



ON Semiconductor®

ON Semiconductor
DATA SHEET**2SJ646** — P-Channel Silicon MOSFET
General-Purpose Switching Device
Applications**Features**

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

Specifications**Absolute Maximum Ratings** at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|-----------|---|-------------|------------------|
| Drain-to-Source Voltage | V_{DS} | | -30 | V |
| Gate-to-Source Voltage | V_{GS} | | ± 20 | V |
| Drain Current (DC) | I_D | | -8 | A |
| Drain Current (Pulse) | I_{DP} | $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$ | -32 | A |
| Allowable Power Dissipation | P_D | | 1 | W |
| | | $T_c=25^\circ\text{C}$ | 15 | W |
| Channel Temperature | T_{ch} | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|--|---------|-----|----------|------------------|
| | | | min | typ | max | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=-1\text{mA}$, $V_{GS}=0\text{V}$ | -30 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$ | | | -1 | μA |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 16\text{V}$, $V_{DS}=0\text{V}$ | | | ± 10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}=-10\text{V}$, $I_D=-1\text{mA}$ | -1.2 | | -2.6 | V |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS}=-10\text{V}$, $I_D=-4\text{A}$ | 3.3 | 5.5 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-4\text{A}$, $V_{GS}=-10\text{V}$ | | 58 | 75 | $\text{m}\Omega$ |
| | $R_{DS(on)2}$ | $I_D=-2\text{A}$, $V_{GS}=-4.5\text{V}$ | | 97 | 136 | $\text{m}\Omega$ |
| | $R_{DS(on)3}$ | $I_D=-2\text{A}$, $V_{GS}=-4\text{V}$ | | 110 | 154 | $\text{m}\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=-10\text{V}$, $f=1\text{MHz}$ | | 510 | | pF |
| Output Capacitance | C_{oss} | $V_{DS}=-10\text{V}$, $f=1\text{MHz}$ | | 115 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS}=-10\text{V}$, $f=1\text{MHz}$ | | 78 | | pF |

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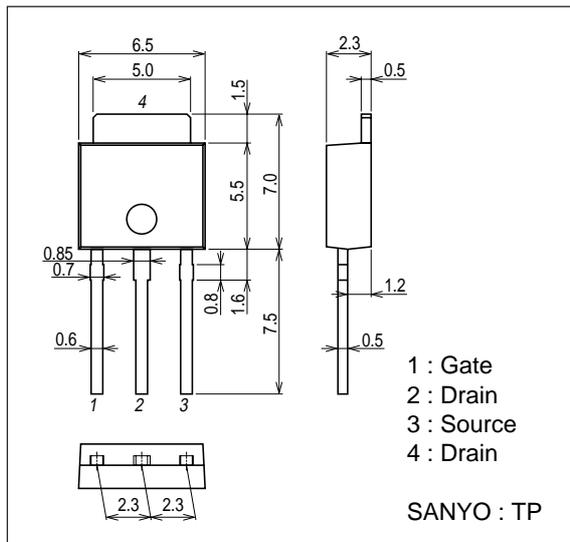
2SJ646

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| Parameter | Symbol | Conditions | Ratings | | | Unit |
|-------------------------------|--------------|-------------------------------------|---------|------|------|------|
| | | | min | typ | max | |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 11 | | ns |
| Rise Time | t_r | See specified Test Circuit. | | 40 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit. | | 40 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | 30 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=-10V, V_{GS}=-10V, I_D=-8A$ | | 11 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=-10V, V_{GS}=-10V, I_D=-8A$ | | 2.4 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=-10V, V_{GS}=-10V, I_D=-8A$ | | 1.7 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=-8A, V_{GS}=0V$ | | -1.0 | -1.2 | V |

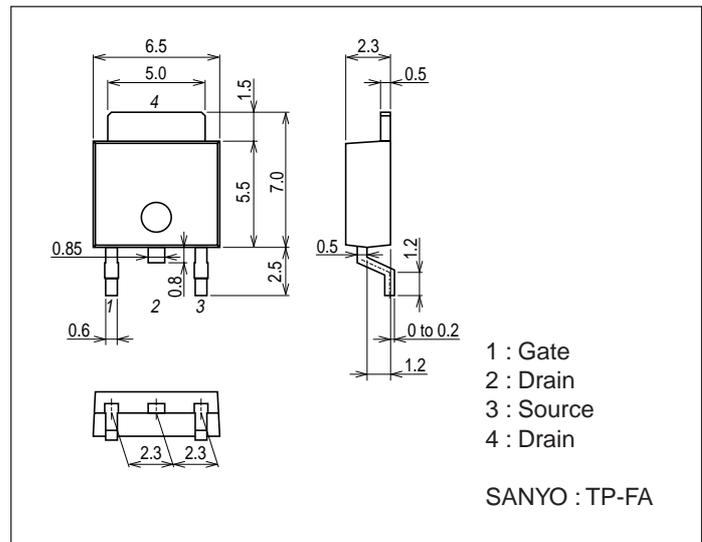
Package Dimensions

unit : mm
7518-004

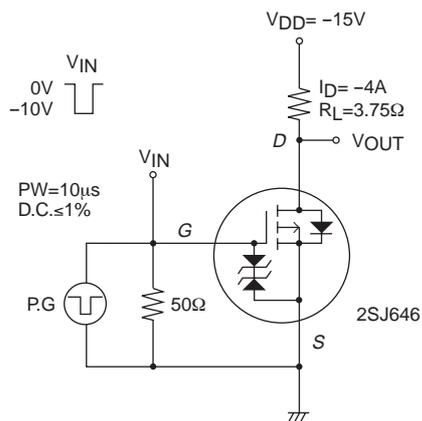


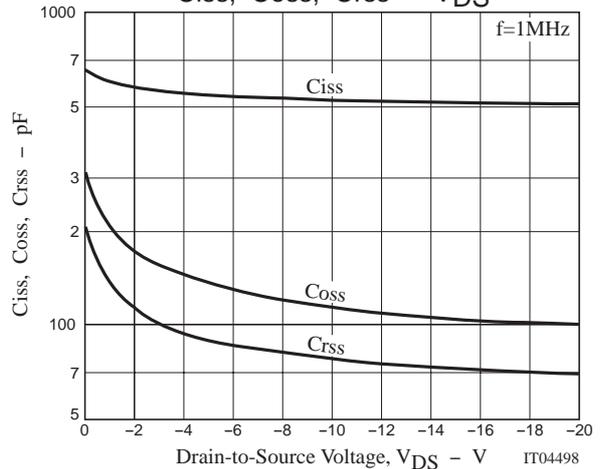
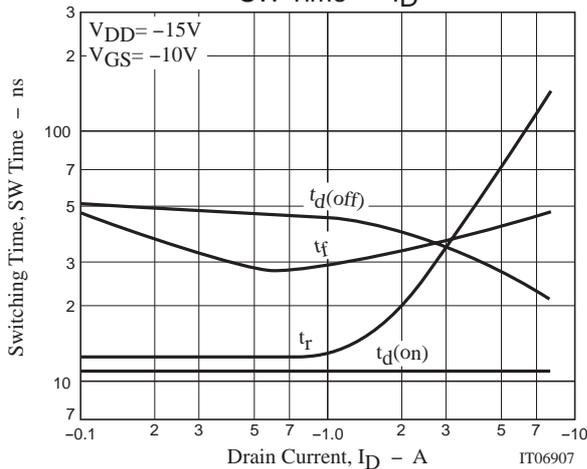
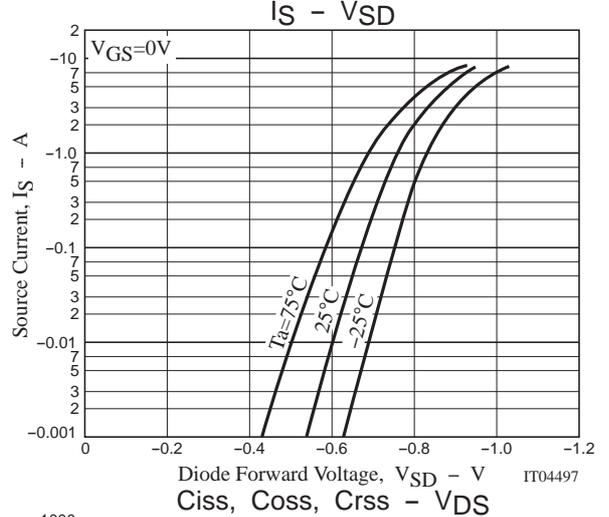
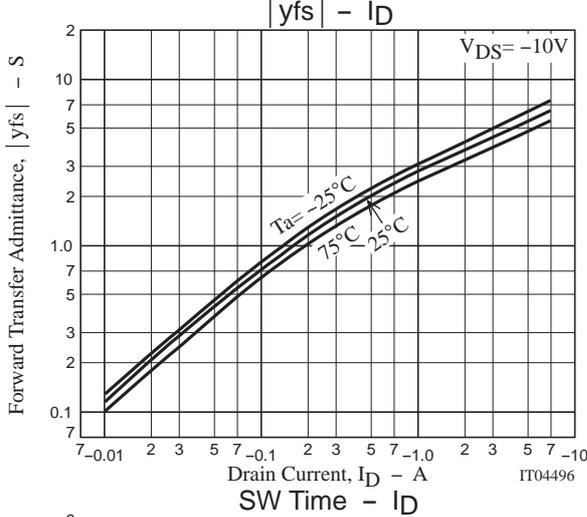
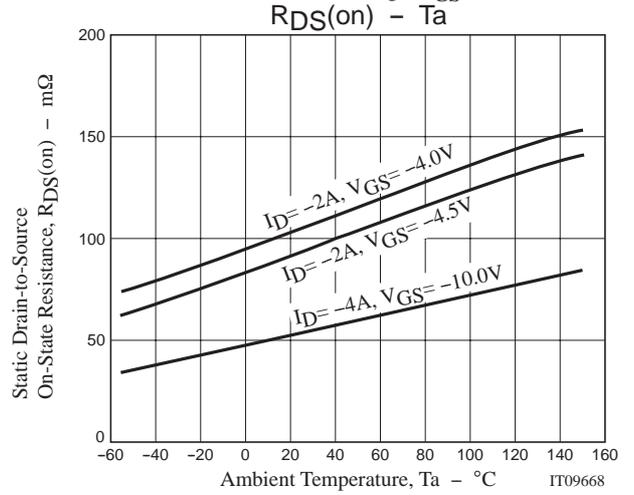
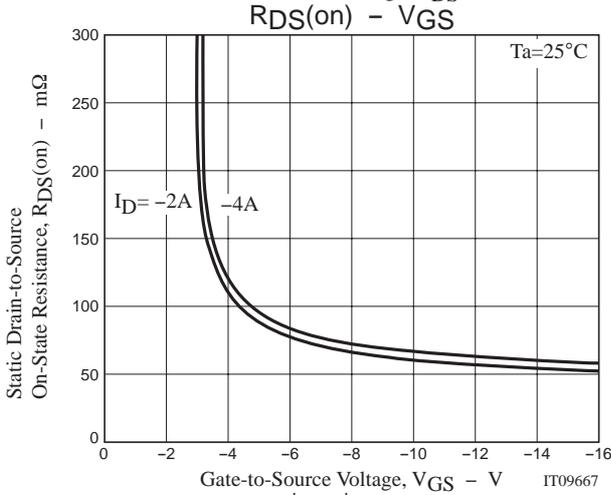
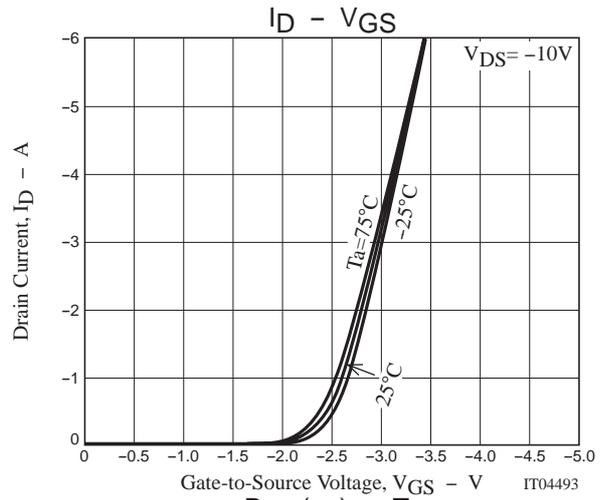
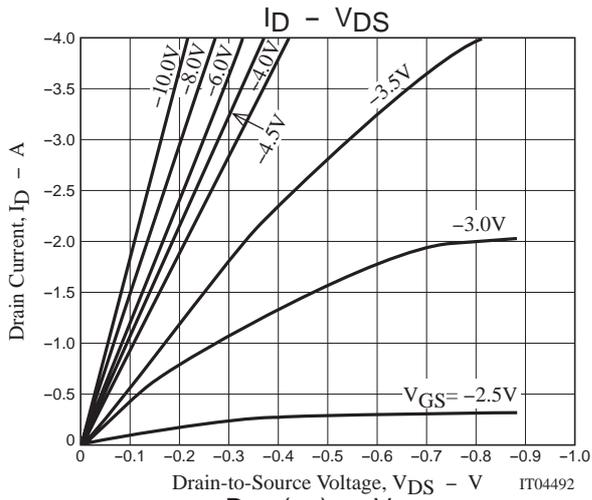
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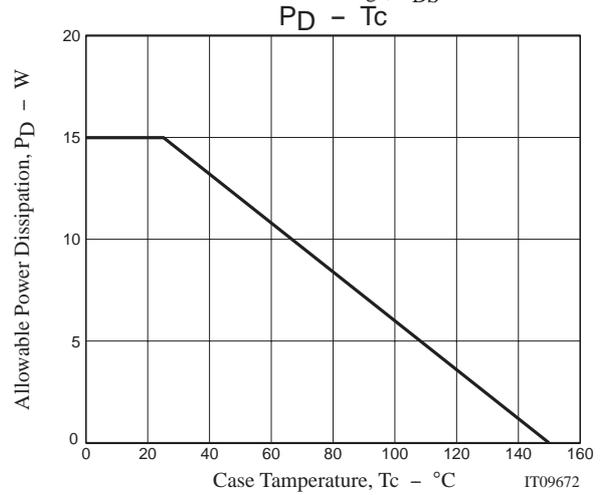
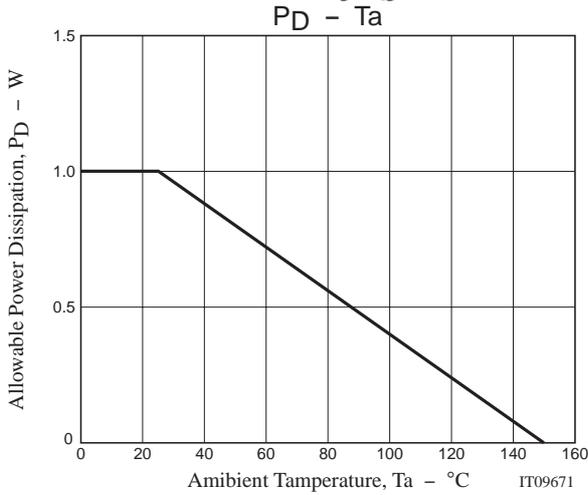
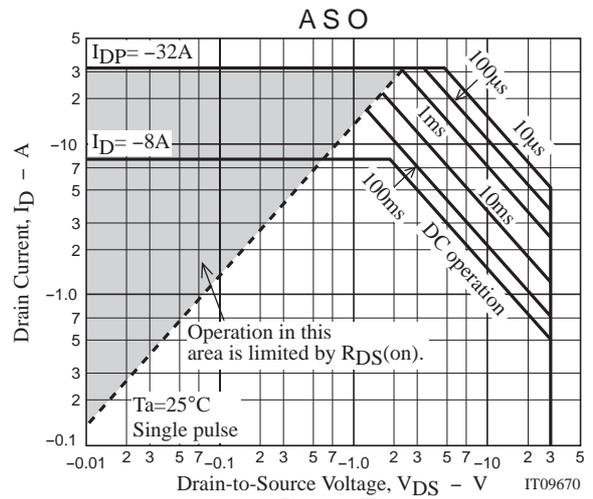
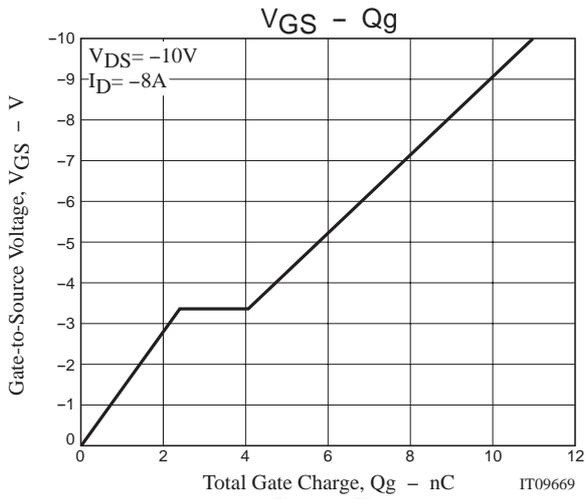
unit : mm
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Switching Time Test Circuit







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