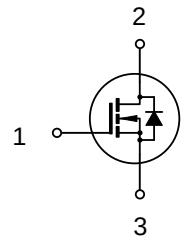
80A, 100V N-CHANNEL MOSFET

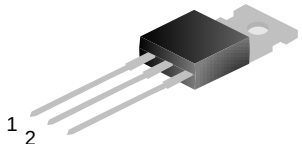
DESCRIPTION

SVG10120NAT(D) is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan's LVMOS technology. The improved process and cell structure have been especially tailored to minimize on-state resistance, provide superior switching performance.

This device is widely used in UPS, Power Management for Inverter Systems.



1.Gate 2.Drain 3.Source



TO-220-3L TO-252-2L

FEATURES

- 80A, 100V, $R_{DS(on)(typ.)}$=10mΩ@V_{GS}=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVG10120NAT	TO-220-3L	10120NAT	Pb free	Tube
SVG10120NADTR	TO-252-2L	10120NAD	Halogen free	Tape&Reel

ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, T_A=25°C)

Characteristics		Symbol	Ratings		Unit
			SVG10120NAT	SVG10120NAD	
Drain-Source Voltage		V_{DS}	100		V
Gate-Source Voltage		V_{GS}	±20		V
Drain Current	T_C=25°C	I_D	80		A
	T_C=100°C		51		
Drain Current Pulsed		I_{DM}	320		A
Power Dissipation(T_C=25°C)		P_D	152	121	W
-Derate above 25°C			1.2	1.0	W/°C
Single Pulsed Avalanche Energy(Note 1)		E_{AS}	157		mJ
Operation Junction Temperature Range		T_J	-55～+150		°C
Storage Temperature Range		T_{stg}	-55～+150		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings		Unit
		SVG10120NAT	SVG10120NAD	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.82	1.03	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62	°C/W

ELECTRICAL CHARACTERISTICS (UNLESS OTHERWISE NOTED, T_J=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	100	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	--	--	1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=250μA	2.5	--	3.5	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=11.5A	--	10	12	mΩ
		--	--	--	--	--
Gate Resistance	R_G	f=1MHz	--	1.8	--	Ω
Input Capacitance	C_{iss}	f=1MHz,V_{GS}=0V,V_{DS}=50V	--	3237	--	pF
Output Capacitance	C_{oss}		--	328	--	
Reverse Transfer Capacitance	C_{rss}		--	12	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V, V_{GS}=10V, R_G=3Ω, I_D=11.5A (Note 2,3)	--	16	--	ns
Turn-on Rise Time	t_r		--	33	--	
Turn-off Delay Time	$t_{d(off)}$		--	56	--	
Turn-off Fall Time	t_f		--	13	--	
Total Gate Charge	Q_g	V_{DD}=50V, V_{GS}=10V, I_D=11.5A (Note 2,3)	--	59	--	nC
Gate-Source Charge	Q_{gs}		--	17	--	
Gate-Drain Charge	Q_{gd}		--	17	--	

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	--	--	80	A
Pulsed Source Current	I_{SM}		--	--	320	
Diode Forward Voltage	V_{SD}	I_S=11.5A,V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_S=11.5A,V_{GS}=0V, dIF/dt=100A/μs (Note 2)	--	58	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.12	--	μC

Notes:

1.L=0.5mH, I_{AS}=25A，V_{DD}=50V, R_G=10Ω,starting T_J=25°C;

2.Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;

3.Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

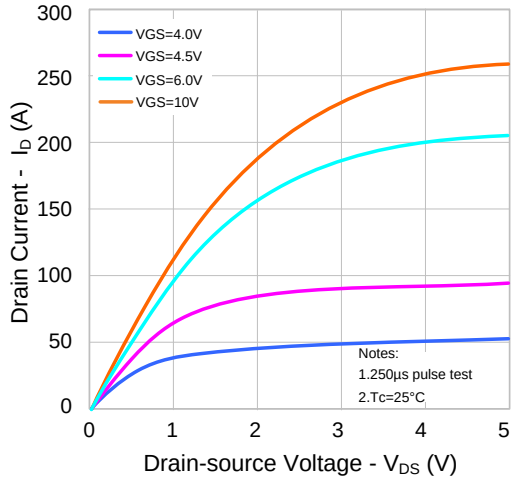


Figure 2. Transfer Characteristics

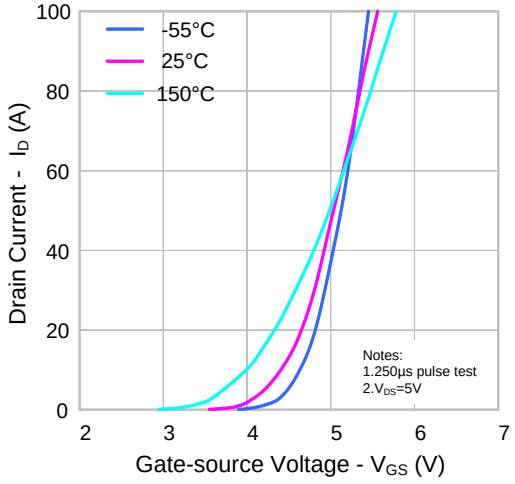


Figure 3. On-resistance vs. Drain Current

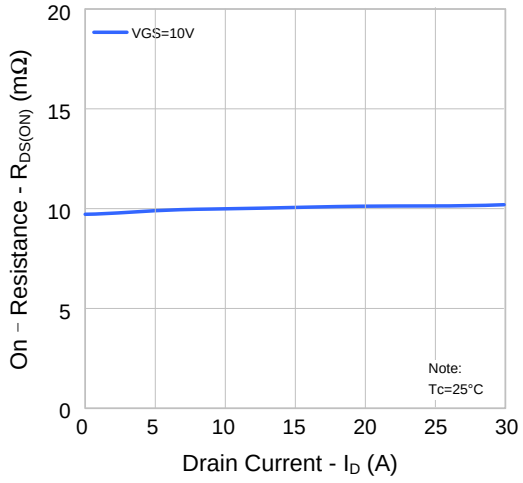


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

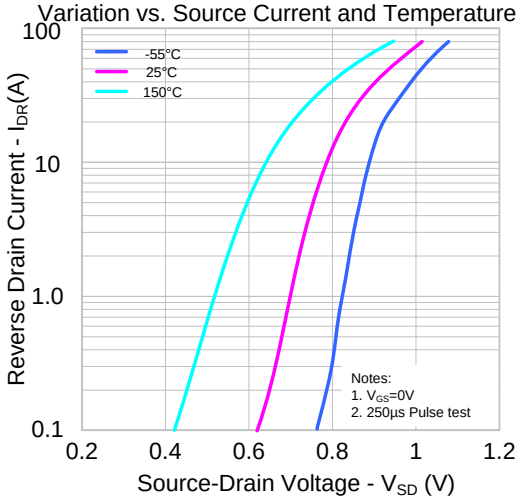


Figure 5. Capacitance Characteristics

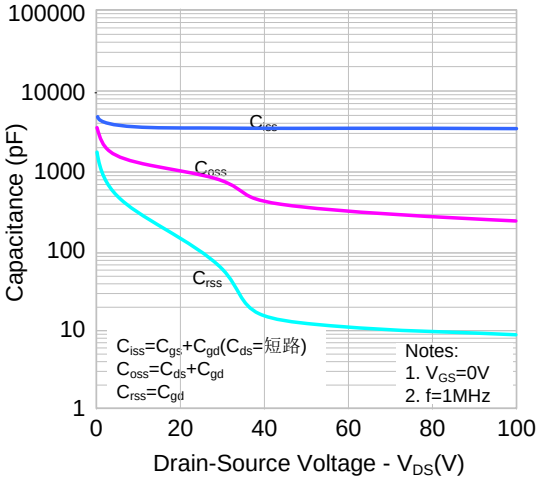
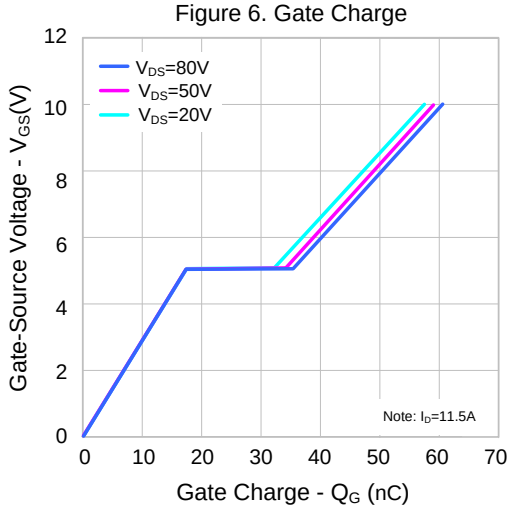


Figure 6. Gate Charge



TYPICAL CHARACTERISTICS(CONTINUED)

Figure 7. Breakdown Voltage vs. Temperature Characteristics

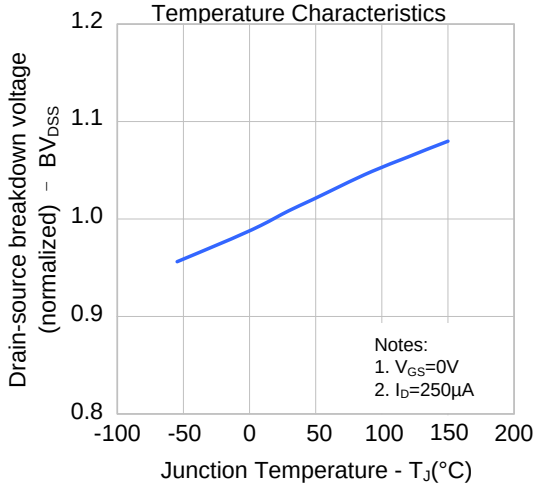


Figure 8. On-resistance vs. Temperature Characteristics

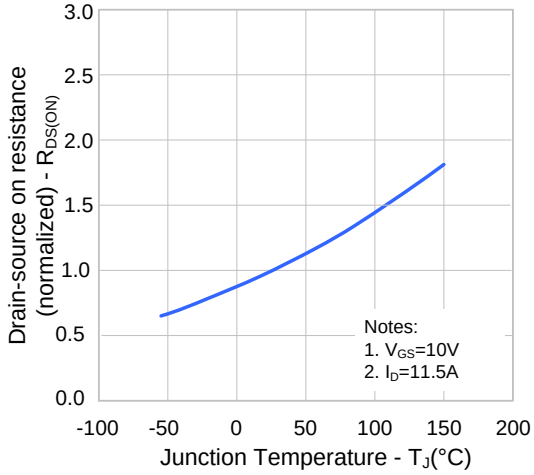


Figure 9-1. Max. Safe Operating Area(SVG10120NAT)

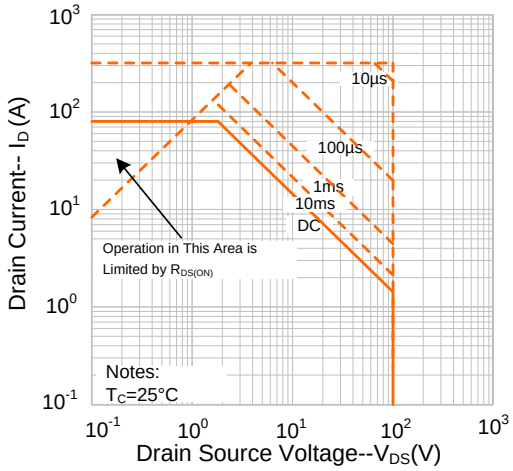
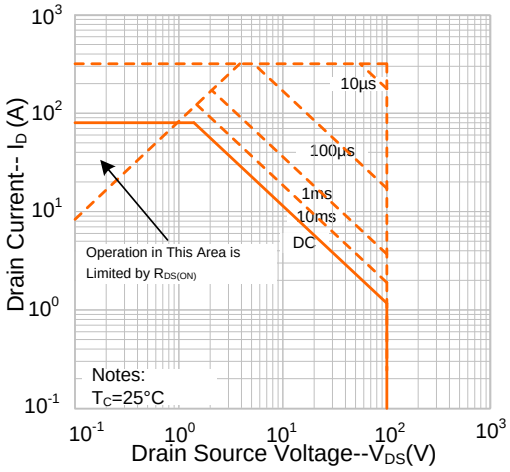
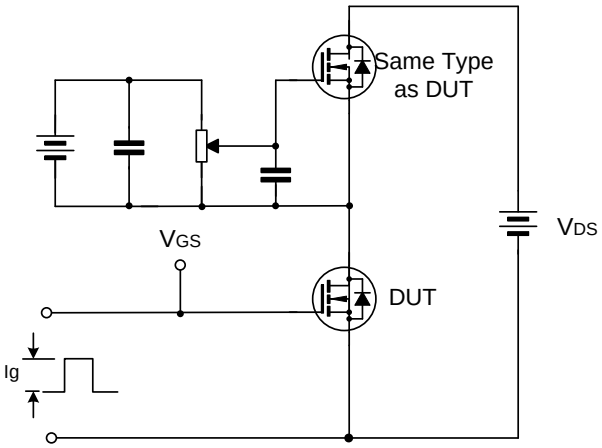


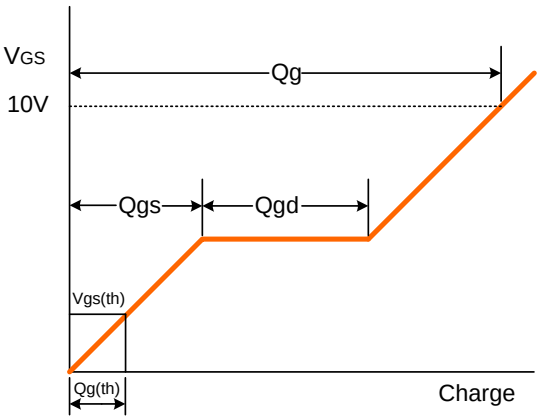
Figure 9-2. Max. Safe Operating Area(SVG10120NAD)



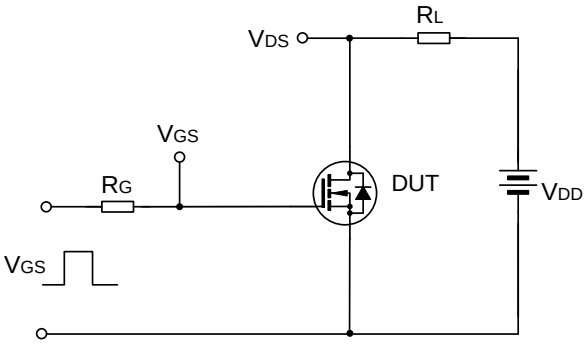
TYPICAL TEST CIRCUIT

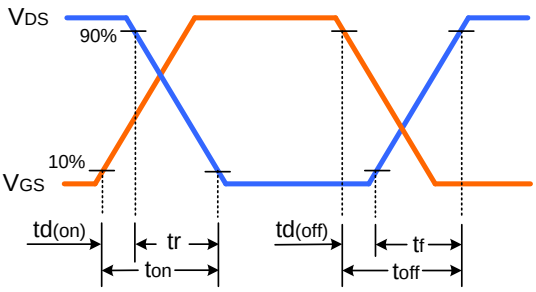
Gate Charge Test Circuit & Waveform



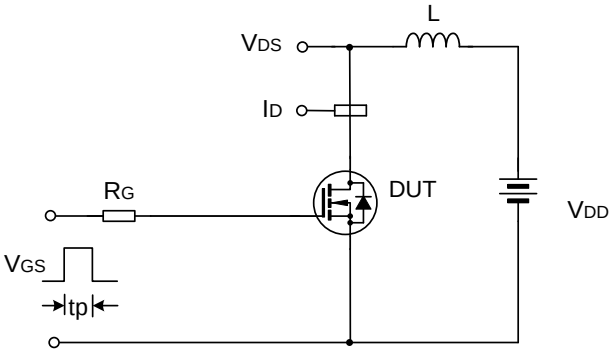


Resistive Switching Test Circuit & Waveform

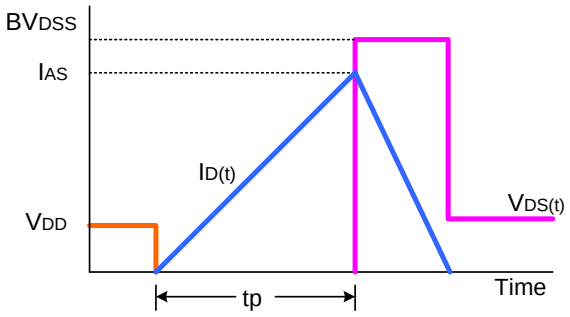




Unclamped Inductive Switching Test Circuit & Waveform



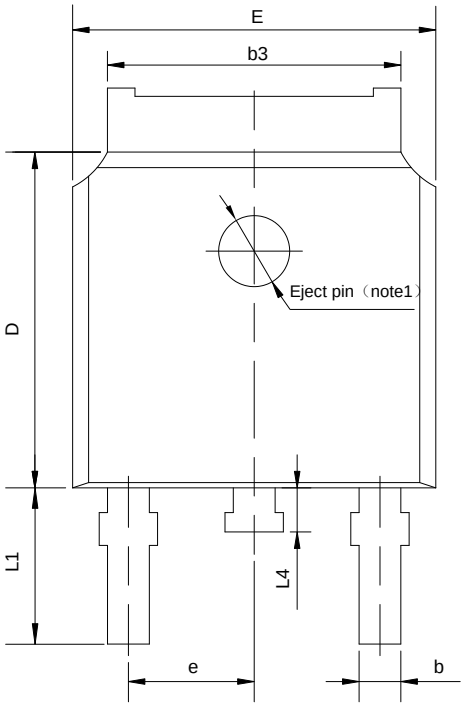
$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

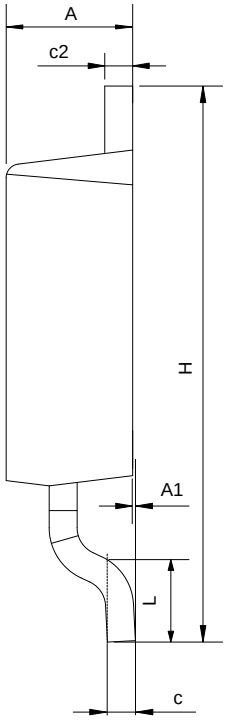


PACKAGE OUTLINE

TO-252-2L

UNIT: mm



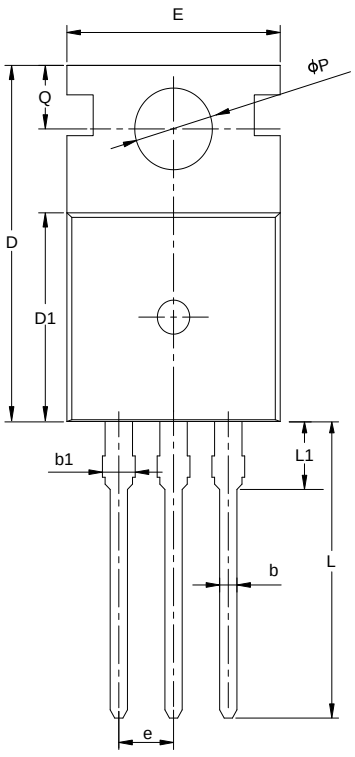


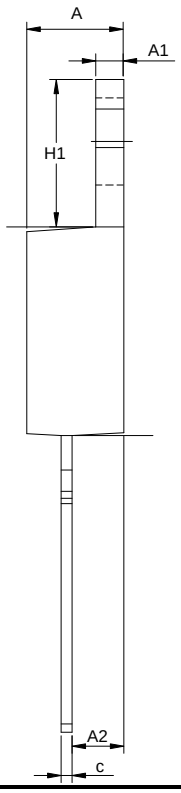
NOTE1 : There are two conditions for this position:has an eject pin or has no eject pin.

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0	—	0.127
b	0.66	0.76	0.89
b3	5.10	5.33	5.46
c	0.45	—	0.65
c2	0.45	—	0.65
D	5.80	6.10	6.40
E	6.30	6.60	6.90
e	2.30TYP		
H	9.60	10.10	10.60
L	1.40	1.50	1.70
L1	2.90REF		
L4	0.60	0.80	1.00

TO-220-3L

UNIT: mm





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.00	1.30	1.50
A2	1.80	2.40	2.80
b	0.60	0.80	1.00
b1	1.00	—	1.60
c	0.30	—	0.70
D	15.10	15.70	16.10
D1	8.10	9.20	10.00
E	9.60	9.90	10.40
e	2.54BSC		
H1	6.10	6.50	7.00
L	12.60	13.08	13.60
L1	—	—	3.95
ϕP	3.40	3.70	3.90
Q	2.60	—	3.20

Important notice :

1. **The instructions are subject to change without notice!**
2. **Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current. Please read the instructions carefully before using our products, including the circuit operation precautions.**
3. **Our products are consumer electronic products or the other civil electronic products.**
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Rev.: 1.1

Revision History:

1. Add SVG10120NAD (To-252-2L) package
2. Modify Figure 1, 2, 3 and add Figure 9
3. Update important notices

Rev.: 1.0

Revision History:

1. First release