

-10A, -30V P-Channel Power MOSFET

GENERAL DESCRIPTION

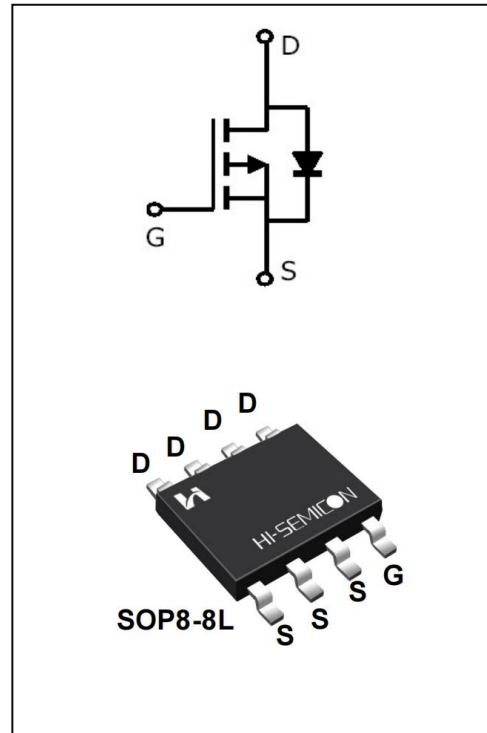
The Power MOSFET has extremely low on resistance, making it especially suitable for applications which require superior power density and outstanding efficiency.

Features

- ◆ $V_{DS} = -30V$, $I_D = -10A$
- ◆ $R_{DS(ON)}$
 TYP: $12.8m\Omega @ V_{GS} = -10V$
 TYP: $21.3m\Omega @ V_{GS} = -4.5V$

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
SFS4435	SOP8-8L	SFS4435	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	
Drain Current	T _C = 25°C	I _D	-10	A
	T _C = 75°C		-8.5	
Drain Current Pulsed (Note 1)		I _{DM}	-40	
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	3.1	W
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	112	mJ
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B _{VDS}	V _{GS} = 0V, I _D = -250μA	-30	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V	--	--	1.0	uA
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	-1.8	-2.5	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -8A	--	12.8	18	mΩ
		V _{GS} = -4.5V, I _D = -6A	--	21.3	28	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -20V V _{GS} = 0V f=1.0MHZ	--	1436	--	pF
Output Capacitance	C _{oss}		--	172	--	
Reverse Transfer Capacitance	C _{rss}		--	138	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15V, V _{GS} = -10V R _G = 6Ω, I _D = -8.0A (Note 3.4)	--	12.3	--	nS
Turn-on Rise Time	t _r		--	13.7	--	
Turn-off Delay Time	t _{d(off)}		--	68.4	--	
Turn-off Fall Time	t _f		--	30.5	--	
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-8.0A V _{GS} =-10V (Note 3.4)	--	25.6	--	nC
Gate-Source Charge	Q _{gs}		--	6.8	--	
Gate-Drain Charge	Q _{gd}		--	9.4	--	

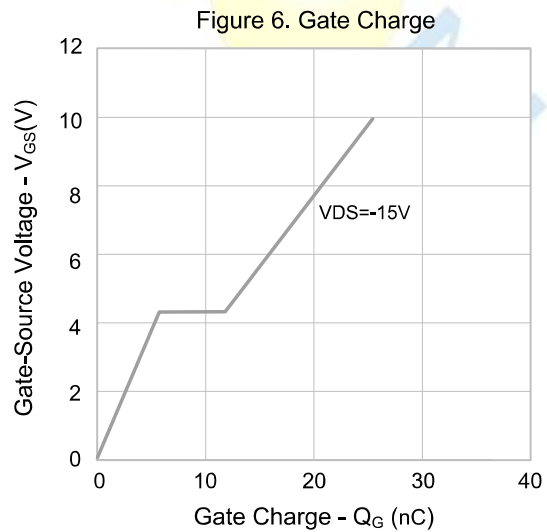
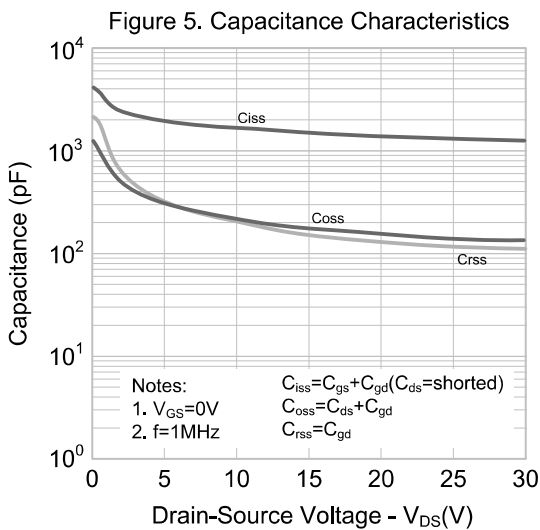
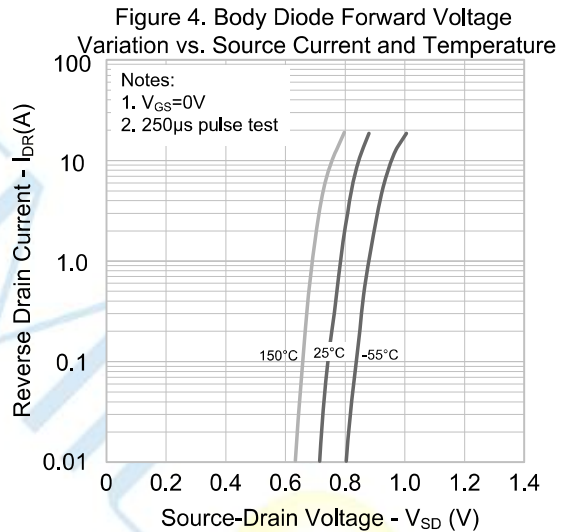
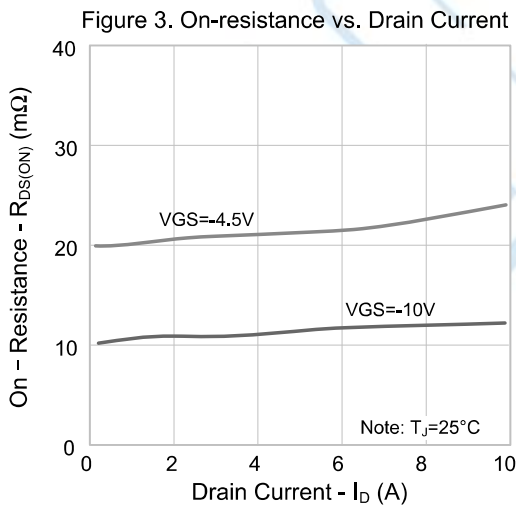
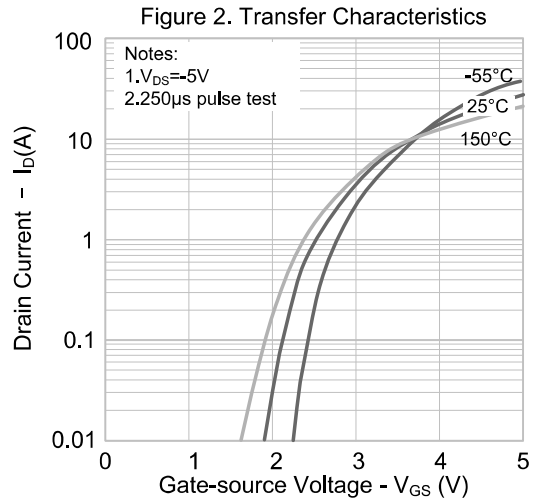
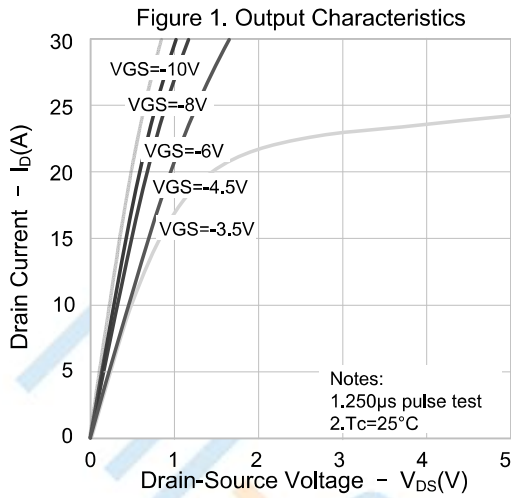
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

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}	$I_S = -10A, V_{GS} = 0V$	--	-0.8	-1.2	V

NOTE:

1. Pulse width limited by maximum junction temperature
2. $L=1mH, V_{DD}=-15V, V_G=-10V, R_G=25\Omega$, starting $T_J=25^\circ C$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Performance Characteristics



Typical Performance Characteristics

Figure 7. Breakdown Voltage Variation vs. Temperature

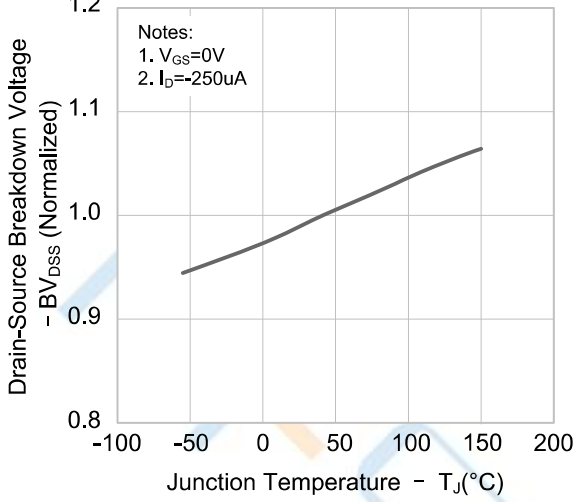


Figure 8. On-resistance Variation vs. Temperature

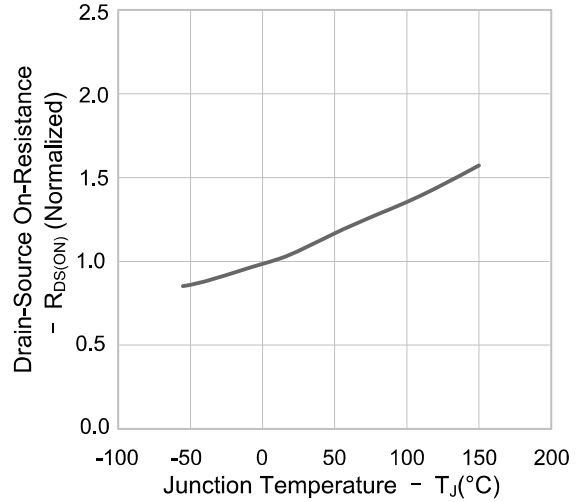
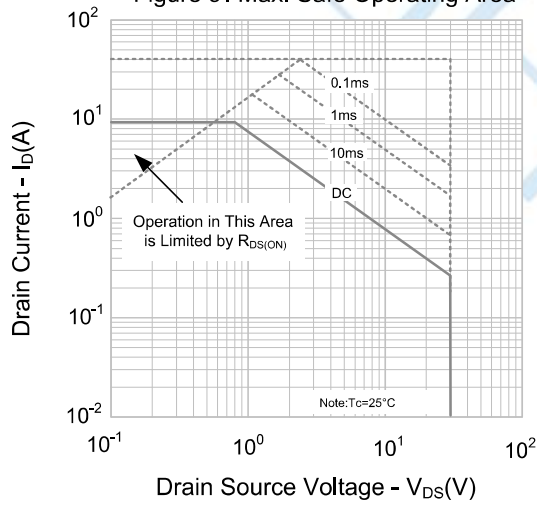
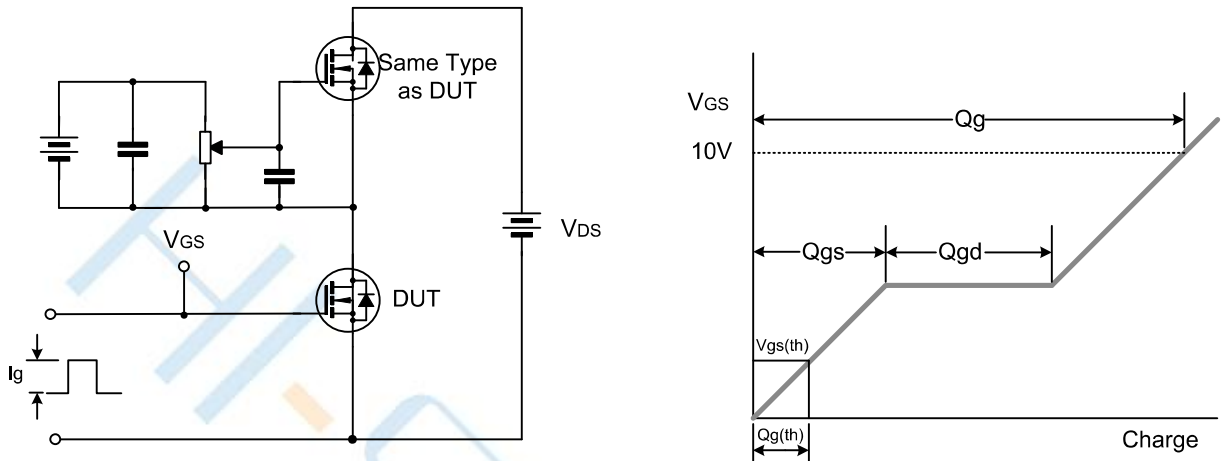


Figure 9. Max. Safe Operating Area

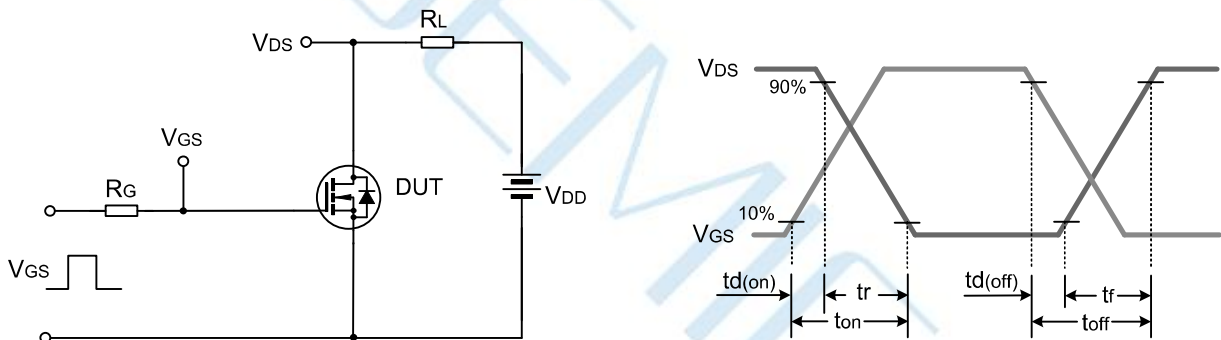


Test Circuit

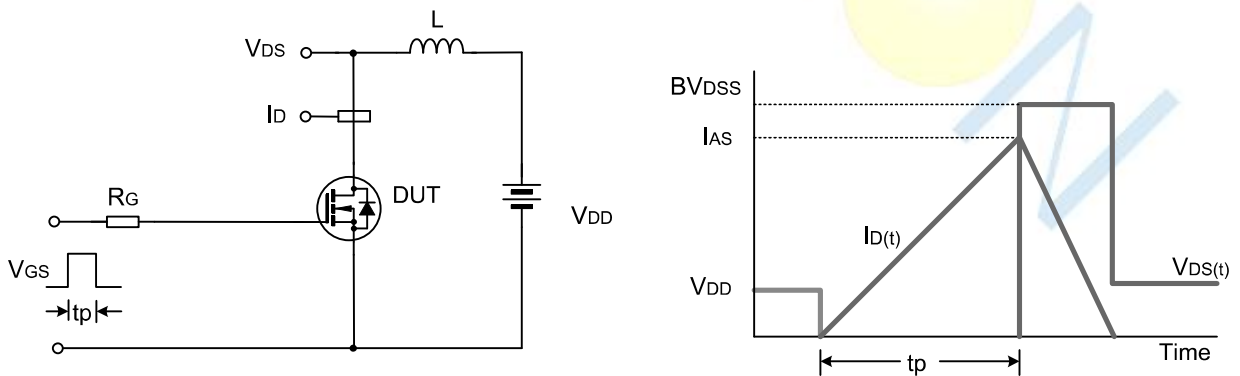
Gate Charge Test Circuit & Waveform



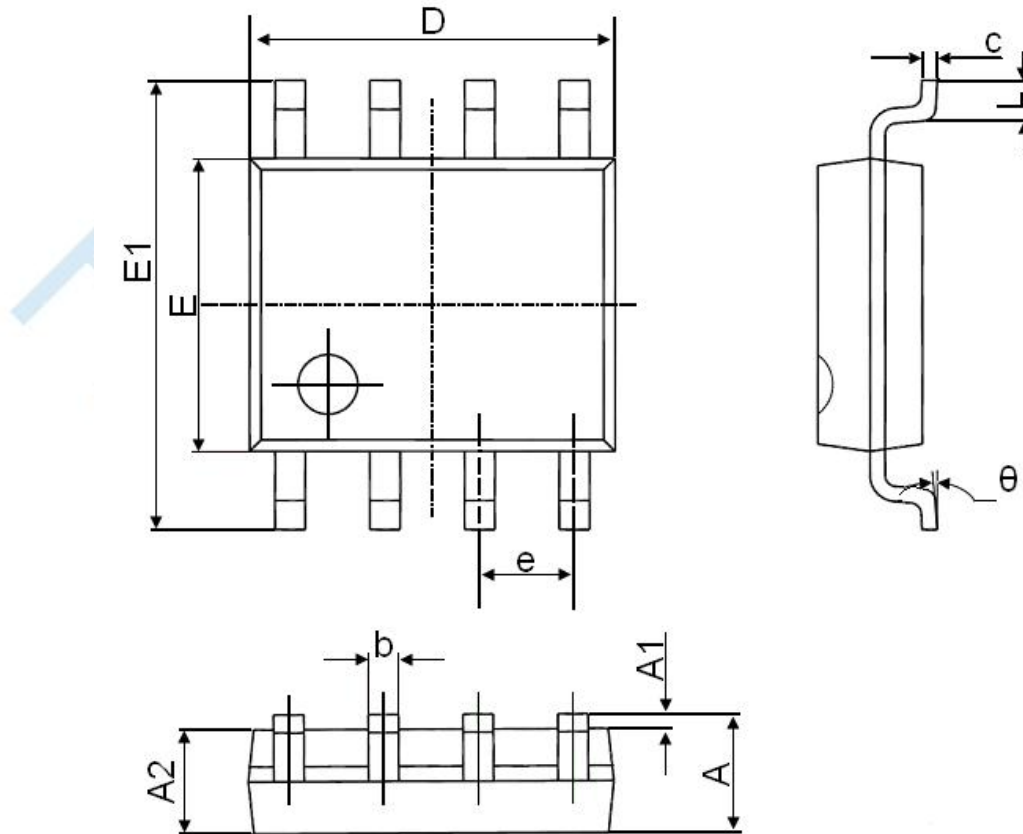
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of SOP8-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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