

Dual N-Channel Enhancement Mode Field Effect Transistor

AO9926A

Features

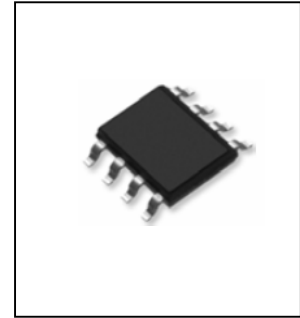
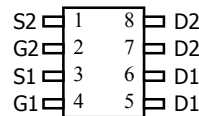
$$V_{DS} (V) = 20V$$

$$I_D = 7A$$

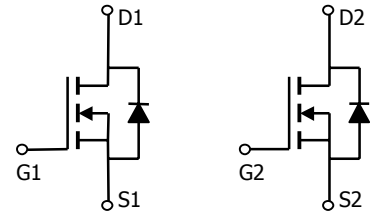
$$R_{DS(ON)} < 26m\Omega (V_{GS} = 4.5V)$$

$$R_{DS(ON)} < 33m\Omega (V_{GS} = 2.5V)$$

$$R_{DS(ON)} < 42m\Omega (V_{GS} = 1.8V)$$



SOP-8 top view



Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ^A	I_D	$T_A=25^\circ C$	7
		$T_A=70^\circ C$	6
Pulsed Drain Current ^B	I_{DM}	40	A
Power Dissipation	P_D	$T_A=25^\circ C$	2
		$T_A=70^\circ C$	1.44
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	$t \leq 10s$	48	$^\circ C/W$
Maximum Junction-to-Ambient ^A		Steady-State	74	$^\circ C/W$
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	35	40	$^\circ C/W$

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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 =250μA, V _{GS} =0V	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V T _J =55°C			1 5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±8V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =250μA	0.3	0.5	0.8	V
I _{D(ON)}	On state drain current	V _{GS} =4.5V, V _{DS} =5V	30			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =7A T _J =125°C		21.6 29.2	26 36	mΩ
		V _{GS} =2.5V, I _D =5A		26.4	33	
		V _{GS} =1.8V, I _D =4A		33.3	42	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =5A		22		S
V _{SD}	Diode Forward Voltage	I _S =1A		0.76	1	V
I _S	Maximum Body-Diode Continuous Current				3	A
DYNAMIC PARAMETERS						
C _{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, f=1MHz		1050		pF
C _{OSS}	Output Capacitance			163		pF
C _{RSS}	Reverse Transfer Capacitance			129		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		4		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =7A		15.2		nC
Q _{gs}	Gate Source Charge			1		nC
Q _{gd}	Gate Drain Charge			4		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =5V, V _{DS} =10V, R _L =1.5Ω, R _{GEN} =3Ω		6.5		ns
t _r	Turn-On Rise Time			9		ns
t _{D(off)}	Turn-Off DelayTime			56.5		ns
t _f	Turn-Off Fall Time			13.2		ns
t _{rr}	Body Diode Reverse Recovery time		I _F =5A, di/dt=100A/μs		21	
Q _{rr}	Body Diode Reverse Recovery charge	I _F =5A, di/dt=100A/μs		7.1		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any a 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_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D: The static characteristics in Figures 1 to 6 are obtained using 80μs pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

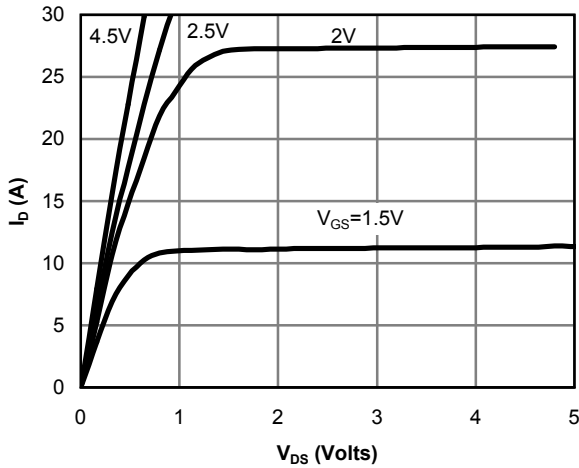


Fig 1: On-Region Characteristics

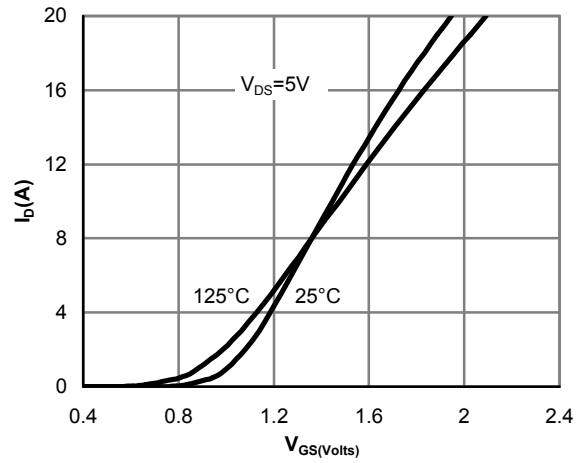


Figure 2: Transfer Characteristics

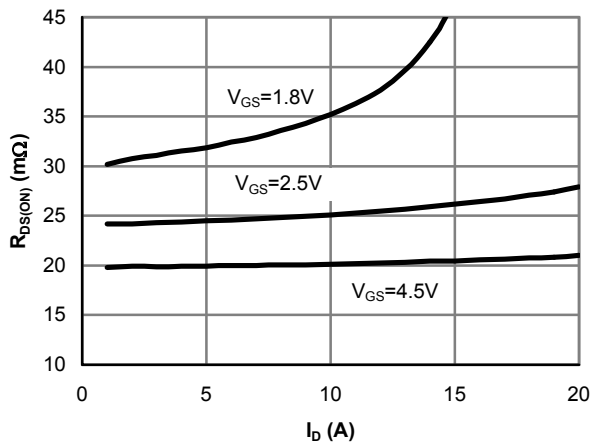


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

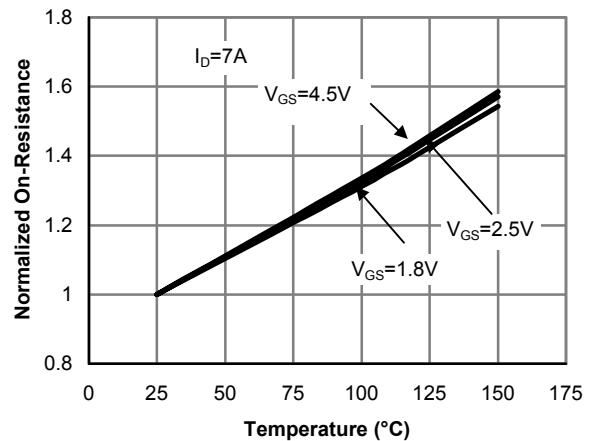


Figure 4: On-Resistance vs. Junction Temperature

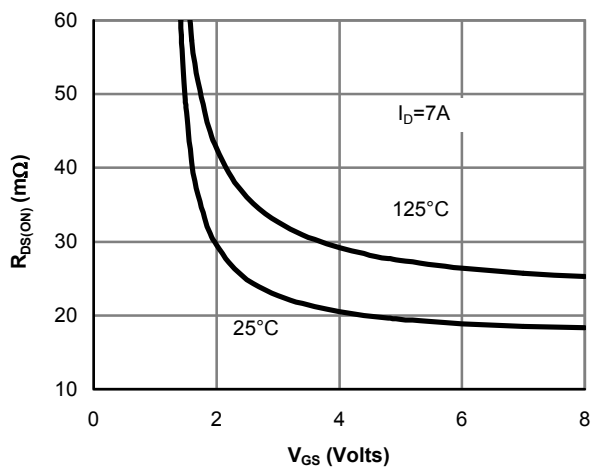


Figure 5: On-Resistance vs. Gate-Source Voltage

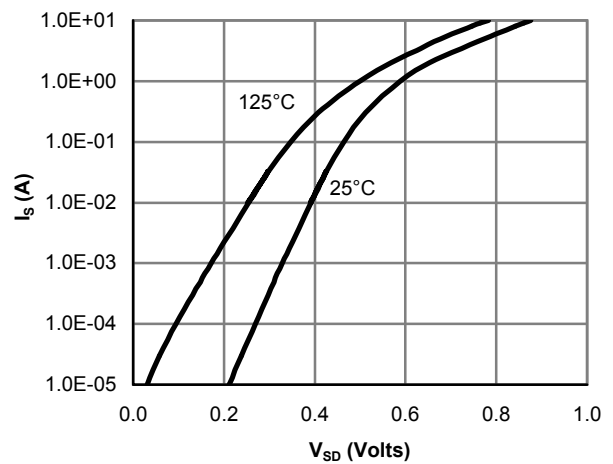


Figure 6: Body-Diode Characteristics

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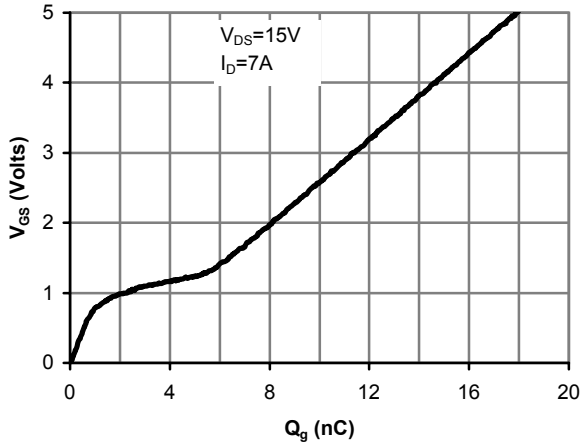


Figure 7: Gate-Charge Characteristics

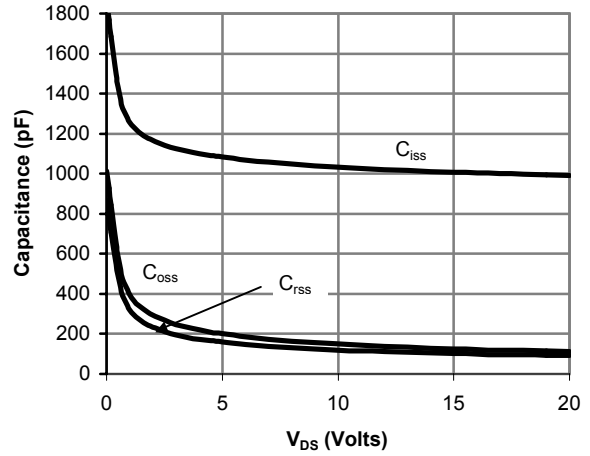


Figure 8: Capacitance Characteristics

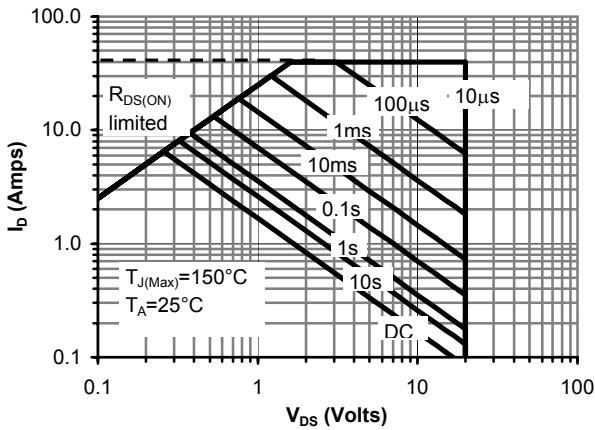


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

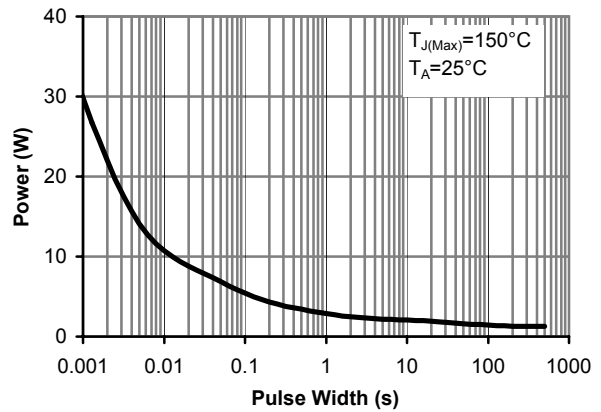


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

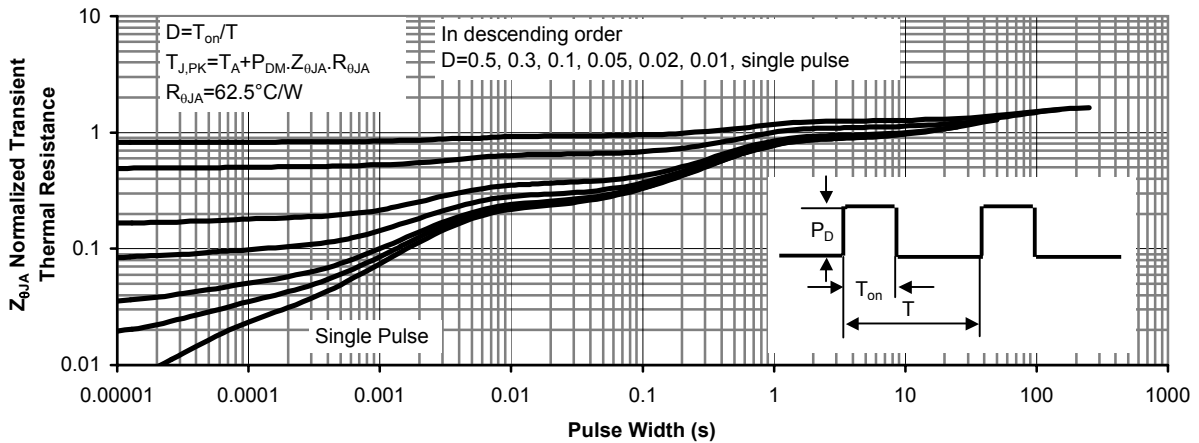


Figure 11: Normalized Maximum Transient Thermal Impedance