Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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Micro Commercial Components
20736 Marilla Street Chatsworth
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# 2N7002

## 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
- Advanced Trench Process Technology
- High Input Impedance
- High Speed Switching
- CMOS Logic Compatible Input
- Marking : 7002/S72

## Maximum Ratings @ 25°C Unless Otherwise Specified

| Symbol | Rating | Rating | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-source Voltage | 60 | V |
| $I_D$ | Drain Current | 115 | mA |
| $P_D$ | Total Power Dissipation | 200 | mW |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 625 | ℃/W |
| $T_J$ | Operating Junction Temperature | -55 to +150 | ℃ |
| $T_{STG}$ | Storage Temperature | -55 to +150 | ℃ |

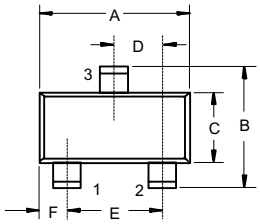
## Electrical Characteristics @ 25°C Unless Otherwise Specified

| Symbol | Parameter | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage ($V_{GS}$=0Vdc, $I_D$=10μAdc) | 60 | --- | --- | Vdc |
| $V_{tth(GS)}$ | Gate-Threshold Voltage ($V_{DS}$=$V_{GS}$, $I_D$=250μAdc) | 1.0 | --- | 2.5 | Vdc |
| $I_{GSS}$ | Gate-body Leakage ($V_{DS}$ =0Vdc, $V_{GS}$ =±20Vdc) | --- | --- | ±100 | nAdc |
| $I_{DSS}$ | Zero Gate Voltage Drain Current ($V_{DS}$ =60Vdc, $V_{GS}$ =0Vdc)<br>($V_{DS}$ =60Vdc, $V_{GS}$ =0Vdc, $T_j$=125℃) | ---<br>--- | ---<br>--- | 1<br>500 | μAdc |
| $I_{D(ON)}$ | On-state Drain Current ($V_{DS}$ =7.5Vdc, $V_{GS}$ =10Vdc) | 500 | 2700 | --- | mAdc |
| $r_{DS(on)}$ | Drain-Source On-Resistance ($V_{GS}$=10Vdc, $I_D$=500mAdc)<br>($V_{GS}$=5Vdc, $I_D$=50mAdc) | ---<br>--- | 1.2<br>1.7 | 7.5<br>7.5 | Ω |
| $V_{DS(on)}$ | Drain-Source On-Voltage ($V_{GS}$=10Vdc, $I_D$=500mAdc)<br>($V_{GS}$=5Vdc, $I_D$=50mAdc) | ---<br>--- | ---<br>--- | 3.75<br>1.5 | Vdc |
| $G_{FS}$ | Forward Transconductance ($V_{DS}$=10Vdc, $I_D$=200mAdc) | 80 | --- | --- | ms |
| $V_{SD}$ | Diode Forward Voltage ($V_{GS}$=0Vdc, $I_S$=115mAdc) | --- | --- | 1.5 | Vdc |
| $I_S$ | Maximum Continuous Drain-Source Diode Forward Current | - | --- | 115 | mA |
| $C_{iss}$ | Input Capacitance ($V_{DS}$=25Vdc, $V_{GS}$ =0Vdc f=1MHz) | --- | --- | 50 | pF |
| $C_{OSS}$ | Output Capacitance | --- | --- | 25 | |
| $C_{rSS}$ | Reverse Transfer Capacitance | --- | --- | 5 | |

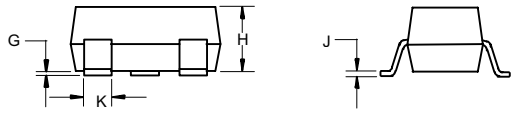
## Switching

| | | | | | | |
|---|---|---|---|---|---|---|
| $t_{d(on)}$ | Turn-on Time | $V_{DD}$=30Vdc, $V_{GEN}$=10Vdc $R_L$=150Ω,$I_D$=200mA, $R_{GEN}$=25Ω | --- | --- | 20 | ns |
| $t_{d(off)}$ | Turn-off Time | | --- | --- | 20 | |

## SOT-23




1.GATE
2. SOURCE
3. DRAIN




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .110 | .120 | 2.80 | 3.04 | |
| B | .083 | .104 | 2.10 | 2.64 | |
| C | .047 | .055 | 1.20 | 1.40 | |
| D | .035 | .041 | .89 | 1.03 | |
| E | .070 | .081 | 1.78 | 2.05 | |
| F | .018 | .024 | .45 | .60 | |
| G | .0005 | .0039 | .013 | .100 | |
| H | .035 | .044 | .89 | 1.12 | |
| J | .003 | .007 | .085 | .180 | |
| K | .015 | .020 | .37 | .51 | |

Suggested Solder Pad Layout

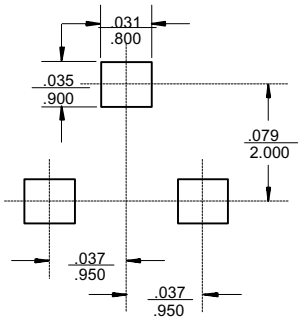


Fig. 1 – On-Resistance vs. Gate-to-Source Voltage

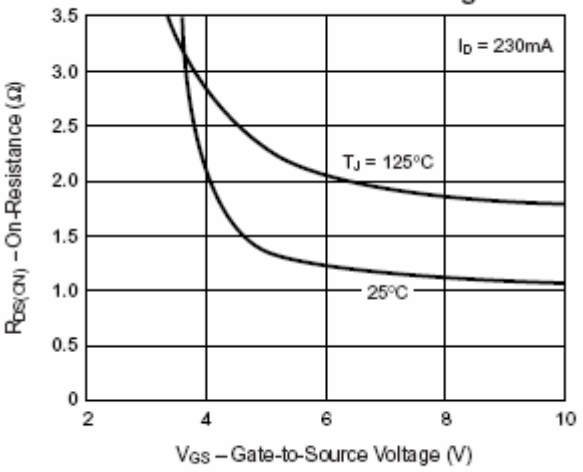



Fig. 2 – Source-Drain Diode Forward Voltage

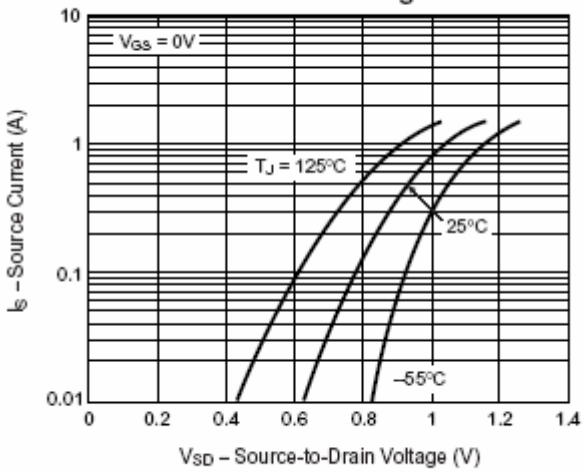



Fig. 3 – Output Characteristics

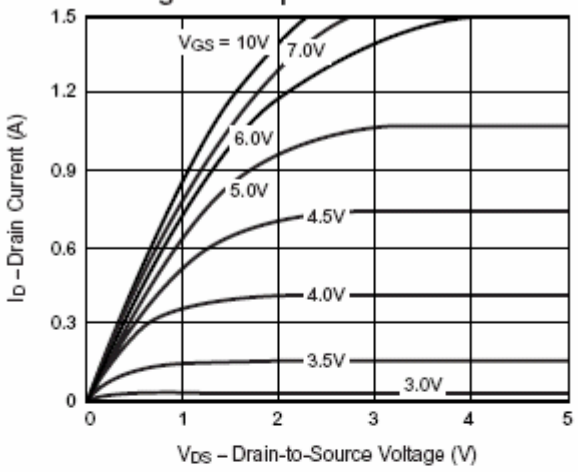



Fig. 4 – Transfer Characteristics

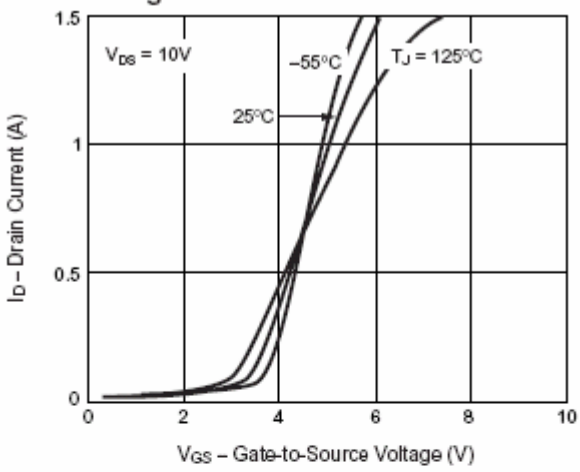



Fig. 5 – Capacitance

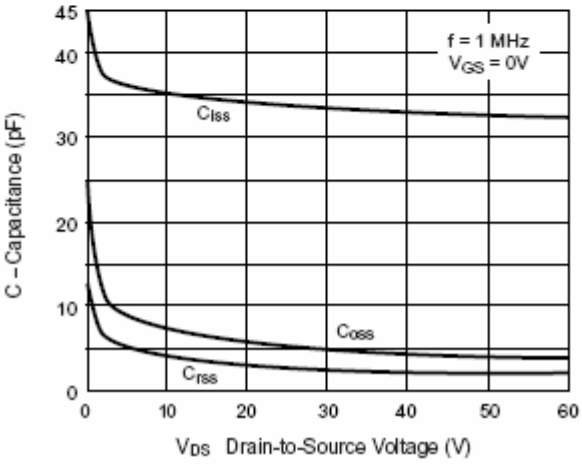



Fig. 6 – On-Resistance vs. Drain Current

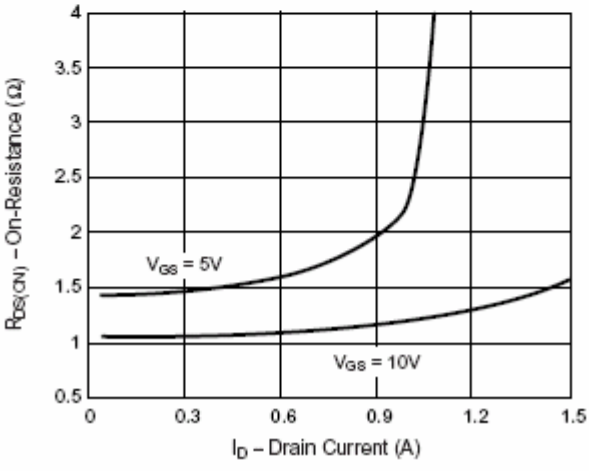


Fig. 7 – Gate Charge

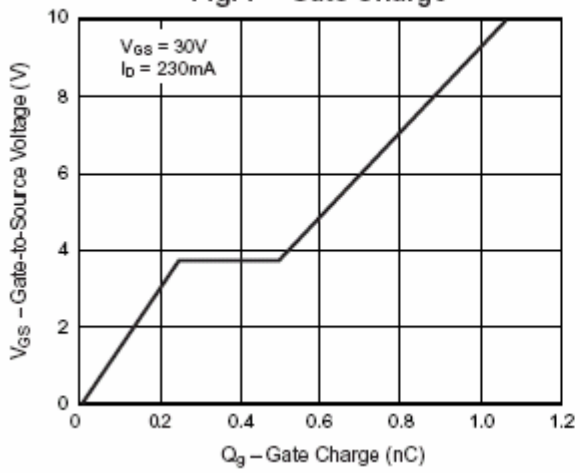



Fig. 8 – Breakdown Voltage vs. Junction Temperature

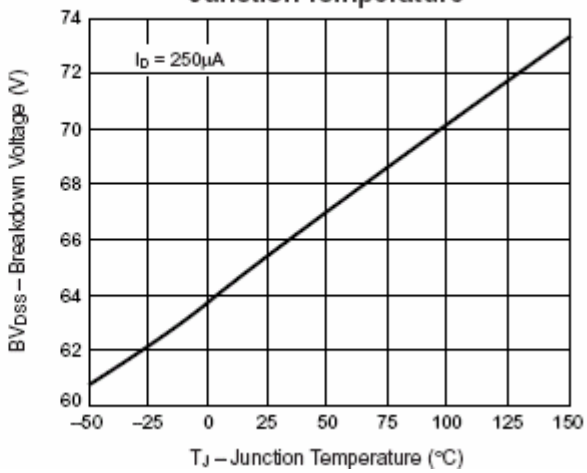



Fig. 9 – Threshold Voltage

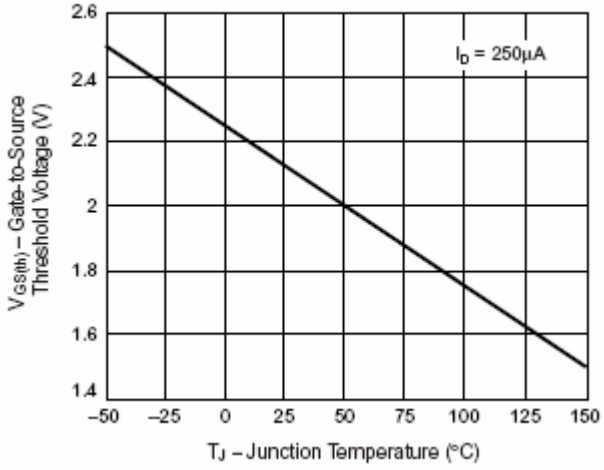



Fig. 10 – On-Resistance vs. Junction Temperature

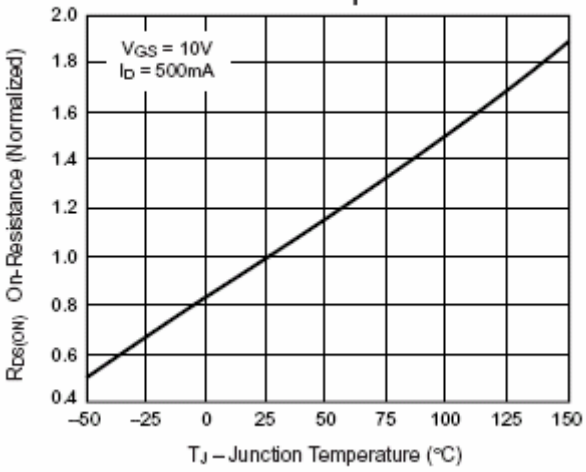



Fig. 11 – Thermal Impedance

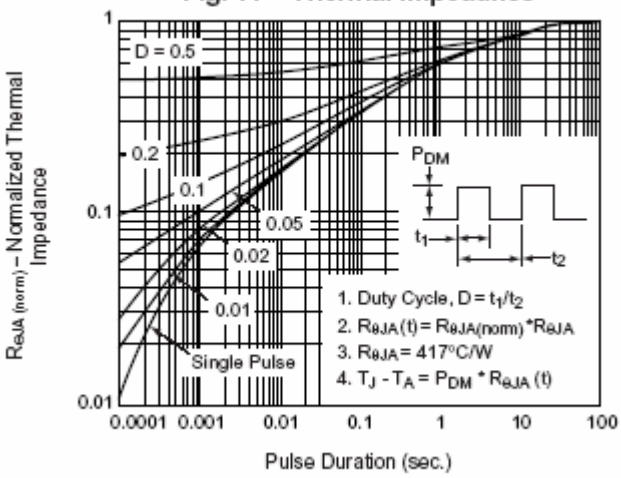



Fig. 12 – Power vs. Pulse Duration

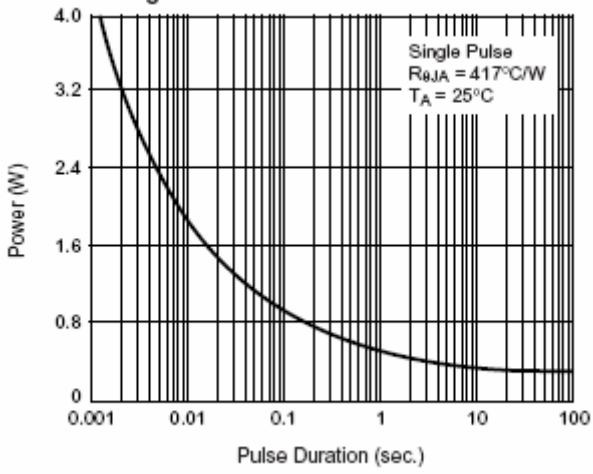
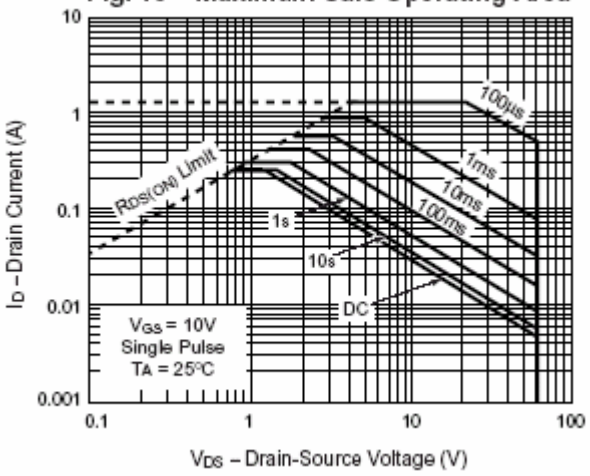


Fig. 13 – Maximum Safe Operating Area



Micro Commercial Components

## 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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|---|
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