



**Solid State Devices, Inc.**

14830 Valley View Blvd \* La Mirada, Ca 90638

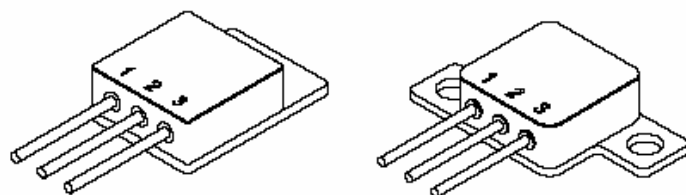
Phone: (562) 404-7855 \* Fax: (562) 404-1773

ssdi@ssdi-power.com \* www.ssdi-power.com

## DESIGNER'S DATA SHEET

TO-254 and TO-254Z

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



# SFF85N06M SFF85N06Z

**55 AMP (note 1) /60 Volts  
7 mO**

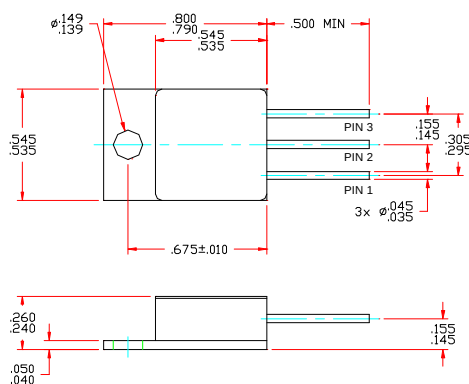
**N-Channel Trench Gate MOSFET**

### Features:

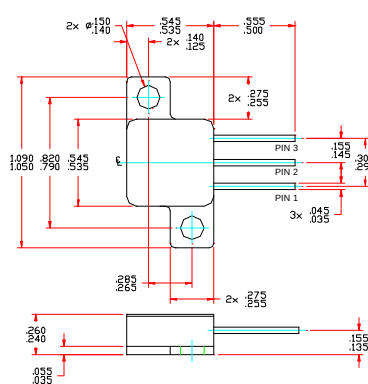
- Trench gate technology for high cell density
- Lowest ON-resistance in the industry
- Enhanced operating temperature range
- Hermetically Sealed, Isolated Package
- Low Total Gate Charge
- Fast Switching
- Enhanced replacement for IRFP064
- TX, TXV, S-Level screening available
- Improved ( $R_{DS(ON)}$   $Q_G$ ) figure of merit

| Maximum Ratings                                   |                       | Symbol               | Value             | Units        |
|---------------------------------------------------|-----------------------|----------------------|-------------------|--------------|
| Drain - Source Voltage                            |                       | $V_{DSS}$            | 60                | V            |
| Gate – Source Voltage                             |                       | $V_{GS}$             | $\pm 20$          | V            |
| Max. Continuous Drain Current (package limited)   | @ $T_C = 25^\circ C$  | $I_{D1}$             | 55 (note 1)       | A            |
|                                                   | @ $T_C = 125^\circ C$ | $I_{D2}$             | 55 (note 1)       | A            |
| Max. Instantaneous Drain Current ( $T_j$ limited) | @ $T_C = 25^\circ C$  | $I_{D3}$             | 175               | A            |
|                                                   | @ $T_C = 125^\circ C$ | $I_{D4}$             | 75                | A            |
| Max. Avalanche current                            | @ $L = 0.1$ mH        | $I_{AR}$             | 75                | A            |
| Repetitive Avalanche Energy                       | @ $L = 0.1$ mH        | $E_{AR}$             | 280               | mJ           |
| Total Power Dissipation                           | @ $T_C = 25^\circ C$  | $P_D$                | 210               | W            |
| Operating & Storage Temperature                   |                       | $T_{OP}$ & $T_{STG}$ | -55 to +175       | $^\circ C$   |
| Maximum Thermal Resistance<br>(Junction to Case)  |                       | $R_{\theta JC}$      | 0.7<br>(typ 0.55) | $^\circ C/W$ |

TO-254 (M)



TO-254Z (Z)



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

**DATA SHEET #: FT0020A**

**DOC**



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# SFF85N06M

# SFF85N06Z

| Electrical Characteristics <sup>4/</sup> |                                                | Symbol        | Min | Typ  | Max       | Units   |
|------------------------------------------|------------------------------------------------|---------------|-----|------|-----------|---------|
| Drain to Source Breakdown Voltage        | $V_{GS} = 0V, I_D = 250\mu A$                  | $BV_{DSS}$    | 60  | —    | —         | V       |
| Drain to Source On State Resistance      | $V_{GS} = 10V, I_D = 30A, T_j = 25^\circ C$    | $R_{DS(on)}$  | —   | 5.0  | 7.0       | mΩ      |
|                                          | $V_{GS} = 4.5V, I_D = 20A, T_j = 25^\circ C$   |               | —   | 7.0  | —         |         |
|                                          | $V_{GS} = 10V, I_D = 30A, T_j = 125^\circ C$   |               | —   | 9.0  | —         |         |
|                                          | $V_{GS} = 10V, I_D = 30A, T_j = 200^\circ C$   |               | —   | 10.5 | —         |         |
| Gate Threshold Voltage                   | $V_{DS} = V_{GS}, I_D = 250\mu A$              | $V_{GS(th)}$  | 1.0 | —    | 3.0       | V       |
| Gate to Source Leakage                   | $V_{GS} = \pm 20V$                             | $I_{GSS}$     | —   | —    | $\pm 100$ | nA      |
| Zero Gate Voltage Drain Current          | $V_{DS} = 48V, V_{GS} = 0V, T_j = 25^\circ C$  | $I_{DSS}$     | —   | —    | 1         | $\mu A$ |
|                                          | $V_{DS} = 48V, V_{GS} = 0V, T_j = 125^\circ C$ |               | —   | —    | 50        | $\mu A$ |
|                                          | $V_{DS} = 48V, V_{GS} = 0V, T_j = 200^\circ C$ |               | —   | —    | 10        | mA      |
| Forward Transconductance                 | $V_{DS} = 15V, I_D = 30A, T_j = 25^\circ C$    | $g_{fs}$      | 25  | —    | —         | Mho     |
| Total Gate Charge                        | $V_{GS} = 10V$                                 | $Q_g$         | —   | 150  | 225       | nC      |
| Gate to Source Charge                    | $V_{DS} = 30V$                                 | $Q_{gs}$      | —   | 30   | —         |         |
| Gate to Drain Charge                     | $I_D = 110A$                                   | $Q_{gd}$      | —   | 50   | —         |         |
| Turn on Delay Time                       | $V_{GS} = 10V$                                 | $t_{d(on)}$   | —   | 25   | 35        | nsec    |
| Rise Time                                | $V_{DS} = 30V$                                 | $t_r$         | —   | 135  | 200       |         |
| Turn off Delay Time                      | $I_D = 110A$                                   | $t_{d(off)}$  | —   | 85   | 125       |         |
| Fall Time                                | $R_G = 2.5\Omega$                              | $t_f$         | —   | 150  | 225       |         |
| Diode Forward Voltage                    | $I_F = 110A, V_{GS} = 0V$                      | $V_{SD}$      | —   | 1.1  | 1.5       | V       |
| Diode Reverse Recovery Time              | $I_F = 100A, di/dt = 100A/\mu sec$             | $t_{rr}$      | —   | 75   | 125       | nsec    |
| Peak Reverse Recovery Current            |                                                | $I_{RM(rec)}$ | —   | 2.5  | 5         | A       |
| Reverse Recovery Charge                  |                                                | $Q_{rr}$      | —   | 0.1  | 0.25      | $\mu C$ |
| Input Capacitance                        | $V_{GS} = 0V$                                  | $C_{iss}$     | —   | 7500 | —         | pF      |
| Output Capacitance                       | $V_{DS} = 25V$                                 | $C_{oss}$     | —   | 1050 | —         |         |
| Reverse Transfer Capacitance             | $f = 1 MHz$                                    | $C_{rss}$     | —   | 700  | —         |         |

## NOTES:

\* Pulse Test: Pulse Width = 300 $\mu$ sec, 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  |
|-------------|-------|--------|-------|
| TO-254 (M)  | Pin 1 | Pin 2  | Pin 3 |
| TO-254Z (Z) | Pin 1 | Pin 2  | Pin 3 |
|             |       |        |       |

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