



**THE DATASHEET OF  
2N7002DW-TP**





Micro Commercial Components



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# 2N7002DW

## N-Channel MOSFET

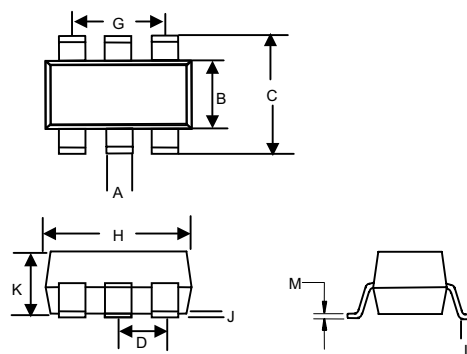
### Features

- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- High density cell design for low  $R_{DS(ON)}$
- Rugged and reliable
- Voltage controlled small signal switch
- Operating Junction Temperature: -55 to +150°C
- Storage Temperature: -55 to +150°C
- Marking: K72

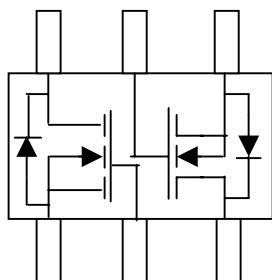
### Electrical Characteristics @ 25°C Unless Otherwise Specified

| Symbol     | Parameter                                   | Value | Units |
|------------|---|-------|-------|
| $V_{DS}$   | Drain-Source Voltage                        | 60    | V     |
| $V_{GS}$   | Gate-Source Voltage                         | 20    | V     |
| $I_D$      | Drain Current                               | 115   | mA    |
| $P_D$      | Power Dissipation                           | 150   | mW    |
| $R_{thJA}$ | Thermal Resistance from Junction to Ambient | 833   | °C/W  |

### SOT-363



| DIM | DIMENSIONS |      |             |      | NOTE |
|-----|------------|------|-------------|------|------|
|     | INCHES     |      | MM          |      |      |
|     | MIN        | MAX  | MIN         | MAX  |      |
| A   | .006       | .014 | 0.15        | 0.35 |      |
| B   | .045       | .053 | 1.15        | 1.35 |      |
| C   | .085       | .096 | 2.15        | 2.45 |      |
| D   | .026       |      | 0.65Nominal |      |      |
| G   | .047       | .055 | 1.20        | 1.40 |      |
| H   | .071       | .087 | 1.80        | 2.20 |      |
| J   | ---        | .004 | ---         | 0.10 |      |
| K   | .035       | .043 | 0.90        | 1.10 |      |
| L   | .010       | .018 | 0.26        | 0.46 |      |
| M   | .003       | .006 | 0.08        | 0.15 |      |



## Electrical Characteristics @ $T_a=25^\circ\text{C}$ unless otherwise specified

| Parameter                       | Symbol        | Test conditions                                      | Min  | Typ | Max      | Unit     |
|---------------------------------|---------------|--|------|-----|----------|----------|
| Drain-source breakdown voltage  | $V_{(BR)DSS}$ | $V_{GS}=0\text{ V}, I_D=250\ \mu\text{A}$            | 60   |     |          | V        |
| Gate-threshold voltage *        | $V_{th(GS)}$  | $V_{DS}=V_{GS}, I_D=250\ \mu\text{A}$                | 1    |     | 2.5      |          |
| Gate-body leakage               | $I_{GSS}$     | $V_{DS}=0\text{ V}, V_{GS}=\pm 20\text{ V}$          |      |     | $\pm 80$ | nA       |
| Zero gate voltage drain current | $I_{DSS}$     | $V_{DS}=60\text{ V}, V_{GS}=0\text{ V}$              |      |     | 80       | nA       |
| Drain-source on-resistance *    | $R_{DS(on)}$  | $V_{GS}=10\text{ V}, I_D=500\text{mA}$               |      |     | 7        | $\Omega$ |
|                                 |               | $V_{GS}=5\text{ V}, I_D=50\text{mA}$                 |      |     | 7        |          |
| Forward transconductance *      | $g_{fs}$      | $V_{DS}=10\text{ V}, I_D=200\text{mA}$               | 80   |     |          | ms       |
| Drain-source on-voltage *       | $V_{DS(on)}$  | $V_{GS}=10\text{V}, I_D=500\text{mA}$                |      |     | 3.75     | V        |
|                                 |               | $V_{GS}=5\text{V}, I_D=50\text{mA}$                  |      |     | 0.375    | V        |
| Diode forward voltage           | $V_{SD}$      | $I_S=115\text{mA}, V_{GS}=0\text{ V}$                | 0.55 |     | 1.2      | V        |
| Input capacitance **            | $C_{iss}$     | $V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$ |      |     | 50       | pF       |
| Output capacitance **           | $C_{oss}$     |  |      |     | 25       |          |
| Reverse transfer capacitance ** | $C_{rss}$     |  |      |     | 5        |          |

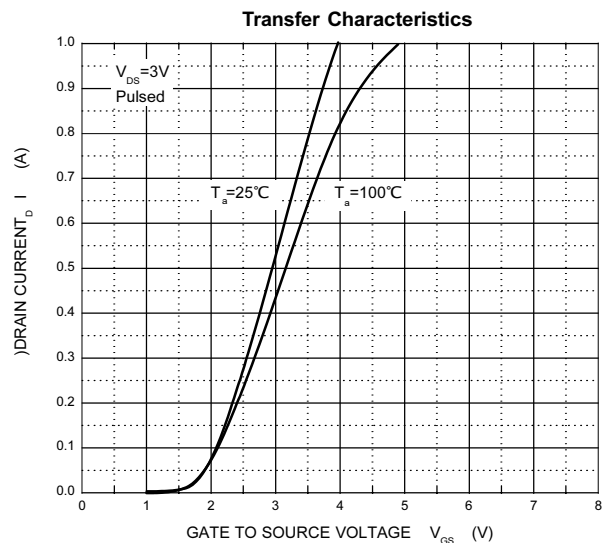
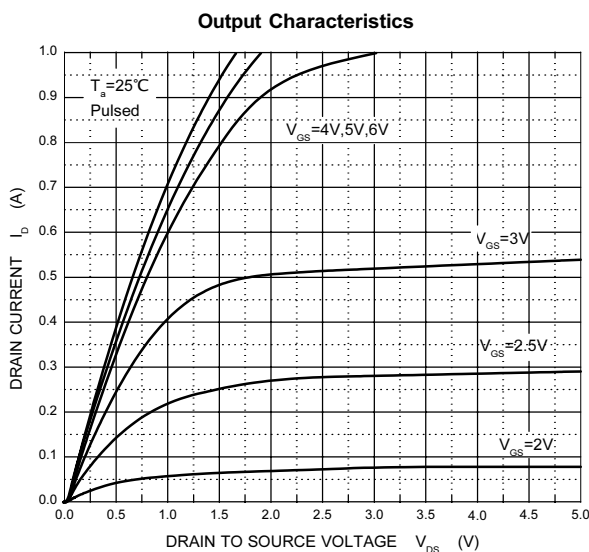
### SWITCHING TIME

|                  |              |  |  |  |    |    |
|------------------|--------------|--|--|--|----|----|
| Turn-on time **  | $t_{d(on)}$  | $V_{DD}=25\text{ V}, R_L=50\ \Omega$                 |  |  | 20 | ns |
| Turn-off time ** | $t_{d(off)}$ | $I_D=500\text{mA}, V_{GEN}=10\text{V}, G=25\ \Omega$ |  |  | 40 |    |

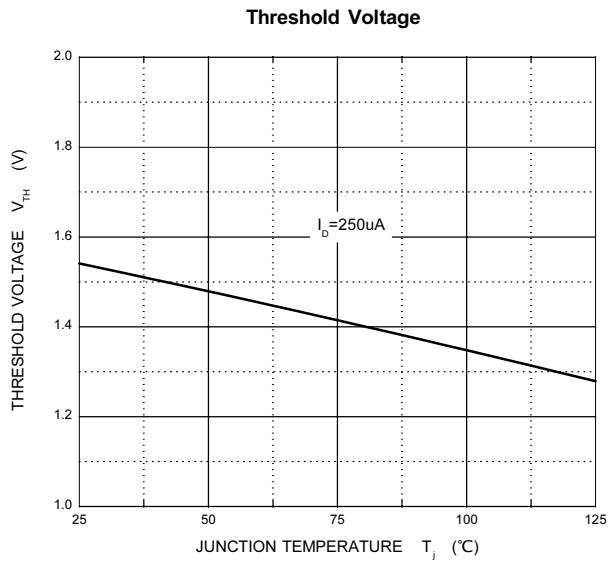
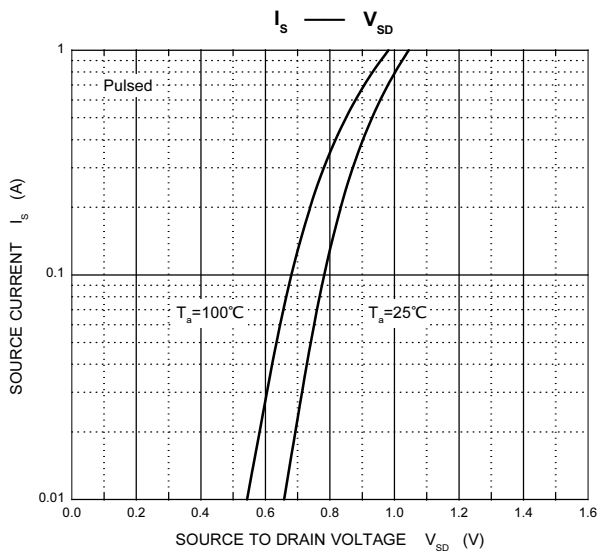
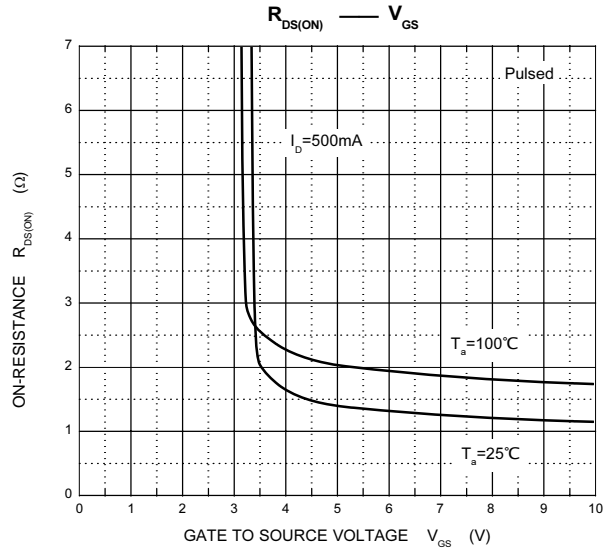
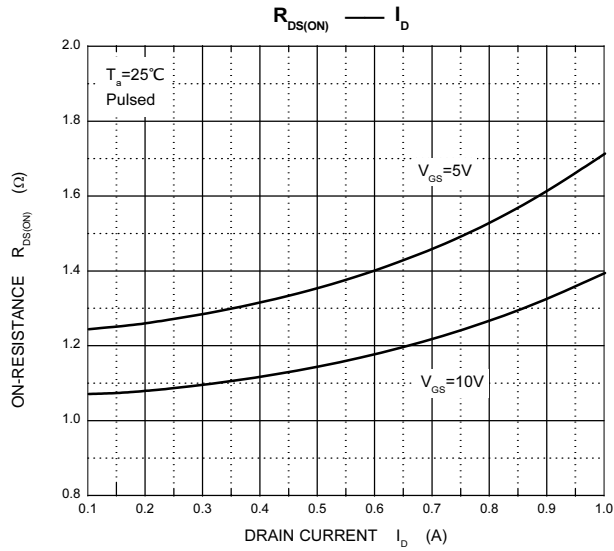
\* Pulse Test: Pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

\*\* These parameters have no way to verify.

## Typical Characteristics



## Typical Characteristics





TM

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## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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