
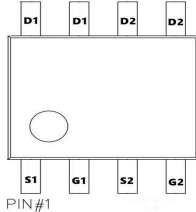


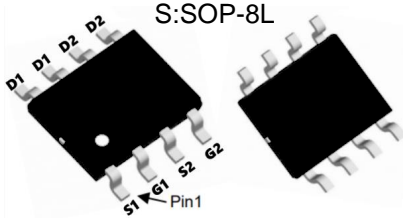
TM10H02S

N+N-Channel Enhancement Mode Mosfet

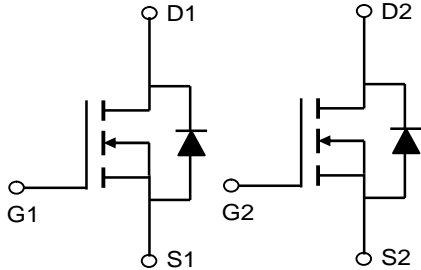
| | |
|--|---|
| <p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM | <p>Product Summary</p> <p>$V_{DS} = 20V$ $I_D = 10A$ $R_{DS(ON)} = 13m\Omega$ (typ.) @ $V_{GS} = 4.5V$</p> <p>100% UIS Tested 100% R_g Tested</p>  |
|--|---|



Marking: 10V02 OR 9928



S:SOP-8L



Absolute Maximum Rating ($T_A = 25^\circ C$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|----------------|------------|------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current | I_D | 10 | A |
| Pulsed Drain Current ¹ | I_{DM} | 28 | A |
| Power Dissipation | P_D | 2.25 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 150 | $^\circ C$ |

Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|--|-----------------|-------|--------------|
| Thermal Resistance from Junction to Ambient ² | $R_{\theta JA}$ | 80 | $^\circ C/W$ |

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Electrical Characteristics (T_J=25°C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---------------------------|---|------|------|------|------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | V _{GS} = 0V, I _D = 250μA | 20 | - | - | V |
| Gate Leakage Current | I_{GSS} | V _{GS} = ±12V, V _{DS} = 0V | - | - | ±100 | nA |
| Drain Cut-off Current | I_{DSS} | V _{DS} = 20V, V _{GS} = 0V | - | - | 1 | μA |
| Gate Threshold Voltage | V_{GS(th)} | V _{GS} = V _{DS} , I _D = 250μA | 0.45 | 0.7 | 1 | V |
| Drain-Source On-State Resistance ³ | R_{DS(on)} | V _{GS} = 4.5V, I _D = 5A | - | 13 | 20 | mΩ |
| | | V _{GS} = 2.5V, I _D = 4.7A | - | 18 | 30 | |
| | | V _{GS} = 1.8V, I _D = 4.3A | - | 28 | 57 | |
| Dynamic Characteristics⁴ | | | | | | |
| Input Capacitance | C_{iss} | V _{GS} = 0V, V _{DS} = 10V, f = 1MHz | - | 700 | - | pF |
| Output Capacitance | C_{oss} | | - | 120 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 105 | - | |
| Switching Characteristics⁴ | | | | | | |
| Total Gate Charge | Q_g | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 5A | - | 10.5 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 2 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 2.5 | - | |
| Turn-On Time | t_{d(on)} | V _{GS} = 5V, V _{DD} = 10V, I _D = 5A, R _G = 3Ω, | - | 10 | - | ns |
| Rise Time | t_r | | - | 20 | - | |
| Turn-Off Time | t_{d(off)} | | - | 32 | - | |
| Fall Time | t_f | | - | 12 | - | |
| Source-Drain Diode Characteristics | | | | | | |
| Body Diode Voltage ³ | V_{SD} | I _S = 4A, V _{GS} = 0V | - | - | 1.2 | V |
| Continuous Source Current | I_S | | - | - | 10 | A |

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C.
2. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 2%.
4. This value is guaranteed by design hence it is not included in the production test.

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Typical Characteristics

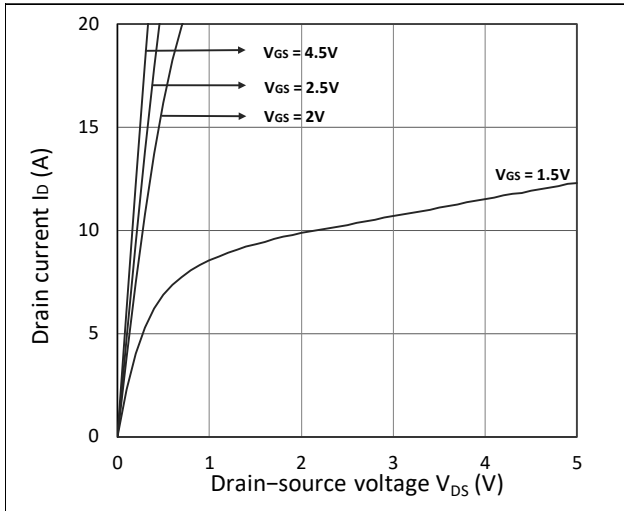


Figure 1. Output Characteristics

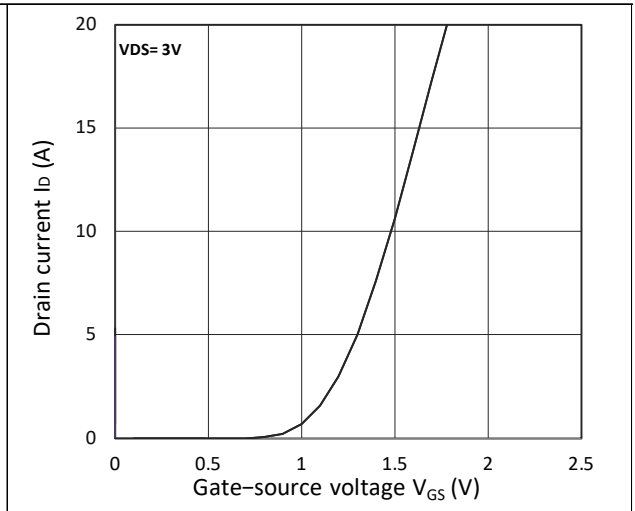


Figure 2. Transfer Characteristics

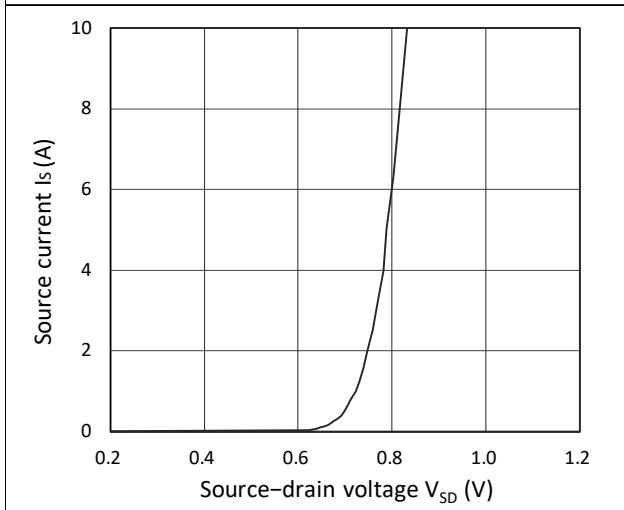


Figure 3. Forward Characteristics of Reverse

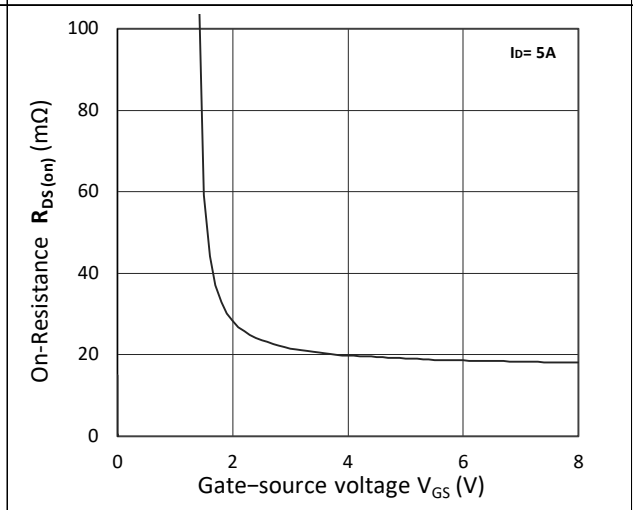


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

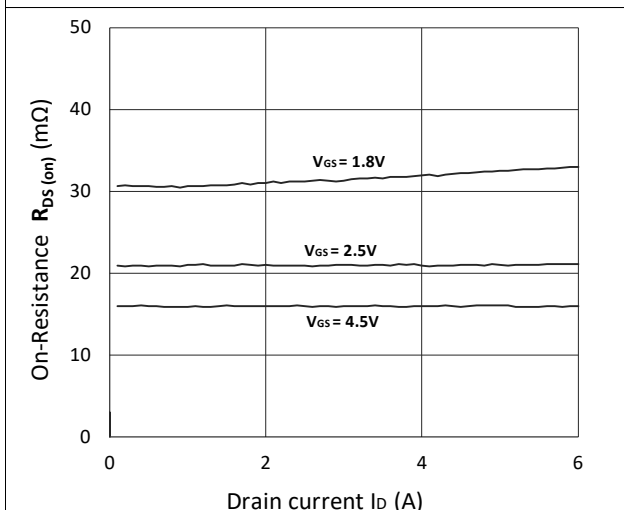


Figure 5. $R_{DS(ON)}$ vs. I_D

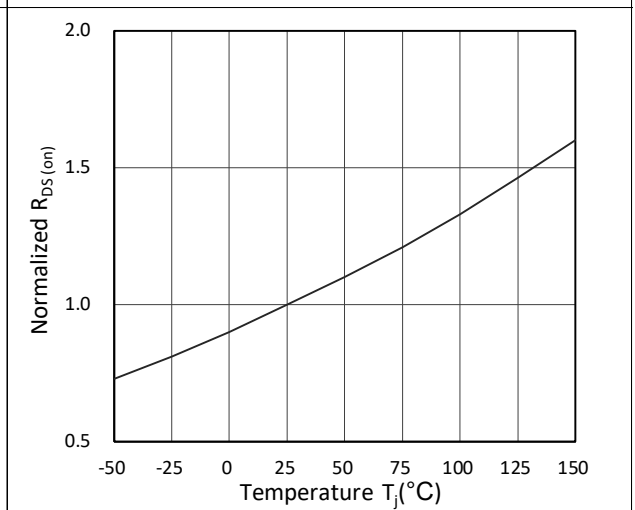


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature



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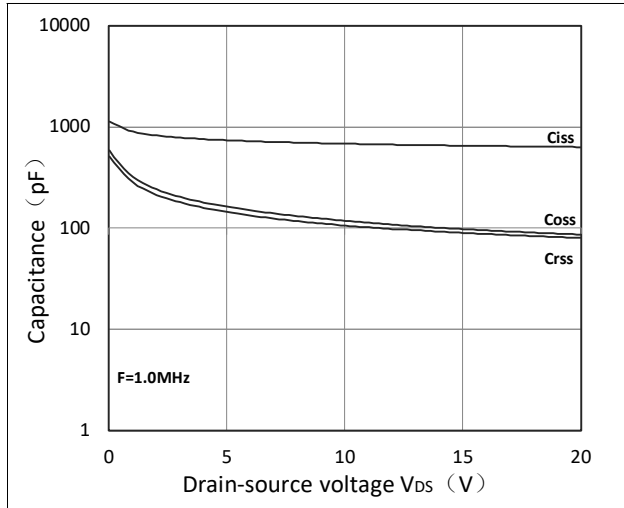


Figure 7. Capacitance Characteristics

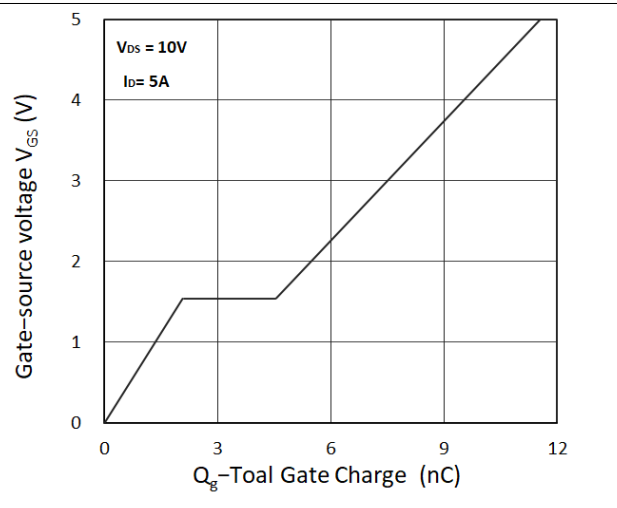
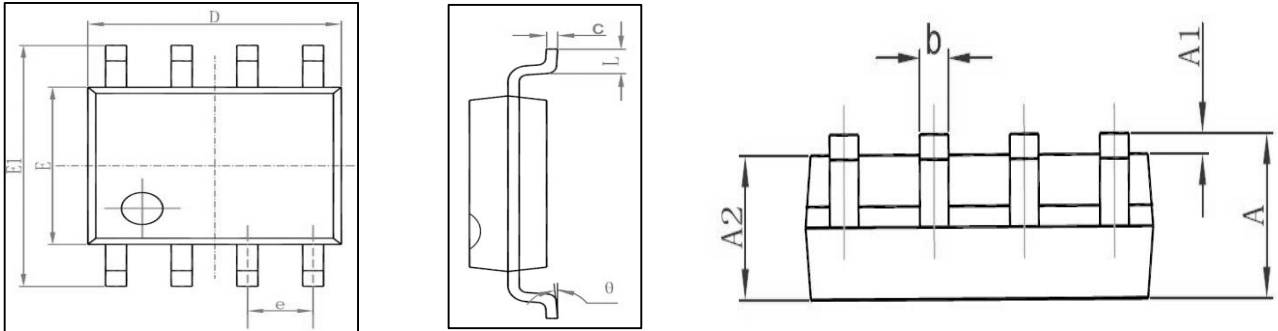
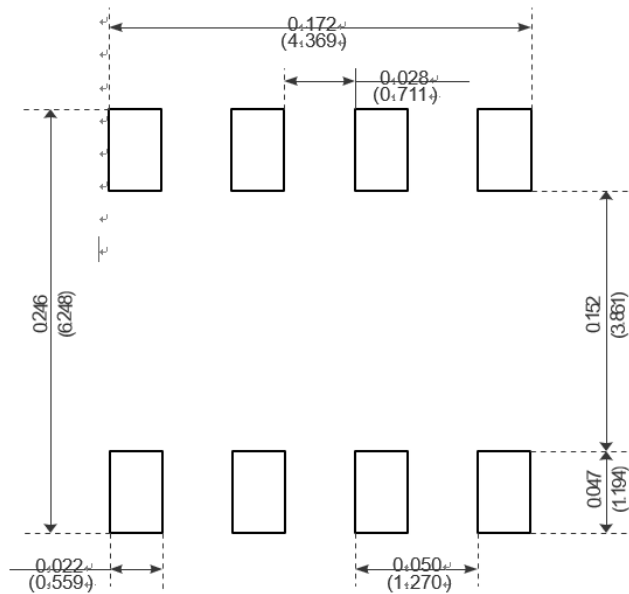


Figure 8. Gate Charge Characteristics

Package Mechanical Data:SOP-8L



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |



Recommended Minimum Pads