



100V 9.2mΩ N-Ch Power MOSFET

Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Product Summary

| Parameter | Typ. | Unit |
|--|------|------|
| V_{DS} | 100 | V |
| $V_{GS(th_typ)}$ | 1.8 | V |
| I_D (@ $V_{GS} = 10V$) ⁽¹⁾ | 11 | A |
| $R_{DS(ON)}$ (@ $V_{GS} = 10V$) | 9.2 | mΩ |
| $R_{DS(ON)}$ (@ $V_{GS} = 4.5V$) | 11.8 | mΩ |

Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

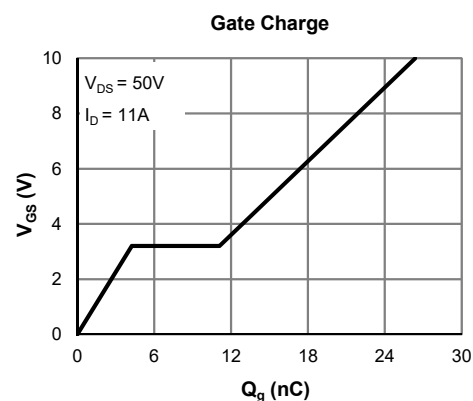
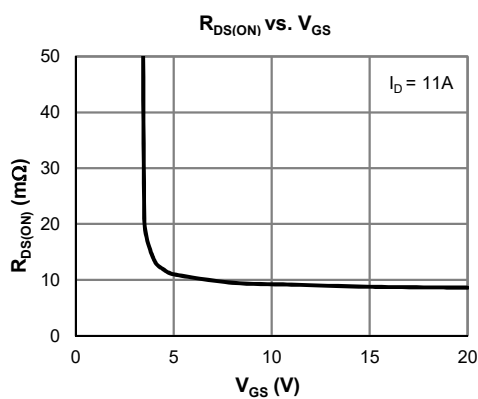


Ordering Information

| Device | Package | # of Pins | Marking | MSL | T_J (°C) | Media | Quantity (pcs) |
|---------------|---------|-----------|---------|-----|------------|--------------|----------------|
| JMSL1010AP-13 | SOP-8L | 8 | SL1010A | 3 | -55 to 150 | 13-inch Reel | 2500 |

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|----------------|--------------------|------|
| Drain-to-Source Voltage | V_{DS} | 100 | V |
| Gate-to-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current ⁽¹⁾ | I_D | $T_A = 25^\circ C$ | 11.1 |
| | | $T_A = 70^\circ C$ | 8.9 |
| Pulsed Drain Current ⁽²⁾ | I_{DM} | 34 | A |
| Avalanche Current ⁽³⁾ | I_{AS} | 32 | A |
| Avalanche Energy ⁽³⁾ | E_{AS} | 51 | mJ |
| Power Dissipation ⁽⁴⁾ | P_D | $T_A = 25^\circ C$ | 2.5 |
| | | $T_A = 70^\circ C$ | 1.6 |
| Junction & Storage Temperature Range | T_J, T_{STG} | -55 to 150 | °C |



**Electrical Characteristics** (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---------------|--|--|------|-----------|---------------|
| STATIC PARAMETERS | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$ | 100 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 80\text{V}$, $V_{GS} = 0\text{V}$ | | | 1.0 | μA |
| | | | | | 5.0 | |
| Gate-Body Leakage Current | I_{GSS} | $V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$ | | | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$ | 1.2 | 1.8 | 2.5 | V |
| Static Drain-Source ON-Resistance | $R_{DS(on)}$ | $V_{GS} = 10\text{V}$, $I_D = 11\text{A}$ | | 9.2 | 11.1 | m Ω |
| | $R_{DS(on)}$ | $V_{GS} = 4.5\text{V}$, $I_D = 5\text{A}$ | | 11.8 | 14.8 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS} = 5\text{V}$, $I_D = 11\text{A}$ | | 30 | | S |
| Diode Forward Voltage | V_{SD} | $I_S = 1\text{A}$, $V_{GS} = 0\text{V}$ | | 0.70 | 1.0 | V |
| Diode Continuous Current | I_S | $T_A = 25^\circ\text{C}$ | | | 2.5 | A |
| DYNAMIC PARAMETERS ⁽⁵⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0\text{V}$, $V_{DS} = 50\text{V}$, $f = 1\text{MHz}$ | | 1535 | | pF |
| Output Capacitance | C_{oss} | | | 335 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 8.2 | | pF |
| Gate Resistance | R_g | $V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1\text{MHz}$ | | 1.8 | | Ω |
| SWITCHING PARAMETERS ⁽⁵⁾ | | | | | | |
| Total Gate Charge (@ $V_{GS} = 10\text{V}$) | Q_g | $V_{GS} = 0$ to 10V $V_{DS} = 50\text{V}$, $I_D = 11\text{A}$ | | 26 | | nC |
| Total Gate Charge (@ $V_{GS} = 4.5\text{V}$) | Q_g | | | 14.0 | | nC |
| Gate Source Charge | Q_{gs} | | | 4.3 | | nC |
| Gate Drain Charge | Q_{gd} | | | 6.8 | | nC |
| Turn-On Delay Time | $t_{D(on)}$ | $V_{GS} = 10\text{V}$, $V_{DS} = 50\text{V}$ $R_L = 4.5\Omega$, $R_{GEN} = 6\Omega$ | | 7.5 | | ns |
| Turn-On Rise Time | t_r | | | 15.7 | | ns |
| Turn-Off Delay Time | $t_{D(off)}$ | | | 31 | | ns |
| Turn-Off Fall Time | t_f | | | 28 | | ns |
| Body Diode Reverse Recovery Time | t_{rr} | | $I_F = 11\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$ | | 50 | |
| Body Diode Reverse Recovery Charge | Q_{rr} | $I_F = 11\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$ | | 70 | | nC |

Thermal Performance

| Parameter | Symbol | Typ. | Max. | Unit |
|---|-----------------|------|------|---------------------------|
| Thermal Resistance, Junction-to-Ambient ($t \leq 10\text{s}$) | $R_{\theta JA}$ | 40 | 50 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (steady state) | $R_{\theta JA}$ | 70 | 85 | $^\circ\text{C}/\text{W}$ |

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ\text{C}$.
3. This single-pulse measurement was taken under the following condition [$L = 100\mu\text{H}$, $V_{GS} = 10\text{V}$, $V_{DS} = 50\text{V}$] while its value is limited by $T_{J_Max} = 150^\circ\text{C}$.
4. The power dissipation P_D is based on $T_{J_Max} = 150^\circ\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

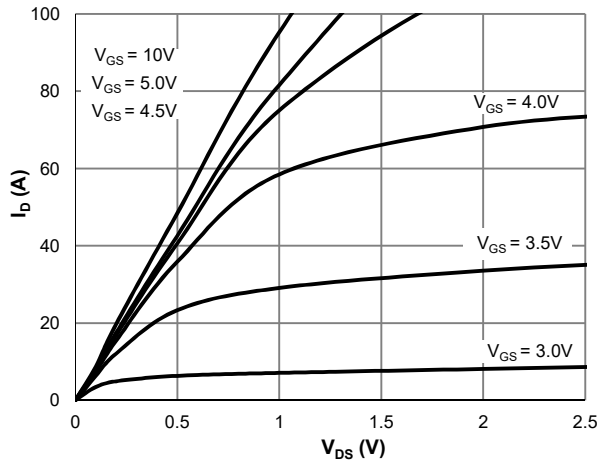


Figure 1: Saturation Characteristics

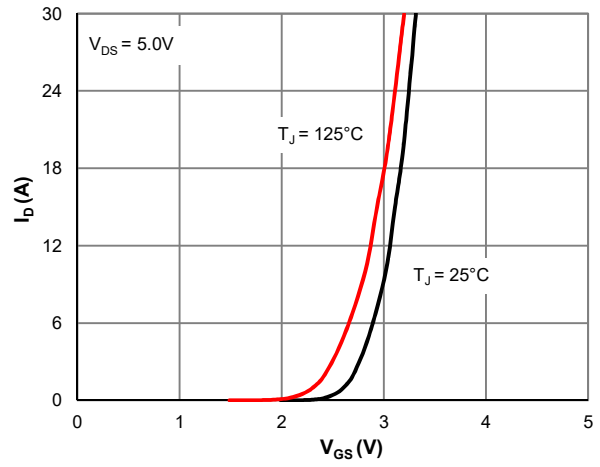


Figure 2: Transfer Characteristics

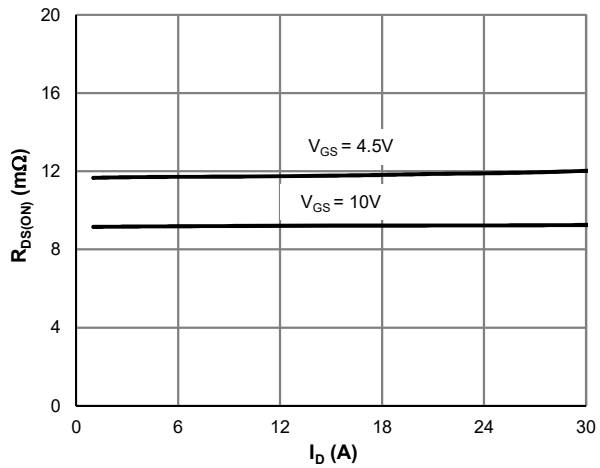


Figure 3: $R_{DS(ON)}$ vs. Drain Current

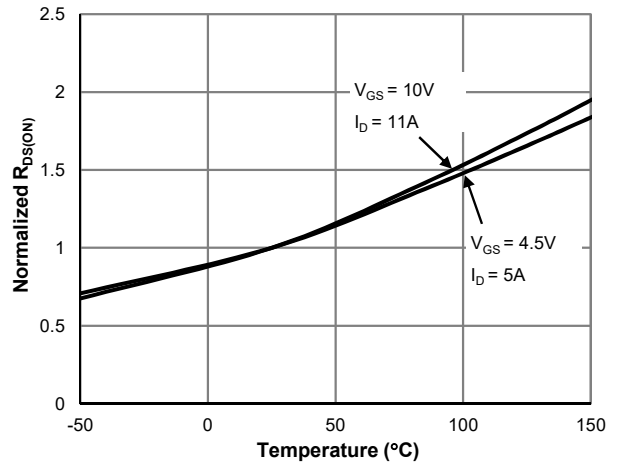


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

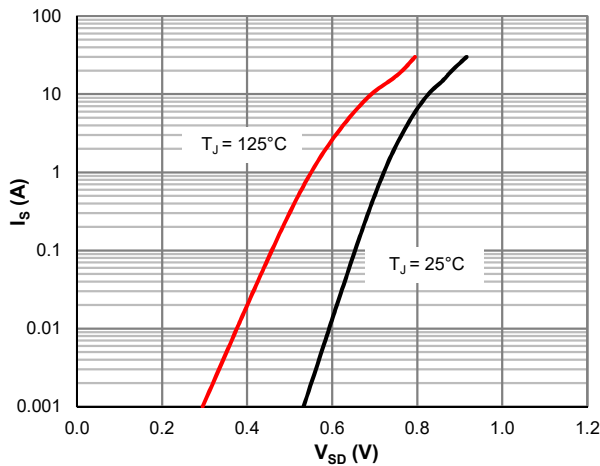


Figure 5: Body-Diode Characteristics

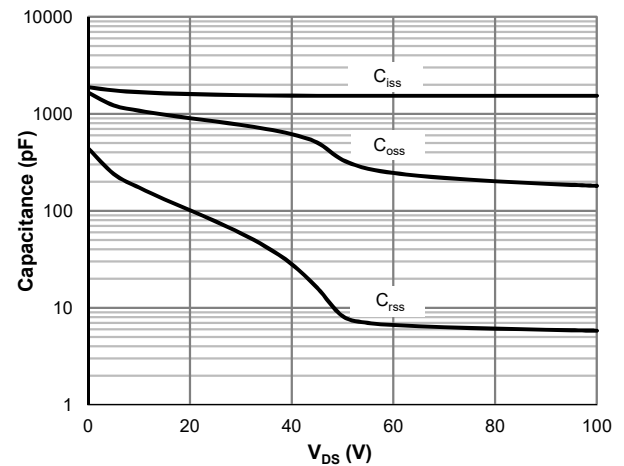


Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

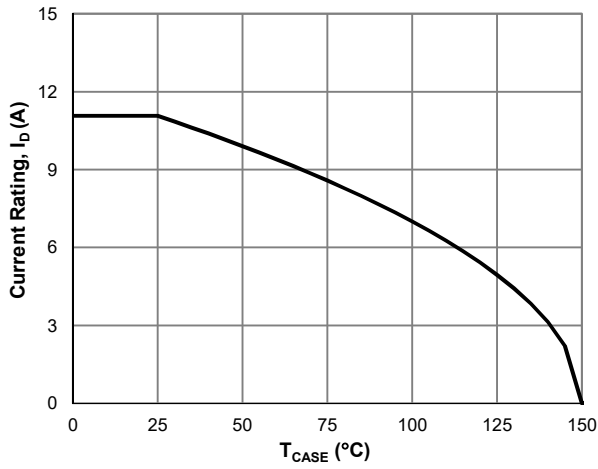


Figure 7: Current De-rating

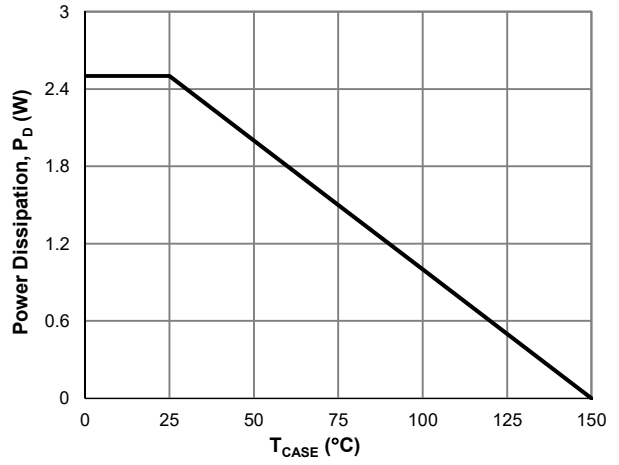


Figure 8: Power De-rating

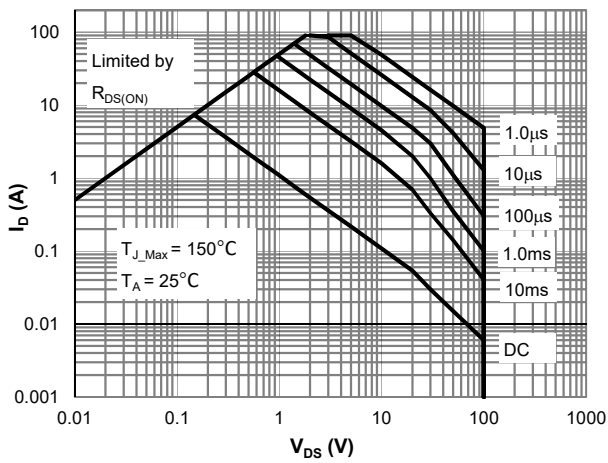


Figure 9: Maximum Safe Operating Area

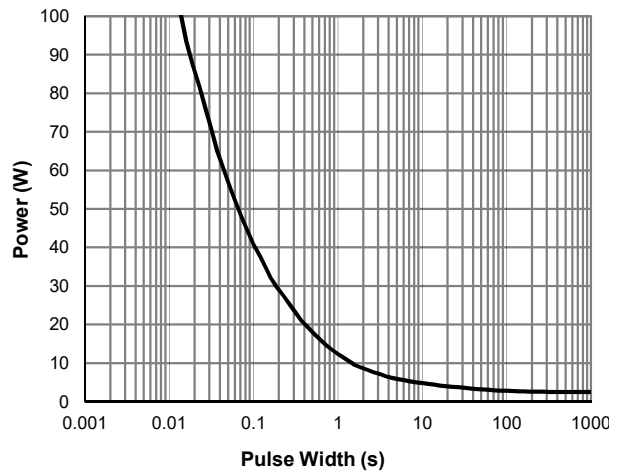


Figure 10: Single Pulse Power Rating, Junction-to-Case

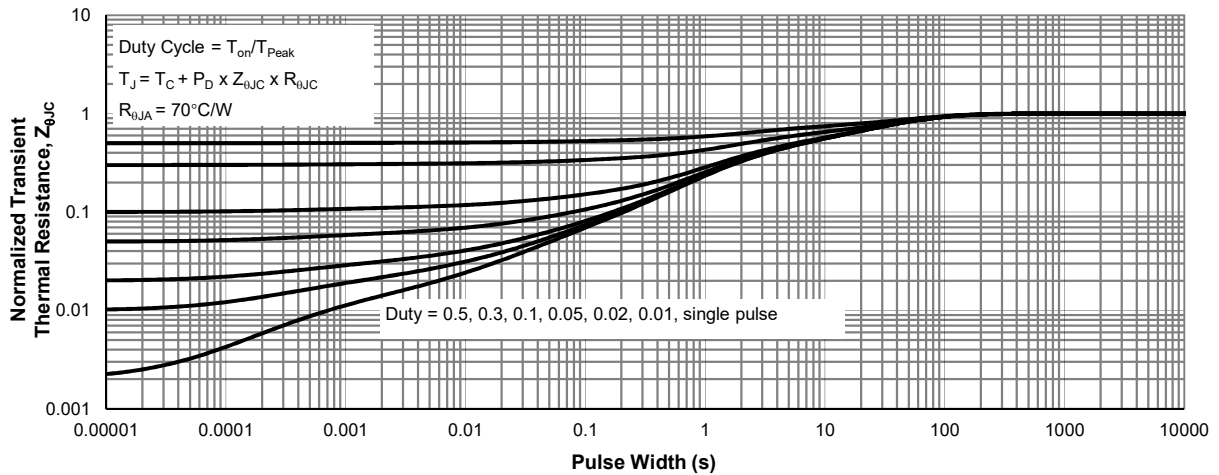
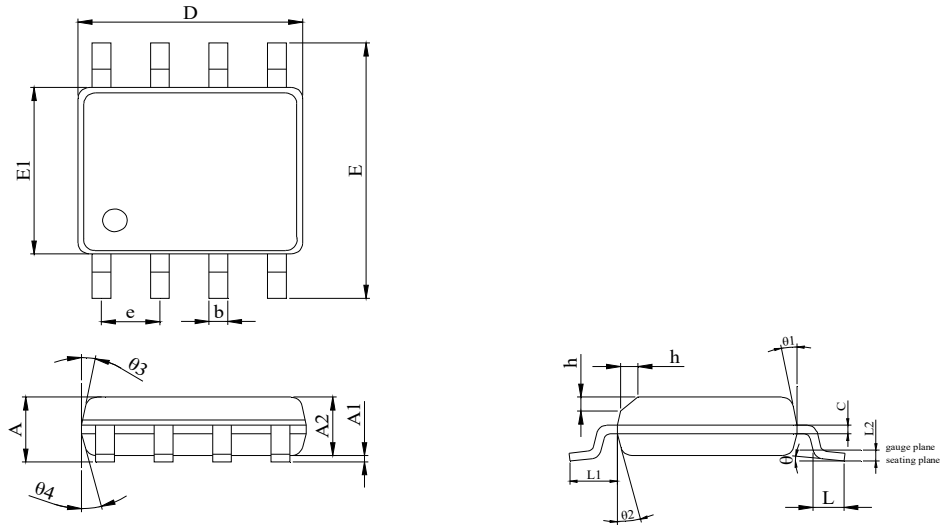


Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8L Package Information
Package Outline


| DIM | MILLIMETER | | |
|------------|------------|------|------|
| | MIN. | NOM. | MAX. |
| A | 1.35 | 1.50 | 1.65 |
| A1 | 0.05 | 0.10 | 0.15 |
| A2 | 1.35 | 1.40 | 1.50 |
| b | 0.38 | -- | 0.50 |
| c | 0.17 | -- | 0.25 |
| D | 4.80 | 4.90 | 5.00 |
| E | 5.80 | 6.00 | 6.20 |
| E1 | 3.80 | 3.90 | 4.00 |
| e | 1.27(BSC) | | |
| L | 0.45 | 0.60 | 0.80 |
| L1 | 1.04 REF | | |
| L2 | 0.25 BSC | | |
| h | 0.30 | 0.40 | 0.50 |
| θ | 0° | -- | 8° |
| θ_1 | 10° | 12° | 14° |
| θ_2 | 8° | 10° | 12° |
| θ_3 | 10° | 12° | 14° |
| θ_4 | 8° | 10° | 12° |

Recommended Footprint
