



Solid State Devices, Inc.

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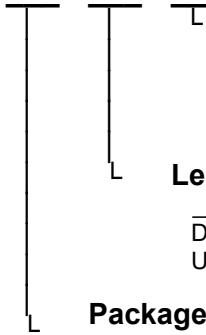
SFF57P20 Series

**57 AMP, 200 Volts, 60 mΩ
Avalanche Rated P-channel
TrenchFET**

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFF57P20



Screening ^{2/}

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

Lead Option ^{3/}

— = Straight Leads
DB = Down Bend
UB = Up Bend

Package ^{3/ 4/}

N = TO-258
P = TO-259

Features:

- TrenchMOS technology
- Lowest ON-Resistance in the Industry
- Avalanche Rated
- Hermetically Sealed, Isolated Package
- 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 | V_{GS} | ±15 ±25 | V |
| Continuous Drain Current (T_{OP} limited) | @ $T_C = 25^\circ C$ | 57 | A |
| | @ $T_C = 100^\circ C$ | 38 | A |
| Pulsed Drain Current (P_{width} / T_{OP} limited) | I_{D3} | 57 | A |
| Single and Repetitive Avalanche Energy | E_{AS} | 2.5 | J |
| Total Power Dissipation | P_D | 175 | W |
| Operating & Storage Temperature | T_{OP} & T_{STG} | -55 to +150 | $^\circ C$ |
| Thermal Resistance (Junction to Case) | $R_{\theta JC}$ | 0.7 (0.5 typ) | $^\circ C/W$ |

NOTES:

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

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

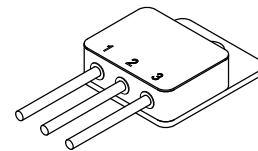
^{2/} Screening based on MIL-PRF-19500. Screening flows available on request.

^{3/} For lead bending options / pinout configurations - contact factory.

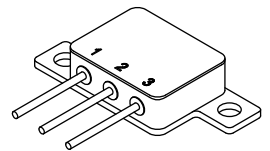
^{4/} Maximum current limited by package configuration

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

TO-258 (N)



TO-259 (P)



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

DATA SHEET #: FT0069A

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SFF57P20 Series

| Electrical Characteristics ^{5/} | | Symbol | Min | Typ | Max | Units |
|--|--|----------------------|-----------------|-------------------|-----------------|----------|
| Drain to Source Breakdown Voltage | $V_{GS} = 0V, I_D = 0.25 \text{ mA}$ | BV_{DSS} | 200 | 230 | — | V |
| Drain to Source On State Resistance | $V_{GS} = 10V, I_D = 35A, T_j = 25^\circ C$ $V_{GS} = 10V, I_D = 35A, T_j = 125^\circ C$ | $R_{DS(on)}$ | — — | 35 60 | 60 — | mΩ |
| Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}, T_j = 25^\circ C$ $V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}, T_j = 125^\circ C$ $V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}, T_j = -55^\circ C$ | $V_{GS(th)}$ | 2.0 1.0 — | 3.0 2.0 3.5 | 4.0 — 5.0 | V |
| Gate to Source Leakage | $V_{GS} = \pm 15V, T_j = 25^\circ C$ $V_{GS} = \pm 15V, T_j = 125^\circ C$ | I_{GSS} | — — | 10 30 | ±100 — | nA |
| Zero Gate Voltage Drain Current | $V_{DS} = 200V, V_{GS} = 0V, T_j = 25^\circ C$ $V_{DS} = 200V, V_{GS} = 0V, T_j = 125^\circ C$ | I_{DSS} | — — | 0.8 10 | 10 200 | μA μA |
| Transconductance | $V_{DS} = 10 \text{ V}, I_D = 35 \text{ A}$ | g_{fs} | 55 | 100 | - | S |
| Total Gate Charge | $V_{GS} = 10V$ | Q_g | — | 450 | 650 | nC |
| Gate to Source Charge | $V_{DS} = 100V$ | Q_{gs} | — | 160 | 250 | |
| Gate to Drain Charge | $I_D = 35A$ | Q_{gd} | — | 70 | 150 | |
| Turn on Delay Time | $V_{GS} = 10V$ | $t_{d(on)}$ | — | 115 | — | nsec |
| Rise Time | $V_{DS} = 100V$ | t_r | — | 60 | — | |
| Turn off Delay Time | $I_D = 35A$ | $t_{d(off)}$ | — | 240 | — | |
| Fall Time | $pw = 3\mu s$ | t_f | — | 35 | — | |
| Diode Forward Voltage | $I_F = 68A, V_{GS} = 0V$ | V_{SD} | — | 0.85 | 1.2 | V |
| Diode Reverse Recovery Time | $I_F = 10A, di/dt = 100A/\mu sec$ | t_{rr} | — | 180 | 250 | nsec |
| Reverse Recovery Charge | $I_F = 10A, di/dt = 100A/\mu sec$ $I_F = 10A, di/dt = 100A/\mu sec$ | I_{rm} Q_{rr} | — — | 14.5 1.35 | 21 — | A μC |
| Input Capacitance | $V_{GS} = 0V$ | C_{iss} | — | 23,500 | — | pF |
| Output Capacitance | $V_{DS} = 100V$ | C_{oss} | — | 1450 | — | |
| Reverse Transfer Capacitance | $f = 1 \text{ MHz}$ | C_{rss} | — | 650 | — | |

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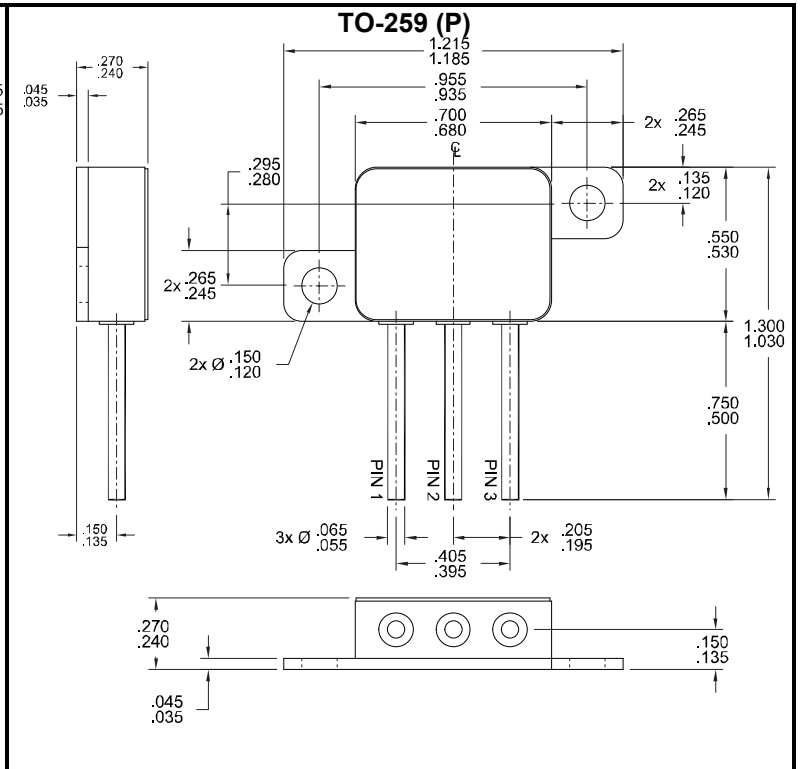
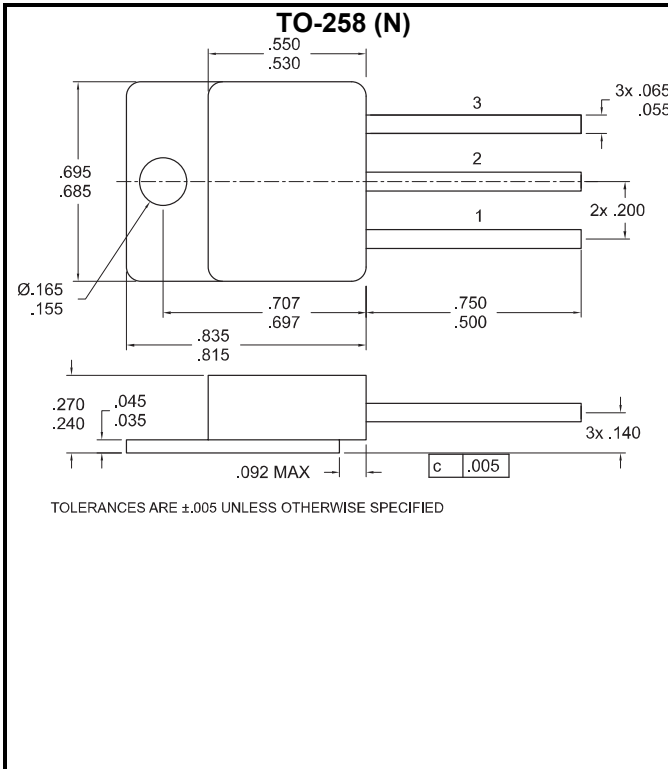
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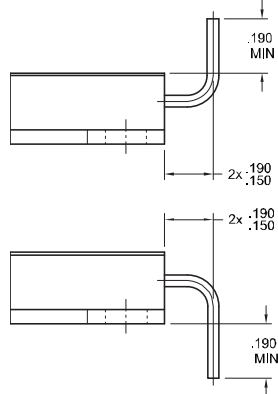
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SFF57P20 Series



Lead Bend Options for TO-258 (N) and TO-259 (P)



PIN ASSIGNMENT (Standard)

| Package | Drain | Source | Gate |
|------------|-------|--------|-------|
| TO-258 (N) | Pin 1 | Pin 2 | Pin 3 |
| TO-259 (P) | Pin 1 | Pin 2 | Pin 3 |

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