# MY4459

## -30V P-Channel Enhancement ModeMOSFET

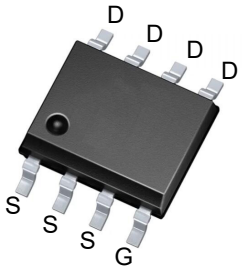
MAOYUANWEI semiconductor

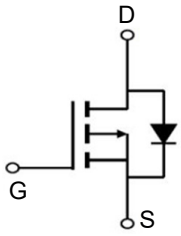
## General Description

The MY4459 is the single P-Channel logic enhancement mode power field effect transistors to provide excellent RDS(on), low gate charge and low gate resistance. It's up to -30V operation voltage is well suited in switching mode power supply, SMPS, notebook computer power management

## Features

| | | |
|---|---|---|
| $V_{DSS}$ | -30 | V |
| $I_D$ | -5.1 | A |
| $R_{DS(ON)}$(at$V_{GS}$=10V) | 43 | mΩ |
| $R_{DS(ON)}$(at$V_{GS}$=4.5V) | 62 | mΩ |




## Application

- Switching power supply, SMPS
- Battery Powered System
- DC/DC Converter
- DC/AC Converter

### Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| MY4459 | SOP-8 | 4459 | 3000 |

### Absolute Maximum Ratings ($T_A$=25℃unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous | $I_D$ | -5.1 | A |
| Drain Current-Pulsed (Note 1) | $I_{DM}$ | -20 | A |
| Maximum Power Dissipation | $P_D$ | 2.5 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 50 | ℃/W |

## Electrical Characteristics ($T_A$=25 ℃, unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=-250μA | -30 | -33 | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-24V,$V_{GS}$=0V | - | - | -1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V,$V_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics** (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -0.8 | -1.2 | -2.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=-10V, $I_D$=-5.1A | - | 43 | 55 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-4.2A | - | 62 | 90 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-15V,$I_D$=-4.5A | 4 | 7 | - | S |
| **Dynamic Characteristics** (Note4) | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=-15V,$V_{GS}$=0V, F=1.0MHz | - | 520 | - | PF |
| Output Capacitance | $C_{oss}$ | | - | 130 | - | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 70 | - | PF |
| **Switching Characteristics** (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=-15V, ID=-1A, $V_{GS}$=-10V,$R_{GEN}$=6Ω | - | 7 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 13 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 14 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 9 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-15V,$I_D$=-5.1A,$V_{GS}$=-10V | - | 11 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 2.2 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 3 | - | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-5.1A | - | - | -1.2 | V |

## Typical Electrical and Thermal Characteristics

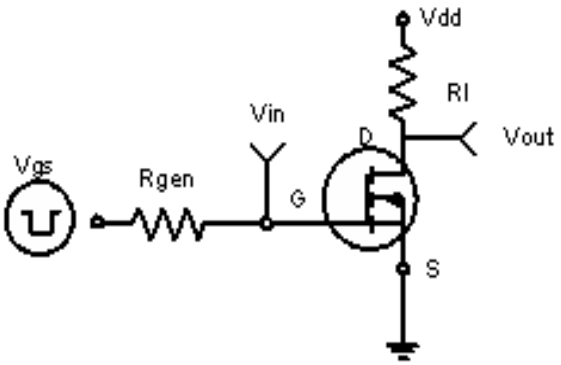



**Figure 1:Switching Test Circuit**

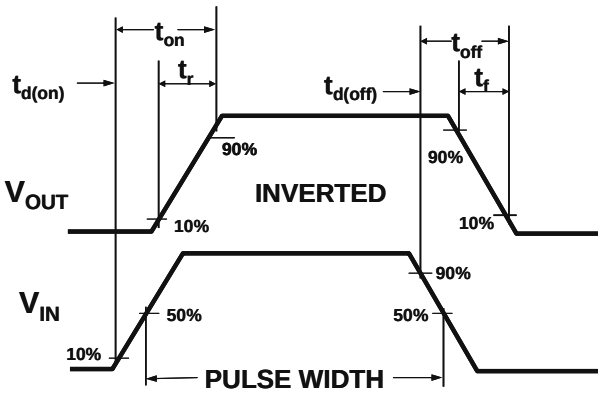
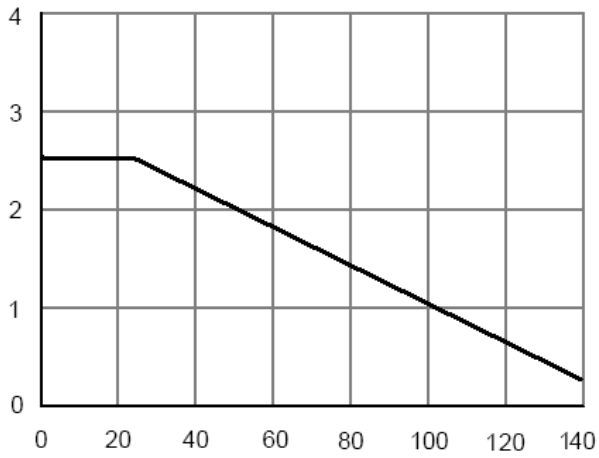
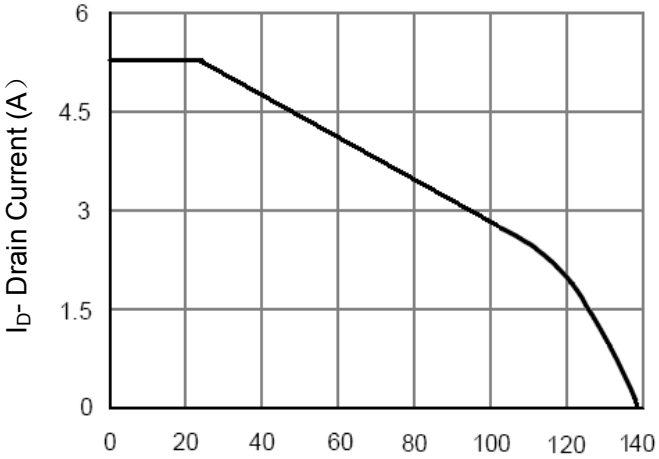



**Figure 2:Switching Waveforms**



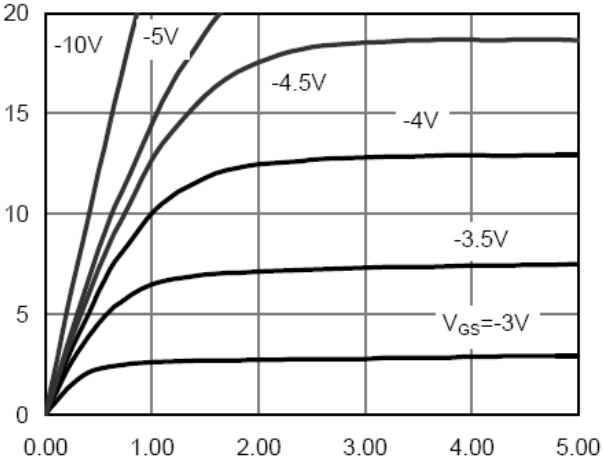

$T_J$-Junction Temperature(℃)

**Figure 3 Power Dissipation**



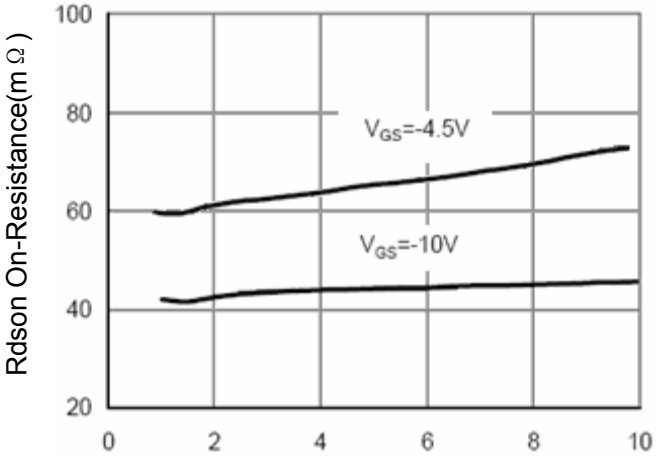

$T_J$-Junction Temperature(℃)

**Figure 4 Drain Current**




Vds Drain-Source Voltage (V)

**Figure 5 Output Characteristics**




$I_D$- Drain Current (A)

**Figure 6 Drain-Source On-Resistance**

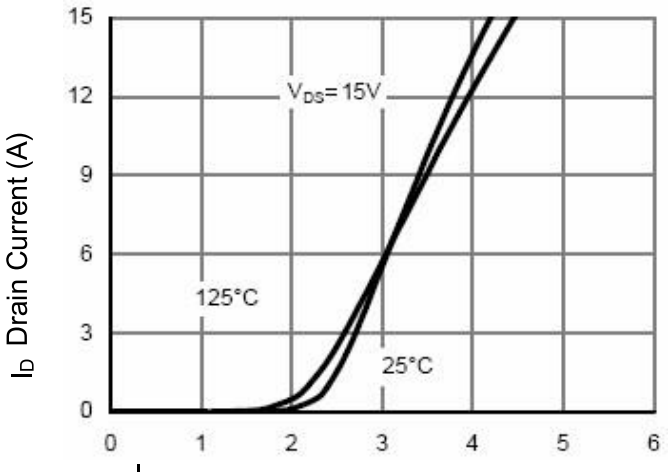



**Figure 7 Transfer Characteristics**

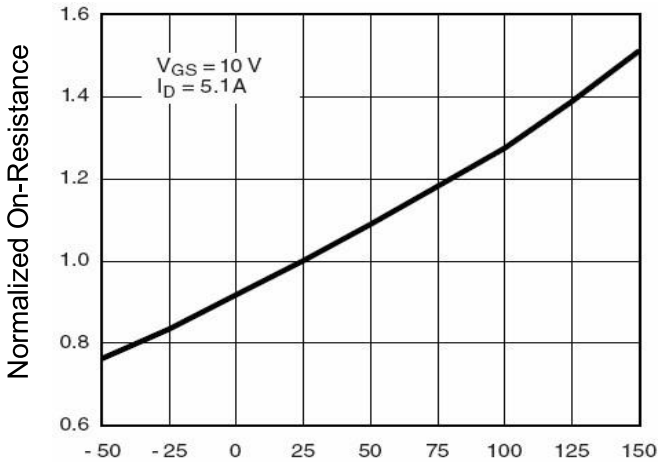



**Figure 8 Drain-Source On-Resistance**

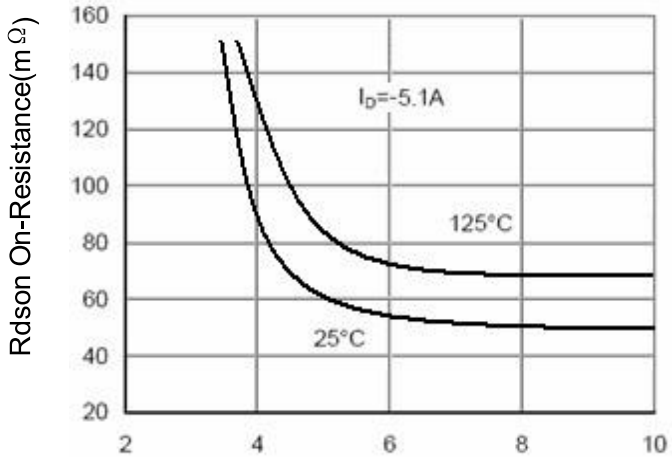



**Figure 9 Rdson vs Vgs**

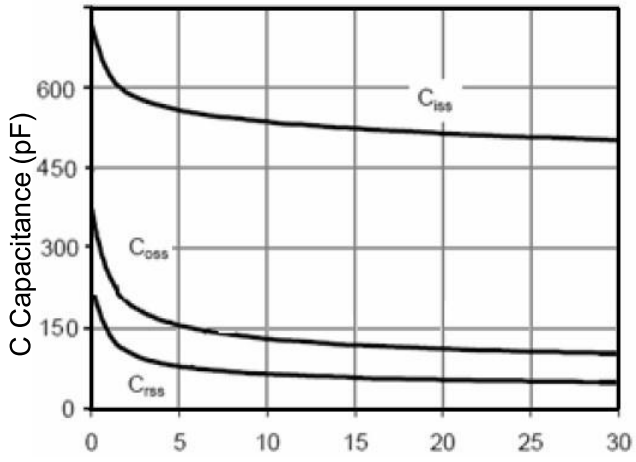



**Figure 10 Capacitance vs Vds**

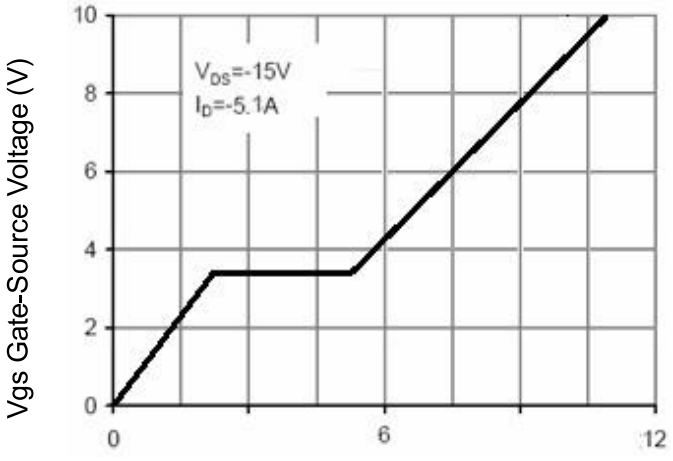



**Figure 11 Gate Charge**

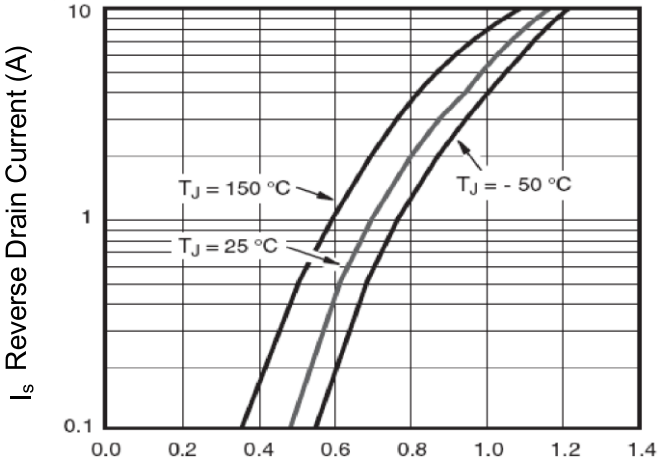



**Figure 12 Source- Drain Diode Forward**

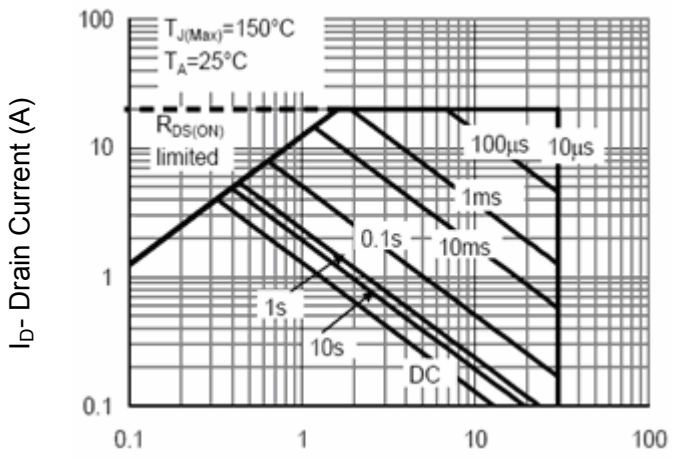



**Figure 13 Safe Operation Area**

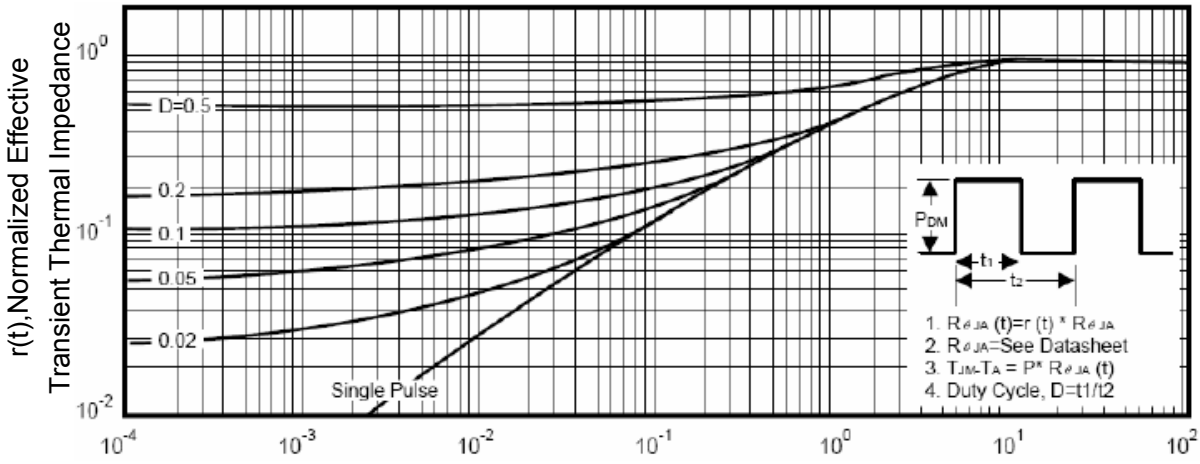
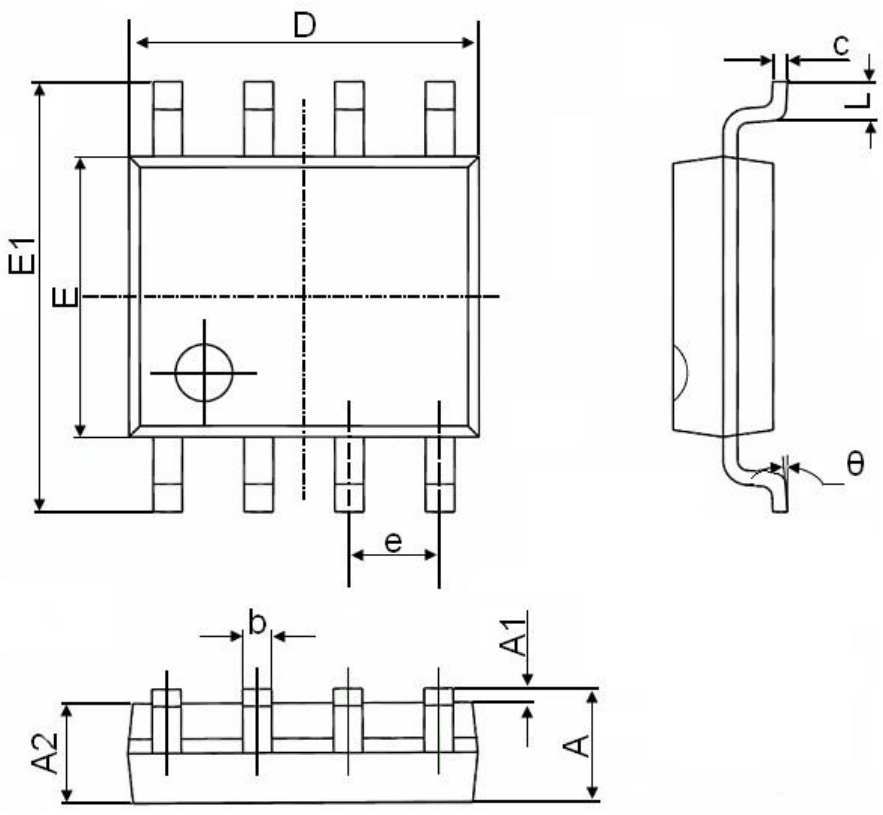



**Figure 14 Normalized Maximum Transient Thermal Impedance**

## Package Mechanical Data-SOP-8




| 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 |