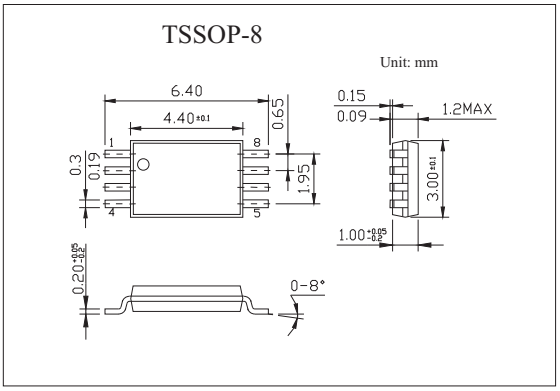
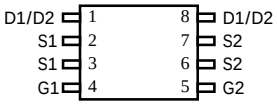
# Common-Drain Dual N-Channel Enhancement Mode Field Effect Transistor

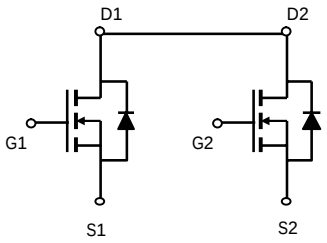
# SI8822

## ■ Features

- $V_{DS}$ (V) = 20V
- $I_D$ = 7A ($V_{GS}$=10V)
- $R_{DS(ON)}$ < 21mΩ ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 24mΩ ($V_{GS}$ = 4.5V)
- $R_{DS(ON)}$ < 32mΩ ($V_{GS}$ = 2.5V)
- $R_{DS(ON)}$ < 50mΩ ($V_{GS}$ = 1.8V)




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current *1 $T_A$=25℃ | $I_D$ | 7 | A |
| $T_A$=70℃ | | 5.7 | |
| Pulsed Drain Current *2 | $I_{DM}$ | 30 | |
| Power Dissipation *1 $T_A$=25℃ | $P_D$ | 1.5 | W |
| $T_A$=70℃ | | 0.96 | |
| Maximum Junction-to-Ambient *1 t ≤ 10s | $R_{\theta JA}$ | 83 | ℃/W |
| Maximum Junction-to-Ambient *1 Steady-State | | 130 | |
| Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to 150 | ℃ |

*1The value of $R_{\theta JA}$ is measured with the device mounted on 1in $^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25℃

*2 Repetitive rating, pulse width limited by junction temperature.

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## ■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test conditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=16V, $V_{GS}$=0V | | | 1 | μA |
| | | $V_{DS}$=16V, $V_{GS}$=0V ,$T_J$=55℃ | | | 5 | |
| Gate-Body leakage current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±10V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ $I_D$=250μA | 0.5 | 0.8 | 1 | V |
| On state drain current | $I_{D(ON)}$ | $V_{GS}$=4.5V, $V_{DS}$=5V | 30 | | | A |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=7A | | 16.5 | 21 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=7A $T_J$=125℃ | | 23 | 28 | |
| | | $V_{GS}$=4.5V, $I_D$=6.6A | | 19 | 24 | |
| | | $V_{GS}$=2.5V, $I_D$=5.5A | | 25 | 32 | |
| | | $V_{GS}$=1.8V, $I_D$=2A | | 36 | 50 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5V, $I_D$=7A | | 24 | | S |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=10V, f=1MHz | | 630 | | pF |
| Output Capacitance | $C_{oss}$ | | | 164 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 137 | | |
| Gate resistance | $R_g$ | $V_{GS}$=0V, $V_{DS}$=0V, f=1MHz | | 1.5 | | Ω |
| Total Gate Charge | $Q_g$ | $V_{GS}$=4.5V, $V_{DS}$= =10V, $I_D$=7A | | 9.3 | | nC |
| Gate Source Charge | $Q_{gs}$ | | | 0.6 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 3.6 | | |
| Turn-On DelayTime | $t_{D(on)}$ | $V_{GS}$=5V, $V_{DS}$=10V, $R_L$=1.4Ω ,$R_{GEN}$=3Ω | | 5.7 | | ns |
| Turn-On Rise Time | $t_r$ | | | 11.5 | | ns |
| Turn-Off DelayTime | $t_{D(off)}$ | | | 31.5 | | ns |
| Turn-Off FallTime | $t_f$ | | | 9.7 | | ns |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=7A, dI/dt=100A/μs | | 15.2 | | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | $I_F$=7A, dI/dt=100A/μs | | 6.3 | | nC |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 2.5 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A,$V_{GS}$=0V | | 0.7 | 1 | V |

## ■ Marking

| Marking | 8822 |
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