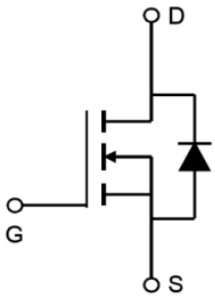
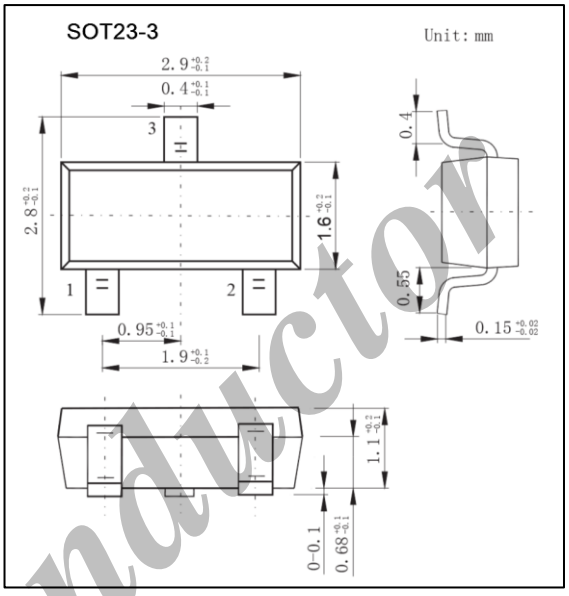
AP3402B
30V N-Channel Enhancement Mode MOSFET

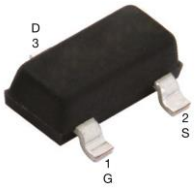
- **General Description**

AP3402A 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.





Top View



- **Applications**

- DC/DC converter for portable devices
- Load switch

- **Product Summary**

V_{DS}	30V
I_D (at V_{GS} = 10V)	4.0A
$R_{DS(ON)}$ (at V_{GS} = 10V)	< 55mΩ
$R_{DS(ON)}$ (at V_{GS} = 4.5V)	< 70mΩ
$R_{DS(ON)}$ (at V_{GS} = 2.5V)	< 110mΩ

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current T_A=25	I_D	4.0	A
Continuous Drain Current T_A=70		3.4	
Pulsed Drain Current *	I_{DM}	15	
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-Case	$R_{\theta JC}$	80	℃/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°C**

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}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.6	1	1.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=4A		45	55	mΩ
		V_{GS}=10V, I_D=4A T_J=125°C		66	80	
		V_{GS}=4.5V, I_D=3A		55	70	mΩ
		V_{GS}=2.5V, I_D=2A		83	110	mΩ
On state drain current	$I_{D(ON)}$	V_{GS}=4.5V, V_{DS}=5V	10			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=4A		8		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz		390		pF
Output Capacitance	C_{oss}			54.5		pF
Reverse Transfer Capacitance	C_{rss}			41		pF
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		3		Ω
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=15V, I_D=4A		4.34		nC
Gate Source Charge	Q_{gs}			0.6		nC
Gate Drain Charge	Q_{gd}			1.38		nC
Turn-On Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=3.75Ω, R_{GEN}=6Ω		3.3		ns
Turn-On Rise Time	t_r			1		ns
Turn-Off Delay Time	$t_{D(off)}$			21.7		ns
Turn-Off Fall Time	t_f			2.1		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F=4A, d_I/d_t=100A/ μs		12		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=4A, d_I/d_t=100A/ μs		6.3		nC
Maximum Body-Diode Continuous Current	I_S				2.5	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.8	1	V

- **Ordering Information**

Ordering Part Number	Package	MOQ
AP3402B	SOT23-3	3,000 pcs / reel

- **Typical Characteristics**

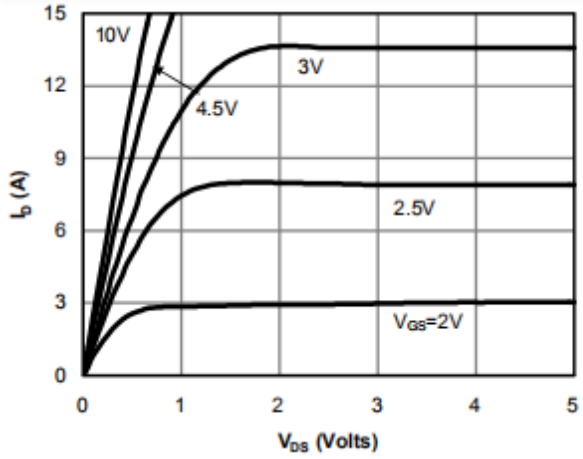


Fig 1: On-Region Characteristics

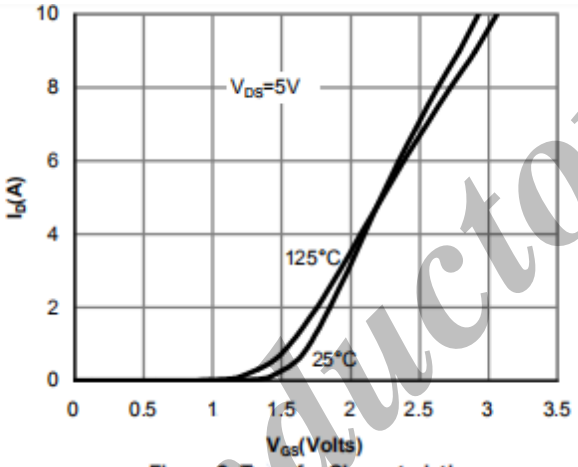


Figure 2: Transfer Characteristics

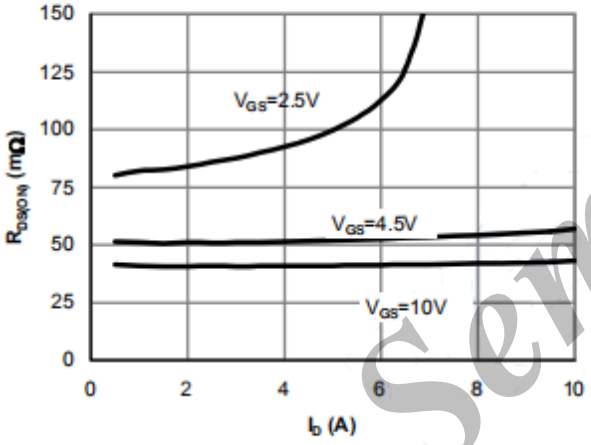


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

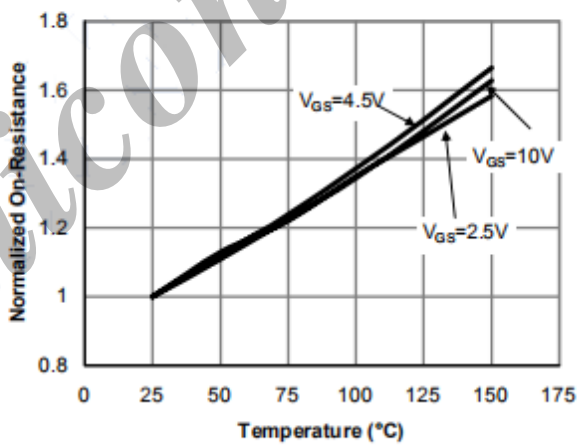


Figure 4: On-Resistance vs. Junction Temperature

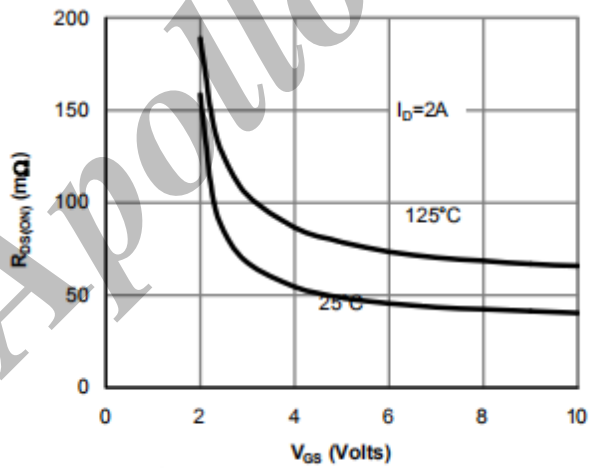


Figure 5: On-Resistance vs. Gate-Source Voltage

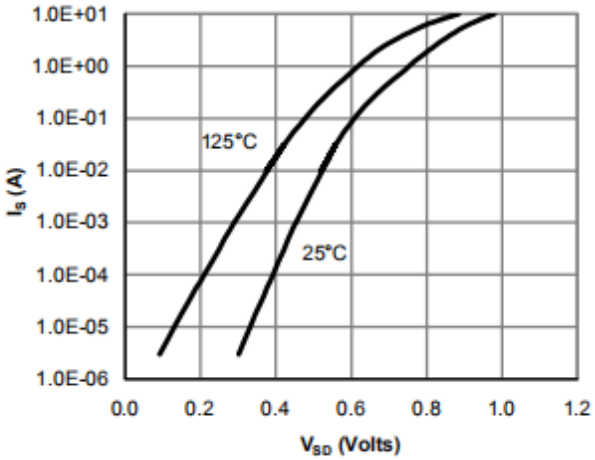


Figure 6: Body-Diode Characteristics

- **Typical Characteristics**

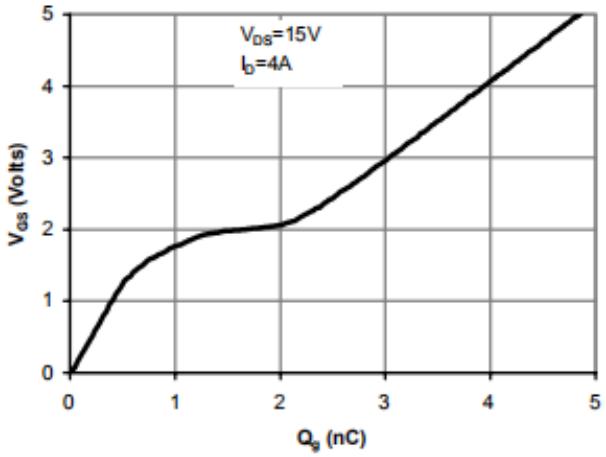


Figure 7: Gate-Charge Characteristics

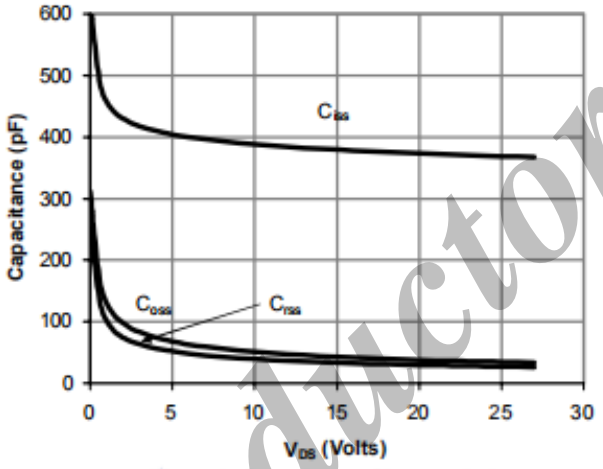


Figure 8: Capacitance Characteristics

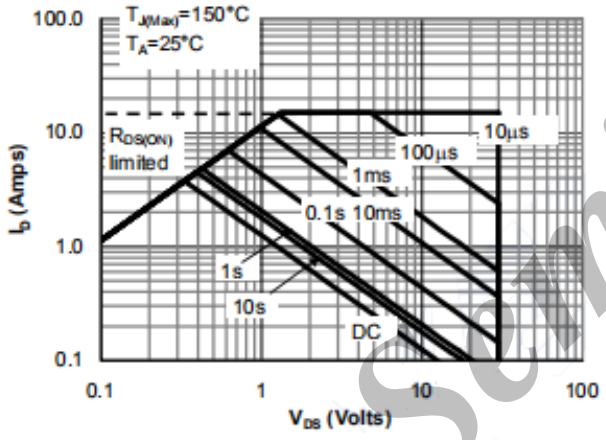


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

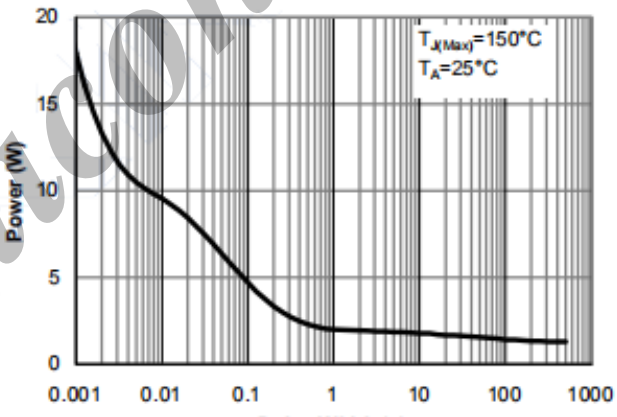


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

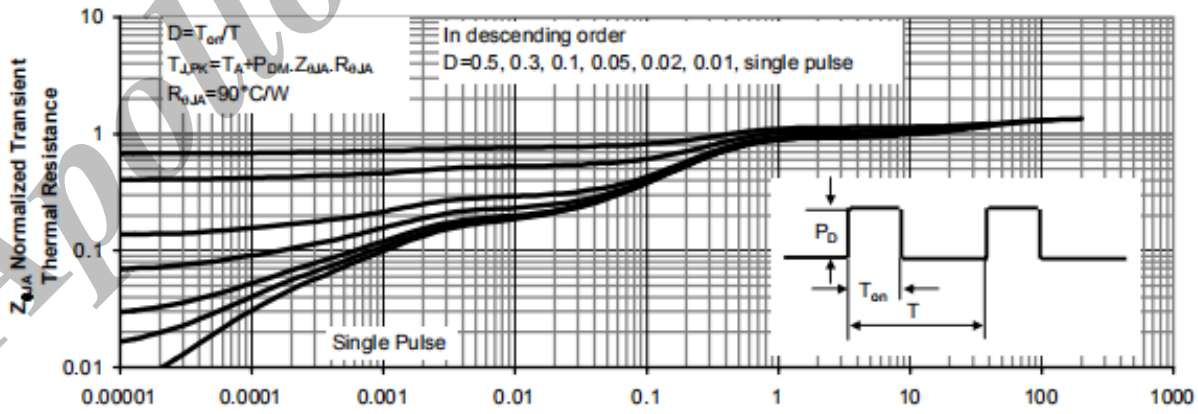


Figure 11: Normalized Maximum Transient Thermal Impedance

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