

• General Description

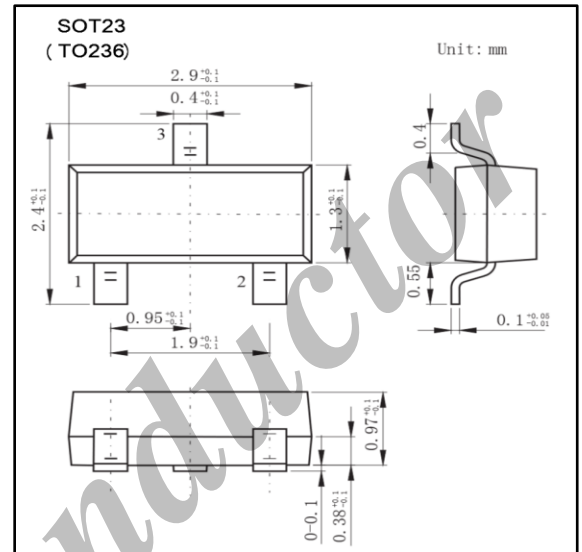
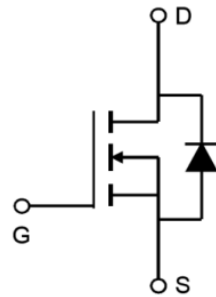
AP2300A-SI-2 combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.

• Applications

- DC/DC converter for portable devices
- Load switch

• Product Summary

V_{DS}	30V
I_D (at $V_{GS} = 4.5V$)	3.8A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 55m Ω
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 65m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 85m Ω



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_A = 25^\circ C$	3.8
		$T_A = 70^\circ C$	3.1
Pulsed Drain Current *	I_{DM}	15	A
Power Dissipation	P_D	$T_A = 25^\circ C$	1.4
		$T_A = 70^\circ C$	0.9
Thermal Resistance. Junction- to-Ambient	$R_{\theta JA}$	$t \leq 10s$	90
		Steady-State	125
Thermal Resistance. Junction- to-Lead	$R_{\theta JL}$	80	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

* 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}	$V_{DS}=30V, V_{GS}=0V$			1	μA
		$V_{DS}=30V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5		1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.8A$			55	m Ω
		$V_{GS}=10V, I_D=3.8A, T_J=125^\circ C$			84	
		$V_{GS}=4.5V, I_D=3.5A$			65	m Ω
		$V_{GS}=2.5V, I_D=1A$			85	m Ω
On state Drain Current	$I_{D(on)}$	$V_{GS}=10V, V_{DS}=5V$	15			A
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=3.8A$		14		S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=15V, f=1MHz$	185	235	285	pF
Output Capacitance	C_{oss}		25	35	45	pF
Reverse Transfer Capacitance	C_{rss}		10	17.5	25	pF
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	2.1		6.5	Ω
Total Gate Charge (10V)	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=3.8A$		10	12	nC
Total Gate Charge (4.5V)				4.7		
Gate Source Charge			Q_{gs}	0.95		
Gate Drain Charge			Q_{gd}	1.6		
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=15V, R_L=3.95\Omega, R_{GEN}=3\Omega$		3.5		ns
Turn-On Rise Time	t_r			1.5		
Turn-Off Delay Time	$t_{D(off)}$			17.5		
Turn-Off Fall Time	t_f			2.5		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=3.8A, d_i/d_t=100A/\mu s$		8.5	11	ns
Body Diode Reverse Recovery Charge	Q_{rr}			2.6	3.5	nC
Maximum Body-Diode Continuous Current	I_S				1.5	A
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1	V

• **Ordering Information**

Ordering Part Number	Package	MOQ
AP2300A-SI-2	SOT23	3,000 pcs / reel

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• Typical Characteristics

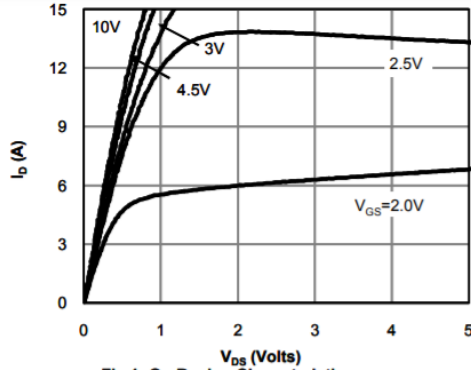


Figure 1: On-Region Characteristics

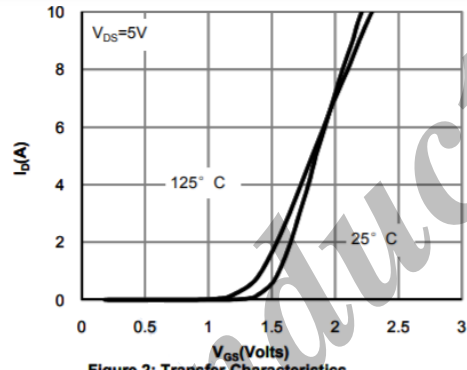


Figure 2: Transfer Characteristics

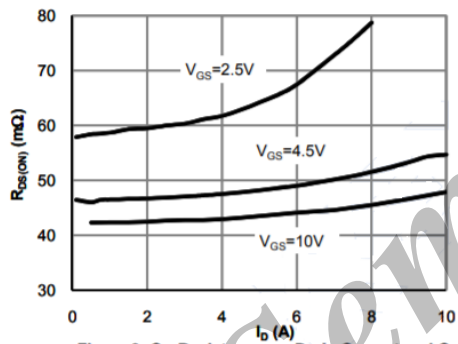


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

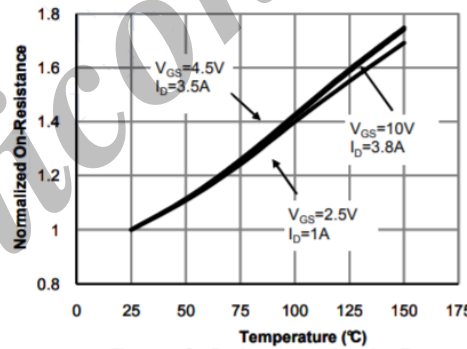


Figure 4: On-Resistance vs. Junction Temperature

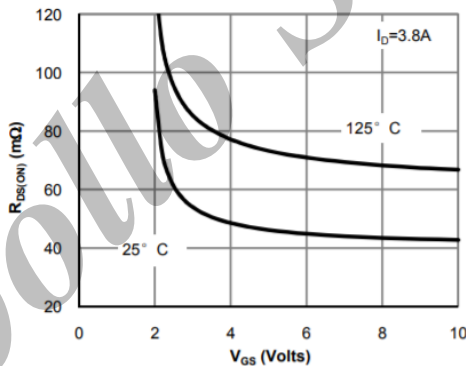


Figure 5: On-Resistance vs. Gate-Source Voltage

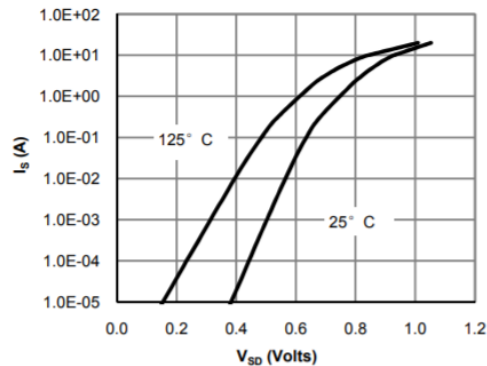


Figure 6: Body-Diode Characteristics

• **Typical Characteristics**

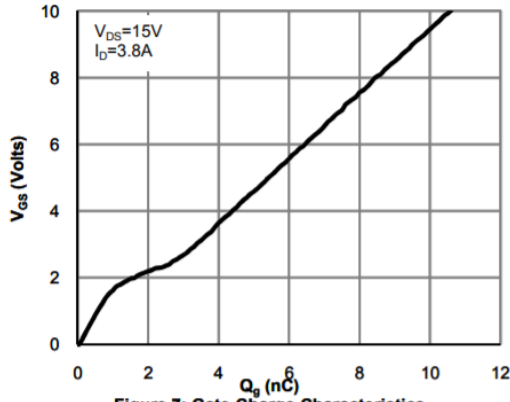


Figure 7: Gate-Charge Characteristics

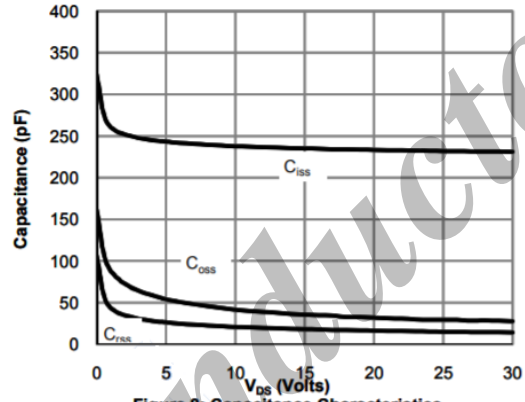


Figure 8: Capacitance Characteristics

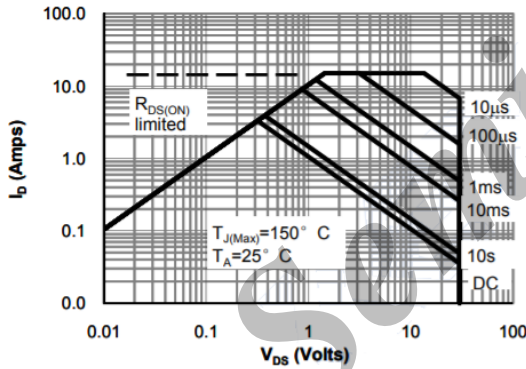


Figure 9: Maximum Forward Biased Safe Operating Area

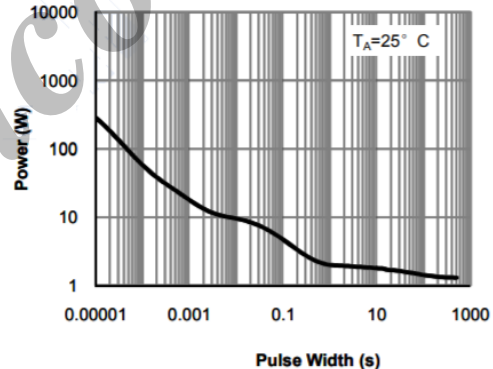


Figure 10: Single Pulse Power Rating Junction-to-Ambient

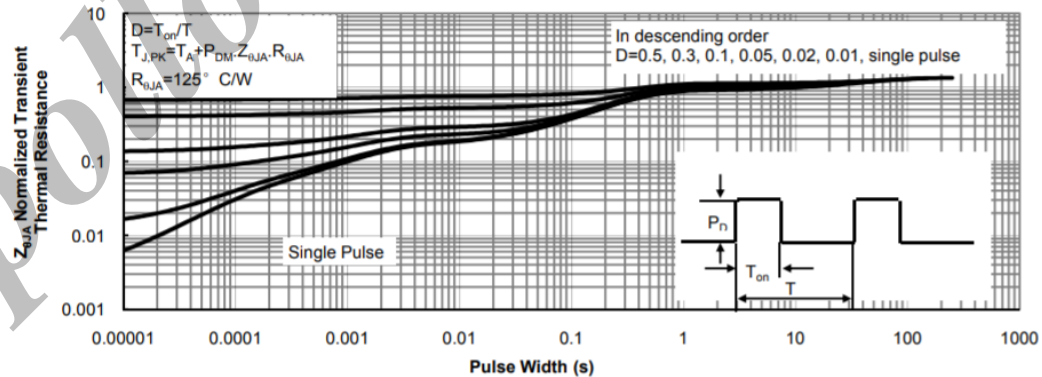


Figure 11: Normalized Maximum Transient Thermal Impedance

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