

atrin **electronic**

Expertise, variety and quality



www.atrinelec.com

آترین الکترونیک

تخصص، تنوع و کیفیت

02166766957 - 02166766927



info@atrinelec.com



تهران پاساژ امجد طبقه 1 واحد 16



@atrinelec



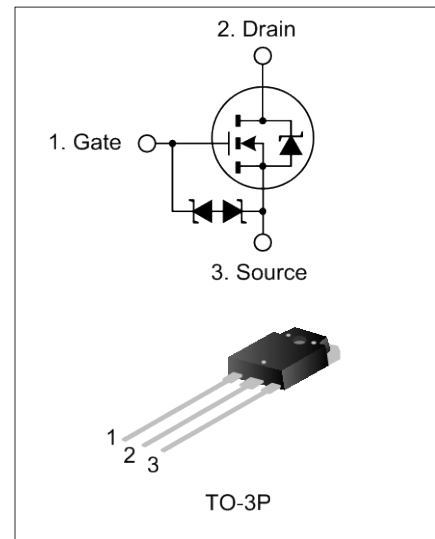
9A, 900V N-CHANNEL MOSFET

DESCRIPTION

SVF3878PN is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell™ 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

- ◆ 9A, 900V, $R_{DS(on)}$ (typ.)=1.0Ω@ $V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low Crss
- ◆ Fast switching
- ◆ Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVF3878PN	TO-3P	3878	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS (unless otherwise noted, $T_C=25^\circ\text{C}$)

Characteristics	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current	I_D	$T_C=25^\circ\text{C}$	9.0
		$T_C=100^\circ\text{C}$	5.7
Drain Current Pulsed	I_{DM}	27.0	A
Power Dissipation ($T_C=25^\circ\text{C}$) -Derate above 25°C	P_D	150	W
		1.2	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	966	mJ
Operation Junction Temperature Range	T_J	-55~+150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~+150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.83	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	B _{VDSS}	V _{GS} =0V, I _D =250μA	900	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V	--	--	100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	--	--	±10.0	μA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D =250μA	2.5	--	4.5	V
On State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =4.5A	--	1.0	1.28	Ω
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	--	2009	--	pF
Output Capacitance	C _{OSS}		--	208	--	
Reverse Transfer Capacitance	C _{RSS}		--	46.5	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} =400V, R _G =25Ω, I _D =4.0A (Note2,3)	--	21.67	--	ns
Turn-on Rise Time	t _r		--	27.60	--	
Turn-off Delay Time	t _{d(off)}		--	83.73	--	
Turn-off Fall Time	t _f		--	29.73	--	
Total Gate Charge	Q _g	V _{DD} =450V, V _{GS} =10V, I _D =9.0A (Note 2,3)	--	67.8	--	nC
Gate-Source Charge	Q _{gs}		--	10.1	--	
Gate-Drain Charge	Q _{gd}		--	38.6	--	

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	--	--	9.0	A
Pulsed Source Current	I _{SM}		--	--	27.0	
Diode Forward Voltage	V _{SD}	I _S =9.0A, V _{GS} =0V	--	--	1.4	V
Reverse Recovery Time	T _{rr}	I _S =9.0A, V _{GS} =0V, dI _F /dt=100A/μS (Note2)	--	715	--	ns
Reverse Recovery Charge	Q _{rr}		--	6.47	--	μC

Notes:

- L=30mH, I_{AS}=7.70A, V_{DD}=100V, R_G=25Ω, starting T_J=25°C;
- Pulse Test: Pulse width ≤300μs, Duty cycles ≤2%;
- Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

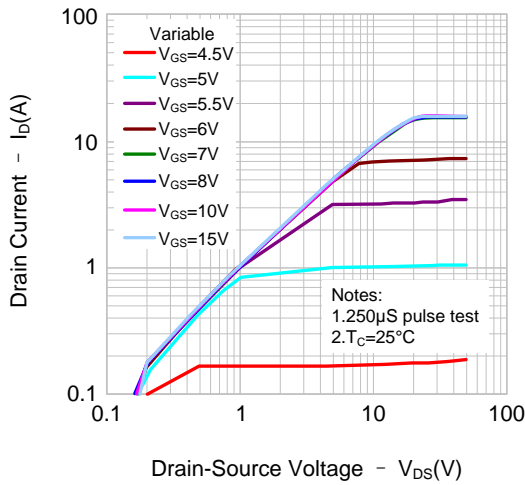


Figure 2. Transfer Characteristics

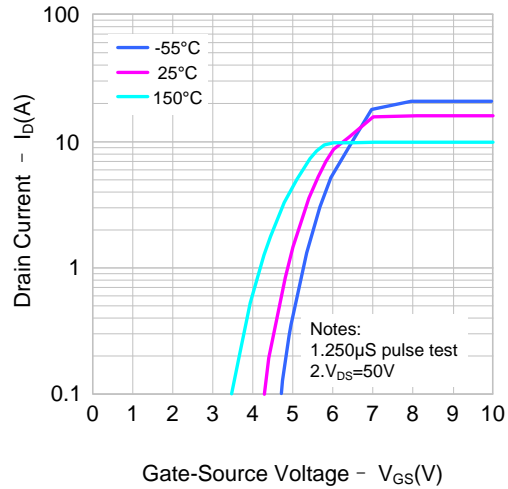


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

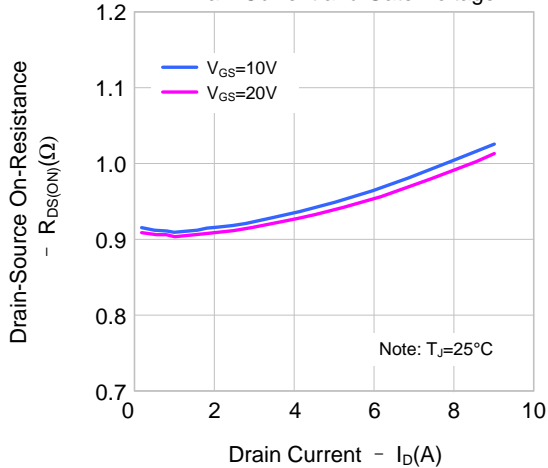


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

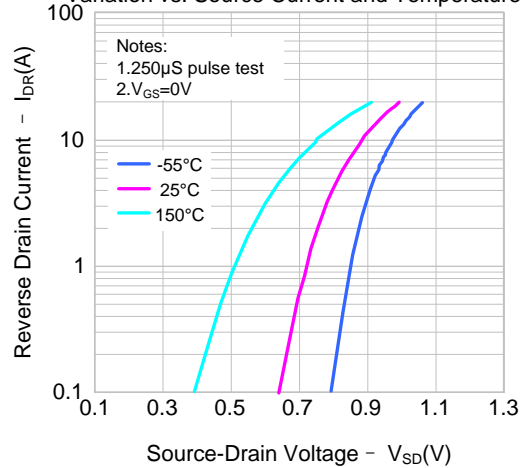


Figure 5. Capacitance Characteristics

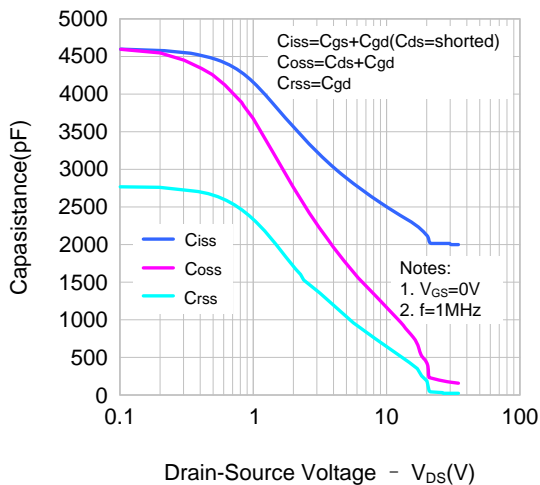
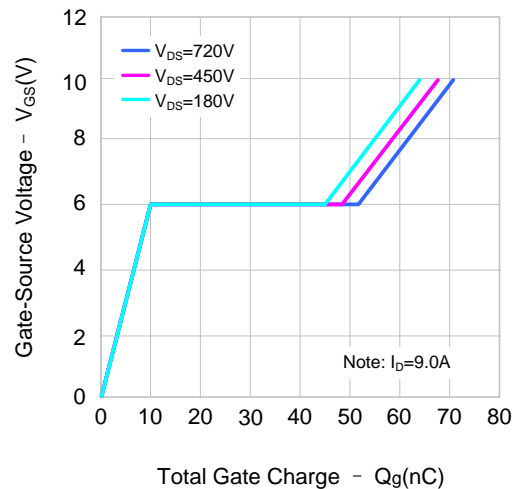


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS(CONTINUED)

Figure 7. Breakdown Voltage Variation vs. Temperature

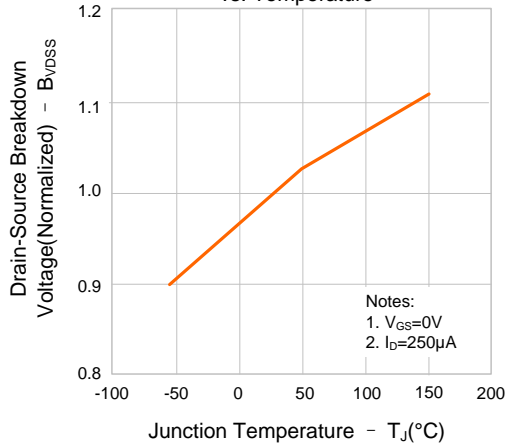


Figure 8. On-resistance Variation vs. Temperature

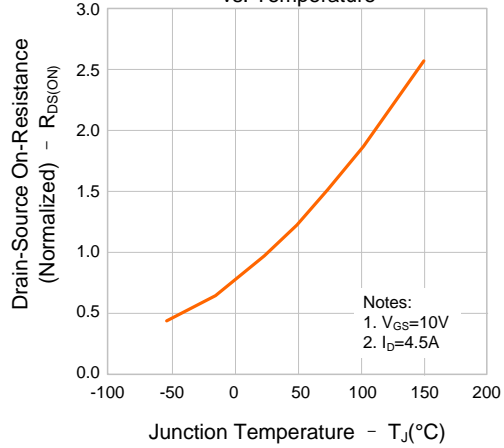


Figure 9. Max. Safe Operating Area

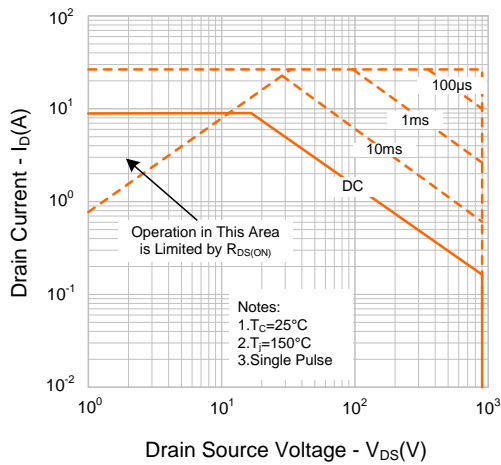
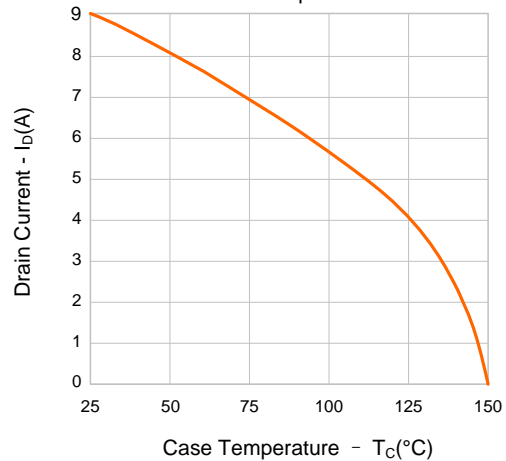
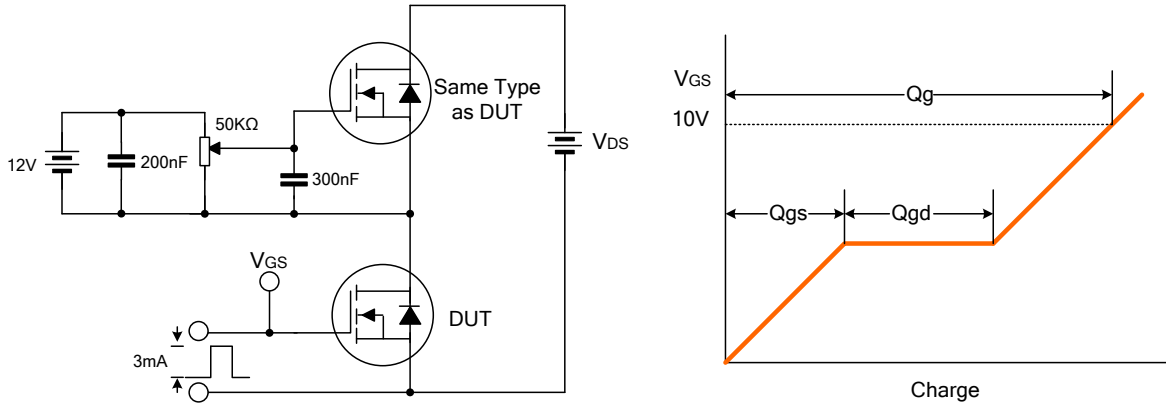


Figure 10. Maximum Drain Current vs. Case Temperature

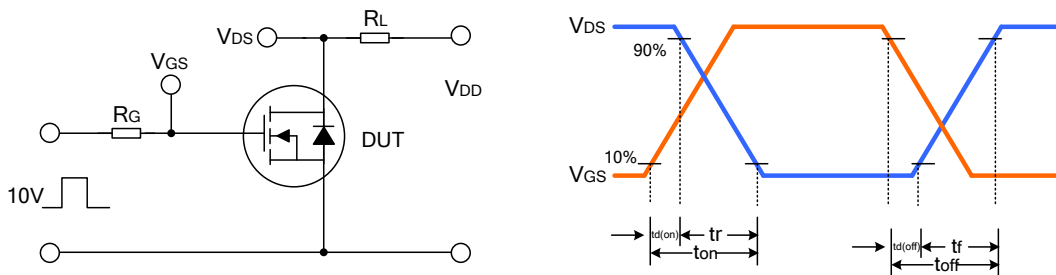


TYPICAL TEST CIRCUIT

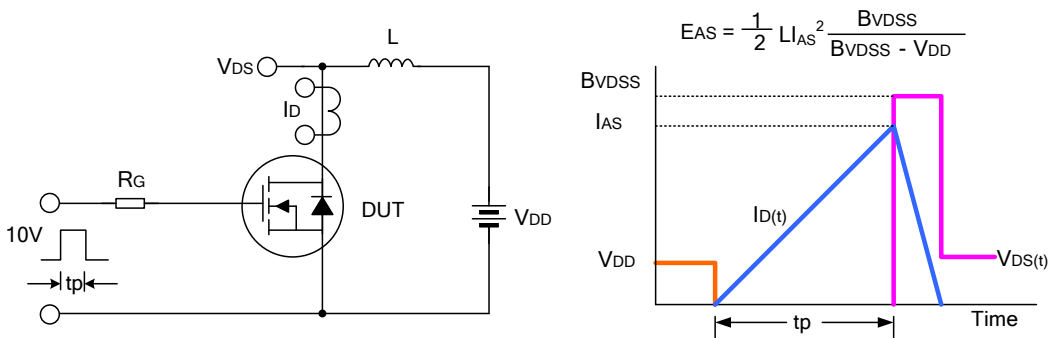
Gate Charge Test Circuit & Waveform



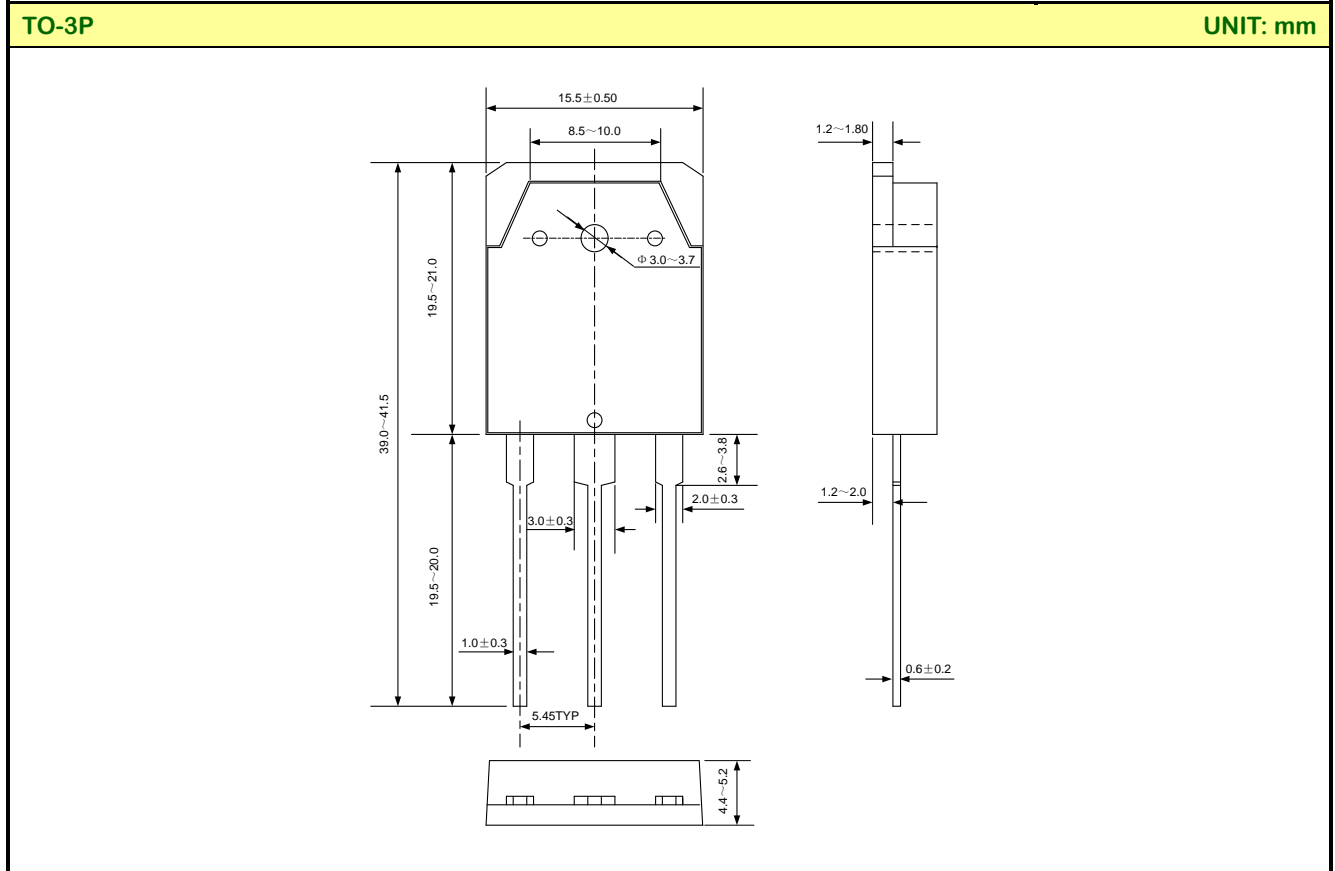
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE



Disclaimer :

- Silan reserves the right to make changes to the information herein for the improvement of the design and performance without further notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.
- All semiconductor products malfunction or fail with some probability under special conditions. When using Silan products in system design or complete machine manufacturing, it is the responsibility of the buyer to comply with the safety standards strictly and take essential measures to avoid situations in which a malfunction or failure of such Silan products could cause loss of body injury or damage to property.
- Silan will supply the best possible product for customers!

Part No.:	SVF3878PN	Document Type:	Datasheet
Copyright:	HANGZHOU SILAN MICROELECTRONICS CO.,LTD	Website:	http://www.silan.com.cn

Rev.:	1.0	Author:	Yin Zi
-------	-----	---------	--------

Revision History:

1. First release
-
-