## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 20V | 250mΩ@4.5V | 0.75A |
| | 350mΩ@2.5V | |

## Feature

- Surface Mount Package
- N-Channel Switch with Low $R_{DS}$(on)
- Operated at Low Logic Level Gate Drive
- ESD Protected:HBM 2KV

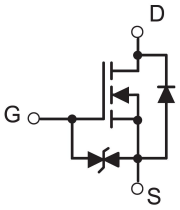
## Application

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

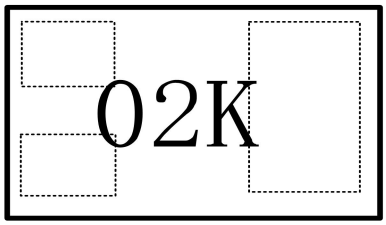
## Package


DFN1006-3L

## Circuit diagram




## Marking




**02K =Device Code**

## Absolute maximum ratings (Ta=25℃ unless otherwise noted)

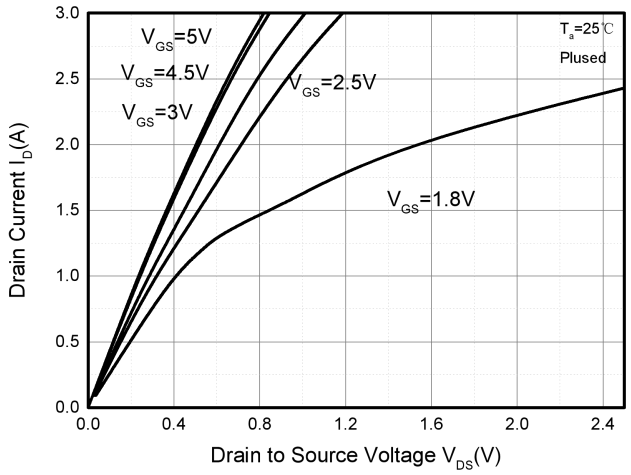
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $I_D$ | 0.75 | A |
| Pulsed Drain Current | $I_{DM}$ | 3.0 | A |
| Power Dissipation | $P_D$ | 0.15 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 833 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | ℃ |

## Electrical characteristics ($T_A$=25 °C, unless otherwise noted)

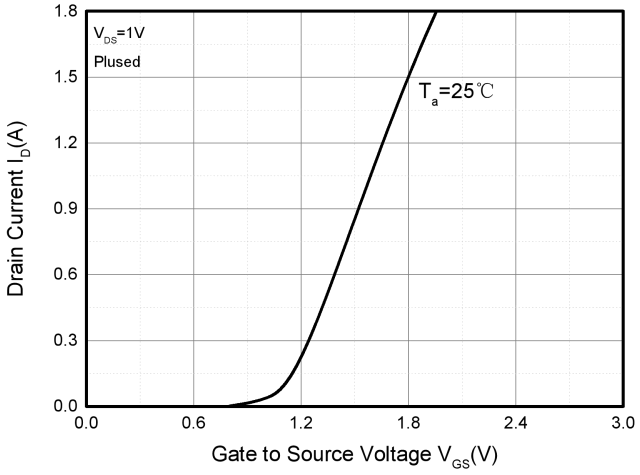
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 20 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =16V,$V_{GS}$ = 0V | | | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±10V, $V_{DS}$ = 0V | | | ±10 | uA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 0.3 | 0.65 | 1 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ = 0.5A | | 0.25 | 0.38 | Ω |
| | | $V_{GS}$ =2.5V, $I_D$ = 0.5A | | 0.35 | 0.45 | |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =16V,$V_{GS}$ =0V, f=1MHz | | 79 | 120 | pF |
| Output Capacitance | $C_{oss}$ | | | 13 | 20 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 9 | 15 | |
| **Switching Characteristics** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=4.5V,$V_{DS}$=10V, $I_D$ =500mA,$R_{GEN}$=10Ω | | 6.7 | | ns |
| Turn-on rise time | $t_r$ | | | 4.8 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 17.3 | | |
| Turn-off fall time | $t_f$ | | | 7.4 | | |
| **Source-Drain Diode characteristics** | | | | | | |
| Body Diode Voltage | $V_{SD}$ | $I_S$=0.5A, $V_{GS}$ = 0V | | 0.7 | 1.2 | V |

## Typical Characteristics

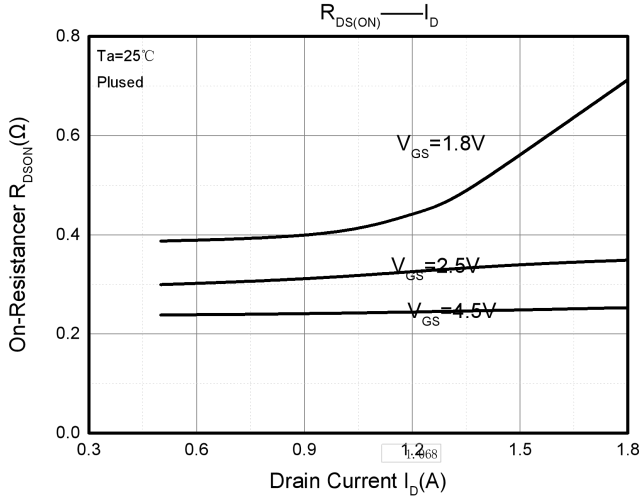
Output Characteristics



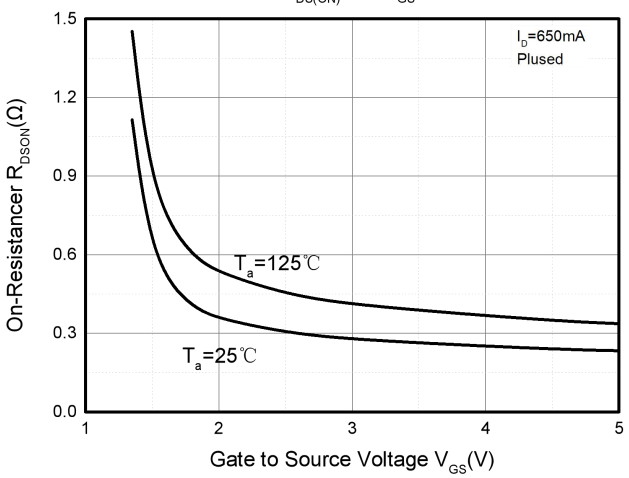

Transfer Characteristics



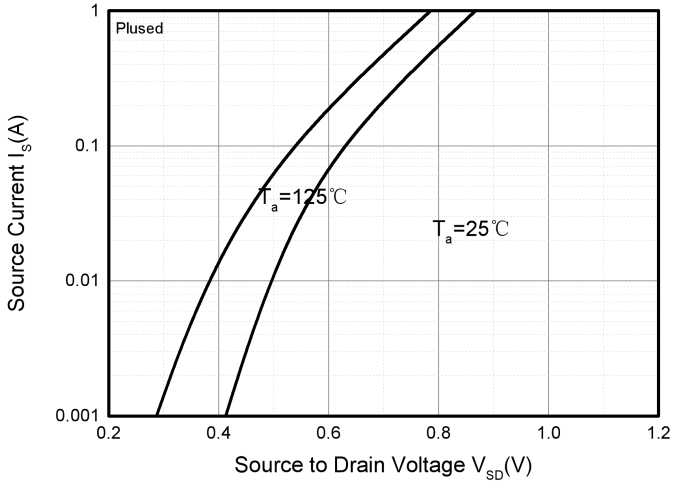

$R_{DS(ON)}$——$I_D$



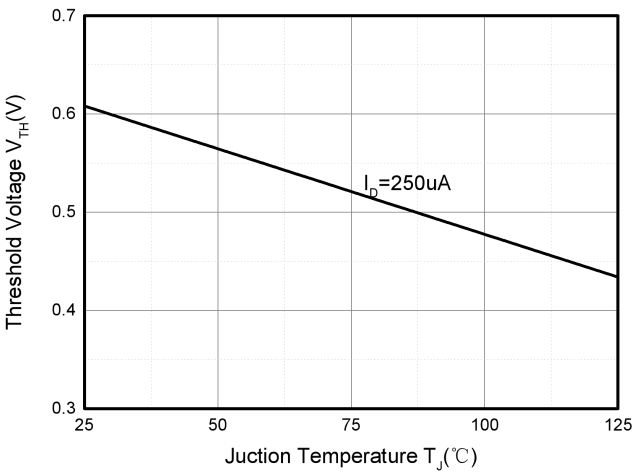

$R_{DS(ON)}$——$V_{GS}$



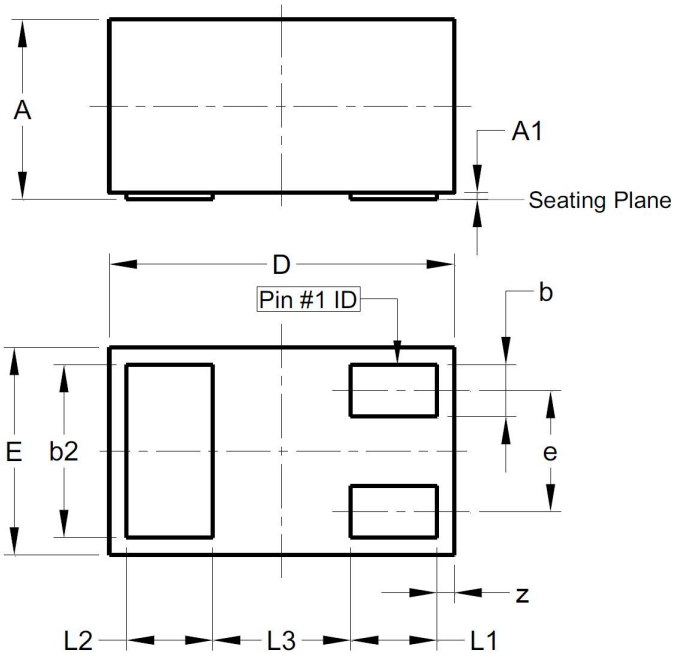

$I_S$——$V_{SD}$




Threshold Voltage

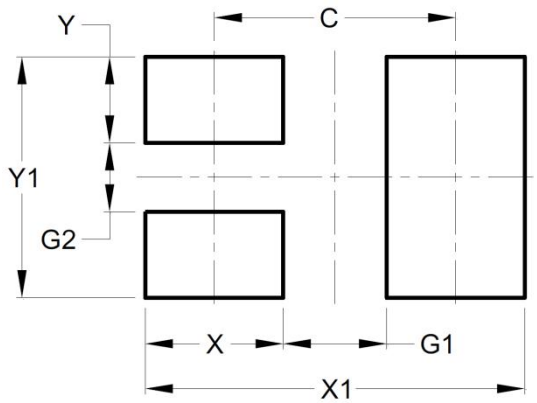


## DFN1006-3L Package Information




| Symbol | Dimensions In Millimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.47 | 0.50 | 0.55 |
| A1 | 0.00 | - | 0.05 |
| b | 0.10 | 0.15 | 0.20 |
| b2 | 0.45 | 0.50 | 0.55 |
| D | 0.95 | 1.0 | 1.05 |
| E | 0.55 | 0.60 | 0.65 |
| e | 0.35BSC | | |
| L1 | 0.20 | 0.25 | 0.30 |
| L2 | 0.20 | 0.25 | 0.30 |
| L3 | 0.40 | | |
| z | 0.02 | 0.05 | 0.08 |

## Recommend land pattern (Unit: mm)




| Dimensions | Value (in mm) |
|---|---|
| C | 0.70 |
| G1 | 0.30 |
| G2 | 0.20 |
| X | 0.40 |
| X1 | 1.10 |
| Y | 0.25 |
| Y1 | 0.70 |

## DFN1006-3L Tape

DFN1006-3L Tape Leader and Trailer