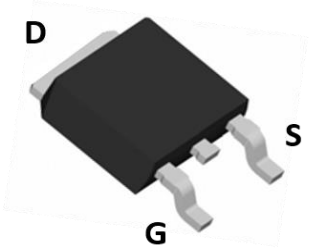
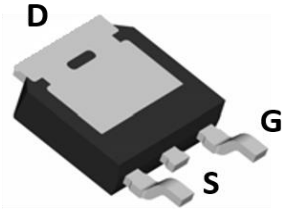
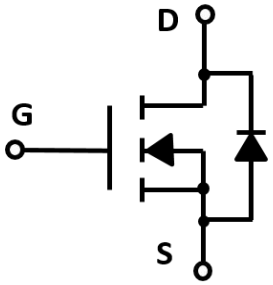
# N-Channel Enhancement Mode Field Effect Transistor




TO-252




## Product Summary

- $V_{DS}$ 100V
- $I_D$ 15A
- $R_{DS(ON)}$( at $V_{GS}$=10V) ＜110 mohm
- $R_{DS(ON)}$( at $V_{GS}$=4.5V) ＜120 mohm
- 100% UIS Tested
- 100% ▽$V_{DS}$ Tested

## General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

## Applications

- DC-DC Converters
- Power management functions

## ■ Absolute Maximum Ratings ($T_A$=25℃unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-source Voltage | | $V_{DS}$ | 100 | V |
| Gate-source Voltage | | $V_{GS}$ | ±20 | V |
| Drain Current | $T_C$=25℃ | $I_D$ | 15 | A |
| | $T_C$=100℃ | | 10.5 | |
| Pulsed Drain Current [A] | | $I_{DM}$ | 60 | A |
| Single Pulse Avalanche Energy | | $E_{AS}$ | 9 | mJ |
| Total Power Dissipation | $T_C$=25℃ | $P_D$ | 45 | W |
| | $T_C$=100℃ | | 22.5 | W |
| Thermal Resistance Junction-to-Case [B] | | $R_{\theta JC}$ | 3.3 | ℃/ W |
| Junction and Storage Temperature Range | | $T_J$ ,$T_{STG}$ | -55～+175 | ℃ |

## ■ Ordering Information (Example)

| PREFERED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| YJD15N10A | F1 | YJD15N10A | 2500 | 2500 | 25000 | 13“ reel |

## ■ Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|
| **Static Parameter** | | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$= 0V, $I_D$=250μA | | 100 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V,$V_{GS}$=0V | $T_J$=25℃ | | | 1 | μA |
| | | | $T_J$=55℃ | | | 5 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$= ±20V, $V_{DS}$=0V | | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$= $V_{GS}$, $I_D$=250μA | | 1 | 1.8 | 3.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$= 10V, $I_D$=12A | | | 95 | 110 | mΩ |
| | | $V_{GS}$= 4.5V, $I_D$=8A | | | 100 | 120 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=15A,$V_{GS}$=0V | | | 0.8 | 1.2 | V |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | | 15 | A |
| **Dynamic Parameters** | | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=50V,$V_{GS}$=0V,f=1MHZ | | | 785 | | pF |
| Output Capacitance | $C_{oss}$ | | | | 38 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 30 | | |
| **Switching Parameters** | | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{GS}$=10V,$V_{DS}$=50V,$I_D$=10A | | | 16 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | | 2.5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | | 2.6 | | |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}$=10V,$V_{DD}$=50V,$R_L$=6.4Ω $R_{GEN}$=3Ω | | | 5 | | ns |
| Turn-on Rise Time | $t_r$ | | | | 40 | | |
| Turn-off Delay Time | $t_{D(off)}$ | | | | 20 | | |
| Turn-off fall Time | $t_f$ | | | | 7 | | |

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

## ■ Typical Performance Characteristics

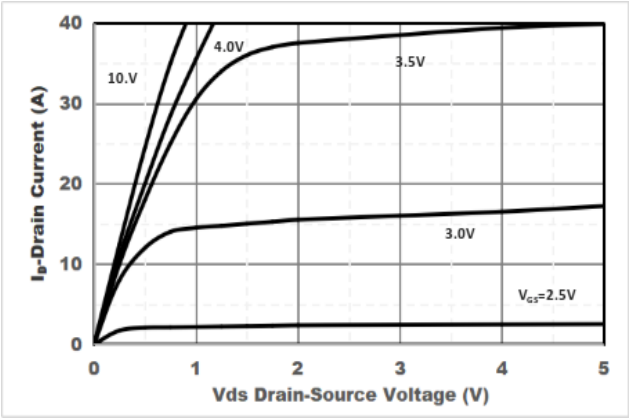



Figure1. Output Characteristics

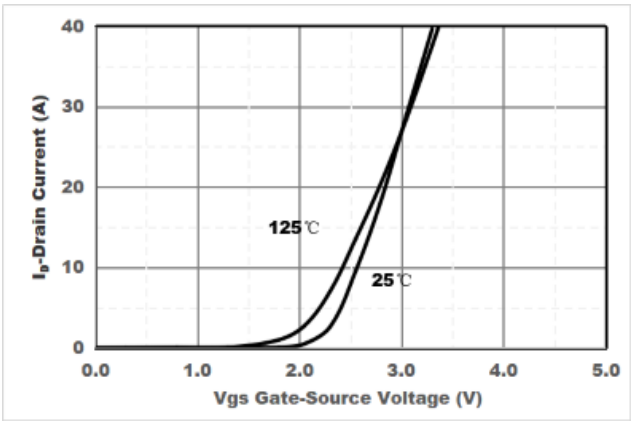



Figure2. Transfer Characteristics

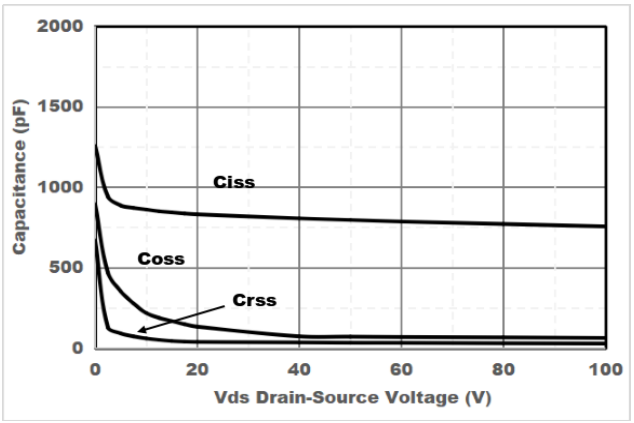



Figure3. Capacitance Characteristics

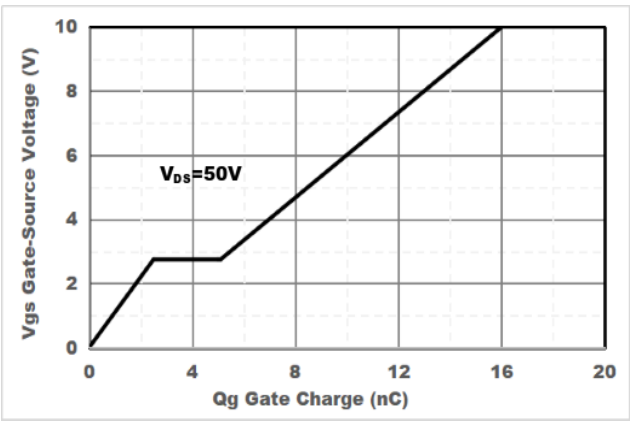



Figure4. Gate Charge

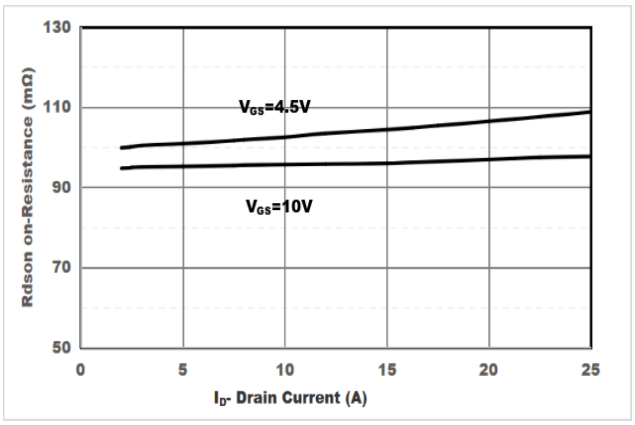



Figure5. Drain-Source on Resistance

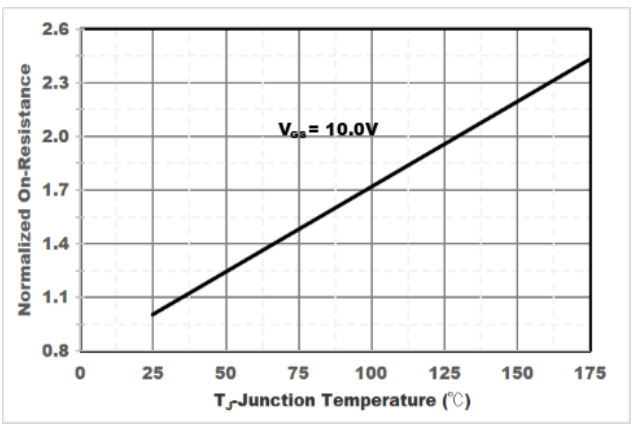



Figure6. Drain-Source on Resistance

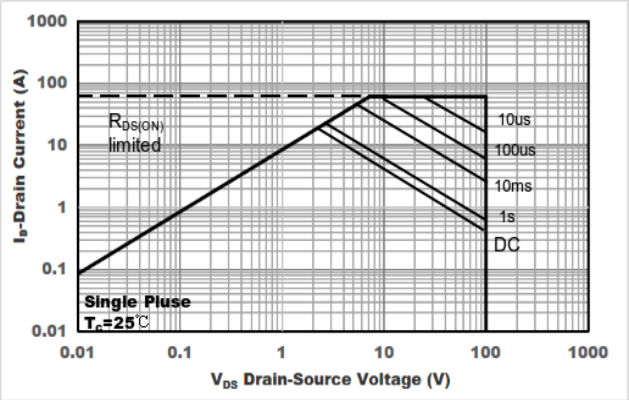



Figure7. Safe Operation Area

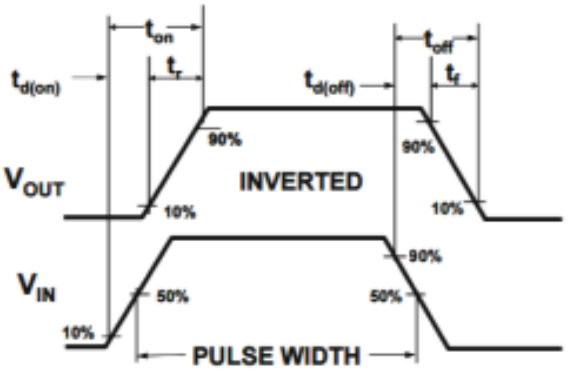
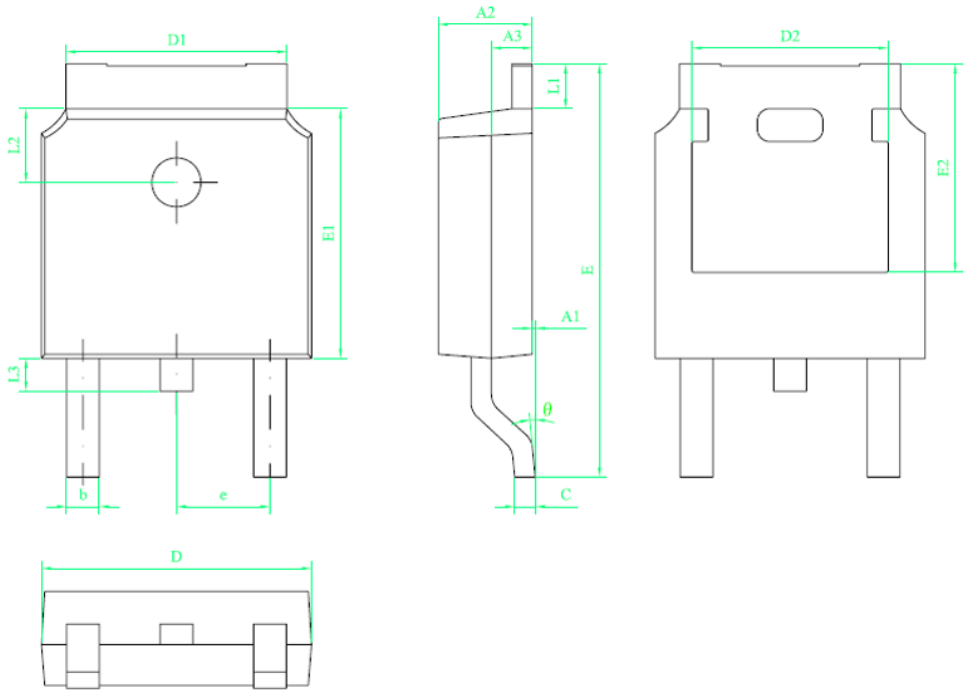



Figure8. Switching wave

## ■ TO-252 Package information




| 符 号 | 尺 寸 | | |
|---|---|---|---|
| | min | nom | max |
| A1 | 0 | ---- | 0.10 |
| A2 | 2.20 | 2.30 | 2.40 |
| A3 | 0.90 | 1.00 | 1.10 |
| b | 0.75 | ---- | 0.85 |
| c | 0.50 | ---- | 0.60 |
| D | 6.50 | 6.60 | 6.70 |
| D1 | 5.30 | 5.40 | 5.50 |
| D2 | 4.70 | 4.80 | 4.90 |
| E | 9.90 | 10.10 | 10.30 |
| E1 | 6.00 | 6.10 | 6.20 |
| E2 | 5.20 | 5.30 | 5.40 |
| e | 2.20 | 2.286 | 2.40 |
| L1 | 0.90 | ---- | 1.25 |
| L2 | 1.70 | 1.80 | 1.90 |
| L3 | 0.60 | 0.80 | 1.00 |
| θ | 0° | ---- | 8° |

技术要求：
1. 树脂体不应有崩裂、缺损等缺陷；
2. 树脂上下部X、Y方向偏差不超过0.20；
3. 胶体两端留废胶总和宽度不超过0.50；
4. 所有单位为mm；

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