

SuperMOS –SOP8 30V BV_{DSS} 10.5m Ω $R_{DS(on)}$ 10A I_D , N-channel MOSFET

1. Description

The AO4406AL is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AO4406AL is Pb-free.

2. Features

- 30V, $R_{DS(ON)}=10.5m\Omega(Typ)$, $V_{GS}=10V$
- $R_{DS(ON)}=15.5m\Omega(Typ)$, $V_{GS}=4.5V$
- Use trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
AO4406AL	SOP8	ES4406A/lot	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1/2/3	Source1		
4	Gate1		
5/6/7/8	Drain1		

Table-2 Pin configuration

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_A=25^{\circ}C$	I_D	10	A
	$T_A=75^{\circ}C$		7.8	
Maximum Power Dissipation	$T_A=25^{\circ}C$	P_D	3.2	W
	$T_A=75^{\circ}C$		1.9	
Pulsed Drain Current ^a		I_{DM}	40	A
Operating Junction Temperature		T_J	150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10$ s	$R_{\theta JA}$	32	40	°C/W

Note:

a: Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1.0	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.4	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		10.5	19	m Ω
		$V_{GS}=4.5V, I_D=8A$		15.5	26	
Forward Trans conductance	g_{FS}	$V_{DS}=5.0V, I_D=10A$			80	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS}=0V, f=1MHz, V_{DS}=15V$		750		pF
Output Capacitance	C_{OSS}			125		
Reverse Transfer Capacitance	C_{RSS}			70		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=4.5V, V_{DS}=15V, I_D=10A$		15		nC
Gate-to-Source Charge	Q_{GS}			2.5		
Gate-to-Drain Charge	Q_{GD}			3		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V, R_L=1.5\Omega, R_{GEN}=3\Omega$		4.5		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(OFF)}$			18		
Fall Time	t_f			6		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1.0A$	0.45		1.2	V

7. Typical Characteristic

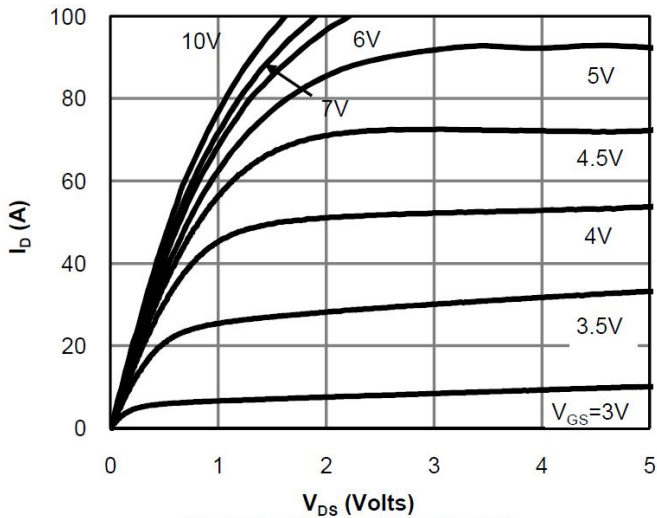


Fig 1: On-Region Characteristics

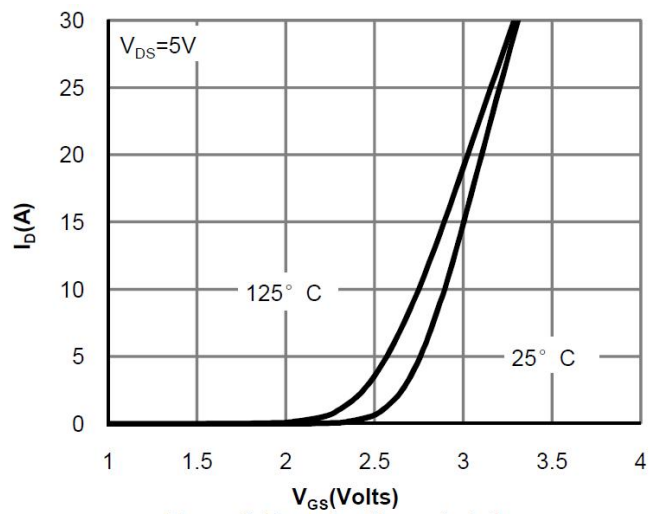


Figure 2: Transfer Characteristics

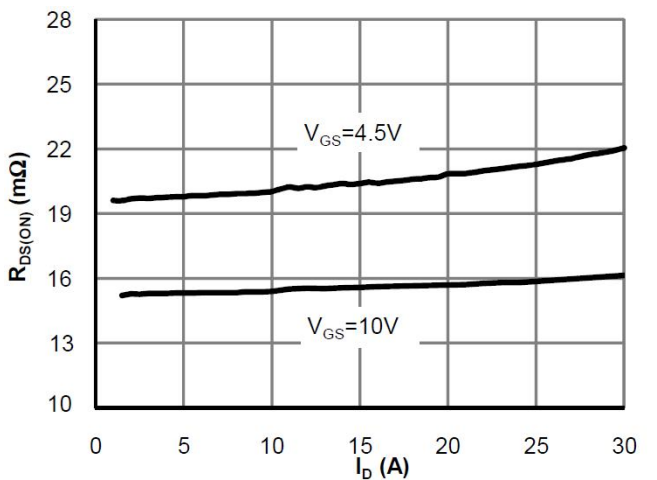


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

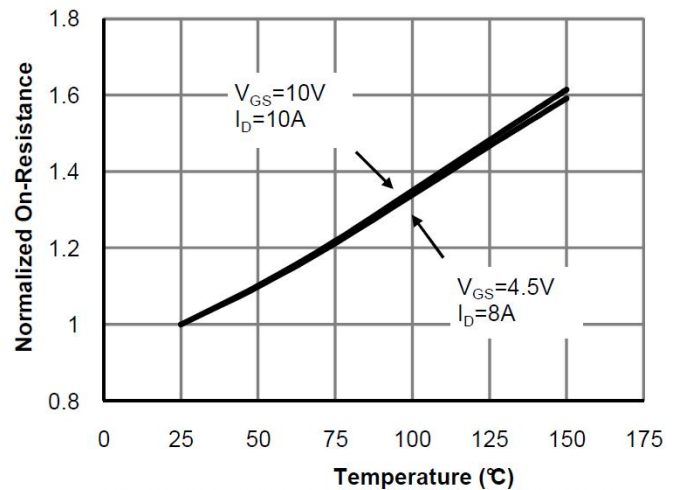


Figure 4: On-Resistance vs. Junction Temperature

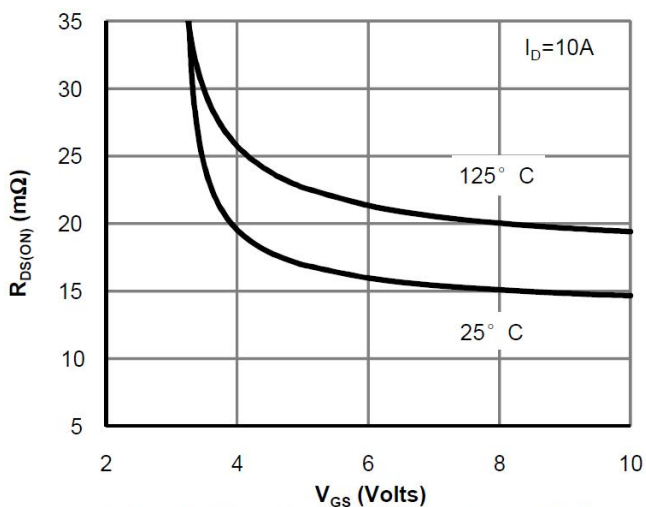


Figure 5: On-Resistance vs. Gate-Source Voltage

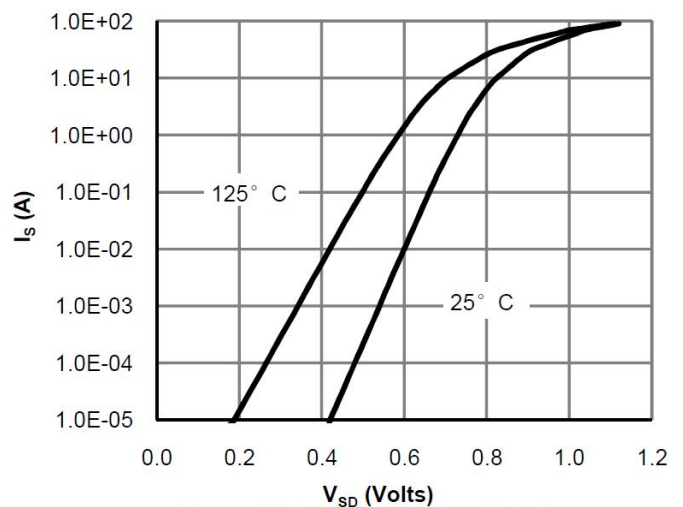


Figure 6: Body-Diode Characteristics

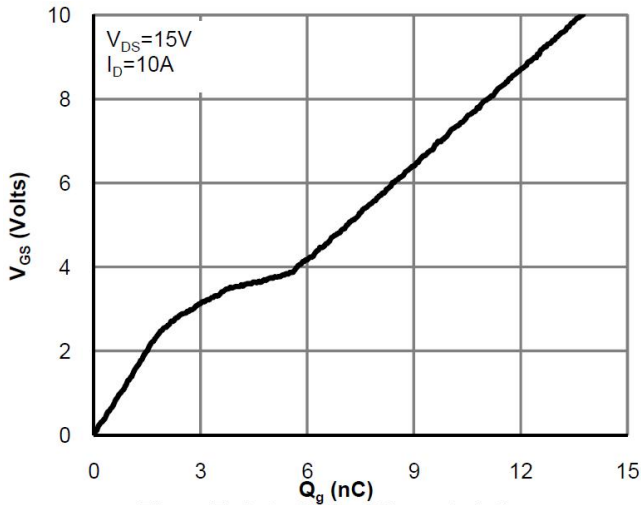


Figure 7: Gate-Charge Characteristics

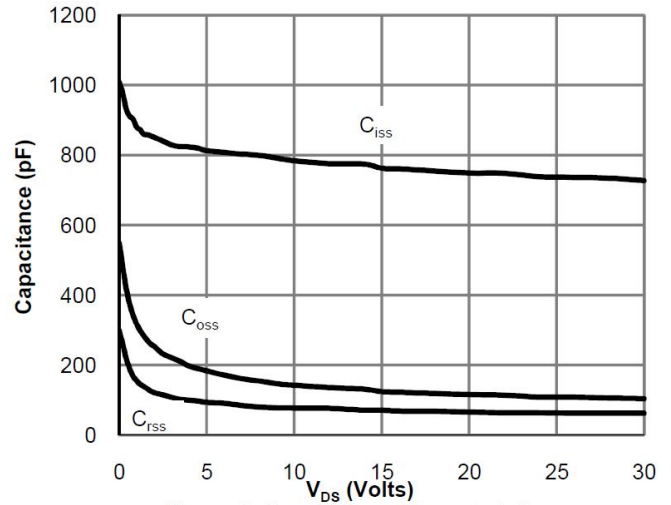


Figure 8: Capacitance Characteristics

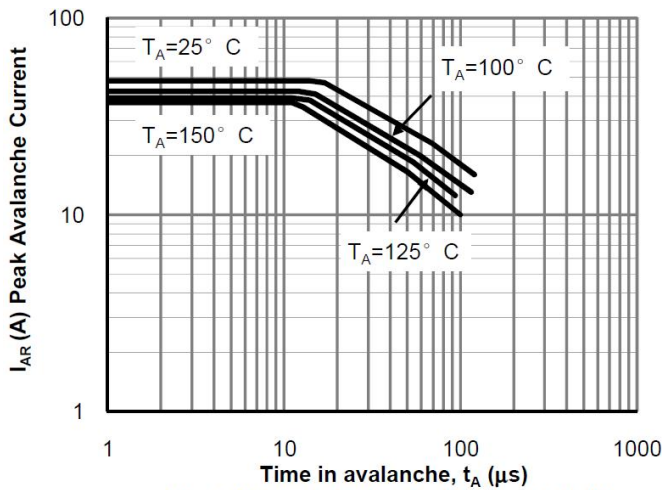


Figure 9: Single Pulse Avalanche capability

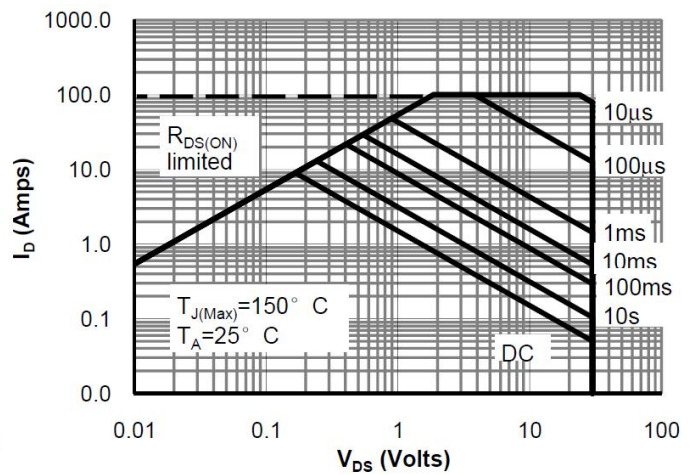


Figure 10: Maximum Forward Biased Safe Operating Area

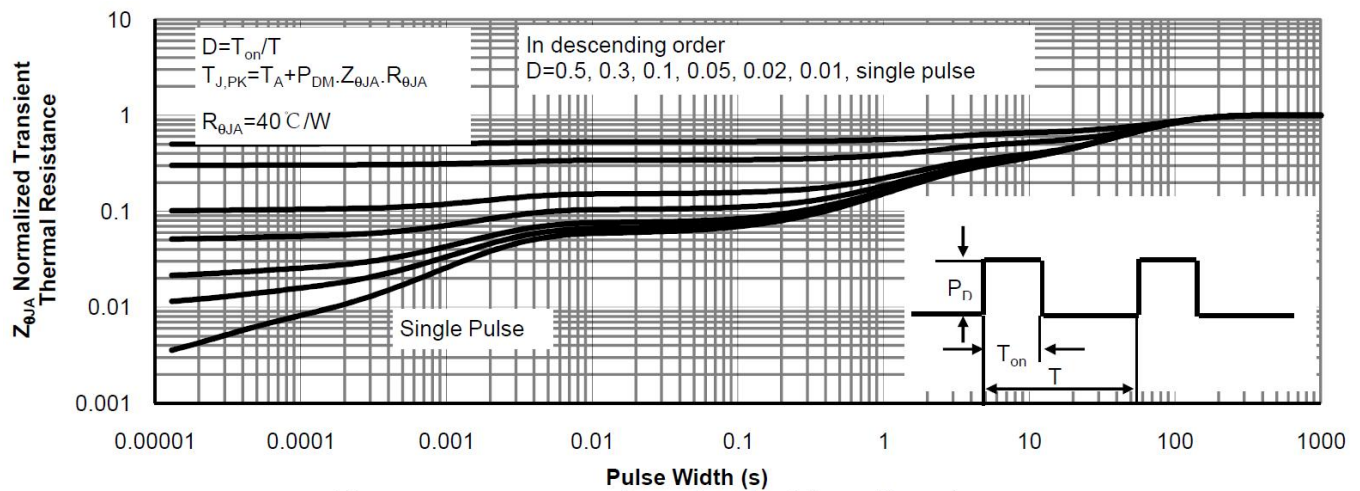
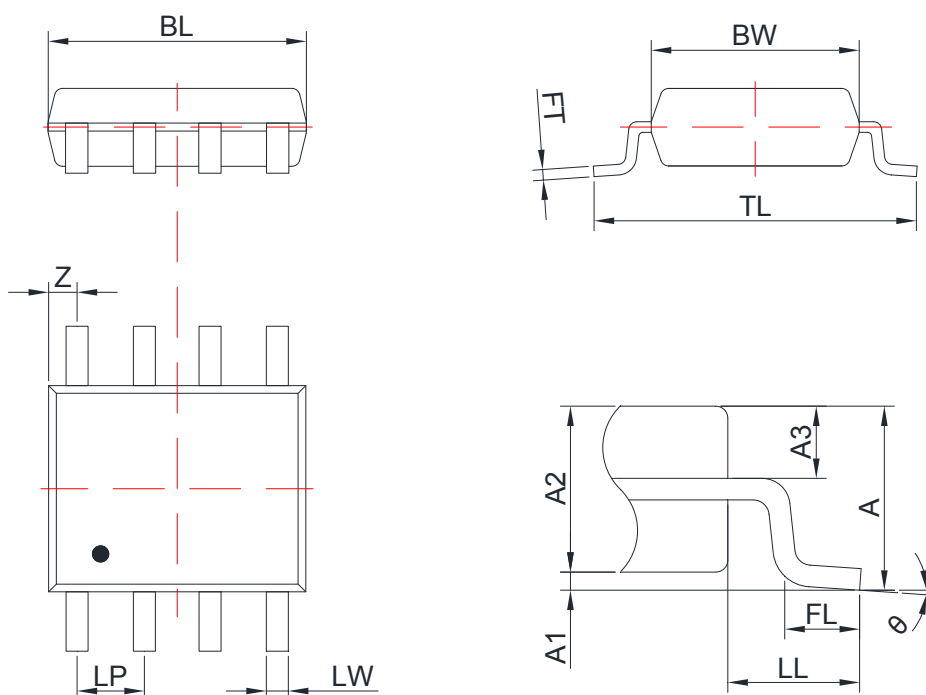


Figure 11: Normalized Maximum Transient Thermal Impedance

8. Dimension (SOP8)



COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	1.75		FL	0.50	0.80
A1	0.05	0.15	LP	1.25	1.30
A2	1.40	1.50	LL	1.1 BSC	
A3	0.623 BSC		LW	0.38	0.43
BL	4.92	5.80	TL	5.90	6.10
BW	3.70	4.10	Z	0.54	
FT	0.20	0.21	θ	0°	8°

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