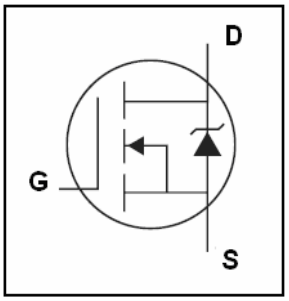
Features

- ♦ Ron(typ.)=25mΩ @VGS=10V
- ♦ Ron(typ.)=35mΩ @VGS=4.5V
- ♦ Low On-Resistance
- ♦ 150°C Operating Temperature
- ♦ Fast Switching
- ♦ Lead-Free, RoHS Compliant

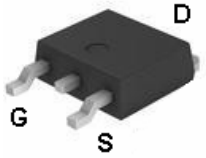


V_{DSS} =30V

$R_{DS(on)}$= 25mΩ@V_{GS}=10V

$R_{DS(on)}$= 35mΩ@V_{GS}=4.5V

I_D=19A



TO-252

Description

VS3019AD 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

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		30	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	19①	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	T_C=25°C	76①	A
I_D	Continuous Drain Current(VGS=10V)	T_C=25°C	19①	A
		T_C=70°C	12	
P_D	Maximum Power Dissipation	T_C=25°C	40	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		80	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ③		13	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	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current (Tc=25℃)	V_{DS}=24V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current (Tc=125℃)	V_{DS}=24V,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	0.5	0.9	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=9A	--	25	35	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=7A	--	35	45	mΩ
Dynamic Electrical Characteristics @ T_J = 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	V_{DD}=15V, I_D=2.8A, R_G=3.3Ω, V_{GS}=4.5V	--	7.0	--	nS
t_r	Turn-on Rise Time		--	13	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	32	--	nS
t_f	Turn-Off Fall Time		--	3.5	--	nS
Source- Drain Diode Characteristics						
I_{SD}	Source-drain current(Body Diode)	T_c=25℃	--	--	12①	A
V_{SD}	Forward on voltage	T_j=25℃,I_S=7A, V_{GS}=0V	--	0.8	1.3	V

Notes:

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

② Pulse width limited by maximum allowable junction temperature.

③ Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} = 7A, V_{GS} =10V. Part not recommended for use above this value

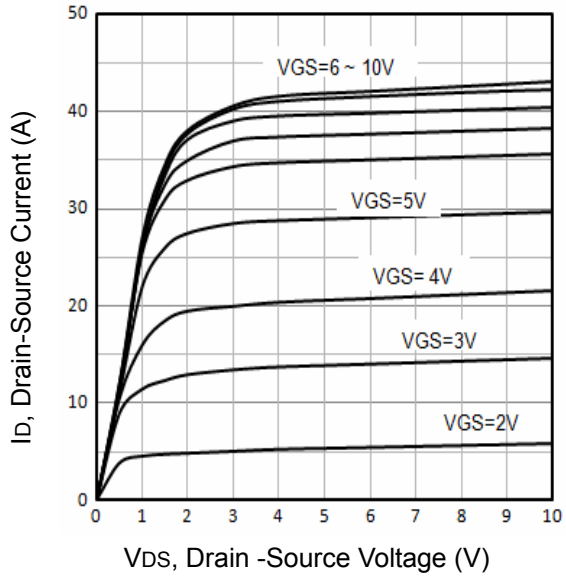


Fig1. Typical Output Characteristics

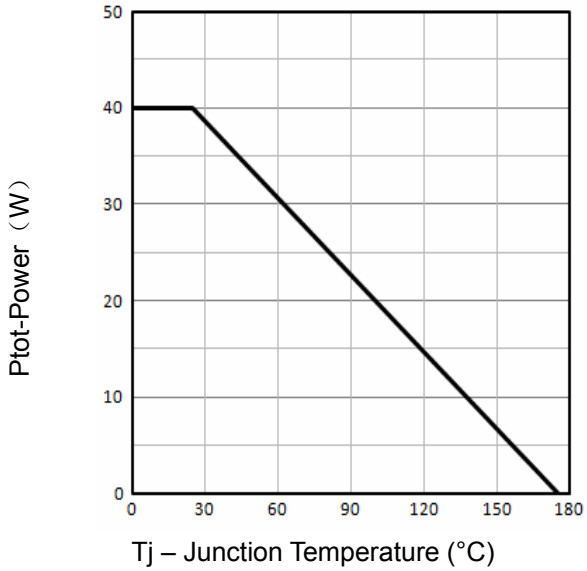


Fig2. Power Dissipation

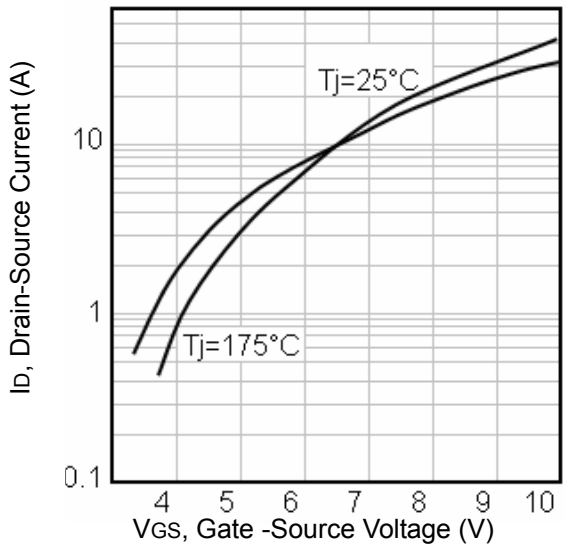


Fig3. Typical Transfer Characteristics

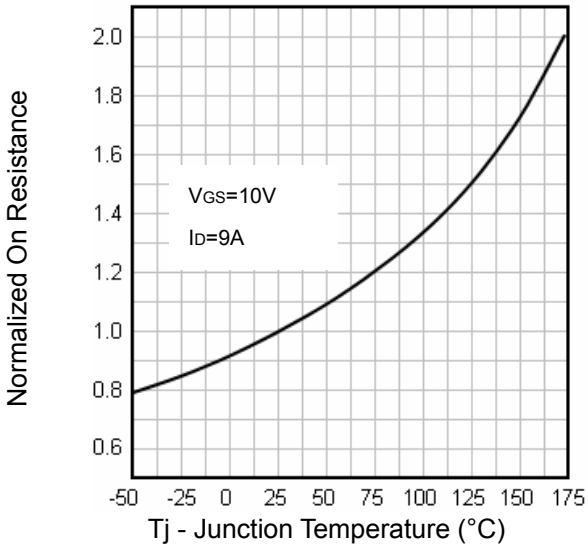


Fig4. Normalized On-Resistance Vs. Temperature

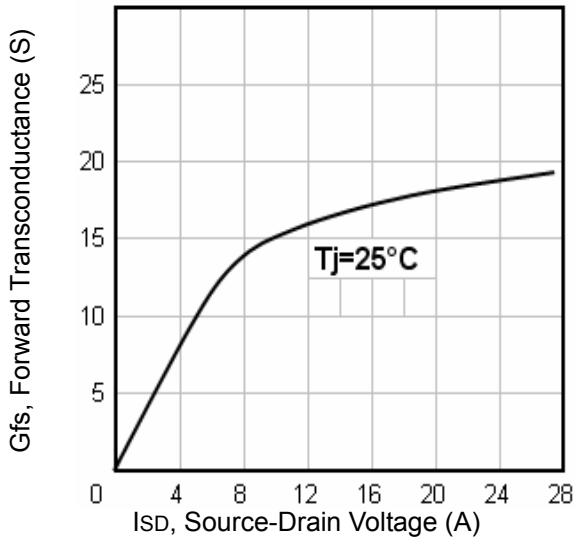


Fig5.Typical Forward Transconductance Vs. Drain Current

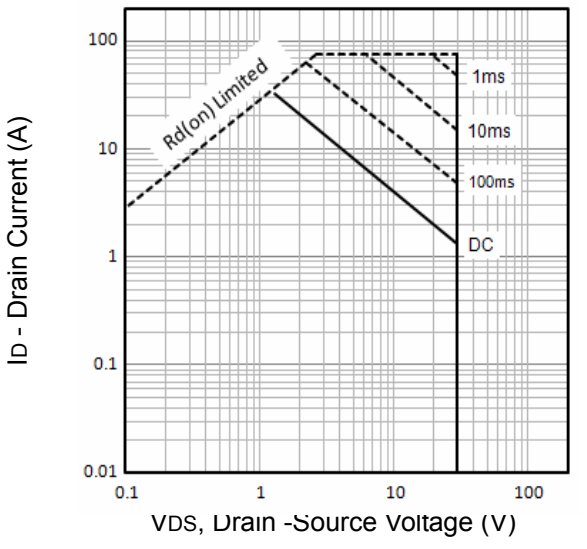


Fig6. Maximum Safe Operating Area

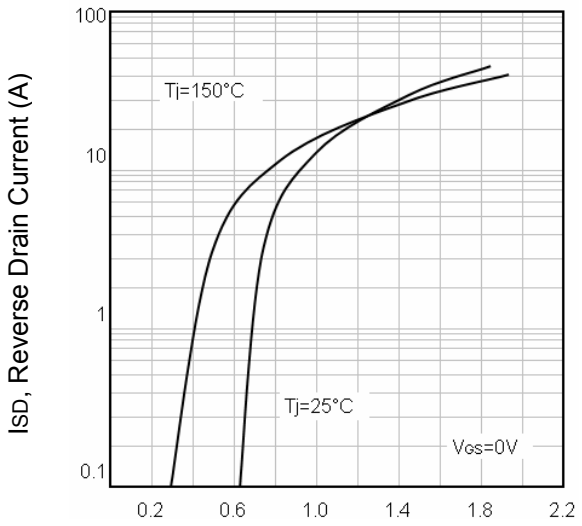


Fig7. Typical Source-Drain Diode Forward Voltage

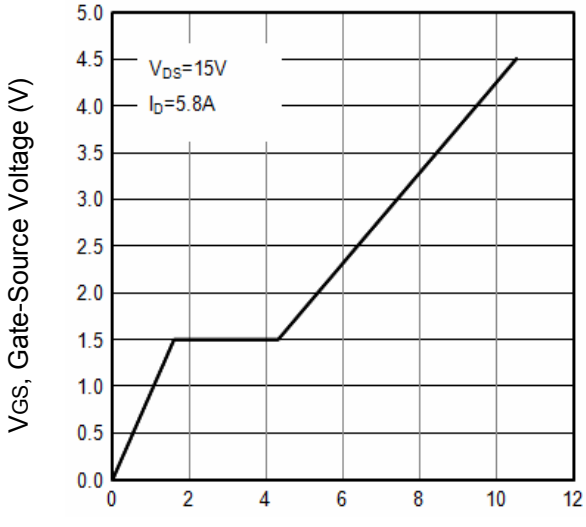


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

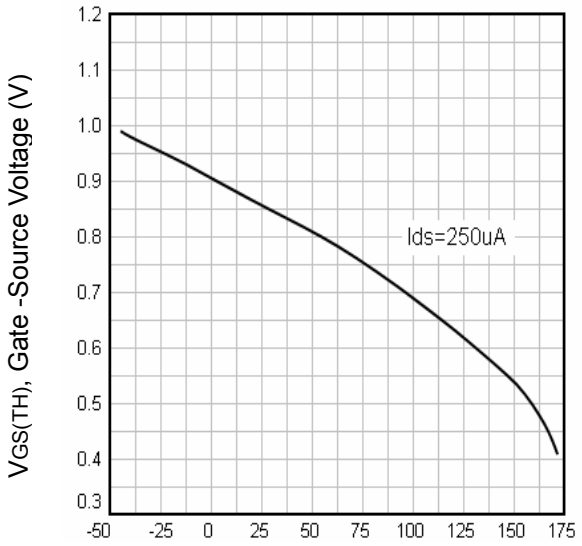


Fig9. Threshold Voltage Vs. Temperature

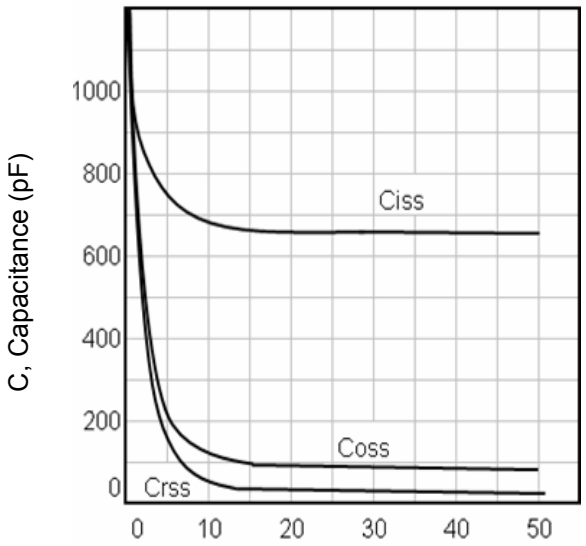


Fig10. Typical Capacitance Vs.Drain-Source Voltage

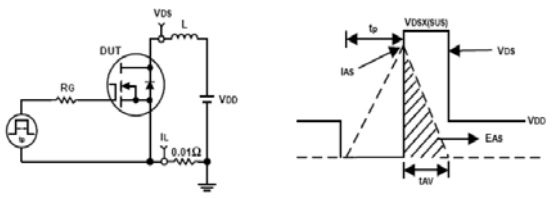


Fig11. Unclamped Inductive Test Circuit and waveforms

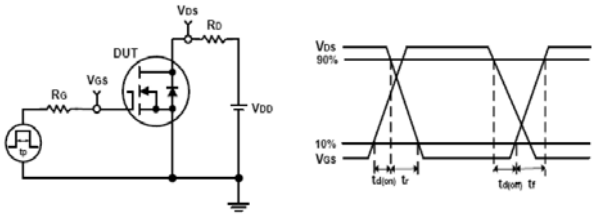
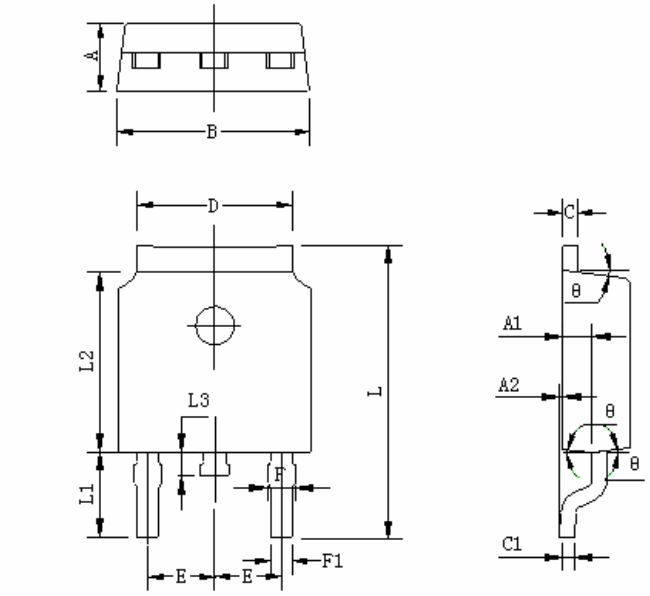


Fig12. Switching Time Test Circuit and waveforms

TO-252 Mechanical Data



Symbol	Dimensions In Millimeters		
	Min	Nom	Max
A	2.25	2.3	2.35
A1	0.96	1.01	1.06
A2	0.05	0.1	0.15
B	6.05	6.6	6.65
C	0.46	0.508	0.580
C1	0.508	0.508	0.508
D	5.31	5.32	5.33
E	2.186	2.286	2.386
F	0.075	0.085	0.095
F1	0.660	0.76	0.860
L	9.80	9.825	10.40
L1	2.9REF		
L2	6.05	6.1	6.15
L3	0.79	0.8	0.81
θ	7°	7°	7°

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS3019AD	VS3019AD	TO-252	2500/Reel	5000

Customer Service

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