

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOS V)

2SK2882

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

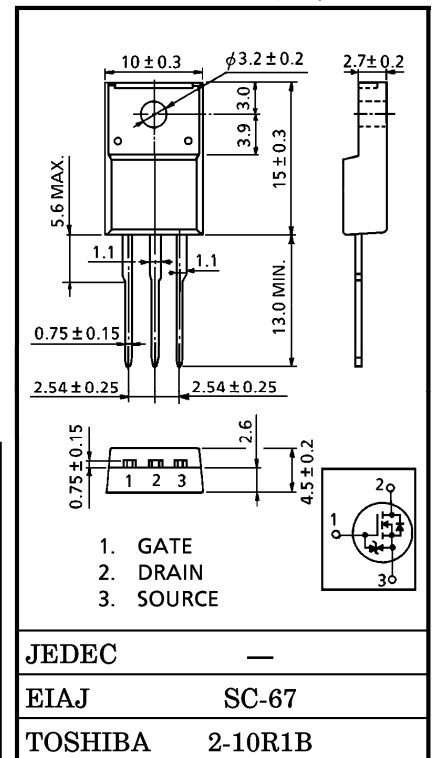
INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source On Resistance : $R_{DS(ON)} = 0.08 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 17 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 150 V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0 V$
($V_{DS} = 10 V, I_D = 1 mA$)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|-----------|----------|------|
| Drain-Source Voltage | V_{DSS} | 150 | V |
| Drain-Gate Voltage ($R_{GS} = 20 k\Omega$) | V_{DGR} | 150 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Drain Current | DC | I_D | 18 A |
| | Pulse | I_{DP} | 54 A |
| Drain Power Dissipation ($T_c = 25^\circ C$) | P_D | 45 | W |
| Single Pulse Avalanche Energy** | E_{AS} | 176 | mJ |
| Avalanche Current | I_{AR} | 18 | A |
| Repetitive Avalanche Energy* | E_{AR} | 4.5 | mJ |
| Channel Temperature | T_{ch} | 150 | °C |
| Storage Temperature Range | T_{stg} | -55~150 | °C |



Weight : 1.9 g (Typ.)

THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 2.78 | °C/W |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 62.5 | °C/W |

Note ;

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

** $V_{DD} = 50 V, T_{ch} = 25^\circ C$ (initial), $L = 0.8 mH, R_G = 25 \Omega, I_{AR} = 18 A$

This transistor is an electrostatic sensitive device.

Please handle with caution.

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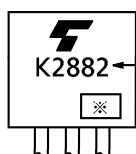
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|---------------|--|--|------|----------|---------------|
| Gate Leakage Current | | I_{GSS} | $V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$ | — | — | ± 10 | μA |
| Drain Cut-off Current | | I_{DSS} | $V_{DS} = 150\text{ V}, V_{GS} = 0\text{ V}$ | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$ | 150 | — | — | V |
| Gate Threshold Voltage | | V_{th} | $V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$ | 0.8 | — | 2.0 | V |
| Drain-Source ON Resistance | | $R_{DS(ON)}$ | $V_{GS} = 4\text{ V}, I_D = 9\text{ A}$ | — | 0.09 | 0.18 | Ω |
| | | | $V_{DS} = 10\text{ V}, I_D = 9\text{ A}$ | — | 0.08 | 0.12 | |
| Forward Transfer Admittance | | $ Y_{fs} $ | $V_{DS} = 10\text{ V}, I_D = 9\text{ A}$ | 10 | 17 | — | S |
| Input Capacitance | | C_{iss} | $V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ | — | 1380 | — | pF |
| Reverse Transfer Capacitance | | C_{rss} | | — | 200 | — | |
| Output Capacitance | | C_{oss} | | — | 610 | — | |
| Switching Time | Rise Time | t_r | | — | 12 | — | ns |
| | Turn-on Time | t_{on} | | — | 24 | — | |
| | Fall Time | t_f | | — | 56 | — | |
| | Turn-off Time | t_{off} | | $V_{IN} : t_r, t_f < 5\text{ ns},$ $Duty \leq 1\%, t_w = 10\ \mu\text{s}$ | — | 130 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q_g | $V_{DD} \approx 120\text{ V}, V_{GS} = 10\text{ V}, I_D = 18\text{ A}$ | — | 57 | — | nC |
| Gate-Source Charge | | Q_{gs} | | — | 43 | — | |
| Gate-Drain ("Miller") Charge | | Q_{gd} | | — | 14 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-----------|--|------|------|------|---------------|
| Continuous Drain Reverse | I_{DR} | — | — | — | 18 | A |
| Pulse Drain Reverse Current | I_{DRP} | — | — | — | 54 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = 18\text{ A}, V_{GS} = 0\text{ V}$ | — | — | -1.7 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = 18\text{ A}, V_{GS} = 0\text{ V}$ $dI_{DR}/dt = 100\text{ A}/\mu\text{s}$ | — | 185 | — | ns |
| Reverse Recovery Charge | Q_{rr} | | — | 1.3 | — | μC |

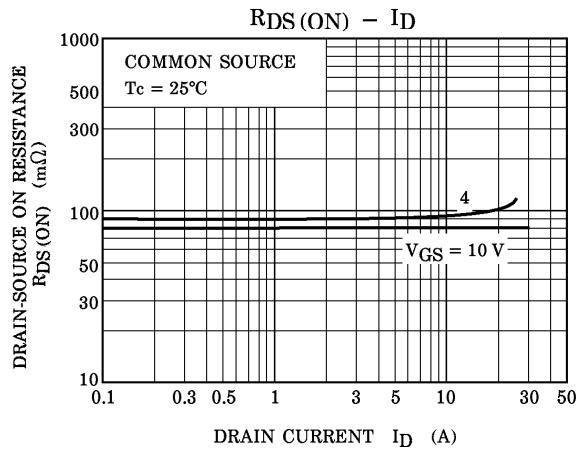
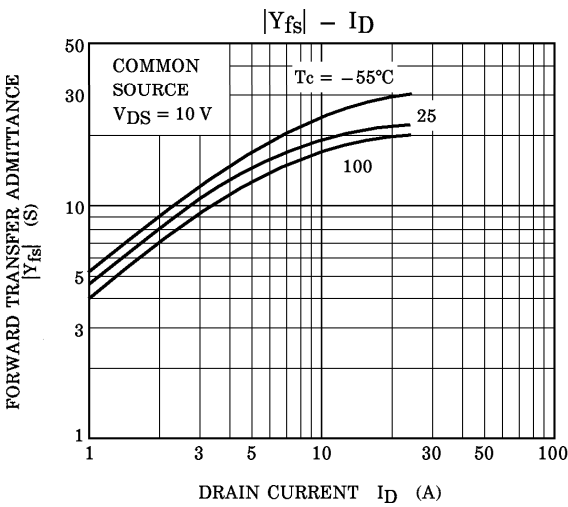
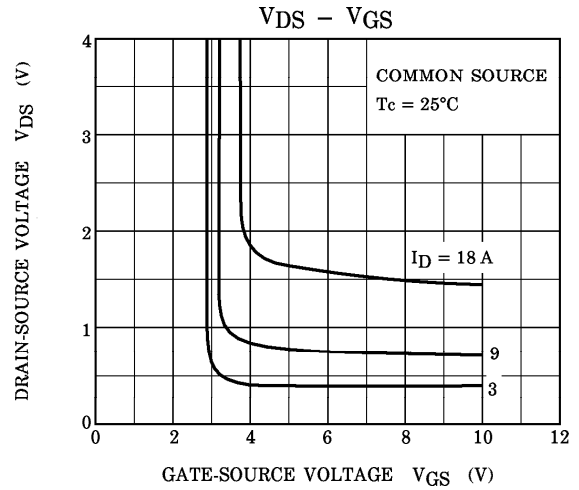
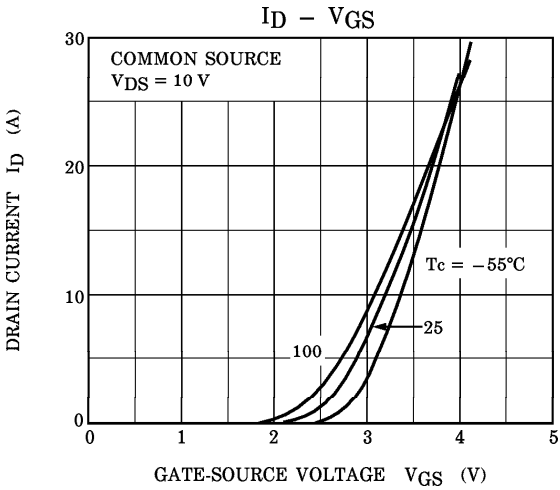
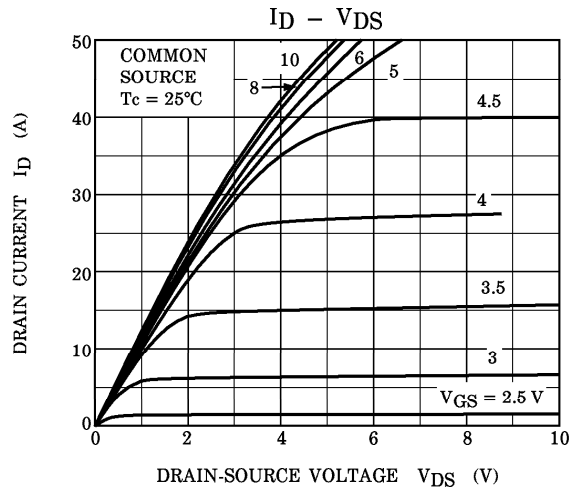
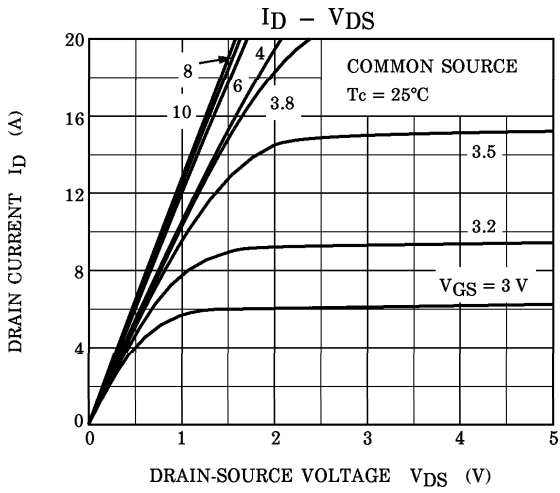
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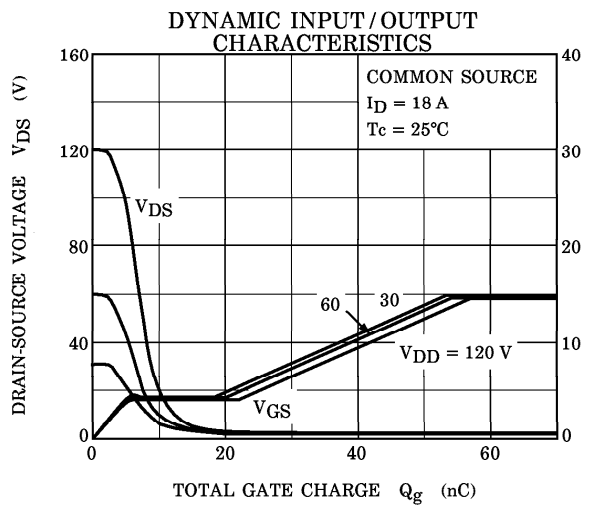
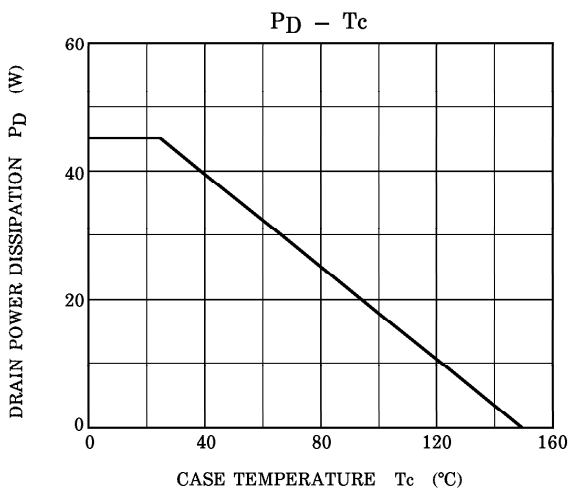
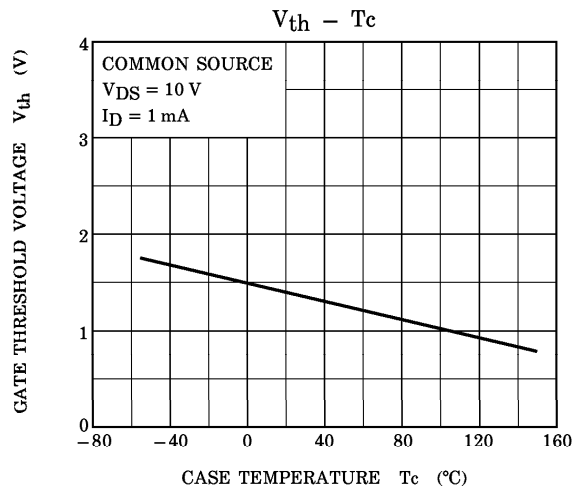
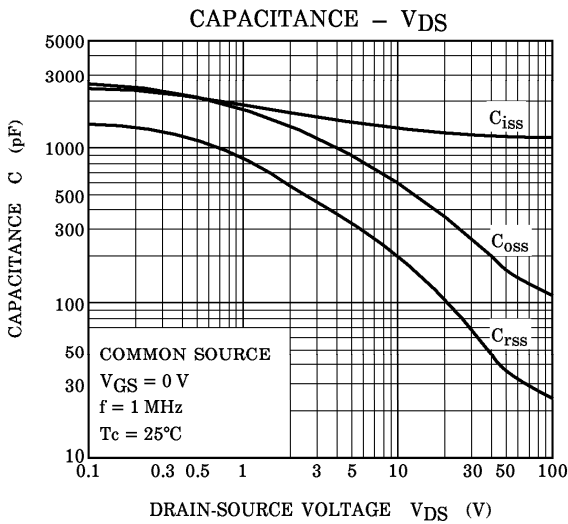
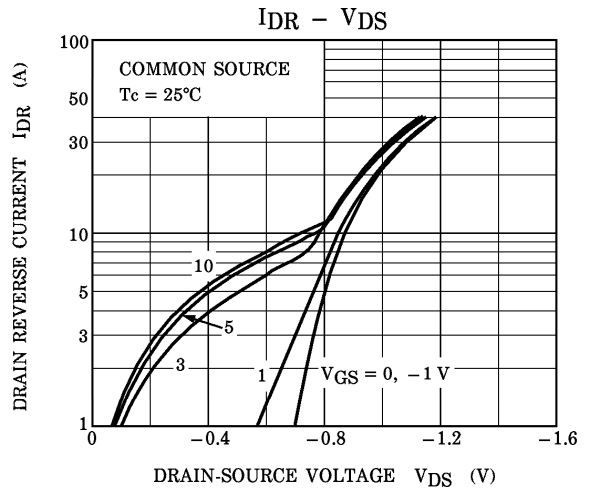
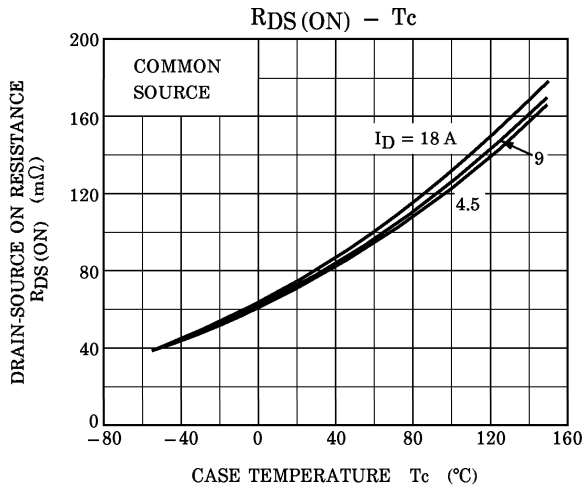


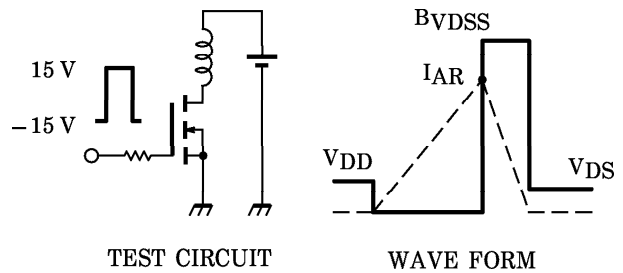
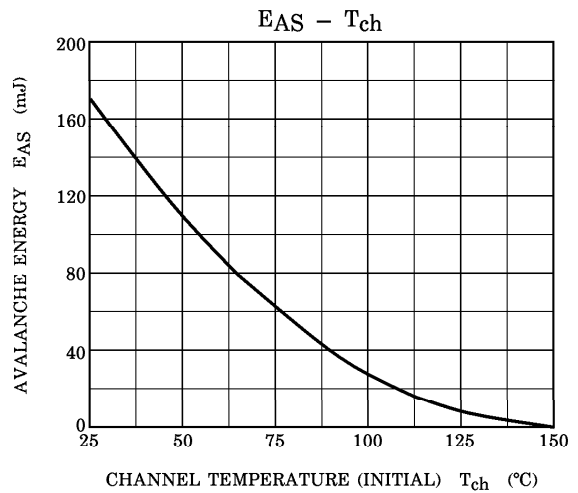
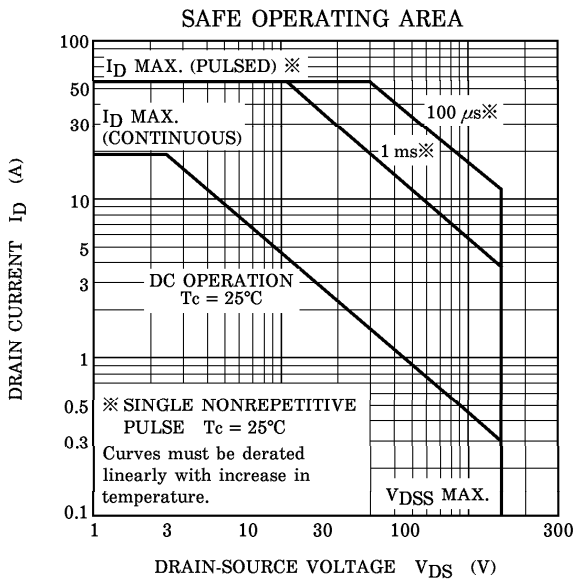
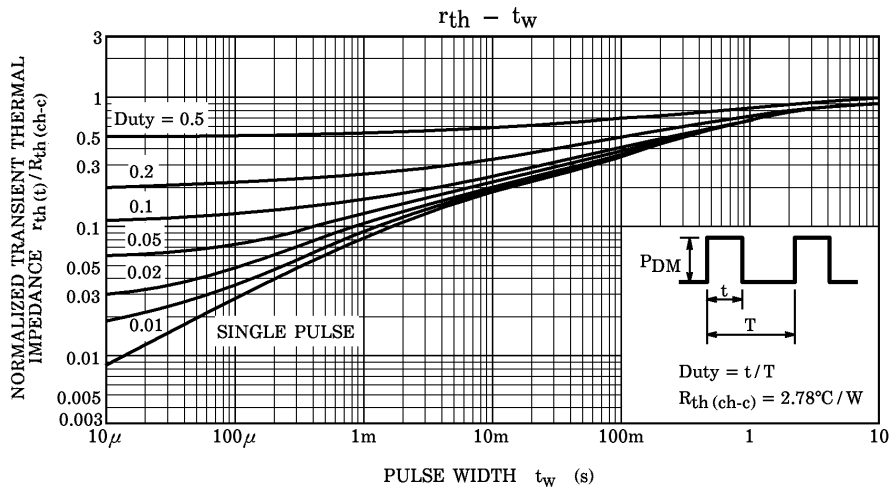
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 18 \text{ A}$, $R_G = 25 \Omega$
 $V_{DD} = 50 \text{ V}$, $L = 0.8 \text{ mH}$

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