ZHEJIANG UNIU-NE Technology CO.,LTD

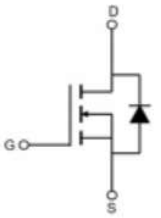
浙 江 宇 力 微 新 能 源 科 技 有 限 公 司

# AP3004S Data Sheet

V 1.1

## Feature

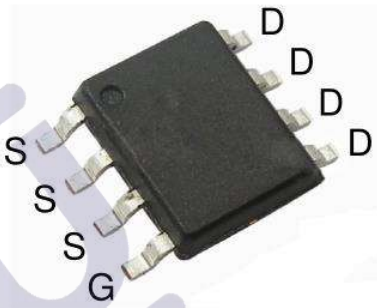
- 30V,20A
  $R_{DS(ON)}$ <6mΩ @$V_{GS}$=10V
  $R_{DS(ON)}$ <9mΩ @$V_{GS}$=4.5V
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge




Schematic Diagram

## Application

- PWM applications
- Load Switch
- Power management




SOP-8

## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity (PCS) |
|---|---|---|---|---|---|
| 3004S | AP3004S | SOP-8 | 13 inch | - | 4000 |

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

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current ($T_a$ =25℃) | $I_D$ | 20 | A |
| Continuous Drain Current ($T_a$ =100℃) | $I_D$ | 14 | A |
| Pulsed Drain Currenr (1) | $I_{DM}$ | 52 | A |
| Singel Pulsed Avalanche Energy (2) | $E_{AS}$ | 64.8 | mJ |
| Power Dissipation | $P_D$ | 3 | W |
| Thermal Resistance from Junction to Ambient(4) | $R_{\theta JA}$ | 42 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | ℃ |

## 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 | 30 | - | - | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =30V, $V_{GS}$ = 0V | - | - | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±20V,$V_{DS}$ = 0V | - | - | ±100 | nA |
| Gate threshold voltage(3) | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 1 | 1.5 | 2.5 | V |
| Drain-source on-resistance(3) | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =20A | - | 5.0 | 6.0 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =10A | - | 7.0 | 9.0 | |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =15V, $V_{GS}$ =0V, f =1MHz | - | 1614 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 245 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 215 | - | |
| **Switching characteristics** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=15V, $I_D$=20A, $V_{GS}$=10V, $R_G$=3Ω | - | 7.5 | - | ns |
| Turn-on rise time | $t_r$ | | - | 14.5 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 35.2 | - | |
| Turn-off fall time | $t_f$ | | - | 9.6 | - | |
| Total Gate Charge | Qg | VDS=15V, ID=20A, VGS=10V | - | 33.7 | - | nC |
| Gate-Source Charge | Qgs | | - | 8.5 | - | |
| Gate-Drain Charge | Qgd | | - | 7.5 | - | |
| **Source-Drain Diode characteristics** | | | | | | |
| Diode Forward voltage(3) | $V_{DS}$ | $V_{GS}$ =0V, $I_S$=1A | - | - | 1.2 | V |
| Diode Forward current(4) | $I_S$ | | - | - | 20 | A |

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:$T_J$=25℃,$V_{DD}$=15V,$R_G$=25Ω,L=0.1mH,$I_{AS}$=36A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

## Test Circuit

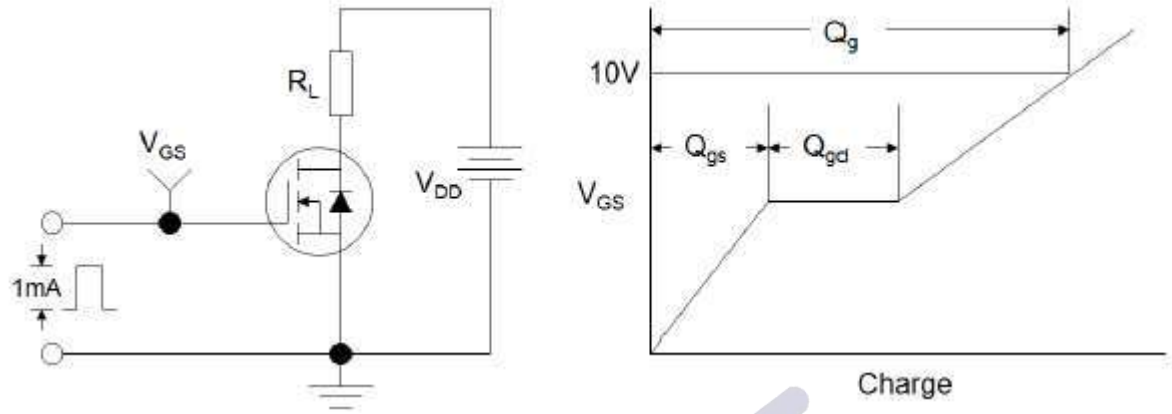



**Figure1:Gate Charge Test Circuit & Waveform**

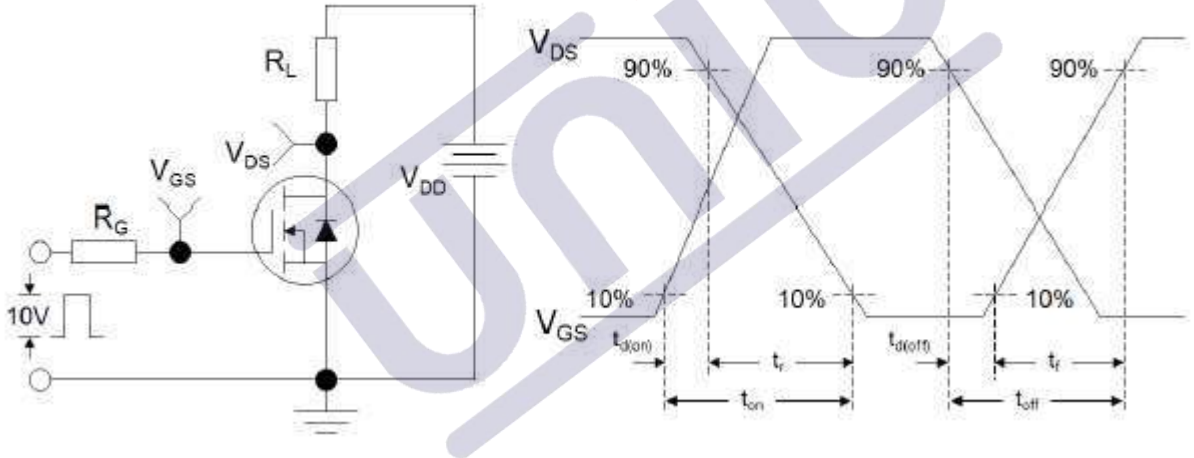



**Figure 2: Resistive Switching Test Circuit & Waveforms**

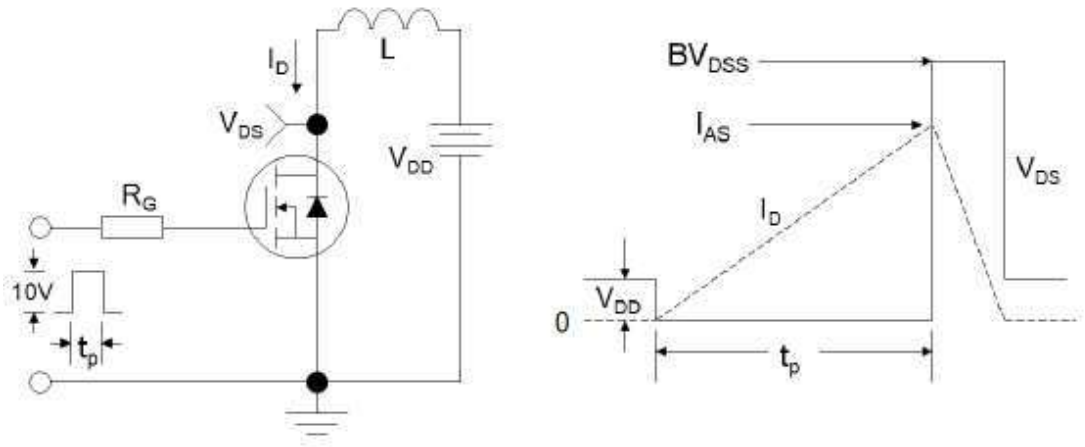



**Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms**

## 1.版本记录

| DATE | REV. | DESCRIPTION |
|---|---|---|
| 2018/04/19 | 1.0 | First Release |
| 2021/11/15 | 1.1 | Layout adjustment |
| | | |
| | | |

## 2.免责声明

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