

N-Channel Enhancement Mode Power MOSFET

Description

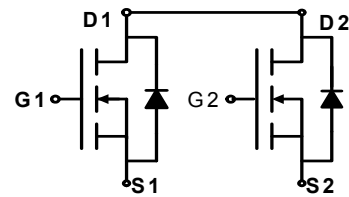
The FL8205 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

- $V_{DS} = 20V, I_D = 6A$
 $R_{DS(ON)} < 35m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



TSSOP-8 top view

Package Marking And Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|--------|----------------|-----------|------------|------------|
| 8205A | FL8205 | TSSOP-8 | Ø330mm | 12mm | 3000 units |

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--|----------------|------------|------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ±10 | V |
| Drain Current-Continuous | I_D | 6 | A |
| Drain Current-Pulsed ^(Note 1) | I_{DM} | 25 | A |
| Maximum Power Dissipation | P_D | 1.5 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | °C |

Thermal Characteristic

| | | | |
|---|-----------------|----|------|
| Thermal Resistance, Junction-to-Ambient ^(Note 2) | $R_{\theta JA}$ | 83 | °C/W |
|---|-----------------|----|------|

Electrical Characteristics (T_A=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---------------------|---|-----|------|------|------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | 20 | 21 | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =19.5V, V _{GS} =0V | - | - | 1 | μA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±10V, V _{DS} =0V | - | - | ±100 | nA |
| On Characteristics (Note 3) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.5 | 0.7 | 1.2 | V |
| Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =4.5V, I _D =4.5A | - | 19 | 25 | mΩ |
| | | V _{GS} =2.5V, I _D =3.5A | - | 25 | 35 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =5V, I _D =4.5A | - | 10 | - | S |
| Dynamic Characteristics (Note 4) | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =8V, V _{GS} =0V, F=1.0MHz | - | 600 | - | PF |
| Output Capacitance | C _{oss} | | - | 330 | - | PF |
| Reverse Transfer Capacitance | C _{rss} | | - | 140 | - | PF |
| Switching Characteristics (Note 4) | | | | | | |
| Turn-on Delay Time | t _{d(on)} | V _{DD} =10V, I _D =1A V _{GS} =4.5V, R _{GEN} =6Ω | - | 10 | 20 | nS |
| Turn-on Rise Time | t _r | | - | 11 | 25 | nS |
| Turn-Off Delay Time | t _{d(off)} | | - | 35 | 70 | nS |
| Turn-Off Fall Time | t _f | | - | 30 | 60 | nS |
| Total Gate Charge | Q _g | V _{DS} =10V, I _D =6A, V _{GS} =4.5V | - | 10 | 15 | nC |
| Gate-Source Charge | Q _{gs} | | - | 2.3 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 1.5 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage (Note 3) | V _{SD} | V _{GS} =0V, I _S =1.7A | - | 0.75 | 1.2 | V |
| Diode Forward Current (Note 2) | I _S | | - | - | 1.7 | A |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

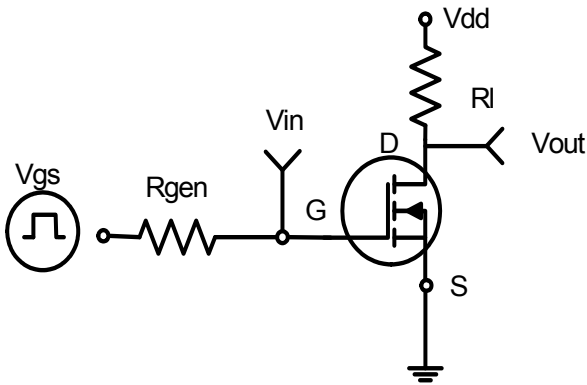


Figure 1: Switching Test Circuit

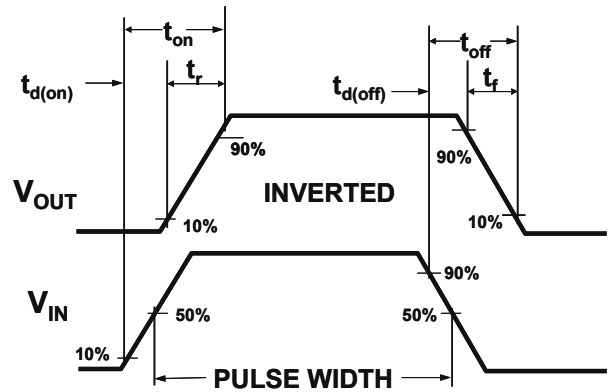


Figure 2: Switching Waveforms

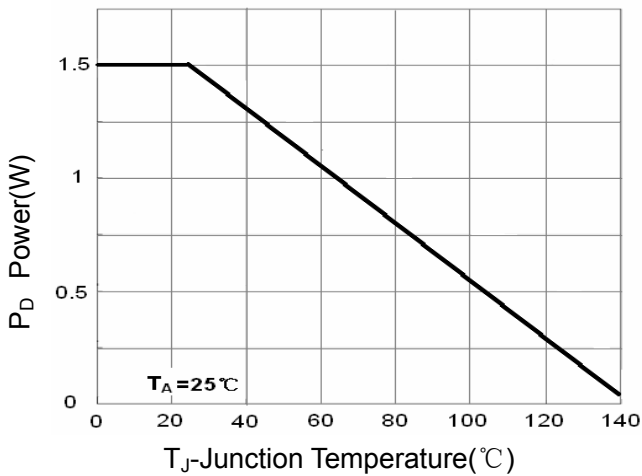


Figure 3 Power Dissipation

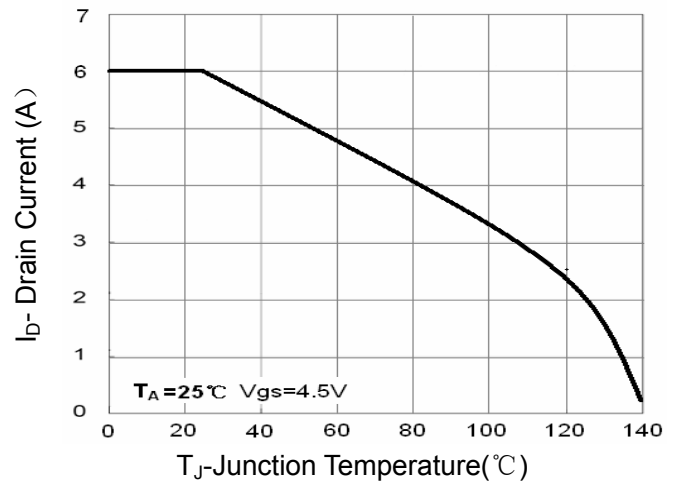


Figure 4 Drain Current

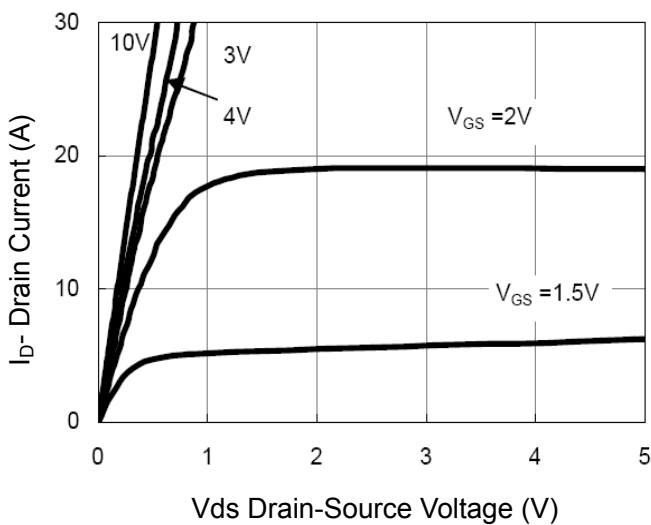


Figure 5 Output Characteristics

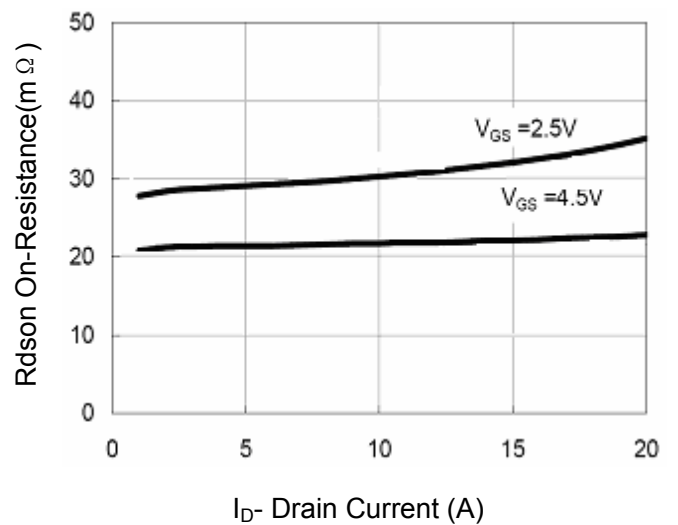


Figure 6 Drain-Source On-Resistance

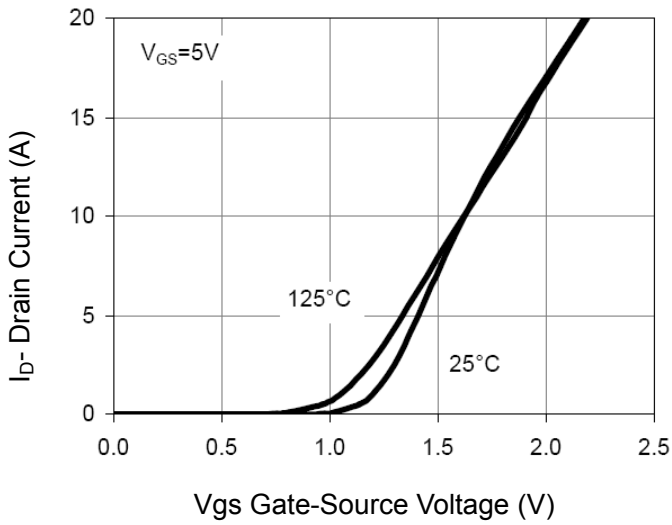


Figure 7 Transfer Characteristics

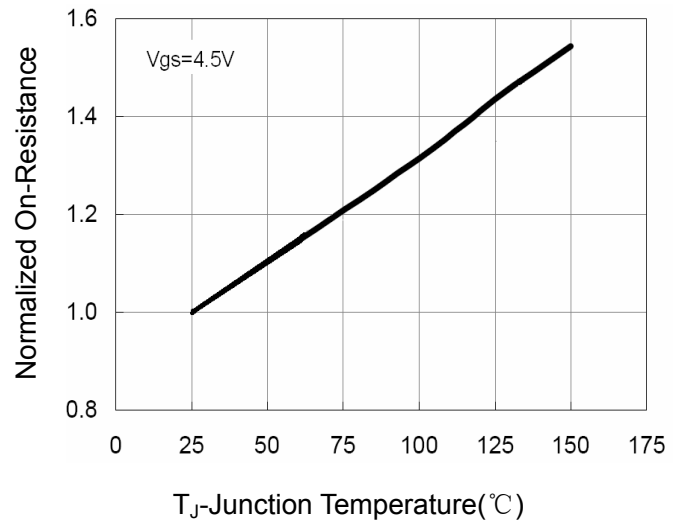


Figure 8 Drain-Source On-Resistance

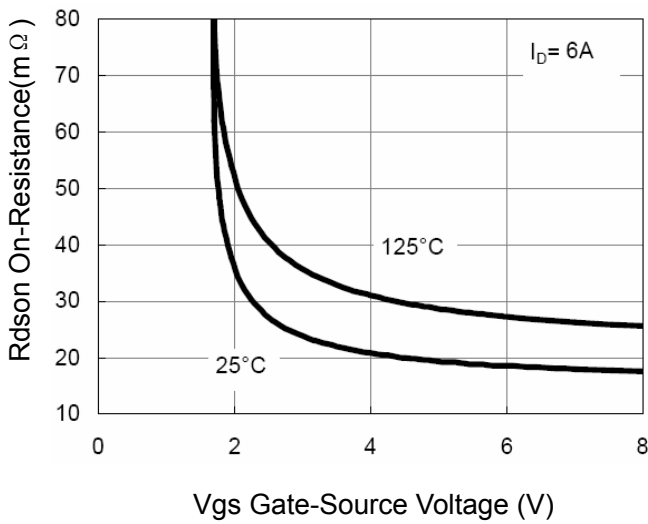


Figure 9 Rdson vs Vgs

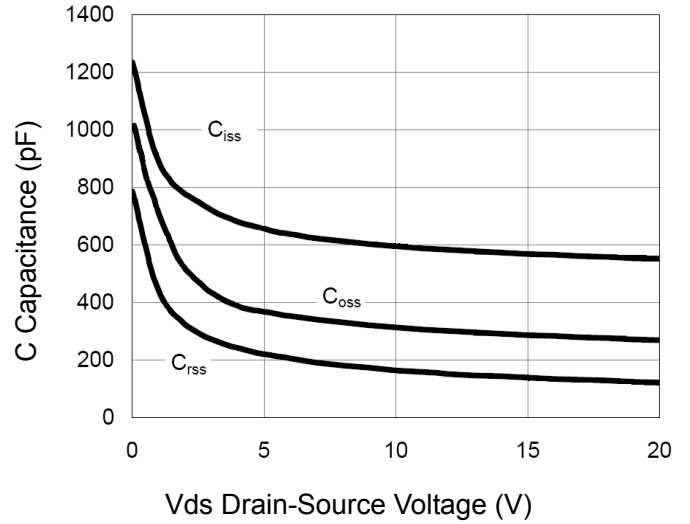


Figure 10 Capacitance vs Vds

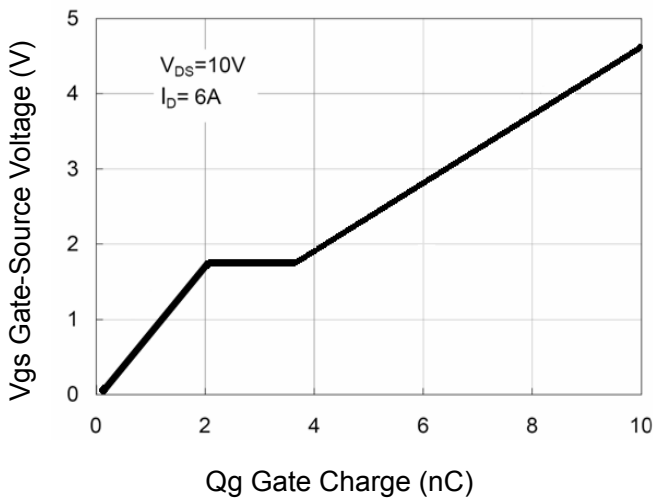


Figure 11 Gate Charge

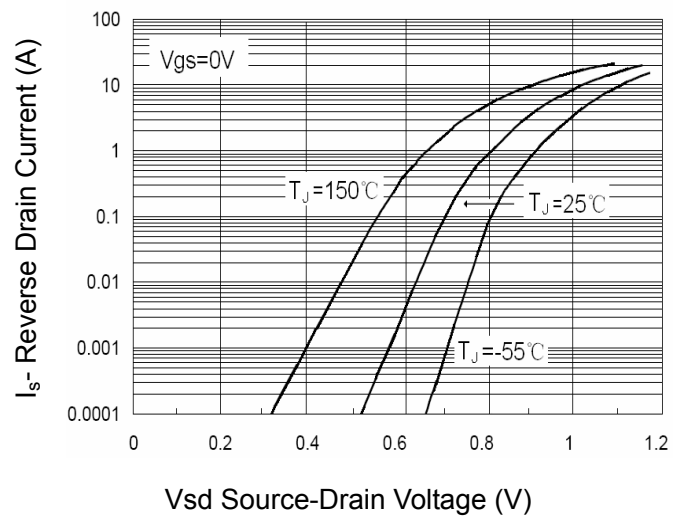


Figure 12 Source- Drain Diode Forward

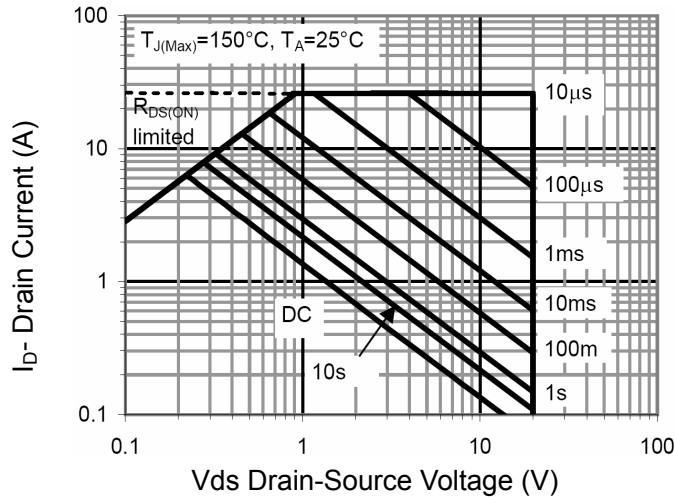


Figure 13 Safe Operation Area

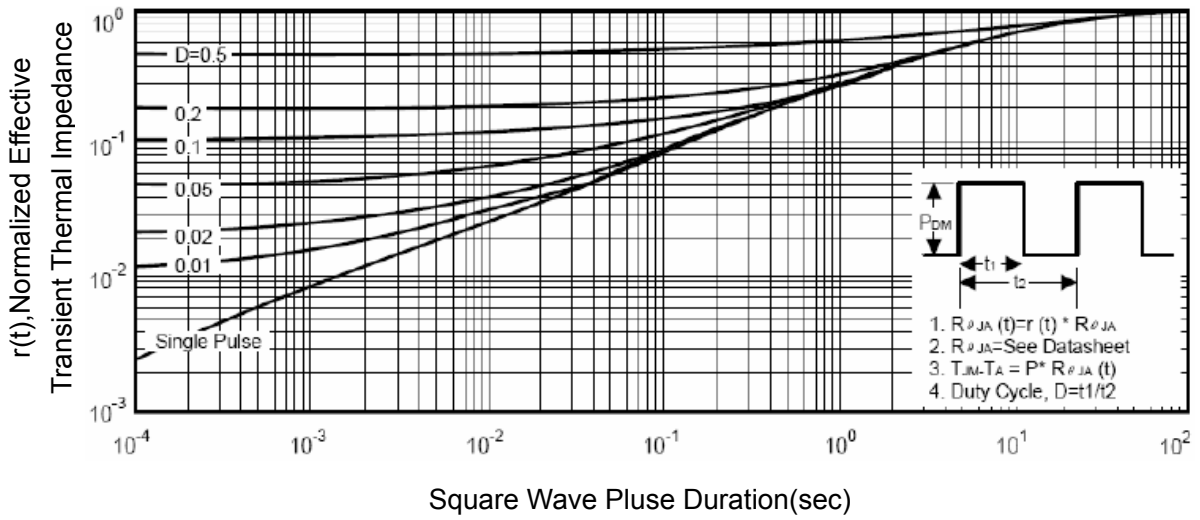
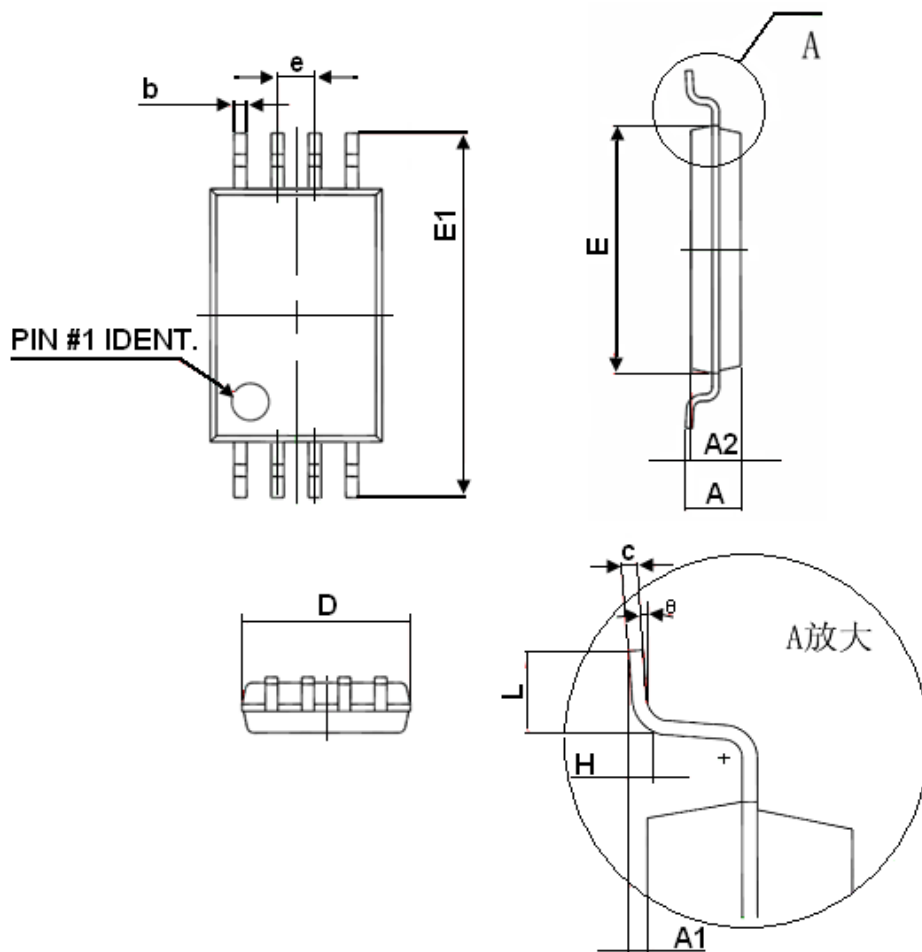


Figure 14 Normalized Maximum Transient Thermal Impedance

Tssop-8 Package Information



| Symbol | Dimensions In Millimeters | |
|----------|---------------------------|-------|
| | Min | Max |
| D | 2.900 | 3.100 |
| E | 4.300 | 4.500 |
| b | 0.190 | 0.300 |
| c | 0.090 | 0.200 |
| E1 | 6.250 | 6.550 |
| A | | 1.100 |
| A2 | 0.800 | 1.000 |
| A1 | 0.020 | 0.150 |
| e | 0.65(BSC) | |
| L | 0.500 | 0.700 |
| H | 0.25(TYP) | |
| θ | 1° | 7° |