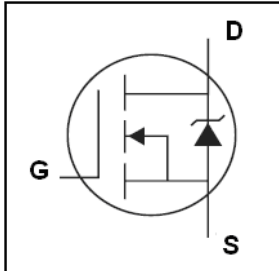


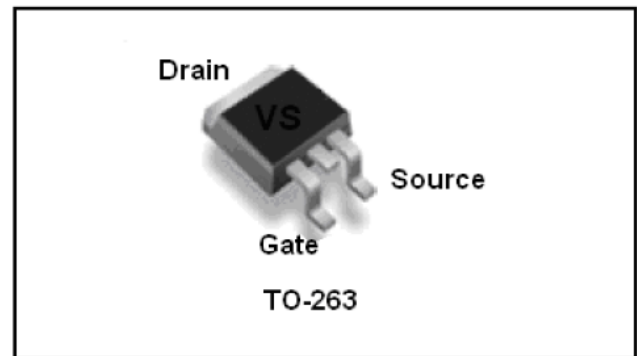
Features

- ◆ Low On-Resistance
- ◆ Fast Switching
- ◆ 100% Avalanche Tested
- ◆ Repetitive Avalanche Allowed up to Tjmax
- ◆ Lead-Free, RoHS Compliant

Description

VS4410ATD designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 175°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 Motor applications and a wide variety of other applications.

	V_{DSS}	100V
	$R_{DS(on)}$	6.0m Ω
	I_D	110A


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	175	°C	
T_{STG}	Storage Temperature Range	-55 to 175	°C	
I_S	Maxium Diode Continuous Forward Current	$T_C = 25^\circ C$	110	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested ①	$T_C = 25^\circ C$	370	A
I_D	Continuous Drain current@VGS=10V	$T_C = 25^\circ C$	110	A
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	250	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.58	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		900	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	110	--	V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25°C)	V _{DS} =100V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V _{DS} =100V,V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250μA	2	3.0	4	V
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =10V, I _D =55A	--	6.0	8.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =50V,V _{GS} =0V, f=1MHz	--	6050	--	pF
C _{oss}	Output Capacitance		--	560	--	pF
C _{rss}	Reverse Transfer Capacitance		--	205	--	pF
Q _g	Total Gate Charge	V _{DS} =50V,I _D =75A, V _{GS} =10V	--	120	--	nC
Q _{gs}	Gate-Source Charge		--	26	--	nC
Q _{gd}	Gate-Drain Charge		--	30	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =60V, I _D =30A, R _G =2.8Ω, V _{GS} =10V	--	21	--	nS
t _r	Turn-on Rise Time		--	50	--	nS
t _{d(off)}	Turn-Off Delay Time		--	46	--	nS
t _f	Turn-Off Fall Time		--	60	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	T _C =25°C	--	--	110	A
V _{SD}	Forward on voltage	I _{SD} =50A,V _{GS} =0V	--	0.86	1.3	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{sd} =75A, V _{GS} =0V	--	50	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs		105		nC

NOTE:

- ① Pulse width ≤ 300μs; duty cycle ≤ 2%; pulse width limited by max. junction temperature.
 ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} =50A, V_{GS} =10V.

Typical Characteristics

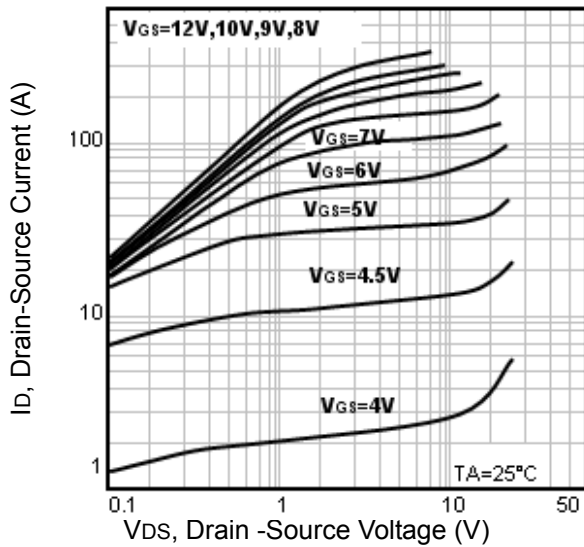


Fig1. Typical Output Characteristics

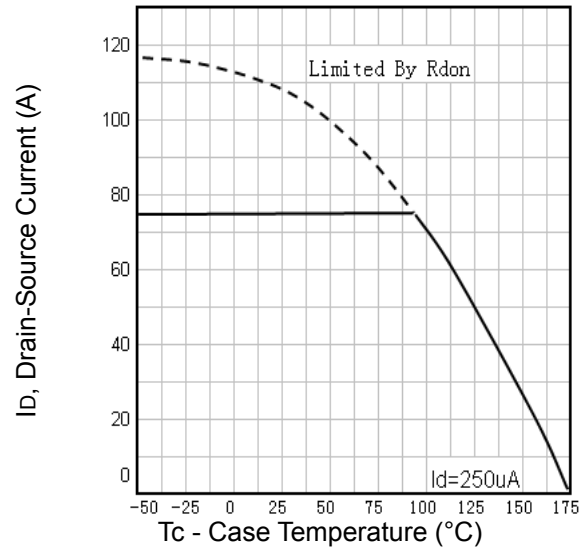


Fig2. Maximum Drain Current Vs. Case Temperature

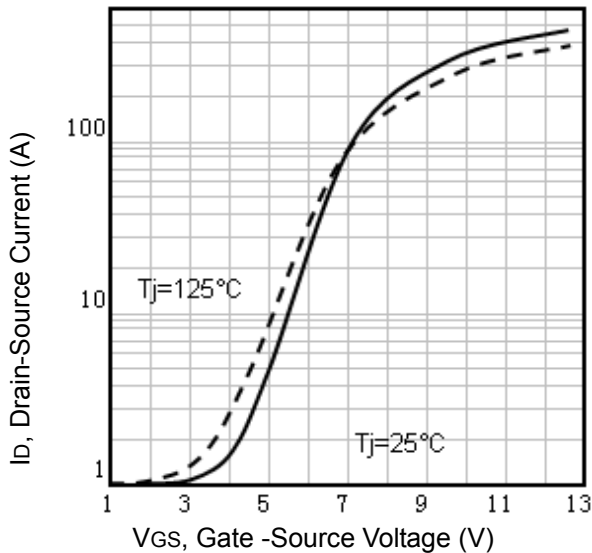


Fig3. Typical Transfer Characteristics

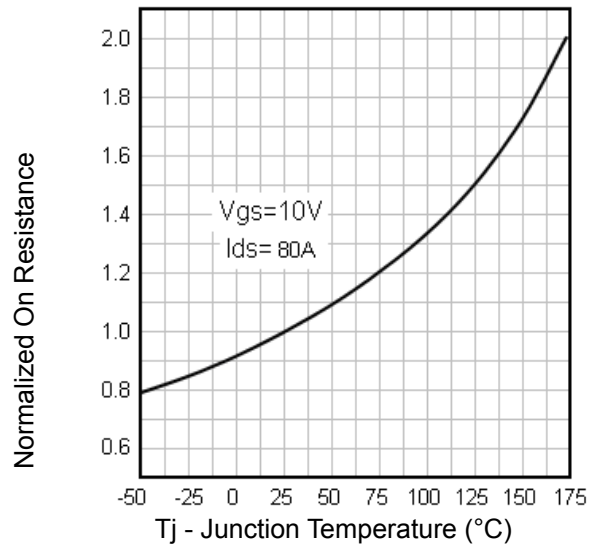


Fig4. Normalized On-Resistance Vs. Temperature

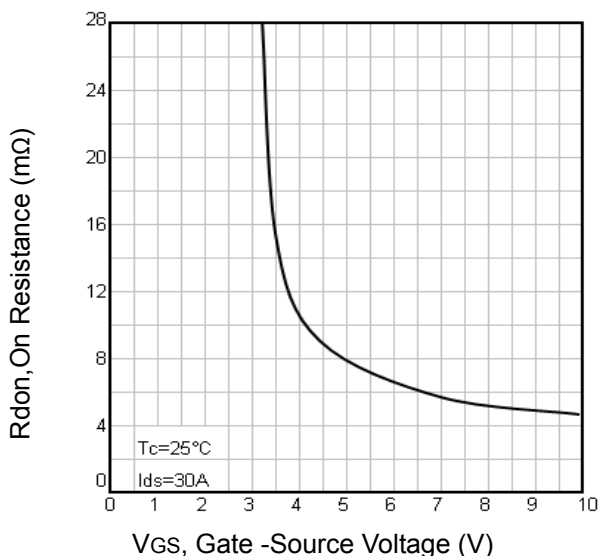


Fig5. Typical On-Resistance Vs. Gate-Source Voltage

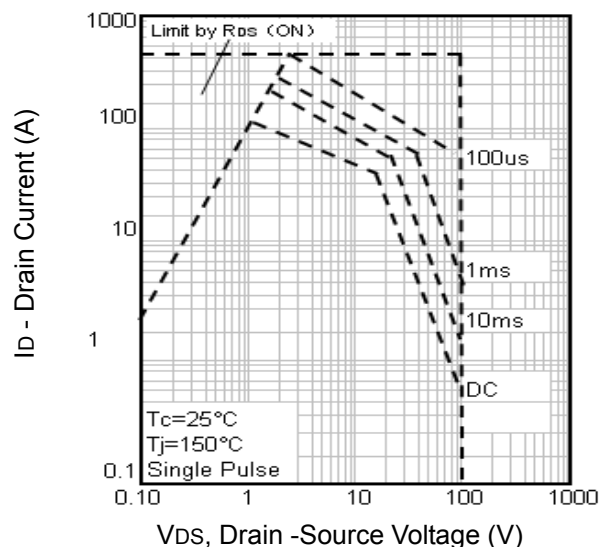


Fig6. Maximum Safe Operating Area

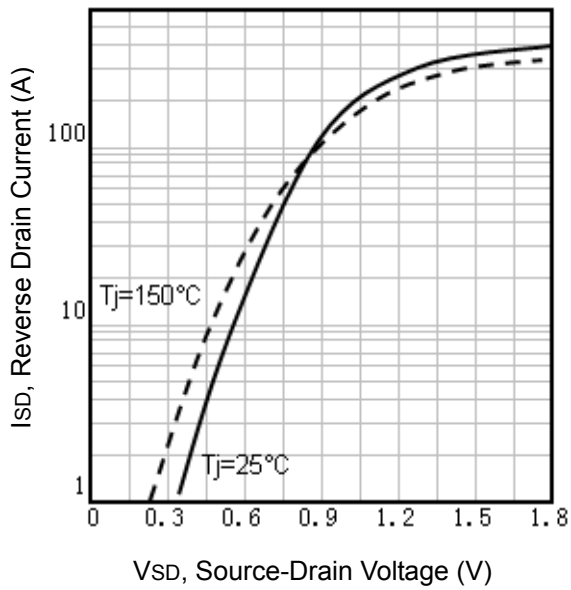


Fig7. Typical Source-Drain Diode Forward Voltage

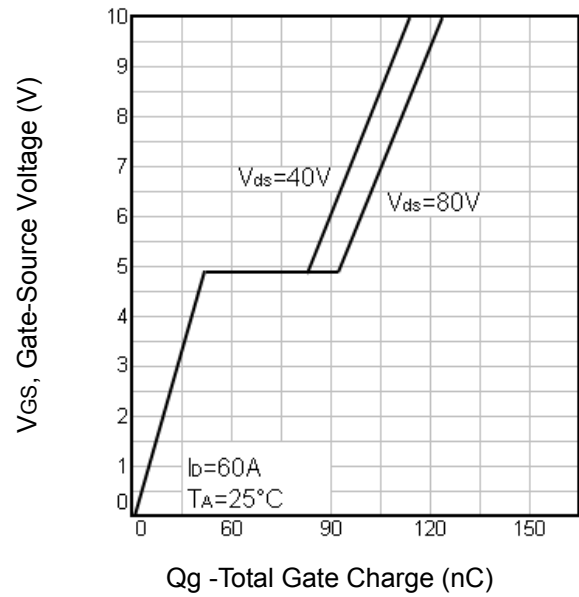


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

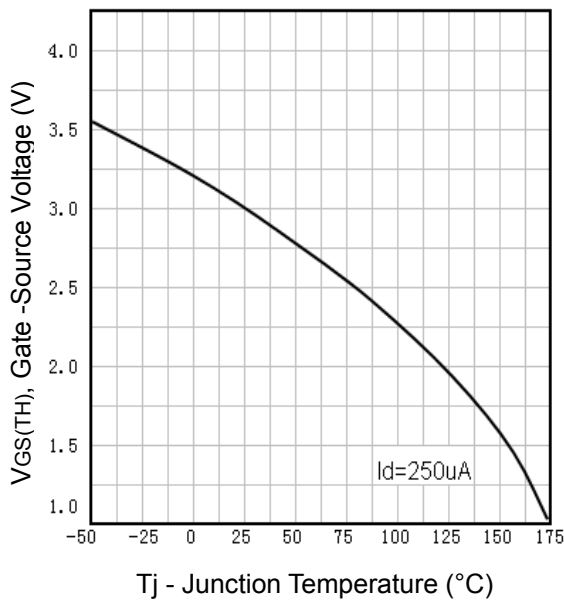


Fig9. Threshold Voltage Vs. Temperature

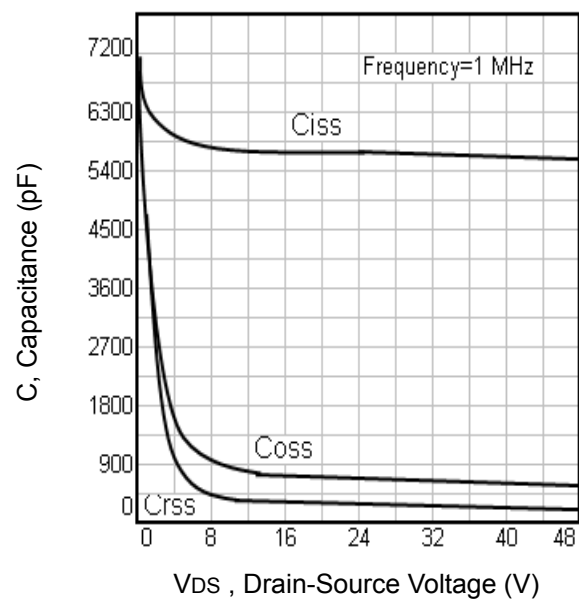


Fig10. Typical Capacitance Vs. Drain-Source Voltage

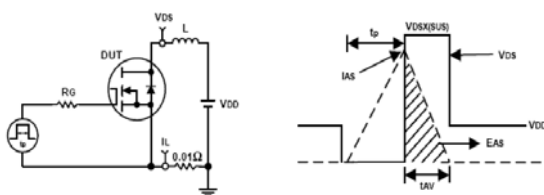


Fig11. Unclamped Inductive Test Circuit and waveforms

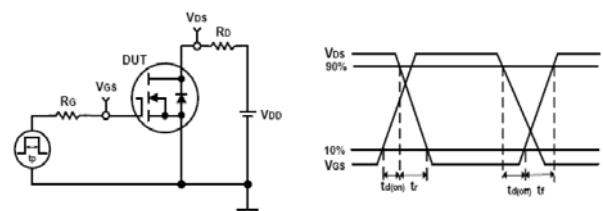
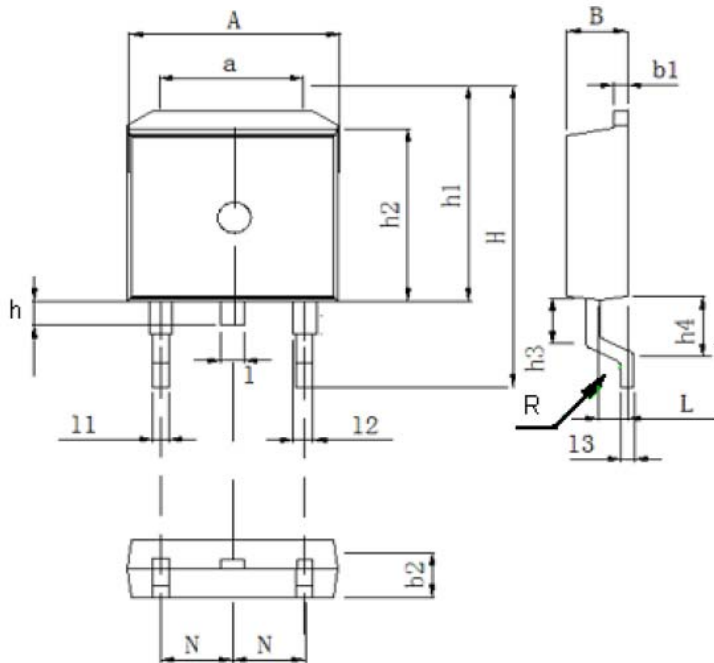


Fig12. Switching Time Test Circuit and waveforms

TO-263 Package Outline



DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.2
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
1	1.3±0.1
11	0.8±0.1
12	1.3±0.1
13	0.5±0.1
N	2.45

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS4410ATD	VS4410ATD	TO-263	800PCS/Reel	1600PCS

Customer Service

Sales and Service:

sales@vgsemi.com

Shen Zhen Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: www.vgsemi.com