

## 120A, 80V N-CHANNEL MOSFET

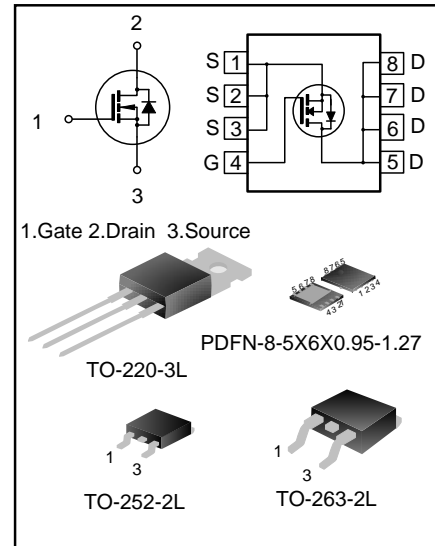
### DESCRIPTION

SVG086R0NT(S)(D)(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.

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

### FEATURES

- ◆ 120A, 80V,  $R_{DS(on)(typ.)}=5.0m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low Crss
- ◆ Fast switching
- ◆ Improved dv/dt capability



### ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVG086R0NT	TO-220-3L	086R0NT	Pb free	Tube
SVG086R0NS	TO-263-2L	086R0NS	Halogen free	Tube
SVG086R0NSTR	TO-263-2L	086R0NS	Halogen free	Tape&Reel
SVG086R0NDTR	TO-252-2L	086R0ND	Halogen free	Tape&Reel
SVG086R0NL5TR	PDFN-8-5X6X0.95-1.27	086R0NL5	Halogen free	Tape&Reel

**ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, T<sub>J</sub>=25°C)**

Characteristics	Symbol	Ratings			Unit
		SVG086R0NT/ NS	SVG086R0ND	SVG086R0NL 5	
Drain-Source Voltage	V <sub>DS</sub>	80			V
Gate-Source Voltage	V <sub>GS</sub>	±20			V
Drain Current	I <sub>D</sub>	T <sub>C</sub> =25°C	120	100	A
		T <sub>C</sub> =100°C	76	64	
Drain Current Pulsed	I <sub>DM</sub>	480		400	A
Power Dissipation(T <sub>C</sub> =25°C) -Derate above 25°C	P <sub>D</sub>	156	114	109	W
		1.3	0.9	0.87	W/°C
Single Pulsed Avalanche Energy (Note 1)	E <sub>AS</sub>	306			mJ
Operation Junction Temperature Range	T <sub>J</sub>	-55~+150			°C
Storage Temperature Range	T <sub>stg</sub>	-55~+150			°C

**THERMAL CHARACTERISTICS**

Characteristics	Symbol	Ratings			Unit
		SVG086R0NT/ NS	SVG086R0ND	SVG086R0NL 5	
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.8	1.1	1.15	°C/W
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62.5	62.0	50.0	°C/W

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	80	--	--	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	--	--	1.0	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	$\pm 100$	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	$R_{DS(on)}$	$V_{GS}=10V, I_D=50A$	--	5.0	6.0	$m\Omega$
Gate Resistance	$R_G$	$f=1\text{MHz}$	--	2.2	--	$\Omega$
Input Capacitance	$C_{iss}$	$f=1\text{MHz}, V_{GS}=0V, V_{DS}=40V$	--	3896	--	pF
Output Capacitance	$C_{oss}$		--	520	--	
Reverse Transfer Capacitance	$C_{rss}$		--	25	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=40V, V_{GS}=10V, R_G=3.5\Omega,$ $I_D=10A$ (Note 2,3)	--	22	--	ns
Turn-on Rise Time	$t_r$		--	35	--	
Turn-off Delay Time	$t_{d(off)}$		--	56	--	
Turn-off Fall Time	$t_f$		--	19	--	
Total Gate Charge	$Q_g$	$V_{DD}=64V, V_{GS}=10V, I_D=50A$ (Note 2,3)	--	66	--	nC
Gate-Source Charge	$Q_{gs}$		--	25	--	
Gate-Drain Charge	$Q_{gd}$		--	17	--	

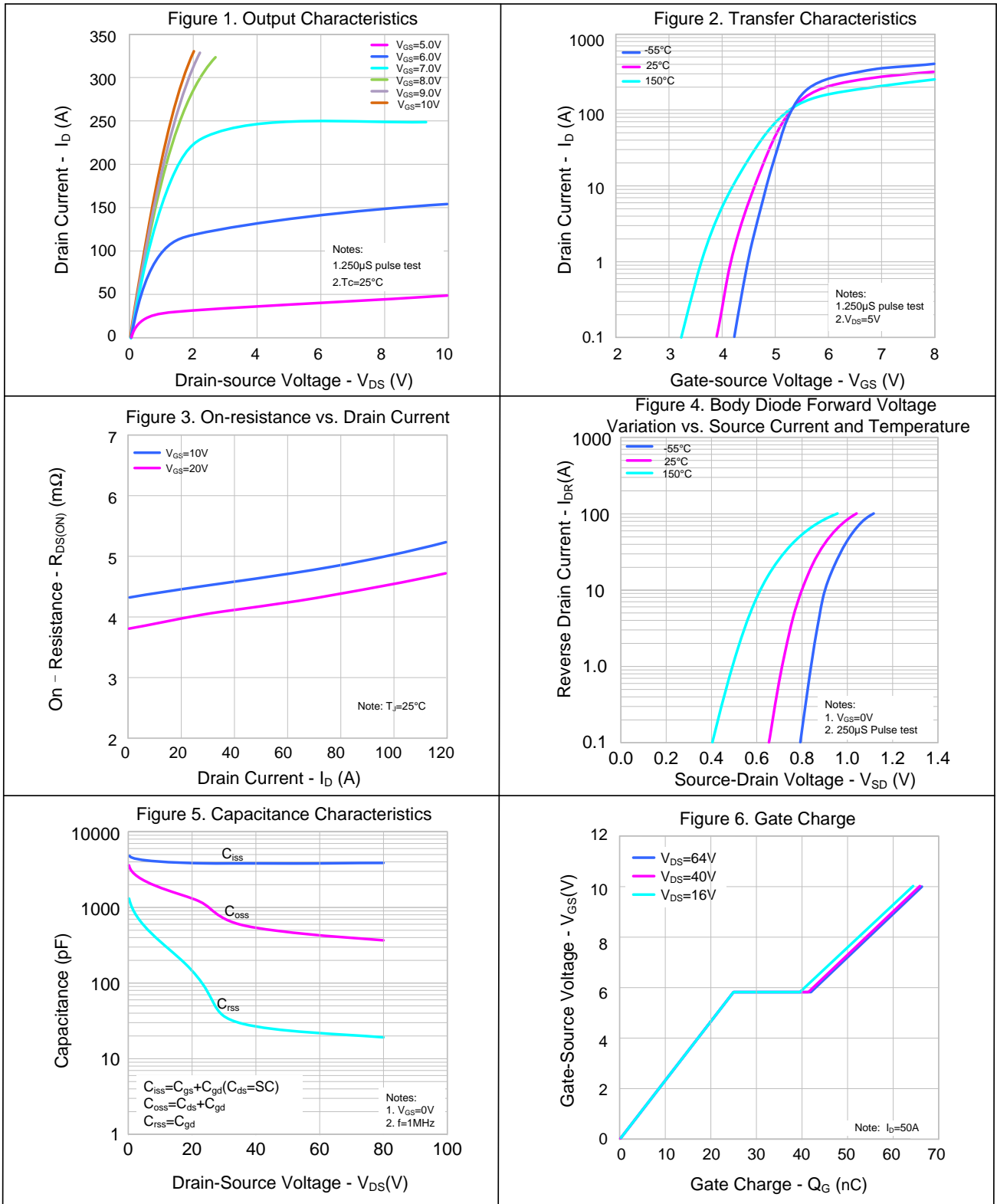
**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	$I_S$	Integral Reverse P-N Junction Diode in the MOSFET	--	--	120	A
Pulsed Source Current	$I_{SM}$		--	--	480	
Diode Forward Voltage	$V_{SD}$	$I_S=50A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	$T_{rr}$	$I_S=30A, V_{GS}=0V,$ $dI_F/dt=100A/\mu s$ (Note 2)	--	47	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	0.06	--	$\mu C$

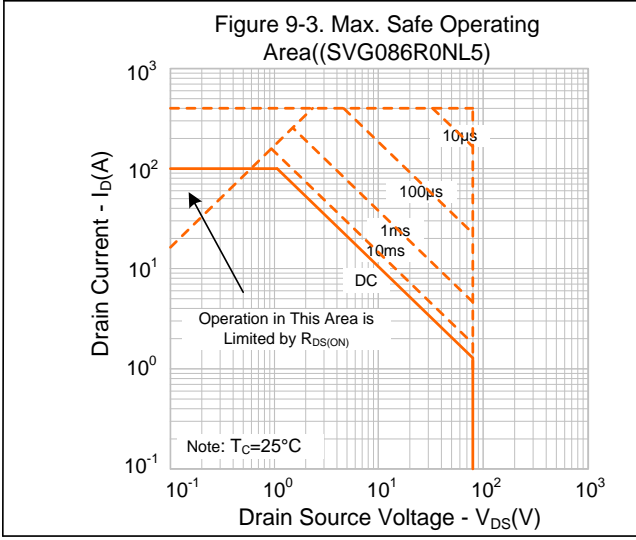
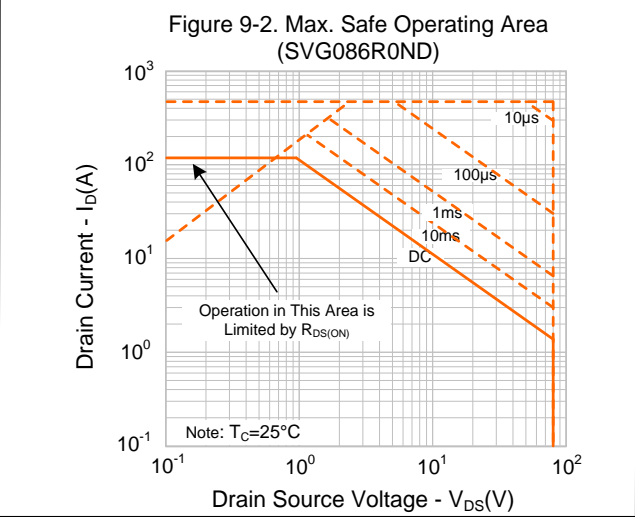
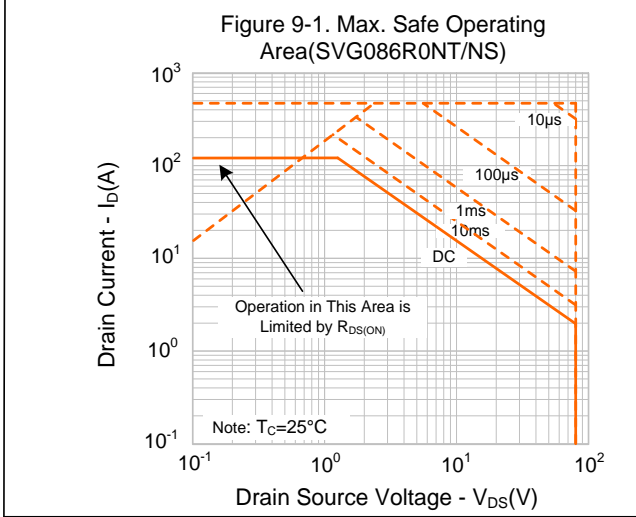
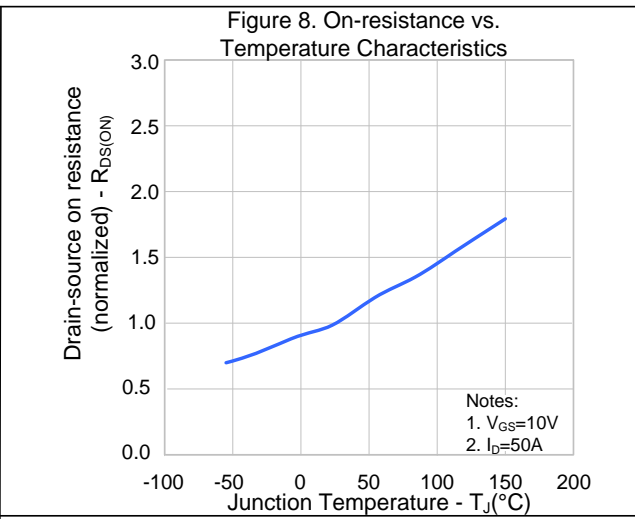
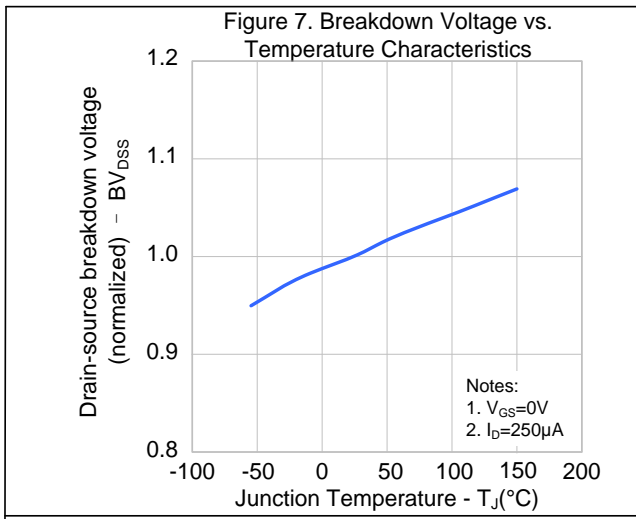
**Notes:**

- $L=0.5\text{mH}, I_{AS}=35A, V_{DD}=50V, R_G=25\Omega,$  starting  $T_J=25^{\circ}\text{C}$ ;
- Pulse Test: Pulse width  $\leq 300\mu s,$  Duty cycle  $\leq 2\%$ ;
- Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

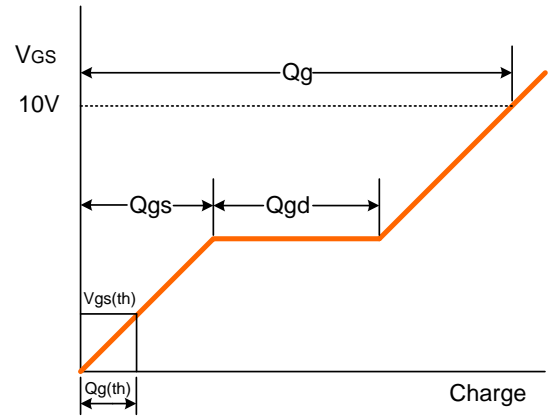
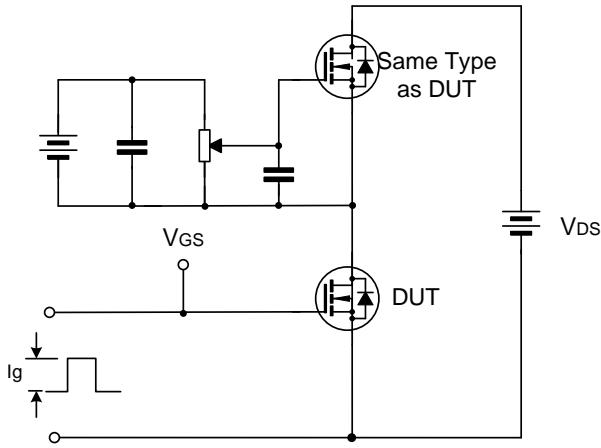


**TYPICAL CHARACTERISTICS (CONTINUED)**

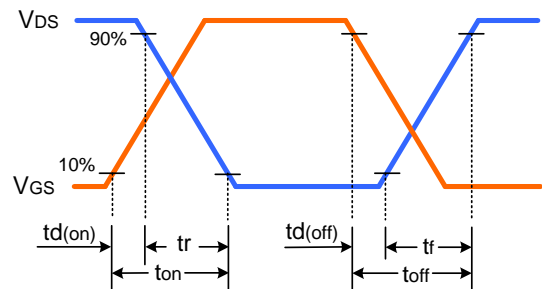
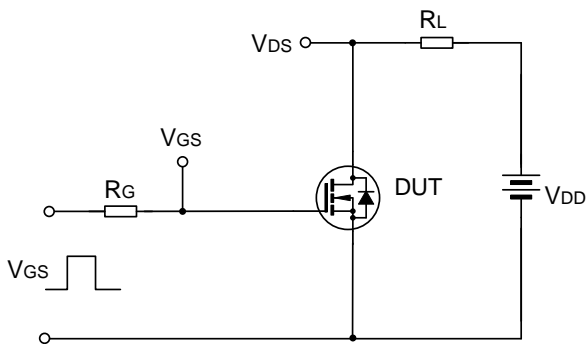


**TYPICAL TEST CIRCUIT**

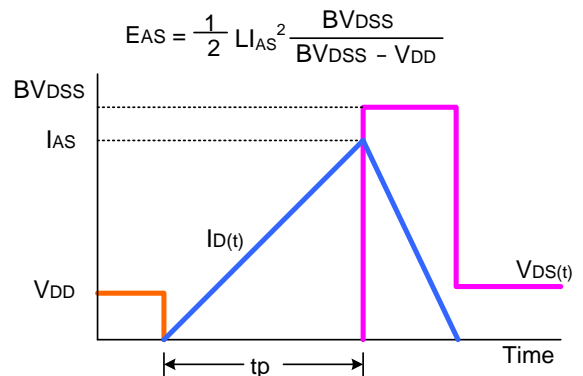
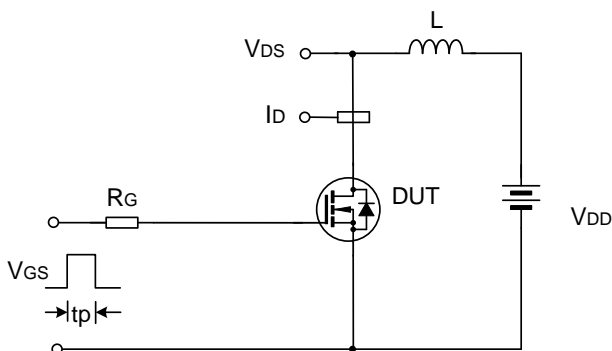
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



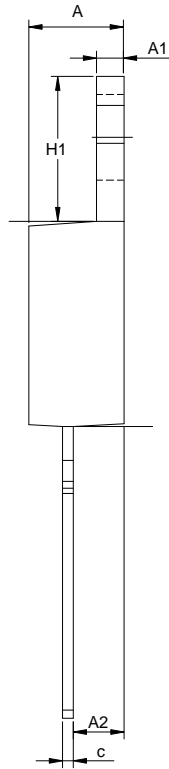
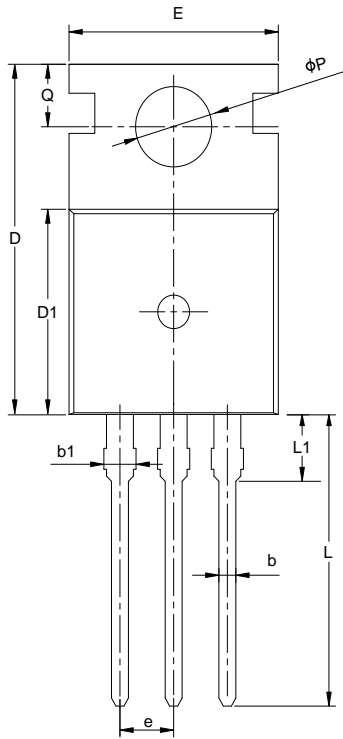
Unclamped Inductive Switching Test Circuit & Waveform



**PACKAGE OUTLINE**

**TO-220-3L**

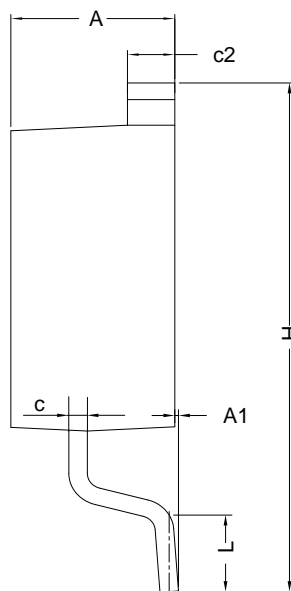
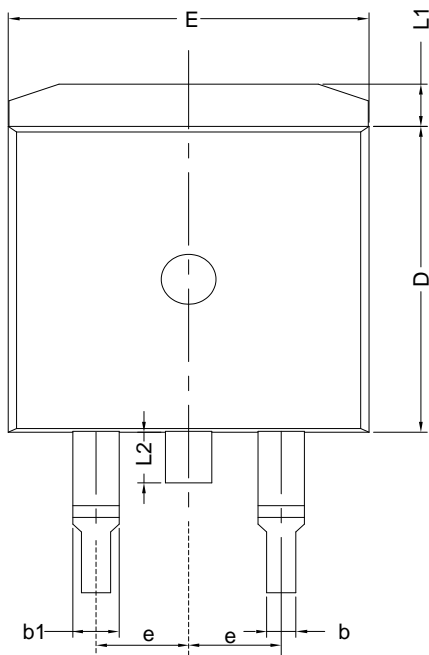
**UNIT: mm**



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
$\phi P$	3.40	3.70	3.90
Q	2.60	—	3.20

**TO-263-2L**

**UNIT: mm**

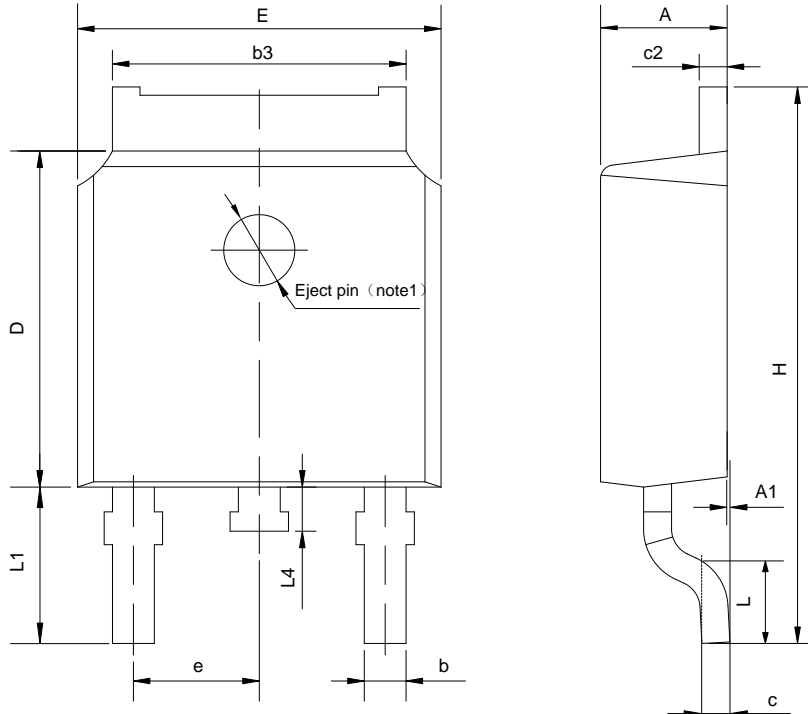


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
b1	1.17	—	1.50
c	0.30	—	0.60
c2	1.17	1.27	1.37
D	8.50	—	9.35
E	9.80	—	10.45
e	2.54BSC		
H	14.70	—	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	—	—	1.75

**PACKAGE OUTLINE(CONTINUED)**

TO-252-2L

UNIT: mm

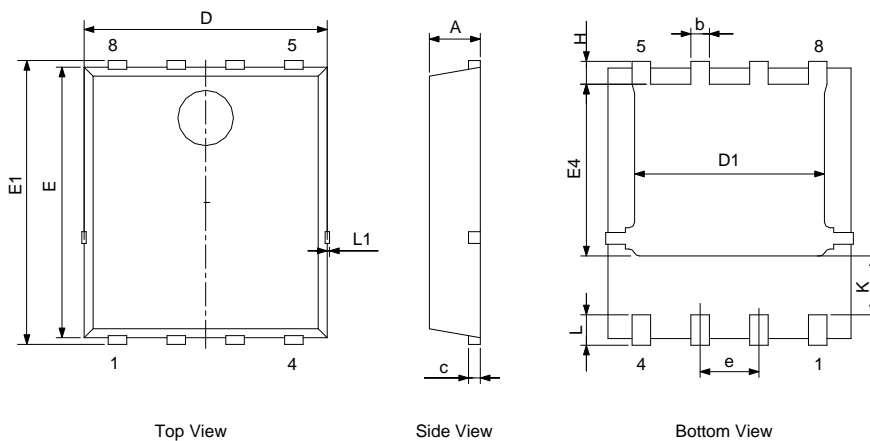


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0	—	0.127
b	0.66	0.76	0.89
b3	5.10	5.33	5.46
c	0.45	—	0.65
c2	0.45	—	0.65
D	5.80	6.10	6.40
E	6.30	6.60	6.90
e	2.30TYP		
H	9.60	10.10	10.60
L	1.40	1.50	1.70
L1	2.90REF		
L4	0.60	0.80	1.00

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

PDFN-8-5X6X0.95-1.27

UNIT: mm



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



**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.
4. 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.
5. It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
6. Product promotion is endless, our company will wholeheartedly provide customers with better products!
7. Website: <http://www.silan.com.cn>

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Rev.: 1.4

## Revision History:

1. Add package of SVG086R0NL5(PDFN-8-5X6X0.95-1.27) and figure 9-3
2. Update Typical test circuit
3. Update curve template
4. Update package outline of TO-263-2L
5. Update important notice

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Rev.: 1.3

## Revision History:

1. Update Electrical schematic and typical test circuit

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Rev.: 1.2

## Revision History:

1. Add TO-252-2L

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Rev.: 1.1

## Revision History:

1. Add TO-263-2L

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Rev.: 1.0

## Revision History:

1. First release
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