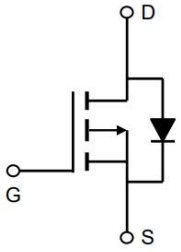
迈诺斯科技

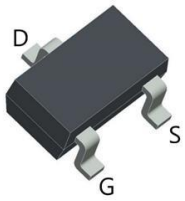
AO3401S

Description

The AO3401S combines advanced trench technology to provide excellent RDS(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



SOT23 Package

Features

① VDS= -30V, ID= -4.2A
RDS(ON)typ. =45mΩ@VDS=-10V
RDS(ON)typ. =51mΩ@VDS=-4.5V
RDS(ON)typ. =65mΩ@VDS=-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

Maximum Ratings(TA=25℃ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	-4.2	A
Pulsed Drain CurrentB	I_{DM}	-20	A
Maximum Power DissipationA	P_D	1.2	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	104	℃/W

Electrical Characteristics (TA=25℃unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-30			V
Gate-Threshold Voltage	$V_{th(GS)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.7	-9	-1.3	V
Gate-body Leakage	IGSS	V_{DS}=0V, V_{GS}=±10V			±100	nA
Zero Gate Voltage Drain Current	IDSS	V_{DS}=-24V, V_{GS}=0V			-1	uA
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.2A		45	55	mΩ
		V_{GS}=-4.5V, I_D=-4A		51	68	mΩ
		V_{GS}=-2.5V, I_D=-1A		65	88	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-4.2A		10		s
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz		880		pF
Output Capacitance	C_{oss}			105		
Reverse Transfer Capacitance	C_{rss}			65		
Switching Capacitance						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -15V, I_D=-4.2A V_{GS}= -10V, R_{GEN}=6Ω		7		nS
Turn-on Rise Time	t_r			3		nS
Turn-off Delay Time	$t_{d(off)}$			30		nS
Turn-off Fall Time	t_f			12		nS
Total Gate Charge	Q_g	V_{DS}= -15V, I_D=-4.2A, V_{GS}=-4.5V		8.5		nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			2.7		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} =0V, I_D=-4.2A			-1.2	V
Diode Forward Current	I_s				-4.2	A

Notes:

A.The Power dissipation PD is based on TJ(MAX)=150℃, using≤10s junction-to ambient thermal resistance.
B.Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150℃.Ratings are based on low frequency and duty cycles to keep initial TJ=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

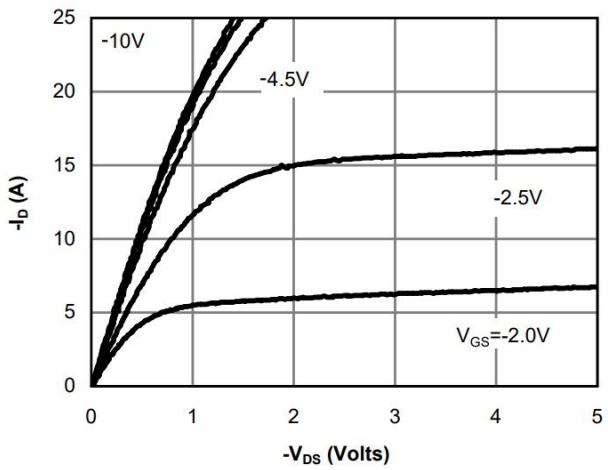


Figure 2: Transfer Characteristics

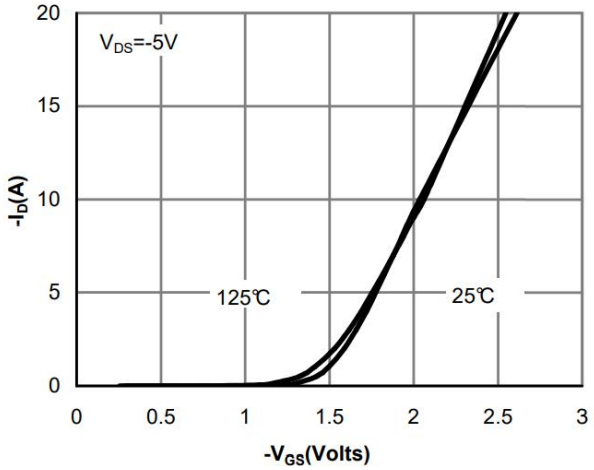


Figure 3: Drain-Source On-Resistance

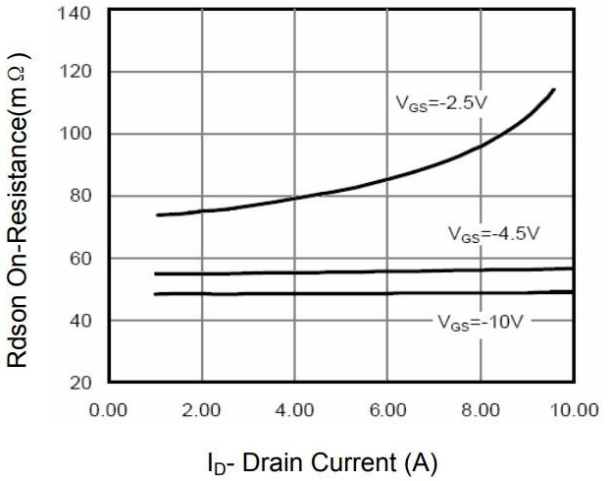


Figure 4: On-Resistance vs. Junction Temperature

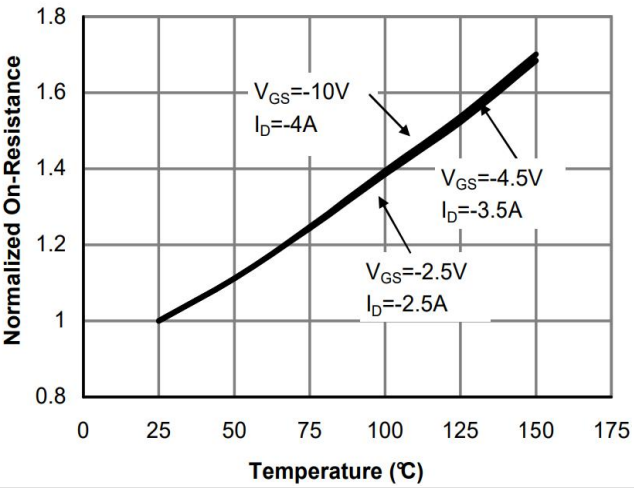


Figure 5: On-Resistance vs. Gate-Source Voltage

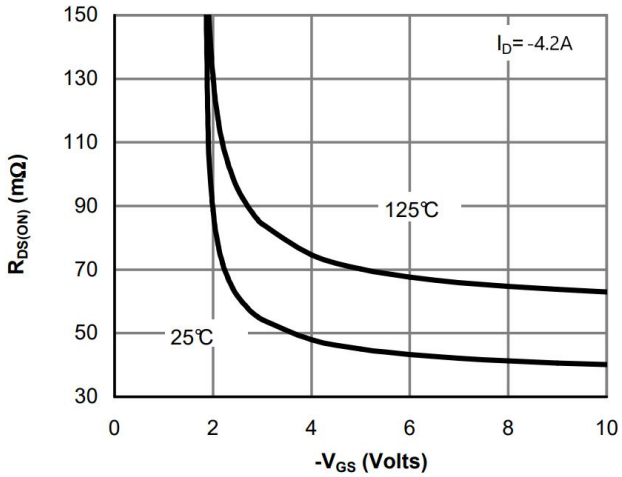


Figure 6: Body-Diode Characteristics

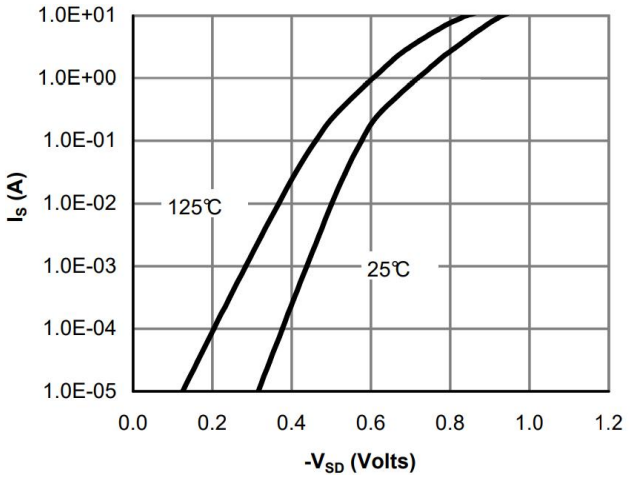


Figure 7: Gate-Charge Characteristics

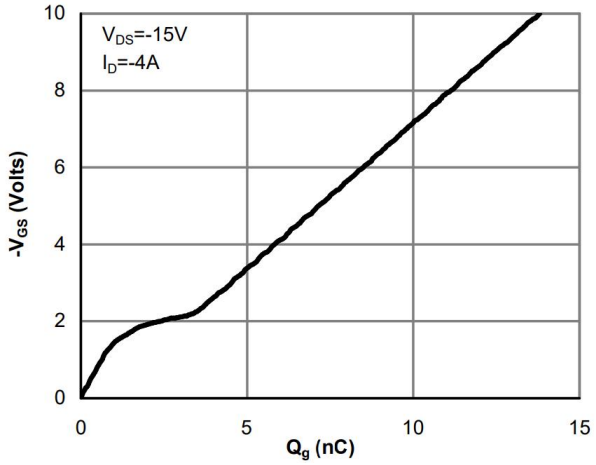


Figure 8: Capacitance Characteristics

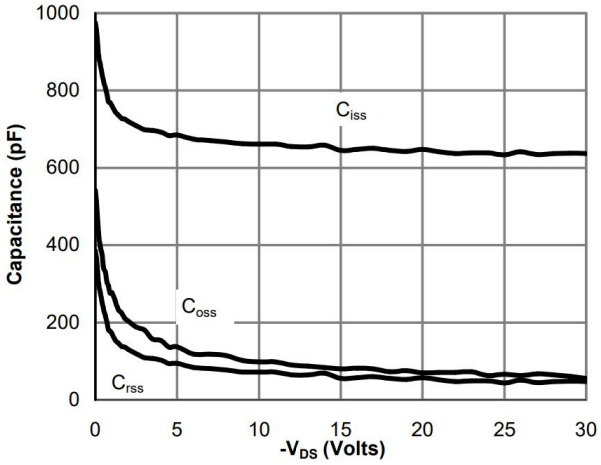


Figure 9: Power Dissipation

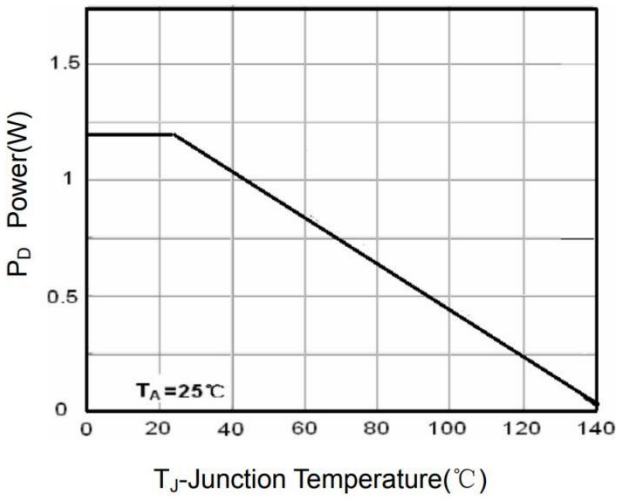


Figure 10: Drain Current

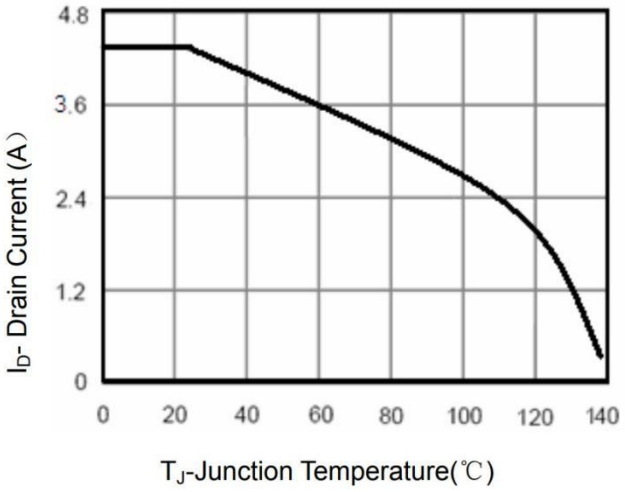


Figure 11: Switching Test Circuit

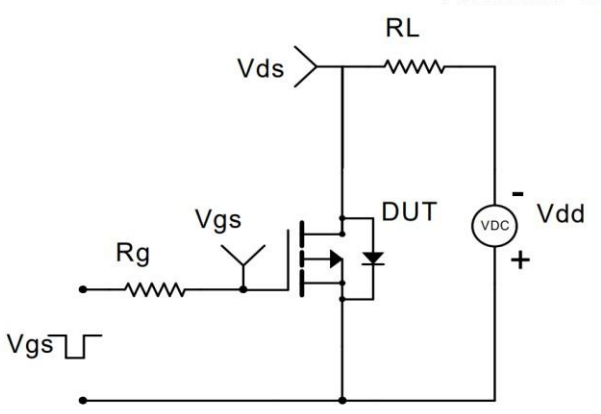


Figure 12: Switching Waveform

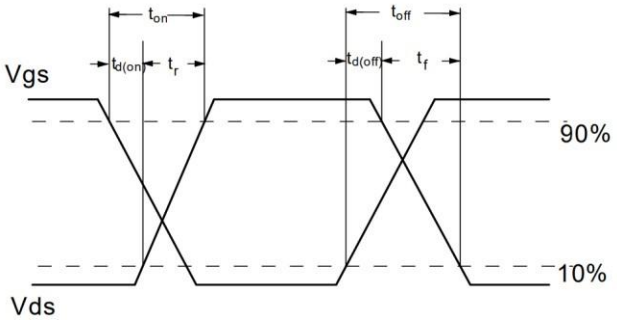


Figure 13: Safe Operation Area

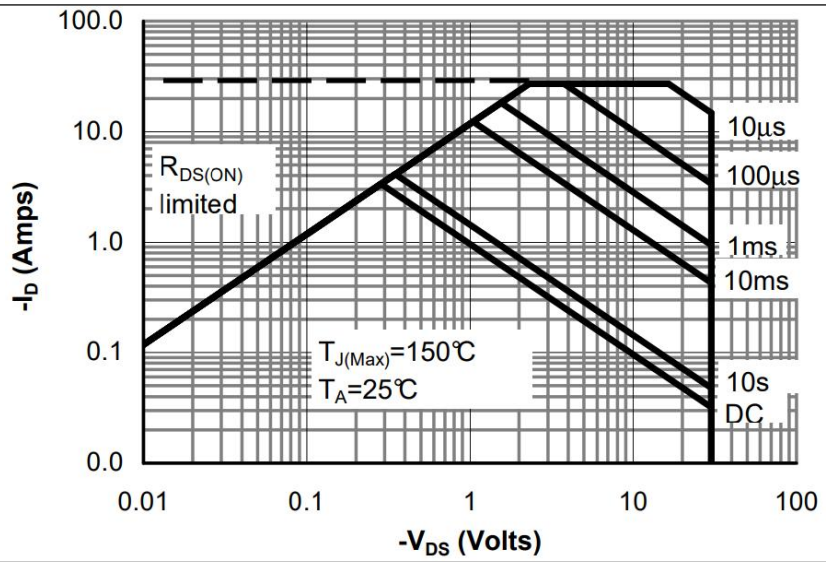
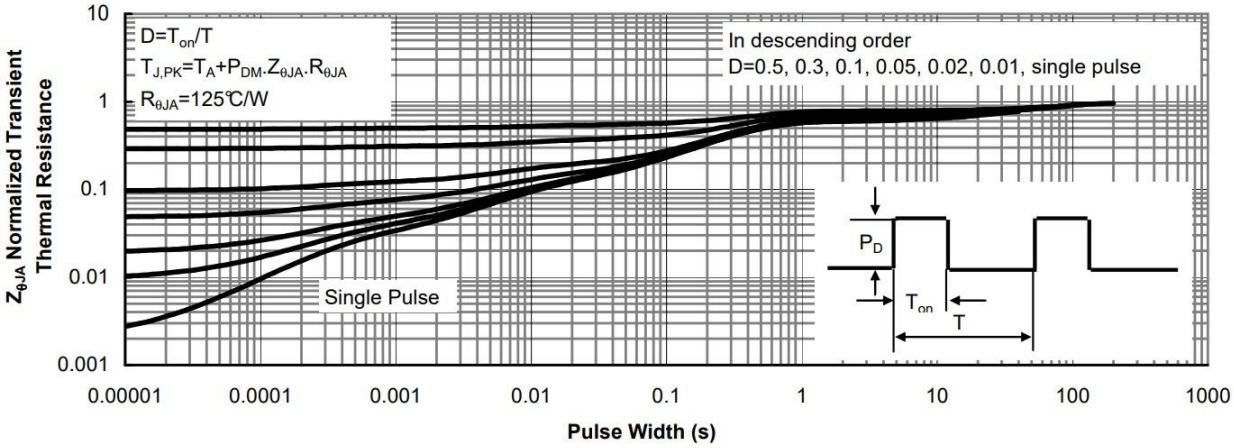
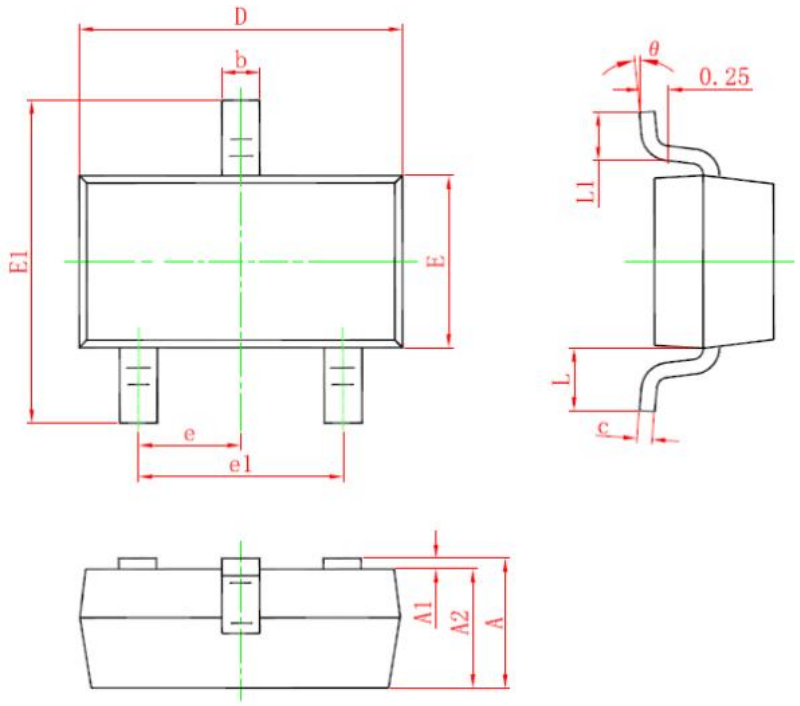


Figure 14: Normalized Maximum transient Thermal Impedance



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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