



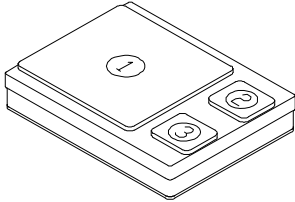
**Solid State Devices, Inc.**

14701 Firestone Blvd \* La Mirada, Ca 90638  
 Phone: (562) 404-4474 \* Fax: (562) 404-1773  
 ssdi@ssdi-power.com \* www.ssdi-power.com

# SFF44N50S1 SFF44N50S2

## DESIGNER'S DATA SHEET

**SMD1, 2**

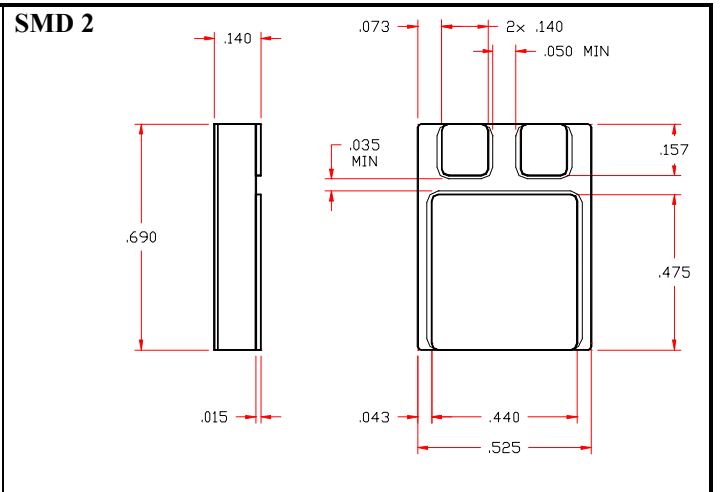
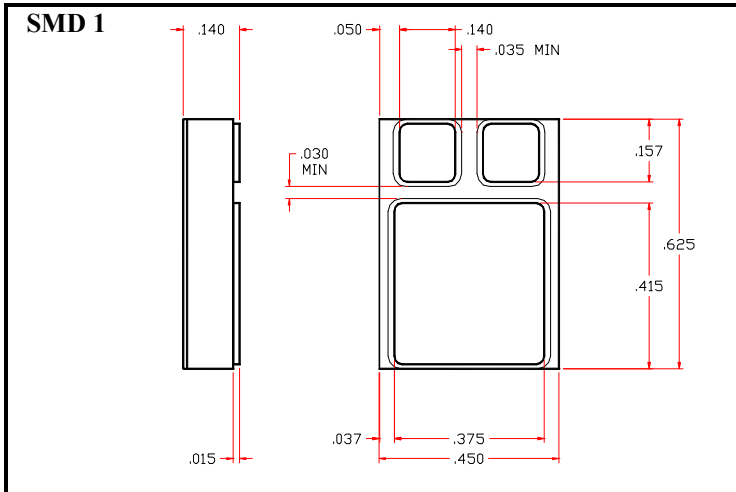


**Note**  
1/ maximum current limited by package configuration

## 35 AMP, 500 Volts, 110 mΩ Avalanche Rated N-channel MOSFET

- Features:**
- Rugged poly-Si gate
  - Lowest ON-resistance in the industry
  - Avalanche rated
  - Hermetically Sealed, Hot Case power SMD
  - Low Total Gate Charge
  - Fast Switching
  - TX, TXV, S-Level screening available
  - Improved ( $R_{DS(ON)}$   $Q_G$ ) figure of merit

Maximum Ratings	Symbol	Value	Units
Drain - Source Voltage	$V_{DSS}$	500	V
Gate – Source Voltage	$V_{GS}$	±30 ±40	V
Max. Continuous Drain Current (package limited)	@ $T_C = 25^\circ C$	$I_{D1}$	35
	@ $T_C = 125^\circ C$	$I_{D2}$	16
Pulsed Drain (Instantaneous) Current ( $T_j$ limited)	@ $T_C = 25^\circ C$	$I_{D3}$	50
Max. Avalanche current	@ $L = 0.1$ mH	$I_{AR}$	20
Single / Repetitive Avalanche Energy	@ $L = 0.1$ mH	$E_{AS} / E_{AR}$	1100 / 1
Total Power Dissipation	@ $T_C = 25^\circ C$	$P_D$	250
Operating & Storage Temperature		$T_{OP} \ \& \ T_{STG}$	-55 to +150
Maximum Thermal Resistance	Junction to Case	$R_{\theta JC}$	0.5 (typ 0.35)



**NOTE:** All specifications are subject to change without notification. SCD's for these devices should be reviewed by SSDI prior to release.

**DATA SHEET #: FT0031C**

**DOC**

**Solid State Devices, Inc.**

14701 Firestone Blvd \* La Mirada, Ca 90638  
 Phone: (562) 404-4474 \* Fax: (562) 404-1773  
 ssdi@ssdi-power.com \* www.ssdi-power.com

# SFF44N50S1

# SFF44N50S2

Electrical Characteristics <sup>4/</sup>		Symbol	Min	Typ	Max	Units
<b>Drain to Source Breakdown Voltage</b>	$V_{GS} = 0V, I_D = 250\mu A$	$BV_{DSS}$	500	530	—	V
<b>Drain to Source On State Resistance</b>	$V_{GS} = 10V, I_D = 20A, T_j = 25^\circ C$ $V_{GS} = 10V, I_D = 12A, T_j = 125^\circ C$ $V_{GS} = 10V, I_D = 20A, T_j = 150^\circ C$	$R_{DS(on)}$	— — —	110 230 270	120 — —	mΩ
<b>Gate Threshold Voltage</b>	$V_{DS} = V_{GS}, I_D = 1.8mA, T_j = 25^\circ C$ $V_{DS} = V_{GS}, I_D = 250\mu A, T_j = 25^\circ C$ $V_{DS} = V_{GS}, I_D = 250\mu A, T_j = -55^\circ C$ $V_{DS} = V_{GS}, I_D = 250\mu A, T_j = 125^\circ C$	$V_{GS(th)}$	2.1 — — —	3.0 2.7 3.2 1.9	3.9 — — —	V
<b>Gate to Source Leakage</b>	$V_{GS} = \pm 20V, T_j = 25^\circ C$ $V_{GS} = \pm 20V, T_j = 125^\circ C$	$I_{GSS}$	— —	10 30	$\pm 100$ —	nA
<b>Zero Gate Voltage Drain Current</b>	$V_{DS} = 500V, V_{GS} = 0V, T_j = 25^\circ C$ $V_{DS} = 500V, V_{GS} = 0V, T_j = 125^\circ C$ $V_{DS} = 500V, V_{GS} = 0V, T_j = 150^\circ C$	$I_{DSS}$	— — —	0.01 2.0 10	25 — 250	$\mu A$ $\mu A$ $\mu A$
<b>Forward Transconductance</b>	$V_{DS} = 10V, I_D = 20A, T_j = 25^\circ C$	$g_{fs}$	10	30	—	Mho
<b>Total Gate Charge</b>	$V_{GS} = 10V$	$Q_g$	—	175	—	nC
<b>Gate to Source Charge</b>	$V_{DS} = 380V$	$Q_{gs}$	—	28	—	nC
<b>Gate to Drain Charge</b>	$I_D = 32A$	$Q_{gd}$	—	80	—	nC
<b>Turn on Delay Time</b>	$V_{GS} = 10V$	$t_{d(on)}$	—	30	—	nsec
<b>Rise Time</b>	$V_{DS} = 380V$	$t_r$	—	10	—	
<b>Turn off Delay Time</b>	$I_D = 32A$	$t_{d(off)}$	—	70	—	
<b>Fall Time</b>	$R_G = 2.7\Omega, pw = 3\mu s$	$t_f$	—	10	—	
<b>Diode Forward Voltage</b>	$I_F = 32A, V_{GS} = 0V$	$V_{SD}$	—	1.0	1.5	V
<b>Diode Reverse Recovery Time</b>	$I_F = 32A, di/dt = 100A/\mu sec$	$t_{rr}$	—	540	—	nsec
<b>Peak Reverse Recovery Current</b>		$I_{RM(rec)}$	—	45	—	A
<b>Reverse Recovery Charge</b>		$Q_{rr}$	—	12	—	$\mu C$
<b>Input Capacitance</b>	$V_{GS} = 0V$	$C_{iss}$	—	4500	—	pF
<b>Output Capacitance</b>	$V_{DS} = 25V$	$C_{oss}$	—	540	—	
<b>Reverse Transfer Capacitance</b>	$f = 1 MHz$	$C_{rss}$	—	100	—	

**NOTES:**

- \* Pulse Test: Pulse Width = 300μsec, Duty Cycle = 2%.
- 1/ For Ordering Information, Price, and Availability Contact Factory.
- 2/ Screening per MIL-PRF-19500.
- 3/ For Package Outlines Contact Factory.
- 4/ Unless Otherwise Specified, All Electrical Characteristics @25°C.

**Available Part Numbers:**

Consult Factory

**PIN ASSIGNMENT (Standard)**

Package	Drain	Source	Gate
<b>SMD1</b>	Pin 1	Pin 2	Pin 3
<b>SMD2</b>	Pin 1	Pin 2	Pin 3

**NOTE:** All specifications are subject to change without notification.  
 SCD's for these devices should be reviewed by SSDI prior to release.

**DATA SHEET #: FT0031C****DOC**