

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type (L²-π-MOSVI)

2SJ537

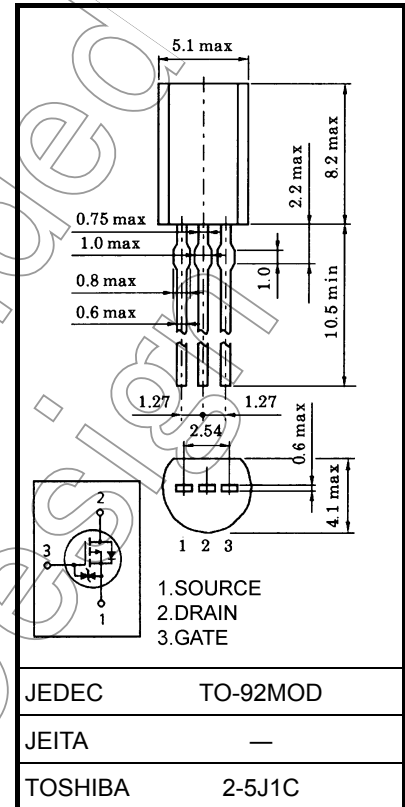
Chopper Regulator, DC-DC Converter and Motor Drive Applications

Unit: mm

- Low drain-source ON resistance : $R_{DS(ON)} = 0.16 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 3.5 S$ (typ.)
- Low leakage current : $I_{DSS} = -100 \mu A$ ($V_{DS} = -50 V$)
- Enhancement mode : $V_{th} = -0.8$ to $-2.0 V$ ($V_{DS} = -10 V, I_D = -1 mA$)

Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|--|----------------|-----------|----------|------|
| Drain-source voltage | | V_{DSS} | -50 | V |
| Drain-gate voltage ($R_{GS} = 20 k\Omega$) | | V_{DGR} | -50 | V |
| Gate-source voltage | | V_{GSS} | ± 20 | V |
| Drain current | DC (Note 1) | I_D | -5 | A |
| | Pulse (Note 1) | I_{DP} | -15 | A |
| Drain power dissipation | | P_D | 0.9 | W |
| Channel temperature | | T_{ch} | 150 | °C |
| Storage temperature range | | T_{stg} | -55~150 | °C |



Weight: 0.36 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 ambient | $R_{th(ch-a)}$ | 138 | °C / W |

Note 1: Please use devices on condition that the channel temperature is below 150°C.

This transistor is an electrostatic sensitive device.

Please handle with caution.

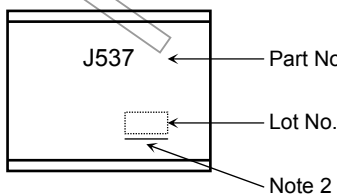
Electrical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---------------|---------------|---|------|------|----------|---------------|
| Gate leakage current | | I_{GSS} | $V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$ | — | — | ± 10 | μA |
| Drain cut-off current | | I_{DSS} | $V_{DS} = -50\text{ V}, V_{GS} = 0\text{ V}$ | — | — | -100 | μA |
| Drain-source breakdown voltage | | $V_{(BR)DSS}$ | $I_D = -10\text{ mA}, V_{GS} = 0\text{ V}$ | -50 | — | — | 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 | | $R_{DS(ON)}$ | $V_{GS} = -4\text{ V}, I_D = -1.3\text{ A}$ | — | 0.27 | 0.34 | Ω |
| | | | $V_{GS} = -10\text{ V}, I_D = -2.5\text{ A}$ | — | 0.16 | 0.19 | |
| Forward transfer admittance | | $ Y_{fs} $ | $V_{DS} = -10\text{ V}, I_D = -2.5\text{ A}$ | 1.5 | 3.5 | — | S |
| Input capacitance | | C_{iss} | $V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ | — | 470 | — | pF |
| Reverse transfer capacitance | | C_{rss} | | — | 60 | — | |
| Output capacitance | | C_{oss} | | — | 210 | — | |
| Switching time | Rise time | t_r | | — | 25 | — | ns |
| | Turn-on time | t_{on} | | — | 35 | — | |
| | Fall time | t_f | | — | 20 | — | |
| | Turn-off time | t_{off} | | — | 120 | — | |
| Total gate charge (Gate-source plus gate-drain) | | Q_g | $V_{DD} \approx -40\text{ V}, V_{GS} = -10\text{ V}, I_D = -5\text{ A}$ | — | 18 | — | nC |
| Gate-source charge | | Q_{gs} | | — | 13 | — | |
| Gate-drain ("miller") charge | | Q_{gd} | | — | 5 | — | |

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

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|-----------|---|-----|------|-----|------|
| Continuous drain reverse current (Note 1) | I_{DR} | — | — | — | -5 | A |
| Pulse drain reverse current (Note 1) | I_{DRP} | — | — | — | -15 | A |
| Forward voltage (diode) | V_{DSF} | $I_{DR} = -5\text{ A}, V_{GS} = 0\text{ V}$ | — | — | 1.5 | V |

Marking

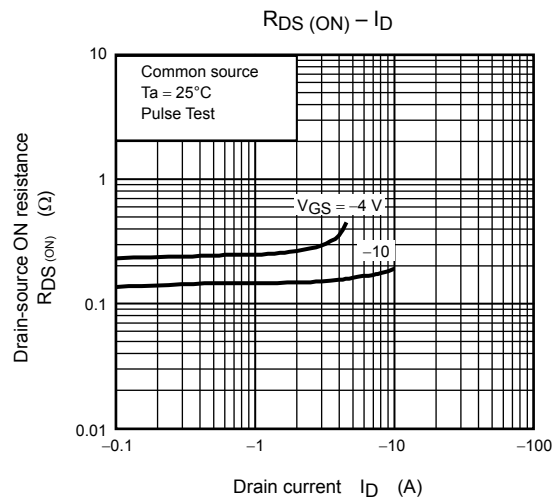
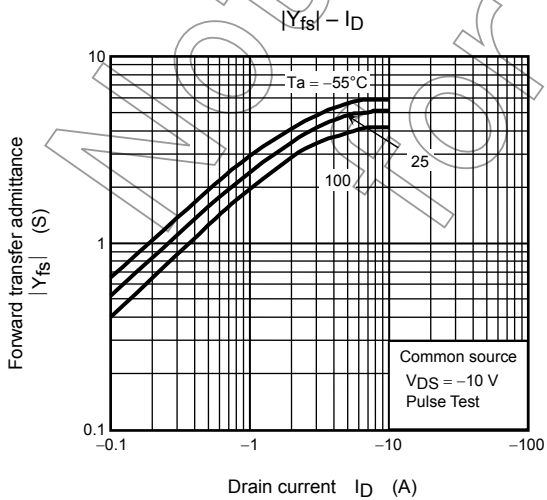
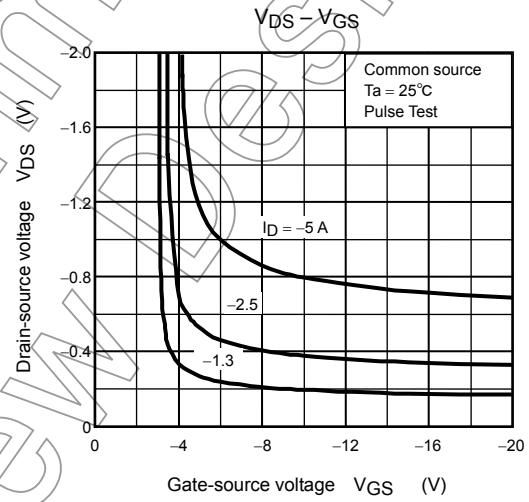
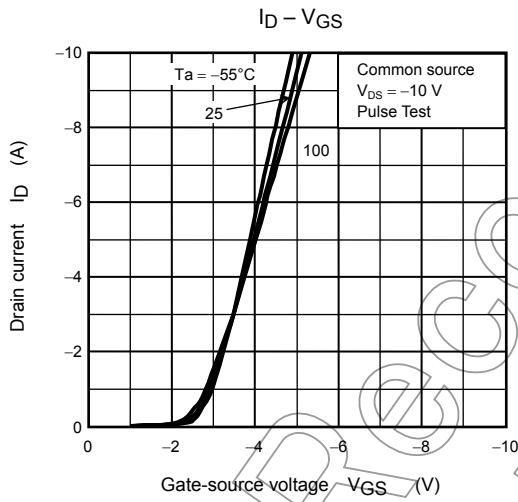
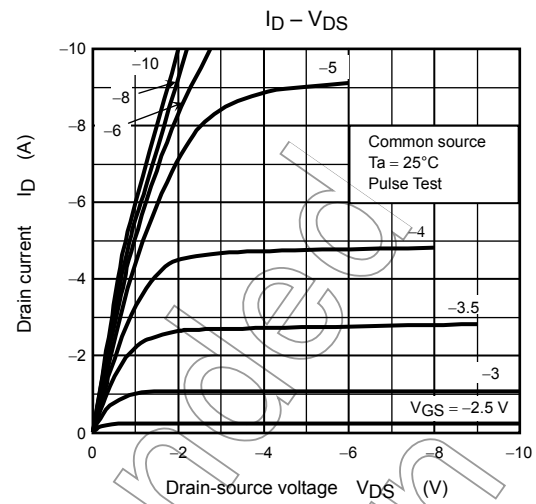
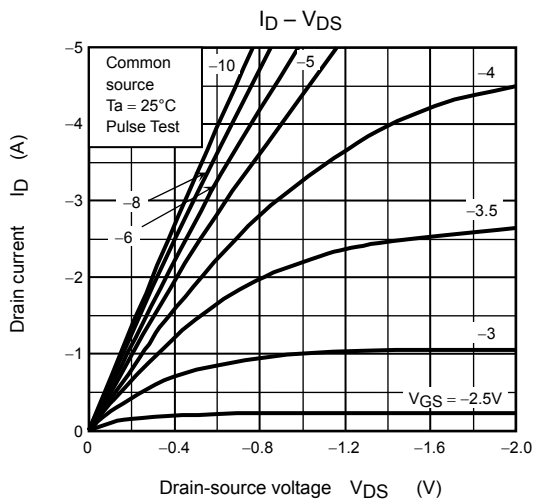


Note 2: A line under a Lot No. identifies the indication of product Labels.

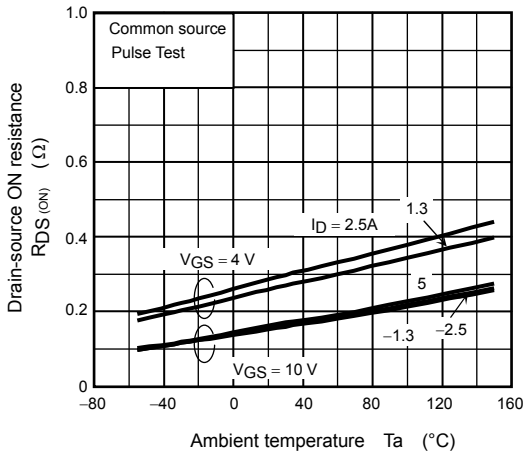
Not underlined: [[Pb]]/INCLUDES > MCV

Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

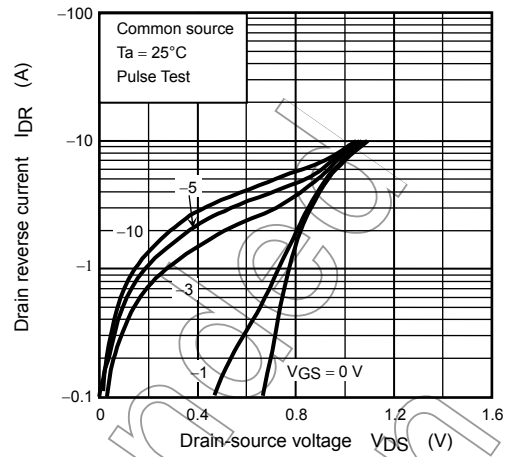
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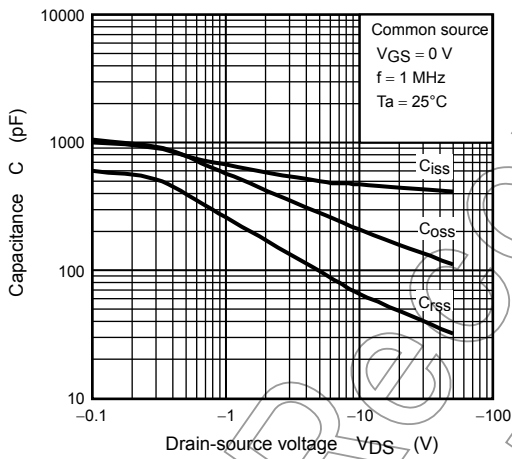
$R_{DS(ON)} - T_a$



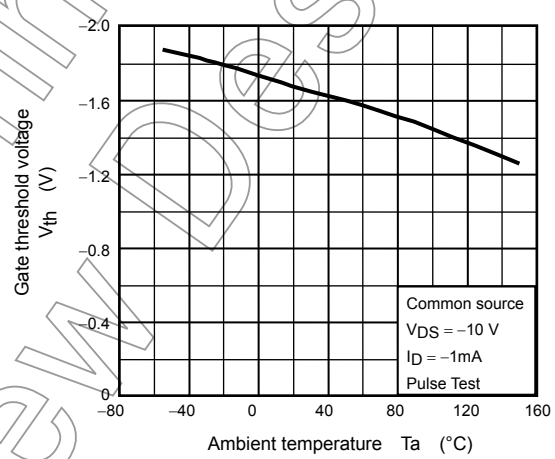
$I_{DR} - V_{DS}$



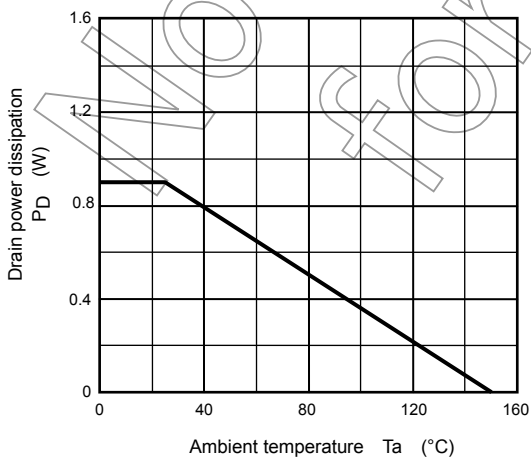
Capacitance - V_{DS}



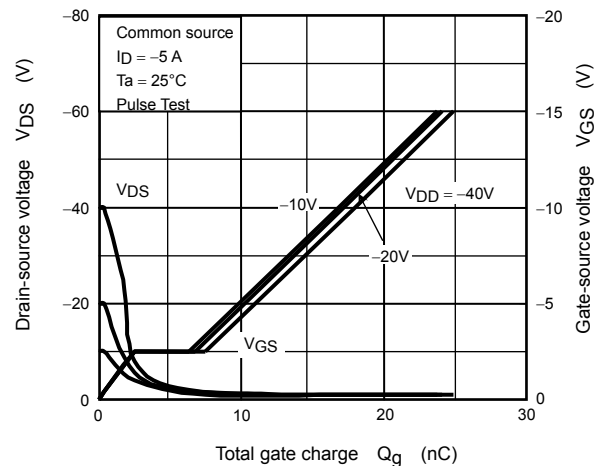
$V_{th} - T_a$

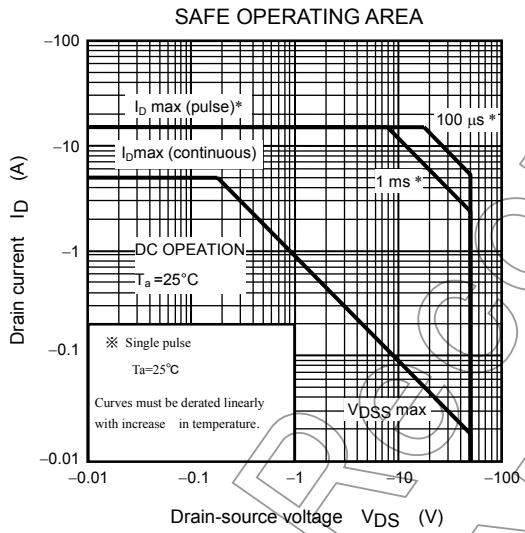
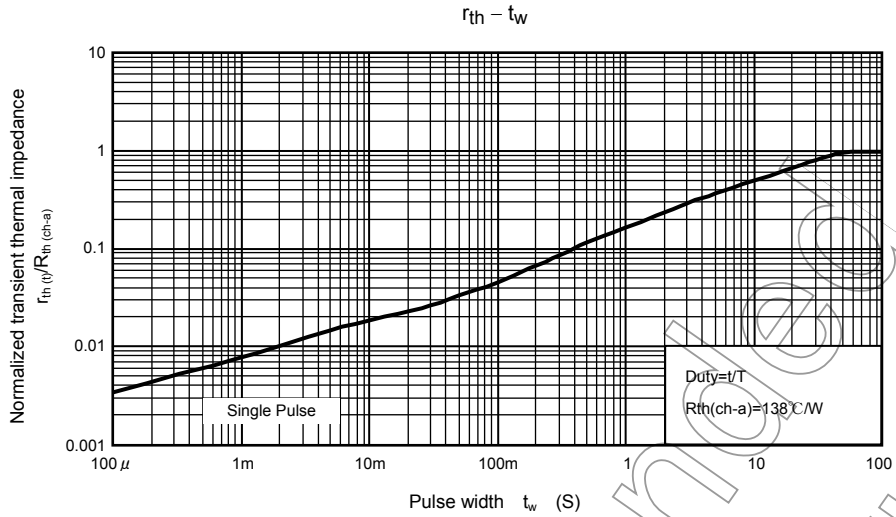


$P_D - T_a$



Dynamic input / output characteristics





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