

**Features**

- Rugged and Reliable
- Lead Free Product is Acquired
- High Dense Cell Design for Extremely Low  $R_{DS(ON)}$
- 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)

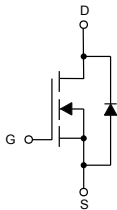
**Maximum Ratings**

- 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:  $100^{\circ}\text{C/W}$  Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Drain Current-Continuous	$I_D$	3.0	A
Drain Current-Pulsed <sup>(Note 2)</sup>	$I_{DM}$	10	A
Power Dissipation	$P_D$	1.25	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**

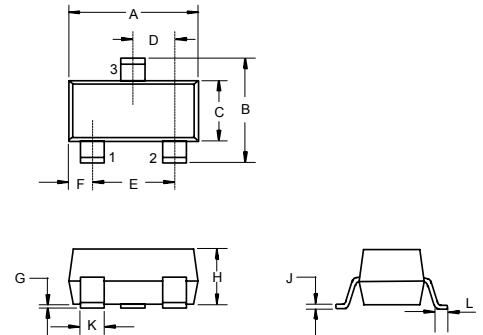


1. GATE
2. SOURCE
3. DRAIN

**Marking: S2**

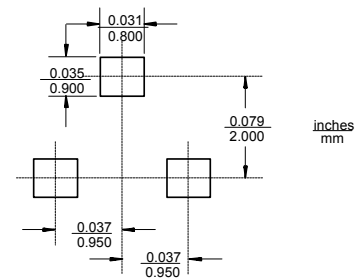
**N-Channel  
Enhancement Mode  
Field Effect Transistor**

**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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=10\mu A$	20			V
Gate-Threshold Voltage <sup>(Note3)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=50\mu A$	0.65		1.2	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance <sup>(Note 4)</sup>	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.3A$		21	27	m $\Omega$
		$V_{GS}=2.5V, I_D=3.0A$		28	37	
Forward Transconductance <sup>(Note 4)</sup>	$g_{FS}$	$V_{DS}=5V, I_D=3.6A$		8.5		S
<b>Dynamic Characteristics<sup>(Note 5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		602		pF
Output Capacitance	$C_{oss}$			79		
Reverse Transfer Capacitance	$C_{riss}$			62		
<b>Switching Characteristics<sup>(Note 5)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, I_D=3.6A, R_{GEN}=6\Omega$		8		ns
Turn-On Rise Time	$t_r$			58		
Turn-Off Delay Time	$t_{d(off)}$			20		
Turn-Off Fall Time	$t_f$			68		
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$		6	10	nC
Gate-Source Charge	$Q_{gs}$			1.6		
Gate-Drain Charge	$Q_{gd}$			1.5		
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Diode Forward Voltage <sup>(Note4)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=0.94A$			1.2	V
Drain-Source Diode Forward Current <sup>(Note3)</sup>	$I_S$				0.94	A

Notes:

2. Repetitive Rating : Pulse Width limited By Maximum Junction Temperature.
3. Surface Mounted on FR4 Board,  $t < 10$  sec.
4. Pulse Test : Pulse Width  $< 300\mu s$ , Duty Cycle  $< 2\%$ .
5. Guaranteed By Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Output Characteristics

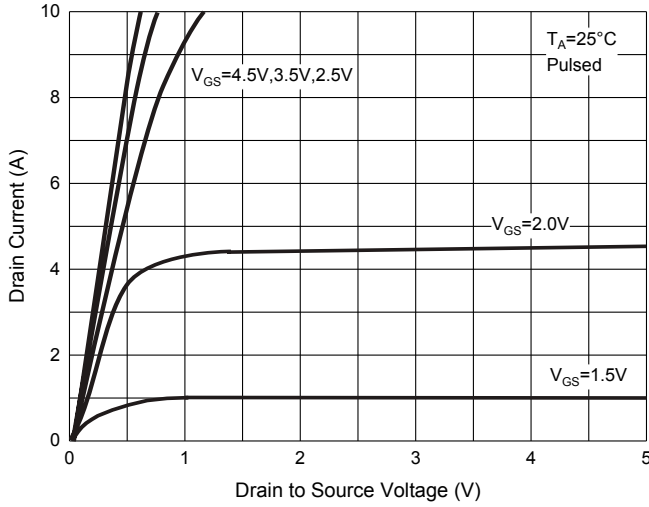


Fig. 2 - Transfer Characteristics

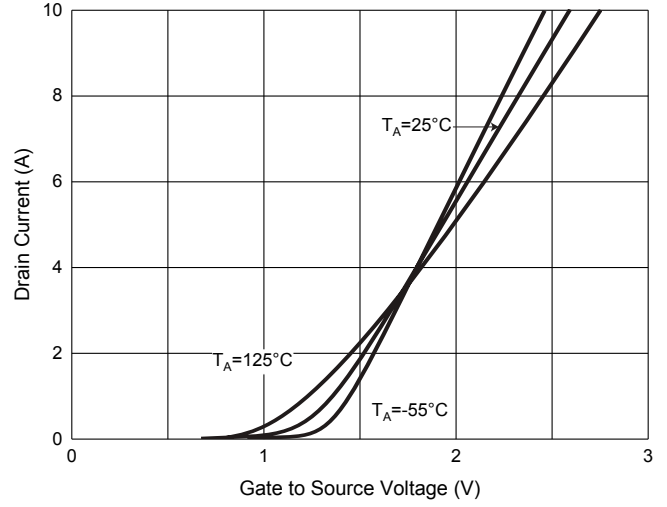


Fig. 3 - Capacitance Characteristics

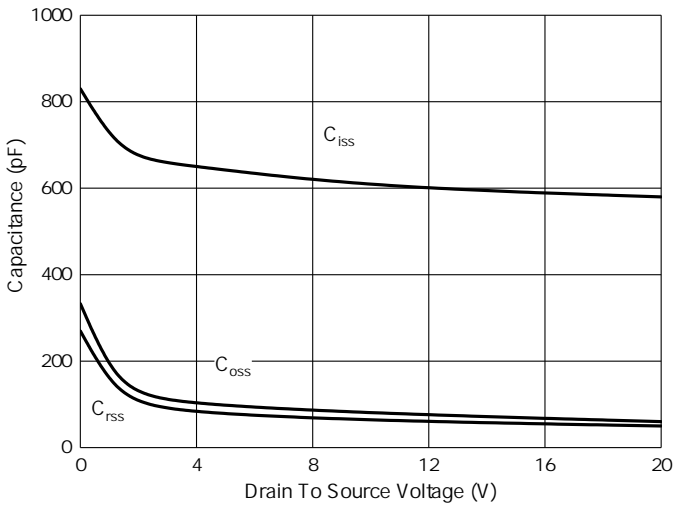


Fig. 4 -  $R_{DS(ON)}$ —Temperature

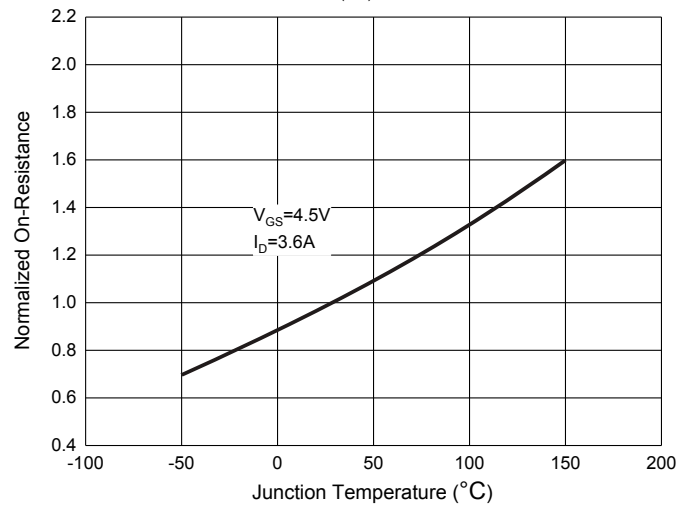


Fig. 5 - Threshold Voltage

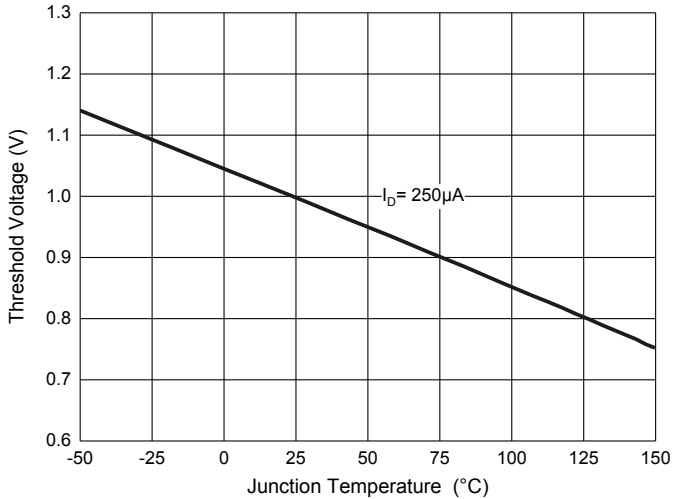
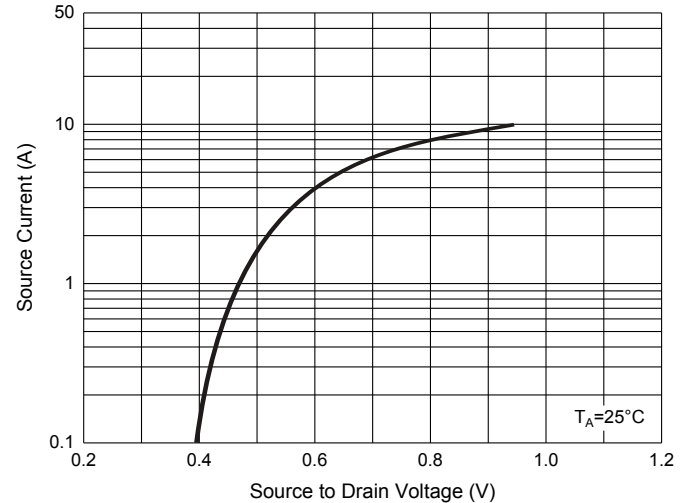


Fig. 6 -  $I_S$ — $V_{SD}$



## Ordering Information

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

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