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SEMICONDUCTOR



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PLED

AO4407-MS

Product specification

Description

The AO4407-MS uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

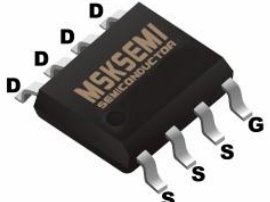
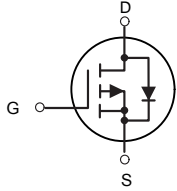
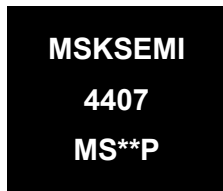
General Features

- $V_{DS} = -30V$ $I_D = -12A$
- $R_{DS(ON)} < 9.5m\Omega @ V_{GS}=10V$

Applications

- Battery protection
- Load switch
- Uninterruptible power supply

Reference News

PACKAGE OUTLINE	P-Channel MOSFET	Marking
 SOP-8		

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^\circ C$	Drain Current ³ , $V_{GS} @ 10V$	-12	A
$I_D @ T_A=70^\circ C$	Drain Current ³ , $V_{GS} @ 10V$	-9.1	A
I_{DM}	Pulsed Drain Current ¹	-40	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation	2.5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient ³	50	$^\circ C/W$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-10A	-	9.5	15	mΩ
		V _{GS} =-4.5V, I _D =-6A	-	15	25	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1	-	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-10A	-	22	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-24V, V _{GS} =0V	-	-	-10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =+20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =-6A	-	28	45	nC
Q _{gs}	Gate-Source Charge	V _{DS} =-15	-	7	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =-45	-	11	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15	-	13	-	ns
t _r	Rise Time	I _D =-1A	-	10	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	80	-	ns
t _f	Fall Time	V _{GS} =-10V	-	37	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V V _{DS} =-15V f=1.0MHz	-	2940	4700	pF
C _{oss}	Output Capacitance		-	290	-	pF
C _{rss}	Reverse Transfer Capacitance		-	210	-	pF
R _g	Gate Resistance	f=1.0MHz	-	6.2	12.4	Ω
V _{SD}	Forward On Voltage ²	I _S =-2.1A, V _{GS} =0V	-	-	-1.2	V
t _{rr}	Reverse Recovery Time	I _S =-10A, V _{GS} =0V, dI/dt=100A/μs	-	19	-	ns
Q _{rr}	Reverse Recovery Charge		-	6	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in² copper pad of FR4 board, t ≤ 10s ; 125 °C/W when mounted on Min. copper pad.

Typical Performance Characteristics

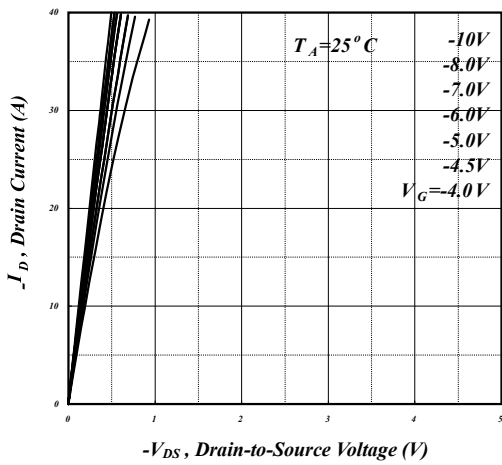


Fig 1. Typical Output Characteristics

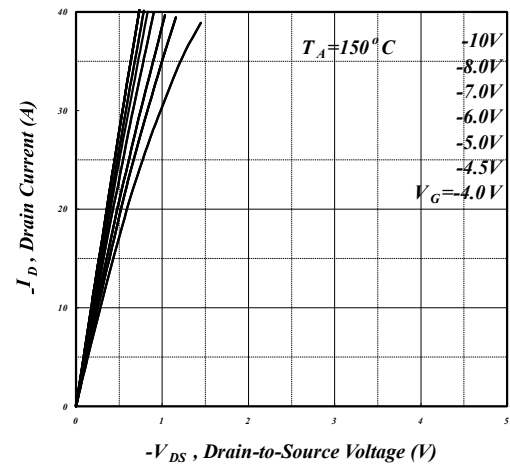


Fig 2. Typical Output Characteristics

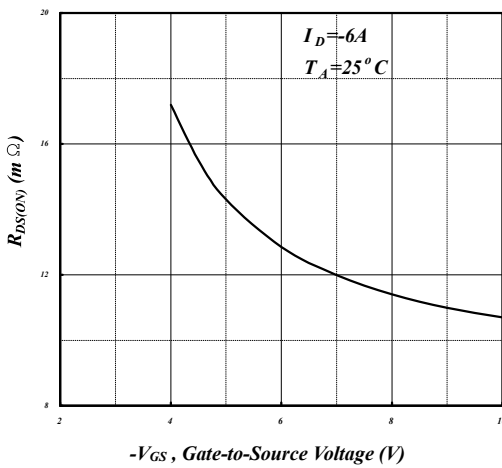


Fig 3. On-Resistance v.s. Gate Voltage

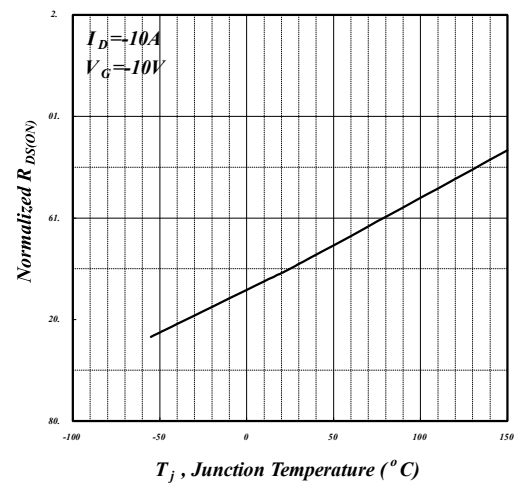
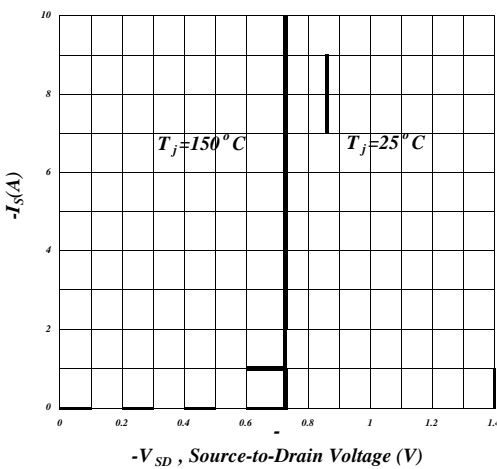


Fig 4. Normalized On-Resistance v.s. Junction Temperature



Reverse Diode

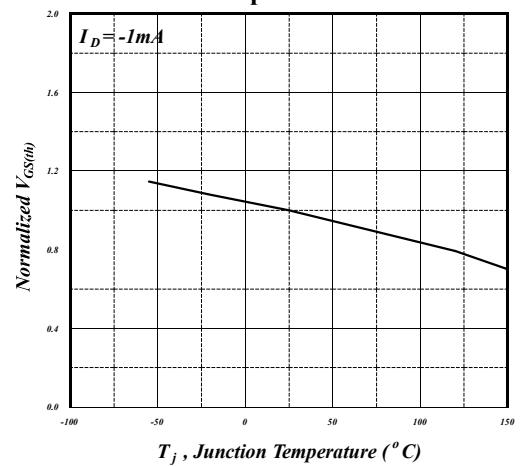


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

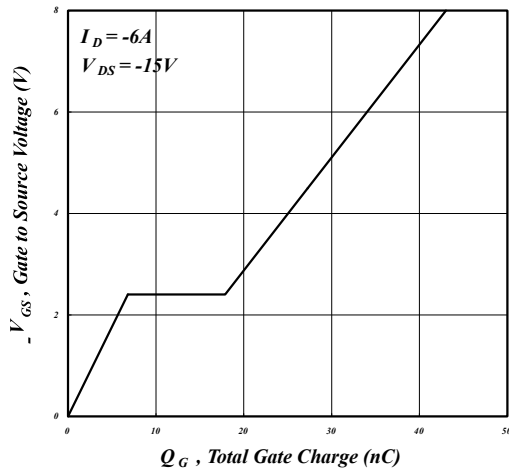


Fig 7. Gate Charge Characteristics

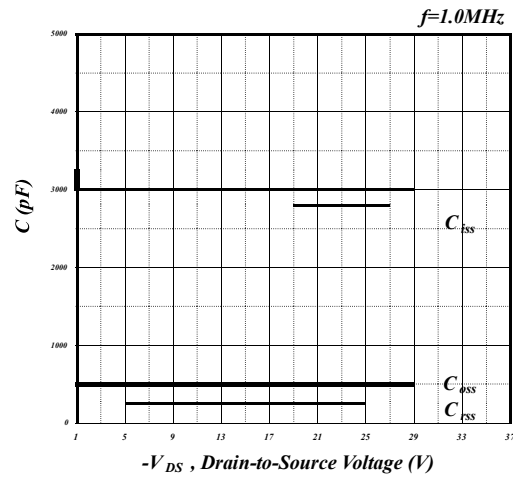


Fig 8. Typical Capacitance Characteristics

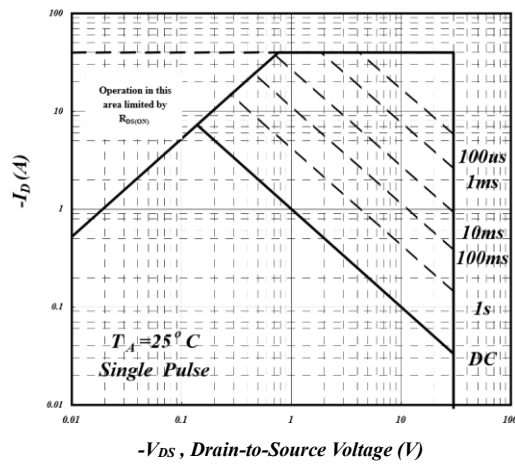


Fig 9. Maximum Safe Operating Area

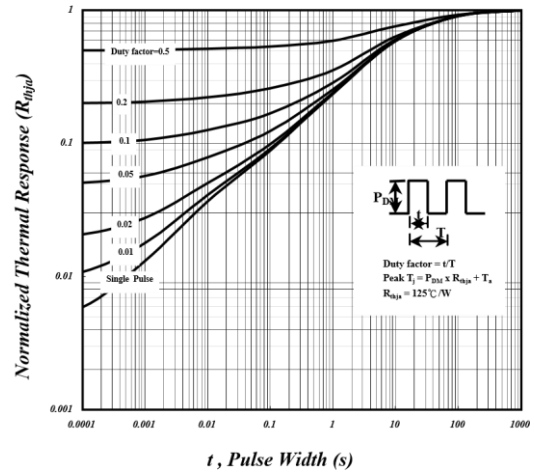


Fig 10. Effective Transient Thermal Impedance

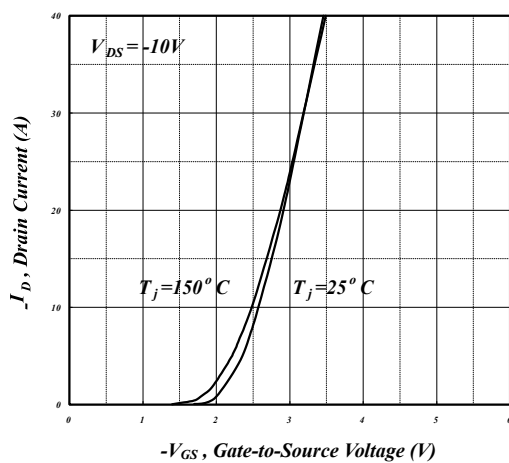


Fig 11. Transfer Characteristics

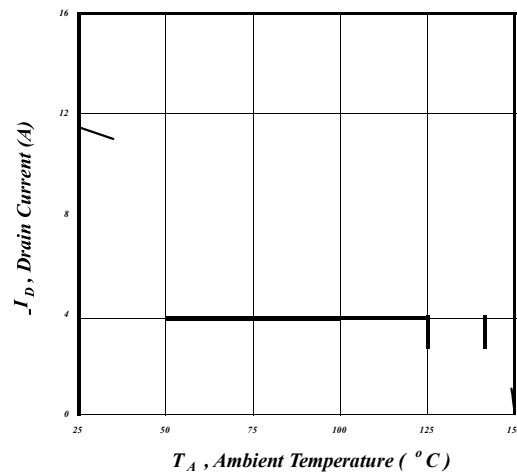


Fig 12. Drain Current v.s. Ambient Temperature

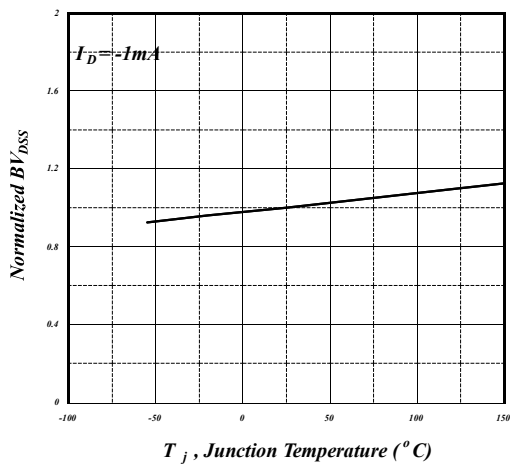


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

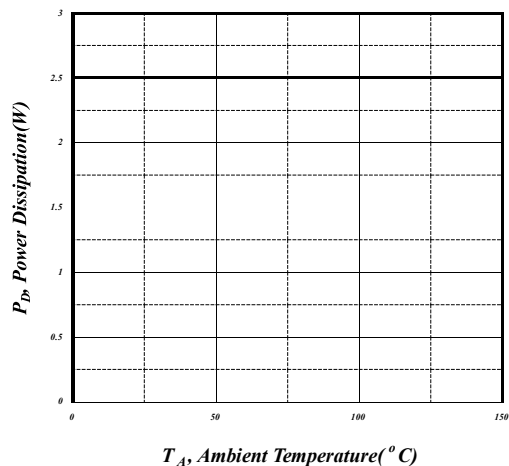


Fig 14. Total Power Dissipation

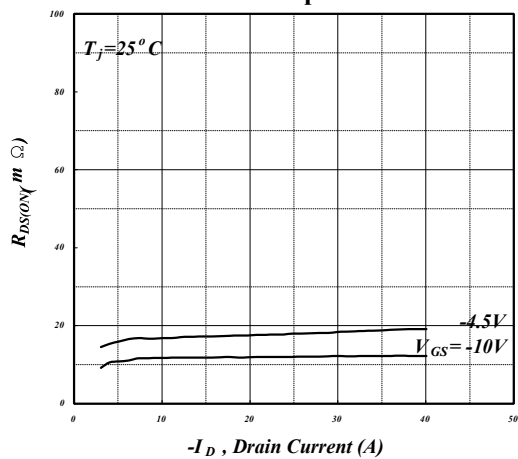
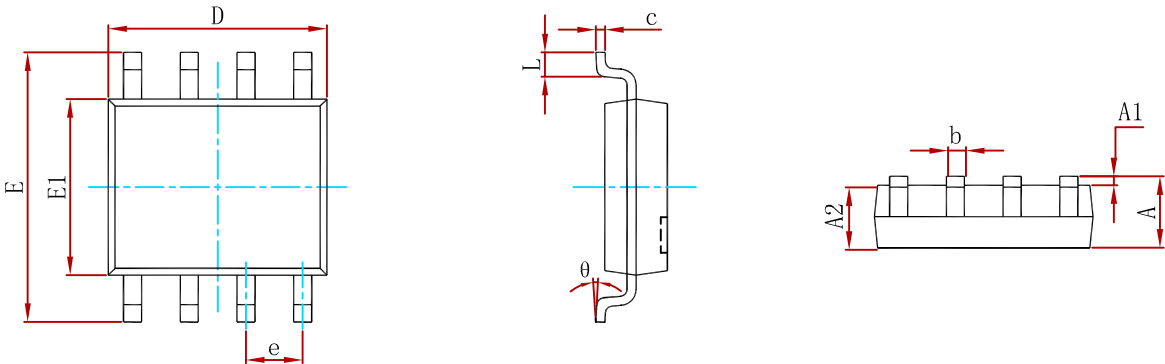


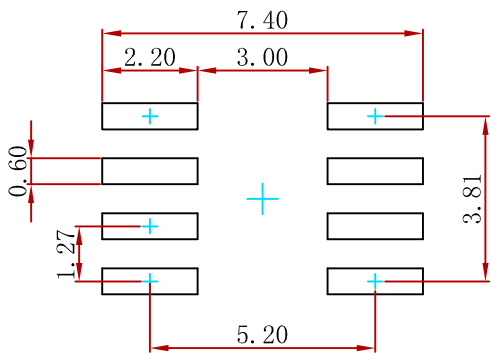
Fig 15. Typ. Drain-Source on State Resistance

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Suggested Pad Layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
AO4407-MS	SOP-8	3000

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