

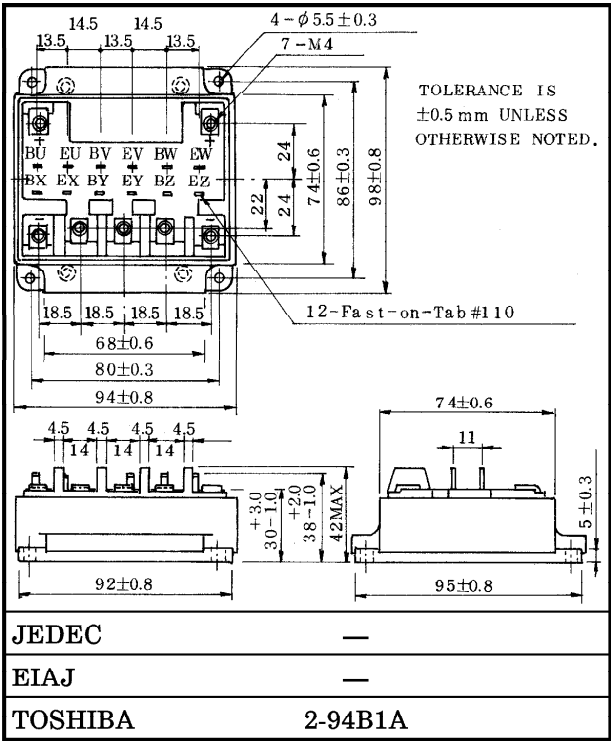
TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG50Q6ES40

HIGH POWER SWITCHING APPLICATIONS.  
MOTOR CONTROL APPLICATIONS.

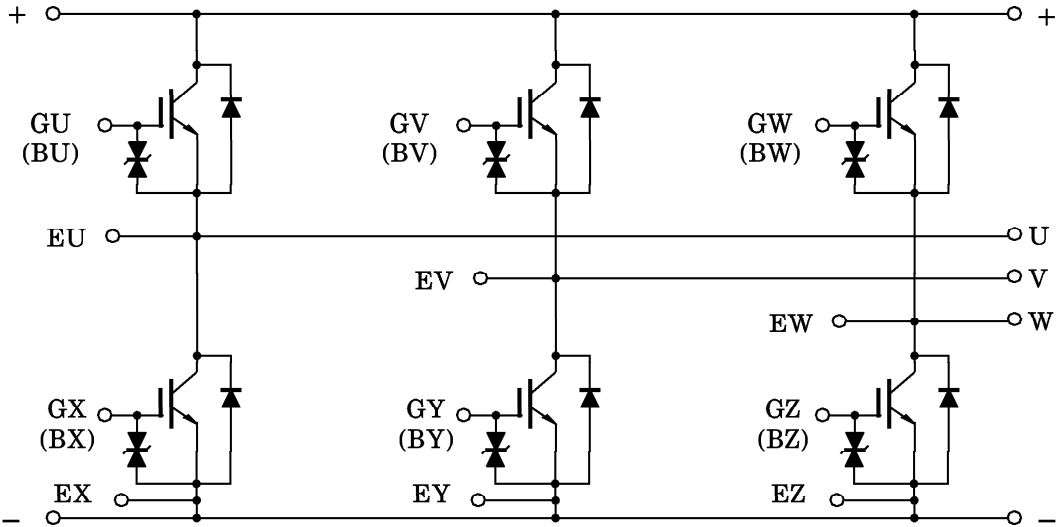
Unit in mm

- The Electrodes are Isolated from Case.
- 6 IGBTs are Built Into 1 Package.
- Enhancement-Mode
- Low Saturation Voltage  
:  $V_{CE(sat)} = 4.0V$  (Max.)
- High Speed :  $t_f = 0.5\mu s$  (Max.)



Weight : 690g

EQUIVALENT CIRCUIT



961001EAA2

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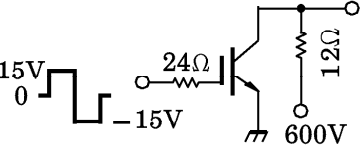
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## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                        |     | SYMBOL            | RATING             | UNIT  |
|---------------------------------------|-----|-------------------|--------------------|-------|
| Collector-Emitter Voltage             |     | V <sub>CES</sub>  | 1200               | V     |
| Gate-Emitter Voltage                  |     | V <sub>GES</sub>  | ± 20               | V     |
| Collector Current                     | DC  | I <sub>C</sub>    | 50                 | A     |
|                                       | 1ms | I <sub>CP</sub>   | 100                |       |
| Forward Current                       | DC  | I <sub>F</sub>    | 50                 | A     |
|                                       | 1ms | I <sub>FM</sub>   | 100                |       |
| Collector Power Dissipation (Tc=25°C) |     | P <sub>C</sub>    | 250                | 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 minute) | 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                                         | —    | —    | ± 10 | μA     |
| Collector Cut-off Current            |                      | I <sub>CES</sub>     | V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0                                         | —    | —    | 1.0  | mA     |
| Gate-Emitter Cut-off Voltage         |                      | V <sub>GE(OFF)</sub> | I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V                                          | 3.0  | —    | 6.0  | V      |
| Collector-Emitter Saturation Voltage |                      | V <sub>CE(sat)</sub> | I <sub>C</sub> = 50A, V <sub>GE</sub> = 15V                                          | —    | 3.0  | 4.0  | V      |
| Input Capacitance                    |                      | C <sub>ies</sub>     | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz                                 | —    | 6000 | —    | pF     |
| Switching Time                       | Rise Time            | t <sub>r</sub>       |  | —    | 0.3  | 0.6  | μs     |
|                                      | Turn-on Time         | t <sub>on</sub>      |                                                                                      | —    | 0.4  | 0.8  |        |
|                                      | Fall Time            | t <sub>f</sub>       |                                                                                      | —    | 0.2  | 0.5  |        |
|                                      | Turn-off Time        | t <sub>off</sub>     |                                                                                      | —    | 0.8  | 1.5  |        |
| Forward Voltage                      |                      | V <sub>F</sub>       | I <sub>F</sub> = 50A, V <sub>GE</sub> = 0                                            | —    | 2.0  | 2.5  | V      |
| Reverse Recovery Time                |                      | t <sub>rr</sub>      | I <sub>F</sub> = 50A, V <sub>GE</sub> = − 10V<br>di / dt = 100A / μs                 | —    | 0.25 | 0.5  | μs     |
| Thermal Resistance                   | R <sub>th(j-c)</sub> |                      | Transistor                                                                           | —    | —    | 0.5  | °C / W |
|                                      |                      |                      | Diode                                                                                | —    | —    | 1.0  |        |

