AO4459

General Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

-30V,-6.5A, RDS(ON) =30mΩ@VGS = -10V

Fast switching

Green Device Available

Suit for -4.5V Gate Drive Applications

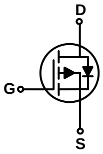
Applications

Notebook

Load Switch

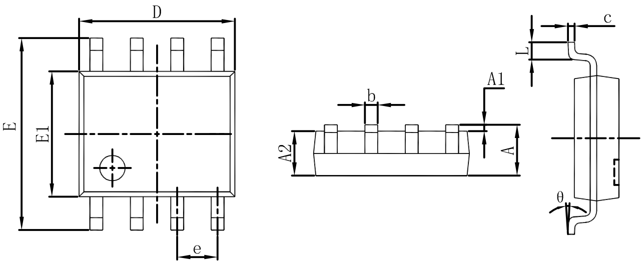
Battery Protection

Hand-held Instruments



BVDSS	RDSON	ID
-30V	30mΩ	-6.5A

SOP-8



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°

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25˚C)	-6.5	A
	Drain Current – Continuous (T_C=100˚C)	-5.5	A
I_{DM}	Drain Current – Pulsed[1]	-30	A
P_D	Power Dissipation (T_C=25˚C)	2.1	W
	Power Dissipation – Derate above 25˚C	0.017	W/˚C
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	60	˚C/W

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.03	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=125℃	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-6A	---	30	45	mΩ
		V_{GS}=-4.5V , I_D=-5A	---	50	70	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-1.6	-2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_D=-3A	---	3.5	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge[2,3]	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-3A	---	5.1	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	2	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-15V , V_{GS}=-10V , R_G=6Ω $_D$=-1A	---	3.4	---	ns
T_r	Rise Time[2,3]		---	10.8	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	26.9	---	
T_f	Fall Time[2,3]		---	6.9	---	
C_{iss}	Input Capacitance	V_{DS}=-10V , V_{GS}=0V , F=1MHz	---	1400	---	pF
C_{oss}	Output Capacitance		---	300	---	
C_{rss}	Reverse Transfer Capacitance		---	230	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-6.5	A
I_{SM}	Pulsed Source Current		---	---	-13	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

RATING AND CHARACTERISTIC CURVES (AO4459)

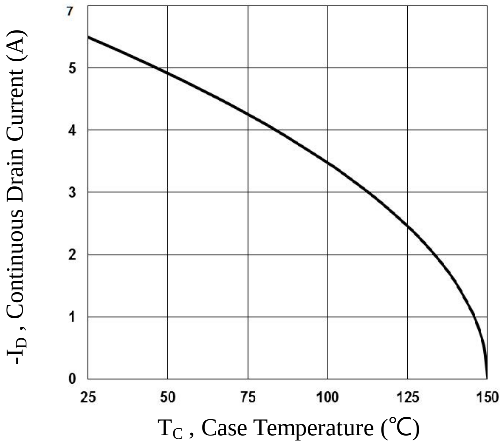

Fig.1 Continuous Drain Current vs. T_C

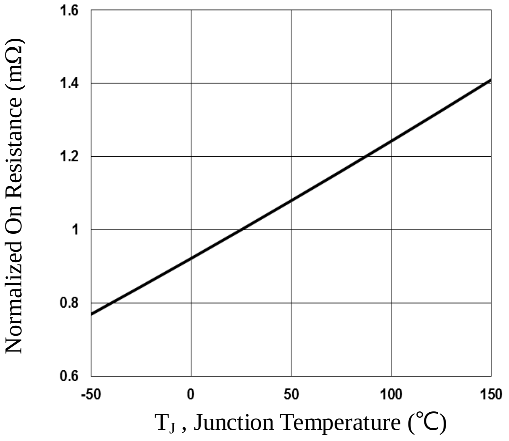

Fig.2 Normalized RDSON vs. T_J

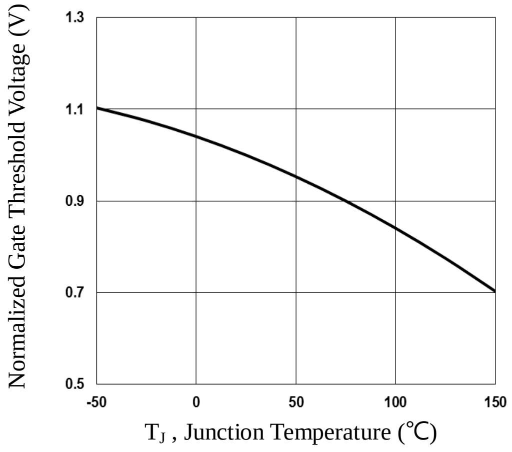

Fig.3 Normalized V_{th} vs. T_J

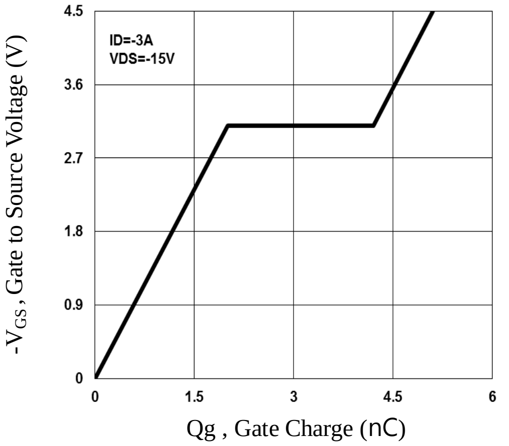

Fig.4 Gate Charge Waveform

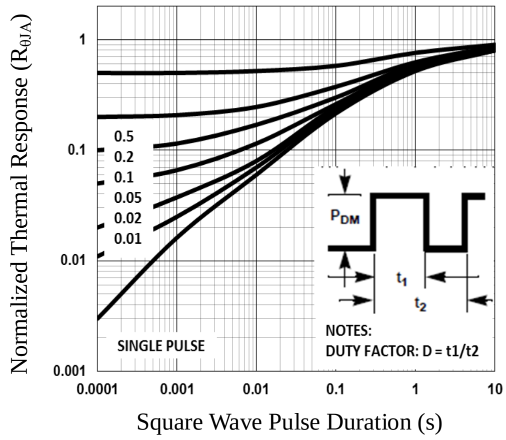

Fig.5 Normalized Transient Impedance

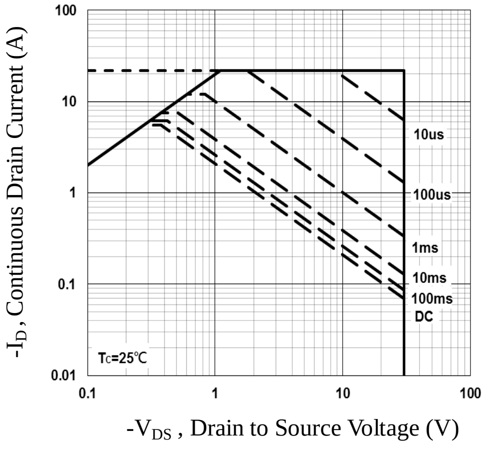

Fig.6 Maximum Safe Operation Area