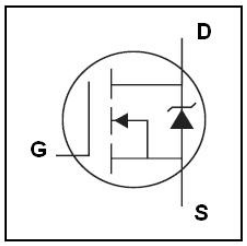
Features

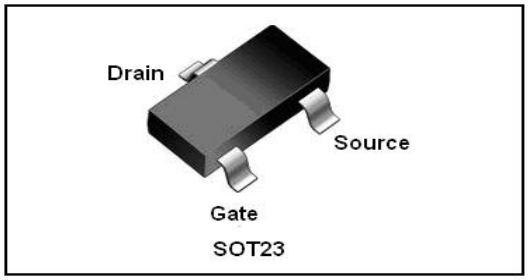
- ♦Low On-Resistance
- ♦Fast Switching
- ♦Green Product (RoHS Compliant)



V_{DSS}	100V
$R_{DS(on)}$	150 mΩ
I_D	2.6 A

Description

VSC160N10MS designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 150°C junction operating temperature, fast switching speed and improved repetitive avalanche rating . These features combine to make this design an extremely efficient and reliable device for use in Power applications and a wide variety of other supply 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 (Tc=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		100	V
T_J	Maximum Junction Temperature		155	°C
T_{STG}	Storage Temperature Range		-55 to 155	°C
I_S	Diode Continuous Forward Current	T_C=25°C	2.1	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested ①	T_C=25°C	10	A
I_D	Continuous Drain current@VGS=10V	T_C=25°C	2.6	A
P_D	Maximum Power Dissipation	T_C=25°C	1.0	W
		T_C=100°C	0.60	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		125	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		1.5	mJ

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	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=100V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±10	uA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=2.5A	--	150	165	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=4.5V, I_D=1.5A	--	165	180	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	405	--	pF
C_{oss}	Output Capacitance		--	36	--	pF
C_{rss}	Reverse Transfer Capacitance		--	18	--	pF
Q_g	Total Gate Charge	V_{DS}=30V,I_D=1A, V_{GS}=10V	--	9	--	nC
Q_{gs}	Gate-Source Charge		--	1.5	--	nC
Q_{gd}	Gate-Drain Charge		--	2.1	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=1A, R_G=6.8Ω, V_{GS}=10V	--	9	--	nS
t_r	Turn-on Rise Time		--	8.1	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	nS
t_f	Turn-Off Fall Time		--	13.5	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=2.5A,V_{GS}=0V	--	0.83	1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=1.5A, V_{GS}=0V di/dt=100A/μs	--	25	--	nS
Q_{rr}	Reverse Recovery Charge			31		nC

NOTE:

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

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH,R_G = 25Ω, I_{AS} = 2.5A, V_{GS} =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

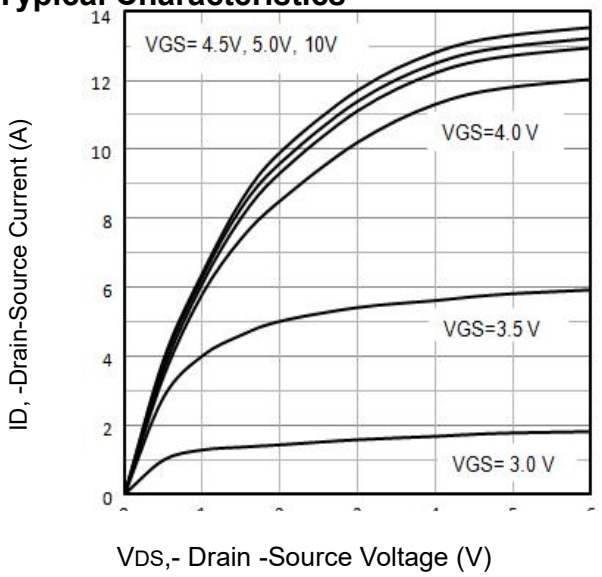


Fig1. Typical Output Characteristics

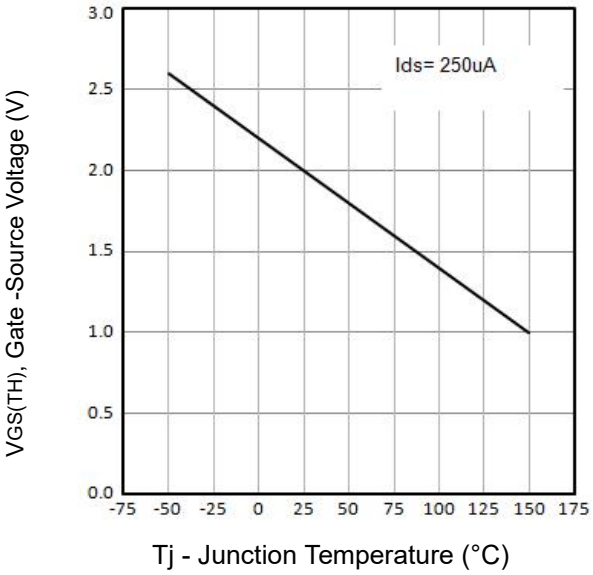


Fig2. Threshold Voltage Vs. Temperature

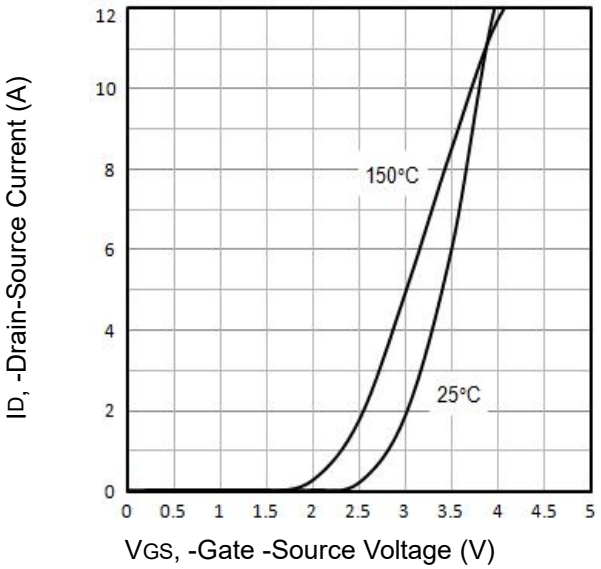


Fig3. Typical Transfer Characteristics

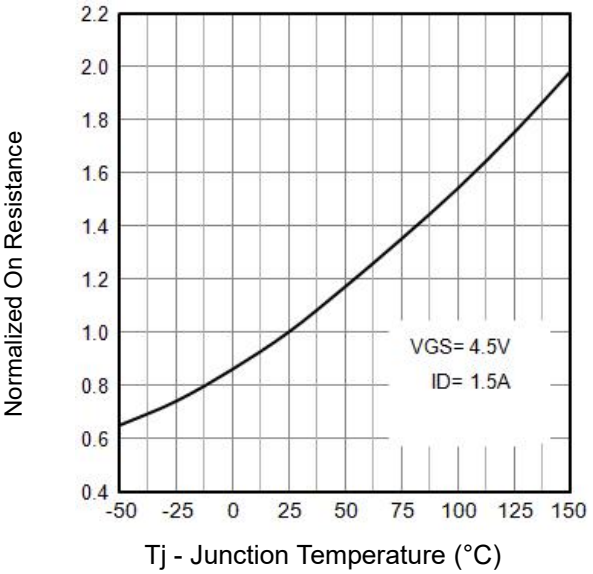


Fig4. Normalized On-Resistance Vs. Temperature

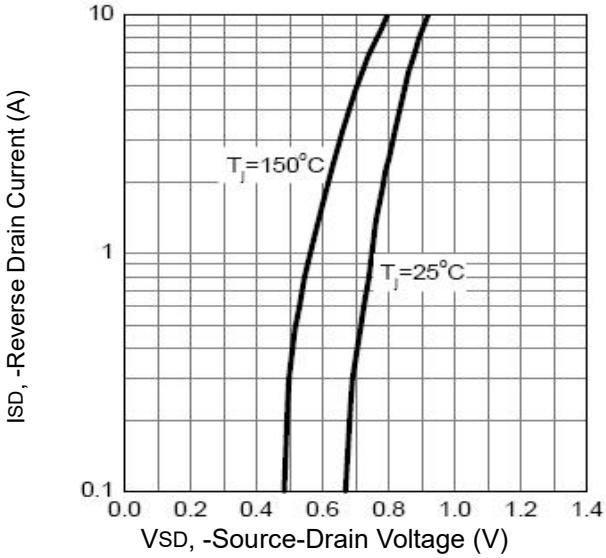


Fig5. Typical Source-Drain Diode Forward Voltage

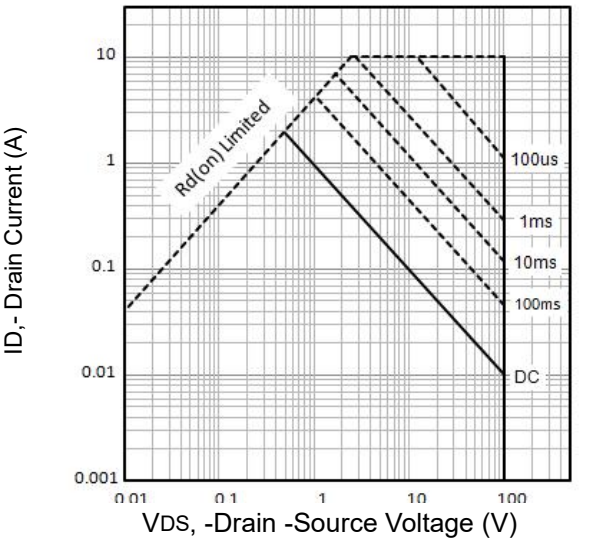


Fig6. Maximum Safe Operating Area

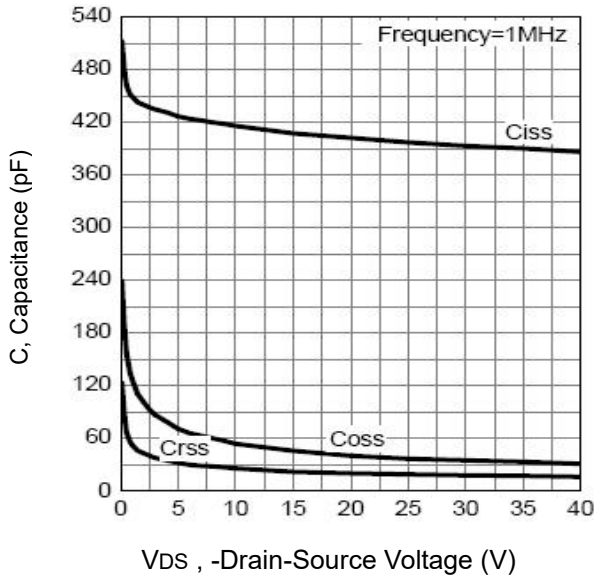


Fig7. Typical Capacitance Vs.Drain-Source Voltage

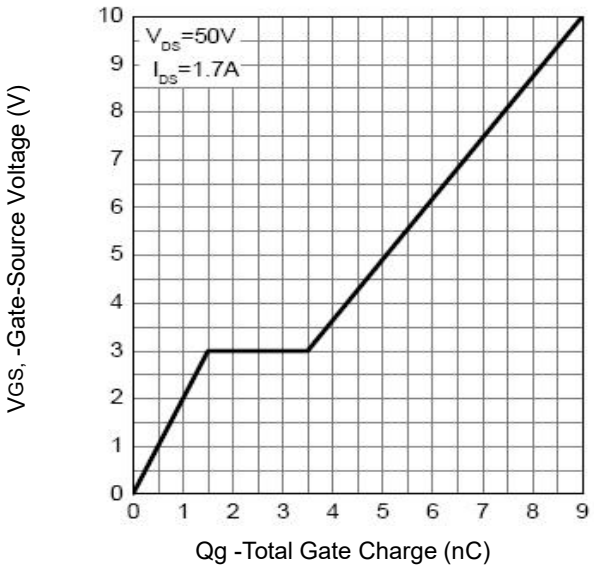


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

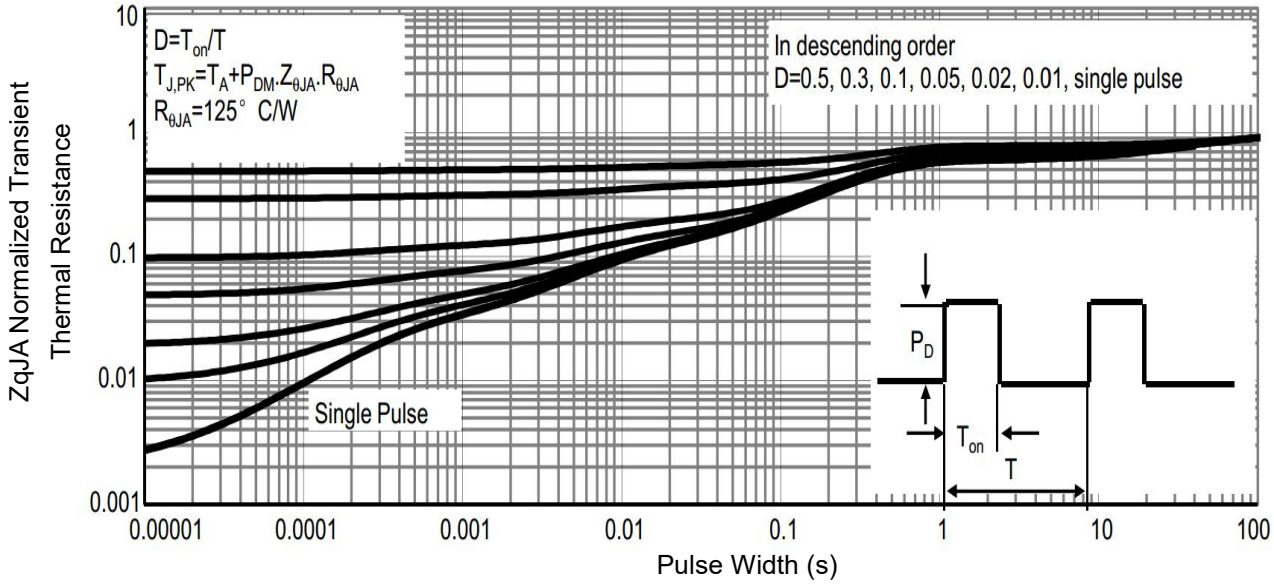


Figure 9: Normalized Maximum Transient Thermal

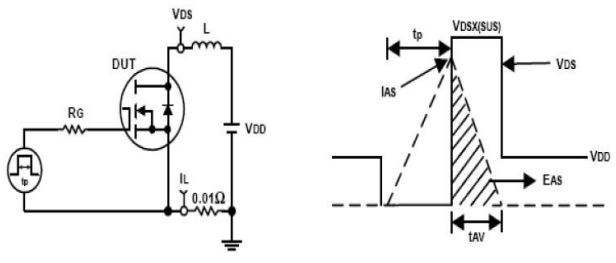


Fig10. Unclamped Inductive Test Circuit and Waveforms

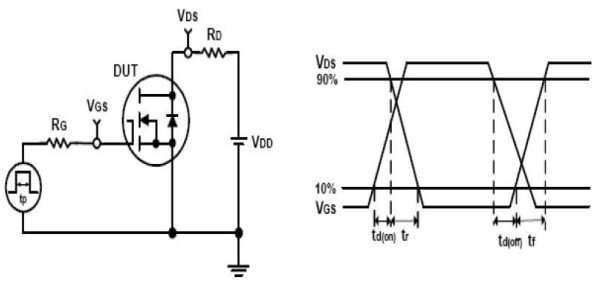
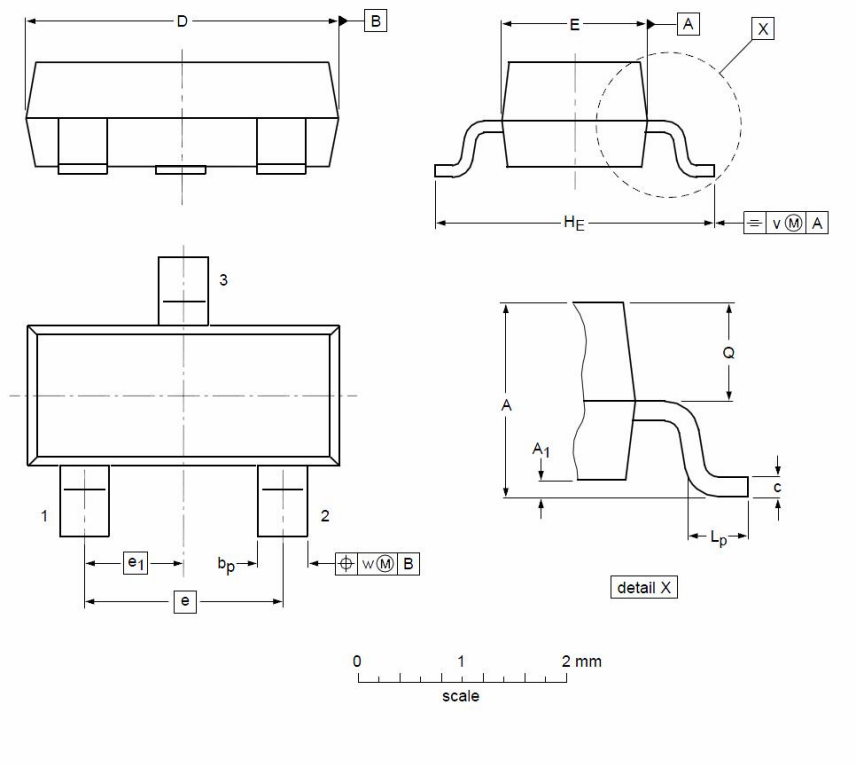


Fig11. Switching Time Test Circuit and waveforms

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
VSC160N10MS	1H2	SOT23	3000/Reel	6000

Customer Service

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