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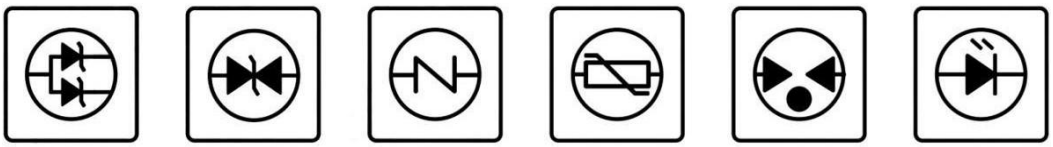
SEMICONDUCTOR



AON7401-MS

Product specification

Description

The AON7401-MS uses advanced trench technology to provide excellent RDS(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.

Features

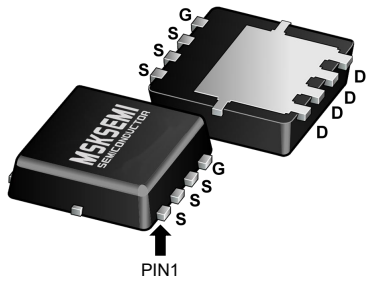
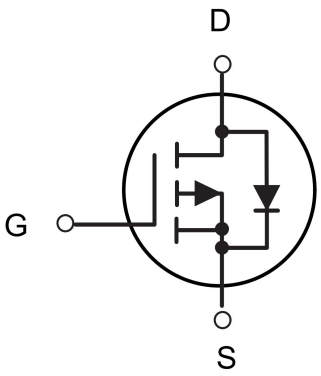
V_{DS} = -30V I_D =-50 A

$R_{DS(ON)}$ < 13mΩ @ V_{GS}=-10V

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Reference News

PACKAGE OUTLINE	P-Channel MOSFET	Marking
		MSKSEMI AON7401 P30
DFN3X3-8L		

Absolute Maximum Ratings (TC=25℃ unless otherwise specified)

Symbol	Parameter	Rating		Units
		10s	Steady State	
VDS	Drain-Source Voltage	-30		V
VGS	Gate-Source Voltage	±20		V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-50		A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-27		A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-14.3	-9	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-11.4	-7.2	A
IDM	Pulsed Drain Current[2]	-130		A
EAS	Single Pulse Avalanche Energy[3]	125		mJ
IAS	Avalanche Current	-50		A
P_D@T_C=25℃	Total Power Dissipation[4]	37		W
P_D@T_A=25℃	Total Power Dissipation[4]	4.2	1.67	W
TSTG	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	75		℃/W
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	30		℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	3.36		℃/W

Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain- Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=- 1mA	---	-0.0232	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-30A	---	9	13	mΩ
		V_{GS}=-4.5V , I_D=-15A	---	16	22	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.2	---	-2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.6	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate- Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	---	---	± 100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-30A	---	30	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	9	---	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-15A	---	22	---	nC
Q_{gs}	Gate- Source Charge		---	8.7	---	
Q_{gd}	Gate- Drain Charge		---	7.2	---	
$T_{d(on)}$	Turn- On Delay Time	V_{DD}=-15V , V_{GS}=-10V , R_G=3.3 I_D=-15A	---	8	---	ns
T_r	Rise Time		---	73.7	---	
$T_{d(off)}$	Turn- Off Delay Time		---	61.8	---	
T_f	Fall Time		---	24.4	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	2215	---	pF
C_{oss}	Output Capacitance		---	310	---	
C_{rss}	Reverse Transfer Capacitance		---	237	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-42	A
I_{SM}	Pulsed Source Current[2,5]		---	---	-130	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V
t_{rr}	Reverse Recovery Time	I_F=- 15A , dI/dt=100A/μs , T_J= 25 ℃	---	19	---	nS
Q_{rr}	Reverse Recovery Charge		---	9	---	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us duty cycle≦2%

3.The EAS data shows Max. rating . The test condition is V_{DD} =-25V V_{GS} =-10V,L=0.1mH,I_{AS}=-50A,

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

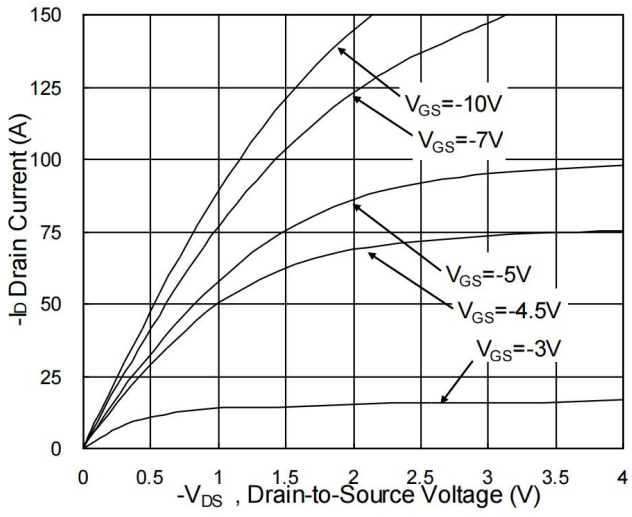


Fig.1 Typical Output Characteristics

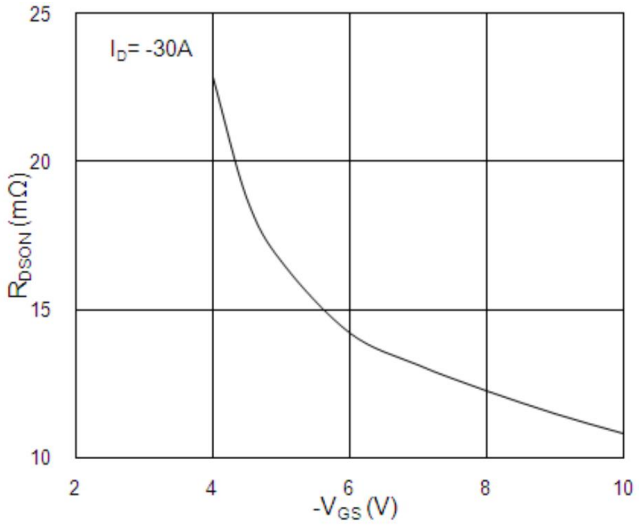


Fig.2 On-Resistance vs. G-S Voltage

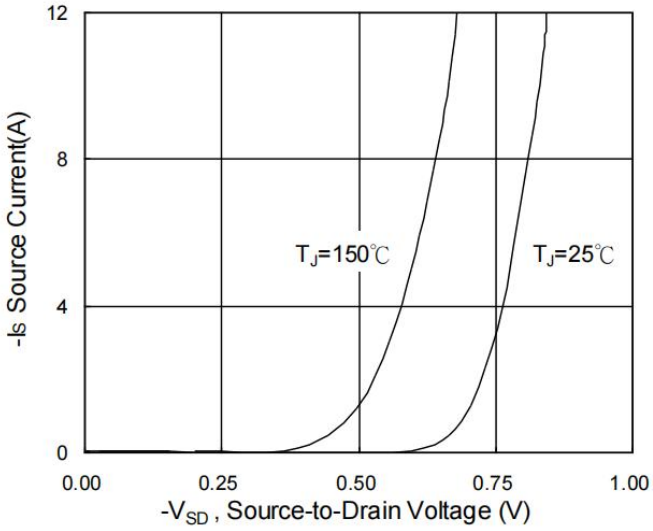


Fig.3 Forward Characteristics of Reverse

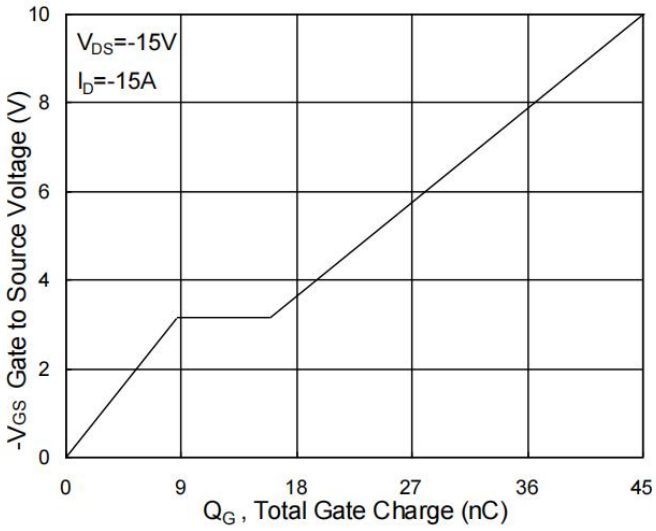


Fig.4 Gate-Charge Characteristics

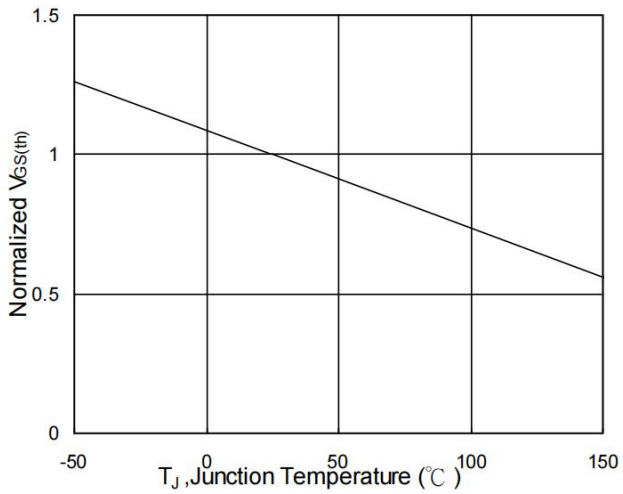


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

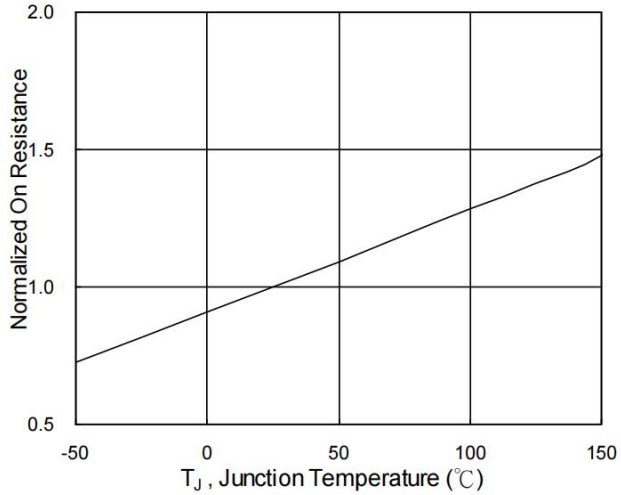


Fig.6 Normalized R_{DSON} vs. T_J

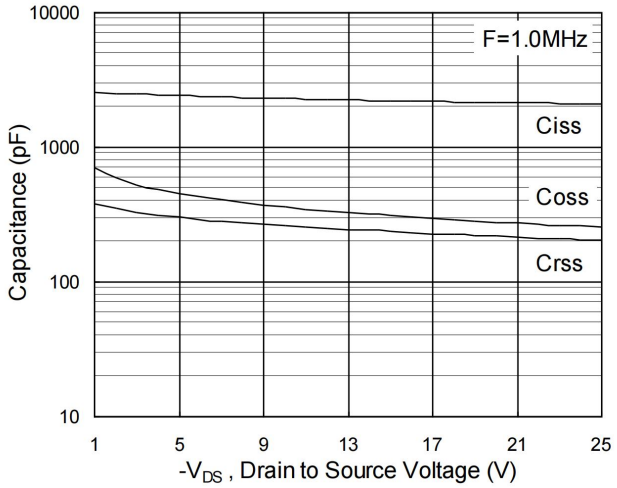


Fig.7 Capacitance

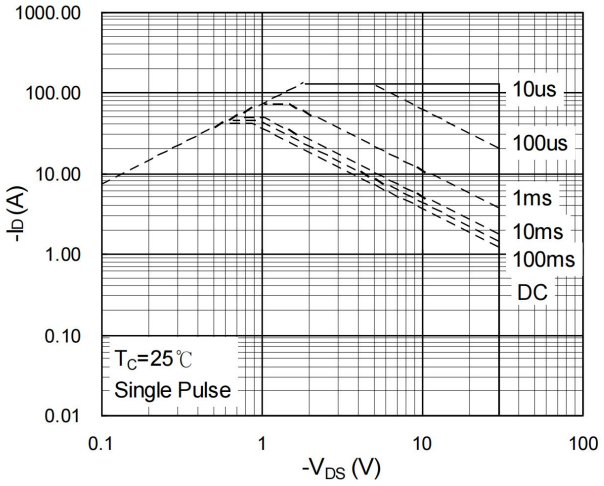


Fig.8 Safe Operating Area

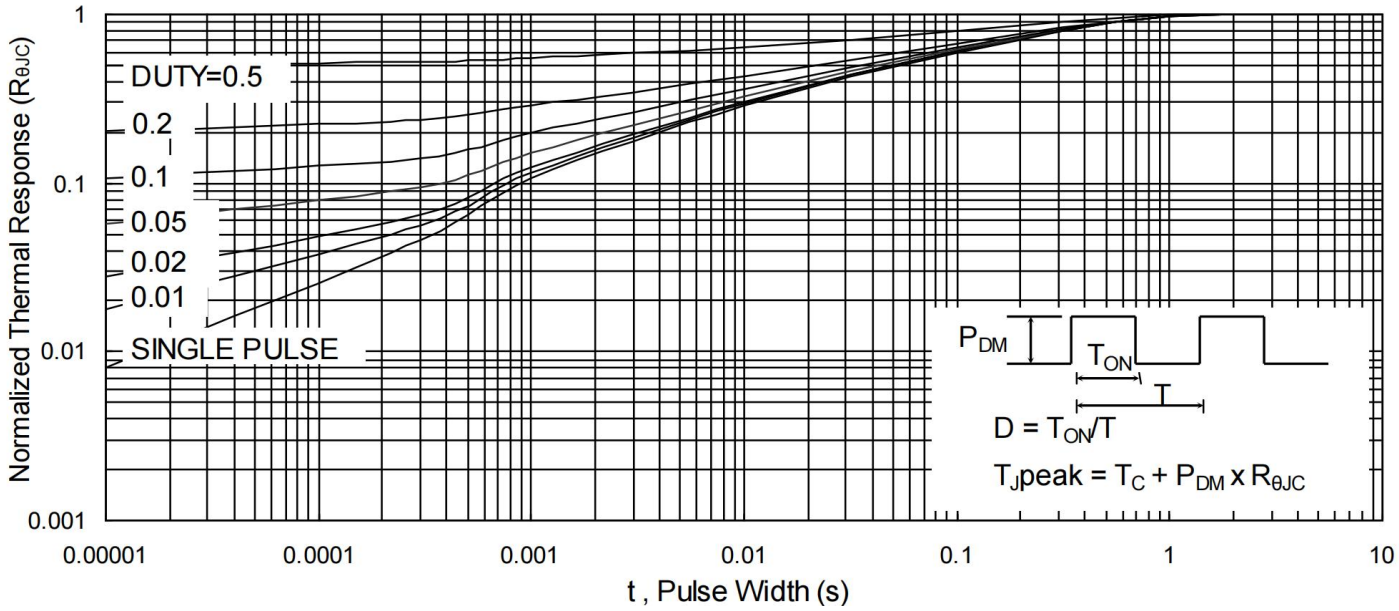


Fig.9 Normalized Maximum Transient Thermal Impedance

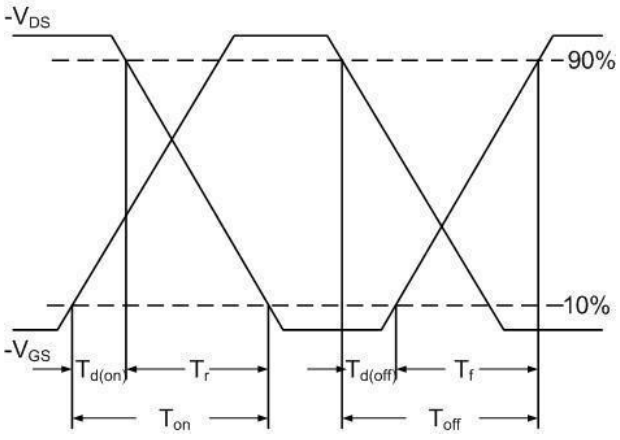


Fig.10 Switching Time Waveform

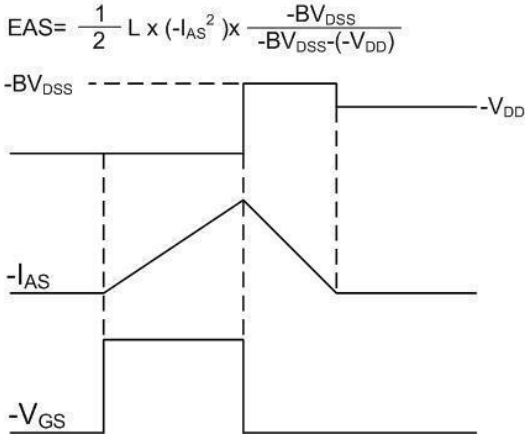
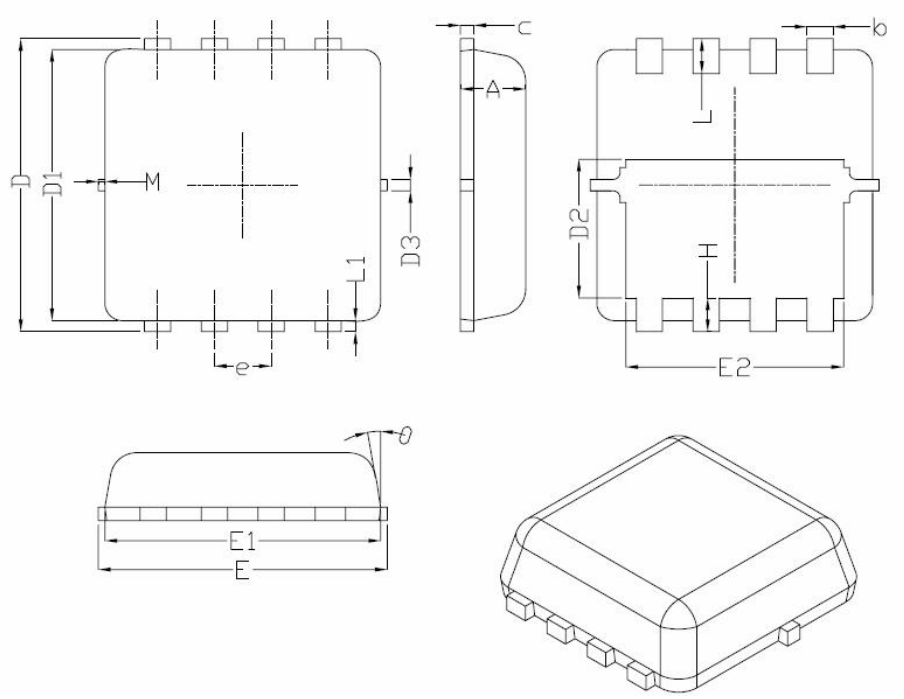


Fig.11 Unclamped Inductive Switching Waveform

DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°

REEL SPECIFICATION

P/N	PKG	QTY
AON7401-MS	DFN3X3-8L	5000

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