

SI2302S

N-Channel MOSFET

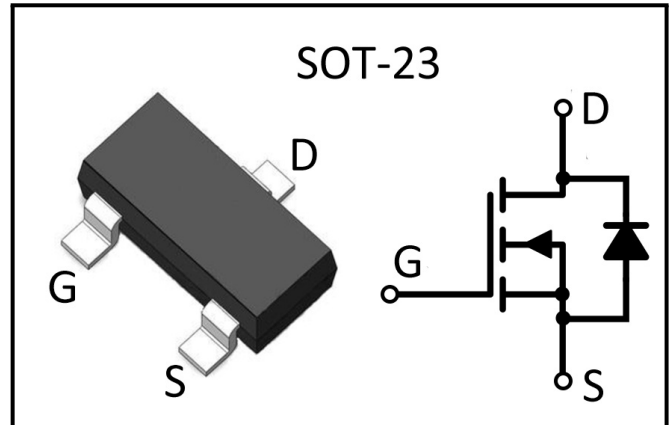
Features

- $V_{DS}=20V$
- $I_D=3.2A$
- $R_{DS(ON)} @V_{GS}=4.5V, TYP=60m\Omega$
- $R_{DS(ON)} @V_{GS}=2.5V, TYP=80m\Omega$

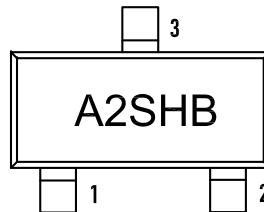
Description

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- SOT-23 for Surface Mount Package.

Package



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
SI2302S	SOT-23	A2SHB	3K	Tape and reel

Absolute Maximum Ratings (@ $T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter		Value	Unit
V _{DS}	Drain-Source Voltage		20	V
V _{GS}	Gate-Source Voltage		±10	V
I _D	Continuous Drain Current	T _A = 25°C	3.2	A
		T _A = 70°C	2.5	A
I _{DM}	Pulsed Drain Current ⁽¹⁾	T _A = 25°C	12.8	A
P _D	Maximum Power Dissipation	T _A = 25°C	1	W
		T _A = 70°C	0.8	W
T _J	Maximum Junction Temperature		150	°C
T _{stg}	Storage Temperature Range		-55 to + 150	°C
R _{θJA}	Thermal Resistance Junction-Ambient		125	°C/W

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Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @T _J =25°C (unless otherwise noted)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	20	–	–	V
I _{DSS}	Zero Gate Voltage (T _A =25°C)	V _{DS} = 20V, V _{GS} = 0V	–	1	–	uA
	Drain Current (T _A =125°C)	V _{DS} = 16V, V _{GS} = 0V	–	–	100	
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±10V, V _{DS} = 0V	–	–	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	0.4	0.6	1.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} = 2.5V, I _D = 1A	–	66	80	mΩ
		V _{GS} = 3.3V, I _D = 2A	–	55	70	
		V _{GS} = 4.5V, I _D = 3A	–	48	60	
Dynamic Electrical Characteristics @T _J =25°C (unless otherwise noted)						
Q _g	Total Gate Charge	V _{DS} = 10V I _D = 3A, V _{GS} = 5V	–	4.0	–	nC
Q _{gs}	Gate-Source Charge		–	0.4	–	
Q _{gd}	Gate-Drain Charge		–	1.2	–	
t _{d(on)}	Turn-On Delay Time	V _{DD} = 10V, I _D = 2A, V _{GS} = 4.5V, R _G = 3.3Ω	–	8	–	ns
t _r	Turn-On Rise Time		–	30	–	
t _{d(off)}	Turn-Off Delay Time		–	19	–	
t _f	Turn-Off Fall Time		–	28	–	
C _{iss}	Input Capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHZ	–	160	–	pF
C _{oss}	Output Capacitance		–	30	–	
C _{rss}	Reverse Transfer Capacitance		–	25	–	
Source-Drain Diode Characteristics						
I _{SD}	Source drain current(Body Diode)	T _A =25°C	–	–	1.5	A
V _{SD}	Diode Forward Voltage	T _J =25°C ,I _{SD} = 1.0A,V _{GS} = 0V,	–	0.82	1.2	V

Notes:(1)Pulse width limited by maximum allowable junction temperature



Typical Performance Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1 : Typical Output Characteristics

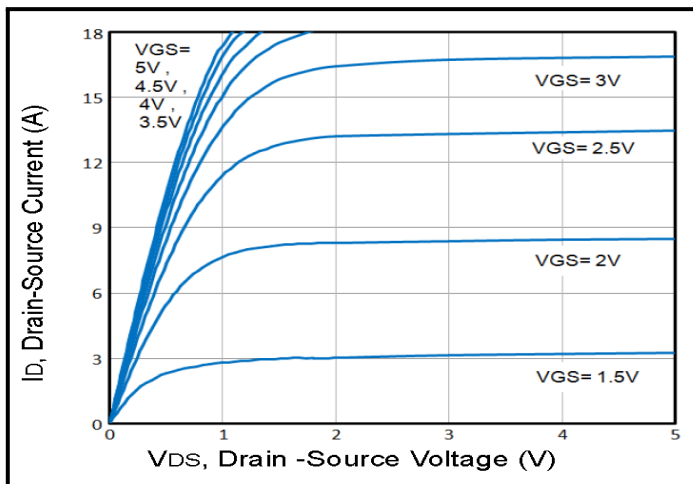


Figure 2 : Normalized Threshold Voltage Vs. Temperature

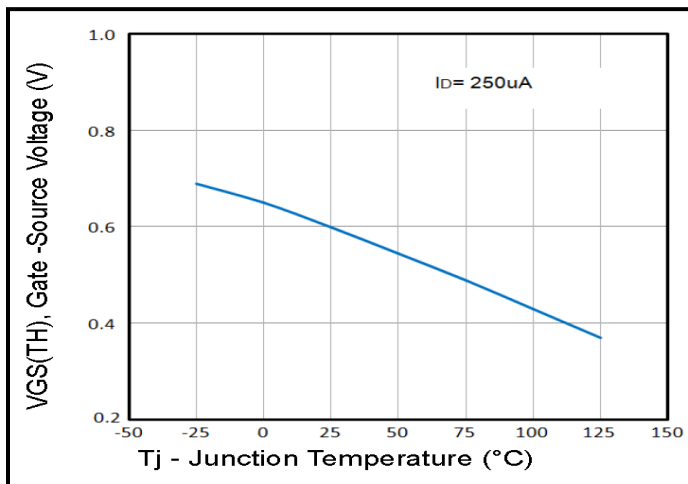


Figure 3 : Typical Transfer Characteristics

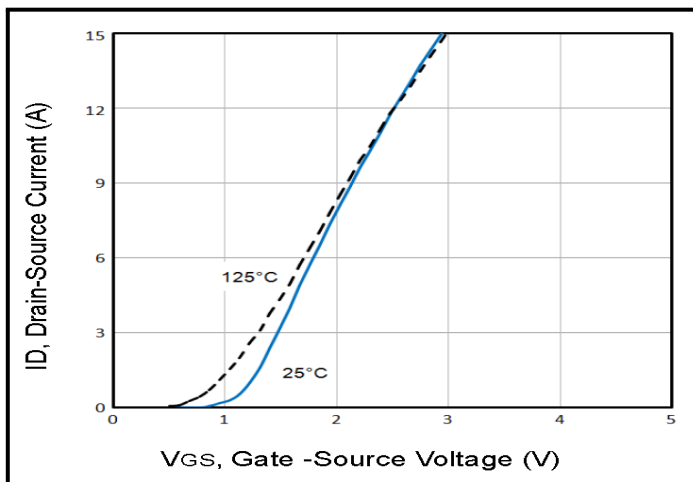


Figure 4 : Drain-Source Voltage vs Gate-Source Voltage

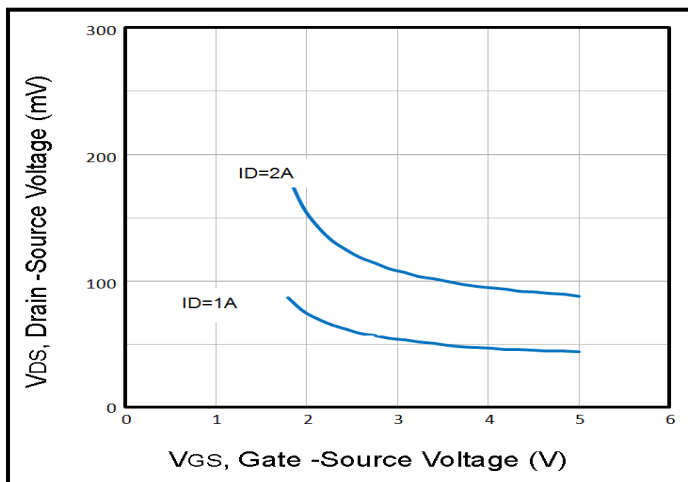


Figure 5 : Typical Source-Drain Diode Forward Voltage

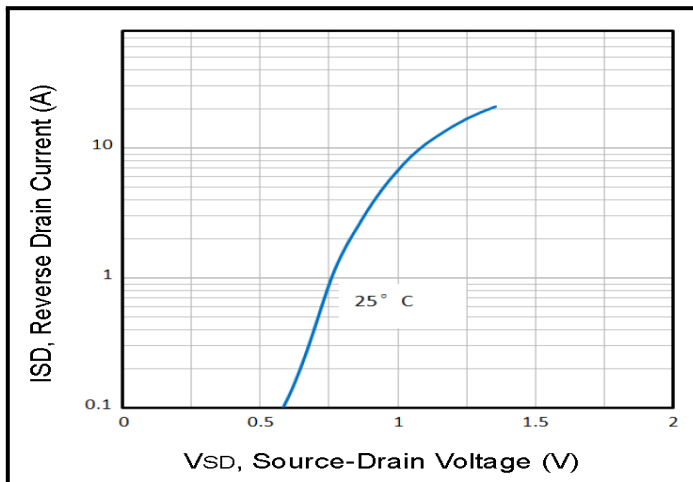


Figure 6 : Maximum Safe Operating Area

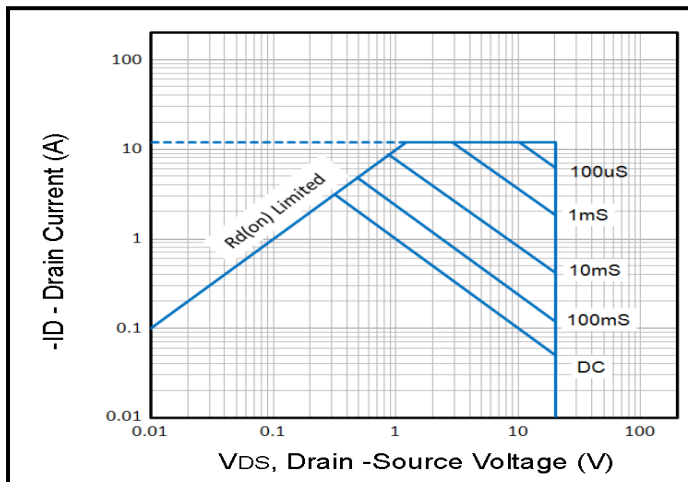


Figure 7 :Typical Capacitance Vs. Drain-Source Voltage

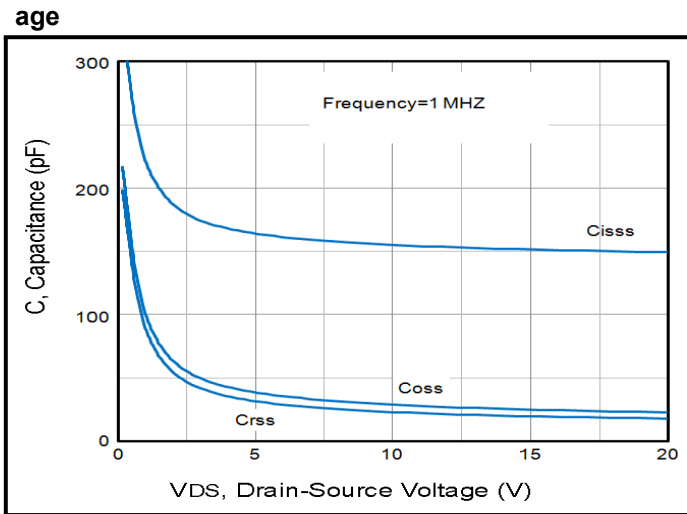


Figure 8 :Typical Gate Charge Vs. Gate-Source Voltage

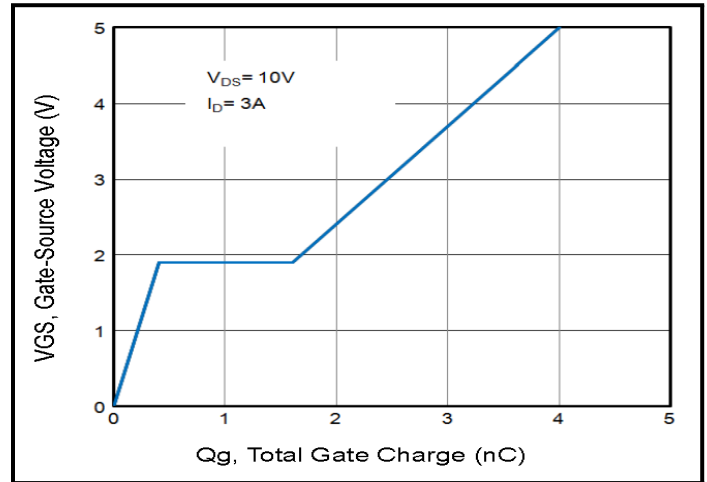


Figure 9 :Normalized Maximum Transient Thermal Impedance

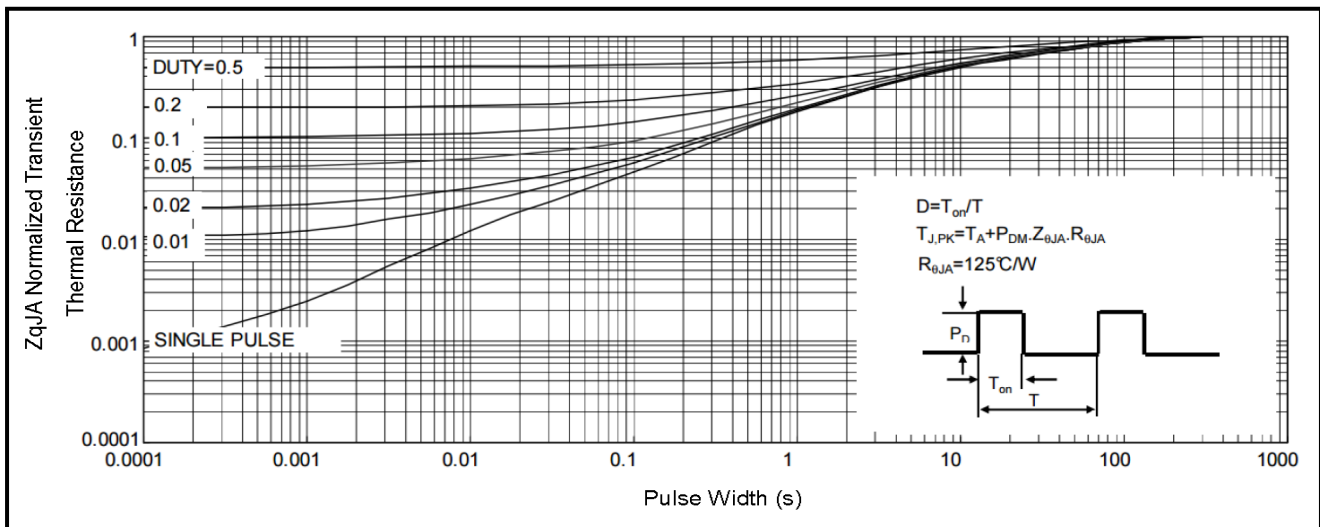
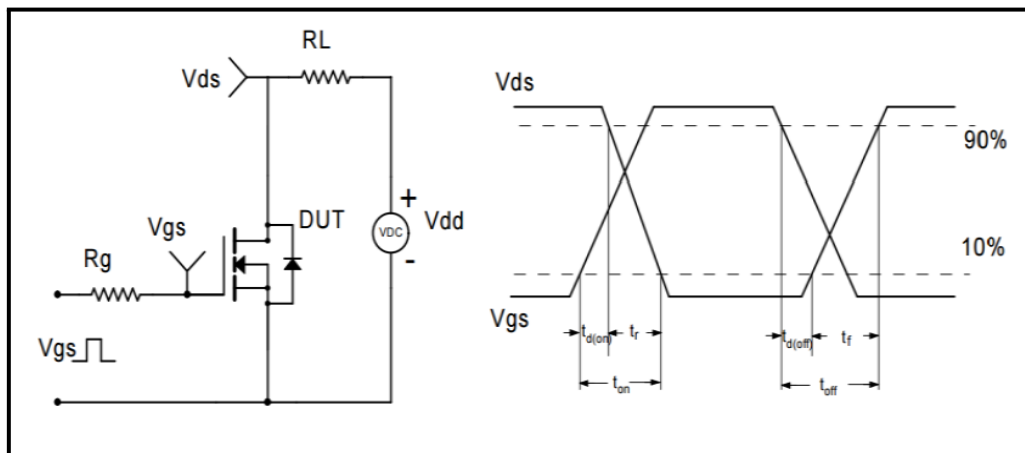


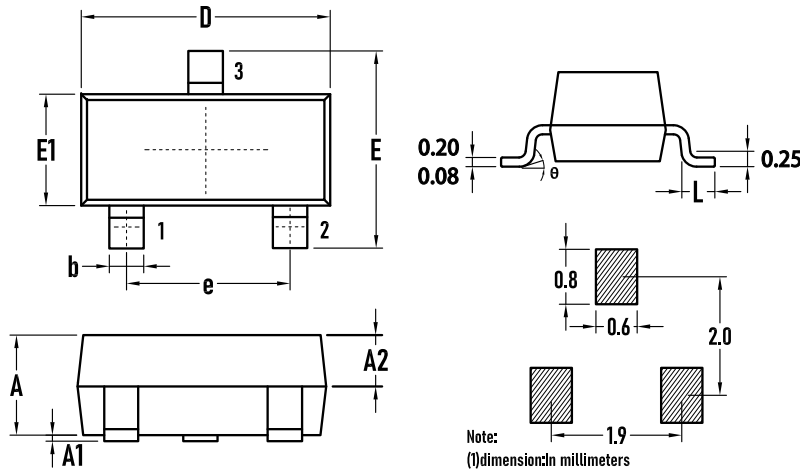
Figure 10 :Switching Time Test Circuit and waveforms



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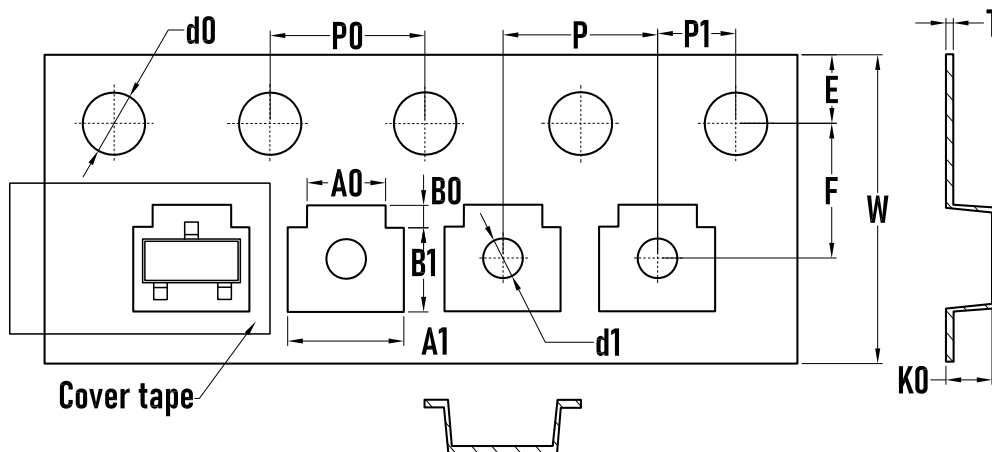
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Outline Drawing - SOT-23



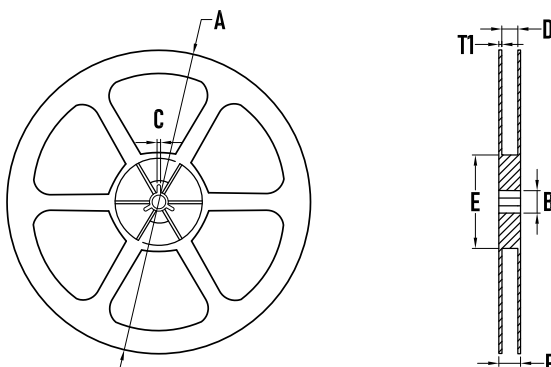
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.01	—	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	—	8°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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