

Features

- High Dense Cell Design For Extremely Low $R_{DS(ON)}$
- AEC-Q101 Qualified
- Rugged and reliable
- High Speed Switching
- 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

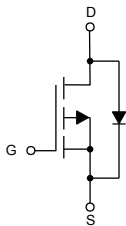
- Operating Junction Temperature Range : -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Maximum Thermal Resistance: 125°C/W Junction to Ambient (Note 2)

Parameter	Symbol	Rating	Unit	
Drain -source Voltage	V_{DS}	-20V	V	
Gate -Source Voltage	V_{GS}	± 10	V	
Drain Current-Continuous	I_D	$T_A=25^{\circ}\text{C}$	-3.4	A
		$T_A=70^{\circ}\text{C}$	-2.7	
Drain Current-Pulse (Note 2)	I_{DM}	-14	A	
Power Dissipation	P_D	1.0	W	

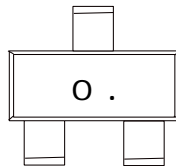
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2.Surface Mounted on FR4 Board $t \leq 5\text{sec}$.

Internal Structure and Marking Code

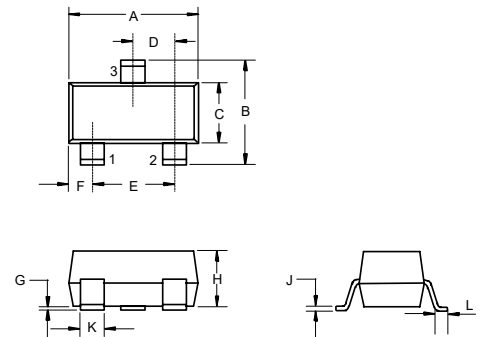


1. GATE
2. SOURCE
3. DRAIN



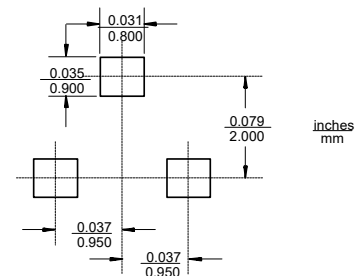
P-Channel MOSFET

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	0.004	0.01	0.10	
H	0.035	0.041	0.90	1.025	
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
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Threshold Voltage ^(Note 3)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Drain-Source On-Resistance ^(Note 4)	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		42	51	m Ω
		$V_{GS}=-2.5V, I_D=-3.0A$		55	67	
		$V_{GS}=-1.8V, I_D=-2.5A$		76	91	
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-0.75A$			-1.2	V
Dynamic Characteristics^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		438		pF
Output Capacitance	C_{oss}			76		
Reverse Transfer Capacitance	C_{rss}			62		
Switching Characteristics^(Note 4)						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, V_{GS}=-4.5V, I_D=-1A, R_{GEN}=3\Omega$		6.4		ns
Turn-On Rise Time	t_r			21.8		
Turn-Off Delay Time	$t_{d(off)}$			37.4		
Turn-Off Fall Time	t_f			34		
Reverse Recovery Time	t_{rr}	$I_S=-3.4A, di_F/dt=100A/\mu s$		24.5		nC
Reverse Recovery Charge	Q_{rr}			4		
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-10V, I_D=-3.4A$		5.41		nC
Gate-Source Charge	Q_{gs}			1.17		
Gate-Drain Charge	Q_{gd}			1.24		

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

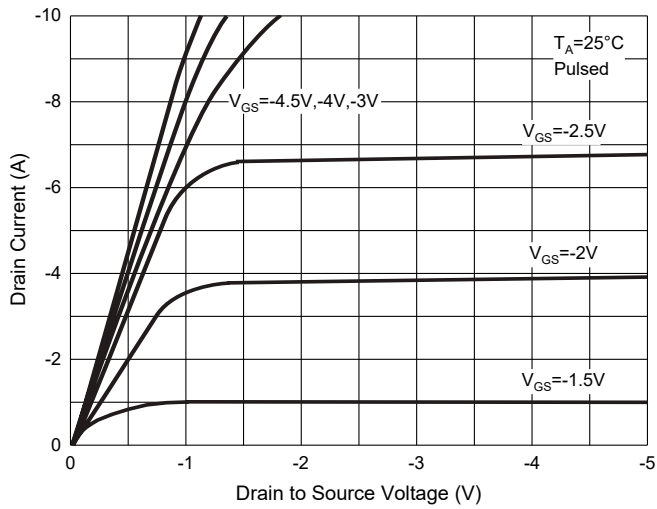


Fig. 2 - Transfer Characteristics

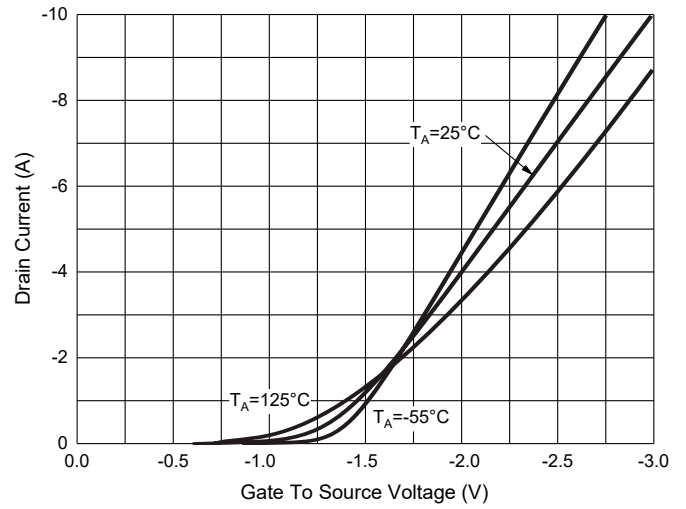


Fig. 3 - Capacitance Characteristics

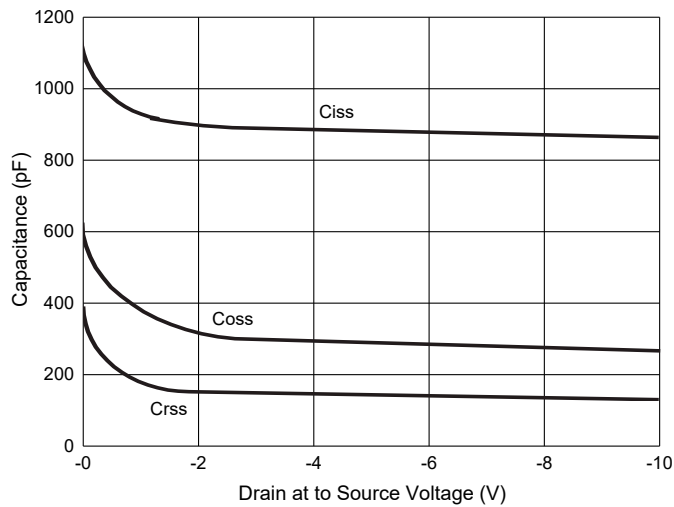


Fig. 4 - $R_{DS(ON)}$ —Temperature

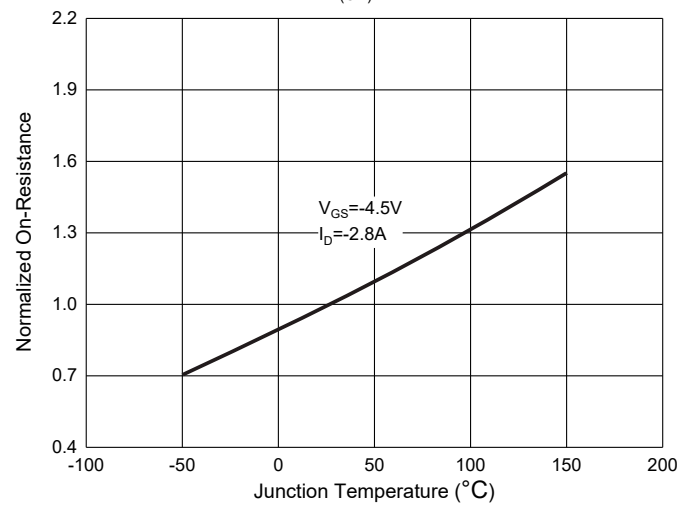


Fig. 5 - Threshold Voltage

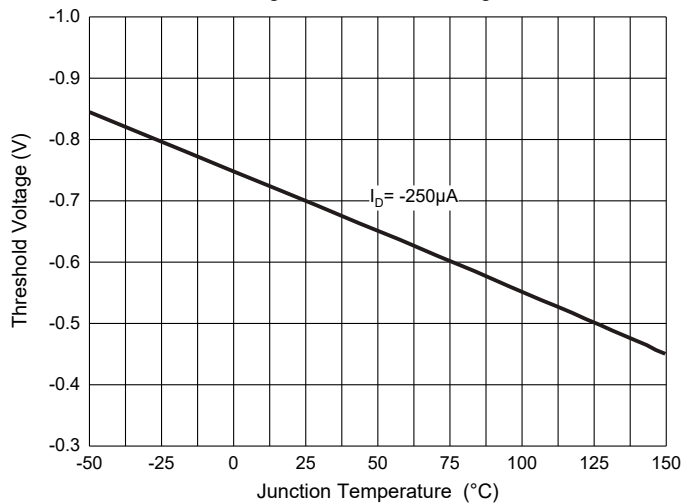
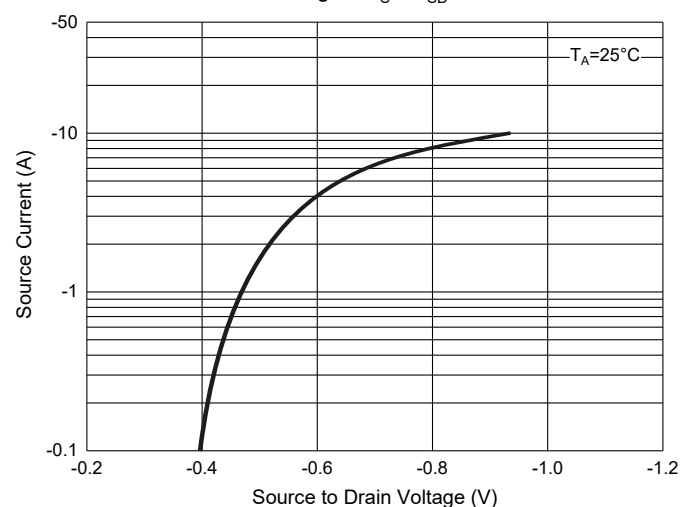


Fig. 6 - I_S — V_{SD}



Ordering Information

Device	Packing
SI2301AHE3-TP	Tape&Reel:3Kpcs/Reel

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