



**THE DATASHEET OF  
SI2300-TP**



### Features

- High Dense Cell Design for Extremely Low  $R_{DS(ON)}$
- Rugged and Reliable
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

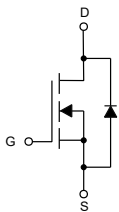
### Maximum Ratings

- Operating Junction Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Storage Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Thermal Resistance:  $125^{\circ}\text{C/W}$  Junction to Ambient

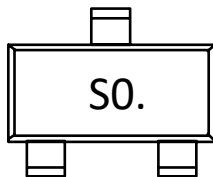
Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	20	V
Gate -Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current-Continuous	$I_D$	4.5	A
Power Dissipation	$P_D$	1.0	W

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

### Internal Structure and Marking Code

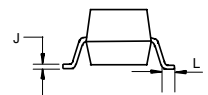
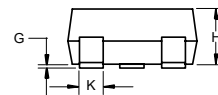
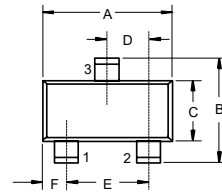


1. GATE
2. SOURCE
3. DRAIN



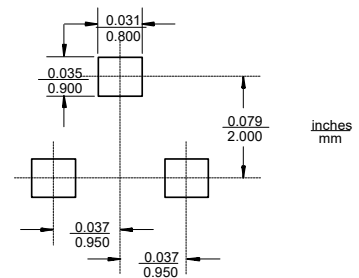
## N-Channel MOSFET

### SOT-23



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

### Suggested Solder Pad Layout



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

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>	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.5A$		19.5	25	m $\Omega$
		$V_{GS}=2.5V, I_D=4.0A$		25	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	$I_S$	$V_{GS}=0V, I_S=1A$			4.5	A
Diode Forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$		0.8	1.2	V

Notes:

2. Pulse Test: Pulse Width $\leq 300\mu A$ , Duty Cycle $\leq 2\%$ .
3. These Parameters Have No Way to Verify.

Curve Characteristics

Fig. 1 - Output Characteristics

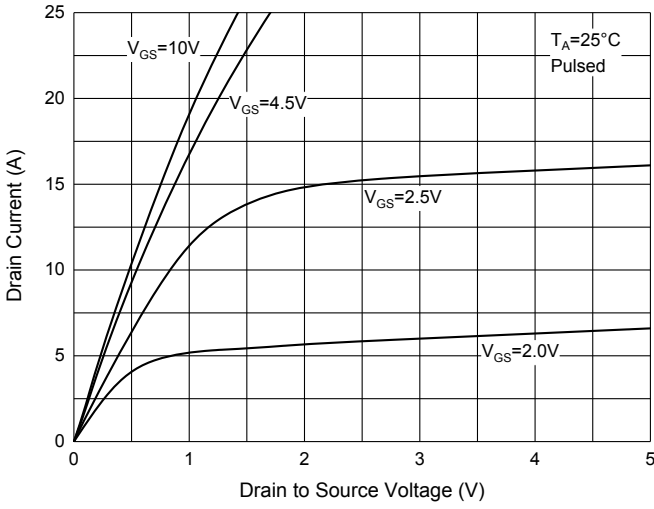


Fig. 2 - Transfer Characteristics

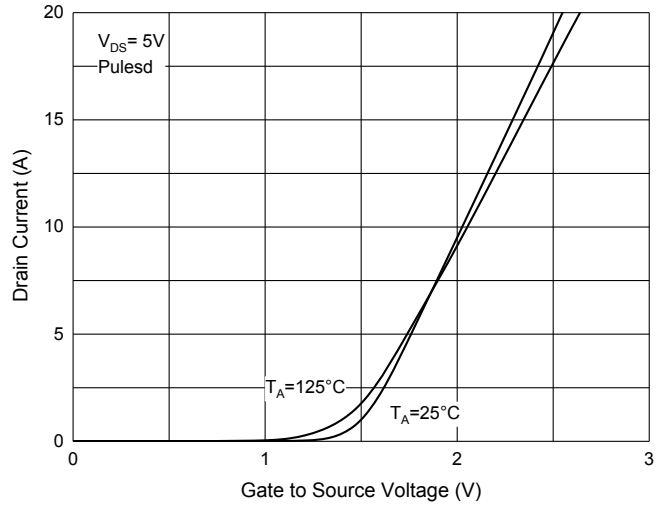


Fig. 3 - Capacitance Characteristics

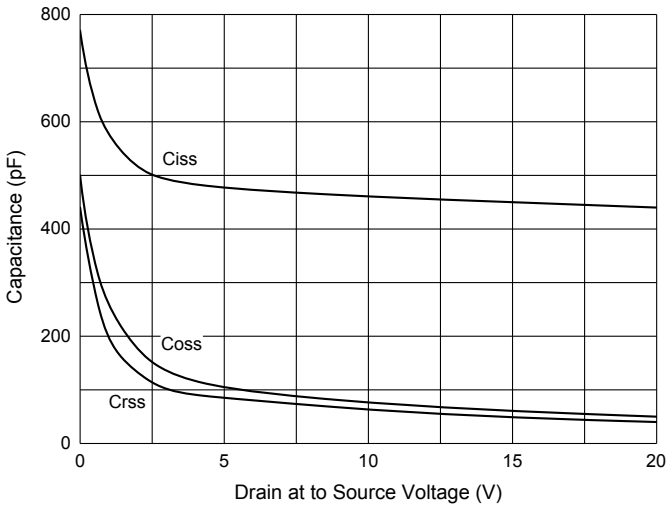


Fig. 4 -  $R_{DS(ON)}$ —Temperature

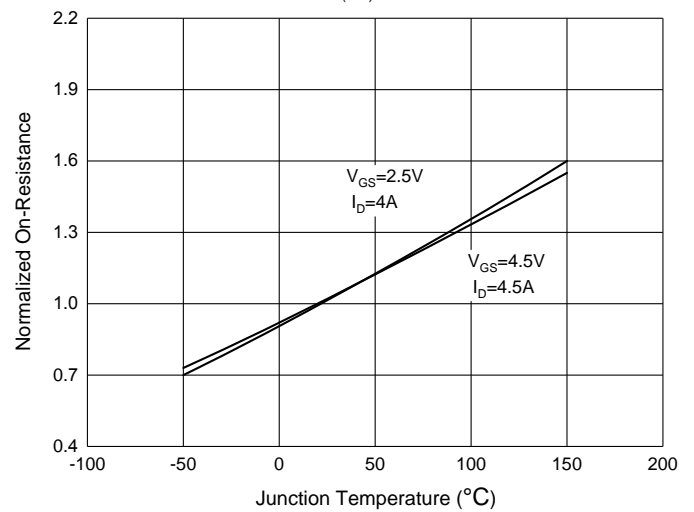


Fig. 5 - Threshold Voltage

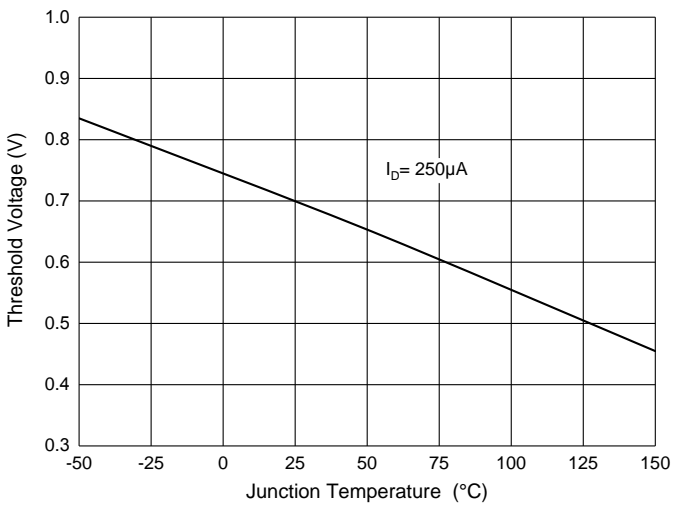
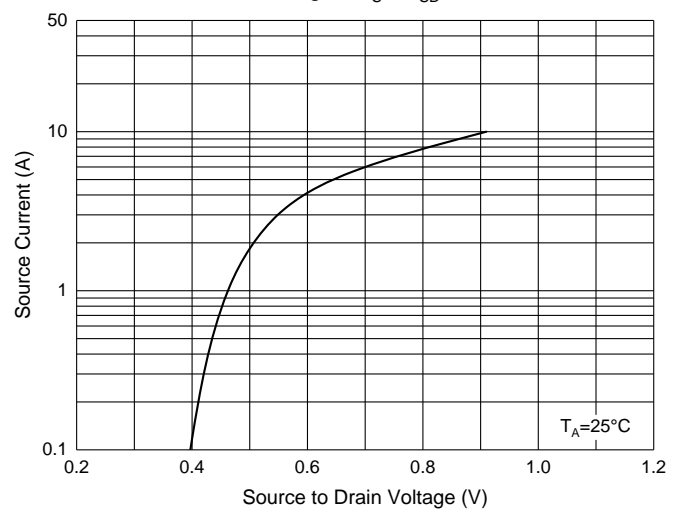


Fig. 6 -  $I_S$ — $V_{SD}$



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel

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