

## Features

- High Density 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 Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

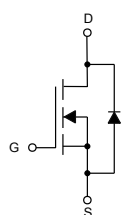
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 357°C/W Junction to Ambient<sup>(Note 1)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	5.8	A
Pulsed Drain Current <sup>(Note 2)</sup>	$I_{DM}$	30	A
Total Power Dissipation	$P_D$	0.35	W

Note 1. Surface Mounted on FR4 Board,  $t < 5$  sec.

2. Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature.

## Internal Structure

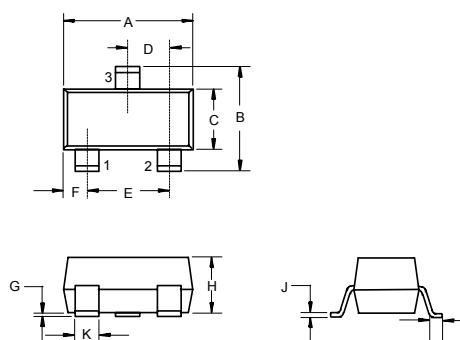


1. GATE
2. SOURCE
3. DRAIN

**Marking: R4**

# N-CHANNEL MOSFET

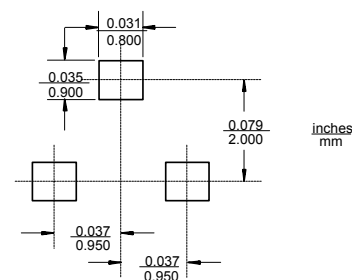
## SOT-23



### 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 @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		3	V
Drain-Source On-Resistance <sup>(Note 3)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.8A$			28	m $\Omega$
		$V_{GS}=4.5V, I_D=4.8A$			42	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$			1	V
Forward tranconductance <sup>(Note 3)</sup>	$g_{FS}$	$V_{DS}=5V, I_D=5.8A$	5			S
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$			820	pF
Output Capacitance	$C_{OSS}$			118		
Reverse Transfer Capacitance	$C_{RSS}$			85		
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1MHz$			1.5	$\Omega$
<b>Switching Characteristics<sup>(Note 4)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=15V, R_L=2.6\Omega, R_{GEN}=3\Omega$			6.5	ns
Turn-On Rise Time	$t_r$			3.1		
Turn-Off Delay Time	$t_{d(off)}$			15.1		
Turn-Off Fall Time	$t_f$			2.7		

Note 3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

4. Guaranteed by Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Output Characteristics

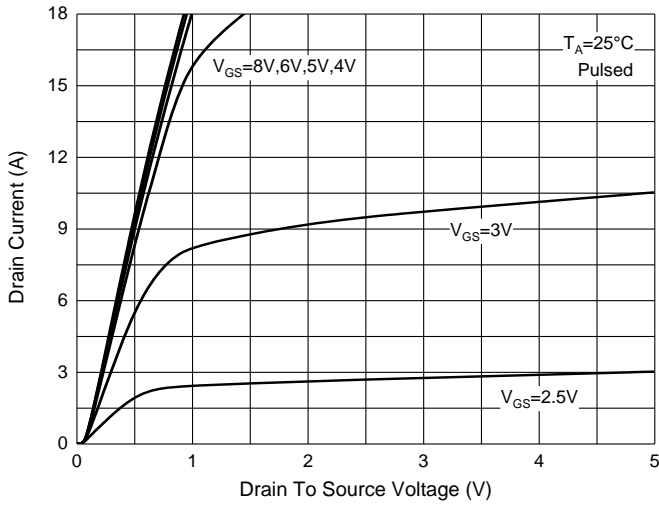


Fig. 2 - Transfer Characteristics

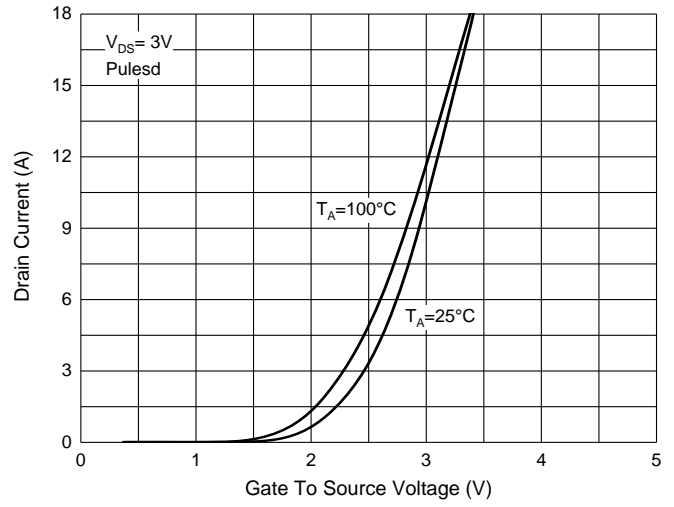


Fig. 3 -  $R_{DS(ON)} - I_D$

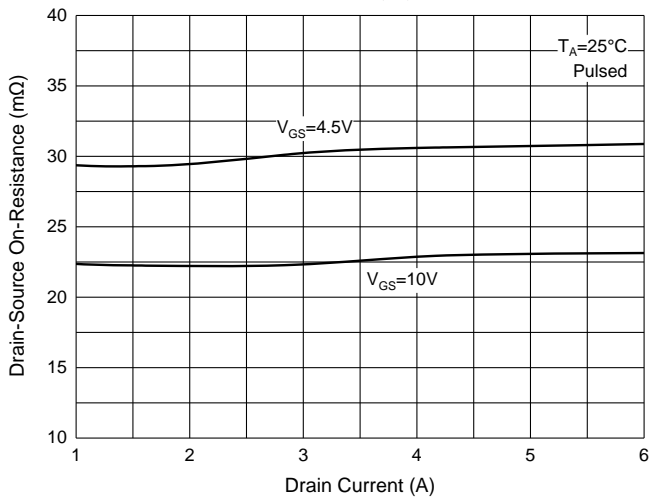


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

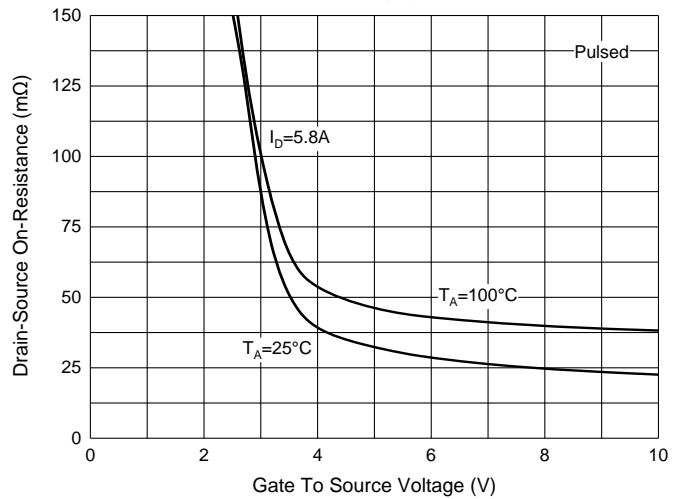


Fig. 5 -  $I_S - V_{SD}$

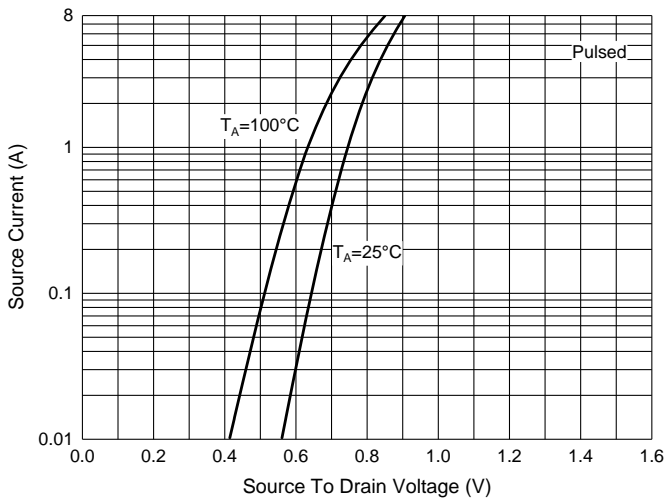
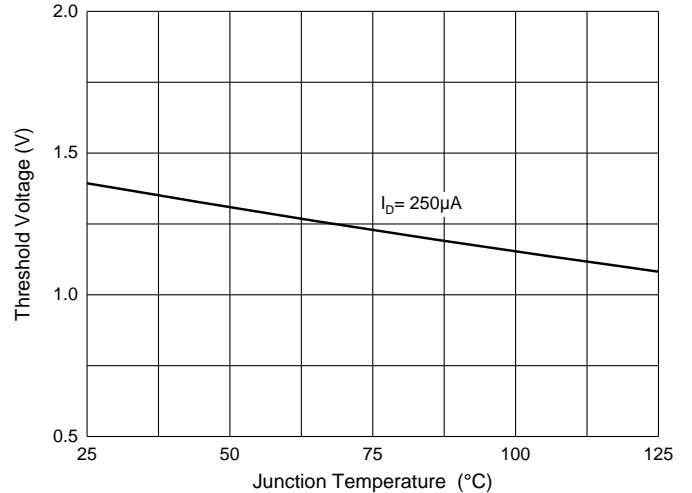


Fig. 6 - Threshold Voltage



## Ordering Information

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

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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