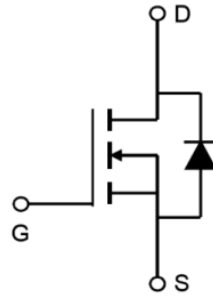


• General Description

AP2300B-SI 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.



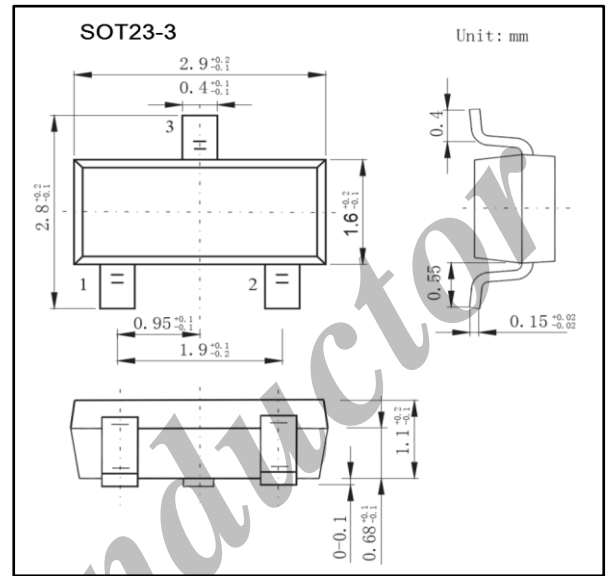
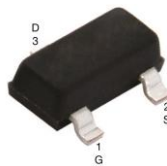
• Applications

- DC/DC converter for portable devices
- Load switch

• Product Summary

V_{DS}	30V
I_D (at $V_{GS} = 10V$)	4.0A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 55m Ω
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 70m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 110m 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}	± 12	V
Continuous Drain Current	I_D	$T_A=25$	4.0
		$T_A=70$	3.4
Pulsed Drain Current *	I_{DM}	15	A
Power Dissipation	P_D	$T_A=25$	1.4
		$T_A=70$	1
Thermal Resistance. Junction- to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance. Junction- to-Case	$R_{\theta JC}$	80	$^\circ\text{C/W}$
Junction and Storage Temperature Range	T_J, 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}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	1	1.4	V	
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4A$		45	55	m Ω	
		$V_{GS}=10V, I_D=4A, T_J=125^\circ C$		66	80		
		$V_{GS}=4.5V, I_D=3A$		55	70		
		$V_{GS}=2.5V, I_D=2A$		83	110		
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	$t_{D(on)}$				3.3		ns
Turn-On Rise Time	t_r	$V_{GS}=10V, V_{DS}=15V, R_L=3.75\Omega, R_{GEN}=6\Omega$		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}		$I_F=4A, d_i/d_t=100A/\mu s$		12		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=4A, d_i/d_t=100A/\mu s$		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
AP2300B-SI	SOT23-3	3,000 pcs / reel

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• Typical Characteristics

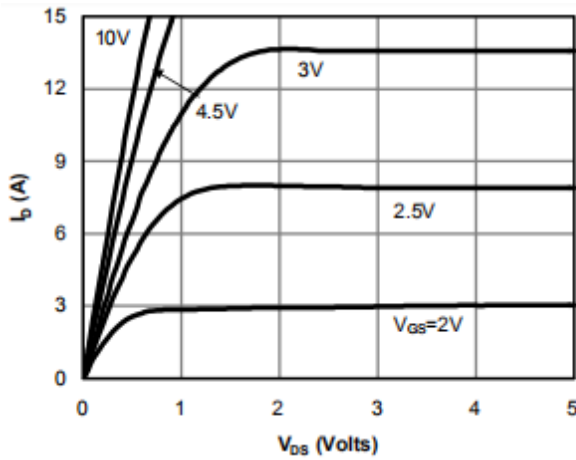


Fig 1: On-Region Characteristics

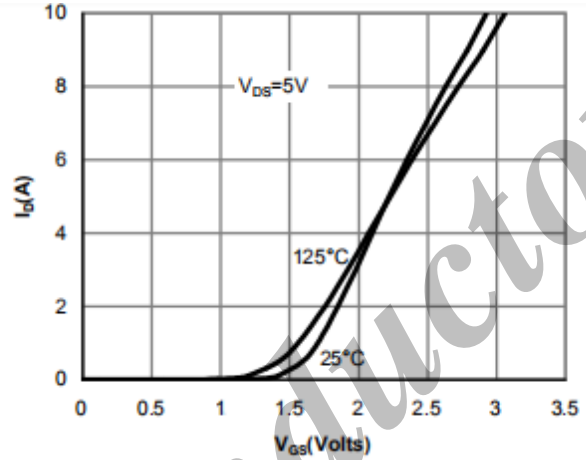


Figure 2: Transfer Characteristics

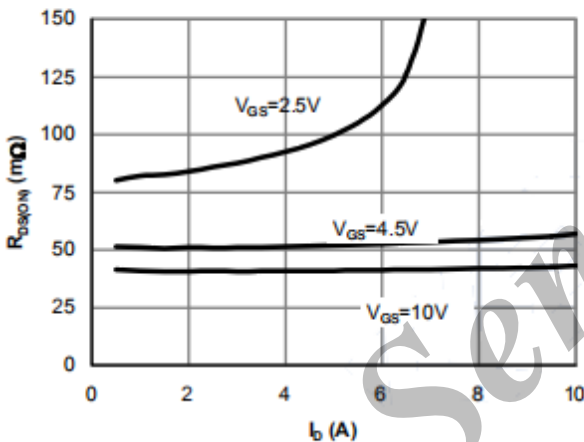


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

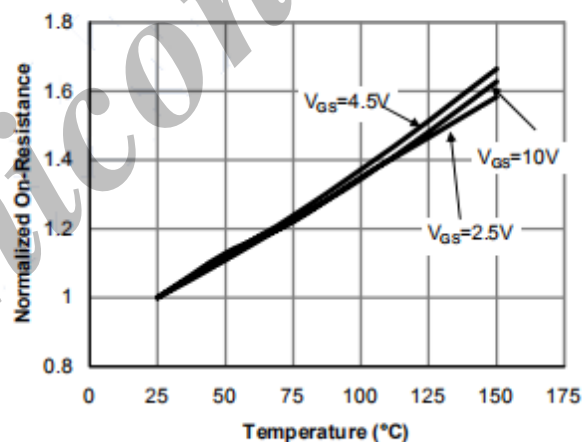


Figure 4: On-Resistance vs. Junction Temperature

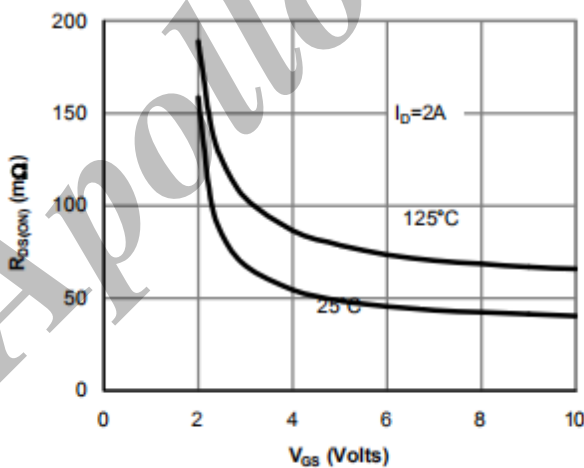


Figure 5: On-Resistance vs. Gate-Source Voltage

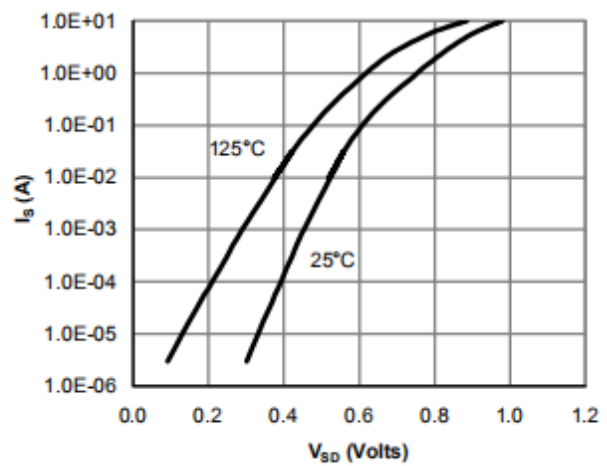


Figure 6: Body-Diode Characteristics

• Typical Characteristics

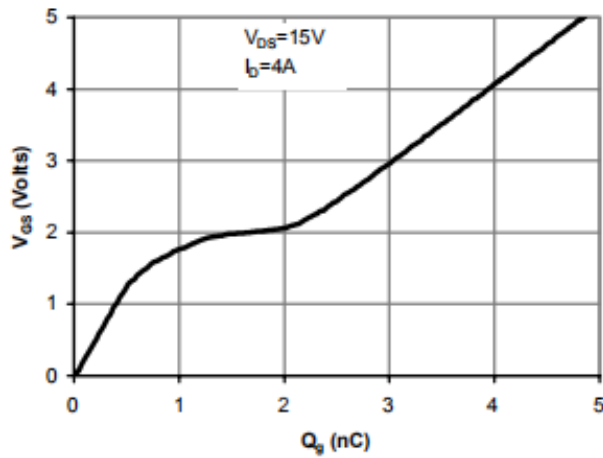


Figure 7: Gate-Charge Characteristics

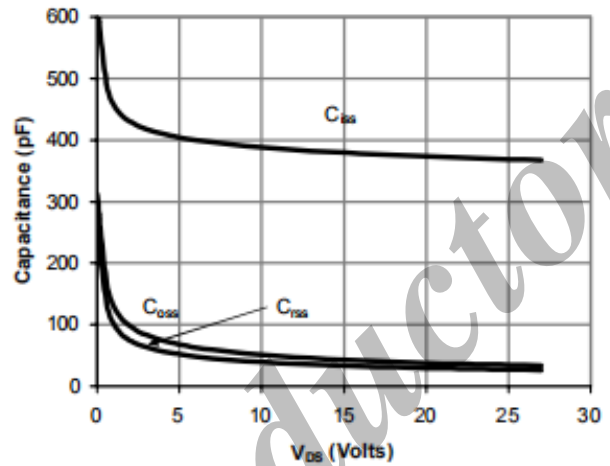


Figure 8: Capacitance Characteristics

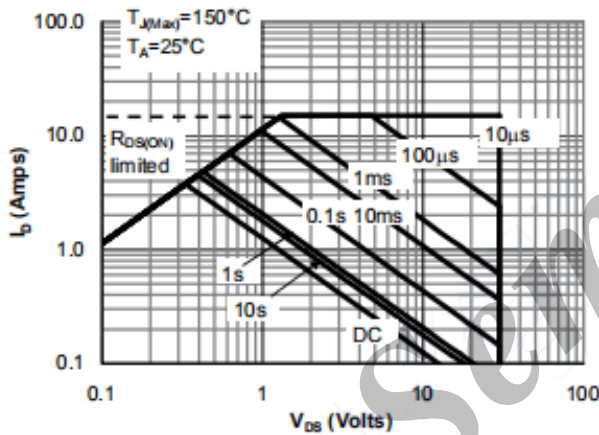


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

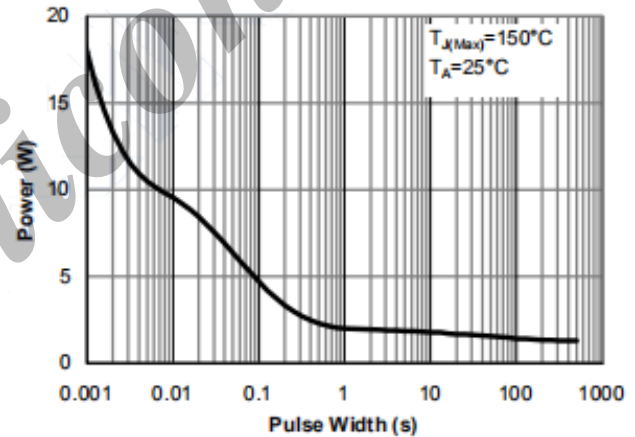


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

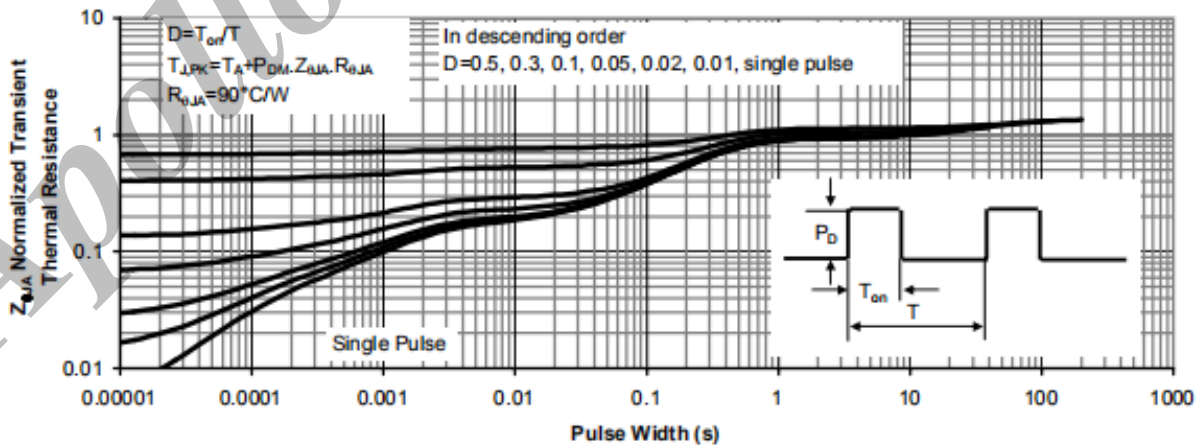


Figure 11: Normalized Maximum Transient Thermal Impedance

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