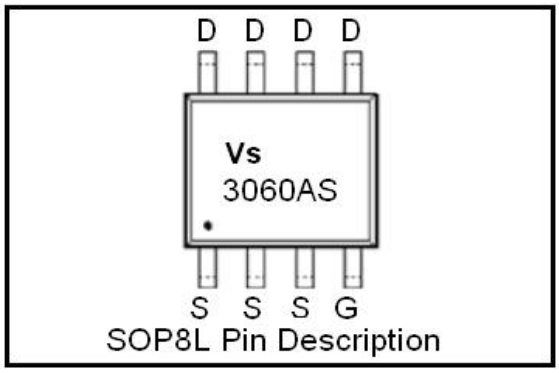
Features

♦Low On-Resistance
♦Fast Switching
♦ Repetitive Avalanche Allowed up to Tjmax ♦Lead-Free, RoHS Compliant
♦Green Product

V_{DS}	30	V
$R_{DS(on),Typ}$	9.0	mΩ
I_D	20	A



SOP8L Pin Description

Description

VS3060AS 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 Motor applications 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 (T_C=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		30	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	20	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested (Sillicon Limit)	T_C=25°C	80	A
I_D	Continuous Drain current@V_{GS}=10V (See Fig2)	T_C=25°C	20	A
P_D	Maximum Power Dissipation	T_C=25°C	20	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		3.0	°C/W

Electrical Characteristics

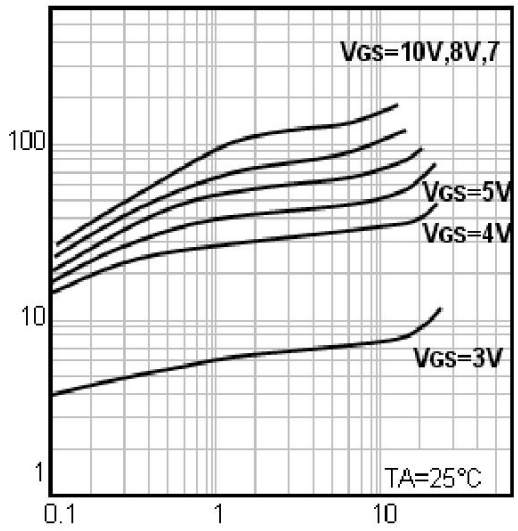
Symbol	Parameter		Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		V_{GS}=0V I_D=250μA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)		V_{DS}=24V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)		V_{DS}=24V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current		V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage		V_{DS}=V_{GS},I_D=250μA	1.0	1.8	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance①		V_{GS}=10V, I_D=12A	--	9.0	11	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance①		V_{GS}=5V, I_D=8A	--	12	15	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)							
C_{iss}	Input Capacitance		V_{DS}=15V,V_{GS}=0V, f=1MHz	--	1550	--	pF
C_{oss}	Output Capacitance			--	190	--	pF
C_{rss}	Reverse Transfer Capacitance			--	135	--	pF
Q_g	Total Gate Charge	V_{GS}=10V	V_{DS}=15V,I_D=20A, V_{GS}=10V	--	32	--	nC
		V_{GS}=4.5V			15.5		nC
Q_{gs}	Gate-Source Charge			--	3.5	--	nC
Q_{gd}	Gate-Drain Charge			--	6.8	--	nC
Switching Characteristics							
$t_{d(on)}$	Turn-on Delay Time		V_{DD}=15V, I_D=10A, R_G=6.8Ω, V_{GS}=10V	--	10.5	--	nS
t_r	Turn-on Rise Time			--	13	--	nS
$t_{d(off)}$	Turn-Off Delay Time			--	12	--	nS
t_f	Turn-Off Fall Time			--	10	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)							
I_{SD}	Source-drain current(Body Diode)		T_C=25℃	--	--	60	A
V_{SD}	Forward on voltage		I_{SD}=30A,V_{GS}=0V	--	--	1.3	V
t_{rr}	Reverse Recovery Time		T_j=25℃,I_{sd}=10A, V_{GS}=0V di/dt=100A/μs	--	18	--	nS
Q_{rr}	Reverse Recovery Charge				10	--	nC

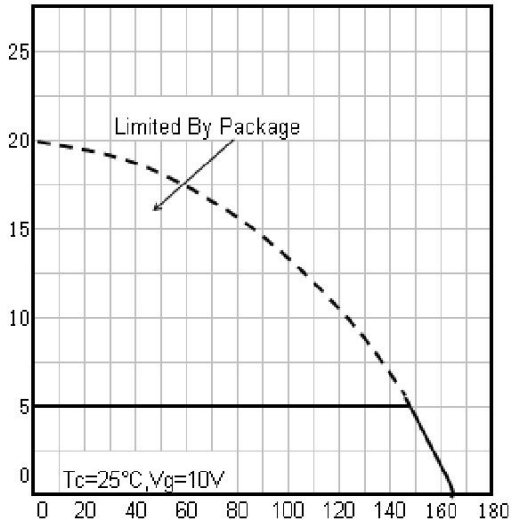
NOTE:

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

② Repetitive rating; pulse width limited by max. junction temperature.

Typical Characteristics

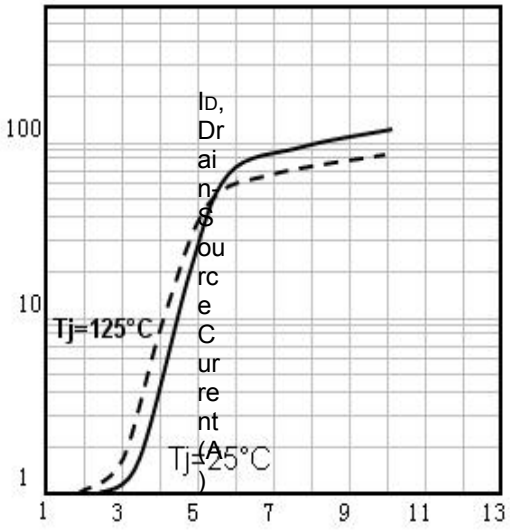




I_D, Drain-Source Current (A)

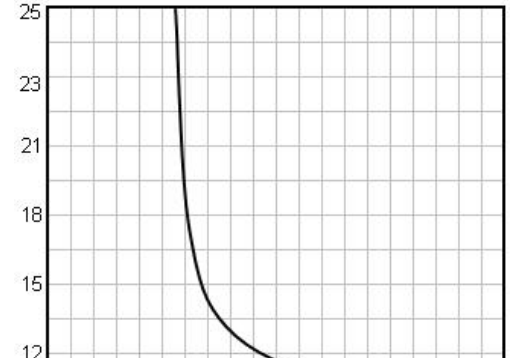
V_{DS}, Drain -Source Voltage (V)

Fig1. Typical Output Characteristics



V_{GS}, Gate -Source Voltage (V)

Fig3. Typical Transfer Characteristics



On Resistance (mΩ)

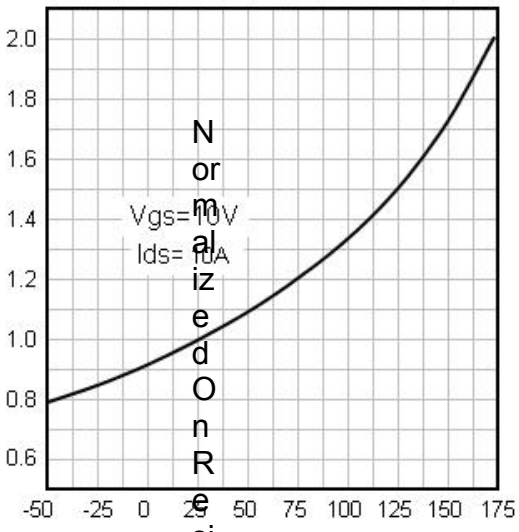
V_{GS}, Gate -Source Voltage (V)

Fig5. On Resistance Vs. Gate -Source Voltage

I_D, Drain-Source Current (A)

Tc - Case Temperature (°C)

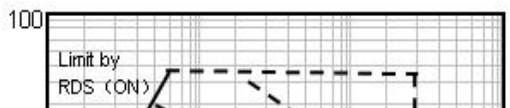
Fig2. Maximum Drain Current Vs.Case Temperature



Normalized On Resistance

Tj - Junction Temperature (°C)

Fig4. Normalized On-Resistance Vs. Temperature



I_D - Drain Current (A)

V_{DS}, Drain -Source Voltage (V) Fig6. Maximum Safe Operating Area

Typical Characteristics

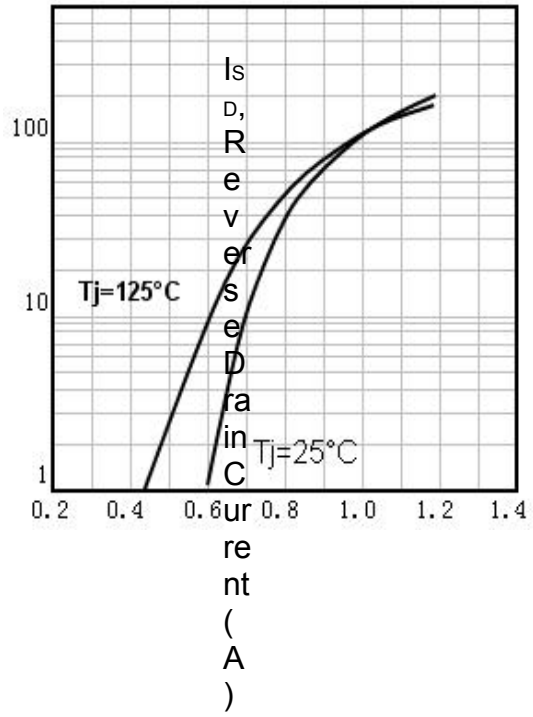


Fig7. Typical Source-Drain Diode Forward Voltage

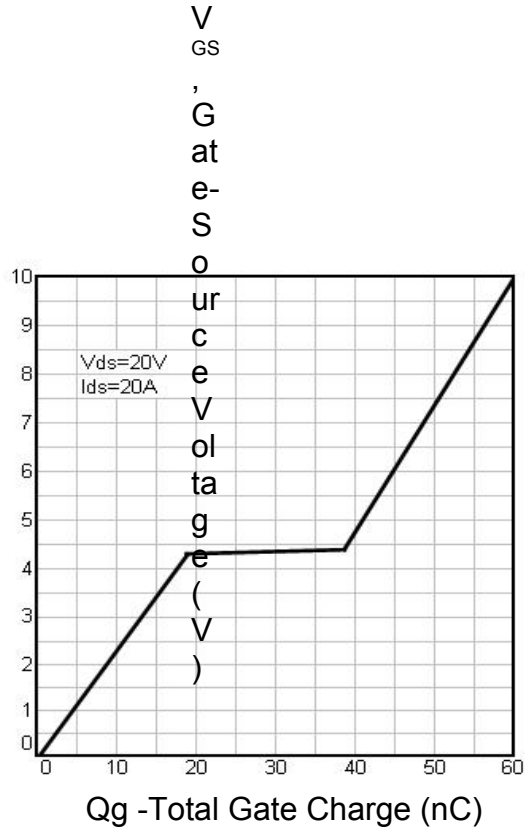
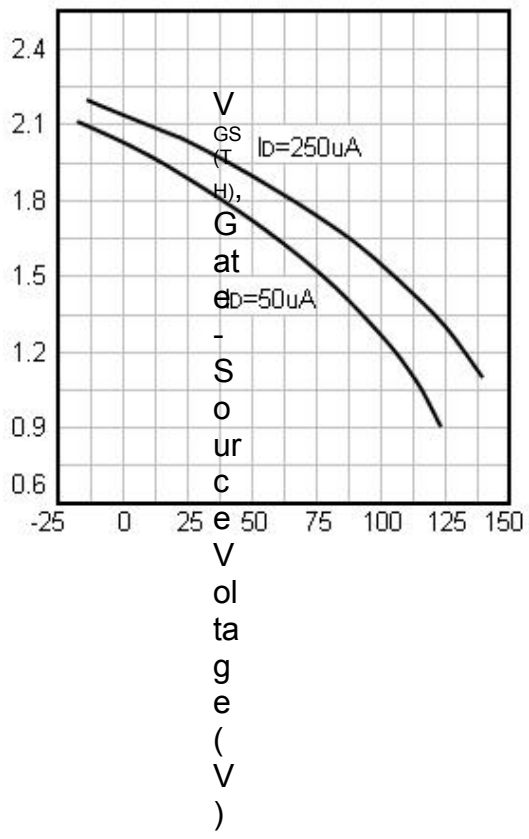
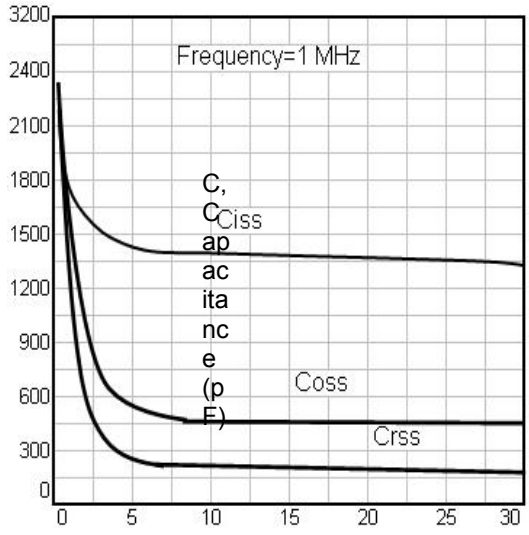


Fig8. Typical Gate Charge Vs.Gate-Source Voltage





Tj - Junction Temperature (°C)

Fig9. Threshold Voltage Vs. Temperature

V_{DS} , Drain-Source Voltage (V)

Fig10. Typical Capacitance Vs.Drain-Source Voltage

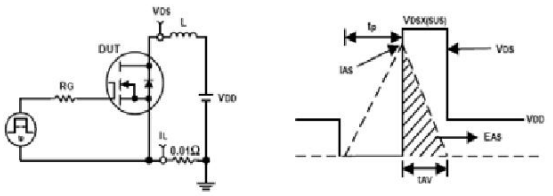


Fig11. Unclamped Inductive Test Circuit and waveforms

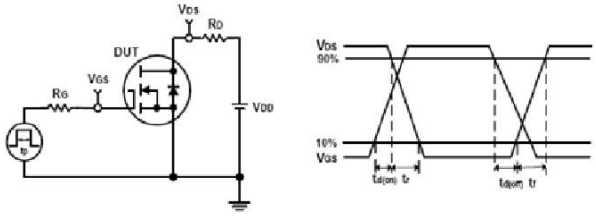
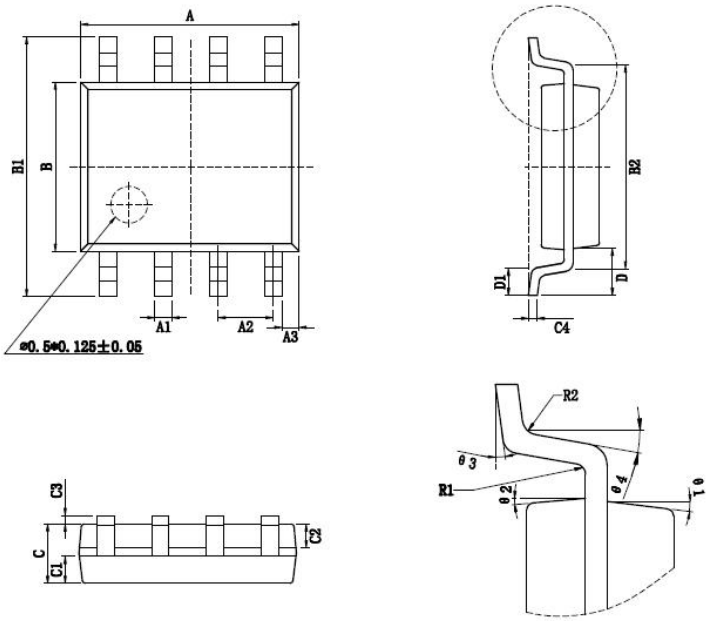


Fig12. Switching Time Test Circuit and waveforms

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
VS3060AS	VS3060AS	SOP8	3000PCS/Reel	6000PCS
VS3060AS	VS3060AS	SOP8	100PCS/Tube	2000PCS

Customer Service

Sales and Service:
sales@vgsemi.com
Shen Zhen Vangaurd Semiconductor CO.,
WEB: www.vgsemi.com