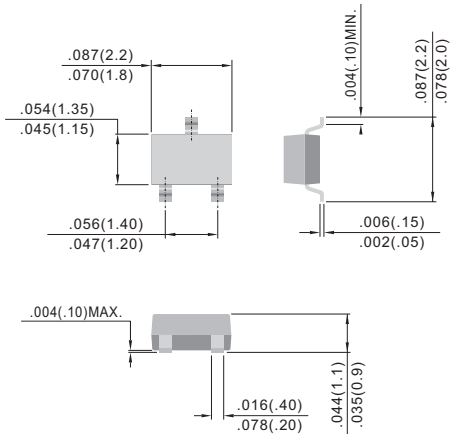
# 2N7002W

## N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

**VOLTAGE** 60 Volts **POWER** 200 mWatts

**SOT-323** Unit: inch (mm)




### FEATURES

- N-channel enhancement mode field effect transistor,designed for high speed pulse amplifier and drive application,which ismanufactured by the N-channel DMOS process.
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switching.
- Rugged and reliabale.
- High saturation current capability.
- High-speed switching.CMOS logic compatible.
- CMOS logic compatible input.
- Not thermal runaway.
- No secondary breakdown.
- Pb free product : 99% Sn above can meet RoHS environment substance directive request

### MECHANICAL DATA

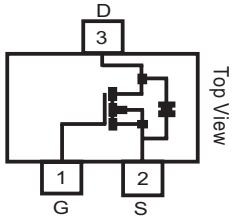
- Case: SOT-323, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0048 gram
- Marking: 72W

### ABSOLUTE RATINGS

| PARAMETER | Symbol | Value | Units |
|---|---|---|---|
| Drain-Source Voltagee | $V_{DSS}$ | 60 | V |
| Drain-gate Voltagee | $V_{DRG}$ | 60 | V |
| Gate-Source Voltage | $V_{GSS}$ | 20 | V |
| Drain Current | $I_D$ | 115 | mA |
| Total Power Dissipation | $P_D$ | 200 | mW |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to + 150 | °C |
| Thermal Risistance,Junction-to-Ambient | $R_{\theta JA}$ | 625 | °C/W |

Note 1: $R_{GS}$<20K Ω

2: FR-5 board 1.0x0.75x0.062 inch witg minmum recommended pad layout



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## ELECTRICAL CHARACTERISTICS TA=25°C Unless otherwise noted

| PARAMETER | Symbol | Test Condition | MIN. | TYP. | MAX. | Units |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=10uA | 60 | 80 | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V, $V_{GS}$=0V, $T_J$=25°C<br>$V_{DS}$=60V, $V_{GS}$=0V, $T_J$=125°C | -- | -- | 1.0<br>0.5 | uA<br>mA |
| Gate-Body Leakage, Forward | $I_{GSSF}$ | $V_{DS}$=0, $V_{GS}$=20V | -- | -- | 100 | nA |
| Gate-Body Leakage, Reverse | $I_{GSSR}$ | $V_{DS}$=0, $V_{GS}$=20V | -- | -- | -100 | nA |
| **ON CHARACTERISTIC(note1)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 1.0 | 2.1 | 2.5 | V |
| Static Drain-Source On-Resisitance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=500mA, $T_J$=25°C | -- | 3.7 | 2.5 | Ω |
| Drain-Source On-Voltage | $V_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=500mA<br>$V_{GS}$=5V, $I_D$=50mA | -- | -- | 3.75<br>1.5 | V |
| On-State Drain Current | $I_{D(ON)}$ | VGS=10V, $V_{DS}$≥2$V_{DS(ON)}$ | 500 | -- | -- | mA |
| Forward Transconductance | $G_{FS}$ | $V_{DS}$≥2$V_{DS(ON)}$, $I_D$=200mA | 80 | -- | -- | mS |
| **DYNAMIC CHARACTERISTICS** | | | | | | |
| Input Capacitance | $G_{ISS}$ | $V_{DS}$=25V, $V_{GS}$=0V, f=1.0MHz | -- | -- | 50 | pF |
| Output Capacitance | $G_{OSS}$ | | -- | -- | 25 | pF |
| Reverse Transfer Capacitance | $G_{RSS}$ | | -- | -- | 5 | pF |
| Turn-On Time | $T_{ON}$ | $V_{DD}$=30V, $R_L$=25Ω, $I_D$=500mA<br>$V_{GS}$=10V, $R_{GEN}$=25Ω | -- | -- | 20 | ns |
| Turn-Off Time | $T_{OFF}$ | | -- | -- | 20 | ns |

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## ELECTRICAL CHARACTERISTICS CURVE

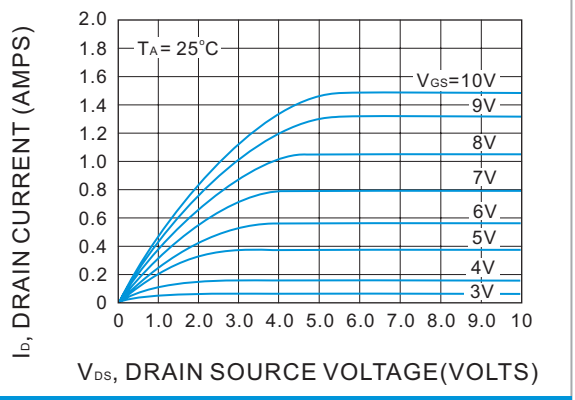


**Figure 1. Ohmic Region**

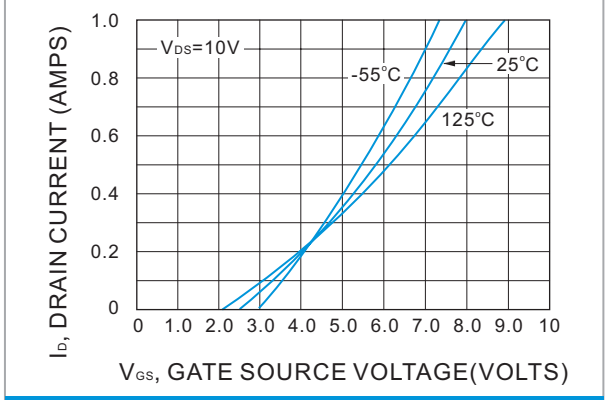


**Fig. 9 Z-Current vs. Z-Voltage**

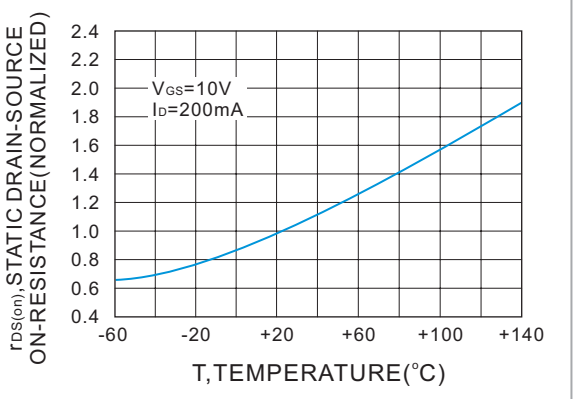


**Figure 3. Temperature versus Static Drain-Source On-Resistance**

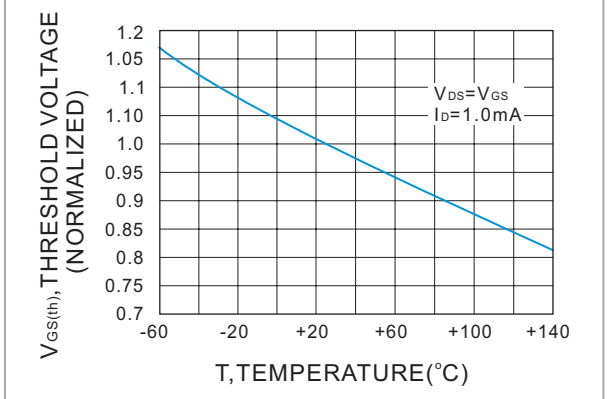


**Figure 4. Temperature versus Gate Threshold Voltage**

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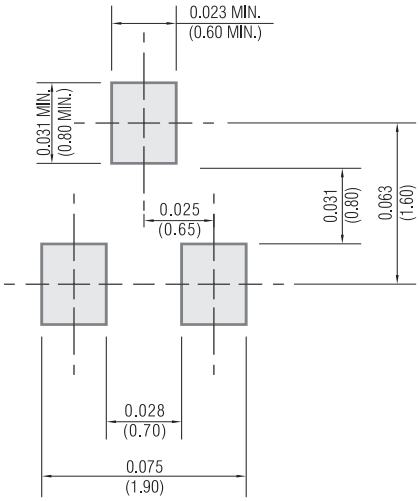
## MOUNTING PAD LAYOUT

SOT-323 Unit: inch ( mm )




## ORDER INFORMATION

- Packing information

  T/R - 12K per 13" plastic Reel

  T/R - 3K per 7" plastic Reel

## LEGAL STATEMENT