



TO-252-2L Plastic-Encapsulate MOSFETS

CJU55N02 N-Channel Power MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$ TYP | I_D |
|---------------|------------------|-------|
| 20V | 5.8mΩ@10V | 55 A |
| | 7.0mΩ@4.5V | |

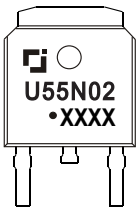
DESCRIPTION

The CJU55N02 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications

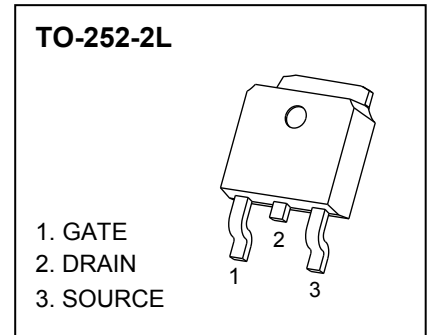
FEATURE

- Excellent package for good heat dissipation
- Ultra low gate charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified

MARKING



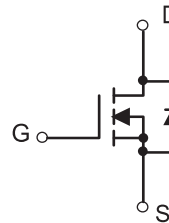
U55N02 = Device code.
Solid dot = Green molding compound device if none, the normal device.
XXXX = Code.



APPLICATION

- Power switching application

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ 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 ① | 55 | A |
| Pulsed Drain Current | I_{DM} ② | 200 | A |
| Single Pulsed Avalanche Energy | E_{AS} ③ | 80 | mJ |
| Maximum Power Dissipation | P_D ① | 55 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ ⑥ | 100 | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ ① | 2.27 | $^\circ\text{C/W}$ |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | $^\circ\text{C}$ |

MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-----------------------|--|-----------------------------------|------|-----------|------------|
| Off characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 20 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 16V,$ $V_{GS} = 0V$ | $T_J = 25\text{ }^\circ\text{C}$ | | 1.0 | μA |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | | 100 | |
| Gate-body leakage current | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 12V$ | | | ± 100 | nA |
| On characteristics ^④ | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.4 | 0.7 | 1.2 | V |
| Static drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 20A$ | | 5.8 | 8 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 20A$ | | 7.0 | 10 | m Ω |
| Forward transconductance | g_{fs} | $V_{DS} = 10V, I_D = 20A$ | | 24 | | S |
| Dynamic characteristics ^{④ ⑤} | | | | | | |
| Input capacitance | C_{iss} | $V_{DS} = 15V, V_{GS} = 0V,$ $f = 100KHz$ | | 1145 | 2290 | μF |
| Output capacitance | C_{oss} | | | 189 | 378 | |
| Reverse transfer capacitance | C_{rss} | | | 181 | 362 | |
| Gate resistance | R_g | $f = 1MHz$ | | 3.9 | | Ω |
| Switching characteristics ^{④ ⑤} | | | | | | |
| Total gate charge | Q_g | $V_{GS} = 10V, V_{DS} = 25V,$ $I_D = 14A$ | | 35 | 70 | nC |
| Gate-source charge | Q_{gs} | | | 1.0 | 2.0 | |
| Gate-drain charge | Q_{gd} | | | 8.3 | 17 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DS} = 15V,$ $V_{GS} = 10V, I_D = 14A,$ $R_G = 3\Omega,$ $R_L = 0.75\Omega,$ | | 10 | | ns |
| Turn-on rise time | t_r | | | 34 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 41 | | |
| Turn-off fall time | t_f | | | 11 | | |
| Drain-Source Diode Characteristics | | | | | | |
| Drain-source diode forward voltage | V_{SD} ^④ | $V_{GS} = 0V, I_S = 20A$ | | | 1.2 | V |
| Continuous drain-source diode forward current | I_S ^① | | | | 55 | A |
| Pulsed drain-source diode forward current | I_{SM} ^② | | | | 200 | A |

Notes:

1. $T_C = 25\text{ }^\circ\text{C}$ Limited only by maximum temperature allowed.

2. $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.

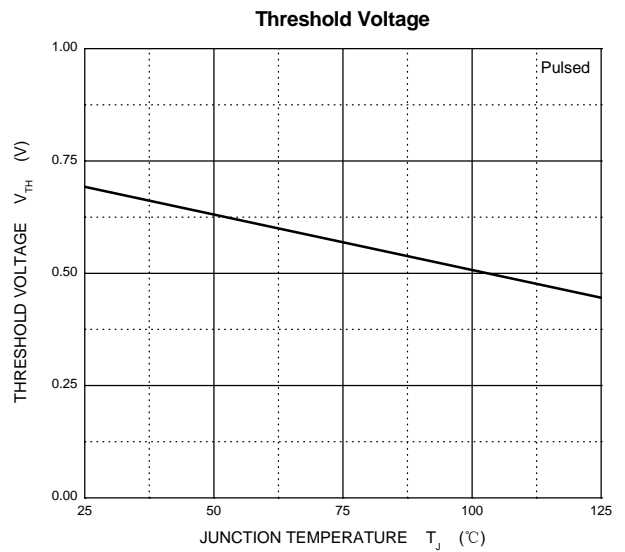
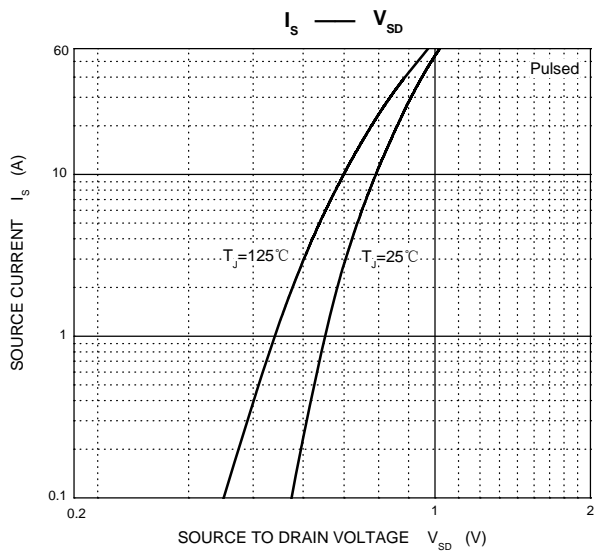
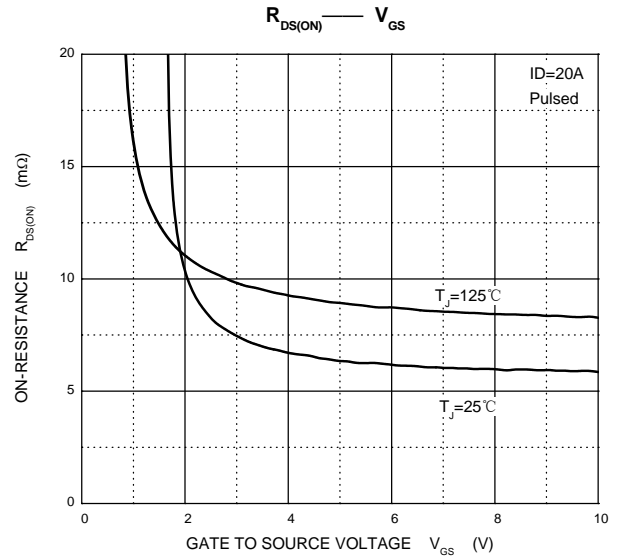
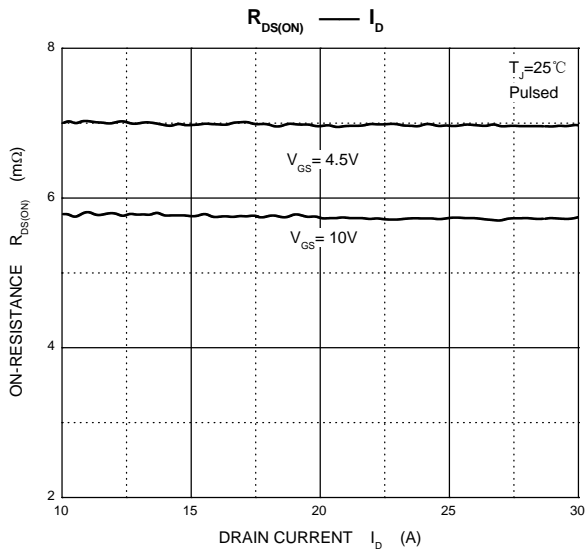
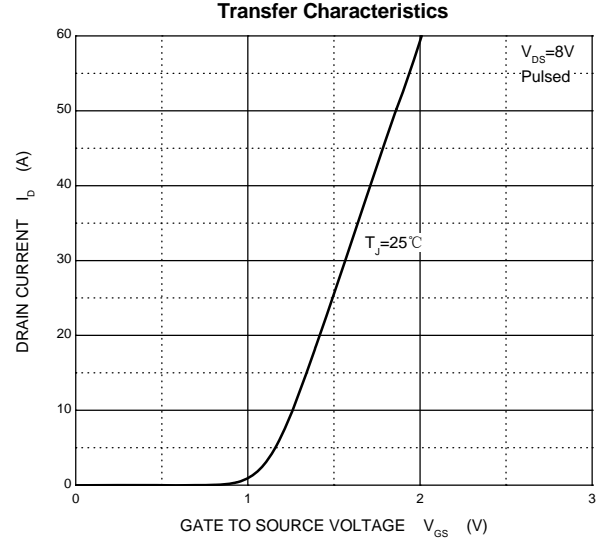
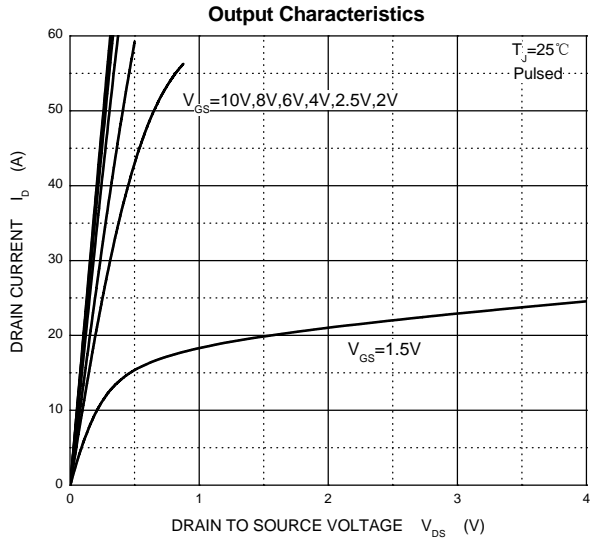
3. EAS condition: $V_{DD} = 10V, V_{GS} = 10V, L = 0.5mH, R_g = 25\Omega$ Starting $T_J = 25\text{ }^\circ\text{C}$.

4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

5. Guaranteed by design, not subject to production.

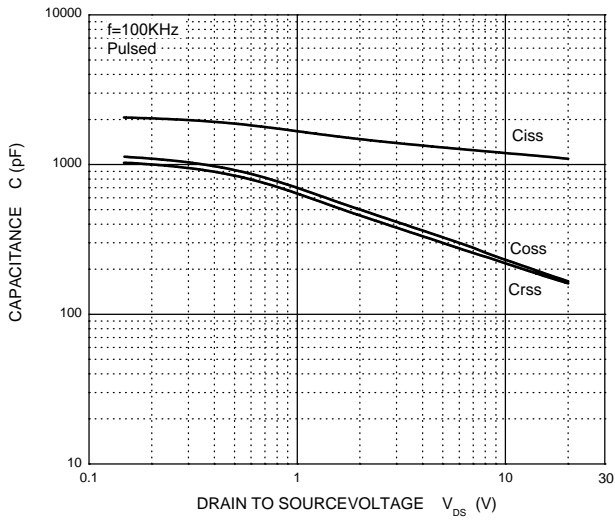
6. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25\text{ }^\circ\text{C}$.

Typical Characteristics

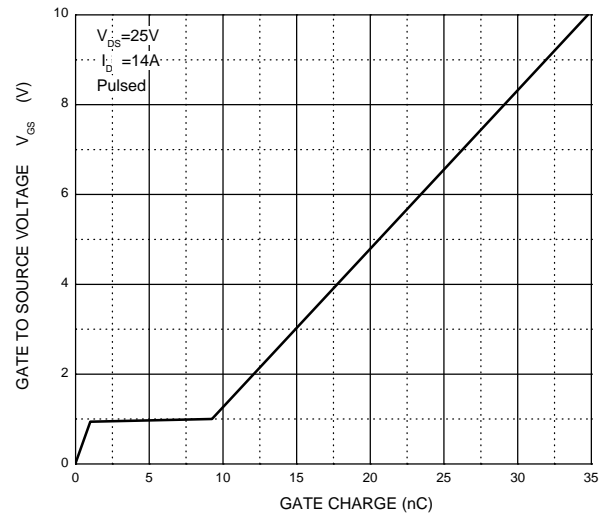


Typical Characteristics

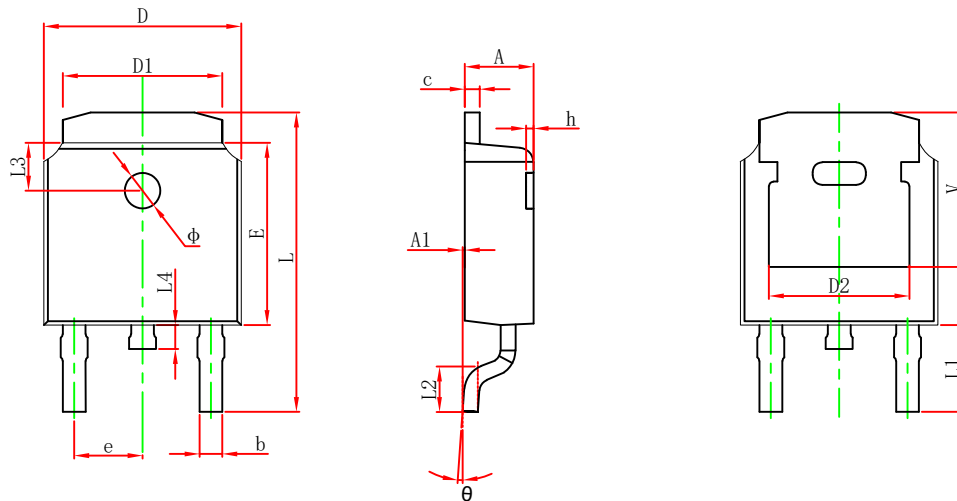
Capacitances



Gate Charge

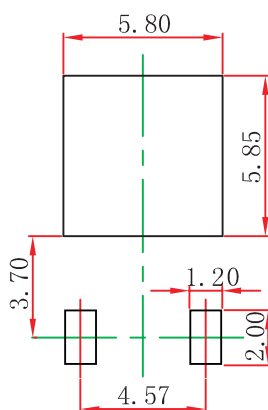


TO-252-2L Package Outline Dimensions



| 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: ± 0.05 mm.
 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-252-2L Embossed Carrier Tape

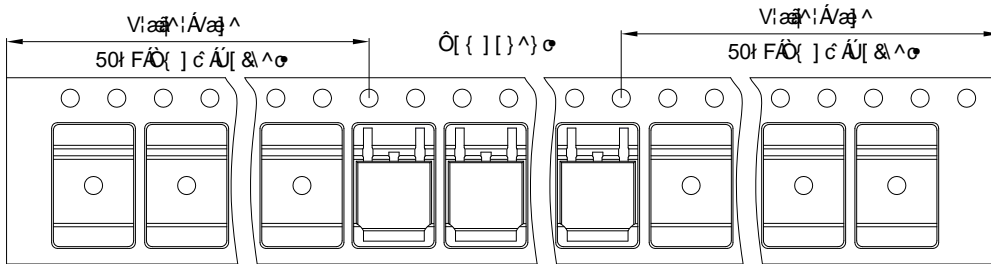


Packaging Description:

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 | l |
| 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 |