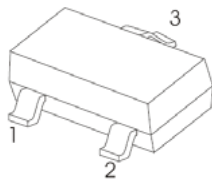


### FEATURE

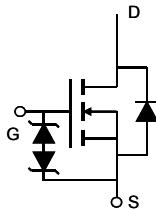
- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

### SOT-23



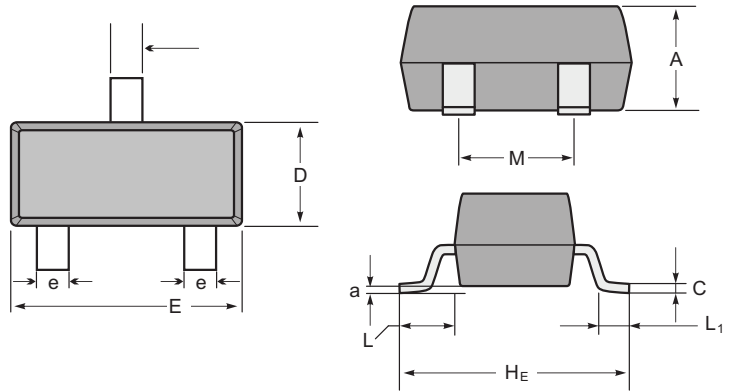
1. GATE
2. SOURCE
3. DRAIN

### Equivalent circuit



### Marking

Type number	Marking code
AO3416	3416



SOT-23 mechanical data

UNIT		A	C	D	E	H <sub>E</sub>	e	M	L	L <sub>1</sub>	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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current	$I_D$	$T_a=25^\circ\text{C}$	A
		$T_a=70^\circ\text{C}$	
Pulsed Drain Current	$I_{DM}$	30	
Power Dissipation	$P_D$	$T_a=25^\circ\text{C}$	W
		$T_a=70^\circ\text{C}$	
Thermal Resistance.Junction- to-Ambient $t \leq 10\text{sec}$ Steady State	$R_{thJA}$	90	$^\circ\text{C/W}$
		125	
Thermal Resistance.Junction-to-Foot	$R_{thJF}$	80	
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

# AO3416

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>BSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, Ta=70°C			5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	0.4		1.1	V
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> =5 V, V <sub>GS</sub> = 4.5 V	30			A
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.5A			22	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.5A T <sub>J</sub> =125°C			30	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.5A			26	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =5A			34	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =6.5A		50		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz		1295	1650	pF
Output Capacitance	C <sub>oss</sub>			160		
Reverse Transfer Capacitance	C <sub>rss</sub>			87		
Gate Resistance	R <sub>g</sub>		V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.8	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =6.5A		10		nC
Gate Source Charge	Q <sub>gs</sub>			4.2		
Gate Drain Charge	Q <sub>gd</sub>			2.6		
Turn-On DelayTime	t <sub>d(on)</sub>		V <sub>DS</sub> =10V, V <sub>GEN</sub> =4.5V R <sub>L</sub> =1.54Ω, R <sub>G</sub> =3Ω		280	
Turn-On Rise Time	t <sub>r</sub>			328		
Turn-Off DelayTime	t <sub>d(off)</sub>			3.76		
Turn-Off Fall Time	t <sub>f</sub>			2.24		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 6.5A, di/dt= 100A/μs		31	41	nC
Body Diode Reverse Recovery Charg	Q <sub>rr</sub>			6.8		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V		0.62	1	V

\*1 Pulse test: PW ≤ 300us duty cycle ≤ 2%.

# RATING AND CHARACTERISTIC CURVES (AO3416)

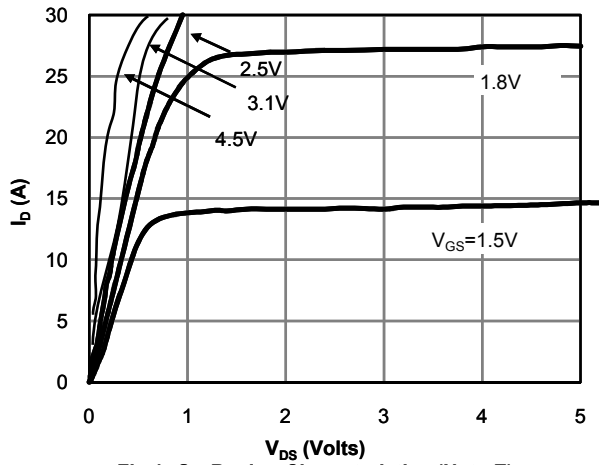


Fig 1: On-Region Characteristics (Note E)

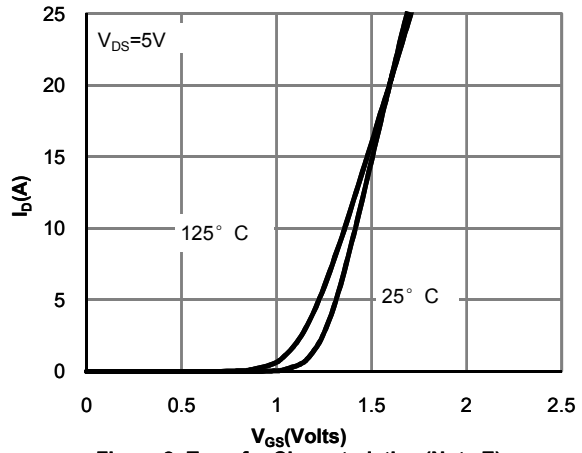


Figure 2: Transfer Characteristics (Note E)

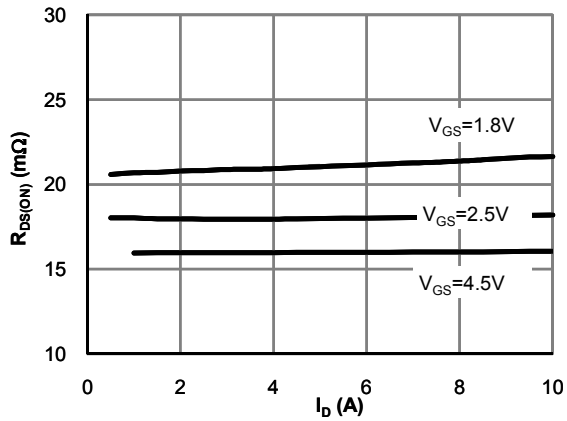


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

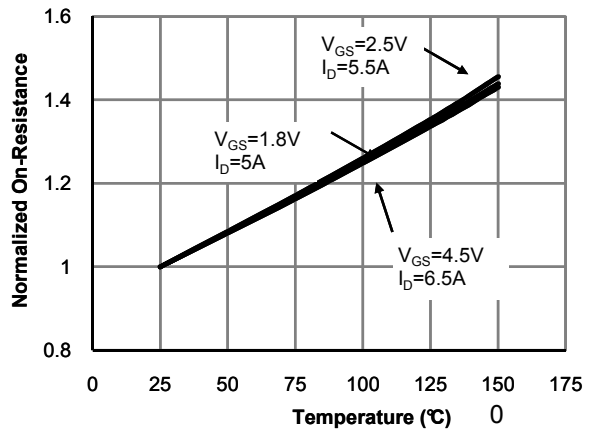


Figure 4: On-Resistance vs. Junction Temperature (Note E)

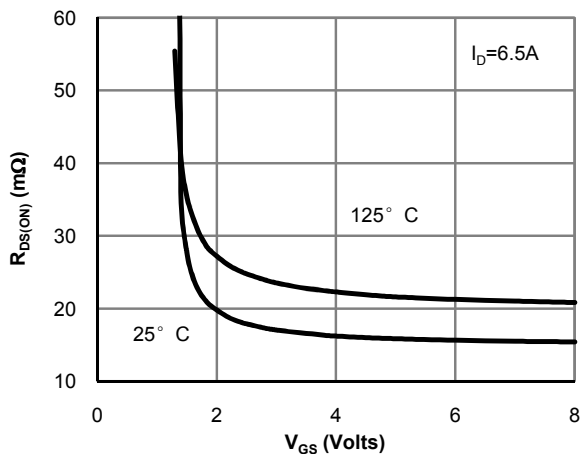


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

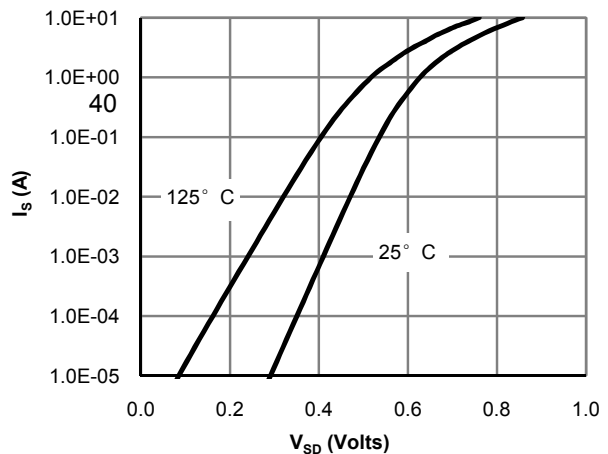


Figure 6: Body-Diode Characteristics (Note E)

# RATING AND CHARACTERISTIC CURVES (AO3416)

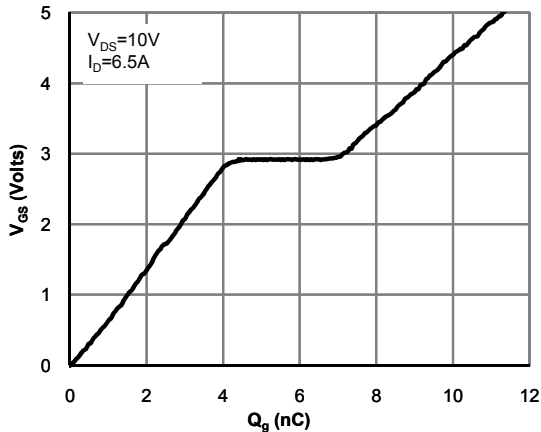


Figure 7: Gate-Charge Characteristics

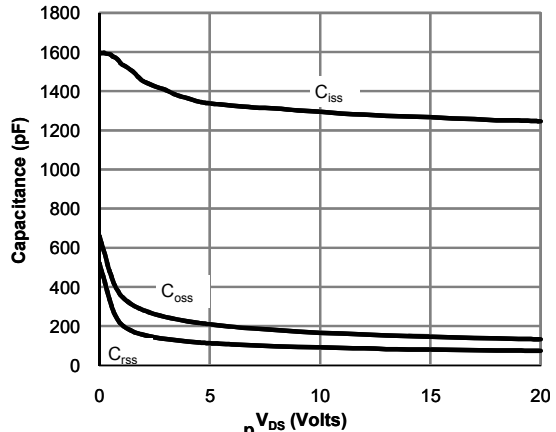


Figure 8: Capacitance Characteristics

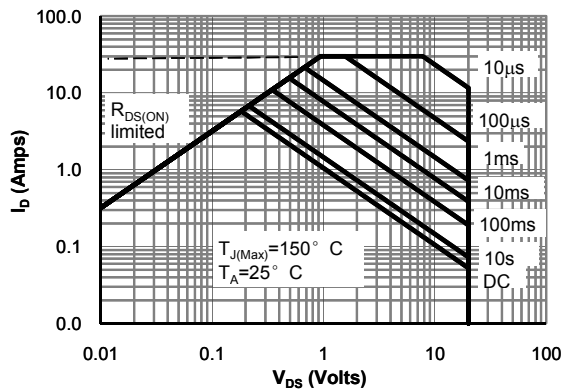


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

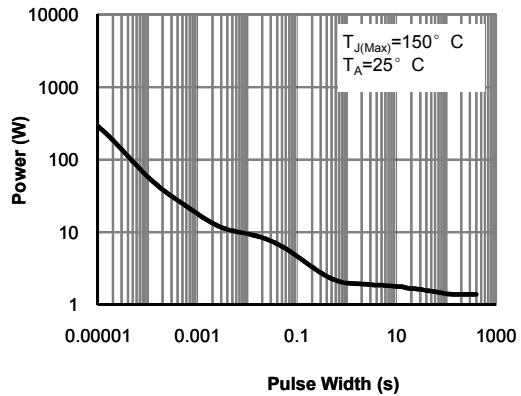


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

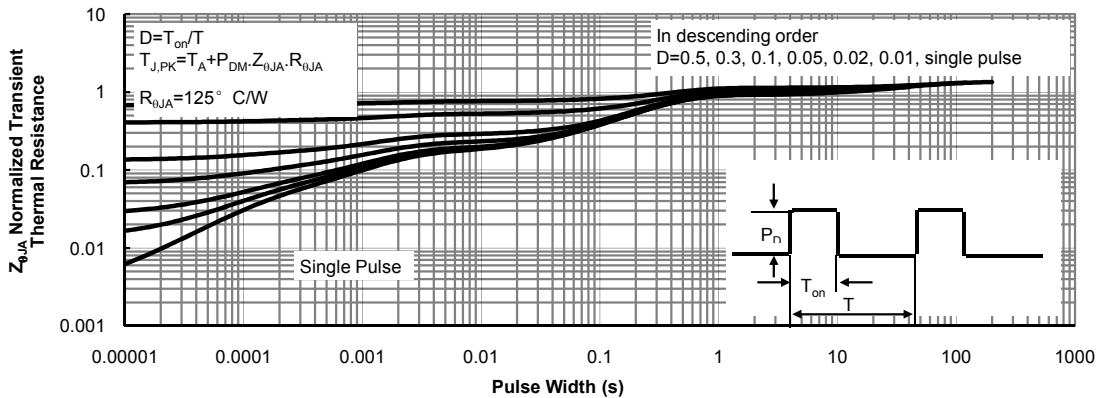


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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