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SEMICONDUCTOR



ESD



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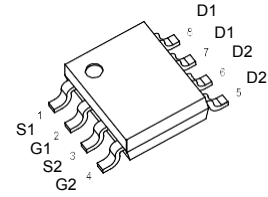
Product data sheet

Application

Battery protection

Load switch

Uninterruptible power supply

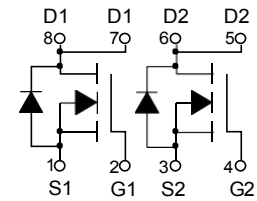


SOP-8

General Features

$V_{DS} = 40V$ $I_D = 6A$

$R_{DS(ON)} < 30m\Omega$ @ $V_{GS}=10V$



N-Channel MOSFET

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ C$	Continuous Drain Current ¹	6	A
$I_D@T_A=70^\circ C$	Continuous Drain Current ¹	4	A
I_{DM}	Pulsed Drain Current ²	36	A
EAS	Single Pulse Avalanche Energy ³	31	mJ
I_{AS}	Avalanche Current	25	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	1.9	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹ ($t \leq 10s$)	40	$^\circ C/W$
	Thermal Resistance Junction-ambient ¹	65	$^\circ C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	40	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.032	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =6A	---	25	30	mΩ
		V _{GS} =4.5V, I _D =4A	---	35	45	
V _{GS(th)}	Gate Threshold Voltage		1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient	V _{GS} =V _{DS} , I _D =250uA	---	-4.8	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =32V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =6A	---	32	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	2.1	---	
Q _g	Total Gate Charge (4.5V)		---	9.8	---	nC
Q _{gs}	Gate-Source Charge	V _{DS} =32V, V _{GS} =4.5V, I _D =6A	---	2.8	---	
Q _{gd}	Gate-Drain Charge		---	3.9	---	
T _{d(on)}	Turn-On Delay Time		---	2.8	---	ns
T _r	Rise Time	V _{DD} =20V, V _{GS} =10V, R _G =3.3	---	40.4	---	
T _{d(off)}	Turn-Off Delay Time	I _D =6A	---	22.8	---	
T _f	Fall Time		---	6.4	---	
C _{iss}	Input Capacitance		---	1013	---	pF
C _{oss}	Output Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	107	---	
C _{rss}	Reverse Transfer Capacitance		---	76	---	
I _S	Continuous Source Current ^{1,5}		---	---	8	A
I _{SM}	Pulsed Source Current ^{2,5}	V _G =V _D =0V, Force Current	---	---	36	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	I _F =7A, dI/dt=100A/μs, T _J =25°C	---	10	---	nS
Q _{rr}	Reverse Recovery Charge		---	3.3	---	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}=25A
- 4.The power dissipation is limited by 150°C 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

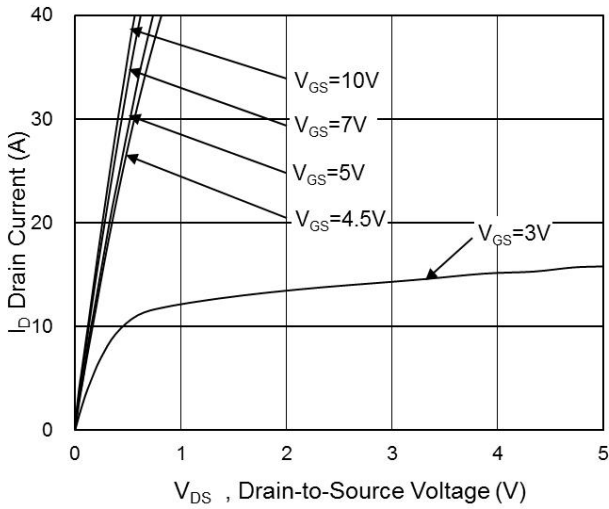


Fig.1 Typical Output Characteristics

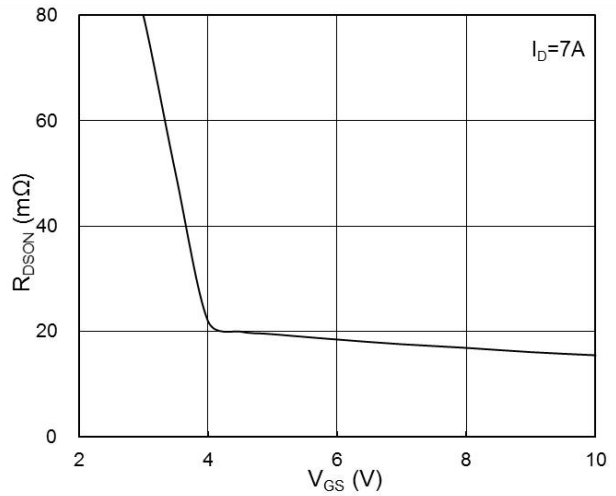


Fig.2 On-Resistance vs. G-S Voltage

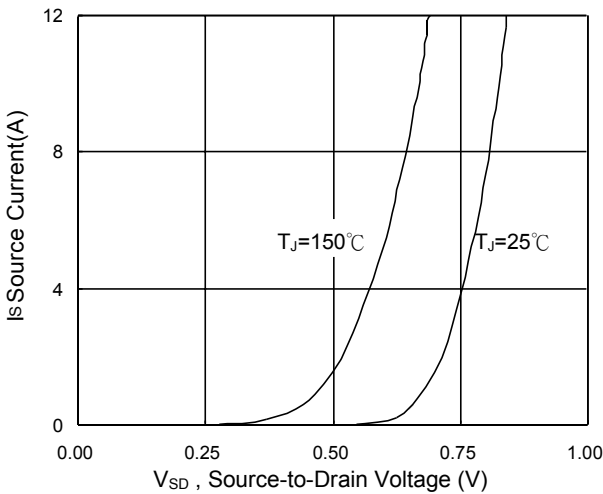


Fig.3 Forward Characteristics of Reverse

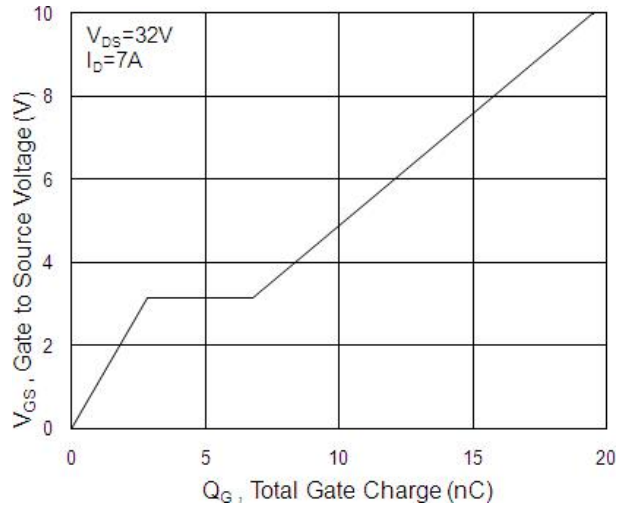


Fig.4 Gate-Charge Characteristics

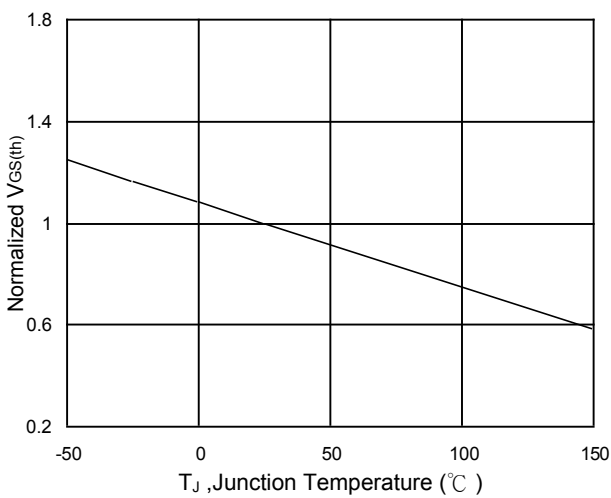


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

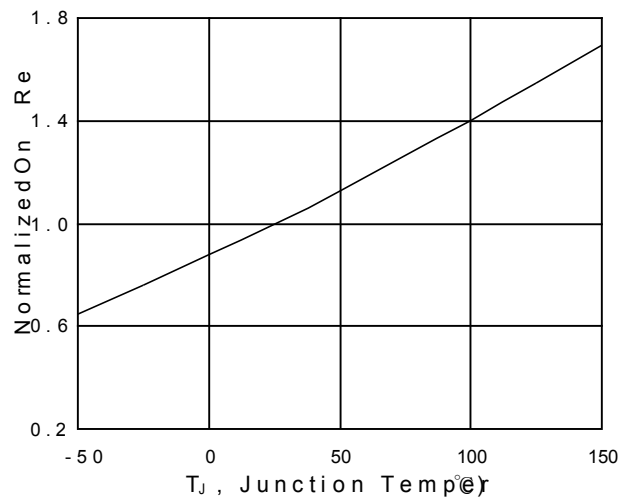


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

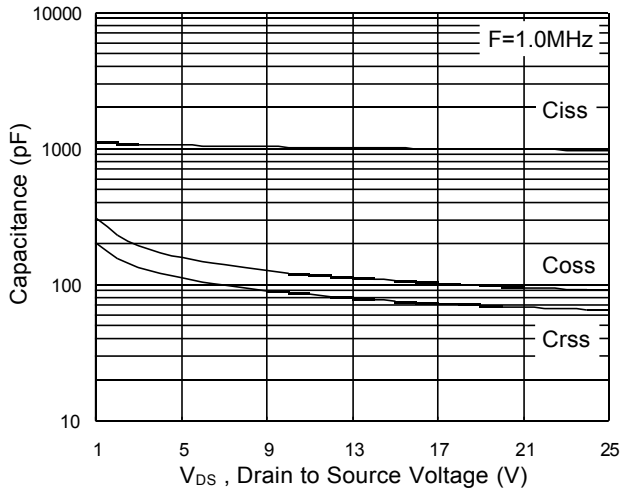


Fig.7 Capacitance

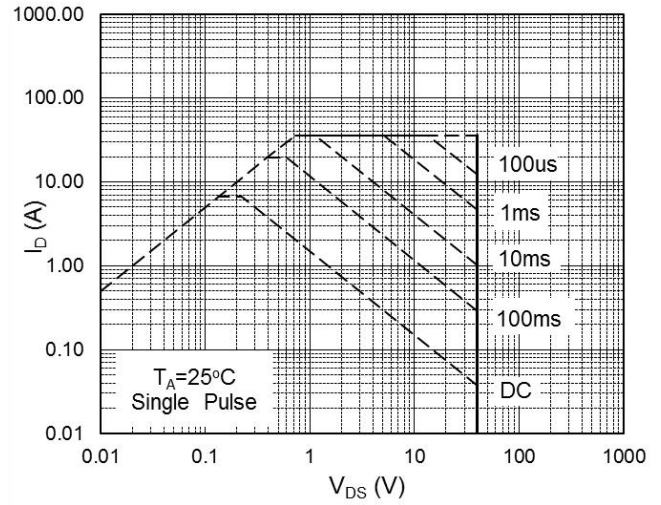


Fig.8 Safe Operating Area

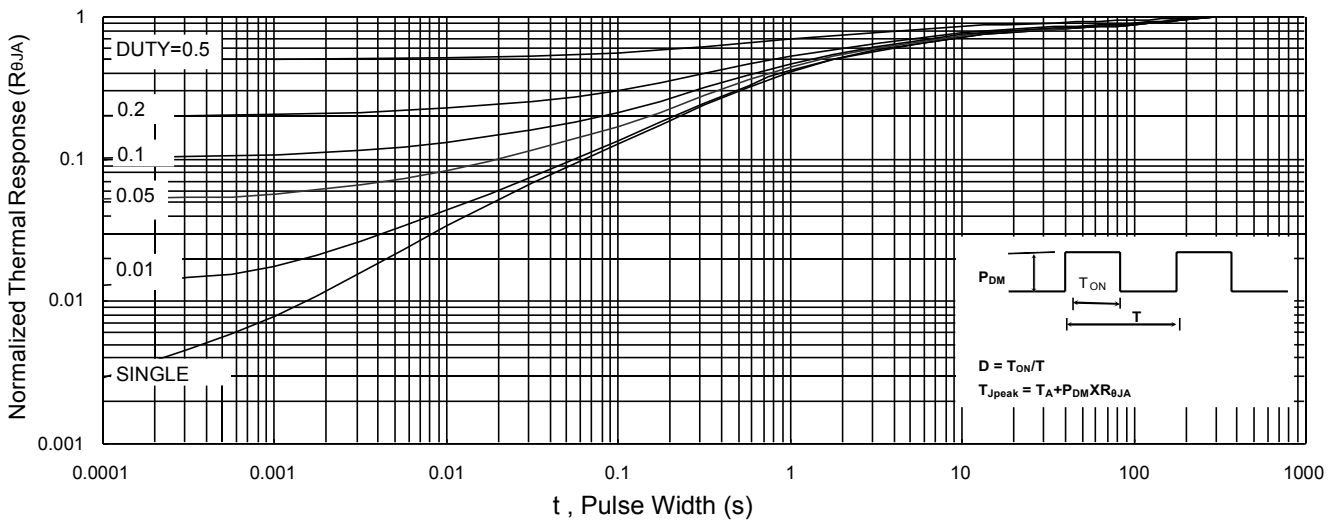


Fig.9 Normalized Maximum Transient Thermal Impedance

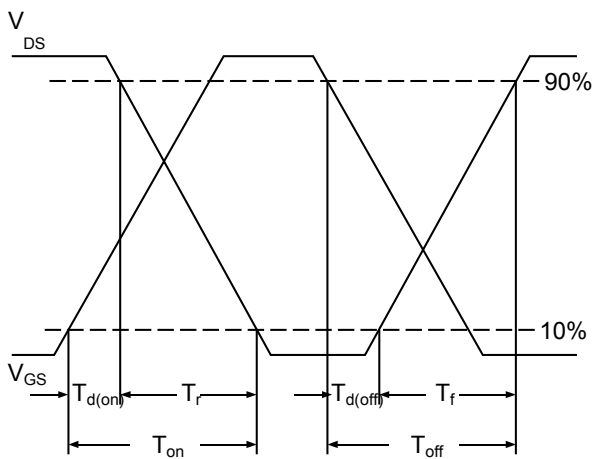


Fig.10 Switching Time Waveform

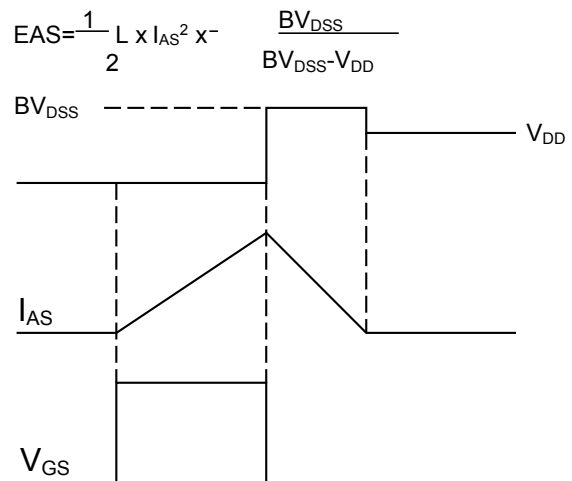
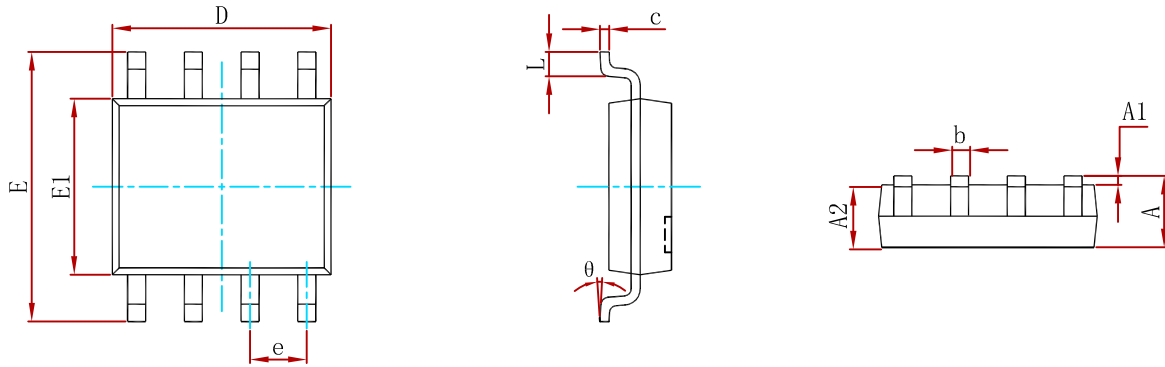


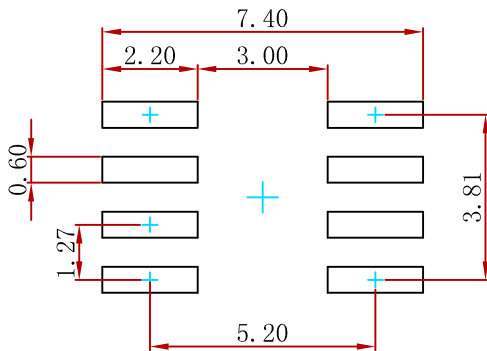
Fig.11 Unclamped Inductive Switching Waveform

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: ± 0.05mm.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
AO4882-MS	SOP-8	3000

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