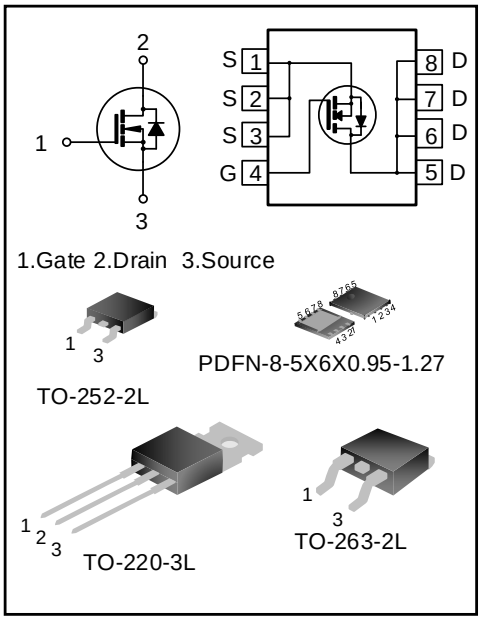
80A, 60V N-CHANNEL MOSFET

DESCRIPTION

SVT068R5NT/D/S/L5 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.

These devices are widely used in UPS, Power Management for Inverter Systems.



FEATURES

- 80A, 60V, $R_{DS(on)(typ.)}$=7.0mΩ@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
SVT068R5NT	TO-220-3L	068R5NT	Pb free	Tube
SVT068R5NDTR	TO-252-2L	068R5ND	Halogen free	Tape&Reel
SVT068R5NSTR	TO-263-2L	068R5NS	Halogen free	Tape&Reel
SVT068R5NL5TR	PDFN-8-5×6×0.95-1.27	068R5NL5	Halogen free	Tape&Reel

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

Characteristics		Symbol	Ratings			Unit
			SVT068R5NT/S	SVT068R5ND	SVT068R5NL5	
Drain-Source Voltage		V_{DS}	60			V
Gate-Source Voltage		V_{GS}	±20			V
Drain Current	T_C=25°C	I_D	80			A
	T_C=100°C		57			
Drain Current Pulsed		I_{DM}	320			A
Power Dissipation (T_C=25°C)		P_D	158	107	100	W
-Derate above 25°C			1.05	0.7	0.67	W/°C
Single Pulsed Avalanche Energy (Note 1)		E_{AS}	389			mJ
Operation Junction Temperature Range		T_J	-55~+175			°C
Storage Temperature Range		T_{stg}	-55~+175			°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings			Unit
		SVT068R5NT/S	SVT068R5ND	SVT068R5NL5	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.95	1.4	1.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.0	50.0	°C/W

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, 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	--	4	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	--	7.0	8.5	mΩ
Gate Resistance	R_G	f=1MHz	--	5.5	--	Ω
Input Capacitance	C_{iss}	f=1MHz, V_{GS}=0V, V_{DS}=30V	--	4890	--	pF
Output Capacitance	C_{oss}		--	235	--	
Reverse Transfer Capacitance	C_{rss}		--	170	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, V_{GS}=10V, R_G=3Ω, I_D=30A (Notes 2,3)	--	16	--	ns
Turn-on Rise Time	t_r		--	44	--	
Turn-off Delay Time	$t_{d(off)}$		--	93	--	
Turn-off Fall Time	t_f		--	26	--	
Total Gate Charge	Q_g	V_{DD}=48V, V_{GS}=10V, I_D=20A (Notes 2,3)	--	89	--	nC
Gate-Source Charge	Q_{gs}		--	26	--	
Gate-Drain Charge	Q_{gd}		--	20	--	

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	--	--	60	A
Pulsed Source Current	I_{SM}		--	--	240	
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_S=20A, V_{GS}=0V, dI_F/dt=100A/μs (Note 2)	--	29	--	ns
Reverse Recovery Charge	Q_{rr}		--	38	--	nC

Notes:

1. L=0.5mH, 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

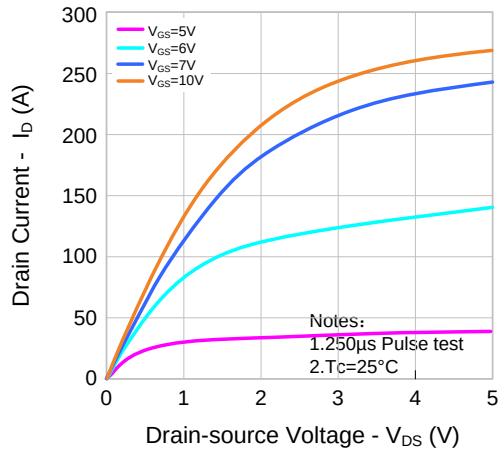


Figure 2. Transfer Characteristics

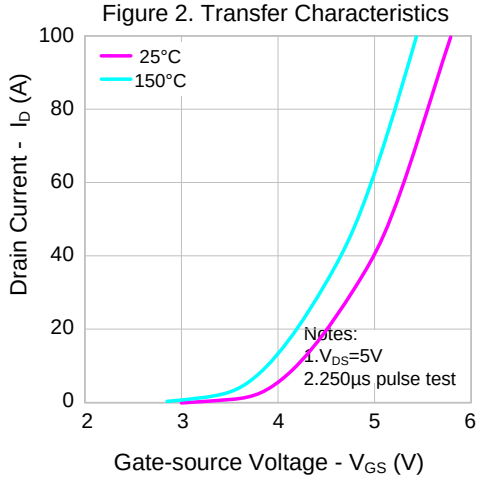


Figure 3. On-resistance vs. Drain Current

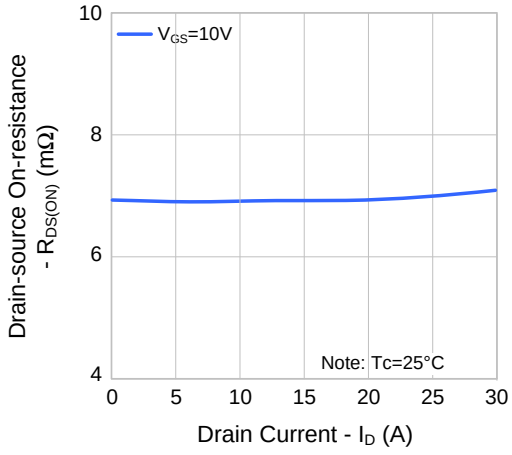


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

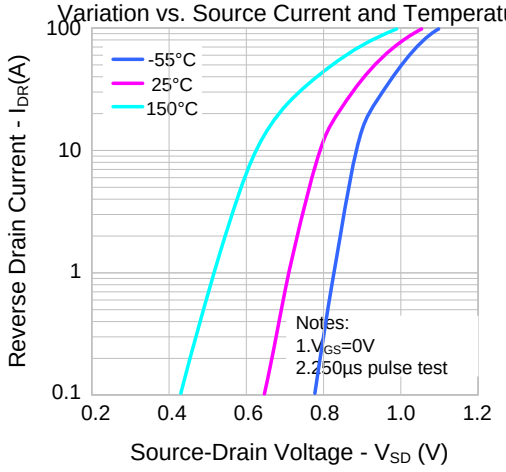


Figure 5. Capacitance Characteristics

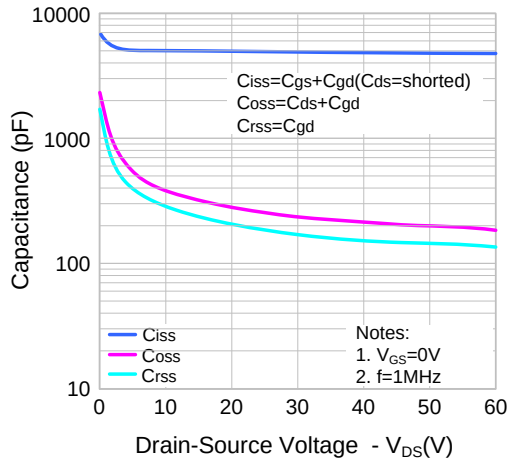
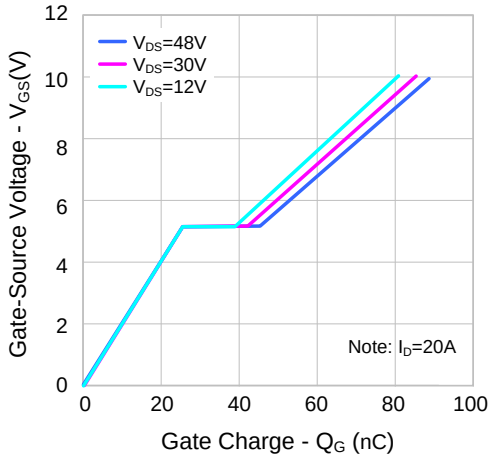


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 7. Breakdown Voltage vs. Temperature Characteristics

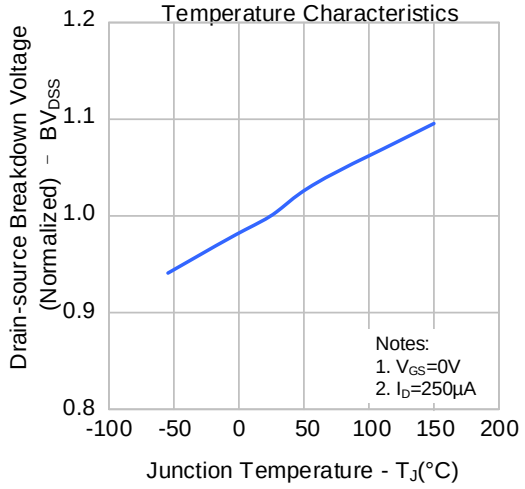


Figure 8. On-resistance vs. Temperature Characteristics

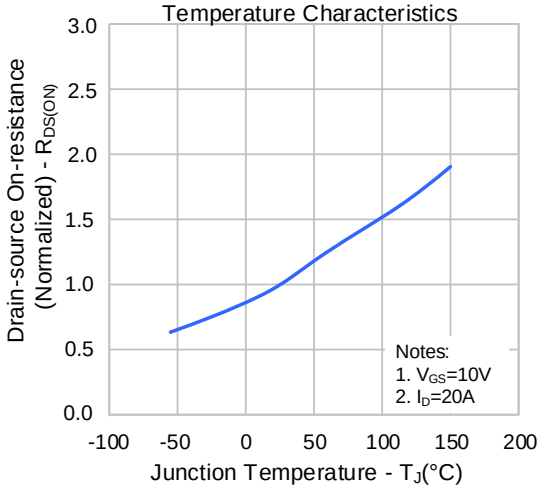


Figure 9-1. Max. Safe Operating Area (SVT068R5ND)

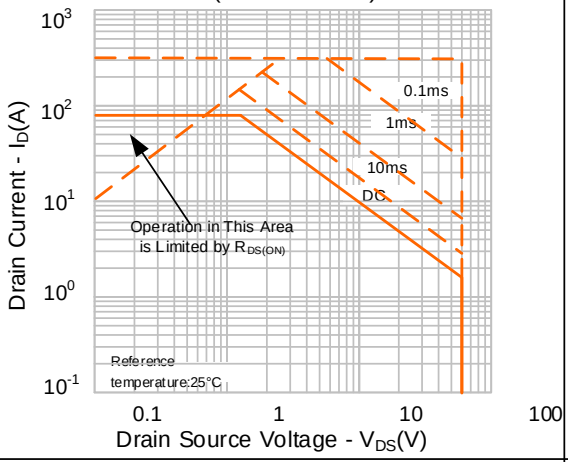


Figure 9-2. Max. Safe Operating Area (SVT068R5NT/S)

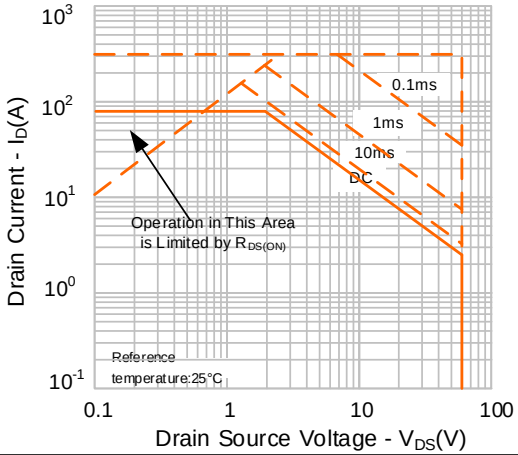
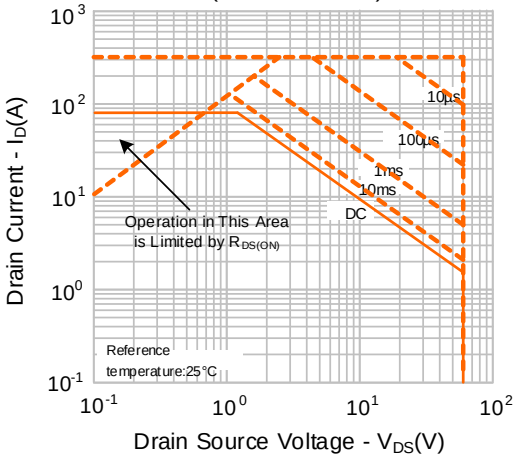
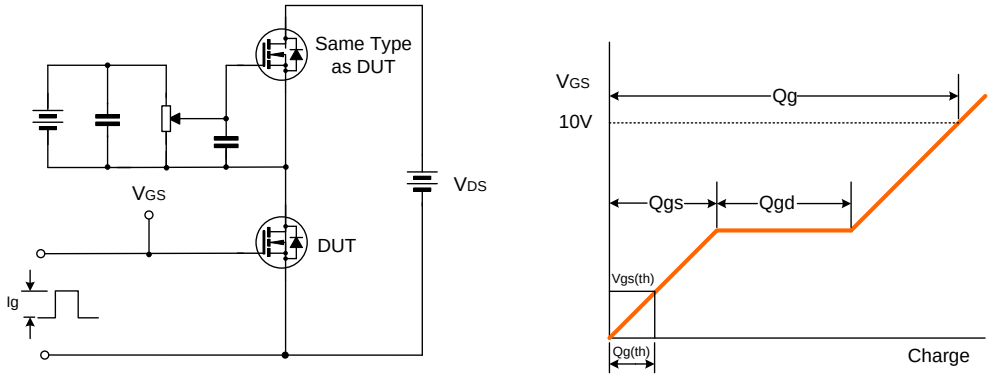


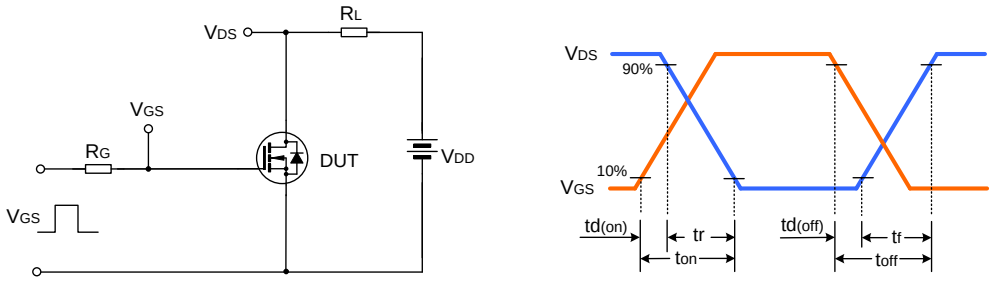
Figure 9-3. Max. Safe Operating Area (SVT068R5NL5)



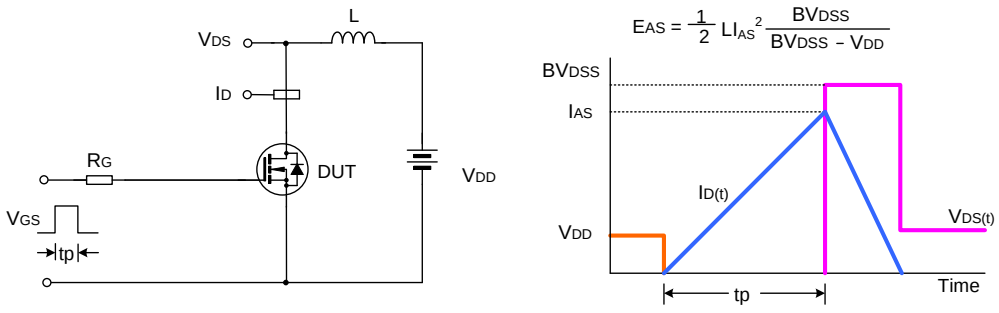
TYPICAL TEST CIRCUIT



Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

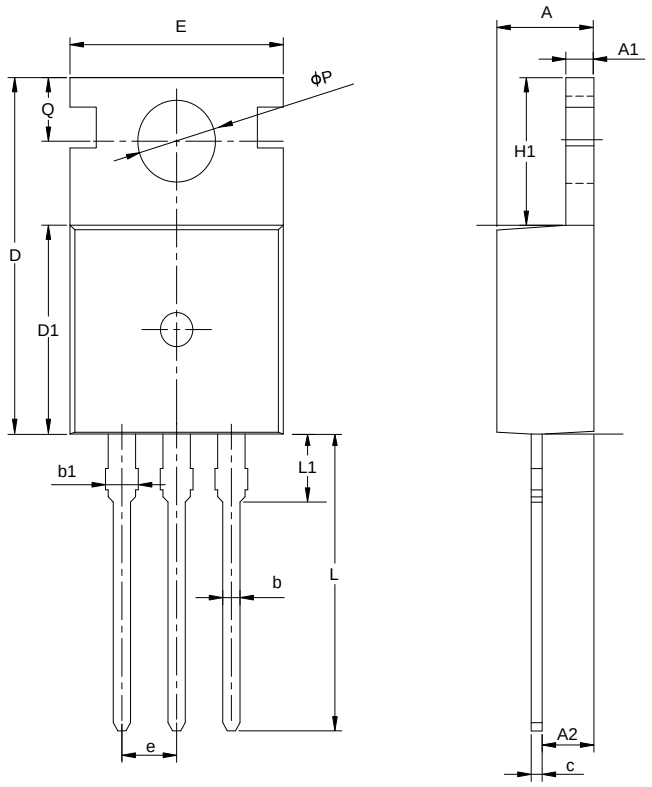


Unclamped Inductive Switching Test Circuit & Waveform

PACKAGE OUTLINE

TO-220-3L

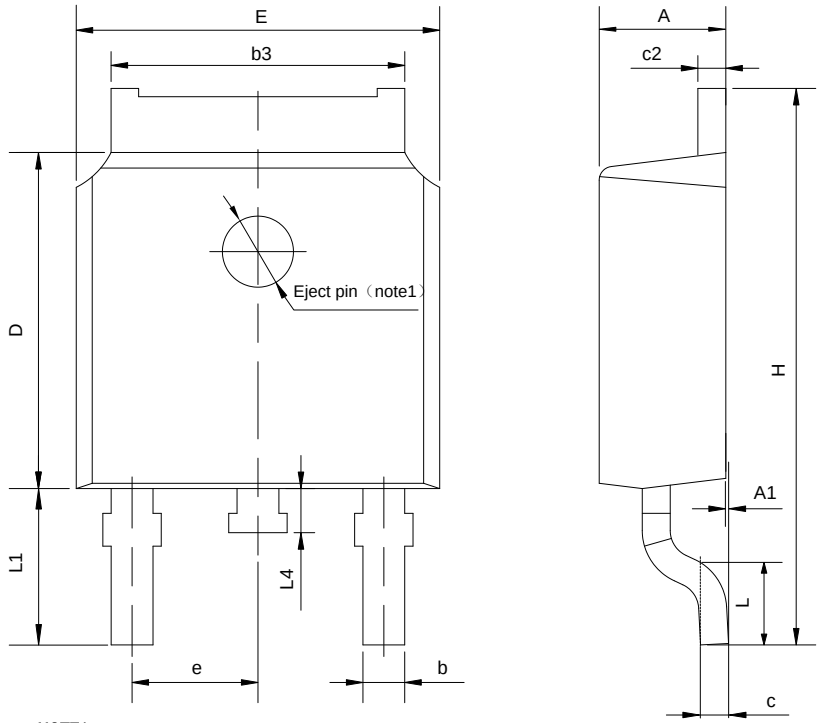
UNIT: mm



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

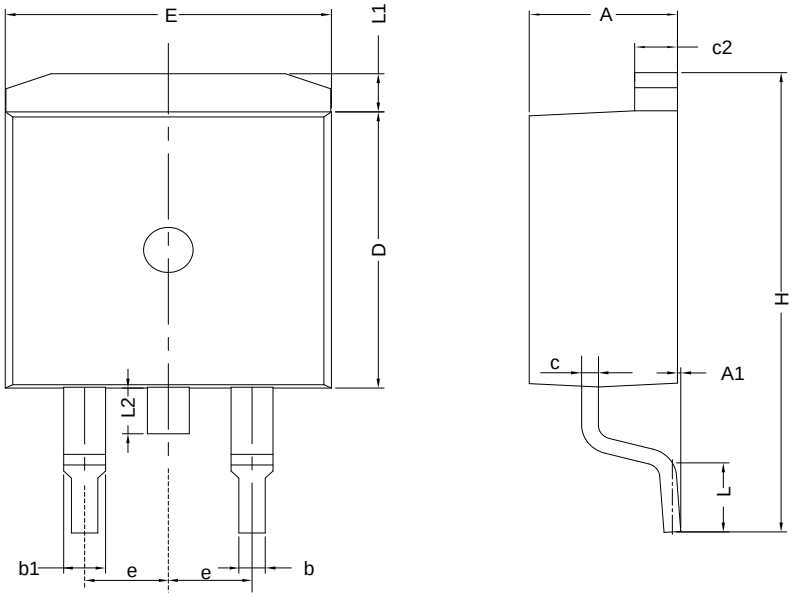


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0	—	0.127
b	0.66	0.76	0.89
b3	5.10	5.33	5.46
c	0.45	—	0.65
c2	0.45	—	0.65
D	5.80	6.10	6.40
E	6.30	6.60	6.90
e	2.30TYP		
H	9.60	10.10	10.60
L	1.40	1.50	1.70
L1	2.90REF		
L4	0.60	0.80	1.00

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

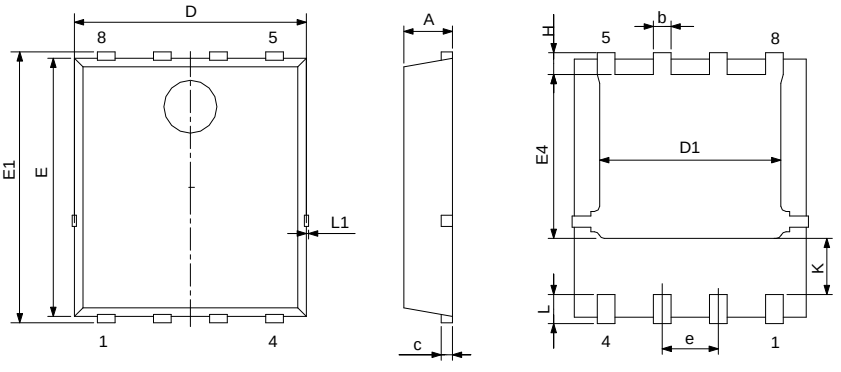
PACKAGE OUTLINE (CONTINUED)

TO-263-2L **UNIT: mm**



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
b1	1.17	—	1.50
c	0.30	—	0.60
c2	1.17	1.27	1.37
D	8.50	—	9.35
E	9.80	—	10.45
e	2.54BSC		
H	14.70	—	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	—	—	1.75

PDFN-8-5×6×0.95-1.27 **UNIT: mm**



Top View Side View Bottom View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	—	1.20
c	0.154	0.25	0.354
D	4.80	—	5.40
E	5.66	—	6.06
D1	3.76	—	4.30
E1	5.90	—	6.35
b	0.30	—	0.55
K	1.10	1.30	1.50
e	1.07	1.27	1.37
E4	3.34	—	3.92
L	0.30	0.60	0.71
L1	—	—	0.12
H	0.40	—	0.71

MOS DEVICES OPERATE NOTES:

Electrostatic charges may exist in many things. Please take following preventive measures to prevent effectively the MOS electric circuit as a result of the damage which is caused by discharge:

- The operator must put on wrist strap which should be earthed to against electrostatic.
- Equipment cases should be earthed.
- All tools used during assembly, including soldering tools and solder baths, must be earthed.
- MOS devices should be packed in antistatic/conductive containers for transportation.

Important notice:

1. Silan reserves the right to make changes of this instruction without notice.
2. Customers should obtain the latest relevant information when purchasing and should verify whether such information is latest and complete. Please read this instruction and application manual and related materials carefully before using products, including the circuit operation precautions, etc.
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7. Please use and apply product in compliance with all applicable laws and regulations, including but not limited to trade control regulations etc. The product is civil electronic product, please do not use it in non-civil fields.
8. Product promotion is endless, our company will wholeheartedly provide customers with better products!
9. Website: http: //www.silan.com.cn

Part No.:	SVT068R5NT/D/S/L5	Document Type:	Datasheet
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Rev.: 1.1

Revision History:

1. Add PDFN-8-5×6×0.95-1.27 package
2. Update typical characteristics
3. Update important notice

Rev.: 1.0

Revision History:

1. First release