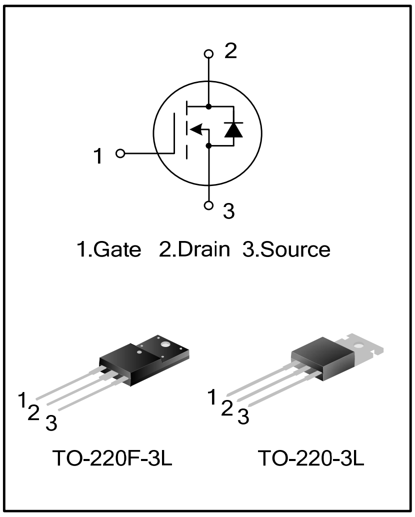
8A, 650V N-CHANNEL MOSFET

GENERAL DESCRIPTION

SVF8N65T/F is a N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell^{TM} structure VDMOS 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.

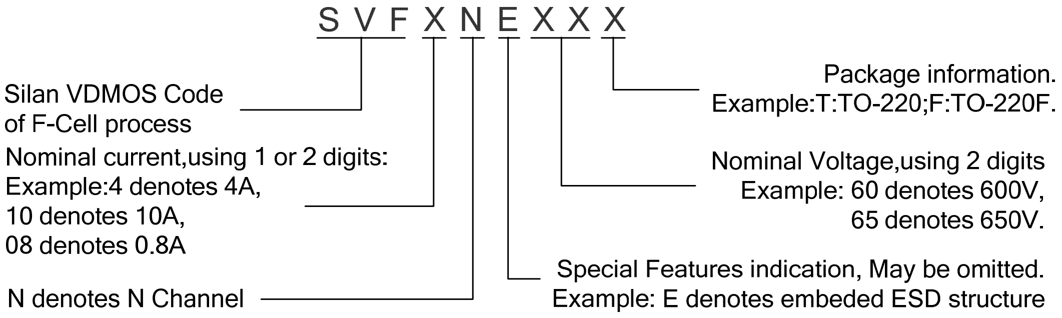
These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.



FEATURES

- 8A, 650V, $R_{DS(on)(typ)}$= 1.2Ω@V_{GS}=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVF8N65T	TO-220-3L	SVF8N65T	Pb free	Tube
SVF8N65F	TO-220F-3L	SVF8N65F	Pb free	Tube

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

Characteristics		Symbol	Ratings		Unit
			SVF8N65T	SVF8N65F	
Drain-Source Voltage		V_{DS}	650		V
Gate-Source Voltage		V_{GS}	±30		V
Drain Current	T_C=25°C	I_D	8.0		A
	T_C=100°C		5.1		
Drain Current Pulsed		I_{DM}	32.0		A
Power Dissipation (T_C=25°C)		P_D	150	48	W
- Derate above 25°C			1.20	0.38	W/°C
Single Pulsed Avalanche Energy (Note 1)		E_{AS}	398		mJ
Operation Junction Temperature Rating		T_J	-55～+150		°C
Storage Temperature Rating		T_{stg}	-55～+150		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings		Unit
		SVF8N65T	SVF8N65F	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.83	2.60	°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	650	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	--	--	1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=250μA	2.0	--	4.0	V
On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=4.0A	--	1.2	1.4	Ω
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	--	902.3	--	pF
Output Capacitance	C_{oss}		--	99	--	
Reverse Transfer Capacitance	C_{rss}		--	3.2	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=325V, I_D=8.0A, R_G=25Ω (Note 2,3)	--	28.40	--	ns
Turn-on Rise Time	t_r		--	51.47	--	
Turn-off Delay Time	$t_{d(off)}$		--	38.93	--	
Turn-off Fall Time	t_f		--	29.07	--	
Total Gate Charge	Q_g	V_{DS}=520V, I_D=8.0A, V_{GS}=10V (Note 2,3)	--	14.47	--	nC
Gate-Source Charge	Q_{gs}		--	5.04	--	
Gate-Drain Charge	Q_{gd}		--	4.72	--	

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}		--	--	32.0	
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	--	365	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.4	--	μC

Notes:

1. L=30mH, I_{AS}=4.80A, V_{DD}=120V, R_G=25Ω, starting T_J=25°C;
2. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

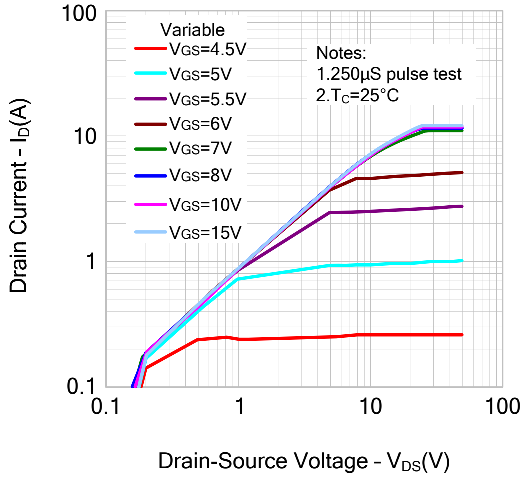


Figure 2. Transfer Characteristics

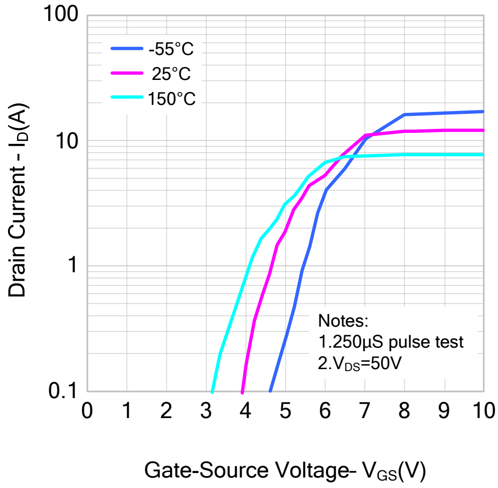


Figure 3. On-Resitance Variation vs. Drain Current and Gate Voltage

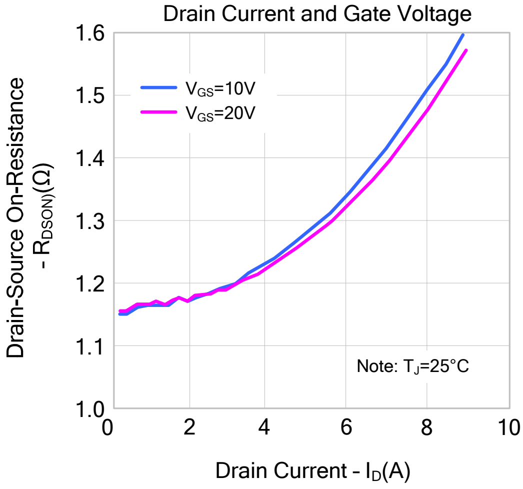


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

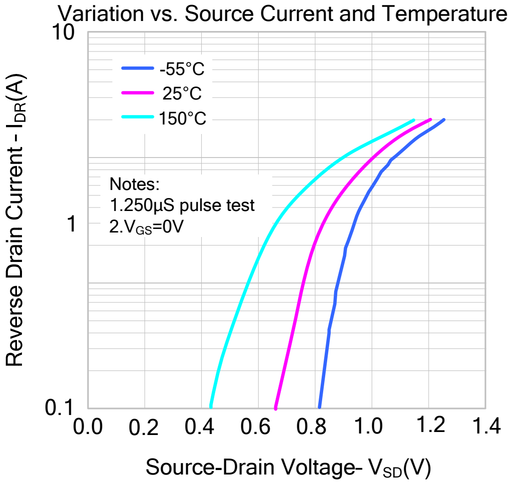


Figure 5. Capacitance Characteristics

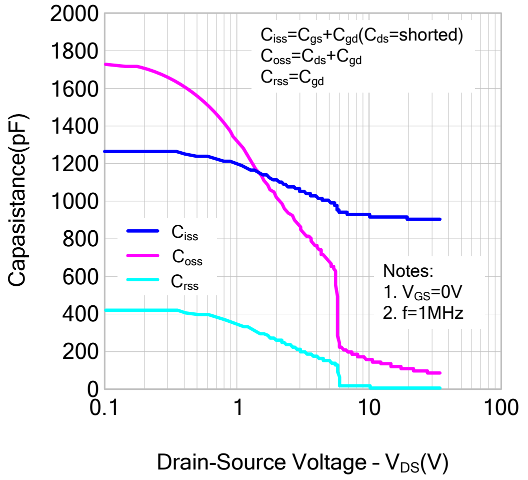
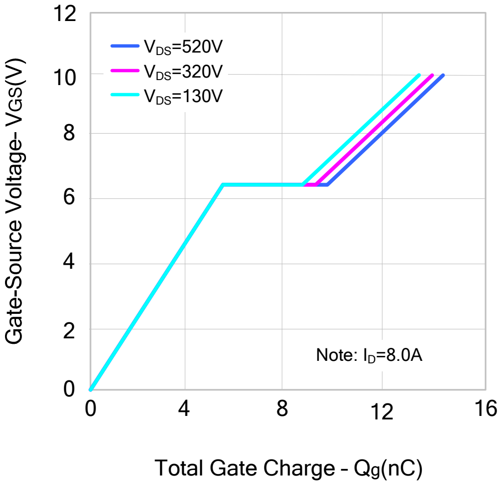


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS(continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

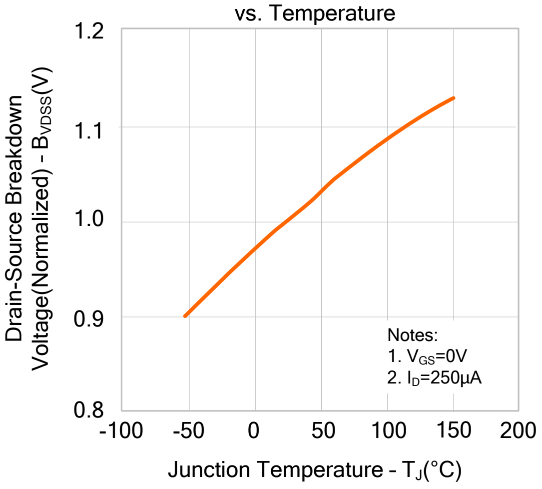


Figure 8. On-resistance Variation vs. Temperature

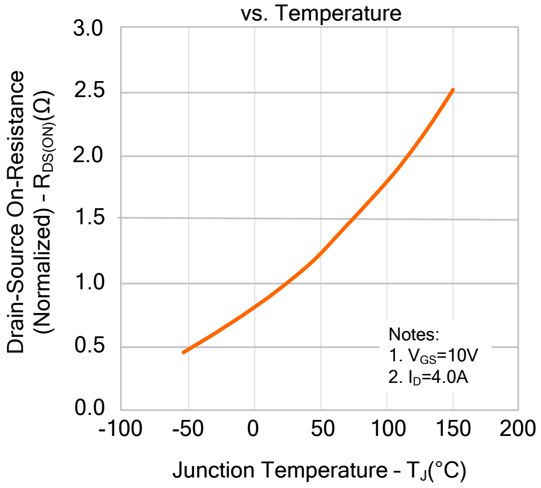


Figure 9-1. Max. Safe Operating Area(SVF8N65T)

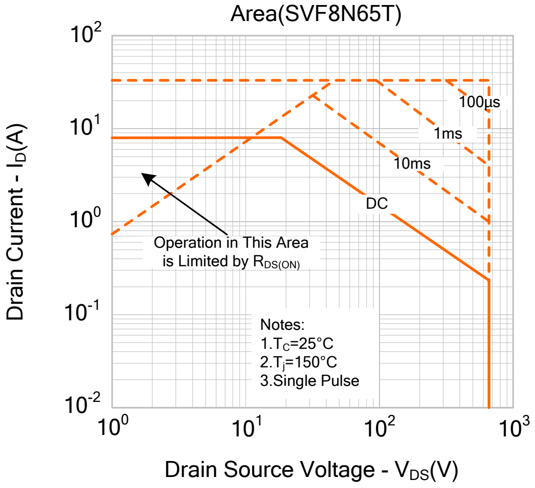


Figure 9-2. Max. Safe Operating Area(SVF8N65F)

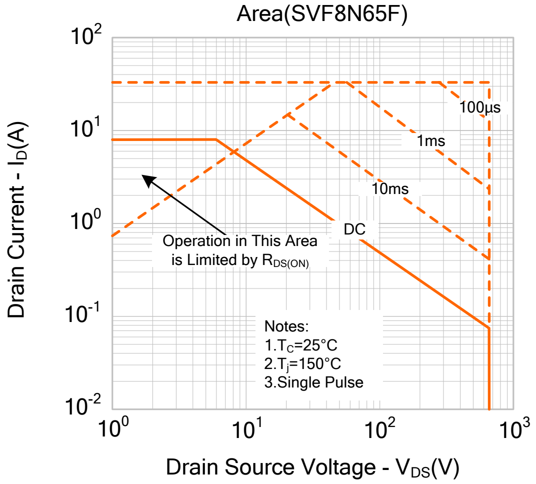
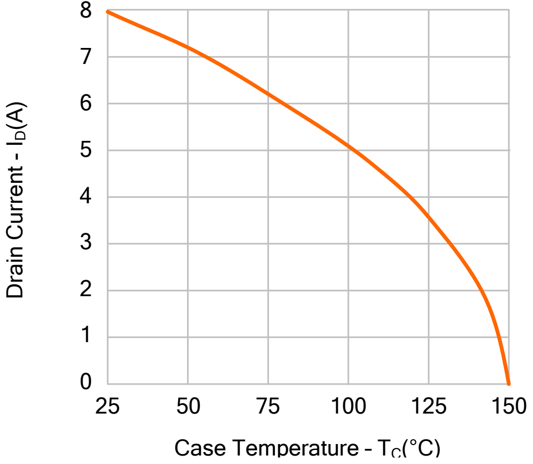
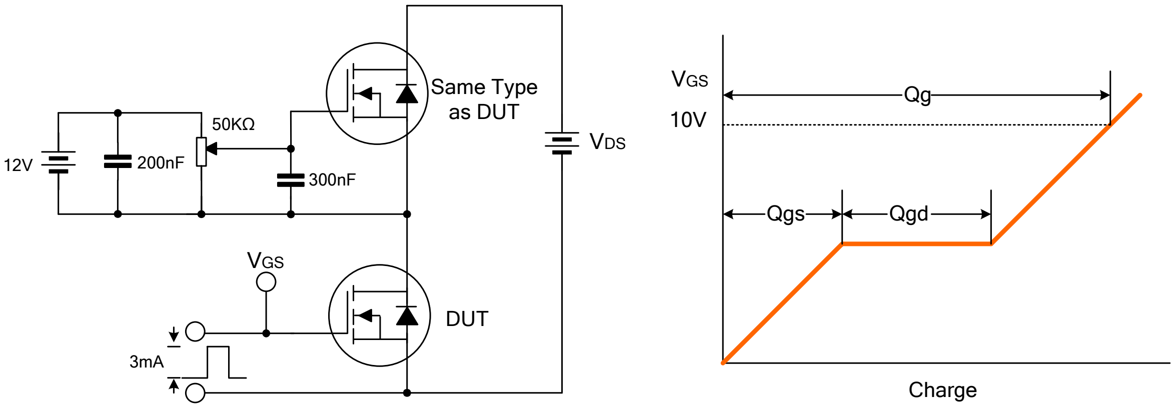


Figure 10. Maximum Drain Current vs. Case Temperature

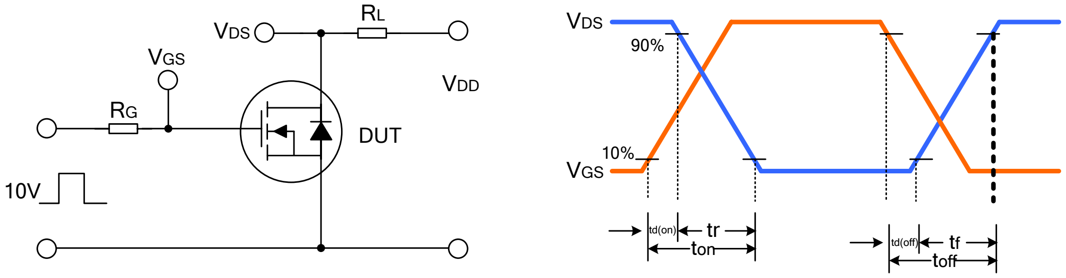


TYPICAL TEST CIRCUIT

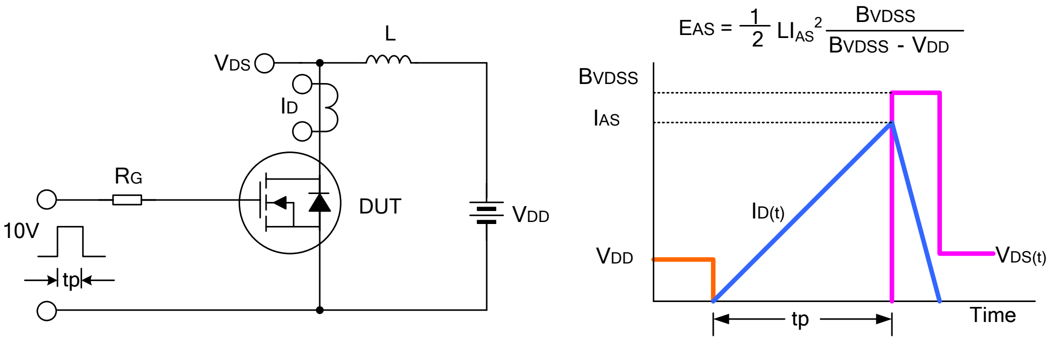
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

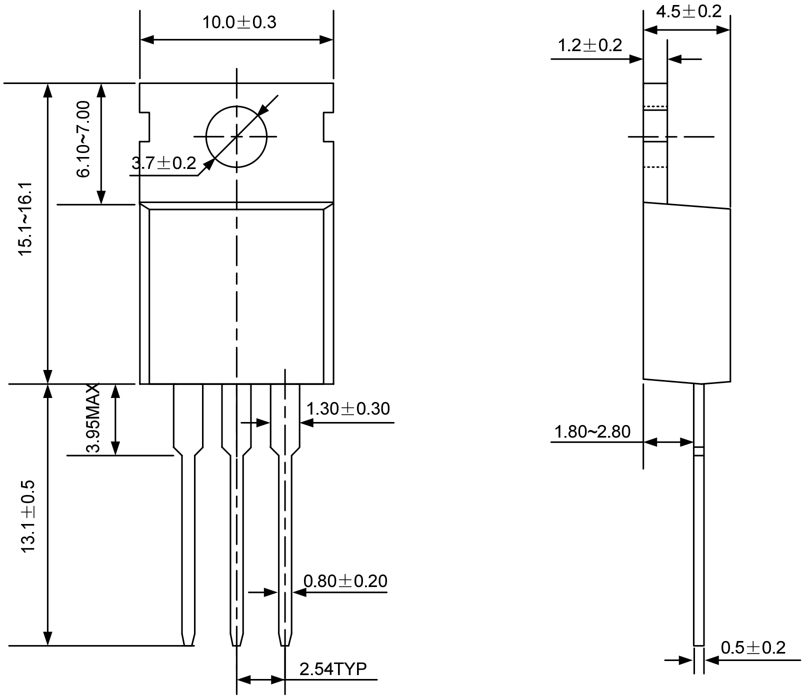


Unclamped Inductive Switching Test Circuit & Waveform

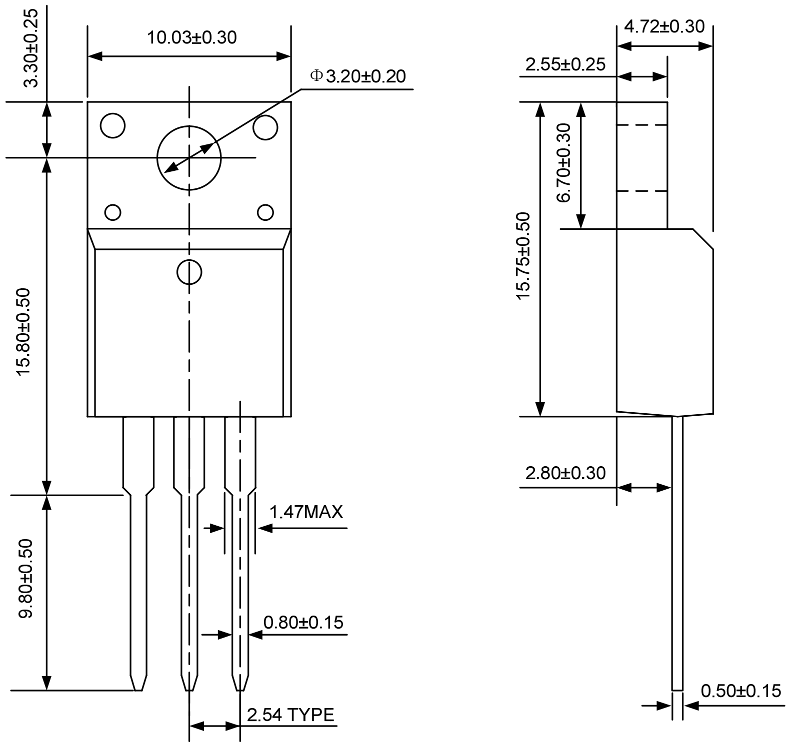


PACKAGE OUTLINE

TO-220-3L **UNIT: mm**



TO-220F-3L **UNIT: mm**



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- **Silan will supply the best possible product for customers!**

ATTACHMENT

Revision History

Date	REV	Description	Page
2011.05.04	1.0	Original	
2011.09.13	1.1	Modify “PACKAGE OUTLINE”	
2011.12.27	1.2	Modify “ELECTRICAL CHARACTERISTICS” and the capacitance characteristic curve	