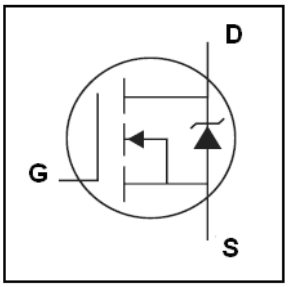
Features

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



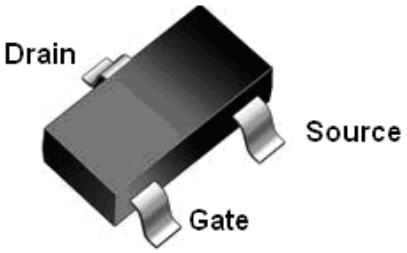
V_{DSS}=30V

$R_{DS(on)}$=27mΩ @V_{GS}=4. 5V

$R_{DS(on)}$=35mΩ @V_{GS}=2. 5V

Description

VS3400BC 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.



SOT23

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_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 Tested①	T_A=25°C	20	A
I_D	Continuous Drain Current(VGS=10V)	T_A=25°C	5.8①	A
		T_A=100°C	3.6	
P_D	Maximum Power Dissipation	T_A=25°C	1.20	W
$R_{\theta JA}$	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℃)	V_{DS}=30V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tj=125℃)	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 Resistance②	V_{GS}=4.5V, I_D=5.8A	--	27	35	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=3.3V, I_D=4.5A	--	29	38	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	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℃,I_{sd}=3A, V_{GS}=0V di/dt=100A/μs	--	8.1	--	nS
Q_{rr}	Reverse Recovery Charge			3.4		nC

NOTE:

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

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

Typical Characteristics

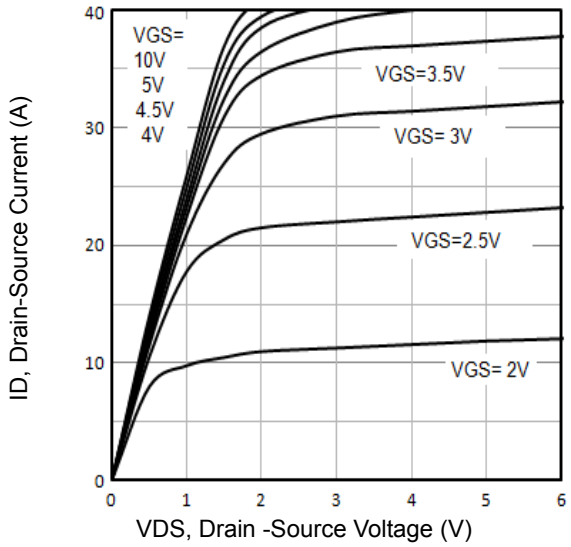


Fig1. Typical Output Characteristics

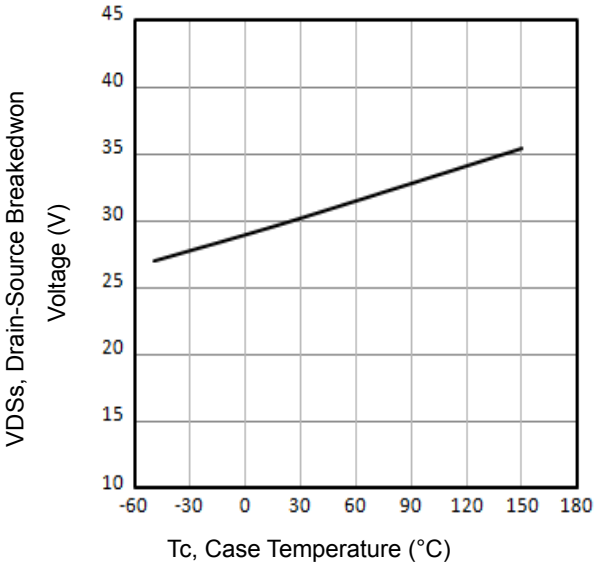


Fig2. Drain-source breakdown voltage

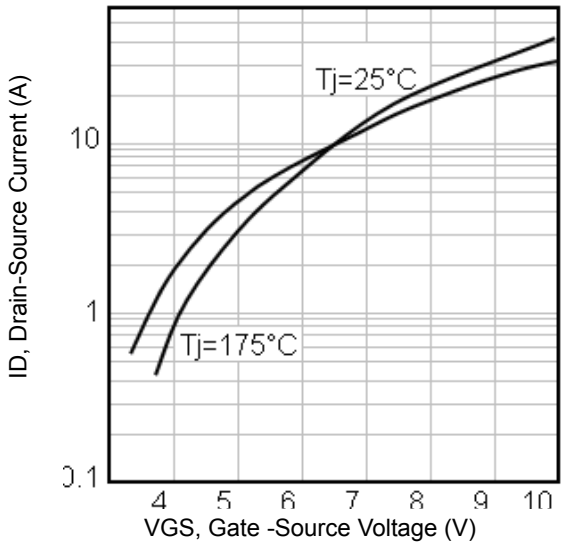


Fig3. Typical Transfer Characteristics

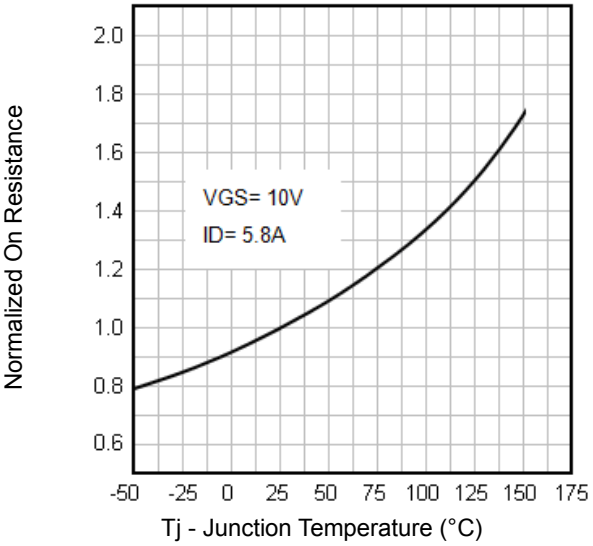


Fig4. Normalized On-Resistance Vs. Temperature

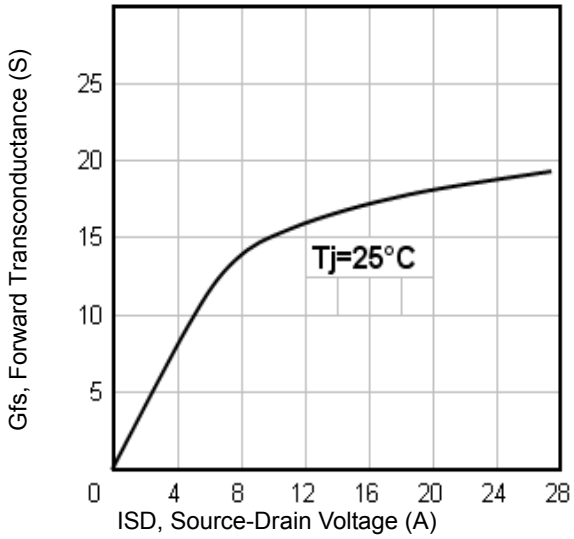


Fig5. Typical Forward Transconductance Vs. Drain Current

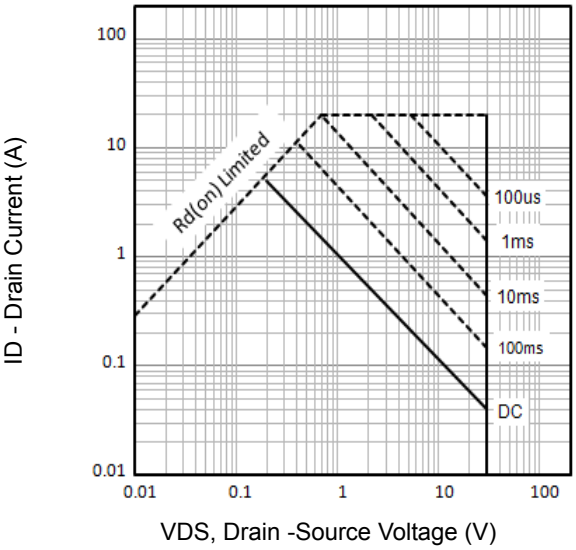


Fig6. Maximum Safe Operating Area

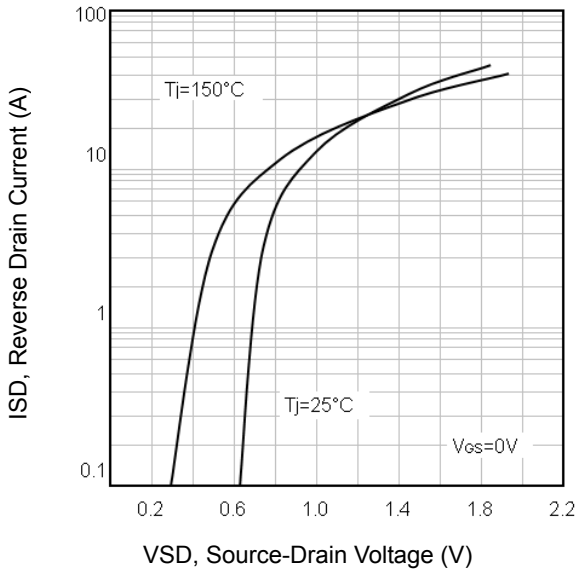


Fig7. Typical Source-Drain Diode Forward Voltage

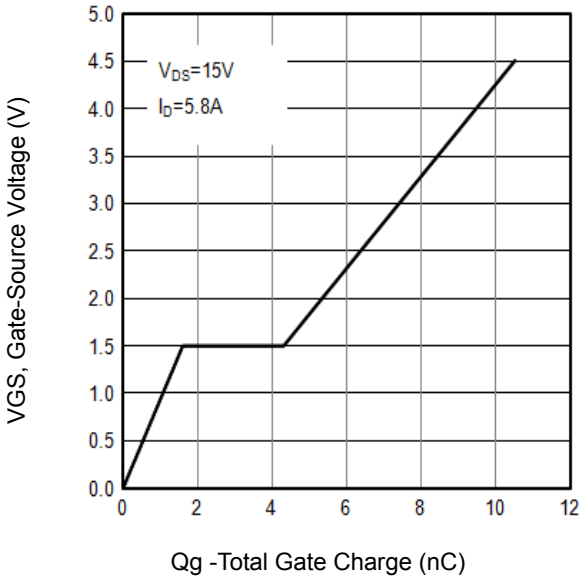


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

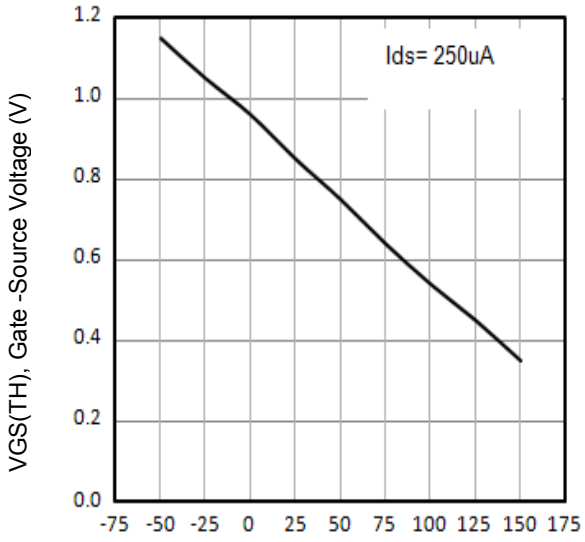


Fig9. Threshold Voltage Vs. Temperature

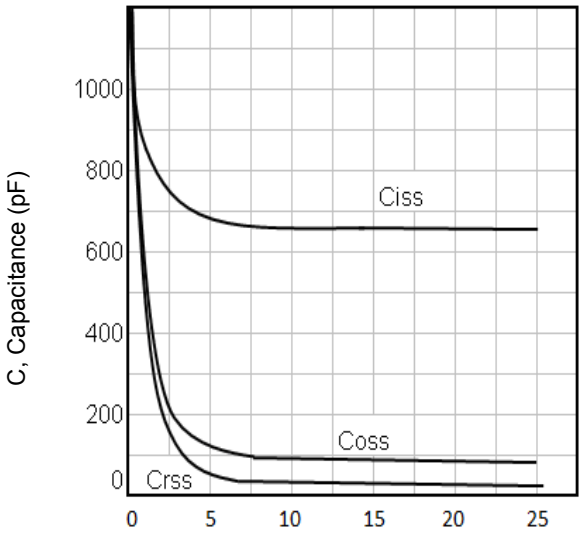


Fig10. Typical Capacitance Vs.Drain-Source Voltage

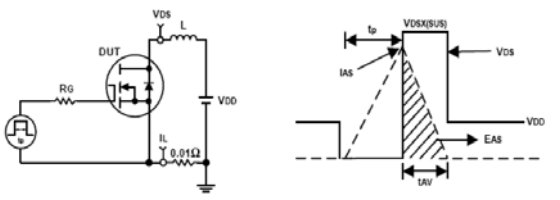


Fig11. Unclamped Inductive Test Circuit and waveforms

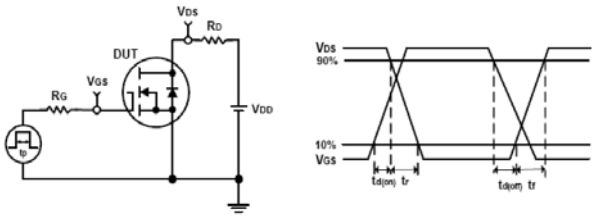
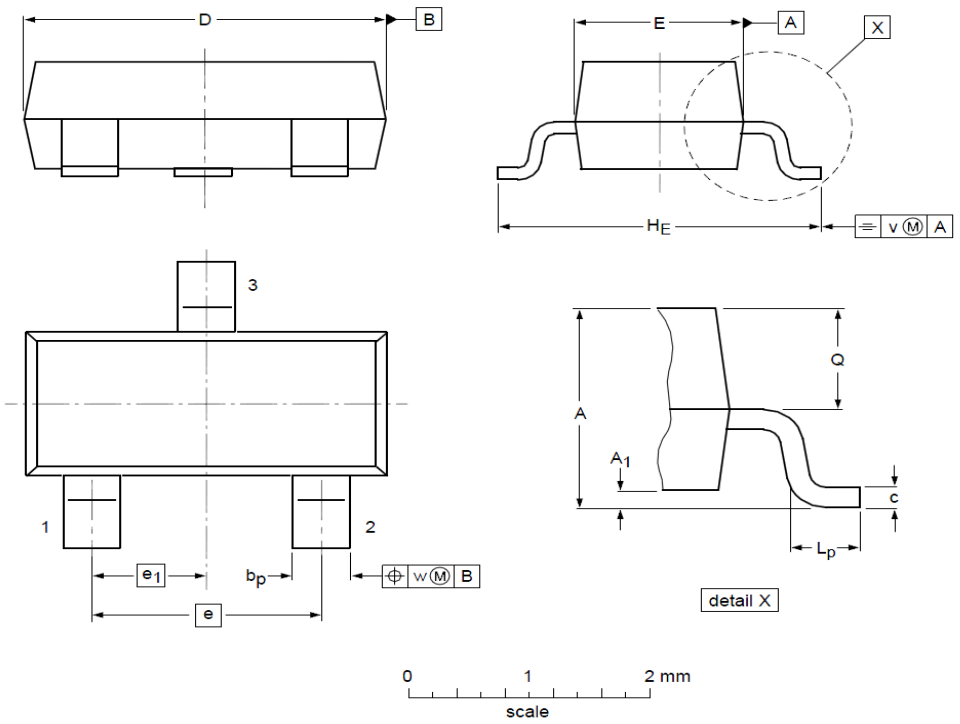


Fig12. Switching Time Test Circuit and waveforms

SOT23 Package Outline 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
VS3400BC	VS30	SOT23	3000/Reel	6000

Customer Service

Sales and Service:

Sales@vgsemi.com

Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: **www.vgsemi.com**