## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| -60V | 90mΩ@-10V | -3A |
| | 100mΩ@-4.5V | |

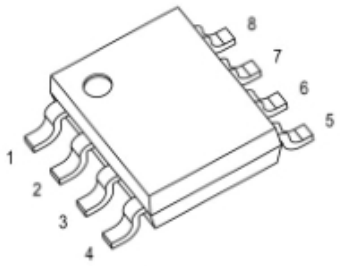
## Feature

- $R_{DS(on)}$ ⩽ 105mΩ at $V_{GS}$ = -10V, $I_D$ = -3A
- $R_{DS(on)}$ ⩽ 135mΩ at $V_{GS}$ = -4.5V, $I_D$ = -2.5A
- RoHS Compliant

## Application

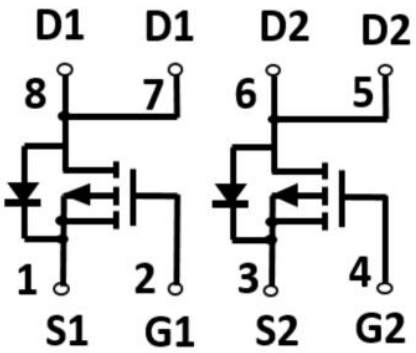
- Load Switch
- Power Management

## Package

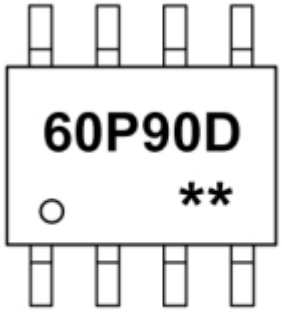



SOP-8L

## Circuit diagram



## Marking




60P90D =Device Code
** =Week Code

## Absolute maximum ratings

($T_a$=25℃ unless otherwise noted)

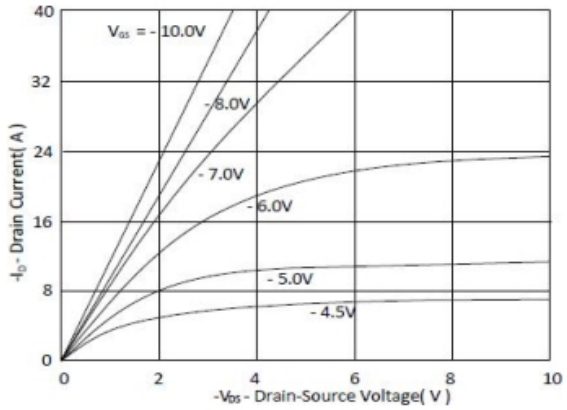
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current(Tc=25℃) | $I_D$ | -3 | A |
| Pulsed Drain Current | $I_{DM}$ | -12 | A |
| Maximum Power Dissipation（Ta=25℃） | $P_D$ | 2 | W |
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 78 | °C/W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to 150 | °C |

## Electrical characteristics

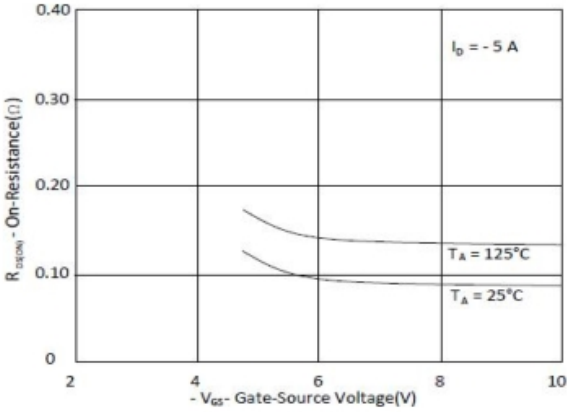
($T_A$=25℃, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =-60V, $V_{GS}$ = 0V | | | -1 | uA |
| Gate-Source Leakage | $I_{GSS}$ | $V_{GS}$ =±20V, $V_{DS}$ =0V | | | ±100 | uA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -1 | -1.5 | -2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-3A | | 90 | 105 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-2.5A | | 100 | 135 | |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-25V, $V_{GS}$=0V, f=1MHz | | 963 | | pF |
| Output Capacitance | $C_{oss}$ | | | 96 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 71 | | |
| **Switching Characteristics** | | | | | | |
| Turn-on Delay Time | $T_{d(on)}$ | $V_{DD}$ =-10V, $I_D$=-1A, $V_{GS}$=-10V, $R_G$=6Ω | | 8 | | nS |
| Turn-on Rise Time | $T_r$ | | | 12 | | |
| Turn-off Delay Time | $T_{d(off)}$ | | | 20 | | |
| Turn-off Fall Time | $T_f$ | | | 12 | | |
| Total Gate Charge (4.5V) | $Q_g$ | $V_{DD}$=-30V, $I_D$=-10A, $V_{GS}$=-10V | | 16.2 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 2.0 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 3.5 | | |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $I_{SD}$=-10A,$V_{GS}$=0V | | | -1.3 | V |

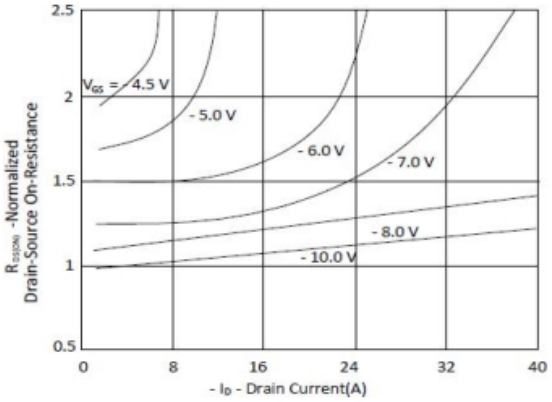
## Typical Characteristics



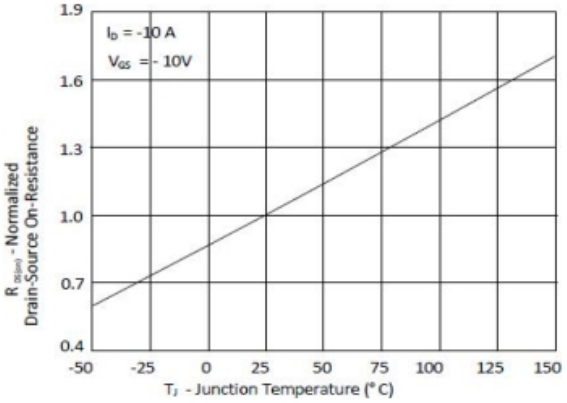

**Typical Output Characteristics**



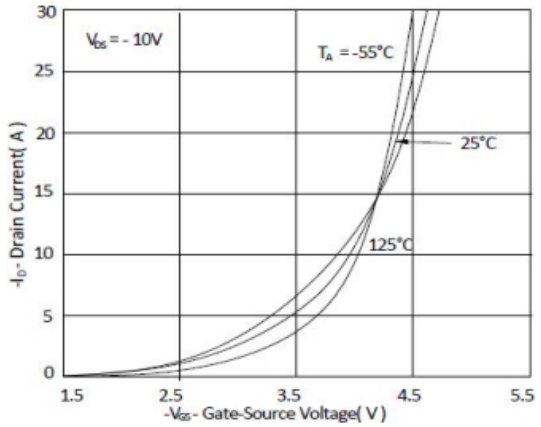

**On-Resistance vs. Gate-Source Voltage**



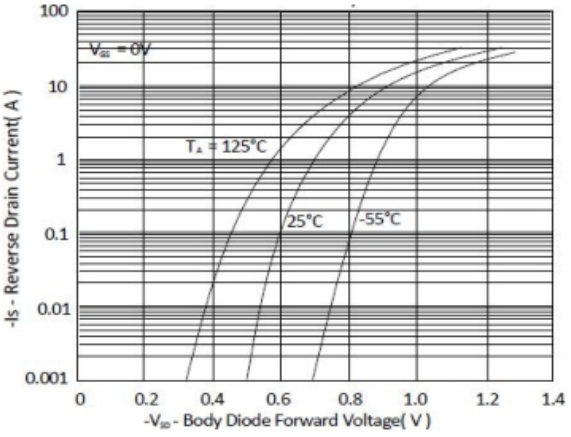

**On-Resistance vs. Drain Current and Gate Voltage**



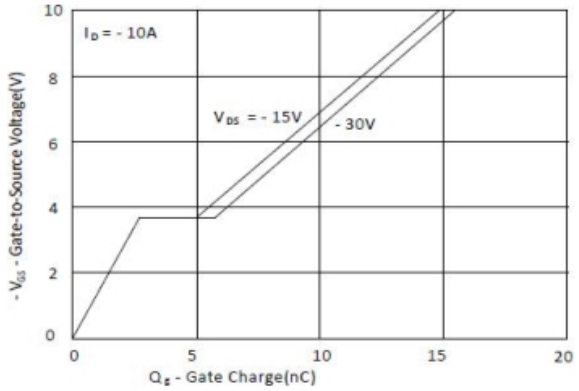

**Normalized On-Resistance vs. Junction Temperature**



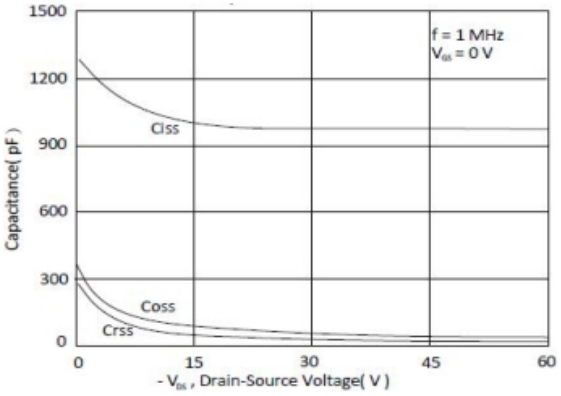

**Typical Transfer Characteristics**



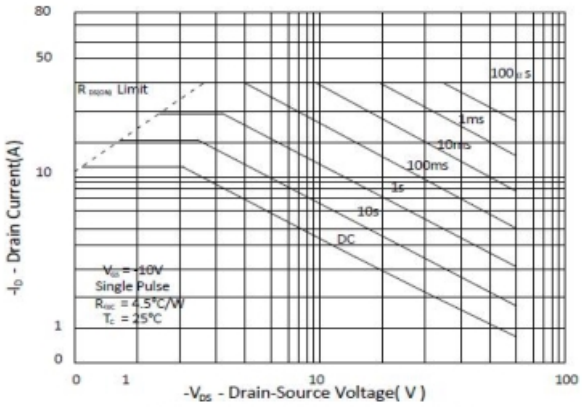

**Typical Source-Drain Diode Forward Voltage**



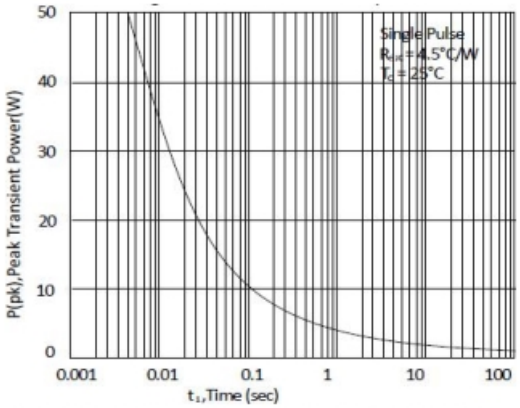

Typical Gate-Charge vs. Gate-to-Source Voltage



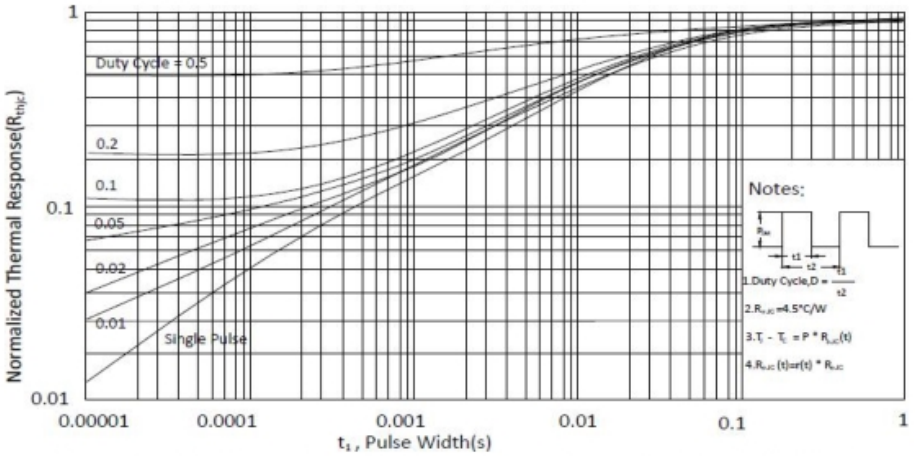

Typical Capacitance vs. Drain-to-Source Voltage




Maximum Safe Operating Area

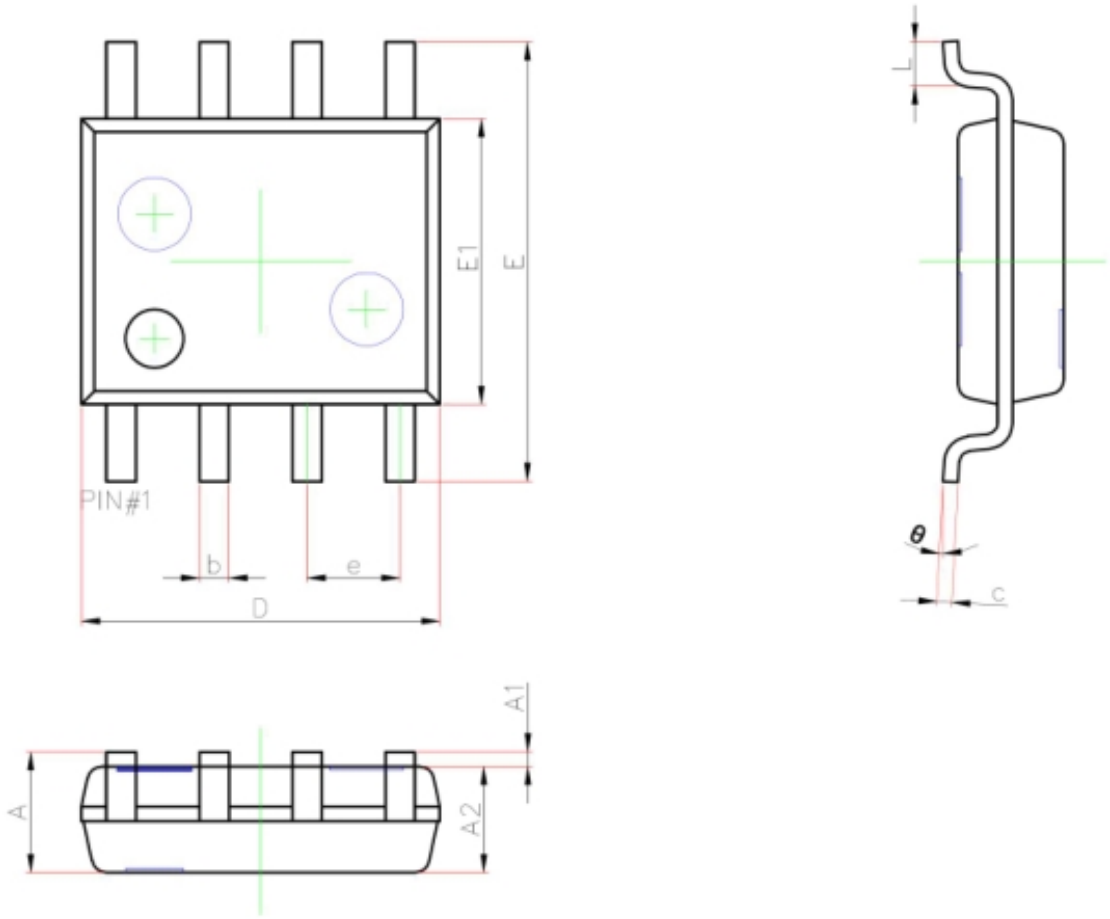



Maximun Drain Current vs. Case Temperature




Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

## SOP-8L Package Information




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | Min. | Max. |
| A | 1.35 | 1.75 |
| A1 | 0.10 | 0.25 |
| A2 | 1.35 | 1.55 |
| b | 0.33 | 0.51 |
| c | 0.17 | 0.25 |
| D | 4.80 | 5.00 |
| e | 1.27 REF. | |
| E | 5.80 | 6.20 |
| E1 | 3.80 | 4.00 |
| L | 0.40 | 1.27 |
| θ | 0° | 8° |