

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

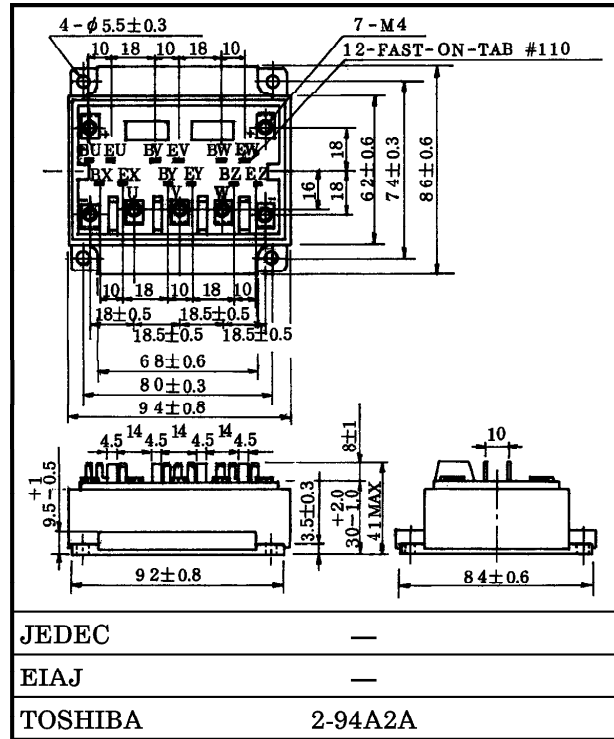
# MG75J6ES50

HIGH POWER SWITCHING APPLICATIONS.

Unit in mm

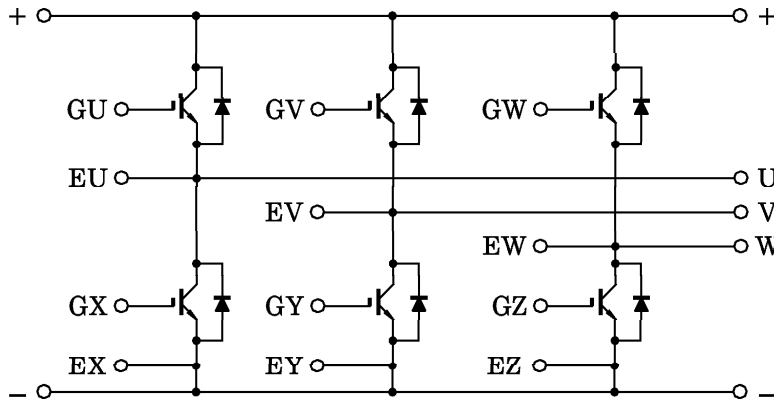
MOTOR CONTROL APPLICATIONS.

- The Electrodes are Isolated from Case.
- High Input Impedance.
- 6 IGBTs Built Into 1 Package.
- Enhancement-Mode.
- High Speed :  $t_f=0.30\mu s$  (Max.) ( $I_C=75A$ )  
 $t_{rr}=0.15\mu s$  (Max.) ( $I_F=75A$ )
- Low Saturation Voltage  
:  $V_{CE(sat)}=2.70V$  (Max.) ( $I_C=75A$ )



Weight : 505g (TYP.)

EQUIVALENT CIRCUIT



961001EAA2

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## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                                      |     | SYMBOL            | RATING           | UNIT |
|---|-----|-------------------|------------------|------|
| Collector-Emitter Voltage                           |     | V <sub>CES</sub>  | 600              | V    |
| Gate-Emitter Voltage                                |     | V <sub>GES</sub>  | ±20              | V    |
| Collector Current                                   | DC  | I <sub>C</sub>    | 75               | A    |
|   | 1ms | I <sub>CP</sub>   | 150              |      |
| Forward Current                                     | DC  | I <sub>F</sub>    | 75               | A    |
|   | 1ms | I <sub>FM</sub>   | 150              |      |
| Collector Power Dissipation (T <sub>c</sub> = 25°C) |     | P <sub>C</sub>    | 390              | W    |
| Junction Temperature                                |     | T <sub>j</sub>    | 150              | °C   |
| Storage Temperature Range                           |     | T <sub>stg</sub>  | -40~125          | °C   |
| Isolation Voltage                                   |     | V <sub>Isol</sub> | 2500 (AC 1 min.) | V    |
| Screw Torque (Terminal/Mounting)                    |     | —                 | 2/3              | N·m  |

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                       |                     | SYMBOL               | TEST CONDITION   | MIN. | TYP. | MAX. | UNIT   |
|--------------------------------------|---------------------|----------------------|--|------|------|------|--------|
| Gate Leakage Current                 |                     | I <sub>GES</sub>     | V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0  | —    | —    | ±500 | nA     |
| Collector Cut-off Current            |                     | I <sub>CES</sub>     | V <sub>CE</sub> = 600V, V <sub>GE</sub> = 0  | —    | —    | 1.0  | mA     |
| Gate-Emitter Cut-off Voltage         |                     | V <sub>GE(off)</sub> | I <sub>C</sub> = 7.5mA, V <sub>CE</sub> = 5V   | 5.0  | 7.0  | 8.0  | V      |
| Collector-Emitter Saturation Voltage |                     | V <sub>CE(sat)</sub> | I <sub>C</sub> = 75A, V <sub>GE</sub> = 15V  | —    | 2.10 | 2.70 | V      |
| Input Capacitance                    |                     | C <sub>ies</sub>     | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz   | —    | 7100 | —    | pF     |
| Switching Time                       | Turn-on Delay Time  | t <sub>d(on)</sub>   | Inductive Load<br>V <sub>CC</sub> = 300V<br>I <sub>C</sub> = 75A<br>V <sub>GE</sub> = ±15V<br>R <sub>G</sub> = 18Ω<br>(Note 1) | —    | 0.08 | 0.16 | μs     |
|                                      | Rise Time           | t <sub>r</sub>       |  | —    | 0.12 | 0.24 |        |
|                                      | Turn-on Time        | t <sub>on</sub>      |  | —    | 0.40 | 0.80 |        |
|                                      | Turn-off Delay Time | t <sub>d(off)</sub>  |  | —    | 0.20 | 0.40 |        |
|                                      | Fall Time           | t <sub>f</sub>       |  | —    | 0.15 | 0.30 |        |
|                                      | Turn-off Time       | t <sub>off</sub>     |  | —    | 0.50 | 1.00 |        |
| Forward Voltage                      |                     | V <sub>F</sub>       | I <sub>F</sub> = 75A, V <sub>GE</sub> = 0  | —    | 2.10 | 2.80 | V      |
| Reverse Recovery Time                |                     | t <sub>rr</sub>      | I <sub>F</sub> = 75A, V <sub>GE</sub> = -10V<br>di / dt = 100A / μs  | —    | 0.08 | 0.15 | μs     |
| Thermal Resistance                   |                     | R <sub>th(j-c)</sub> | Transistor   | —    | —    | 0.32 | °C / W |
|                                      |                     |                      | Diode  | —    | —    | 0.69 |        |

Note 1 Switching Time Test Circuit & Timing Chart

