

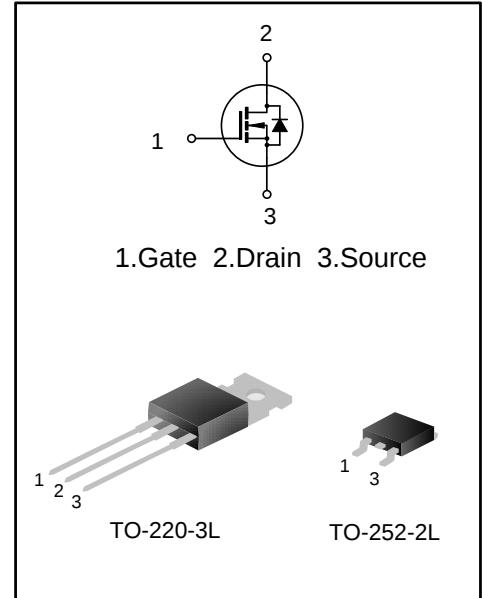
17A, 55V N-CHANNEL MOSFET

GENERAL DESCRIPTION

SVDZ24NT is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan new planar VDMOS process. 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. This device is widely used in electrical ballast, low power switching power supply.

FEATURES

- ◆ 17A, 55V, $R_{DS(on)}(typ.)=45m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low C_{rss}
- ◆ Fast switching
- ◆ Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVDZ24NT	TO-220-3L	SVDZ24NT	Pb free	Tube
SVDZ24NDTR	TO-252-2L	SVDZ24ND	Halogen free	Tape & Reel

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

Characteristics		Symbol	Ratings		Unit
			SVDZ24NT	SVDZ24ND	
Drain-Source Voltage		V _{DS}	55		V
Gate-Source Voltage		V _{GS}	±20		V
Drain Current	T _C =25°C	I _D	17		A
	T _C =100°C		12		
Drain Current Pulsed		I _{DM}	68		A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	45	39	W
			0.36	0.3	W/°C
Single Pulsed Avalanche Energy (Note 1)		E _{AS}	122		mJ
Operation Junction Temperature Range		T _J	-55~+175		°C
Storage Temperature Range		T _{stg}	-55~+175		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings		Unit
		SVDZ24NT	SVDZ24ND	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.78	3.2	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62	$^{\circ}\text{C/W}$

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	55	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=55V, V_{GS}=0V$	--	--	20	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	--	4.0	V
Static Drain-Source On State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	--	45	70	m Ω
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	--	400	--	pF
Output Capacitance	C_{oss}		--	130	--	
Reverse Transfer Capacitance	C_{rss}		--	12.5	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=28V, V_{GS}=10V, R_G=25\Omega, I_D=10A$ (Note 2,3)	--	5.4	--	ns
Turn-on Rise Time	t_r		--	32.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	22.1	--	
Turn-off Fall Time	t_f		--	12.4	--	
Total Gate Charge	Q_g	$V_{DD}=44V, V_{GS}=10V, I_D=10A$ (Note 2,3)	--	10.5	--	nC
Gate-Source Charge	Q_{gs}		--	2.5	--	
Gate-Drain Charge	Q_{gd}		--	4.0	--	

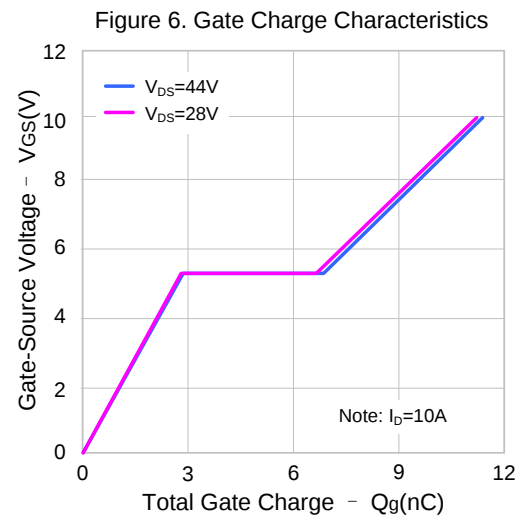
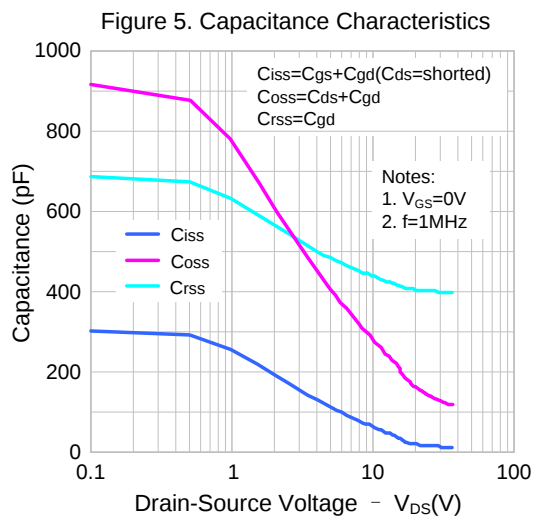
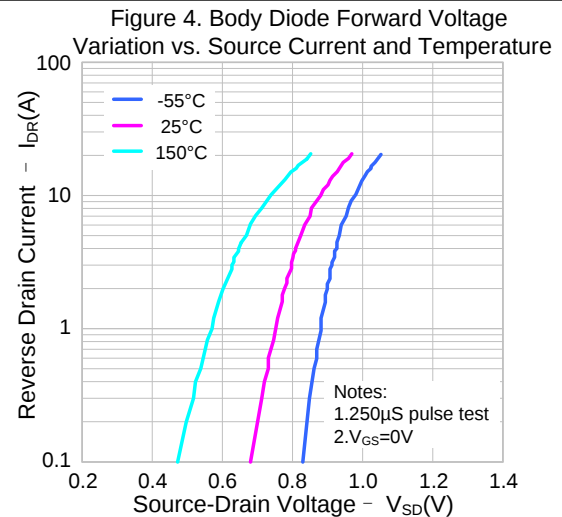
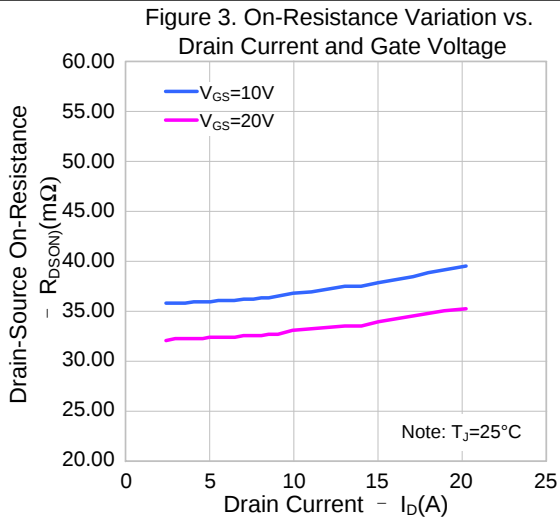
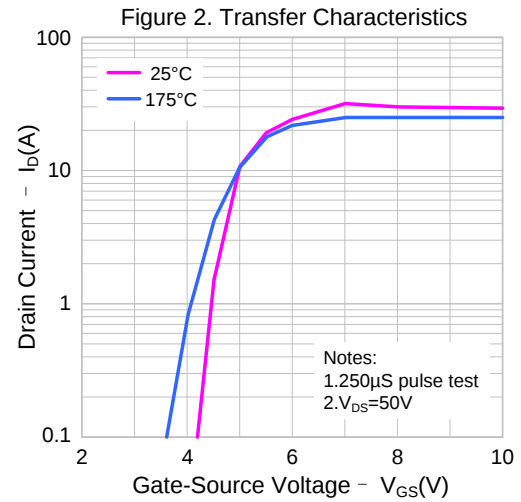
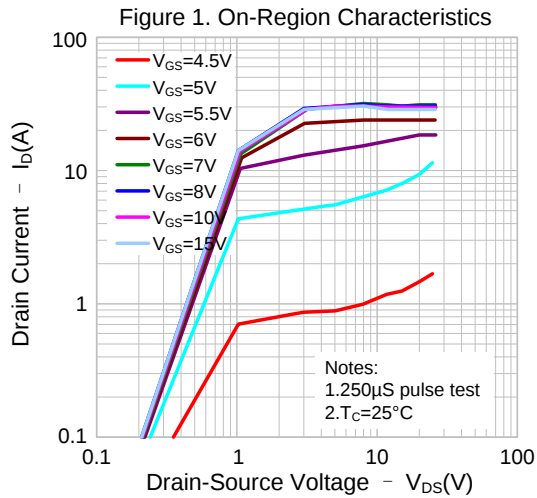
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	17	A
Pulsed Source Current	I_{SM}		--	--	68	
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$	--	--	1.3	V
Reverse Recovery Time	T_{rr}	$I_S=10A, V_{GS}=0V, dl_F/dt=100A/\mu S$ (Note 2)	--	43	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.05	--	μC

Notes:

1. $L=1mH, I_{AS}=13A, V_{DD}=25V, R_G=25\Omega$, starting $T_J=25^{\circ}\text{C}$;
2. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 7. Breakdown Voltage Variation vs. Temperature

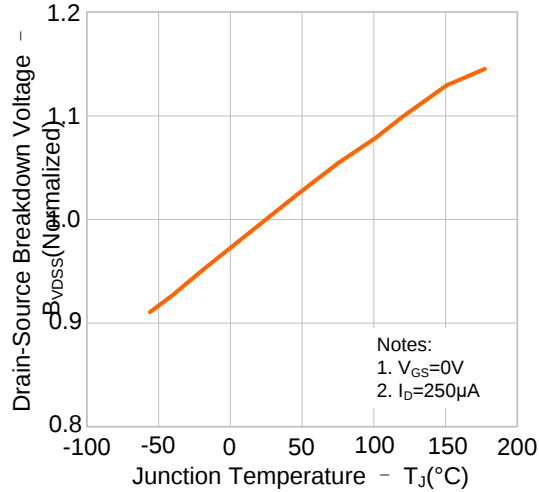


Figure 8. On-resistance Variation vs. Temperature

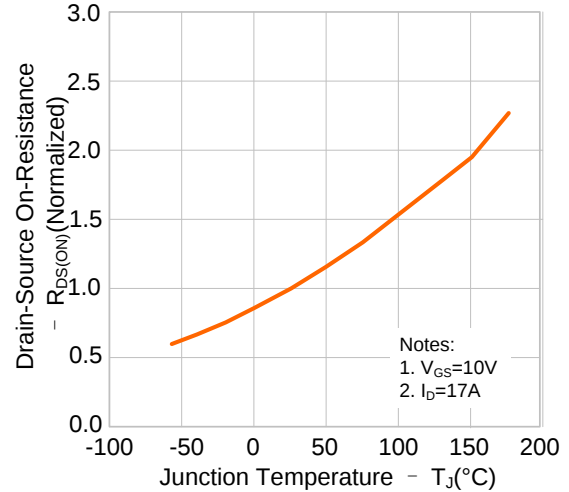


Figure9-1. Max. Safe Operating Area(SVDZ24NT)

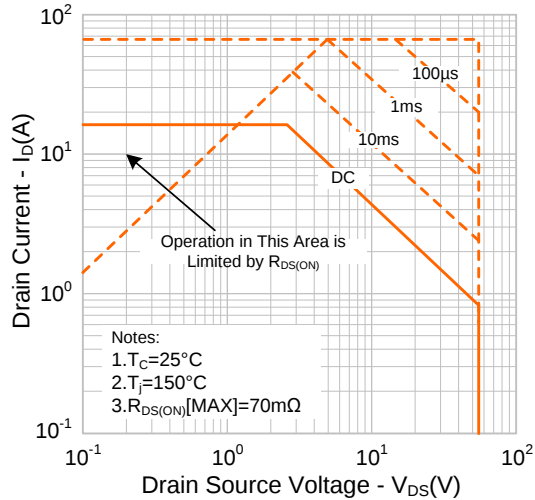


Figure 9-2. Max. Safe Operating Area(SVDZ24ND)

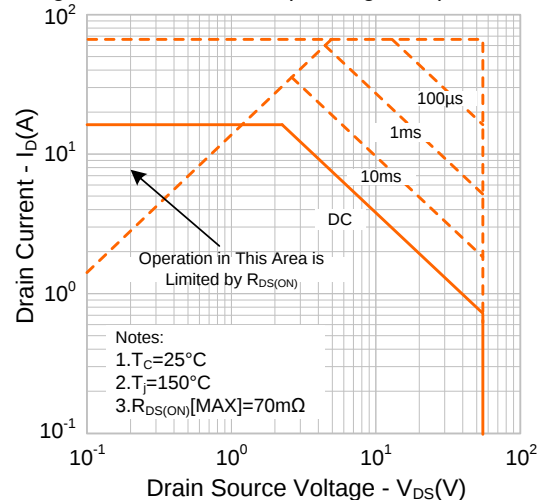
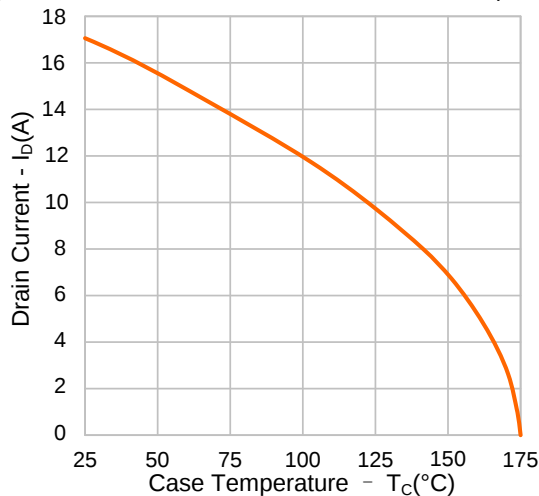
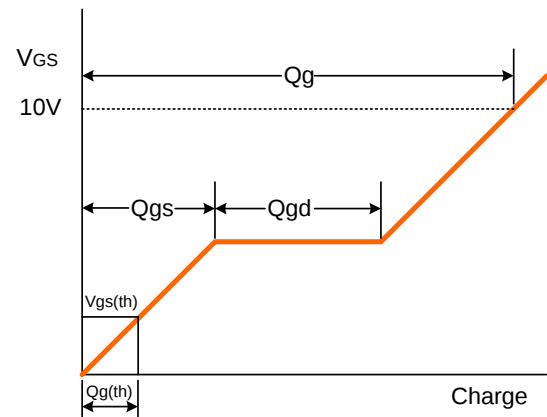
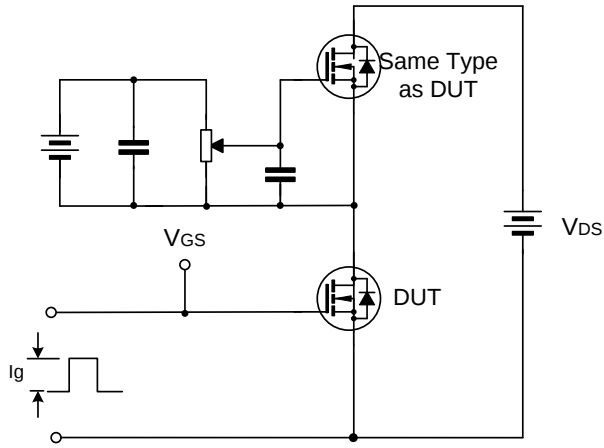


Figure 10. Maximum Drain Current vs. Case Temperature

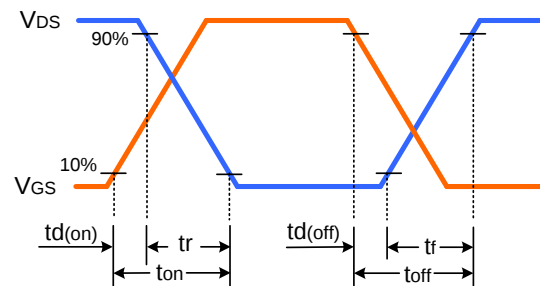
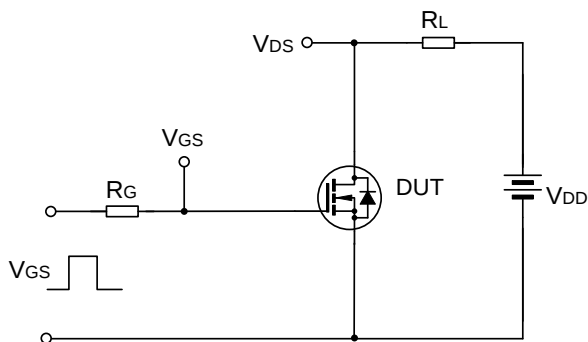


TYPICAL TEST CIRCUIT

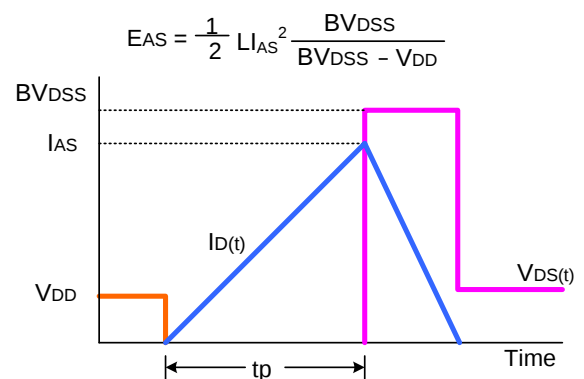
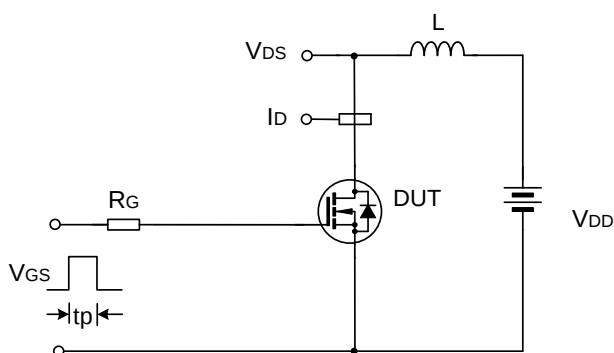
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



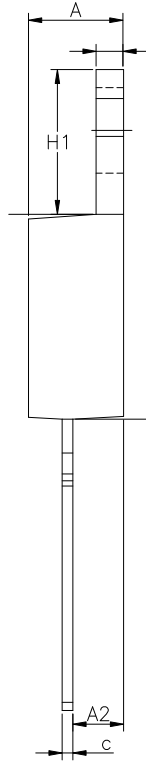
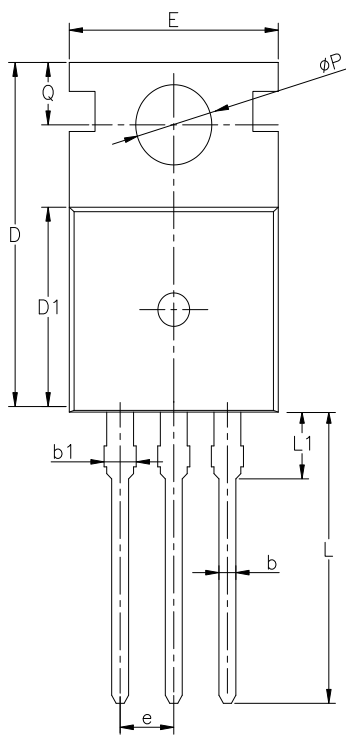
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-220-3L

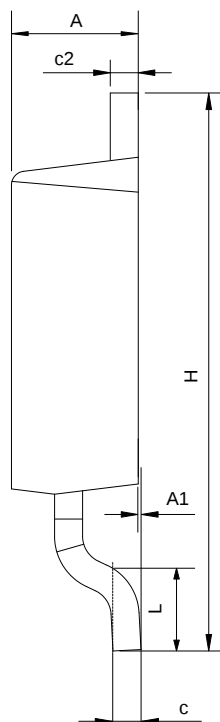
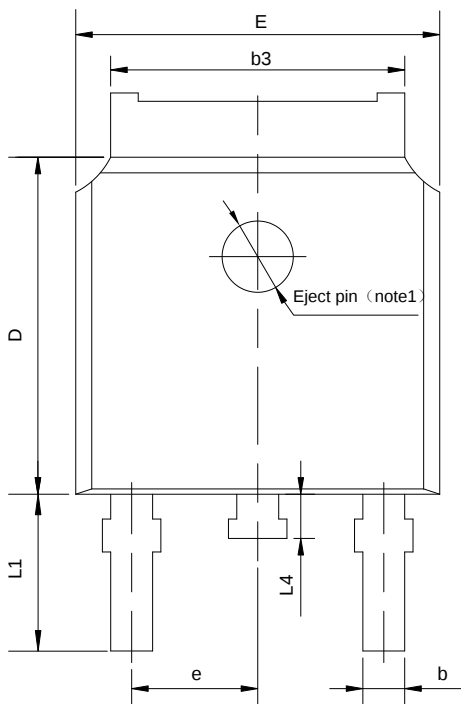
Unit: mm



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

TO-252-2L

Unit: mm



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

Important notice :

- The instructions are subject to change without notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.
- Our products are consumer electronic products, and / or civil electronic products.
- When using our products, please do not exceed the maximum rating of the products, otherwise the reliability of the whole machine will be affected. There is a certain possibility of failure or malfunction of any semiconductor product under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design, sample and whole machine manufacturing, so as to avoid potential failure risk that may cause personal injury or property loss.
- It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
- When exporting, using and reselling our products, buyer must comply with the international export control laws and regulations of China, the United States, the United Kingdom, the European Union and other countries & regions.
- Product promotion is endless, our company will wholeheartedly provide customers with better products!
- Website: <http://www.silan.com.cn>

Part No.:	SVDZ24NT(D)	Document Type:	Datasheet
Copyright:	HANGZHOU SILAN MICROELECTRONICS CO.,LTD	Website:	http://www.silan.com.cn

Rev.: **1.2**

Revision History:

1. Add the package information of TO-252-2L
-

Rev.: **1.1**

Revision History:

1. Modify the package information of TO-220-3L
-

Rev.: **1.0**

Revision History:

1. First release
-
-