

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

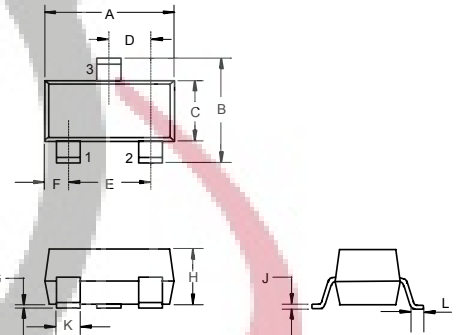
**N-Channel
Enhancement Mode
Field Effect Transistor**

Maximum Ratings

- Operating Junction Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 100°C/W Junction to Ambient

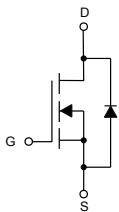
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current-Continuous	I_D	3.0	A
Drain Current-Pulsed ^(Note1)	I_{DM}	10	A
Power Dissipation	P_D	1.25	W

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	

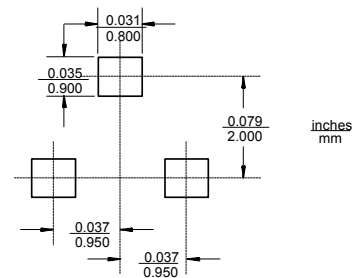
Internal Structure



1. GATE
2. SOURCE
3. DRAIN

Marking: S2

Suggested Solder Pad Layout



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=10\mu A$	20			V
Gate-Threshold Voltage ^(Note3)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=50\mu A$	0.65		1.2	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Drain-Source On-Resistance ^(Note3)	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=3.6A$		55	72	m Ω
		$V_{GS}=2.5V, I_D=3.1A$		82	110	
Forward Transconductance ^(Note3)	g_{FS}	$V_{DS}=5V, I_D=3.6A$		8.5		S
Dynamic Characteristics^(Note4)						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		237		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			45		
Switching Characteristics^(Note4)						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, I_D=3.6A, R_{GEN}=6\Omega$		23	45	ns
Turn-On Rise Time	t_r			11	30	
Turn-Off Delay Time	$t_{d(off)}$			34	70	
Turn-Off Fall Time	t_f			36	70	
Total Gate Charge	Q_g			6	10	
Gate-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$		1.4		nC
Gate-Drain Charge	Q_{gd}			1.8		
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage ^(Note3)	V_{SD}	$V_{GS}=0V, I_S=0.94A$			1.2	V
Drain-Source Diode Forward Current ^(Note2)	I_S				0.94	A

Notes:

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

Curve Characteristics

Fig. 1 - Output Characteristics

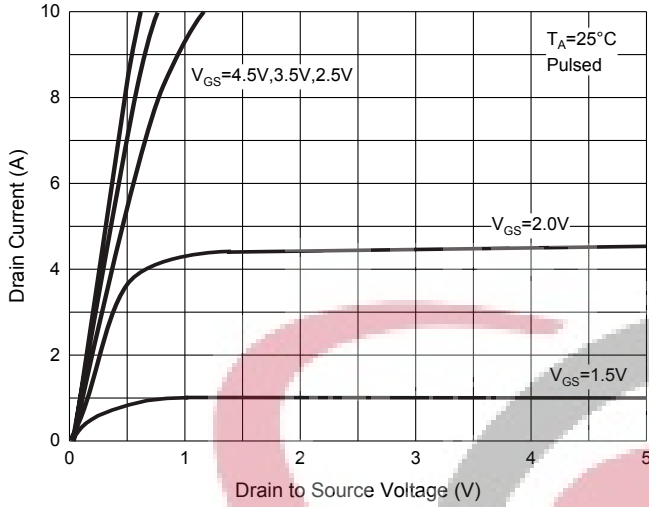


Fig. 2 - Transfer Characteristics

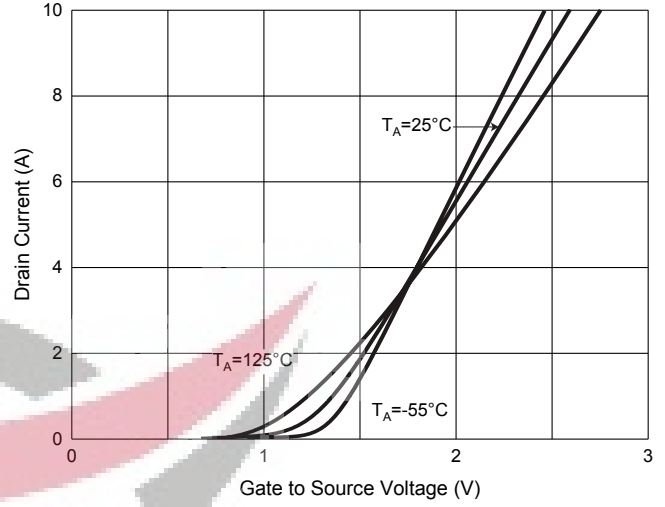


Fig. 3 - Capacitance Characteristics

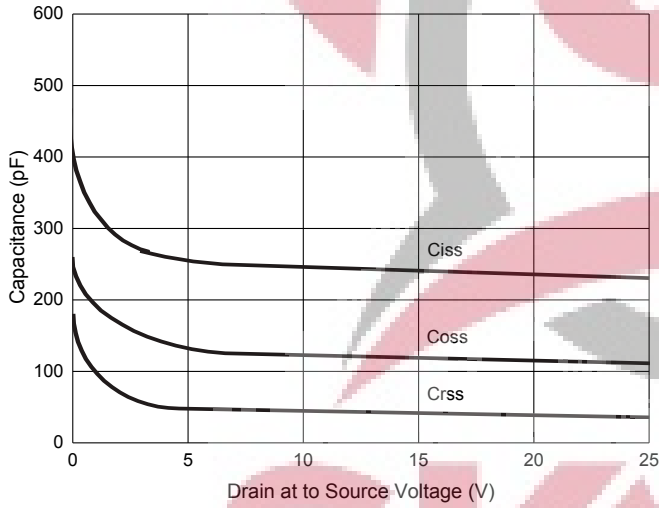


Fig. 4 - $R_{DS(ON)}$ - Temperature

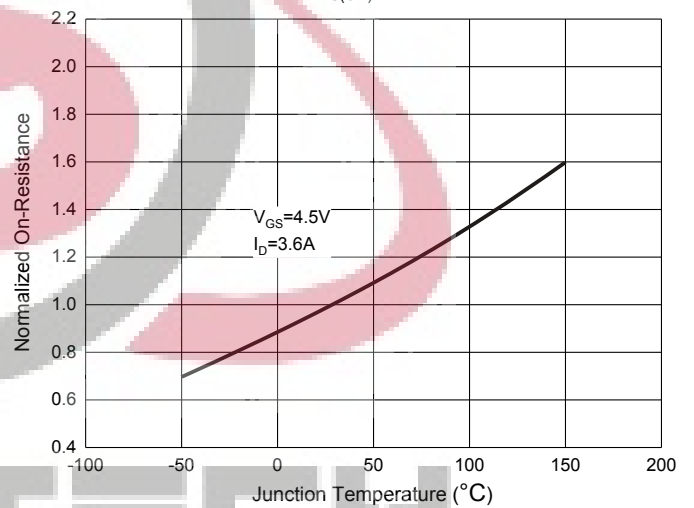


Fig. 5 - Threshold Voltage

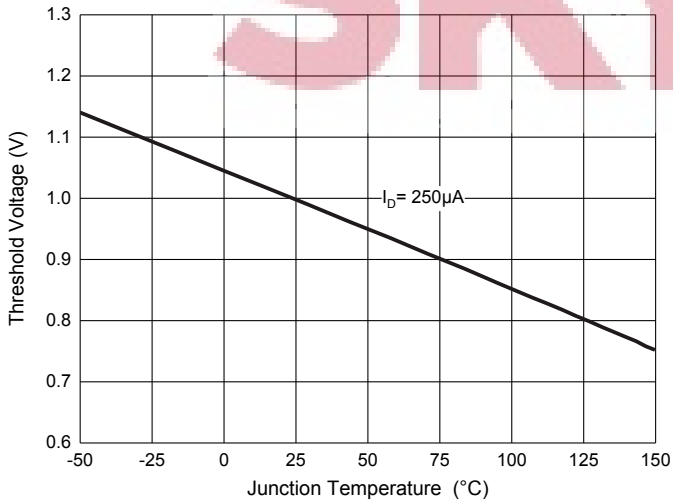
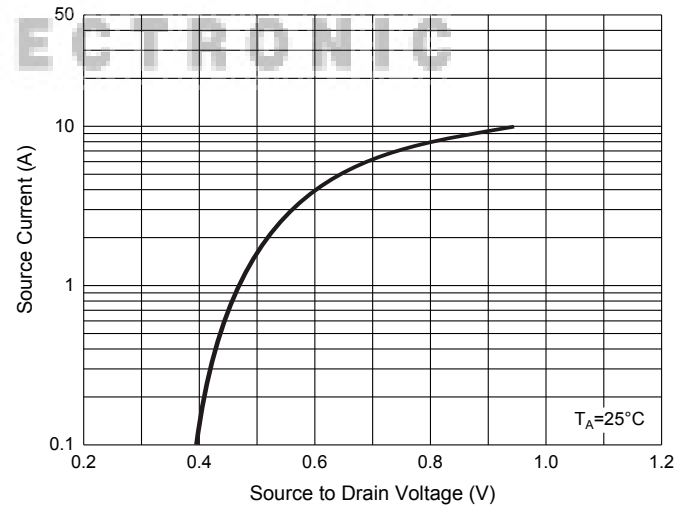


Fig. 6 - $I_S - V_{SD}$



Ordering Information

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

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

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