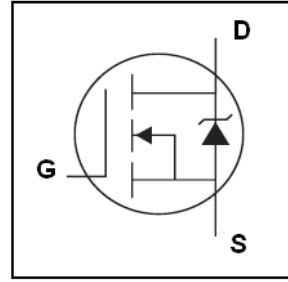


Features

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



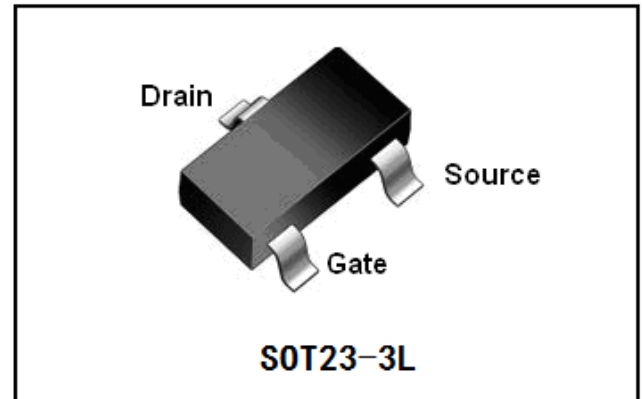
V_{DSS}=30V

R_{DS(on)}=27mΩ @V_{GS}=4.5V

R_{DS(on)}=35mΩ @V_{GS}=2.5V

Description

VS3400BL 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 (T_A) is 25°C, unless otherwise specified.

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±12	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		30	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-50 to 150	°C
I _S	Diode Continuous Forward Current	T _A =25°C	1	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested ^①	T _A =25°C	20	A
I _D	Continuous Drain Current(V _{GS} =10V)	T _A =25°C	5.8 ^①	A
		T _A =100°C	3.6	
P _D	Maximum Power Dissipation	T _A =25°C	1.20	W
R _{θJA}	Thermal Resistance Junction-Ambient		105	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_A = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _J =25°C)	V _{DS} =30V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _J =125°C)	V _{DS} =30V,V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V,V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250μA	0.60	0.85	1.20	V
R _{DS(ON)}	Drain-Source On-State Resistance ^②	V _{GS} =4.5V, I _D =5.8A	--	27	35	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^②	V _{GS} =3.3V, I _D =4.5A	--	29	38	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^②	V _{GS} =2.5V, I _D =4.5A	--	35	45	mΩ
Dynamic Electrical Characteristics @ T_A = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V,V _{GS} =0V, f=1MHz	--	635	--	pF
C _{oss}	Output Capacitance		--	135	--	pF
C _{rss}	Reverse Transfer Capacitance		--	40	--	pF
Q _g	Total Gate Charge	V _{DS} =15V,I _D =5.8A, V _{GS} =4.5V	--	10.5	--	nC
Q _{gs}	Gate-Source Charge		--	1.6	--	nC
Q _{gd}	Gate-Drain Charge		--	2.7	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	VDD=15V, ID=2.8A, RG=3.3Ω, VGS=4.5V	--	7.2	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	36	--	nS
t _f	Turn-Off Fall Time		--	3	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	I _{SD} =3A,V _{GS} =0V	--	0.81	1.20	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{SD} =3A, V _{GS} =0V	--	8.1	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs		3.4		nC

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

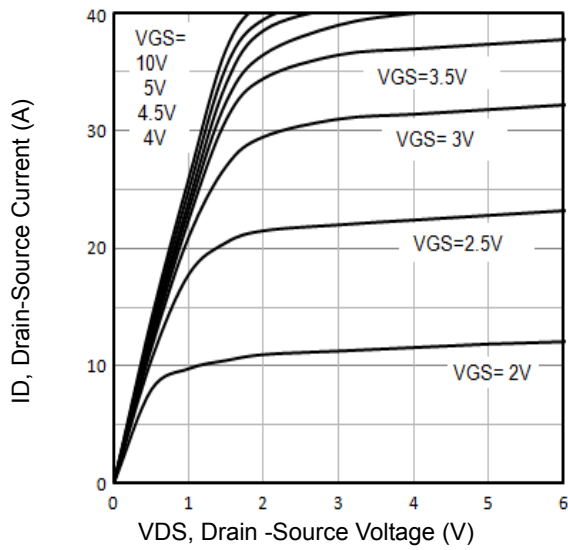


Fig1. Typical Output Characteristics

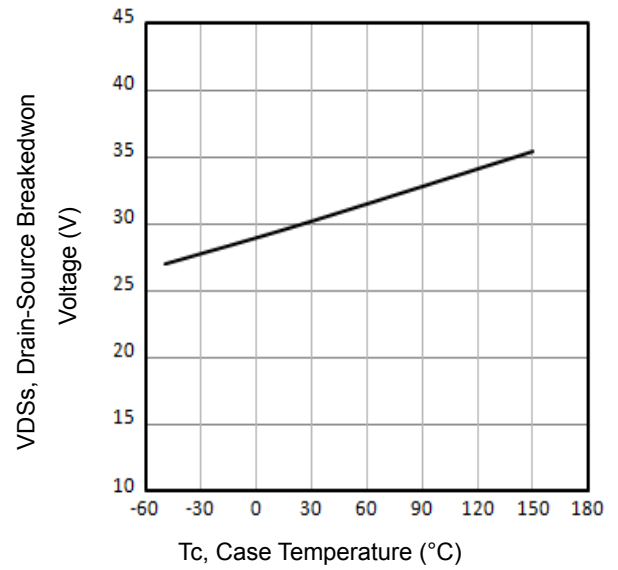


Fig2. Drain-source breakdown voltage

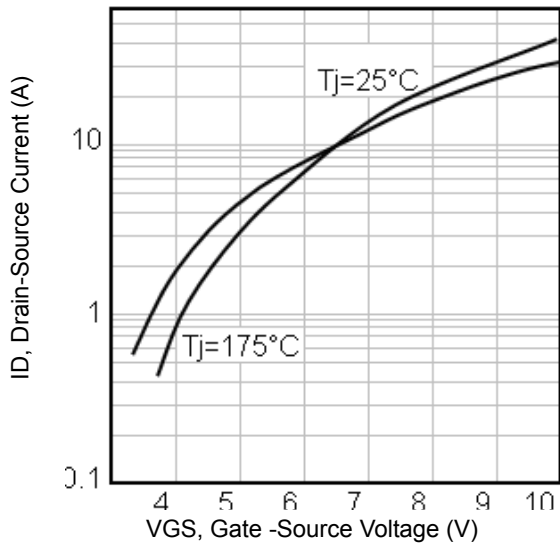


Fig3. Typical Transfer Characteristics

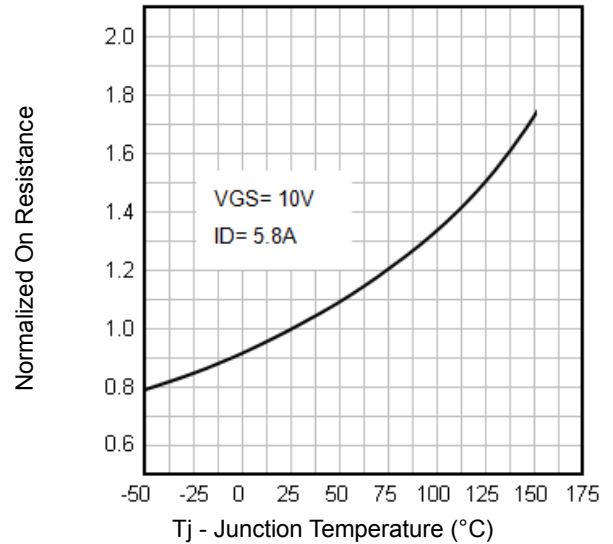


Fig4. Normalized On-Resistance Vs. Temperature

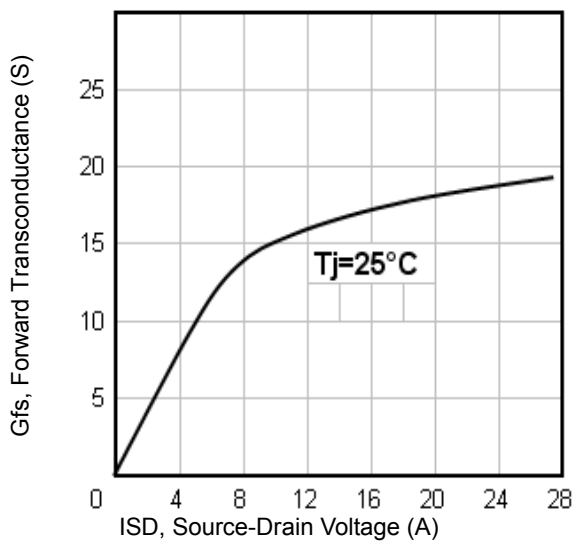


Fig5. Typical Forward Transconductance Vs. Drain Current

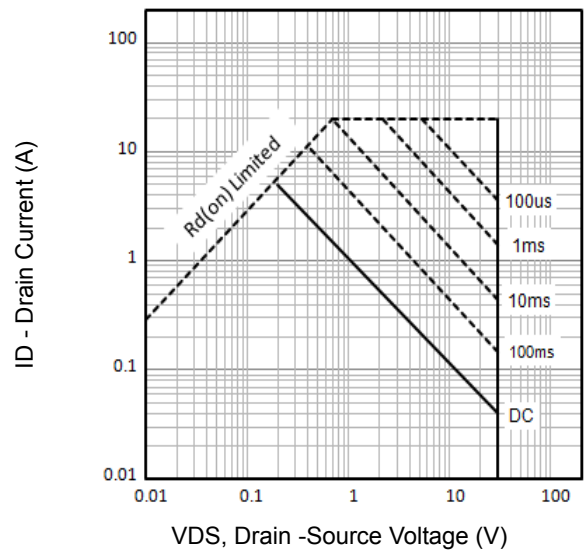


Fig6. Maximum Safe Operating Area

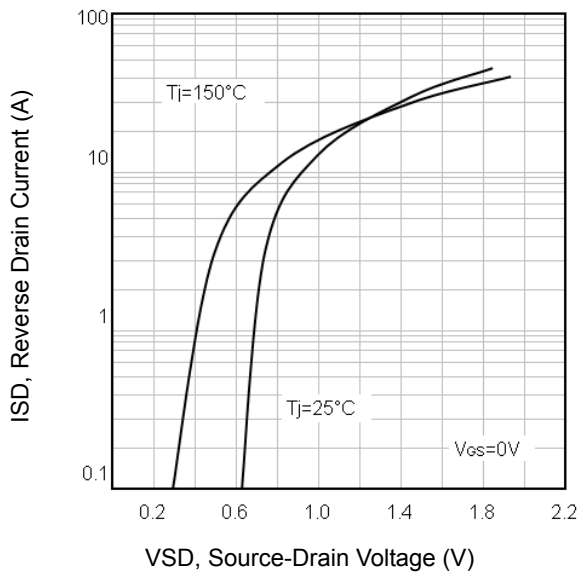


Fig7. Typical Source-Drain Diode Forward Voltage

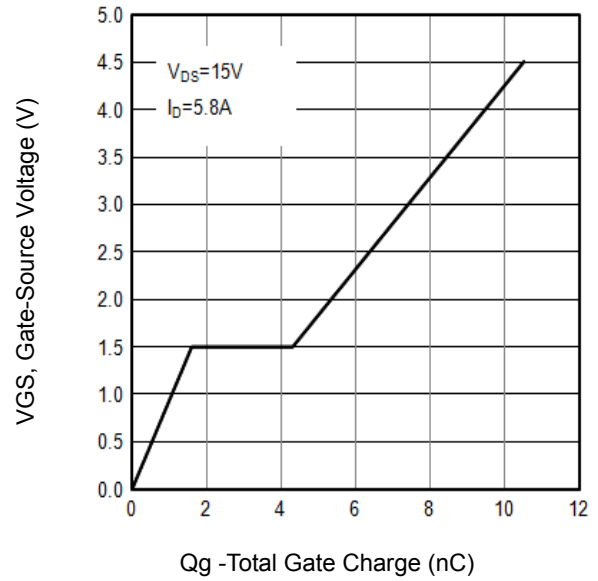


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

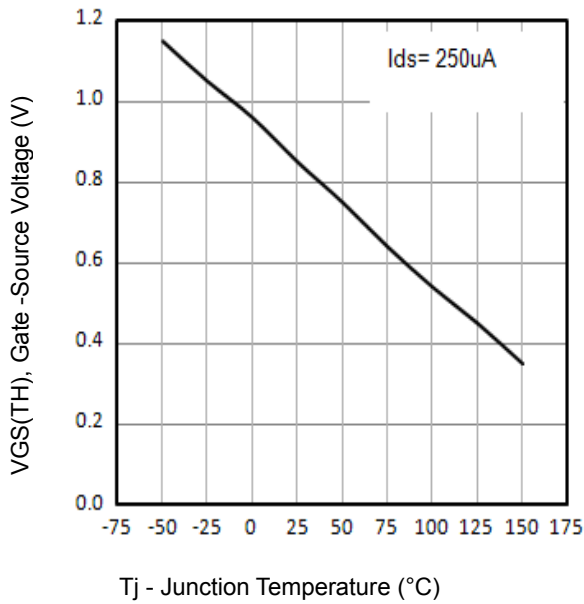


Fig9. Threshold Voltage Vs. Temperature

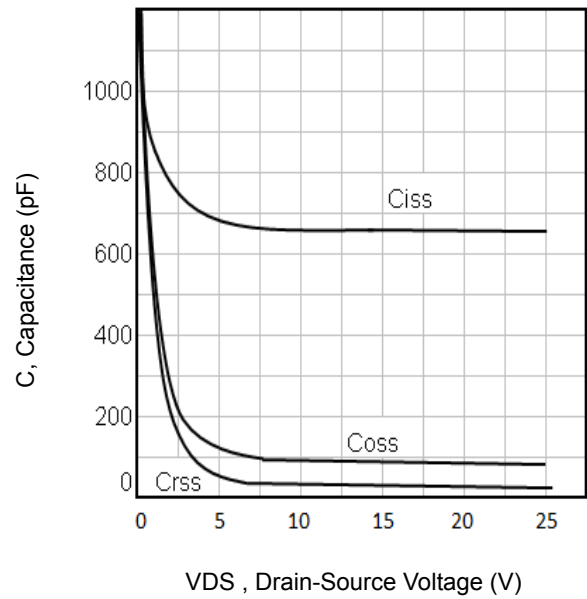


Fig10. Typical Capacitance Vs. Drain-Source Voltage

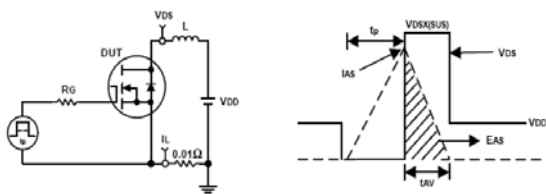


Fig11. Unclamped Inductive Test Circuit and waveforms

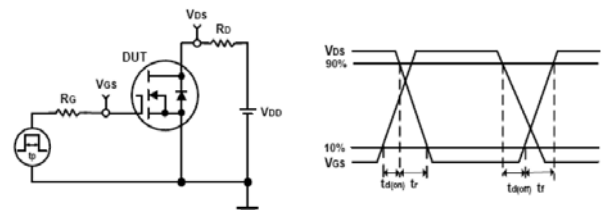
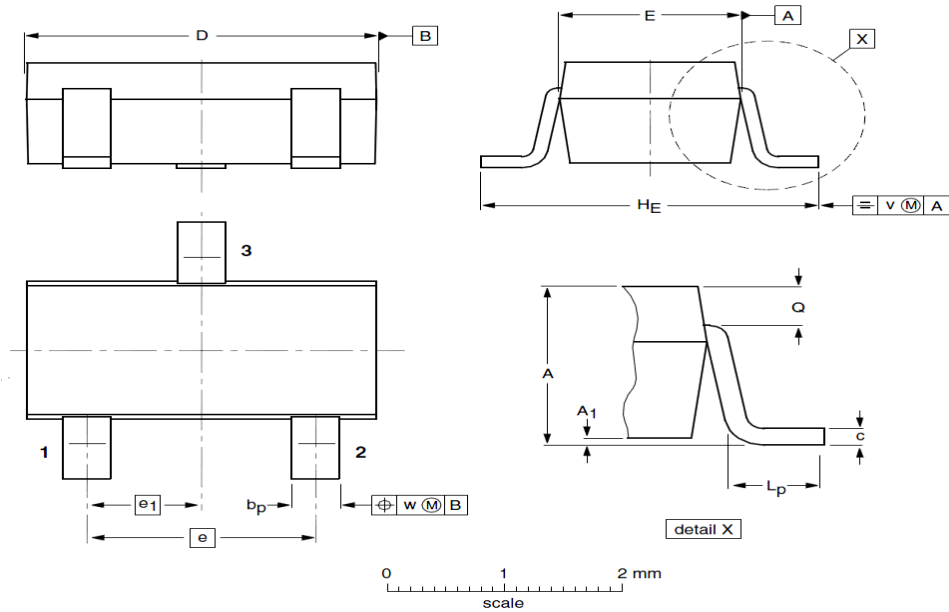


Fig12. Switching Time Test Circuit and waveforms

SOT23-3L Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	1.00	1.17	1.30	A ₁	0.01	0.05	0.10
b _p	0.35	0.39	0.50	c	0.10	0.20	0.26
D	2.70	2.98	3.10	E	1.30	1.58	1.70
e	--	1.90	--	e ₁	--	0.95	--
H _E	2.50	2.78	3.00	L _p	0.20	0.32	0.60
Q	0.23	0.27	0.33	v	--	0.20	--
w	--	0.20	--				

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS3400BL	VS30	SOT23-3L	3000/Reel	6000

Customer Service

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