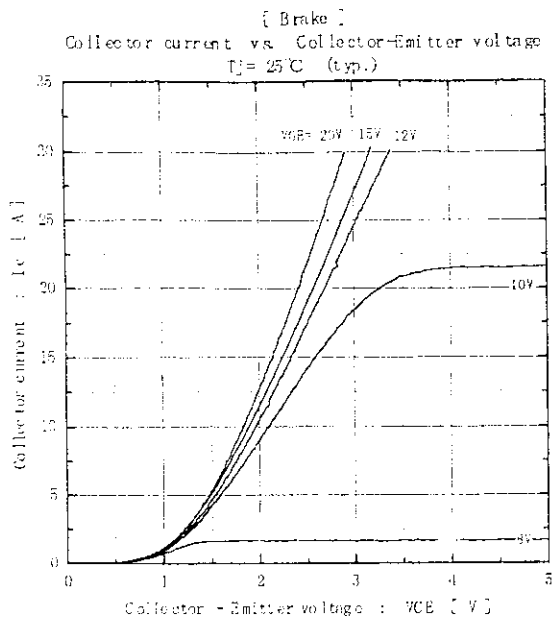
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