



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

# FSS294 — General-Purpose Switching Device Applications

## Features

- ON-resistance  $R_{DS(on)} = 7.8\text{m}\Omega$ (typ.)
- Input capacitance  $C_{iss} = 2650\text{pF}$ (typ.)
- 4V drive
- Protection diode in
- Halogen free compliance

## Specifications

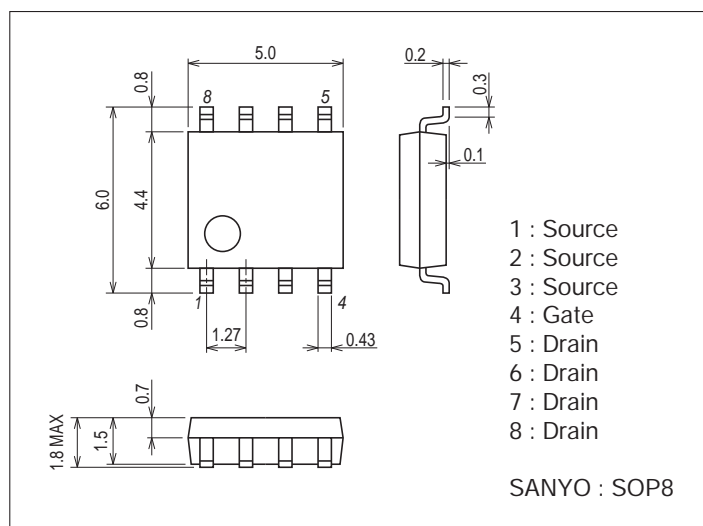
Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$ 

| Parameter                                 | Symbol    | Conditions  | Ratings     | Unit             |
|---|-----------|---|-------------|------------------|
| Drain-to-Source Voltage                   | $V_{DS}$  |   | 40          | V                |
| Gate-to-Source Voltage                    | $V_{GS}$  |   | $\pm 20$    | V                |
| Drain Current (DC)                        | $I_D$     |   | 13          | A                |
| Drain Current ( $PW \leq 10\mu\text{s}$ ) | $I_{DP}$  | Duty cycle $\leq 1\%$   | 52          | A                |
| Allowable Power Dissipation               | $P_D$     | When mounted on ceramic substrate ( $1200\text{mm}^2 \times 0.8\text{mm}$ ), $PW \leq 10\text{s}$ | 3.0         | W                |
| Channel Temperature                       | $T_{ch}$  |   | 150         | $^\circ\text{C}$ |
| Storage Temperature                       | $T_{stg}$ |   | -55 to +150 | $^\circ\text{C}$ |

## Package Dimensions

unit : mm (typ)

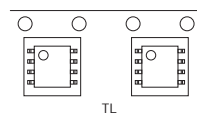
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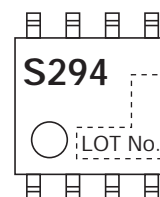
## Product & Package Information

- Package : SOP8
- JEITA, JEDEC : SC-87, SOT-96
- Minimum Packing Quantity : 1,000 pcs./reel

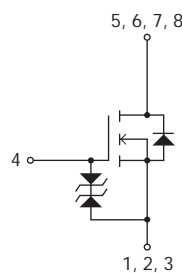
## Packing Type : TL



## Marking



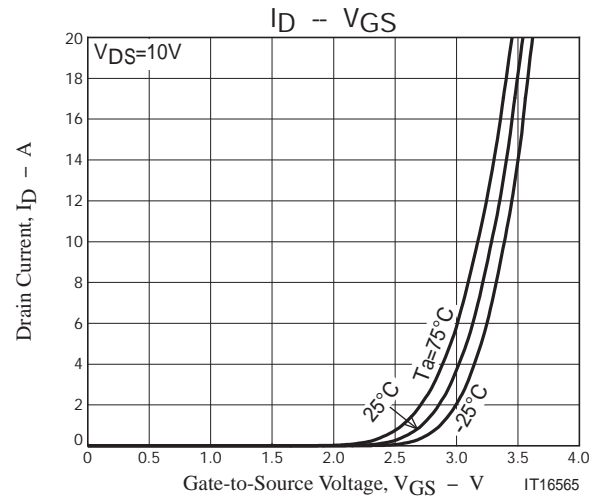
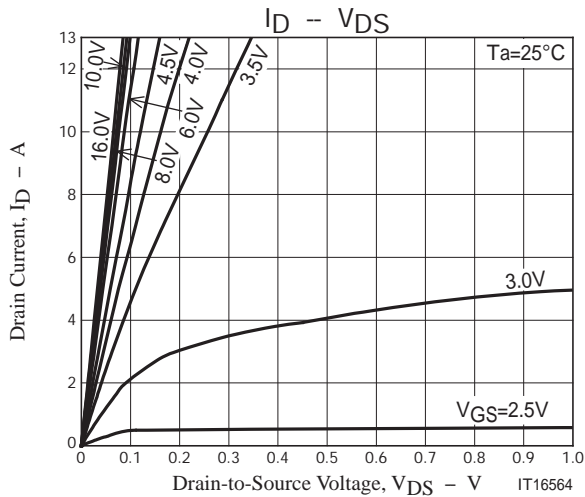
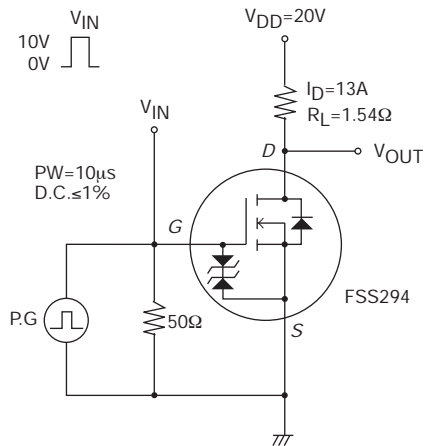
## Electrical Connection

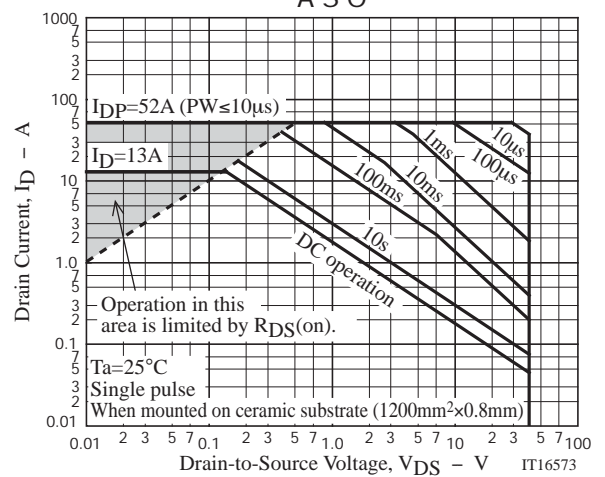
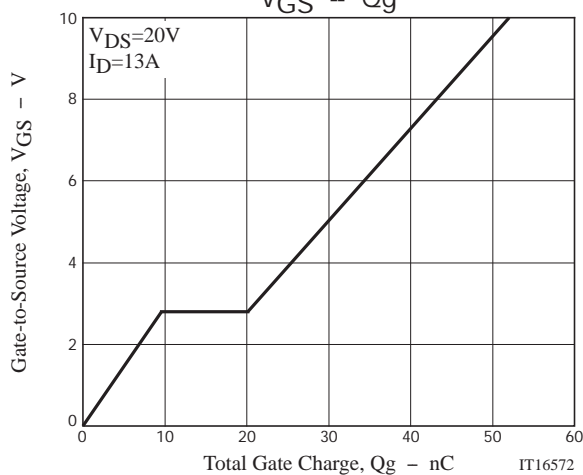
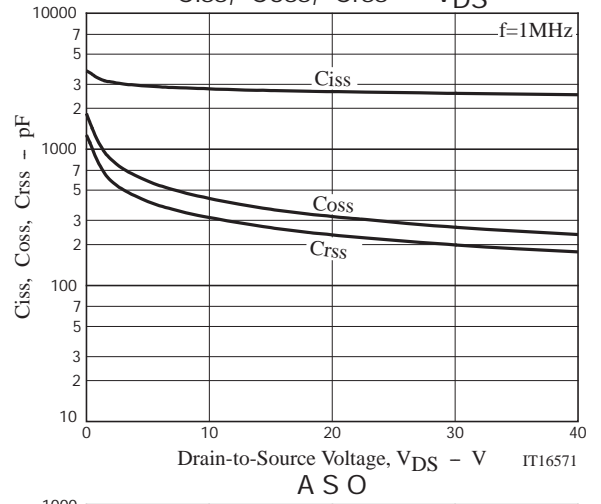
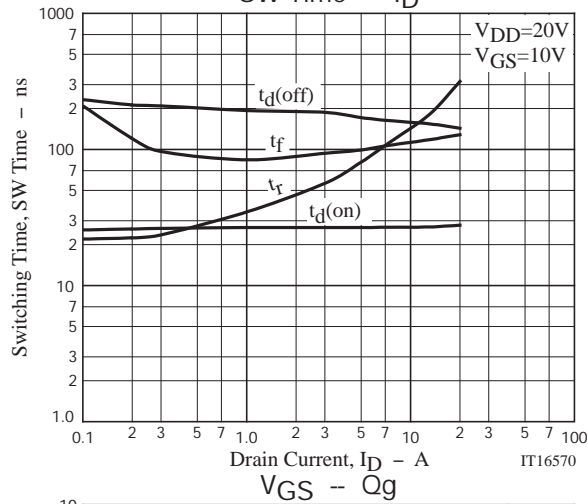
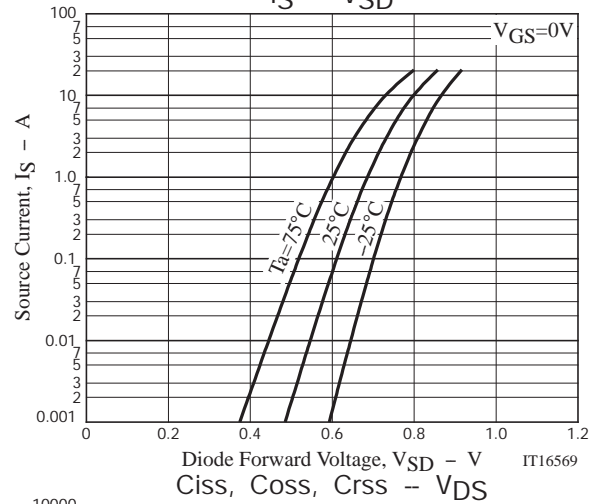
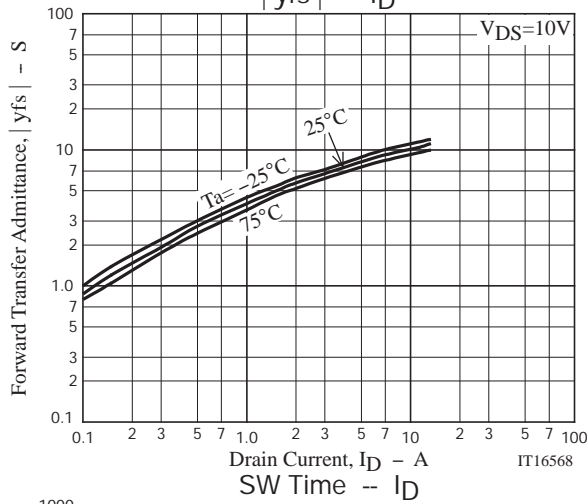
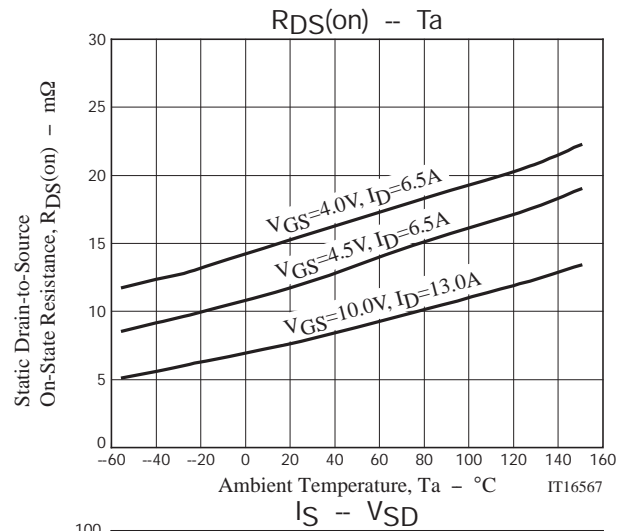
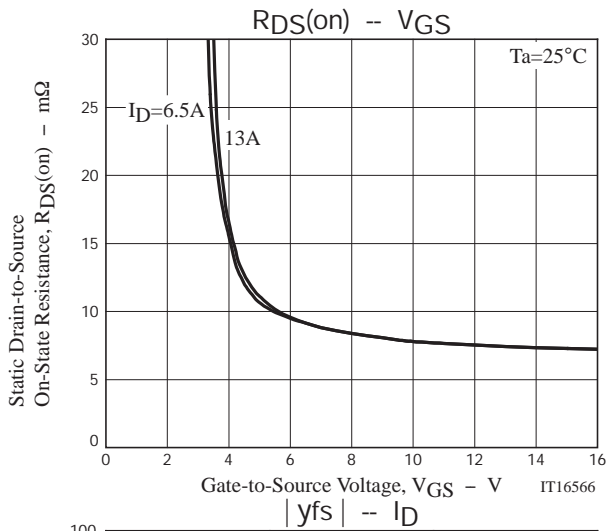


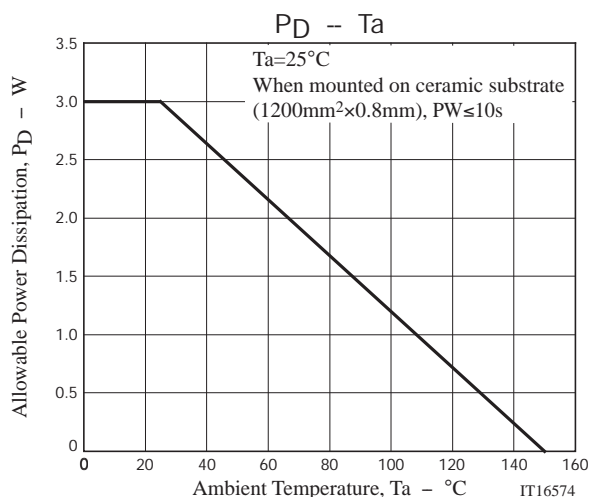
Electrical Characteristics at  $T_a=25^{\circ}\text{C}$ 

| Parameter                                  | Symbol        | Conditions   | Ratings |      |          | Unit             |
|--|---------------|--|---------|------|----------|------------------|
|  |               |  | min     | typ  | max      |                  |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=1\text{mA}$ , $V_{GS}=0\text{V}$                        | 40      |      |          | V                |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=40\text{V}$ , $V_{GS}=0\text{V}$                     |         |      | 1        | $\mu\text{A}$    |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 16\text{V}$ , $V_{DS}=0\text{V}$                 |         |      | $\pm 10$ | $\mu\text{A}$    |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10\text{V}$ , $I_D=1\text{mA}$                       | 1.5     |      | 2.6      | V                |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=10\text{V}$ , $I_D=13\text{A}$                       |         | 11   |          | S                |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=13\text{A}$ , $V_{GS}=10\text{V}$                       |         | 7.8  | 10.2     | $\text{m}\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=6.5\text{A}$ , $V_{GS}=4.5\text{V}$                     |         | 12   | 17       | $\text{m}\Omega$ |
|  | $R_{DS(on)3}$ | $I_D=6.5\text{A}$ , $V_{GS}=4\text{V}$                       |         | 15.5 | 22       | $\text{m}\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=20\text{V}$ , $f=1\text{MHz}$                        |         | 2650 |          | pF               |
| Output Capacitance                         | $C_{oss}$     |  |         | 320  |          | pF               |
| Reverse Transfer Capacitance               | $C_{rss}$     |  |         | 235  |          | pF               |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit.                                  |         | 27   |          | ns               |
| Rise Time                                  | $t_r$         |  |         | 180  |          | ns               |
| Turn-OFF Delay Time                        | $t_{d(off)}$  |  |         | 154  |          | ns               |
| Fall Time                                  | $t_f$         |  |         | 118  |          | ns               |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=20\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=13\text{A}$ |         | 52   |          | nC               |
| Gate-to-Source Charge                      | $Q_{gs}$      |  |         | 9.6  |          | nC               |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      |  |         | 10.5 |          | nC               |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=13\text{A}$ , $V_{GS}=0\text{V}$                        |         | 0.81 | 1.2      | V                |

## Switching Time Test Circuit







Note on usage : Since the FSS294 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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