

### • General Description

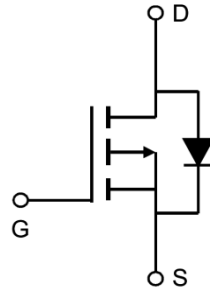
AP3403B combines advanced MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is most suitable to load-switch or PWM applications.

### • Applications

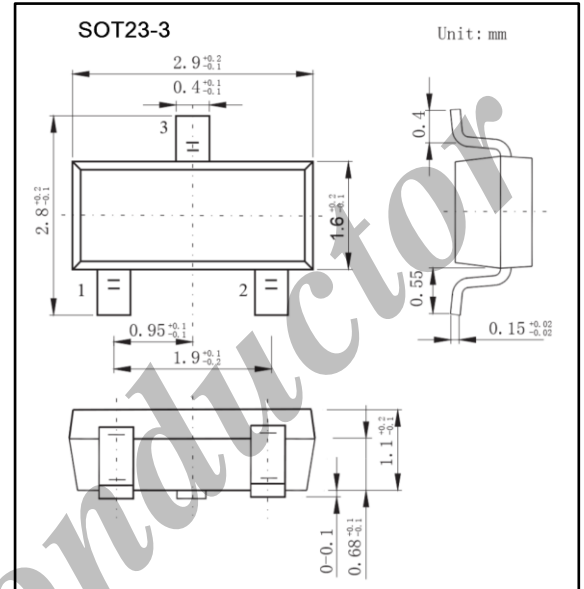
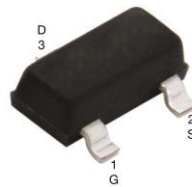
- DC/DC converter for portable devices
- Load switch

### • Product Summary

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



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	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_A = 25^\circ\text{C}$	A
		$T_A = 70^\circ\text{C}$	
Pulsed Drain Current *	$I_{DM}$	-13	
Power Dissipation	$P_D$	$T_A = 25^\circ\text{C}$	W
		$T_A = 70^\circ\text{C}$	
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)		$R_{\theta JL}$	
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	$\mu A$
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 55^\circ C$			-5	
Gate-Body leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 12V$			$\pm 100$	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 $\Omega$
		$V_{GS} = -10V, I_D = -2.6A, T_J = 125^\circ C$		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	
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	$t_r$	$V_{GS} = -10V, V_{DS} = -15V,$ $R_L = 5.76\Omega, R_{GEN} = 3\Omega$		3.5		
Turn-Off Delay Time	$t_{D(off)}$		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
AP3403B	SOT23-3	3,000 pcs / reel

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• Typical Characteristics

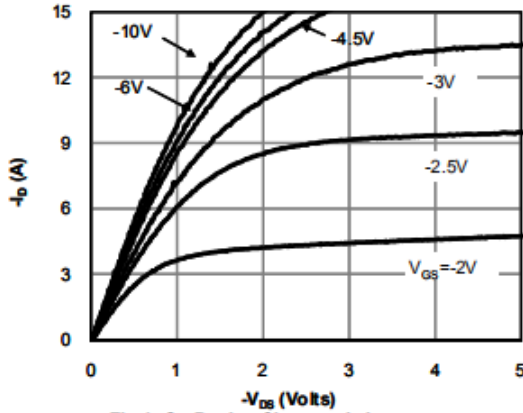


Fig 1: On-Region Characteristics

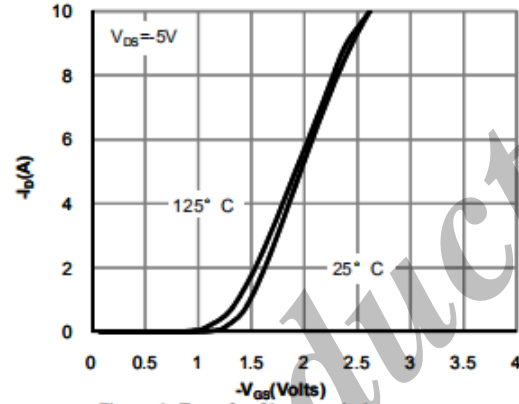


Figure 2: Transfer Characteristics

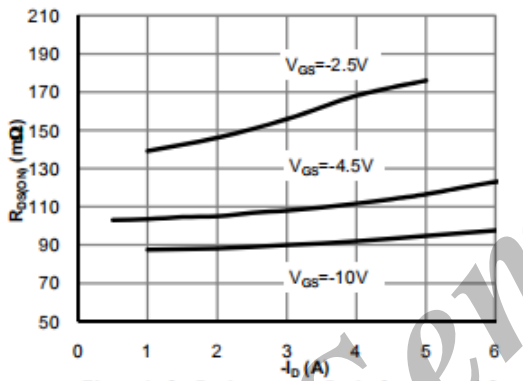


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

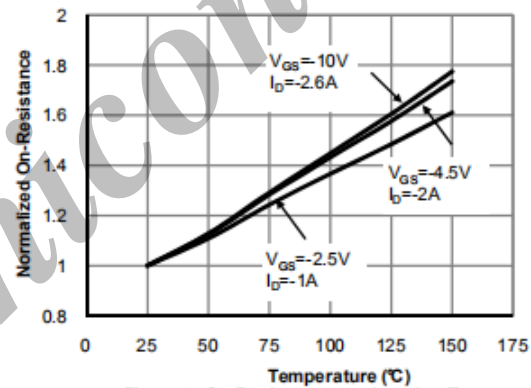


Figure 4: On-Resistance vs. Junction Temperature

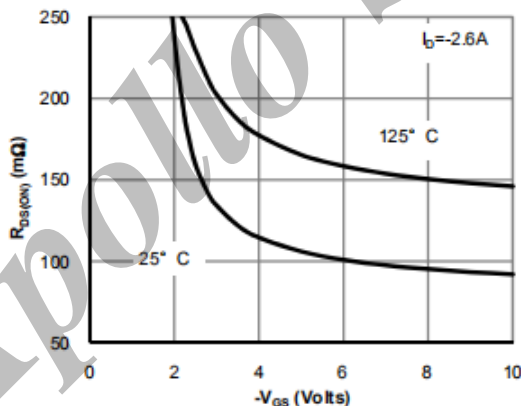


Figure 5: On-Resistance vs. Gate-Source Voltage

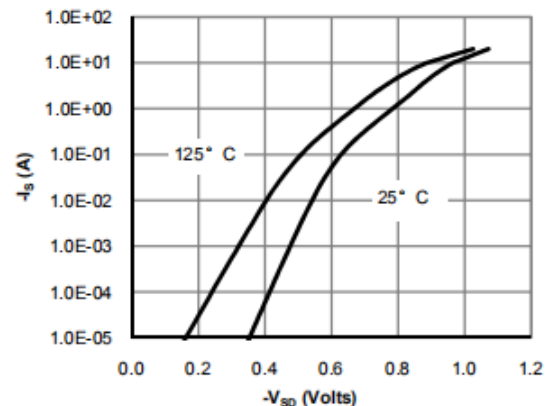


Figure 6: Body-Diode Characteristics

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

• Typical Characteristics

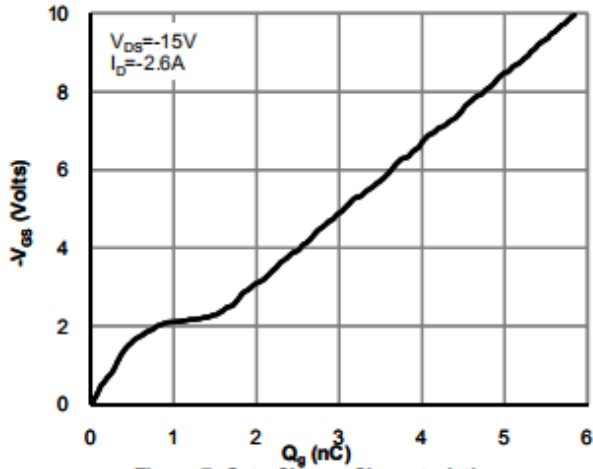


Figure 7: Gate-Charge Characteristics

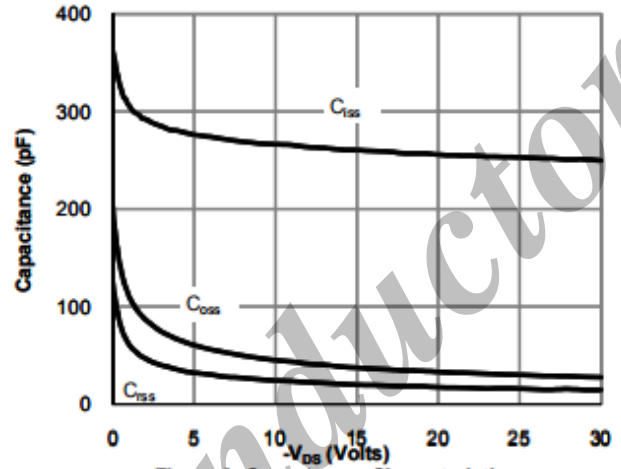


Figure 8: Capacitance Characteristics

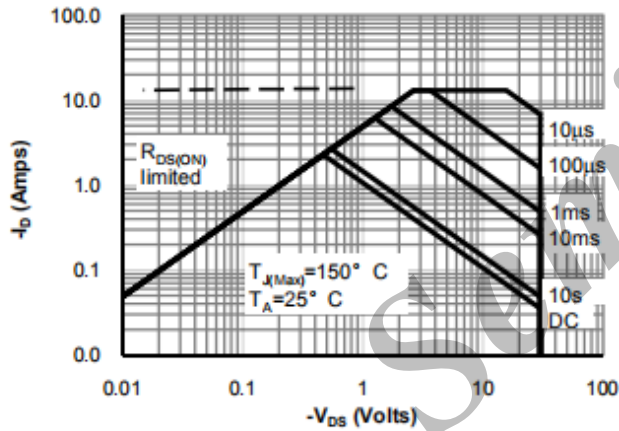


Figure 9: Maximum Forward Biased Safe Operating Area

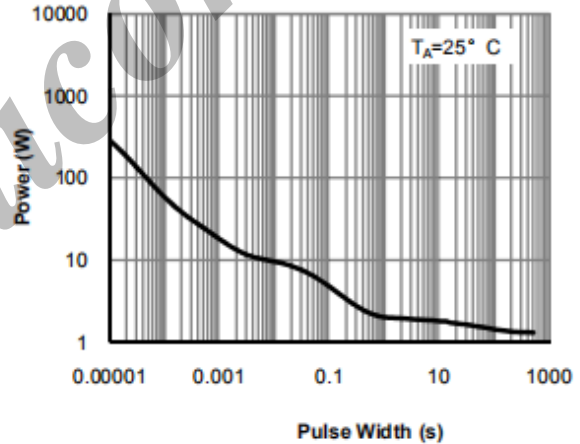


Figure 10: Single Pulse Power Rating Junction-to-Ambient

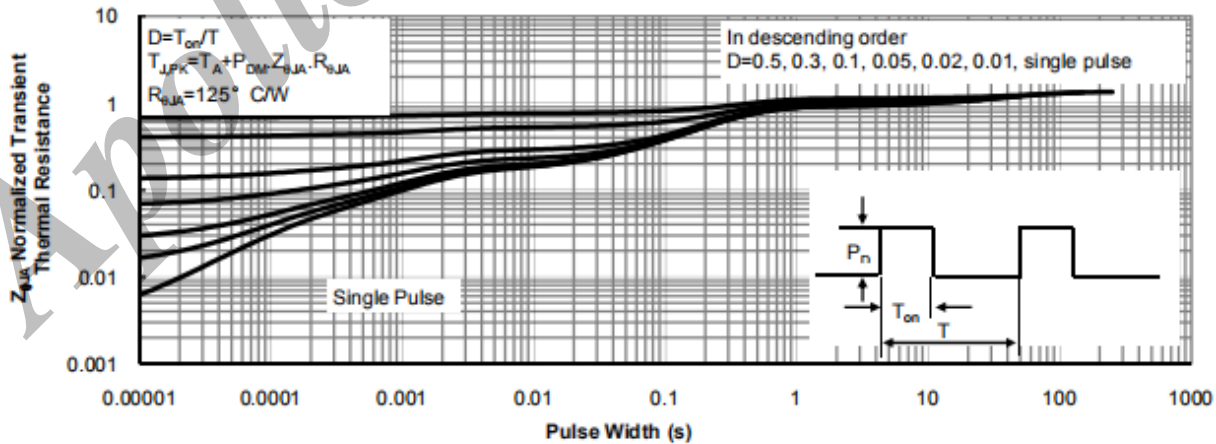


Figure 11: Normalized Maximum Transient Thermal Impedance

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