

SuperMOS –SOT-23 30V BV_{DSS} , 40m Ω $R_{DS(ON)}$, I_D N-channel MOSFET

1. Description

The AO3402A-ES is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AO3402A-ES is Pb-free.

2. Features

- 30V, $R_{DS(ON)}$ =40m Ω (Typ.) @ V_{GS} =10V
- $R_{DS(ON)}$ =43m Ω (Typ.) @ V_{GS} =4.5V
- $R_{DS(ON)}$ =55m Ω (Typ.) @ V_{GS} =2.5V
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current


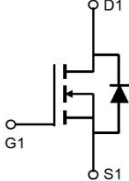
3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per Reel	Flammability Rating	Reel Sizes
AO3402A-ES	SOT-23	3402	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	BV_{DSS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	4.2
		$T_A=75^\circ\text{C}$	3.3
Maximum Power Dissipation	P_D	1.4	W
Pulsed Drain Current	I_{DM}	15.6	A
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Lead Temperature	T_L	260	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal resistance ratings

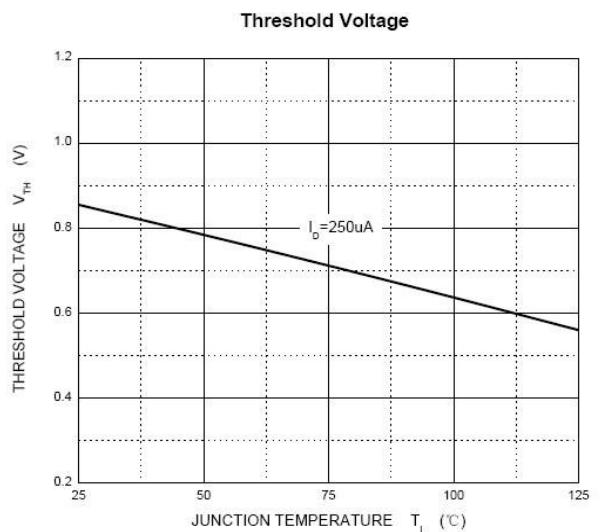
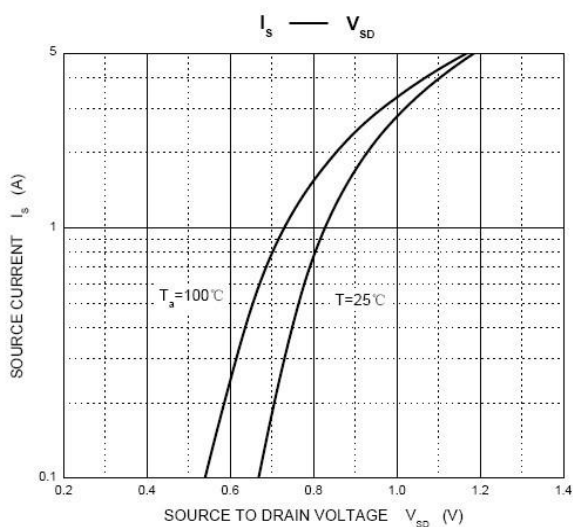
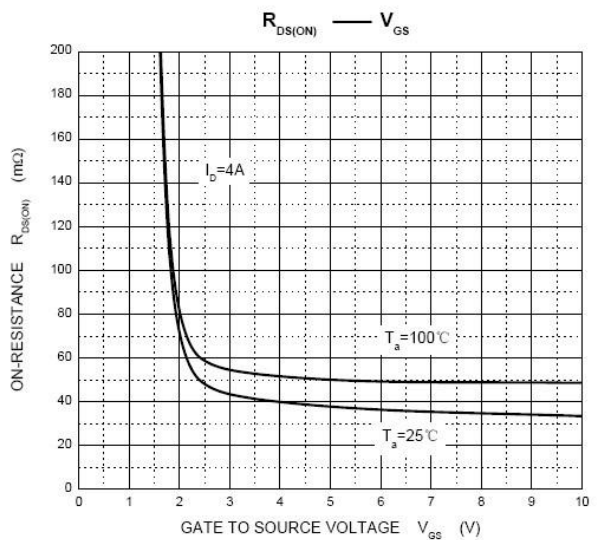
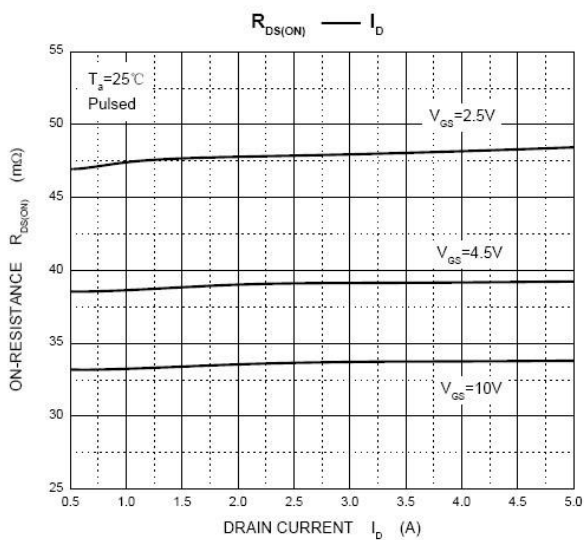
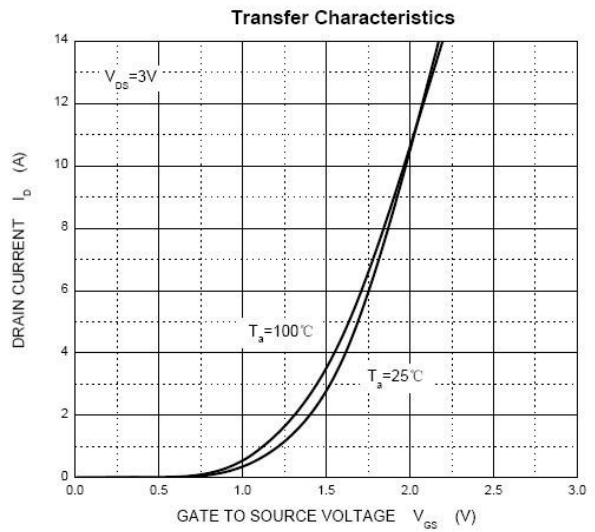
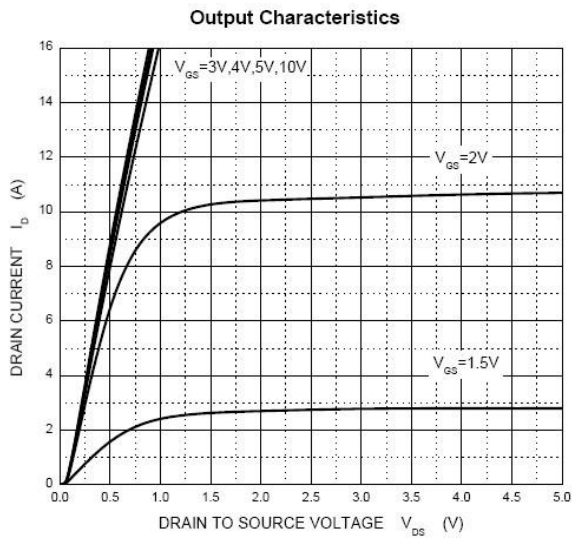
Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$		90	$^\circ\text{C/W}$

Electrical Characteristics

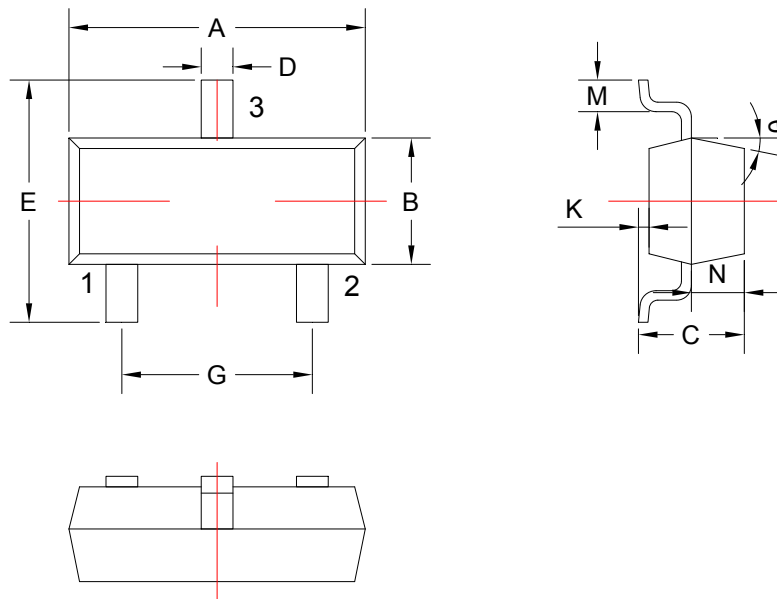
At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.6	0.9	1.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.6A$		40	51	m Ω
		$V_{GS}=4.5V, I_D=2A$		43	54	
		$V_{GS}=2.5V, I_D=1A$		55	69	
Forward transconductance	g_{fs}	$V_{DS}=5V, I_D=3.6A$			40	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS}=0V, f=1MHz,$ $V_{DS}=15V$		390		pF
Output Capacitance	C_{OSS}			55		
Reverse Transfer Capacitance	C_{RSS}			41		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=3.6A$		4.4		nC
Gate-to-Source Charge	Q_{GS}			0.6		
Gate-to-Drain Charge	Q_{GD}			1.4		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V,$ $RL=3.5\Omega, R_G=6\Omega$		3.3		ns
Rise Time	t_r			1		
Turn-Off Delay Time	$t_{d(OFF)}$			21.7		
Fall Time	t_f			2.1		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=3.6A$			1.5	V

7. Typical Characteristic



8. Dimension (SOT-23)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	2.85	3.04	G	1.80	2.00
B	1.20	1.40	K	0	0.10
C	0.90	1.10	M	0.20	-
D	0.40	0.50	N	0.50	0.70
E	2.25	2.55	θ	5°	9°

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