

• General Description

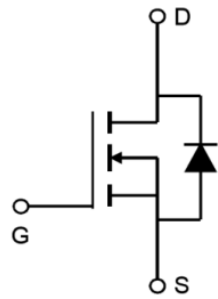
AP3404B combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.

• Applications

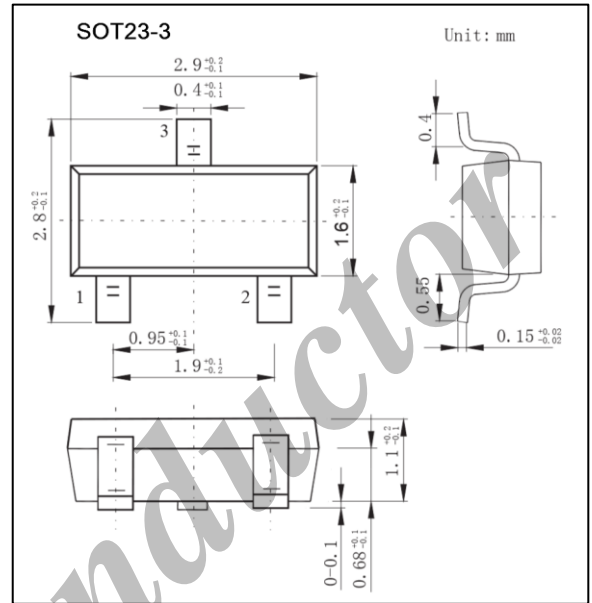
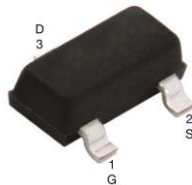
- DC/DC converter for portable devices
- Load switch

• Product Summary

V_{DS}	30V
I_D (at $V_{GS} = 10V$)	5.8A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 28m Ω
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 43m 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}	± 20	V
Continuous Drain Current	I_D	$T_A=25$	A
		$T_A=70$	
Pulsed Drain Current *	I_{DM}	20	
Power Dissipation	P_D	$T_A=25$	W
		$T_A=70$	
Thermal Resistance, Junction- to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction- to-Lead	$R_{\theta JL}$	60	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$

* Repetitive rating, pulse width limited by junction temperature.

• **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}	$V_{DS}=24V, V_{GS}=0V$			1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.9	3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.8A$		22.5	28	m Ω
		$V_{GS}=10V, I_D=5.8A, T_J=125^\circ C$		31.3	38	
		$V_{GS}=4.5V, I_D=5.0A$		34.5	43	
On state drain current	$I_{D(on)}$	$V_{GS}=4.5V, V_{DS}=5V$	20			A
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5.8A$	10	14.5		S
Input Capacitance	C_{iss}			680	820	pF
Output Capacitance	C_{oss}	$V_{GS}=0V, V_{DS}=15V, f=1MHz$		102		pF
Reverse Transfer Capacitance	C_{rss}			77		pF
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		3	3.6	Ω
Total Gate Charge (10V)	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=5.8A$		13.88	17	nC
Total Gate Charge (4.5)	Q_g			6.78	8.1	nC
Gate Source Charge	Q_{gs}			1.8		nC
Gate Drain Charge	Q_{gd}			3.12		nC
Turn-On Delay Time	$t_{D(on)}$				4.6	6.5
Turn-On Rise Time	t_r	$V_{GS}=10V, V_{DS}=15V, R_L=2.7\Omega, R_{GEN}=3\Omega$		3.8	5.7	ns
Turn-Off Delay Time	$t_{D(off)}$			20.9	30	ns
Turn-Off Fall Time	t_f			5	7.5	ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=5.8A, d_i/d_t=100A/\mu s$		16.1	21	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=5.8A, d_i/d_t=100A/\mu s$		7.4	10	nC
Maximum Body-Diode Continuous Current	I_S				2.5	A
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$		0.76	1	V

• **Ordering Information**

Ordering Part Number	Package	MOQ
AP3404B	SOT23-3	3,000 pcs / reel

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• Typical Characteristics

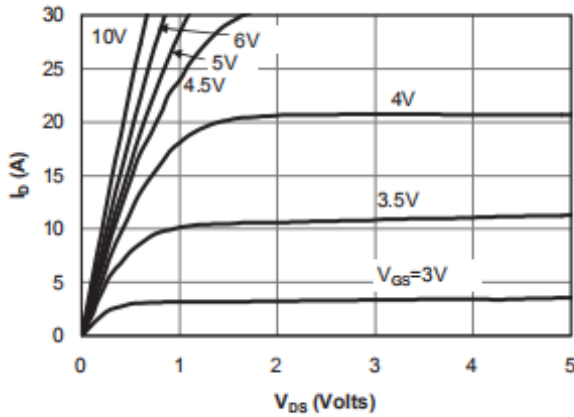


Fig 1: On-Region Characteristics

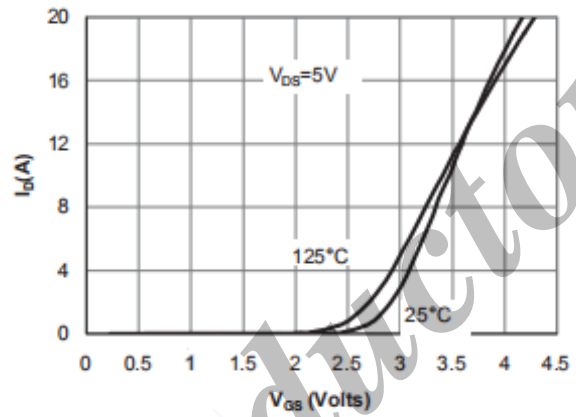


Figure 2: Transfer Characteristics

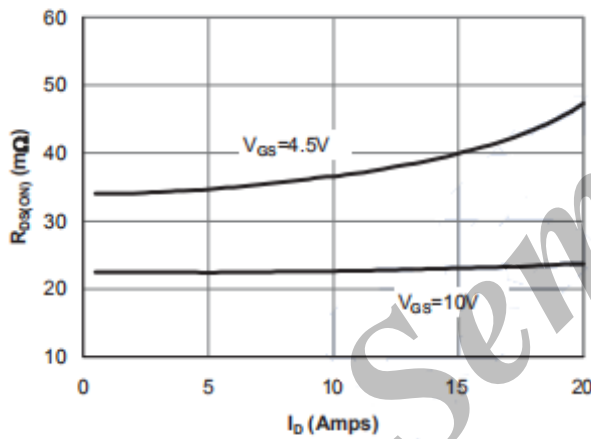


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

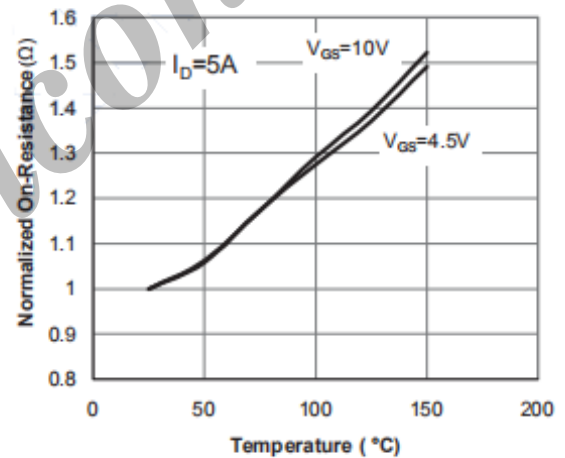


Figure 4: On-Resistance vs. Junction Temperature

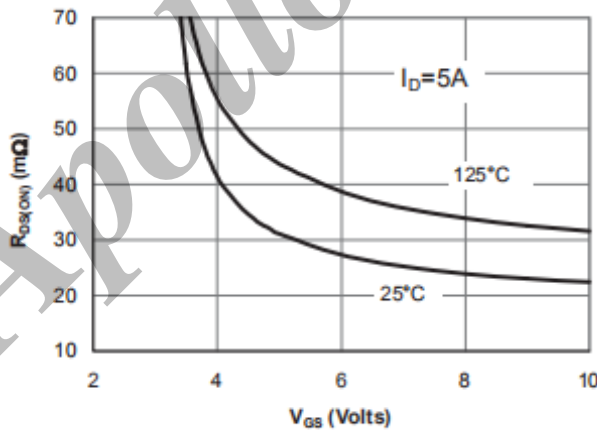


Figure 5: On-Resistance vs. Gate-Source Voltage

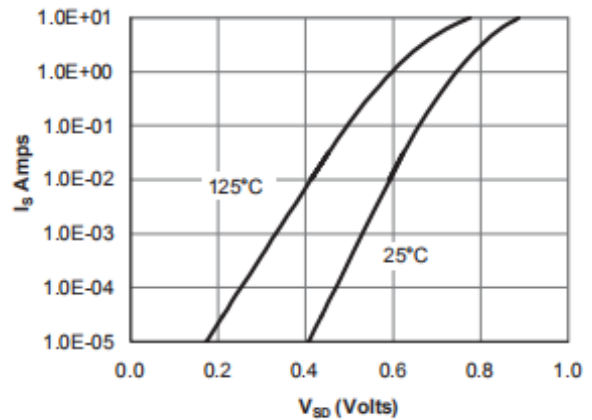


Figure 6: Body diode characteristics

• **Typical Characteristics**

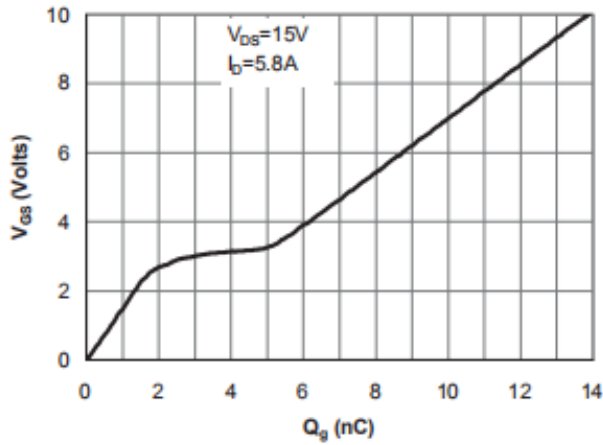


Figure 7: Gate-Charge characteristics

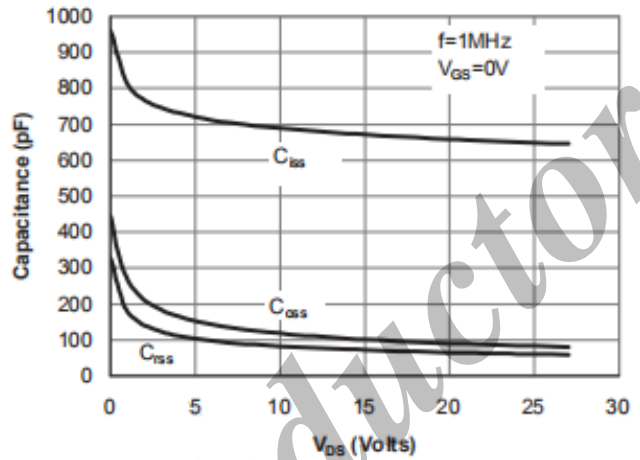


Figure 8: Capacitance Characteristics

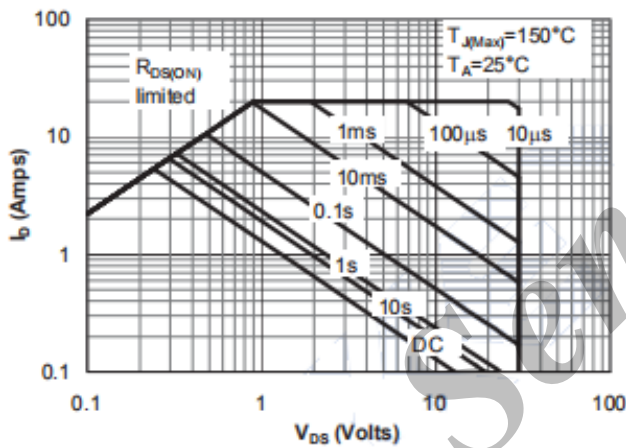


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

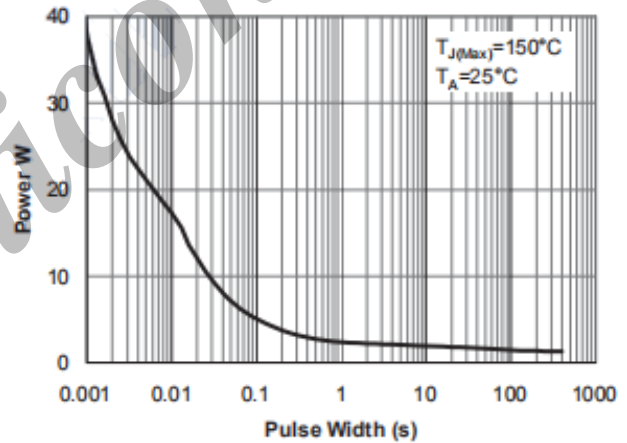


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

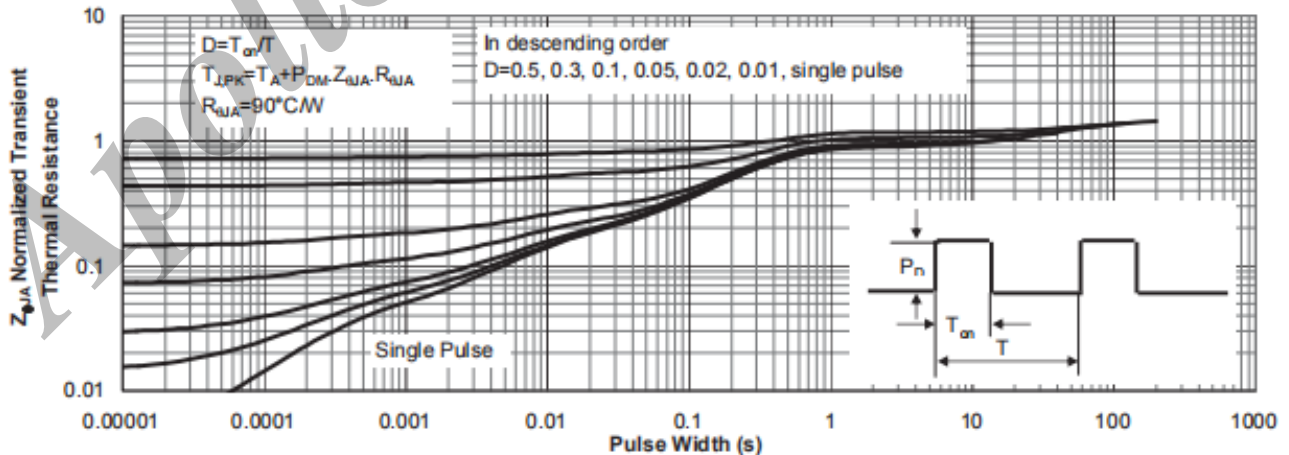


Figure 11: Normalized Maximum Transient Thermal Impedance

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