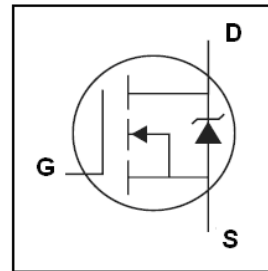


Features

- ◆ Ron(typ.)=30 mΩ @VGS=4.5V
- ◆ Low On-Resistance
- ◆ 150°C Operating Temperature
- ◆ Fast Switching
- ◆ Lead-Free, RoHS Compliant



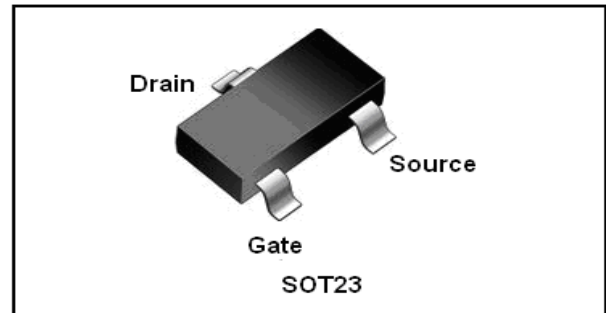
$$V_{DS} \geq 20V$$

$$R_{DS(on)} = 30m\Omega @V_{GS}=4.5V$$

$$R_{DS(on)} = 40m\Omega @V_{GS}=2.5V$$

Description

VS2302AT designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective . These features combine to make this design an extremely efficient and reliable device for variety of DC-DC applications.



Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter		Rating	Unit
Common Ratings (T _c =25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±12	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		20	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-50 to 155	°C
I _S	Diode Continuous Forward Current	T _C =25°C	3.2 ^①	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested	T _C =25°C	12	A
I _D	Continuous Drain Current(VGS=10V)	T _C =25°C	3.2 ^①	A
		T _C =100°C	2.0	
P _D	Maximum Power Dissipation	T _C =25°C	1.05	W
R _{θJA}	Thermal Resistance Junction-Ambient		140	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current (T _c =25°C)	V _{DS} =20V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T _c =125°C)	V _{DS} =20V,V _{GS} =0V	--	--	100	μA
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 =250μA	0.4	0.6	1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =3A	--	30	55	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =2.5V, I _D =2A	--	40	65	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =10V,V _{GS} =0V, f=1MHz	--	530	--	pF
C _{oss}	Output Capacitance		--	130	--	pF
C _{rss}	Reverse Transfer Capacitance		--	50	--	pF
Q _g	Total Gate Charge	V _{DS} =10V,I _D =3A, V _{GS} =4.5V	--	10	--	nC
Q _{gs}	Gate-Source Charge		--	1.3	--	nC
Q _{gd}	Gate-Drain Charge		--	2.2	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =1A, R _G =6Ω, V _{GS} =4.5V, R _L =5Ω,	--	12.5	--	nS
t _r	Turn-on Rise Time		--	40	--	nS
t _{d(off)}	Turn-Off Delay Time		--	42	--	nS
t _f	Turn-Off Fall Time		--	29	--	nS
Source- Drain Diode Characteristics						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	3.2 ^①	A
I _{SDM}	Pulsed Source-drain current (Body Diode)		--	--	12 ^①	A
V _{SD}	Forward on voltage	T _J =25°C,I _{SD} =3A, V _{GS} =0V	--	0.85	1.3	V

Notes: ① Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Typical Characteristics

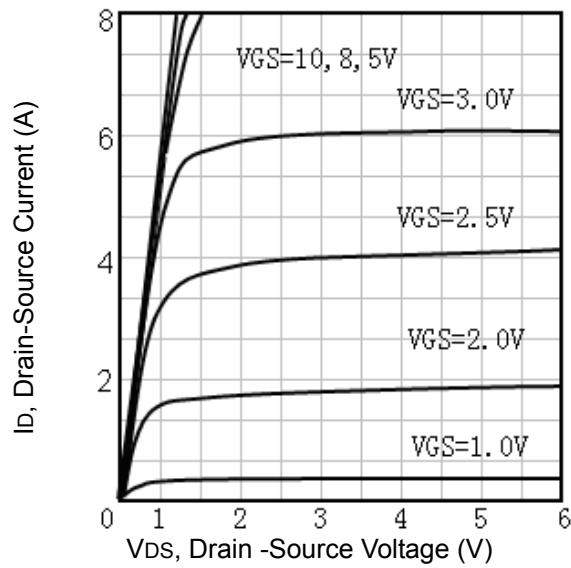


Fig1. Typical Output Characteristics

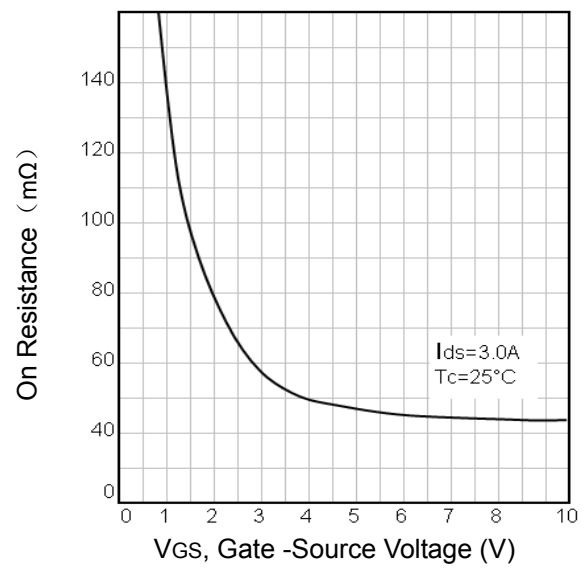


Fig2. Typical Transfer Characteristics

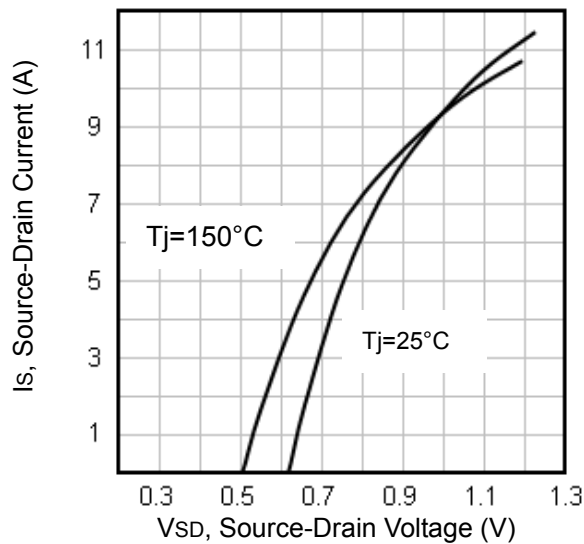


Fig7. Typical Source-Drain Diode Forward Voltage

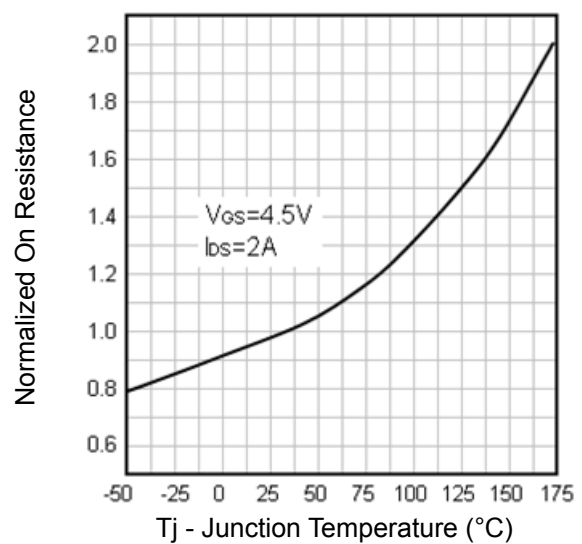


Fig4. Normalized On-Resistance Vs. Temperature

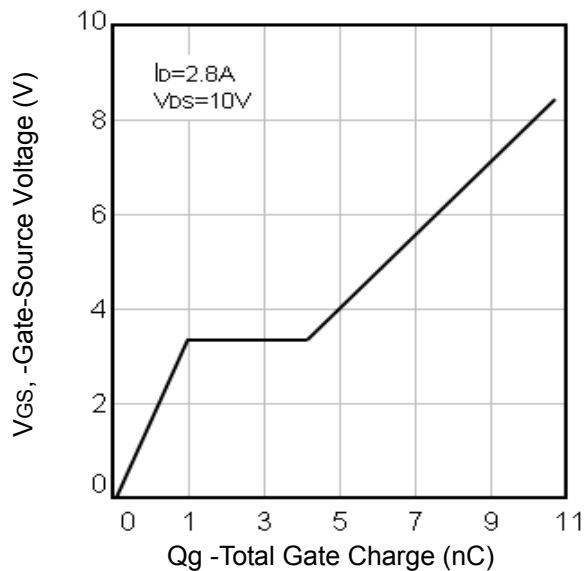


Fig5. Typical Gate Charge Vs. Gate-Source Voltage

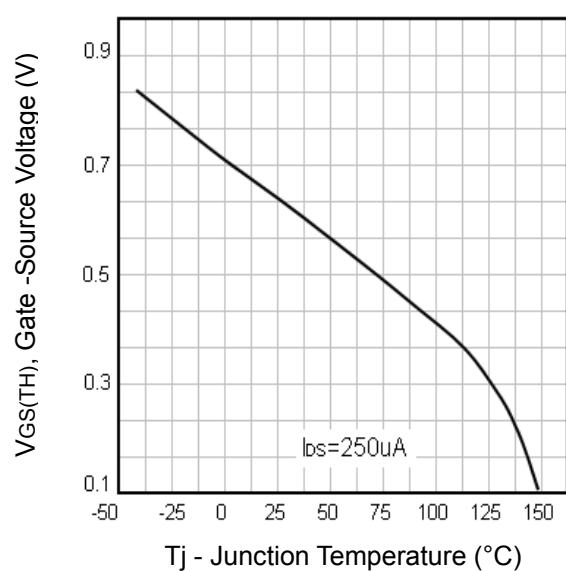
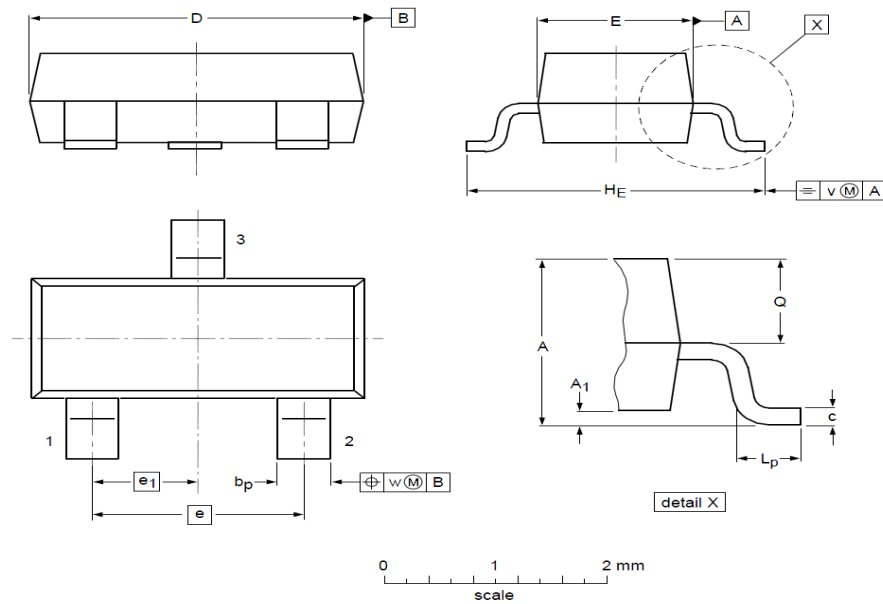


Fig6. Threshold Voltage Vs. Temperature

SOT23 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.03	1.10	A ₁	0.01	0.05	0.10
b _p	0.38	0.42	0.48	c	0.09	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e ₁	--	0.95	--
H _E	2.10	2.40	2.50	L _p	0.15	0.23	0.45
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS2302AT	VS22	SOT23	3000/Reel	6000

Customer Service

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