

SOT-23 Plastic-Encapsulate MOSFETS

AO3402

N-Channel MOSFET

Features

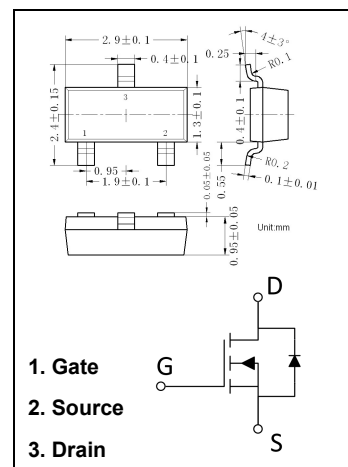
- $R_{DS(on)} < 70m\Omega (V_{GS}=10V, I_D=4.0A)$
- $R_{DS(on)} < 75m\Omega (V_{GS}=4.5V, I_D=2.3A)$
- $R_{DS(on)} < 105m\Omega (V_{GS}=2.5V, I_D=1.5A)$
- $V_{DS}=30V$
- $I_D=4.0A$

Applications

- Load Switch and in PWM applications

Description

The AO3402 uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a load switch or in PWM application.



Maximum Ratings ($T_a=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source voltage	30	V
V_{GS}	Gate-Source voltage	± 12	
I_D	Continuous Drain Current	4	A
I_{DM}	Drain Current-Pulsed ¹⁾	15	
P_D	Power Dissipation	1.4	W
T_J	Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature	-55 to +150	

Thermal Characteristics ($T_a=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Typ	Max	Unit
Maximum junction-ambient($t \leq 10s$)	$R_{\theta JA}$	70	90	$^\circ C/W$
Maximum junction-ambient	$R_{\theta JA}$	100	125	$^\circ C/W$
Maximum junction-Lead	$R_{\theta JL}$	63	80	$^\circ C/W$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} = 0V			1	μA
I _{GSS}	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±12V			±100	nA
On characteristics ³⁾						
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} = 10V, I _D = 4A			70	mΩ
		V _{GS} = 4.5V, I _D = 2.3A			75	mΩ
		V _{GS} = 2.5V, I _D = 1.5A			105	mΩ
g _{fs}	Forward Trans conductance	V _{DS} = 5V, I _D = 4A		8		S
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.8		1.6	V
Dynamic Characteristics ⁴⁾						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz		390		pF
C _{oss}	Output Capacitance			54.5		
C _{rss}	Reverse Transfer Capacitance			41		
R _g	Gate resistance	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		3		Ω
Switching Characteristics ⁴⁾						
t _{d(on)}	Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 15V, R _L = 3.75Ω, R _{GEN} = 6Ω		3.3		ns
t _r	Rise Time			1		
t _{d(off)}	Turn-Off Delay Time			21.7		
t _f	Fall Time			2.1		
Q _g	Total gate charge	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 4A		4.34		nC
Q _{gs}	Gate-source Charge			0.6		
Q _{gd}	Gate-drain Charge			1.38		
t _{rr}	Body diode reverse recovery time	I _F = 4A, dI/dt = 100A/μs		12		nS
Q _{rr}	Body diode reverse recovery charge			6.3		nC
V _{SD}	Diode forward voltage	V _{GS} = 0V, I _D = 1A		0.8	1.2	V

Notes

1. Repetitive rating: Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , t_s≤10s.
3. Pulse Test : Pulse Width≤80μs, Duty Cycle≤0.5%.
4. Guaranteed by design, not subject to production.

Typical Characteristics

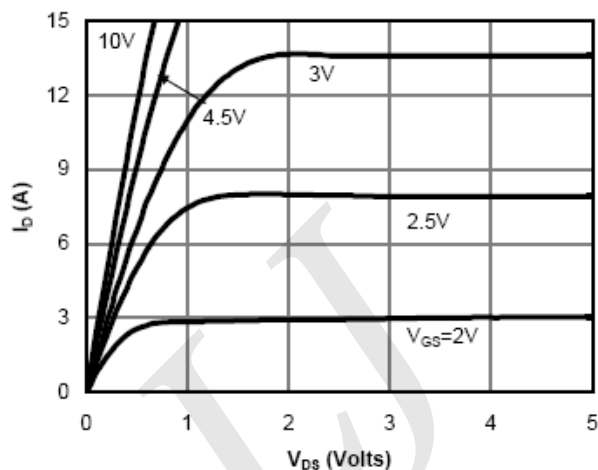


Fig 1: On-Region Characteristics

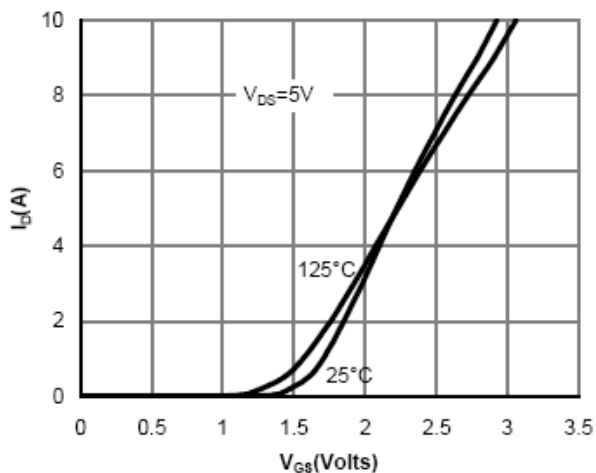


Figure 2: Transfer Characteristics

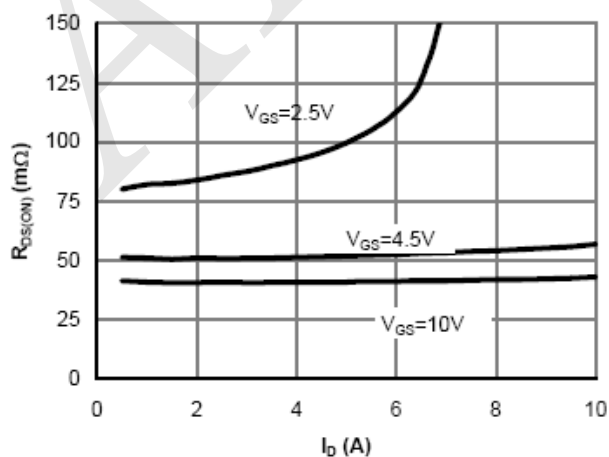


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

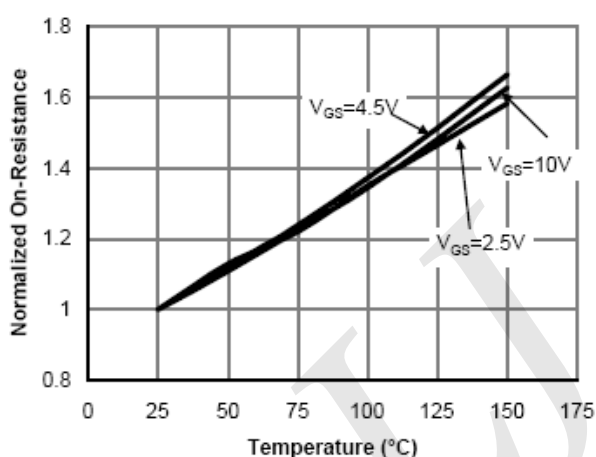


Figure 4: On-Resistance vs. Junction Temperature

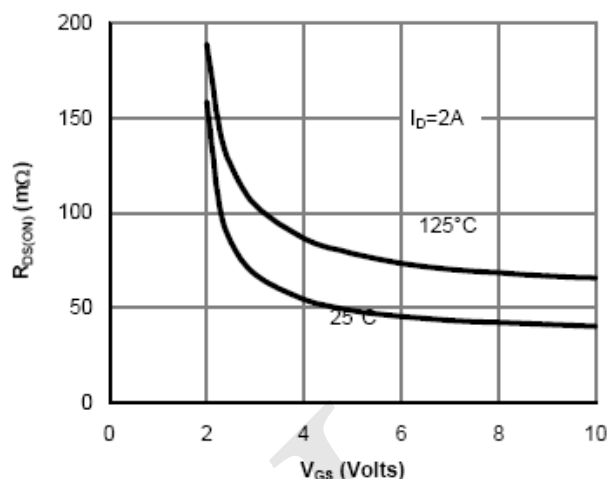


Figure 5: On-Resistance vs. Gate-Source Voltage

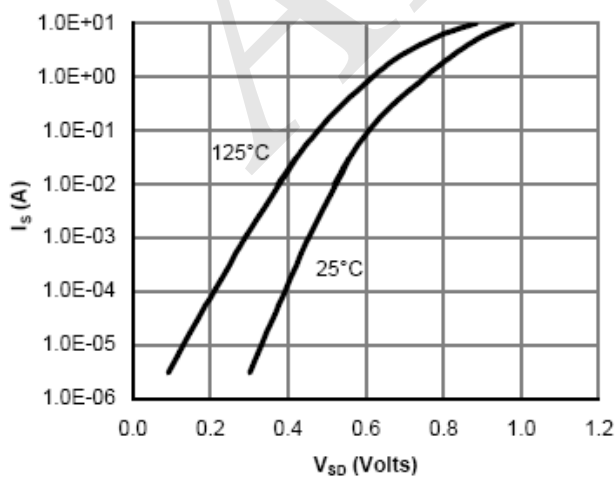


Figure 6: Body-Diode Characteristics

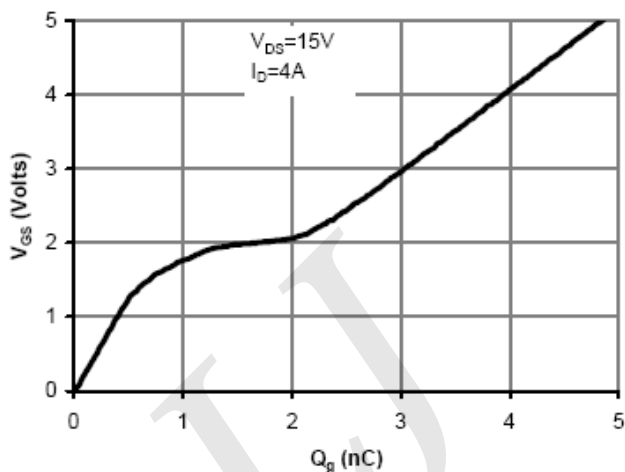


Figure 7: Gate-Charge Characteristics

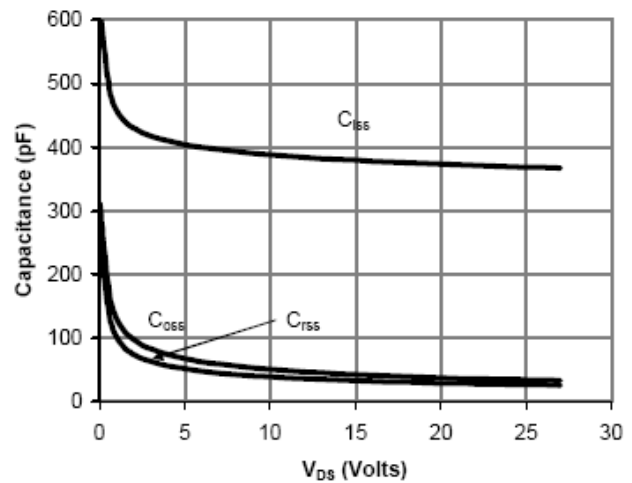


Figure 8: Capacitance Characteristics

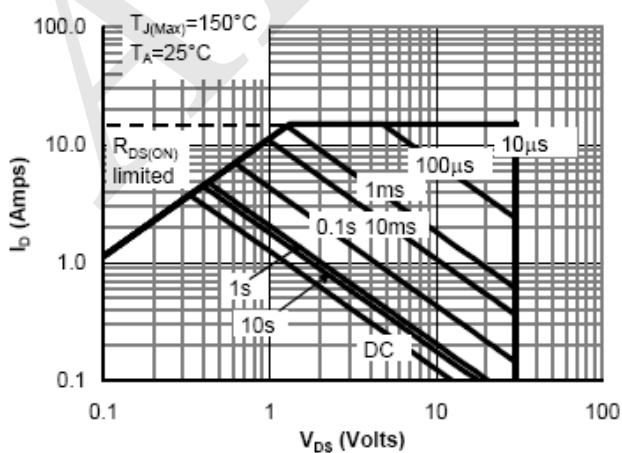


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

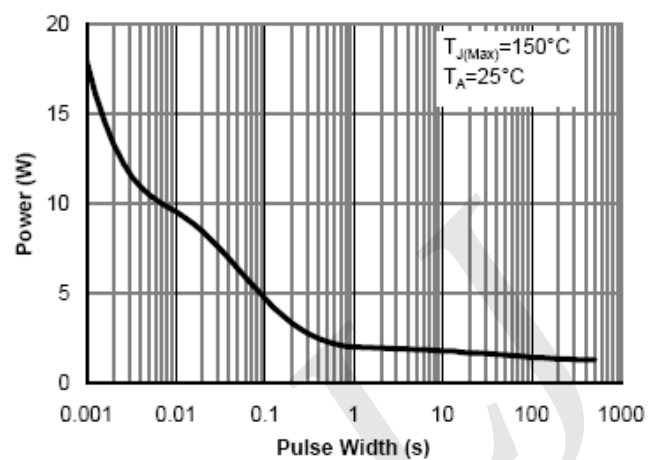


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

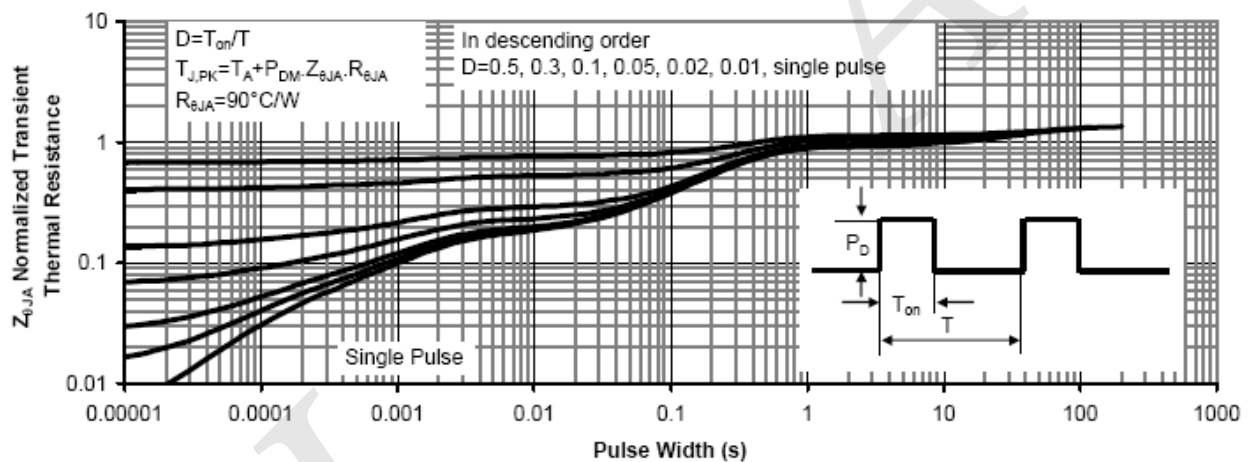


Figure 11: Normalized Maximum Transient Thermal Impedance