

**Features**

- High Dense Cell Design for Extremely Low  $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Surface Mount Package
- 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)

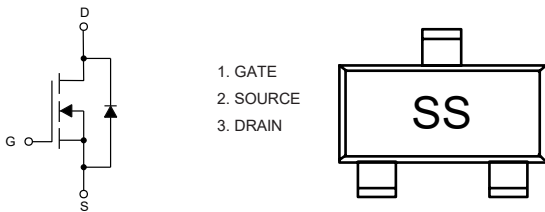
**Maximum Ratings**

- Operating Junction Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Storage Temperature:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Thermal Resistance:  $357^{\circ}\text{C/W}$  Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	0.22	A
Power Dissipation	$P_D$	0.35	W

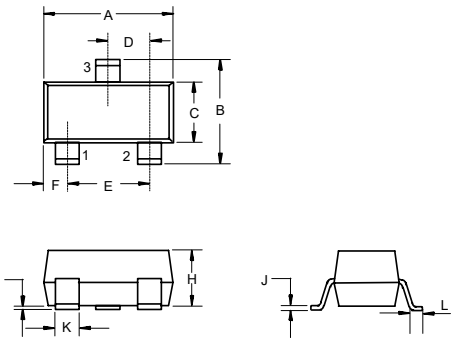
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

**Internal Structure and Marking Code**



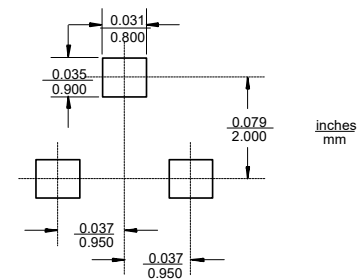
**N-Channel MOSFET**

**SOT-23**



DIM	INCHES		MM		NOTE
	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	50			V
Gate-Threshold Voltage <sup>(Note2)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1mA$	0.8		1.5	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=50V, V_{GS}=0V$			100	nA
Drain-Source On-Resistance <sup>(Note2)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.3A$		0.9	2.5	$\Omega$
		$V_{GS}=4.5V, I_D=0.2A$		1.05	3	
Forward Transconductance <sup>(Note2)</sup>	$g_{FS}$	$V_{DS}=10V, I_D=0.22A$	120			mS
Diode Forward Voltage <sup>(Note2)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=0.44A$			1.4	V
<b>Dynamic Characteristics<sup>(Note3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		27	60	pF
Output Capacitance	$C_{oss}$			13	20	
Reverse Transfer Capacitance	$C_{rss}$			6	15	
<b>Switching Characteristics</b>						
Turn-On Delay Time <sup>(Note2,3)</sup>	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=6\Omega, I_D=0.29A$			5	ns
Turn-On Rise Time <sup>(Note2,3)</sup>	$t_r$				18	
Turn-Off Delay Time <sup>(Note2,3)</sup>	$t_{d(off)}$				36	
Turn-Off Fall Time <sup>(Note2,3)</sup>	$t_f$				14	

Note:

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

## Curve Characteristics

Fig. 1 - Output Characteristics

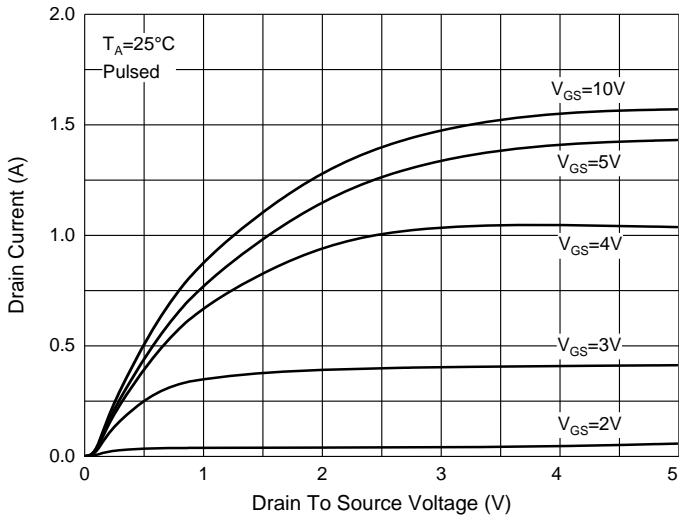


Fig. 2 - Transfer Characteristics

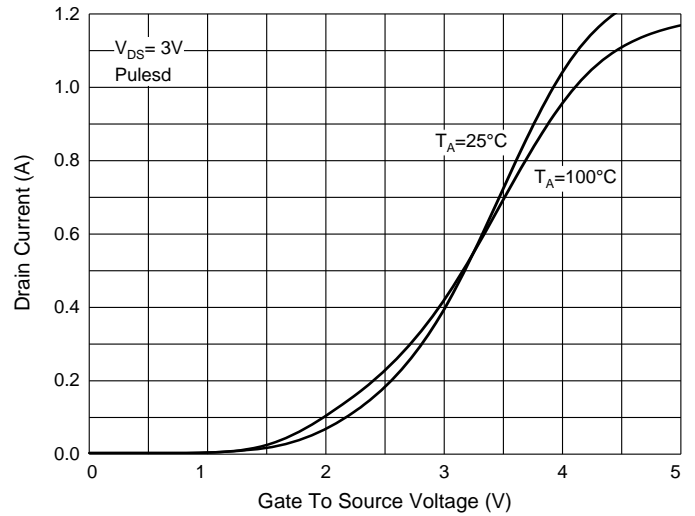


Fig. 3 -  $R_{DS(ON)} - I_D$

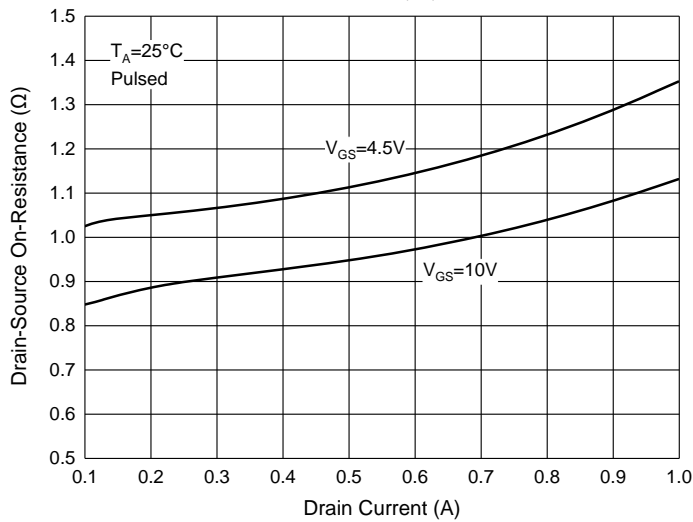


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

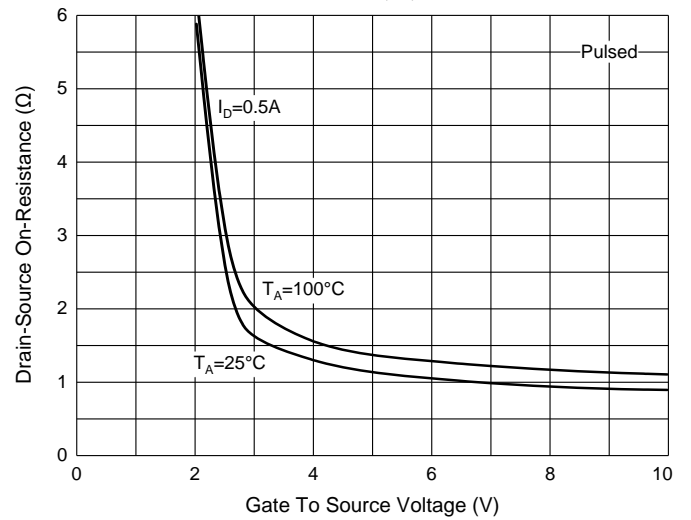


Fig. 5 -  $I_S - V_{SD}$

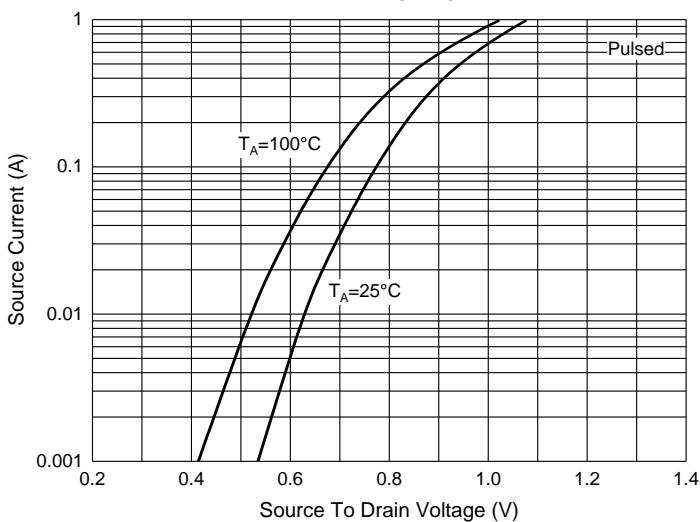
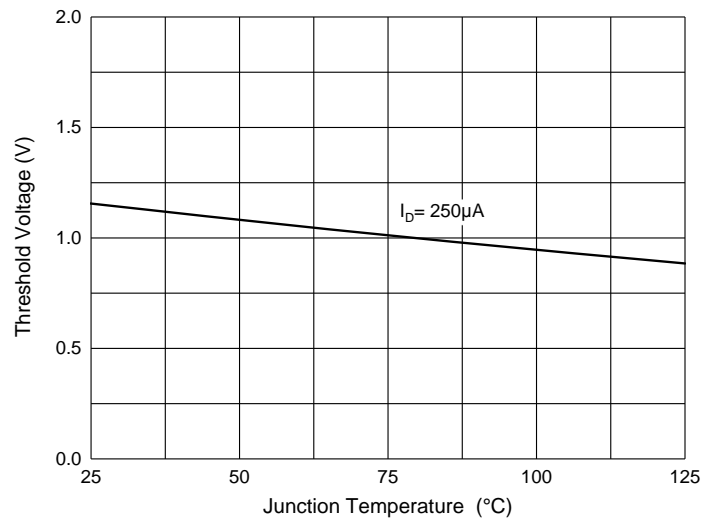


Fig. 6 - Threshold Voltage



## Ordering Information

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

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