



Solid State Devices, Inc.

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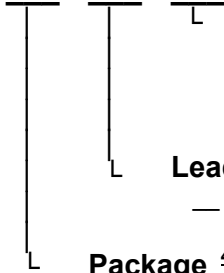
SFF100N20/3T

100 AMP , 200 Volts, 25 mΩ Avalanche Rated N-channel MOSFET

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFF100N20



Screening ^{2/}

— = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

Lead Option

— = Straight Leads

Package ^{4/}

/3T= TO-3 (Pin Diameter : 0.058"-0.063")

Features:

- Rugged poly-Si gate
- Lowest ON-resistance in the industry
- Avalanche rated
- Hermetically Sealed, Power Package with high pin current carrying capability
- Low Total Gate Charge
- Fast Switching
- TX, TXV, S-Level screening available
- Improved ($R_{DS(ON)}$, Q_G) figure of merit

| Maximum Ratings ^{5/} | | Symbol | Value | Units |
|---|-------------------------|----------------------|----------------------|--------------|
| Drain - Source Voltage | | V_{DSS} | 200 | V |
| Gate - Source Voltage | continuous transient | V_{GS} | ± 20 ± 30 | V |
| Max. Continuous Drain Current (package limited) | @ $T_C = 25^\circ C$ | I_{D1} | 55 | A |
| Max. Instantaneous Drain Current (Tj limited) | @ $T_C = 25^\circ C$ | I_{D2} | 100 | A |
| | @ $T_C = 125^\circ C$ | I_{D3} | 40 | A |
| Max. Avalanche current | @ L= 0.1 mH | I_{AR} | 60 | A |
| Single and Repetitive Avalanche Energy | @ L= 0.1 mH | E_{AS} | 1500 | mJ |
| | | E_{AR} | 50 | |
| Total Power Dissipation | @ $T_C = 25^\circ C$ | P_D | 300 | W |
| Operating & Storage Temperature | | T_{OP} & T_{STG} | -55 to +175 | $^\circ C$ |
| Maximum Thermal Resistance (Junction to Case) | | $R_{\theta JC}$ | 0.5 (typ.0.3) | $^\circ C/W$ |

NOTES:

*Pulse Test: Pulse Width = 300μsec, Duty Cycle = 2%.

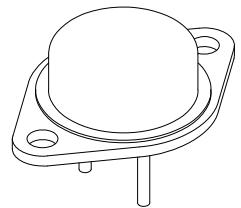
1/ For ordering information, price, and availability - contact factory.

2/ Screening based on MIL-PRF-19500. Screening flows available on request.

4/ Maximum current limited by package configuration

5/ Unless otherwise specified, all electrical characteristics @25°C.

TO-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 #: FT0044A

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SFF100N20/3T

| Electrical Characteristics ^{5/} | Symbol | Min | Typ | Max | Units |
|---|--------------|-----------------|-------------------|----------------|----------------|
| Drain to Source Breakdown Voltage $V_{GS} = 0V, I_D = 250\mu A$ | BV_{DSS} | 200 | 220 | — | V |
| Drain to Source On State Resistance $V_{GS} = 10V, I_D = 48A, T_j = 25^\circ C$ $V_{GS} = 10V, I_D = 48A, T_j = 125^\circ C$ $V_{GS} = 10V, I_D = 48A, T_j = 175^\circ C$ | $R_{DS(on)}$ | — | 25 50 65 | 30 65 — | mΩ |
| Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 4.0mA, T_j = 25^\circ C$ $V_{DS} = V_{GS}, I_D = 4.0mA, T_j = 125^\circ C$ $V_{DS} = V_{GS}, I_D = 4.0mA, T_j = -55^\circ C$ | $V_{GS(th)}$ | 2.5 1.5 — | 4.5 3.6 5 | 5.0 — 6 | V |
| Gate to Source Leakage $V_{GS} = \pm 20V, T_j = 25^\circ C$ $V_{GS} = \pm 20V, T_j = 125^\circ C$ | I_{GSS} | — — | 10 30 | ±100 — | nA |
| Zero Gate Voltage Drain Current $V_{DS} = 200V, V_{GS} = 0V, T_j = 25^\circ C$ $V_{DS} = 200V, V_{GS} = 0V, T_j = 125^\circ C$ $V_{DS} = 200V, V_{GS} = 0V, T_j = 150^\circ C$ | I_{DSS} | — — — | 0.01 2.5 25 | 25 150 — | μA μA μA |
| Forward Transconductance $V_{DS} = 10V, I_D = 48A, T_j = 25^\circ C$ | g_{fs} | 25 | 50 | — | Mho |
| Total Gate Charge $V_{GS} = 10V$ | Q_g | — | 150 | 250 | nC |
| Gate to Source Charge $V_{DS} = 100V$ | Q_{gs} | — | 45 | 65 | nC |
| Gate to Drain Charge $I_D = 48A$ | Q_{gd} | — | 75 | 120 | nC |
| Turn on Delay Time $V_{GS} = 10V$ | $t_{d(on)}$ | — | 50 | 75 | nsec |
| Rise Time $V_{DS} = 100V$ | t_r | — | 50 | 75 | |
| Turn off Delay Time $I_D = 48A$ | $t_{d(off)}$ | — | 110 | 135 | |
| Fall Time $R_G = 4.0\Omega, pw = 3\mu s$ | t_f | — | 50 | 75 | |
| Diode Forward Voltage $I_F = 48A, V_{GS} = 0V$ | V_{SD} | — | 0.90 | 1.5 | V |
| Diode Reverse Recovery Time $I_F = 10A, di/dt = 100A/\mu sec$ | t_{rr1} | — | 190 | 250 | nsec |
| Reverse Recovery Charge $I_F = 10A, di/dt = 100A/\mu sec$ | I_{rm1} | — | 11 | — | A |
| $I_F = 10A, di/dt = 100A/\mu sec$ | Q_{rr1} | — | 1 | — | μC |
| $I_F = 25A, di/dt = 100A/\mu sec$ | t_{rr2} | — | 310 | — | nsec |
| $I_F = 25A, di/dt = 100A/\mu sec$ | I_{rm2} | — | 17 | — | A |
| $I_F = 25A, di/dt = 100A/\mu sec$ | Q_{rr2} | — | 2.5 | — | μC |
| Input Capacitance $V_{GS} = 0V$ | C_{iss} | — | 5300 | — | pF |
| Output Capacitance $V_{DS} = 25V$ | C_{oss} | — | 1050 | — | |
| Reverse Transfer Capacitance $f = 1 MHz$ | C_{rss} | — | 175 | — | |

Package Outline: TO-3

Pin Out:

Pin 1: GATE

Pin 2: SOURCE

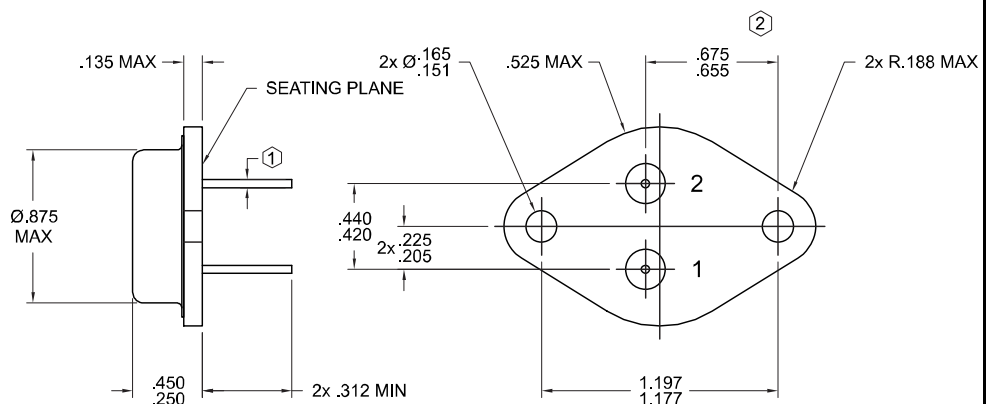
Pin 3: DRAIN

Note 1:

P/N: SFF80N20/3T
 Pin Diameter: 0.063"
 0.058"

Note 2:

This dimension shall be measured at points .050 - .055" below the seating plane. When gage is not used, measurement will be made at seating plane. This outline does not meet the minimum criteria established by JS-10 for registration.



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