

SPECIFICATION

Device Name : IGBT module

Type Name : 7MBR30NF060

Spec. No. : **MS6M0255**

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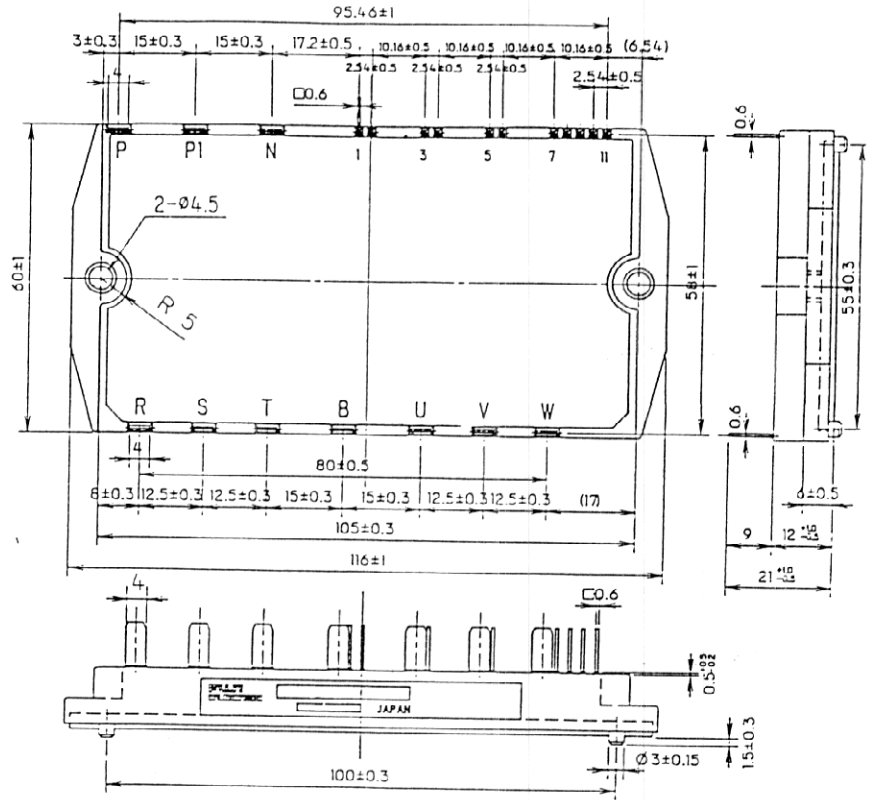
| | DATE | NAME | APPROVED | Fuji Electric Co., Ltd. | |
|---------|----------------|--------------|---------------------|-------------------------|------|
| DRAWN | Oct. - 3 - '95 | S. Miyashita | <i>S. Miyashita</i> | MS6M0255 | 1/10 |
| CHECKED | Oct. - 3 - '95 | T. HOSEN | | | |
| | | | | | |

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1. Outline Drawing

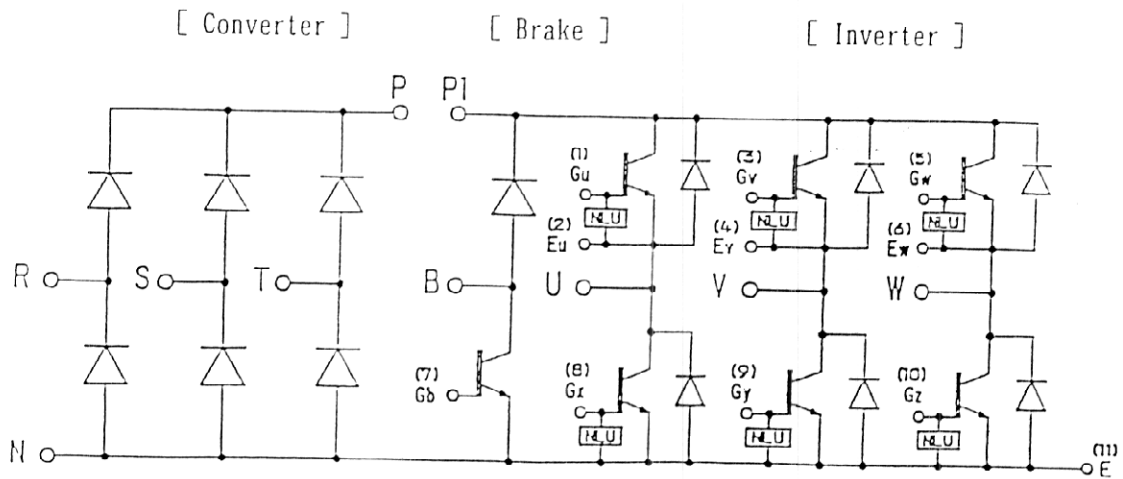
Unit : mm

*Isolation Voltage (Terminal to Case) : AC 2500V 1 minute



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2. Equivalent Circuit of Module



* NLU (Over current Limiting circuit)

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3. Absolute Maximum Ratings (Tc=25°C unless without specified)

| Items | | Symbols | Conditions | Maximum Ratings | Units |
|--------------------------------|-------------------------------------|--------------------|------------------------|-----------------|------------------|
| Inverter | Collector-Emitter Voltage | V _{CEs} | | 600 | V |
| | Gate-Emitter Voltage | V _{GEs} | | ±20 | V |
| | Collector Current | I _c | Continuous | 30 | A |
| | | I _{CP} | 1ms | 60 | A |
| | | -I _c | | 30 | A |
| | Collector Power Dissipation | P _c | 1 device | 120 | W |
| Brake | Collector-Emitter Voltage | V _{CEs} | | 600 | V |
| | Gate-Emitter Voltage | V _{GEs} | | ±20 | V |
| | Collector Current | I _c | Continuous | 30 | A |
| | | I _{CP} | 1ms | 60 | A |
| | Collector power Dissipation | P _c | 1 device | 120 | W |
| | Repetitive peak Reverse Voltage | V _{RRM} | | 600 | V |
| | Average Forward Current | I _{F(AV)} | | 1 | A |
| | Surge Current | I _{FSM} | 10ms | 50 | A |
| Converter | Repetitive Peak Reverse Voltage | V _{RRM} | | 800 | V |
| | Non-Repetitive Peak Reverse Voltage | V _{RSM} | | 900 | V |
| | Average Output Current | I _o | 50Hz/60Hz sine wave | 50 | A |
| | Surge Current (Non-Repetitive) | I _{FSM} | Tj=150°C, 10ms | 350 | A |
| | I ² t (Non-Repetitive) | | Tj=150°C, 10ms | 648 | A ² s |
| Operating Junction Temperature | Tj | | + 150 | °C | |
| Storage Temperature | Tstg | | -40 ~ +125 | °C | |
| Isolation Voltage | Viso | AC : 1 minute | AC 2500 | V | |
| Mounting Screw Torque (*1) | | | 1.7 | N · m | |

Note : (*1) Recommendable Value : 1.3 ~ 1.7 N · m (M4)

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4. Electrical Characteristics (Tj=25°C unless without specified)

| Characteristics | | Symbols | Conditions | min. | max. | Units |
|------------------------------|--------------------------------------|---------------|--|------|----------------|---------|
| Inverter | Zero gate voltage collector current | I_{CES} | $V_{CE} = 600V$ $V_{GE} = 0V$ | | 1.0 | mA |
| | Gate-emitter leakage current | I_{GES} | $V_{CE} = 0V$ $V_{GE} = \pm 20V$ | | 20 | μA |
| | Gate-emitter threshold voltage | $V_{GE(th)}$ | $V_{CE} = 20V$ $I_C = 30mA$ | 4.5 | 7.5 | V |
| | Collector-emitter saturation Voltage | $V_{CE(sat)}$ | $V_{CE} = 15V$ $I_C = 30A$ | | 2.8 | V |
| | Collector-Emitter Voltage | $-V_{CE}$ | $-I_C = 30A$ | | 3.0 | |
| | Input capacitance | C_{ies} | $V_{GE} = 0V$ $V_{CE} = 10V$ $f = 1MHz$ | | 1980 (typ.) | pF |
| | Switching Time | t_{on} | $V_{CC} = 300V$ $I_C = 30A$ $V_{GE} = \pm 15V$ $R_G = 82\Omega$ | | 1.2 | μS |
| | | t_r | | | 0.6 | |
| | | t_{off} | | | 1.0 | |
| | | t_f | | | 0.35 | |
| Reverse Recovery Time of FRD | t_{rr} | $I_F = 30A$ | | 300 | ns | |
| Brake | Zero gate voltage collector current | I_{CES} | $V_{CES} = 600V$ $V_{GE} = 0V$ | | 1.0 | mA |
| | Gate-emitter leakage current | I_{GES} | $V_{CE} = 0V$ $V_{GE} = \pm 20V$ | | 100 | nA |
| | Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 30A$ $V_{CE} = 15V$ | | 2.8 | V |
| | Switching Time | t_{on} | $V_{CC} = 300V$ $I_C = 30A$ $V_{GE} = \pm 15V$ $R_G = 82\Omega$ | | 0.8 | μS |
| | | t_r | | | 0.6 | |
| | | t_{off} | | | 1.0 | |
| | | t_f | | | 0.35 | |
| Reverse Current | I_{RRM} | $V_R = 600V$ | | 1 | mA | |
| Reverse Recovery Time | t_{rr} | | | 600 | ns | |

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| Characteristics | | Symbols | Conditions | min. | max. | Units |
|-----------------|-----------------|-----------|--------------|------|------|-------|
| Converter | Forward Voltage | V_{FM} | $I_F = 50A$ | | 1.55 | V |
| | Reverse Current | I_{RRM} | $V_R = 800V$ | | 1 | mA |

5. Thermal Characteristics

| Characteristics | Symbols | Conditions | min. | max. | Units |
|-------------------------------|---------------|-----------------------|------|------------|---------------|
| Thermal Resistance (1 device) | $R_{th(j-c)}$ | Inverter IGBT | | 1.04 | $^{\circ}C/W$ |
| | | Inverter FRD | | 2.22 | |
| | | Brake IGBT | | 1.04 | |
| | | Converter Diode | | 2.1 | |
| Contact Thermal Resistance | $R_{th(c-f)}$ | With Thermal Compound | | (typ) 0.05 | |

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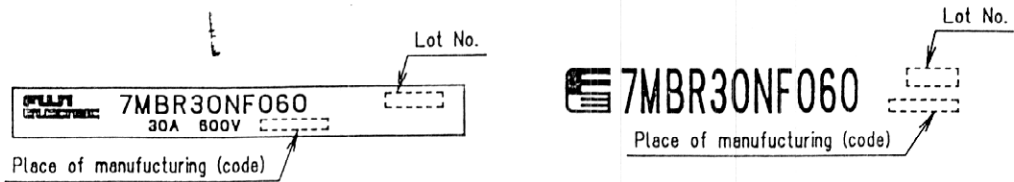
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6. Indication on module (モジュール表示)



7. Applicable category (適用範囲)

This specification is applied to IGBT module named 7MBR30NF060.
 本納入仕様書は、IGBTモジュール 7MBR30NF060 に適用する。

8. UL recognition (UL承認)

This product is recognized by Underwriters Laboratories Inc., the file No. is E82988.
 本製品は、ファイルNo. E 8 2 9 8 8 にてULより承認されている。

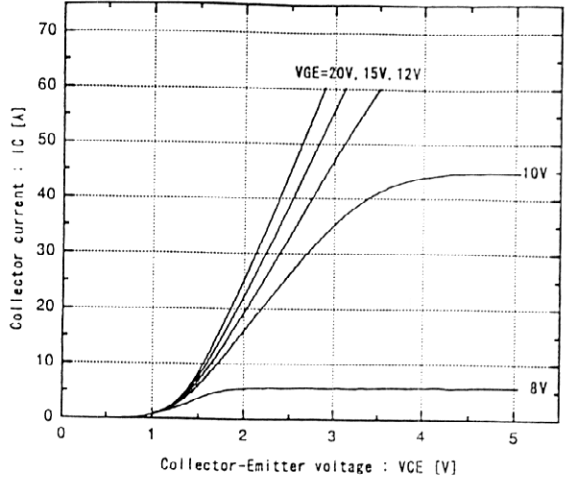
9. Storage and transportation notes (保管、運搬上の注意事項)

- The IGBT module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75%.
 常温保存が望ましい。(5~35°C、45~75%)
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
 急激な温度変化の無きこと。(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の保管すること。
- 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。

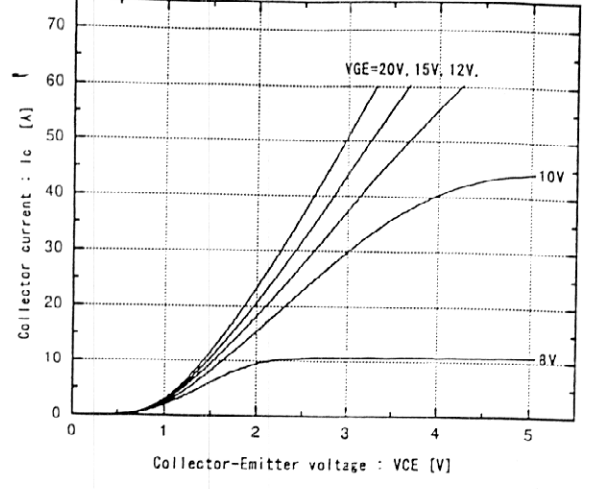
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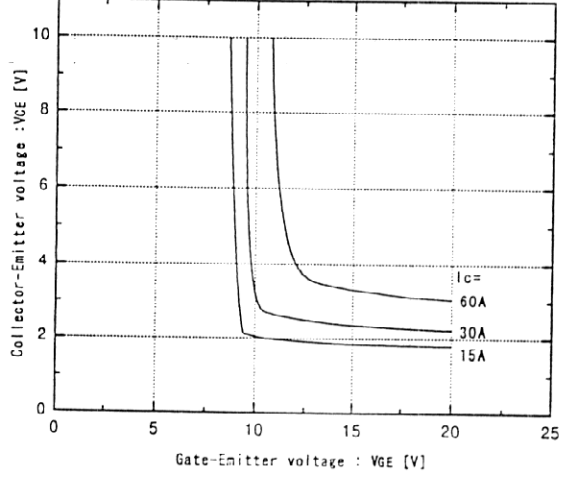
Collector current vs. Collector-Emitter voltage
Tj=25°C



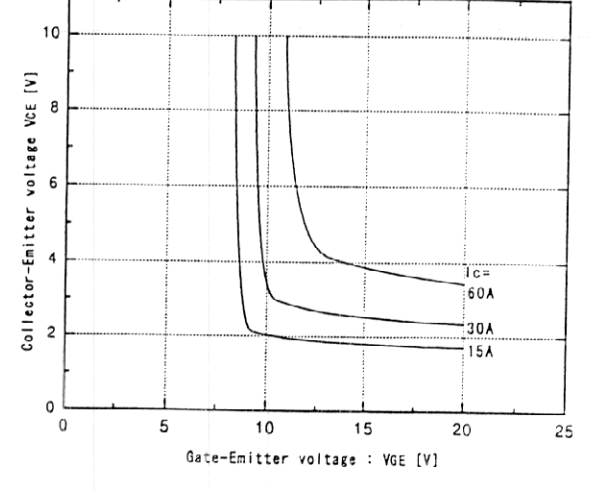
Collector current vs. Collector-Emitter voltage
Tj=125°C



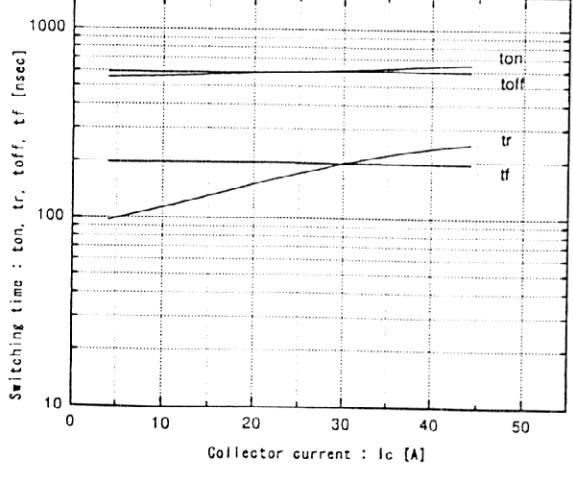
Collector-Emitter vs. Gate-Emitter voltage
Tj=25°C



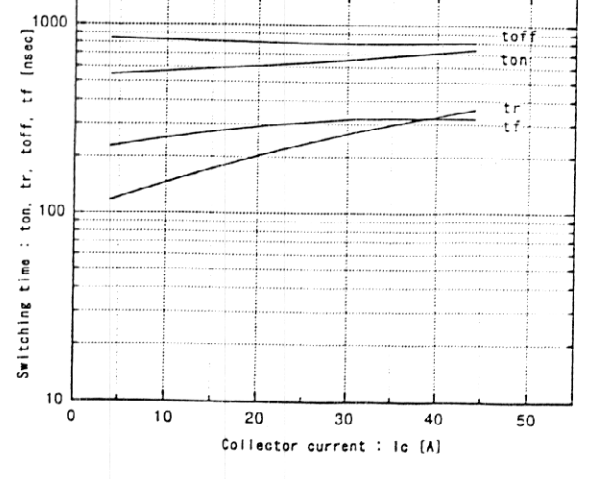
Collector-Emitter vs. Gate-Emitter voltage
Tj=125°C



Switching time vs. Collector current
Vcc=300V, RG=82Ω, VGE=±15V, Tj=25°C



Switching time vs. Collector current
Vcc=300V, RG=82Ω, VGE=±15V, Tj=125°C



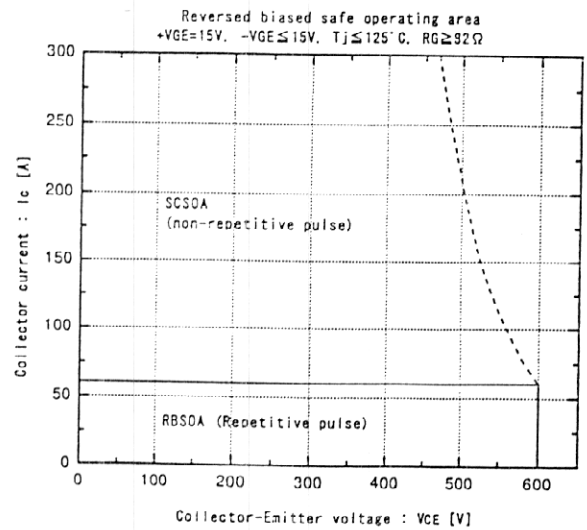
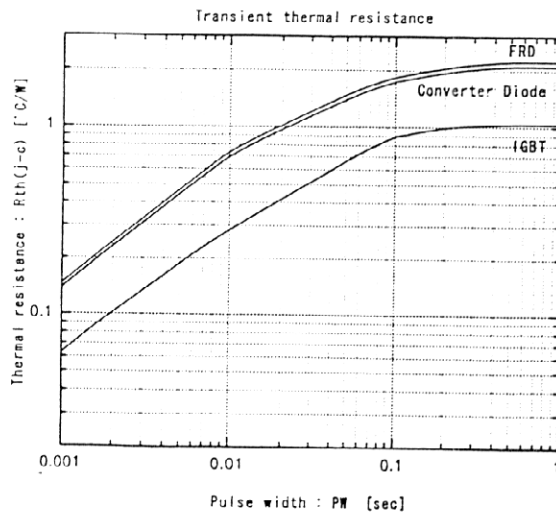
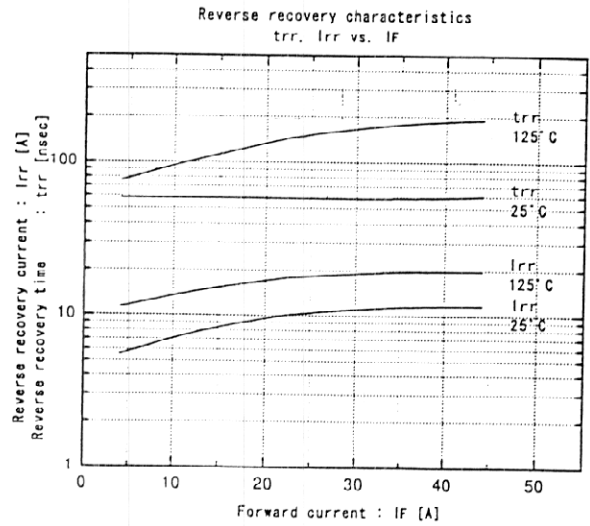
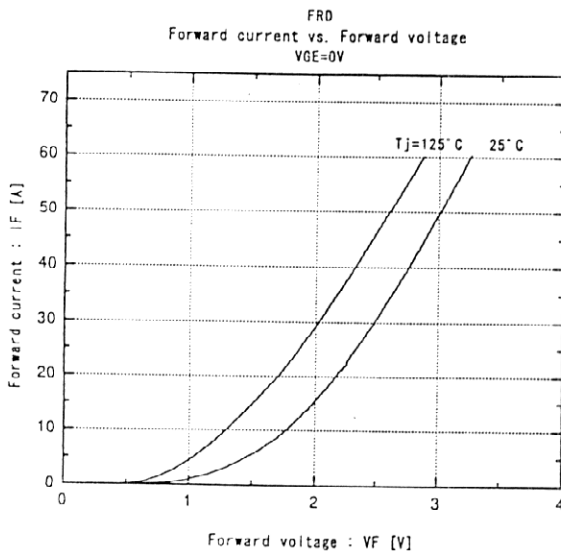
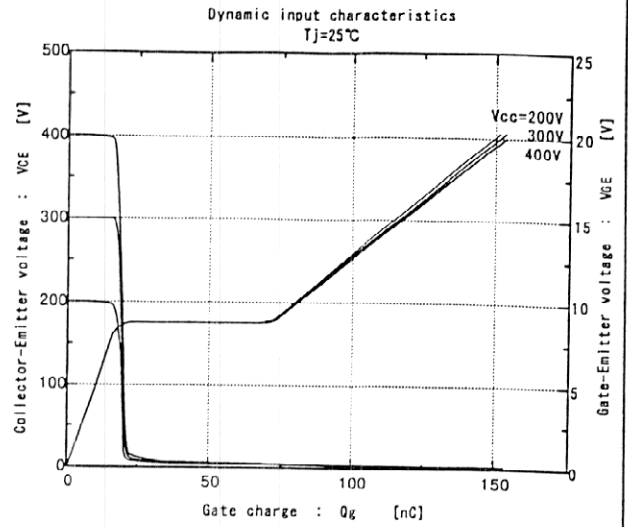
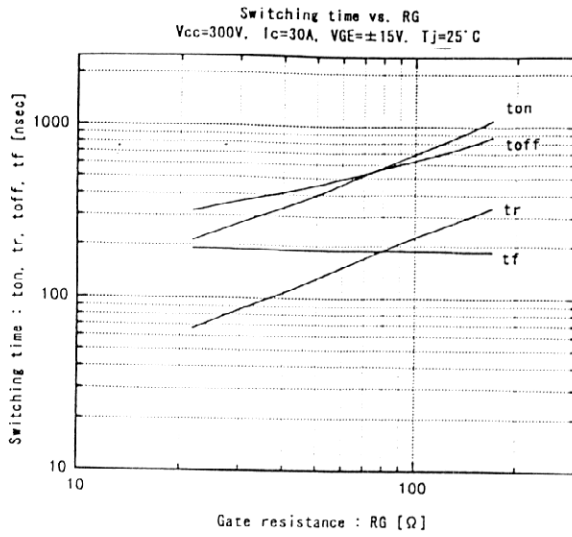
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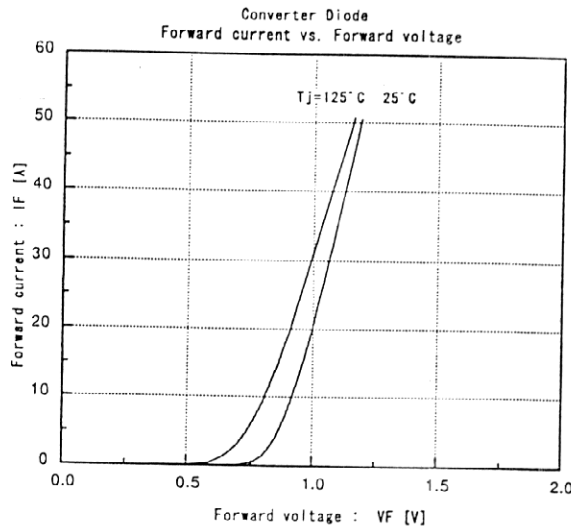
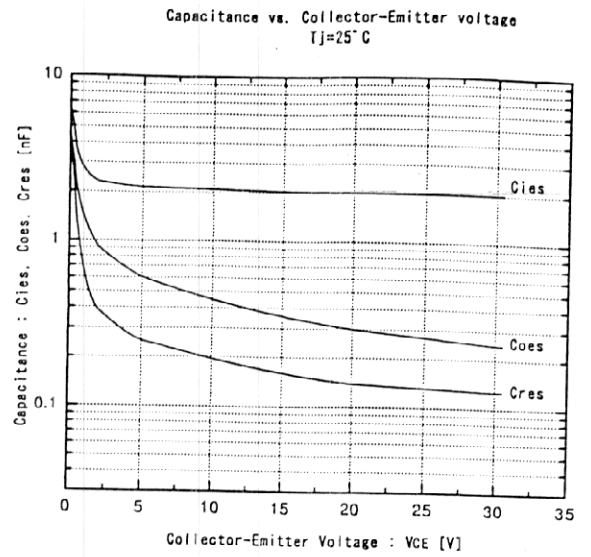
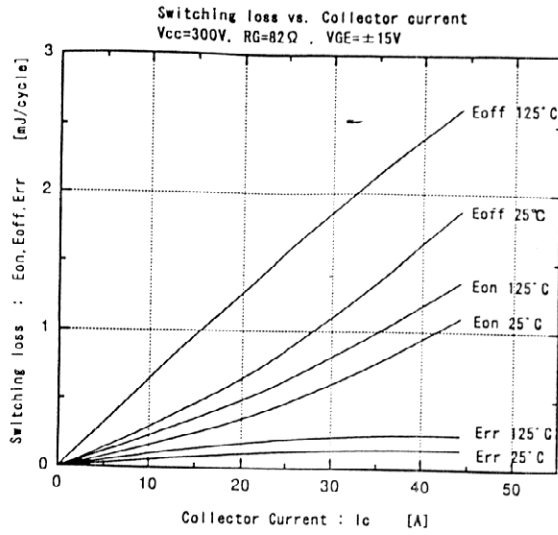
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