

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

2SK2968

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

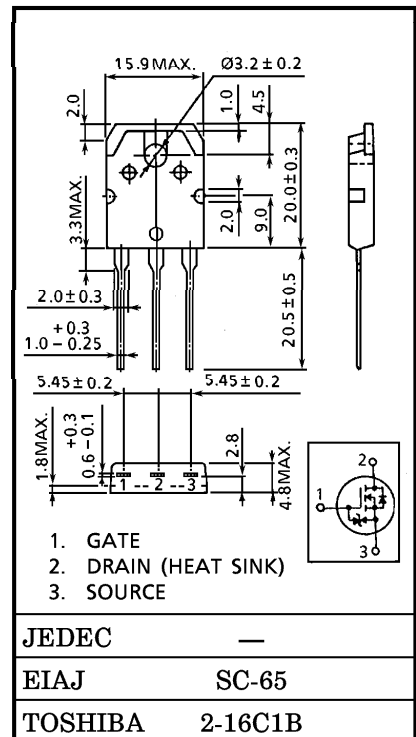
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)}=1.05\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=7.6S$ (Typ.)
- Low Leakage Current : $I_{DSS}=100\mu A$ (Max.) ($V_{DS}=720V$)
- 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} | 900 | V |
| Drain-Gate Voltage ($R_{GS}=20k\Omega$) | | V_{DGR} | 900 | V |
| Gate-Source Voltage | | V_{GSS} | ± 30 | V |
| Drain Current | DC | I_D | 10 | A |
| | Pulse | I_{DP} | 30 | A |
| Drain Power Dissipation ($T_c=25^\circ C$) | | P_D | 150 | W |
| Single Pulse Avalanche Energy** | | E_{AS} | 810 | mJ |
| Avalanche Current | | I_{AR} | 10 | A |
| Repetitive Avalanche Energy* | | E_{AR} | 15 | mJ |
| Channel Temperature | | T_{ch} | 150 | $^\circ C$ |
| Storage Temperature Range | | T_{stg} | $-55\sim 150$ | $^\circ C$ |



Weight : 4.6g (Typ.)

THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|----------------------------------------|----------------|-------|----------------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 0.833 | $^\circ C / W$ |
| 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 $T_{ch}=25^\circ C$, $L=14.9mH$, $R_G=25\Omega$, $I_{AR}=10A$

This transistor is an electrostatic sensitive device.

Please handle with caution.

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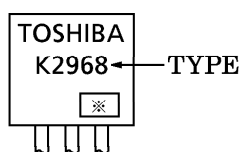
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------------------|---------------|----------|---------------------------------|---------------------------------------------|------|------|------|
| Gate Leakage Current | | IGSS | VGS = ±30V, VDS = 0V | — | — | ±10 | μA |
| Gate-Source Breakdown Voltage | | V(BR)GSS | IG = ±10μA, VDS = 0V | ±30 | — | — | V |
| Drain Cut-off Current | | IDSS | VDS = 720V, VGS = 0V | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | V(BR)DSS | ID = 10mA, VGS = 0V | 900 | — | — | V |
| Gate Threshold Voltage | | Vth | VDS = 10V, ID = 1mA | 2.0 | — | 4.0 | V |
| Drain-Source ON Resistance | | RDS(ON) | VGS = 10V, ID = 4A | — | 1.05 | 1.25 | Ω |
| Forward Transfer Admittance | | Yfs | VDS = 15V, ID = 4A | 3.5 | 7.6 | — | S |
| Input Capacitance | | Ciss | VDS = 25V, VGS = 0V f = 1MHz | — | 2150 | — | pF |
| Reverse Transfer Capacitance | | Crss | | — | 35 | — | |
| Output Capacitance | | Coss | | — | 220 | — | |
| Switching Time | Rise Time | tr | | — | 25 | — | ns |
| | Turn-on Time | ton | | — | 60 | — | |
| | Fall Time | tf | | — | 25 | — | |
| | Turn-off Time | toff | | VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs | — | 120 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Qg | VDD = 400V, VGS = 10V | — | 70 | — | nC |
| Gate-Source Charge | | Qgs | ID = 10A | — | 37 | — | |
| Gate-Drain ("Miller") Charge | | Qgd | | — | 33 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------------|-----------------------|------|------|------|------|
| Continuous Drain Reverse Current | IDR | — | — | — | 10 | A |
| Pulse Drain Reverse Current | IDRP | — | — | — | 30 | A |
| Diode Forward Voltage | VDSF | IDR = 10A, VGS = 0V | — | — | -1.9 | V |
| Reverse Recovery Time | t _{rr} | IDR = 10A, VGS = 0V | — | 1300 | — | ns |
| Reverse Recovery Charge | Q _{rr} | dIDR / dt = 100A / μs | — | 14.5 | — | μC |

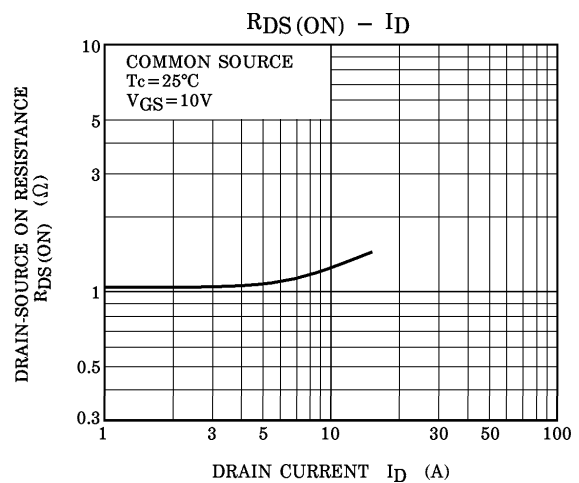
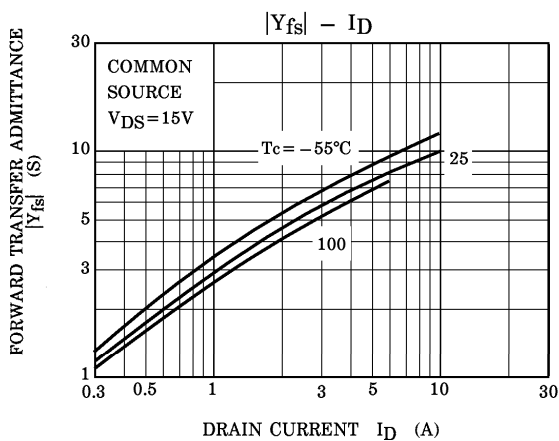
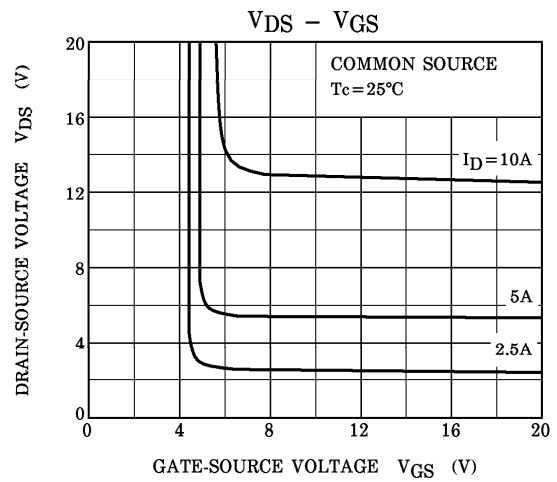
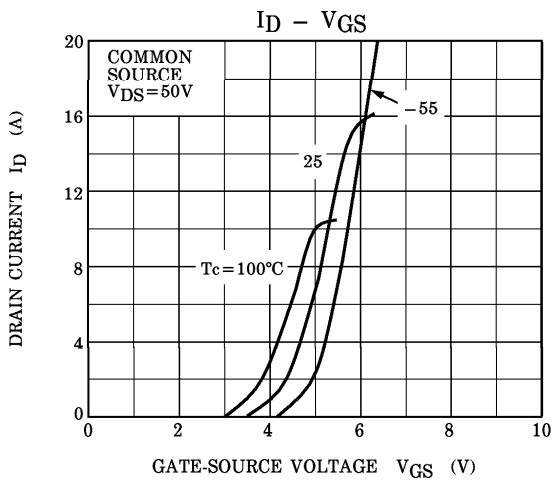
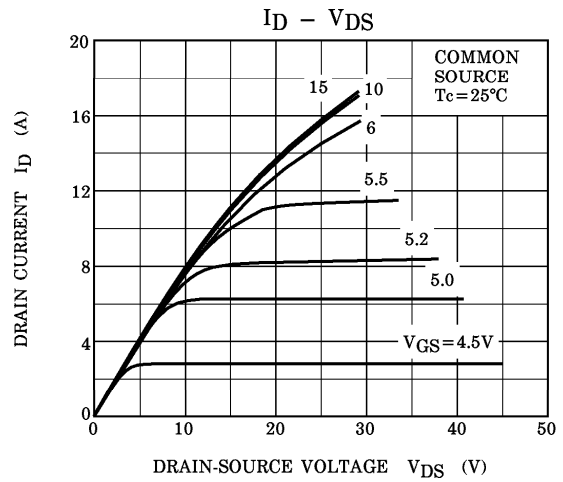
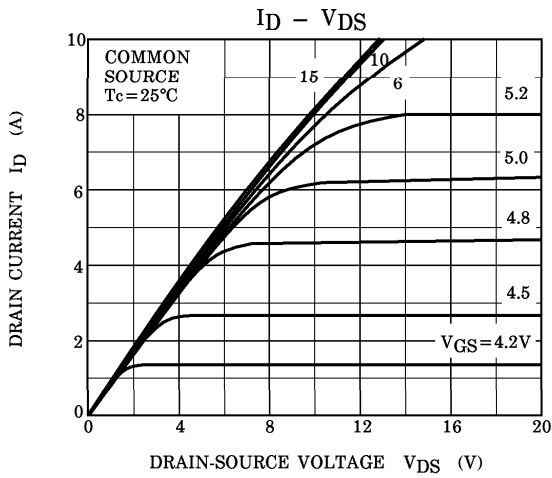
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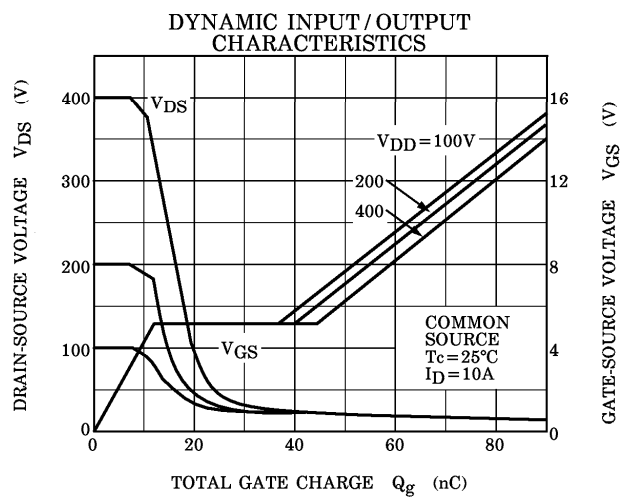
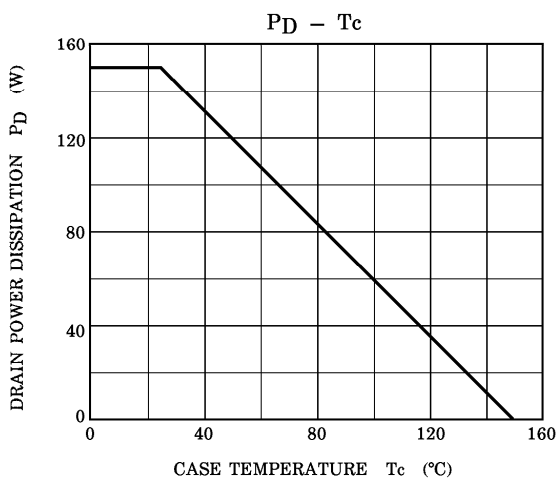
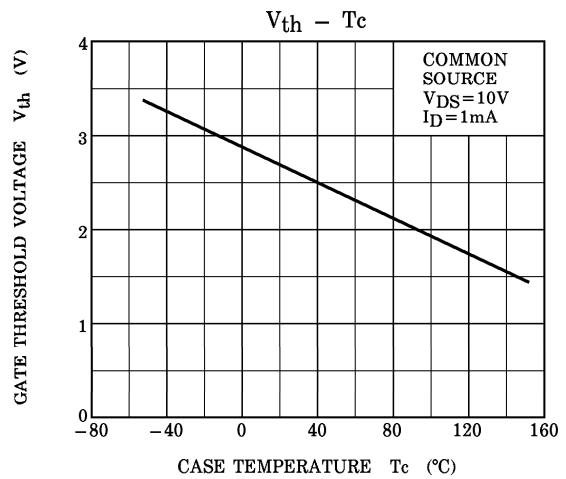
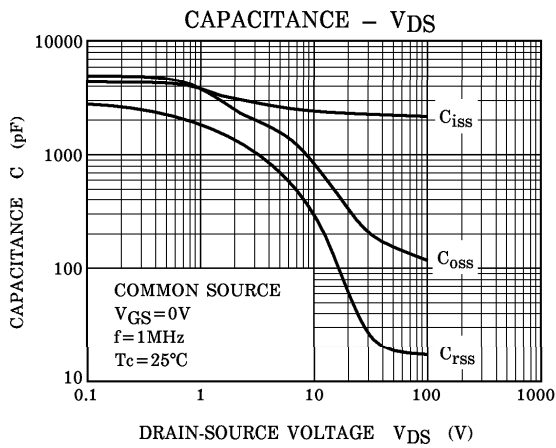
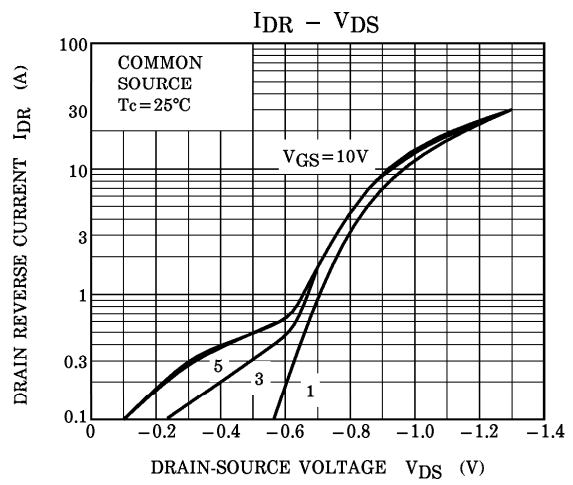
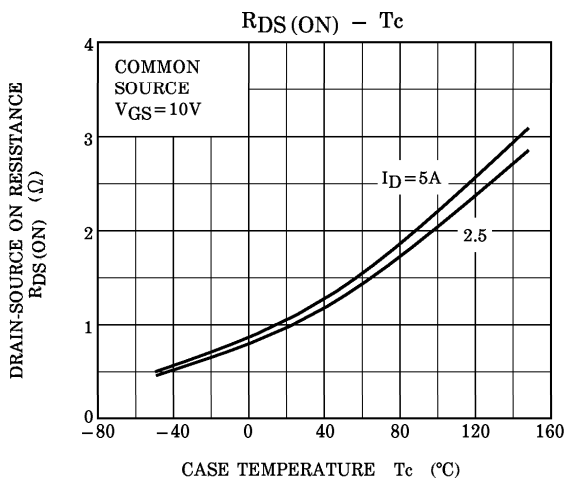


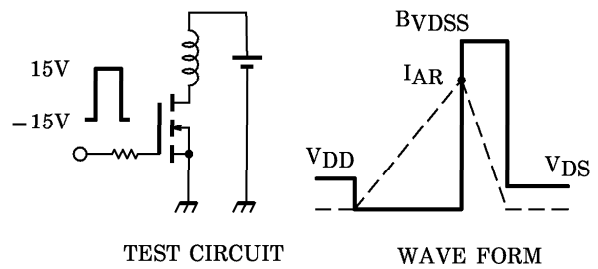
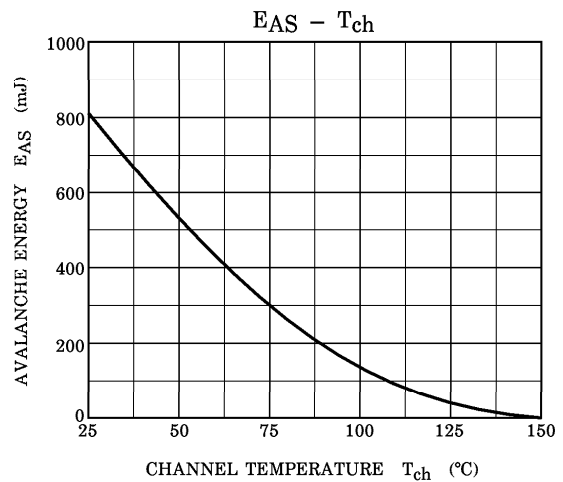
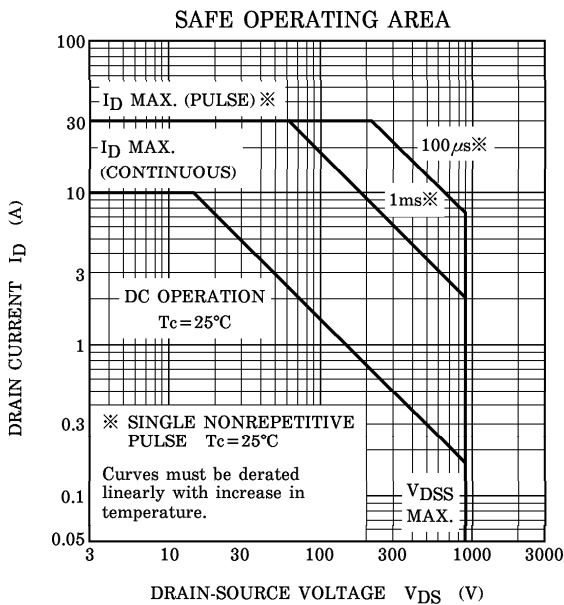
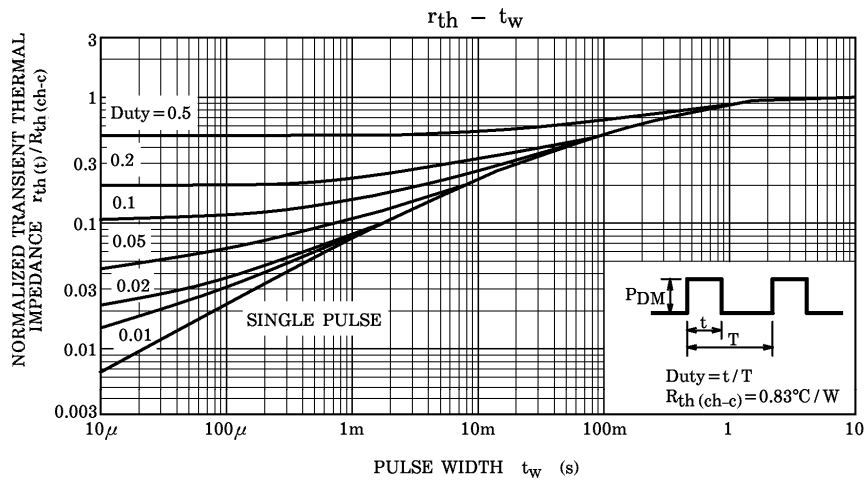
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 10A$, $R_G = 25\Omega$
 $V_{DD} = 90V$, $L = 14.9mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$