

• General Description

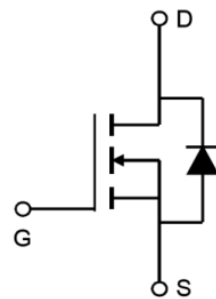
AP3422A combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load switch or PWM applications.

• Applications

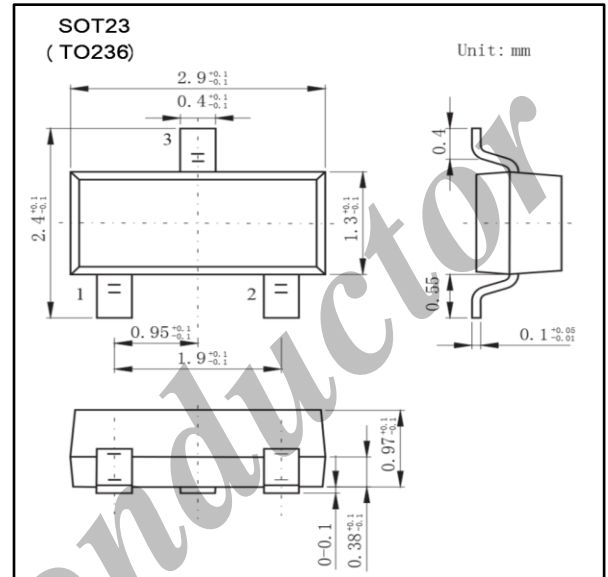
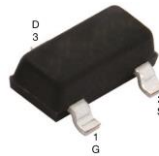
- DC-DC converter for portable devices
- Load switch

• Product Summary

V_{DS}	55V
I_D (at $V_{GS} = 4.5V$)	2.1A
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 160m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 200m Ω



Top View



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_j = 150^\circ C$) (Surface Mounted on FR4 Board)	I_D	$T_a = 25^\circ C$	2.1
		$T_a = 70^\circ C$	1.7
Pulsed Drain Current (Pulse width limited by maximum junction temperature)	I_{DM}	10	A
Power Dissipation	P_D	$T_a = 25^\circ C$	1.25
		$T_a = 70^\circ C$	0.8
Junction and Storage Temperature Range	T_j, T_{STG}	-55 to 150	$^\circ C$
Thermal Characteristics			
Thermal Resistance. Junction-to-Ambient (Surface Mounted on FR4 Board)	$R_{\theta JA}$	$t \leq 10s$	100
		Steady State	150
Thermal Resistance. Junction-to-Case	$R_{\theta JC}$	60	$^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	V_{DSS}	$I_D=10mA, V_{GS}=0V$	55			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=44V, V_{GS}=0V$			1	μA
		$V_{DS}=44V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Source 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	1.3	2	V
On-State Drain Current	$I_{D(ON)}$	$V_{GS}=4.5V, V_{DS}=5V$	10			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=2.1A$		125	160	m Ω
		$V_{GS}=4.5V, I_D=2.1A, T_J=125^\circ C$		175	210	
		$V_{GS}=2.5V, I_D=1.5A$		157	200	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=2.1A$		11		S
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$		0.78	1	V
Maximum Body-Diode Continuous Current	I_S				1	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$		214	300	pF
Output Capacitance	C_{oss}			31		
Reverse Transfer Capacitance	C_{rss}			12.6		
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		1.3	3	Ω
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=27.5V, I_D=2.1A$		2.6	3.3	nC
Gate Source Charge	Q_{gs}			0.6		
Gate Drain Charge	Q_{gd}			0.8		
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=27.5V, R_L=12\Omega, R_{GEN}=3\Omega$		2.3		ns
Turn-On Rise Time	t_r			2.4		
Turn-Off Delay Time	$t_{D(off)}$			16.5		
Turn-Off Fall Time	t_f			2		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=2.1A, dI/dt=100A/\mu s$		20	30	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=2.1A, dI/dt=100A/\mu s$		17		nC

• **Ordering Information**

Ordering Part Number	Package	MOQ
AP3422A	SOT23 (TO236)	3,000 pcs / reel

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• Typical Electrical and Thermal Characteristics

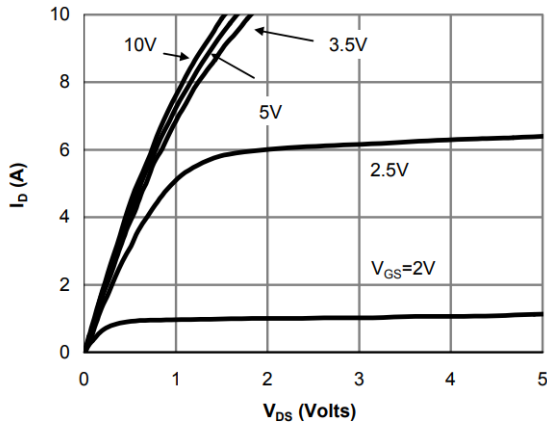


Fig 1: On-Region characteristics

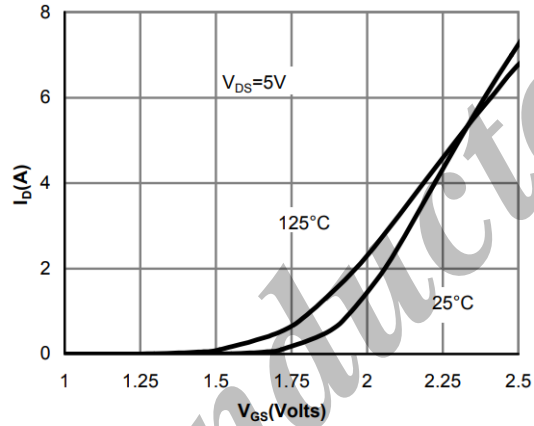


Figure 2: Transfer Characteristics

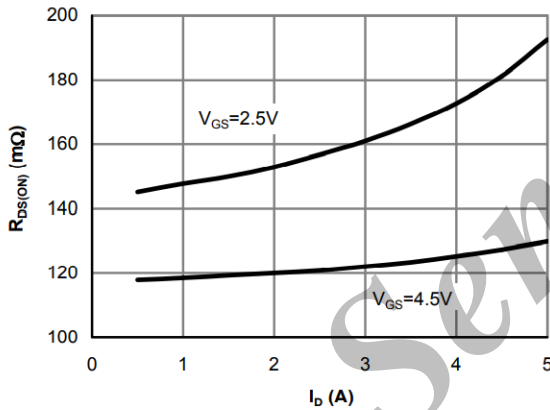


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

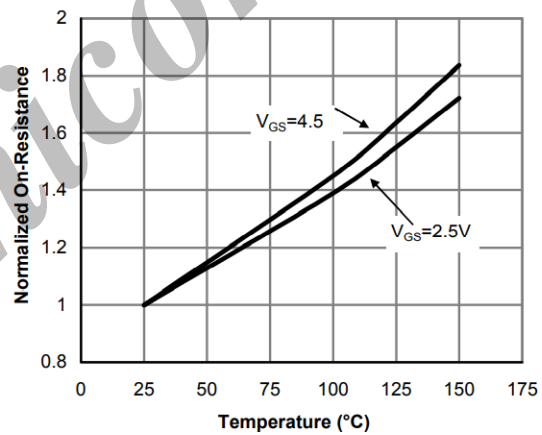


Figure 4: On-Resistance vs. Junction Temperature

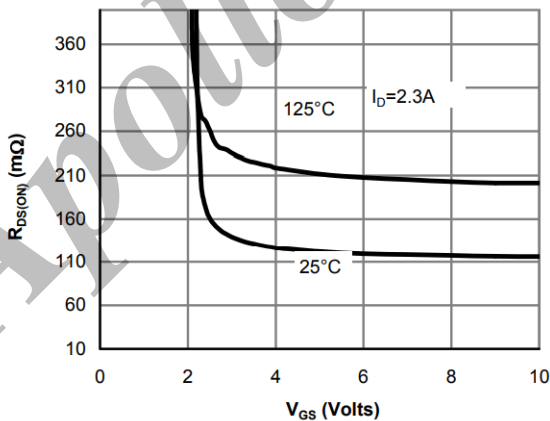


Figure 5: On-Resistance vs. Gate-Source Voltage

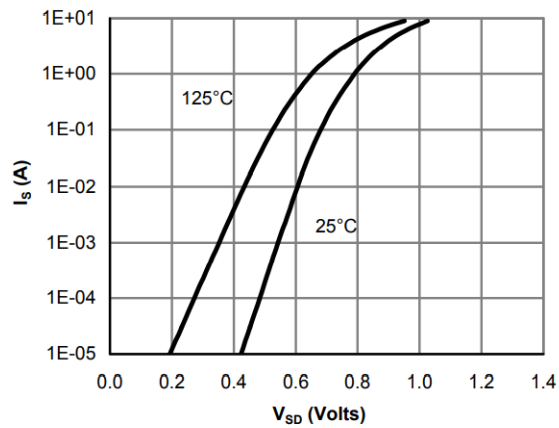


Figure 6: Body-Diode Characteristics

• Typical Electrical and Thermal Characteristics

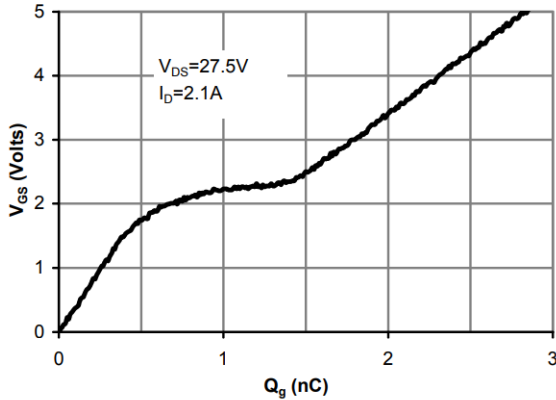


Figure 7: Gate-Charge Characteristics

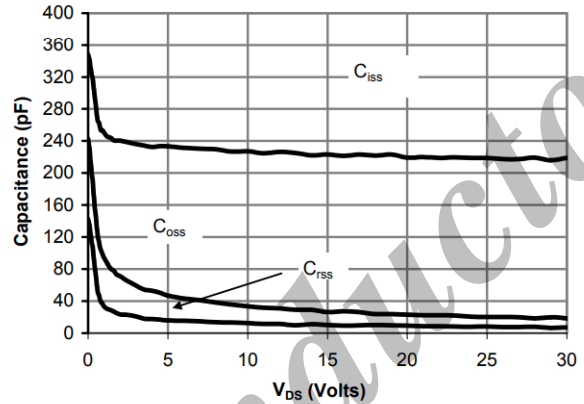


Figure 8: Capacitance Characteristics

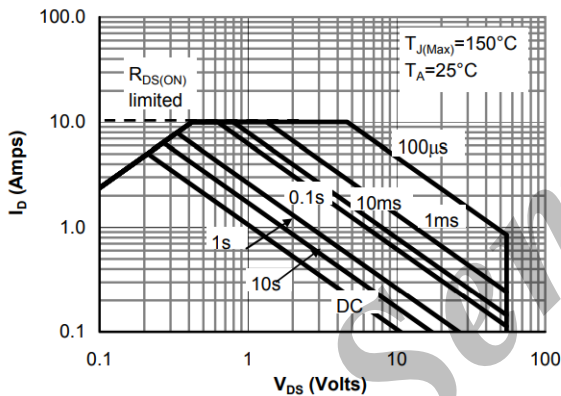


Figure 9: Maximum Forward Biased Safe Operating Area

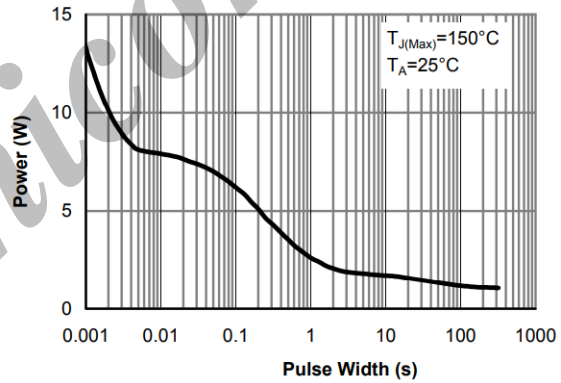


Figure 10: Single Pulse Power Rating Junction-to-Ambient

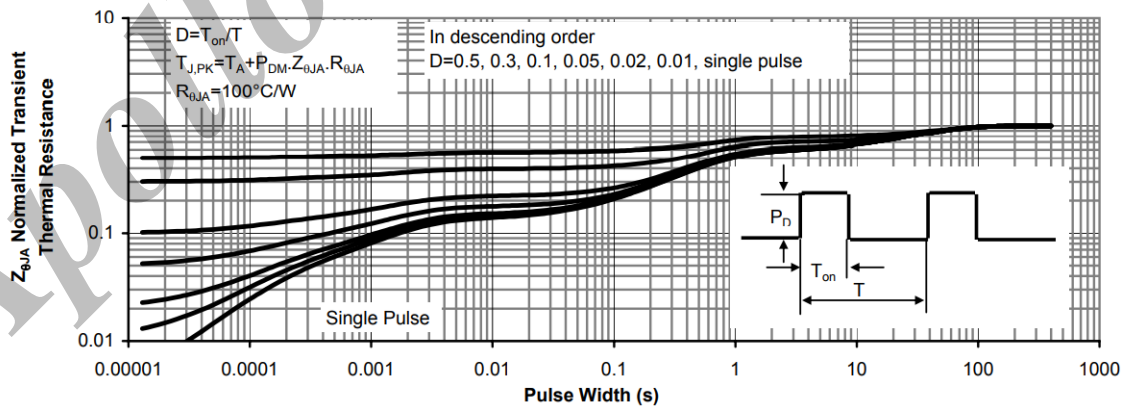


Figure 11: Normalized Maximum Transient Thermal Impedance

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