



YJD18G15A

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

| | |
|---------------------------------|------|
| V_{DS} | 150V |
| I_D | 18A |
| $R_{DS(ON)}$ (at $V_{GS}=10V$) | 70m |
| $R_{DS(ON)}$ (at $V_{GS}=6V$) | 80m |
| 100% EAS Tested | |
| 100% V_{DS} Tested | |

General Description

gate trench MOSFET technology
 $DS(on)$ & FOM
 Excellent stability and uniformity
 Moisture Sensitivity Level 1
 -0 Flammability Rating
 Free

Applications

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

| Parameter | | Symbol | Limit | Units |
|--|-------------------|----------------|----------|------------|
| Drain-source Voltage | | V_{DS} | 150 | V |
| Gate-source Voltage | | V_{GS} | ± 20 | V |
| Drain Current | $T_A=25^\circ C$ | I_D | 4 | A |
| | $T_A=100^\circ C$ | | 2.5 | |
| | $T_C=25^\circ C$ | | 18 | |
| | $T_C=100^\circ C$ | | 11 | |
| Pulsed Drain Current ^A | | I_{DM} | 40 | A |
| Avalanche energy ^B | | EAS | 4.4 | mJ |
| Total Power Dissipation ^C | $T_A=25^\circ C$ | P_D | 2.5 | W |
| | $T_A=100^\circ C$ | | 1 | |
| | $T_C=25^\circ C$ | | 62 | |
| | $T_C=100^\circ C$ | | 25 | |
| Junction and Storage Temperature Range | | T_J, T_{STG} | -55 +150 | $^\circ C$ |

Thermal resistance

| Parameter | | Symbol | Typ | Max | Units |
|---|--------------|--------|-----|-----|--------------|
| Thermal Resistance Junction-to-Ambient ^D | Steady-State | R | 40 | 50 | $^\circ C/W$ |
| Thermal Resistance Junction-to-Case | Steady-State | R | 1.6 | 2 | |

Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking |
|---------------|--------------|---------|
| | | |



YJD18G15A

Electrical Characteristics ($T_J=25$ unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---------------------------------------|--------------|---|-----|------|-----------|-------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D$ | 150 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=150V, V_{GS}=0V$ | - | - | 1 | |
| | | $V_{DS}=150V, V_{GS}=0V, T_J=150^\circ C$ | - | - | 100 | |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D$ | 2 | 3 | 4 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=18A$ | - | 48 | 70 | |
| | | $V_{GS}=6V, I_D=10A$ | - | 55 | 80 | |
| Diode Forward Voltage | V_{SD} | $I_S=18A, V_{GS}=0V$ | - | 0.95 | 1.3 | V |
| Gate resistance | R_G | $f=1MHz$ | - | 1 | - | |
| Maximum Body-Diode Continuous Current | I_S | | - | - | 18 | A |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=75V, V_{GS}=0V, f=1MHz$ | - | 785 | - | pF |
| Output Capacitance | C_{oss} | | - | 55 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 4 | - | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q_g | $V_{GS}=10V, V_{DS}=75V, I_D=9A$ | - | 18 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 6 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 5 | - | |
| Reverse Recovery Charge | Q_{rr} | $I_F=9A, di/dt=100A/us$ | - | 185 | - | nC |
| Reverse Recovery Time | t_{rr} | | - | 58 | - | ns |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}=10V, V_{DD}=75V, I_D=9A$ $R_{GEN}=2.2$ | - | 12 | - | ns |
| Turn-on Rise Time | t_r | | - | 6 | - | |
| Turn-off Delay Time | $t_{D(off)}$ | | - | 41 | - | |
| Turn-off fall Time | t_f | | - | 7 | - | |

A. Repetitive rating; pulse width limited by max. junction temperature.

B. $T_J=25^\circ C, V_{DD}=50V, V_G=10V, R_G=0.5mH, I_{AS}=4.2A$.

C. P_g is based on max. junction temperature, using junction-case thermal resistance.

D. The value of $R_{\theta j-c}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



YJD18G15A

Typical Electrical and Thermal Characteristics Diagrams

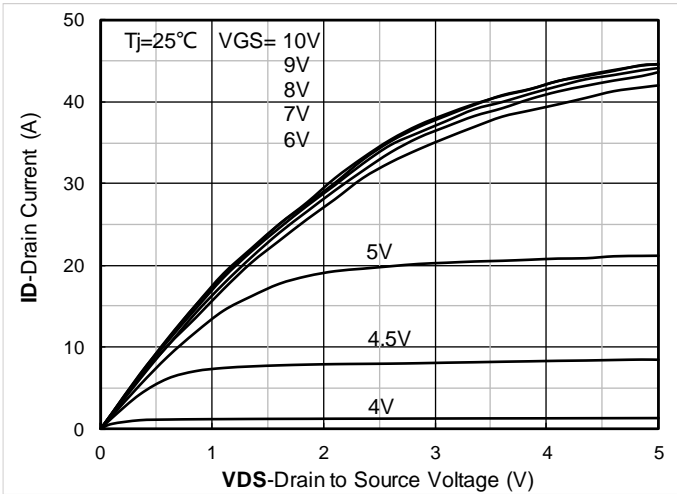


Figure 1. Output Characteristics

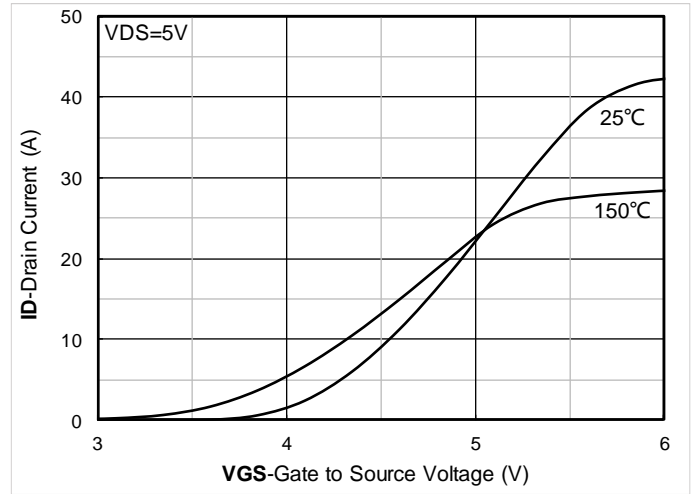


Figure 2. Transfer Characteristics

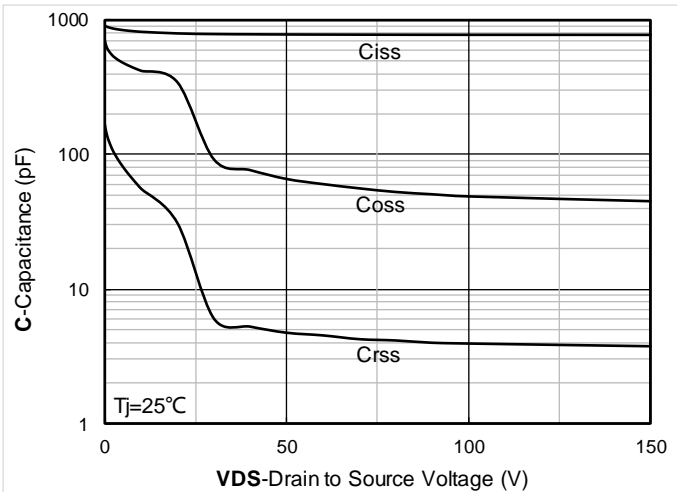


Figure 3. Capacitance Characteristics

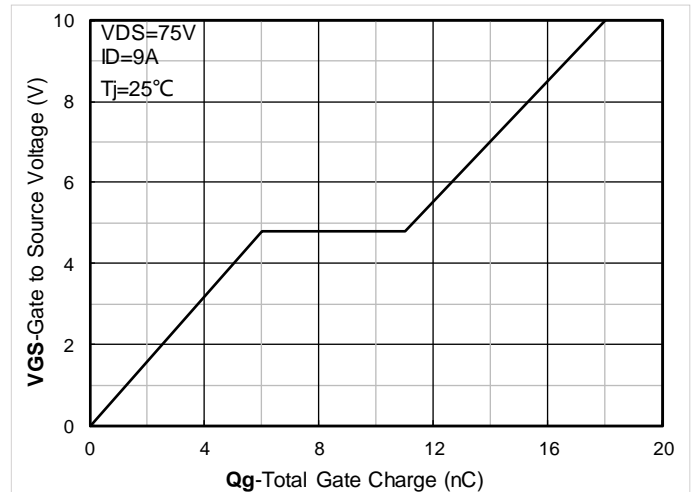


Figure 4. Gate Charge

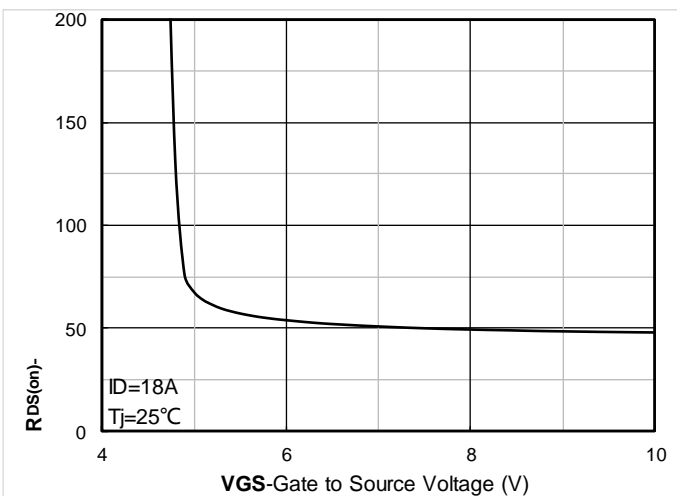


Figure 5. On-Resistance vs Gate to Source Voltage

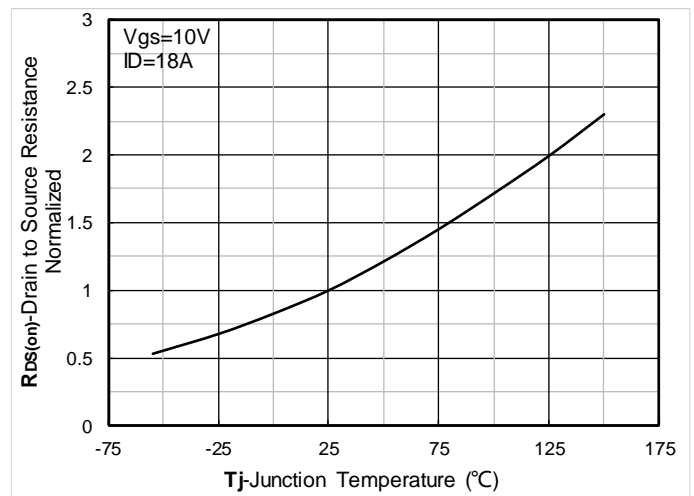


Figure 6. Normalized On-Resistance



YJD18G15A

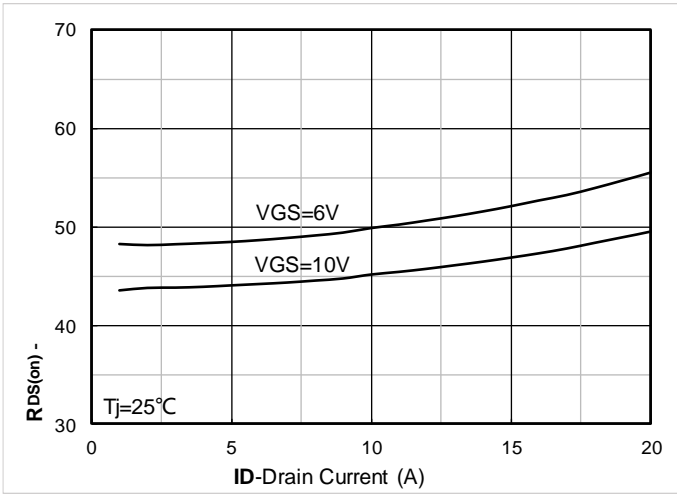


Figure 7. RDS(on) VS Drain Current

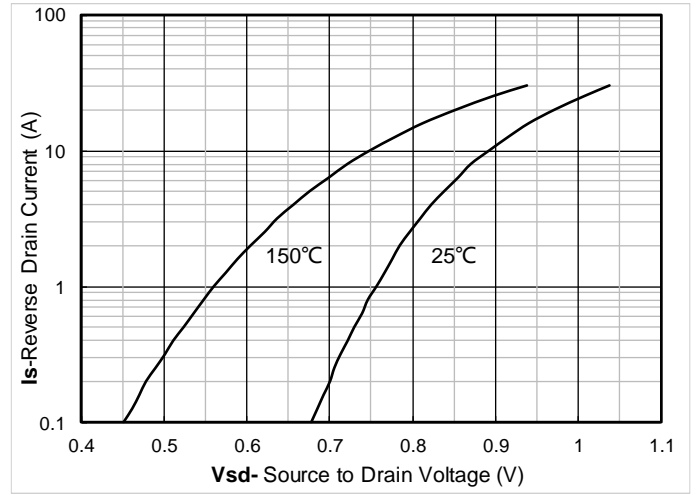


Figure 8. Forward characteristics of reverse diode

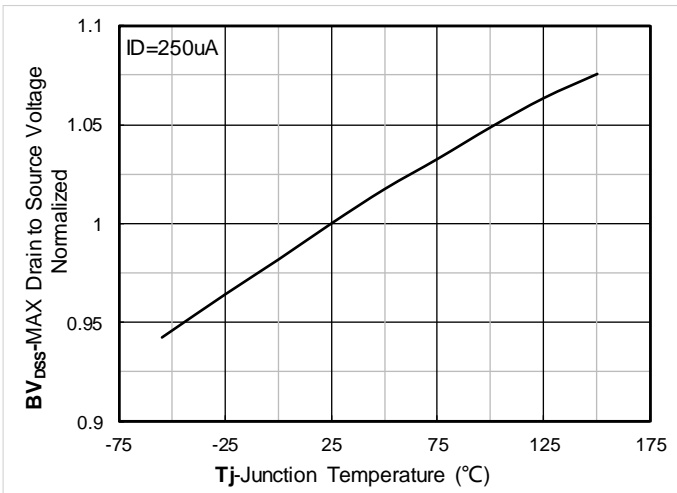


Figure 9. Normalized breakdown voltage

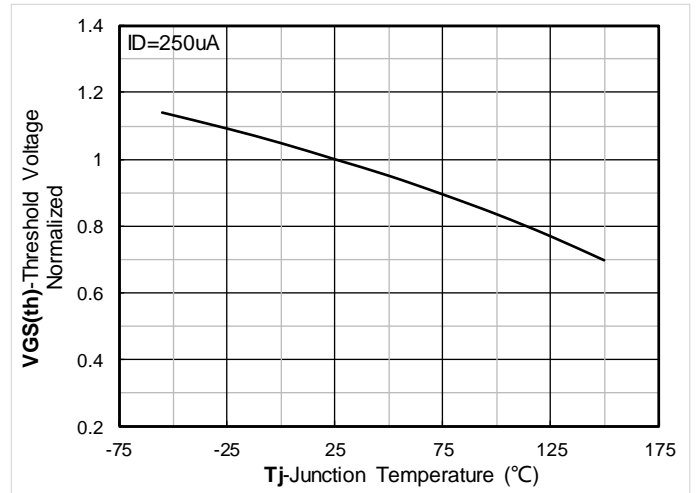


Figure 10. Normalized Threshold voltage

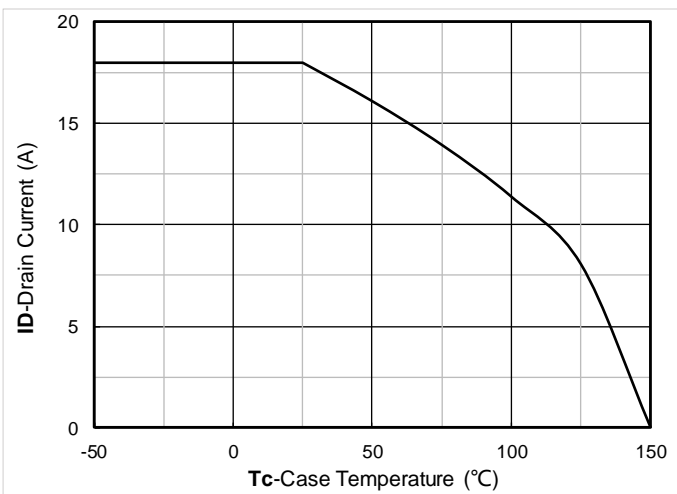


Figure 11. Current dissipation

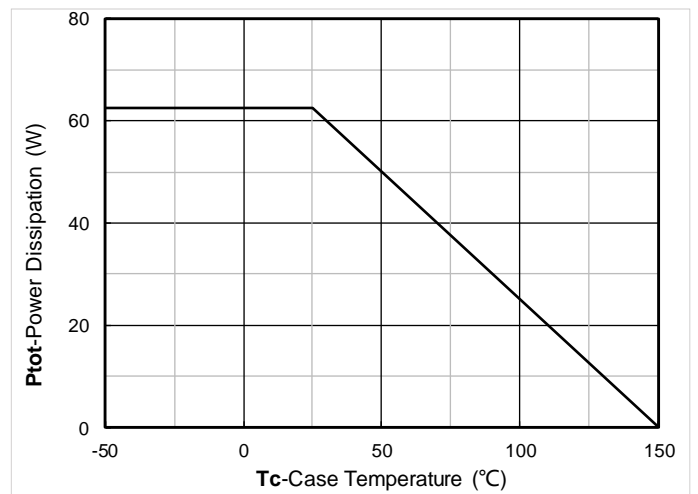


Figure 12. Power dissipation



YJD18G15A

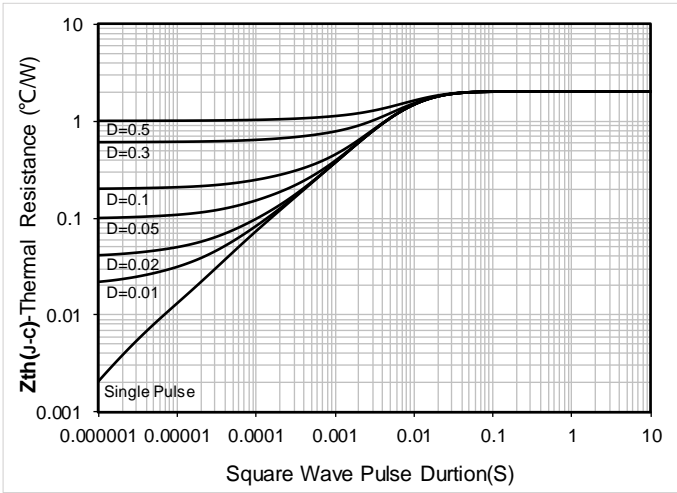


Figure 13. Maximum Transient Thermal Impedance

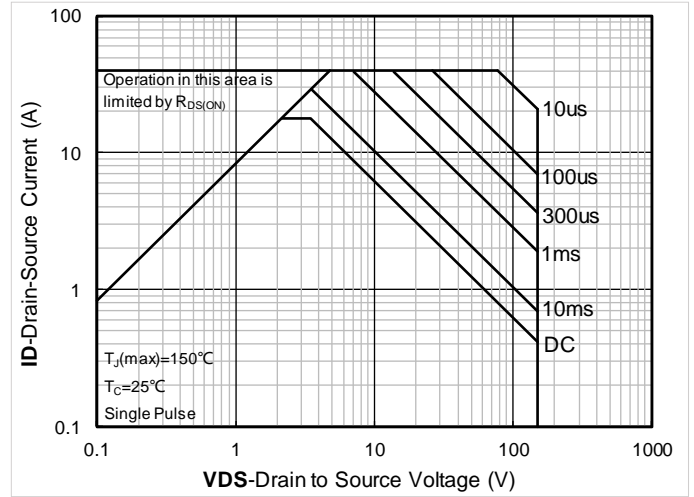


Figure 14. Safe Operation Area

Test Circuits & Waveforms

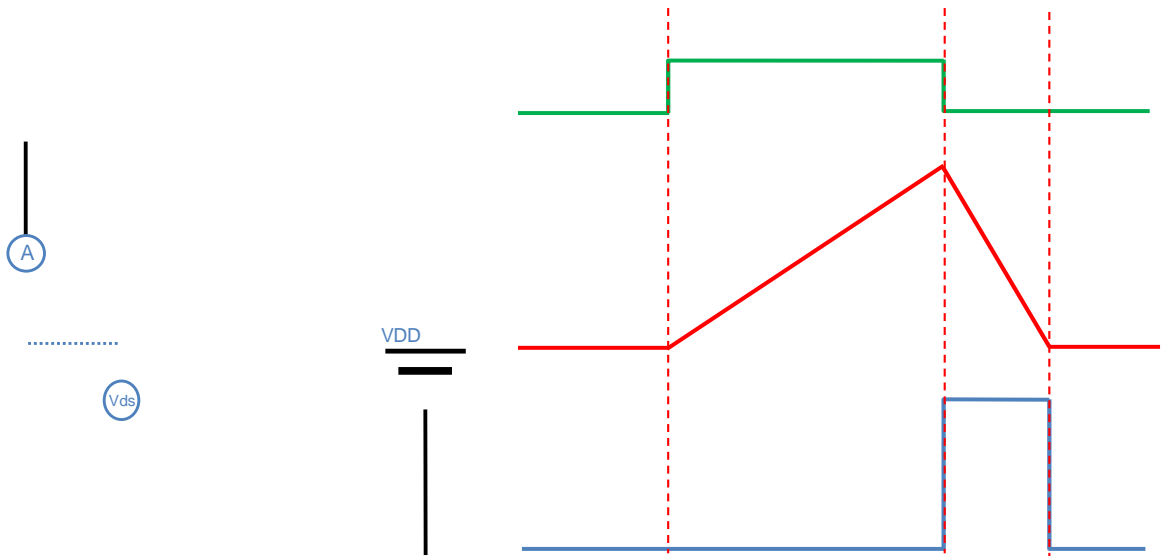


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

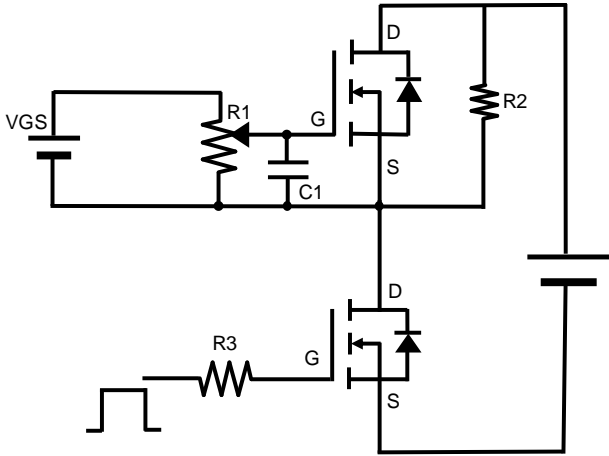


Figure B. Gate Charge Test Circuit & Waveform

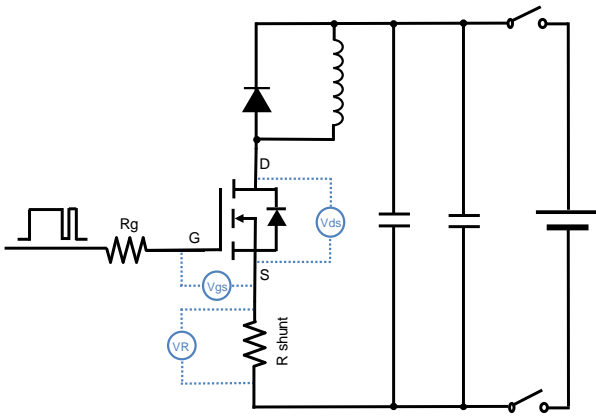


Figure C. Resistive Switching Test Circuit & Waveform

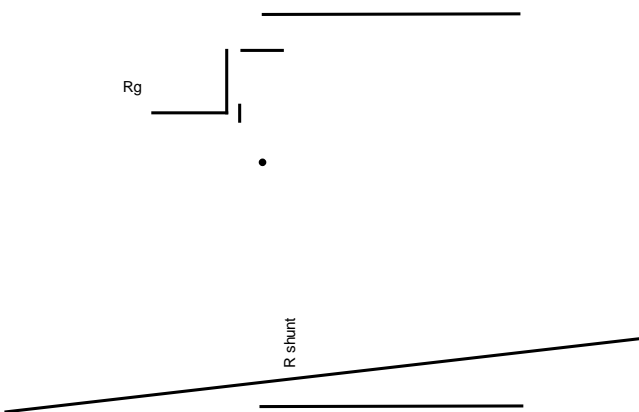
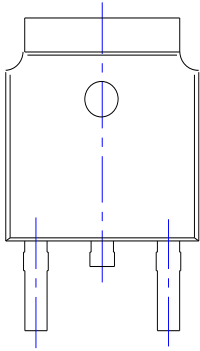


Figure D. Diode Recovery Test Circuit & Waveform

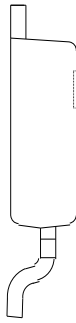


YJD18G15A

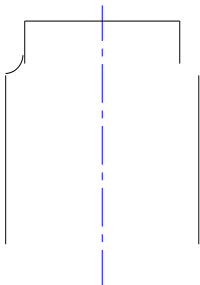
TO-252-B Package information



TOP VIEW



SIDE VIEW



BOTTOM VIEW

SUGGESTED SOLDER PAD LAYOUT

| SYMBOL | DIMENSIONS | | | | |
|--------|------------|-------|--|--|--|
| | INCHES | | | | |
| | MIN. | NOM. | | | |
| A1 | 0.000 | | | | |
| A2 | 0.087 | 0.091 | | | |
| A3 | 0.035 | 0.039 | | | |
| b | 0.026 | 0.030 | | | |
| c | 0.018 | 0.020 | | | |
| D | 0.256 | 0.260 | | | |
| D1 | | | | | |
| D2 | 0.181 | 0.189 | | | |
| E | 0.390 | 0.398 | | | |
| E1 | 0.236 | 0.240 | | | |

NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



YJD18G15A

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <http://www.21yangjie.com>