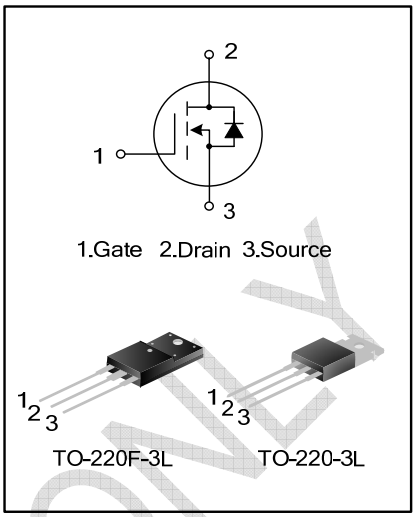
# 8A, 600V N-CHANNEL MOSFET

## GENERAL DESCRIPTION

SVF8N60T/F is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell™ structure DMOS technology. The improved planar stripe cell and the improved guard ring terminal have been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.




## FEATURES

- 8A,600V,$R_{DS(on)}$ (typ) =0.96Ω@$V_{GS}$=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

## NOMENCLATURE

S V D X N E X X X

- Silan VDMOS Code of F-cell process
- Nominal current,using 1 or2 digits: Example:4 denotes 4A, 10 denotes 10A, 08 denotes 0.8A
- N denotes N Channel
- Special Features indication, May be omitted. Example: E denotes embeded ESD structure
- Nominal Voltage,using 2 digits Example: 60 denotes 600V, 65 denotes 650V.
- Package information. Example:F:TO-220F;T:TO-220.

## ORDERING SPECIFICATIONS

| Part No. | Package | Marking | Material | Packing |
|---|---|---|---|---|
| SVF8N60T | TO-220-3L | SVF8N60T | Pb free | Tube |
| SVF8N60F | TO-220F-3L | SVF8N60F | Pb free | Tube |

## ABSOLUTE MAXIMUM RATINGS ($T_C$=25°C unless otherwise noted)

| Characteristics | Symbol | Ratings | | Unit |
|---|---|---|---|---|
| | | SVF8N60T | SVF8N60F | |
| Drain-Source Voltage | $V_{DS}$ | 600 | | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | | V |
| Drain Current | $I_D$ | 8.0 | | A |
| Drain Current Pulsed | $I_{DM}$ | 28 | | A |
| Power Dissipation($T_C$=25°C) | $P_D$ | 147 | 48 | W |
| -Derate above 25°C | | 1.18 | 0.38 | W/°C |
| Single Pulsed Avalanche Energy (Note 1) | $E_{AS}$ | 658 | | mJ |
| Operation Junction Temperature | $T_J$ | -55～+150 | | °C |
| Storage Temperature | $T_{stg}$ | -55～+150 | | °C |

## THERMAL CHARACTERISTICS

| Characteristics | Symbol | Ratings | | Unit |
|---|---|---|---|---|
| | | SVF8N60T | SVF8N60F | |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.85 | 2.6 | °C/W |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 62.5 | 120 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_C$=25°C unless otherwise noted)

| Characteristics | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain -Source Breakdown Voltage | $B_{VDSS}$ | $V_{GS}$=0V, $I_D$=250μA | 600 | -- | -- | V |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{DS}$=600V, $V_{GS}$=0V | -- | -- | 10 | μA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±30V, $V_{DS}$=0V | -- | -- | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$= VDS, $I_D$=250μA | 2.0 | -- | 4.0 | V |
| Static Drain- Source On State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=4A | -- | 0.96 | 1.2 | Ω |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V, f=1.0MHZ | -- | 1057 | | pF |
| Output Capacitance | $C_{oss}$ | | -- | 85 | -- | |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 10.3 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=300V,$I_D$=8.0A, $R_G$=25Ω (Note 2,3) | -- | 13.6 | -- | ns |
| Turn-on Rise Time | $t_r$ | | -- | 51 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 74.5 | -- | |
| Turn-off Fall Time | $t_f$ | | -- | 56.2 | -- | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=480V,$I_D$=8.0A, $V_{GS}$=10V (Note 2,3) | -- | 25.1 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 4.6 | -- | |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 10.4 | -- | |

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

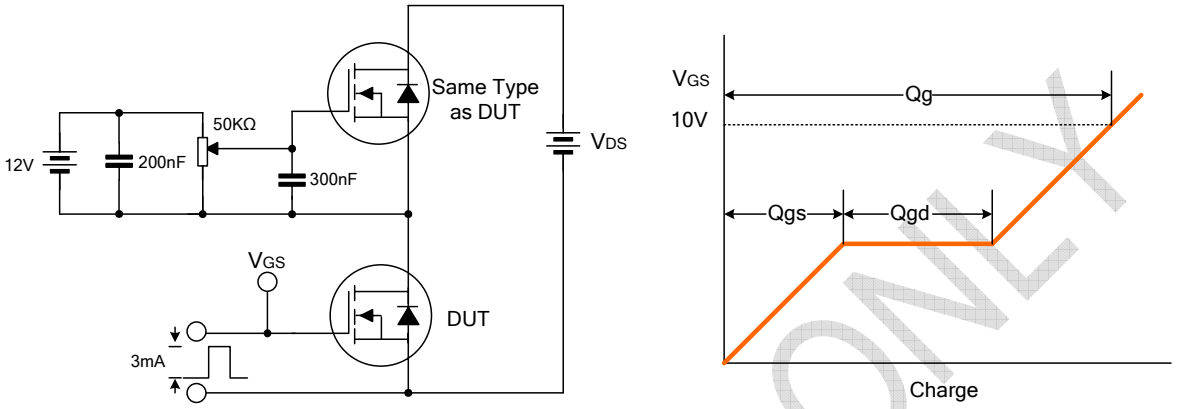
| Characteristics | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Continuous Source Current | $I_S$ | Integral Reverse P-N Junction Diode in the MOSFET | -- | -- | 8.0 | A |
| Pulsed Source Current | $I_{SM}$ | | -- | -- | 28 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=8.0A,$V_{GS}$=0V | -- | -- | 1.4 | V |
| Reverse Recovery Time | $T_{rr}$ | $I_S$=8.0A,$V_{GS}$=0V, $dI_F/dt$=100A/μS | -- | 356 | -- | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | -- | 3.1 | -- | μC |

**Notes:**

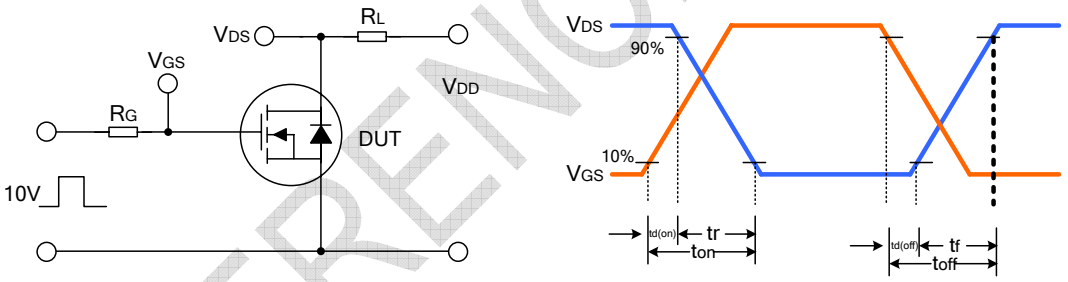
1. L=30mH,$I_{AS}$=5.64A,$V_{DD}$=185V, $R_G$=25Ω ,starting $T_J$=25°C;
2. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
3. Essentially independent of operating temperature.

## TYPICAL TEST CIRCUIT

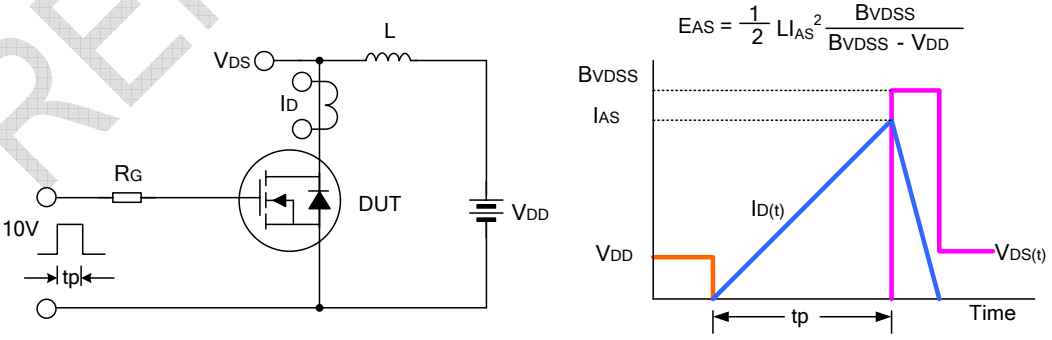
Gate Charge Test Circuit & Waveform




Resistive Switching Test Circuit & Waveform

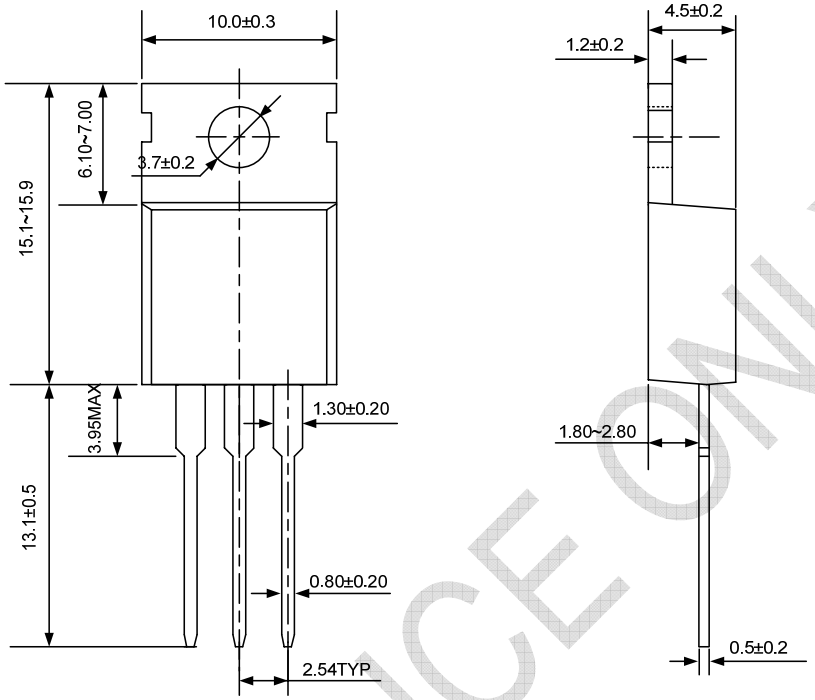



Unclamped Inductive Switching Test Circuit & Waveform

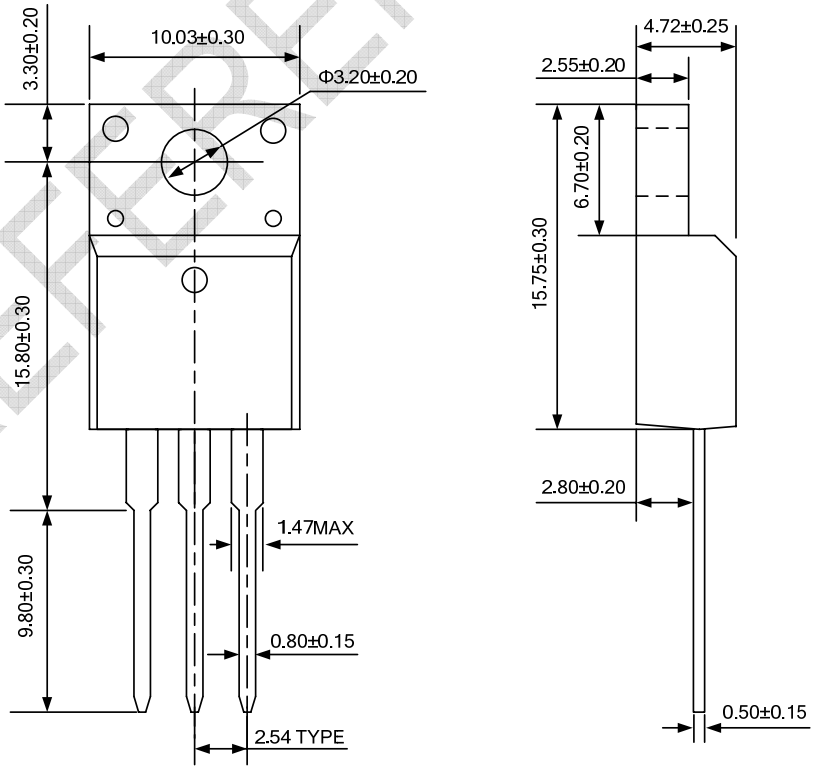


## PACKAGE OUTLINE

TO-220-3L UNIT: mm




TO-220F-3L UNIT: mm



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