

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

SSM6N04FU

High Speed Switch Applications

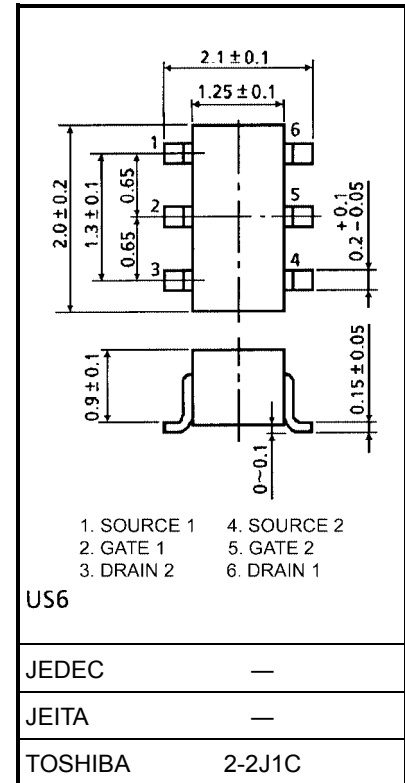
- With built-in gate-source resistor: $R_{GS} = 1\text{ M}\Omega$ (typ.)
- 2.5 V gate drive
- Low gate threshold voltage: $V_{th} = 0.7\sim 1.3\text{ V}$
- Small package

Maximum Ratings ($T_a = 25^\circ\text{C}$) (Q1, Q2 common)

| Characteristics | Symbol | Rating | Unit |
|---------------------------|-----------------|---------|------------------|
| Drain-source voltage | V_{DS} | 20 | V |
| Gate-source voltage | V_{GSS} | 10 | V |
| DC drain current | I_D | 100 | mA |
| Drain power dissipation | P_D (Note) | 200 | mW |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55~150 | $^\circ\text{C}$ |

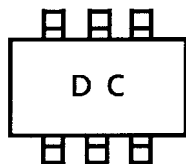
Note: Total rating

Unit: mm

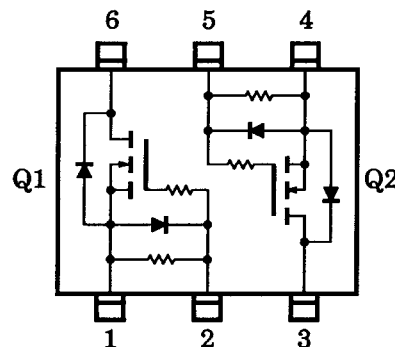


Weight: 6.8 mg (typ.)

Marking

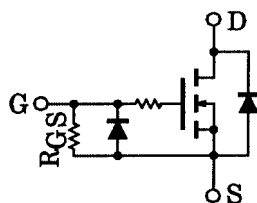


Pin Assignment (top view)



(Q1, Q2 common)

Equivalent Circuit

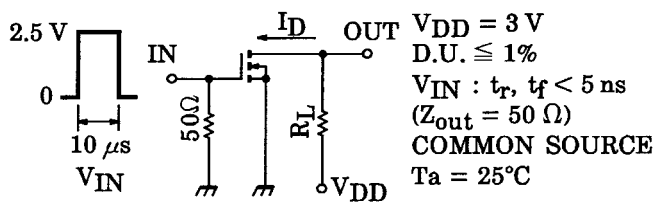


Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

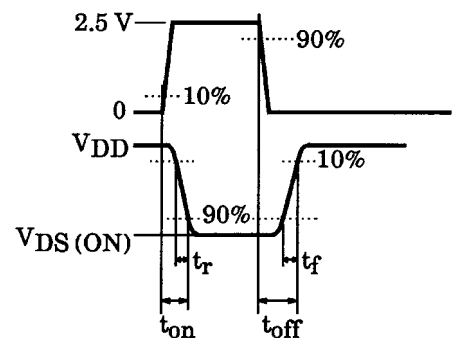
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------|---------------|---|--|------|------|---------------|---------------|
| Gate leakage current | I_{GSS} | $V_{GS} = 10\text{ V}, V_{DS} = 0$ | — | — | 15 | μA | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $I_D = 100\ \mu\text{A}, V_{GS} = 0$ | 20 | — | — | V | |
| Drain cut-off current | I_{DSS} | $V_{DS} = 20\text{ V}, V_{GS} = 0$ | — | — | 1 | μA | |
| Gate threshold voltage | V_{th} | $V_{DS} = 3\text{ V}, I_D = 0.1\text{ mA}$ | 0.7 | — | 1.3 | V | |
| Forward transfer admittance | $ Y_{fs} $ | $V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$ | 25 | 50 | — | mS | |
| Drain-source ON resistance | $R_{DS(ON)}$ | $I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$ | — | 4 | 12 | Ω | |
| Input capacitance | C_{iss} | $V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$ | — | 11.0 | — | pF | |
| Reverse transfer capacitance | C_{rss} | $V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$ | — | 3.3 | — | pF | |
| Output capacitance | C_{oss} | $V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$ | — | 9.3 | — | pF | |
| Switching time | Turn-on time | t_{on} | $V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 2.5\text{ V}$ | — | 0.16 | — | μs |
| | Turn-off time | t_{off} | $V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 2.5\text{ V}$ | — | 0.19 | — | |
| Gate-source resistor | R_{GS} | $V_{GS} = 0\sim 10\text{ V}$ | 0.7 | 1.0 | 1.3 | M Ω | |

Switching Time Test Circuit

(a) Test circuit

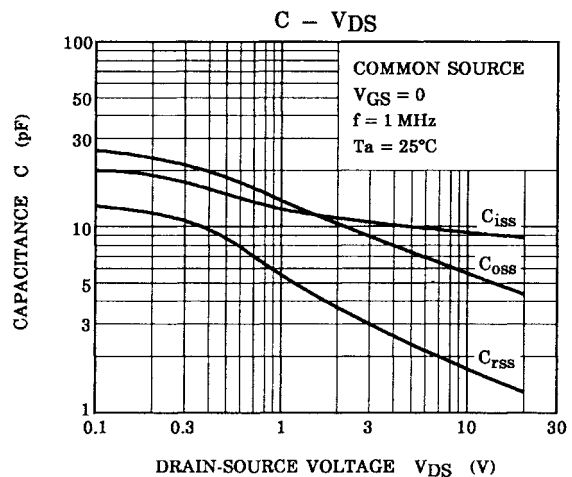
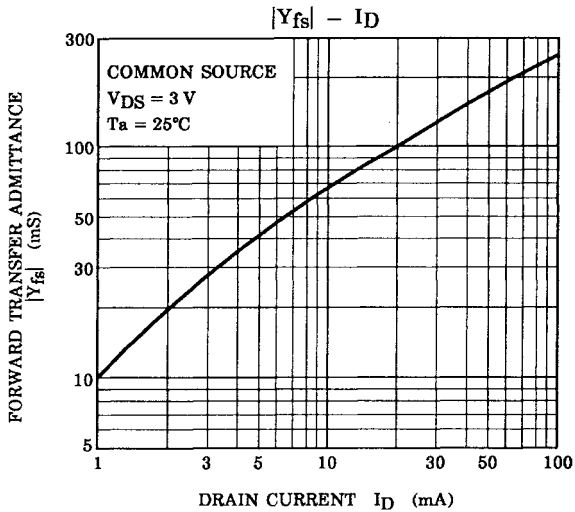
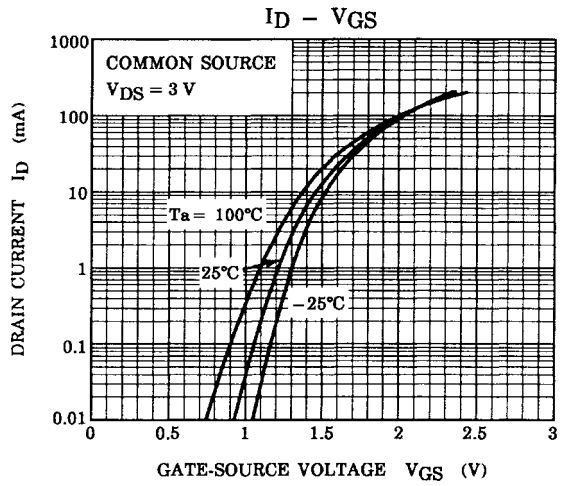
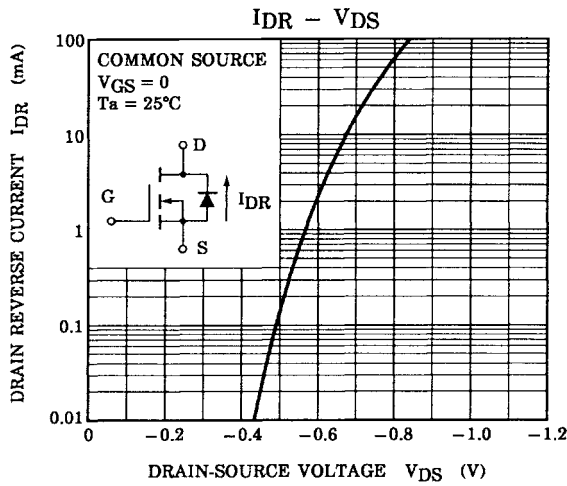
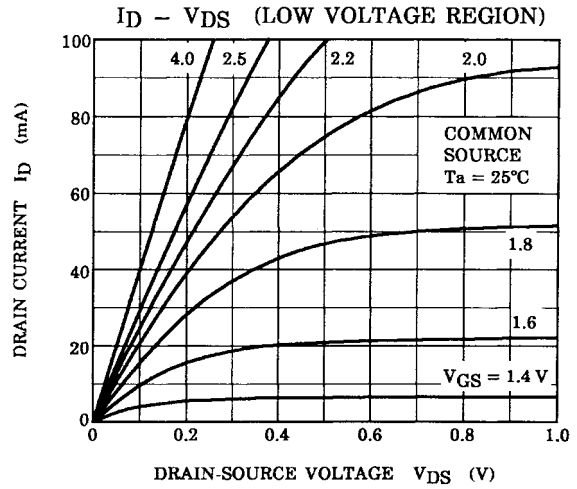
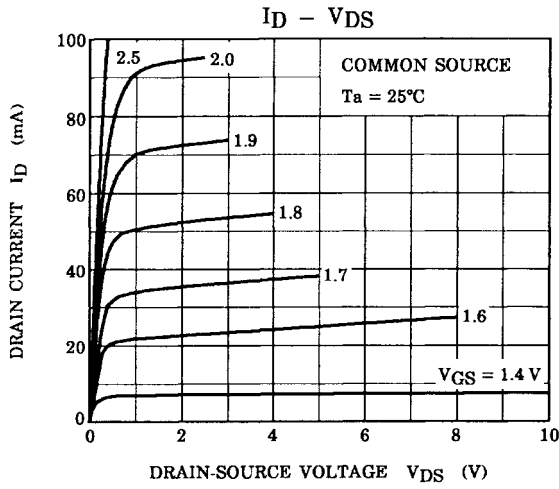


(b) V_{IN}
 V_{GS}

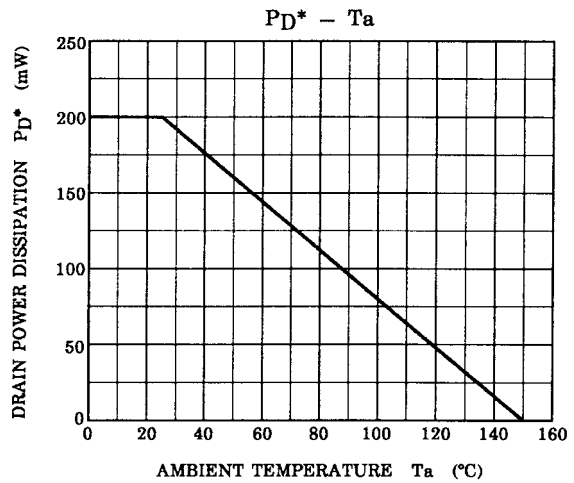
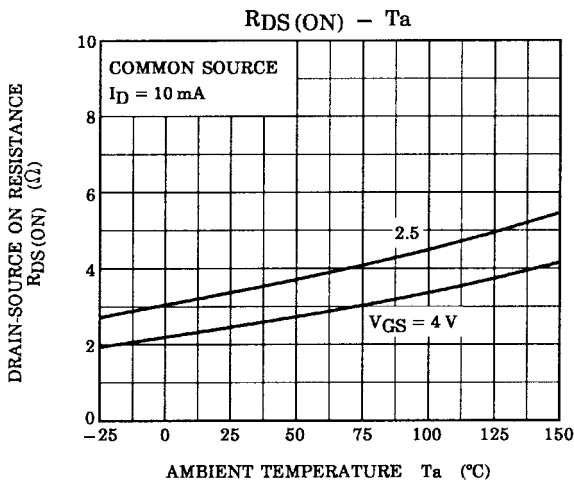
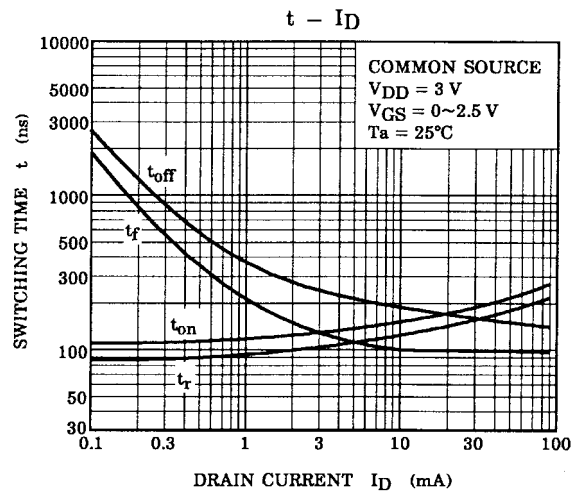
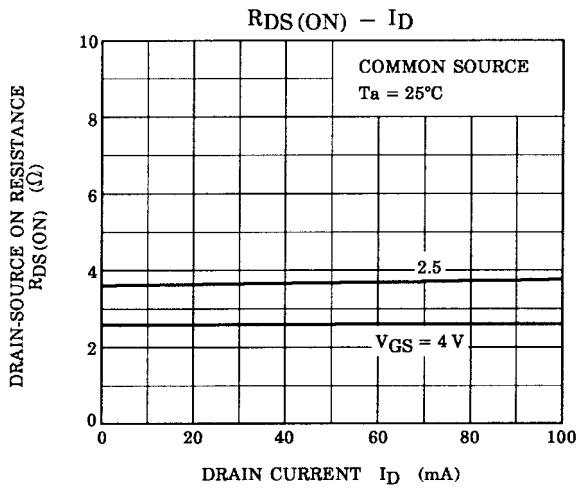


(c) V_{OUT}
 V_{DS}

(Q1, Q2 common)



(Q1, Q2 common)



*: Total rating

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