

TPC8210

Lithium Ion Battery Applications
 Portable Equipment Applications
 Notebook PC Applications

- Low drain-source ON resistance: $R_{DS(ON)} = 11 \text{ m}\Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 13 \text{ S}$ (typ.)
- Low leakage current: $I_{DSS} = 10 \text{ }\mu\text{A}$ (max) ($V_{DS} = 30 \text{ V}$)
- Enhancement-mode: $V_{th} = 1.3 \text{ to } 2.5 \text{ V}$ ($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

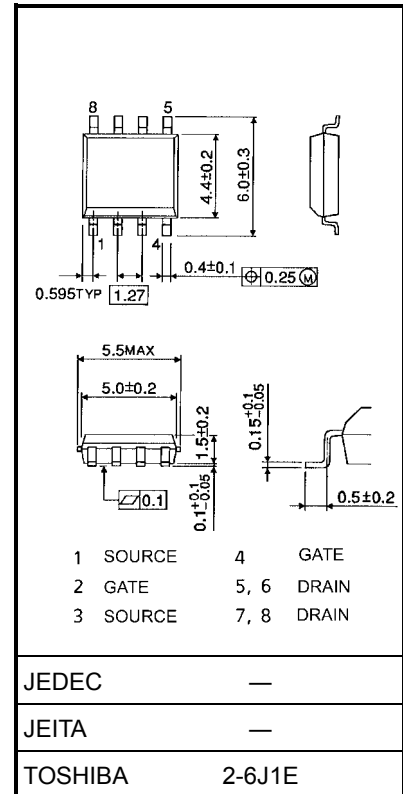
Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristics | | Symbol | Rating | Unit |
|---|---|------------|------------|------------------|
| Drain-source voltage | | V_{DSS} | 30 | V |
| Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$) | | V_{DGR} | 30 | V |
| Gate-source voltage | | V_{GSS} | ± 20 | V |
| Drain current | D C (Note 1) | I_D | 8 | A |
| | Pulse (Note 1) | I_{DP} | 32 | |
| Drain power dissipation ($t = 10 \text{ s}$) (Note 2a) | Single-device operation (Note 3a) | $P_{D(1)}$ | 1.5 | W |
| | Single-device value at dual operation (Note 3b) | $P_{D(2)}$ | 1.1 | |
| Drain power dissipation ($t = 10 \text{ s}$) (Note 2b) | Single-device operation (Note 3a) | $P_{D(1)}$ | 0.75 | W |
| | Single-device value at dual operation (Note 3b) | $P_{D(2)}$ | 0.45 | |
| Single pulse avalanche energy (Note 4) | | E_{AS} | 83.2 | mJ |
| Avalanche current | | I_{AR} | 8 | A |
| Repetitive avalanche energy Single-device value at dual operation (Note 2a, 3b, 5) | | E_{AR} | 0.1 | mJ |
| Channel temperature | | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

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

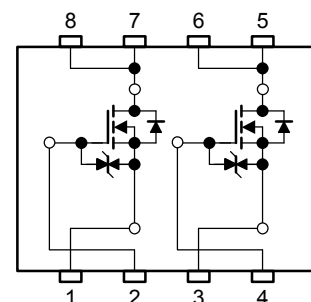
This transistor is an electrostatic sensitive device. Please handle with caution.

Unit: mm



Weight: 0.08 g (typ.)

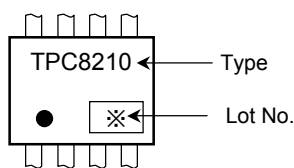
Circuit Configuration



Thermal Characteristics

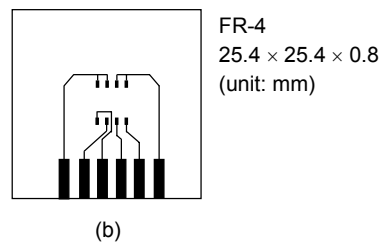
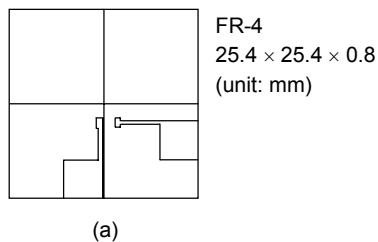
| Characteristics | | Symbol | Max | Unit |
|--|---|----------------------------|------|------|
| Thermal resistance, channel to ambient (t = 10 s) | Single-device operation (Note 3a) | R _{th (ch-a)} (1) | 83.3 | °C/W |
| | Single-device value at dual operation (Note 3b) | R _{th (ch-a)} (2) | 114 | |
| Thermal resistance, channel to ambient (t = 10 s) | Single-device operation (Note 3a) | R _{th (ch-a)} (1) | 167 | |
| | Single-device value at dual operation (Note 3b) | R _{th (ch-a)} (2) | 278 | |

Marking (Note 6)



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)

Note 3:

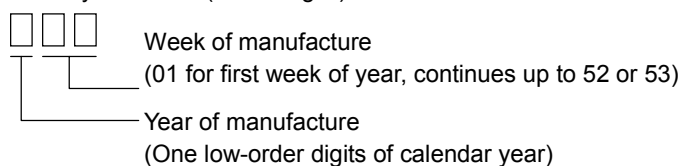
- a) The power dissipation and thermal resistance values are shown for a single device.
(During single-device operation, power is only applied to one device.)
- b) The power dissipation and thermal resistance values are shown for a single device.
(During dual operation, power is evenly applied to both devices.)

Note 4: $V_{DD} = 24 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 1.0 \text{ mH}$, $R_G = 25 \Omega$, $I_{AR} = 8 \text{ A}$

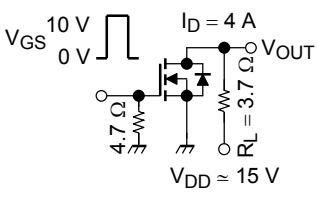
Note 5: Repetitive rating: pulse width limited by maximum channel temperature

Note 6: • on lower left of the marking indicates Pin 1.

※ Weekly code: (Three digits)

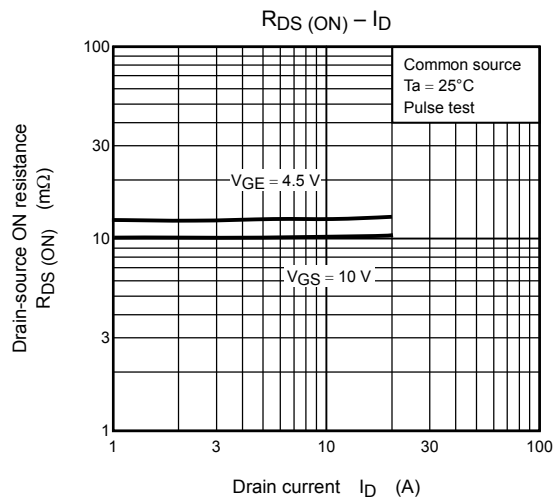
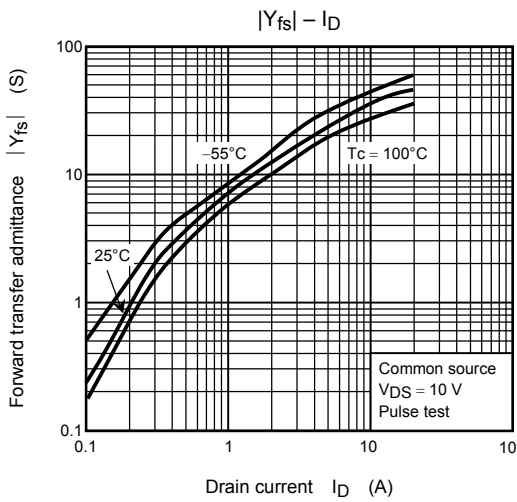
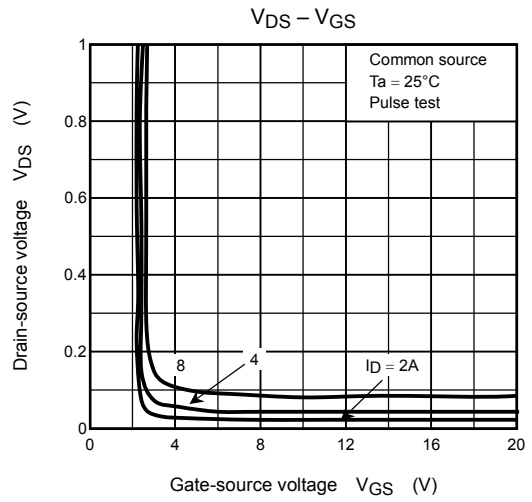
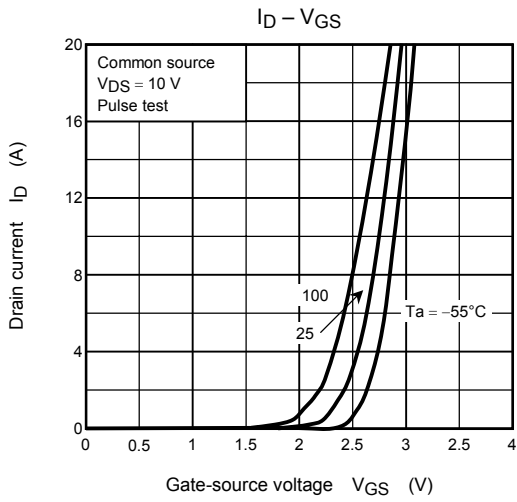
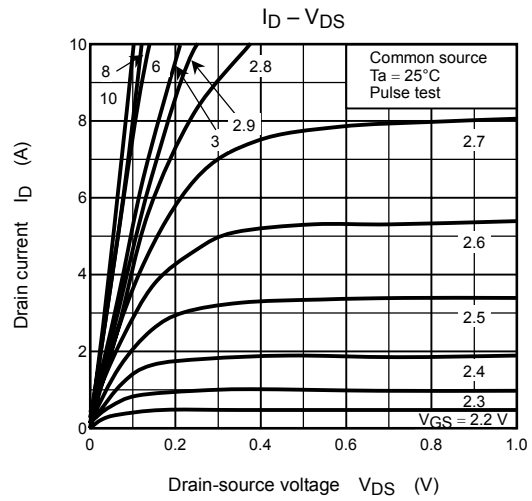
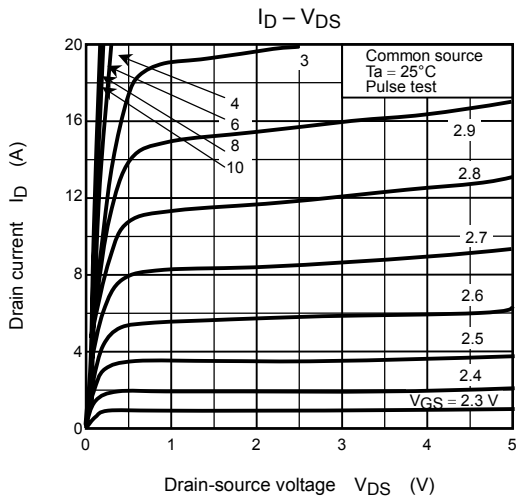


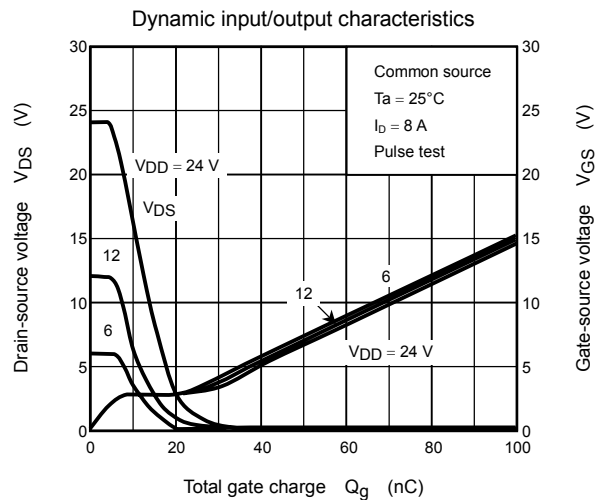
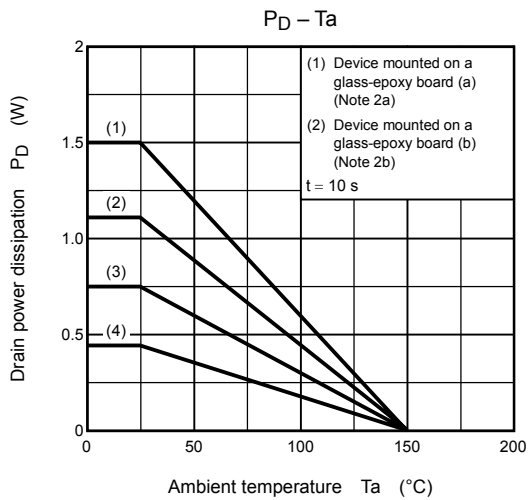
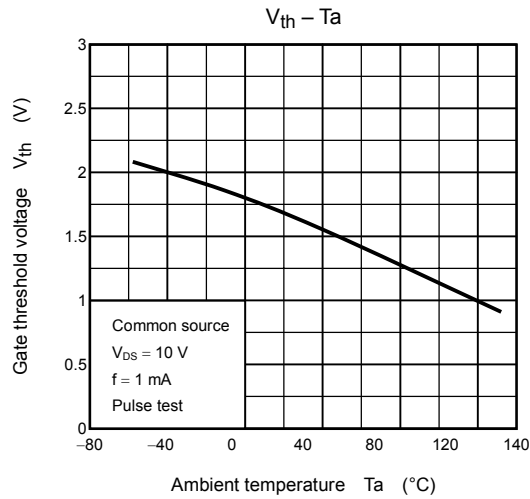
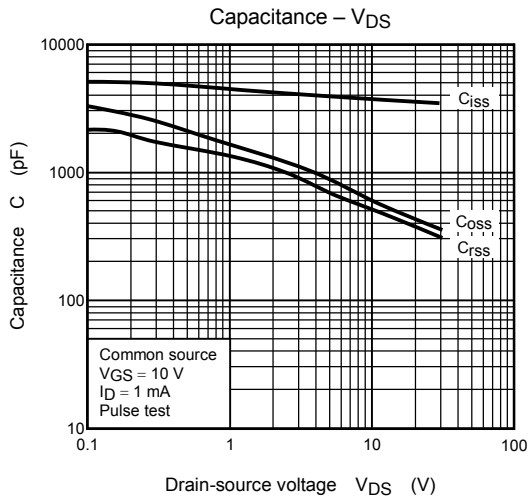
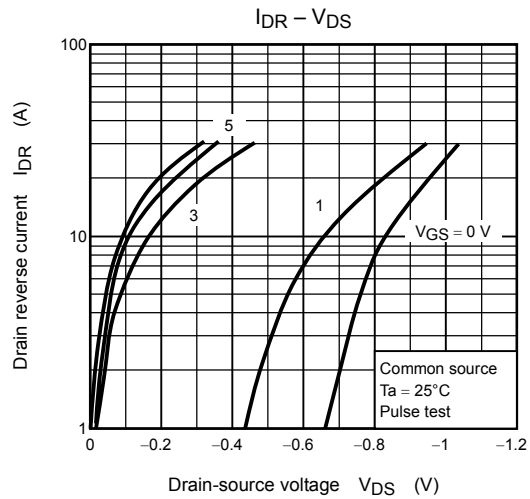
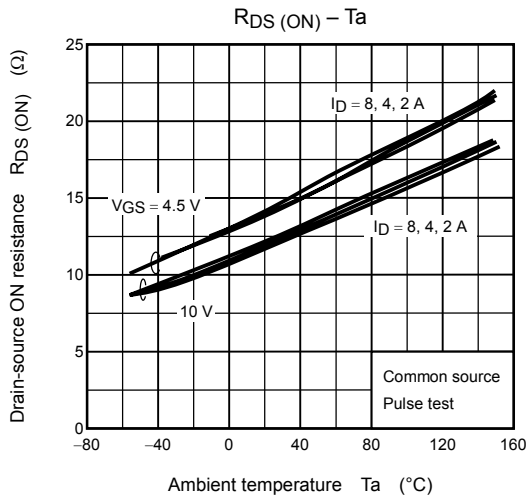
Electrical Characteristics (Ta = 25°C)

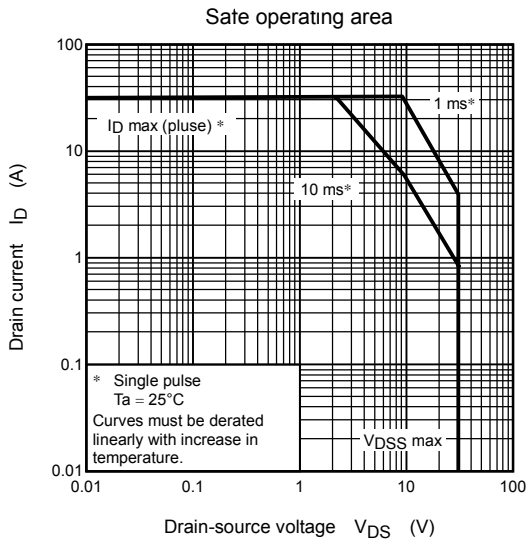
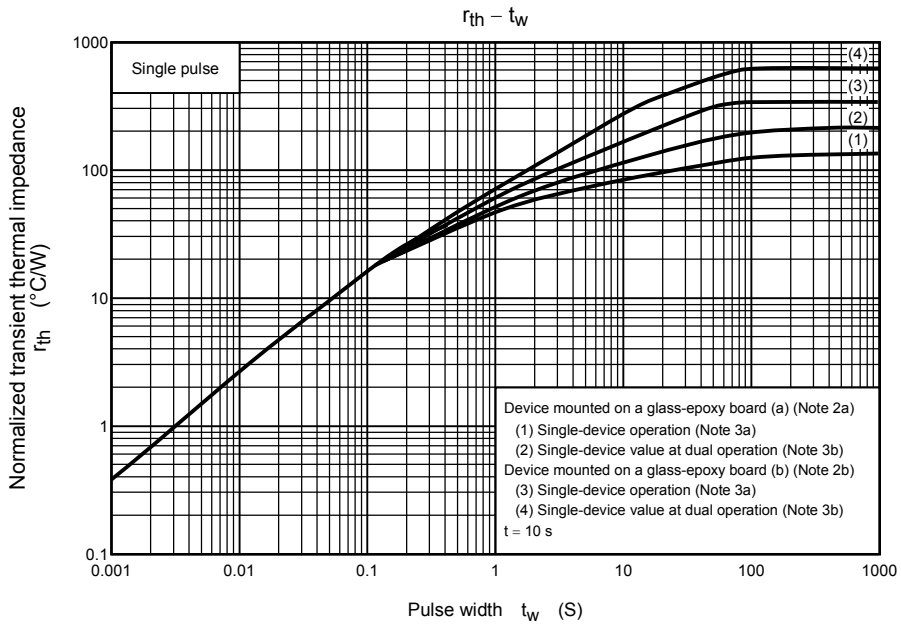
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---------------|---------------|---|-----|------|----------|---------------|
| Gate leakage current | | I_{GSS} | $V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$ | — | — | ± 10 | μA |
| Drain cut-OFF current | | I_{DSS} | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$ | — | — | 10 | μA |
| Drain-source breakdown voltage | | $V_{(BR)DSS}$ | $I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$ | 30 | — | — | V |
| | | $V_{(BR)DSS}$ | $I_D = 10\text{ mA}, V_{GS} = -20\text{ V}$ | 15 | — | — | |
| Gate threshold voltage | | V_{th} | $V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$ | 1.3 | — | 2.5 | V |
| Drain-source ON resistance | | $R_{DS(ON)}$ | $V_{GS} = 4.5\text{ V}, I_D = 4\text{ A}$ | — | 13 | 20 | m Ω |
| | | $R_{DS(ON)}$ | $V_{GS} = 10\text{ V}, I_D = 4\text{ A}$ | — | 11 | 15 | |
| Forward transfer admittance | | $ Y_{fs} $ | $V_{DS} = 10\text{ V}, I_D = 4\text{ A}$ | 6.5 | 13 | — | S |
| Input capacitance | | C_{iss} | $V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ | — | 3530 | — | pF |
| Reverse transfer capacitance | | C_{rss} | | — | 495 | — | |
| Output capacitance | | C_{oss} | | — | 580 | — | |
| Switching time | Rise time | t_r |  <p>$I_D = 4\text{ A}$ $R_L = 3.7\ \Omega$ $V_{DD} \approx 15\text{ V}$ Duty $\leq 1\%$, $t_w = 10\ \mu\text{s}$</p> | — | 26 | — | ns |
| | Turn-ON time | t_{on} | | — | 39 | — | |
| | Fall time | t_f | | — | 32 | — | |
| | Turn-OFF time | t_{off} | | — | 115 | — | |
| Total gate charge (Gate-source plus gate-drain) | | Q_g | $V_{DD} \approx 24\text{ V}, V_{GS} = 10\text{ V}, I_D = 8\text{ A}$ | — | 75 | — | nC |
| Gate-source charge | | Q_{gs} | | — | 6 | — | |
| Gate-drain ("miller") charge | | Q_{gd} | | — | 19 | — | |

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

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------|----------------|-----------|--|-----|------|------|------|
| Drain reverse current | Pulse (Note 1) | I_{DRP} | — | — | — | 32 | A |
| Forward voltage (diode) | | V_{DSF} | $I_{DR} = 8\text{ A}, V_{GS} = 0\text{ V}$ | — | — | -1.2 | V |







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