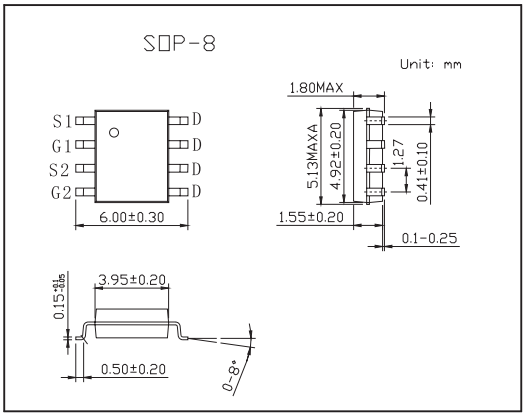
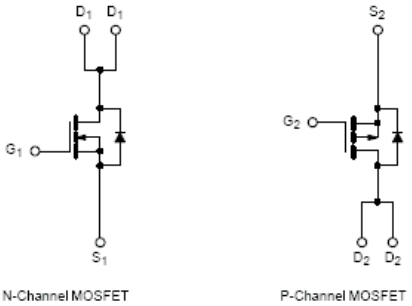
# N-Channel 60-V (D-S), 175℃ MOSFET

# KI4559EY




■ PIN Configuration




■ Absolute Maximum Ratings $T_A$ = 25℃

| Parameter | Symbol | N-Channel | P-Channel | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | -60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | ±20 | V |
| Continuous Drain Current ($T_J$ = 150℃)* $T_A$ = 25℃ | $I_D$ | ±4.5 | ±3.1 | A |
| $T_A$ = 70℃ | | ±3.8 | ±2.6 | A |
| Pulsed Drain Current | $I_{DM}$ | ±30 | ±30 | A |
| Continuous Source Current (Diode Conduction)* | $I_S$ | 2 | -2 | A |
| Maximum Power Dissipation* $T_A$ = 25℃ | $P_D$ | 2.4 | | W |
| $T_A$ = 70℃ | | 1.7 | | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | -55 to 175 | | ℃ |
| Maximum Junction-to-Ambient * | $R_{thJA}$ | 62.5 | | ℃/W |

*Surface Mounted on FR4 Board, t≤10 sec.

# KI4559EY

■ Electrical Characteristics $T_J$ = 25℃

| Parameter | Symbol | Testconditons | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | N-Ch | 1 | | | V |
| | | $V_{DS}$ = $V_{GS}$, $I_D$ = -250 μA | P-Ch | -1 | | | |
| Gate Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V $V_{GS}$ = ±20 V | N-Ch | | | ±100 | nA |
| | | $V_{DS}$ = 0 V $V_{GS}$ = ±20 V | P-Ch | | | ±100 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 60V, $V_{GS}$ = 0 V | N-Ch | | | 2 | μA |
| | | $V_{DS}$ = -60V, $V_{GS}$ = 0 V | P-Ch | | | -2 | |
| | | $V_{DS}$ = 60 V, $V_{GS}$ = 0 V, $T_J$ = 55℃ | N-Ch | | | 25 | μA |
| | | $V_{DS}$ = -60V, $V_{GS}$ = 0 V, $T_J$ =55℃ | P-Ch | | | -25 | |
| On State Drain Currenta | $I_{D(on)}$ | $V_{DS}$ ≥5 V, $V_{GS}$ = 10 V | N-Ch | 20 | | | A |
| | | $V_{DS}$ ≤-5 V, $V_{GS}$ = -10 V | P-Ch | -20 | | | |
| Drain Source On State Resistance* | $r_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ =4.5A | N-Ch | | 0.045 | 0.055 | Ω |
| | | $V_{GS}$ = -10 V, $I_D$ = -3.1A | P-Ch | | 0.100 | 0.120 | |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 3.9A | N-Ch | | 0.055 | 0.075 | |
| | | $V_{GS}$ = -4.5 V, $I_D$ = -2.8A | P-Ch | | 0.125 | 0.150 | |
| Forward Transconductance* | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 4.5A | N-Ch | | 13 | | S |
| | | $V_{DS}$ = -15 V, $I_D$ = -3.1A | P-Ch | | 7.5 | | |
| Diode Forward Voltage* | $V_{SD}$ | $I_S$ = 2A, $V_{GS}$ = 0 V | N-Ch | | 0.9 | 1.2 | V |
| | | $I_S$ = -2A, $V_{GS}$ = 0 V | P-Ch | | -0.8 | -1.2 | |
| Total Gate Charge | $Q_g$ | N-Channel | N-Ch | | 19 | 30 | nC |
| | | $V_{DS}$ = 30 V, $V_{GS}$ = 10V, $I_D$ =4.5A | P-Ch | | 16 | 25 | |
| Gate Source Charge | $Q_{gs}$ | | N-Ch | | 4 | | |
| | | P-Channel | P-Ch | | 4 | | |
| Gate Drain Charge | $Q_{gd}$ | $V_{DS}$ = -30 V, $V_{GS}$ = -10 V, $I_D$ = -3.1A | N-Ch | | 3 | | |
| | | | P-Ch | | 1.6 | | |
| Turn On Time | $t_{d(on)}$ | N Channel | N-Ch | | 13 | 20 | ns |
| | | $V_{DD}$ = 30 V, $R_L$ = 30Ω | P-Ch | | 8 | 15 | |
| Rise Time | $t_r$ | $I_D$= 1A, $V_{GEN}$ = 10V, $R_g$ = 6 Ω | N-Ch | | 11 | 20 | |
| | | | P-Ch | | 10 | 20 | |
| Turn Off Delay Time | $t_{d(off)}$ | P-Channel | N-Ch | | 36 | 60 | |
| | | $V_{DD}$ = -30 V, $R_L$ = 30Ω | P-Ch | | 12 | 25 | |
| Fall Time | $t_f$ | $I_D$= -1 A, $V_{GEN}$ = -10 V, $R_g$ = 6 Ω | N-Ch | | 11 | 20 | |
| | | | P-Ch | | 35 | 50 | |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F$ = 2 A, $di/dt$ = 100 A/μs | N-Ch | | 35 | 60 | |
| | | $I_F$ = -2 A, $di/dt$ = 100 A/μs | P-Ch | | 60 | 90 | |

* Pulse test; pulse width ≤300μs, duty cycle≤2%.