AO3418

General Description

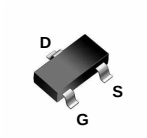
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

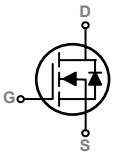
Features

30V,3.8A , RDS(ON)=45mΩ@VGS=10V
Improved dv/dt capability
Fast switching
Green Device Available

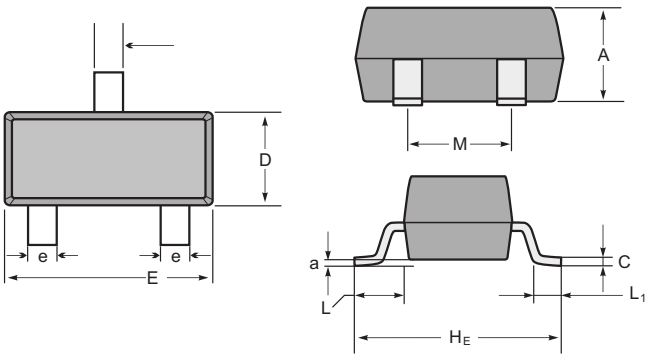
Applications

MB / VGA / Vcore
Load Switch
Hand-Held Instrument





BVDSS	RDSON	ID
30V	45mΩ	3.8A



SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous (T_A=25℃)	3.8	A
	Drain Current – Continuous (T_A=70℃)	3.0	A
I_{DM}	Drain Current – Pulsed[1]	12	A
P_D	Power Dissipation (T_A=25℃)	1.3	W
	Power Dissipation – Derate above 25℃	2.22	mW/℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	450	℃/W

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Electrical Characteristics (T_J=25 ˚C, 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˚C , I_D=1mA	---	0.018	---	V/˚C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25˚C	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125˚C	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=3A	---	45	55	mΩ
		V_{GS}=4.5V , I_D=2A	---	48	65	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.5	1.0	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.2	---	mV/˚C
gfs	Forward Transconductance	V_{DS}=10V , I_D=2A	---	2.3	---	S

Q_g	Total Gate Charge[2,3]	V_{DS}=24V , V_{GS}=10V , I_D=1A	---	3.1	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	0.1	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	1.7	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=24V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	2.2	---	ns
T_r	Rise Time[2,3]		---	6.9	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	15.2	---	
T_f	Fall Time[2,3]		---	4.5	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	250	---	pF
C_{oss}	Output Capacitance		---	40	---	
C_{rss}	Reverse Transfer Capacitance		---	20	---	

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	---	---	3.8	A
I_{SM}	Pulsed Source Current		---	---	7.6	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25˚C	---	---	1.2	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

RATING AND CHARACTERISTIC CURVES (AO3418)

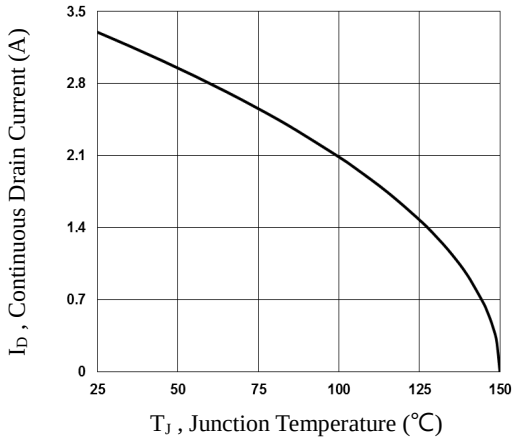

Fig.1 Continuous Drain Current vs. T_J

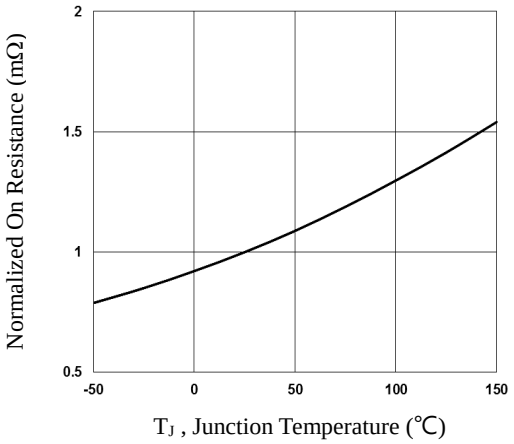

Fig.2 Normalized RDSON vs. T_J

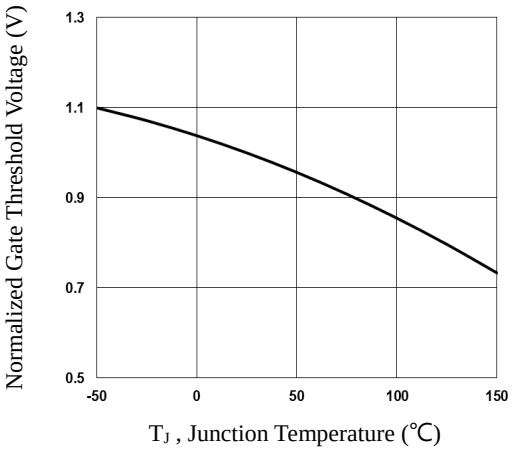

Fig.3 Normalized V_{th} vs. T_J

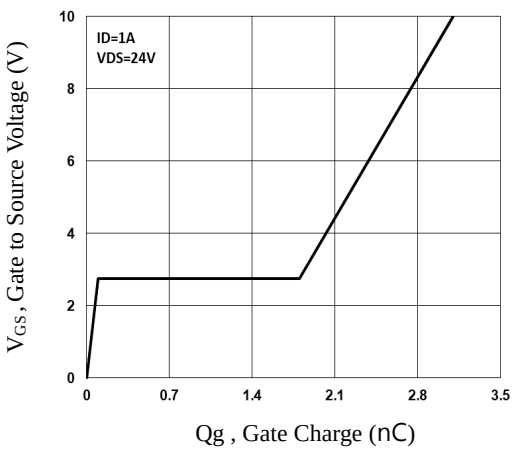

Fig.4 Gate Charge Waveform

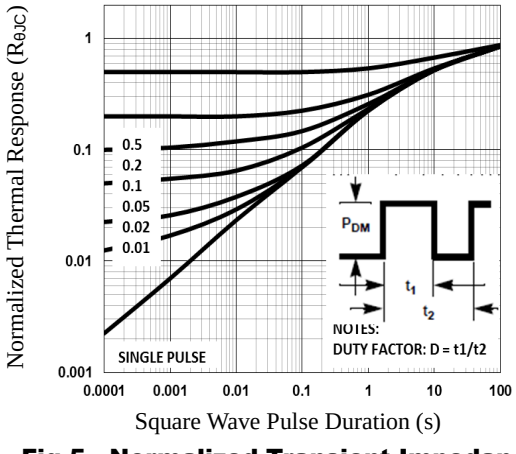

Fig.5 Normalized Transient Impedance

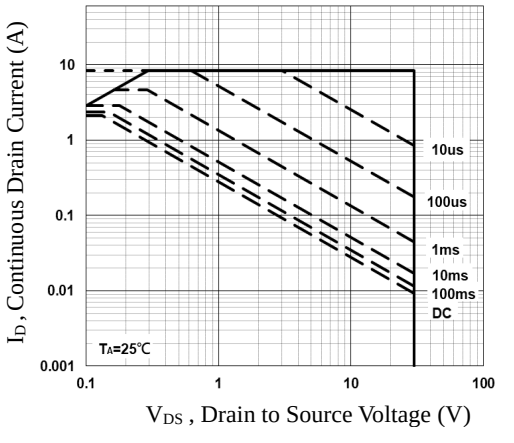

Fig.6 Maximum Safe Operation Area

RATING AND CHARACTERISTIC CURVES (AO3418)

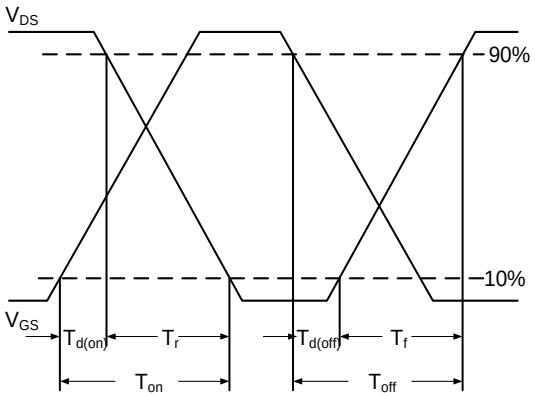

Fig.7 Switching Time Waveform

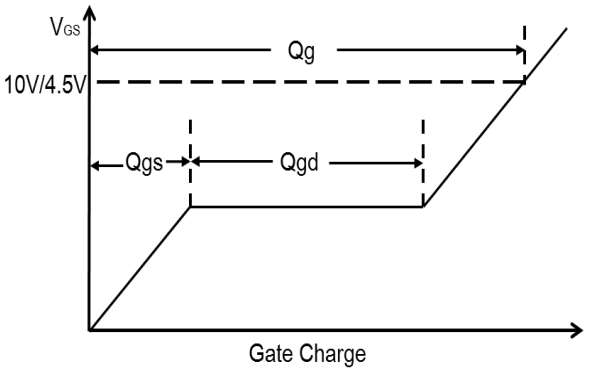

Fig.8 Gate Charge Waveform