

# SPECIFICATION

Device Name : IGBT Module

Type Name : 6MBI100S-120

Spec. No. : MS5F4517

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Fuji Electric Co., Ltd.  
Matsumoto Factory

|         | DATE          | NAME      | APPROVED         | Fuji Electric Co., Ltd. |          |
|---------|---------------|-----------|------------------|-------------------------|----------|
| DRAWN   | Jan - 29 - 99 | N. Aikawa | <i>J. Miyata</i> | DWG. NO.                | MS5F4517 |
| CHECKED | -             |           |                  |                         |          |

# Revised Records

| Date       | Classi-<br>fication | Ind. | Content | Applied<br>date | Drawn | Checked            | Approved           |
|------------|---------------------|------|---------|-----------------|-------|--------------------|--------------------|
| Jan-29-'99 | enactment           | —    | —————   | Issued<br>date  | —     | <i>T. Miyasaka</i> | <i>T. Miyasaka</i> |
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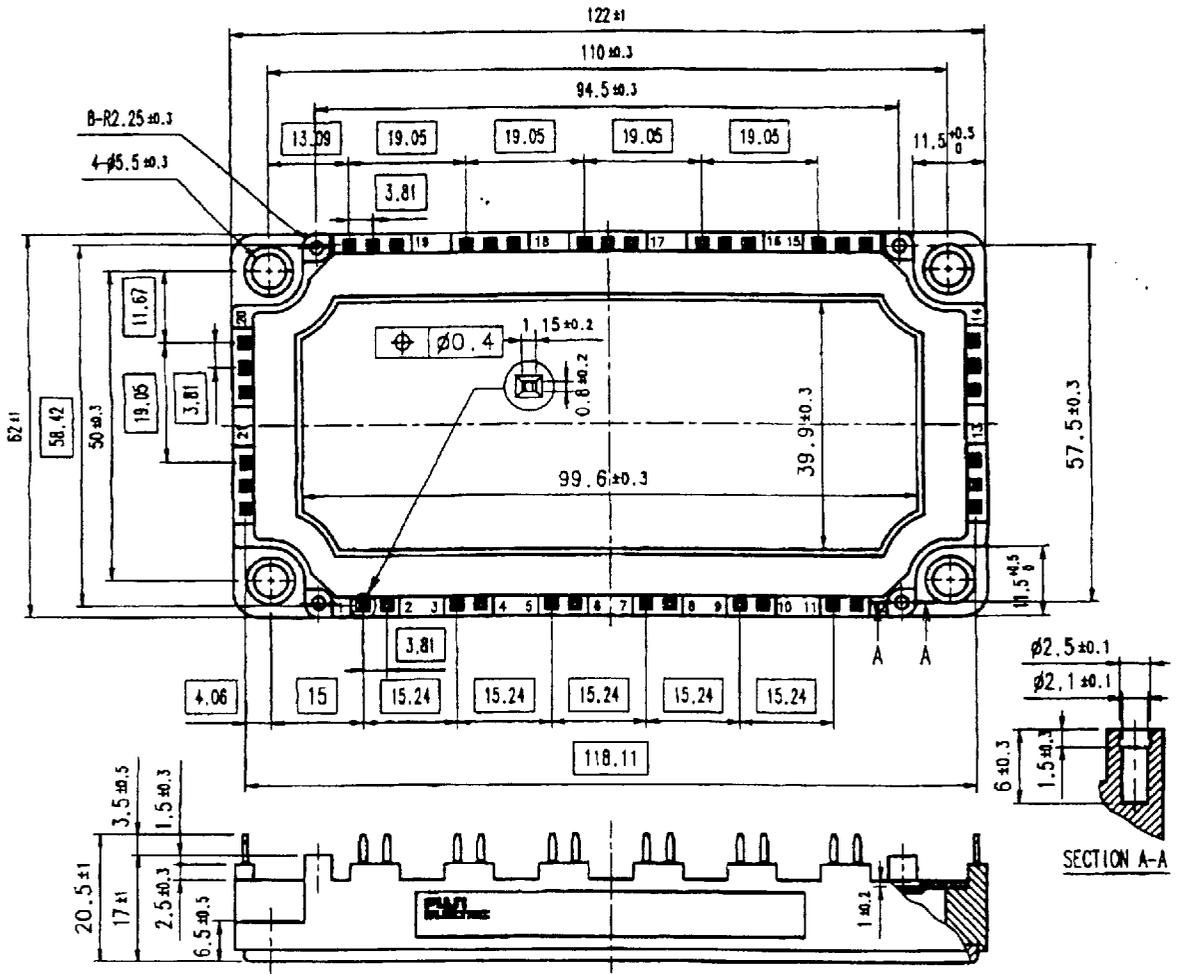
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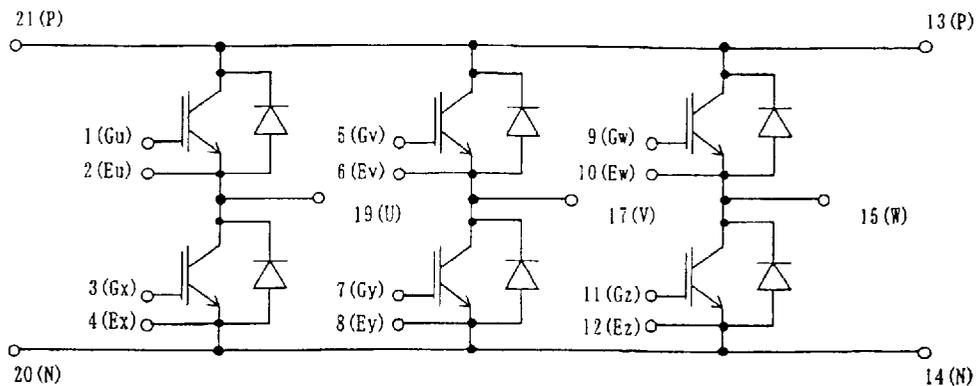
6MBI100S-120

1. Outline Drawing ( Unit : mm )



□ shows theoretical dimension.

2. Equivalent circuit



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

| Items                                | Symbols              | Conditions | Maximum Ratings      |     | Units |
|--------------------------------------|----------------------|------------|----------------------|-----|-------|
|                                      |                      |            |                      |     |       |
| Collector-Emitter voltage            | V <sub>CES</sub>     |            | 1200                 |     | V     |
| Gate-Emitter voltage                 | V <sub>GES</sub>     |            | ±20                  |     | V     |
| Collector current                    | I <sub>c</sub>       | Continuous | T <sub>c</sub> =25°C | 150 | A     |
|                                      |                      |            | T <sub>c</sub> =80°C | 100 |       |
|                                      | I <sub>c</sub> pulse | 1ms        | T <sub>c</sub> =25°C | 300 |       |
|                                      |                      |            | T <sub>c</sub> =80°C | 200 |       |
|                                      | -I <sub>c</sub>      |            |                      | 100 |       |
| -I <sub>c</sub> pulse                | 1ms                  |            | 200                  |     |       |
| Collector Power Dissipation          | P <sub>c</sub>       | 1 device   | 700                  |     | W     |
| Junction temperature                 | T <sub>j</sub>       |            | 150                  |     | °C    |
| Storage temperature                  | T <sub>stg</sub>     |            | -40~ +125            |     | °C    |
| Isolation voltage <sup>(*)</sup>     | V <sub>iso</sub>     | AC : 1min. | 2500                 |     | V     |
| Mounting Screw Torque <sup>(*)</sup> |                      |            | 3.5                  |     | N·m   |

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

(\*) Recommendable Value : 2.5~3.5 N·m (M5)

4. Electrical characteristics ( at T<sub>j</sub>= 25°C unless otherwise specified)

| Items                                | Symbols              | Conditions                                      | Characteristics         |      |       | Units |   |
|--------------------------------------|----------------------|---|-------------------------|------|-------|-------|---|
|                                      |                      |   | min.                    | typ. | Max.  |       |   |
| Zero gate voltage Collector current  | ICES                 | V <sub>GE</sub> = 0 V, V <sub>CE</sub> = 1200 V |                         |      | 1.0   | mA    |   |
| Gate-Emitter leakage current         | IGES                 | V <sub>CE</sub> = 0 V, V <sub>GE</sub> = ±20 V  |                         |      | 200   | nA    |   |
| Gate-Emitter threshold voltage       | V <sub>GE(th)</sub>  | V <sub>CE</sub> = 20 V, I <sub>c</sub> = 100 mA | 5.5                     | 7.2  | 8.5   | V     |   |
| Collector-Emitter saturation voltage | V <sub>CE(sat)</sub> | V <sub>GE</sub> = 15 V                          |                         |      |       | V     |   |
|                                      |                      | I <sub>c</sub> = 100 A                          |                         |      |       |       |   |
|                                      |                      | T <sub>j</sub> = 25 °C                          |                         |      |       |       |   |
|                                      |                      | T <sub>j</sub> = 125 °C                         |                         |      |       |       |   |
| Input capacitance                    | C <sub>ies</sub>     | V <sub>GE</sub> = 0 V                           |                         |      | 12000 | pF    |   |
| Output capacitance                   | C <sub>oes</sub>     | V <sub>CE</sub> = 10 V                          |                         |      | 2500  |       |   |
| Reverse transfer capacitance         | C <sub>res</sub>     | f = 1 MHz                                       |                         |      | 2200  |       |   |
| Turn-on time                         | t <sub>on</sub>      | V <sub>cc</sub> = 600 V                         |                         |      | 0.35  | μs    |   |
|                                      | t <sub>r</sub>       | I <sub>c</sub> = 100 A                          |                         |      | 0.25  |       |   |
|                                      | t <sub>r(i)</sub>    | V <sub>GE</sub> = ±15 V                         |                         |      | 0.1   |       |   |
| Turn-off time                        | t <sub>off</sub>     | R <sub>G</sub> = 12 Ω                           |                         |      | 0.45  | μs    |   |
|                                      | t <sub>f</sub>       |   |                         |      | 0.08  |       |   |
| Forward on voltage                   | V <sub>F</sub>       | I <sub>F</sub> = 100 A                          | T <sub>j</sub> = 25 °C  |      | 2.5   | 3.3   | V |
|                                      |                      |   | T <sub>j</sub> = 125 °C |      | 2.0   |       |   |
| Reverse recovery time                | t <sub>rr</sub>      | I <sub>F</sub> = 100 A                          |                         |      | 0.35  | μs    |   |

5. Thermal resistance characteristics

| Items                            | Symbols              | Conditions                           | Characteristics |      |      | Units |
|----------------------------------|----------------------|--------------------------------------|-----------------|------|------|-------|
|                                  |                      |                                      | min.            | typ. | Max. |       |
| Thermal resistance<br>(1 device) | R <sub>th(j-c)</sub> | IGBT                                 |                 |      | 0.18 | °C/W  |
|                                  |                      | FWD                                  |                 |      | 0.36 |       |
| Contact Thermal resistance       | R <sub>th(c-f)</sub> | with Thermal Compound <sup>(*)</sup> |                 | 0.05 |      |       |

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

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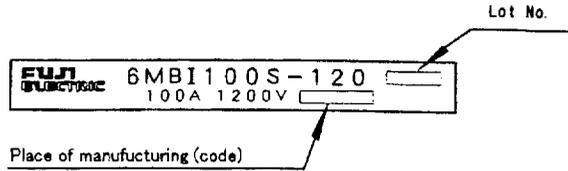
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6. Indication on module (モジュール表示)



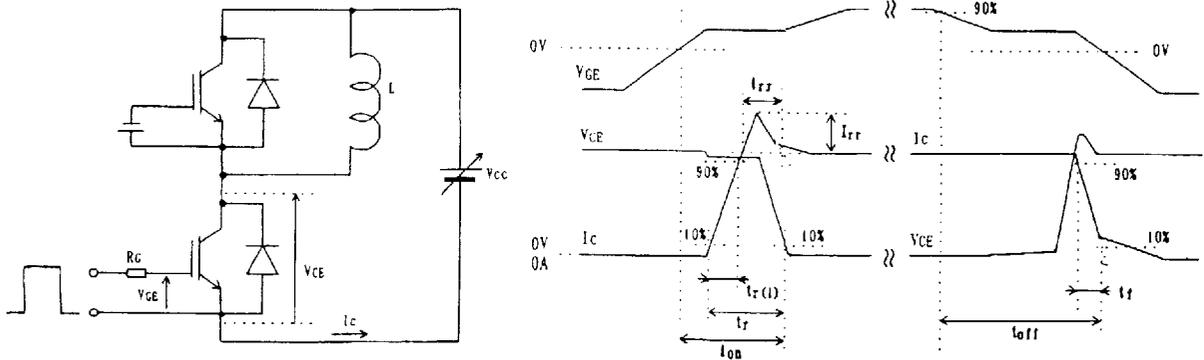
7. Applicable category (適用範囲)

This specification is applied to IGBT Module named 6MBI100S-120.  
 本納入仕様書は IGBTモジュール 6MBI100S-120 に適用する。

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

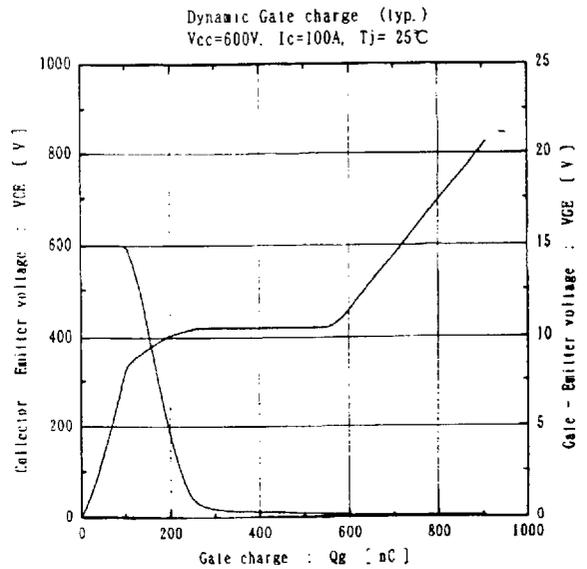
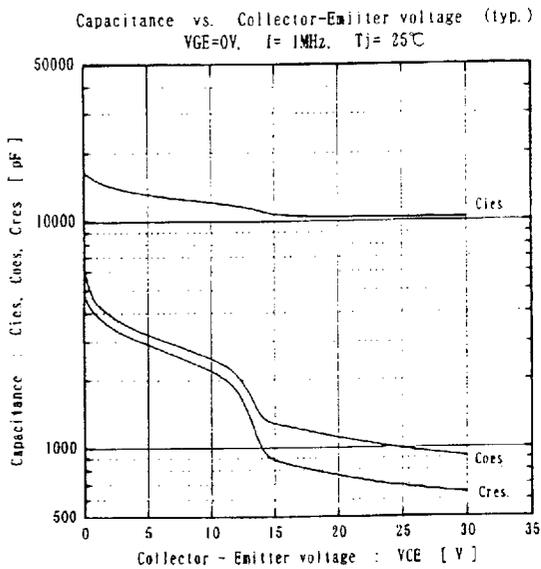
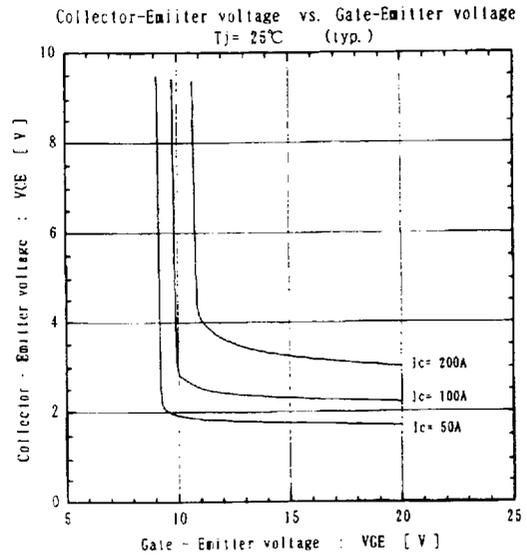
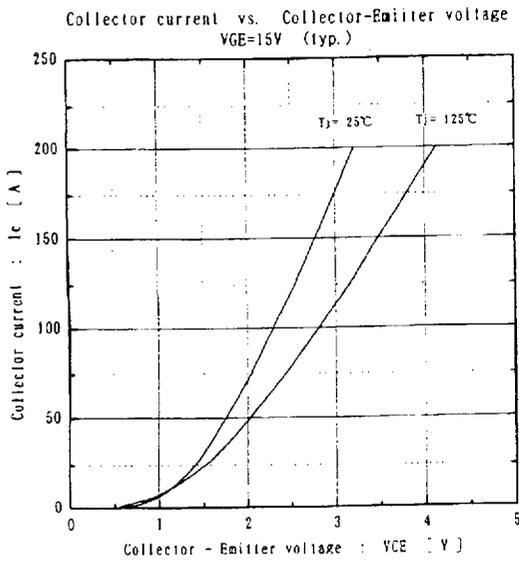
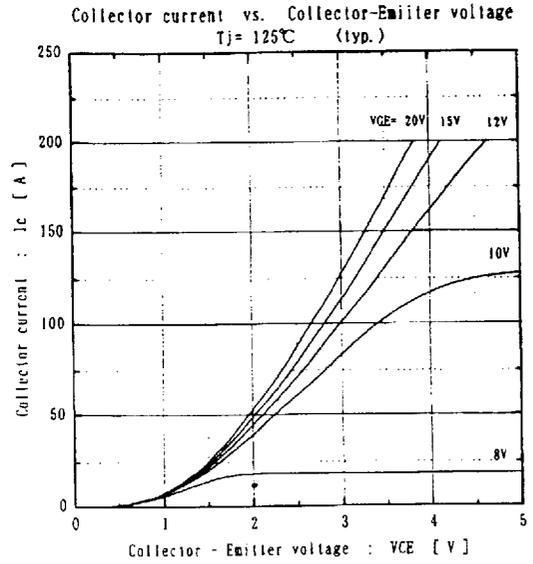
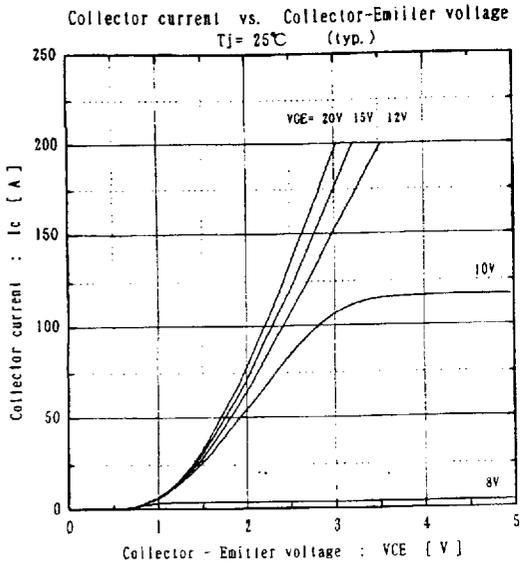
- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75%.  
 常温・常湿保存が望ましい。(5~35°C, 45~75%)
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.  
 急激な温度変化のなきこと。(モジュール表面が結露しないこと)
- Avoid exposure to corrosive gases and dust.  
 腐蝕性ガスの発生場所, 塵埃の多い場所は避けること。
- Avoid excessive external force on the module.  
 製品に荷重がかからないように 十分注意すること。
- Store modules with unprocessed terminals.  
 モジュールの端子は未加工の状態 で保管すること。
- Do not drop or otherwise shock the modules when transporting.  
 製品の運搬時に衝撃を与えたり, 落下させたりしないこと。

9. Definitions of switching time (スイッチング時間の定義)



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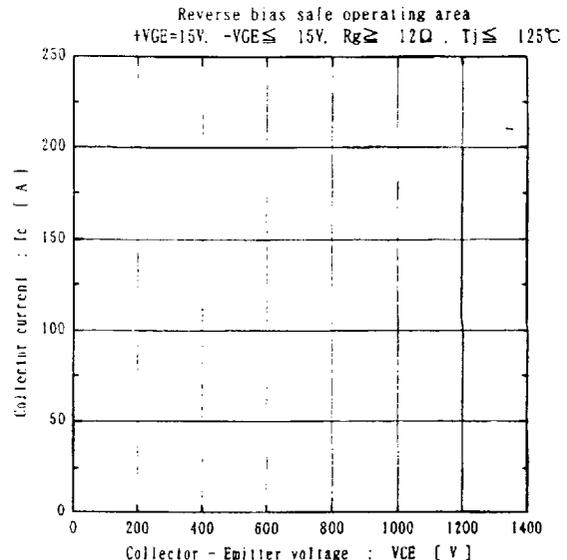
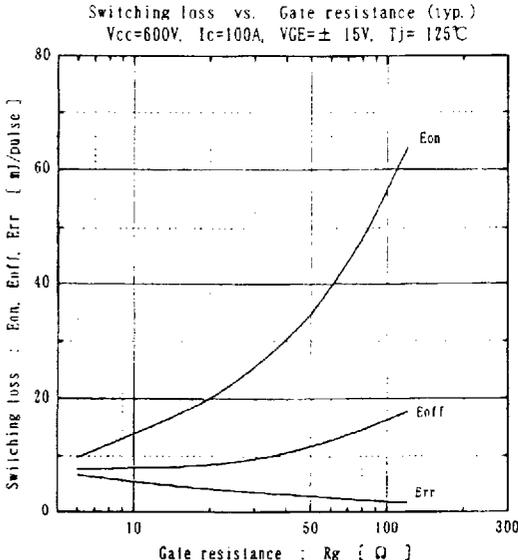
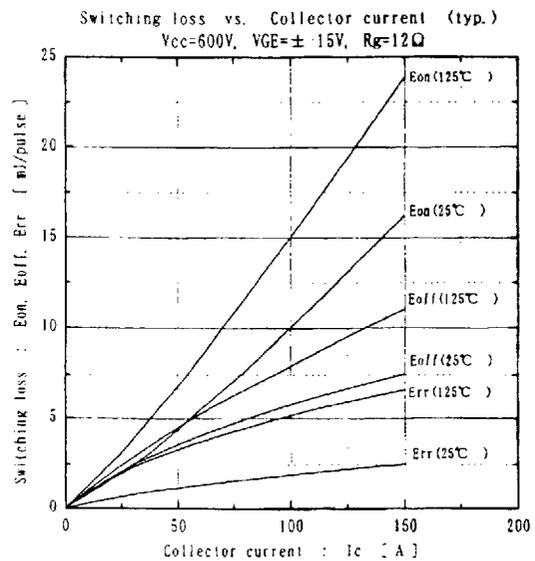
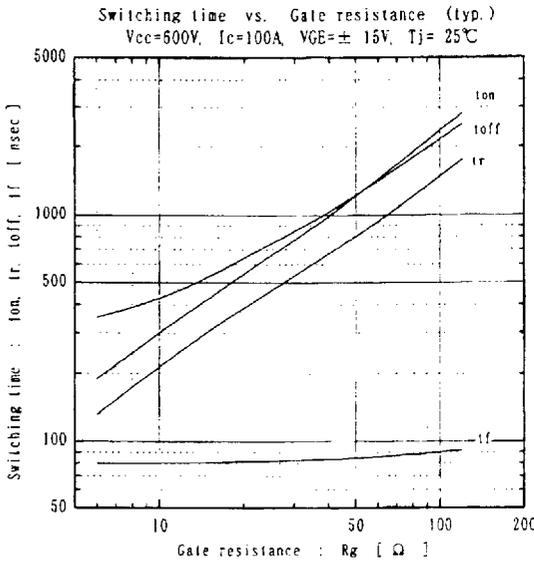
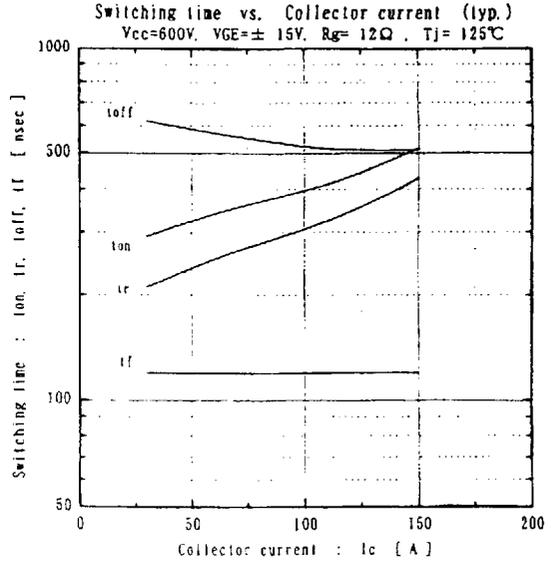
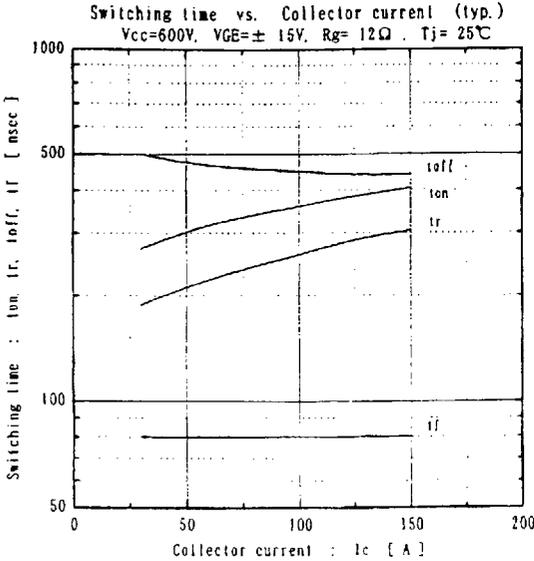
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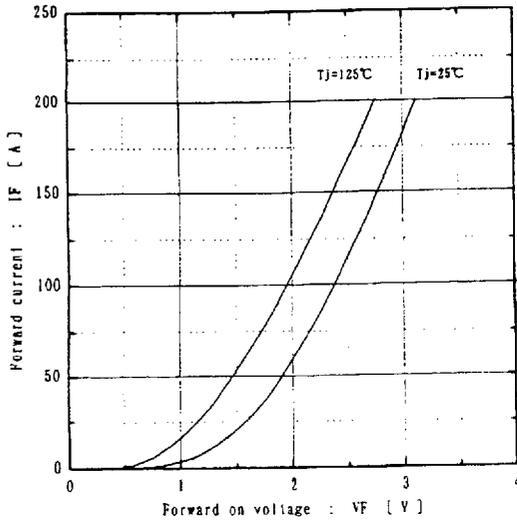
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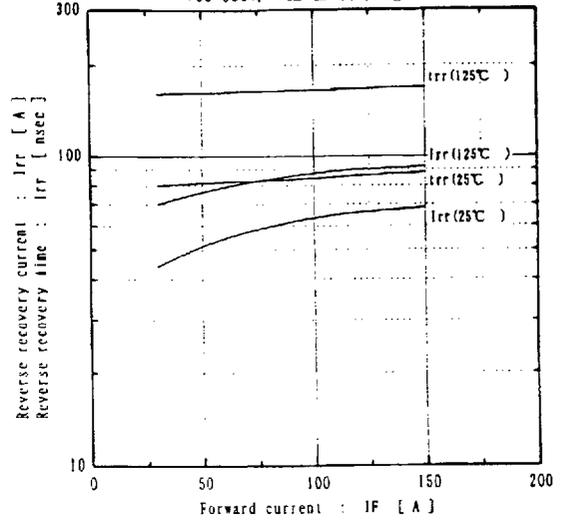
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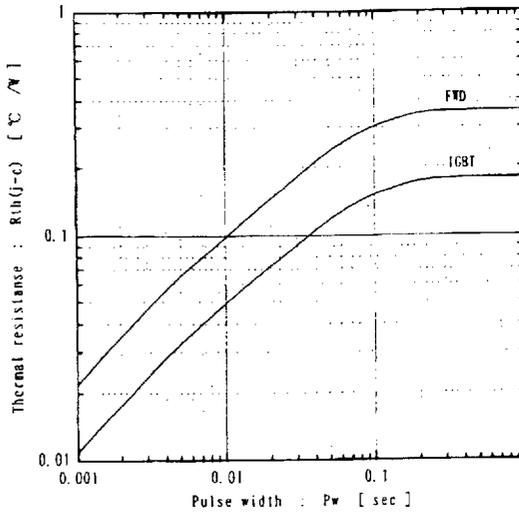
Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)  
Vcc=600V, VGE=±15V, Rg=12Ω



Transient thermal resistance



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