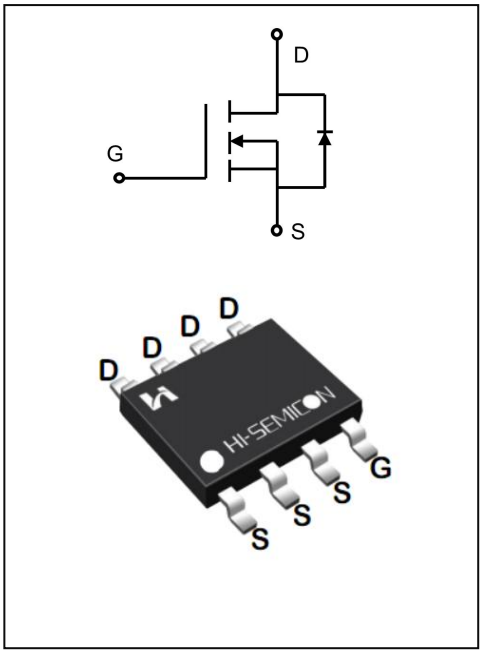
30V,10A N-CHANNEL POWER MOSFET



GENERAL DESCRIPTION

The SFS3001T uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.
It can be used in a wide variety applications.

Features

- ◆V_{DS}=30V,I_D=10A
- ◆$R_{DS(on)}$
  - TYP: 9.0mΩ@V_{GS}=10V
  - TYP: 14mΩ@V_{GS}=4.5V

Applications

- ◆Power faction correction (PFC)
- ◆Switched mode power supplies (SMPS)
- ◆Uninterruptible power supply (UPS)
- ◆LED lighting power

ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFS3001T	SOP8-8L	SFS3001T	Pb Free	Reel

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_C = 25°C	I_D	10	A
	T_C = 100°C		6	
Drain Current Pulsed(Note 1)		I_{DM}	40	A
Power Dissipation(T_C=25°C)		P_D	2.5	W
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	56.25	mJ
Operation Junction Temperature Range		T_J	-55～+150	°C
Storage Temperature Range		T_{stg}	-55～+150	°C
Maximum lead temperature for soldering purposes,1/8" from case for 5 seconds		TL	300	℃

THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	86	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V I_D=250μA	30	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V V_{GS}=0V	--	--	1	A
Gate-Source Leakage Current	I_{GSS}	V_{GS}=20V V_{DS}=0V	--	--	100	nA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=-20V V_{DS}=0V	--	--	-100	
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS} I_D=250μA	1.0	1.6	2.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=10A	--	9.0	12.5	mΩ
		V_{GS}=4.5V I_D=5.0A	--	14	18	
Dynamic Characteristics						
Gate Resistance	Rg	V_{GS}=0V f=1.0MHZ	--	2.8	--	Ω
Input Capacitance	C_{iss}	V_{DS}=15V V_{GS}=0V f=1.0MHZ	--	1250	--	pF
Output Capacitance	C_{oss}		--	297	--	
Reverse Transfer Capacitance	C_{rss}		--	178	--	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=25V V_{GS}=10V R_G=6Ω I_D=1A (Note 3.4)	--	30.5	--	ns
Turn-on Rise Time	t_r		--	20.6	--	
Turn-off Delay Time	$t_{d(off)}$		--	101.7	--	
Turn-off Fall Time	t_f		--	79.6	--	

Total Gate Charge	Q_g	V_{DS}=15V I_D=10A	--	13.5	--	nc
Gate-Source Charge	Q_{gs}	V_{GS}=5V	--	5.8	--	
Gate-Drain Charge	Q_{gd}	(Note 3.4)	--	3.6	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	10	A
Pulsed Source Current	I_{SM}		--	--	40	
Diode Forward Voltage	V_{SD}	I_S=12A V_{GS}=0V	--	--	1.4	V

1.Pluse width limited by maximum junction temperature

2.L=0.5mH, V_{DD}=15V, V_G=10V, R_G=25Ω, starting T_J=25°C

3.Pulse Test: Pulse width ≤300μs, Duty cycle≤2%

4.Essentially independent of operating temperature

Typical Electrical and Thermal Characteristics (Curves)

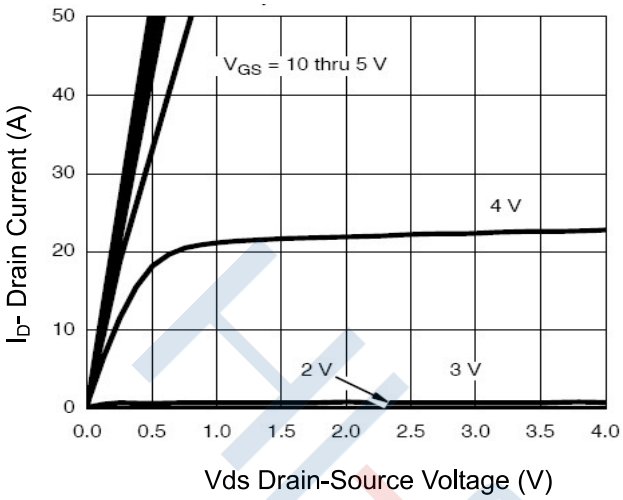


Figure 1 Output Characteristics

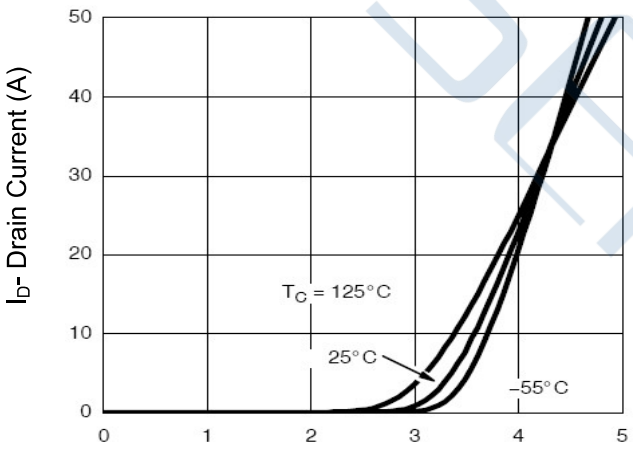


Figure 2 Transfer Characteristics

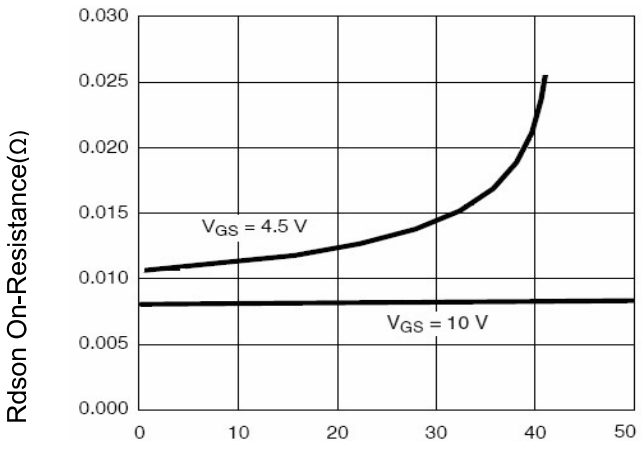


Figure 3 Rdson- Drain Current

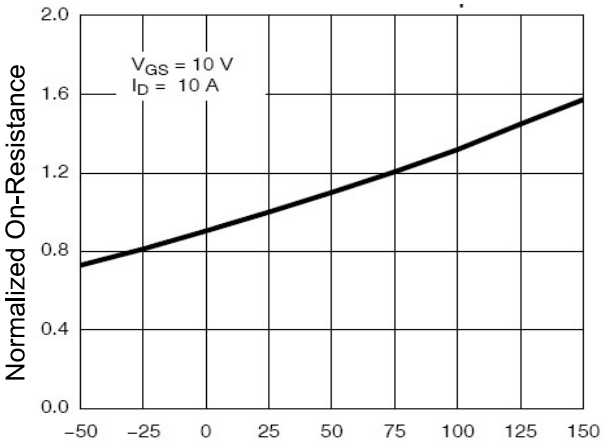


Figure 4 Rdson-JunctionTemperature

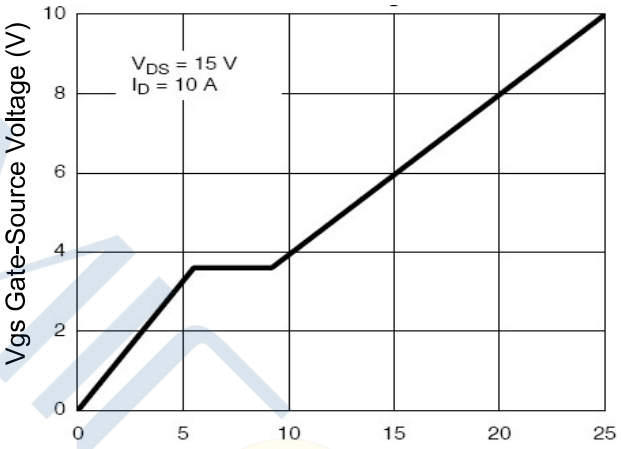


Figure 5 Gate Charge

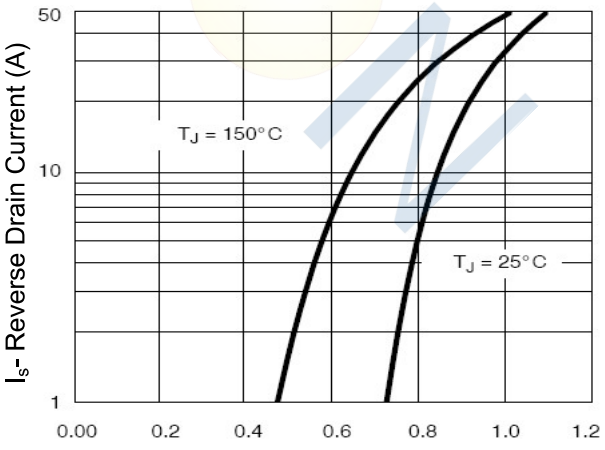


Figure 6 Source- Drain Diode Forward

Typical Performance Characteristics

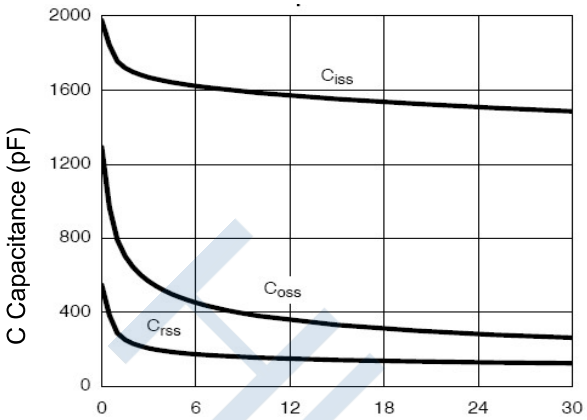


Figure 7 Capacitance vs Vds

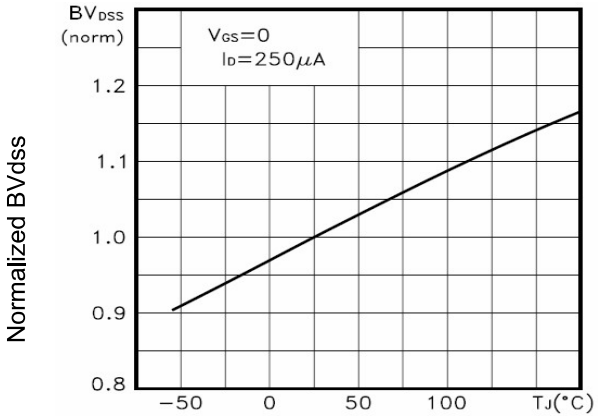


Figure 9 BV_{DSS} vs Junction Temperature

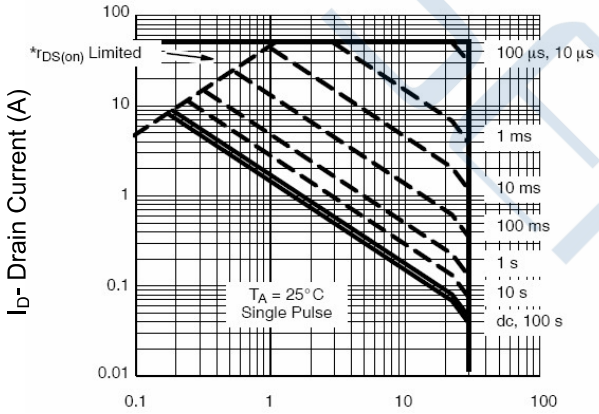


Figure 8 Safe Operation Area

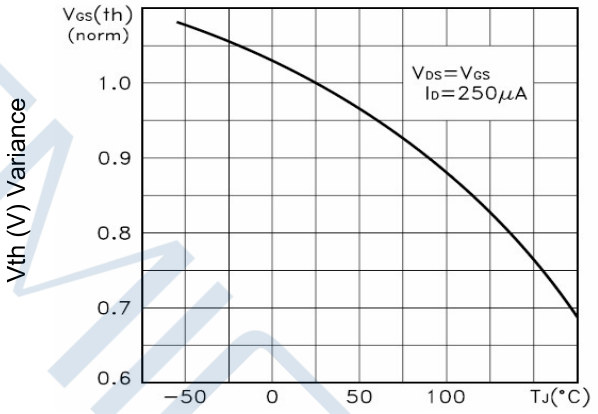
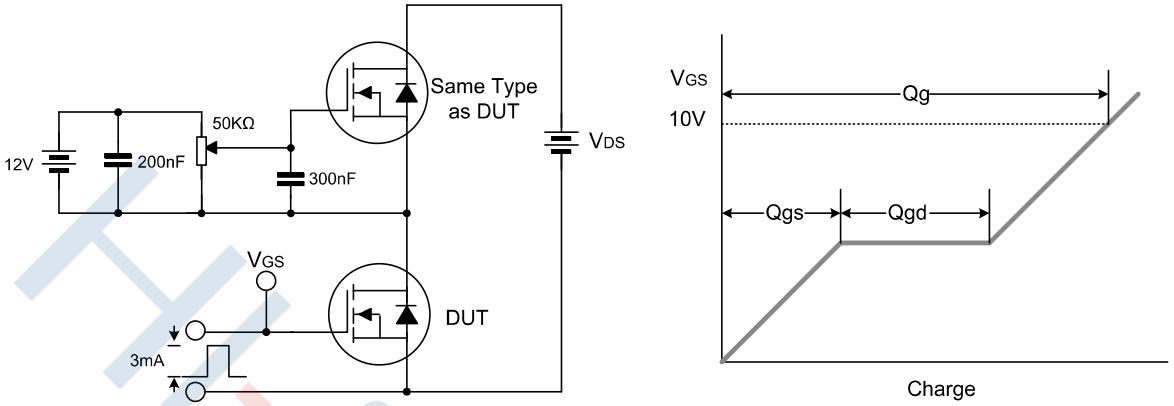


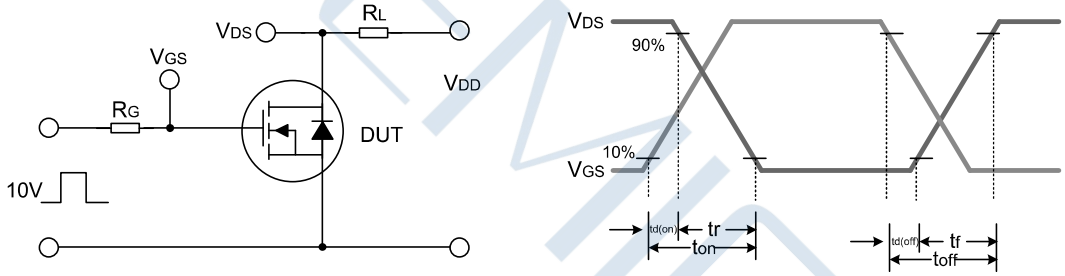
Figure 10 $V_{GS(th)}$ vs Junction Temperature

Test Circuit

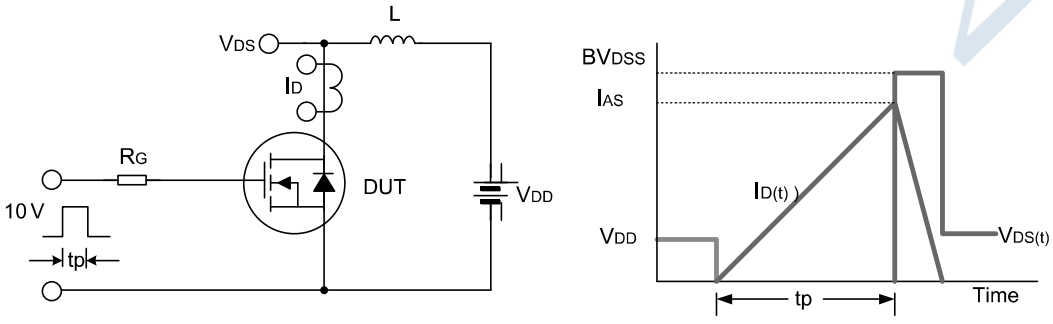
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

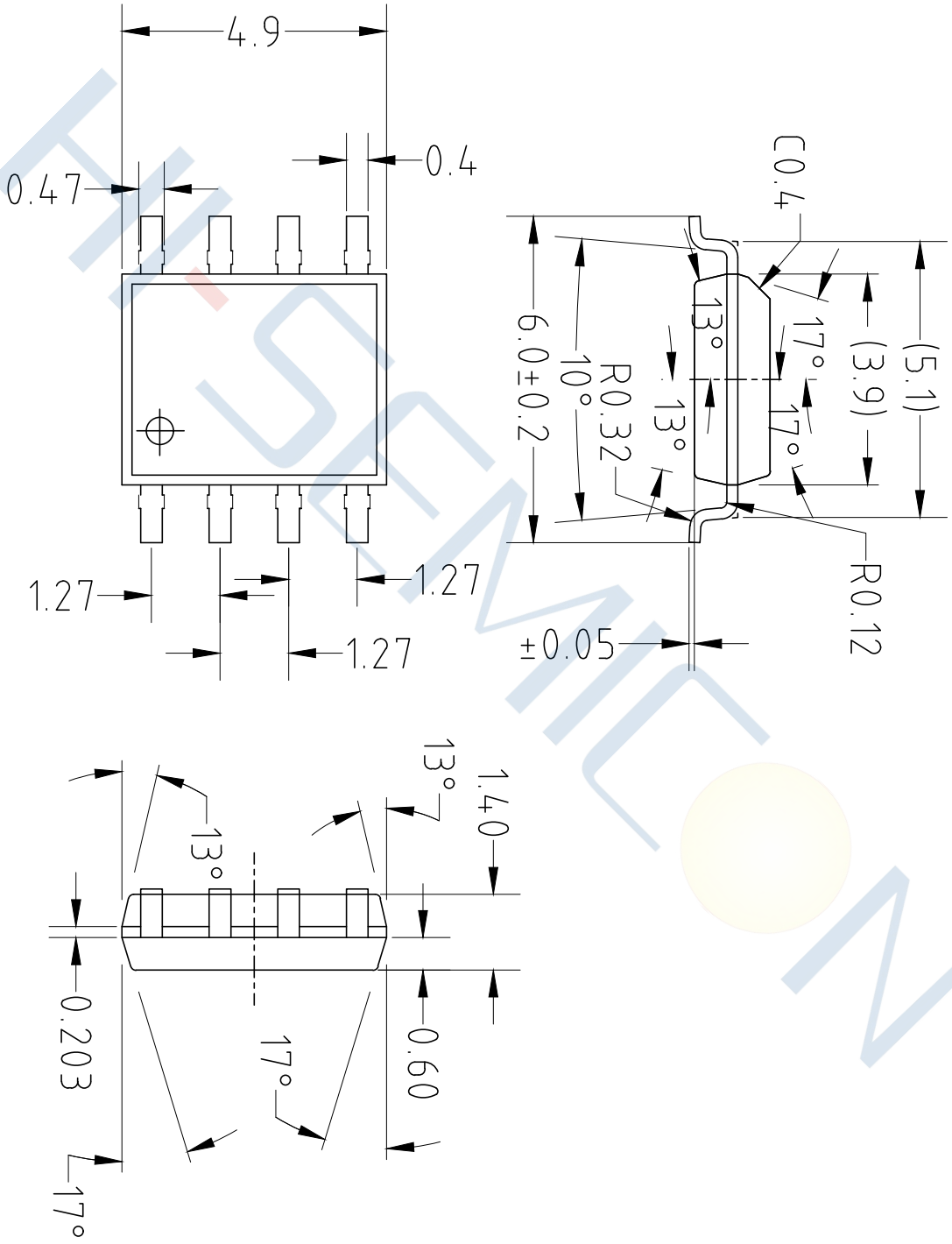


Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of SOP8-8L

Unit:mm



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