

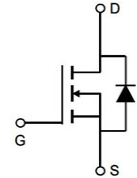
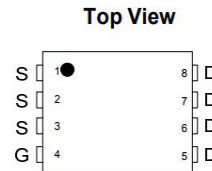
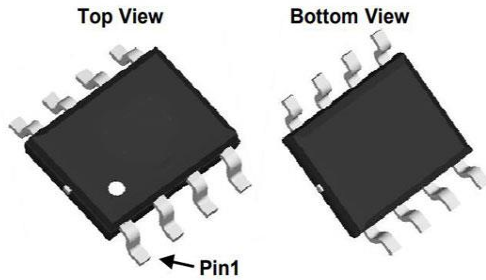
30V /10A Single N Power MOSFET
General Description

30V /10A Single N Power MOSFET

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

Pb-free lead plating; RoHS compliant

| | | |
|-----------------------------|------|------------|
| V_{DS} | 30 | V |
| $R_{DS(on),TYP@V_{GS}=10V}$ | 18.2 | m Ω |
| $R_{DS(on),TYP@V_{GS}=4.5}$ | 28.6 | m Ω |
| I_D | 10 | A |



| | | | |
|-----------|--------------|---------|---------------------------|
| Part ID | Package Type | Marking | Tape and reel information |
| SM4496PRL | SOP8 | 4496 | 3000 |


 100% UIS Tested
 100% Kg Tested

| Parameter | Symbol | Maximum | Units |
|---|----------------|------------------------|------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | 20 | \pm V |
| Continuous Drain Current ^A | I_D | $T_A=25^\circ\text{C}$ | A |
| | | $T_A=70^\circ\text{C}$ | |
| Pulsed Drain Current ^B | I_{DM} | 16.0 | |
| Avalanche Current ^G | I_{AR} | 3.2 | |
| Repetitive avalanche energy $L=0.1\text{mH}$ ^G | E_{AR} | 7.4 | mJ |
| Power Dissipation ^A | P_D | $T_A=25^\circ\text{C}$ | W |
| | | $T_A=70^\circ\text{C}$ | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Units |
|--|-----------------|--------------|-----|---------------------------|
| Maximum Junction-to-Ambient ^A | $R_{\theta JA}$ | 65 | 97 | $^\circ\text{C}/\text{W}$ |
| Maximum Junction-to-Ambient ^A | | Steady State | 130 | 156 |
| Maximum Junction-to-Lead ^c | $R_{\theta JL}$ | 39 | 62 | $^\circ\text{C}/\text{W}$ |



STATIC PARAMETERS

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---------------------|---------------------------------------|--|-----|------|--------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | I _D = -250uA, V _{GS} = 0V | 30 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =30V, V _{GS} =0V | | | 1 5 | uA |
| I _{GSS} | Gate-Body leakage current | V _{DS} = 0V, V _{GS} = ±20V | | | ±100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} I _D = 250µA | 1.3 | 1.9 | 2.5 | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =-10V, I _D =10A | | 18.2 | 26.0 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | | 28.6 | 37.2 | |
| g _{FS} | Forward Transconductance | V _{DS} =5V, I _D =10A | | 51 | | S |
| V _{SD} | Diode Forward Voltage | I _S =1A, V _{GS} =46V | | 0.72 | 1 | V |
| I _S | Maximum Body-Diode Continuous Current | | | | 10 | A |

DYNAMIC PARAMETERS

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|------------------|------------------------------|---|-----|-----|-----|-------|
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =15V, f=1MHz | | 550 | 671 | pF |
| C _{oss} | Output Capacitance | | | 110 | 135 | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 55 | 65 | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz | | | 1.1 | Ω |

SWITCHING PARAMETERS

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|----------------------|------------------------------------|---|-----|------|-----|-------|
| Q _g (10V) | Total Gate Charge | V _{GS} =10V, V _{DS} =15V, I _D =10A | | 4.6 | | nC |
| Q _g 4.5V) | Total Gate Charge | | | 2.3 | | |
| Q _{gs} | Gate Source Charge | | | 1.54 | | |
| Q _{gd} | Gate Drain Charge | | | 2.2 | | |
| t _{D(on)} | Turn-On DelayTime | V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω | | 11 | | ns |
| t _r | Turn-On Rise Time | | | 8.8 | | |
| t _{D(off)} | Turn-Off DelayTime | | | 30.8 | | |
| t _f | Turn-Off Fall Time | | | 9.9 | | |
| t _{rr} | Body Diode Reverse Recovery Time | I _F =-8A, dI/dt=500A/µs | | 22 | | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | I _F =18A, dI/dt=500A/µs | | 14 | | nC |

DC ELECTRICAL AND THERMAL CHARACTERISTICS

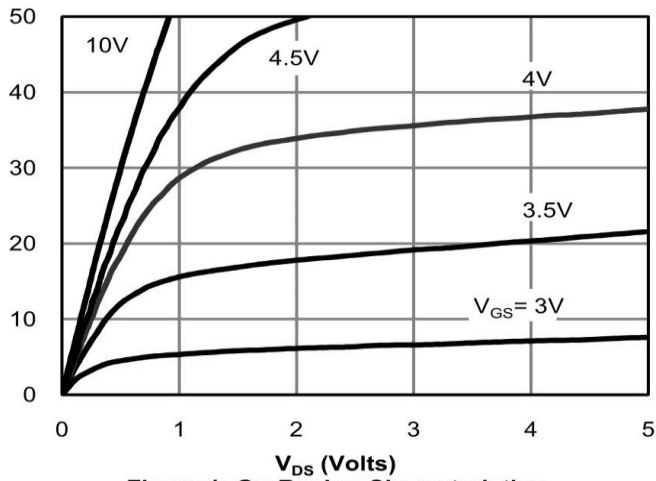


Figure 1: On-Region Characteristics

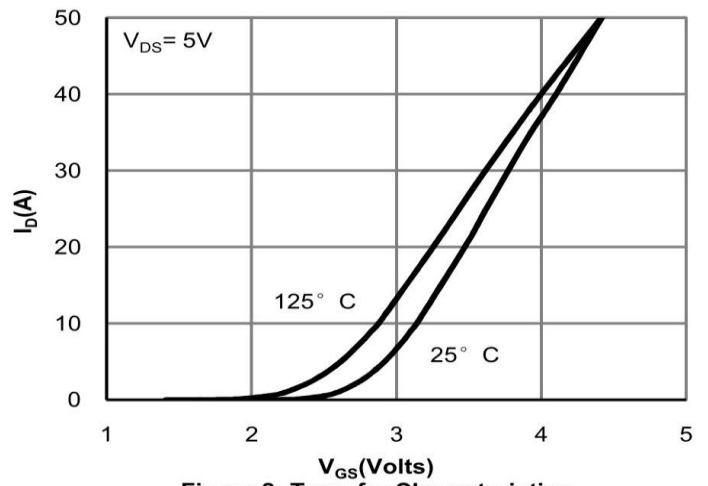


Figure 2: Transfer Characteristics

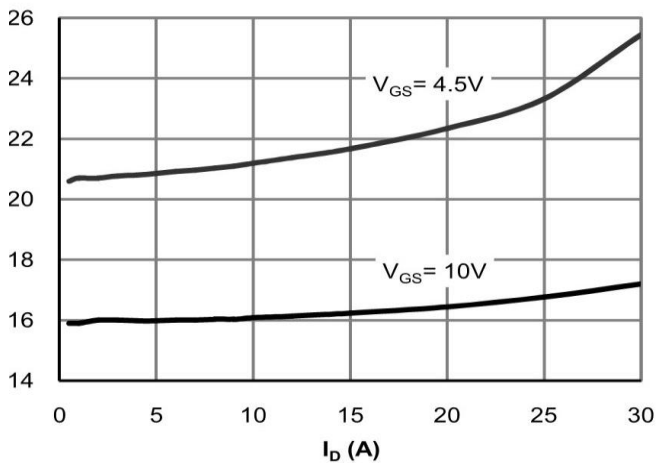


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

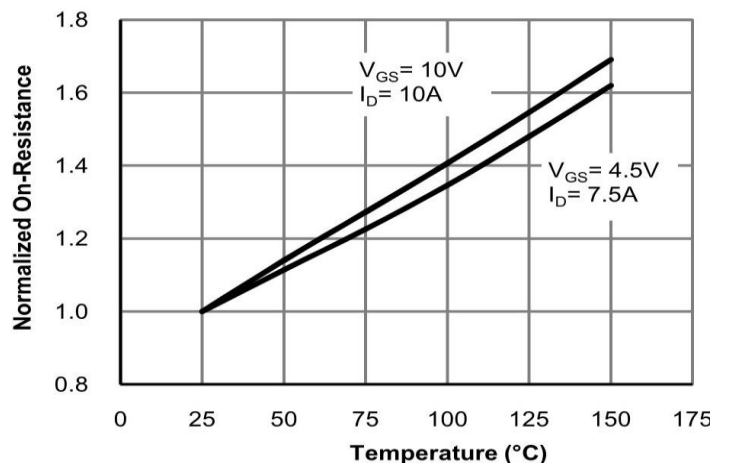
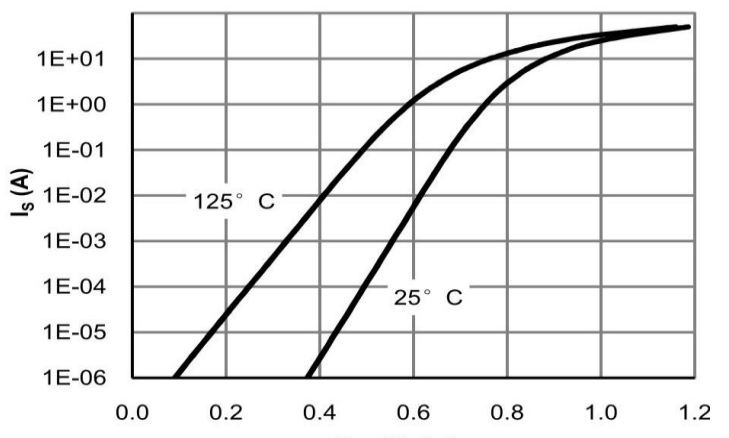
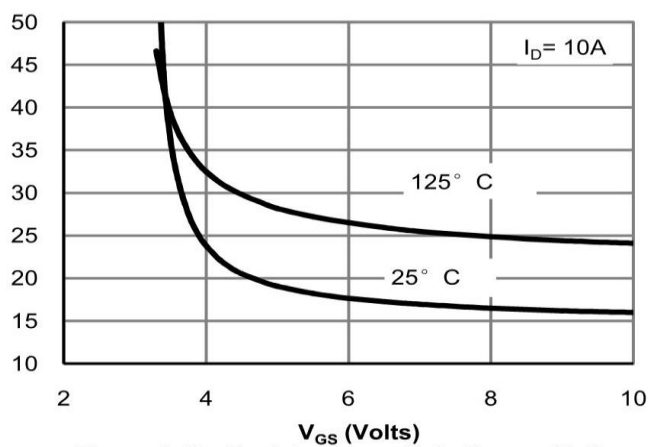


Figure 4: On-Resistance vs. Junction Temperature



MECHANICAL ELECTRICAL AND THERMAL CHARACTERISTICS

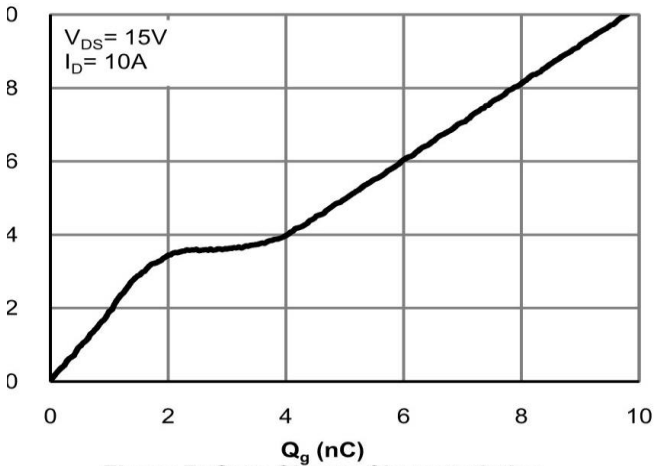


Figure 7: Gate-Charge Characteristics

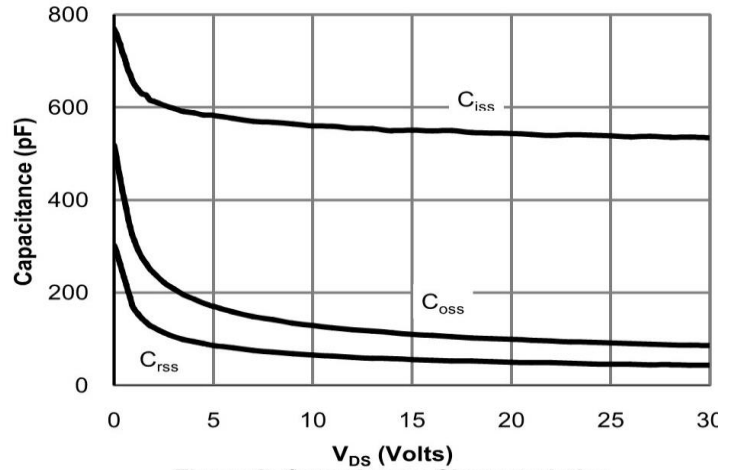


Figure 8: Capacitance Characteristics

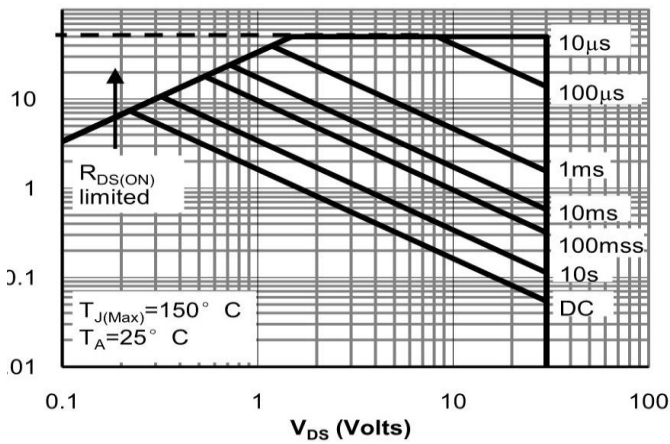


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

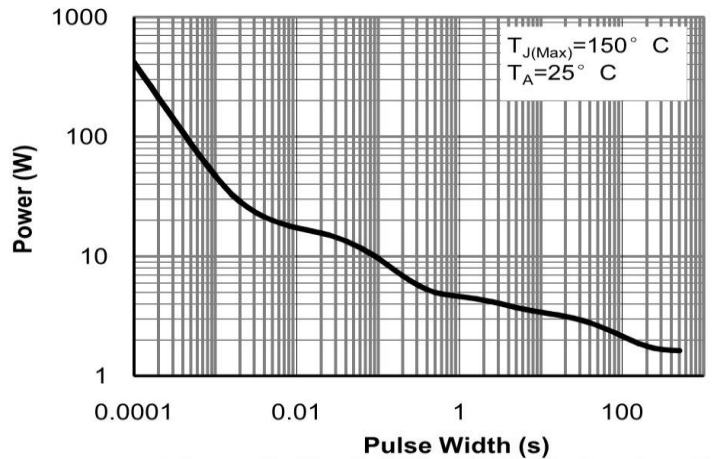


Figure 10: Single Pulse Power Rating Junction to-Ambient (Note E)

