

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOSV)

2SK2602

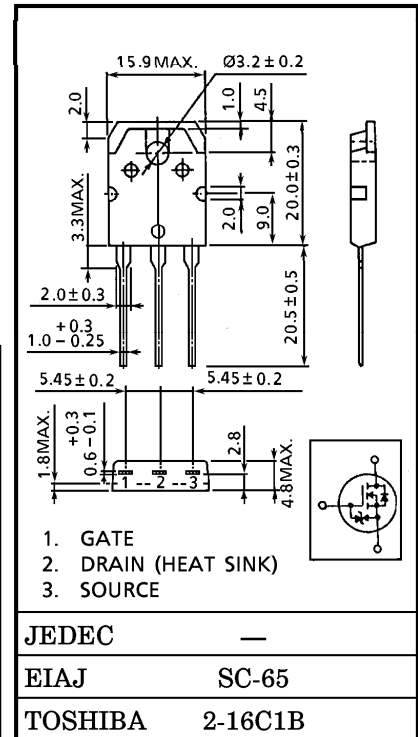
HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS
SWITCHING REGULATOR APPLICATIONS

INDUSTRIAL APPLICATIONS
Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.9\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 5.5S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 600V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0V$ ($V_{DS} = 10V, I_D = 1mA$)

MAXIMUM RATINGS ($T_a = 25^\circ C$)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|--|-------|-----------|----------------|------------|
| Drain-Source Voltage | | V_{DSS} | 600 | V |
| Drain-Gate Voltage ($R_{GS} = 20k\Omega$) | | V_{DGR} | 600 | V |
| Gate-Source Voltage | | V_{GSS} | ± 30 | V |
| Drain Current | DC | I_D | 6 | A |
| | Pulse | I_{DP} | 24 | A |
| Drain Power Dissipation ($T_c = 25^\circ C$) | | P_D | 125 | W |
| Single Pulse Avalanche Energy** | | E_{AS} | 345 | mJ |
| Avalanche Current | | I_{AR} | 6 | A |
| Repetitive Avalanche Energy* | | E_{AR} | 12.5 | mJ |
| Channel Temperature | | T_{ch} | 150 | $^\circ C$ |
| Storage Temperature Range | | T_{stg} | $-55 \sim 150$ | $^\circ C$ |



Weight : 4.6g

THEMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|----------------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 1.0 | $^\circ C / W$ |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 50 | $^\circ C / W$ |

Note ;

* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = 90V$, Starting $T_{ch} = 25^\circ C$, $L = 16.8mH$, $R_G = 25\Omega$, $I_{AR} = 6A$

**This transistor is an electrostatic sensitive device.
Please handle with caution.**

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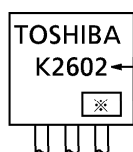
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|------------------|--|--|------|------|------|
| Gate Leakage Current | | IGSS | VGS = ±25V, VDS = 0V | — | — | ±10 | μA |
| Gate-Source Breakdown Voltage | | V(BR)GSS | IG = ±10μA, VDS = 0V | ±30 | — | — | V |
| Drain Cut-off Current | | IDSS | VDS = 600V, VGS = 0V | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | V(BR)DSS | ID = 10mA, VGS = 0V | 600 | — | — | V |
| Gate Threshold Voltage | | Vth | VDS = 10V, ID = 1mA | 2.0 | — | 4.0 | V |
| Drain-Source ON Resistance | | RDS(ON) | VGS = 10V, ID = 3A | — | 0.9 | 1.25 | Ω |
| Forward Transfer Admittance | | Yfs | VDS = 10V, ID = 3A | 2.0 | 5.5 | — | S |
| Input Capacitance | | Ciss | VDS = 10V, VGS = 0V, f = 1MHz | — | 1300 | — | pF |
| Reverse Transfer Capacitance | | Crss | | — | 130 | — | |
| Output Capacitance | | Coss | | — | 400 | — | |
| Switching Time | Rise Time | tr | <p> $V_{GS} = 10V$ $V_{GS} = 0V$ $I_D = 3A$ $R_L = 100\Omega$ $V_{DD} \doteq 300V$ </p> | — | 25 | — | ns |
| | Turn-on Time | ton | | — | 45 | — | |
| | Fall Time | tf | | — | 40 | — | |
| | Turn-off Time | t _{off} | | $V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$ | — | 150 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Qg | VDD ≐ 400V, VGS = 10V, ID = 6A | — | 30 | — | nC |
| Gate-Source Charge | | Qgs | | — | 18 | — | |
| Gate-Drain ("Miller") Charge | | Qgd | | — | 12 | — | |

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------------|-----------------------|------|------|------|------|
| Continuous Drain Reverse Current | IDR | — | — | — | 6 | A |
| Pulse Drain Reverse Current | IDRP | — | — | — | 24 | A |
| Diode Forward Voltage | VDSF | IDR = 6A, VGS = 0V | — | — | -1.7 | V |
| Reverse Recovery Time | t _{rr} | IDR = 6A, VGS = 0V | — | 1000 | — | ns |
| Reverse Recovery Charge | Q _{rr} | dIDR / dt = 100A / μs | — | 7 | — | μC |

MARKING

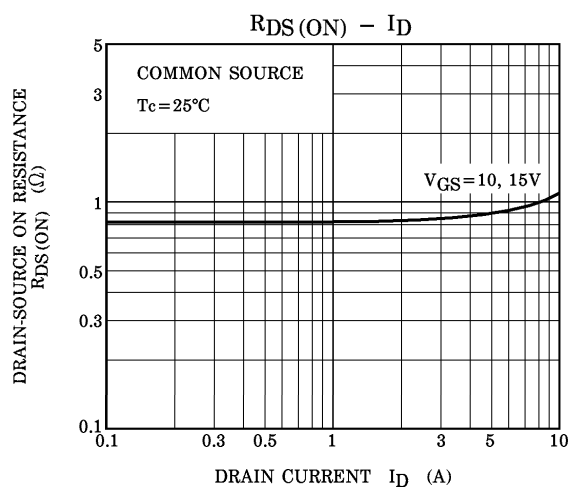
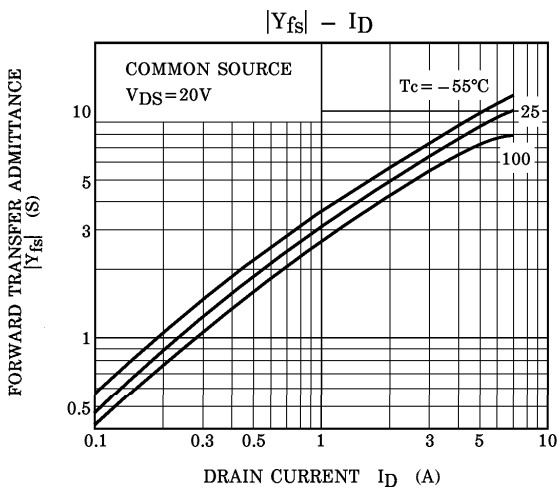
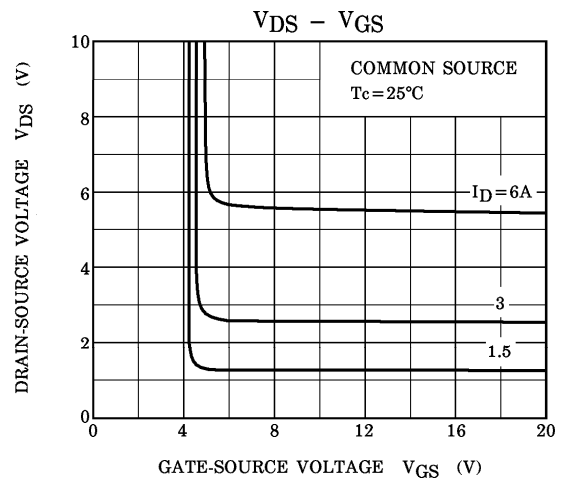
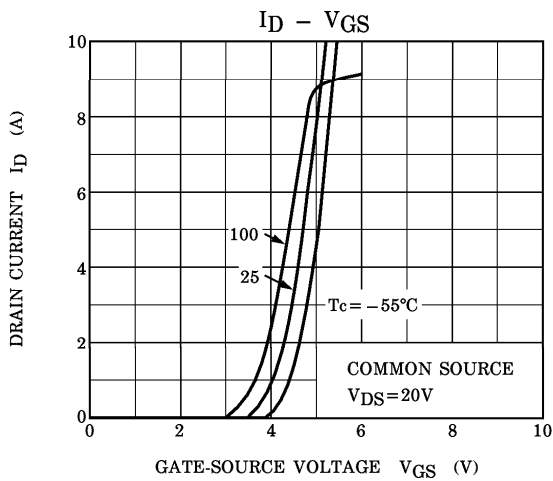
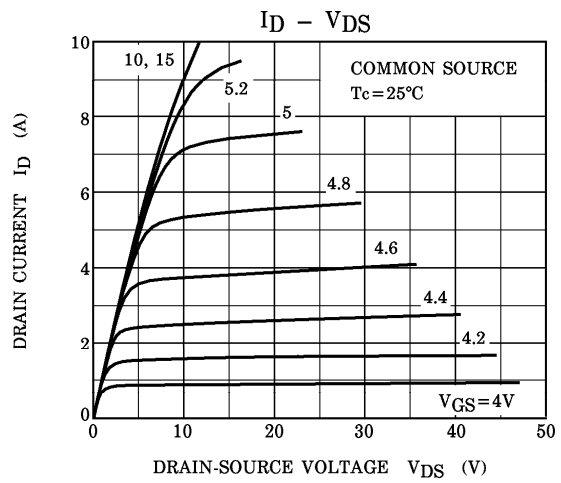
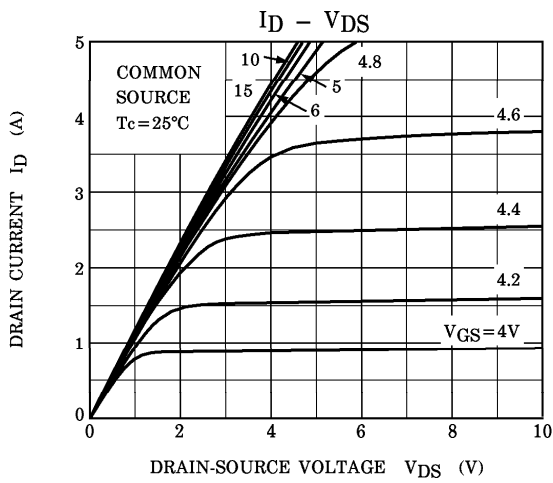


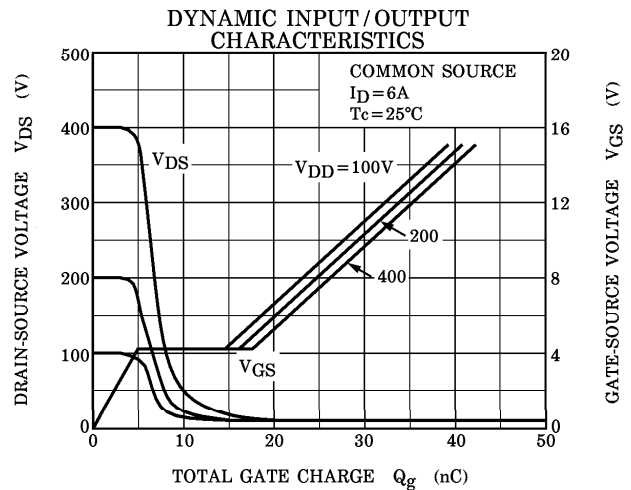
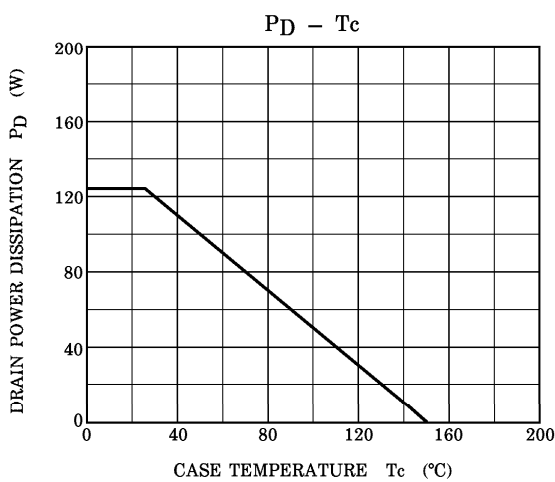
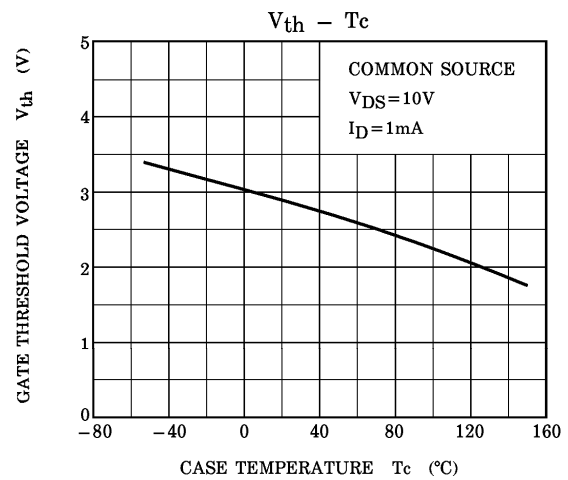
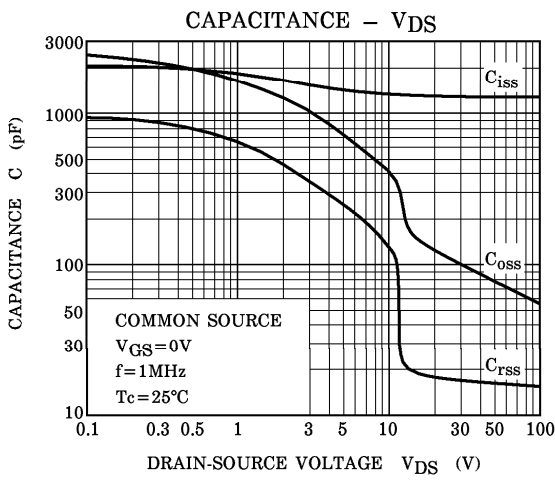
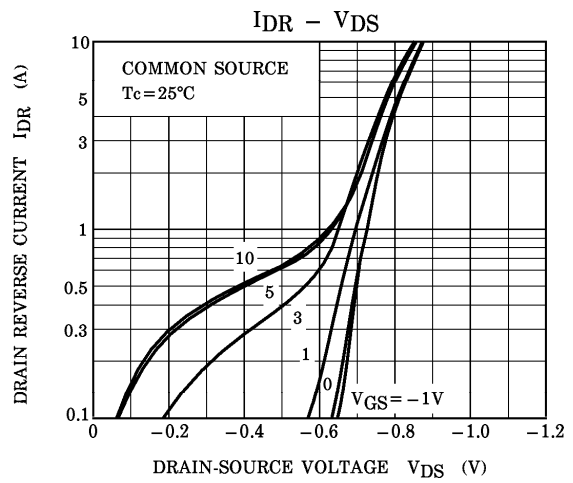
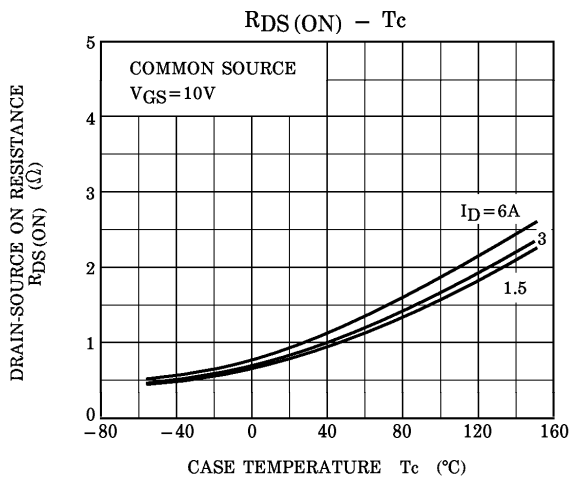
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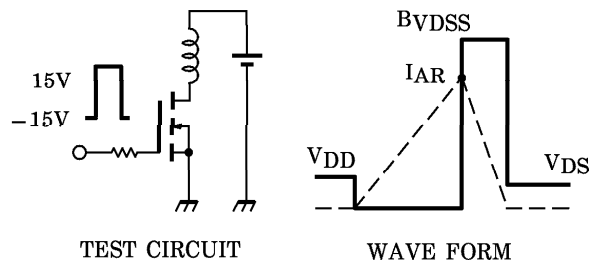
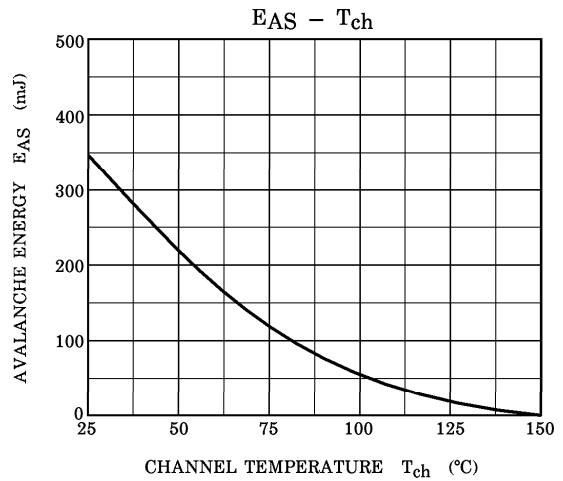
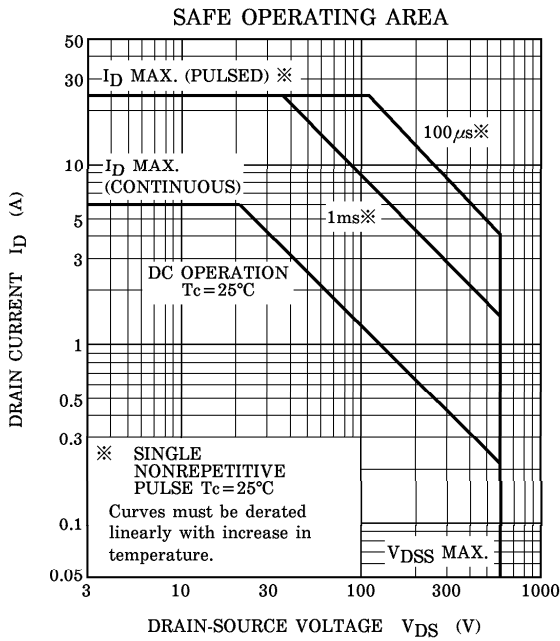
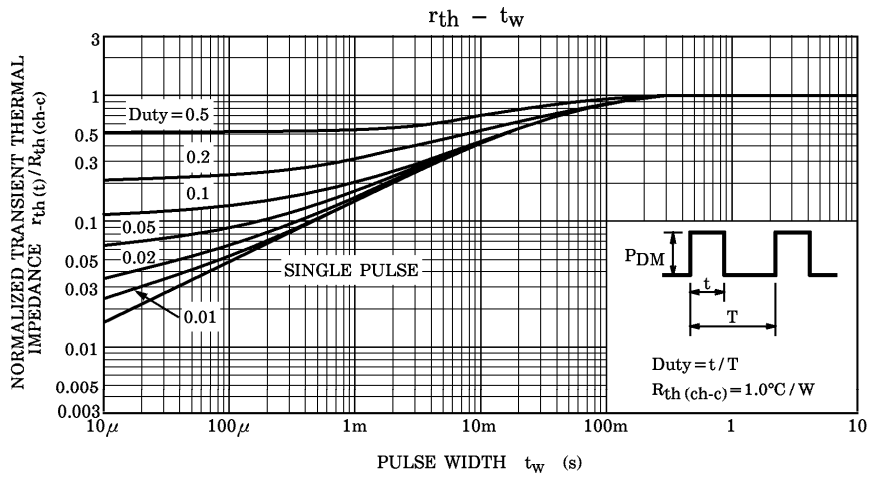
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 6A$, $R_G = 25\Omega$
 $V_{DD} = 90V$, $L = 16.8mH$

$$EAS = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{V}D_{SS}}{B_{V}D_{SS} - V_{DD}} \right)$$