

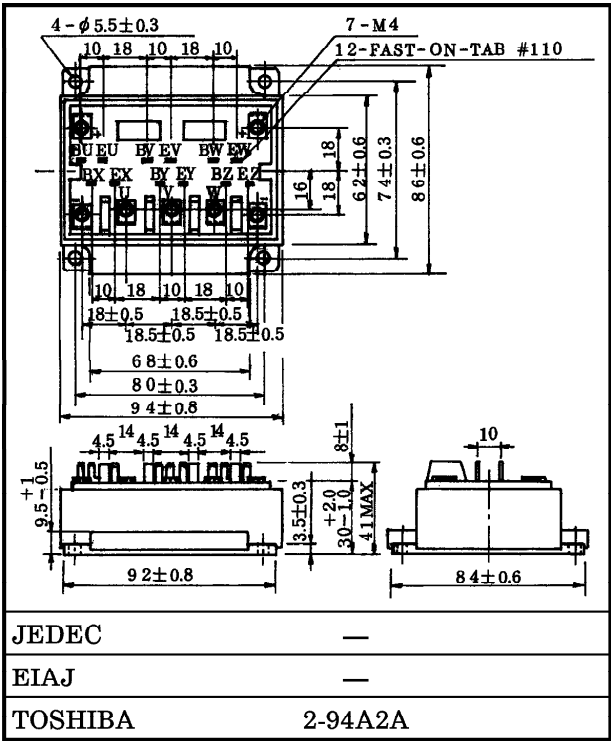
TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG100J6ES50

HIGH POWER SWITCHING APPLICATIONS.  
MOTOR CONTROL APPLICATIONS.

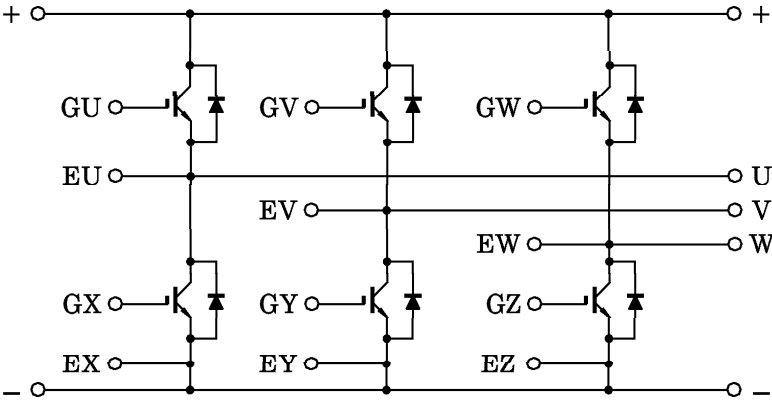
Unit in mm

- 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.) ( $I_C=100A$ )  
 $t_{rr}=0.15\mu s$  (Max.) ( $I_F=100A$ )
- Low Saturation Voltage  
:  $V_{CE(sat)}=2.70V$  (Max.) ( $I_C=100A$ )



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>    | 100              | A    |
|                                            | 1ms | I <sub>CP</sub>   | 200              |      |
| Forward Current                            | DC  | I <sub>F</sub>    | 100              | A    |
|                                            | 1ms | I <sub>FM</sub>   | 200              |      |
| Collector Power Dissipation<br>(Tc = 25°C) |     | P <sub>C</sub>    | 450              | 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> = 10mA, 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> = 100A, 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                                                                            | —    | 9000 | —    | 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> = 100A<br>V <sub>GE</sub> = ±15V<br>R <sub>G</sub> = 13Ω<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> = 100A, V <sub>GE</sub> = 0                                                                                      | —    | 2.30 | 3.00 | V      |
| Reverse Recovery Time                |                      | t <sub>rr</sub>      | I <sub>F</sub> = 100A, V <sub>GE</sub> = −10V<br>di / dt = 100A / μs                                                            | —    | 0.08 | 0.15 | μs     |
| Thermal Resistance                   | R <sub>th(j-c)</sub> | Transistor           |                                                                                                                                 | —    | —    | 0.28 | °C / W |
|                                      |                      | Diode                |                                                                                                                                 | —    | —    | 0.69 |        |

## Note 1 Switching Time Test Circuit &amp; Timing Chart

