

SuperMOS –SOT-23 20V BV_{DSS}, 13mΩ R_{DS(ON)}, N-channel MOSFET

1. Description

The AO3416 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 AO3416 is Pb-free.

2. Features

- 20V, R_{DS(ON)}=13mΩ(Typ.) @V_{GS}=4.5V
R_{DS(ON)}=16mΩ(Typ.) @V_{GS}=2.5V
- Use trench MOSFET technology
- High density cell design for low R_{DS(on)}
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

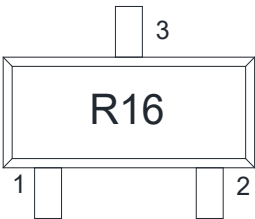
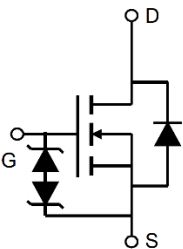
3. Applications

- 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 Size
AO3416	SOT-23	R16	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}	20	V
Gate-Source Voltage		V _{GS}	±10	V
Continuous Drain Current	T _A =25°C	I _D	7.5	A
	T _A =75°C		5.8	
Maximum Power Dissipation	T _A =25°C	P _D	1.39	W
	T _A =75°C		0.83	
Pulsed Drain Current		I _{DM}	30	A
Operating Junction Temperature		T _J	150	°C
Lead Temperature		T _L	260	°C
Storage Temperature Range		T _{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance	R _{θJA}	70	90	°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 =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	0.5	0.7	0.9	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6.5A		13	17	mΩ
		V _{GS} =2.5V, I _D =5.5A		16	23	mΩ
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =6.5A			40	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, f=1MHz, V _{DS} =10V		1300		pF
Output Capacitance	C _{OSS}			160		
Reverse Transfer Capacitance	C _{RSS}			88		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =4.5V, V _{DS} =10V, I _D =7.5A		10		nC
Gate-to-Source Charge	Q _{GS}			4.5		
Gate-to-Drain Charge	Q _{GD}			2.5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =4.5V, V _{DS} =10V, RL=1.5Ω, RG=3Ω		280		ns
Rise Time	t _r			330		
Turn-Off Delay Time	t _{d(OFF)}			4		
Fall Time	t _f			2.5		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =6.5A			1.5	V

7. Typical Characteristic

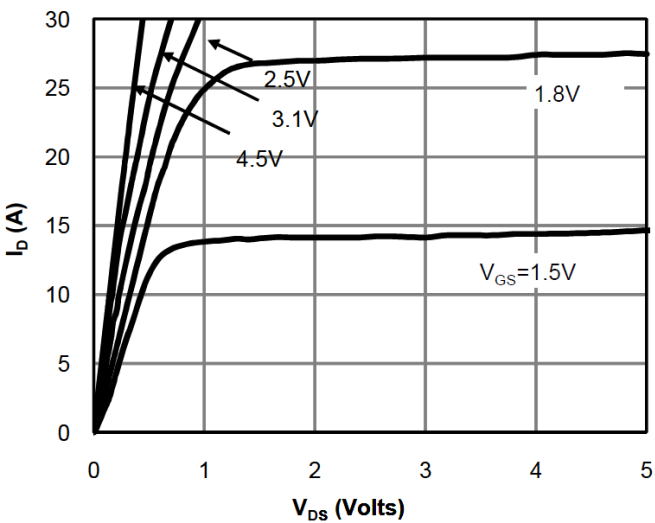


Fig 1: On-Region Characteristics

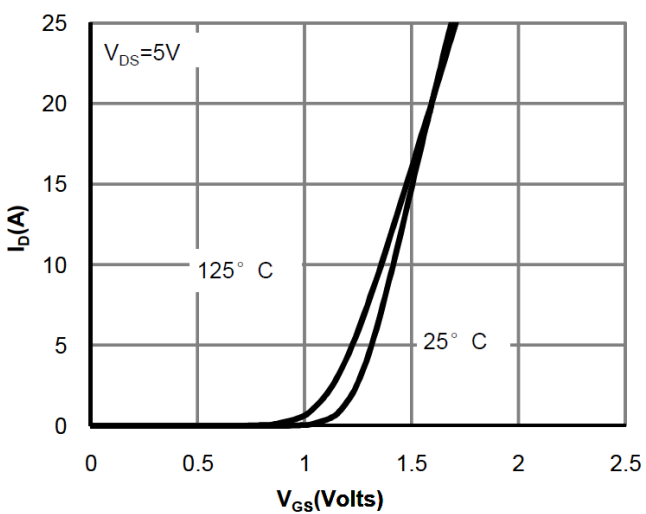


Figure 2: Transfer Characteristics

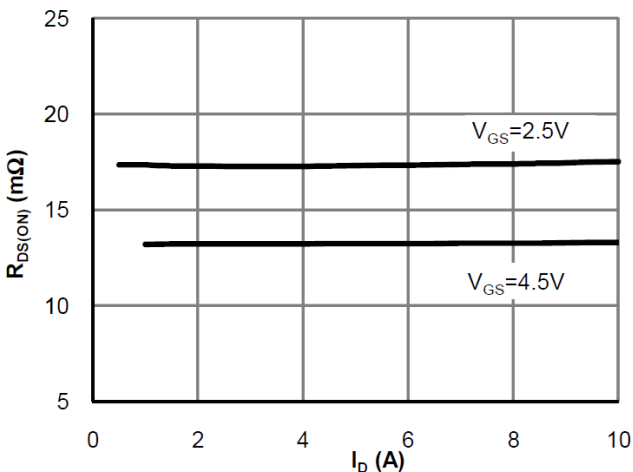


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

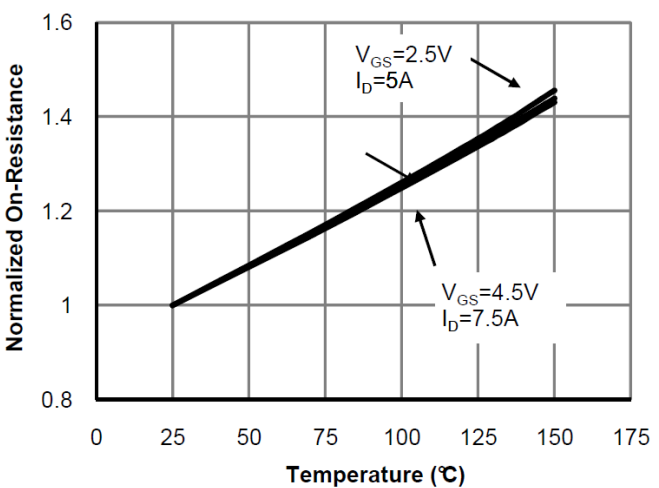


Figure 4: On-Resistance vs. Junction Temperature

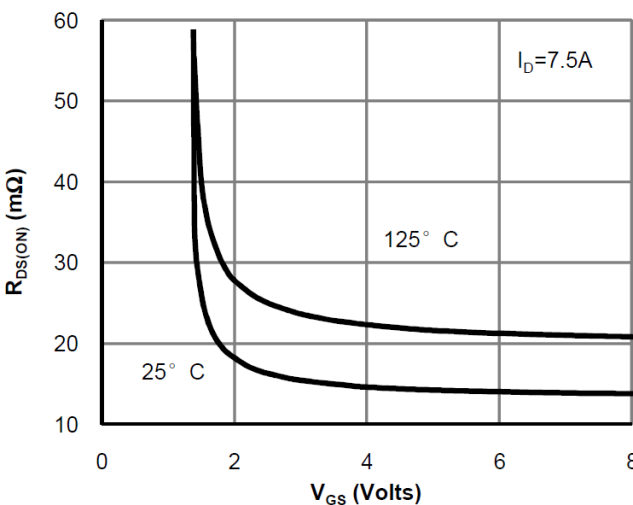


Figure 5: On-Resistance vs. Gate-Source Voltage

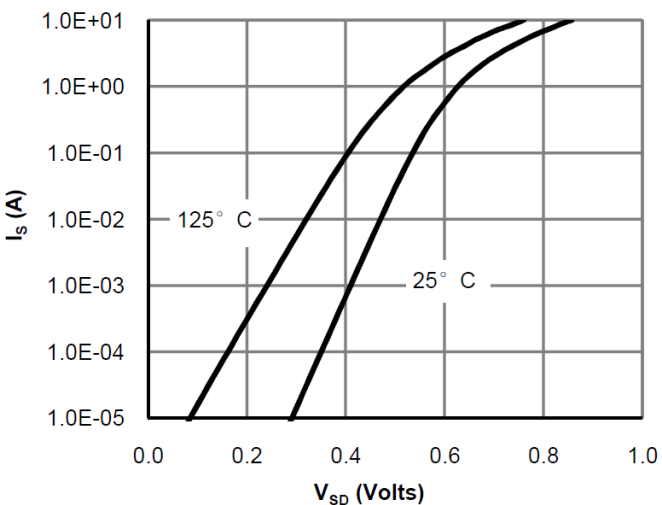
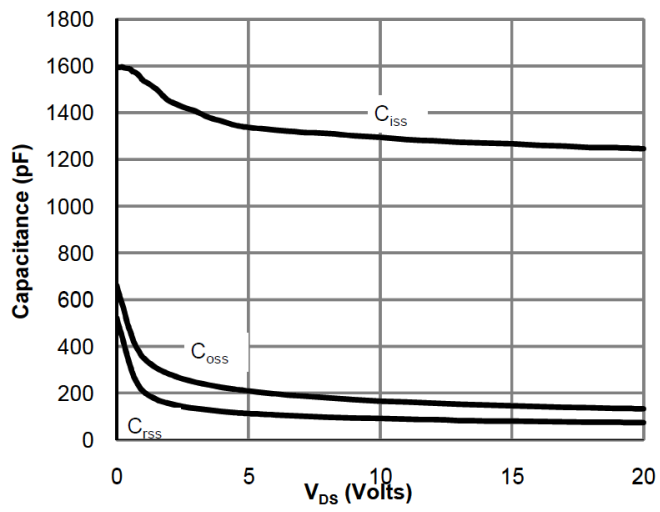
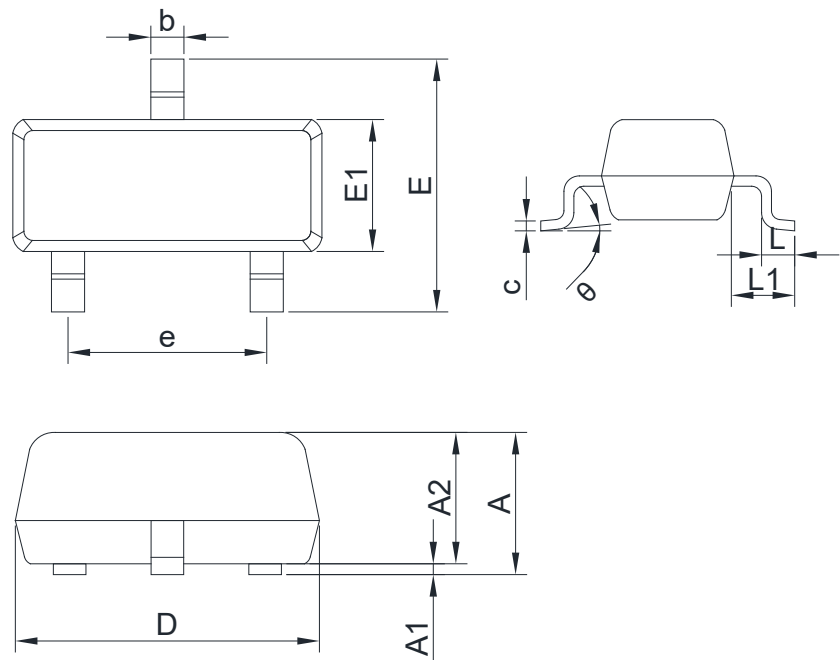


Figure 6: Body-Diode Characteristics

**Figure 7: Capacitance Characteristics**

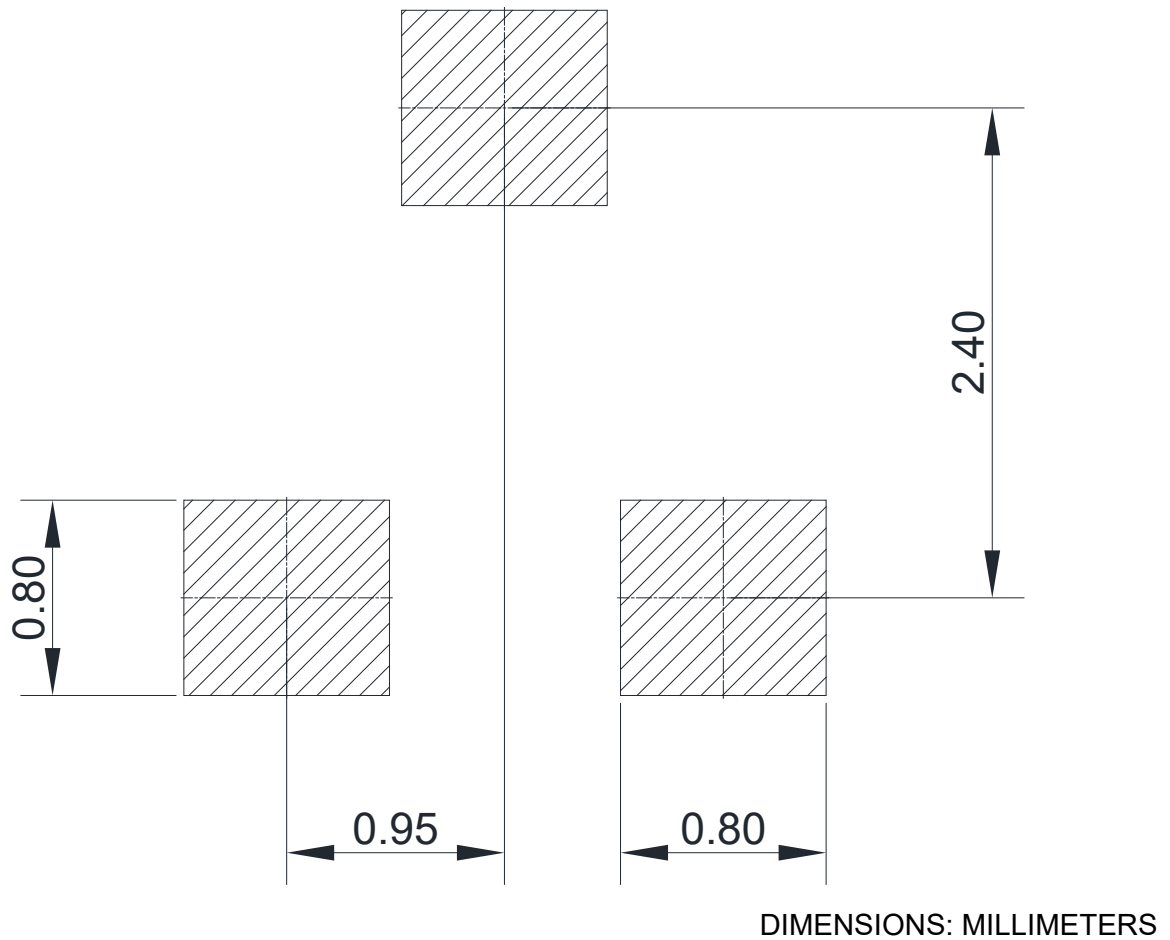
8. Dimension (SOT-23)

POD(Z)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.90	1.20	E	2.25	2.55
A1	0.00	0.10	E1	1.20	1.40
A2	0.90	1.10	e	1.80	2.00
b	0.30	0.50	L	0.30	0.50
c	0.07	0.18	L1	0.475	0.625
D	2.80	3.04	θ	0°	8°

9. Recommended Soldering Footprint



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