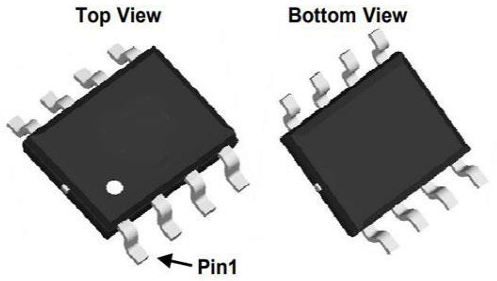
## General Description

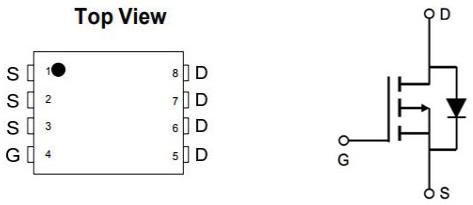
-30V /-12A Single P Power MOSFET

Very low on-resistance RDS(on) @ VGS=4.5 V

Pb-free lead plating; RoHS compliant

| | | |
|---|---|---|
| $V_{DS}$ | -30 | V |
| $R_{DS(on),TYP@VGS=10V}$ | 11.9 | mΩ |
| $R_{DS(on),TYP@VGS=4.5}$ | 18.7 | mΩ |
| $I_D$ | -12 | A |




| Part ID | Package Type | Marking | Tape and reel infomation |
|---|---|---|---|
| AC4407A | SOP8 | 4407A | 3000 |

100% UIS Tested
100% Rg Tested

| Parameter | | Symbol | Maximum | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | | $V_{GS}$ | 25 | ±V |
| Continuous Drain Current A | $T_A$=25°C | $I_D$ | -12.0 | A |
| | $T_A$=70°C | | -10.0 | |
| Pulsed Drain Current B | | $I_{DM}$ | -19.2 | |
| Avalanche Current G | | $I_{AR}$ | -3.8 | |
| Repetitive avalanche energy L=0.1mH G | | $E_{AR}$ | -8.8 | mJ |
| Power Dissipation A | $T_A$=25°C | $P_D$ | 3.1 | W |
| | $T_A$=70°C | | 2 | |
| Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | °C |

## Thermal Characteristics

| Parameter | | Symbol | Typ | Max | Units |
|---|---|---|---|---|---|
| Maximum Junction-to-Ambient A | t ≤ 10s | $R_{\theta JA}$ | 42 | 63 | °C/W |
| Maximum Junction-to-Ambient A | Steady State | | 85 | 102 | °C/W |
| Maximum Junction-to-Lead C | Steady State | $R_{\theta JL}$ | 25 | 40 | °C/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 | VDS=-30V, VGS=0V | | | -1 | uA |
| | | | | | -5 | |
| $I_{GSS}$ | 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 | -1.5 | -2.3 | -3 | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | VGS=-10V, ID=-12A | | 11.9 | 17.0 | mΩ |
| | | VGS=-4.5V, ID=-12A | | 18.7 | 24.3 | |
| $g_{FS}$ | Forward Transconductance | VDS=-5V, ID=-12A | | 94 | | S |
| $V_{SD}$ | Diode Forward Voltage | IS=-1A,VGS=0V | | -0.72 | -1 | V |
| $I_S$ | Maximum Body-Diode Continuous Current | | | | -12 | A |

## DYNAMIC PARAMETERS

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| $C_{iss}$ | Input Capacitance | VGS=0V, VDS=-15V, f=1MHz | | 2060 | 2513 | pF |
| $C_{oss}$ | Output Capacitance | | | 370 | 455 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 295 | 351 | pF |
| $R_g$ | Gate resistance | VGS=0V, VDS=0V, f=1MHz | | | 5 | Ω |

## SWITCHING PARAMETERS

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| $Q_g$ (10V) | Total Gate Charge | VGS=-10V, VDS=-15V, ID=-12A | | 30 | | nC |
| $Q_g$ 4.5V) | Total Gate Charge | | | #REF! | | |
| $Q_{gs}$ | Gate Source Charge | | | 7 | | |
| $Q_{gd}$ | Gate Drain Charge | | | 10 | | |
| $t_{D(on)}$ | Turn-On DelayTime | VGS=-10V, VDS=-15V,RL=0.75Ω, RGEN=3Ω | | 15 | | ns |
| $t_r$ | Turn-On Rise Time | | | 12 | | |
| $t_{D(off)}$ | Turn-Off DelayTime | | | 42 | | |
| $t_f$ | Turn-Off Fall Time | | | 13.5 | | |
| $t_{rr}$ | Body Diode Reverse Recovery Time | $I_F$=-8A, dI/dt=500A/μs | | 30 | | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge | $I_F$=18A, dI/dt=500A/μs | | 22 | | nC |

## CAL ELECTRICAL AND THERMAL CHARACTERISTICS

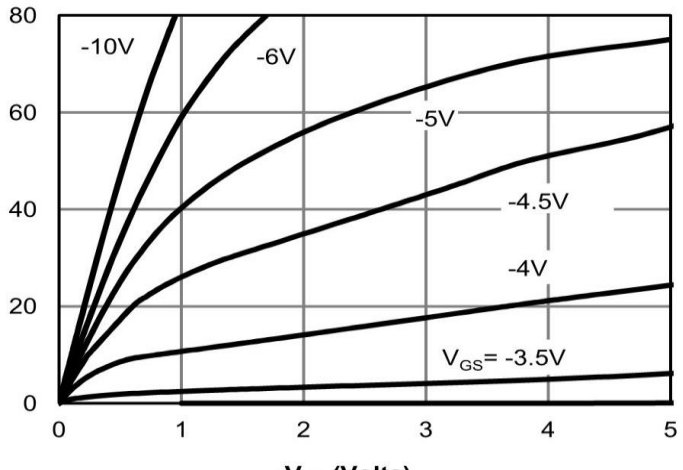



**Figure 1: On-Region Characteristics**

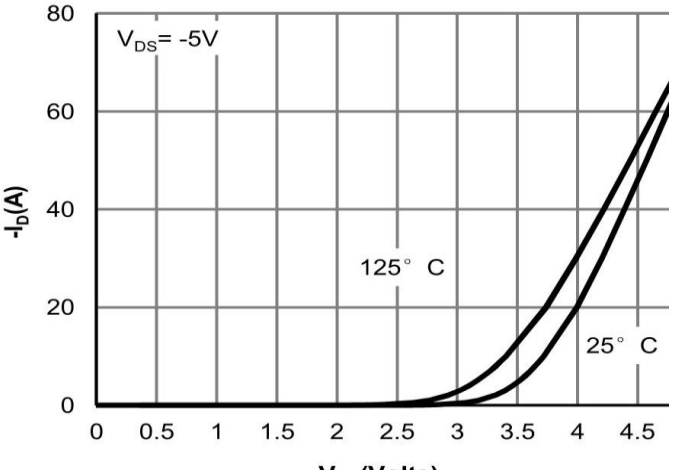



**Figure 2: Transfer Characteristics**

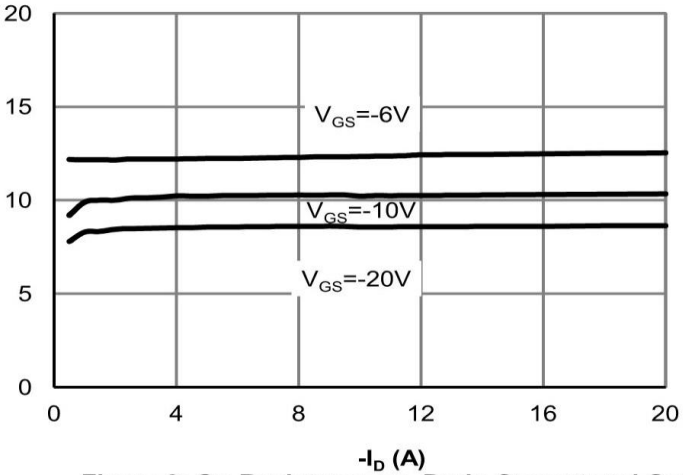



**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**

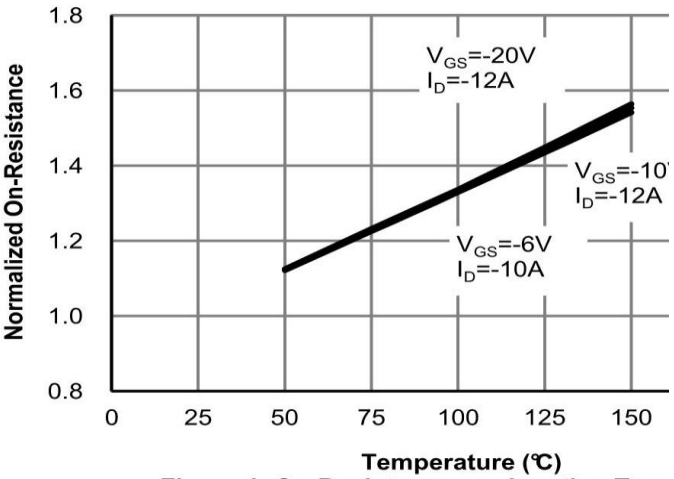
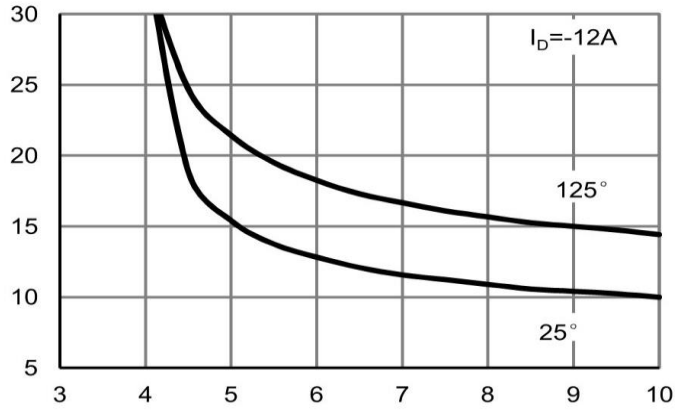
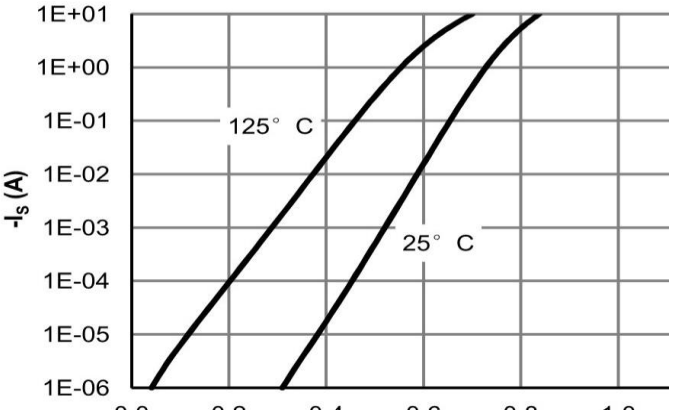



**Figure 4: On-Resistance vs. Junction Tem**



## CAL ELECTRICAL AND THERMAL CHARACTERISTICS

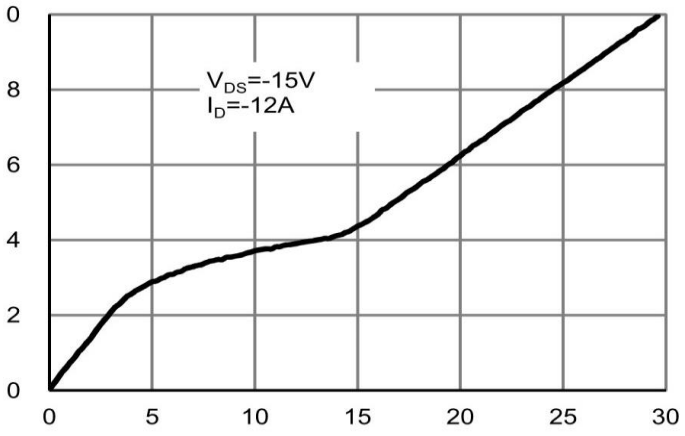



**Figure 7: Gate-Charge Characteristics**

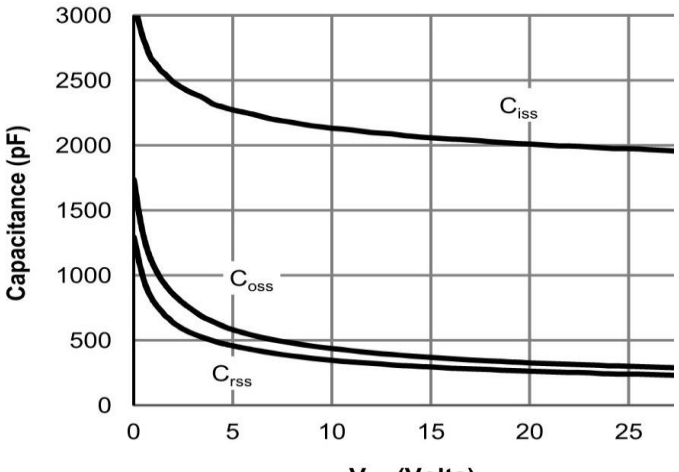



**Figure 8: Capacitance Characteristics**

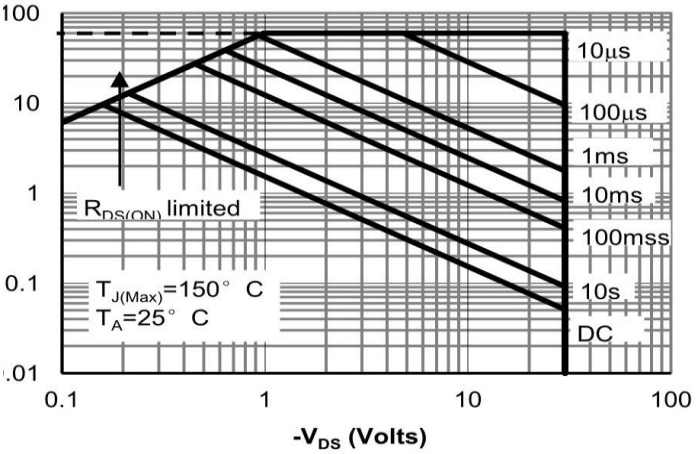



**Figure 9: Maximum Forward Biased Safe Operating Area (Note E)**

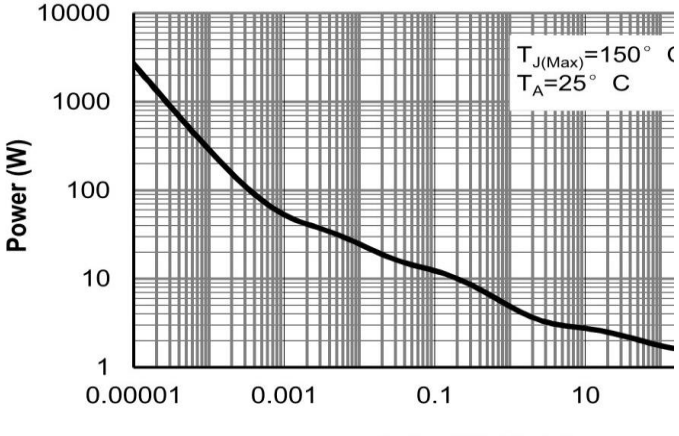



**Figure 10: Single Pulse Power Rating Ju to-Ambient (Note E)**