

95A, 68V N-CHANNEL MOSFET

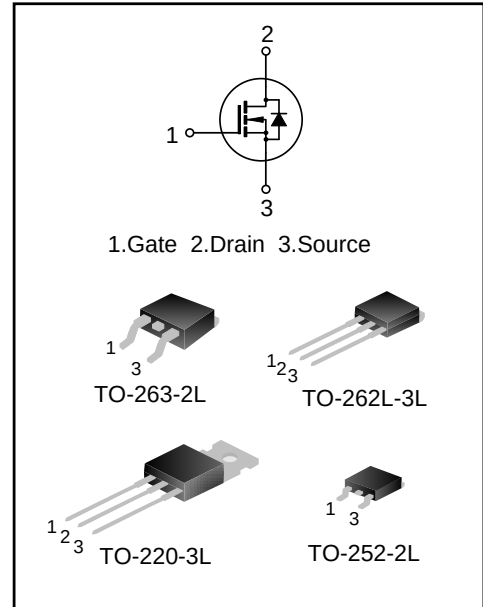
DESCRIPTION

The SVT077R5NT/D/S/KL 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 the fields of uninterruptible power supplies and power management of inverter systems.

FEATURES

- ◆ 95A, 68V, $R_{DS(on)(typ.)}=6.5m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low C_{rss}
- ◆ Fast switching
- ◆ Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVT077R5NT	TO-220-3L	077R5NT	Pb free	Tube
SVT077R5NDTR	TO-252-2L	077R5ND	Halogen free	Tape&Reel
SVT077R5NS	TO-263-2L	077R5NS	Halogen free	Tube
SVT077R5NSTR	TO-263-2L	077R5NS	Halogen free	Tape&Reel
SVT077R5NKL	TO-262L-3L	077R5NKL	Pb free	Tube

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

Characteristics		Symbol	Ratings		Unit
			SVT077R5NT/S/KL	SVT077R5ND	
Drain-Source Voltage		V _{DS}	68		V
Gate-Source Voltage		V _{GS}	±25		V
Drain Current	T _C =25°C	I _D	95		A
	T _C =100°C		67		
Drain Current Pulsed		I _{DM}	380		A
Power Dissipation (T _C =25°C)		P _D	150	143	W
-Derate above 25°C			1.0	0.95	W/°C
Single Pulsed Avalanche Energy (Note 1)		E _{AS}	421		mJ
Operation Junction Temperature Range		T _J	-55~+175		°C
Storage Temperature Range		T _{stg}	-55~+175		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings		Unit
		SVT077R5NT/S/KL	SVT077R5ND	
Thermal Resistance, Junction-to-Case	R _{θJC}	1.0	1.05	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	62.0	°C/W

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	68	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=68V, V_{GS}=0V$	--	--	1.0	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	$R_{DS(on)}$	$V_{GS}=10V, I_D=35A$ (TO-220-3L)	--	6.5	7.5	m Ω
		$V_{GS}=10V, I_D=35A$ (TO-252-2L)	--	6.5	8.0	m Ω
Gate Resistance	R_G	$f=1\text{MHz}$	--	1.7	--	Ω
Input Capacitance	C_{iss}	$f=1\text{MHz}, V_{GS}=0V, V_{DS}=30V$	--	4832	--	pF
Output Capacitance	C_{oss}		--	296	--	
Reverse Transfer Capacitance	C_{rss}		--	213	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=34V, V_{GS}=10V, R_G=24\Omega, I_D=95A$ (Notes 2,3)	--	48	--	ns
Turn-on Rise Time	t_r		--	98	--	
Turn-off Delay Time	$t_{d(off)}$		--	181	--	
Turn-off Fall Time	t_f		--	135	--	
Total Gate Charge	Q_g	$V_{DD}=54V, V_{GS}=10V, I_D=95A$ (Notes 2,3)	--	90	--	nC
Gate-Source Charge	Q_{gs}		--	27	--	
Gate-Drain Charge	Q_{gd}		--	26	--	

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	--	--	95	A
Pulsed Source Current	I_{SM}		--	--	380	
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=47.5A, V_{GS}=0V,$ $dI_F/dt=100A/\mu s$ (Note 2)	--	30	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.03	--	μC

Notes:

1. $L=1\text{mH}, I_{AS}=29A, V_{DD}=50V, R_G=25\Omega$, 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

Figure 1. Output Characteristics

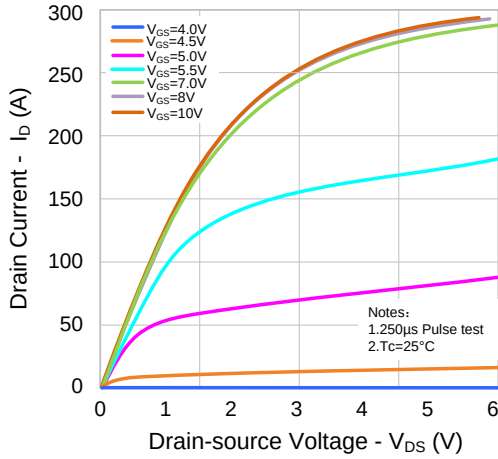


Figure 2. Transfer Characteristics

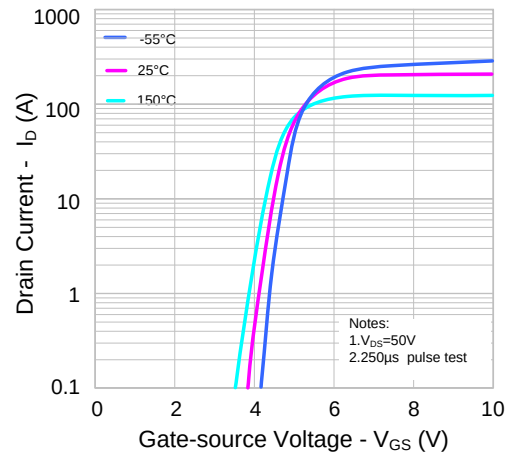


Figure 3. On-Resistance vs. Drain Current

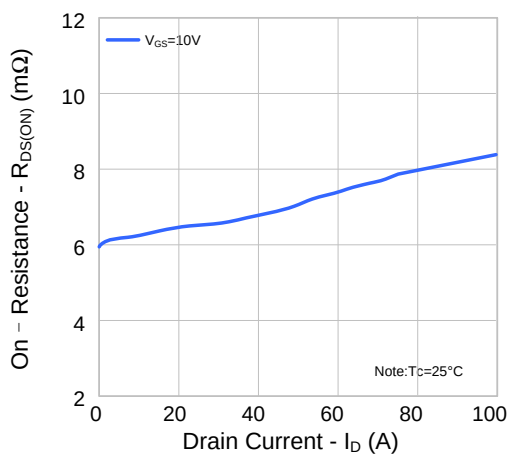


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

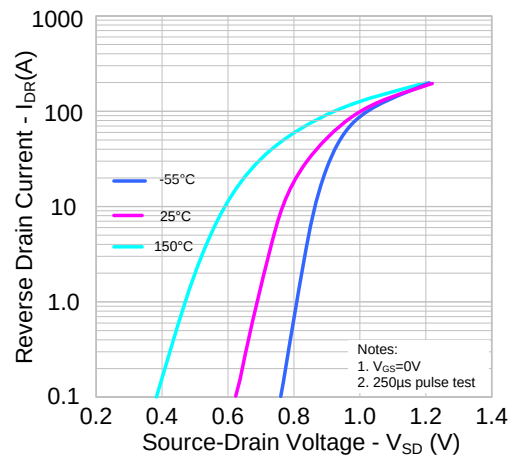


Figure 5. Capacitance Characteristics

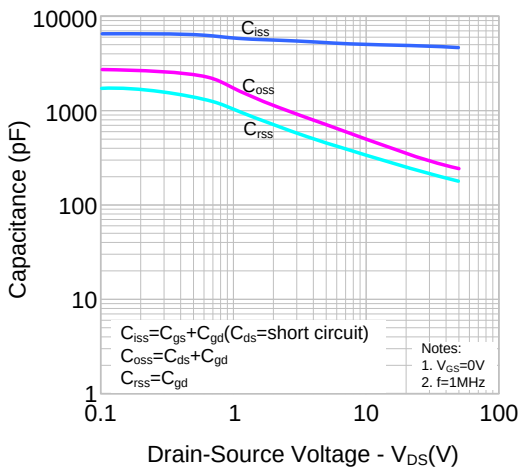
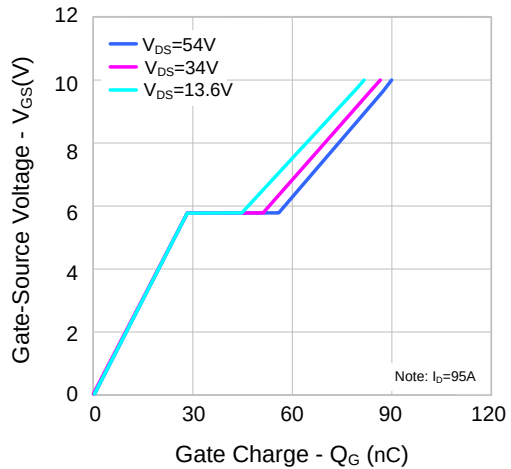
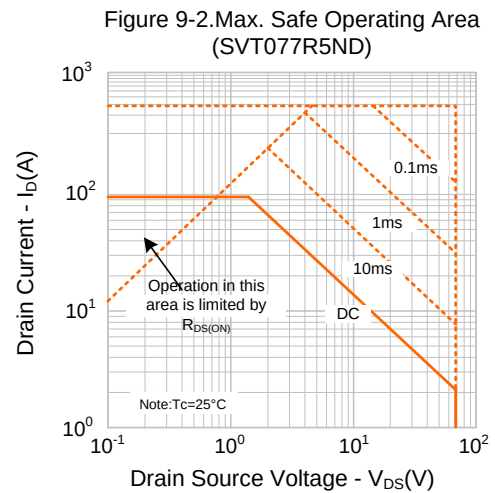
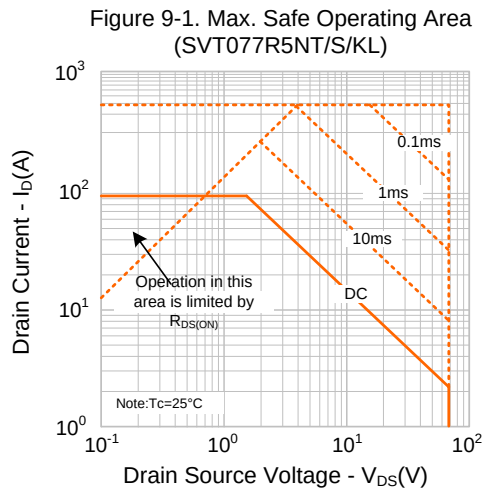
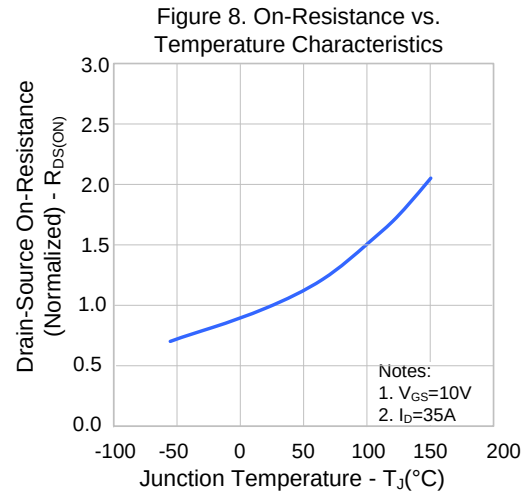
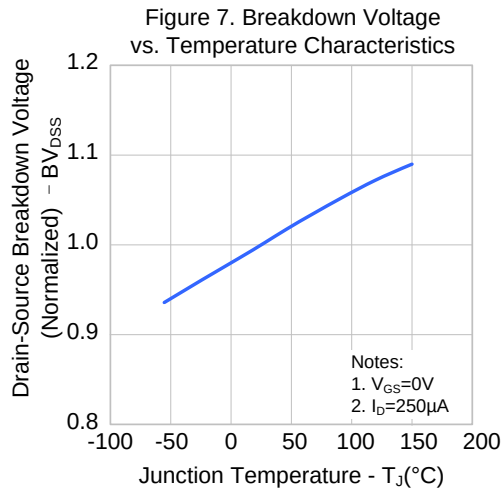


Figure 6. Gate Charge

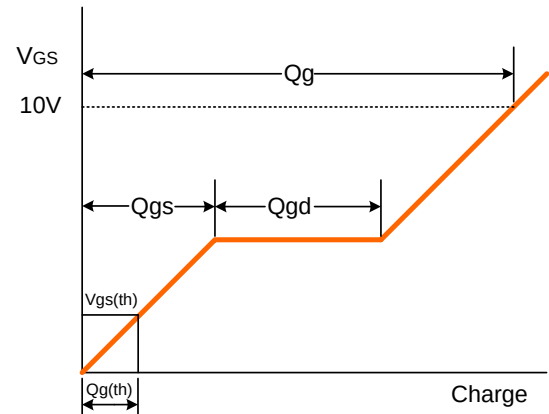
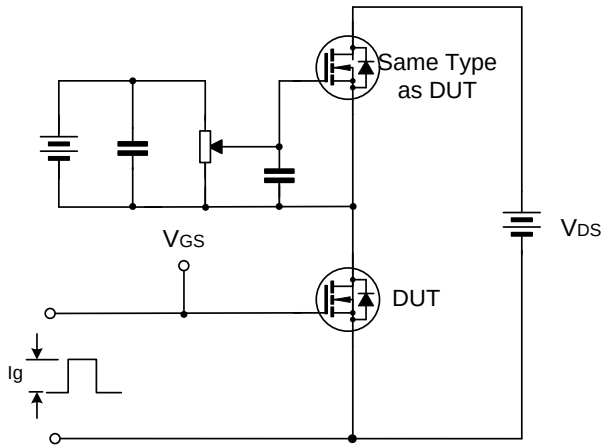


TYPICAL CHARACTERISTICS (CONTINUED)

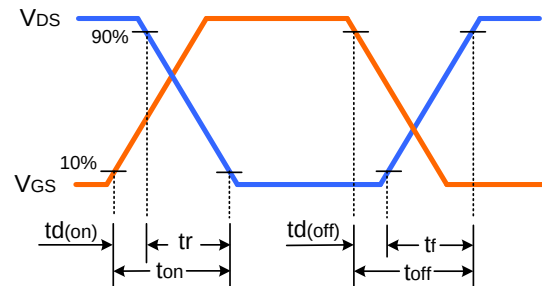
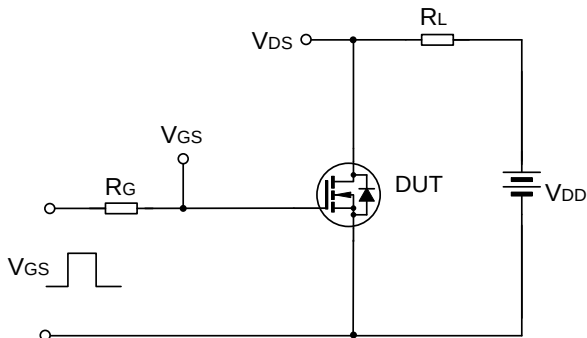


TYPICAL TEST CIRCUIT

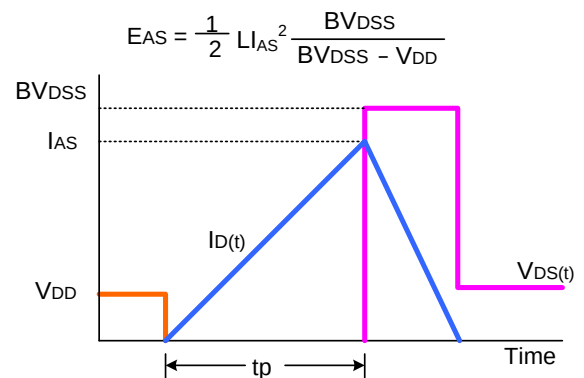
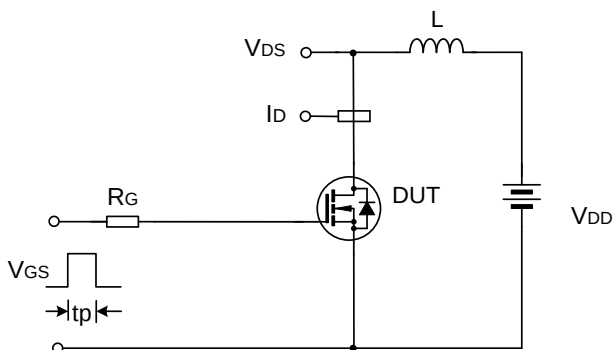
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



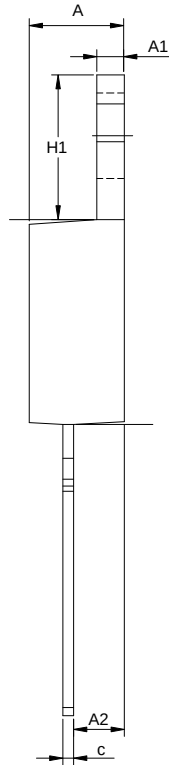
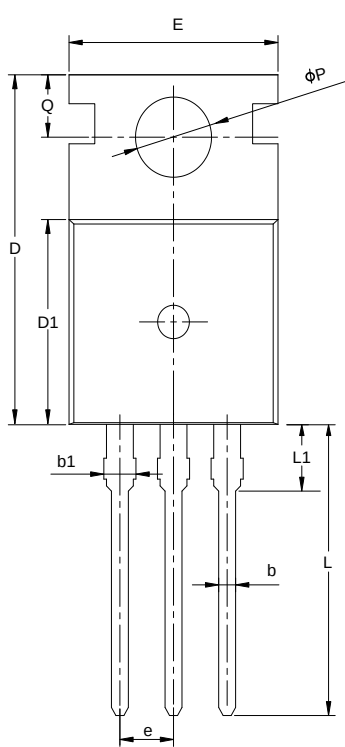
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-220-3L

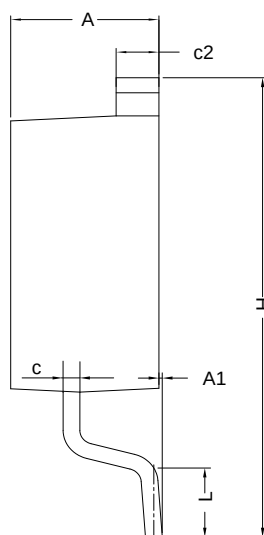
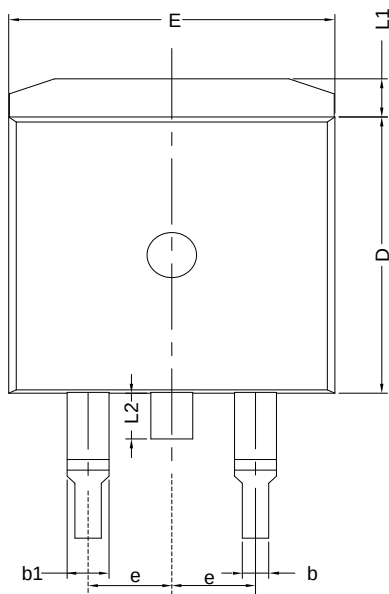
UNIT: mm



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-263-2L

UNIT: mm

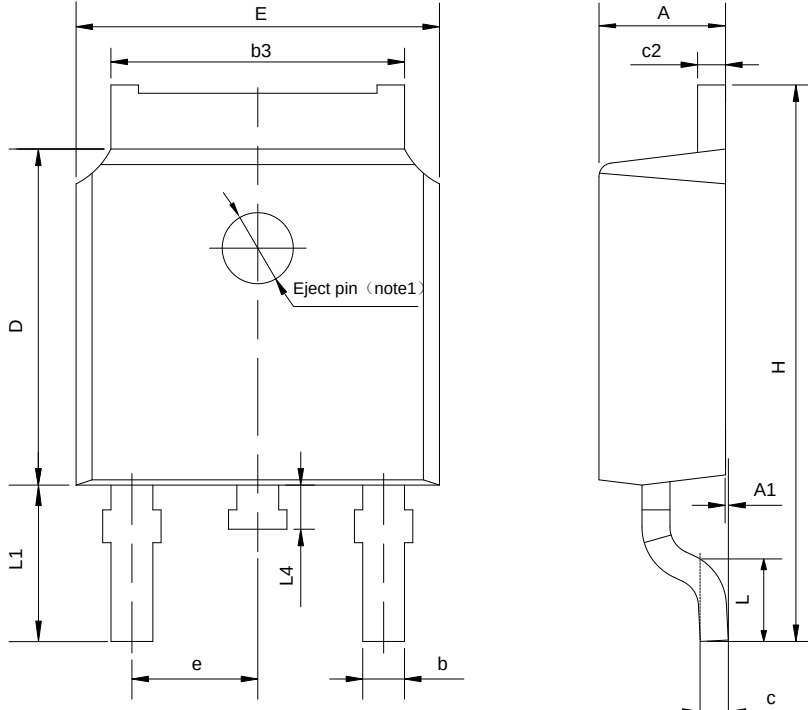


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
b1	1.17	—	1.50
c	0.30	—	0.60
c2	1.17	1.27	1.37
D	8.50	—	9.35
E	9.80	—	10.45
e	2.54BSC		
H	14.70	—	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	—	—	1.75

PACKAGE OUTLINE (CONTINUED)

TO-252-2L

UNIT: mm

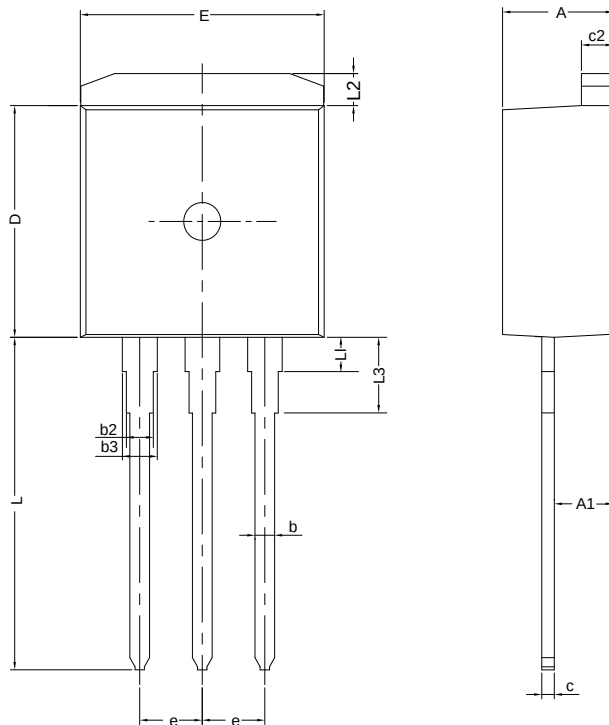


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0	—	0.127
b	0.66	0.76	0.89
b3	5.10	5.33	5.46
c	0.45	—	0.65
c2	0.45	—	0.65
D	5.80	6.10	6.40
E	6.30	6.60	6.90
e	2.30TYP		
H	9.60	10.10	10.60
L	1.40	1.50	1.70
L1	2.90REF		
L4	0.60	0.80	1.00

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

TO-262L-3L

UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	2.20	—	2.92
b	0.71	0.80	0.88
b2	0.90	1.01	1.08
b3	1.20	—	1.50
c	0.34	—	0.76
c2	1.22	1.30	1.35
D	8.38	—	9.30
E	9.80	10.16	10.54
e	2.54 BSC		
L	12.80	—	14.10
L1	1.40	1.50	1.60
L2	1.12	—	1.42
L3	3.00	3.20	3.40

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!
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Part No.: SVT077R5NT(D)(S)(KL)

Document Type: Datasheet

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Rev.: 1.5

Revision History:

1. Add package of SVG076R5NKL
2. Update typical test circuit and important notice
3. Delete nomenclature
4. Update curve template

Rev.: 1.4

Revision History:

1. Add SVT077R5NS (To-263-2L) package

Rev.: 1.3

Revision History:

1. Modify the values of $R_{DS(ON)}$

Rev.: 1.2

Revision History:

1. Update Fig3

Rev.: 1.1

Revision History:

1. Add TO-252-2L

Rev.: 1.0

Revision History:

1. First release