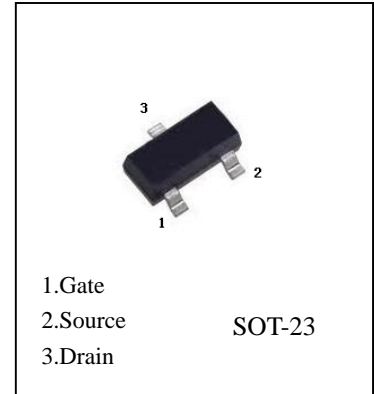
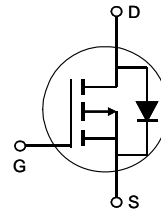


FEATURES

- The AO3407 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. This device is suitable for use as a load switch or in PWM applications.

**AO3407**

P-Channel MOSFET



Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_A=25^{\circ}\text{C}$	-4.1
		$T_A=70^{\circ}\text{C}$	-3.5
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-25	A
Power Dissipation <sup>B</sup>	$P_D$	$T_A=25^{\circ}\text{C}$	1.4
		$T_A=70^{\circ}\text{C}$	0.9
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit	
Maximum Junction-to-Ambient <sup>A</sup>	$R_{JA}$	t = 10s	70	90	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient <sup>A,D</sup>		Steady-State	100	125	$^{\circ}\text{C/W}$
Maximum Junction-to-Lead	$R_{JL}$	Steady-State	63	80	$^{\circ}\text{C/W}$

**AO3407**

Electrical Characteristics (TA=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=-250\text{ A}, V_{GS}=0V$	-30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V$			-1	uA
		$T_J=55^\circ C$			-5	
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\text{ A}$	-1.4	-1.9	-2.4	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-10V, V_{DS}=-5V$	-25			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-4.1A$		34	52	m
		$T_J=125^\circ C$		52	73	
		$V_{GS}=-4.5V, I_D=-3A$		54	87	m
$g_{FS}$	Forward Transconductance	$V_{DS}=-5V, I_D=-4.1A$		10		S
$V_{SD}$	Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$		-0.7	-1	V
$I_S$	Maximum Body-Diode Continuous Current				-2	A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-15V, f=1MHz$		520		pF
$C_{oss}$	Output Capacitance			100		pF
$C_{rss}$	Reverse Transfer Capacitance			65		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	3.5	7.5	11.5	
<b>SWITCHING PARAMETERS</b>						
$Q_g(10V)$	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-15V, I_D=-4.1A$		9.2	11	nC
$Q_g(4.5V)$	Total Gate Charge			4.6	6	nC
$Q_{gs}$	Gate Source Charge			1.6		nC
$Q_{gd}$	Gate Drain Charge			2.2		nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-10V, V_{DS}=-15V,$ $R_L=3.65, R_{GEN}=3$		7.5		ns
$t_r$	Turn-On Rise Time			5.5		ns
$t_{D(off)}$	Turn-Off DelayTime			19		ns
$t_f$	Turn-Off Fall Time			7		ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=-4.1A, dI/dt=100A/\mu s$		11		ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=-4.1A, dI/dt=100A/\mu s$		5.3		nC

A. The value of  $R_{JA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^\circ C$ , using  $\leq 10s$  junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ C$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ C$ .

D. The  $R_{JA}$  is the sum of the thermal impedance from junction to lead  $R_{JL}$  and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using  $<300\mu s$  pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of  $T_{J(MAX)}=150^\circ C$ . The SOA curve provides a single pulse rating.

**AO3407** Typical Characteristics

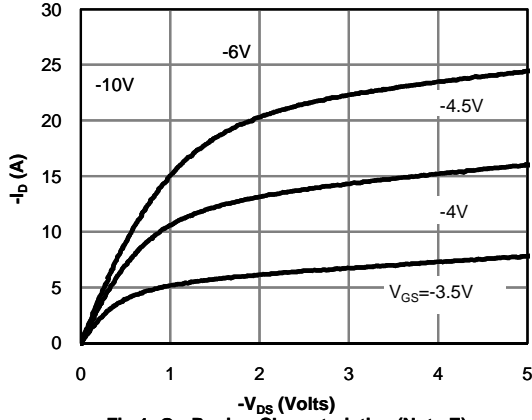


Fig 1: On-Region Characteristics (Note E)

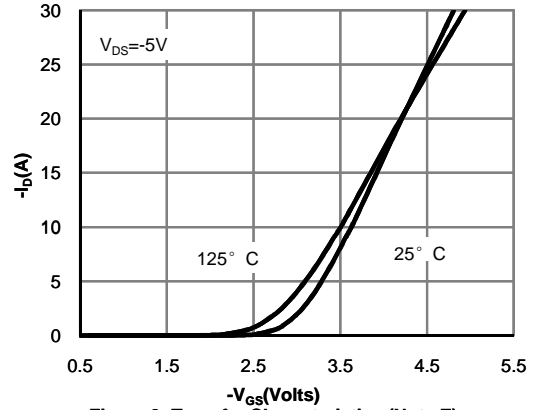


Figure 2: Transfer Characteristics (Note E)

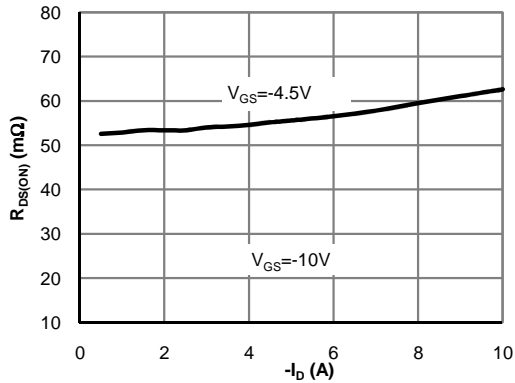


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

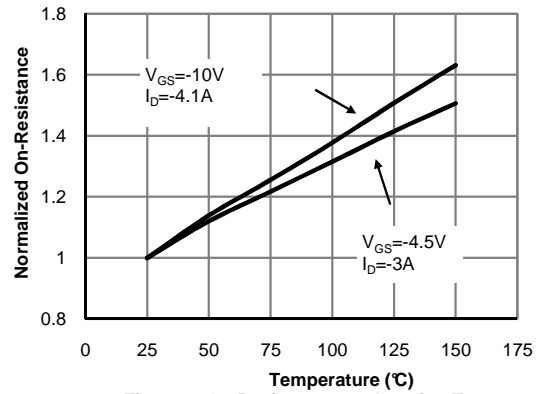


Figure 4: On-Resistance vs. Junction Temperature (Note E)

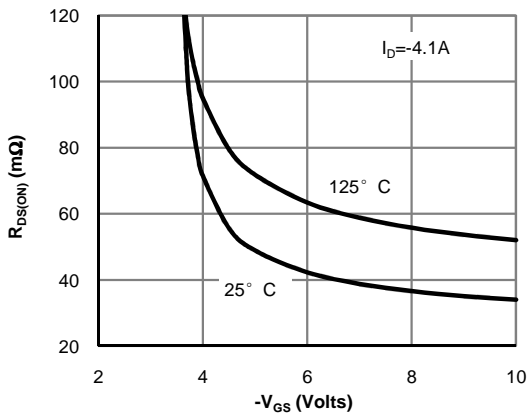


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

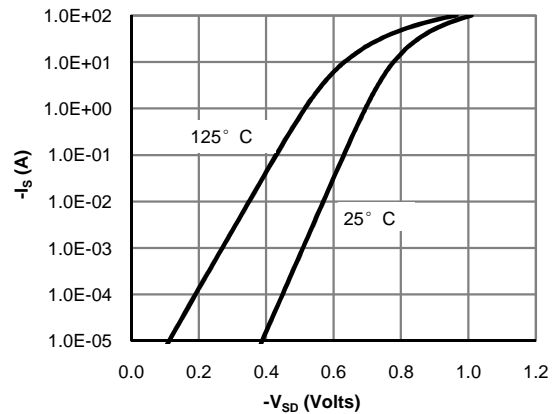


Figure 6: Body-Diode Characteristics (Note E)

**AO3407** Typical Characteristics

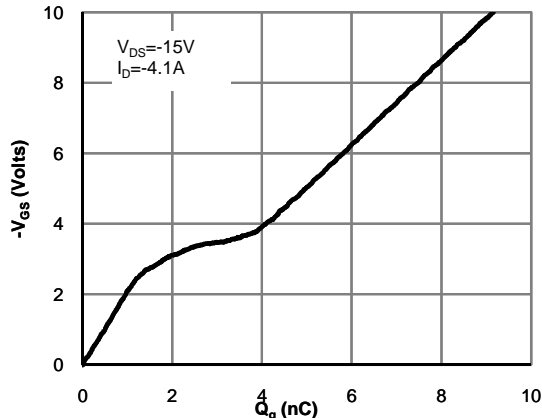


Figure 7: Gate-Charge Characteristics

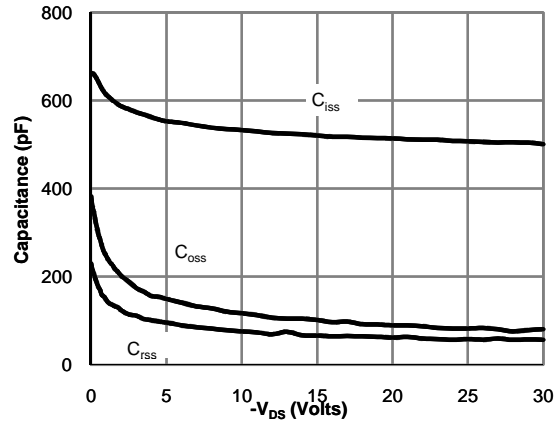


Figure 8: Capacitance Characteristics

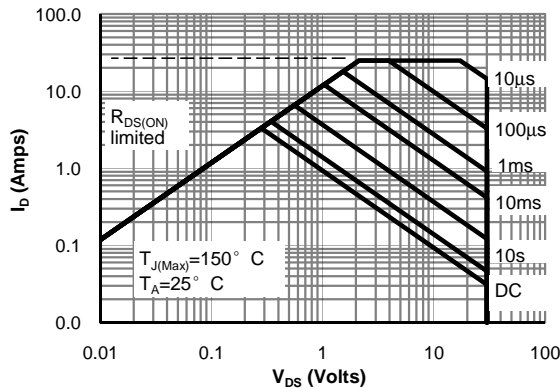


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

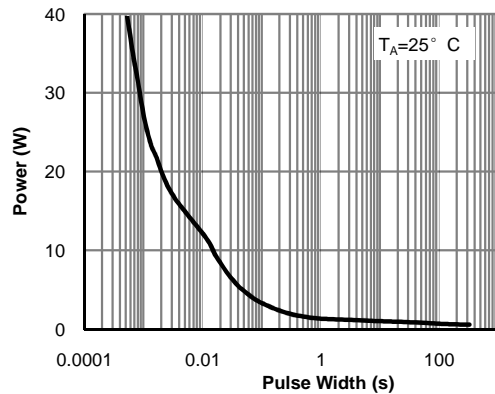


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

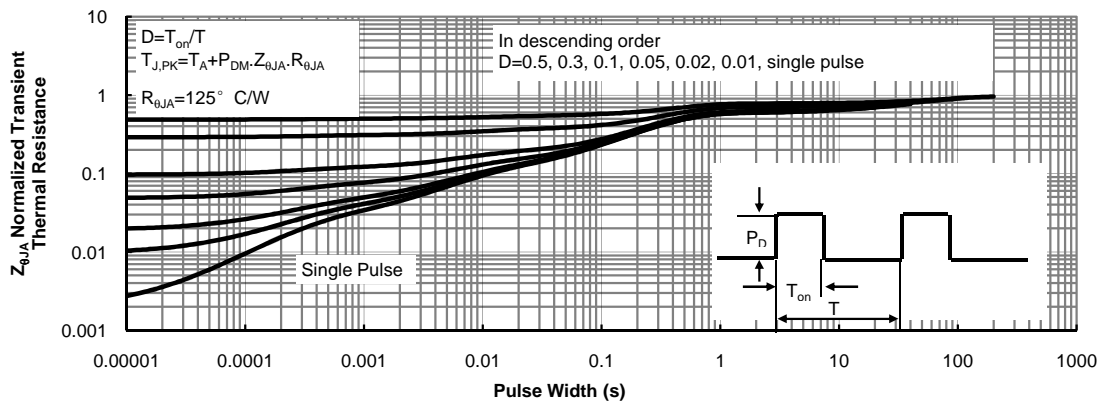


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)