



Solid State Devices, Inc.

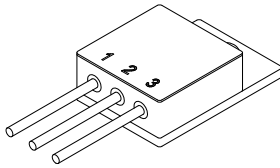
14701 Firestone Blvd * La Mirada, Ca 90638
 Phone: (562) 404-4474 * Fax: (562) 404-1773
 ssdi@ssdi-power.com * www.ssdi-power.com

SFF23N60M SFF23N60Z

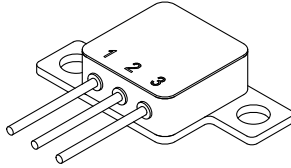
DESIGNER'S DATA SHEET

15 AMP, 600 Volts, 320 mΩ Avalanche Rated N-channel MOSFET

TO-254



TO-254Z

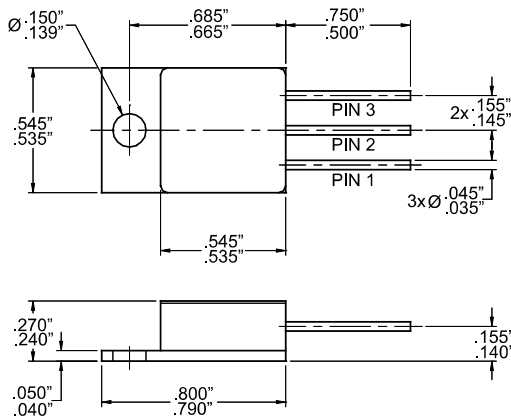


Note 1: maximum current limited by package configuration

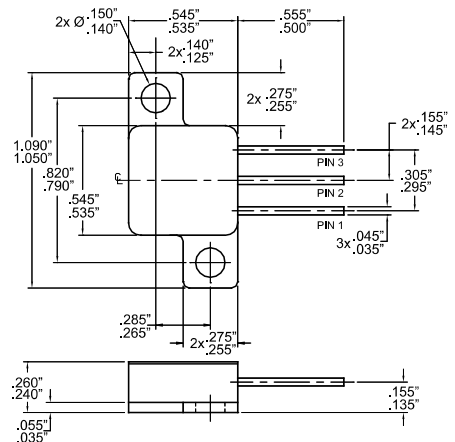
- Features:**
- Advanced low gate charge process
 - Lowest ON-resistance in the industry
 - Avalanche rated
 - Hermetically Sealed, Isolated Package
 - Low Total Gate Charge
 - Fast Switching
 - TX, TXV, S-Level screening available
 - Improved ($R_{DS(ON)}$ Q_G) figure of merit

| Maximum Ratings | Symbol | Value | Units |
|---|-------------------------|-------------------|----------------|
| Drain - Source Voltage | V_{DSS} | 600 | V |
| Gate – Source Voltage | V_{GS} | ±30 ±40 | V |
| Max. Continuous Drain Current (package limited) | @ $T_C = 25^\circ C$ | I_{D1} | 15 |
| | @ $T_C = 125^\circ C$ | I_{D2} | 7 |
| Max. Instantaneous Drain Current (Tj limited) | @ $T_C = 25^\circ C$ | I_{D3} | 23 |
| Max. Avalanche current | @ $L = 0.1$ mH | I_{AR} | 23 |
| Single / Repetitive Avalanche Energy | @ $L = 0.1$ mH | E_{AS} / E_{AR} | 1500 / 30 |
| Total Power Dissipation | @ $T_C = 25^\circ C$ | P_D | 150 |
| Operating & Storage Temperature | $T_{OP} \ \& \ T_{STG}$ | -55 to +150 | $^\circ C$ |
| Maximum Thermal Resistance (Junction to Case) | R_{jc} | 0.83 (typ.0.6) | $^\circ C / W$ |

**TO254
(M)**



**TO254Z
(Z)**



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

DATA SHEET #: FT0028A

DOC



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SFF23N60M

SFF23N60Z

| Electrical Characteristics ^{4/} | | Symbol | Min | Typ | Max | Units |
|--|---|----------------------------|-----|-------|------|-------|
| Drain to Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | BV_{DSS} | 600 | 620 | — | V |
| Drain to Source On State Resistance | $V_{GS} = 10V, I_D = 11.5A, T_j = 25^\circ C$ | R_{DS(on)} | — | 300 | 320 | mΩ |
| | $V_{GS} = 10V, I_D = 25A, T_j = 25^\circ C$ | | — | 300 | — | |
| | $V_{GS} = 10V, I_D = 11.5A, T_j = 125^\circ C$ | | — | 670 | — | |
| Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 4mA, T_j = 25^\circ C$ | V_{GS(th)} | 2.0 | 3.5 | 4.5 | V |
| | $V_{DS} = V_{GS}, I_D = 1mA, T_j = 25^\circ C$ | | — | 3.4 | — | |
| Gate to Source Leakage | $V_{GS} = \pm 30V, T_j = 25^\circ C$ | I_{GSS} | — | 20 | ±100 | nA |
| | $V_{GS} = \pm 20V, T_j = 125^\circ C$ | | — | 30 | — | |
| Zero Gate Voltage Drain Current | $V_{DS} = 600V, V_{GS} = 0V, T_j = 25^\circ C$ | I_{DSS} | — | 0.1 | 25 | μA |
| | $V_{DS} = 480V, V_{GS} = 0V, T_j = 125^\circ C$ | | — | 0.085 | 1 | |
| Forward Transconductance | $V_{DS} = 10V, I_D = 11.5A, T_j = 25^\circ C$ | g_{fs} | 10 | 20 | — | Mho |
| Total Gate Charge | $V_{GS} = 10V$ | Q_g | — | 100 | — | nC |
| Gate to Source Charge | $V_{DS} = 300V$ | Q_{gs} | — | 23 | — | |
| Gate to Drain Charge | $I_D = 16.5A$ | Q_{gd} | — | 45 | — | |
| Turn on Delay Time | $V_{GS} = 10V$ | t_{d(on)} | — | 28 | — | nsec |
| Rise Time | $V_{DS} = 300V$ | t_r | — | 33 | — | |
| Turn off Delay Time | $I_D = 16.5A$ | t_{d(off)} | — | 80 | — | |
| Fall Time | $R_G = 2.0\Omega, pw = 3\mu s$ | t_f | — | 23 | — | |
| Diode Forward Voltage | $I_F = 23A, V_{GS} = 0V$ | V_{SD} | — | 1.0 | 1.5 | V |
| | $I_F = 16.5A, V_{GS} = 0V$ | | — | 0.87 | — | |
| Diode Reverse Recovery Time | $I_F = 16.5A, di/dt = 100A/\mu sec$ | t_{rr} | — | 210 | 250 | nsec |
| Peak Reverse Recovery Current | | I_{RM(rec)} | — | tbd | — | A |
| Reverse Recovery Charge | | Q_{rr} | — | 1.3 | — | μC |
| Safe Operating Area | $V_{DS} = 15.2V, 1 \text{ sec}, T_a = 25^\circ C$ | SOA1 | — | — | 16.5 | A |
| | $V_{DS} = 65V, 1 \text{ sec}, T_a = 25^\circ C$ | SOA2 | — | — | 1.05 | |
| Input Capacitance | $V_{GS} = 0V$ | C_{iss} | — | 4100 | — | pF |
| Output Capacitance | $V_{DS} = 25V$ | C_{oss} | — | 400 | — | |
| Reverse Transfer Capacitance | $f = 1 \text{ MHz}$ | C_{rss} | — | 120 | — | |

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 |

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