- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

### Description

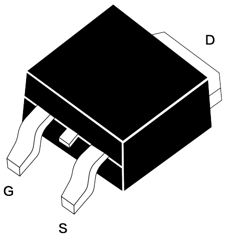
The JH30N02 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

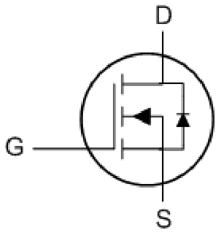
The JH30N02 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

### Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| 20V | 12mΩ | 30A |

### TO-252 Pin Configuration





### Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 20 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25˚C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 30 | A |
| $I_D$@$T_C$=100˚C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 18 | A |
| $I_D$@$T_A$=25˚C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 8.2 | A |
| $I_D$@$T_A$=70˚C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 6.5 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 60 | A |
| EAS | Single Pulse Avalanche Energy[3] | 12.1 | mJ |
| $I_{AS}$ | Avalanche Current | 11 | A |
| $P_D$@$T_C$=25˚C | Total Power Dissipation[4] | 5 | W |
| $P_D$@$T_A$=25˚C | Total Power Dissipation[4] | 2 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ˚C |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ˚C |

### Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient (Steady State)[1] | --- | 100 | ˚C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | --- | ˚C/W |

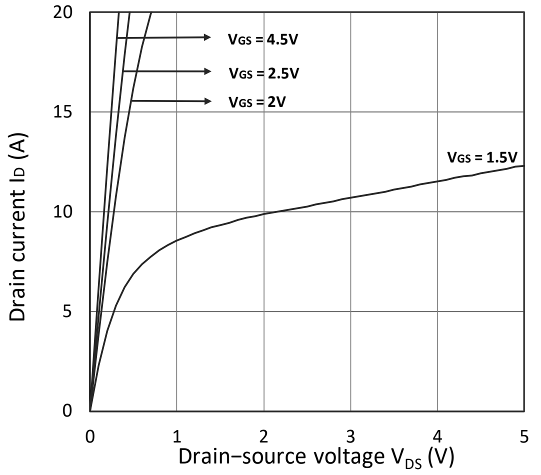
## Electrical Characteristics ($T_J$=25 C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250μA | 20 | - | - | V |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±12V, $V_{DS}$ = 0 V | - | - | ±100 | nA |
| Drain Cut-off Current | $I_{DSS}$ | $V_{DS}$ = 20V, $V_{GS}$ = 0 V | - | - | 1 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS,}$ $I_D$ = 250μA | 0.45 | 0.7 | 1 | V |
| Drain-Source On-State Resistance[3] | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ =5A | - | 12 | 20 | mΩ |
| | | $V_{GS}$ = 2.5V, $I_D$ = 4.7A | - | 17 | 30 | |
| | | $V_{GS}$ = 1.8V, $I_D$ = 4.3A | - | 28 | 50 | |
| **Dynamic Characteristics**[4] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 10V, f = 1MHz | - | 700 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 120 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 105 | - | |
| **Switching Characteristics**[4] | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{GS}$= 4.5V, $V_{DS}$= 10V, $I_D$= 5A | - | 10.5 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 2 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 2.5 | - | |
| Turn-On Time | $t_{d(on)}$ | $V_{GEN}$= 5V, $V_{DD}$ = 10V, $I_D$ = 5A,$R_G$= 3Ω, | - | 10 | - | ns |
| Rise Time | $t_r$ | | - | 20 | - | |
| Turn-Off Time | $t_{d(off)}$ | | - | 32 | - | |
| Fall Time | $t_f$ | | - | 12 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Body Diode Voltage[3] | $V_{SD}$ | $I_S$=4A, $V_{GS}$ = 0V | - | - | 1.2 | V |
| Continuous Source Current | $I_S$ | | - | - | 30 | A |

**Notes:**

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.

## Typical Characteristics



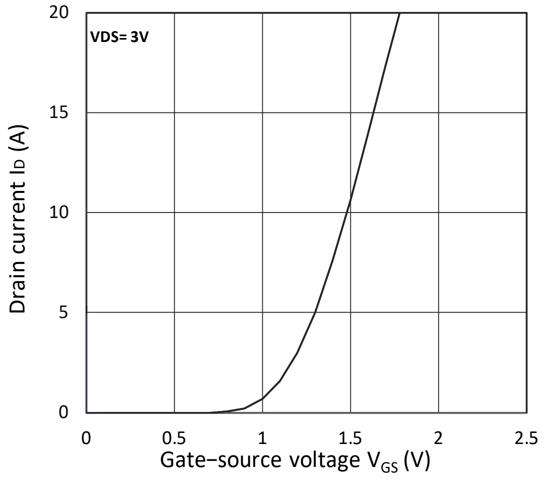
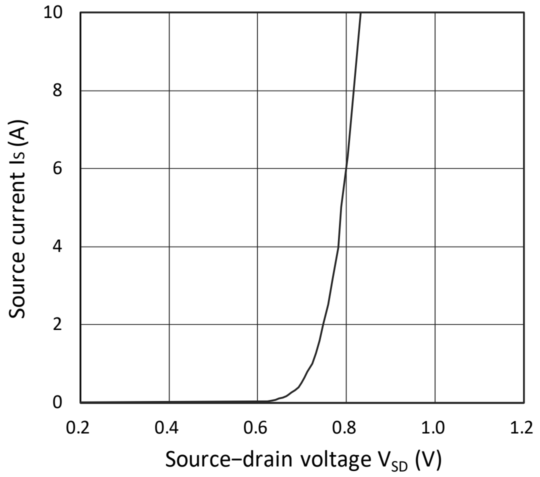


Figure 1. Output Characteristics

Gate–source voltage $V_{GS}$ (V)

Figure 4. $R_{DS(on)}$ vs. $V_{GS}$



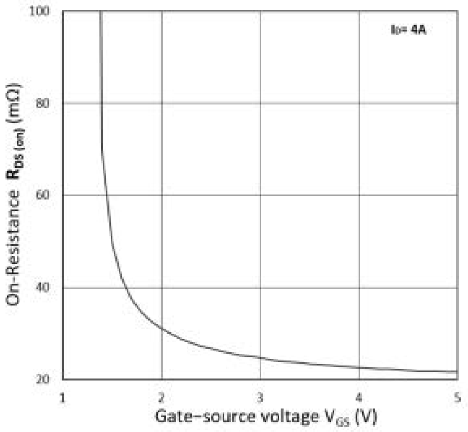
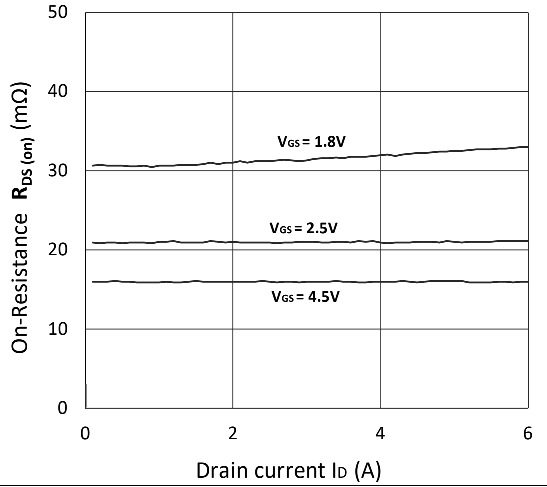


Figure 3. Forward Characteristics of Reverse



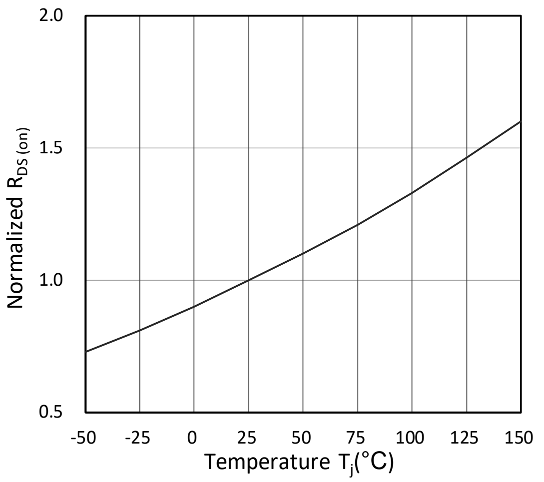
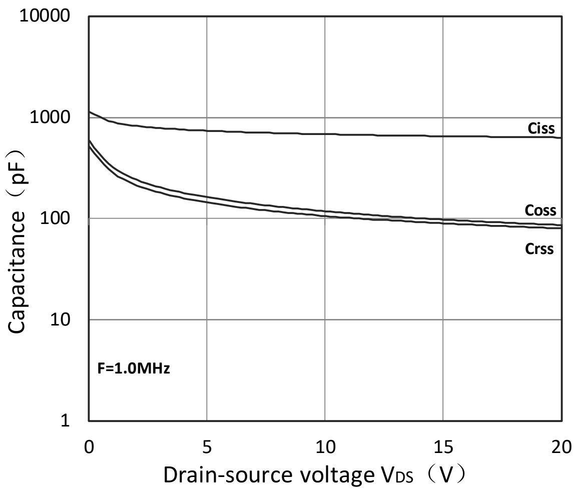
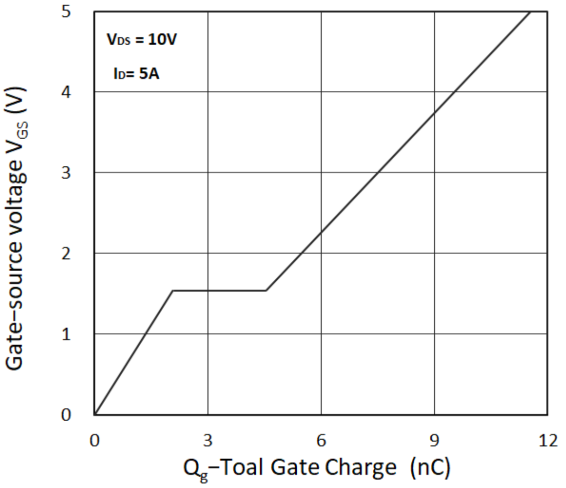


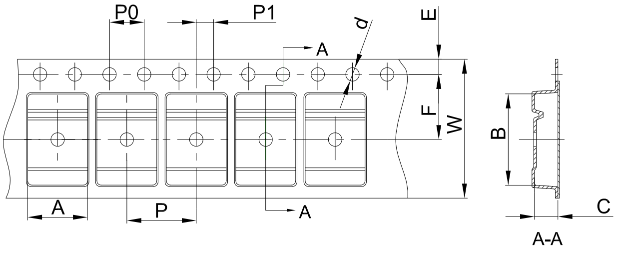
Figure 5. $R_{DS(ON)}$ vs. $I_D$

Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

| | |
|---|---|
|  |  |
| Figure 7. Capacitance Characteristics | Figure 8. Gate Charge Characteristics |

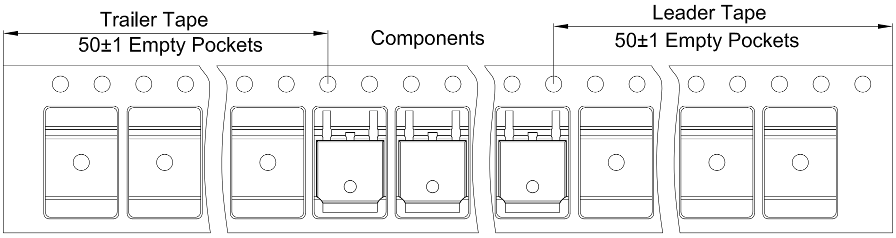
## TO-252-2L  Tape and Reel

### TO-252  Embossed Carrier Tape

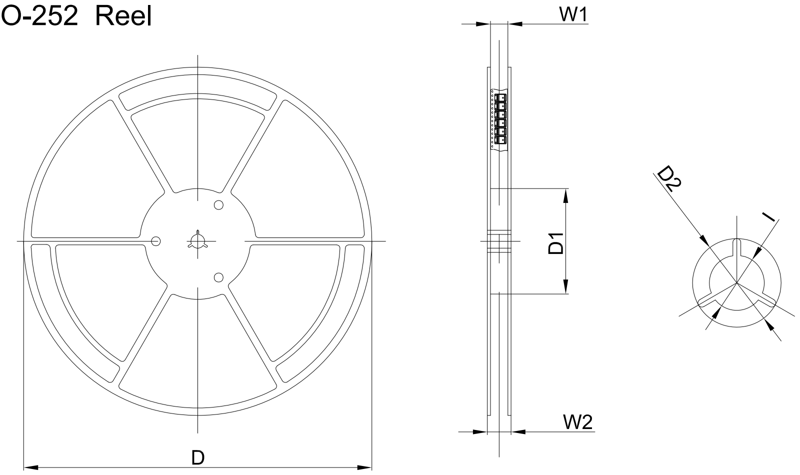


| Dimensions are in millimeter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| TO-252 | 6.90 | 10.50 | 2.70 | Ø1.55 | 1.75 | 7.50 | 4.00 | 8.00 | 2.00 | 16.00 |

### TO-252 Tape Leader and Trailer

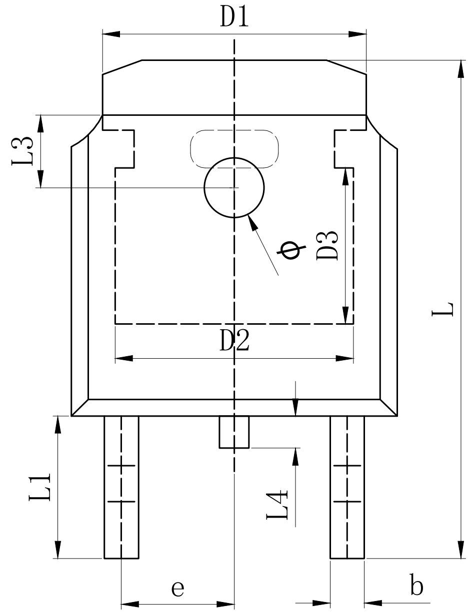


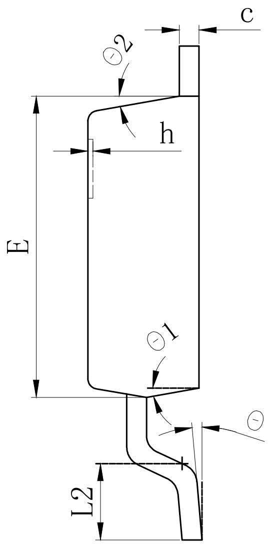
### TO-252  Reel

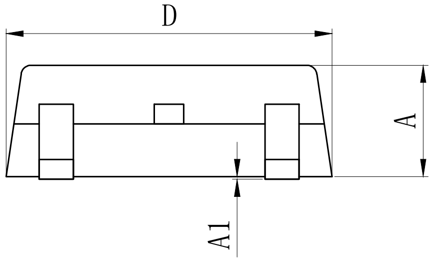


| Dimensions are in millimeter | | | | | | |
|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | W1 | W2 | I |
| 13"Dia | 330.00 | 100.00 | Ø21.00 | 16.40 | 21.00 | Ø13.00 |

| 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 | |







| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | Typ. | MAX |
| A | 2.200 | 2.300 | 2.400 |
| A1 | 0.000 | | 0.127 |
| b | 0.640 | 0.690 | 0.740 |
| c(电镀后) | 0.460 | 0.520 | 0.580 |
| D | 6.500 | 6.600 | 6.700 |
| D1 | 5.334 REF | | |
| D2 | 4.826 REF | | |
| D3 | 3.166 REF | | |
| E | 6.000 | 6.100 | 6.200 |
| e | 2.286 TYP | | |
| h | 0.000 | 0.100 | 0.200 |
| L | 9.900 | 10.100 | 10.300 |
| L1 | 2.888 REF | | |
| L2 | 1.400 | 1.550 | 1.700 |
| L3 | 1.600 REF | | |
| L4 | 0.600 | 0.800 | 1.000 |
| Φ | 1.100 | 1.200 | 1.300 |
| θ | 0° | | 8° |
| θ1 | 9° TYP | | |
| θ2 | 9° TYP | | |

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