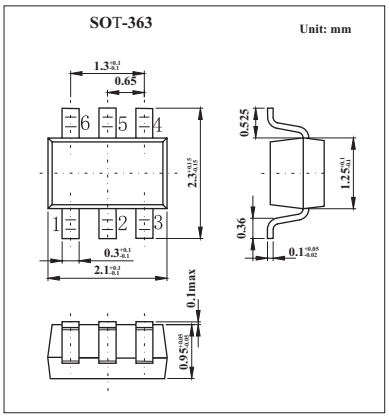
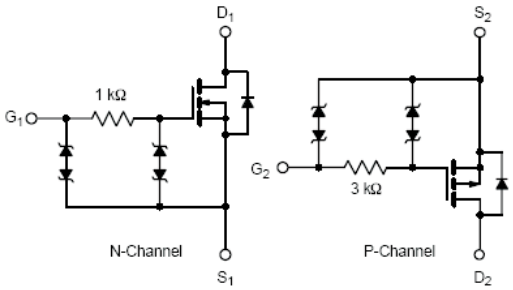
# Complementary 20-V (D-S) Low-Threshold MOSFET

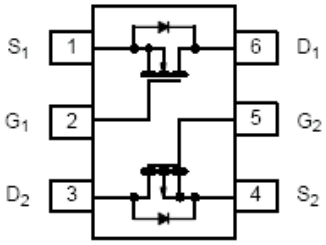
# KI1563EDH




## ■ Features

- TrenchFET Power MOSFETs




## ■ Absolute Maximum Ratings $T_A$ = 25℃

| Parameter | Symbol | N-Channel | | P-Channel | | Unit |
|---|---|---|---|---|---|---|
| | | 5 secs | Steady State | 5 secs | Steady State | |
| Drain-Source Voltage | $V_{DS}$ | 20 | | -20 | | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | | | | V |
| Continuous Drain Current ($T_J$ = 150℃)* $T_A$ = 25℃ | $I_D$ | 1.28 | 1.13 | -1 | -0.88 | A |
| $T_A$ = 85℃ | | 0.92 | 0.81 | -0.72 | -0.63 | A |
| Pulsed Drain Current | $I_{DM}$ | 4 | | -3 | | A |
| Continuous Source Current (Diode Conduction)* | $I_S$ | 0.61 | 0.48 | -0.61 | -0.48 | A |
| Maximum Power Dissipation* $T_A$ = 25℃ | $P_D$ | 0.74 | 0.57 | 0.3 | 0.57 | W |
| $T_A$ = 85℃ | | 0.38 | 0.3 | 0.16 | 0.3 | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | -55 to 150 | | | | ℃ |

*Surface Mounted on 1" X 1' FR4 Board.

## ■ Thermal Resistance Ratings $T_A$ = 25℃

| Parameter | | Symbol | Typical | Maximum | Unit |
|---|---|---|---|---|---|
| Maximum Junction-to-Ambient* | t ≤5 sec | $R_{thJA}$ | 130 | 170 | ℃/W |
| | Steady State | | 170 | 220 | |
| Maximum Junction-to-Foot (Drain) | Steady State | $R_{thJF}$ | 80 | 100 | |

*Surface Mounted on 1" X 1" FR4 Board.

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■ Electrical Characteristics $T_J$ = 25℃

| Parameter | Symbol | Testconditons | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 100μA | N-Ch | 0.45 | | | V |
| | | $V_{DS}$ = $V_{GS}$, $I_D$ = -100 μA | P-Ch | -0.45 | | | |
| Gate Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V $V_{GS}$ = ±4.5V | N-Ch | | | ±1 | μA |
| | | | P-Ch | | | ±1 | |
| | | $V_{DS}$ = 0 V $V_{GS}$ = ±12V | N-Ch | | | ±10 | mA |
| | | | P-Ch | | | ±10 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 16V, $V_{GS}$ = 0 V | N-Ch | | | 1 | μA |
| | | $V_{DS}$ = -16V, $V_{GS}$ = 0 V | P-Ch | | | -1 | |
| | | $V_{DS}$ = 16 V, $V_{GS}$ = 0 V, $T_J$ = 85℃ | N-Ch | | | 5 | μA |
| | | $V_{DS}$ = -16V, $V_{GS}$ = 0 V, $T_J$ = 85℃ | P-Ch | | | -5 | |
| On State Drain Current* | $I_{D(on)}$ | $V_{DS}$ ≥5 V, $V_{GS}$ = 4.5 V | N-Ch | 2 | | | A |
| | | $V_{DS}$ ≤-5 V, $V_{GS}$ = -4.5 V | P-Ch | -2 | | | |
| Drain Source On State Resistance* | $r_{DS(on)}$ | $V_{GS}$ = 4.5 V, $I_D$ = 1.13A | N-Ch | | 0.220 | 0.280 | Ω |
| | | $V_{GS}$ = -4.5 V, $I_D$ = -0.88A | P-Ch | | 0.400 | 0.490 | |
| | | $V_{GS}$ = 2.5 V, $I_D$ = 0.99A | N-Ch | | 0.281 | 0.360 | |
| | | $V_{GS}$ = -2.5 V, $I_D$ = -0.71A | P-Ch | | 0.610 | 0.750 | |
| | | $V_{GS}$ = 1.8 V, $I_D$ = 0.2A | N-Ch | | 0.344 | 0.450 | |
| | | $V_{GS}$ = -1.8 V, $I_D$ = -0.20A | P-Ch | | 0.850 | 1.10 | |
| Forward Transconductance* | $g_{fs}$ | $V_{DS}$ = 10 V, $I_D$ = 1.13A | N-Ch | | 2.6 | | mS |
| | | $V_{DS}$ = -10 V, $I_D$ = -0.88A | P-Ch | | 1.5 | | |
| Diode Forward Voltage* | $V_{SD}$ | $I_S$ = 0.48A, $V_{GS}$ = 0 V | N-Ch | | 0.8 | 1.2 | V |
| | | $I_S$ = -0.48A, $V_{GS}$ = 0 V | P-Ch | | -0.8 | -1.2 | |
| Total Gate Charge | $Q_g$ | N-Channel | N-Ch | | 0.65 | 1.0 | pC |
| | | $V_{DS}$ = 10 V, $V_{GS}$ = 4.5V, $I_D$ = 1.13A | P-Ch | | 1.2 | 1.8 | |
| Gate Source Charge | $Q_{gs}$ | | N-Ch | | 0.2 | | |
| | | P-Channel | P-Ch | | 0.3 | | |
| Gate Drain Charge | $Q_{gd}$ | $V_{DS}$ = -10 V, $V_{GS}$ = -4.5 V, $I_D$ = -0.88A | N-Ch | | 0.23 | | |
| | | | P-Ch | | 0.3 | | |
| Turn On Time | $t_{d(on)}$ | N Channel | N-Ch | | 45 | 70 | ns |
| | | $V_{DD}$ = 10 V, $R_L$ = 20Ω | P-Ch | | 150 | 230 | |
| Rise Time | $t_r$ | $I_D$= 0.5 A, $V_{GEN}$ = 4.5V, $R_g$ = 6 Ω | N-Ch | | 85 | 130 | |
| | | | P-Ch | | 480 | 720 | |
| Turn Off Delay Time | $t_{d(off)}$ | P-Channel | N-Ch | | 350 | 530 | |
| | | $V_{DD}$ = -10 V, $R_L$ = 20Ω | P-Ch | | 840 | 1200 | |
| Fall Time | $t_f$ | $I_D$= -0.5 A, $V_{GEN}$ = -4.5 V, $R_g$ = 6 Ω | N-Ch | | 210 | 320 | |
| | | | P-Ch | | 850 | 1200 | |

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