

SPECIFICATION

Device Name : IGBT Module

Type Name : 7MBR35SB120-01

Spec. No. : MS6M 0554

Date : Jun. - 02 - 2000

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Fuji Electric Co., Ltd.
Matsumoto Factory

| | DATE | NAME | APPROVED | Fuji Electric Co., Ltd. | | |
|---------|----------------|---------------------|---------------------|-------------------------|-----------|--------|
| DRAWN | Jun. - 2 - '00 | <i>T. Kobayashi</i> | <i>T. Kobayashi</i> | DWG. NO. | MS6M 0554 | 1 / 10 |
| CHECKED | June - 2 - 00 | <i>S. Matsu</i> | | | | 0 |

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 | 50 | A |
| | | | | Tc=80C | 35 | |
| | | Icp | 1ms | Tc=25C | 100 | A |
| | | | | Tc=80C | 70 | |
| | -Ic | | | 35 | A | |
| Collector Power Dissipation | Pc | 1 device | | 240 | W | |
| Brake | 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 | |
| Collector Power Dissipation | Pc | 1 device | | 180 | 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 | 35 | A | |
| | Surge Current (Non-Repetitive) | IFSM | Tj=150C,10ms | 360 | A | |
| | I ² t (Non-Repetitive) | I ² t | half sine wave | | 648 | A ² s |
| | | | | | | |
| Junction temperature | Tj | | | 150 | C | |
| Storage temperature | Tstg | | | -40~ +125 | C | |
| Isolation voltage | between terminal and copper base ^(*) | Viso | AC : 1min. | 2500 | V | |
| | between thermistor and others ^(*) | | | 2500 | | |
| Mounting Screw Torque ^(*) | | | | 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= 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 = 35 mA | | | 5.5 | 7.2 | 8.5 | V |
| | Collector-Emitter saturation voltage | VCE(sat) | VGE = 15 V, chip | | | 2.1 | | V | |
| | | | Ic = 35 A terminal | | | 2.25 | 2.7 | | |
| | Input capacitance | Cies | VGE = 0 V, VCE= 10 V f = 1 MHz | | | 4200 | | pF | |
| | Turn-on time | ton | Vcc= 600 V | | | 0.35 | 1.2 | us | |
| | | tr | Ic = 35 A | | | 0.25 | 0.6 | | |
| | | tr(θ) | VGE = +15 V | | | 0.1 | | | |
| | Turn-off time | toff | RG = 33 ohm | | | 0.45 | 1.0 | | |
| tf | | | | | 0.08 | 0.3 | | | |
| Forward on voltage | VF | IF = 35 A | chip | | | 2.3 | | V | |
| | | | terminal | | | 2.45 | 3.3 | | |
| Reverse recovery time | trr | IF = 35 A | | | | 350 | ns | | |
| Brake | Zero gate voltage Collector current | ICES | VGE = 0 V, VCE = 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 = 25 A terminal | | | 2.25 | 2.7 | | |
| | Turn-on time | ton | Vcc= 600 V | | | 0.35 | 1.2 | us | |
| | | tr | Ic = 25 A | | | 0.25 | 0.6 | | |
| | Turn-off time | toff | VGE = +15 V | | | 0.45 | 1.0 | | |
| tf | | RG = 51 ohm | | | 0.08 | 0.3 | | | |
| Reverse current | IRRM | VR = 1200 V | | | | 1.0 | mA | | |
| Converter | Forward on voltage | VFM | IF = 35 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 | | | 0.52 | C/W |
| | | Inverter FWD | | | 0.90 | |
| | | Brake IGBT | | | 0.69 | |
| | | Converter Diode | | | 0.75 | |
| 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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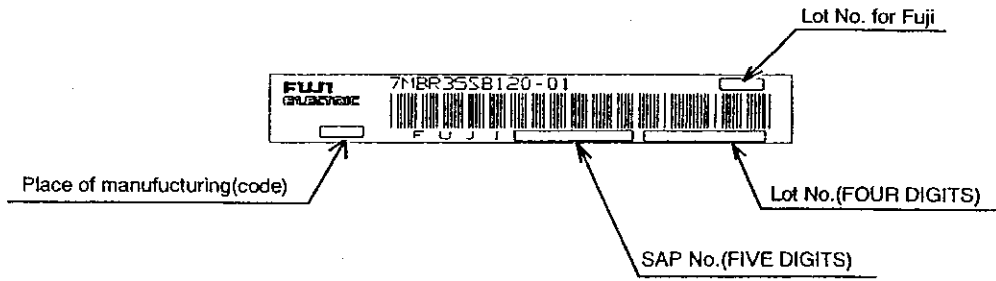
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6. Indication on module



7. Applicable category

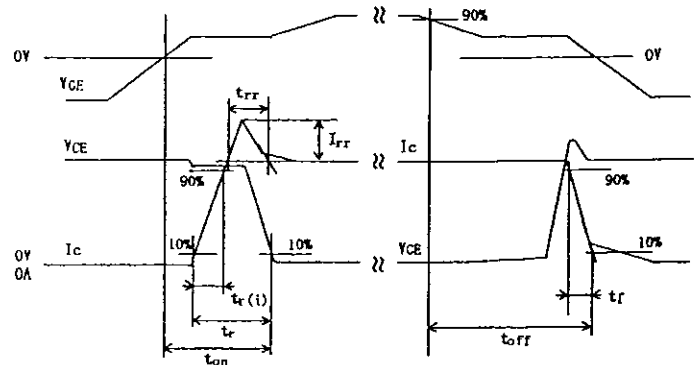
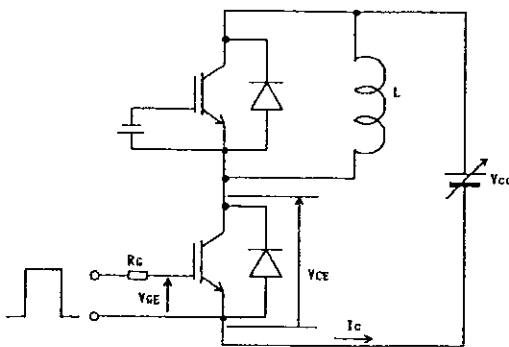
This specification is applied to Power Integrated Module named 7MBR35SB120-01 .

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.

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9. Definitions of switching time



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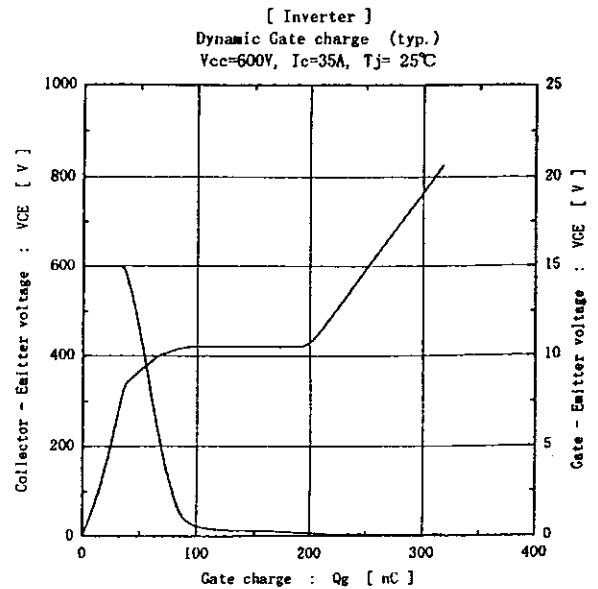
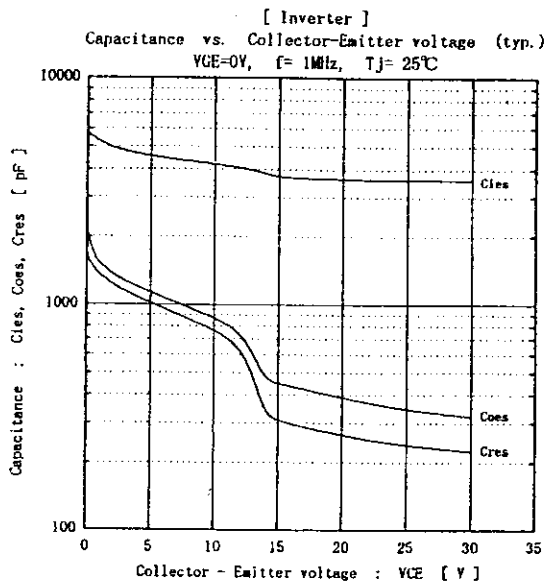
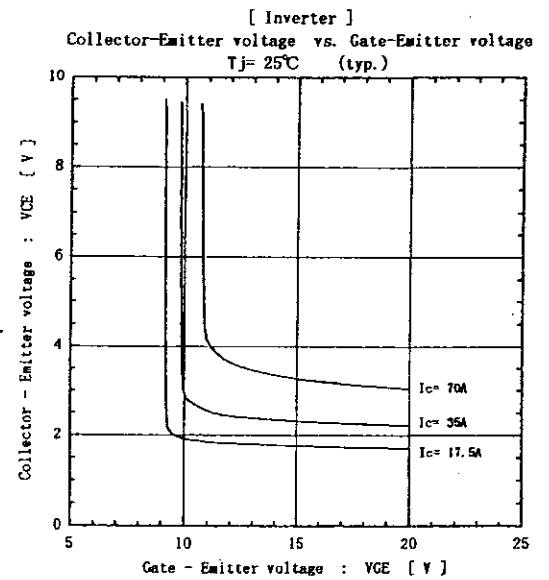
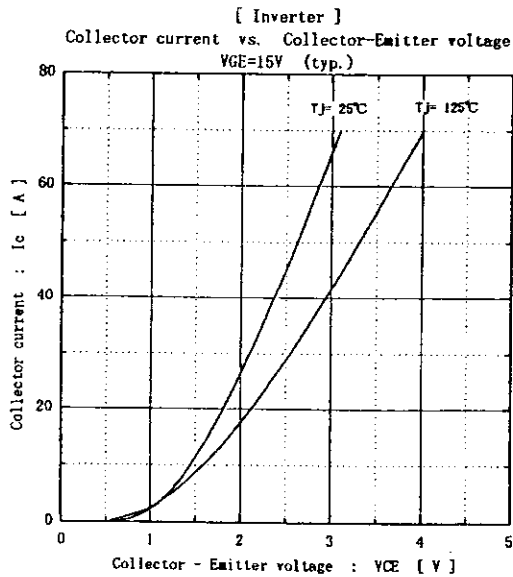
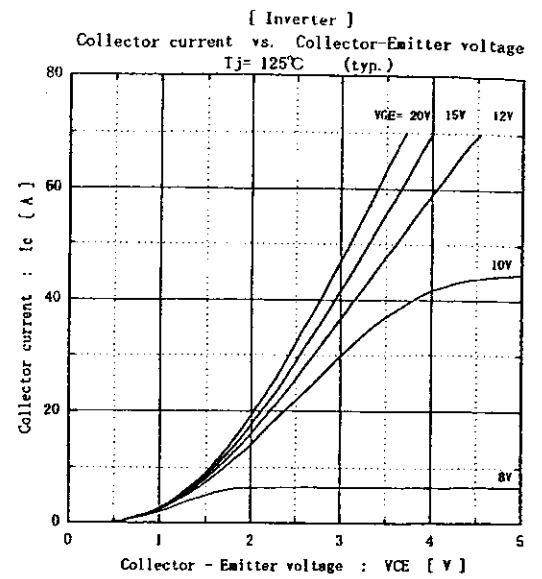
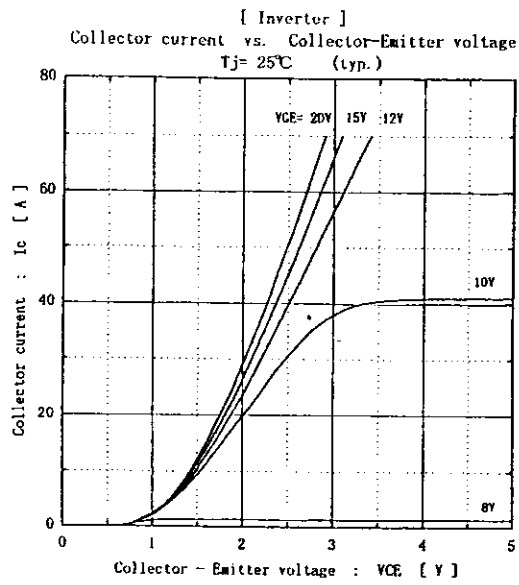
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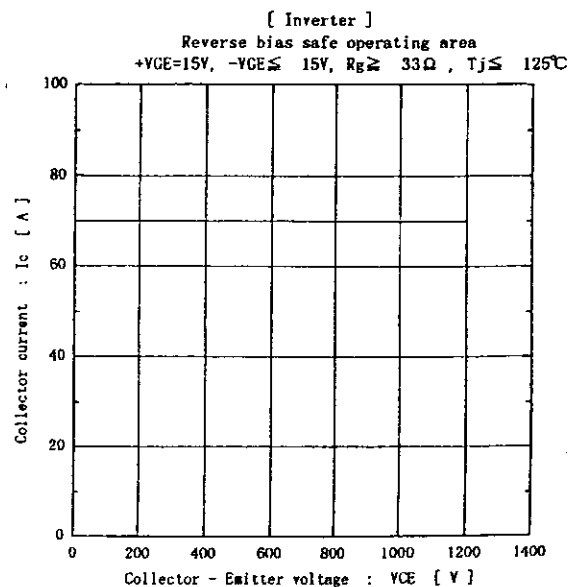
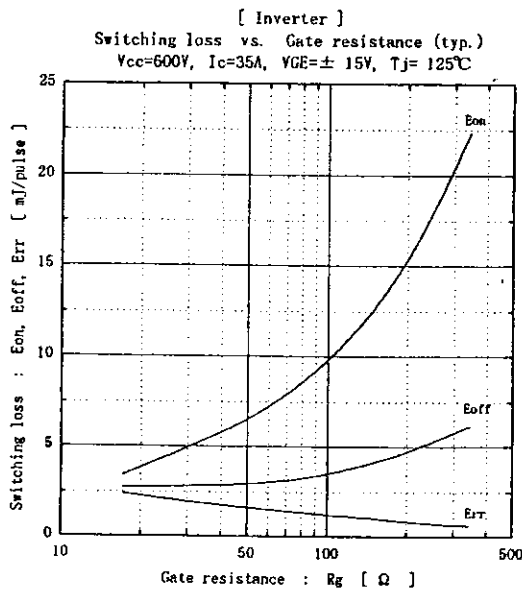
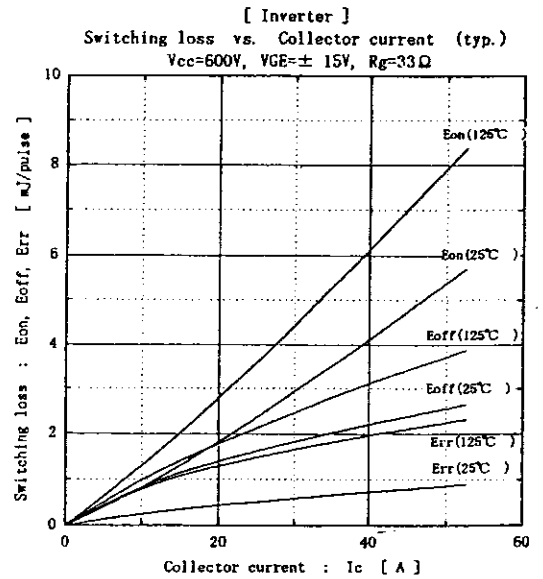
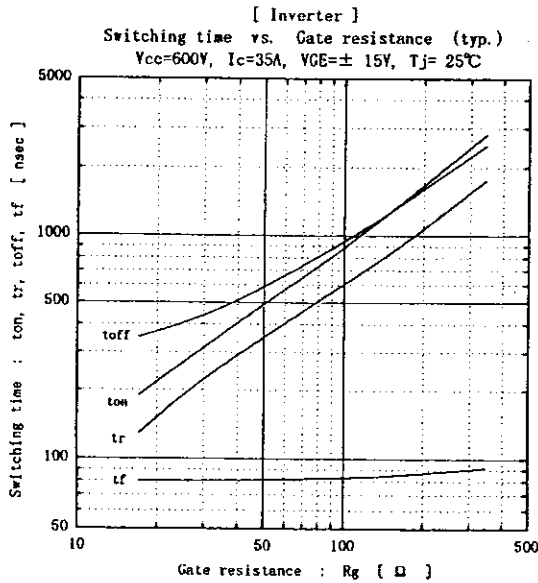
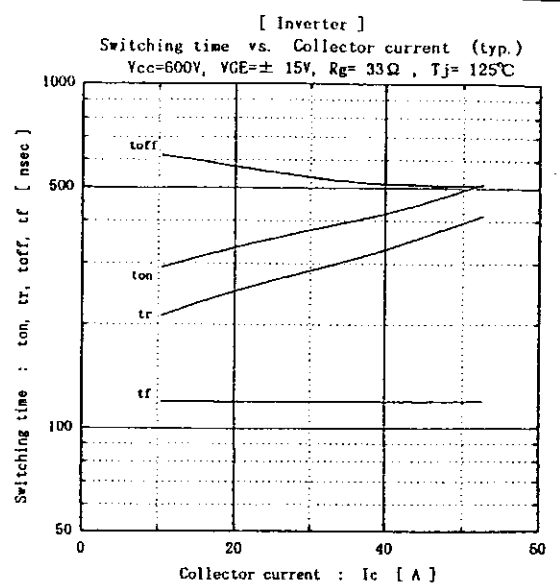
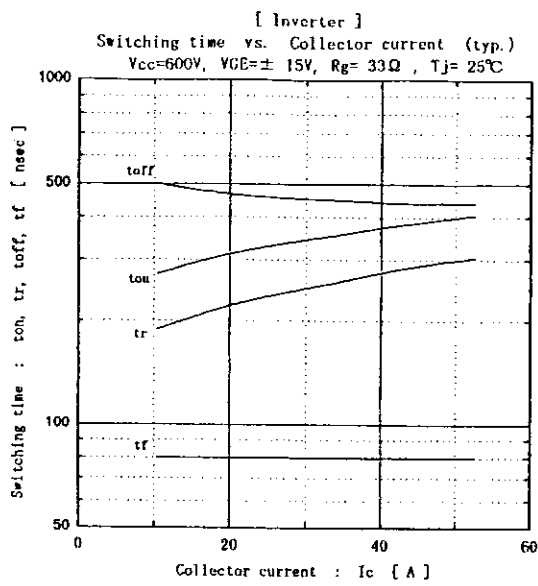
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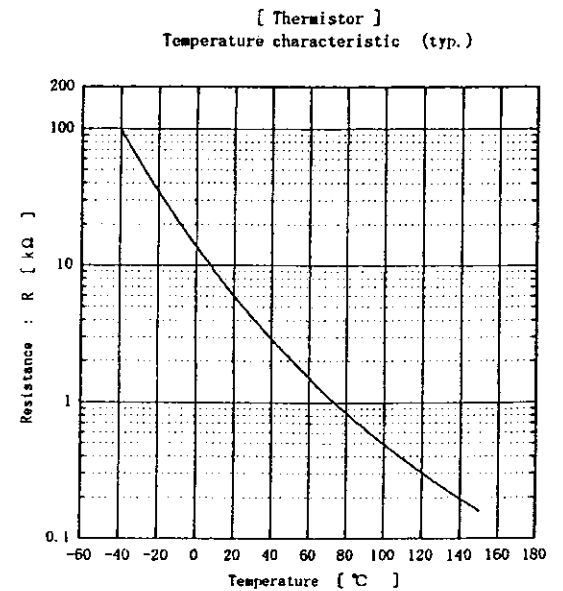
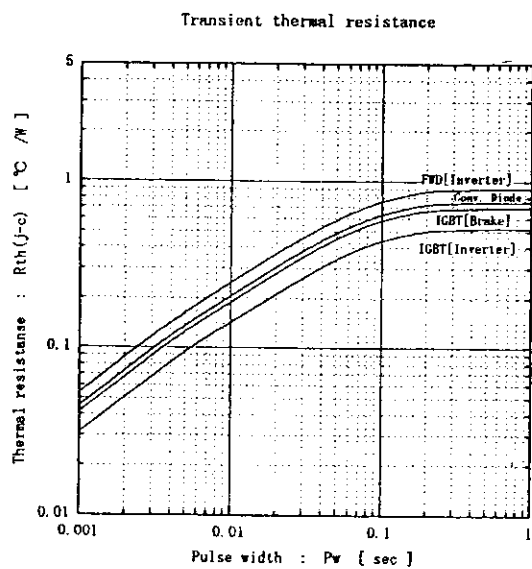
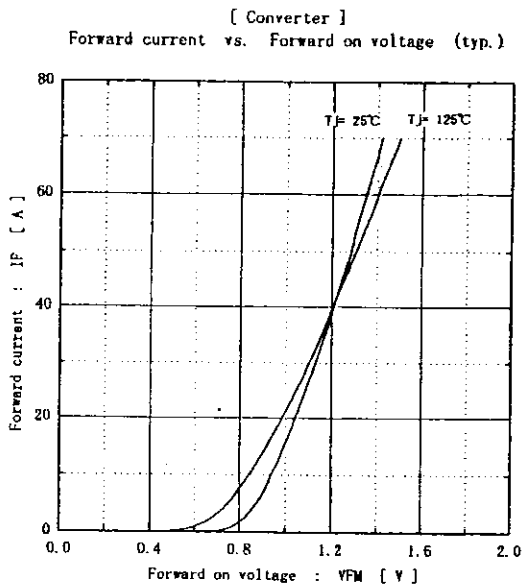
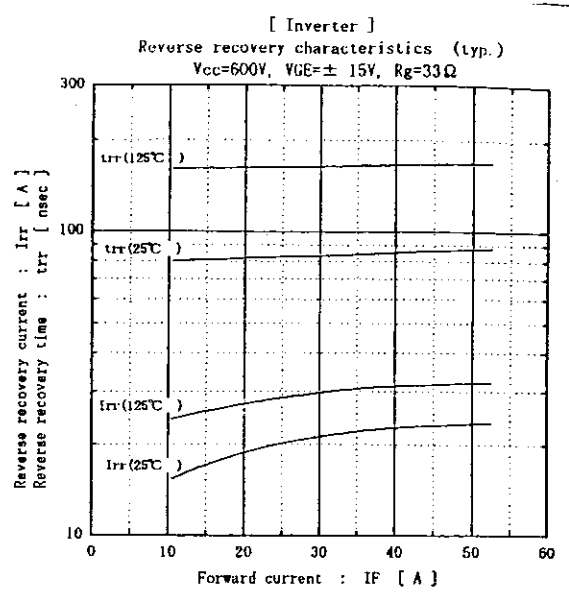
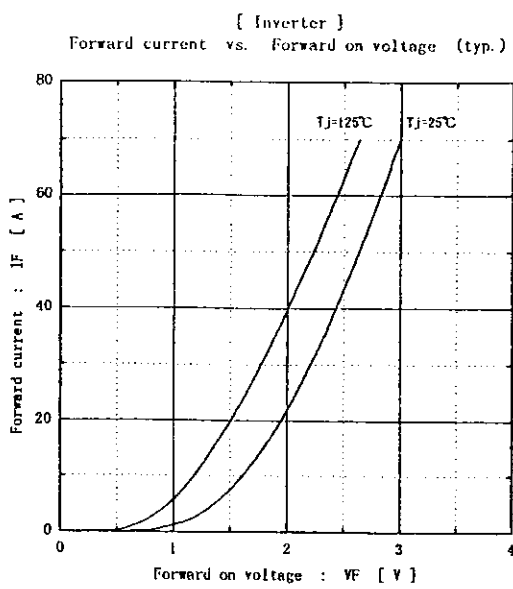
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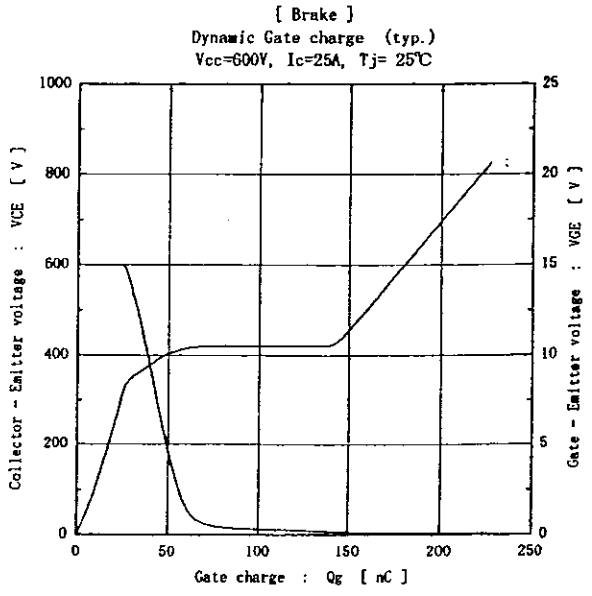
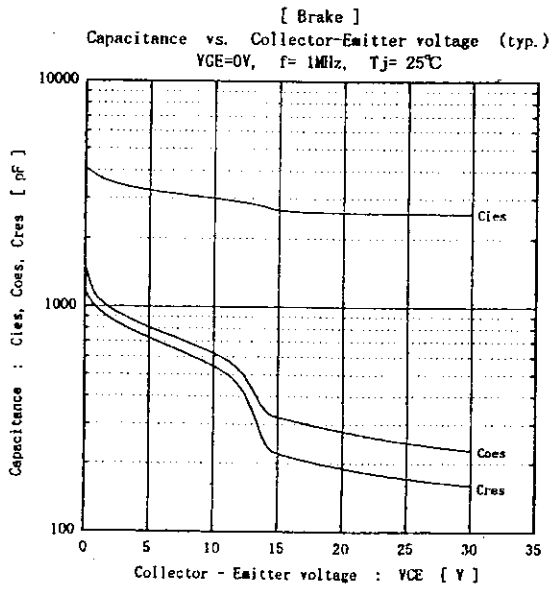
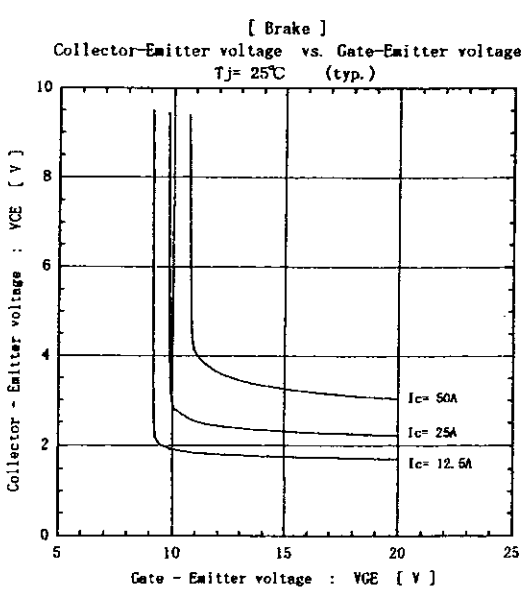
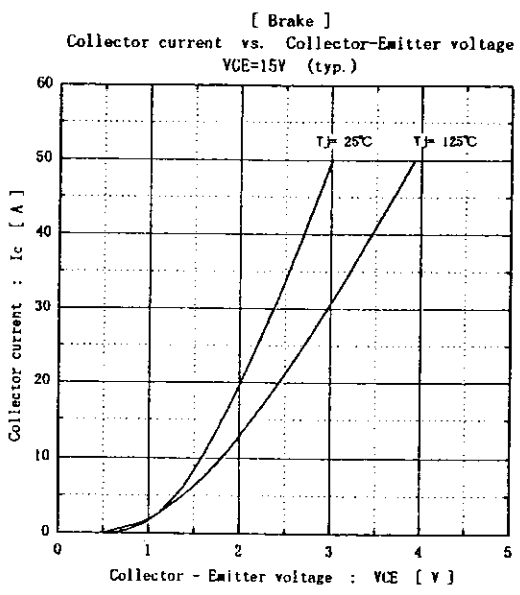
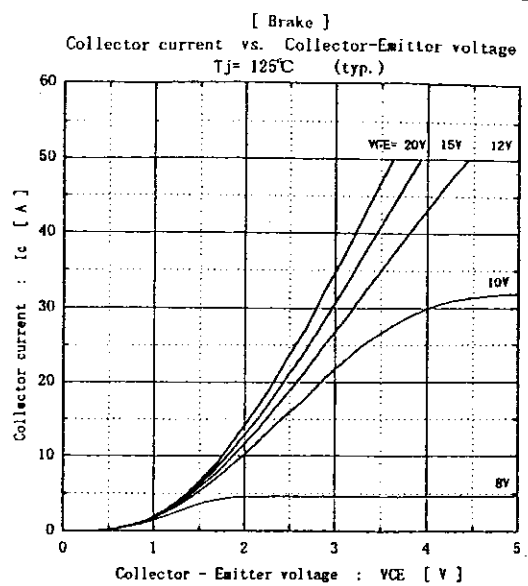
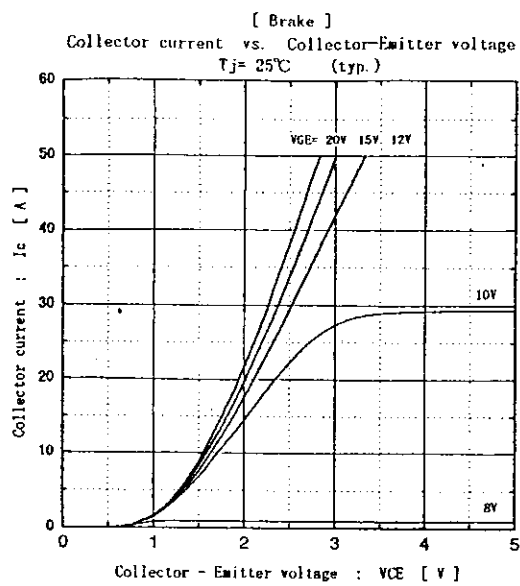
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