

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (π-MOSIII⁵)

2SK1486

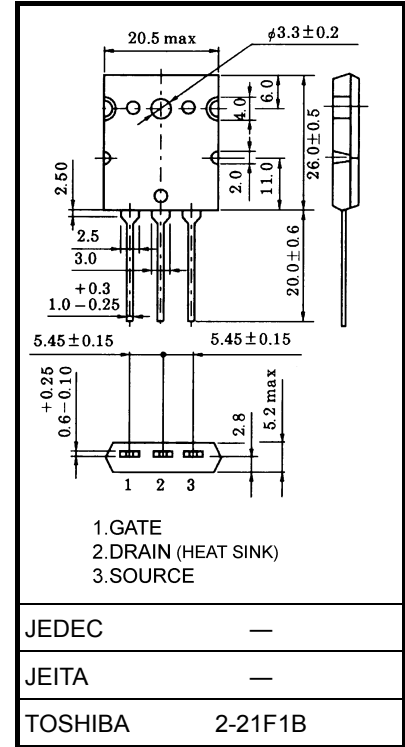
Chopper Regulator, DC-DC Converter and Motor Drive Applications

Unit: mm

- Low drain-source ON resistance : $R_{DS(ON)} = 0.08 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 14 S$ (typ.)
- Low leakage current : $I_{DSS} = 300 \mu A$ (max) ($V_{DS} = 300 V$)
- Enhancement mode : $V_{th} = 2.0 \sim 4.0 V$ ($V_{DS} = 10 V, I_D = 1 mA$)

Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|--|----------------|-----------|----------|------------|
| Drain-source voltage | | V_{DSS} | 300 | V |
| Drain-gate voltage ($R_{GS} = 20 k\Omega$) | | V_{DGR} | 300 | V |
| Gate-source voltage | | V_{GSS} | ± 30 | V |
| Drain current | DC (Note 1) | I_D | 32 | A |
| | Pulse (Note 1) | I_{DP} | 128 | |
| Drain power dissipation ($T_c = 25^\circ C$) | | P_D | 200 | W |
| Channel temperature | | T_{ch} | 150 | $^\circ C$ |
| Storage temperature range | | T_{stg} | -55~150 | $^\circ C$ |



| | |
|---------|---------|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-21F1B |

Weight: 9.75 g (typ.)

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Thermal Characteristics

| Characteristics | Symbol | Max | Unit |
|--|----------------|-------|----------------|
| Thermal resistance, channel to case | $R_{th(ch-c)}$ | 0.625 | $^\circ C / W$ |
| Thermal resistance, channel to ambient | $R_{th(ch-a)}$ | 35.7 | $^\circ C / W$ |

Note 1: Ensure that the channel temperature does not exceed 150°C.

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

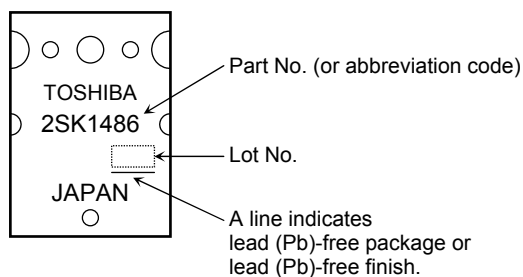
Electrical Characteristics (Ta = 25°C)

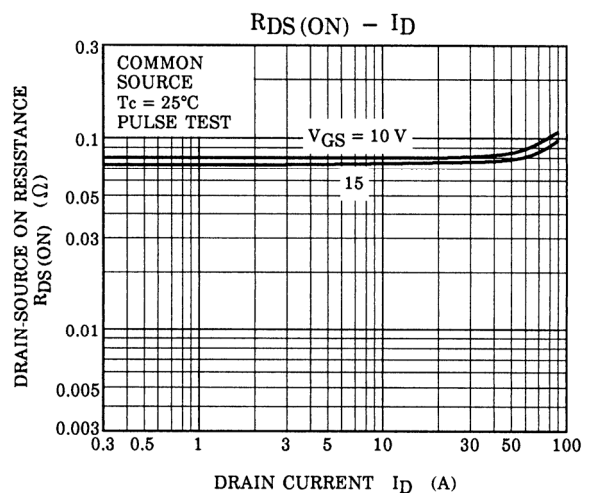
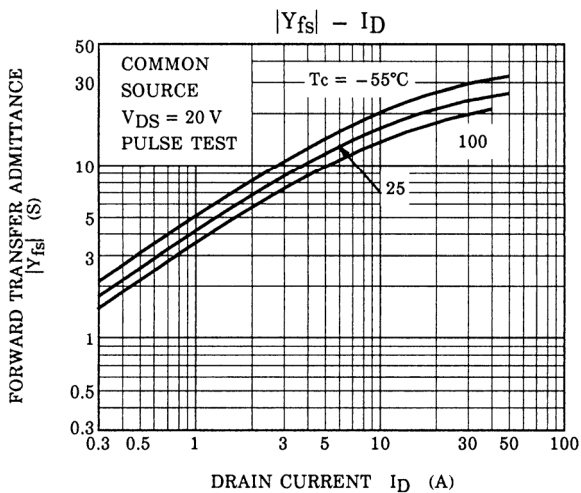
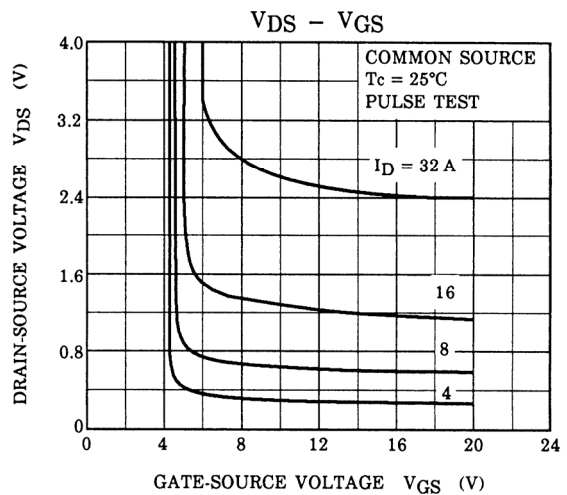
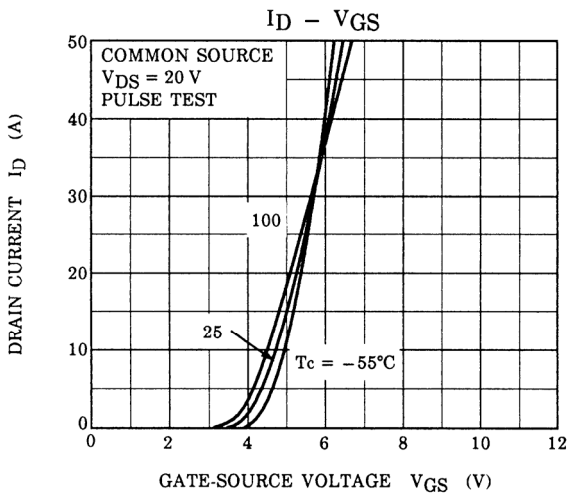
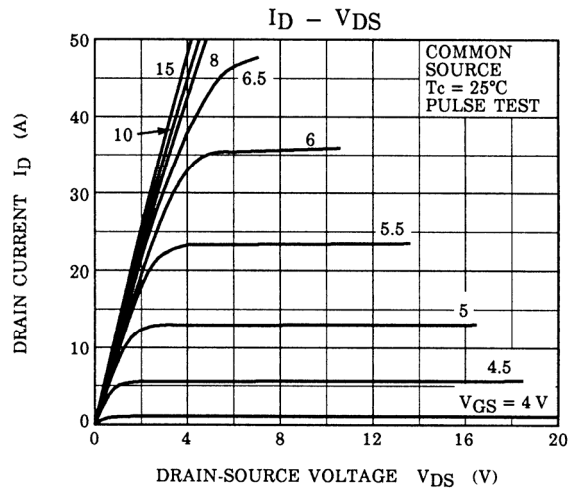
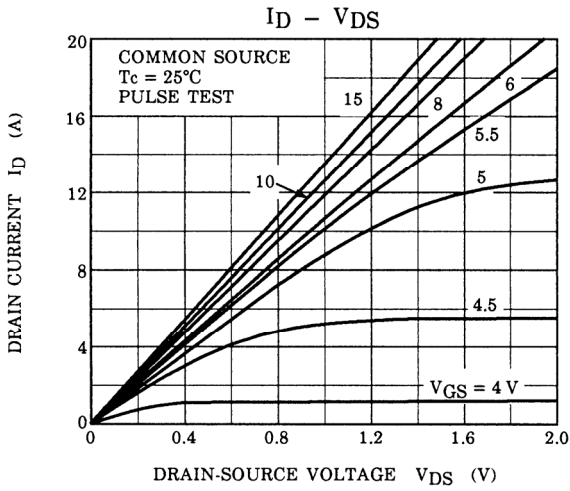
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---------------|---------------|--|-----|------|-----------|---------------|
| Gate leakage current | | I_{GSS} | $V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$ | — | — | ± 100 | nA |
| Drain cut-off current | | I_{DSS} | $V_{DS} = 300\text{ V}, V_{GS} = 0\text{ V}$ | — | — | 300 | μA |
| Drain-source breakdown voltage | | $V_{(BR)DSS}$ | $I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$ | 300 | — | — | V |
| Gate threshold voltage | | V_{th} | $V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$ | 2.0 | — | 4.0 | V |
| Drain-source ON resistance | | $R_{DS(ON)}$ | $I_D = 16\text{ A}, V_{GS} = 10\text{ V}$ | — | 0.08 | 0.095 | Ω |
| Forward transfer admittance | | $ Y_{fs} $ | $V_{DS} = 10\text{ V}, I_D = 16\text{ A}$ | 10 | 14 | — | S |
| Input capacitance | | C_{iss} | $V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ | — | 3500 | — | pF |
| Reverse transfer capacitance | | C_{rss} | | — | 800 | — | |
| Output capacitance | | C_{oss} | | — | 1250 | — | |
| Switching time | Rise time | t_r | <p>$I_D = 16\text{ A}$ $V_{GS} = 10\text{ V}$ 0 V 50Ω $R_L = 10\Omega$ $V_{DD} \approx 160\text{ V}$ V_{OUT} $Duty \leq 1\%, t_W = 10\mu\text{s}$</p> | — | 255 | — | ns |
| | Turn-on time | t_{on} | | — | 325 | — | |
| | Fall time | t_f | | — | 280 | — | |
| | Turn-off time | t_{off} | | — | 540 | — | |
| Total gate charge (Gate-source plus gate-drain) | | Q_g | $V_{DD} \approx 240\text{ V}, V_{GS} = 10\text{ V}, I_D = 32\text{ A}$ | — | 140 | — | nC |
| Gate-source charge | | Q_{gs} | | — | 60 | — | |
| Gate-drain ("miller") charge | | Q_{gd} | | — | 80 | — | |

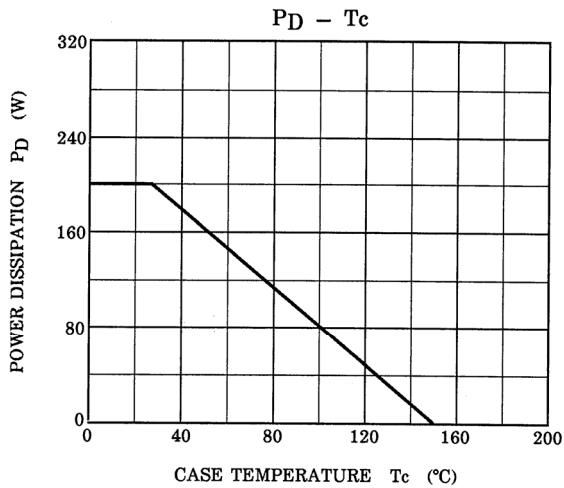
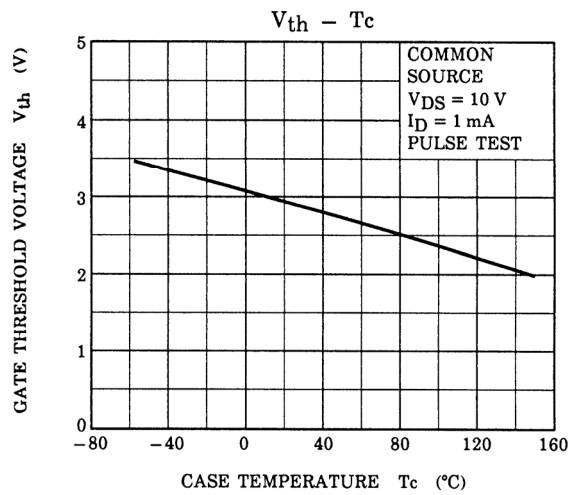
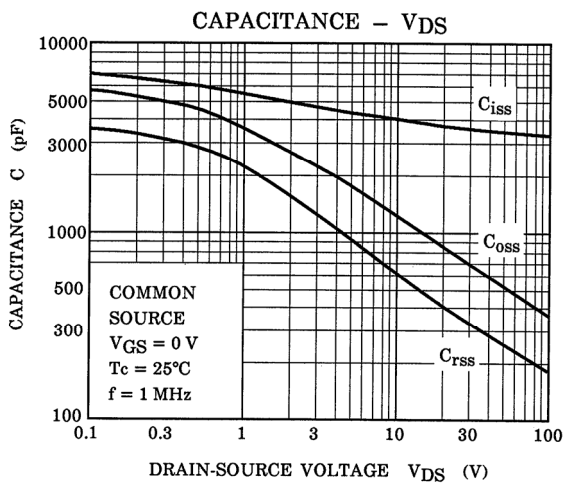
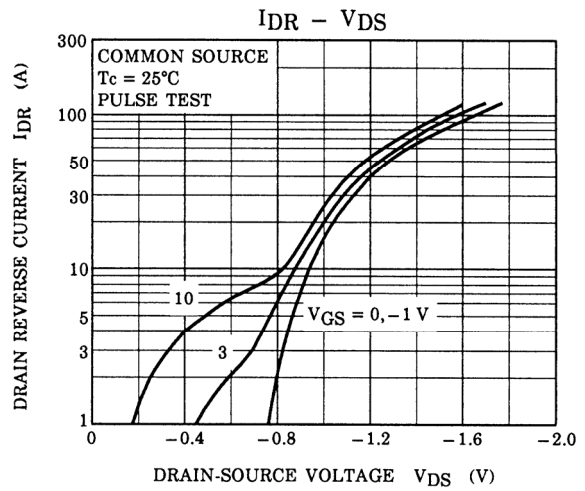
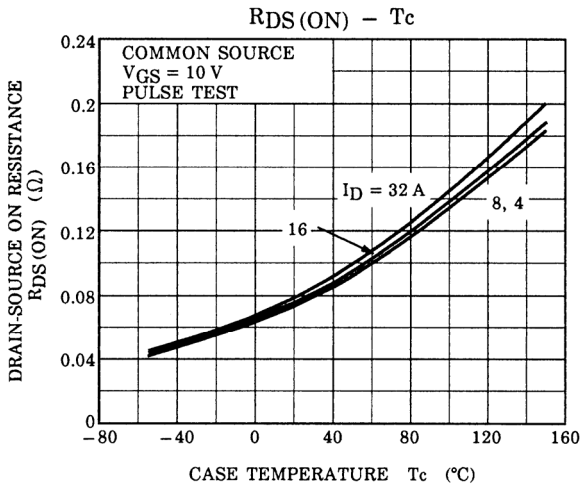
Source-Drain Ratings and Characteristics (Ta = 25°C)

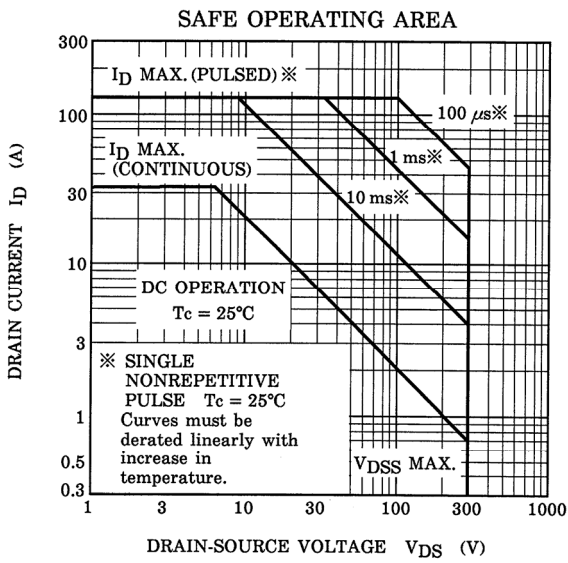
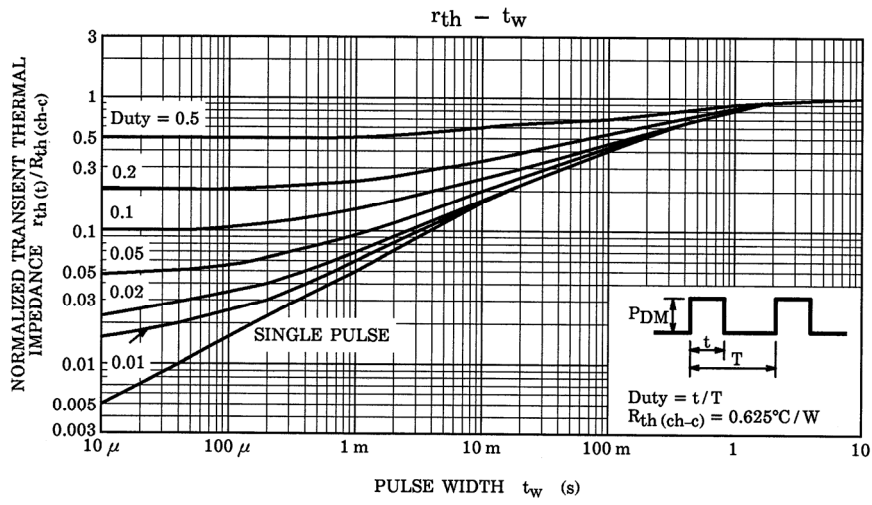
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|-----------|---|-----|------|------|---------------|
| Continuous drain reverse current (Note 1) | I_{DR} | — | — | — | 32 | A |
| Pulse drain reverse current (Note 1) | I_{DRP} | — | — | — | 128 | A |
| Forward voltage (diode) | V_{DSF} | $I_{DR} = 32\text{ A}, V_{GS} = 0\text{ V}$ | — | — | -1.8 | V |
| Reverse recovery time | t_{rr} | $I_{DR} = 32\text{ A}, V_{GS} = 0\text{ V}$ | — | 615 | — | ns |
| Reverse recovered charge | Q_{rr} | $dI_{DR} / dt = 100\text{ A} / \mu\text{s}$ | — | 6.8 | — | μC |

Marking









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20070701-EN

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