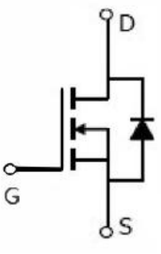
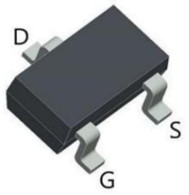
Description

The AO3400S combines advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a load switch or other general applications.



Schematic Diagram



SOT-23 Package

General Features

① V_{DS}= 30V, I_D= 5.1A
$R_{DS(ON)typ.}$ <24mΩ@V_{DS}=10V
$R_{DS(ON)typ.}$ <26mΩ@V_{DS}=4.5V
$R_{DS(ON)typ.}$ <33mΩ@V_{DS}=2.5V
② Low gate charge
③ High power and current handing capability
④ Termination is Lead-free and RoHS Compliant

Applications

① PWM applications
② Load switch
③ Power Management

ABSOLUTE RATINGS (at T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current	5.1	A
I_{DM}	Pulsed Drain CurrentB	20	A
P_D	Maximum Power DissipationA	1.3	W
T_J, T_{STG}	Junction and Storage Temperature Range	-55 To 150	℃

Thermal Characteristic

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	96	℃/W

Electrical Characteristics (T_A=25℃ 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
$V_{th(GS)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	0.7	0.9	1.2	V
I_{GSS}	Gate-body Leakage	V_{DS}=0V, V_{GS}=±12V	--	--	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	--	--	-1	uA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=5A	--	24	33	mΩ
		V_{GS}=4.5V, I_D=4A	--	26	39	mΩ
		V_{GS}=2.5V, I_D=3A	--	33	35	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=5A	10	--	--	s
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	--	595	--	pF
C_{oss}	Output Capacitance		--	39	--	
C_{rss}	Reverse Transfer Capacitance		--	36	--	
Switching Capacitance						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}= 15V, R_L=3Ω V_{GS}= 10V, R_{GEN}=3Ω	--	3.0	--	nS
t_r	Turn-on Rise Time		--	4.5	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	25	--	nS
t_f	Turn-off Fall Time		--	3.8	--	nS
Q_g	Total Gate Charge	V_{DS}= 15V,I_D=5A, V_{GS}=4.5V	--	9.3	--	nC
Q_{gs}	Gate-Source Charge		--	1.6	--	nC
Q_{gd}	Gate-Drain Charge		--	2.7	--	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS} =0V, I_D=5A	--	--	1.2	V
I_s	Diode Forward Current		--	--	5.1	A

Notes:

A.The Power dissipation PD is based on $T_{J(MAX)}$=150℃, using≤10s junction-to ambient thermal resistance.
B.Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.Ratings are based on low frequency and duty cycles to keep initial T_J=25℃.
C.The Static characteristics in Figures are obtained using <300μs pulses, duty cycle 2% max.

Typical Electrical and Thermal Characteristics

Figure 1: On-region Characteristics

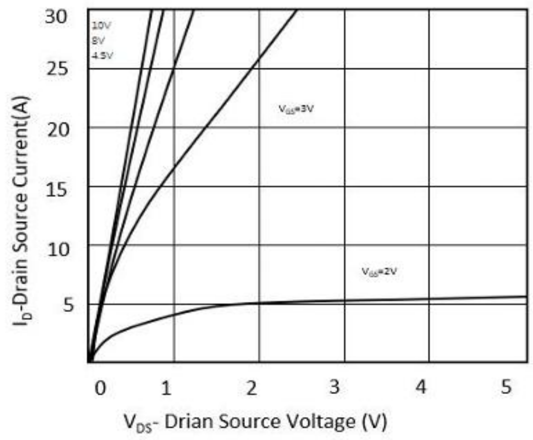


Figure 2: Transfer Characteristics

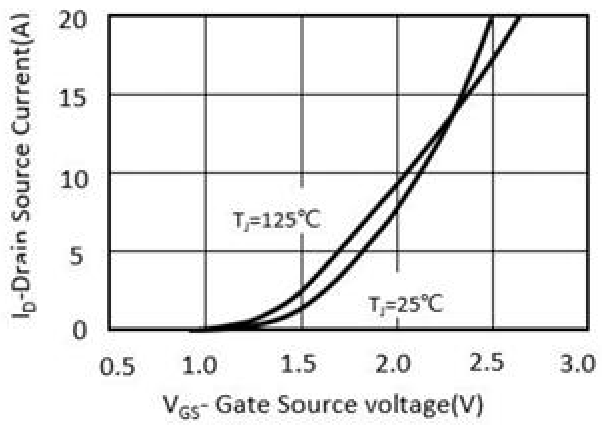


Figure 3: Drain-Source On-Resistance

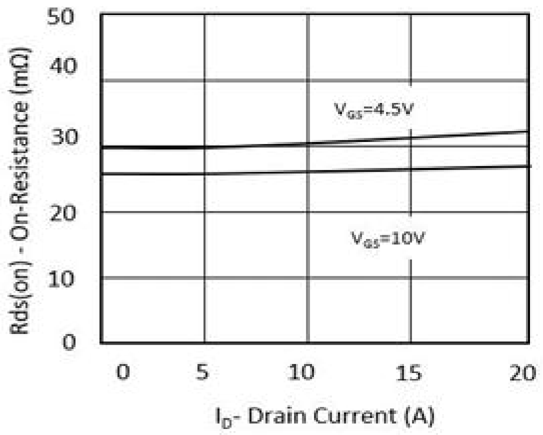


Figure 4: On-Resistance vs. Junction Temperature

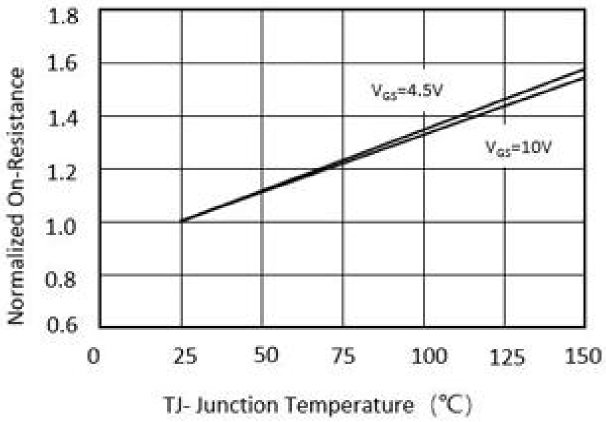


Figure 5: On-Resistance vs. Gate-Source Voltage

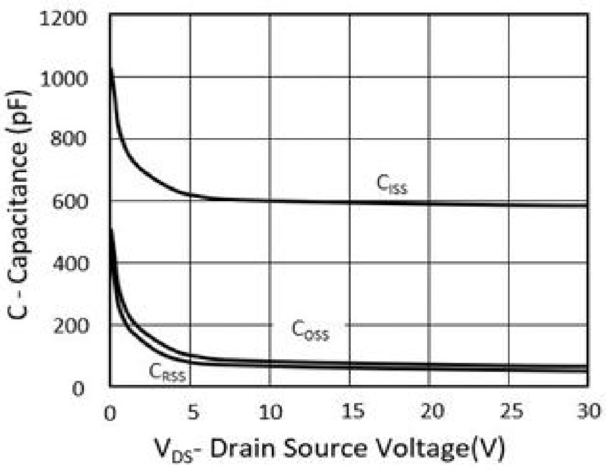


Figure 6: Body-Diode Characteristics

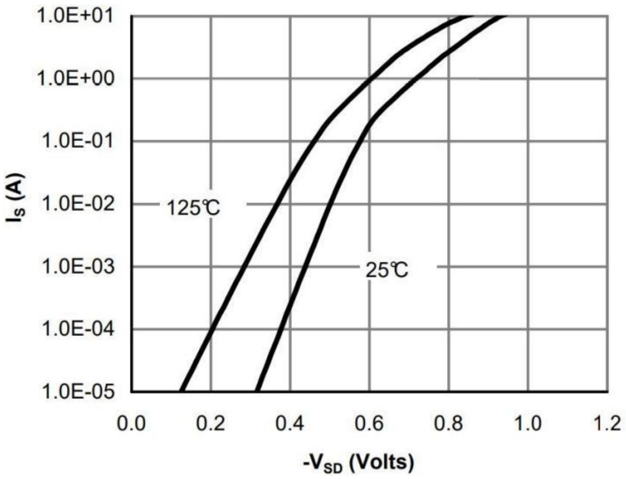


Figure 7: Gate-Charge Characteristics

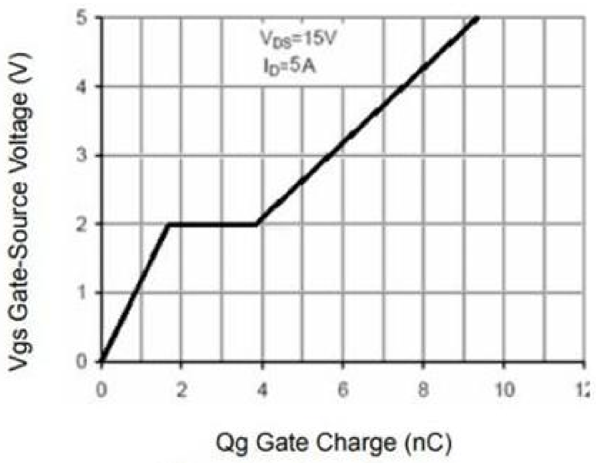


Figure 8: Capacitance Characteristics

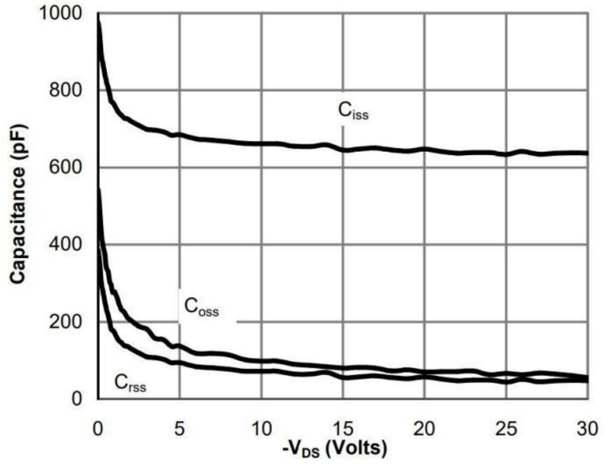


Figure 9: Power Dissipation

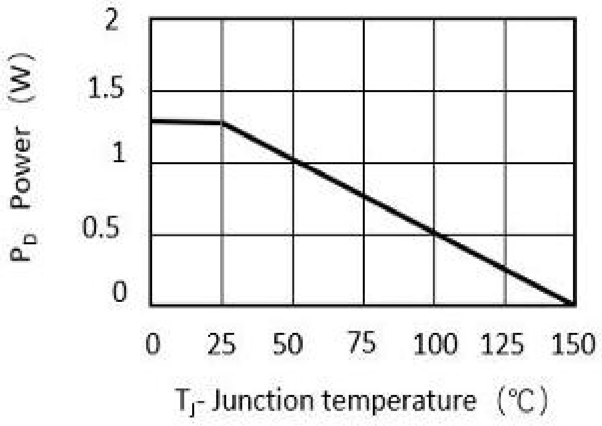


Figure 10: Drain Current

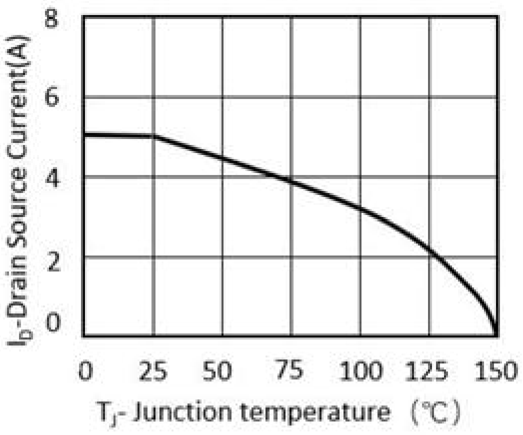


Figure 11: Switching Test Circuit

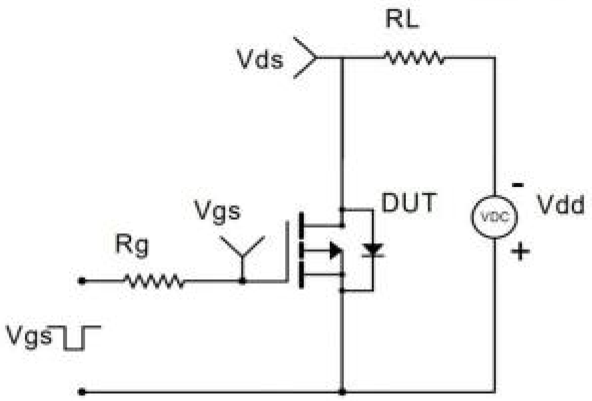


Figure 12: Switching Waveform

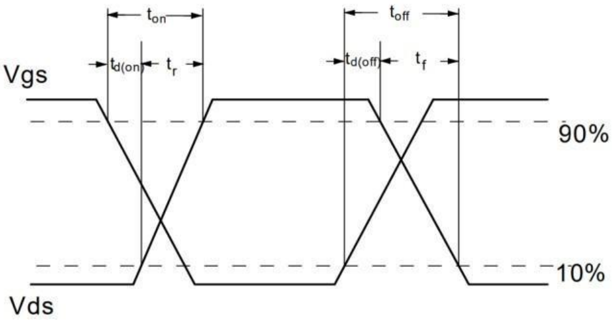


Figure 13: Safe Operation Area

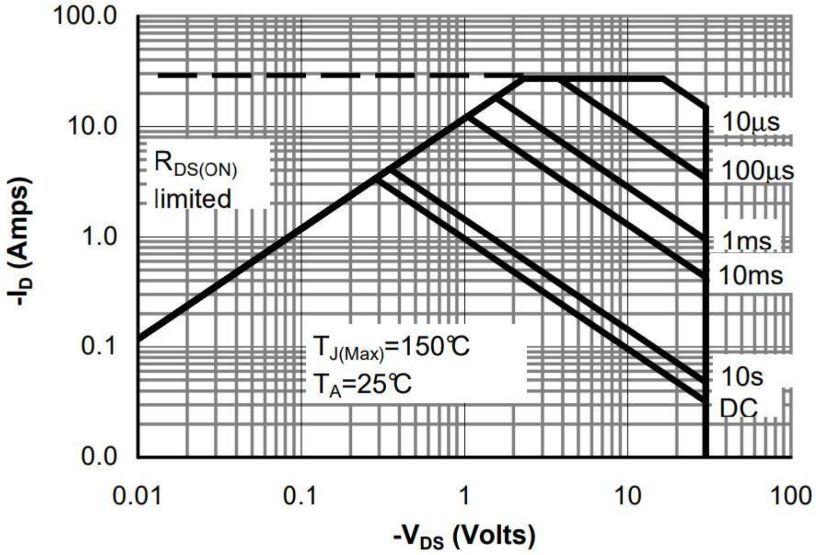
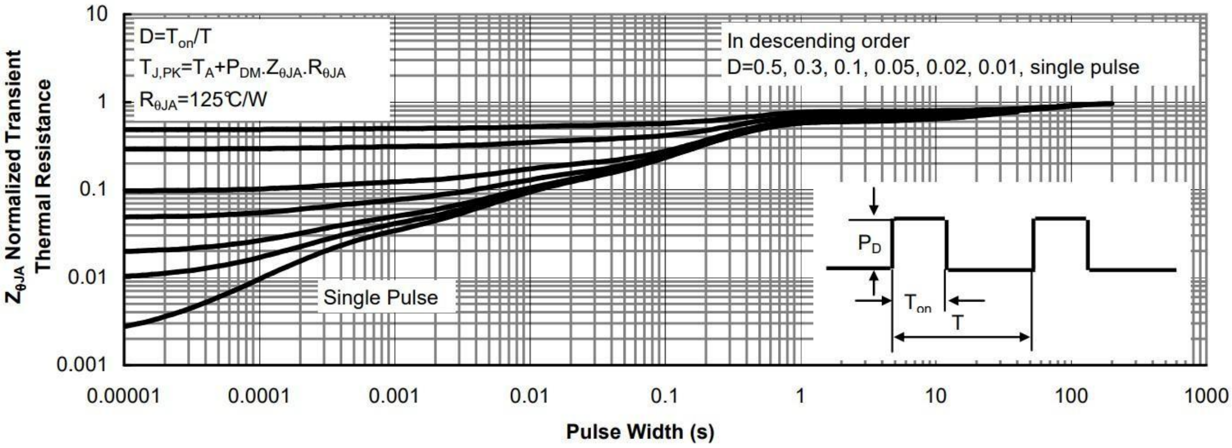
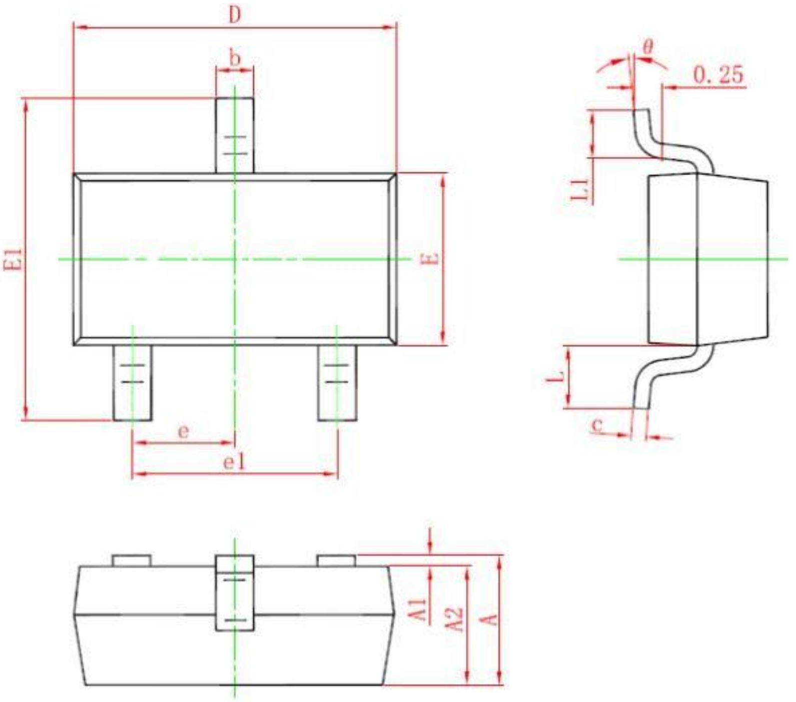


Figure 14: Normalized Maximum transient Thermal Impedance



SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change withoutprior notice.

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