

SPECIFICATION

Device Name : IGBT Module

Type Name : 7MBR25SA120-01

Spec. No. : MS6M 0547

Date : Jun. - 02 - 2000

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Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN	Jun. - 2 - '00	T. Kobayashi		DWG. NO.	MS6M 0547	a
CHECKED	June - 2 - 00	S. Nishida				
			T. Miyazaki			
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Revised Records

Date	Classi- fication	Ind.	Content	Applied date	Drawn	Checked	Approved
Jun.-2-'00	enactment	—	—	Issued date	—	S. Katta	T. Miyasaka
Jun-14-'00	Revision	a	Revised type miss (PS/10)		Y. Kobayashi	S. Katta	T. Miyasaka

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7MBR25SA120-01

Technical drawing of a mechanical part, likely a mold, showing top, side, and cross-sectional views with dimensions in millimeters.

Top View Dimensions:

- Overall width: 107.5 ± 1
- Overall height: 45 ± 1
- Inner width: 93 ± 0.3
- Inner height: 69.6 ± 0.3
- Top edge dimensions (from left to right): 24.36 , 11.43 , 11.43 , 11.43 , $3.81 \times 4 = 15.24$
- Left edge dimensions (from top to bottom): 5.71 , 7.62 , 15.24 , 7.62 , 5.71
- Right edge dimensions (from top to bottom): 3.81 , 15.24
- Bottom edge dimensions (from left to right): 6.9 , 9.12 , 11.43 , 11.43 , 11.43 , 11.43 , 12.93
- Central rectangular area dimensions: 27.6 ± 0.3 (height), 93 ± 0.3 (width)
- Top edge features: $4-\phi 6.1 \pm 0.3$ and $2-\phi 5.5 \pm 0.3$
- Bottom edge features: 1.15 ± 0.2 , 0.8 ± 0.2 , and a hole with diameter $\phi 0.4$

Side View Dimensions:

- Overall height: 20.5 ± 1
- Top section height: 17 ± 1
- Bottom section height: 6.5 ± 1
- Intermediate height: 2.9 ± 0.3
- Top section width: 3.5 ± 0.5
- Bottom section width: 1.1 ± 0.3
- Top section thickness: 1 ± 0.2

Cross-Section A-A Dimensions:

- Overall width: $\phi 2.5 \pm 0.1$
- Inner width: $\phi 2.1 \pm 0.1$
- Top section height: 6 ± 0.3
- Bottom section height: 1.5 ± 0.3

Notes:

- Shows theoretical dimension

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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			1200	V
	Gate-Emitter voltage	VGES			+20	V
	Collector current	Ic	Continuous	Tc=25C	35	A
				Tc=80C	25	
		Icp	1ms	Tc=25C	70	A
				Tc=80C	50	
		-Ic			25	A
Collector Power Dissipation	Pc	1 device		180	W	
Brak	Collector-Emitter voltage	VCES			1200	V
	Gate-Emitter voltage	VGES			+20	V
	Collector current	Ic	Continuous	Tc=25C	25	A
				Tc=80C	15	
		Icp	1ms	Tc=25C	50	A
				Tc=80C	30	
	Collector Power Dissipation	Pc	1 device		110	W
Repetitive peak reverse Voltage(Diode)	VRRM			1200	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 ² t (Non-Repetitive)	I ² t	half sine wave		338	A ² s
Junction temperature		Tj			150	C
Storage temperature		Tstg			-40~ +125	C
Isolation voltage	between terminal and copper base ^{(*)1}	Viso	AC : 1min.		2500	V
	between thermistor and others ^{(*)2}				2500	V
Mounting Screw Torque ^{(*)3}					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)

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

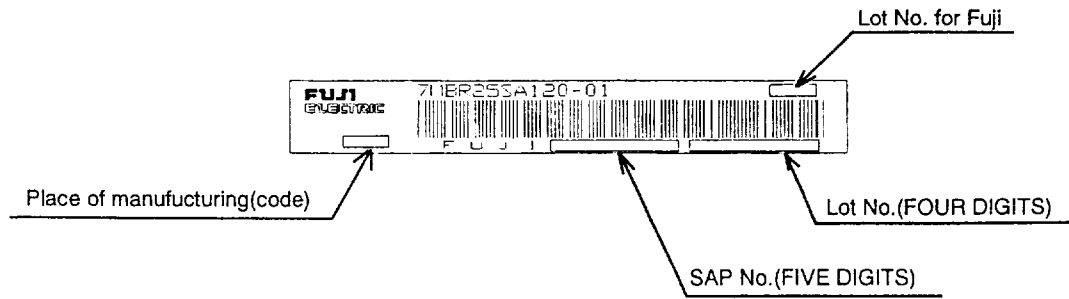
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Inverter	Zero gate voltage Collector current	ICES VGE = 0 V, VCE ^(a) = 1200 V			1.0	mA
	Gate-Emitter leakage current	IGES VCE = 0 V, VGE = +20 V			200	nA
	Gate-Emitter threshold voltage	VGE(th) VCE = 20 V, Ic = 25 mA	5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat) VGE = 15 V, chip		2.1		V
		Ic = 25 A terminal		2.2	2.6	
	Input capacitance	Cies VGE = 0 V, VCE = 10 V f = 1 MHz		3000		pF
	Turn-on time	ton Vcc = 600 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	
Brake	Forward on voltage	VF IF = 25 A chip		2.3		V
		terminal		2.4	3.2	
	Reverse recovery time	trr IF = 25 A			350	ns
	Zero gate voltage Collector current	ICES VGE = 0 V, VCE ^(a) = 1200 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		2.1		V
		Ic = 15 A terminal		2.2	2.6	
	Turn-on time	ton Vcc = 600 V		0.35	1.2	us
		tr Ic = 15 A		0.25	0.6	
		toff VGE = +15 V		0.45	1.0	
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

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.

6. Indication on module



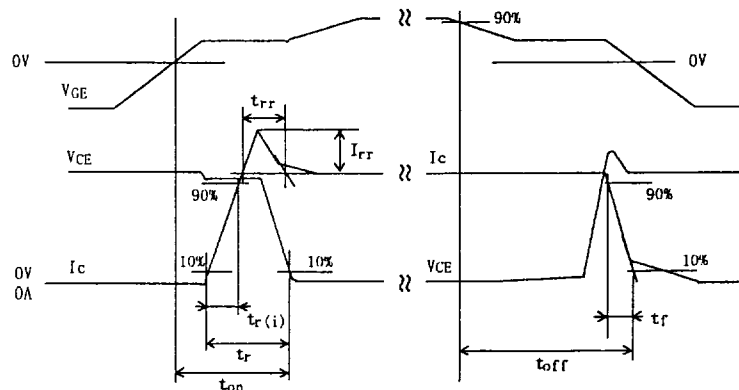
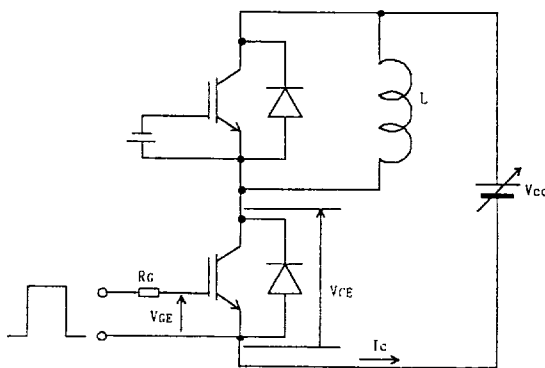
7. Applicable category

This specification is applied to Power Integrated Module named 7MBR25SA120-01 .

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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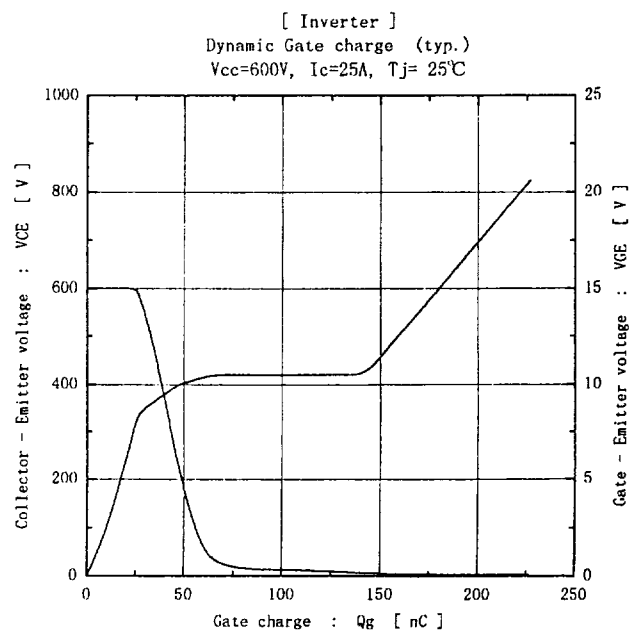
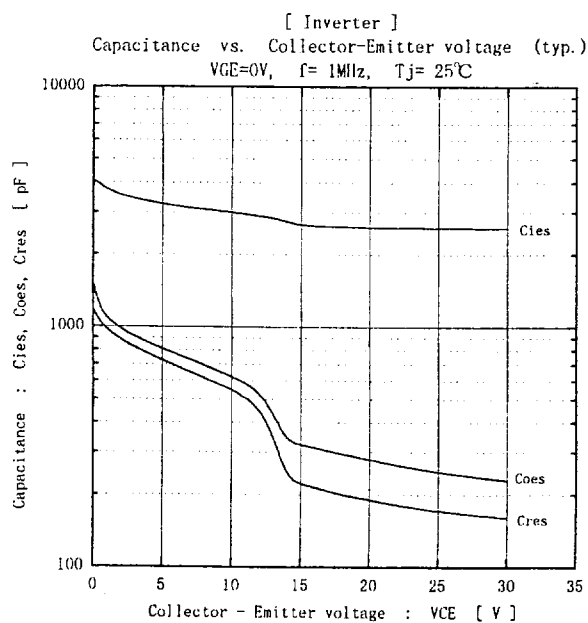
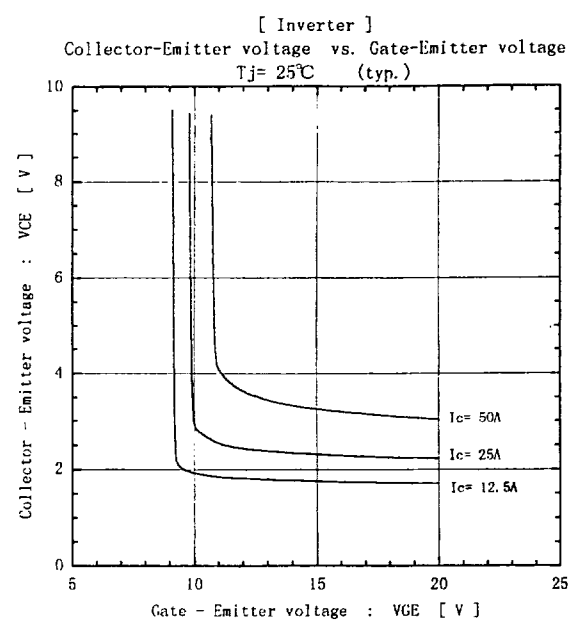
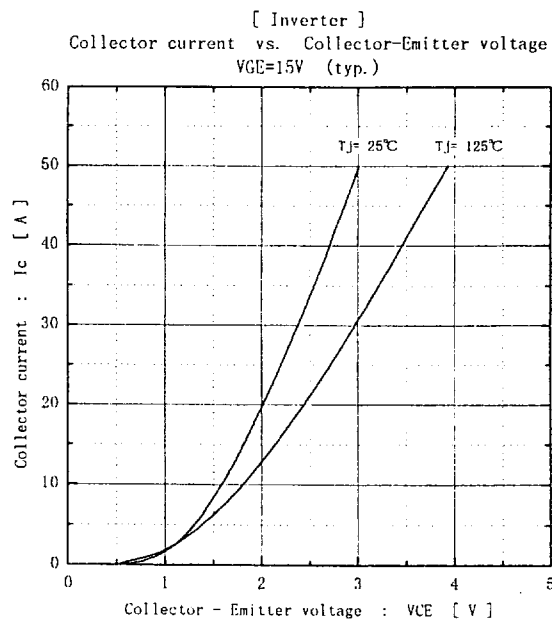
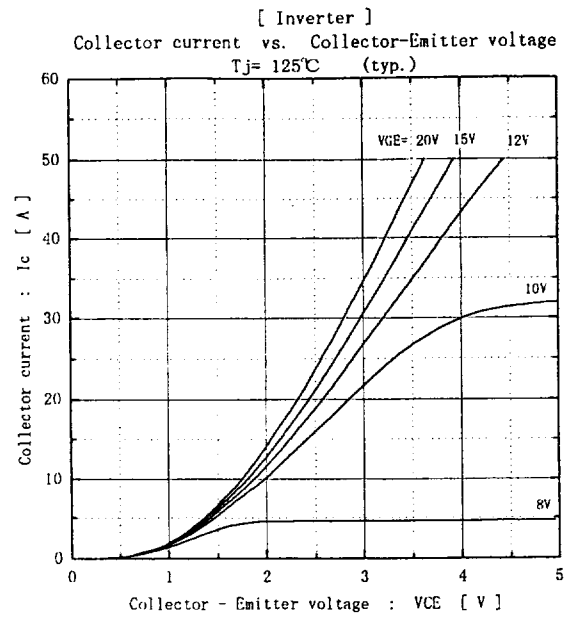
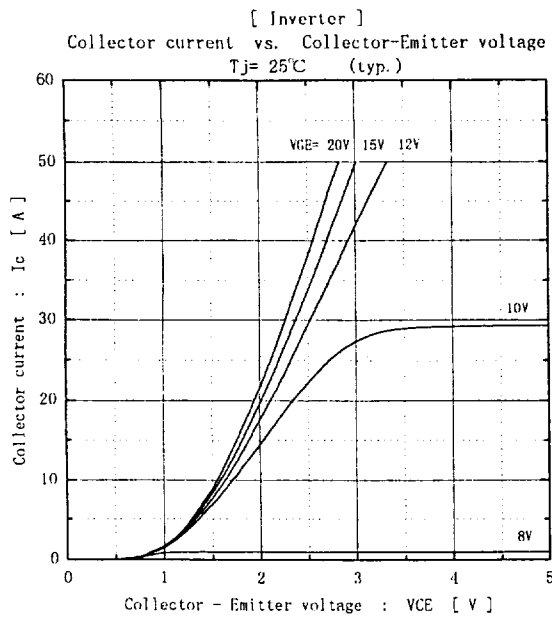
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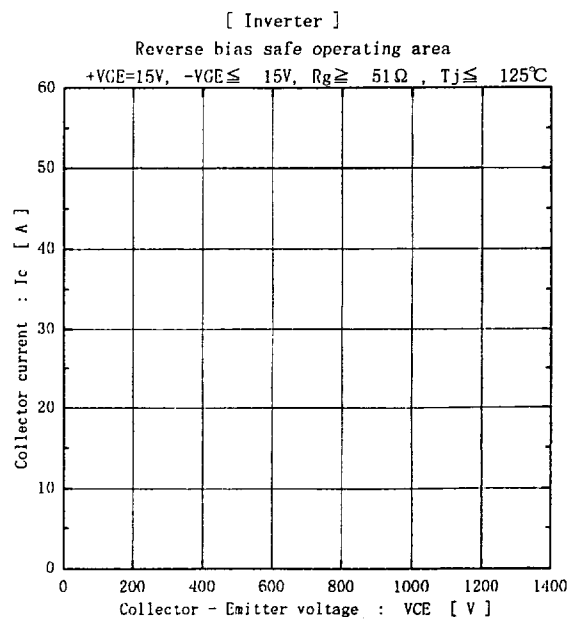
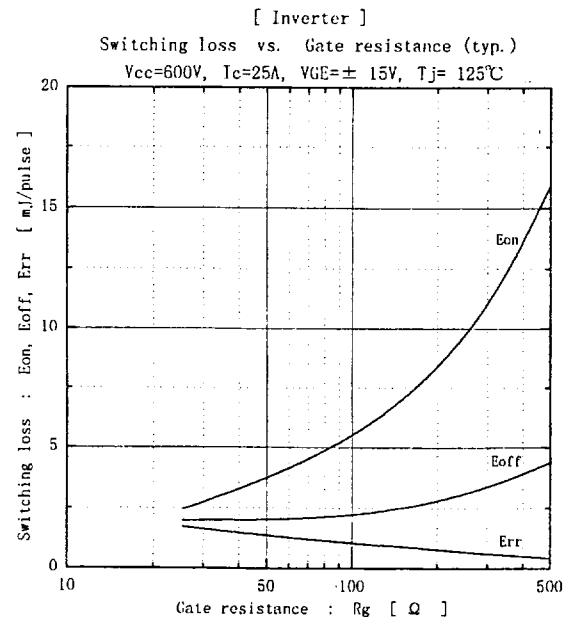
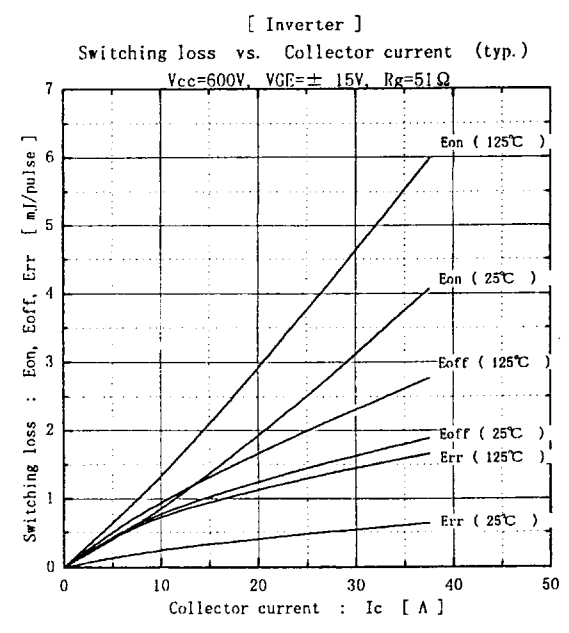
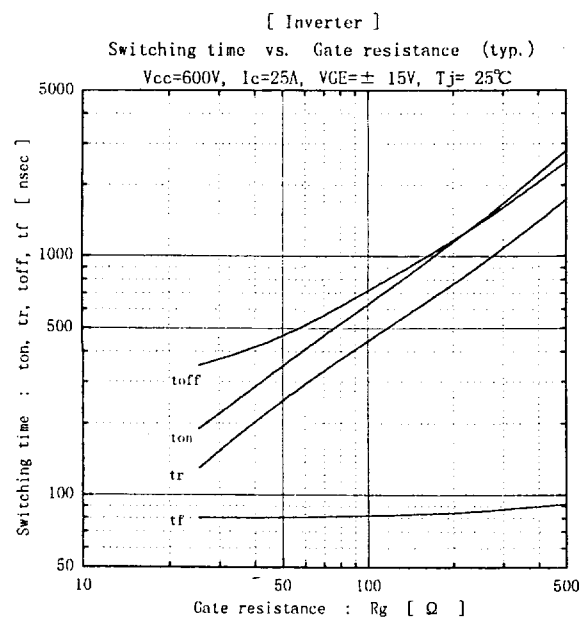
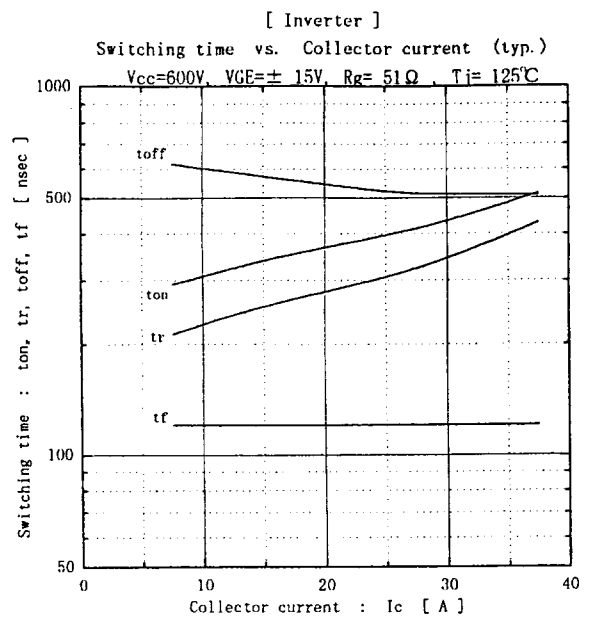
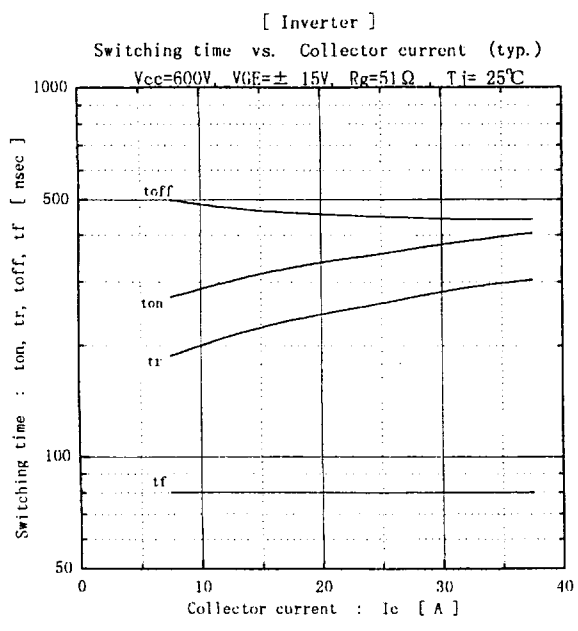
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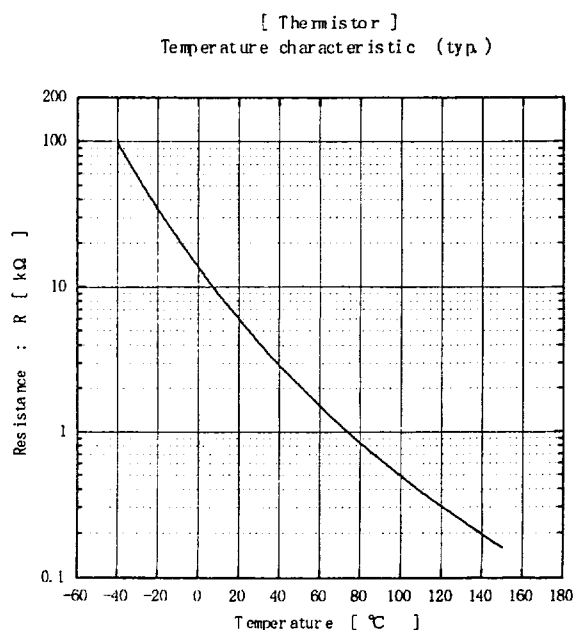
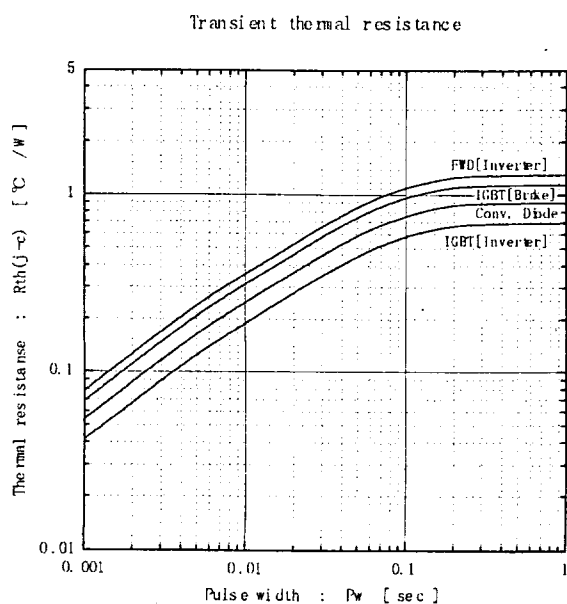
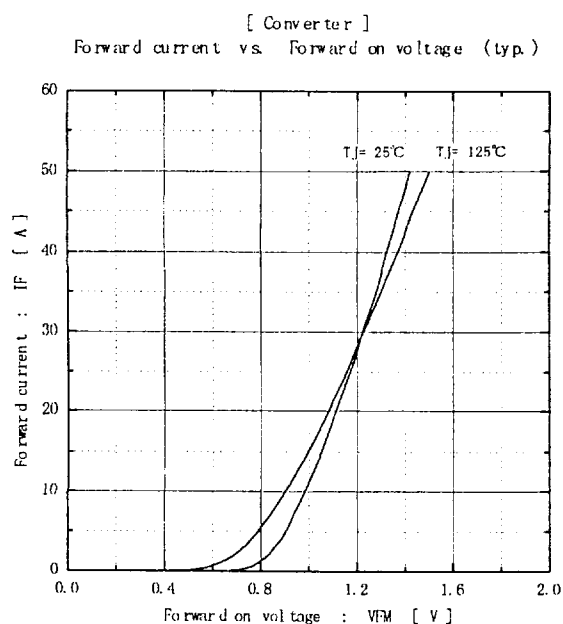
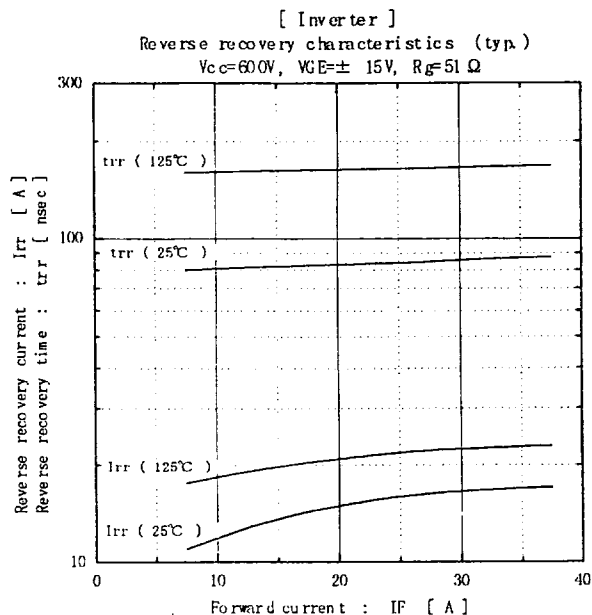
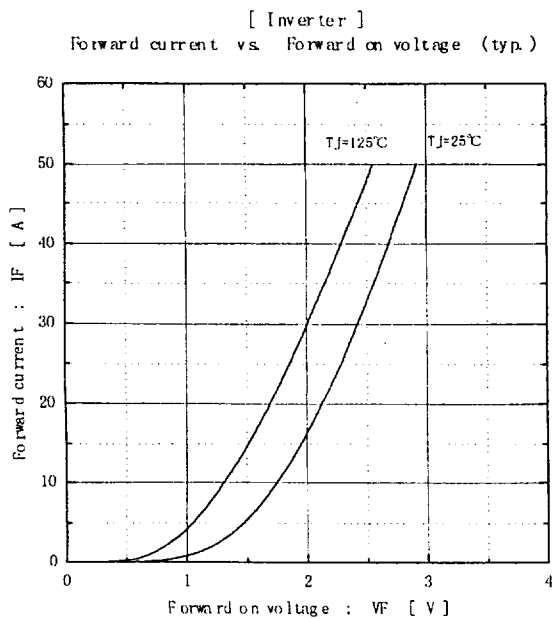
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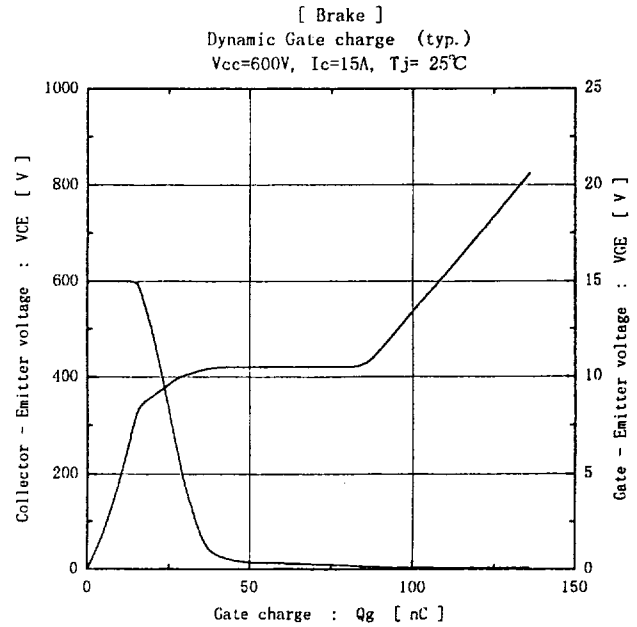
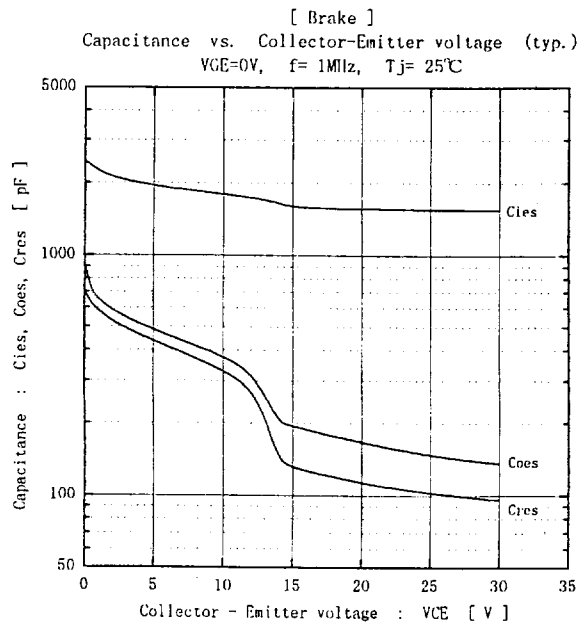
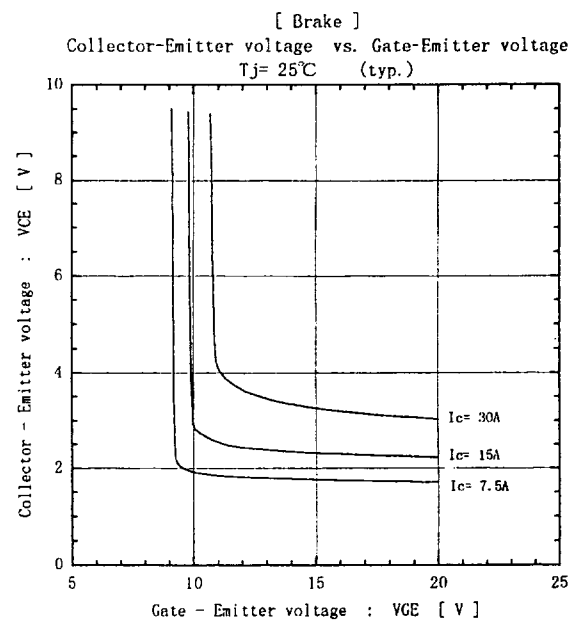
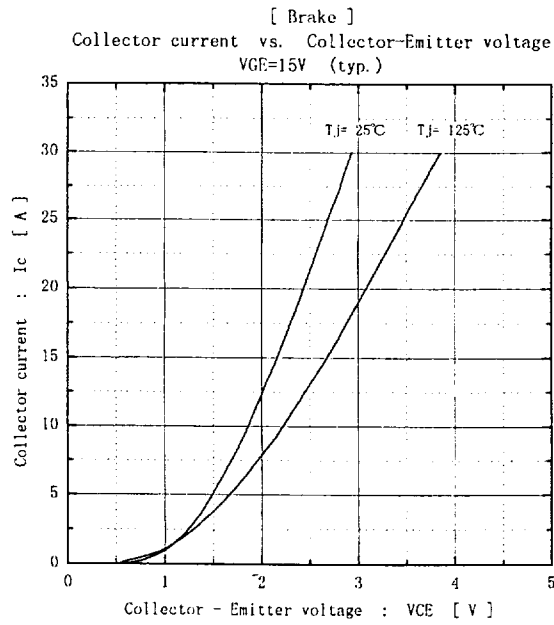
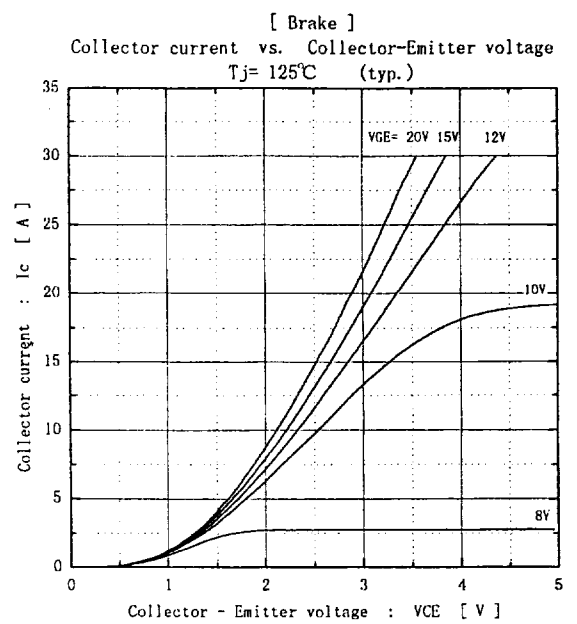
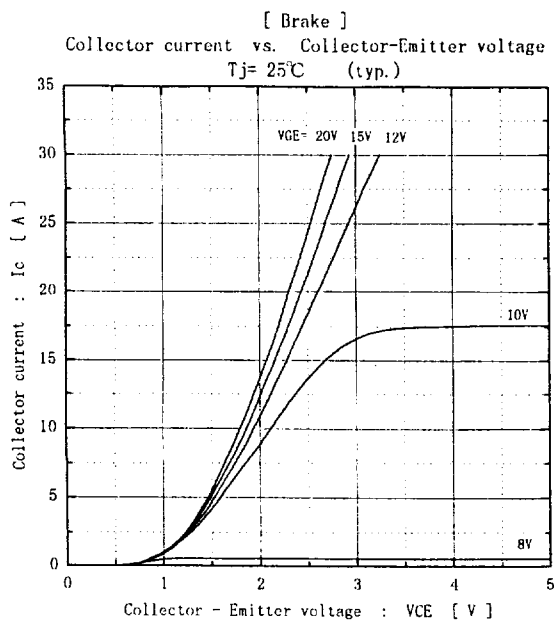
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