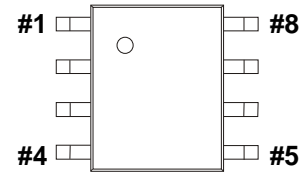


# AO4407

## ■ P-Channel MOSFET

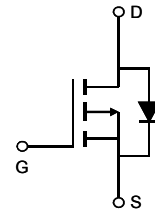
### ■ Features

- $V_{DS} = -30V$
- $I_D = -12 A$  ( $V_{GS} = -20V$ )
- $R_{DS(ON)} < 13m\Omega$  ( $V_{GS} = -20V$ )
- $R_{DS(ON)} < 14m\Omega$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 30m\Omega$  ( $V_{GS} = -5V$ )



- |          |         |
|----------|---------|
| 1.Source | 5.Drain |
| 2.Source | 6.Drain |
| 3.Source | 7.Drain |
| 4.Gate   | 8.Drain |

### ■ Simplified outline(SOP-8)



### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 25$		
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	-12	A
		$T_A=70^\circ C$	-10	
Pulsed Drain Current	$I_{DM}$	-60		
Avalanche Current	$I_{AS}, I_{AR}$	26		
Power Dissipation	$P_D$	$T_A=25^\circ C$	3.1	W
		$T_A=70^\circ C$	2	
Avalanche energy	$L=0.3mH$	$E_{AS}, E_{AR}$	101	mJ
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	$t \leq 10s$	40	$^\circ C/W$
		Steady-State	75	
Thermal Resistance.Junction- to-Case	Steady-State	$R_{thJC}$	24	
Junction Temperature	$T_J$	150	$^\circ C$	
Junction Storage Temperature Range	$T_{stg}$	-55 to 150		

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =-250 μ A, V <sub>GS</sub> =0V	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	μ A
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-5	
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μ A	-1.7		-2.8	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-20V, I <sub>D</sub> =-12A			13	m Ω
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-12A			14	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-12A T <sub>J</sub> =125°C			19	
		V <sub>GS</sub> =-5V, I <sub>D</sub> =-7A			30	
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-60			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-10.5A		27		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		2060	2600	pF
Output Capacitance	C <sub>oss</sub>			370		
Reverse Transfer Capacitance	C <sub>rss</sub>			295		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	1.2	2.4	3.6	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-12A	24	30	36	nC
Gate Source Charge	Q <sub>gs</sub>			4.6		
Gate Drain Charge	Q <sub>gd</sub>			10		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =1.25 Ω, R <sub>G</sub> =3 Ω		11		ns
Turn-On Rise Time	t <sub>r</sub>			9.4		
Turn-Off DelayTime	t <sub>d(off)</sub>			24		
Turn-Off Fall Time	t <sub>f</sub>			12		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-12A, di/dt=100A/μ s		30	40	nC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			22		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-4	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V			-1	V

■ Typical Characteristics

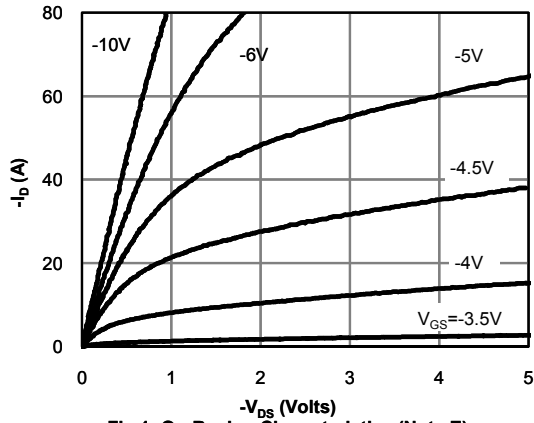


Fig 1: On-Region Characteristics (Note E)

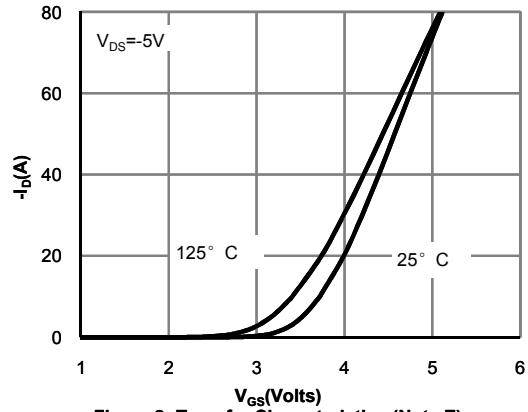


Figure 2: Transfer Characteristics (Note E)

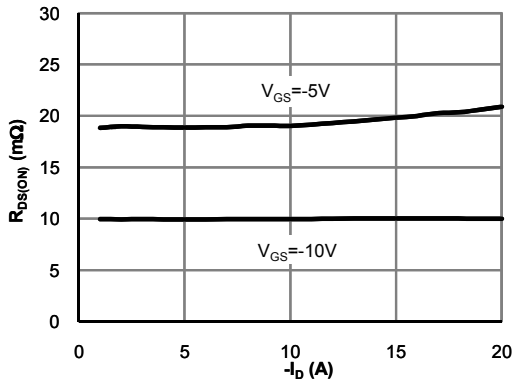


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

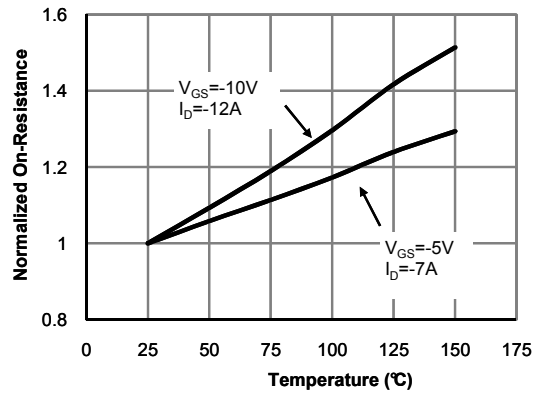


Figure 4: On-Resistance vs. Junction Temperature (Note E)

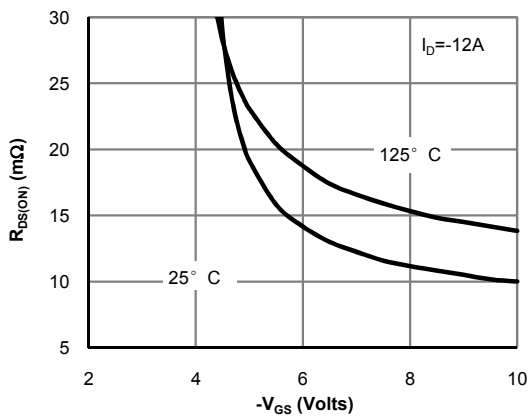


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

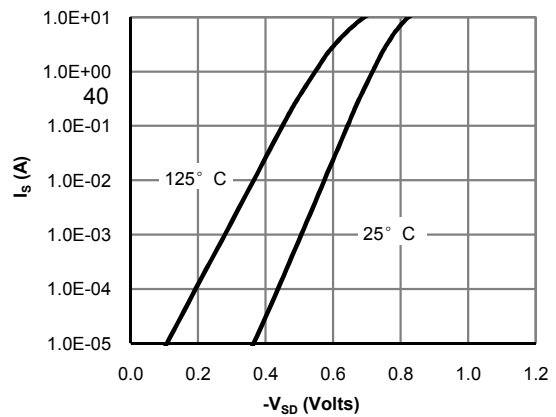


Figure 6: Body-Diode Characteristics (Note E)

■ Typical Characteristics

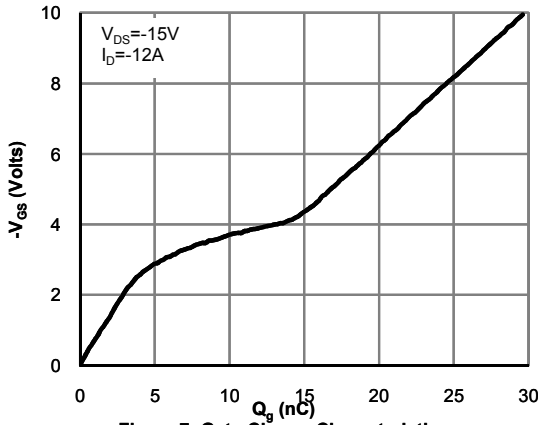


Figure 7: Gate-Charge Characteristics

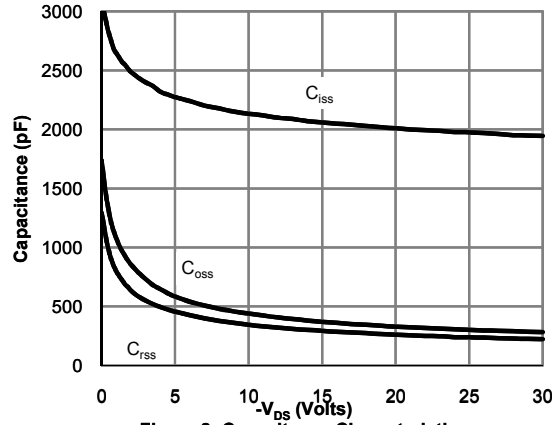


Figure 8: Capacitance Characteristics

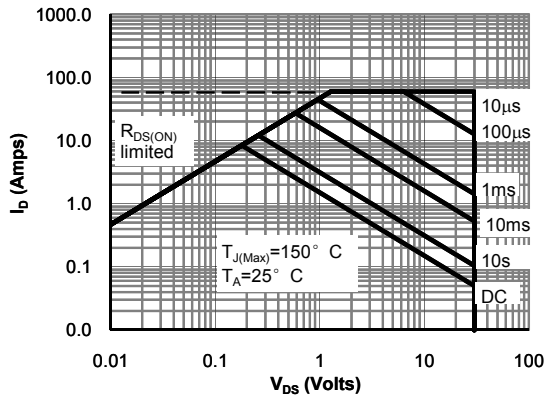


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

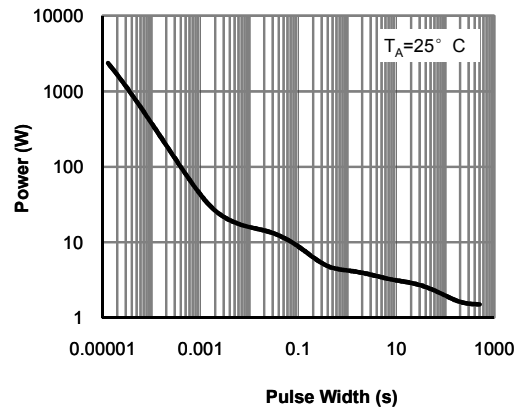


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

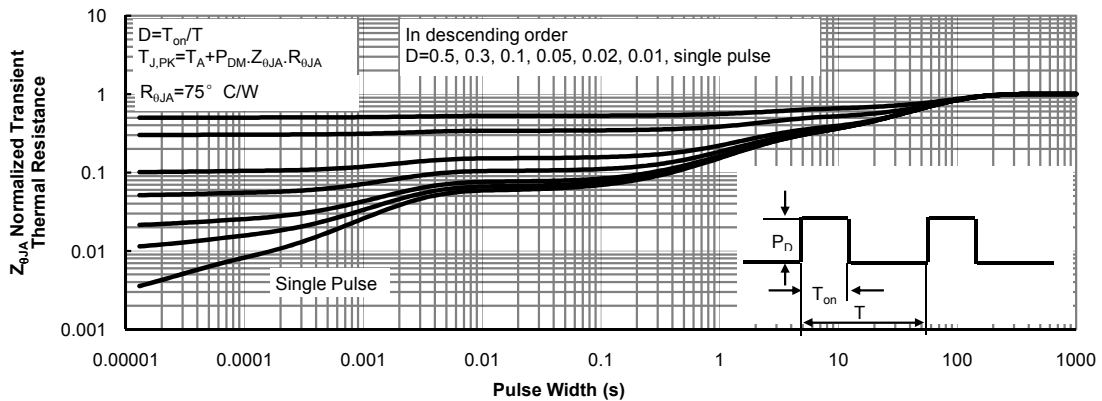
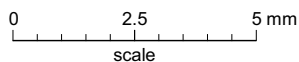
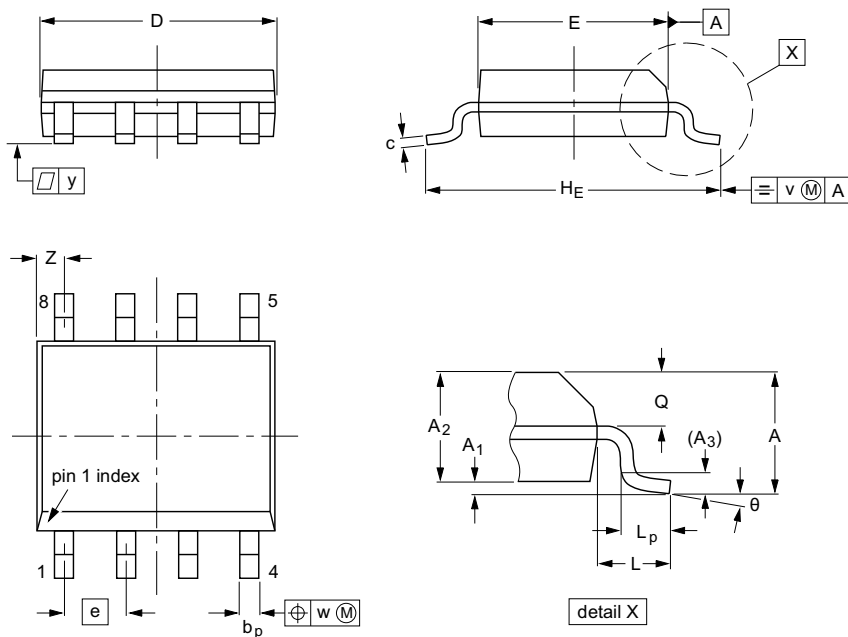


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

■ SOP-8



**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(2)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	Z <sup>(1)</sup>	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	5.0 4.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.20 0.19	0.16 0.15	0.05	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	