

6A, 400V N-CHANNEL MOSFET

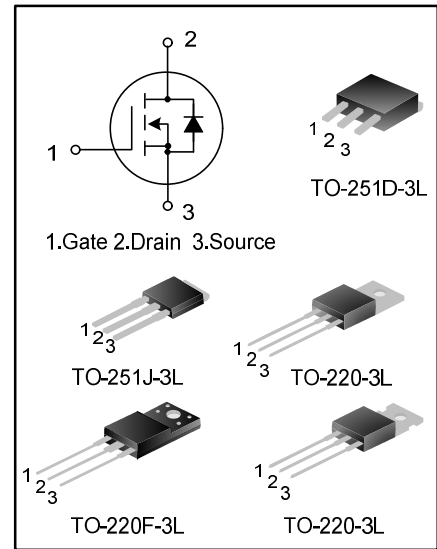
GENERAL DESCRIPTION

SVF730F/T/M/MJ is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell™ high-voltage planar VDMOS technology. The improved process and cell structure have been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are widely used in AC-DC power supplies, DC-DC converters and H-bridge PWM motor drivers.

FEATURES

- 6A, 400V, $R_{DS(on)} (typ) = 0.66\Omega @ V_{GS}=10V$
- Low gate charge
- Low C_{rss}
- Fast switching
- Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing
SVF730T	TO-220-3L	SVF730T	Pb free	Tube
SVF730F	TO-220F-3L	SVF730F	Pb free	Tube
SVF730M	TO-251D-3L	SVF730M	Halogen free	Tube
SVF730MJ	TO-251J-3L	SVF730MJ	Halogen free	Tube

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Characteristics		Symbol	Ratings				Unit
			SVF730M	SVF730MJ	SVF730F	SVF730T	
Drain-Source Voltage		V _{DS}	400				V
Gate-Source Voltage		V _{GS}	±30				V
Drain Current	T _C =25°C	I _D	6				A
	T _C =100°C		3.79				
Drain Current Pulsed		I _{DM}	24				A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	77	79	33	100	W
			0.62	0.63	0.26	0.80	W/°C
Single Pulsed Avalanche Energy(Note 1)		E _{AS}	288				mJ
Operation Junction Temperature Range		T _J	-55~+150				°C
Storage Temperature Range		T _{stg}	-55~+150				°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings				Unit
		SVF730M	SVF730MJ	SVF730F	SVF730T	
Thermal Resistance, Junction-to-Case	R _{θJC}	1.62	1.58	3.79	1.25	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.0	62.0	62.5	62.0	°C/W

ELECTRICAL CHARACTERISTICS (T_c=25°C unless otherwise noted)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	400	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =400V, V _{GS} =0V	--	--	1.0	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D =250μA	2.0	--	4.0	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3A	--	0.66	0.95	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	592	486.00	631.80	pF
Output Capacitance	C _{oss}		--	79.00	102.70	
Reverse Transfer Capacitance	C _{rss}		--	3.30	6.20	
Turn-on Delay Time	t _{d(on)}	V _{DD} =200V, I _D =6A, R _G =12Ω (Note 2,3)	--	10.52	13.68	ns
Turn-on Rise Time	t _r		--	26.44	34.37	
Turn-off Delay Time	t _{d(off)}		--	23.60	30.68	
Turn-off Fall Time	t _f		--	23.76	30.89	
Total Gate Charge	Q _g	V _{DS} =320V, I _D =6A, V _{GS} =10V (Note 2,3)	--	11.11	14.44	nC
Gate-Source Charge	Q _{gs}		--	3.36	4.37	
Gate-Drain Charge	Q _{gd}		--	4.52	5.88	
Gate Resistance	R _G	F=1MHz, Gate DC Bias=0, Test signal level=20mV, open drain	--	5.40	7.20	Ω

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	--	--	6	A
Pulsed Source Current	I _{SM}		--	--	24	
Diode Forward Voltage	V _{SD}	I _S =6.0A, V _{GS} =0V	--	--	1.4	V
Reverse Recovery Time	T _{rr}	I _S =6.0A, V _{GS} =0V, dI _F /dt=100A/μS	--	254.17	330.42	ns
Reverse Recovery Charge	Q _{rr}		--	1.50	2.00	μC

Notes:

1. L=30mH, I_{AS}=3.90A, V_{DD}=50V, R_G=25Ω, starting T_{BJB}=25°C;
2. Pulse Test: Pulse width ≤300μs, Duty cycle≤2%;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

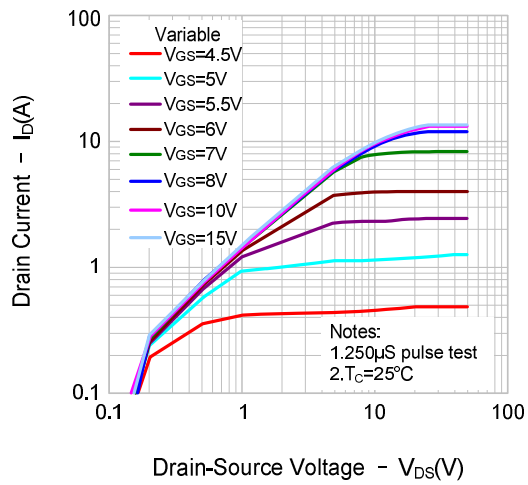


Figure 2. Transfer Characteristics

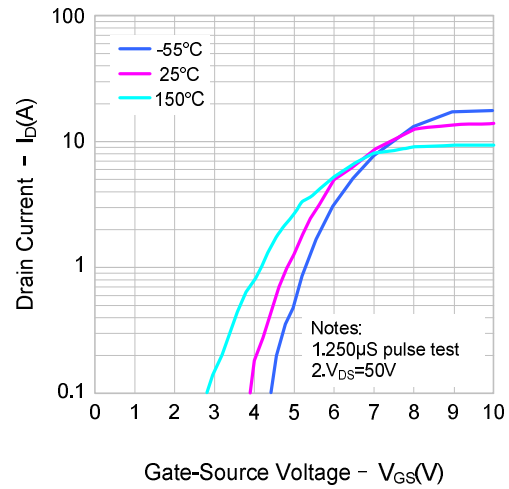


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

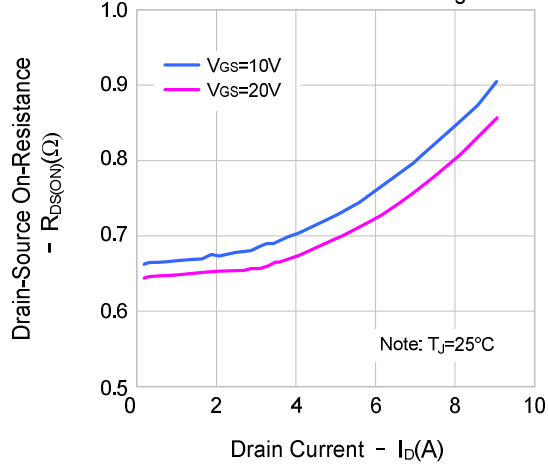
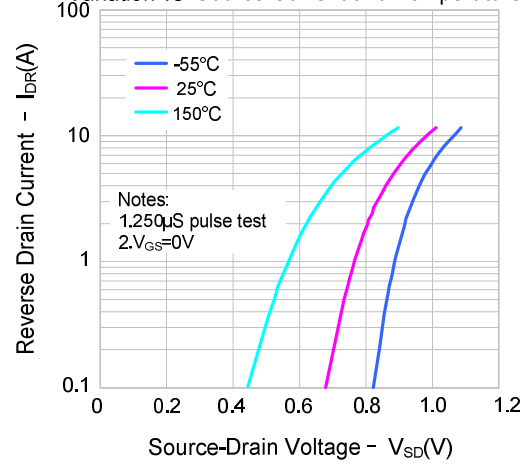


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature



TYPICAL CHARACTERISTICS(continued)

Figure 5. Capacitance Characteristics

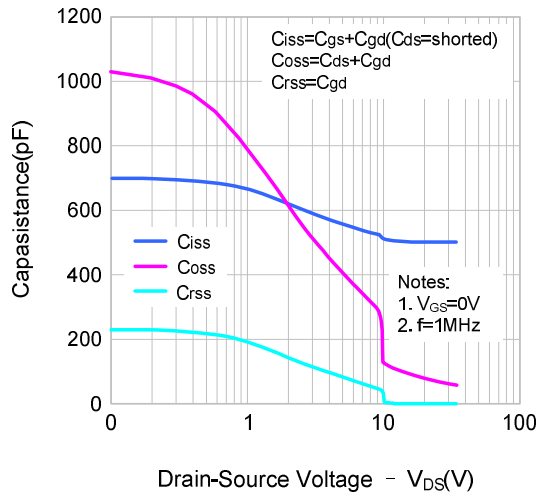


Figure 6. Gate Charge Characteristics

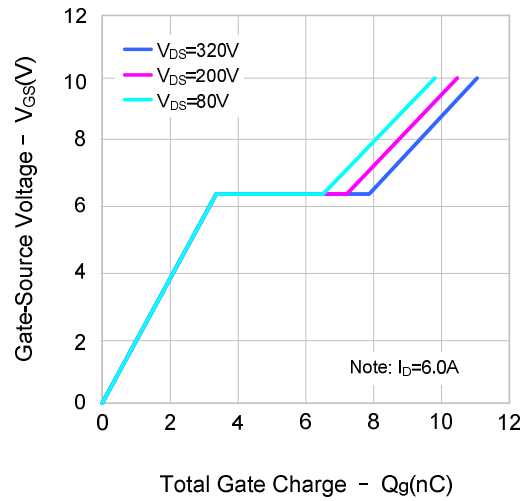


Figure 7. Breakdown Voltage Variation vs. Temperature

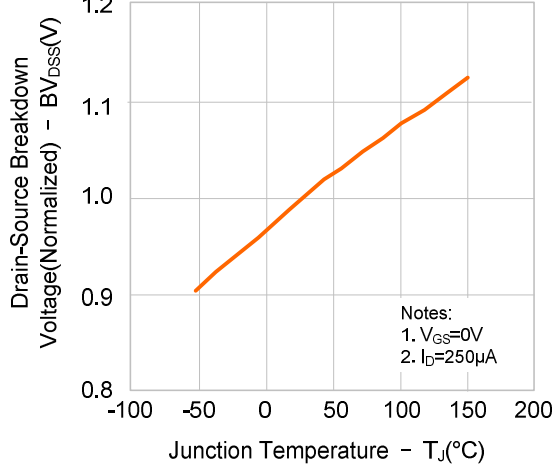


Figure 8. On-resistance Variation vs. Temperature

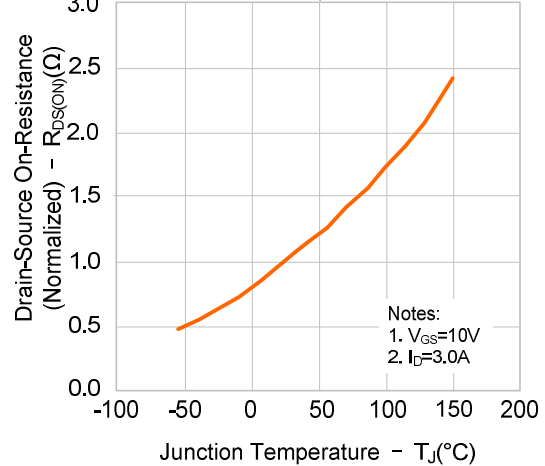


Figure 9-1. Max. Safe Operating Area(SVF730M)

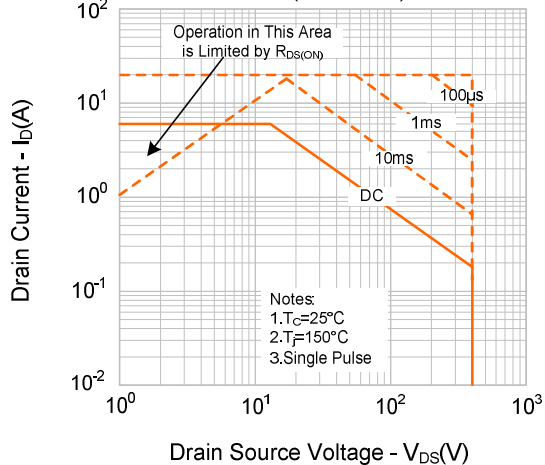
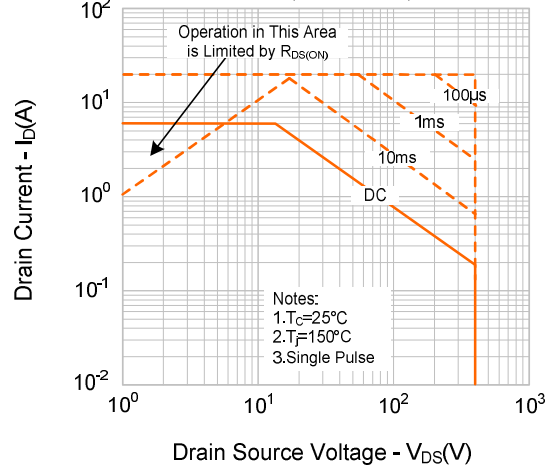


Figure 9-2. Max. Safe Operating Area(SVF730MJ)



TYPICAL CHARACTERISTICS(continued)

Figure 9-3. Max. Safe Operating Area(SVF730F)

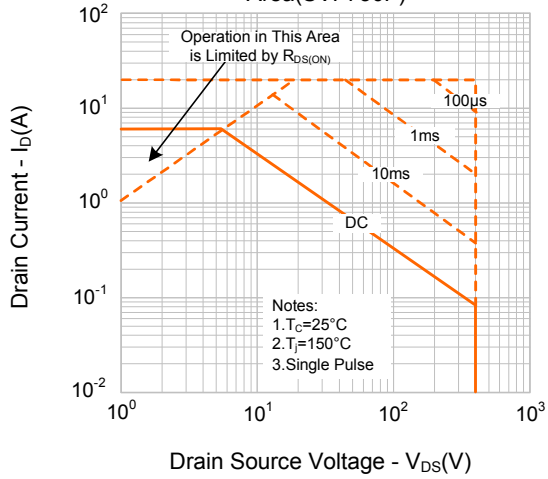


Figure 9-4. Max. Safe Operating Area(SVF730T)

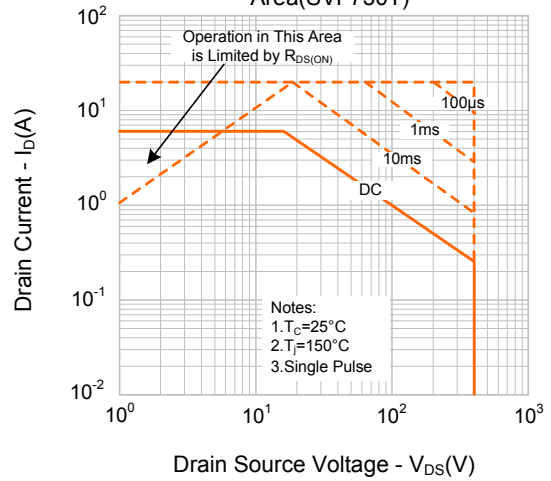
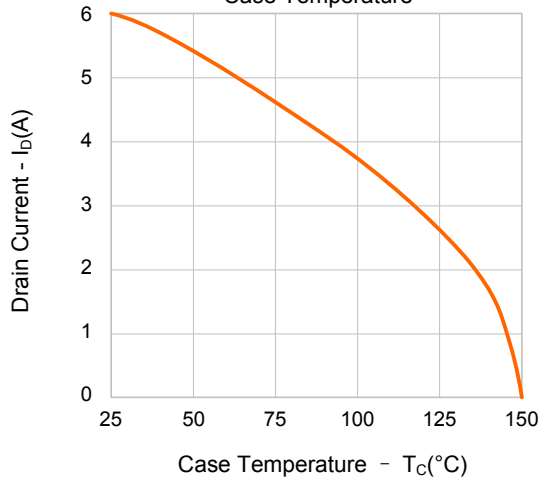
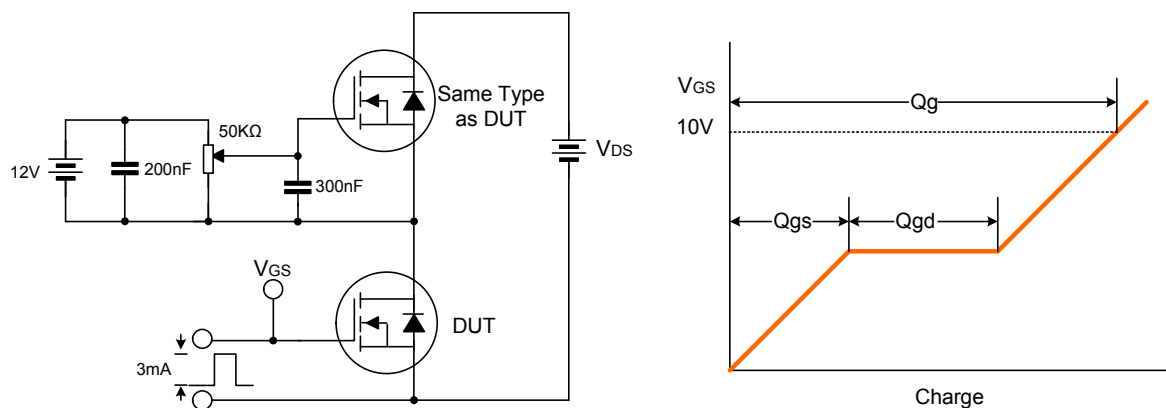


Figure 10. Maximum Drain Current vs. Case Temperature

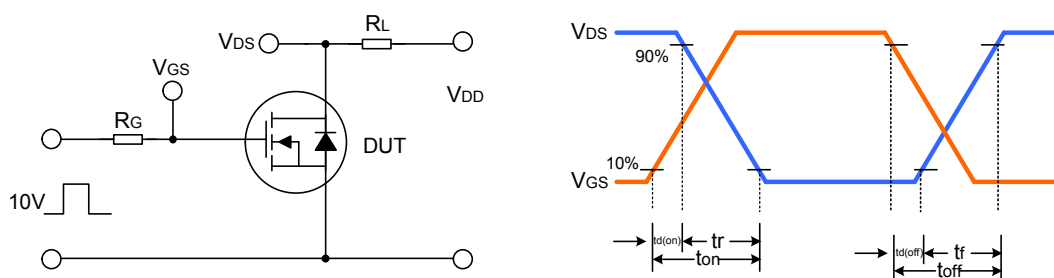


TYPICAL TEST CIRCUIT

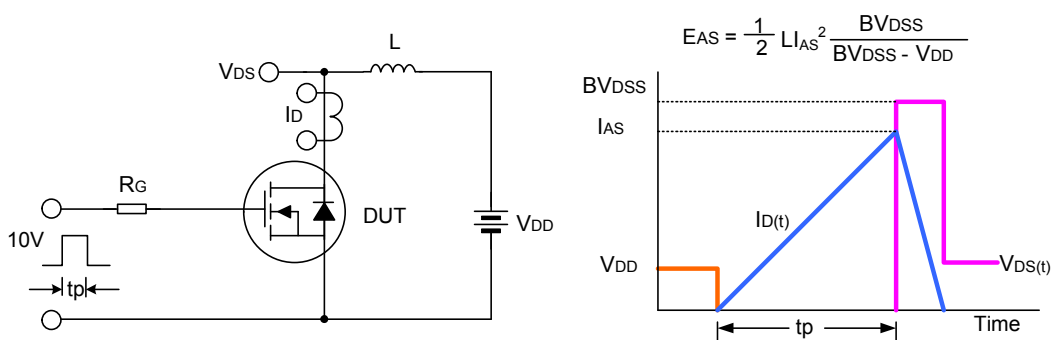
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



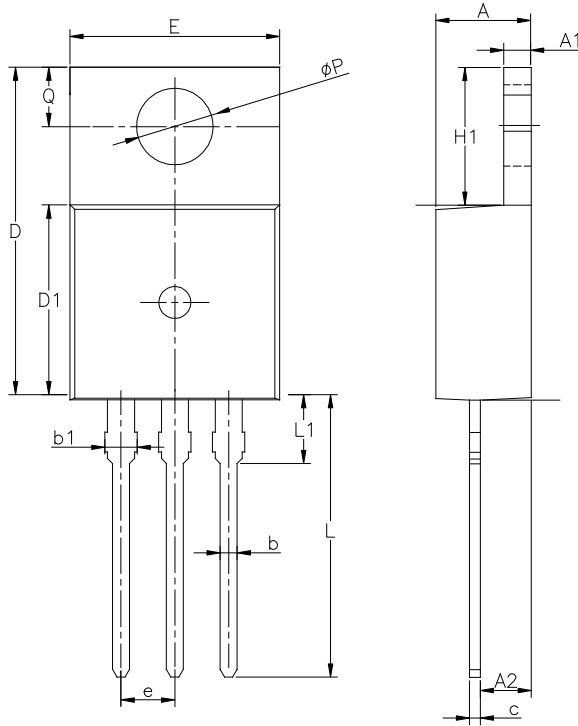
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-220-3L

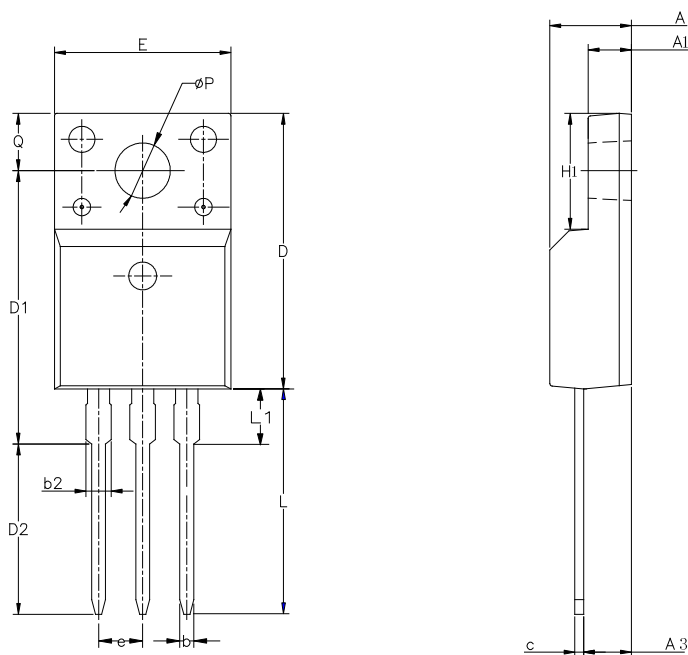
UNIT: mm



SYMBOL	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-220F-3L

UNIT: mm

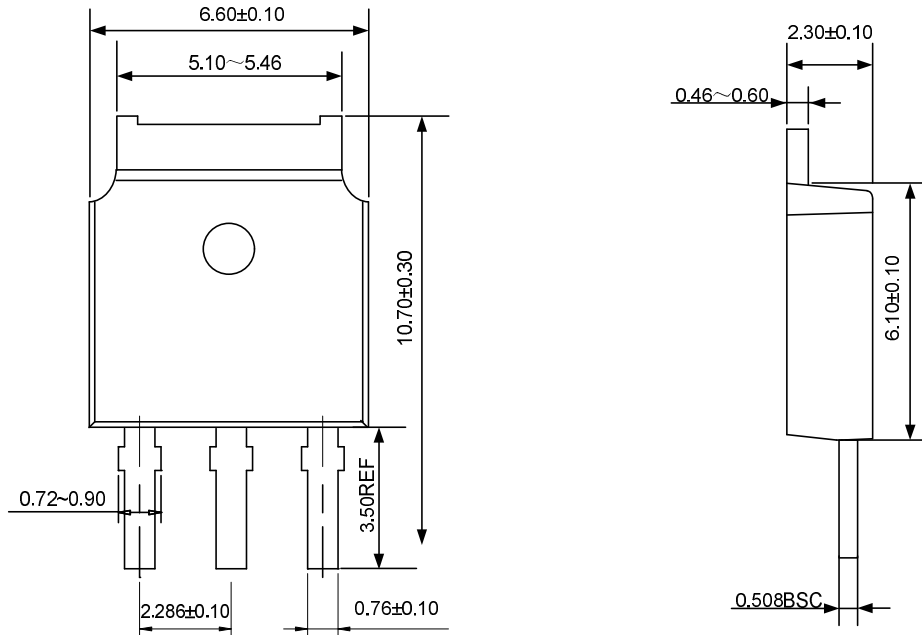


SYMBOL	MIN	NOM	MAX
A	4.42	4.70	5.02
A1	2.30	2.54	2.80
A3	2.50	2.76	3.10
b	0.70	0.80	0.90
b2	—	—	1.47
c	0.35	0.50	0.65
D	15.25	15.87	16.25
D1	15.30	15.75	16.30
D2	9.30	9.80	10.30
E	9.73	10.16	10.36
e	2.54BCS		
H1	6.40	6.68	7.00
L	12.48	12.98	13.48
L1	/	/	3.50
ϕP	3.00	3.18	3.40
Q	3.05	3.30	3.55

PACKAGE OUTLINE(continued)

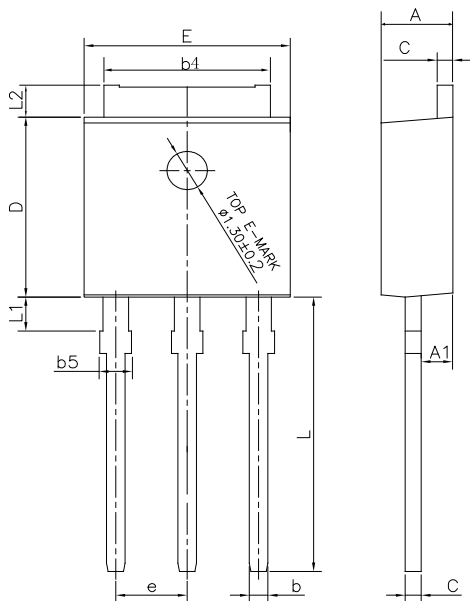
TO-251D-3L

UNIT: mm



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

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.:	SVF730F/T/M/MJ	Document Type:	Datasheet
Copyright:	HANGZHOU SILAN MICROELECTRONICS CO.,LTD	Website:	http://www.silan.com.cn

Rev.: 1.8

Revision History:

1. Delete the package outline of TO-252-2L

Rev.: 1.7

Revision History:

1. Update the package outline of TO-251J-3L

Rev.: 1.6

Revision History:

1. Modify the package information of TO-220F-3L
2. Modify the package information of TO-252-2L
3. Modify the package information of TO-220-3L

Rev.: 1.5

Revision History:

1. Modify the thermal characteristics

Rev.: 1.4

Revision History:

1. Add the package of TO-251J-3L

Rev.: 1.3

Revision History:

1. Modify the ordering information

Rev.: 1.2

Revision History:

1. Modify the package outline of TO-251D-3L

Rev.: 1.1

Revision History:

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

Rev.: 1.0

Revision History:

1. Initial release
-