

TENTATIVE

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR

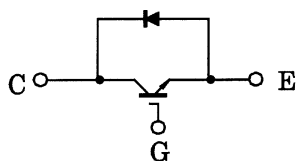
ST1000EX21

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- All Electric contacts by Pressure Structure and Airtight Package
- Anti-Parallel Fast Recovery Diode in This Package
- Enhancement Mode IGBT

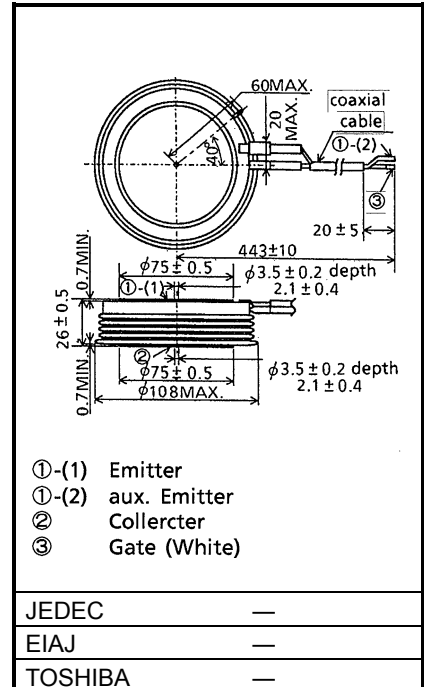
EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|-----|-----------|----------------|------|
| Collector-Emitter Voltage | | V_{CES} | 2500 | V |
| Gate-Emitter Voltage | | V_{GES} | ± 20 | V |
| Collector Current | DC | I_C | 1000 | A |
| | 1ms | I_{CP} | 2000 | A |
| Forward Current | DC | I_F | 1000 | A |
| | 1ms | I_{FM} | 2000 | A |
| Collector Power Dissipation (Tc = 25°C) | | P_C | 5550 | W |
| Operating Junction Temperature | | T_j | -20~125 | °C |
| Storage Temperature Range | | T_{stg} | -40~125 | °C |
| Mounting Force | | — | 31.5 \pm 3.2 | kN |

Unit: mm



Weight: 1250g

ELECTRICAL CHARACTERISTICS (T_c = 125°C without R_{th})

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT |
|--------------------------------------|-----------------|-------------------------|--|-----|------|------|---------|
| Gate Leakage Current | | I _{GES} | V _{GE} = ±20V, V _{CE} = 0V | — | — | ±1 | μA |
| Collector Cut-Off Current | | I _{CES} | V _{CE} = 2500V, V _{GE} = 0V | — | — | 200 | mA |
| Gate-Emitter Cut-Off Voltage | | V _{GE (off)} | V _{CE} = 5V, I _C = 1A | 3.0 | 4.5 | 6.0 | V |
| Collector-Emitter Saturation Voltage | | V _{CE (sat)} | I _C = 1000A, V _{GE} = 15V | — | 5.5 | 6.0 | V |
| Input Capacitance | | C _{ies} | V _{CE} = 10V, V _{GE} = 0V, f = 1MHz | — | 170 | — | nF |
| Switching Times | Rise Time | t _r | Inductive load, V _{CC} = 1500V, I _C = 1000A, V _{GG} = ±15V, R _G = 5.0Ω | — | 0.3 | — | μs |
| | Turn-On Time | t _{on} | | — | 2.2 | — | μs |
| | Fall Time | t _f | | — | 0.5 | — | μs |
| | Turn-Off Time | t _{off} | | — | 1.7 | — | μs |
| Forward Voltage of Diode | | V _F | I _F = 1000A, V _{GE} = 0V | — | 2.7 | 3.2 | V |
| Reverse Recovery Time | | t _{rr} | I _F = 1000A, V _{GG} = -15V, di / dt = 2600A / μs | — | 0.6 | — | μs |
| Thermal Resistance | Transistor Part | R _{th (j-f) E} | Junction-Emitter side | — | — | 47.5 | °C / kW |
| | | R _{th (j-f) C} | Junction-Collector side | — | — | 29.0 | °C / kW |
| | | R _{th (j-f) D} | Junction-double side | — | — | 18.0 | °C / kW |
| | Diode Part | R _{th (j-f) A} | Junction-Anode side | — | — | 125 | °C / kW |
| | | R _{th (j-f) K} | Junction-Cathode side | — | — | 70.3 | °C / kW |
| | | R _{th (j-f) D} | Junction double side | — | — | 45.0 | °C / kW |

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