# TSM2N7002

60V N-Channel Enhancement Mode MOSFET

SOT-23



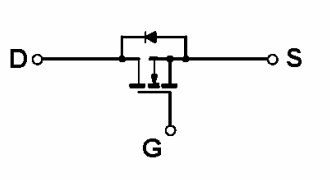

Pin assignment:
1. Gate
2. Source
3. Drain

**$V_{DS}$ = 60V**
**$R_{DS\ (on)}$, Vgs @ 10V, Ids @ 500mA = 7.5Ω**
**$R_{DS\ (on)}$, Vgs @ 5V, Ids @ 50mA = 13.5Ω**

## Features

- ✧ Advanced trench process technology
- ✧ High density cell design for low on-resistance
- ✧ High input impedance
- ✧ High speed switching
- ✧ No minority carrier storage time
- ✧ CMOS logic compatible input
- ✧ No secondary breakdown
- ✧ Compact and low profile SOT-23 package

## Block Diagram




## Ordering Information

| Part No. | Packing | Package |
|---|---|---|
| TSM2N7002CX | Tape & Reel | SOT-23 |

## Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ± 20 | V |
| Continuous Drain Current | | $I_D$ | 115 | mA |
| Pulsed Drain Current | | $I_{DM}$ | 800 | mA |
| Maximum Power Dissipation | Ta = 25°C | $P_D$ | 225 | mW |
| | Ta > 25°C | | 1.8 | MW/°C |
| Operating Junction Temperature | | $T_J$ | +150 | °C |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | - 55 to +150 | °C |

## Thermal Performance

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Lead Temperature (1/8" from case) | $T_L$ | 5 | S |
| Junction to Ambient Thermal Resistance (PCB mounted) | Rθja | 417 | °C/W |

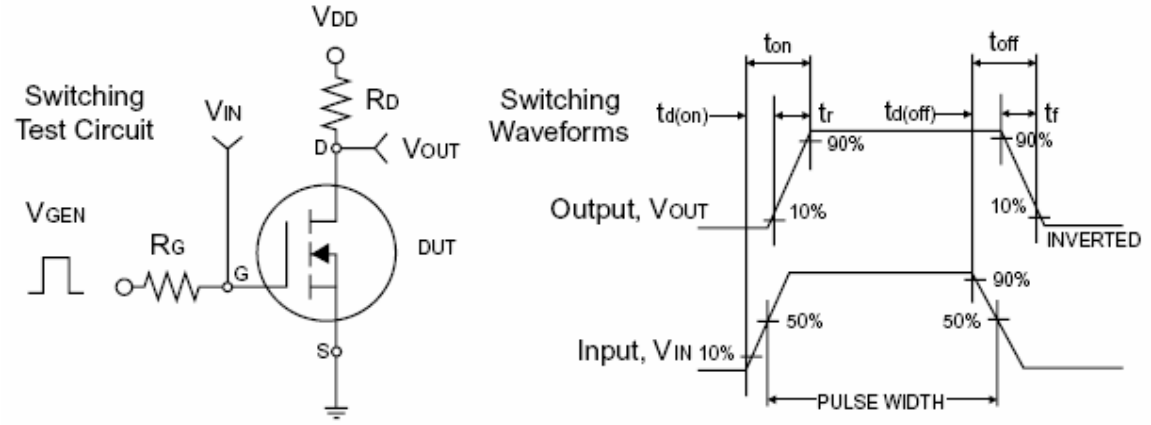
Note: Surface mounted on FR4 board t<=5sec.

## Electrical Characteristics

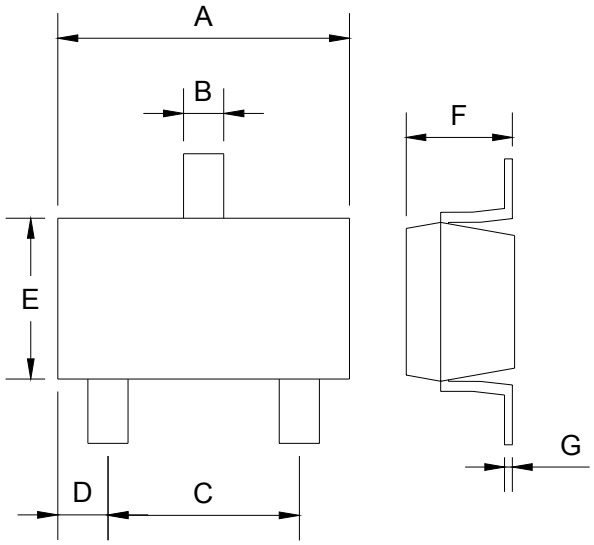
Tj = 25 °C unless otherwise noted

| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{GS}$ = 0V, $I_D$ = 10uA | $BV_{DSS}$ | 60 | -- | -- | V |
| Drain-Source On-State Resistance | $V_{GS}$ = 10V, $I_D$ = 500mA | $R_{DS(ON)}$ | -- | -- | 7.5 | Ω |
| Drain-Source On-State Resistance | $V_{GS}$ = 5V, $I_D$ = 50mA | $R_{DS(ON)}$ | -- | -- | 13.5 | |
| Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250uA | $V_{GS(TH)}$ | 1.0 | -- | 2.5 | V |
| Zero Gate Voltage Drain Current | $V_{DS}$ = 60V, $V_{GS}$ = 0V | $I_{DSS}$ | -- | -- | 1.0 | uA |
| Gate Body Leakage | $V_{GS}$ = ± 20V, $V_{DS}$ = 0V | $I_{GSS}$ | -- | -- | ± 100 | nA |
| On-State Drain Current | $V_{DS}$ □ 2V, $V_{GS}$ = 10V | $I_{D(ON)}$ | 500 | -- | -- | mA |
| **Dynamic** | | | | | | |
| Turn-On Rise Time | $V_{DD}$ = 25V, $R_L$ = 50Ω, $I_D$ = 500mA, $V_{GEN}$ = 10V, $R_G$ = 25Ω | $t_r$ | -- | -- | 20 | nS |
| Turn-Off Fall Time | | $t_f$ | -- | -- | 40 | |
| Input Capacitance | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1.0MHz | $C_{iss}$ | -- | 50 | -- | pF |
| Output Capacitance | | $C_{oss}$ | -- | 25 | -- | |
| Reverse Transfer Capacitance | | $C_{rss}$ | -- | 5 | -- | |
| **Source-Drain Diode** | | | | | | |
| Max. Diode Forward Current | | $I_S$ | -- | -- | 115 | mA |
| Diode Forward Voltage | $I_S$ = 115mA, $V_{GS}$ = 0V | $V_{SD}$ | -- | 1.3 | 1.5 | V |

Note : pulse test: pulse width <=300uS, duty cycle <=2%



# SOT-23 Mechanical Drawing




| SOT-23 DIMENSION | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.88 | 2.91 | 0.113 | 0.115 |
| B | 0.39 | 0.42 | 0.015 | 0.017 |
| C | 1.78 | 2.03 | 0.070 | 0.080 |
| D | 0.51 | 0.61 | 0.020 | 0.024 |
| E | 1.50 | 1.70 | 0.061 | 0.069 |
| F | 1.04 | 1.08 | 0.041 | 0.043 |
| G | 0.07 | 0.09 | 0.003 | 0.004 |