

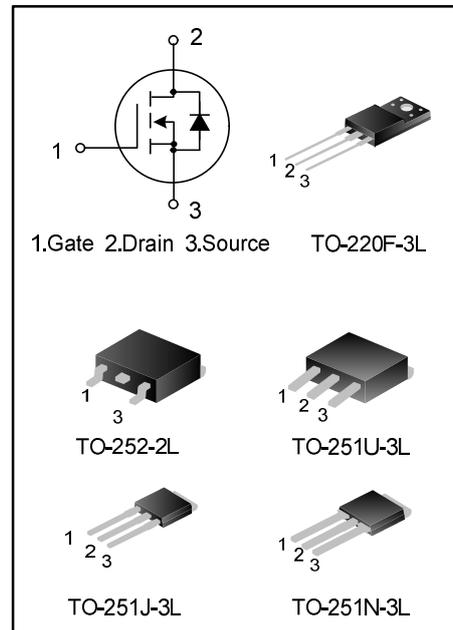
5A, 700V DP MOS POWER TRANSISTOR

DESCRIPTION

SVS5N70D/MJ/MN/F/MU is an N-channel enhancement mode high voltage power MOSFETs produced using Silan's DP MOS technology. It achieves low conduction loss and switching losses. It leads the design engineers to their power converters with high efficiency, high power density, and superior thermal behavior. Furthermore, it's universal applicable, i.e., suitable for hard and soft switching topologies.

FEATURES

- ◆ 5A,700V, $R_{DS(on)(typ.)}=0.8\Omega@V_{GS}=10V$
- ◆ New revolutionary high voltage technology
- ◆ Ultra low gate charge
- ◆ Periodic avalanche rated
- ◆ Extreme dv/dt rated
- ◆ High peak current capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing
SVS5N70D	TO-252-2L	SVS5N70D	Halogen free	Tube
SVS5N70DTR	TO-252-2L	SVS5N70D	Halogen free	Tape&reel
SVS5N70MJ	TO-251J-3L	SVS5N70	Halogen free	Tube
SVS5N70MN	TO-251N-3L	5N70MN	Halogen free	Tube
SVS5N70F	TO-220F-3L	SVS5N70F	Halogen free	Tube
SVS5N70MU	TO-251U-3L	SVS5N70MU	Halogen free	Tube

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_C=25^\circ\text{C}$)

Characteristics	Symbol	Ratings				Unit
		SVS5N70 D	SVS5N70 MJ/MU	SVS5N70 MN	SVS5N70 F	
Drain-Source Voltage	V_{DS}	700				V
Gate-Source Voltage	V_{GS}	± 30				V
Drain Current	I_D	$T_C=25^\circ\text{C}$				A
		$T_C=100^\circ\text{C}$				
Drain Current Pulsed	I_{DM}	18				A
Power Dissipation($T_C=25^\circ\text{C}$) -Derate above 25°C	P_D	58	60	60	24	W
		0.46	0.48	0.48	0.19	W/ $^\circ\text{C}$

Characteristics	Symbol	Ratings				Unit
		SVS5N70 D	SVS5N70 MJ/MU	SVS5N70 MN	SVS5N70 F	
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	180				mJ
Operation Junction Temperature Range	T_J	-55~+150				°C
Storage Temperature Range	T_{stg}	-55~+150				°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings				Unit
		SVS5N70 D	SVS5N70 MJ/MU	SVS5N70 MN	SVS5N70 F	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.16	2.08	2.08	5.21	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.00	62.00	62.00	62.50	°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}	$V_{GS}=0V, I_D=250\mu A$	700	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=700V, V_{GS}=0V$	--	--	1.0	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	± 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	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.5A$	--	0.8	0.9	Ω
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V,$ $f=1.0\text{MHZ}$	--	360	--	pF
Output Capacitance	C_{oss}		--	21	--	
Reverse Transfer Capacitance	C_{rss}		--	1.9	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=350V, I_D=5.0A,$ $V_{GS}=10V, R_G=24\Omega$ (Note 2,3)	--	9.47	--	ns
Turn-on Rise Time	t_r		--	26.3	--	
Turn-off Delay Time	$t_{d(off)}$		--	57.9	--	
Turn-off Fall Time	t_f		--	25.7	--	
Total Gate Charge	Q_g	$V_{DS}=560V, I_D=5.0A,$ $V_{GS}=10V$ (Note 2,3)	--	19.2	--	nC
Gate-Source Charge	Q_{gs}		--	2.45	--	
Gate-Drain Charge	Q_{gd}		--	11.7	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction	--	--	5.0	A
Pulsed Source Current	I_{SM}	Diode in the MOSFET	--	--	18.0	
Diode Forward Voltage	V_{SD}	$I_S=5.0A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=5.0A, V_{GS}=0V,$	--	305	--	ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100A/\mu s$	--	2.3	--	μC

Notes:

1. $L=79mH, I_{AS}=2.0A, V_{DD}=100V, R_G=25\Omega$, starting $T_J=25^\circ C$;
2. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycles $\leq 2\%$;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

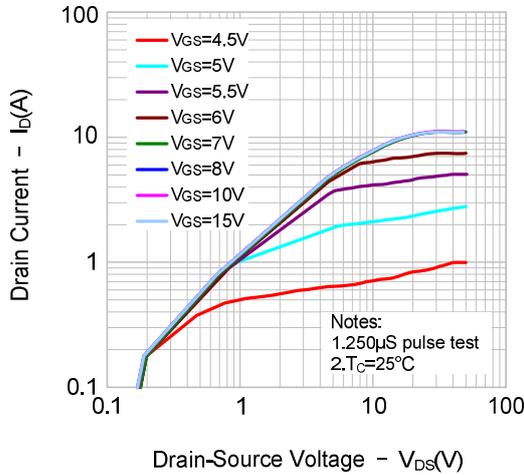


Figure 2. Transfer Characteristics

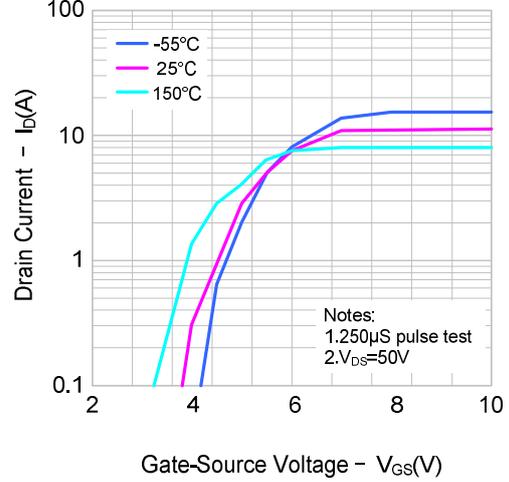


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

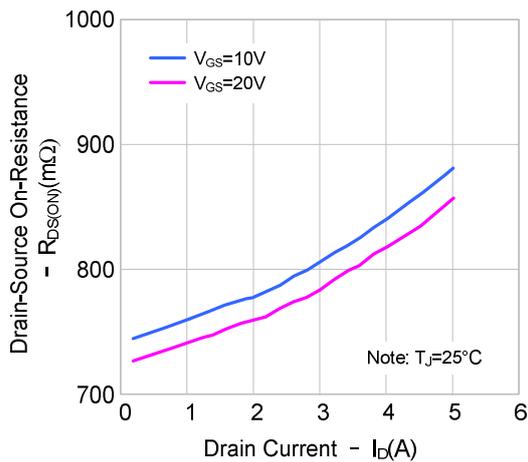


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

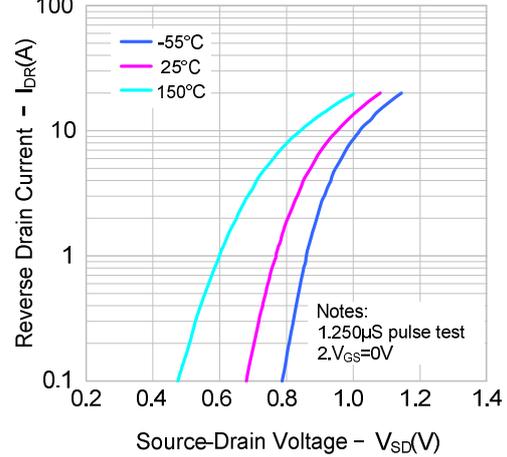


Figure 5. Capacitance Characteristics

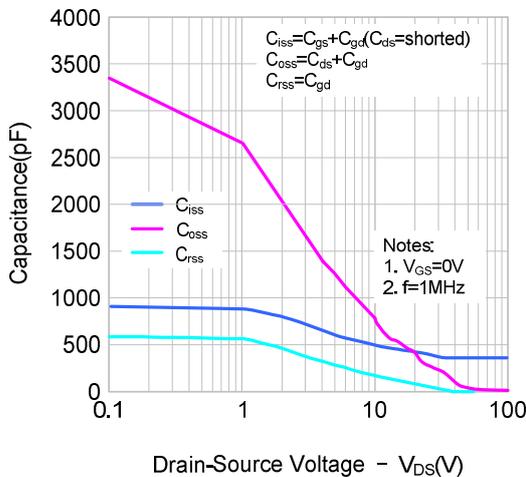
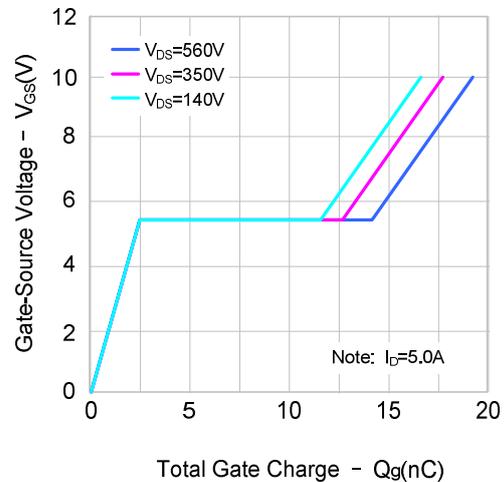
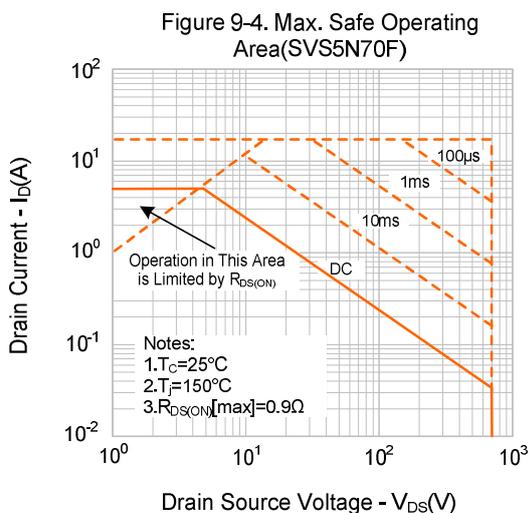
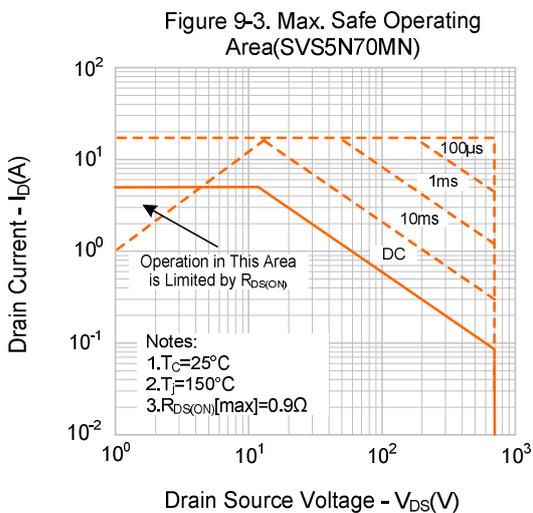
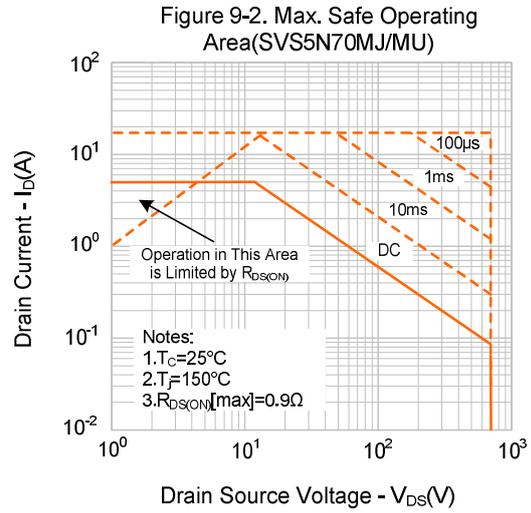
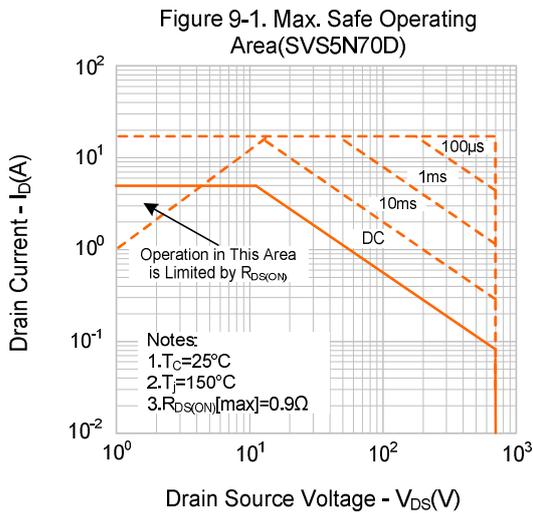
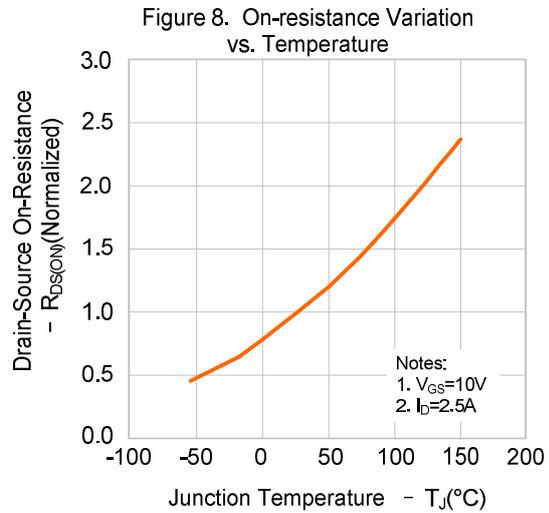
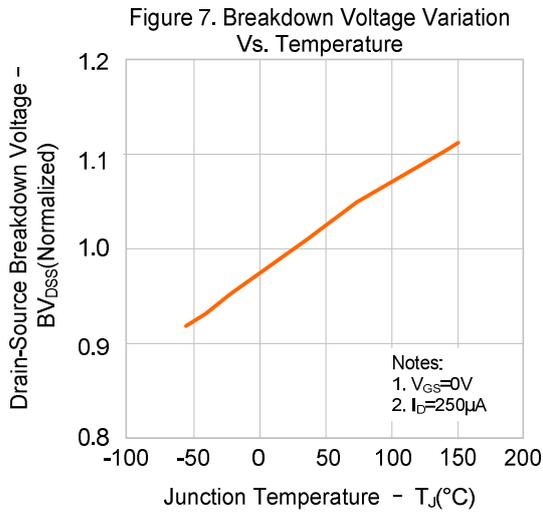


Figure 6. Gate Charge Characteristics

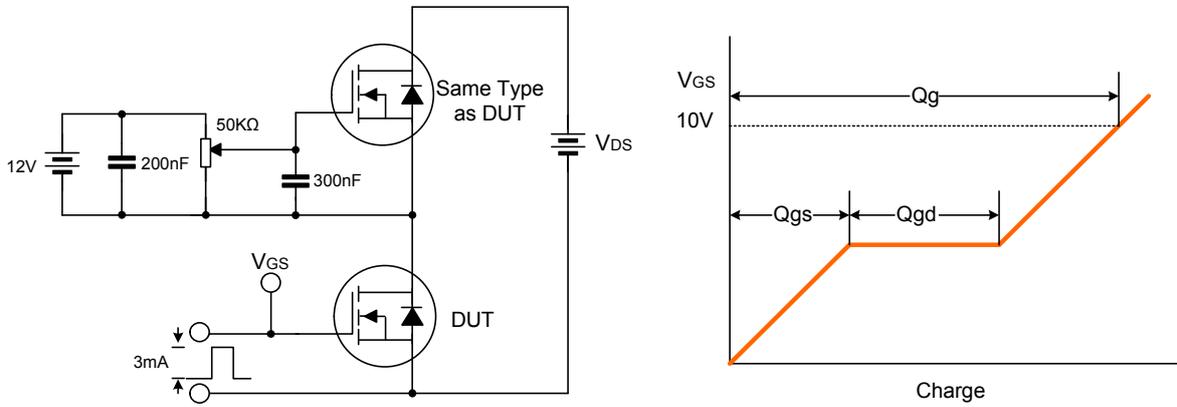


TYPICAL CHARACTERISTICS(continued)

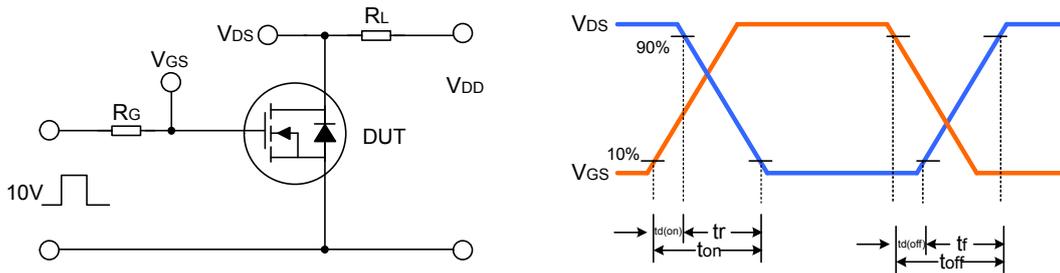


TYPICAL TEST CIRCUIT

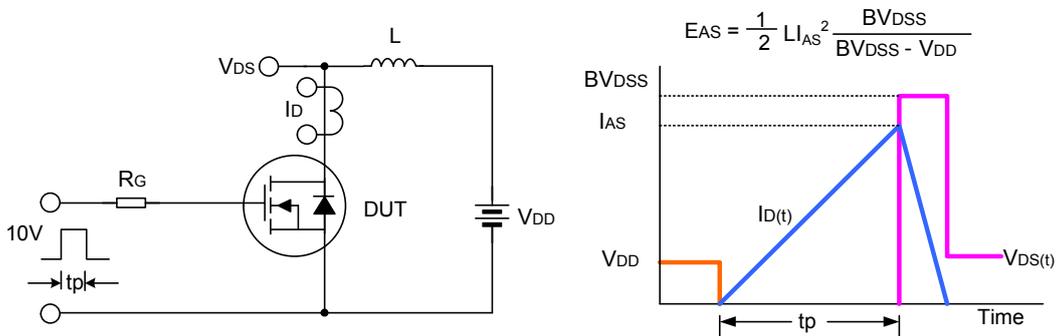
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



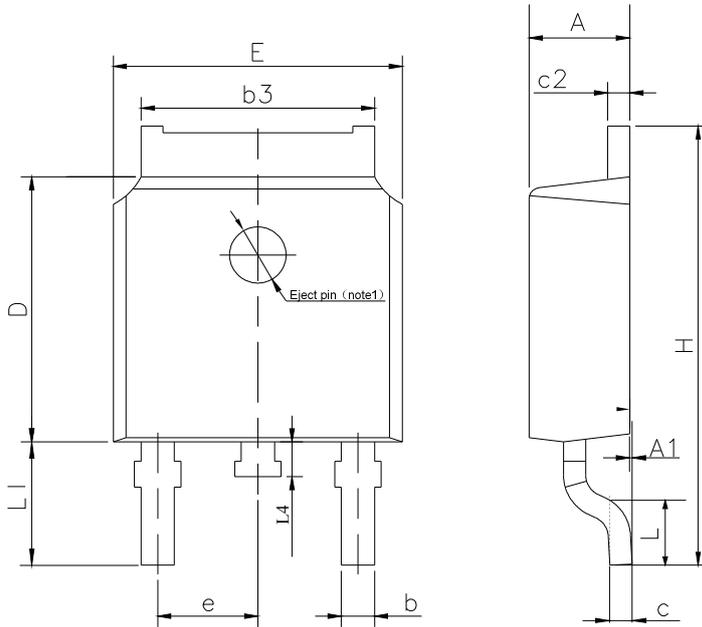
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-252-2L

UNIT: mm

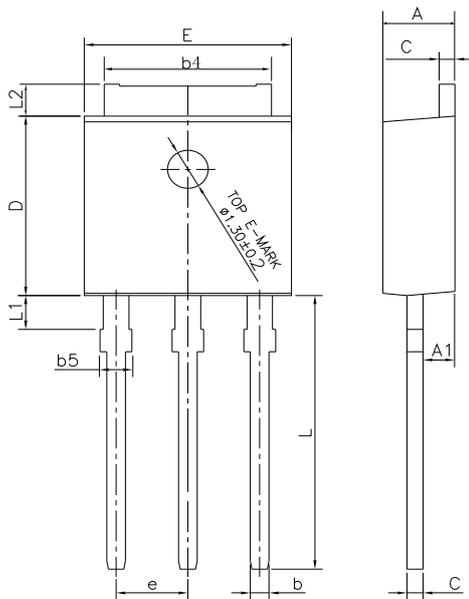


SYMBOL	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0	---	0.127
b	0.66	0.76	0.89
b3	5.10	5.33	5.46
c	0.45	---	0.65
c2	0.45	---	0.65
D	5.80	6.10	6.40
E	6.30	6.60	6.90
e	2.30TYP		
H	9.60	10.10	10.60
L	1.40	1.50	1.70
L1	2.90REF		
L4	0.60	0.80	1.00

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

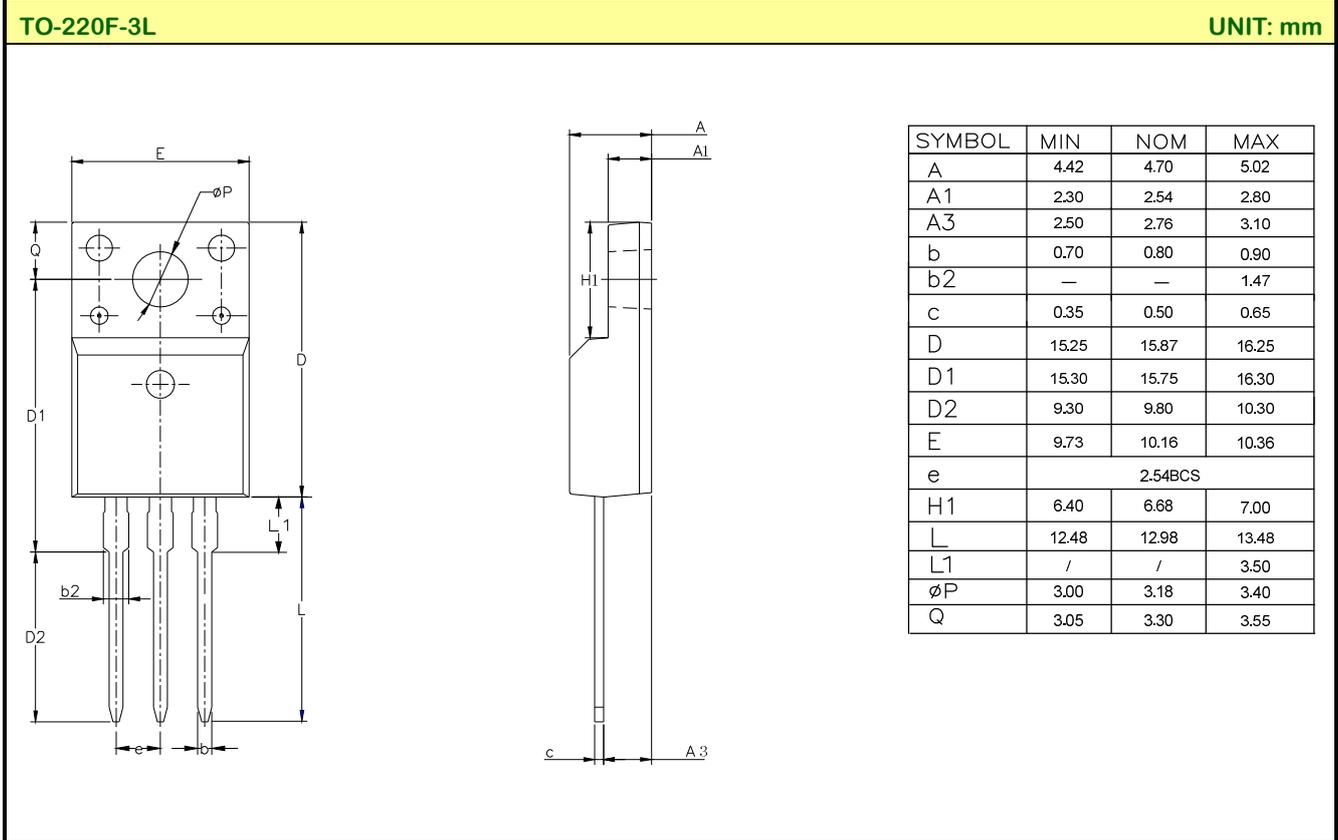
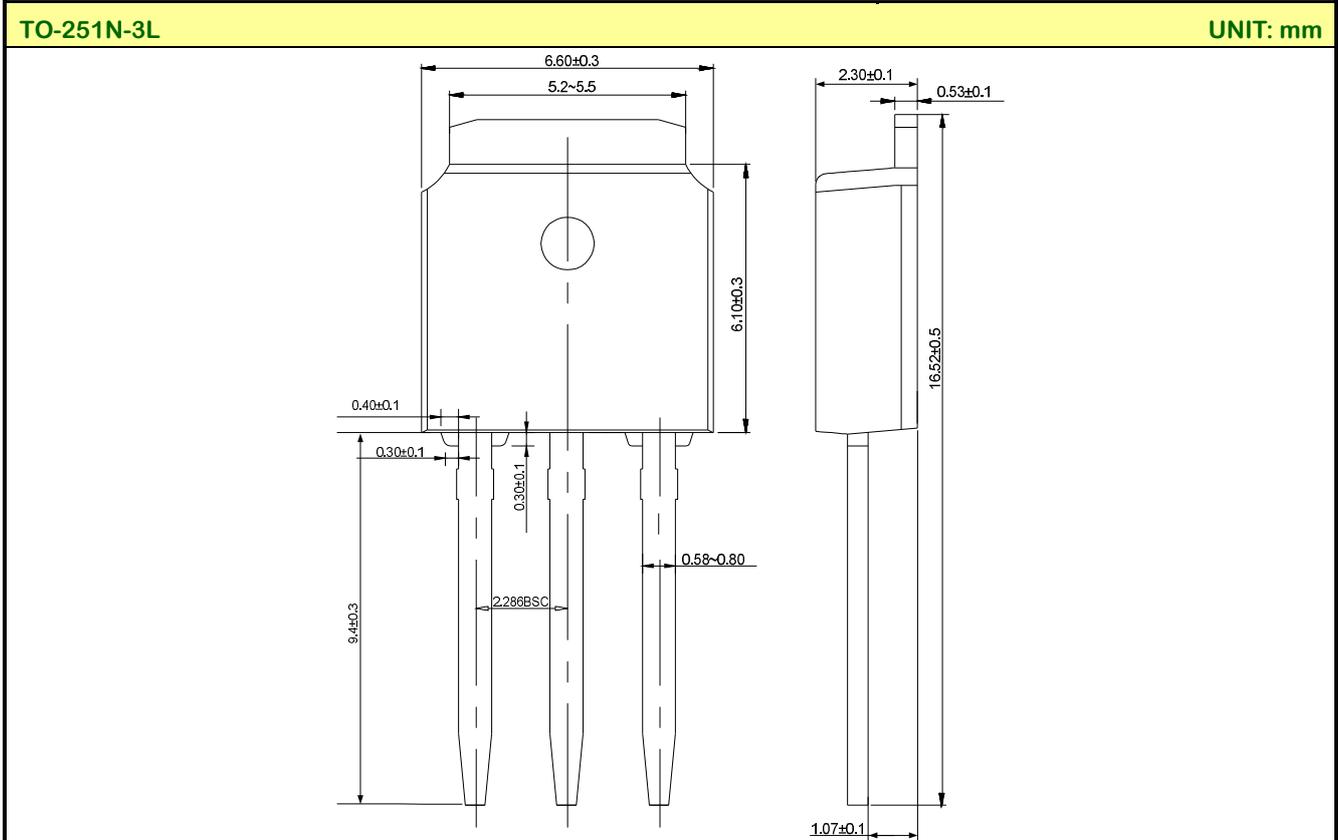
TO-251J-3L

UNIT: mm

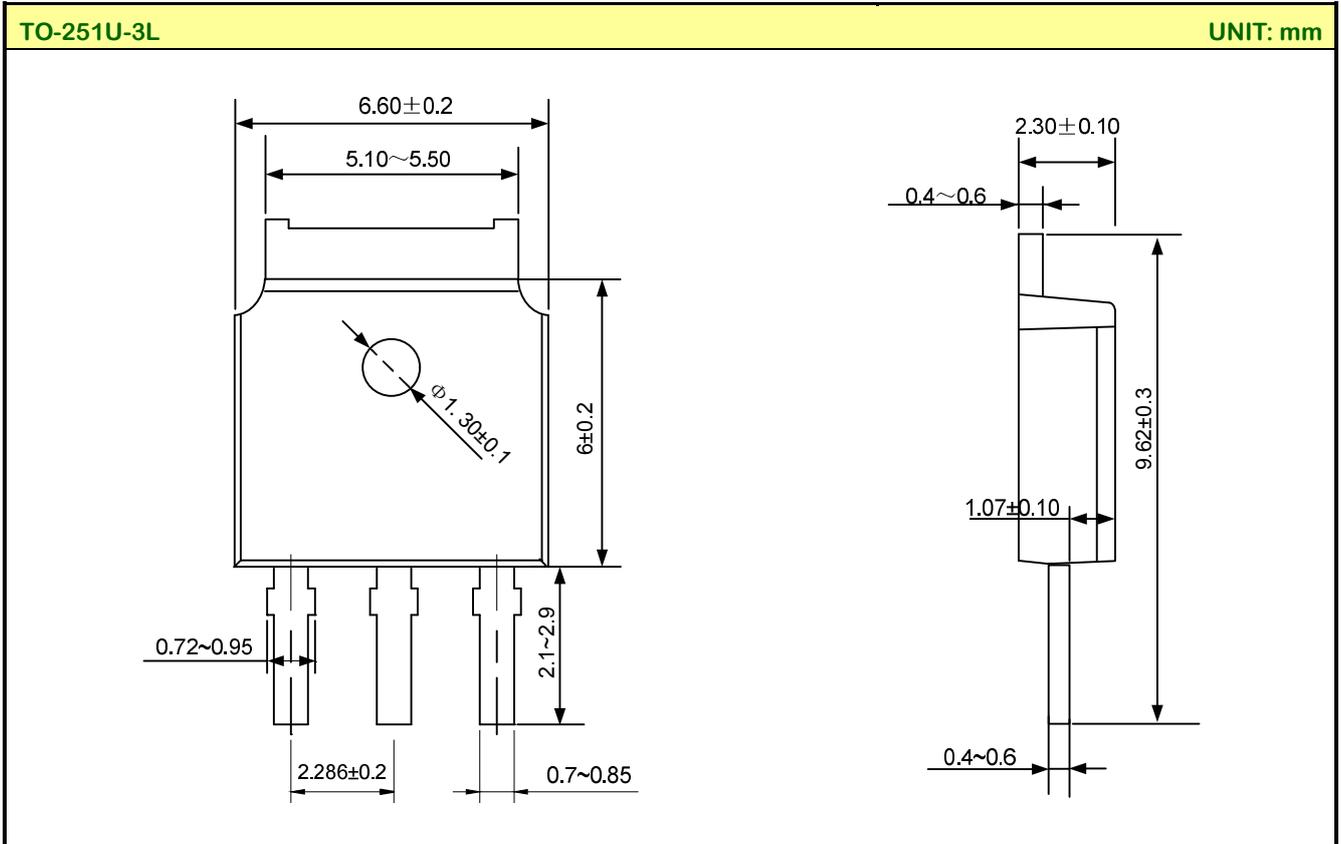


SYMBOL	MIN	NOM	MAX
A	2.18	2.30	2.39
A1	0.89	1.00	1.14
b	0.56	---	0.89
b4	4.95	5.33	5.46
b5	---	---	1.05
c	0.46	---	0.61
D	5.97	6.10	6.27
E	6.35	6.60	6.73
e	2.29 BCS		
L	8.89	9.30	9.65
L1	0.95	---	1.50
L2	0.89	---	1.27

PACKAGE OUTLINE(continued)



PACKAGE OUTLINE(continued)



Disclaimer :

- Silan reserves the right to make changes to the information herein for the improvement of the design and performance without prior notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.
- All semiconductor products malfunction or fail with some probability under special conditions. When using Silan products in system design or complete machine manufacturing, it is the responsibility of the buyer to comply with the safety standards strictly and take essential measures to avoid situations in which a malfunction or failure of such Silan products could cause loss of body injury or damage to property.
- Silan will supply the best possible product for customers!

Part No.: SVS5N70D/MJ/MN/F/MU Document Type: Datasheet
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Rev.: 1.8

Revision History:

1. Update the package information of TO-251J-3L
2. Delete the package outline of TO-220F-3L(2)

Rev.: 1.7

Revision History:

1. Add the package information of TO-251U-3L

Rev.: 1.6

Revision History:

1. Delete the package information of TO-251D-3L

Rev.: 1.5

Revision History:

1. Add the package information of TO-251D-3L

Rev.: 1.4

Revision History:

1. Modify the ordering information
2. Modify the package information of TO-252-2L

Rev.: 1.3

Revision History:

1. Modify the package information

Rev.: 1.2

Revision History:

1. Add the information of TO-220F-3L package

Rev.: 1.1

Revision History:

1. Modify the description

Rev.: 1.0

Revision History:

1. First release
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