TECH PUBLIC
台舟电子

# MGSF2N02ELT1G

**20V N-Channel Mosfet**

www.sot23.com.tw

## Product Summary

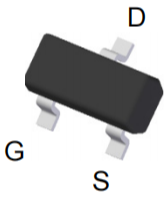
- $V_{DS}$= 20V , $I_D$= 5.5A
  $R_{DS(ON)}$ < 25mΩ @$V_{GS}$= 4.5V

## Application

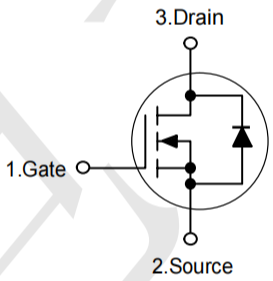
- Load Switch for Portable Devices
- DC/DC Converter

## Package and Pin Configuration

SOT23




## Circuit diagram




# Marking: A0D

## Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±8 | V |
| Drain Current-Continuous | $I_D$ | 5.5 | A |
| Drain Current-Pulsed Note1 | $I_{DM}$ | 18 | A |
| Maximum Power Dissipation | $P_D$ | 1 | W |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

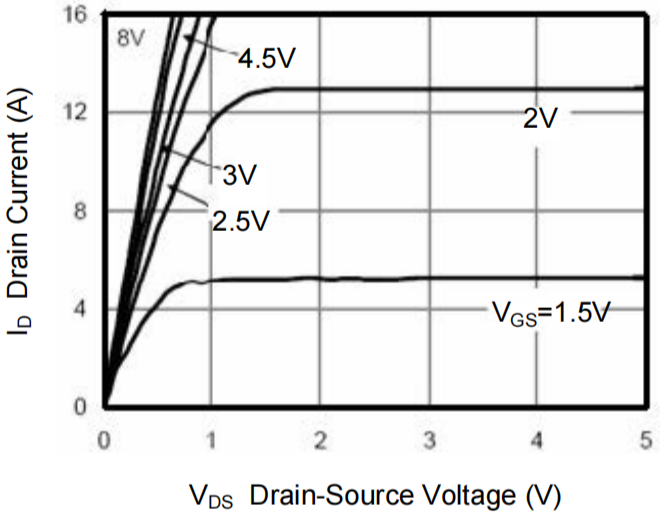
## Thermal Characteristics

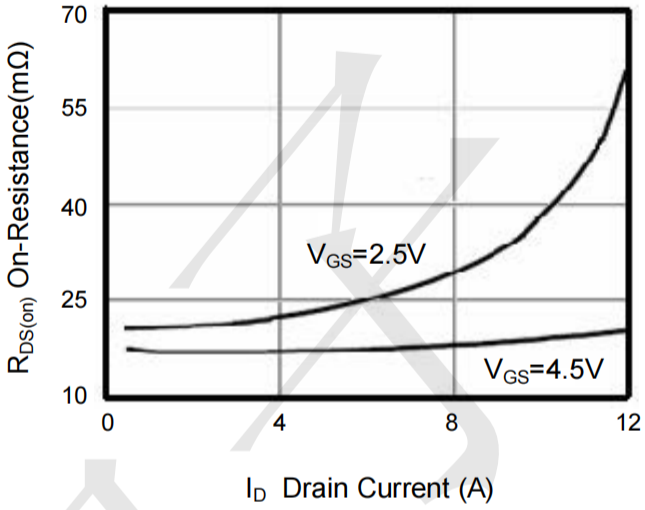
| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient Note2 | $R_{\theta JA}$ | 125 | °C/W |

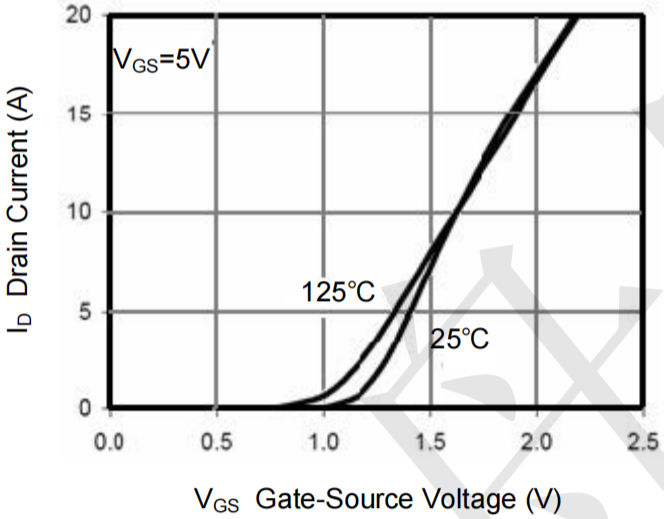
**ELECTRICAL CHARACTERISTICS** ($T_A$=25°C unless otherwise noted)

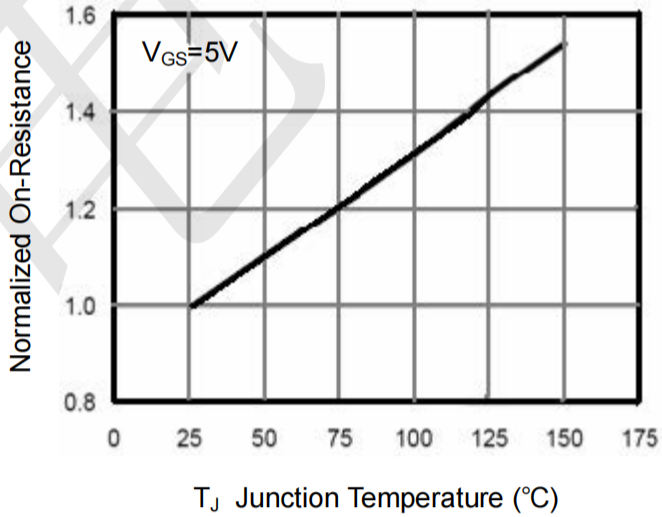
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 20 | -- | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V,$V_{GS}$=0V | -- | -- | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±8V,$V_{DS}$ =0V | -- | -- | ±100 | nA |
| Gate Threshold Voltage Note3 | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 0.45 | -- | 1 | V |
| Drain-Source On-Resistance Note3 | $R_{DS(on)}$ | $V_{GS}$=4.5V, $I_D$=4A | | | 25 | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=3A | | | 35 | mΩ |
| Forward Transconductance Note3 | $g_{FS}$ | $V_{DS}$=5V,$I_D$=3A | -- | 8 | -- | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=10V,$V_{GS}$=0V,f=1MHz | -- | 300 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 120 | -- | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 80 | -- | pF |
| **Switching Characteristics** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=10V, $V_{GS}$=4.5V<br>$I_D$ =3A, $R_{GEN}$=6Ω | -- | 10 | -- | nS |
| Turn-on Rise Time | $t_r$ | | -- | 50 | -- | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 17 | -- | nS |
| Turn-off Fall Time | $t_f$ | | -- | 10 | -- | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =10V,$V_{GS}$ =4.5V<br>$I_D$ =4A | -- | 4.0 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 0.65 | -- | nC |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 1.2 | -- | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage Note3 | $V_{SD}$ | $V_{GS}$=0V,$I_S$=5.5A | -- | -- | 1.2 | V |
| Diode Forward Current Note2 | $I_S$ | | -- | -- | 5.5 | A |

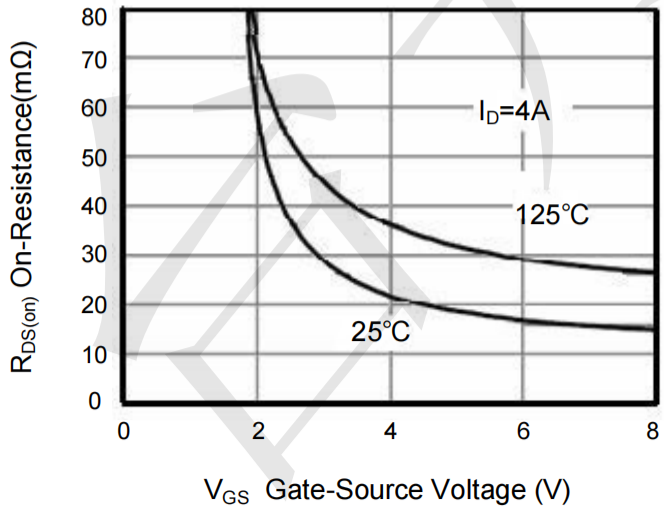
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

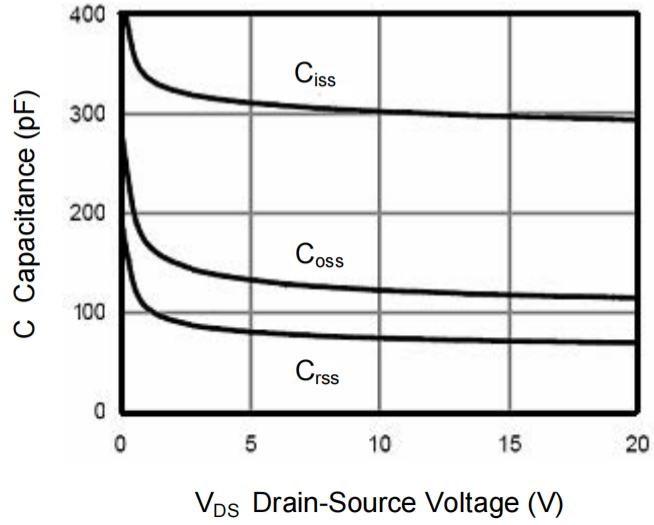


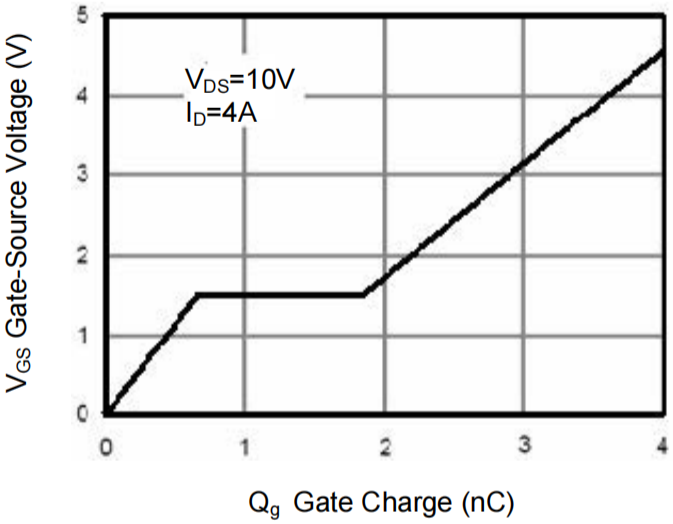



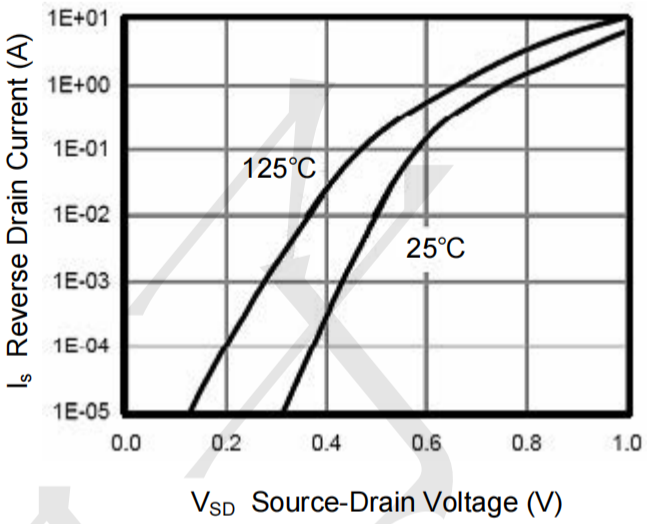



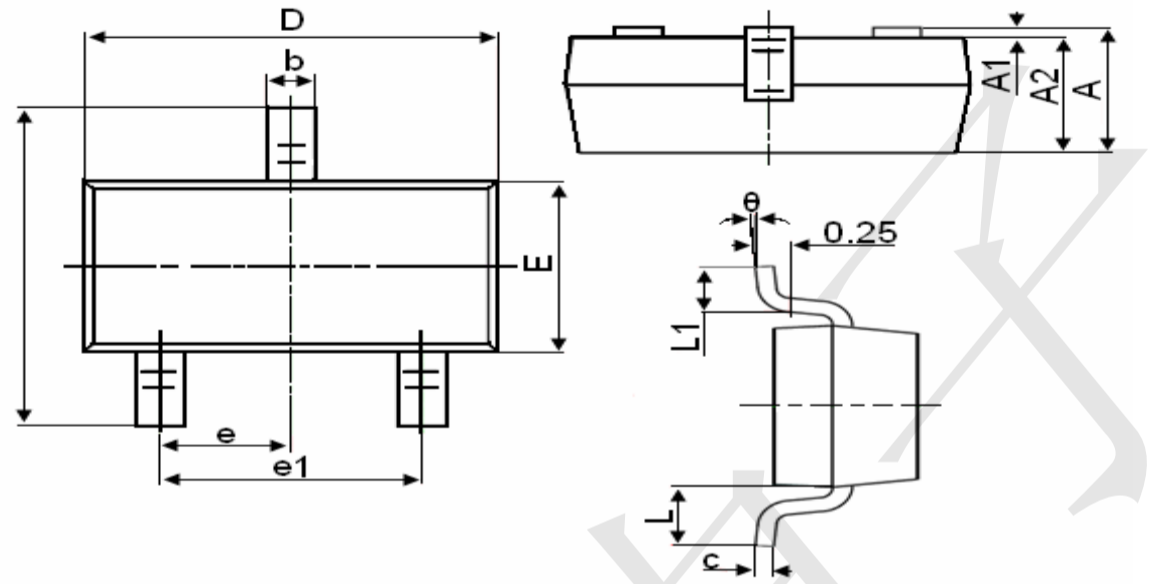




$V_{GS}$ Gate-Source Voltage (V)
$V_{DS}$=10V
$I_D$=4A
0
1
2
3
4
5
$Q_g$ Gate Charge (nC)


$I_s$ Reverse Drain Current (A)
1E+01
1E+00
1E-01
1E-02
1E-03
1E-04
1E-05
125°C
25°C
0.0
0.2
0.4
0.6
0.8
1.0
$V_{SD}$ Source-Drain Voltage (V)

## Package Outline Dimensions (SOT-23)




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |