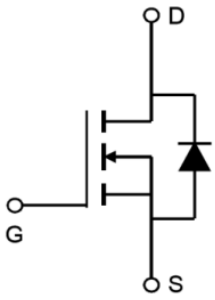
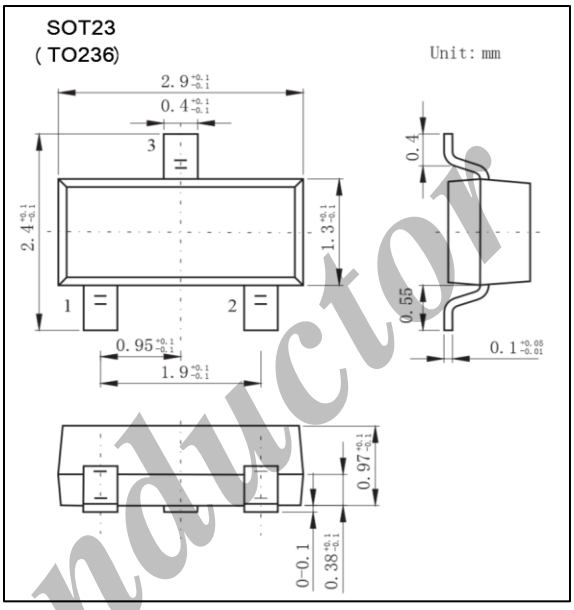
AP3404A
30V N-Channel Enhancement Mode MOSFET

- **General Description**

AP3404A 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.

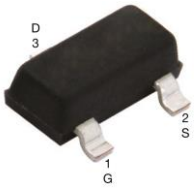




- **Applications**

- DC/DC converter for portable devices
- Load switch

Top View



- **Product Summary**

V_{DS}	30V
I_D (at V_{GS} = 10V)	5.8A
$R_{DS(ON)}$ (at V_{GS} = 10V)	< 28mΩ
$R_{DS(ON)}$ (at V_{GS} = 4.5V)	< 43mΩ

- **Absolute Maximum Ratings Ta = 25℃**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current T_A=25	I_D	5.8	A
Continuous Drain Current T_A=70		4.9	
Pulsed Drain Current *	I_{DM}	20	
Power Dissipation T_A=25	P_D	1.4	W
Power Dissipation T_A=70		1	
Thermal Resistance. Junction- to-Ambient	$R_{\theta JA}$	125	℃/W
Thermal Resistance. Junction- to-Lead	$R_{\theta JL}$	60	℃/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	℃

* Repetitive rating, pulse width limited by junction temperature.

- **Electrical Characteristics Ta = 25℃**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, 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°C			5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.9	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.8A		22.5	28	mΩ
		V_{GS}=10V, I_D=5.8A T_J=125°C		31.3	38	
		V_{GS}=4.5V, I_D=5.0A		34.5	43	mΩ
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}	V_{GS}=0V, V_{DS}=15V, f=1MHz		680	820	pF
Output Capacitance	C_{oss}			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	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=2.7Ω, R_{GEN}=3Ω		4.6	6.5	ns
Turn-On Rise Time	t_r			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/ μs		16.1	21	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=5.8A, d_I/d_t=100A/ μs		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
AP3404A	SOT23 (TO236)	3,000 pcs / reel

- **Typical Characteristics**

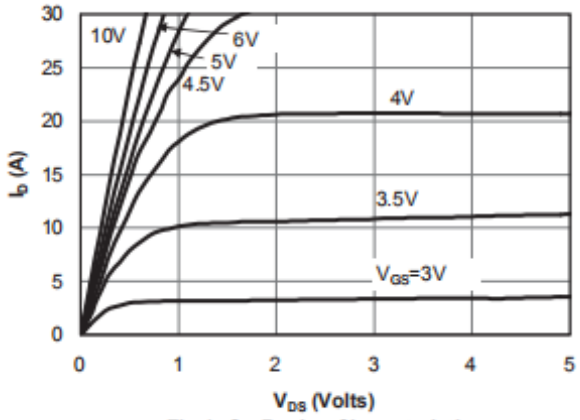


Fig 1: On-Region Characteristics

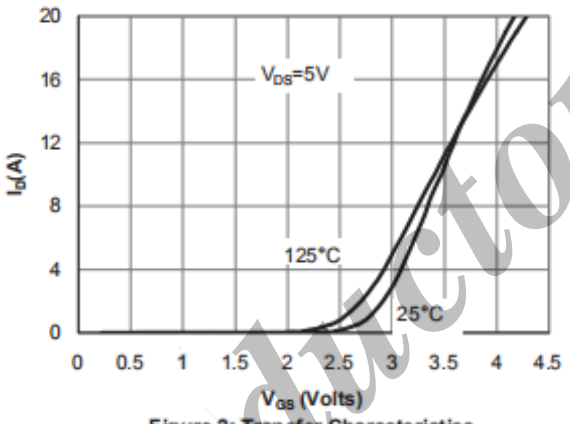


Figure 2: Transfer Characteristics

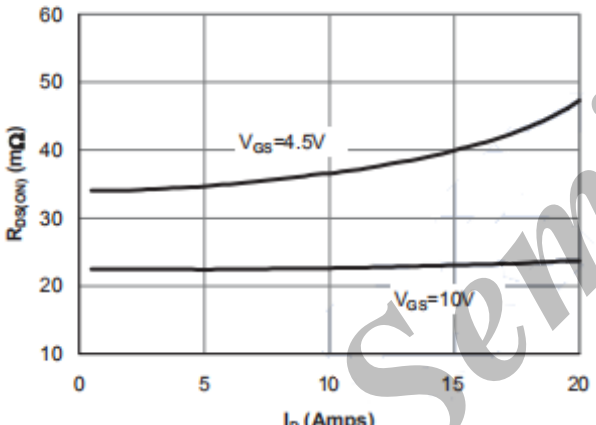


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

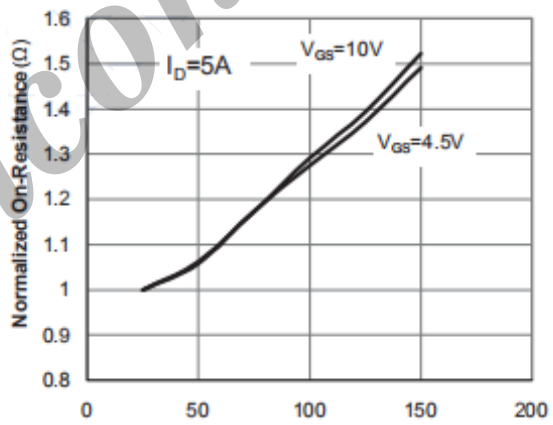


Figure 4: On-Resistance vs. Junction Temperature

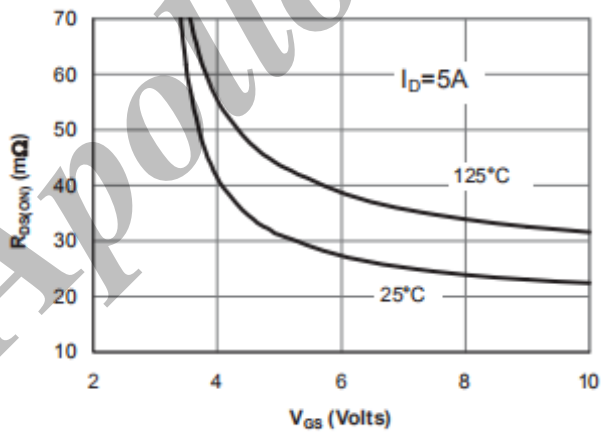


Figure 5: On-Resistance vs. Gate-Source Voltage

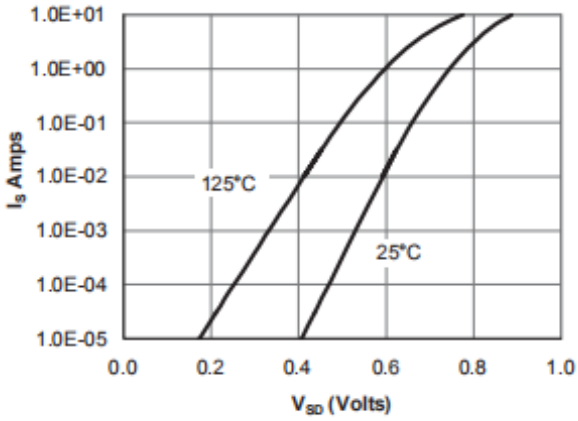


Figure 6: Body diode characteristics

- **Typical Characteristics**

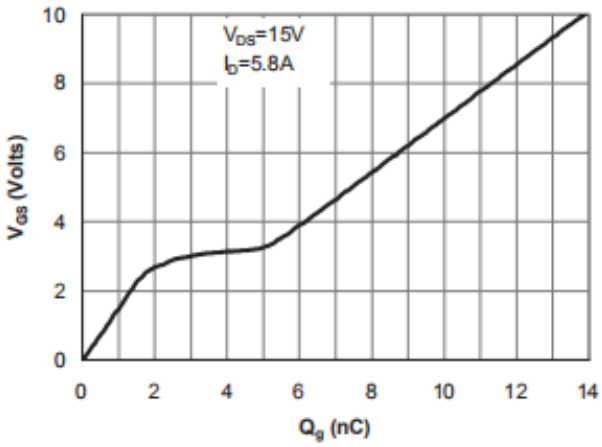


Figure 7: Gate-Charge characteristics

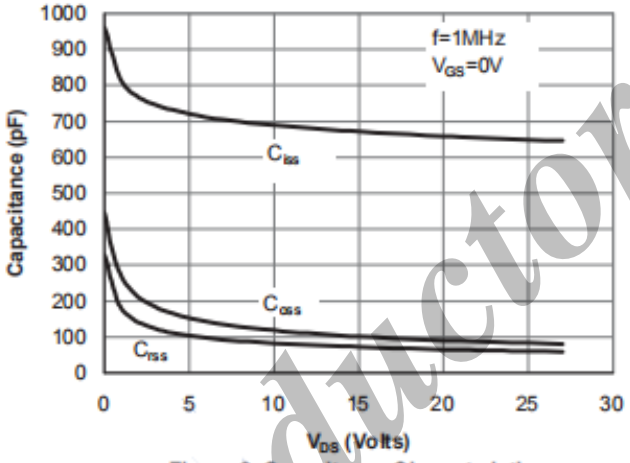


Figure 8: Capacitance Characteristics

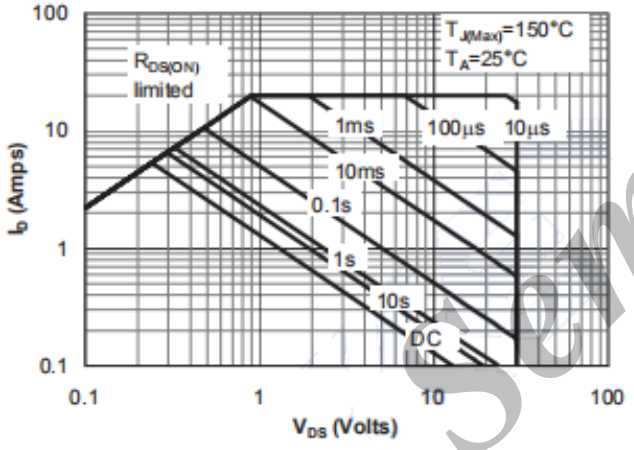


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

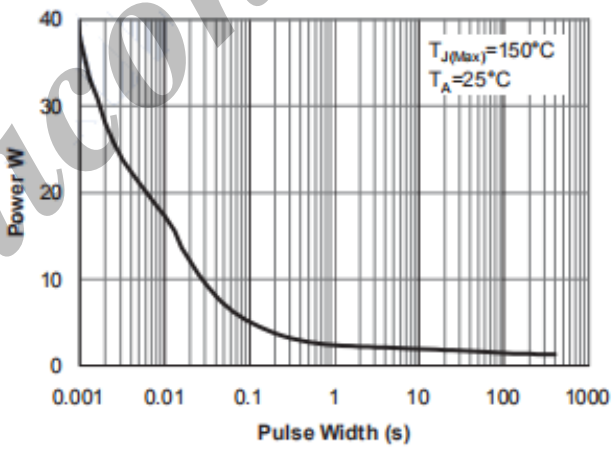


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

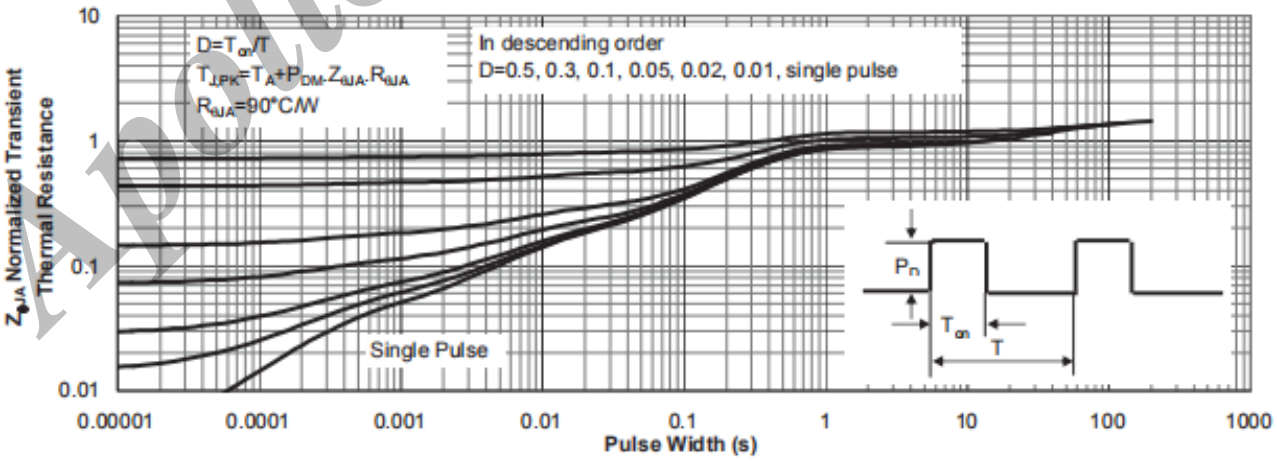


Figure 11: Normalized Maximum Transient Thermal Impedance

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