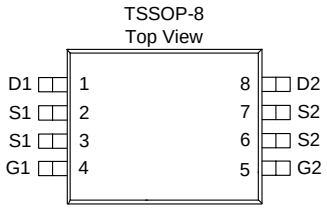
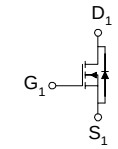
# P & N-Channel 20-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

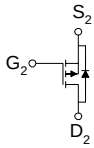
| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ m(Ω) | $I_D$ (A) |
| 30 | 32 @ $V_{GS}$ = 10V | 4.3 |
| | 46 @ $V_{GS}$ = 4.5V | 3.7 |
| -30 | 52 @ $V_{GS}$ = -10V | -3.8 |
| | 80 @ $V_{GS}$ = -4.5V | -2.8 |

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe TSSOP-8 saves board space
- Fast switching speed
- High performance trench technology



N-Channel MOSFET



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C UNLESS OTHERWISE NOTED) | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **N-Channel** | **P-Channel** | **Units** |
| Drain-Source Voltage | | $V_{DS}$ | 30 | -30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | ±20 | |
| Continuous Drain Current[a] | $T_A$=25°C | $I_D$ | 4.3 | -3.8 | A |
| | $T_A$=70°C | | 3.5 | -3.0 | |
| Pulsed Drain Current[b] | | $I_{DM}$ | 20 | -20 | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | 1.0 | -1.0 | A |
| Power Dissipation[a] | $T_A$=25°C | $P_D$ | 1.14 | 1.14 | W |
| | $T_A$=70°C | | 0.73 | 0.73 | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55 to 150 | -55 to 150 | °C |

| THERMAL RESISTANCE RATINGS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Typ** | **Max** | |
| Maximum Junction-to-Ambient[a] | t <= 10 sec | $R_{thJA}$ | 88 | 110 | °C/W |
| | Steady State | | 120 | 150 | |

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

b. Pulse width limited by maximum junction temperature

| SPECIFICATIONS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Symbol** | **Test Conditions** | **Limits** | | | | **Unit** |
| | | | **Ch** | **Min** | **Typ** | **Max** | |
| **Static** | | | | | | | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250 uA | N | 1.0 | | | V |
| | | $V_{GS}$ = $V_{DS}$, $I_D$ = -250 uA | P | -1.0 | | | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$ = 20 V, $V_{DS}$ = 0 V | N | | | ±100 | nA |
| | | $V_{GS}$ = -20 V, $V_{DS}$ = 0 V | P | | | ±100 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 16 V, $V_{GS}$ = 0 V | N | | | 1 | uA |
| | | $V_{DS}$ = -16 V, $V_{GS}$ = 0 V | P | | | -1 | |
| On-State Drain Current[A] | $I_{D(on)}$ | $V_{DS}$ = 5 V, $V_{GS}$ = 10 V | N | 20 | | | A |
| | | $V_{DS}$ = -5 V, $V_{GS}$ = -10 V | P | -20 | | | |
| Drain-Source On-Resistance[A] | $r_{DS(on)}$ | VGS = 10 V, $I_D$ = 4.3 A | N | | | 32 | mΩ |
| | | VGS = 4.5 V, $I_D$ = 3.7 A | | | | 46 | |
| | | VGS = -10 V, $I_D$ = -3.8 A | P | | | 52 | |
| | | VGS = -4.5 V, $I_D$ = -2.8 A | | | | 80 | |
| Forward Tranconductance[A] | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 4.3 A | N | | 11 | | S |
| | | $V_{DS}$ = -15 V, $I_D$ = -3.8 A | P | | 11 | | |
| **Dynamic** | | | | | | | |
| Total Gate Charge | $Q_g$ | N-Channel $V_{DS}$=15V, $V_{GS}$=4.5V, $I_D$=4.3A P-Channel $V_{DS}$=-15V, $V_{GS}$=-4.5V, $I_D$=-3.8A | N | | 4.7 | | nC |
| | | | P | | 8.0 | | |
| Gate-Source Charge | $Q_{gs}$ | | N | | 1.8 | | |
| | | | P | | 2.3 | | |
| Gate-Drain Charge | $Q_{gd}$ | | N | | 1.5 | | |
| | | | P | | 4.5 | | |
| Turn-On Delay Time | $t_{d(on)}$ | N-Chaneel $V_{DD}$=15V, $V_{GS}$=4.5V, $I_D$=1A , $R_{GEN}$=6Ω, P-Channel $V_{DD}$=-15V, $V_{GS}$=-4.5V, $I_D$=-1A $R_{GEN}$=6Ω | N | | 13 | | nS |
| | | | P | | 14 | | |
| Rise Time | $t_r$ | | N | | 14 | | |
| | | | P | | 14 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | N | | 30 | | |
| | | | P | | 40 | | |
| Fall-Time | $t_f$ | | N | | 30 | | |
| | | | P | | 30 | | |

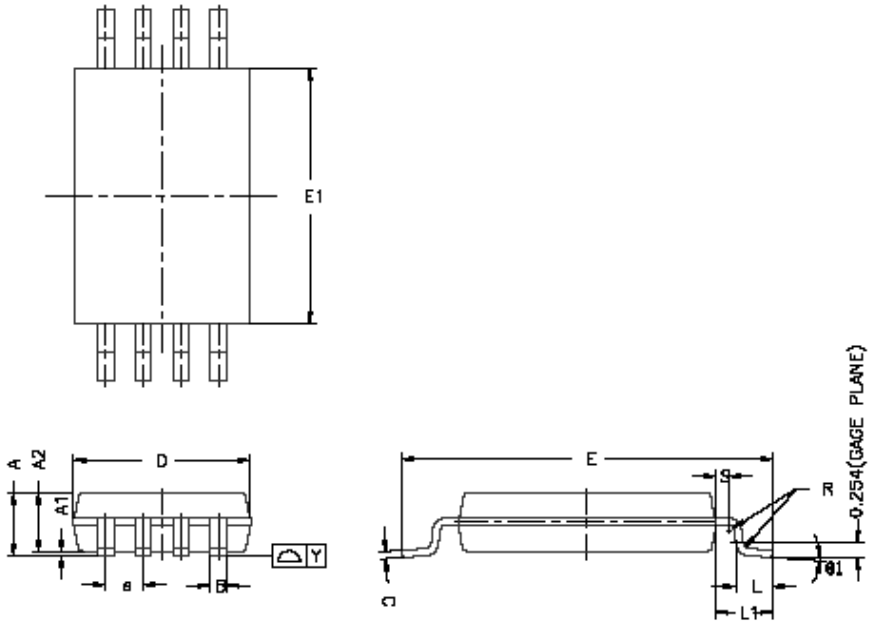
Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

# Package Information

**TSSOP-8: 8LEAD**




| DIM. | MILLIMETERS | | |
|---|---|---|---|
| | MIN. | NDM. | MAX. |
| A | 1.05 | 1.10 | 1.20 |
| A(1) | 0.05 | 0.10 | 0.15 |
| A(2) | 0.99 | 1.02 | 1.05 |
| B | 0.19 | 0.25 | 0.30 |
| C | -- | 0.127 | -- |
| D | 2.90 | 3.00 | 3.10 |
| E | 6.20 | 6.40 | 6.60 |
| E1 | 4.30 | 4.40 | 4.50 |
| e | 0.65BSC | | |
| L | 0.45 | 0.60 | 0.75 |
| L1 | 0.90 | 1.00 | 1.10 |
| Y | -- | -- | 0.10 |
| θ1 | 0° | 4° | 8° |
| R | 0.09 | -- | -- |
| S | 0.20 | -- | -- |