



General Description

The UV4018S uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

Features

Enhancement Mode

Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5V$

100% Avalanche Tested

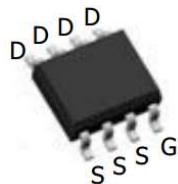
| | | |
|-------------------------------|-----|----|
| V _{DS} | 40 | V |
| $R_{DS(on)\ max}@V_{GS}=10V$ | 8.2 | mΩ |
| $R_{DS(on)\ max}@V_{GS}=4.5V$ | 10 | mΩ |
| I _D | 18 | A |

Applications

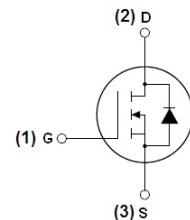
Power switching application

Hard Switched and High Frequency Circuits

Uninterruptible Power Supply



SOP-8 Top view



Schematic diagram

Package Marking And Ordering Information

| Part ID | Package Type | Marking | Tape and Reel information |
|---------|--------------|---------|---------------------------|
| UV4018S | SOP8 | UV4018S | 3000pcs/REEL |

Maximum ratings, at $T_j=25^\circ\text{C}$, unless otherwise specified

| Symbol | Parameter | | Rating | Unit |
|----------------|---|-------------------------|------------------------|------|
| $V_{(BR)DSS}$ | Drain –Source breakdown voltage | | 40 | V |
| I_D | Continuous drain current @ $V_{GS}=10V$ | $T_c=25^\circ\text{C}$ | 18 | A |
| | | $T_c=100^\circ\text{C}$ | 30 | A |
| I_{DM} | Pulse drain current tested① | | $T_c=25^\circ\text{C}$ | A |
| E_{AS} | Avalanche energy, single pulsed② | | 76 | mJ |
| P_D | Maximum power dissipation | | $T_c=25^\circ\text{C}$ | 46 |
| V_{GS} | Gate-Source voltage | | ± 20 | V |
| $T_{STG}\ T_J$ | Storage and operating temperature range | | -55 to 175 | °C |



Thermal Characteristic

| Symbol | Parameter | Typical | Unit |
|-----------|--|---------|------|
| R_{QJC} | Thermal Resistance-Junction to Case | 1.3 | °C/W |
| R_{QJA} | Thermal Resistance-Junction to Ambient | 36 | °C/W |

Typical Characteristics

| Symbol | Parameter | Condition | Min | Type | Max | Unit |
|---|---|--|-----|------|-----------|------------------|
| Static Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise stated) | | | | | | |
| $V_{(\text{BR})DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$ | 40 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=32\text{V}$, $V_{GS}=0\text{V}$ | | | 1 | μA |
| | Zero Gate Voltage Drain Current($T_j=55^\circ\text{C}$) | $V_{DS}=32\text{V}$, $V_{GS}=0\text{V}$ | | | 5 | μA |
| I_{GSS} | Gate-Body Leakage Current | $V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$ | | | ± 100 | nA |
| $V_{GS(\text{TH})}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$ | 1 | | 2.5 | V |
| $R_{DS(\text{ON})}$ | Drain-Source On-State Resistance ^③ | $V_{GS}=10\text{V}$, $I_D=12\text{A}$ | | | 8.2 | $\text{m}\Omega$ |
| | | $V_{GS}=4.5\text{V}$, $I_D=10\text{A}$ | | | 10 | $\text{m}\Omega$ |
| Dynamic Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise stated) | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$ | | 2332 | | PF |
| C_{oss} | Output Capacitance | | | 193 | | PF |
| C_{rss} | Reverse Transfer Capacitance | | | 138 | | PF |
| Q_g | Total Gate Charge | $V_{DS}=20\text{V}$, $I_D=12\text{A}$, $V_{GS}=4.5\text{V}$ | | 18.8 | | nC |
| Q_{gs} | Gate-Source Charge | | | 4.7 | | nC |
| Q_{gd} | Gate-Drain Charge | | | 8.2 | | nC |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-on Delay time | $V_{DD}=15\text{V}$, $I_D=1\text{A}$, $R_G=3.3\Omega$, $V_{GS}=10\text{V}$ | | 14.3 | | nS |
| t_r | Turn-on Rise time | | | 2.6 | | nS |
| $t_{d(off)}$ | Turn-off Delay time | | | 77 | | nS |
| t_f | Turn-off Fall time | | | 4.8 | | nS |
| Source-Drain Diode Characteristics | | | | | | |
| V_{SD} | Forward on voltage | $I_{SD}=1\text{A}$, $V_{GS}=0\text{V}$ | | | 1 | V |
| I_s | Continuous Source Current | Force Current | | | 60 | A |
| I_{SM} | Pulsed Source Current | | | | 120 | A |

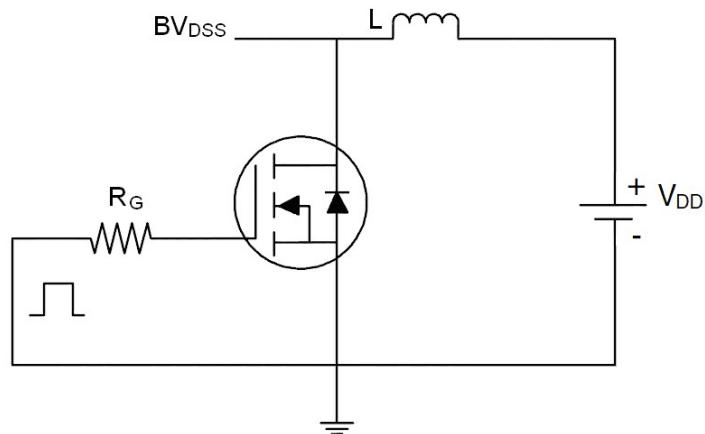
Note:

- ① Repetitive rating; pulse width limited by max, junction temperature.
- ② Limited by T_j max, starting $T_j=25^\circ\text{C}$, $L=0.1\text{mH}$, $R_G=25\Omega$, $I_{AS}=39\text{A}$, $V_{GS}=10\text{V}$, Part not recommended for use above this value
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$

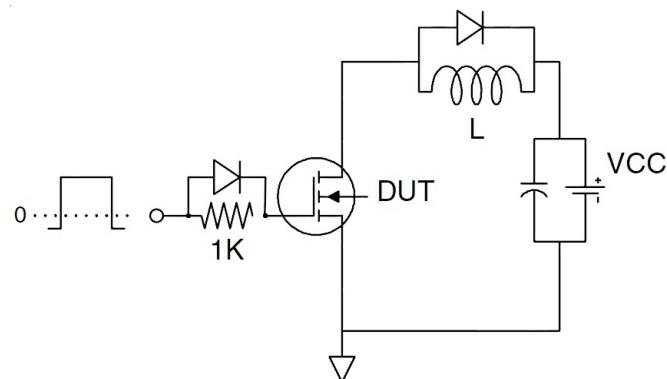


Test circuit

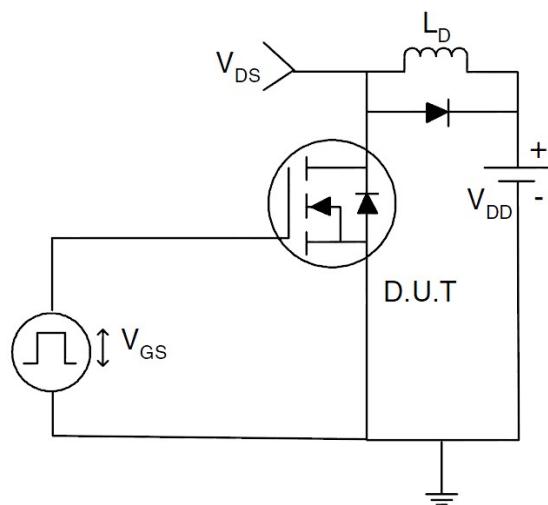
(1) E_{AS} test circuits



(2) Gate charge test circuit



(3) Switch time test circuit





Typical Characteristics

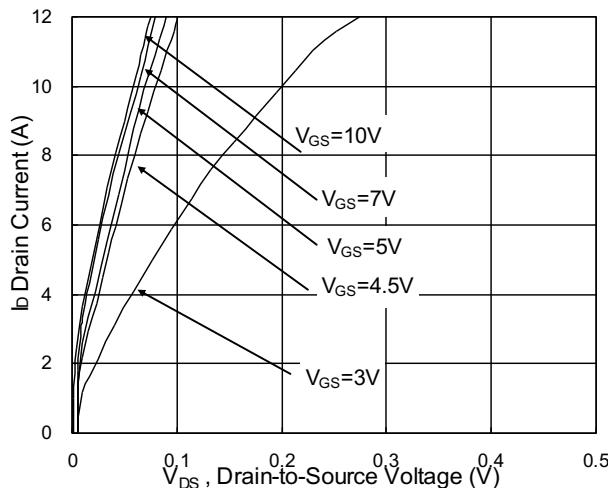


Fig.1 Typical Output Characteristics

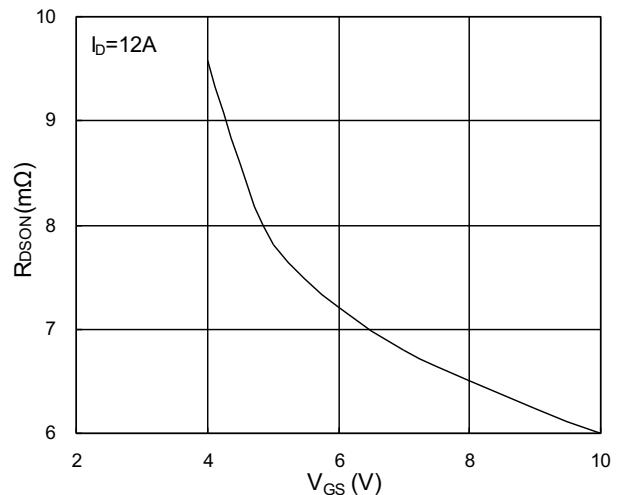


Fig.2 On-Resistance vs. G-S Voltage

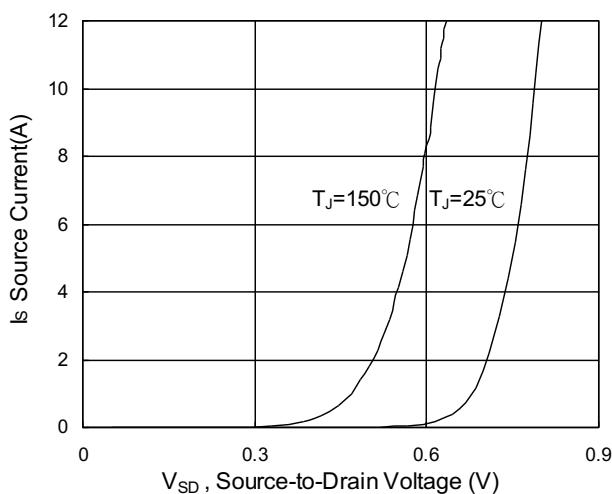


Fig.3 Forward Characteristics of Reverse

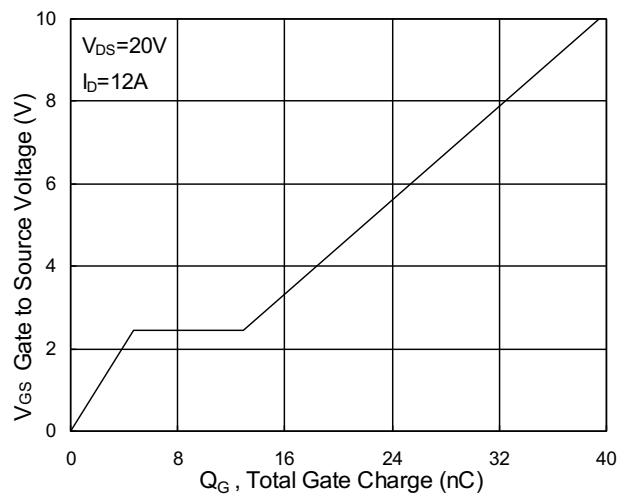


Fig.4 Gate-Charge Characteristics

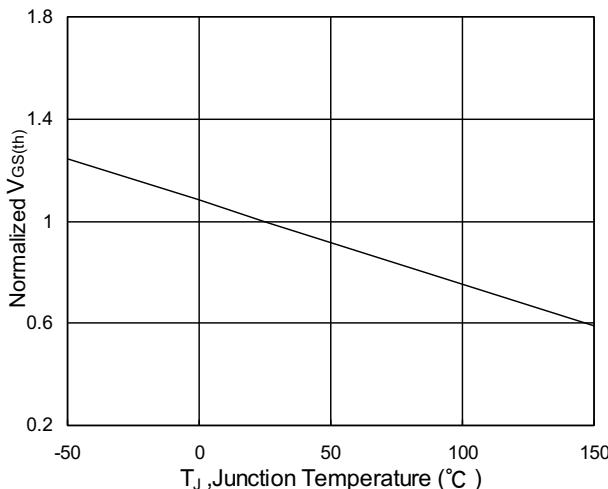


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

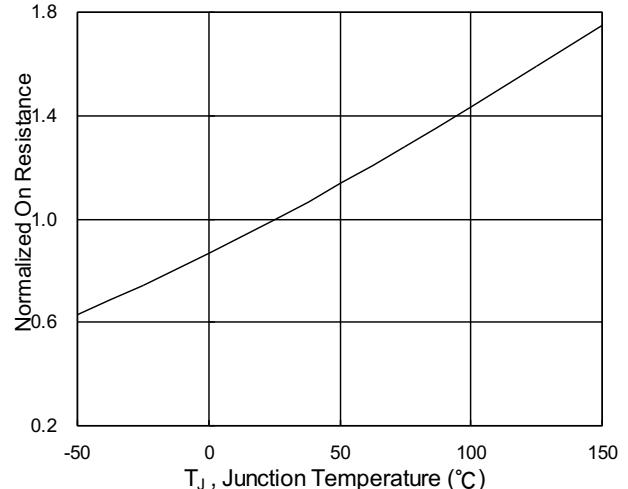


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

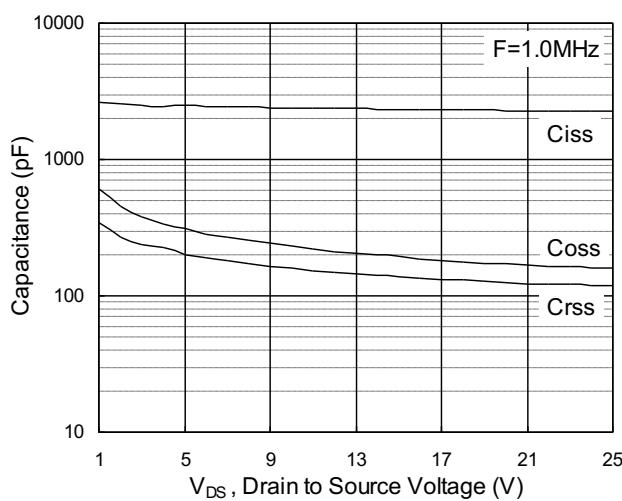


Fig.7 Capacitance

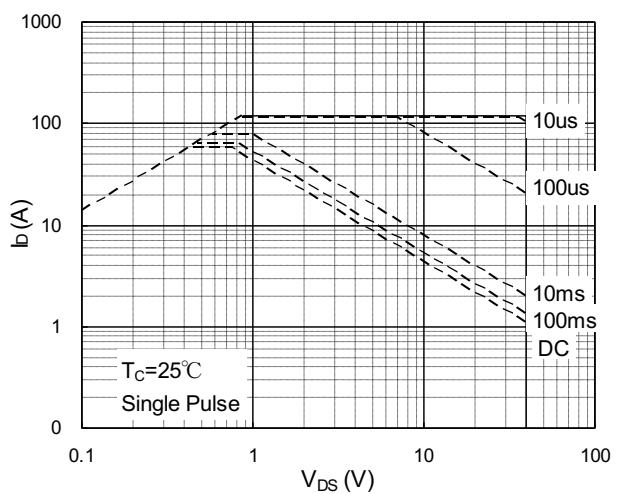


Fig.8 Safe Operating Area

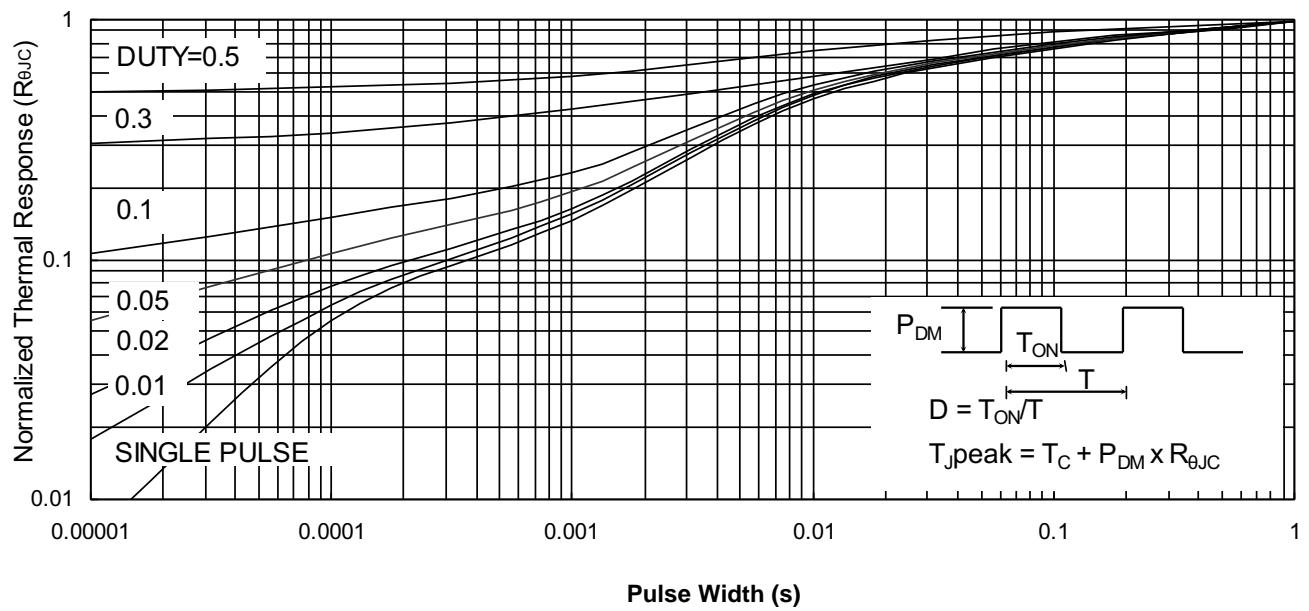


Figure 9: Normalized Maximum Transient Thermal Impedance (Note E)