**Solid State Devices, Inc.**
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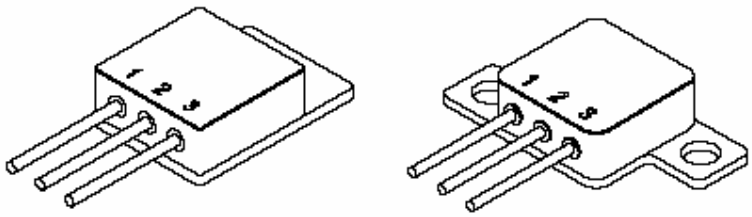
# SFF35N20M
# SFF35N20Z

## DESIGNER'S DATA SHEET

## 55 AMP (note 1) /200 Volts
## 35 mO
## N-Channel Trench Gate
## MOSFET

**TO-254 and TO-254Z**



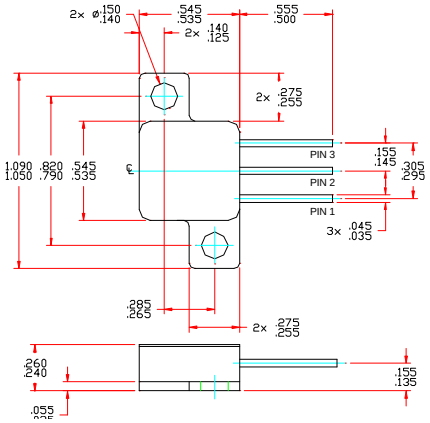
**note 1: Drain Current is package limited**

**Features:**

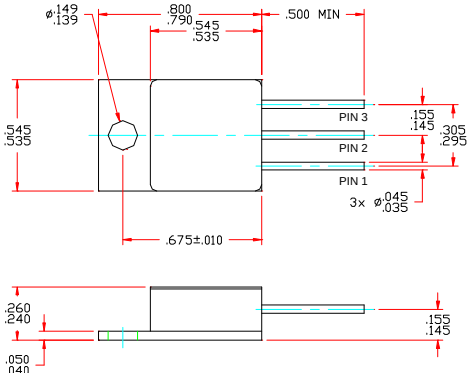
- TRENCH GATE technology
- Lowest ON-resistance in the industry
- UIS rated
- Hermetically Sealed, Isolated Power Package
- Low Total Gate Charge
- Fast Switching
- TX, TXV, S-Level screening available
- Improved ($R_{DS(ON)}$ $Q_G$) figure of merit
- Enhanced replacement for IRHM250 types

| Maximum Ratings | | Symbol | Value | Units |
|---|---|---|---|---|
| **Drain - Source Voltage** | | $V_{DSS}$ | 200 | V |
| **Gate – Source Voltage** | | $V_{GS}$ | ±20 | V |
| **Max. Continuous Drain Current**<br>**(junction temperature limited)** | @ $T_C$ = 25ºC<br>@ $T_C$ = 125ºC | $I_{D1}$<br>$I_{D2}$ | 85<br>12 | A |
| **Max. Continuous Drain Current (package limited)** | @ $T_C$ = 25ºC | $I_{D3}$ | 55 | A |
| **Max. Avalanche current** | @ L= 0.1 mH | $I_{AR}$ | 35 | A |
| **Repetitive Avalanche Energy** | @ L= 0.1 mH | $E_{AR}$ | 60 | mJ |
| **Total Power Dissipation** | @ $T_C$ = 25ºC | $P_D$ | 210 | W |
| **Operating & Storage Temperature** | | $T_{OP}$ & $T_{STG}$ | -55 to +175 | ºC |
| **Maximum Thermal Resistance**<br>(Junction to Case) | | $R_{\theta JC}$ | 0.7<br>(typ 0.55) | ºC/W |

**TO-254Z(Z)**




**TO-254 (M)**




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

**DATA SHEET #: FT0018A DOC**

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# SFRC35N20M
# SFRC35N20Z

| Electrical Characteristics [4/] | | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Drain to Source Breakdown Voltage** | $V_{GS}$ = 0V, $I_D$ = 250µA | $BV_{DSS}$ | 200 | — | — | V |
| **Drain to Source On State Resistance** | $V_{GS}$ = 10V, $I_D$ = 30A, Tj= 25°C | $R_{DS(on)}$ | — | 26 | 35.0 | mO |
| | $V_{GS}$ = 10V, $I_D$ = 30A, Tj=125°C | | — | 51 | — | |
| | $V_{GS}$ = 10V, $I_D$ = 30A, Tj= 175°C | | — | 67 | — | |
| **Gate Threshold Voltage** | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA | $V_{GS(th)}$ | 2.0 | — | 4.0 | V |
| **Gate to Source Leakage** | $V_{GS}$ = ±20V | $I_{GSS}$ | — | — | ±100 | nA |
| **Zero Gate Voltage Drain Current** | $V_{DS}$ = 200V, $V_{GS}$ = 0V, $T_j$ = 25°C | $I_{DSS}$ | — | — | 1 | µA |
| | $V_{DS}$ = 200V, $V_{GS}$ = 0V, $T_j$ = 125°C | | — | — | 50 | µA |
| | $V_{DS}$ = 200V, $V_{GS}$ = 0V, $T_j$ = 175°C | | — | — | 250 | µA |
| **Forward Transconductance** | $V_{DS}$ = 10V, $I_D$ = 30A, $T_j$ = 25°C | $g_{fs}$ | 23 | — | — | Mho |
| **Total Gate Charge** | $V_{GS}$ = 10V | $Q_g$ | — | 90 | 135 | nC |
| **Gate to Source Charge** | $V_{DS}$ = 100V | $Q_{gs}$ | — | 25 | — | |
| **Gate to Drain Charge** | $I_D$ = 65A | $Q_{gd}$ | — | 35 | — | |
| **Turn on Delay Time** | $V_{GS}$ = 10V | $t_{d(on)}$ | — | 25 | 40 | nsec |
| **Rise Time** | $V_{DS}$ = 100V | $t_r$ | — | 225 | 340 | |
| **Turn off Delay Time** | $I_D$ = 65A | $t_{d(off)}$ | — | 50 | 75 | |
| **Fall Time** | $R_G$ = 2.5O min | $t_f$ | — | 200 | 300 | |
| **Diode Forward Voltage** | $I_F$ = 65A, $V_{GS}$ = 0V | $V_{SD}$ | — | 1.0 | 1.50 | V |
| **Diode Reverse Recovery Time** | $I_F$ = 50A, di/dt = 100A/usec | $t_{rr}$ | — | 140 | 220 | nsec |
| **Peak Reverse Recovery Current** | | $I_{RM(rec)}$ | — | 8 | 12.5 | A |
| **Reverse Recovery Charge** | | $Q_{rr}$ | — | 0.55 | 1.3 | µC |
| **Input Capacitance** | $V_{GS}$ = 0V | $C_{iss}$ | — | 5100 | — | pF |
| **Output Capacitance** | $V_{DS}$ = 25V | $C_{oss}$ | — | 480 | — | |
| **Reverse Transfer Capacitance** | f = 1 MHz | $C_{rss}$ | — | 210 | — | |

**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 / lead bending options / pinout configurations Contact Factory.

4/ Unless Otherwise Specified, All Electrical Characteristics @25°C.

**Available Part Numbers:**

Consult Factory

| PIN ASSIGNMENT (Standard) | | | |
|---|---|---|---|
| **Package** | **Drain** | **Source** | **Gate** |
| **TO-254 (M)** | Pin 1 | Pin 2 | Pin 3 |
| **TO-254Z (Z)** | Pin 1 | Pin 2 | Pin 3 |
| | | | |