

TPCF8101

Notebook PC Applications
 Portable Equipment Applications

- Low drain-source ON resistance: $R_{DS(ON)} = 22 \text{ m}\Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 14 \text{ S}$ (typ.)
- Low leakage current: $I_{DSS} = -10 \text{ }\mu\text{A}$ (max) ($V_{DS} = -12 \text{ V}$)
- Enhancement-model: $V_{th} = -0.5 \text{ to } -1.2 \text{ V}$
 ($V_{DS} = -10 \text{ V}$, $I_D = -200 \text{ }\mu\text{A}$)

Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|--|-----------------|-----------|---------|------|
| Drain-source voltage | | V_{DSS} | -12 | V |
| Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$) | | V_{DGR} | -12 | V |
| Gate-source voltage | | V_{GSS} | ± 8 | V |
| Drain current | DC (Note 1) | I_D | -6 | A |
| | Pulsed (Note 1) | I_{DP} | -24 | |
| Drain power dissipation (t = 5 s) (Note 2a) | | P_D | 2.5 | W |
| Drain power dissipation (t = 5 s) (Note 2b) | | P_D | 0.7 | W |
| Single pulse avalanche energy (Note 3) | | E_{AS} | 6.3 | mJ |
| Avalanche current | | I_{AR} | -3 | A |
| Repetitive avalanche energy (Note 4) | | E_{AR} | 0.25 | mJ |
| Channel temperature | | T_{ch} | 150 | °C |
| Storage temperature range | | T_{stg} | -55~150 | °C |

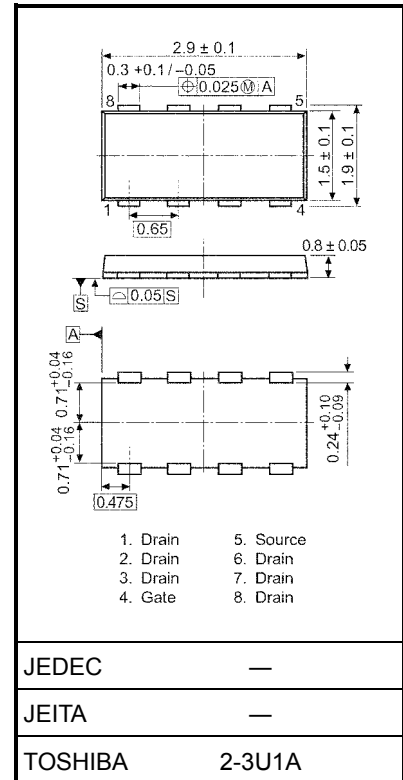
Thermal Characteristics

| Characteristics | Symbol | Max | Unit |
|---|----------------|-------|------|
| Thermal resistance, channel to ambient (t = 5 s) (Note 2a) | $R_{th(ch-a)}$ | 50.0 | °C/W |
| Thermal resistance, channel to ambient (t = 5 s) (Note 2b) | $R_{th(ch-a)}$ | 178.6 | °C/W |

Note: For (Note 1), (Note 2), (Note 3), (Note 4) and (Note 5), please refer to the next page.

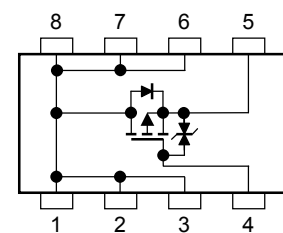
This transistor is an electrostatic sensitive device. Please handle with caution.

Unit: mm

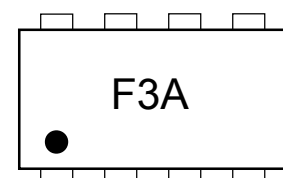


Weight: 0.011 g (typ.)

Circuit Configuration



Marking (Note 5)



Electrical Characteristics (Ta = 25°C)

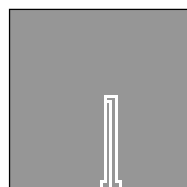
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---------------|---------------|---|------|------|----------|---------------|
| Gate leakage current | | I_{GSS} | $V_{GS} = \pm 8 \text{ V}, V_{DS} = 0 \text{ V}$ | — | — | ± 10 | μA |
| Drain cut-off current | | I_{DSS} | $V_{DS} = -12 \text{ V}, V_{GS} = 0 \text{ V}$ | — | — | -10 | μA |
| Drain-source breakdown voltage | | $V_{(BR)DSS}$ | $I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$ | -12 | — | — | V |
| | | $V_{(BR)DSX}$ | $I_D = -10 \text{ mA}, V_{GS} = 8 \text{ V}$ | -4 | — | — | |
| Gate threshold voltage | | V_{th} | $V_{DS} = -10 \text{ V}, I_D = -200 \mu\text{A}$ | -0.5 | — | -1.2 | V |
| Drain-source ON resistance | | $R_{DS(ON)}$ | $V_{GS} = -1.8 \text{ V}, I_D = -1.5 \text{ A}$ | — | 60 | 85 | m Ω |
| | | $R_{DS(ON)}$ | $V_{GS} = -2.5 \text{ V}, I_D = -3.0 \text{ A}$ | — | 32 | 40 | |
| | | $R_{DS(ON)}$ | $V_{GS} = -4.5 \text{ V}, I_D = -3.0 \text{ A}$ | — | 22 | 28 | |
| Forward transfer admittance | | $ Y_{fs} $ | $V_{DS} = -10 \text{ V}, I_D = -3.0 \text{ A}$ | 7 | 14 | — | S |
| Input capacitance | | C_{iss} | $V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$ | — | 1600 | — | pF |
| Reverse transfer capacitance | | C_{rss} | | — | 260 | — | |
| Output capacitance | | C_{oss} | | — | 335 | — | |
| Switching time | Rise time | t_r | | — | 7 | — | ns |
| | Turn-on time | t_{on} | | — | 13 | — | |
| | Fall time | t_f | | — | 21 | — | |
| | Turn-off time | t_{off} | | — | 68 | — | |
| Total gate charge (gate-source plus gate-drain) | | Q_g | $V_{DD} \approx -10 \text{ V}, V_{GS} = -5 \text{ V}, I_D = -6.0 \text{ A}$ | — | 18.0 | — | nC |
| Gate-source charge | | Q_{gs} | | — | 14.5 | — | |
| Gate-drain ("miller") charge | | Q_{gd} | | — | 3.5 | — | |

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

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------|----------------|-----------|---|-----|------|-----|------|
| Drain reverse current | Pulse (Note 1) | I_{DRP} | — | — | — | -24 | A |
| Forward voltage (diode) | | V_{DSF} | $I_{DR} = -6.0 \text{ A}, V_{GS} = 0 \text{ V}$ | — | — | 1.2 | V |

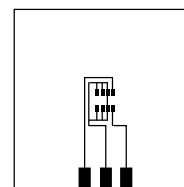
Note 1: Please use devices on condition that the channel temperature is below 150°C.

Note 2: (a) Device mounted on a glass-epoxy board (a) (b) Device mounted on a glass-epoxy board (b)



(a)

FR-4
25.4 × 25.4 × 0.8
Unit: (mm)



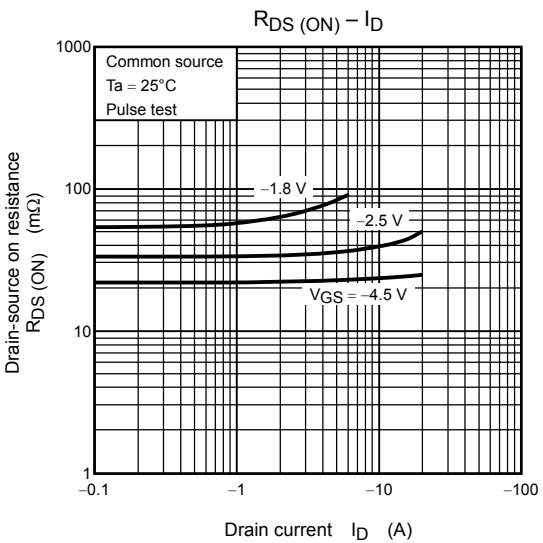
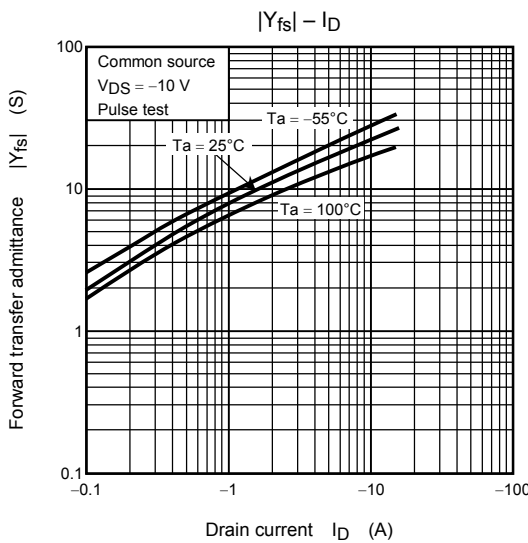
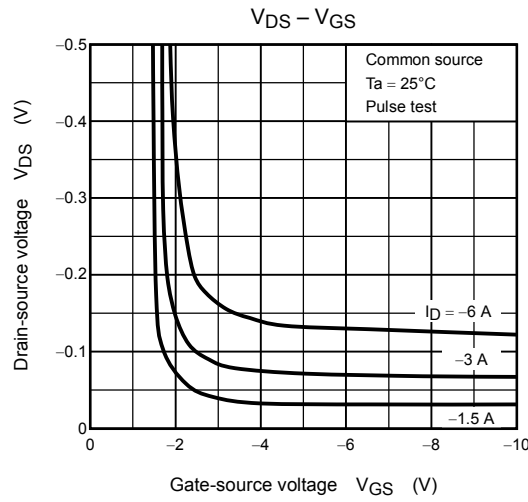
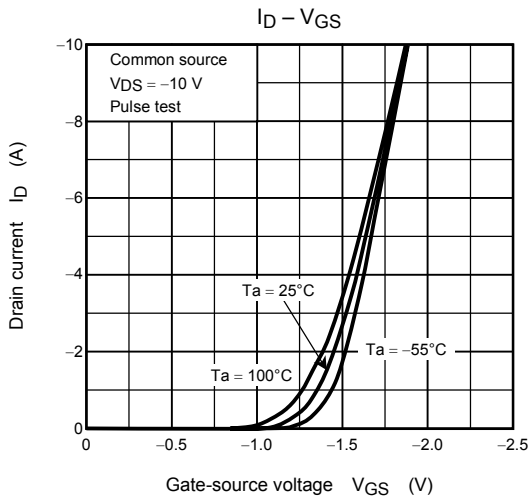
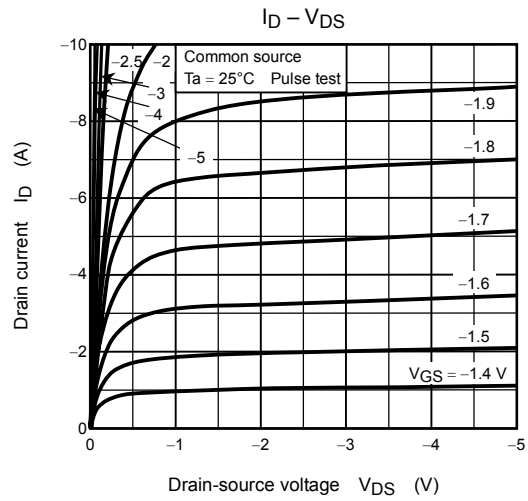
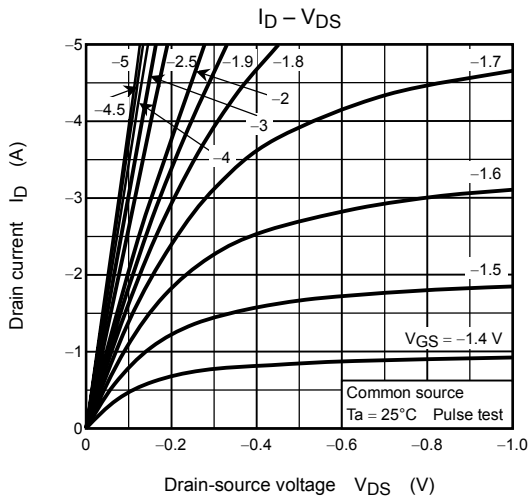
(b)

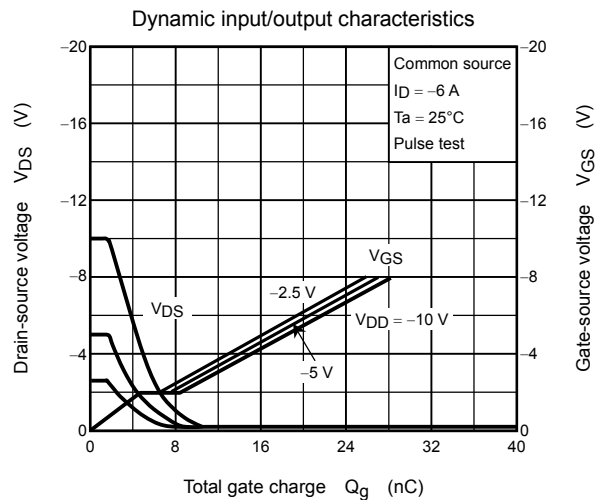
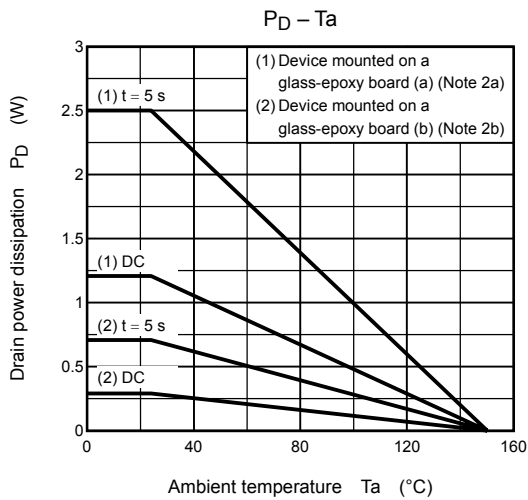
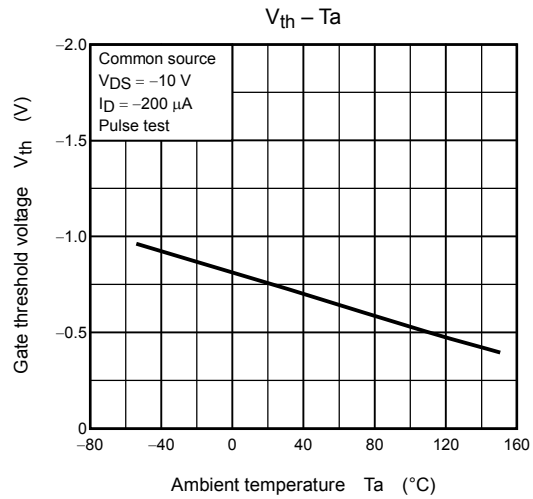
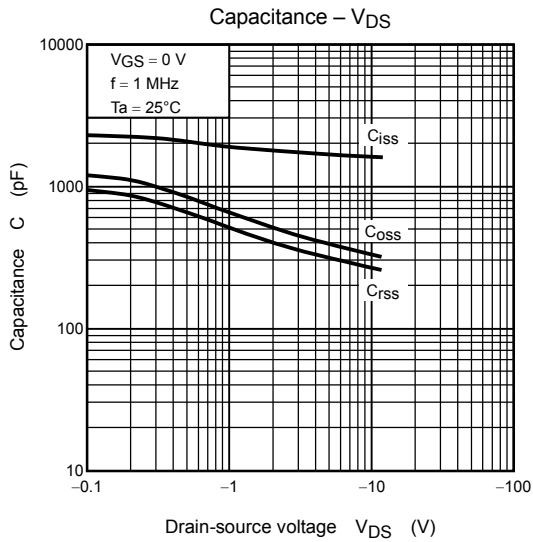
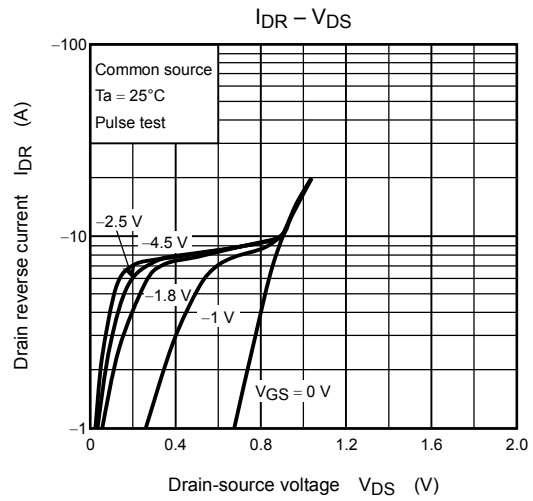
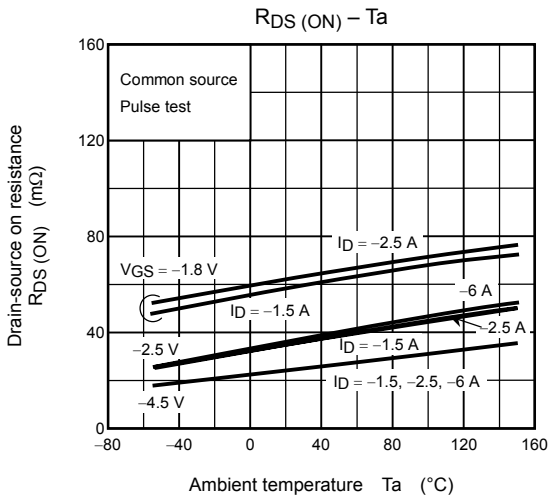
FR-4
25.4 × 25.4 × 0.8
Unit: (mm)

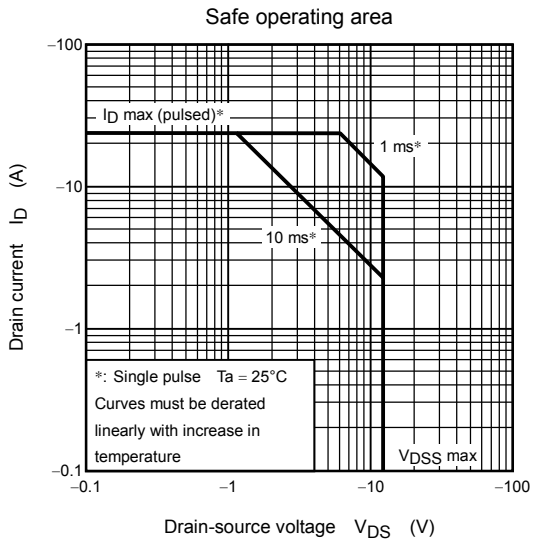
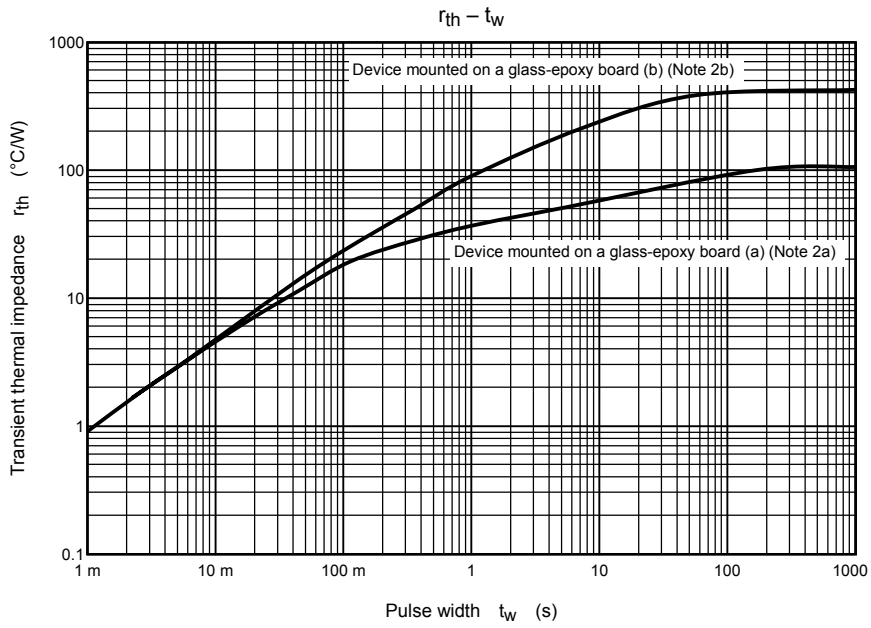
Note 3: $V_{DD} = -10 \text{ V}, T_{ch} = 25^\circ\text{C}$ (initial), $L = 0.5 \text{ mH}, R_G = 25 \Omega, I_{AR} = -3.0 \text{ A}$

Note 4: Repetitive rating: pulse width limited by Max. Channel temperature.

Note 5: Black round marking "●" locates on the left lower side of parts number "F3A" indicates terminal No.1.







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