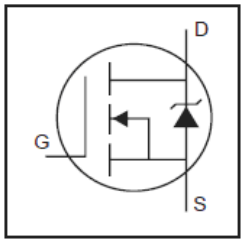
Features

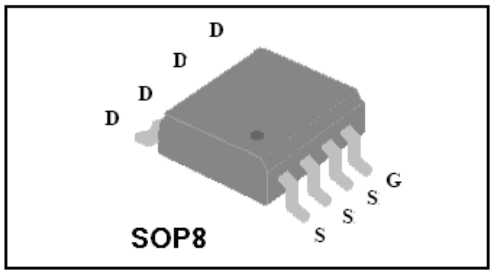
- ♦Low On-Resistance
- ♦Single NMOS，Logic Level 5V Opt.
- ♦Fast Switching
- ♦Repetitive Avalanche Allowed up to Tjmax
- ♦RoHS Compliant



V_{DSS} = 100V

$R_{DS(on)}$ = 32mΩ

I_D =6.8A



Description

VS1H12AS designed by the trench processing techniques to achieve extremely low on-resistance. ATditional 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 DC-DC Converters and Off-line UPS and a wide variety of other 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		175	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current(DC)	T_C=25°C	7	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested ①	T_C=25°C	60	A
I_D	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	7	A
		T_C=70°C	4.5	
P_D	Maximum Power Dissipation	T_C=25°C	3.1	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		72	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		36	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	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1	1.6	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=6A	--	32	36	mΩ
		V_{GS}=4.5V, I_D=5A	--	35	42	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, f=1MHz	--	2020	--	pF
C_{oss}	Output Capacitance		--	450	--	pF
C_{rss}	Reverse Transfer Capacitance		--	255	--	pF
Q_g	Total Gate Charge	V_{DS}=50V I_D=6A, V_{GS}=10V	--	50	--	nC
Q_{gs}	Gate-Source Charge		--	13	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V, I_D=1A, R_G=6.8Ω, V_{GS}=10V R_L=25Ω,	--	25	--	nS
t_r	Turn-on Rise Time		--	18.5	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	58	--	nS
t_f	Turn-Off Fall Time		--	75	--	nS
Source- Drain Diode Characteristics						
I_{SD}	Source-drain current(Body Diode)	T_C=25℃	--	--	7	A
V_{SD}	Forward on voltage	T_j=25℃,I_{SD}=6A,V_{GS}=0V	--	0.80	1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_s=6A, V_{GS}=0V di/dt=100A/μs	--	20	--	nS
Q_{rr}	Reverse Recovery Charge			32		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} = 12A, V_{GS} =10V.

Typical Characteristics

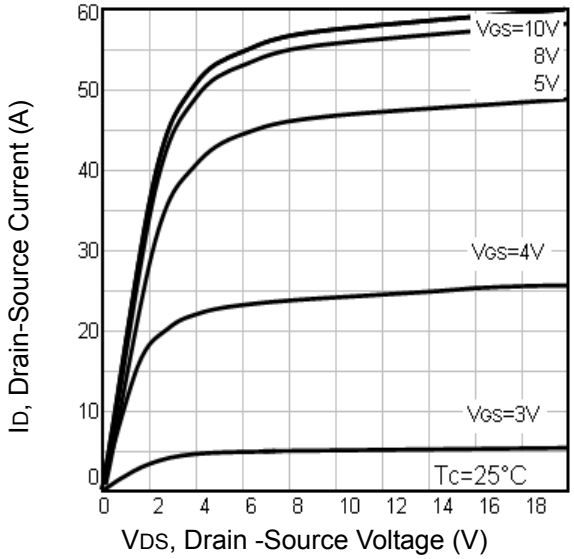


Fig1. Typical Output Characteristics

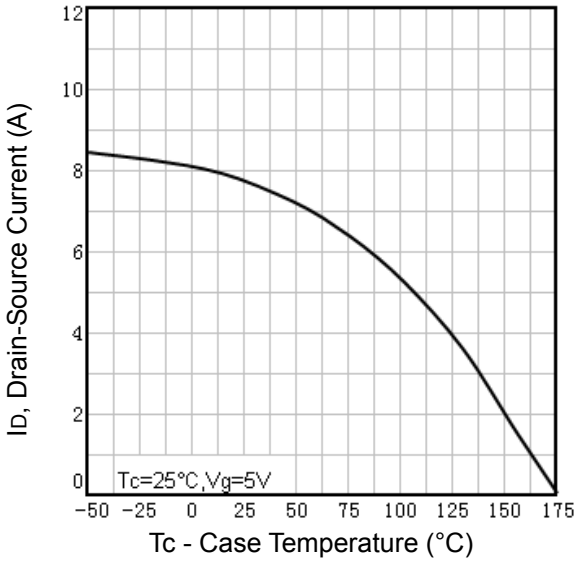


Fig2. Maximum Drain Current Vs.Case Temperature

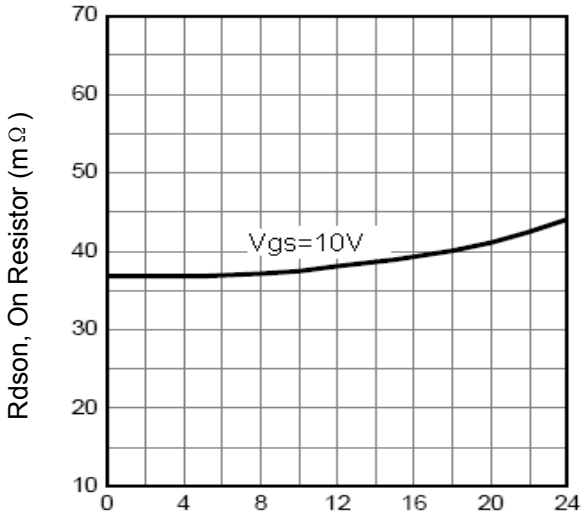


Fig3. Typical On Resistor Vs. Drain Current

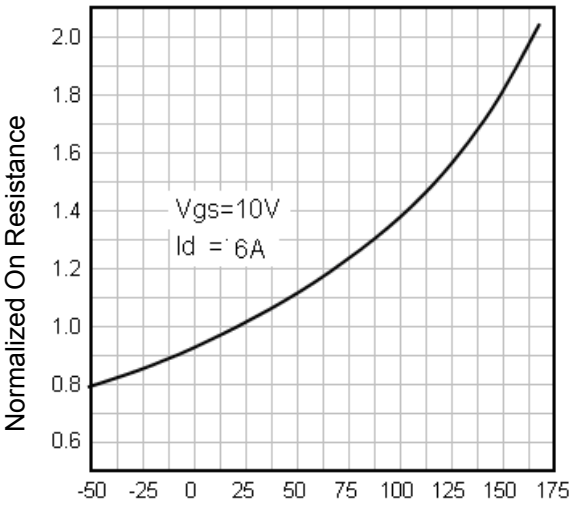


Fig4. Normalized On-Resistance Vs. Temperature

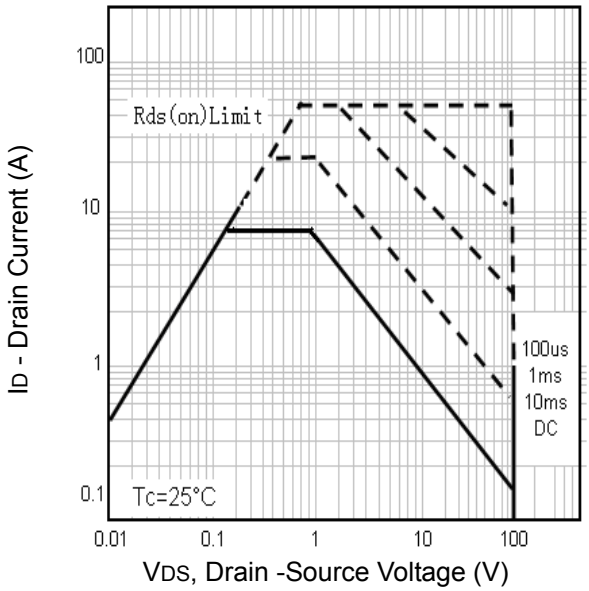


Fig5. Maximum Safe Operating Area

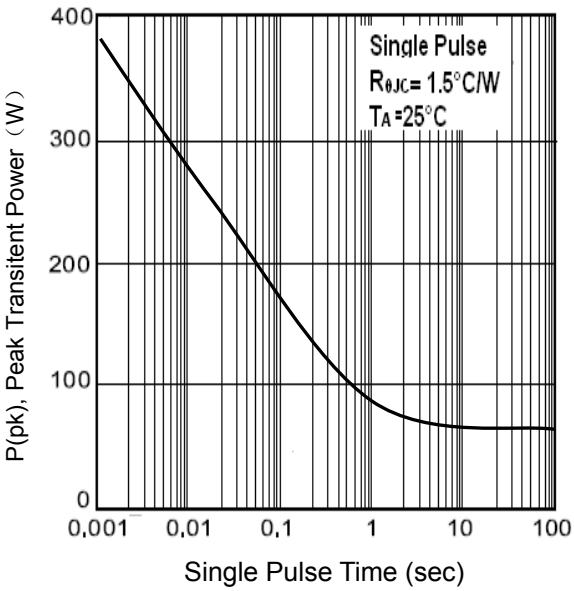


Fig6. Typical Transitent Power

Typical Characteristics

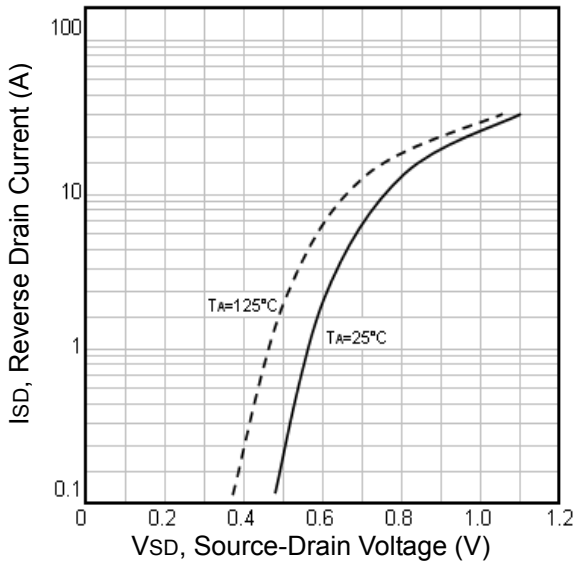


Fig7. Typical Source-Drain Diode Forward Voltage

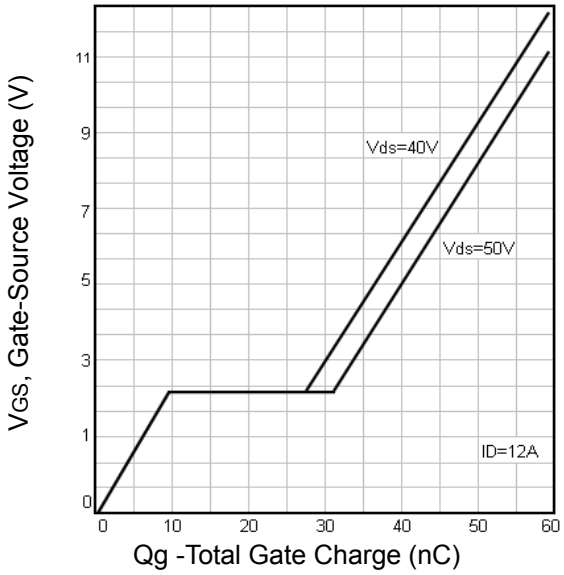


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

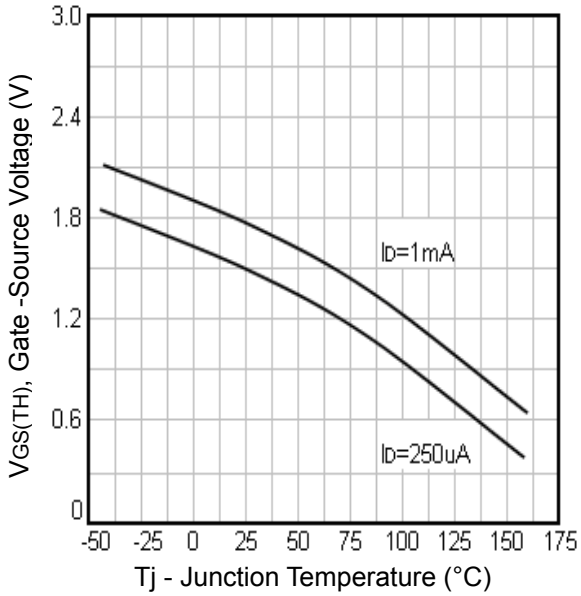


Fig9. Threshold Voltage Vs. Temperature

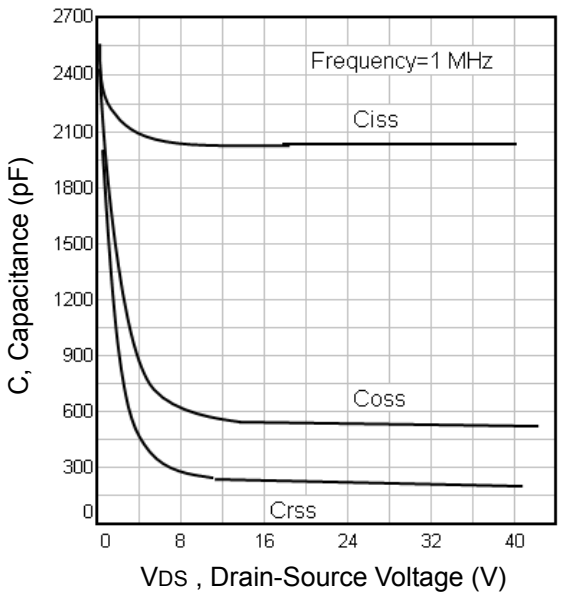


Fig10. Typical Capacitance Vs.Drain-Source Voltage

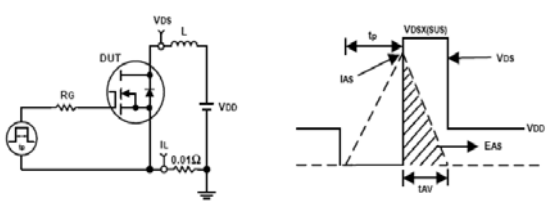


Fig11. Unclamped Inductive Test Circuit and waveforms

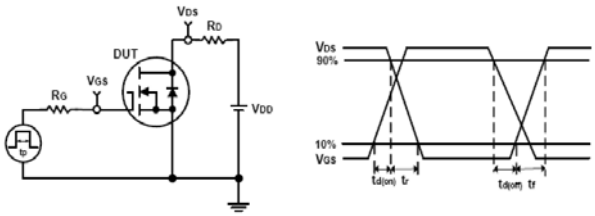
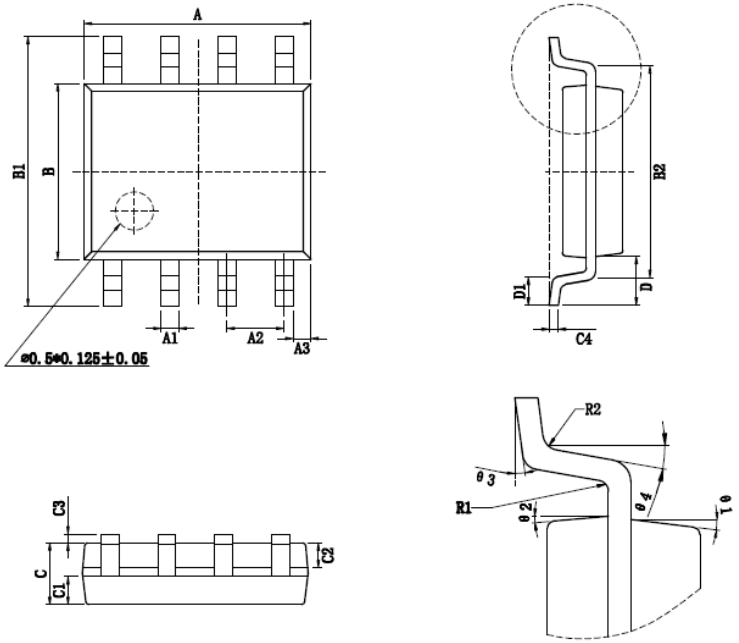


Fig12. Switching Time Test Circuit and waveforms

SOP8 Package Outline



Symbol	Dimensions In Millimeters		
	Min	Nom	Max
A	4.800	4.900	5.000
A1	0.356	0.406	0.456
A2	1.270Typ.		
A3	0.345Typ.		
B	3.800	3.900	4.000
B1	5.800	6.000	6.200
B2	5.00Typ.		
C	1.300	1.400	1.500
C1	0.550	0.600	0.650
C2	0.550	0.600	0.650
C3	0.050	--	0.200
C4	0.203Typ.		
D	1.050Typ.		
D1	0.400	0.500	0.600
R1	0.200Typ.		
R2	0.200Typ.		
Θ1	17°Typ.		
Θ2	13°Typ.		
Θ3	0°~ 8°Typ.		
Θ4	4°~ 12°Typ.		

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS1H12AS	VS1H12AS	SOP8	3000PCS/Reel	6000PCS

Customer Service

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