THE DATASHEET OF

SSF6670

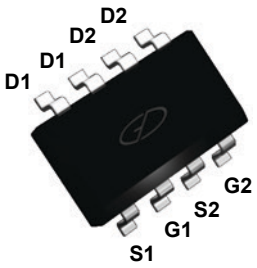
GOOD-ARK
SEMICONDUCTOR

SSF6670

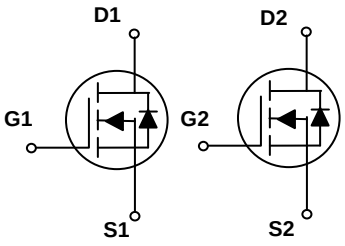
60V Dual N-Channel MOSFETs

Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	120mΩ
I_D	3.5A



SOP-8



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The SSF6670 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±25	V
Drain Current-Continuous (T_C=25°C)[1]	I_D	3.5	A
Drain Current-Continuous (T_C=70°C)[1]		2.8	A
Drain Current-Pulsed[1]	I_{DM}	20	A
Power Dissipation	P_D	2.4	W
Thermal Resistance, Junction-to-Ambient[2]	$R_{\theta JA}$	62.5	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1	-	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=2A	-	80	120	mΩ
		V_{GS}=10V, I_D=3A	-	65	90	
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=3A	3	-	-	S
Dynamic and Switching Characteristics[4]						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	500	-	pF
Output Capacitance	C_{oss}		-	50	-	
Reverse Transfer Capacitance	C_{rss}		-	40	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=30V, R_{GEN}=3Ω V_{GS}=10V, I_D=1A	-	6	-	nS
Rise Time	t_r		-	5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	16	-	
Fall Time	t_f		-	3	-	
Total Gate Charge	Q_g	V_{DS}=48V, I_D=3A V_{GS}=4.5V	-	7	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Body Diode Reverse Recovery Time	T_{rr}	I_F=4A, dI/dt=100A/μs	-	27	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	32	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=1.7A	-	-	1.2	V

NOTES:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in^2 FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristic Curves

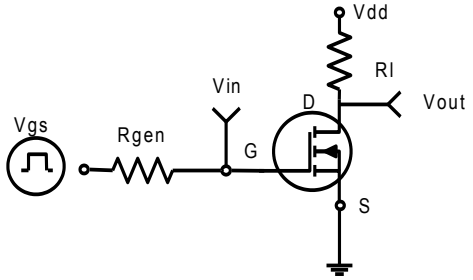


Figure 1. Switching Test Circuit

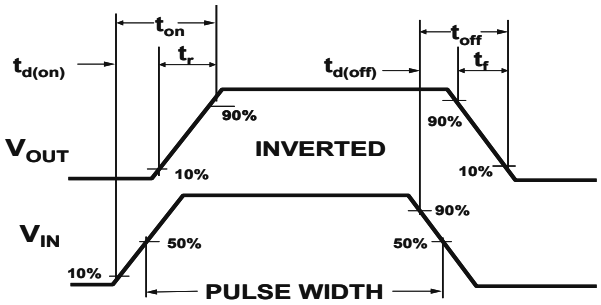


Figure 2. Switching Waveforms

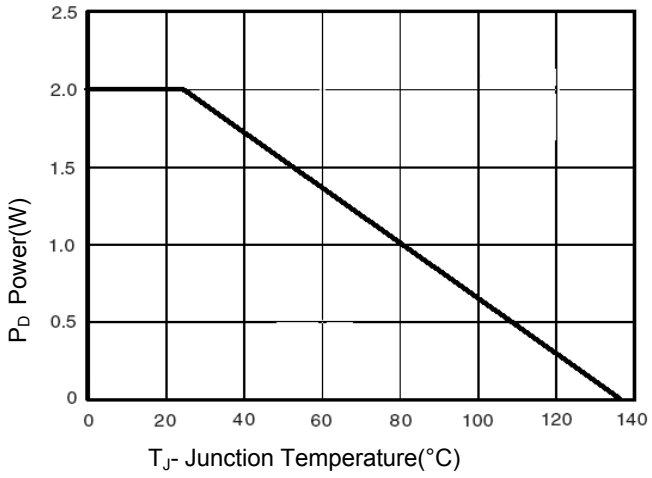


Figure 3. Power Dissipation

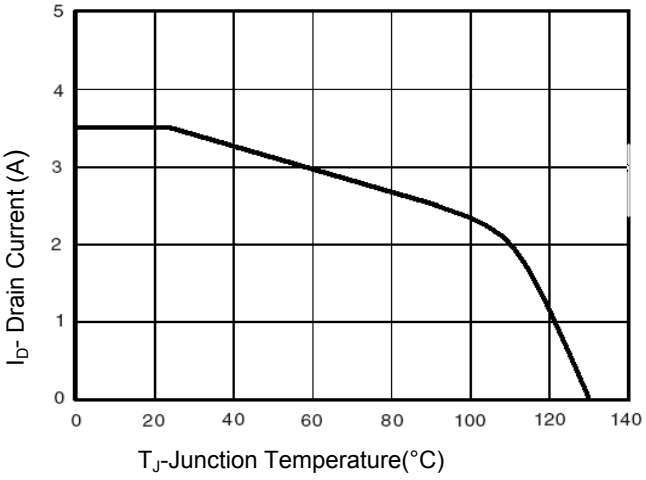


Figure 4. Drain Current vs Junction Temperature

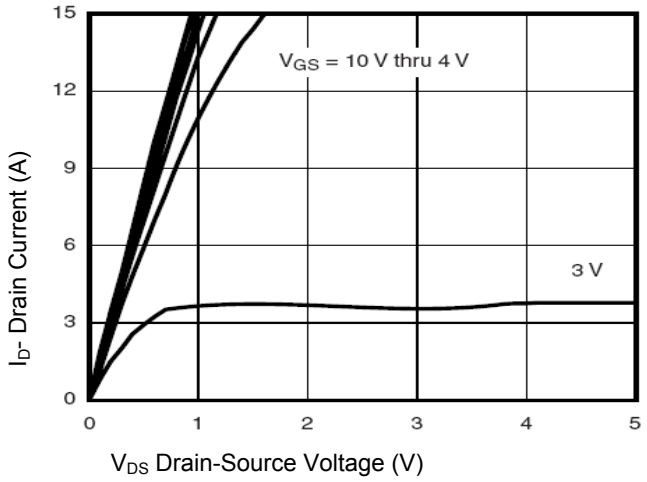


Figure 5. Output Characteristics

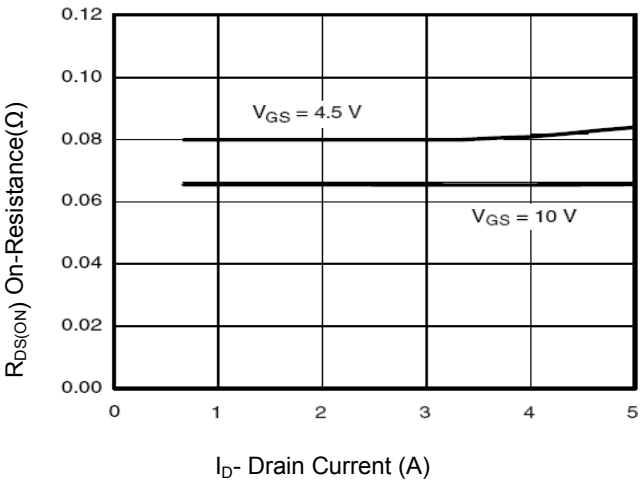


Figure 6. Drain-Source On-Resistance

Typical Electrical and Thermal Characteristic Curves

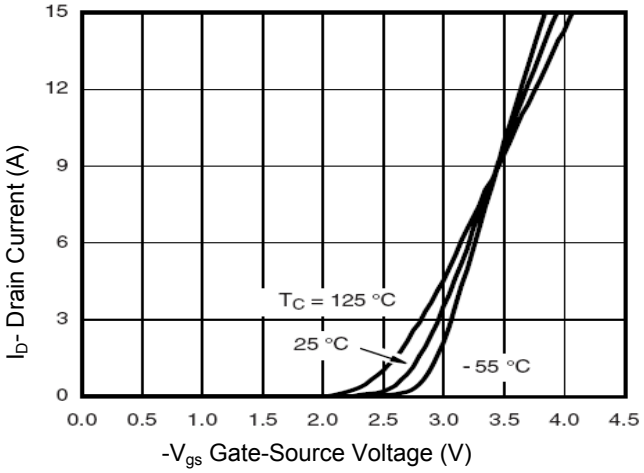


Figure 7. Transfer Characteristics

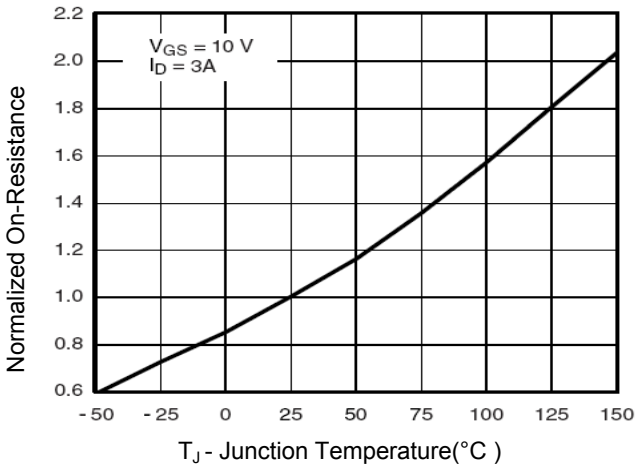


Figure 8. Drain-Source On-Resistance

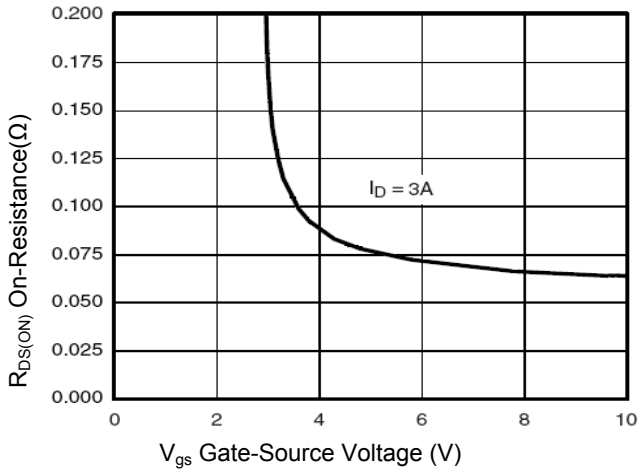


Figure 9. $R_{DS(ON)}$ vs V_{gs}

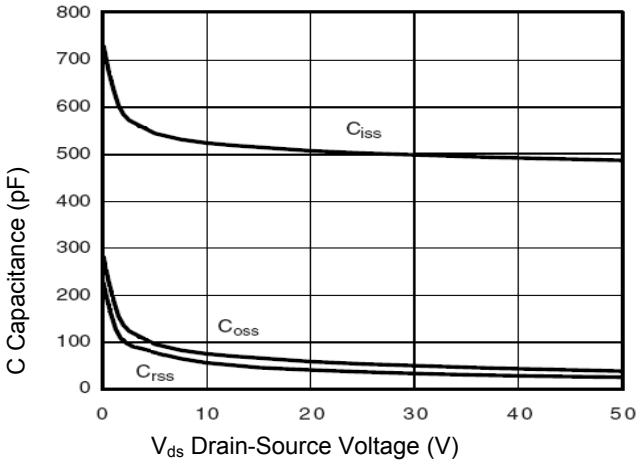


Figure 10. Capacitance vs V_{ds}

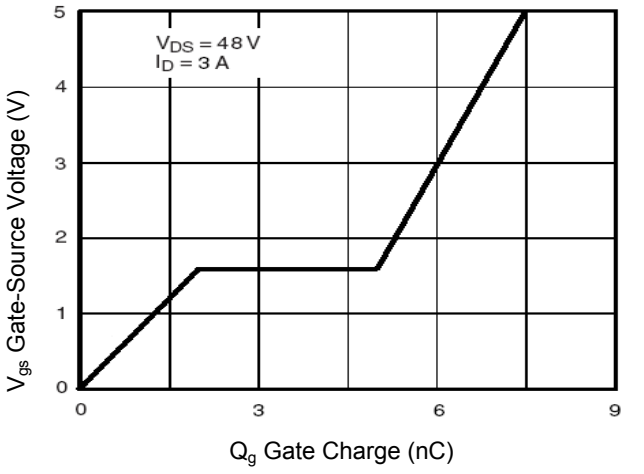


Figure 11. Gate-Source Voltage vs Gate Charge

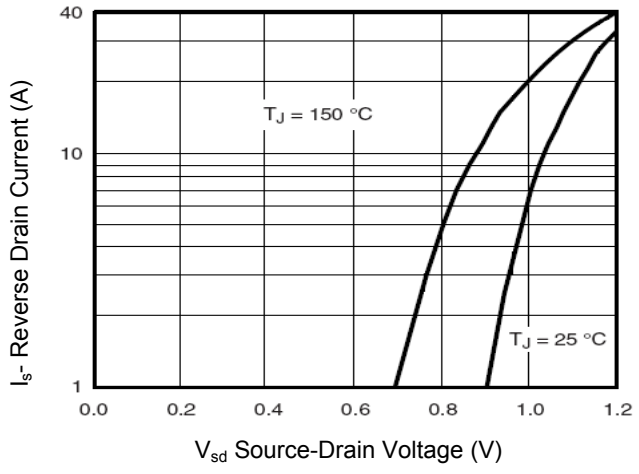


Figure 12. Source- Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

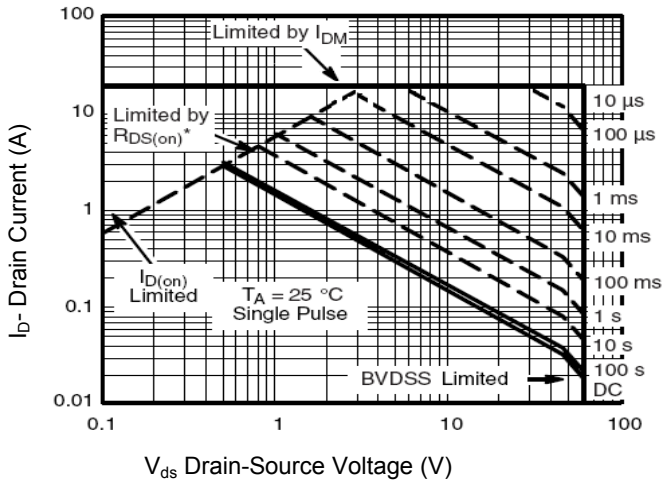


Figure 13. Safe Operation Area

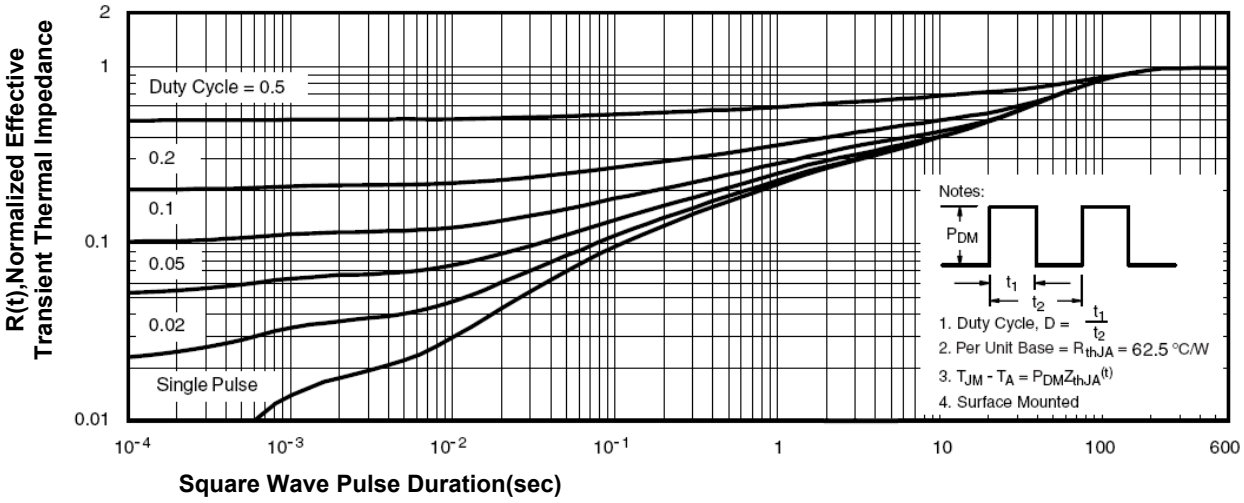
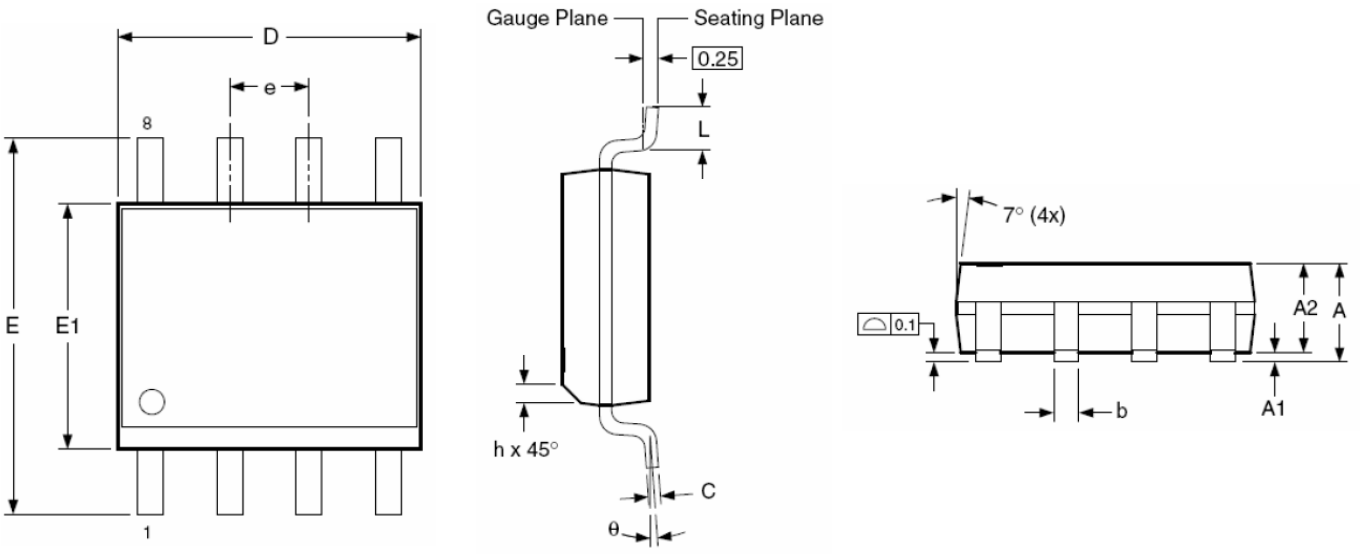
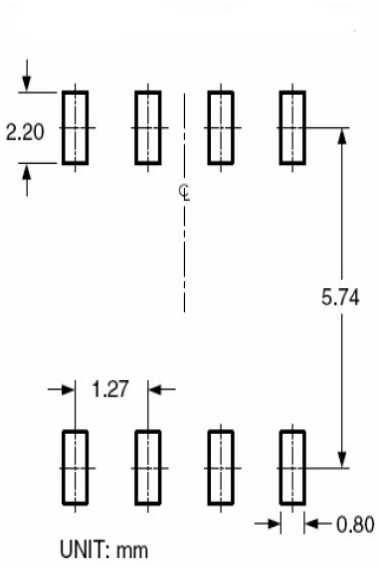


Figure 14. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (SOP-8)



Recommended Pad Layout



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	0.228	0.236	0.244
h	0.010	—	0.020
L	0.016	—	0.050
θ	0°	—	8°

NOTES:

1. Dimensions are inclusive of plating
2. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
3. Dimension L is measured in gauge plane.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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