P-Channel Fast Switching MOSFETs

Features

- Advanced high cell density trench technology
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed

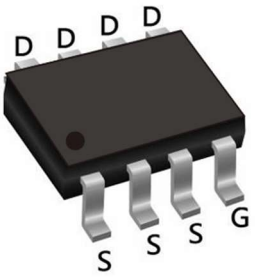
Product Summary

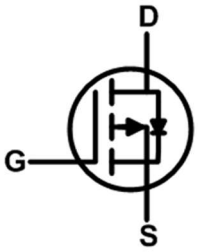
BVDSS	RDSON	ID
-30V	42mΩ	-5.5A

Description

- The ShS3101 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.
- The ShS3101 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOP-8 PIN Configuration





Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current (T_A=25 °C)	I_D	-5.5	A
Continuous drain current (T_A=70 °C)	I_D	-4.5	A
Pulsed Drain Current [2]	I_{DM}	-25	A
Avalanche Current	I_{AS}	-19	A
Single Pulse Avalanche Energy [3]	E_{AS}	18.1	mJ
Power Dissipation (T_A=25 °C)	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case[1]	$R_{\theta JC}$	25	℃/W
Thermal Resistance from Junction to Ambient [1]	$R_{\theta JA}$	85	℃/W

Note: 1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3.The EAS data shows Max. rating. The test condition is VDD=-25V, VGS=-10V, L=0.1mH, IAS=-19A.

Characteristics at T_J = 25℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D=-250μA, V_{GS}=0V	BV_{DSS}	-30			V
Drain-Source Leakage Current at V_{DS}=-24V, V_{GS}=0V	I_{DSS}			1	uA
Gate Leakage Current at V_{GS}=±20V, V_{DS}=0V	I_{GSS}			±100	nA
Gate-Source Threshold Voltage at V_{DS}=V_{GS}, I_D=-250μA	$V_{GS(th)}$	-1.2		-2.5	V
Drain-Source On-State Resistance at V_{GS}=-10V, I_D=-4A at V_{GS}=-4.5V, I_D=-3A	$R_{DS(on)}$		39 61	42 78	mΩ
DYNAMIC PARAMETERS					
Forward Transconductance at V_{DS}=-5V, I_D=-4A	g_{fs}		11		S
Input Capacitance at V_{DS}=-15V, V_{GS}=0V, f=1MHz	C_{iss}		585		pF
Output Capacitance at V_{DS}=-15V, V_{GS}=0V, f=1MHz	C_{oss}		100		pF
Reverse Transfer Capacitance at V_{DS}=-15V, V_{GS}=0V, f=1MHz	C_{rss}		85		pF
Gate charge total at V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V	Q_g		6.4		nC
Gate to Source Charge at V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V	Q_{gs}		2.3		nC
Gate to Drain Charge at V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V	Q_{gd}		2		nC
Turn-On Delay Time at V_{DD}=-15V, I_D=-4A, R_g=3.3Ω, V_{GS}=-10V	$t_{d(on)}$		2.8		nS
Turn-On Rise Time at V_{DD}=-15V, I_D=-4A, R_g=3.3Ω, V_{GS}=-10V	t_r		8.4		nS
Turn-Off Delay Time at V_{DD}=-15V, I_D=-4A, R_g=3.3Ω, V_{GS}=-10V	$t_{d(off)}$		39		nS
Turn-Off Fall Time at V_{DD}=-15V, I_D=-4A, R_g=3.3Ω, V_{GS}=-10V	t_f		6		nS
Diode PARAMETERS					
Diode Forward Voltage at I_S=-1A, V_{GS}=0V	V_{SD}			-1.2	V
Continuous Source Current V_D=V_G=0, Force Current	I_S			-4.9	A
Reverse Recovery Time at I_F=-4A, di/dt=100A/μs	trr		7.8		nS
Reverse Recovery Charge at I_F=-4A, di/dt=100A/μs	Qrr		2.5		nC

Electrical Characteristics Curves

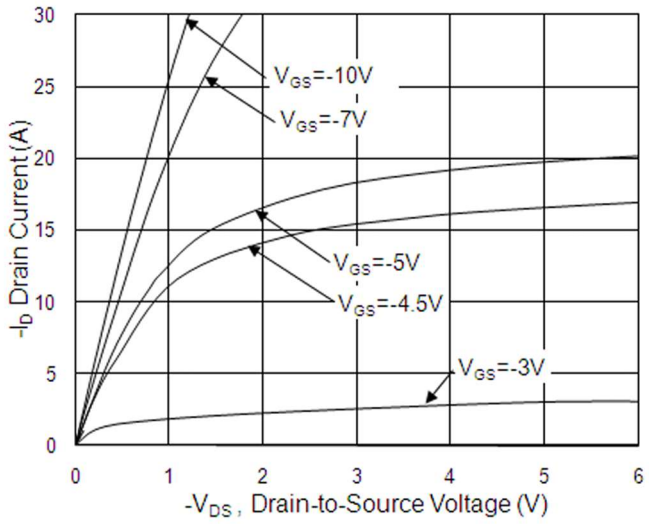


Fig.1 Typical Output Characteristics

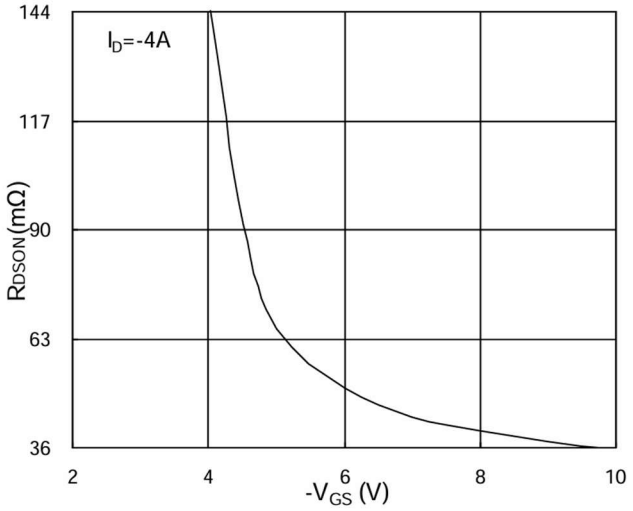


Fig.2 On-Resistance vs. G-S Voltage

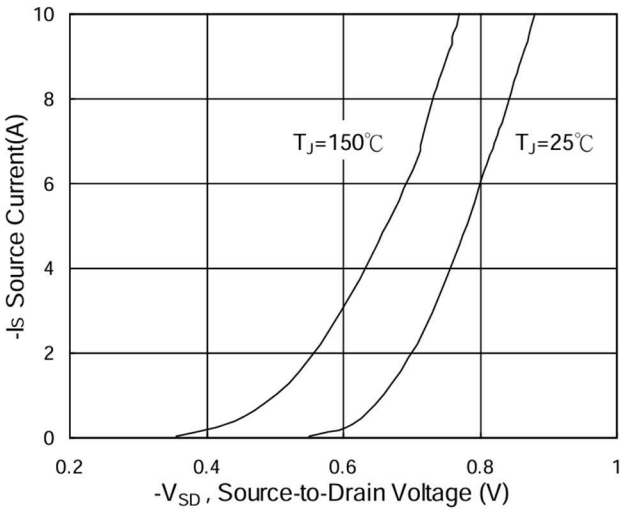


Fig.3 Source Drain Forward Characteristics

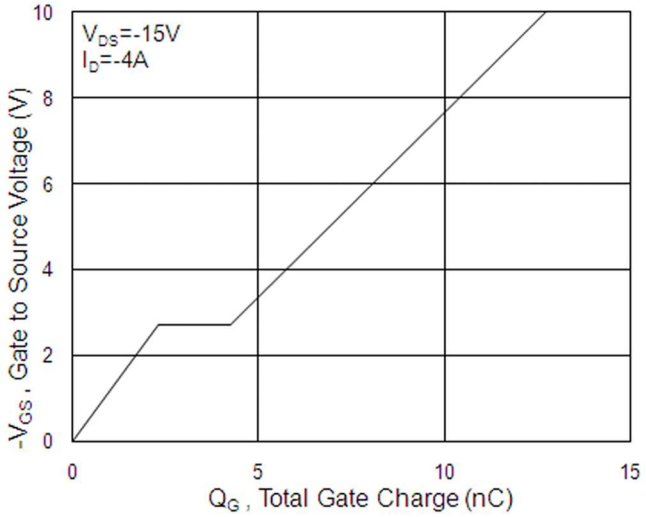


Fig.4 Gate-Charge Characteristics

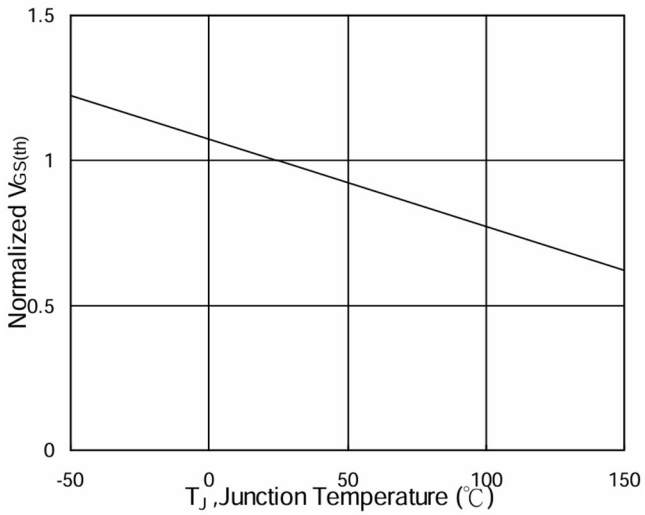


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

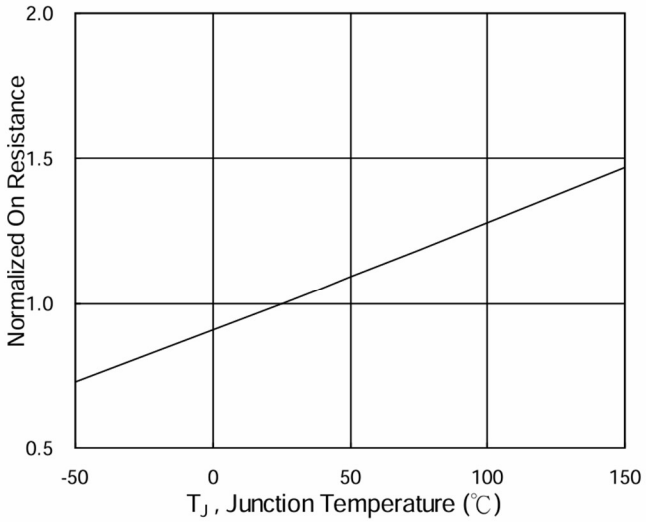


Fig.6 Normalized R_{DSON} vs. T_J

Electrical Characteristics Curves

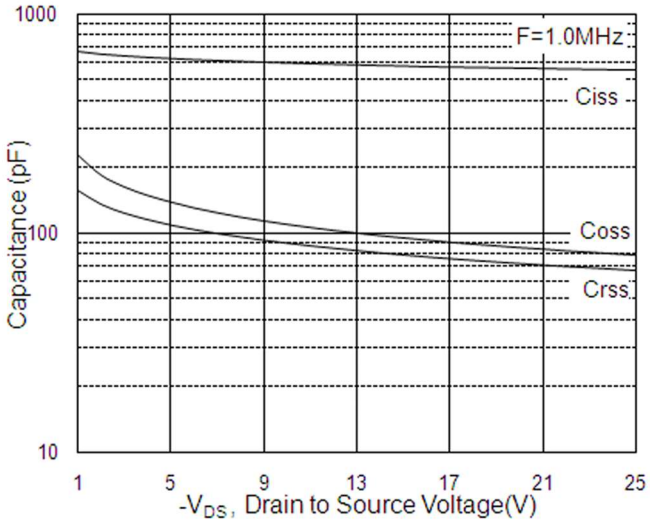


Fig.7 Capacitance

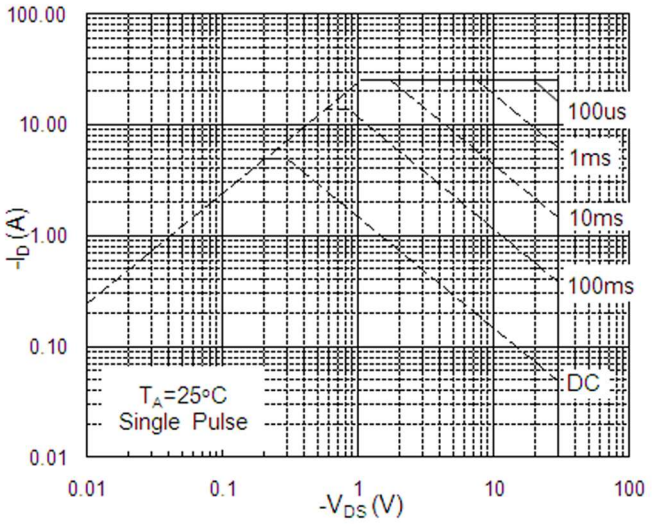


Fig.8 Safe Operating Area

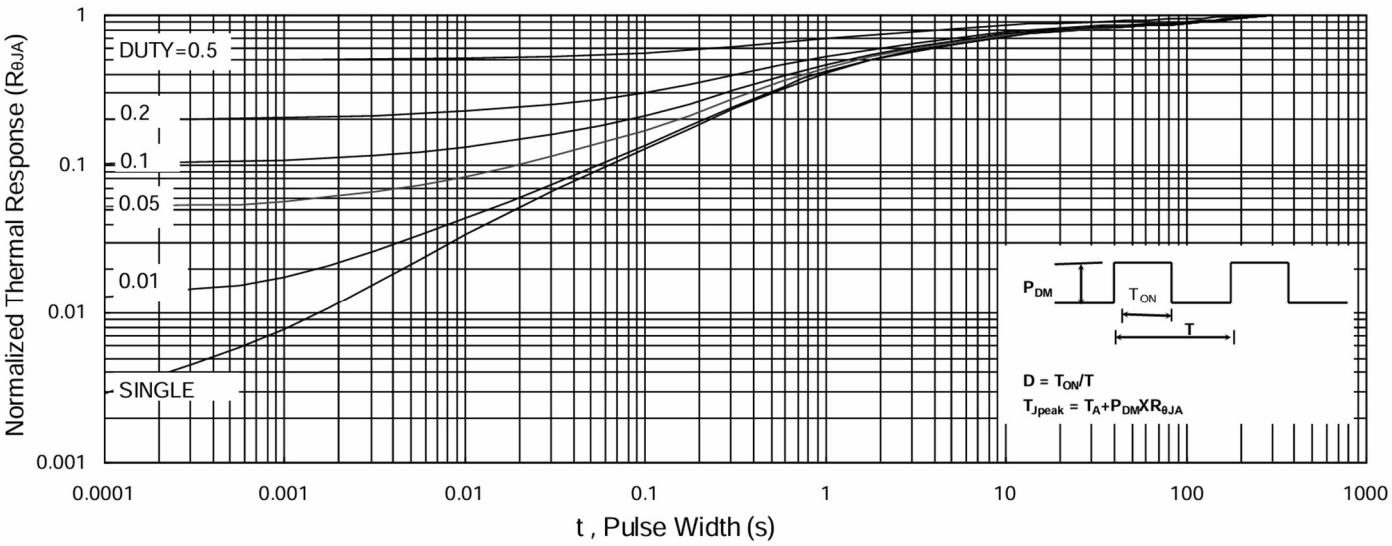


Fig.9 Normalized Maximum Transient Thermal Impedance

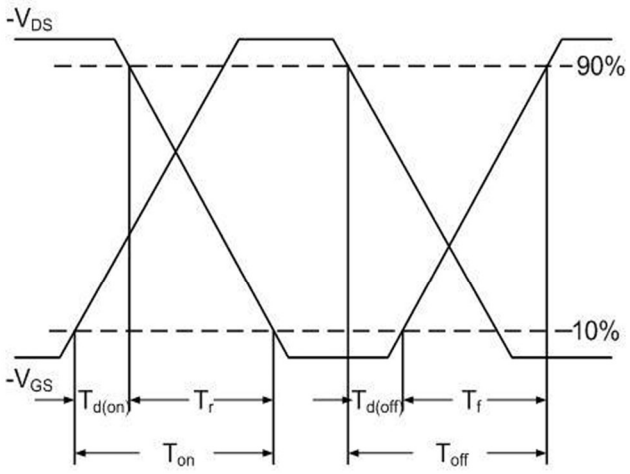


Fig.10 Switching Time Waveform

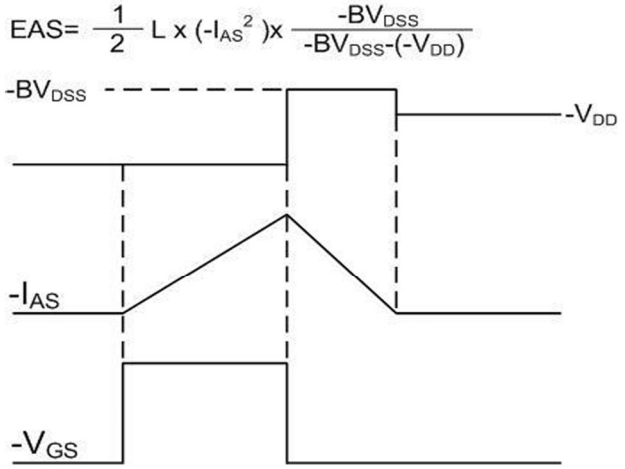
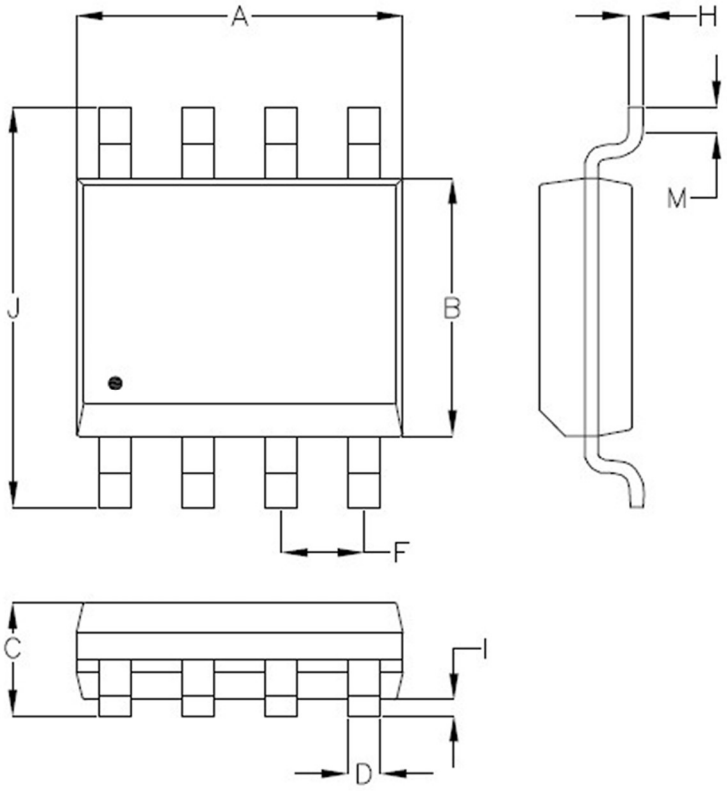


Fig.11 Unclamped Inductive Switching Waveform

Package Outline Dimensions (Units: mm) SOP-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.700	5.150	0.185	0.203
B	3.700	4.100	0.146	0.161
C	1.23	1.753	0.048	0.069
D	0.310	0.510	0.012	0.020
F	1.070	1.470	0.042	0.058
H	0.160	0.254	0.006	0.010
I	0.050	0.254	0.002	0.010
J	5.750	6.250	0.226	0.246
M	0.400	1.270	0.016	0.050

Order Information

Part Number	Package	Marking	Quantity
ShS3101	SOP-8	S3101	2500