

82A, 250V N-CHANNEL MOSFET

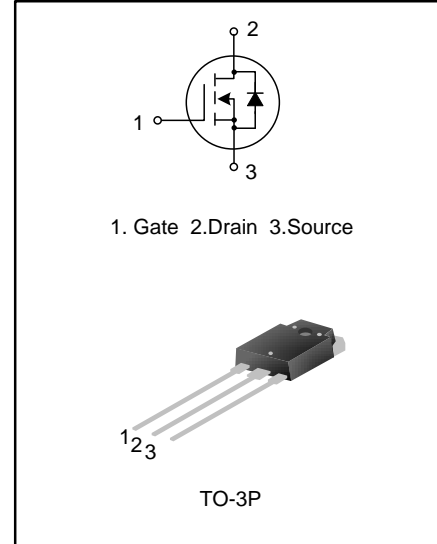
DESCRIPTION

SVF82NF25APN is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell™ structure VDMOS technology. The improved cell and 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 supplies, DC-DC converters and H-bridge PWM motor drivers.

FEATURES

- ◆ 82A, 250V, $R_{DS(on)}(typ.)=28m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low C_{rss}
- ◆ Fast switching
- ◆ Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVF82NF25APN	TO-3P	82NF25A	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, $T_C=25^\circ\text{C}$)

Characteristics	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_C=25^\circ\text{C}$	82
		$T_C=100^\circ\text{C}$	52
Drain Current Pulsed	I_{DM}	328	A
Power Dissipation ($T_C=25^\circ\text{C}$) -Derate above 25°C	P_D	500	W
		4.0	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	4360	mJ
Operation Junction Temperature Range	T_J	$-55\sim+150$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55\sim+150$	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.25	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS (UNLESS OTHERWISE NOTED, $T_C=25^{\circ}C$)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	250	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=250V, V_{GS}=0V$	--	--	6.0	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	--	5.0	V
On State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=41A$	--	28	35	m Ω
Gate Resistance	R_g	$f=1.0MHz$	--	1.9	--	Ω
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	--	5997	--	pF
Output Capacitance	C_{oss}		--	951	--	
Reverse Transfer Capacitance	C_{rss}		--	162	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=125V, R_G=24\Omega, I_D=41A$ (Notes 2, 3)	--	106	--	ns
Turn-on Rise Time	t_r		--	110	--	
Turn-off Delay Time	$t_{d(off)}$		--	326	--	
Turn-off Fall Time	t_f		--	155	--	
Total Gate Charge	Q_g	$V_{DS}=200V, I_D=82A, V_{GS}=10V$ (Notes 2, 3)	--	161	--	nC
Gate-Source Charge	Q_{gs}		--	48	--	
Gate-Drain Charge	Q_{gd}		--	91	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	82	A
Pulsed Source Current	I_{SM}		--	--	328	
Diode Forward Voltage	V_{SD}	$I_S=82A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=41A, V_{GS}=0V, di_F/dt=100A/\mu s$ (Note2)	--	201	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.5	--	μC

Notes:

1. $L=30mH, V_{DD}=100V, R_G=25\Omega$, starting $T_J=25^{\circ}C$;
2. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

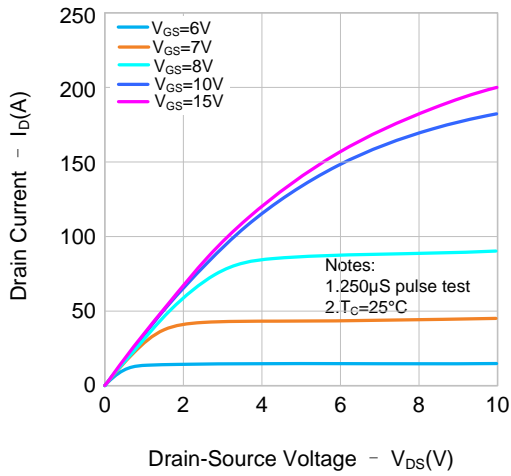


Figure 2. Transfer Characteristics

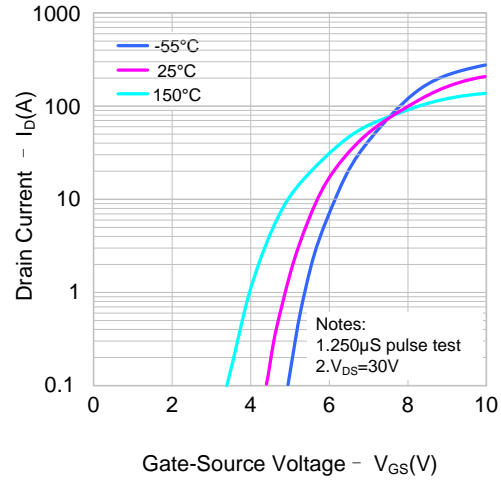


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

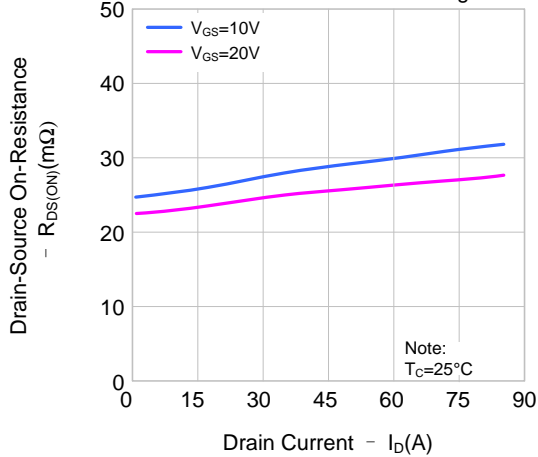


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

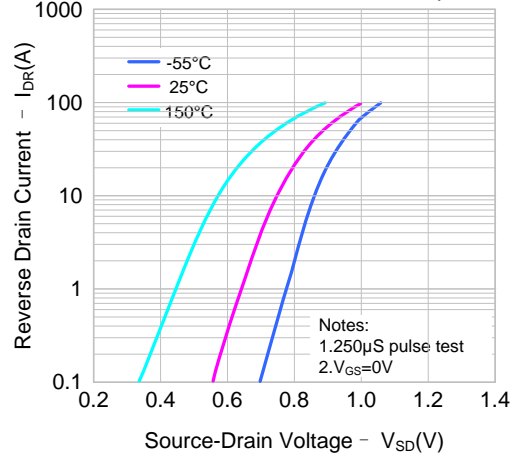


Figure 5. Capacitance Characteristics

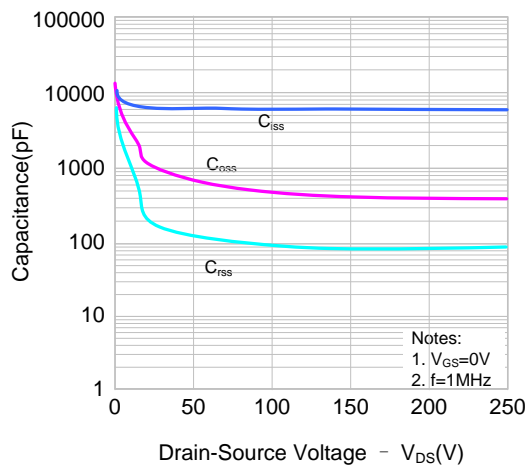
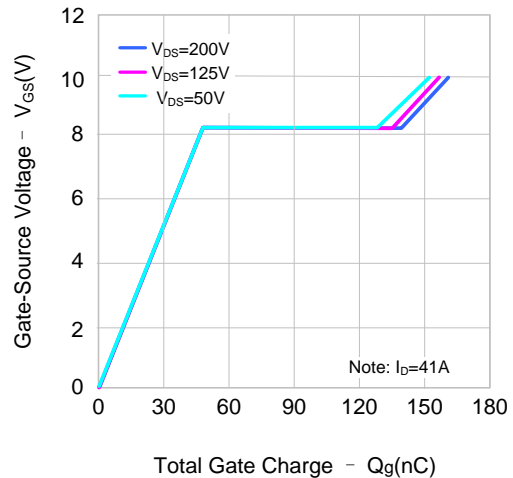


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS(CONTINUED)

Figure 7. Breakdown Voltage Variation vs. Temperature

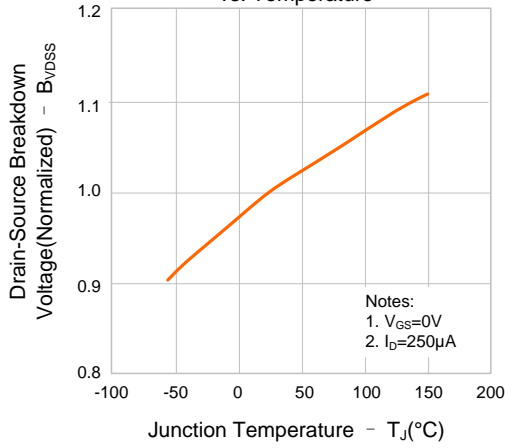


Figure 8. On-resistance Variation vs. Temperature

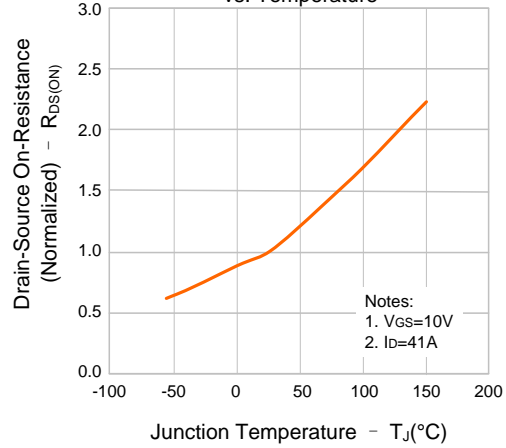
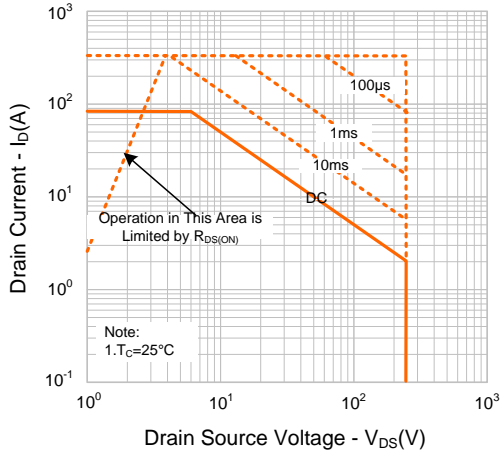
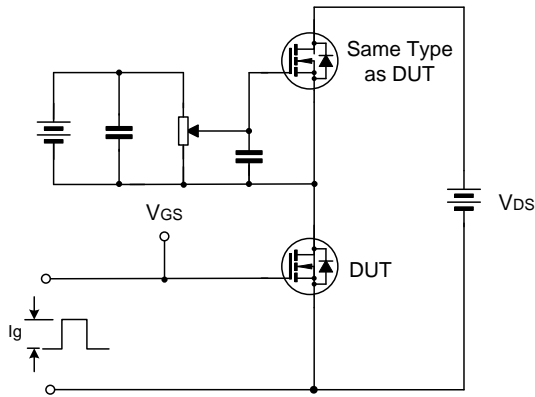


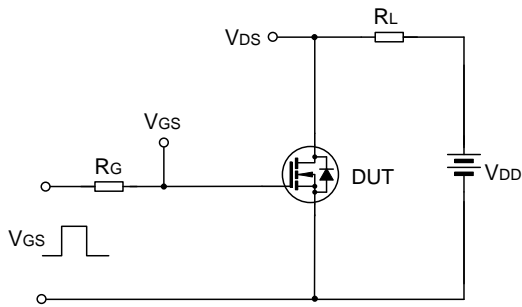
Figure 9. Max. Safe Operating Area



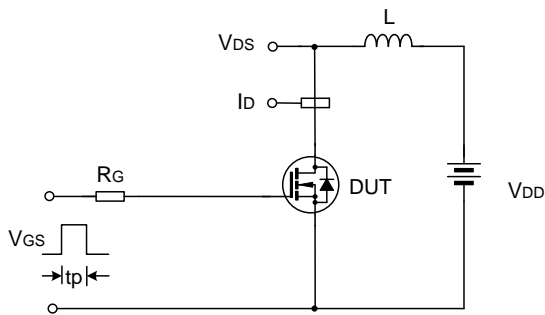
TYPICAL TEST CIRCUIT



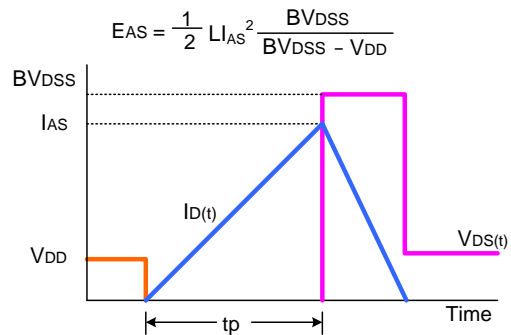
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



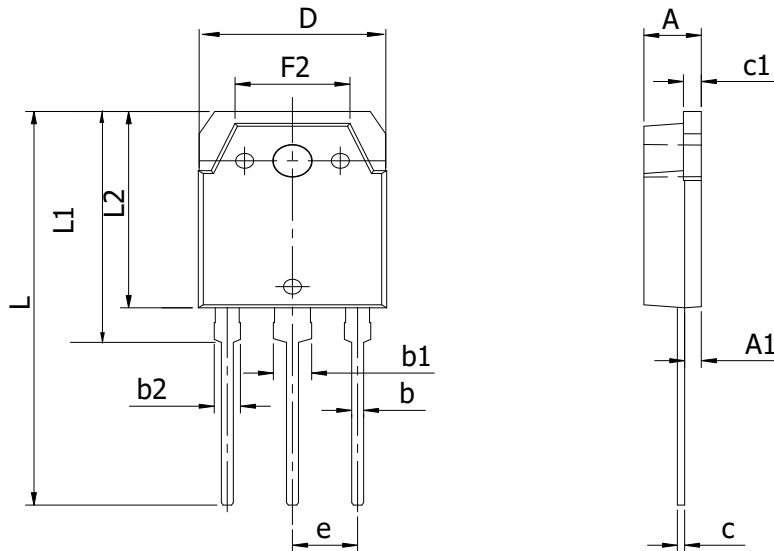
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-3P

UNIT: mm



SYMBOL	MIN	NOM	MAX
A	4.4	\	5.2
C1	1.2	\	1.8
A1	1.2	\	2
b	0.7	1	1.3
b1	2.7	3	3.3
b2	1.7	2	2.3
D	15	15.5	16
C	0.4	0.6	0.8
F2	8.5	\	10
e	5.45typ		
L1	22.6	\	23.6
L	39	\	41.5
L2	19.5	\	21

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Part No.:	SVF82NF25APN	Document Type:	Datasheet
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Rev.: 1.0

Revision History:

1. First release
