



# SSF2649

## 20V Dual P-Channel MOSFET

### DESCRIPTION

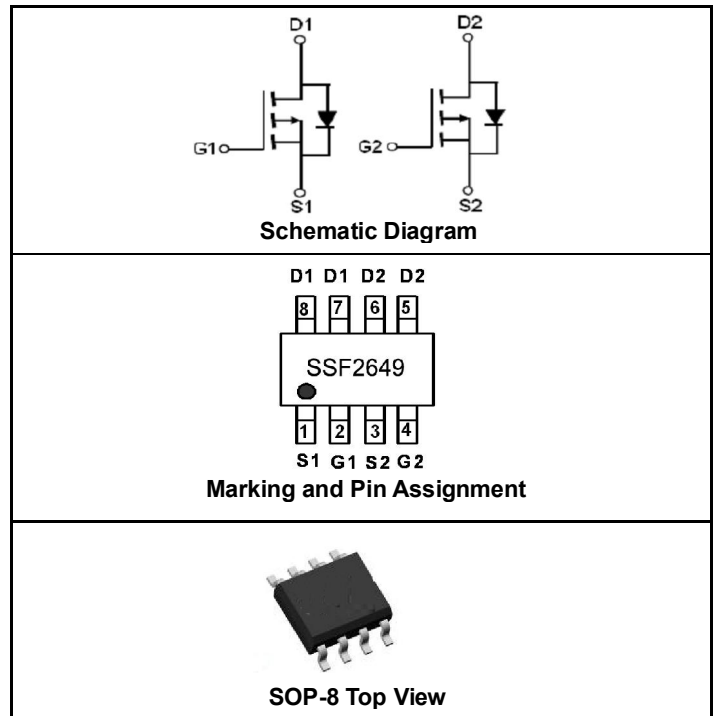
The SSF2649 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge. It has been optimized for power management applications requiring a wide range of gate drive voltage ratings.

### GENERAL FEATURES

- $V_{DS} = -20V, I_D = -2.9A$   
 $R_{DS(ON)} < 98m\Omega @ V_{GS} = -2.5V$   
 $R_{DS(ON)} < 58m\Omega @ V_{GS} = -4.5V$
- High Power and current handling capability
- Lead free product
- Surface Mount Package

### APPLICATIONS

- Battery protection
- Load switch
- Power management



### PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape Width	Quantity
SSF2649	SSF2649	SOP-8	-	-	-

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	-7.9	A
	$I_{DM}$	-30	A
Maximum Power Dissipation	$P_D$	5	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	85	$^\circ C/W$
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### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			$\pm 100$	nA



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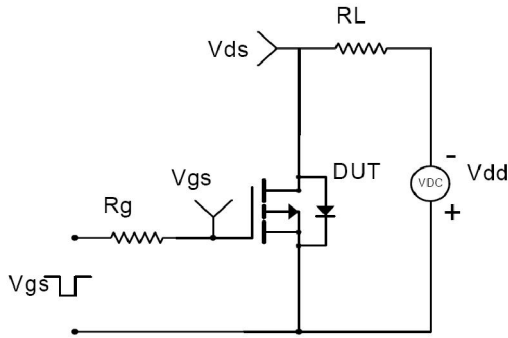
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ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7		-3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-2.9A$		49	58	m $\Omega$
		$V_{GS}=-2.7V, I_D=-1.5A$		82	98	
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	$C_{iss}$	$V_{DS}=-20V, V_{GS}=0V,$ $F=1.0MHz$		1040		PF
Output Capacitance	$C_{oss}$			156		PF
Reverse Transfer Capacitance	$C_{rss}$			112		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A$ $V_{GS}=-4.5V, R_{GEN}=6\Omega$		9		nS
Turn-on Rise Time	$t_r$			8		nS
Turn-Off Delay Time	$t_{d(off)}$			87		nS
Turn-Off Fall Time	$t_f$			38		nS
Total Gate Charge	$Q_g$	$V_{DS}=-10V,$ $I_D=-4.7A, V_{GS}=-4.5V$		12		nC
Gate-Source Charge	$Q_{gs}$			2.7		nC
Gate-Drain Charge	$Q_{gd}$			1.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-2.9A$			-1.0	V

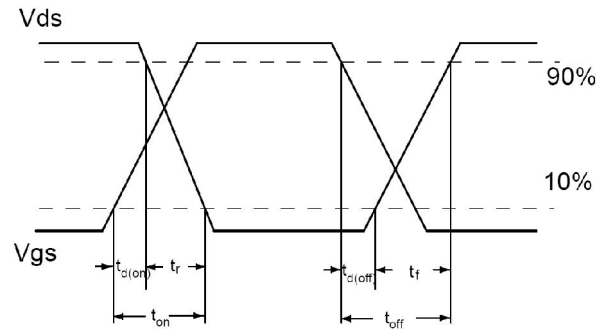
### NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

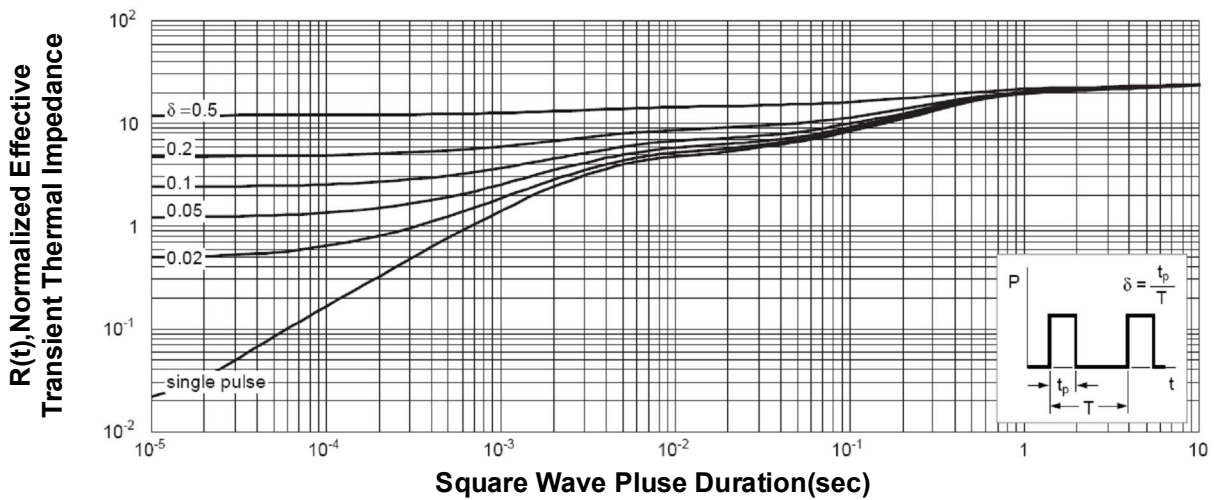
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



**Figure 1: Switching Test Circuit**

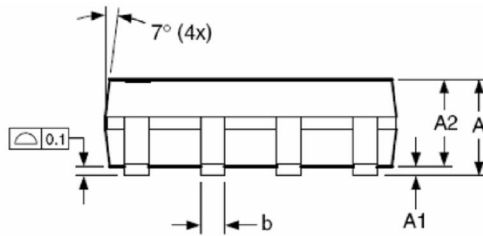
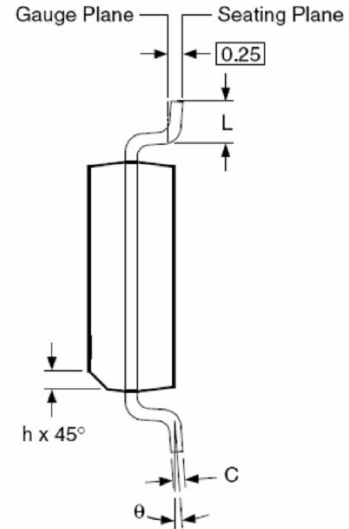
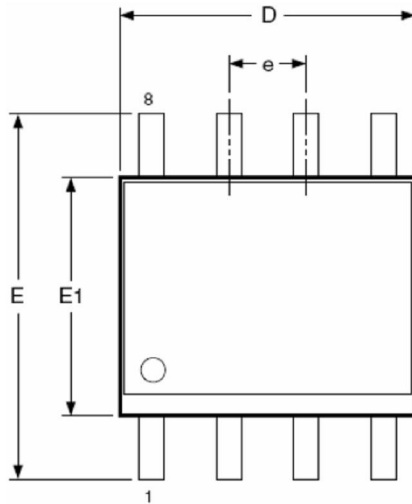


**Figure 2: Switching Waveforms**

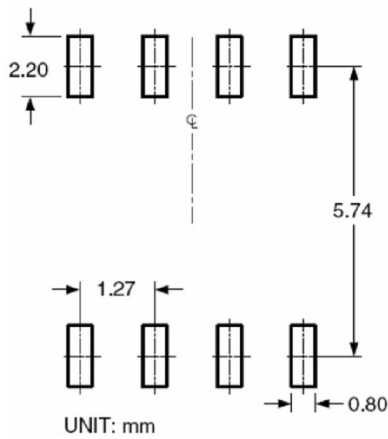


**Figure 3 Normalized Maximum Transient Thermal Impedance**

## SOP-8 PACKAGE INFORMATION



### RECOMMENDED LAND PATTERN



UNIT: mm

### 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.