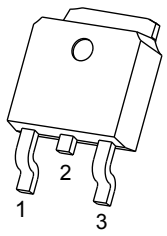
JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD.

# TO-252-2L Plastic-Encapsulate MOSFETS

## CJU30N10 N-Channel Power MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$TYP | $I_D$ |
|---|---|---|
| 100V | 24mΩ@10V | 30A |

**TO-252-2L**




1. GATE
2. DRAIN
3. SOURCE

### DESCRIPTION

This advanced high voltage MOSFET is designed to stand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode fast recovery time. Desighed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.

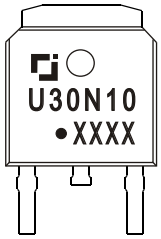
### FEATURES

- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high $E_{AS}$
- Special process technology for high ESD capability
- Excellent package for good heat dissipation

### APPLICATIONS

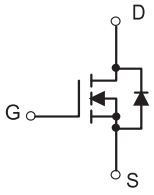
- Hard switched and high frequency circuits
- Uninterruptible power supply
- Power switching application

### MARKING




U30N10 = Device code.
Solid dot = Green molding compound device if none, the normal device.
XXXX = Code.

### EQUIVALENT CIRCUIT




### ABSOLUTE MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | $V_{GS}$ | Ñ20 | V |
| Continuous Drain Current | $I_D$ ① | 30 | A |
| Pulsed Drain Current | $I_{DM}$ ② | 120 | A |
| Single Pulsed Avalanche Energy | $E_{AS}$ ③ | 156 | mJ |
| Maximum Power Dissipation | $P_D$ ① | 85 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ ⑥ | 100 | ℃/W |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ ① | 1.47 | ℃/W |
| Operating Junction and Storage Temperature Range | $T_J$ ,$T_{stg}$ | -55~+150 | ℃ |

## MOSFET ELECTRICAL CHARACTERISTICS

**$T_a$=25℃ unless otherwise specified**

| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Off characteristics** | | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | | 100 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =80V, $V_{GS}$ =0V | $T_J$ =25℃ | | | 1 | μA |
| | | | $T_J$ =125℃ | | | 100 | |
| Gate-body leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±20V | | | | ±100 | nA |
| **On characteristics**④ | | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | | 1.3 | 2.0 | 2.5 | V |
| Static drain-source on-sate resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =15A | | | 24 | 31 | mΩ |
| Forward transconductance | $g_{FS}$ | $V_{DS}$ =5V, $I_D$ =10A | | | 15 | | S |
| **Dynamic characteristics**④⑤ | | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =25V,$V_{GS}$ =0V, f =1MHz | | | 2465 | 4930 | pF |
| Output capacitance | $C_{oss}$ | | | | 118 | 236 | |
| Reverse transfer capacitance | $C_{rss}$ | | | | 108 | 216 | |
| Gate resistance | $R_g$ | f =1MHz | | | 2.3 | | Ω |
| **Switching characteristics**④⑤ | | | | | | | |
| Total gate charge | $Q_g$ | VDS=50V,$V_{GS}$=10V, $I_D$=10A | | | 62 | 124 | nC |
| Gate-source charge | $Q_{gs}$ | | | | 6.2 | 12 | |
| Gate-drain charge | $Q_{gd}$ | | | | 15 | 30 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DS}$=30V, $V_{GS}$=10V,ID=2A, $R_G$=3Ω , $R_L$=5Ω | | | 7 | | ns |
| Turn-on rise time | $t_r$ | | | | 7 | | |
| Turn-off delay time | $t_{d(off)}$ | | | | 29 | | |
| Turn-off fall time | $t_f$ | | | | 7 | | |
| **Drain-Source Diode Characteristics** | | | | | | | |
| Drain-source diode forward voltage | $V_{SD}$ ④ | $V_{GS}$ =0V, $I_S$=40A | | | | 1.2 | V |
| Continuous drain-source diode forward current | $I_S$ ① | | | | | 30 | A |
| Pulsed drain-source diode forward current | $I_{SM}$ ② | | | | | 120 | A |

Notes:

1.$T_C$=25℃ Limited only by maximum temperature allowed.

2.$P_W$≤10μs, Duty cycle≤1%.

3.EAS condition: $V_{DD}$=50V,$V_{GS}$=10V, L=0.5mH, $R_g$=25Ω Starting $T_J$ = 25°℃.

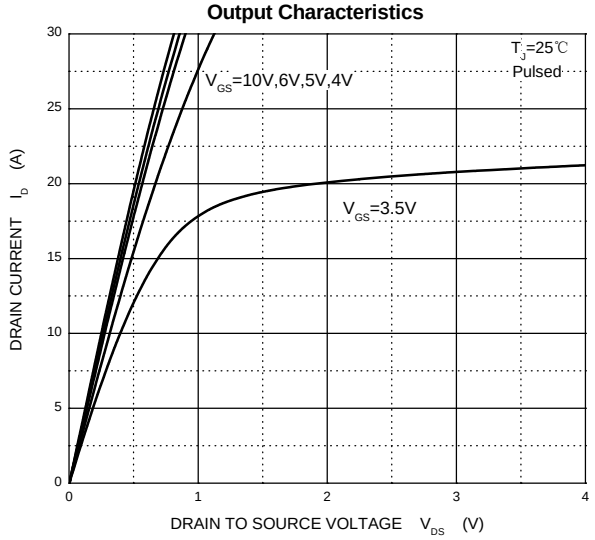
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

5.Guaranteed by design, not subject to production.

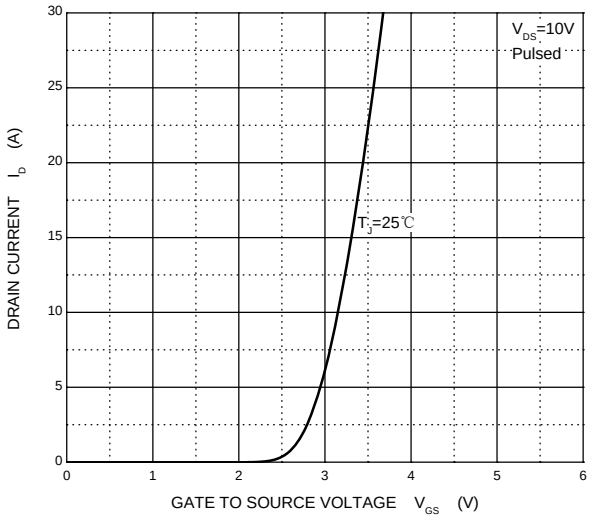
6.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a$=25℃.

# Typical Characteristics

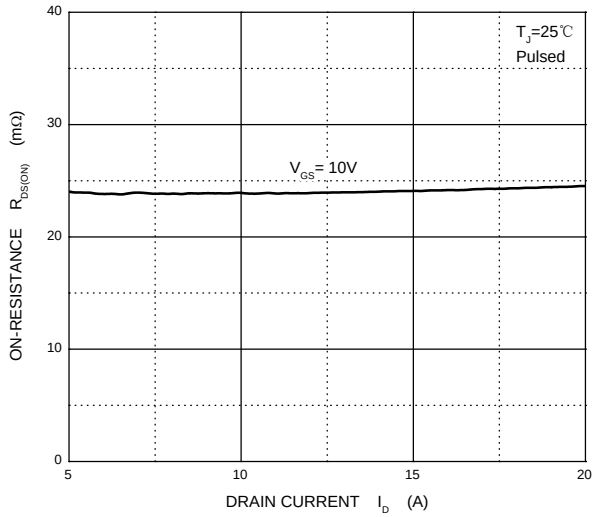
**Output Characteristics**



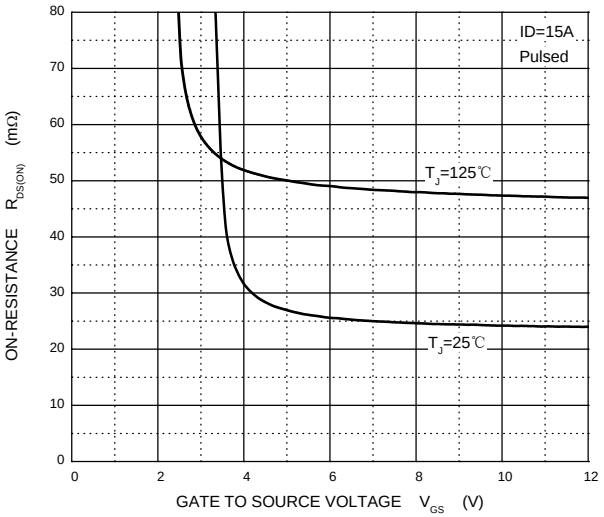

**Transfer Characteristics**



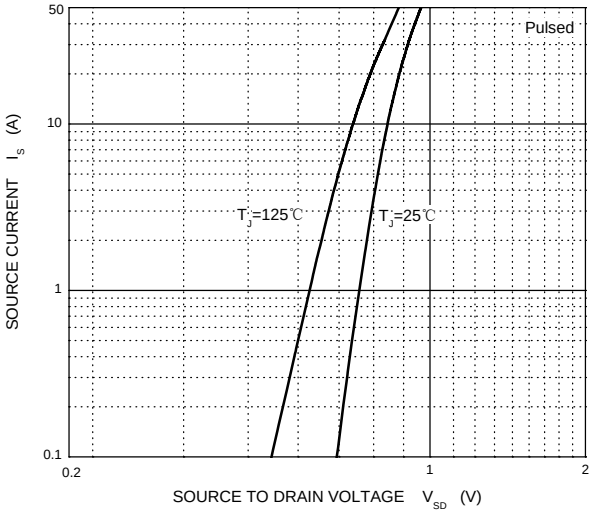

**$R_{DS(ON)}$ —— $I_D$**



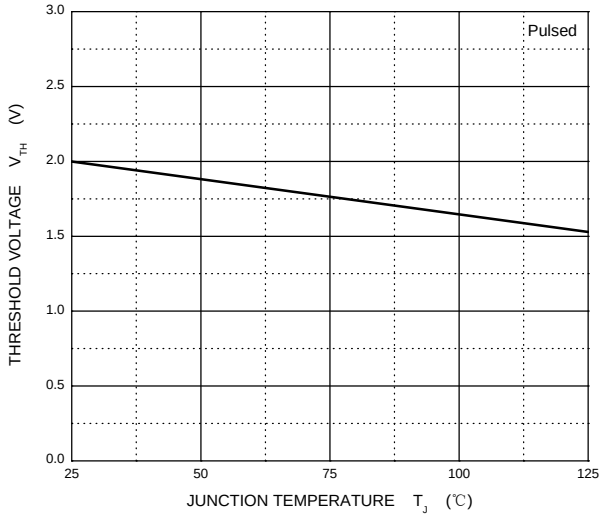

**$R_{DS(ON)}$—— $V_{GS}$**




**$I_S$ —— $V_{SD}$**

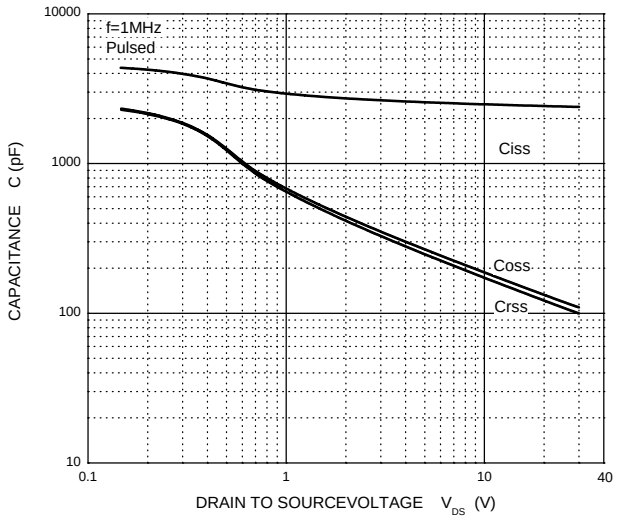



**Threshold Voltage**

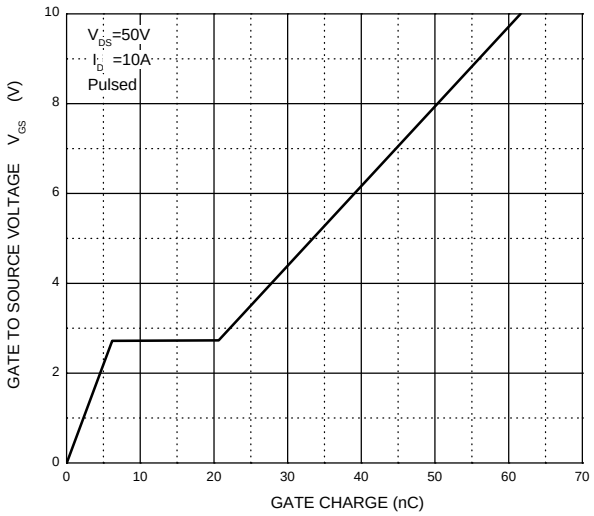


# Typical Characteristics

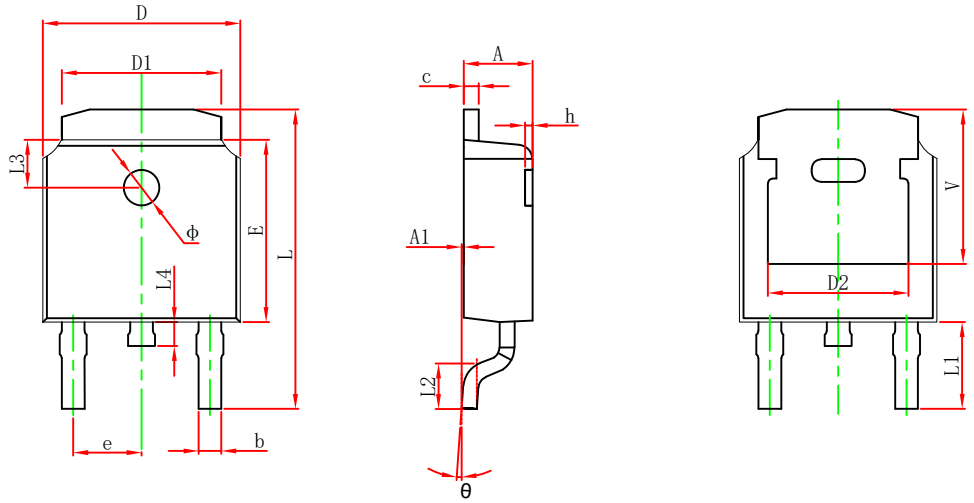
**Capacitances**




**Gate Charge**

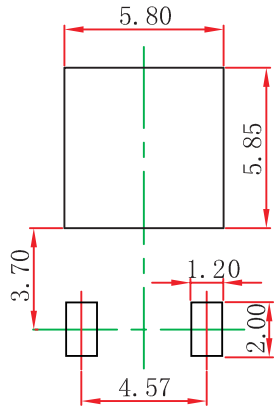


## TO-252-2L Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.635 | 0.770 | 0.025 | 0.030 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.712 | 10.312 | 0.382 | 0.406 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.250 REF. | | 0.207 REF. | |

## TO-252-2L Suggested Pad Layout



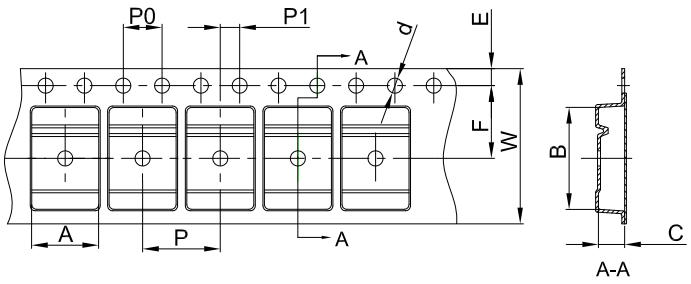

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

NOTICE

JSCJ reserves the right to make modifications,enhancements,improvements,corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

# TO-252-2L Tape and Reel

## TO-252 Embossed Carrier Tape

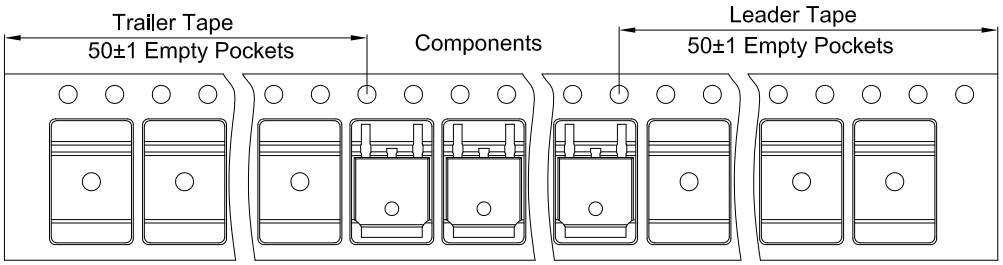



Packaging Description:

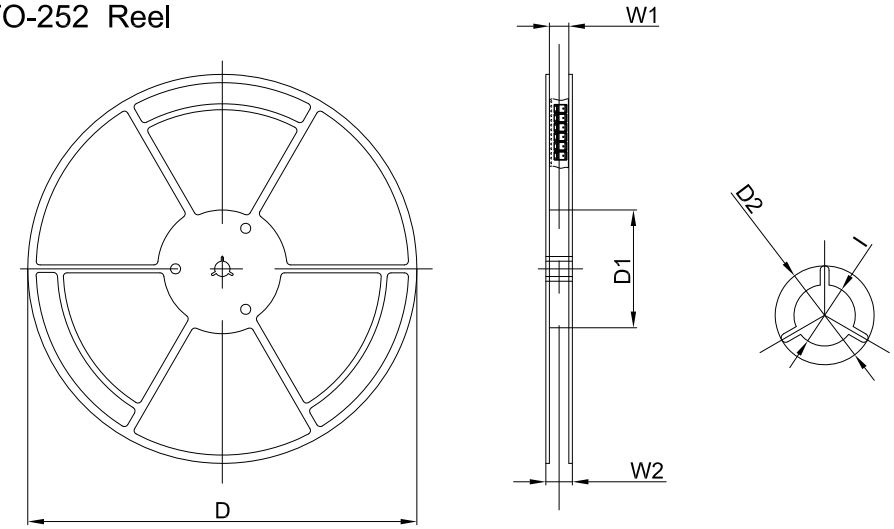
TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 25,00 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| TO-252 | 6.90 | 10.50 | 2.70 | Ø1.55 | 1.75 | 7.50 | 4.00 | 8.00 | 2.00 | 16.00 |

## TO-252 Tape Leader and Trailer




## TO-252 Reel




| Dimensions are in millimeter | | | | | | |
|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | W1 | W2 | I |
| 13"Dia | 330.00 | 100.00 | Ø21.00 | 16.40 | 21.00 | Ø13.00 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|---|---|---|---|---|---|---|
| 2,500 pcs | 13inch | 2,500 pcs | 340×336×29 | 25,000 pcs | 353×346×365 | |