

• General Description

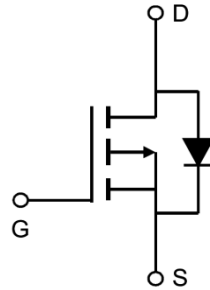
AP3403A combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.

• Applications

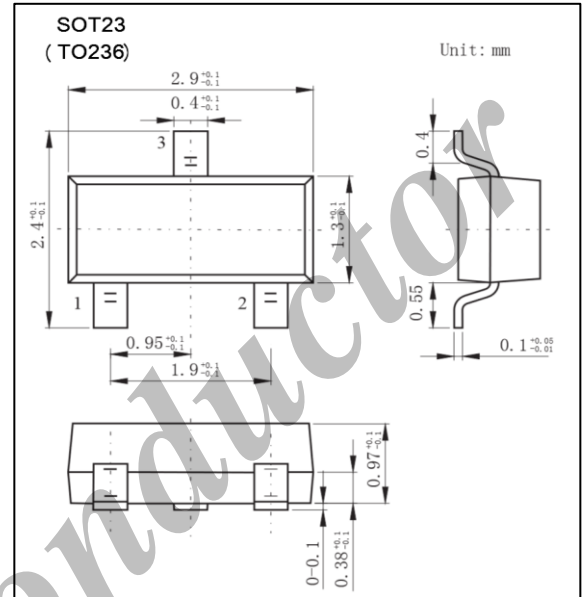
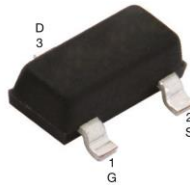
- DC/DC converter for portable devices
- Load switch

• Product Summary

V_{DS}	-30V
I_D (at $V_{GS} = -10V$)	-2.6A
$R_{DS(ON)}$ (at $V_{GS} = -10V$)	< 115m Ω
$R_{DS(ON)}$ (at $V_{GS} = -4.5V$)	< 150m Ω
$R_{DS(ON)}$ (at $V_{GS} = -2.5V$)	< 200m Ω



Top View



• Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_A = 25^\circ\text{C}$	-2.6
		$T_A = 70^\circ\text{C}$	-2.2
Pulsed Drain Current *	I_{DM}	-13	A
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	1.4
		$T_A = 70^\circ\text{C}$	0.9
Thermal Resistance. Junction-to-Ambient $t \leq 10s$	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Thermal Resistance. Junction-to-Ambient (Stead-state)		125	
Thermal Resistance. Junction-to-Lead (Stead-state)		80	
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	

* Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.

• **Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	$I_D = -250\mu A, V_{GS} = 0V$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 55^\circ C$			-5	
Gate-Body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 12V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.6	-1	-1.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -2.6A$		88	115	m Ω
		$V_{GS} = -10V, I_D = -2.6A, T_J = 125^\circ C$		143	200	
		$V_{GS} = -4.5V, I_D = -2A$		103	150	
		$V_{GS} = -2.5V, I_D = -1A$		139	200	
On state drain current	$I_{D(on)}$	$V_{GS} = -10V, V_{DS} = -5V$	-13			A
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -2.6A$		8		S
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$		260	315	pF
Output Capacitance	C_{oss}			37		
Reverse Transfer Capacitance	C_{rss}			20		
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	4	8	12	Ω
Total Gate Charge (10V)	Q_g	$V_{GS} = -10V, V_{DS} = -15V, I_D = -2.6A$		5.9	7.2	nC
Total Gate Charge (4.5V)				2.8	3.5	
Gate Source Charge	Q_{gs}			0.7		
Gate Drain Charge	Q_{gd}			1		
Turn-On Delay Time	$t_{D(on)}$			6		
Turn-On Rise Time	t_r	$V_{GS} = -10V, V_{DS} = -15V,$		3.5		
Turn-Off Delay Time	$t_{D(off)}$	$R_L = 5.76\Omega, R_{GEN} = 3\Omega$		20		
Turn-Off Fall Time	t_f			5		
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -2.6A, d_i/d_t = 100A/\mu s$		11.5	15	
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = -2.6A, d_i/d_t = 100A/\mu s$		4.5		nC
Maximum Body-Diode Continuous Current	I_S				-1.5	A
Diode Forward Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V$		-0.78	-1	V

• **Ordering Information**

Ordering Part Number	Package	MOQ
AP3403A	SOT23 (T0236)	3,000 pcs / reel

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• Typical Characteristics

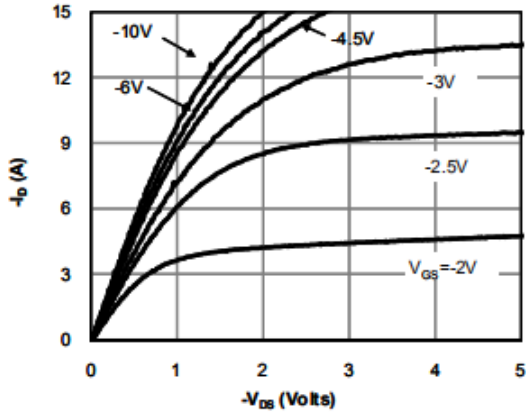


Fig 1: On-Region Characteristics

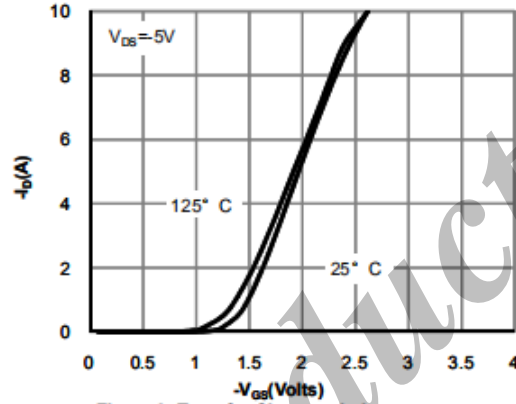


Figure 2: Transfer Characteristics

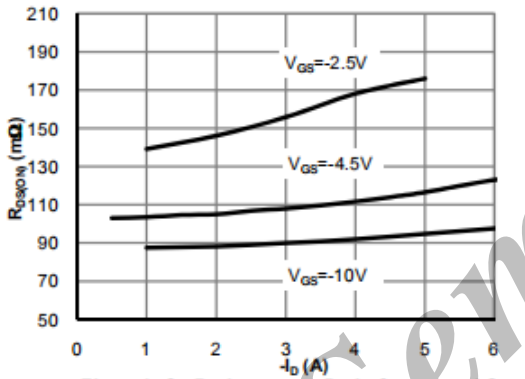


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

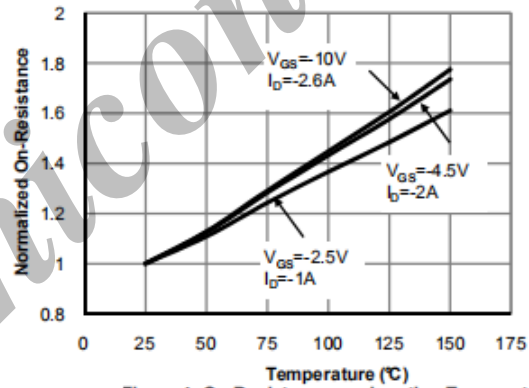


Figure 4: On-Resistance vs. Junction Temperature

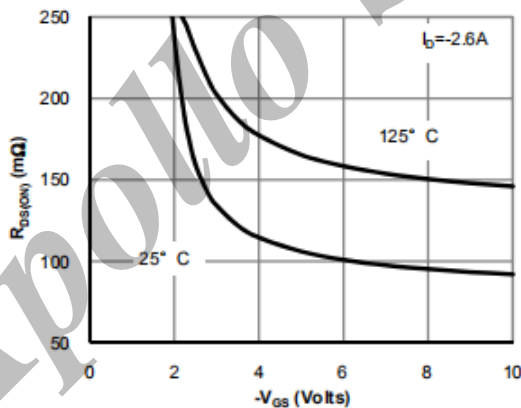


Figure 5: On-Resistance vs. Gate-Source Voltage

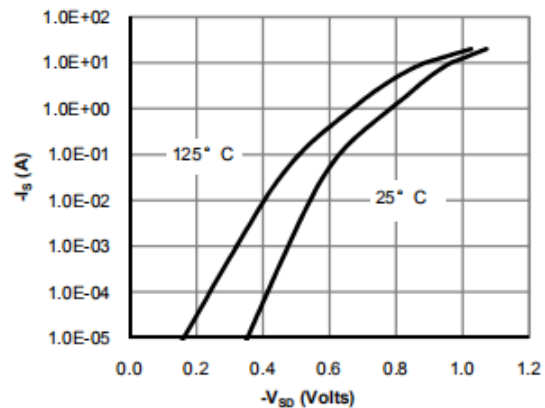


Figure 6: Body-Diode Characteristics

The static characteristics in Figures 1 to 6 are obtained using $300\mu\text{s}$ pulses, duty cycle 0.5% max.

• **Typical Characteristics**

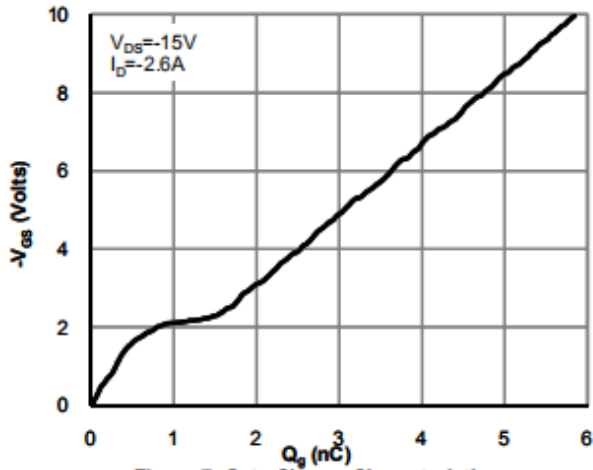


Figure 7: Gate-Charge Characteristics

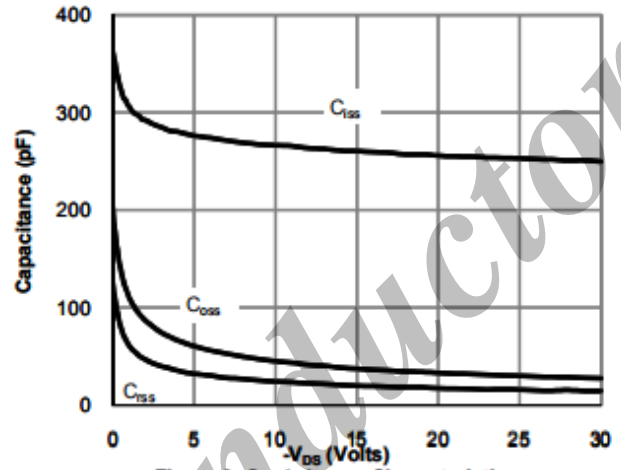


Figure 8: Capacitance Characteristics

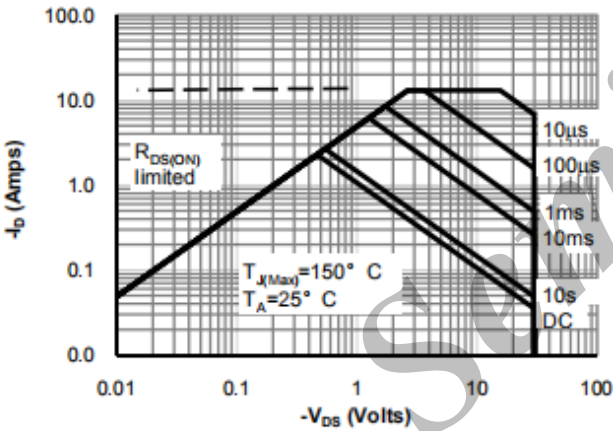


Figure 9: Maximum Forward Biased Safe Operating Area

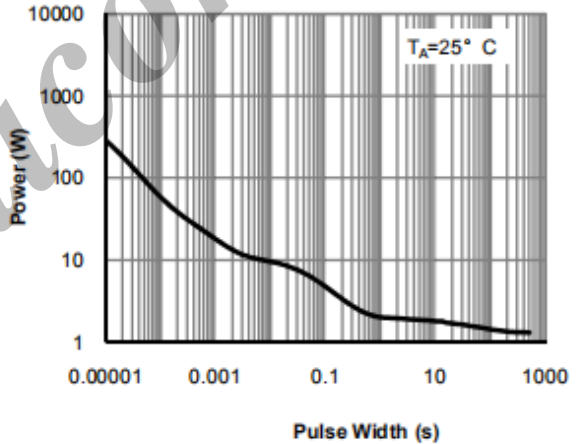


Figure 10: Single Pulse Power Rating Junction-to-Ambient

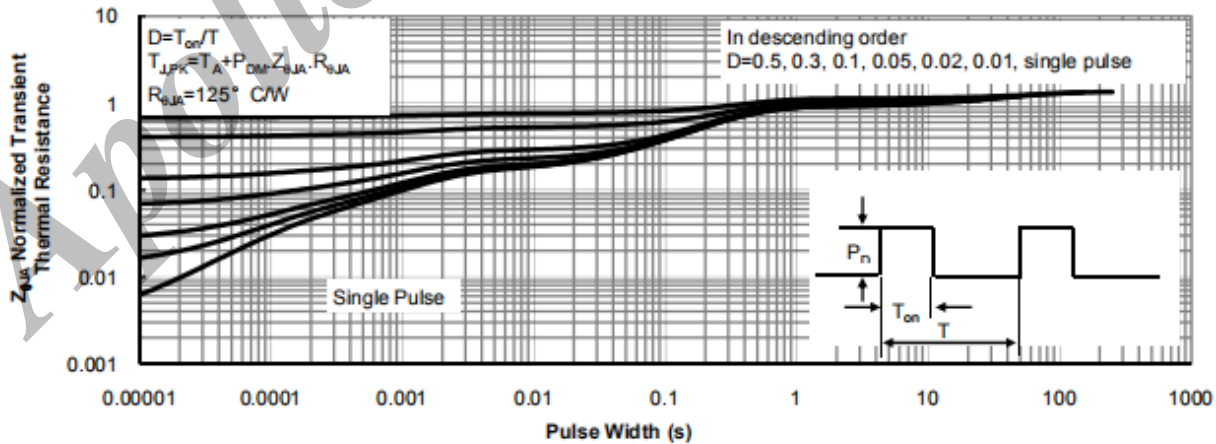


Figure 11: Normalized Maximum Transient Thermal Impedance

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