Features

- Excellent Stability and Uniformity
- 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 (1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

N-Channel Enhancement Mode Field Effect Transistor

Maximum Ratings

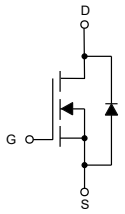
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance:80°C/W Junction to Ambient(Steady-State)(2)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Volltage		V_{GS}	±8	V
Continuous Drain Current	T_A=25°C	I_D	3.0	A
	T_A=100°C		1.9	
Pulsed Drain Current(3)		I_{DM}	10	A
Total Power Dissipation(4)		P_D	1.56	W

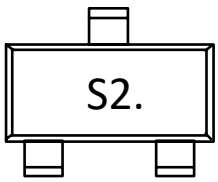
Note:

1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction to ambient thermal resistance.

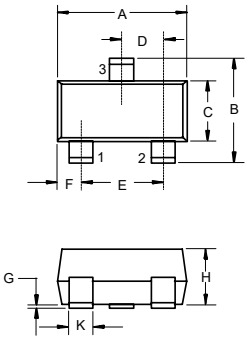
Internal Structure and Marking Code



1. GATE
2. SOURCE
3. DRAIN

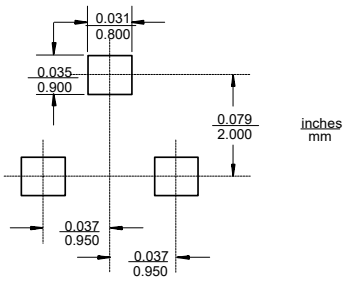


SOT-23



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
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.65		1.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=4.3A		21	27	mΩ
		V_{GS}=2.5V, I_D=3A		28	37	
		V_{GS}=1.8V, I_D=2A		51	67	
Gate Resistance	R_g	F=1 MHz, Open drain		3.4		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				0.94	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=0.94A			1.2	V
Reverse Recovery Time	t_{rr}	I_F=3.6A, dI_F/dt=100A/μs		12.2		ns
Reverse Recovery Charge	Q_{rr}			3.2		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHz		388		pF
Output Capacitance	C_{oss}			77		
Reverse Transfer Capacitance	C_{rss}			68		
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V,I_D=3.6A		5.5		nC
Gate-Source Charge	Q_{gs}			0.63		
Gate-Drain Charge	Q_{gd}			1.7		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=10V, V_{GS}=4.5V, R_{GEN}=6Ω, I_D=3.6A		5.3		ns
Turn-On Rise Time	t_r			10.7		
Turn-Off Delay Time	$t_{d(off)}$			17		
Turn-Off Fall Time	t_f			7.1		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

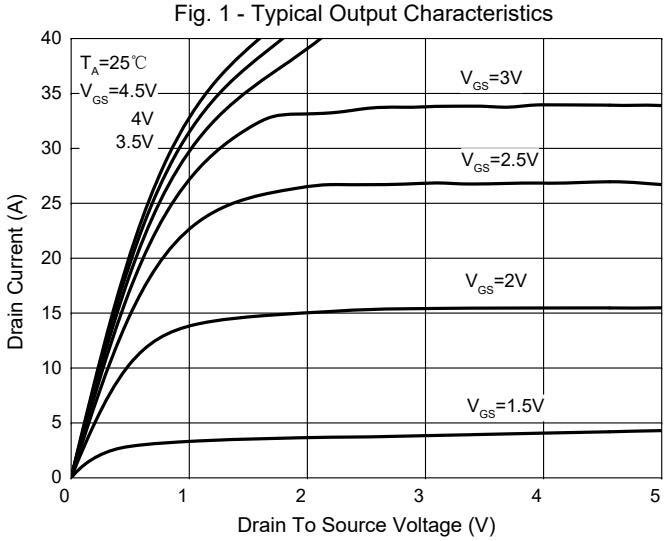


Fig. 2 - Transfer Characteristics

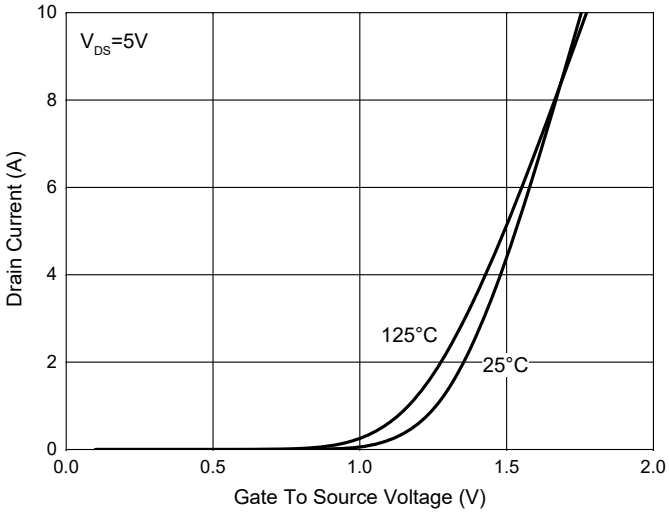


Fig. 3 - Capacitance Characteristics

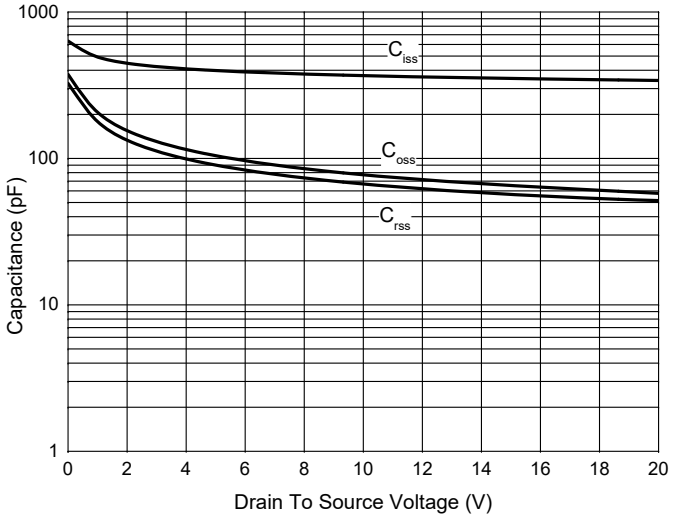


Fig.4-Normalized On Resistance Characteristics

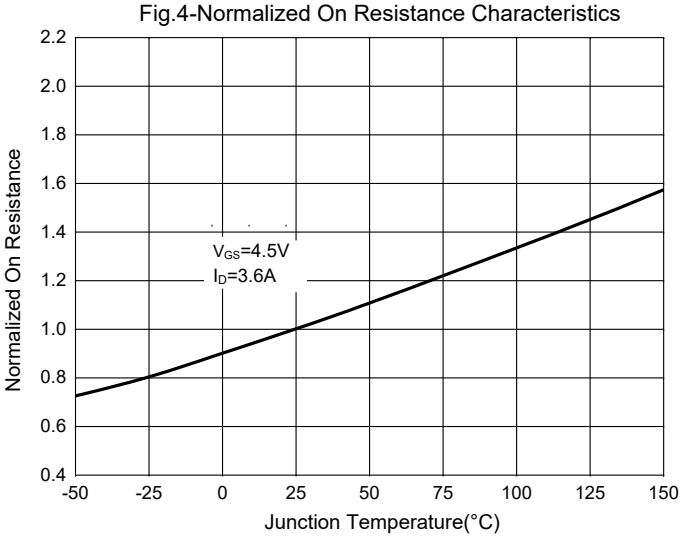


Fig. 5 - Nomalized Threshold voltage

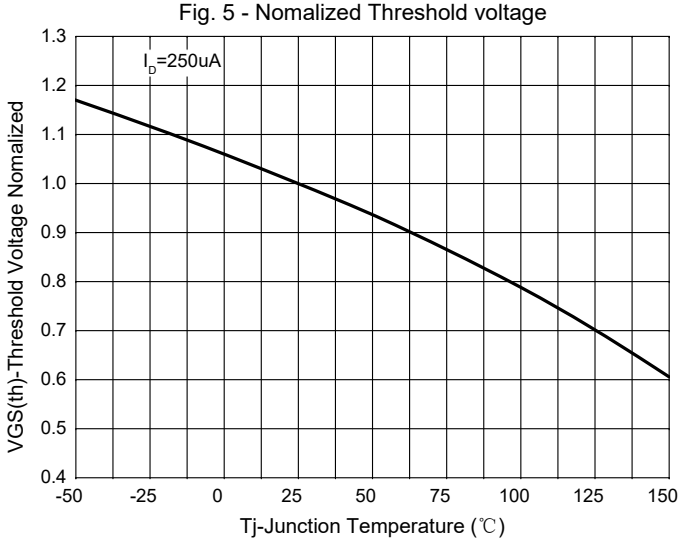
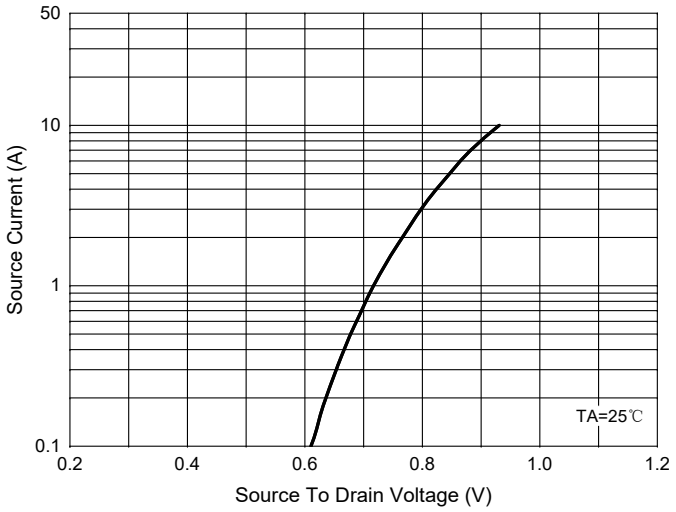


Fig. 6 - I_S—V_{SD}



Curve Characteristics

Fig. 7 - GateCharge

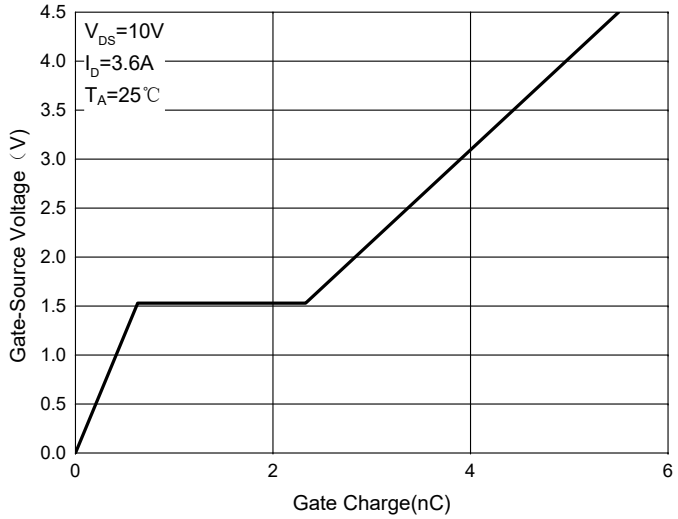


Fig. 8 - $R_{DS(ON)}$—V_{GS}

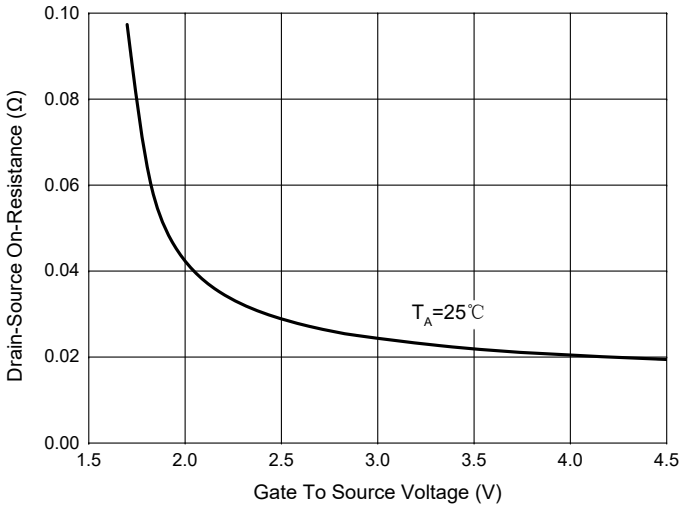


Fig. 9 - $R_{DS(ON)}$—I_D

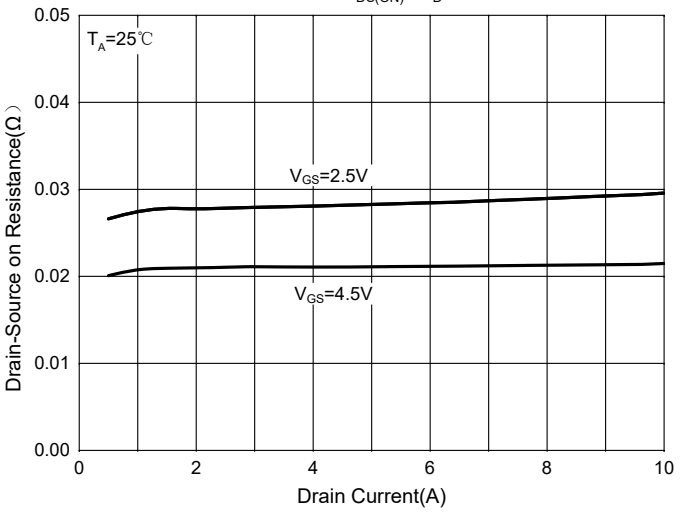


Fig. 10 - Current dissipation

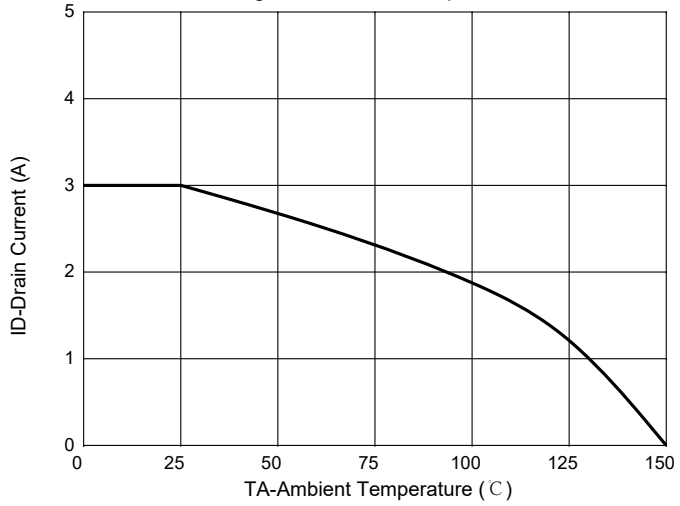
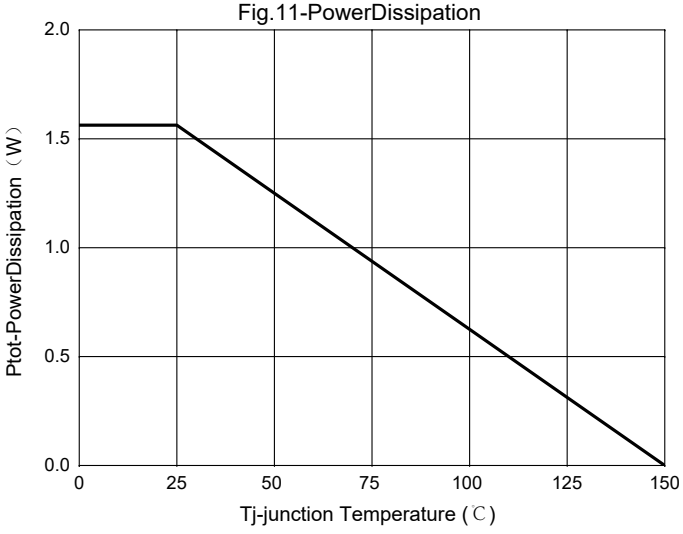


Fig.11-PowerDissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

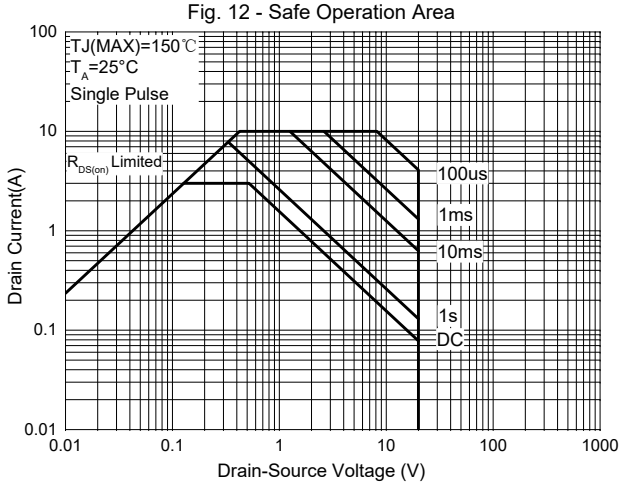
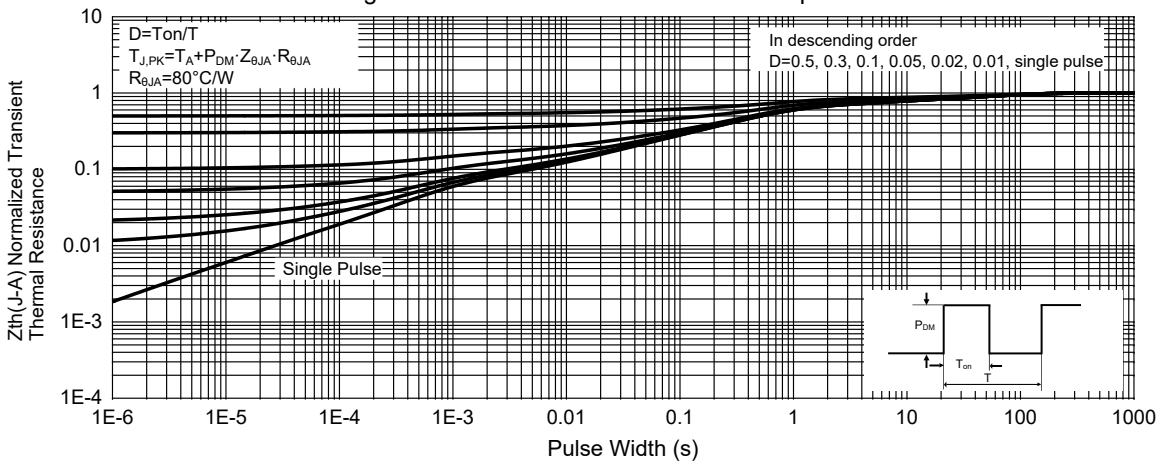


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
SI2302-TP	Tape&Reel: 3Kpcs/Reel

Revision History

Datasheet status	Version No	Release date	Update content
New product datasheet	Rev4-1	20221222	

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