

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type ( $L^2$ - $\pi$ -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 ( $T_a = 25^\circ C$ )

| 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                          |                | $V_{GSS}$ | $\pm 20$ | 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      | $^\circ C$ |
| Storage temperature range                    |                | $T_{stg}$ | -55~150  | $^\circ C$ |

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.).

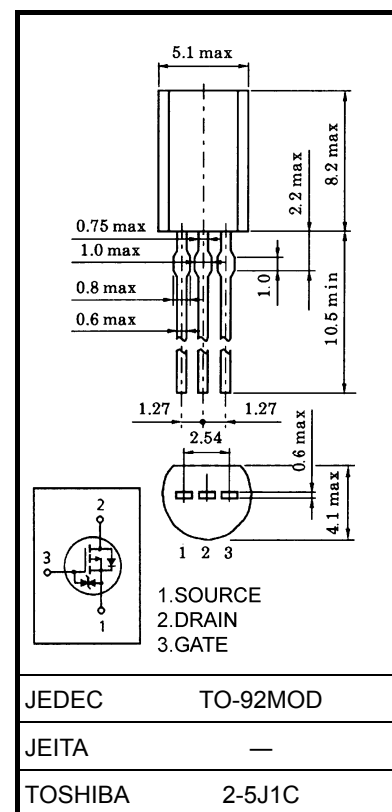
## Thermal Characteristics

| Characteristics                        | Symbol         | Max | Unit           |
|----------------------------------------|----------------|-----|----------------|
| Thermal resistance, channel to ambient | $R_{th(ch-a)}$ | 138 | $^\circ C / W$ |

Note 1: Please use devices on condition that the channel temperature is below  $150^\circ C$ .

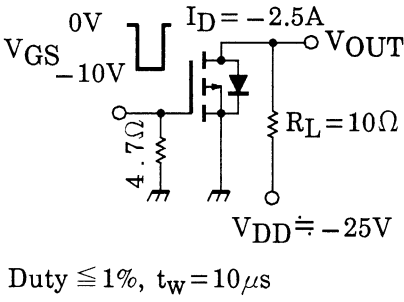
This transistor is an electrostatic sensitive device.

Please handle with caution.



Weight: 0.36 g (typ.)

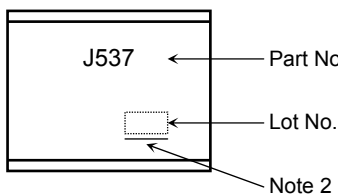
## Electrical Characteristics (Ta = 25°C)

| Characteristics                                 |               | Symbol         | Test Condition                                                                      | Min  | Typ. | Max      | Unit          |
|-------------------------------------------------|---------------|----------------|-------------------------------------------------------------------------------------|------|------|----------|---------------|
| Gate leakage current                            |               | $I_{GSS}$      | $V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$                                   | —    | —    | $\pm 10$ | $\mu\text{A}$ |
| Drain cut-off current                           |               | $I_{DSS}$      | $V_{DS} = -50 \text{ V}, V_{GS} = 0 \text{ V}$                                      | —    | —    | -100     | $\mu\text{A}$ |
| 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     | $\Omega$      |
|                                                 |               |                | $V_{GS} = -10 \text{ V}, I_D = -2.5 \text{ A}$                                      | —    | 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

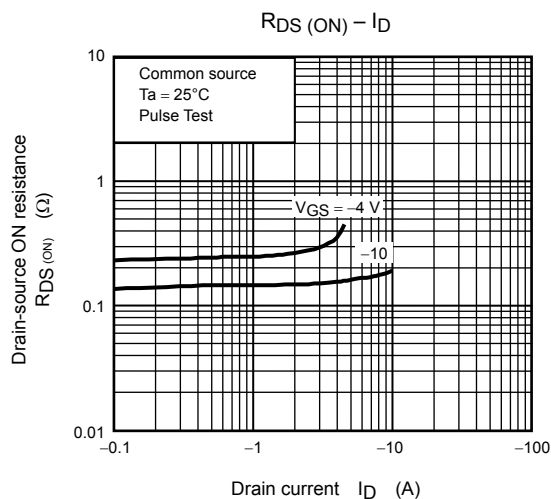
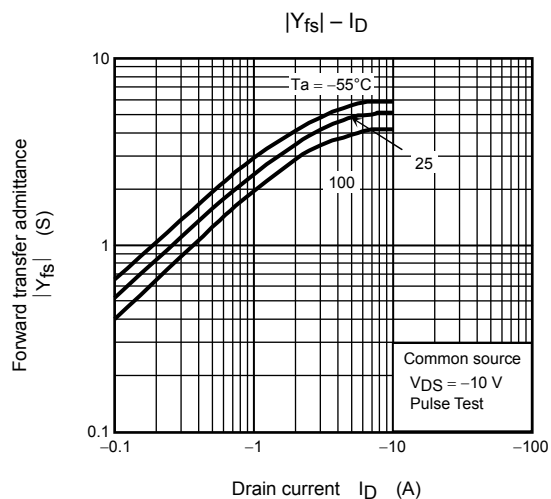
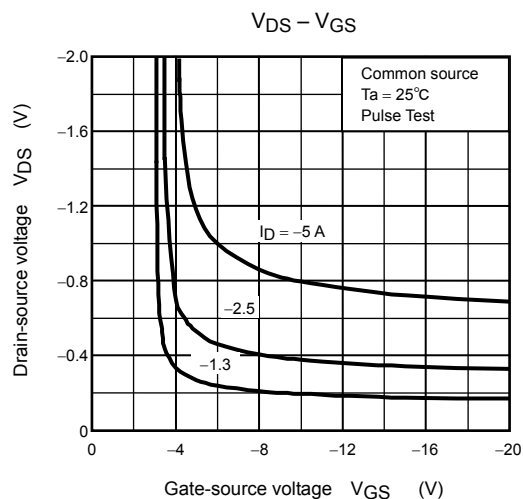
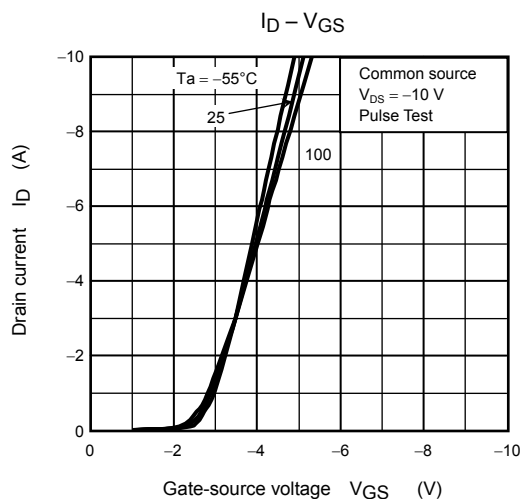
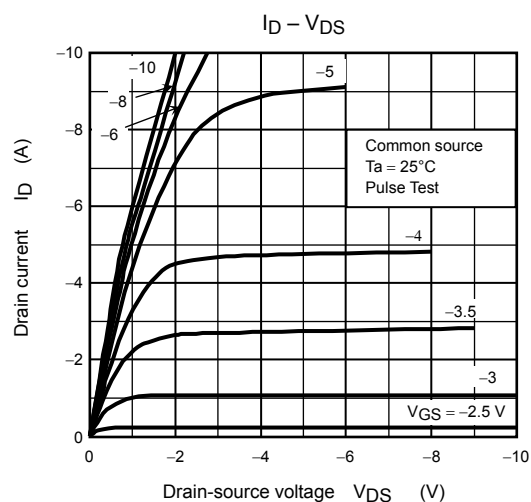
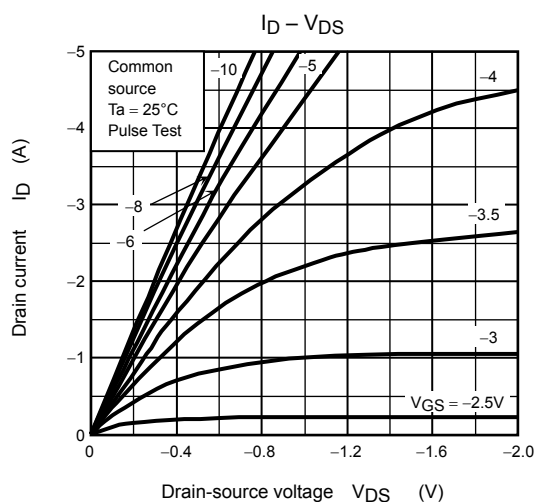


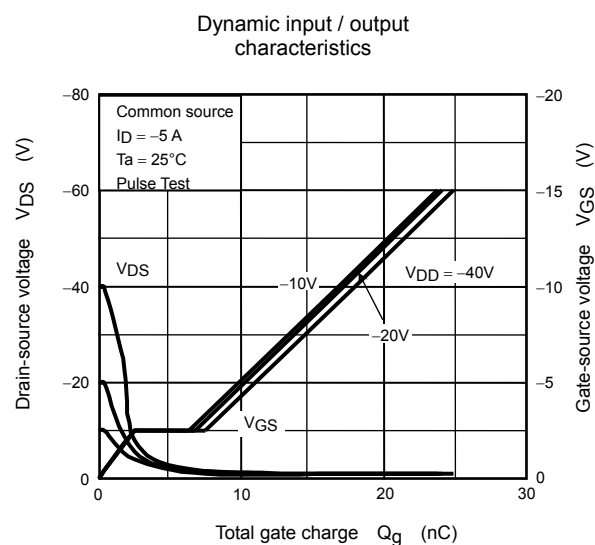
Note 2: A line under a Lot No. identifies the indication of product Labels.

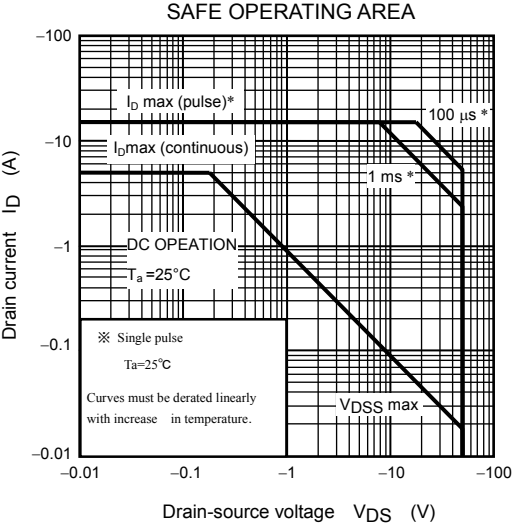
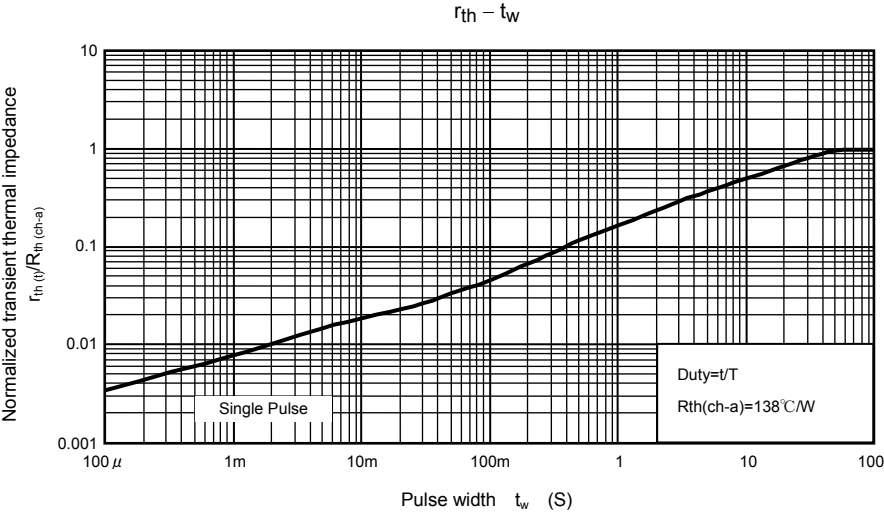
Not underlined: [[Pb]]/INCLUDES > MCV

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

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