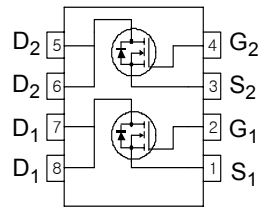
SFS4936

Dual N-Channel MOSFET

Features

- Low $R_{DS(on)}$ (0.035Ω)@V_{GS}=10V
  Low $R_{DS(on)}$ (0.053Ω)@V_{GS}=4.5V
- Gate Charge (Typical 20nC)
- Improved dv/dt Capability
- Maximum Junction Temperature Range (150°C)
- Available in Tape and Reel

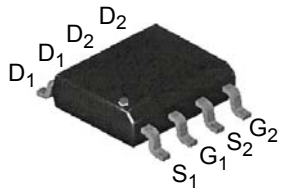
Symbol



General Description

This Power MOSFET is produced using SemiWell's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a low gate charge with superior switching performance, and rugged avalanche characteristics. This Power MOSFET is well suited for Battery switch, Load switch and Motor controler.

8-SOIC



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain to Source Voltage	30	V
I_D	Continuous Drain Current(@T_A = 25°C)	5.8	A
I_{DM}	Drain Current Pulsed (Note 1)	30	A
V_{GS}	Gate to Source Voltage	±20	V
P_D	Total Power Dissipation Single Operation (T_A=25°C)	2.0	W
	Total Power Dissipation Single Operation (T_A=70°C)	1.28	W
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature	- 55 ~ 150	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 4)	-	-	62.5	°C/W

Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.

Electrical Characteristics (T_J = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	30	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature coefficient	I_D = 250uA, referenced to 25 °C	-	29	-	mV/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS} = 30V, V_{GS} = 0V V_{DS} = 30V, V_{GS} = 0V, T_J = 55 °C	-	-	1 25	uA
I_{GSS}	Gate-Source Leakage, Forward	V_{GS} = 20V, V_{DS} = 0V			100	nA
	Gate-Source Leakage, Reverse	V_{GS} = -20V, V_{DS} = 0V	-	-	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	1.0	-	3.0	V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	V_{GS} = 10 V, I_D = 5.8A V_{GS} = 4.5 V, I_D = 4.7A	- -	0.027 0.037	0.035 0.053	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} =0 V, V_{DS} =15V, f = 1MHz	-	600	-	pF
C_{oss}	Output Capacitance		-	295	-	
C_{rss}	Reverse Transfer Capacitance		-	90	-	
Dynamic Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} =15V, I_D =1A, R_G =50Ω (Note 2,3)	-	9	28	ns
t_r	Rise Time		-	10	30	
$t_{d(off)}$	Turn-off Delay Time		-	85	180	
t_f	Fall Time		-	40	90	
Q_g	Total Gate Charge	V_{DS} =15V, V_{GS} =10V, I_D =5.8A (Note 2,3)	-	20	26	nC
Q_{gs}	Gate-Source Charge		-	2.3	-	
Q_{gd}	Gate-Drain Charge(Miller Charge)		-	5	-	

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
I_S	Maximum Continuous Diode Forward Current		-	-	1.7	A
V_{SD}	Diode Forward Voltage	I_S =1.7A, V_{GS} =0V (Note 2)	-	-	1.2	V

※ NOTES
1. Repeativity rating : pulse width limited by junction temperature
2. Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%
3. Essentially independent of operating temperature.
4. Surface mounted on 1 $inch^2$ Cu board.

Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.

Fig 1. On-State Characteristics

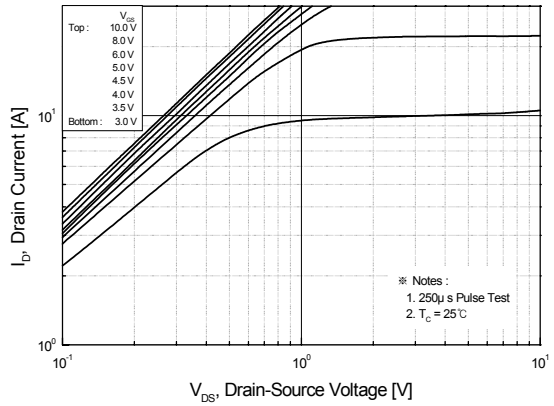


Fig 2. Transfer Characteristics

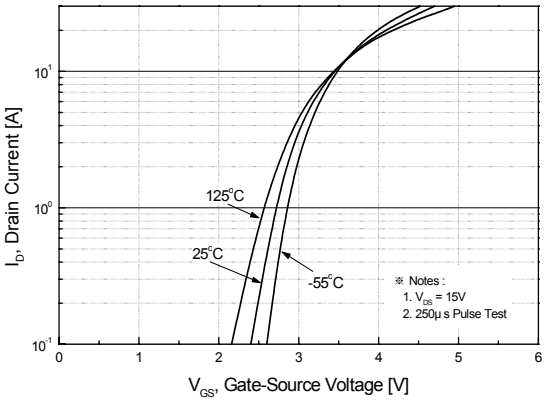


Fig 3. On Resistance Variation vs. Drain Current and Gate Voltage

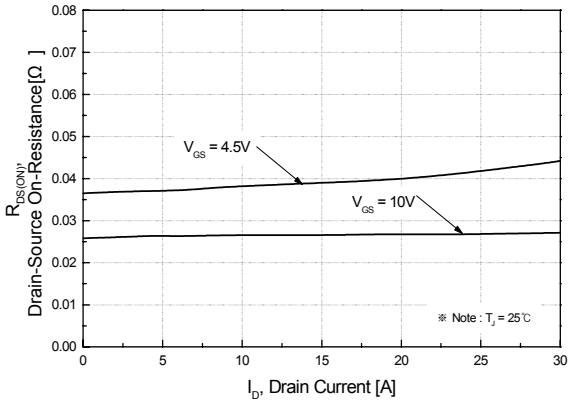


Fig 4. On State Current vs. Allowable Case Temperature

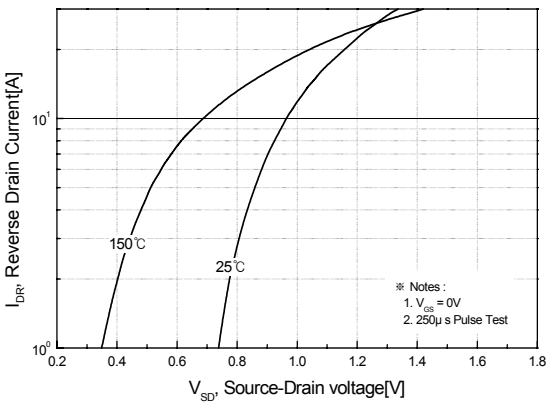


Fig 5. Capacitance Characteristics

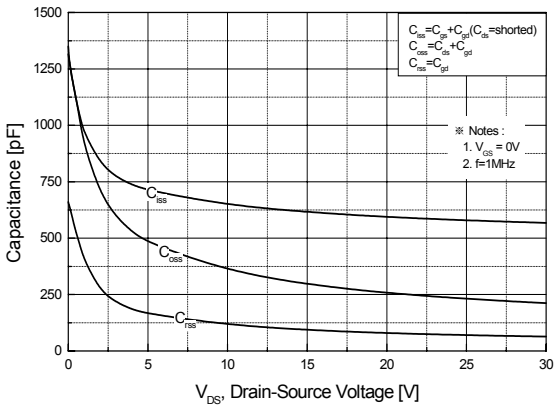
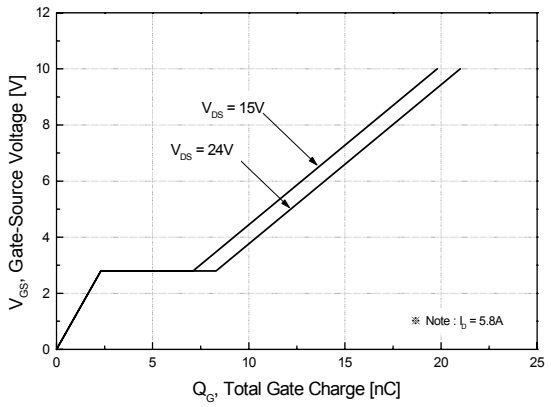


Fig 6. Gate Charge Characteristics



Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.

Fig 7. Breakdown Voltage Variation vs. Junction Temperature

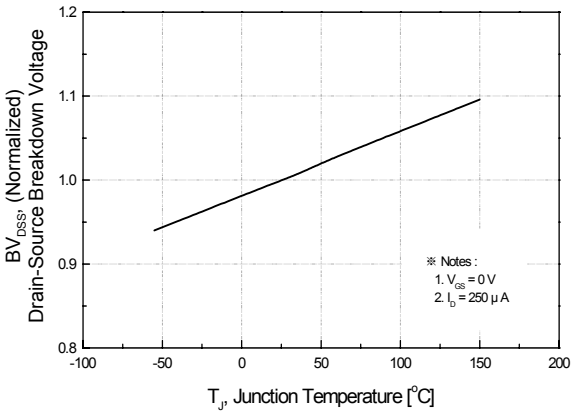


Fig 8. On-Resistance Variation vs. Junction Temperature

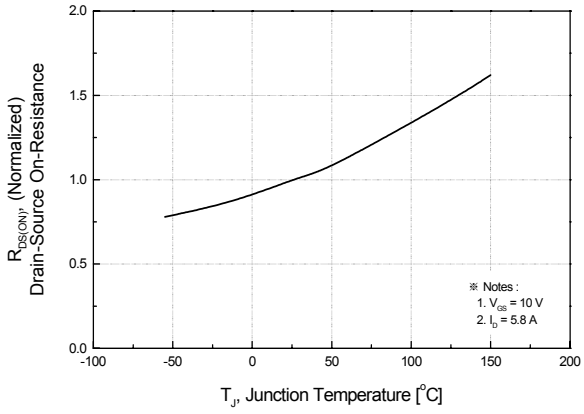
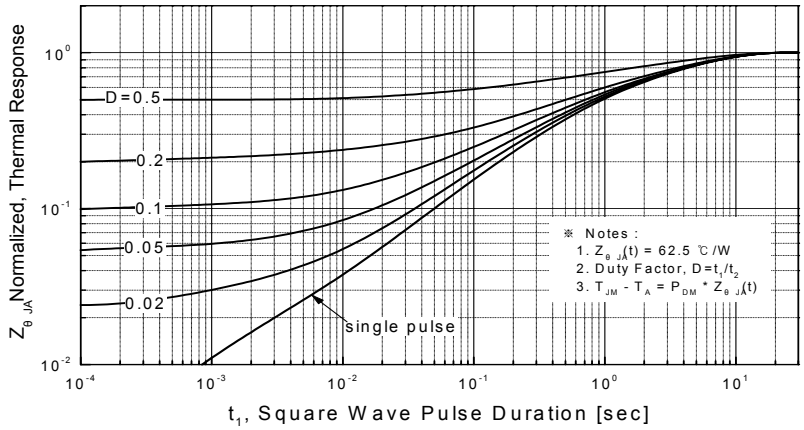


Fig 9. Normalized Transient Thermal Response Curve



Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.

Fig. 10. Gate Charge Test Circuit & Waveforms

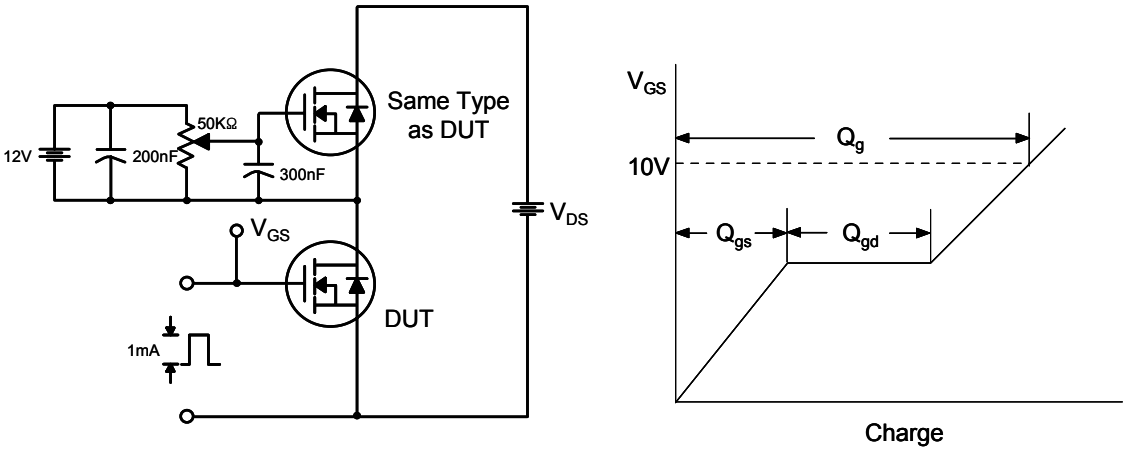
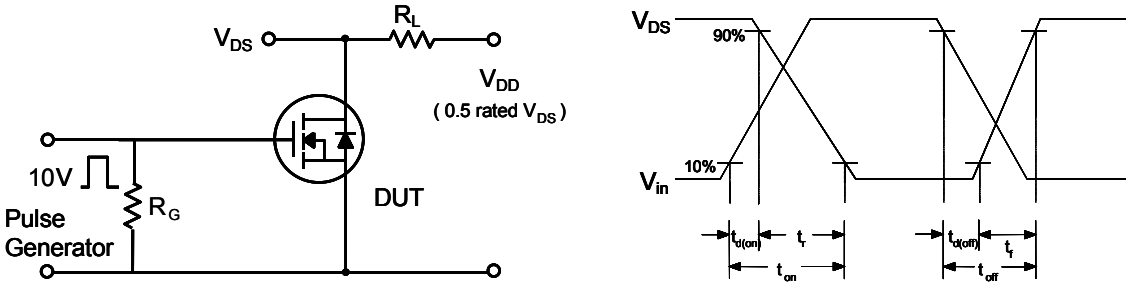


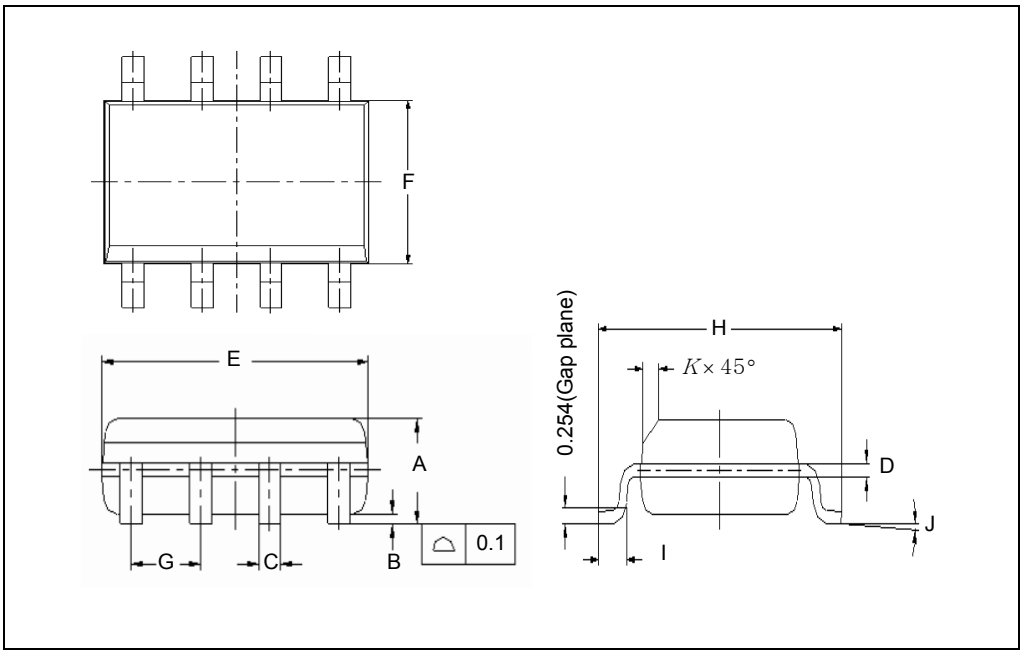
Fig 11. Switching Time Test Circuit & Waveforms



Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.

8-SOIC Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35	1.55	1.75	0.053	0.061	0.069
B	0.1	0.175	0.25	0.004	0.007	0.010
C	0.38	0.445	0.510	0.015	0.018	0.020
D	0.19	0.22	0.25	0.007	0.009	0.010
E	4.8	4.9	5	0.189	0.193	0.197
F	3.8	3.9	4	0.150	0.154	0.157
G	1.27 BSC					
H	5.8	6	6.2	0.228	0.236	0.244
I	0.5	0.715	0.93	0.020	0.028	0.037
J	0’	4’	8’	0’	4’	8’
K	0.250	0.375	0.05	0.010	0.015	0.020



Copyright@SemiWell Semiconductor Co., Ltd., All rights reserved.