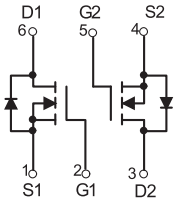
EFMICRO
Semiconductor Limited Company

# 2N7002DW

**Dual N-Channel Advanced MOSFET**

## • Product Summary

| Part # | $V_{DS}$ | $R_{DS(on).typ}$ ($@V_{GS}$=10V) | $R_{DS(on).typ}$ ($@V_{GS}$=5V) | $I_D$ |
|---|---|---|---|---|
| 2N7002DW | 60V | 1.1Ω | 1.2Ω | 340mA |




**Dual N-Channel MOSFET**

## •FEATURE

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

## •Application

- Load Switch for Portable Devices
- DC/DC Converter

**SOT-363**

## •Ordering Information:

| | |
|---|---|
| Part NO. | 2N7002DW |
| Marking | K72 |
| Packing Information | REEL TAPE |
| Basic ordering unit (pcs) | 3000 |

## •Absolute Maximum Ratings ($T_C$=25℃)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous | $I_D$ | 340 | mA |
| Drain Current-Pulsed (Note 1) | $I_{DM}$ | 1 | A |
| Maximum Power Dissipation | $P_D$ | 150 | mW |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

## •Thermal Characteristic

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 833 | ℃/W |

## ● Static Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Drain-source breakdown voltage** | $V_{(BR)DSS}$ | $V_{GS}$=0 V, $I_D$=250 μA | 60 | -- | -- | V |
| **Gate-threshold voltage** | $V_{th(GS)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250 μA | 1 | 1.6 | 2.5 | |
| **Gate-body leakage** | $I_{GSS}$ | $V_{DS}$=0 V, $V_{GS}$=±20 V | -- | -- | ±80 | nA |
| **Zero gate voltage drain current** | $I_{DSS}$ | $V_{DS}$=60 V, $V_{GS}$=0 V | -- | -- | 80 | nA |
| **Drain-source on-resistance** | $R_{DS(on)}$ | $V_{GS}$=10 V, $I_D$=500mA | -- | 1.1 | 5 | Ω |
| | | $V_{GS}$=5 V, $I_D$=50mA | -- | 1.2 | 7 | |
| **Forward transconductance** | $g_{fs}$ | $V_{DS}$=10 V, $I_D$=200mA | 80 | -- | -- | ms |
| **Drain-source on-voltage** | $V_{DS(on)}$ | $V_{GS}$=10V, $I_D$=500mA | -- | -- | 3.75 | V |
| | | $V_{GS}$=5V, $I_D$=50mA | -- | -- | 0.375 | V |
| **Diode forward voltage** | $V_{SD}$ | $I_S$=115mA, $V_{GS}$=0 V | 0.55 | -- | 1.2 | V |
| **Input capacitance** | $C_{iss}$ | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz | -- | -- | 50 | pF |
| **Output capacitance** | $C_{oss}$ | | -- | -- | 25 | |
| **Reverse transfer capacitance** | $C_{rss}$ | | -- | -- | 5 | |

**SWITCHING TIME**

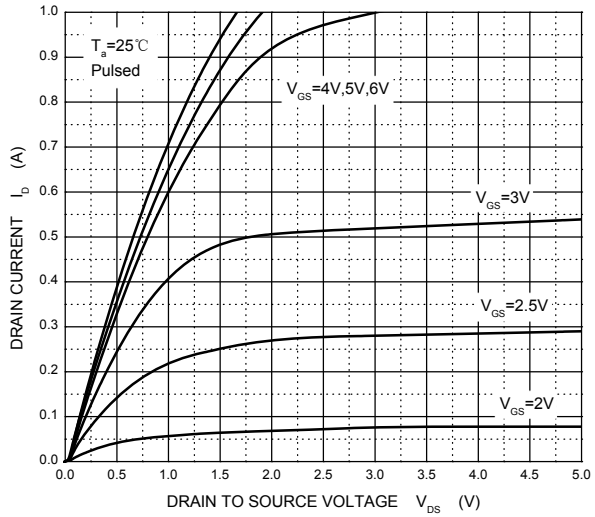
| | | | | | | |
|---|---|---|---|---|---|---|
| **Turn-on time** | $t_{d(on)}$ | $V_{DD}$=25 V, $R_L$=50Ω | -- | -- | 20 | ns |
| **Turn-off time** | $t_{d(off)}$ | $I_D$=500mA,$V_{GEN}$=10V,$_G$=25 Ω | -- | -- | 40 | |

* Pulse Test: Pulse width ≤300μs,duty cycle≤2%.

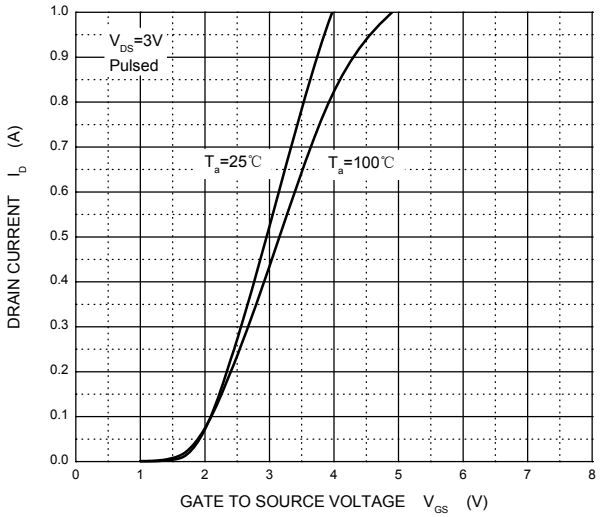
** These parameters have no way to verify.

## • Typical Characteristics

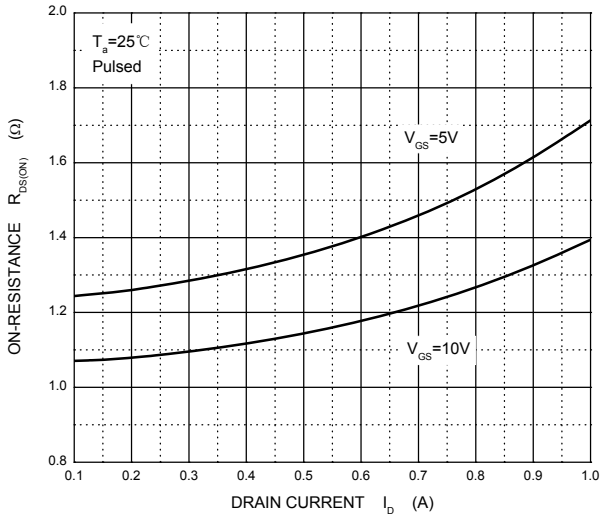
**Output Characteristics**



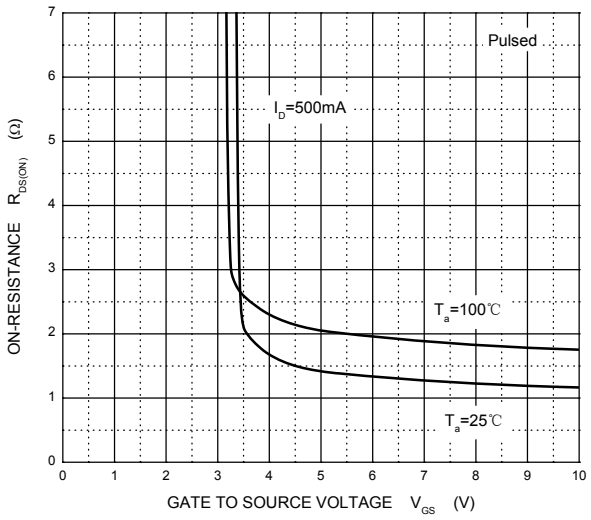

**Transfer Characteristics**



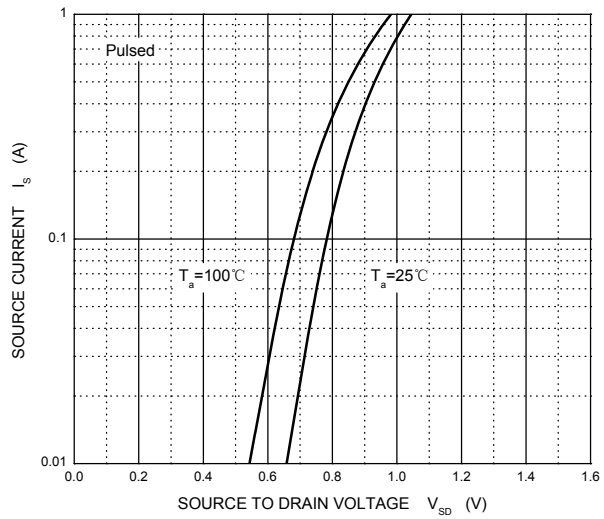

**$R_{DS(ON)}$ — $I_D$**



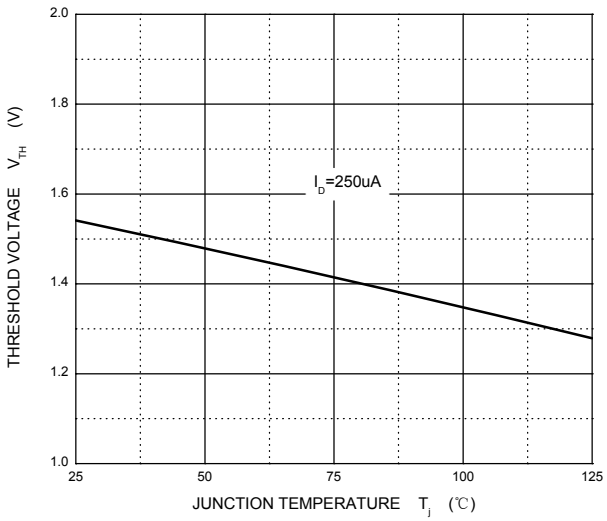

**$R_{DS(ON)}$ — $V_{GS}$**



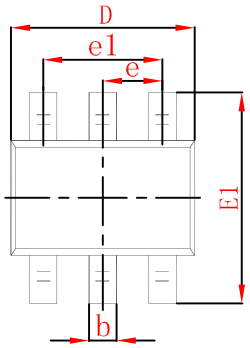

**$I_S$ — $V_{SD}$**

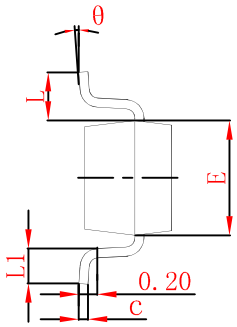


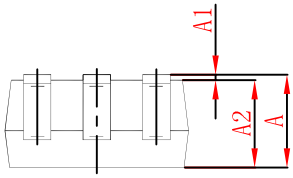

**Threshold Voltage**



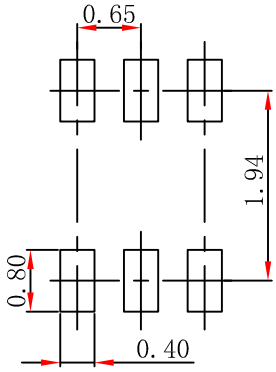
## SOT-363 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.100 | 0.150 | 0.004 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.400 | 0.085 | 0.094 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.