



**ALPHA & OMEGA**  
SEMICONDUCTOR



**AO4718**

**N-Channel Enhancement Mode Field Effect Transistor**

**SRFET™**

### General Description

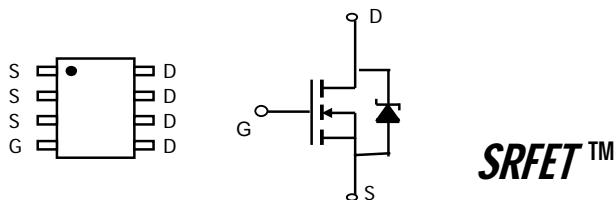
**SRFET™** The AO4718 uses advanced trench technology with a monolithically integrated Schottky diode to provide excellent  $R_{DS(ON)}$ , and low gate charge. This device is suitable for use as a low side FET in SMPS, load switching and general purpose applications. Standard Product AO4718 is Pb-free (meets ROHS & Sony 259 specifications).

### Features

$V_{DS}$  (V) = 30V  
 $I_D$  = 15A ( $V_{GS}$  = 10V)  
 $R_{DS(ON)} < 9m\Omega$  ( $V_{GS}$  = 10V)  
 $R_{DS(ON)} < 14m\Omega$  ( $V_{GS}$  = 4.5V)

**UIS TESTED!**

*Rg, Ciss, Coss, Crss Tested*



**Soft Recovery MOSFET:**  
Integrated Schottky Diode

**SRFET™**

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

Parameter	Symbol	10 Sec	Steady State	Units
Drain-Source Voltage	$V_{DS}$	30		V
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current <sup>A</sup> F	$I_{DSM}$	15	10.9	A
$T_A=70^\circ\text{C}$		12	8.7	
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	80		
Avalanche Current <sup>B</sup>	$I_{AR}$	25		
Repetitive avalanche energy $L=0.3\text{mH}$ <sup>B</sup>	$E_{AR}$	94		mJ
Power Dissipation	$P_{DSM}$	3.1	1.7	W
$T_A=70^\circ\text{C}$		2.0	1.1	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150		°C

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	32	40	°C/W
Steady-State		60	75	°C/W
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	17	24	°C/W

**Electrical Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	30			V
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $T_J=125^\circ\text{C}$		0.1	10	mA
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$		0.1		$\mu\text{A}$
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.3	1.65	2.5	V
$I_{D(\text{ON})}$	On state drain current	$V_{GS}=10\text{V}, V_{DS}=5\text{V}$	80			A
$R_{DS(\text{ON})}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=15\text{A}$ $T_J=125^\circ\text{C}$	7.3	9		$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=12\text{A}$	10.3	13		
$g_{FS}$	Forward Transconductance	$V_{DS}=5\text{V}, I_D=15\text{A}$	43			S
$V_{SD}$	Diode Forward Voltage	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.41	0.5	V
$I_S$	Maximum Body-Diode + Schottky Continuous Current			4		A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$		1620	1950	pF
$C_{oss}$	Output Capacitance			382		pF
$C_{rss}$	Reverse Transfer Capacitance			162		pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$		1.2	1.8	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=15\text{A}$		24.7	32	nC
$Q_g(4.5\text{V})$	Total Gate Charge			12	16	nC
$Q_{gs}$	Gate Source Charge			4.0		nC
$Q_{gd}$	Gate Drain Charge			5.6		nC
$t_{D(\text{on})}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, R_L=1\Omega, R_{\text{GEN}}=3\Omega$		6.3		ns
$t_r$	Turn-On Rise Time			9.3		ns
$t_{D(\text{off})}$	Turn-Off Delay Time			21.6		ns
$t_f$	Turn-Off Fall Time			5.4		ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=15\text{A}, dI/dt=300\text{A}/\mu\text{s}$		19	23	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=15\text{A}, dI/dt=300\text{A}/\mu\text{s}$		36.4		nC

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

B: Repetitive rating, pulse width limited by junction temperature.

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

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

E. These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The SOA curve provides a single pulse rating.

F. The current rating is based on the  $\leq 10\text{s}$  junction to ambient thermal resistance rating.

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## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

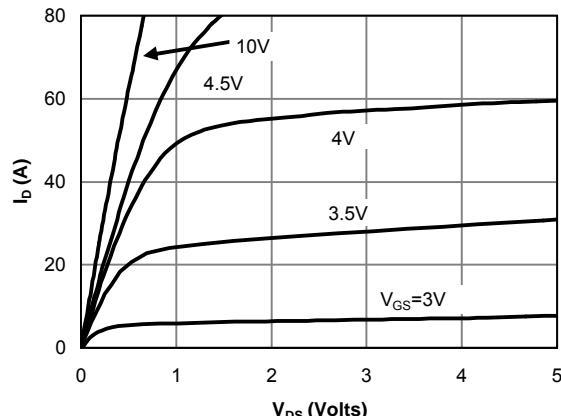


Figure 1: On-Region Characteristics

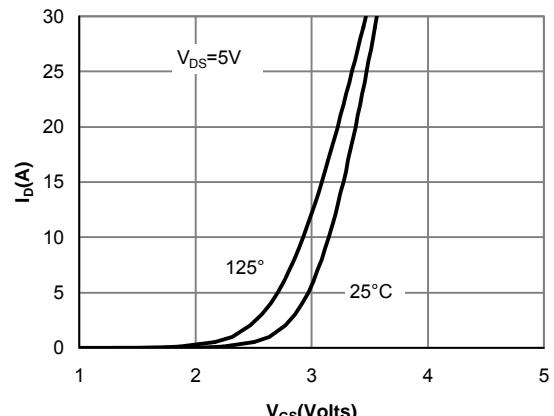


Figure 2: Transfer Characteristics

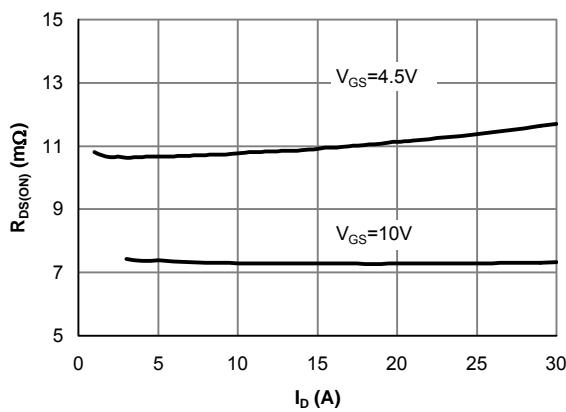


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

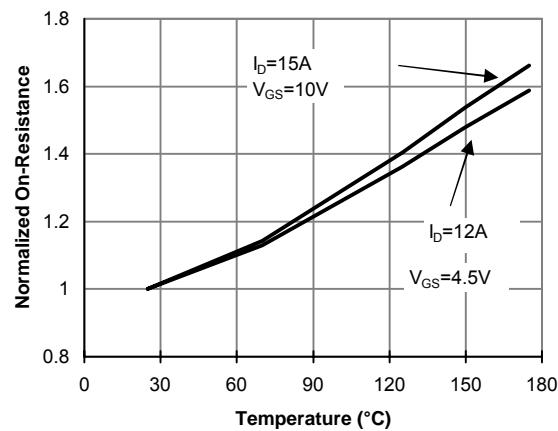


Figure 4: On-Resistance vs. Junction Temperature

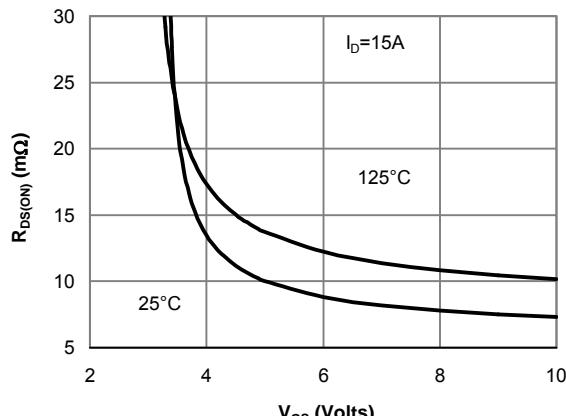


Figure 5: On-Resistance vs. Gate-Source Voltage

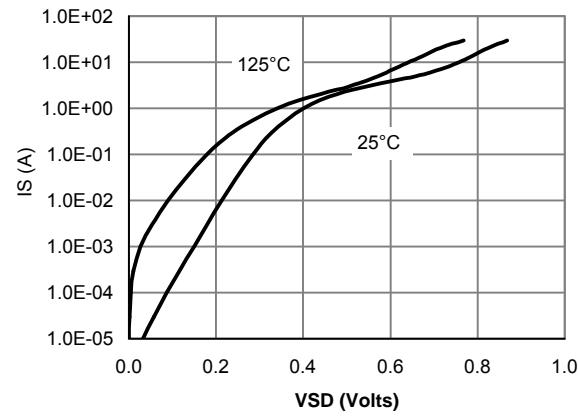


Figure 6: Body-Diode Characteristics

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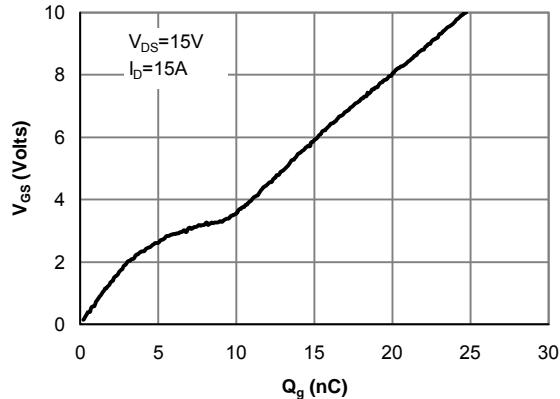


Figure 7: Gate-Charge Characteristics

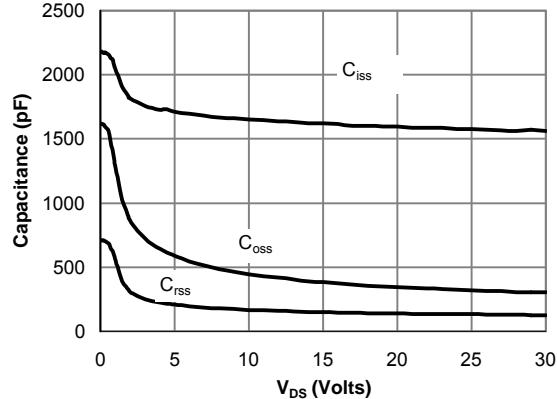


Figure 8: Capacitance Characteristics

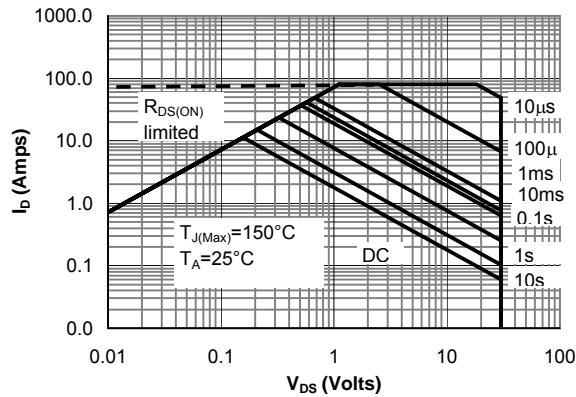


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

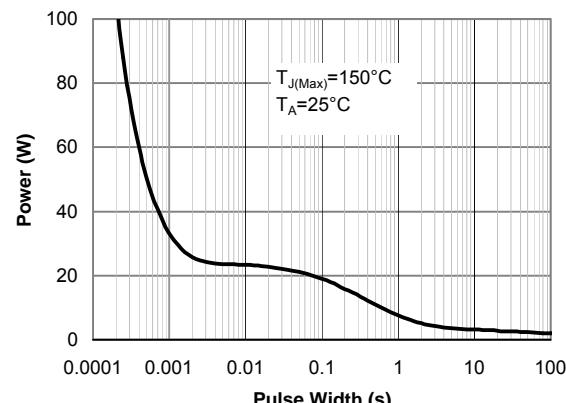


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

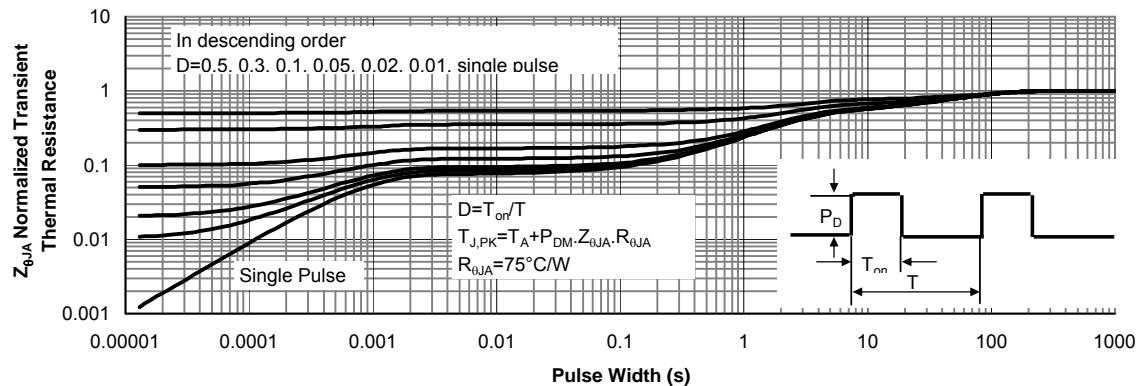


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)