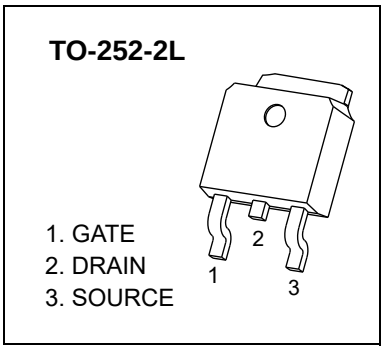
# TO-252-2L Plastic-Encapsulate MOSFETS

## CJU04N65 N-Channel Power MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$MAX | $I_D$ |
|---|---|---|
| 650V | 3.0Ω@10V | 4A |




### GENERAL DESCRIPTION

The CJU04N65 is an N-channel mode power MOSFET using advanced technology to provide costomers with planar stripe. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode. The CJU04N65 is universally applied in high efficiency switch mode power supply.

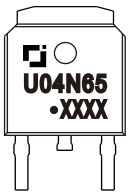
### FEATURE

- Excellent package for good heat dissipation
- High switching speed
- 100% avalanche tested

### APPLICATION

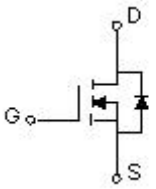
- Power switching application
- DC/DC converters

### MARKING




U04N65= Device code
Solid dot = Green molding compound device, if none, the normal device
XXXX=Code

### EQUIVALENT CIRCUIT




### Maximum ratings ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 650 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | |
| Continuous Drain Current | $I_D$ ① | 4.0 | A |
| Pulsed Drain Current | $I_{DM}$ ② | 16 | |
| Single Pulsed Avalanche Energy | $E_{AS}$ ③ | 280 | mJ |
| Power Dissipation | $P_D$ ① | 48 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ ⑥ | 100 | ℃/W |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ ① | 2.6 | ℃/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 | 650 | | | V |
| Drain-source diode forward voltage | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ =4.0A | | | 1.5 | |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =600V, $V_{GS}$ =0V | | | 25 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±30V | | | ±100 | nA |
| **On characteristics**④ | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 2.0 | | 4.0 | V |
| Static drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =2.0A | | 2.3 | 3.0 | Ω |
| **Dynamic characteristics**④⑤ | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =25V,$V_{GS}$ =0V,f =1MHz | | | 760 | pF |
| Output capacitance | $C_{oss}$ | | | | 180 | |
| Reverse transfer capacitance | $C_{rss}$ | | | | 20 | |
| **Switching characteristics** ④⑤ | | | | | | |
| Total gate charge | $Q_g$ | $V_{DS}$ =480V,$V_{GS}$ =10V,$I_D$ =4.0A | | 5.0 | 10 | nC |
| Gate-source charge | $Q_{gs}$ | | | 2.7 | | |
| Gate-drain charge | $Q_{gd}$ | | | 2.0 | | |
| Turn-on delay time (note3) | $t_{d(on)}$ | $V_{DD}$=300V, $V_{GS}$=10V, $R_G$=9.1Ω, $I_D$ =4.0A | | | 20 | ns |
| Turn-on rise time (note3) | $t_r$ | | | | 10 | |
| Turn-off delay time (note3) | $t_{d(off)}$ | | | | 40 | |
| Turn-off fall time (note3) | $t_f$ | | | | 20 | |

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=10mH, $R_g$=25Ω Starting $T_J$ = 25°℃.

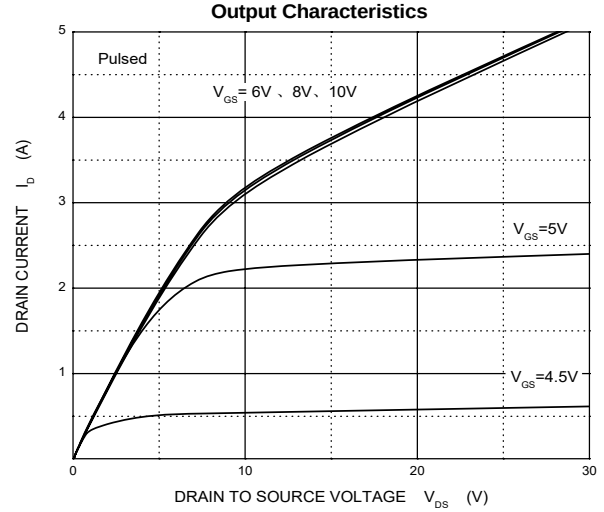
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

5.Guaranteed by design, not subject to production.

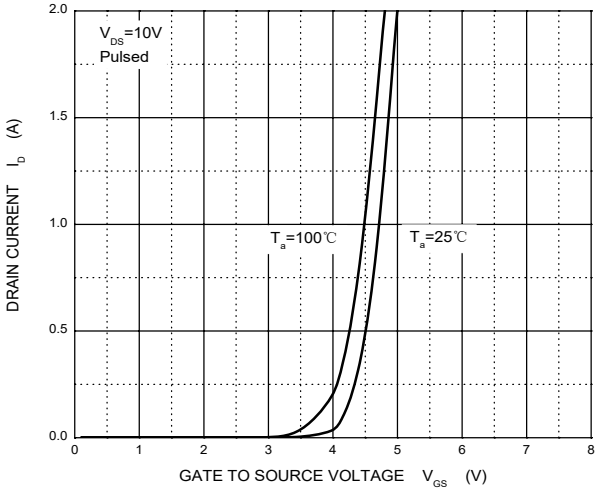
6.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a$=25℃.

# Typical Characteristics

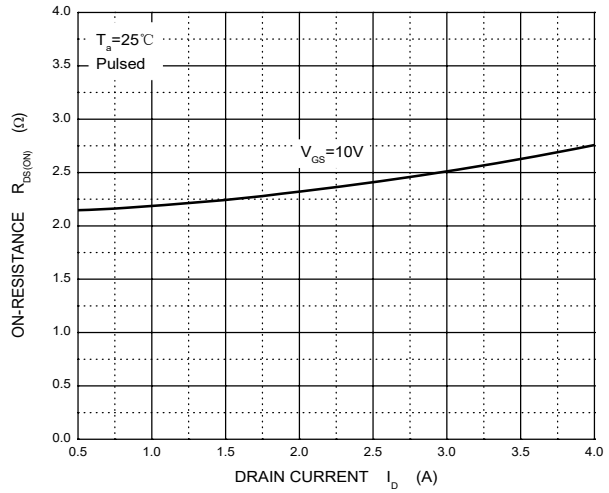
**Output Characteristics**



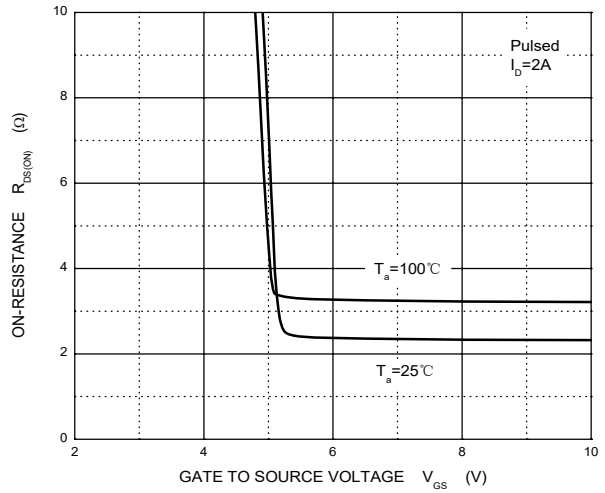

**Transfer Characteristics**



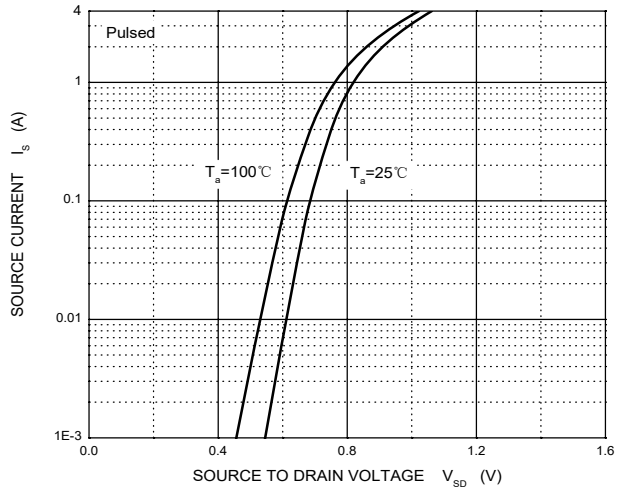

**$R_{DS(ON)}$ —— $I_D$**



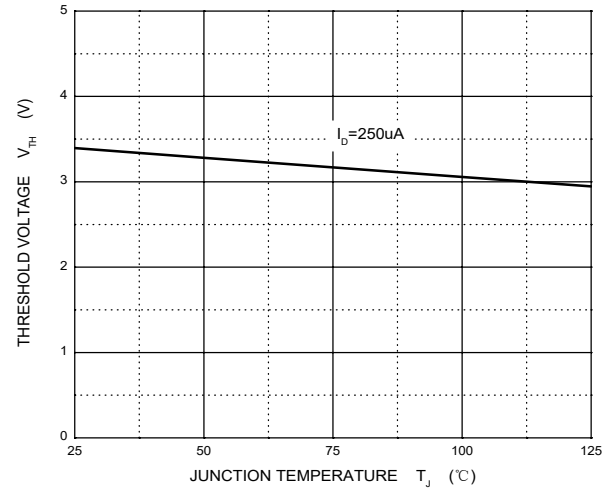

**$R_{DS(ON)}$—— $V_{GS}$**



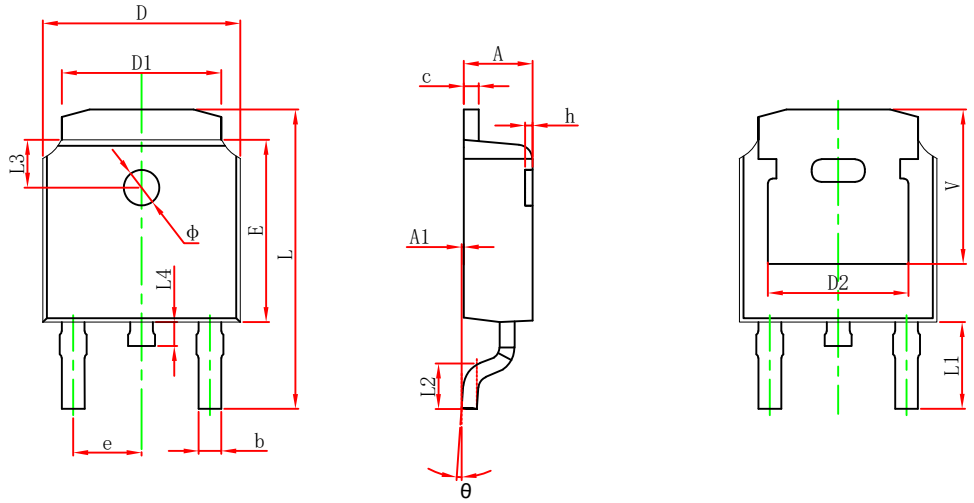

**$I_S$ —— $V_{SD}$**




**Threshold Voltage**

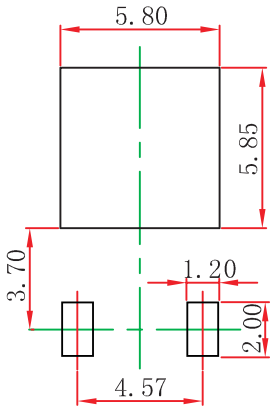


## TO-252-2L Package Outline Dimensions




| 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.

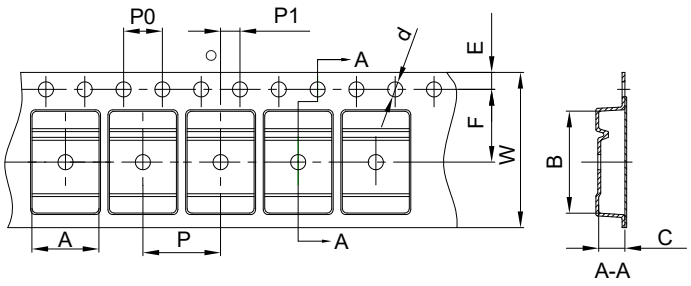
NOTICE

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# TO-252-2L Tape and Reel

## TO-252-2L Embossed Carrier Tabe

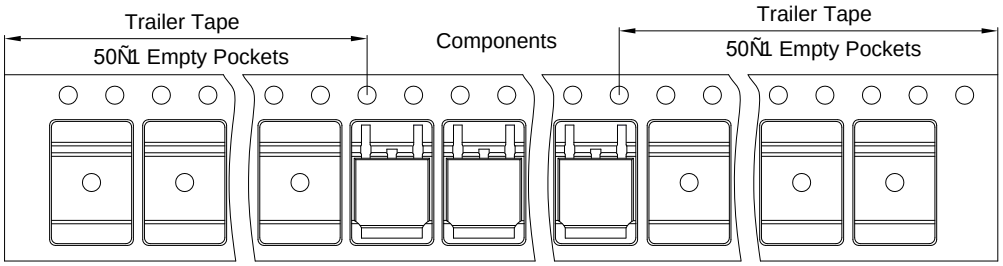



Packaging Description:

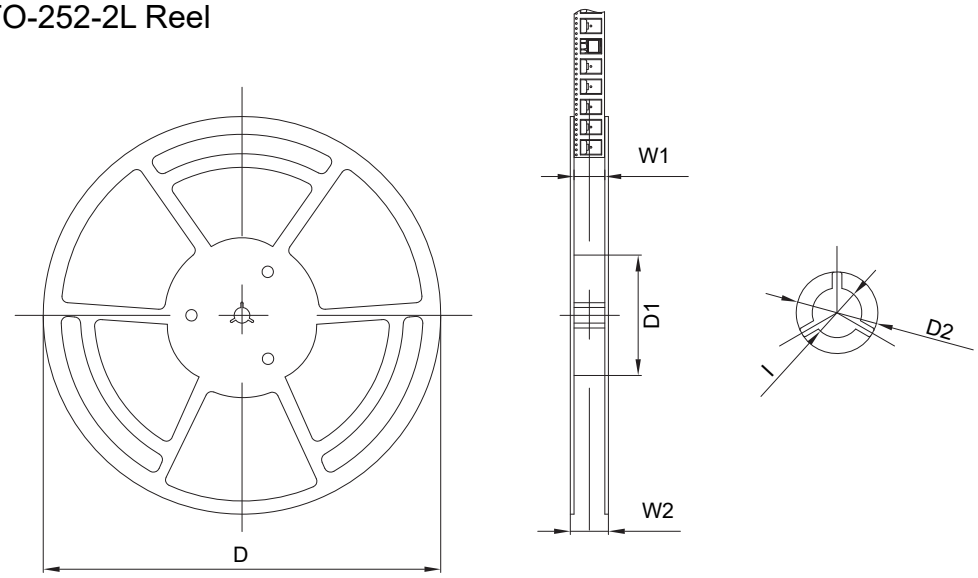
TO-252-2L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Hear Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2500 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 | Φ1.55 | 1.75 | 7.50 | 4.00 | 8.00 | 2.00 | 16.00 |

## TO-252-2L Tape Leader and Trailer




## TO-252-2L Reel




| Dimensions are in millimeter | | | | | | |
|---|---|---|---|---|---|---|
| Reel | D | D1 | D2 | W1 | W2 | I |
| 13" Dia | 330.00 | 100.00 | Φ21.00 | 16.40 | 21.40 | Φ13.00 |

| Reel | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) |
|---|---|---|---|---|---|
| 2500 pcs | 13 inch | 5000 pcs | 360×360×65 | 25000 pcs | 378×358×382 |