freescale
飞思卡尔(深圳)功率半导体有限公司

AO4850

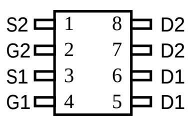
Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

The AO4850 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The two MOSFETs may be used in H-bridge, Inverters and other applications. *AO4850 is Pb-free (meets ROHS & Sony 259 specifications).*

Features

V_{DS} (V) = 75V
I_D = 3.1A (V$_{GS}$ = 10V)
$R_{DS(ON)}$ < 130mΩ (V_{GS} = 10V)
$R_{DS(ON)}$ < 165mΩ (V_{GS} = 4.5V)



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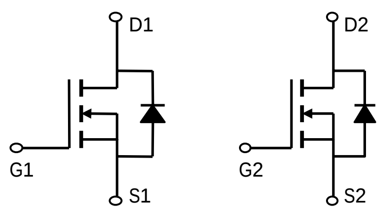

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum 10 Sec	Maximum Steady State	Units
Drain-Source Voltage		V_{DS}	75		V
Gate-Source Voltage		V_{GS}	±25		V
Continuous Drain Current [A]	T_A=25°C	I_D	3.1	2.3	A
	T_A=70°C		2.4	1.8	
Pulsed Drain Current [B]		I_{DM}	15		
Power Dissipation	T_A=25°C	P_D	2	1.1	W
	T_A=70°C		1.3	0.7	
Avalanche Current [B]		I_{AR}	10		A
Repetitive avalanche energy 0.3mH [B]		E_{AR}	15		mJ
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	$R_{\theta JA}$	50	62.5	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		82	110	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	41	50	°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=10mA, V_{GS}=0V		75			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=75V, V_{GS}=0V				1	μA
			T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}= ±25V				100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=250μA		1	2.3	3	V
$I_{D(ON)}$	On state drain current	V_{GS}=10V, V_{DS}=5V		15			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=3.1A			105	130	mΩ
			T_J=125°C		158	195	
		V_{GS}=4.5V, I_D=2A			126	165	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=3.1A			10		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V			0.77	1	V
I_S	Maximum Body-Diode Continuous Current					2.5	A
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, f=1MHz			290	380	pF
C_{oss}	Output Capacitance				54		pF
C_{rss}	Reverse Transfer Capacitance				24		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz			2.4	3.5	Ω
SWITCHING PARAMETERS							
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=3.1A			5.14	7	nC
Q_g(4.5V)	Total Gate Charge				2.34		nC
Q_{gs}	Gate Source Charge				0.97		nC
Q_{gd}	Gate Drain Charge				1.18		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=30V, R_L=9.7Ω, R_{GEN}=3Ω			4		ns
t_r	Turn-On Rise Time				3.4		ns
$t_{D(off)}$	Turn-Off DelayTime				14.4		ns
t_f	Turn-Off Fall Time				2.4		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=3.1A, dI/dt=100A/μs			30.2	45	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=3.1A, dI/dt=100A/μs			21.5		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. The current rating is based on the t ≤10s thermal resistance rating.
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 <300 μs 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.
Rev 1: May. 2007

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

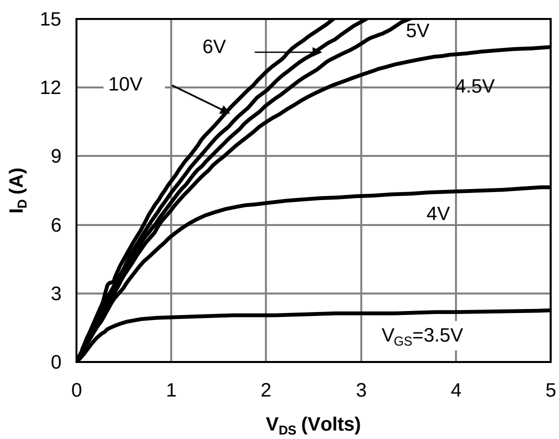

Fig 1: On-Region Characteristics

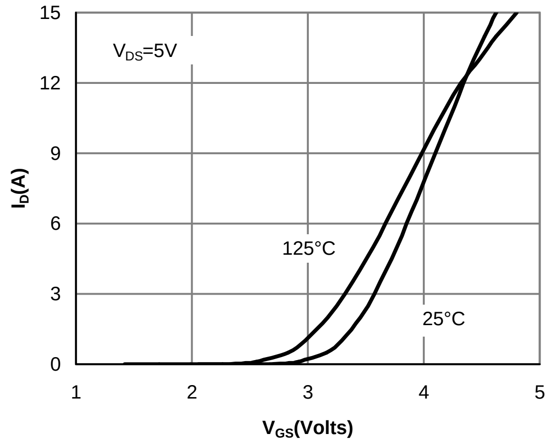

Figure 2: Transfer Characteristics

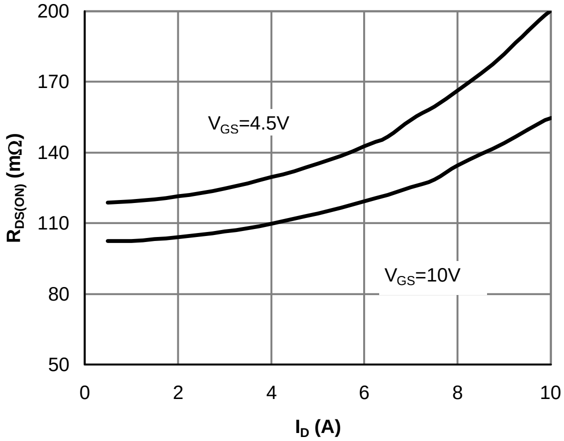

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

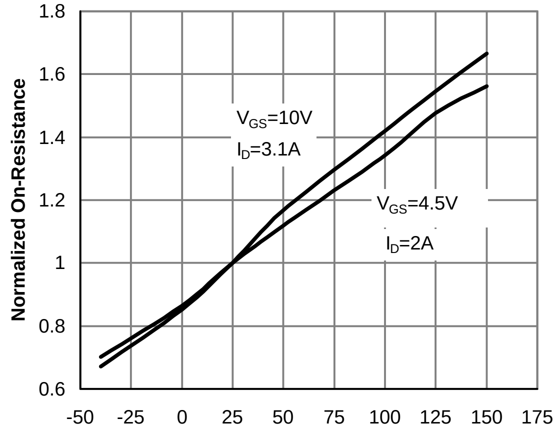

Figure 4: On-Resistance vs. Junction Temperature

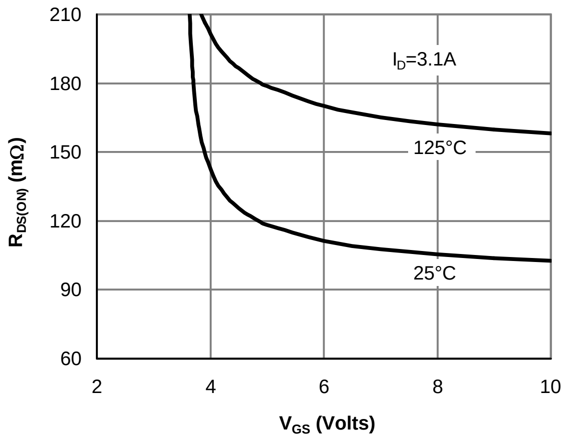

Figure 5: On-Resistance vs. Gate-Source Voltage

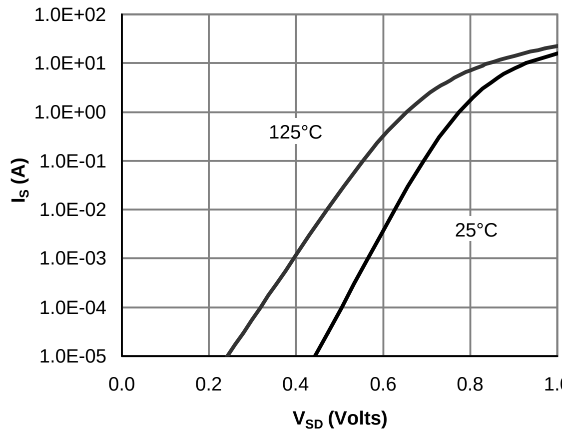

Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

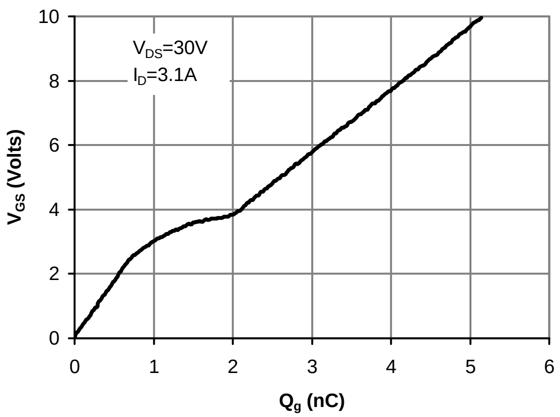

Figure 7: Gate-Charge Characteristics

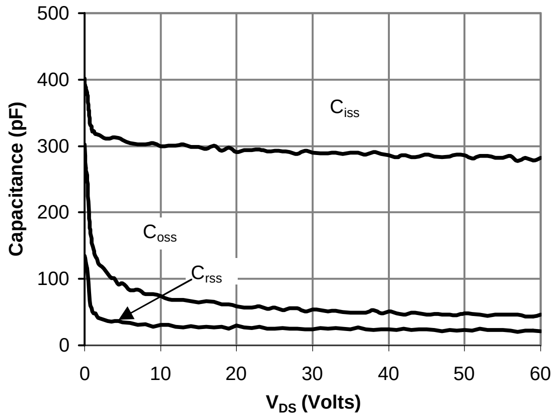

Figure 8: Capacitance Characteristics

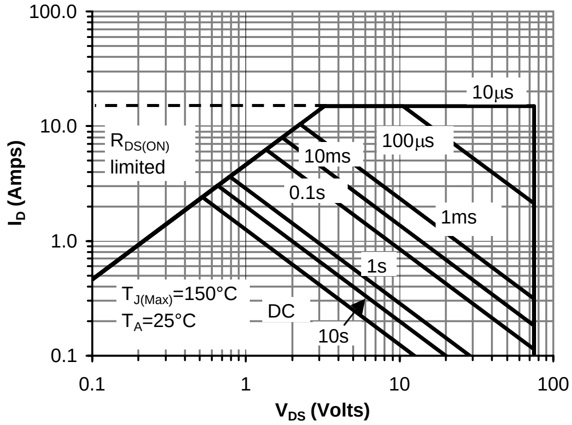

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

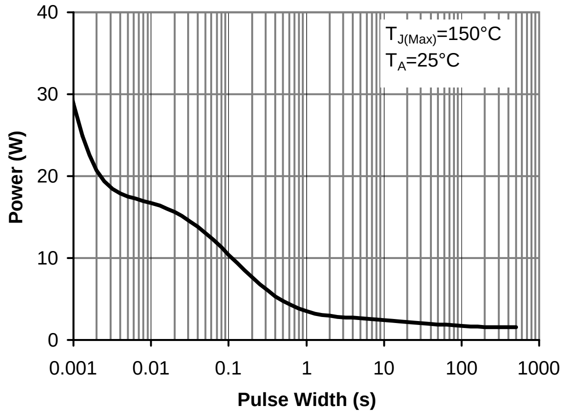

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

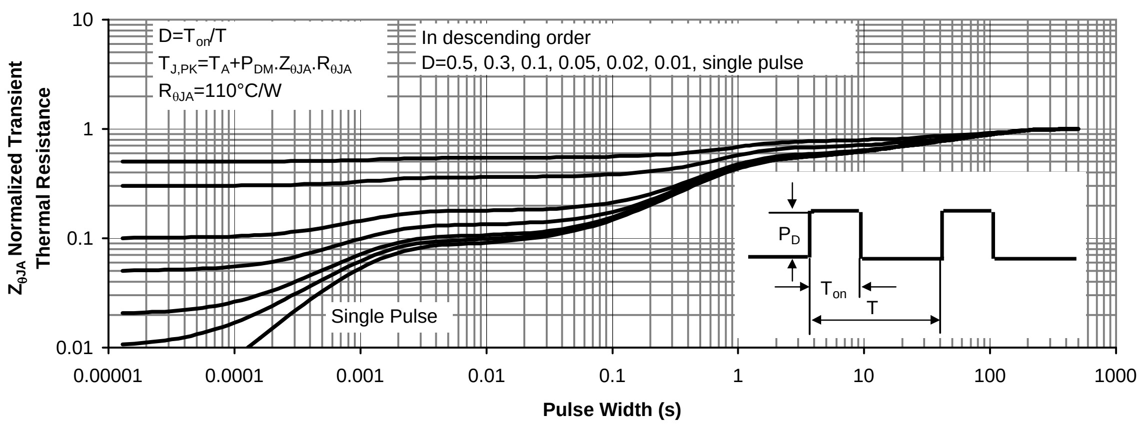

Figure 11: Normalized Maximum Transient Thermal Impedance