

General Description

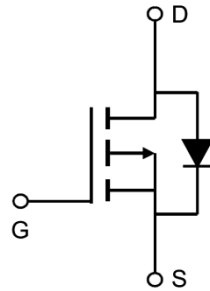
AP2301B combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load switch or PWM applications.

Applications

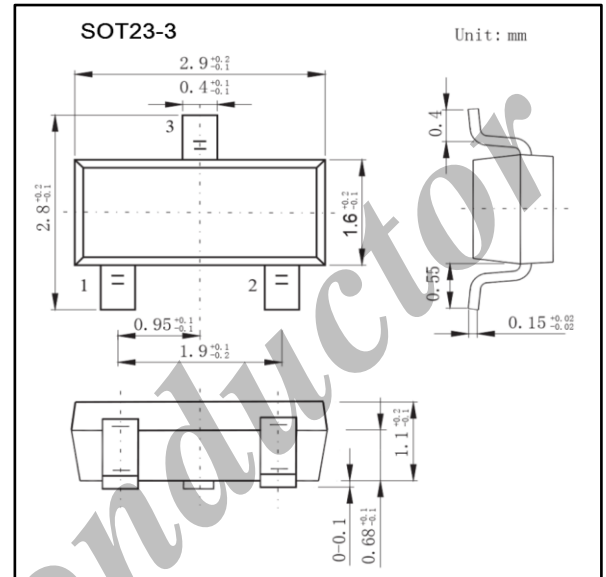
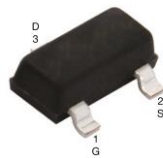
- DC-DC converter for portable devices
- Load switch

Product Summary

V_{DS}	-20V
I_D (at $V_{GS} = -4.5V$)	-2.2A
$R_{DS(ON)}$ (at $V_{GS} = -4.5V$)	< 100m Ω
$R_{DS(ON)}$ (at $V_{GS} = -2.5V$)	< 150m Ω



Top View



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

Parameter		Symbol	Rating		Unit
			t = 5 s	Steady State	
Drain-Source Voltage		V _{DS}	-20		V
Gate-Source Voltage		V _{GS}	±8		V
Continuous Drain Current (T _J = 150 °C)	Ta = 25°C	I _D	-2.4	-2.2	A
	Ta = 70°C		-1.9	-1.8	
Pulsed Drain Current (Pulse width limited by maximum junction temperature)		I _{DM}	-10		
Power Dissipation	Ta = 25°C	P _D	0.9	0.7	W
	Ta = 70°C		0.57	0.45	
Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150		°C
Thermal Characteristics					
Thermal Resistance. Junction-to-Ambient (Surface Mounted on FR4 Board)		R _{θJA}	140	175	°C/W

Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	V_{DS}	$I_D=-250\mu A, V_{GS}=0V$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_J=55^{\circ}C$			-10	
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 8V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45		-0.95	V
On-State Drain Current (** Note a)	$I_{D(ON)}$	$V_{DS} \leq -5V, V_{GS}=-4.5V$	-6			A
		$V_{DS} \leq -5V, V_{GS}=-2.5V$	-3			
Static Drain-Source On-Resistance (** Note a)	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-2.8A$		80	100	m Ω
		$V_{GS}=-2.5V, I_D=-2.0A$		110	150	
Forward Transconductance (** Note a)	g_{FS}	$V_{DS}=-5V, I_D=-2.8A$		6.5		S
Diode Forward Voltage	V_{SD}	$I_S=-0.75A, V_{GS}=0V$		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I_S	t = 5 s			-0.72	A
		Steady State			-0.6	
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-6V, f=1MHz$ (** Note b)		375		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			65		
Switching Parameters						
Total Gate Charge (4.5V)	Q_g	$V_{GS}=-4.5V, V_{DS}=-6V, I_D=-2.8A$ (** Note b)		4.5	10	nC
Gate Source Charge	Q_{gs}			0.7		
Gate Drain Charge	Q_{gd}			1.1		
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=-4.5V, V_{DS}=-6V, R_L=6\Omega,$ $R_{GEN}=6\Omega, I_D=-1.0A$ (** Note c)		20	30	ns
Turn-On Rise Time	t_r			40	60	
Turn-Off Delay Time	$t_{D(off)}$			30	45	
Turn-Off Fall Time	t_f			20	30	

Notes

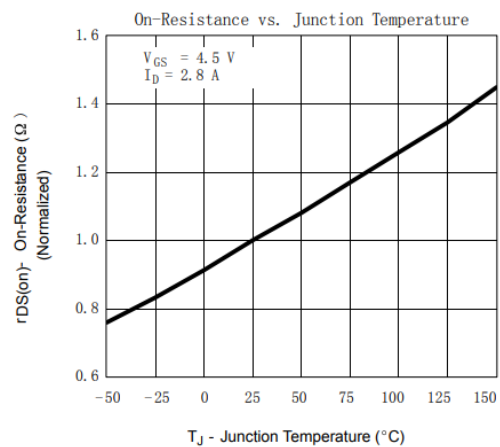
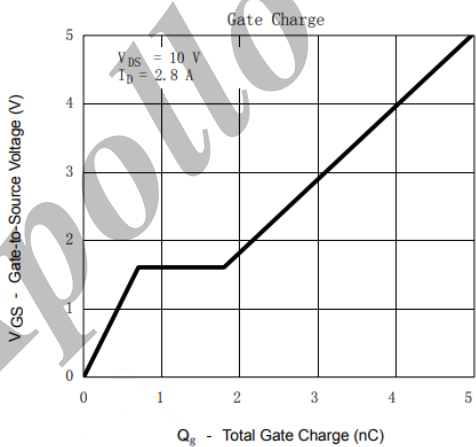
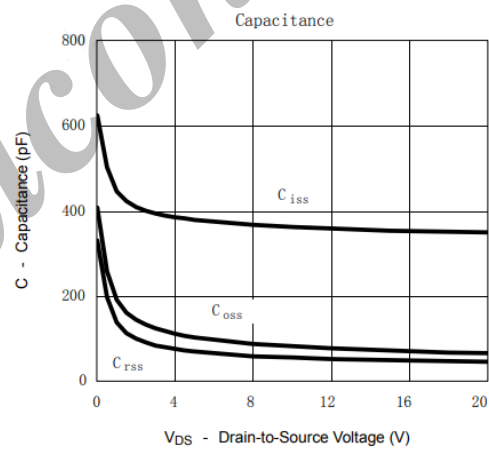
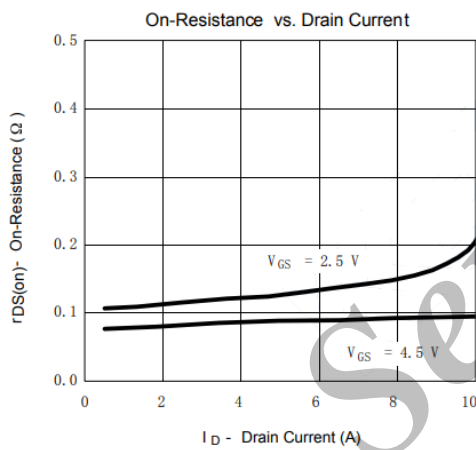
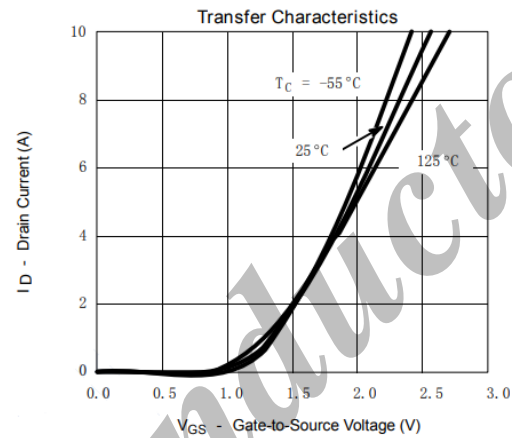
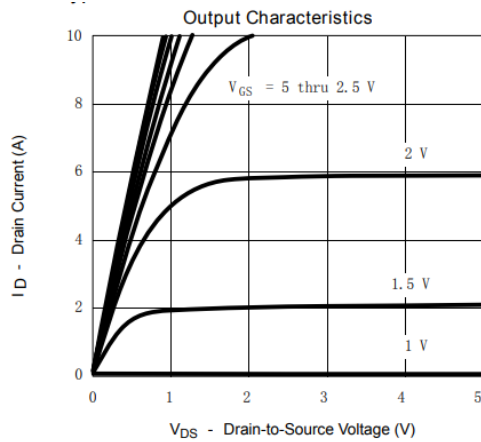
- Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$.
- For DESIGN AID ONLY, not subject to production testing.
- Switching time is essentially independent of operating temperature.

Ordering Information

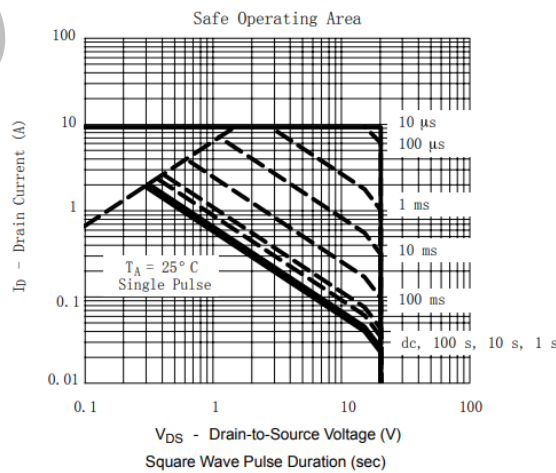
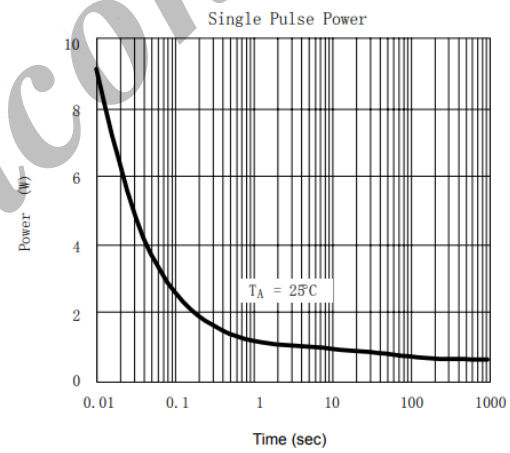
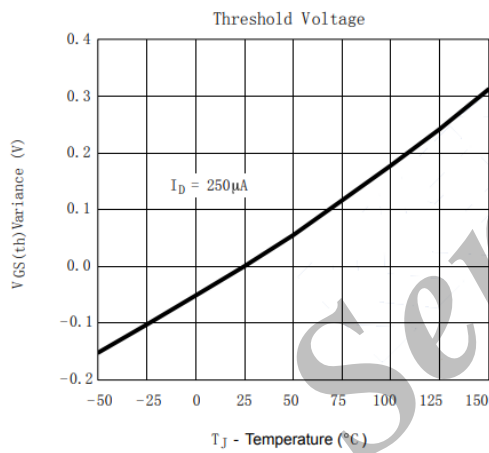
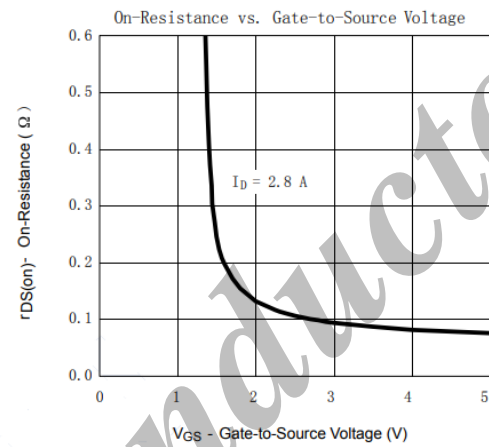
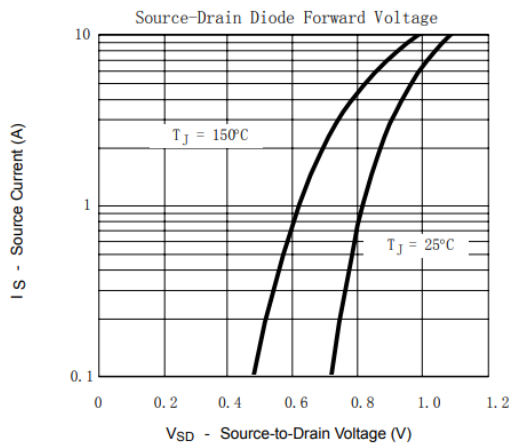
Ordering Part Number	Package	MOQ
AP2301B	SOT23-3	3,000 pcs / reel

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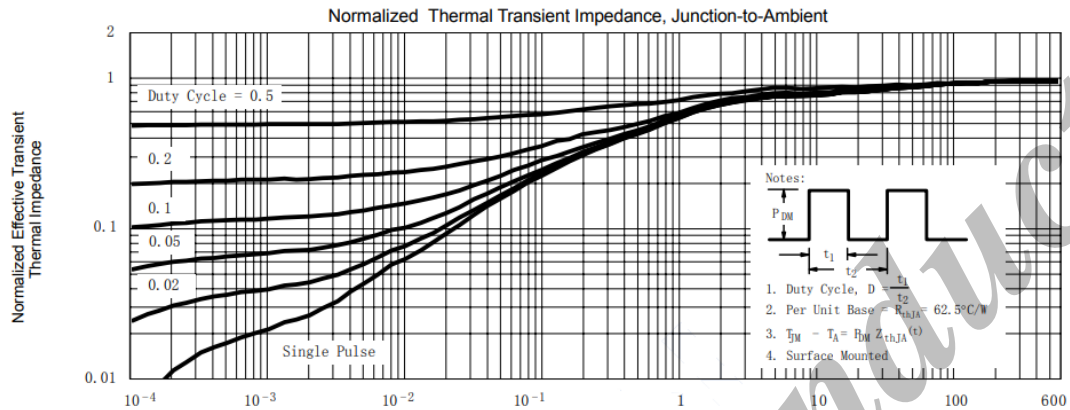
- Typical Electrical and Thermal Characteristics



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