

### • General Description

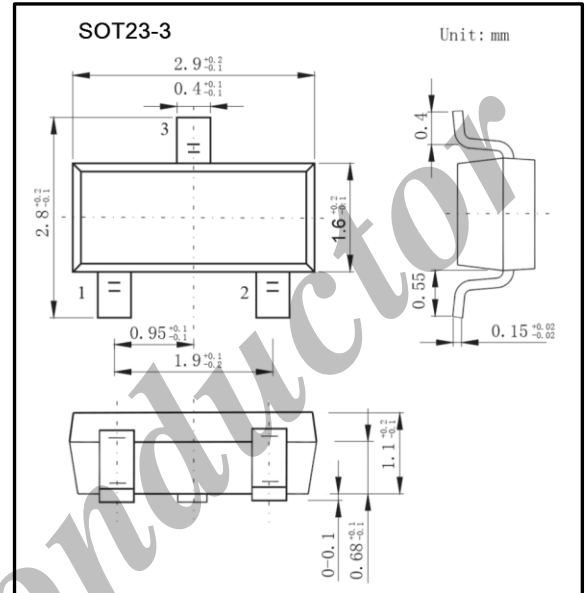
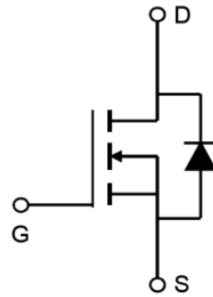
AP2308B combines advanced MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is most suitable to load-switch or PWM applications.

### • Applications

- DC/DC converter for portable devices
- Load switch

### • Product Summary

$V_{DS}$	60V
$R_{DS(ON)}$ (at $V_{GS} = 10V, I_D = 2.0A$ )	< 160m $\Omega$
$R_{DS(ON)}$ (at $V_{GS} = 4.5V, I_D = 1.7A$ )	< 220m $\Omega$



### • Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ unless noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>*b</sup>	$I_D$ ( $T_a = 25^\circ\text{C}$ )	2.0	A
	$I_D$ ( $T_a = 70^\circ\text{C}$ )	1.6	
Pulsed Drain Current <sup>*a</sup>	$I_{DM}$	10	
Continuous Source Current (Diode Conduction) <sup>*b</sup>	$I_S$	1.0	
Power Dissipation <sup>*b</sup>	$P_D$ ( $T_a = 25^\circ\text{C}$ )	1.25	W
	$P_D$ ( $T_a = 70^\circ\text{C}$ )	0.8	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ ( $t \leq 5s$ ) <sup>*b</sup>	100	$^\circ\text{C}/\text{W}$
	$R_{\theta JA}$ (Steady State) <sup>*c</sup>	166	
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 150	

Notes

- \*a Pulse width limited by maximum junction temperature
- \*b Surface Mounted on FR4 Board,  $t \leq 5s$ .
- \*c Surface Mounted on FR4 Board.

• **Electrical Characteristics (Ta = 25°C unless noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			0.5	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			10	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.5		3	V
On-state Drain Current *d	I <sub>D(ON)</sub>	V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =10V	6			A
		V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =4.5V	4			
Static Drain-Source On-Resistance *d	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A			160	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.7A			220	
Forward Transconductance *d	g <sub>FS</sub>	V <sub>DS</sub> =4.5V, I <sub>D</sub> =2.0A		4.6		S
Diode Forward Voltage *d	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1.2	V
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		240		pF
Output Capacitance	C <sub>oss</sub>			50		
Reverse Transfer Capacitance	C <sub>rss</sub>			15		
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =2A		4.8	10	nC
Gate Source Charge	Q <sub>gs</sub>			0.8		
Gate Drain Charge	Q <sub>gd</sub>			1		
Gate Resistance	R <sub>g</sub>		0.5		3.3	Ω
Turn-On Delay Time	t <sub>D(on)</sub>	V <sub>GEN</sub> =4.5V, V <sub>DD</sub> =30V, I <sub>D</sub> =1A, R <sub>L</sub> =30Ω, R <sub>g</sub> =6Ω		7	15	ns
Turn-On Rise Time	t <sub>r</sub>			10	20	
Turn-Off Delay Time	t <sub>D(off)</sub>			17	35	
Turn-Off Fall Time	t <sub>f</sub>			6	15	

Note

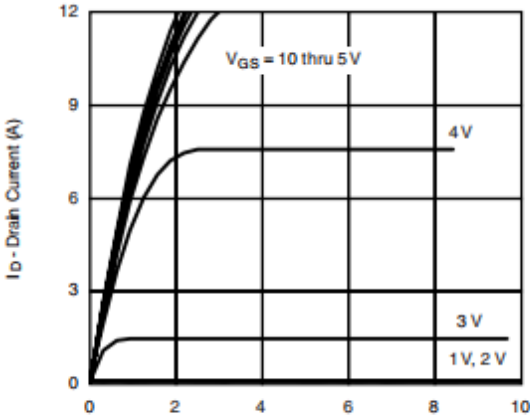
\*d Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

• **Ordering Information**

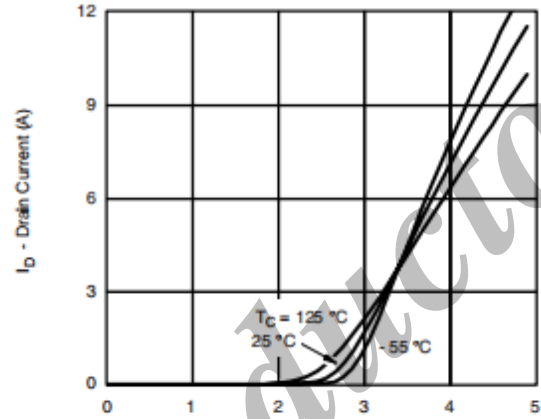
Ordering Part Number	Package	MOQ
AP2308B	SOT23-3	3,000 pcs / reel

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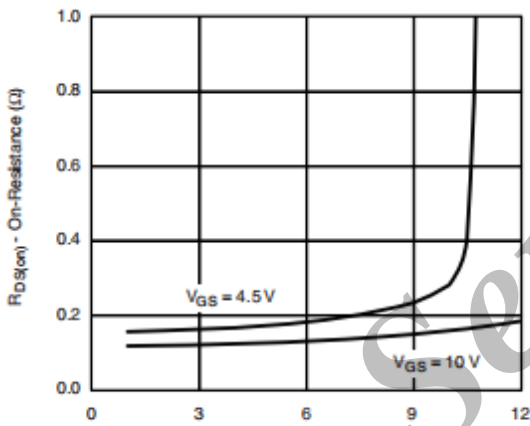
• Typical Characteristics (25°C unless noted)



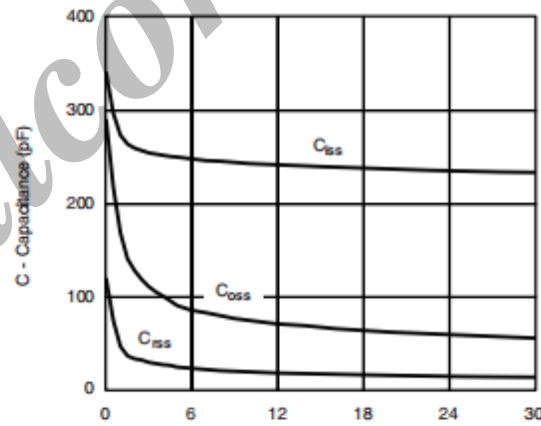
$V_{GS} = 10$  thru  $5V$   
 $I_D$  - Drain Current (A)  
 $V_{DS}$  - Drain-to-Source Voltage (V)  
**Output Characteristics**



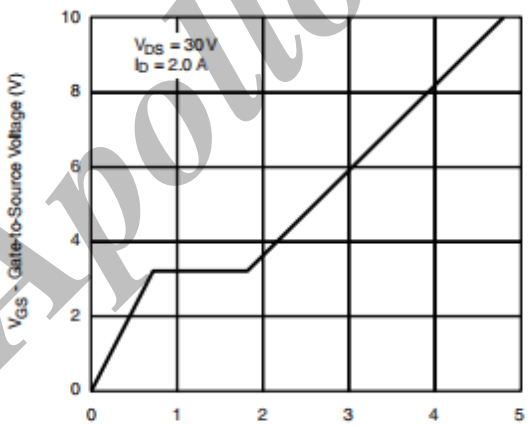
$T_C = 125^\circ C$   
 $25^\circ C$   
 $-55^\circ C$   
 $I_D$  - Drain Current (A)  
 $V_{GS}$  - Gate-to-Source Voltage (V)  
**Transfer Characteristics**



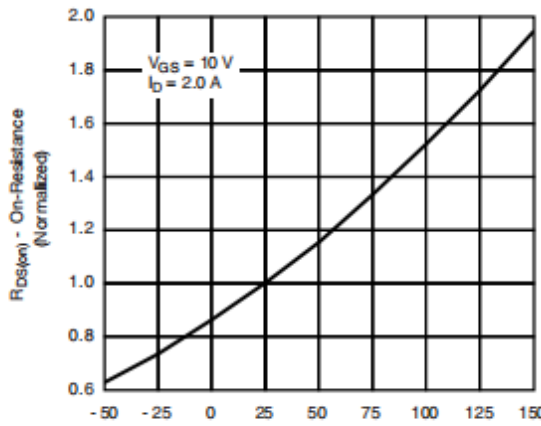
$R_{DS(on)}$  - On-Resistance ( $\Omega$ )  
 $I_D$  - Drain Current (A)  
 $V_{GS} = 4.5V$   
 $V_{GS} = 10V$   
**On-Resistance vs. Drain Current**



$C_{iss}$   
 $C_{oss}$   
 $C_{rss}$   
 $C$  - Capacitance (pF)  
 $V_{DS}$  - Drain-to-Source Voltage (V)  
**Capacitance**

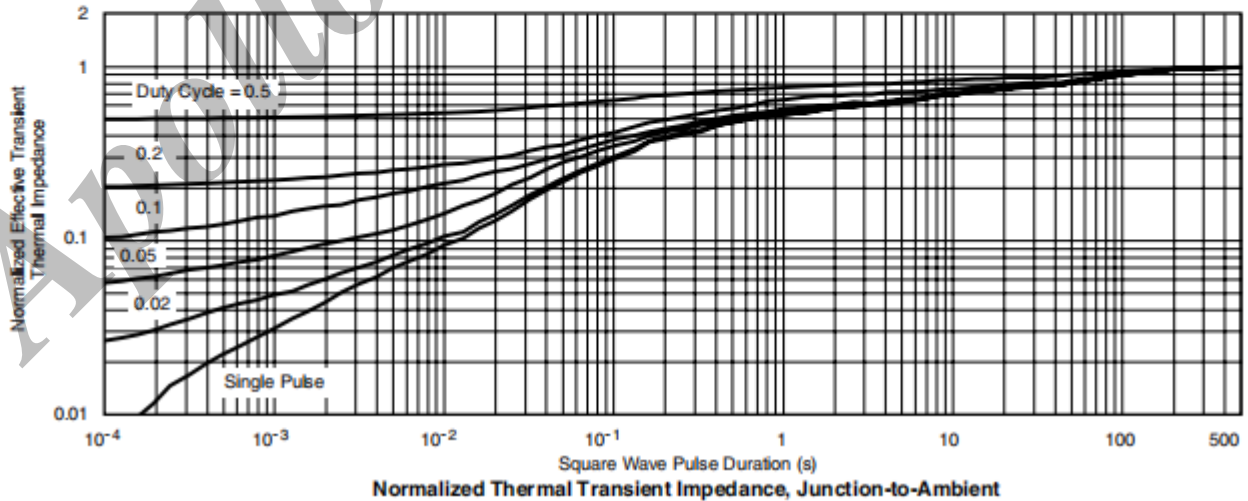
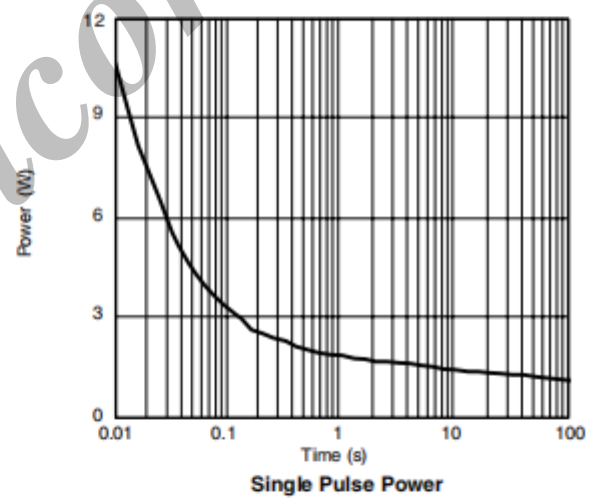
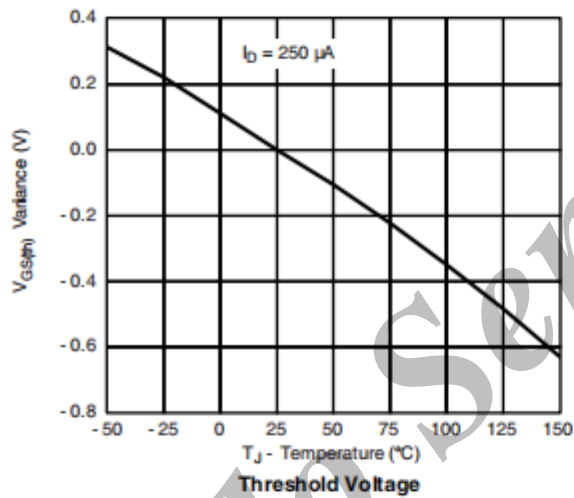
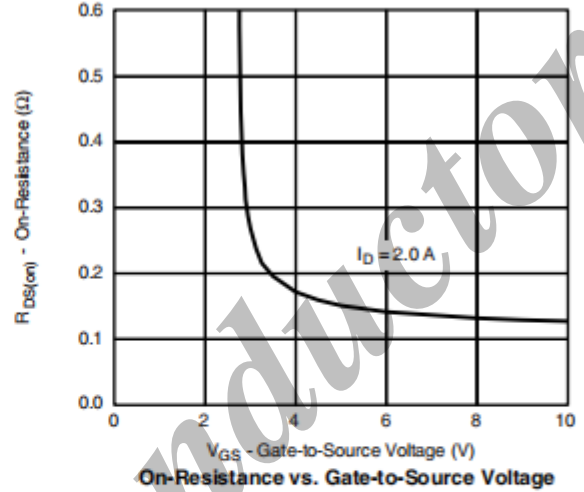
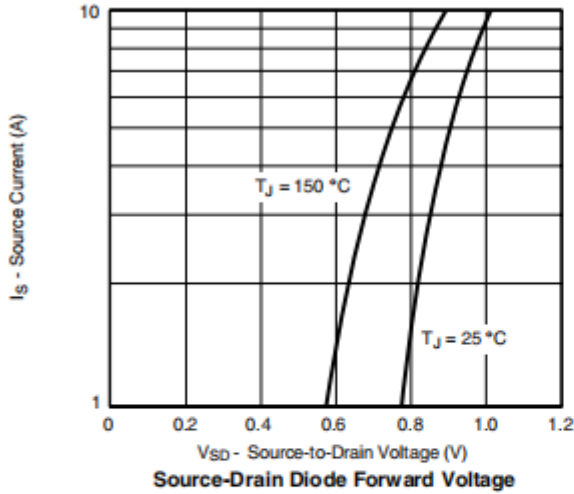


$V_{GS} = 30V$   
 $I_D = 2.0A$   
 $V_{GS}$  - Gate-to-Source Voltage (V)  
 $Q_g$  - Total Gate Charge (nC)  
**Gate Charge**



$V_{GS} = 10V$   
 $I_D = 2.0A$   
 $R_{DS(on)}$  - On-Resistance (Normalized)  
 $T_J$  - Junction Temperature ( $^\circ C$ )  
**On-Resistance vs. Junction Temperature**

• Typical Characteristics (25°C unless noted)



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