

**General Features**

- 20V,4A
- $R_{DS(on)}=Typ\ 23m\Omega@V_{GS}=4.5V$
- $R_{DS(on)}=Typ\ 28m\ \Omega@V_{GS}=2.5V$
- SOT23

**Application**

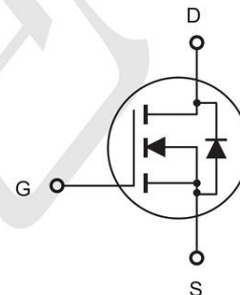
- Battery protection
- Load switch
- Power management

**Package and Pin Configuration**



**MARKING =2300S Or 2300**

**Circuit diagram**



**Absolute Maximum Ratings ( $T_A=25^{\circ}C$  unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current @25°C (note 1)	$I_D$	4.0	A
Power Dissipation @25°C (note 1)	$P_D$	1.0	W
Storage Temperature	$T_{STG}$	-55 ~ +150	°C

**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

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Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-Threshold Voltage <sup>(Note 2)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	0.9	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance <sup>(Note 2)</sup>	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.5A$		23	25	m $\Omega$
		$V_{GS}=2.5V, I_D=4.0A$		28	38	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=4.5A$	5.0			S
<b>Dynamic Characteristics<sup>(Note 3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		482		pF
Output Capacitance	$C_{oss}$			85		
Reverse Transfer Capacitance	$C_{rss}$			52		
<b>Switching Characteristics<sup>(Note 3)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, R_L=2.8\Omega, V_{GS}=4.5V, I_D=1A, R_{GEN}=6\Omega$		13		ns
Turn-On Rise Time	$t_r$			54		
Turn-Off Delay Time	$t_{d(off)}$			18		
Turn-Off Fall Time	$t_f$			11		
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=4.5A, V_{GS}=4.5V$		4.2		nC
Gate-Source Charge	$Q_{gs}$			0.9		
Gate-Drain Charge	$Q_{gd}$			1.4		
<b>Source-Drain Diode characteristics</b>						
Drain-Source Diode Forward Current	$I_S$	$V_{GS}=0V, I_S=1A$			4.0	A
Diode Forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$		0.8	1.2	V

**Curve Characteristics**

Fig. 1 - Output Characteristics

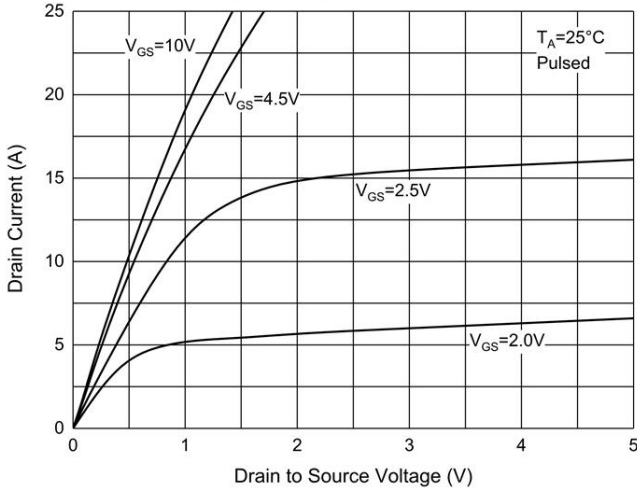


Fig. 2 - Transfer Characteristics

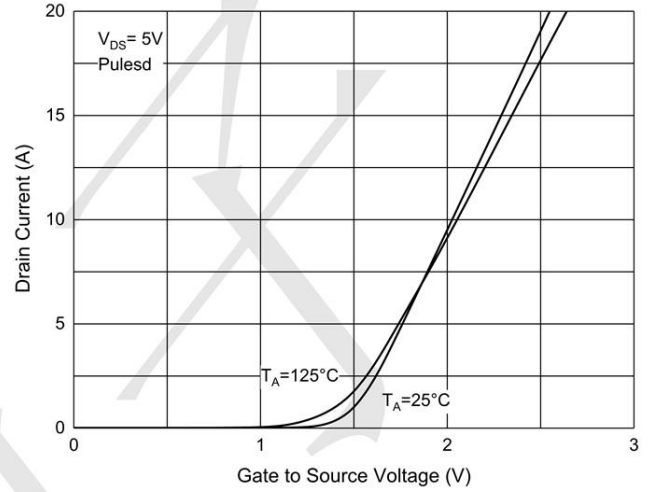


Fig. 3 - Capacitance Characteristics

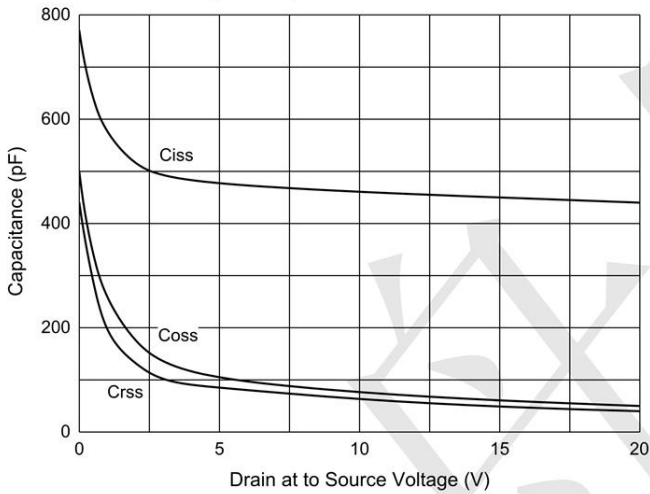


Fig. 4 -  $R_{DS(ON)}$ —Temperature

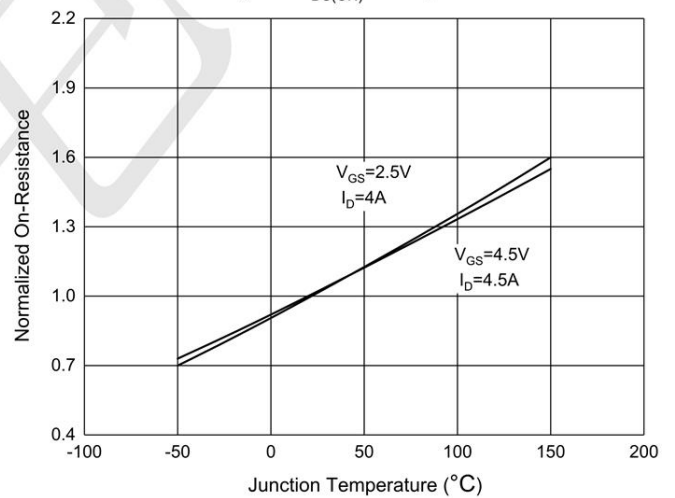


Fig. 5 - Threshold Voltage

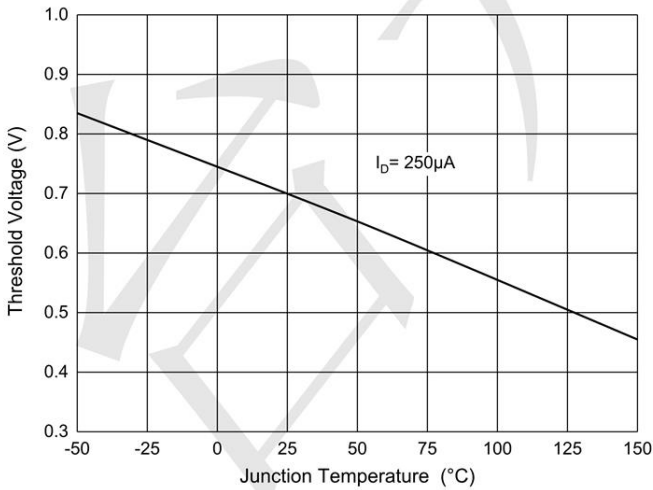
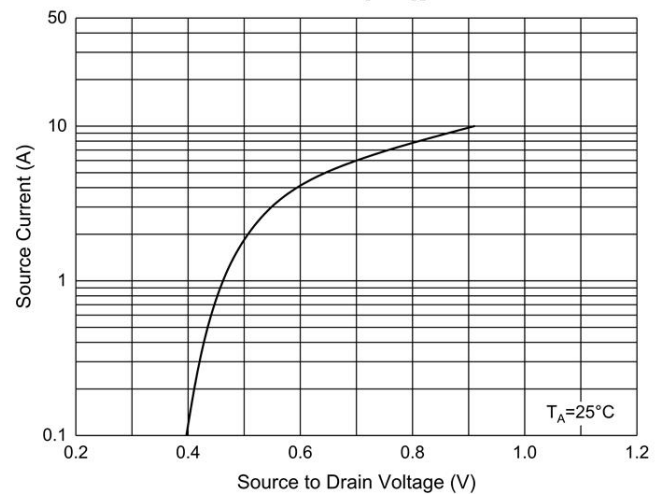
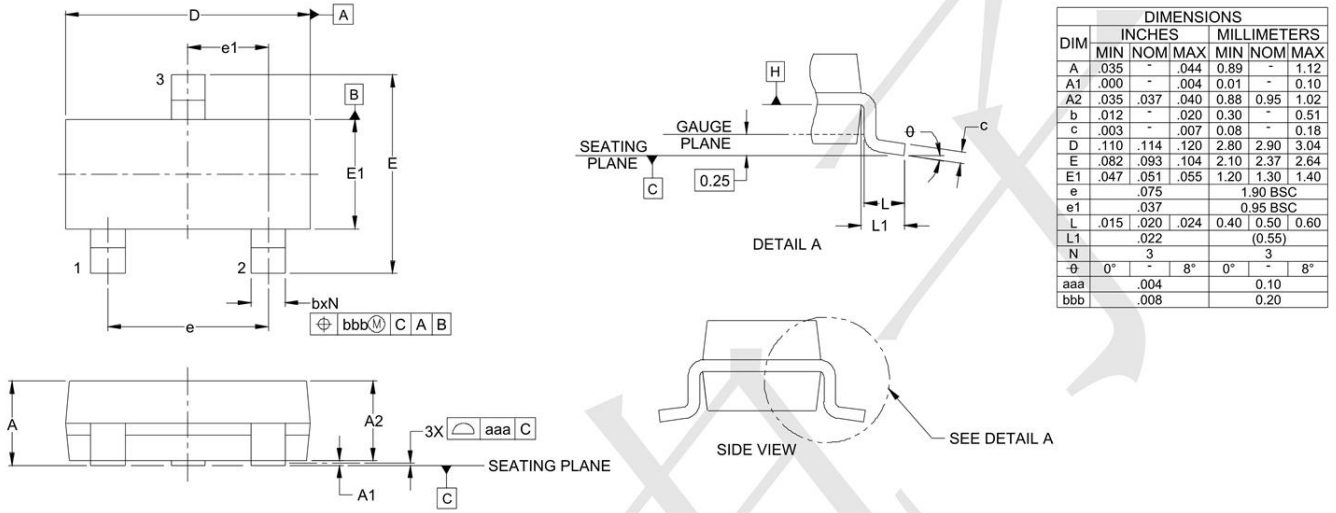


Fig. 6 -  $I_S$ — $V_{SD}$



**Outline Drawing - SOT23**



**Land Pattern - SOT23**

