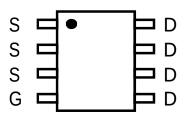
ALPHA & OMEGA
SEMICONDUCTOR

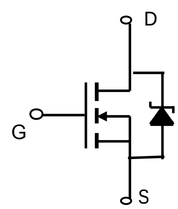
AO4726

N-Channel Enhancement Mode Field Effect Transistor

SRFET ™

General Description	Features
SRFET ™ The AO4726/L 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. *AO4726 and AO4726L are electrically identical.* *-RoHS Compliant* *-AO4726L is Halogen Free*	V_{DS} (V) = 30V I_D =18A (V_{GS} = 10V) $R_{DS(ON)}$ < 6mΩ (V_{GS} = 10V) $R_{DS(ON)}$ < 7mΩ (V_{GS} = 4.5V) ***UIS TESTED!*** ***Rg,Ciss,Coss,Crss Tested***





SRFET ™
Soft **R**ecovery MOS**FET**:
Integrated Schottky Diode

Absolute Maximum Ratings T_A=25°C unless otherwise noted				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±12	
Continuous Drain Current [AF]	T_A=25°C	I_{DSM}	18	A
	T_A=70°C		14	
Pulsed Drain Current [B]		I_{DM}	80	
Avalanche Current [B]		I_{AR}	42	
Repetitive avalanche energy L=0.3mH [B]		E_{AR}	265	mJ
Power Dissipation	T_A=25°C	P_{DSM}	3.1	W
	T_A=70°C		2.0	
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	$R_{\theta JA}$	32	40	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		60	75	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	17	24	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
STATIC PARAMETERS							
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				0.1	mA
			T_J=125°C			10	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}= ±12V				±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=250µA		1.4	1.75	2.3	V
$I_{D(ON)}$	On state drain current	V_{GS}=10V, V_{DS}=5V		80			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=18A			4.5	6	mΩ
			T_J=125°C		7	9	
		V_{GS}=4.5V, I_D=17A			5.3	7	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=18A			90		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V			0.36	0.5	V
I_S	Maximum Body-Diode + Schottky Continuous Current					5.5	A
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz			3940	5120	pF
C_{oss}	Output Capacitance				590		pF
C_{rss}	Reverse Transfer Capacitance				255		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz			0.72	1.1	Ω
SWITCHING PARAMETERS							
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=18A			72.8	95	nC
Q_g(4.5V)	Total Gate Charge				35.0		nC
Q_{gs}	Gate Source Charge				10.4		nC
Q_{gd}	Gate Drain Charge				12.4		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=0.83Ω, R_{GEN}=3Ω			9.8		ns
t_r	Turn-On Rise Time				8.4		ns
$t_{D(off)}$	Turn-Off DelayTime				45		ns
t_f	Turn-Off Fall Time				10		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=18A, dI/dt=300A/µs			36	43	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=18A, dI/dt=300A/µs			32		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°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 impedence from junction to lead $R_{\theta JL}$ and lead to ambient.
D. The static characteristics in Figures 1 to 6 are obtained using <300µs 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°C. The SOA curve provides a single pulse rating.
F. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.
Rev2: May 2008

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

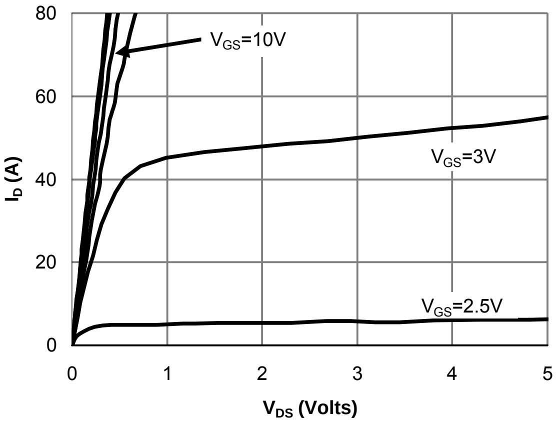


Figure 1: On-Region Characteristics

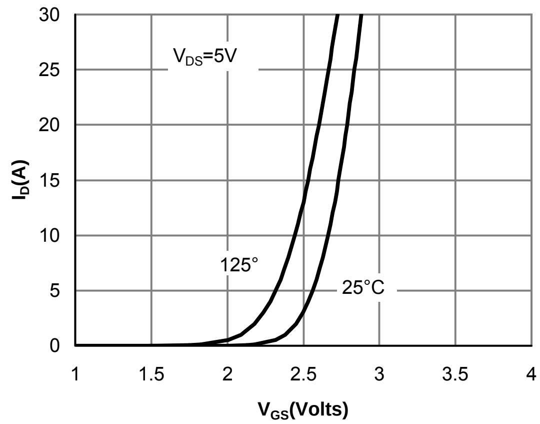


Figure 2: Transfer Characteristics

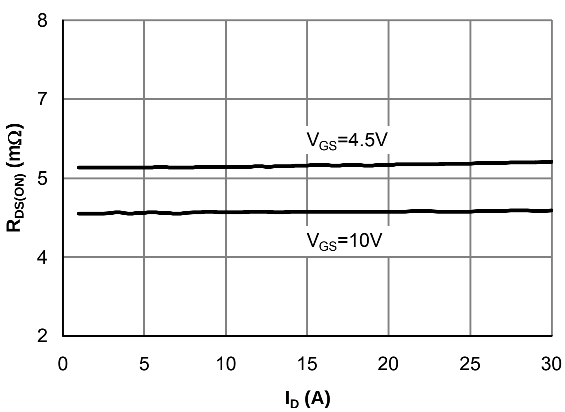


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

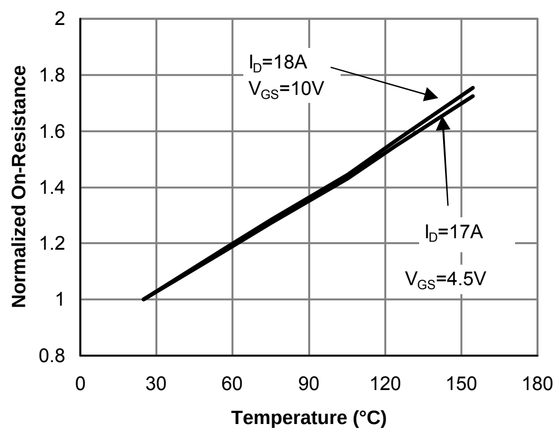


Figure 4: On-Resistance vs. Junction Temperature

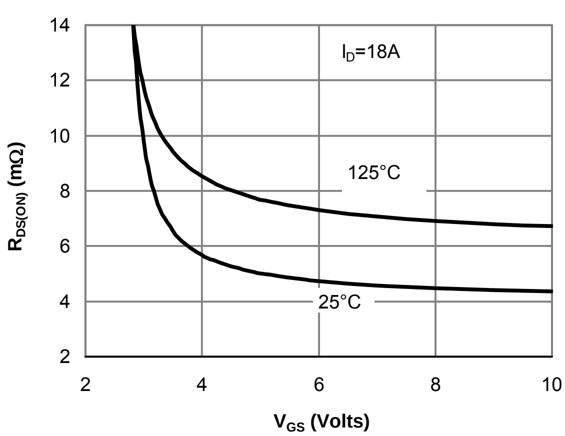


Figure 5: On-Resistance vs. Gate-Source Voltage

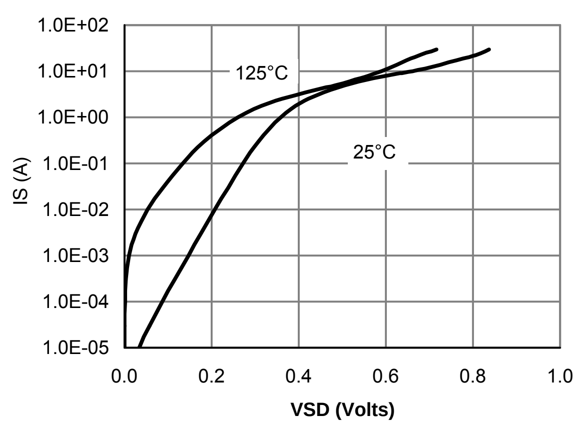


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

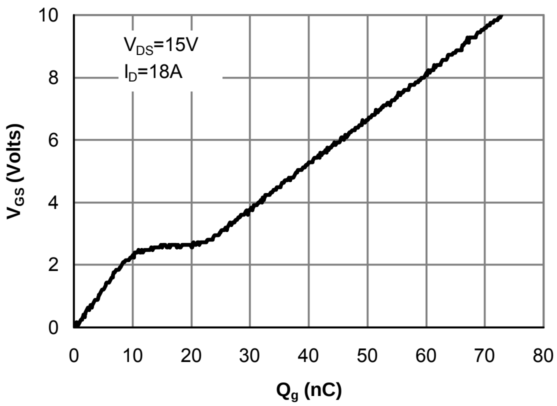


Figure 7: Gate-Charge Characteristics

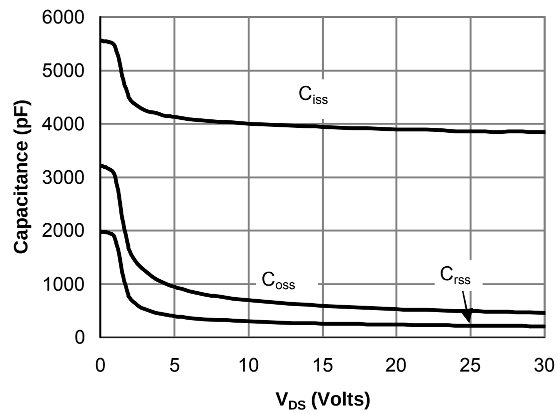


Figure 8: Capacitance Characteristics

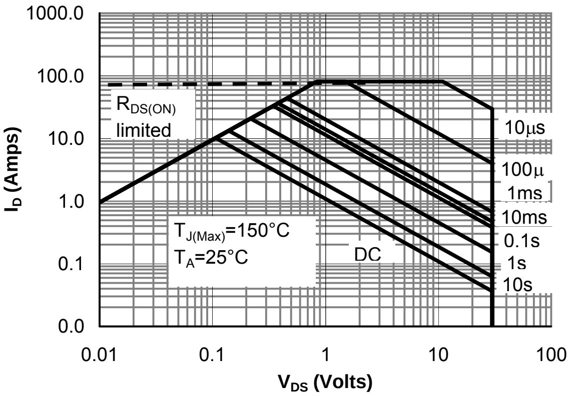


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

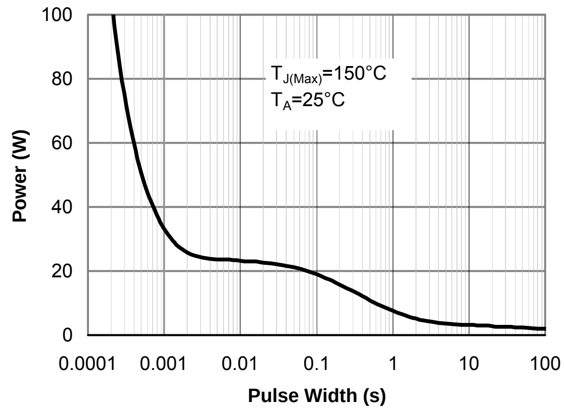


Figure10: Single Pulse Power Rating Junction-to-Ambient (Note E)

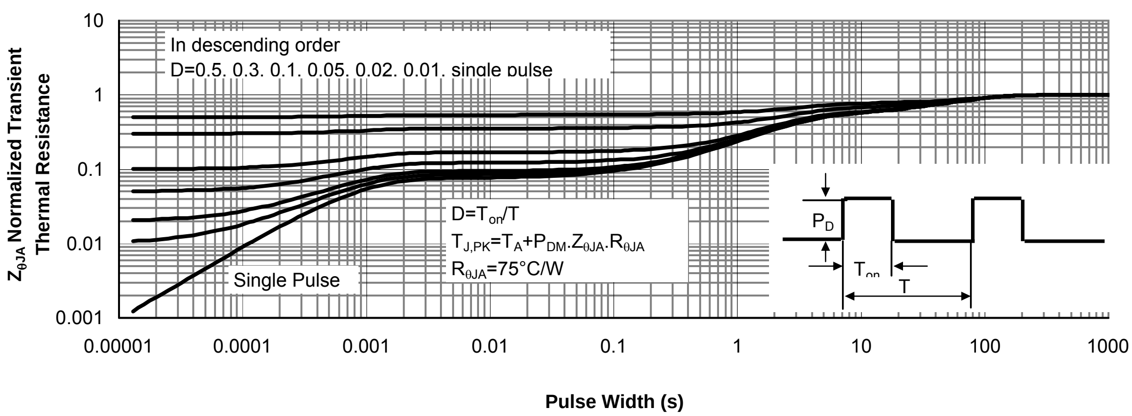


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)