

## 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)

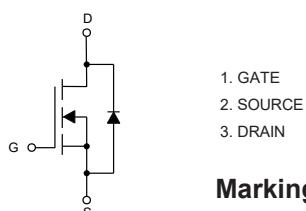
## Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 125°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.

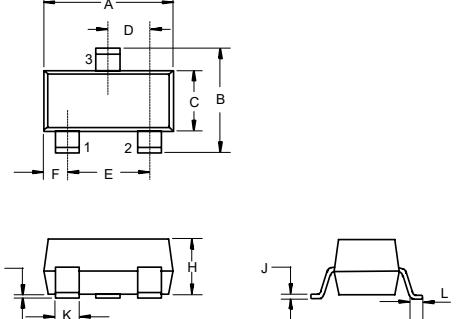
## Internal Structure



## Marketing

## Marking: So

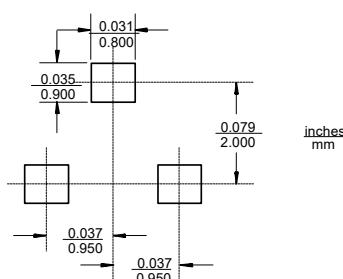
## N-Channel MOSFET



## DIMENSIONS

DIMENSIONS					
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



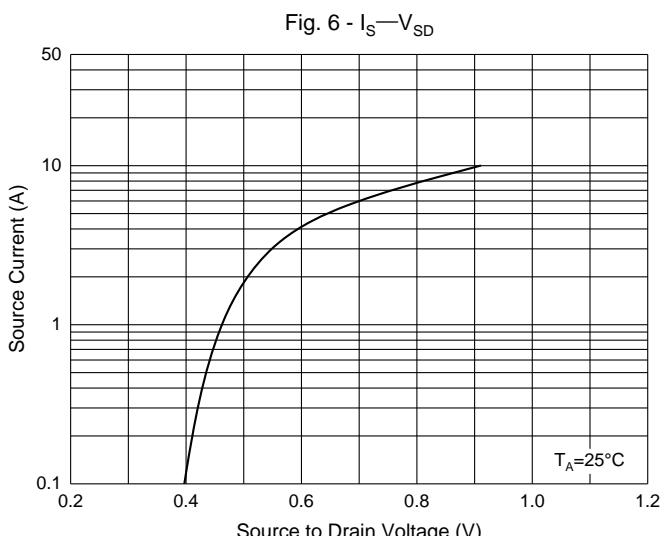
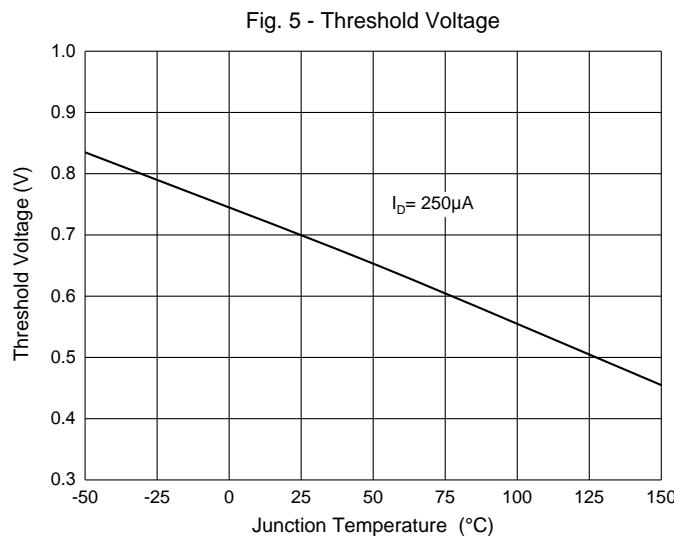
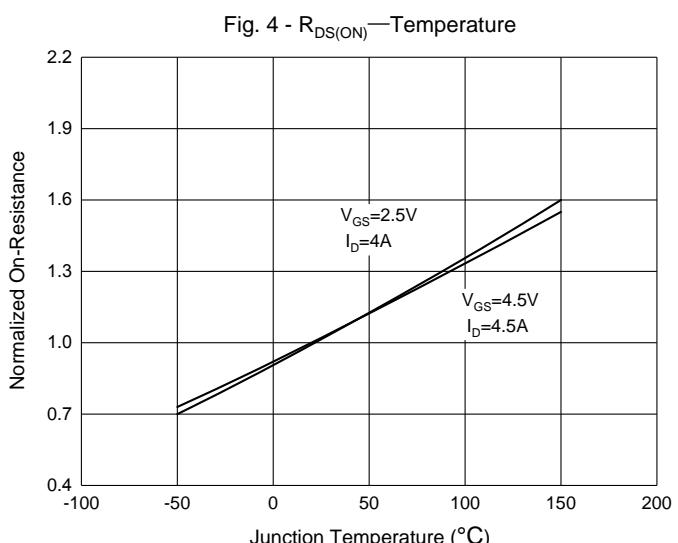
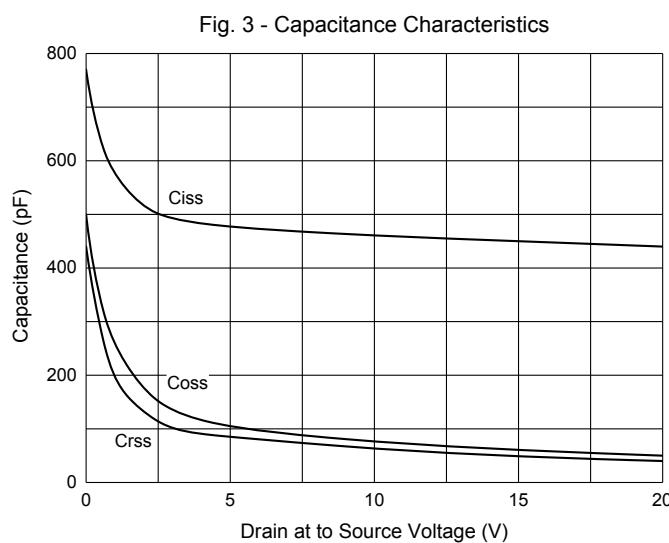
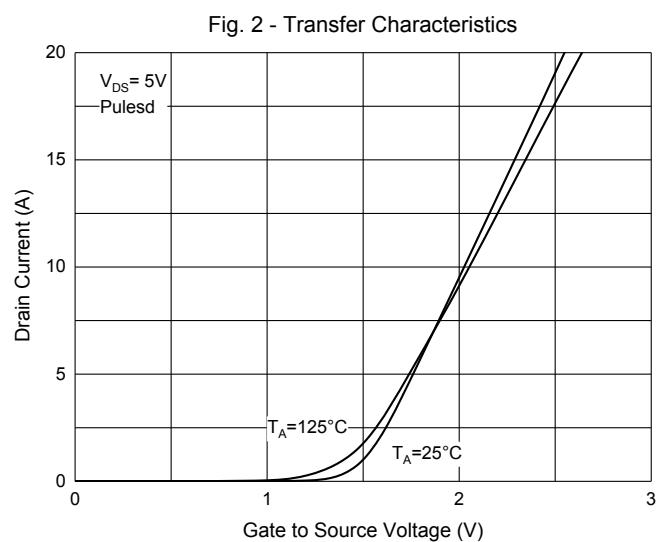
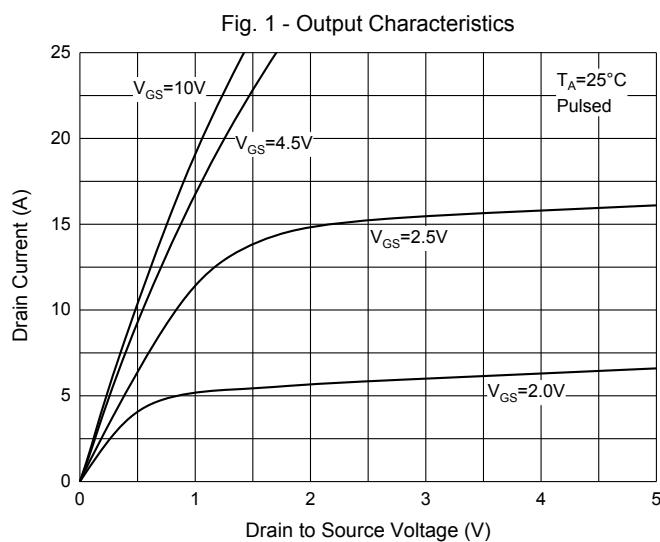
**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20			V
Gate-Threshold Voltage <sup>(Note 2)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.7	0.9	V
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Drain-Source On-Resistance <sup>(Note 2)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A		19.5	25	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.0A		25	38	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =4.5A	5.0			S
<b>Dynamic Characteristics<sup>(Note 3)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		482		pF
Output Capacitance	C <sub>oss</sub>			85		
Reverse Transfer Capacitance	C <sub>rss</sub>			52		
<b>Switching Characteristics<sup>(Note 3)</sup></b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, R <sub>L</sub> =2.8Ω, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A, R <sub>GEN</sub> =6Ω		13		ns
Turn-On Rise Time	t <sub>r</sub>			54		
Turn-Off Delay Time	t <sub>d(off)</sub>			18		
Turn-Off Fall Time	t <sub>f</sub>			11		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =4.5V		4.2		nC
Gate-Source Charge	Q <sub>gs</sub>			0.9		
Gate-Drain Charge	Q <sub>gd</sub>			1.4		
<b>Source-Drain Diode characteristics</b>						
Drain-Source Diode Forward Current	I <sub>S</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A			4.5	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A		0.8	1.2	V

Notes:

2. Pulse Test: Pulse Width≤300μA, Duty Cycle≤2%.
3. These Parameters Have No Way to Verify.

## Curve Characteristics



## Ordering Information

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

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