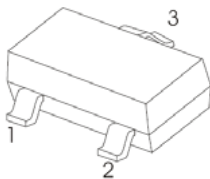


FEATURE

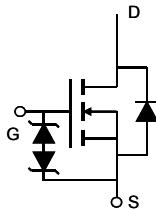
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

SOT-23



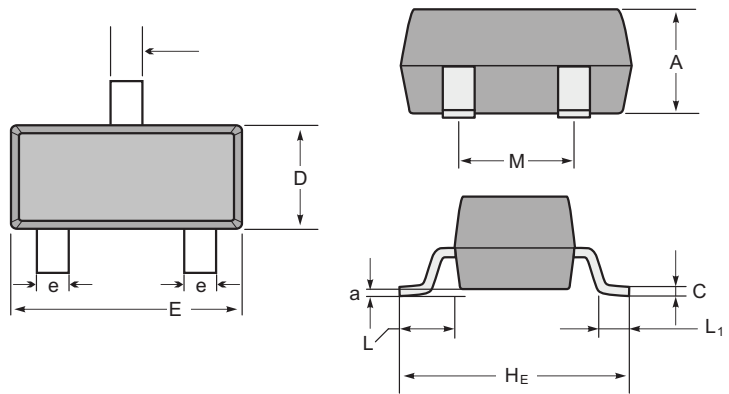
1. GATE
2. SOURCE
3. DRAIN

Equivalent circuit



Marking

Type number	Marking code
AO3416	3416



SOT-23 mechanical data

UNIT	A	C	D	E	HE	e	M	L	L ₁	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}	± 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 _{bss}	I _D =250μA, V _{GS} =0V	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
		V _{DS} =20V, V _{GS} =0V, Ta=70°C			5	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±8V			±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	0.4		1.1	V
On-State Drain Current	I _{D(on)}	V _{DS} =5 V, V _{GS} = 4.5 V	30			A
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6.5A			22	mΩ
		V _{GS} =4.5V, I _D =6.5A T _J =125°C			30	
		V _{GS} =2.5V, I _D =5.5A			26	
		V _{GS} =1.8V, I _D =5A			34	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6.5A		50		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =10V, f=1MHz		1295	1650	pF
Output Capacitance	C _{oss}			160		
Reverse Transfer Capacitance	C _{rss}			87		
Gate Resistance	R _g		V _{GS} =0V, V _{DS} =0V, f=1MHz		1.8	
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =6.5A		10		nC
Gate Source Charge	Q _{gs}			4.2		
Gate Drain Charge	Q _{gd}			2.6		
Turn-On DelayTime	t _{d(on)}		V _{DS} =10V, V _{GEN} =4.5V R _L =1.54Ω, R _G =3Ω		280	
Turn-On Rise Time	t _r			328		
Turn-Off DelayTime	t _{d(off)}			3.76		
Turn-Off Fall Time	t _f			2.24		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 6.5A, di/dt= 100A/μs		31	41	nC
Body Diode Reverse Recovery Charg	Q _{rr}			6.8		
Maximum Body-Diode Continuous Current	I _S				2	A
Diode Forward Voltage	V _{SD}	I _S =1.0A, V _{GS} =0V		0.62	1	V

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

RATING AND CHARACTERISTIC CURVES (AO3416)

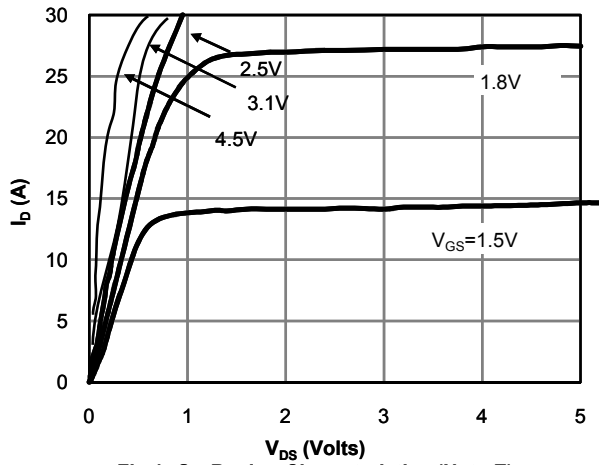


Fig 1: On-Region Characteristics (Note E)

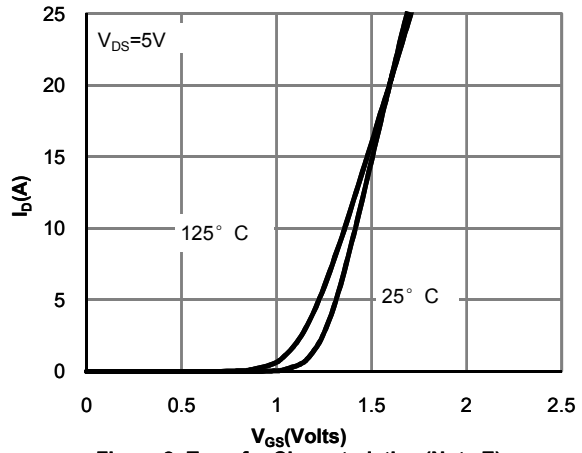


Figure 2: Transfer Characteristics (Note E)

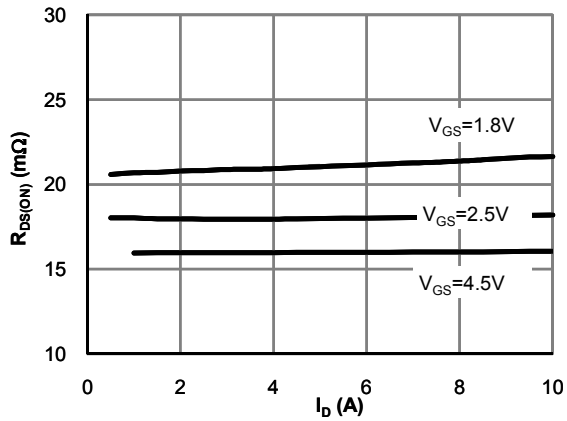


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

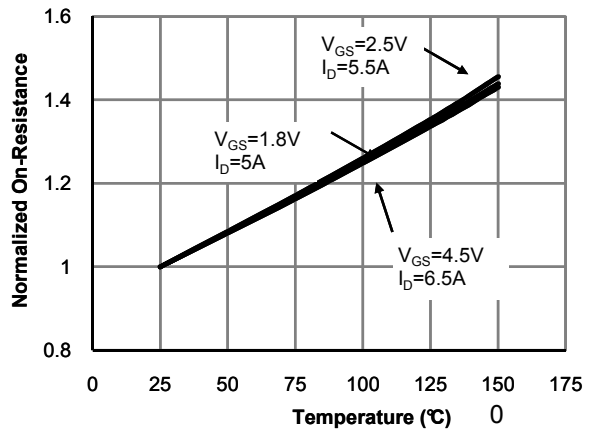


Figure 4: On-Resistance vs. Junction Temperature (Note E)

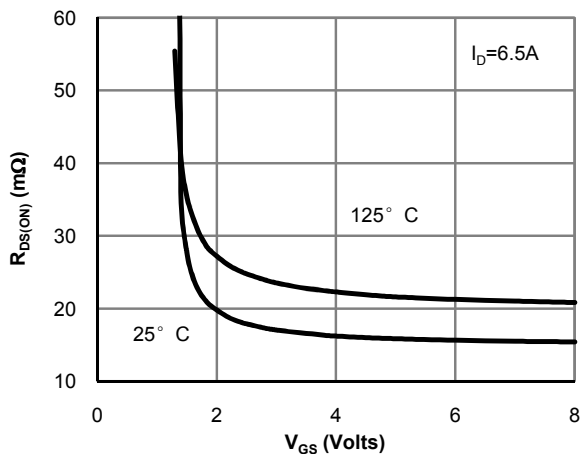


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

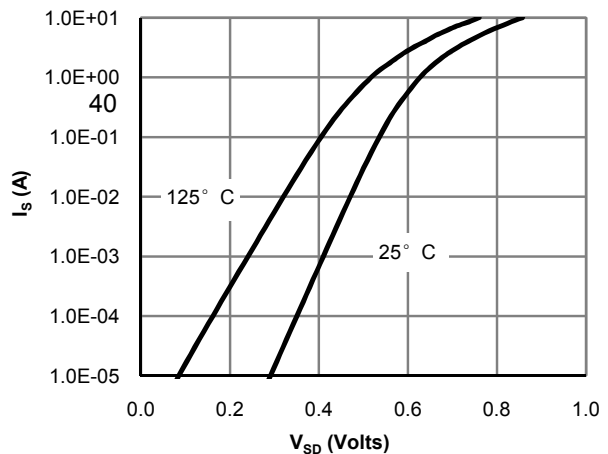


Figure 6: Body-Diode Characteristics (Note E)

RATING AND CHARACTERISTIC CURVES (AO3416)

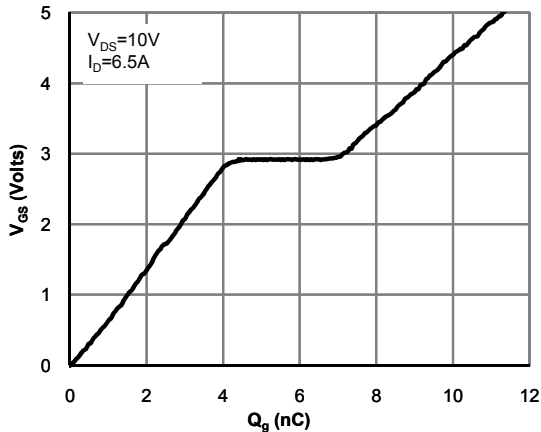


Figure 7: Gate-Charge Characteristics

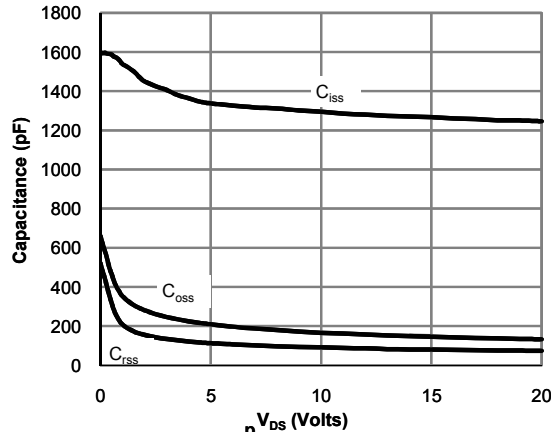


Figure 8: Capacitance Characteristics

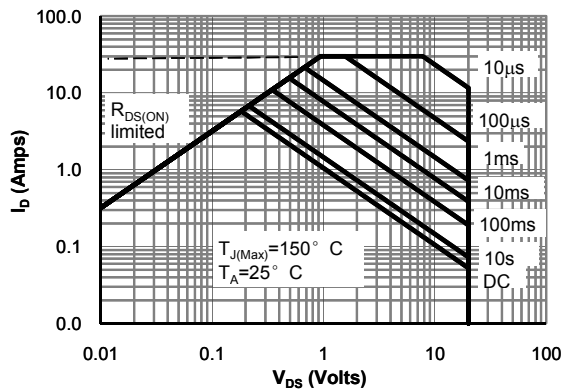


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

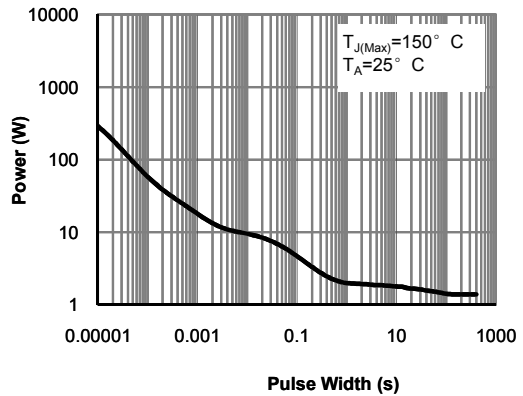


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

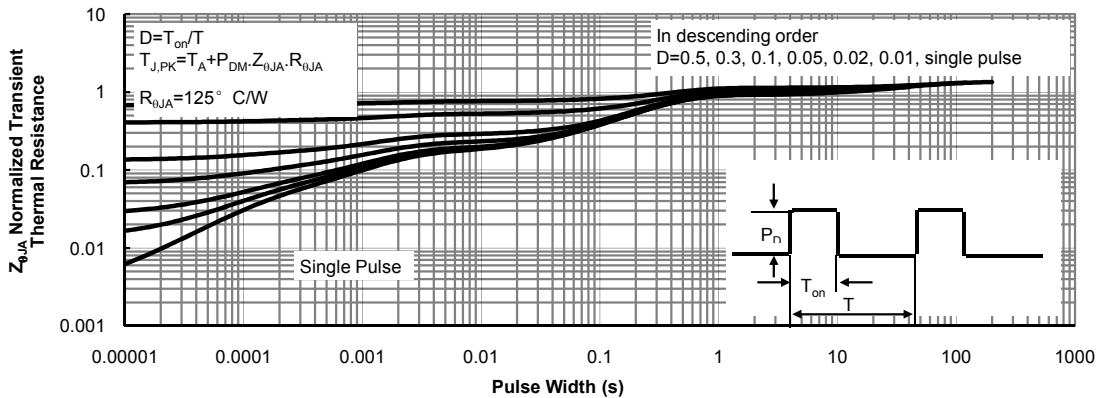


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)