# N-Channel Power MOSFET

## Description

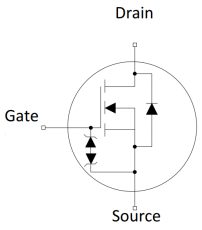
The G2N7002X uses advanced trench technology to provide excellent $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.

## General Features

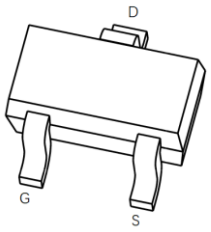
- $V_{DS}$ 60V
- $I_D$ 340mA
- $R_{DS(ON)}$( at $V_{GS}$=10V) ＜5Ω
- $R_{DS(ON)}$( at $V_{GS}$=4.5V) ＜5.3Ω
- ESD Protected Up to 2.5KV (HBM)
- 100% Avalanche Tested
- RoHS Compliant

## Application

- Power switch
- DC/DC converters




**Schematic Diagram**




SOT-523

| Device | Package | Packaging |
|---|---|---|
| G2N7002X | SOT-523 | 3000pcs/Reel |

## ABSOLUTE MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ | 340 | mA |
| Power Dissipation | $P_D$ | 0.15 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 833 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | ℃ |

## Thermal Resistance

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 833 | ºC/W |

## MOSFET ELECTRICAL CHARACTERISTICS($T_a$=25℃ unless otherwise noted)

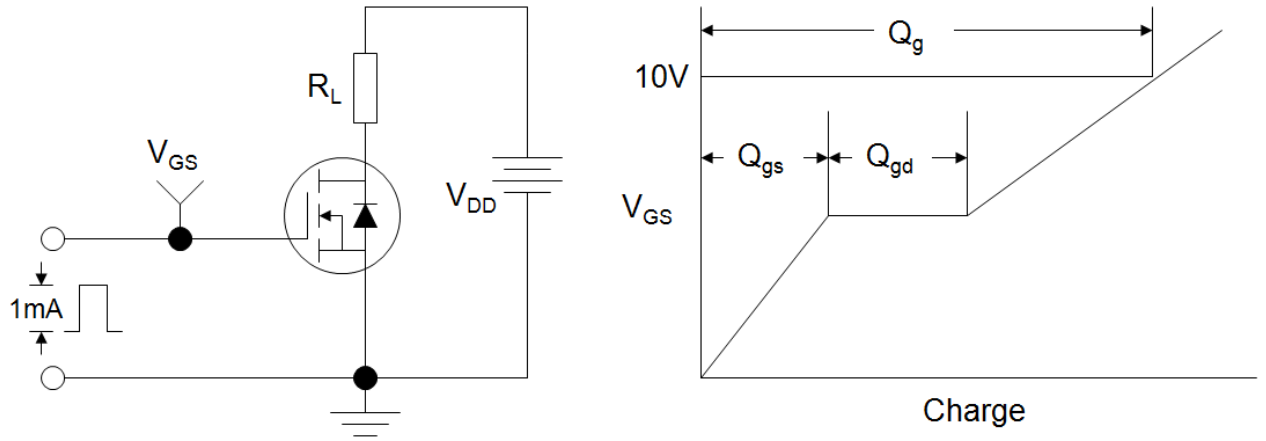
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 60 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =48V,$V_{GS}$ = 0V | | | 1 | uA |
| Gate-body leakage current | $I_{GSS1}$ | $V_{GS}$ =±20V, $V_{DS}$ = 0V | | | ±10 | μA |
| | $I_{GSS2}$ | $V_{GS}$ =±10V, $V_{DS}$ = 0V | | | ±200 | nA |
| | $I_{GSS2}$ | $V_{GS}$ =±5V, $V_{DS}$ = 0V | | | ±100 | nA |
| Gate threshold voltage* | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 1 | 1.4 | 2.5 | V |
| Drain-source on-resistance* | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =500mA | | 1.3 | 5 | Ω |
| | | $V_{GS}$ =4.5V, $I_D$ =200mA | | 1.4 | 5.3 | |
| Recovered charge | $Q_r$ | $V_{GS}$=0V,$I_S$=300mA,$V_R$=25V, $dI_s/d_t$=-100A/μS | | 30 | | nC |
| **Dynamic characteristics**** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=10V,$V_{GS}$=0V,f=1MHz | | | 40 | pF |
| Output Capacitance | $C_{oss}$ | | | | 30 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 10 | |
| **Switching Characteristics**** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=10 V, $V_{DD}$=50V, $R_G$=50Ω | | | 10 | ns |
| Turn-off delay time | $t_{d(off)}$ | $R_{GS}$=50Ω,$R_L$=250Ω | | | 15 | |
| Reverse recovery Time | $t_{rr}$ | $V_{GS}$=0V,$I_S$=300mA,$V_R$=25V, $dI_s/d_t$=-100A/μS | | 30 | | |
| **Source-Drain Diode characteristics** | | | | | | |
| Diode Forward voltage | $V_{SD}$ | $V_{GS}$ =0V, $I_S$=300mA | | 0.97 | 1.5 | V |
| **GATE-SOURCE ZENER DIODE** | | | | | | |
| Gate-Source Breakdown Voltage | $BV_{GSO}$ | IGS=±1mA(Open Drain) | ±21.5 | | ±30 | V |

**Notes:**

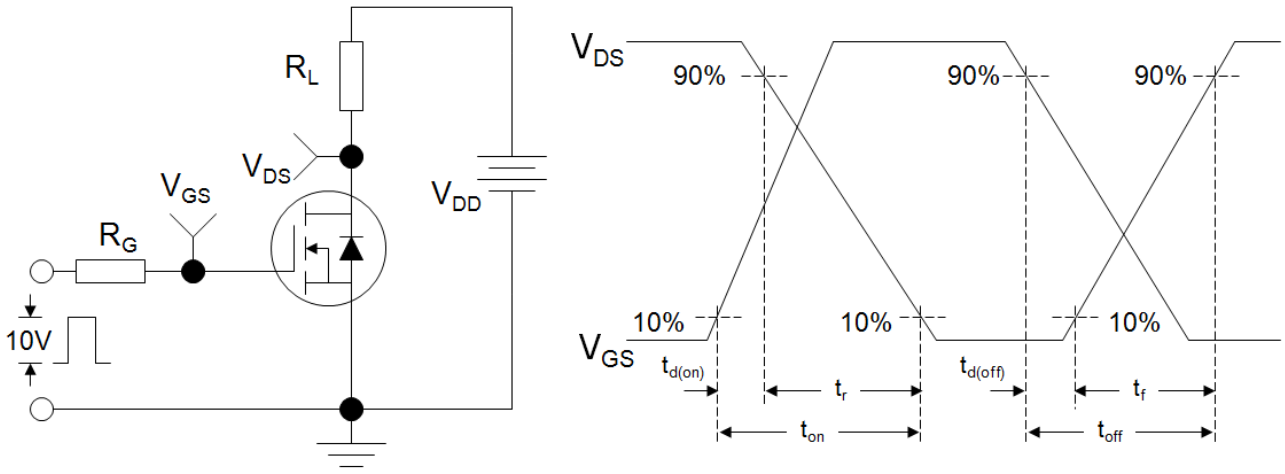
1.Pulse Test: Pulse Width ≤300μs，Duty Cycle ≤2%.

2.These parameters have no way to verify.

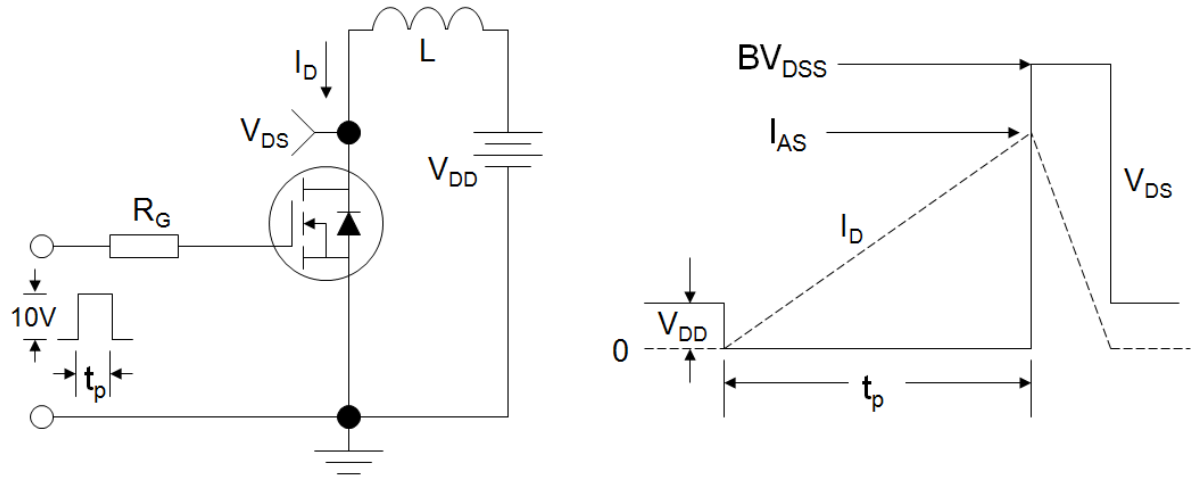
**Gate Charge Test Circuit**



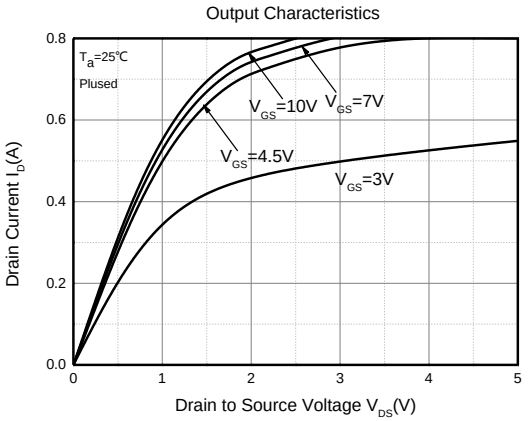

**Switch Time Test Circuit**

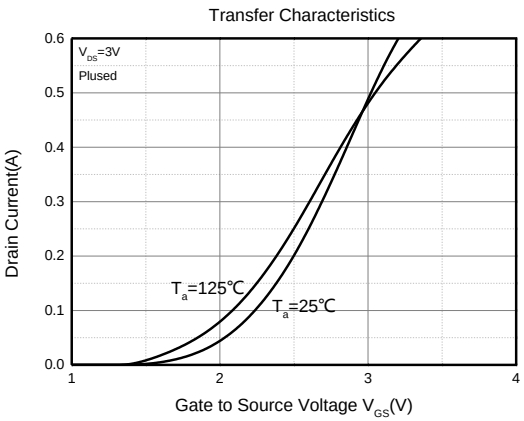


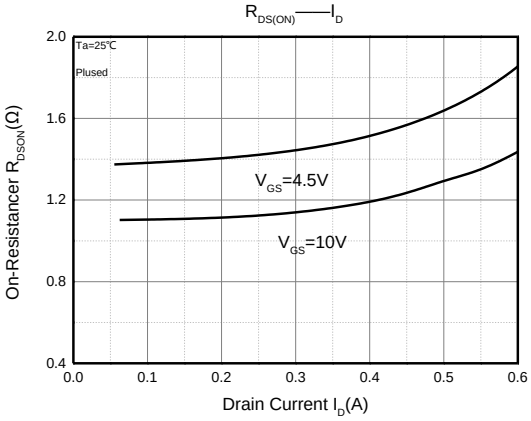

**EAS Test Circuit**

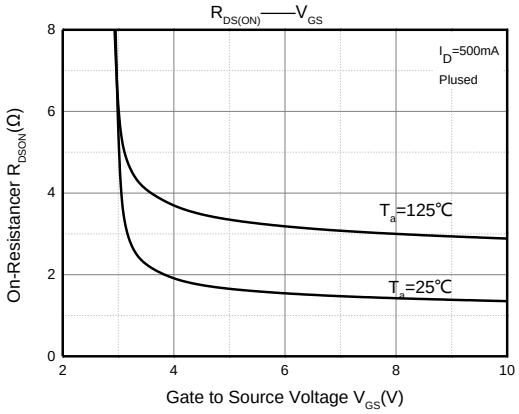


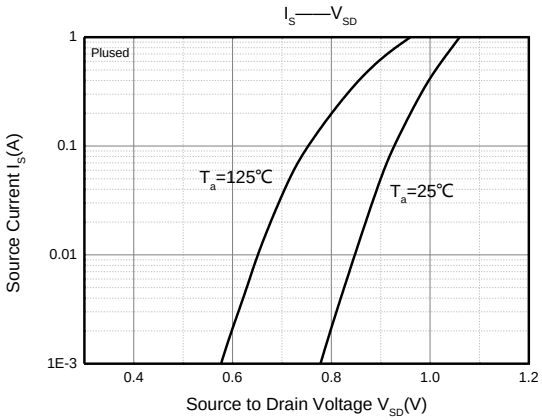
## Typical Characteristics

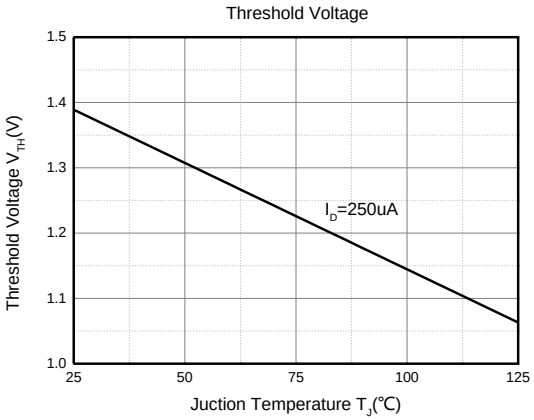


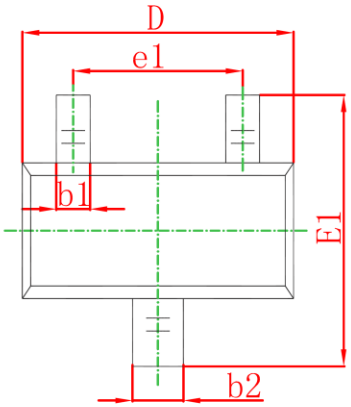



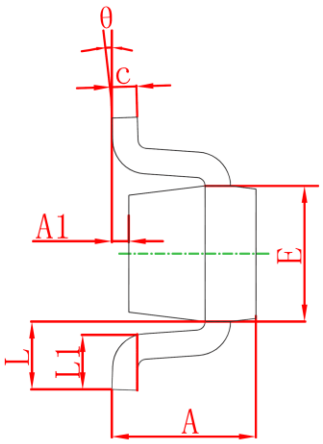



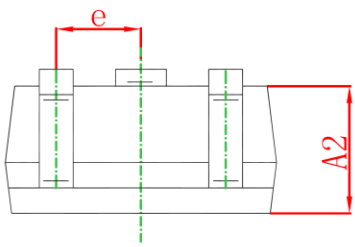



**SOT-523 Package Information**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500 TYP. | | 0.020 TYP. | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.400 REF. | | 0.016 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |