

8A, 500V N-CHANNEL MOSFET

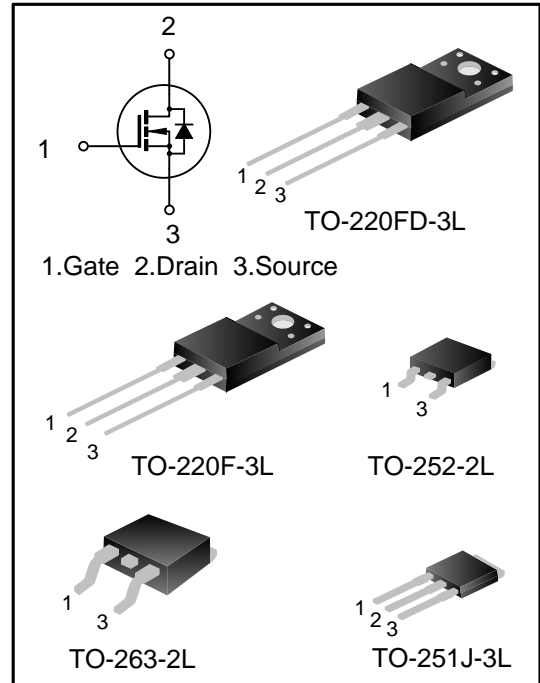
GENERAL DESCRIPTION

SVF840F/D/S/MJ/FD 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

- ◆ 8A, 500V, $R_{DS(on)(typ.)}=0.68\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low Crss
- ◆ Fast switching
- ◆ Improved dv/dt capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVF840F	TO-220F-3L	SVF840F	Pb free	Tube
SVF840DTR	TO-252-2L	SVF840D	Halogen free	Tape & Reel
SVF840S	TO-263-2L	SVF840S	Halogen free	Tube
SVF840STR	TO-263-2L	SVF840S	Halogen free	Tape & Reel
SVF840MJ	TO-251J-3L	SVF840MJ	Halogen free	Tube
SVF840FD	TO-220FD-3L	SVF840FD	Pb free	Tube

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

Characteristics	Symbol	Ratings				Unit
		SVF840F/FD	SVF840D	SVF840S	SVF840MJ	
Drain-Source Voltage	V _{DS}	500				V
Gate-Source Voltage	V _{GS}	±30				V
Drain Current	I _D	8				A
		5				
Drain Current Pulsed	I _{DM}	32				A
Power Dissipation(T _C =25°C) -Derate above 25°C	P _D	49	130	131	120	W
		0.39	1.04	1.05	0.96	W/°C
Single Pulsed Avalanche Energ(Note 1)	E _{AS}	511.6				mJ
Operation Junction Temperature Range	T _J	-55~+150				°C
Storage Temperature Range	T _{stg}	-55~+150				°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings				Unit
		SVF840F/FD	SVF840D	SVF840S	SVF840MJ	
Thermal Resistance, Junction-to-Case	R _{θJC}	2.56	0.96	0.95	1.04	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	62.0	110	62	°C/W

ELECTRICAL CHARACTERISTICS (T_J=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	500	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =500V, 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 =4.0A	--	0.68	0.90	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	--	904	--	pF
Output Capacitance	C _{oss}		--	120	--	
Reverse Transfer Capacitance	C _{rss}		--	2.69	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} =250V, I _D =8.0A, R _G =25Ω (Note 2,3)	--	29.2	--	ns
Turn-on Rise Time	t _r		--	59.6	--	
Turn-off Delay Time	t _{d(off)}		--	41.3	--	
Turn-off Fall Time	t _f		--	29.2	--	
Total Gate Charge	Q _g	V _{DS} =400V, I _D =8.0A, V _{GS} =10V (Note 2,3)	--	14.7	--	nC
Gate-Source Charge	Q _{gs}		--	5.6	--	
Gate-Drain Charge	Q _{gd}		--	4.4	--	

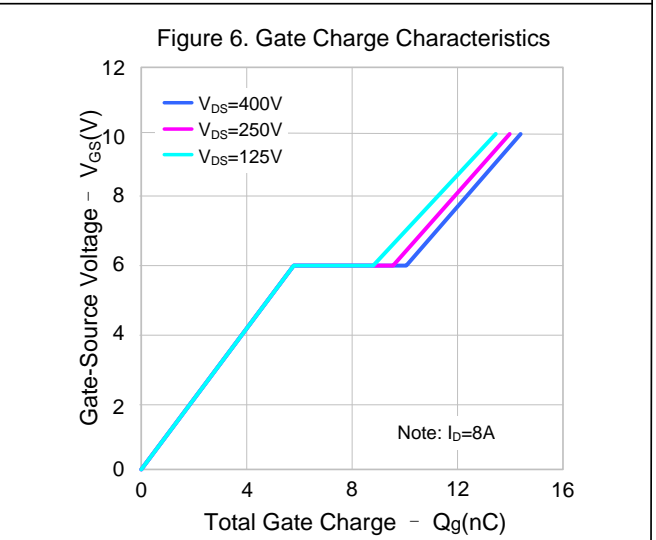
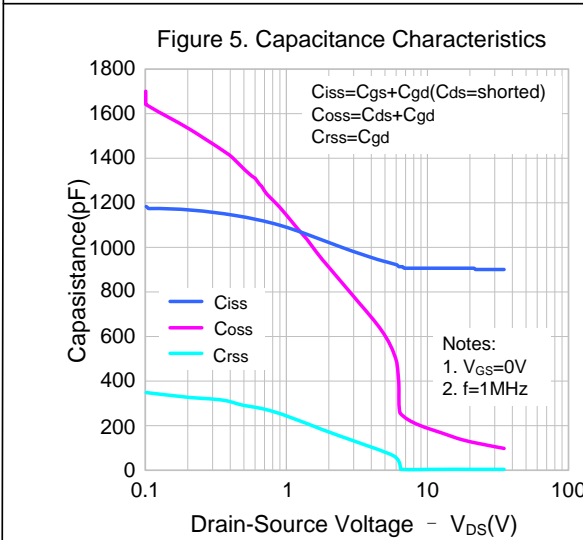
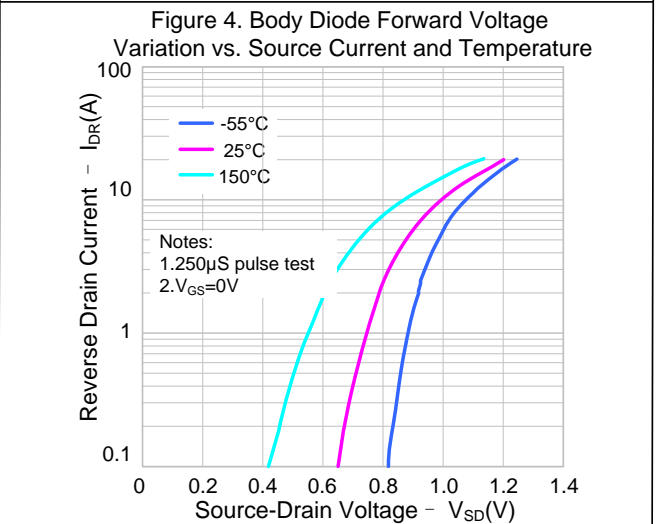
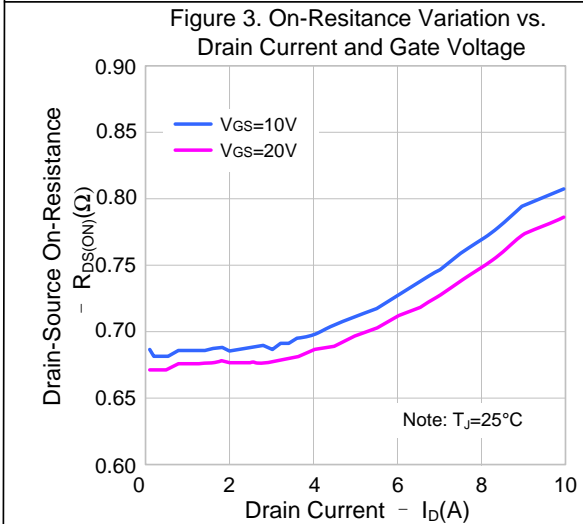
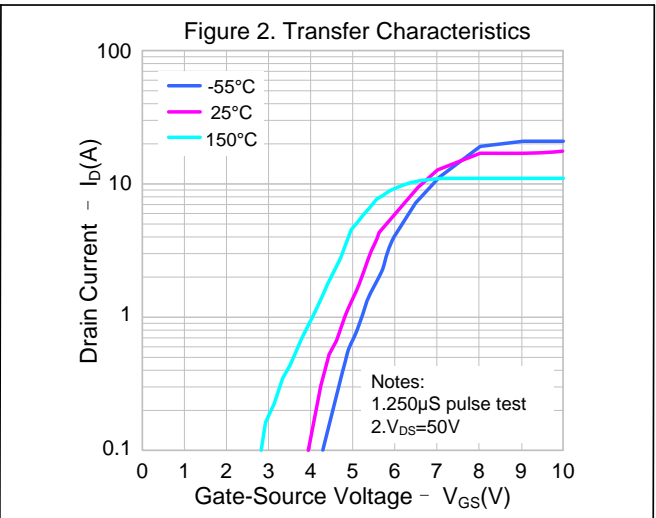
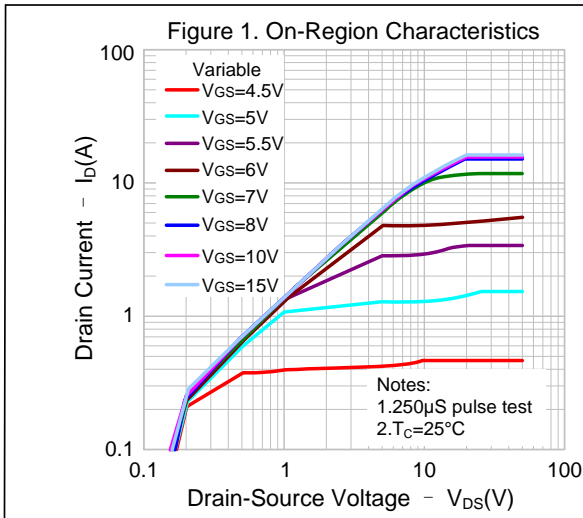
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	Integral Reverse P-N Junction	--	--	8.0	A
Pulsed Source Current	I _{SM}	Diode in the MOSFET	--	--	32.0	
Diode Forward Voltage	V _{SD}	I _S =8.0A, V _{GS} =0V	--	--	1.4	V
Reverse Recovery Time	T _{rr}	I _S =8.0A, V _{GS} =0V,	--	470.91	--	ns
Reverse Recovery Charge	Q _{rr}	di/dt=100A/μS (Note 2)	--	3.28	--	μC

Notes:

- L=30mH, I_{AS}=5.3A, V_{DD}=130V, R_G=25Ω, starting T_J=25°C;
- Pulse Test: Pulse width ≤300μs, Duty cycle≤2%;
- Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(CONTINUED)

Figure 7. Breakdown Voltage Variation vs. Temperature

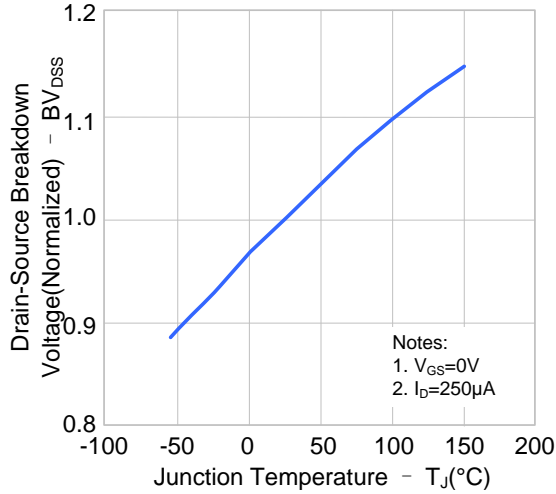


Figure 8. On-resistance Variation vs. Temperature

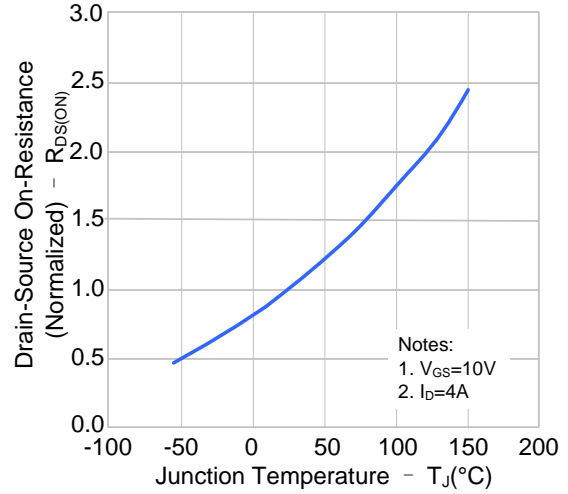


Figure 9-1. Max. Safe Operating Area(SVF840MJ)

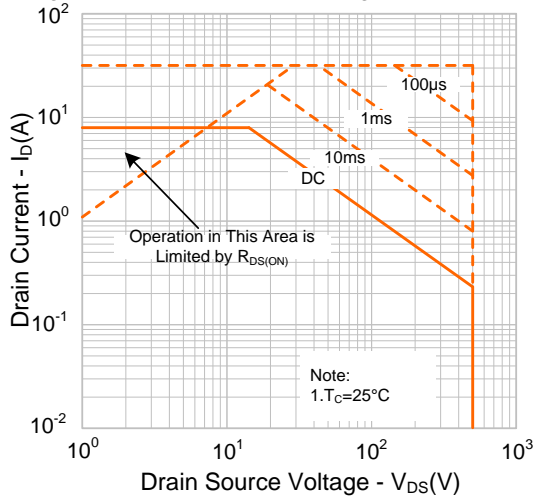


Figure 9-2. Max. Safe Operating Area(SVF840F/FD)

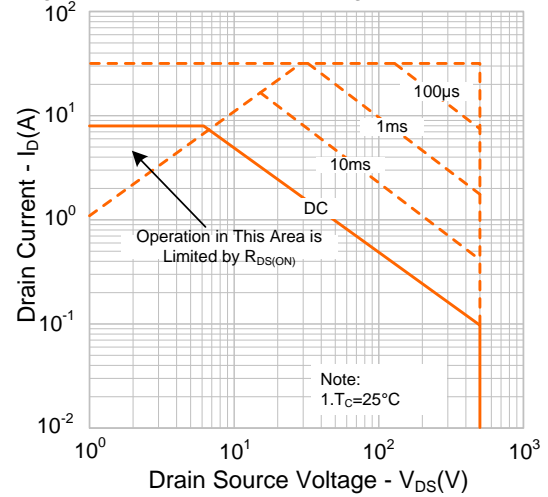


Figure 9-3. Max. Safe Operating Area(SVF840D)

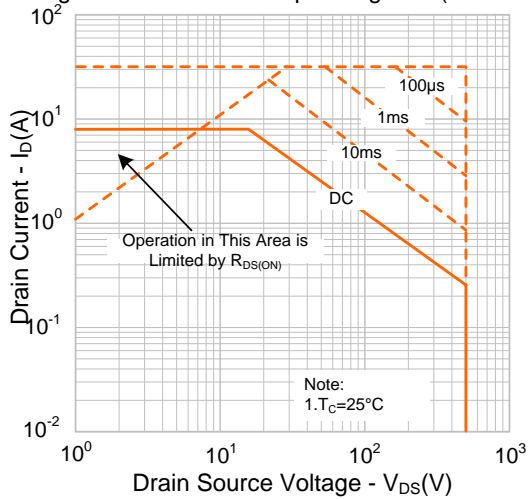
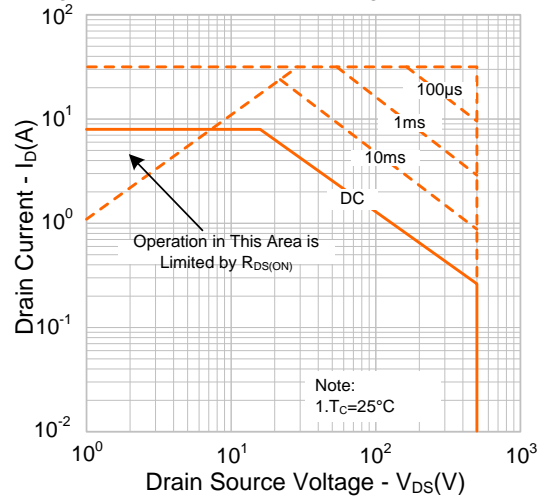
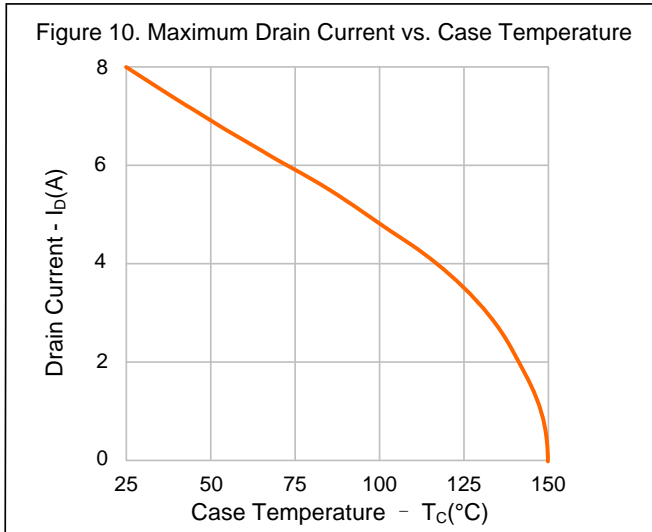


Figure 9-4. Max. Safe Operating Area(SVF840S)

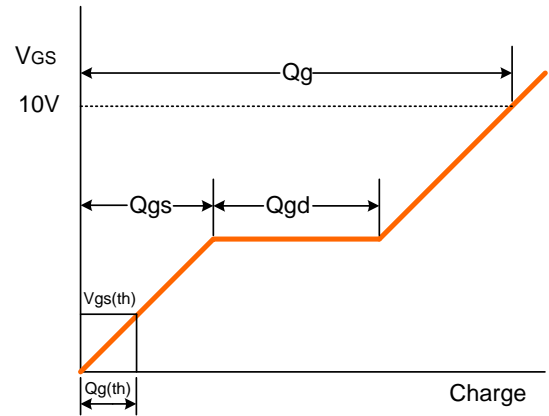
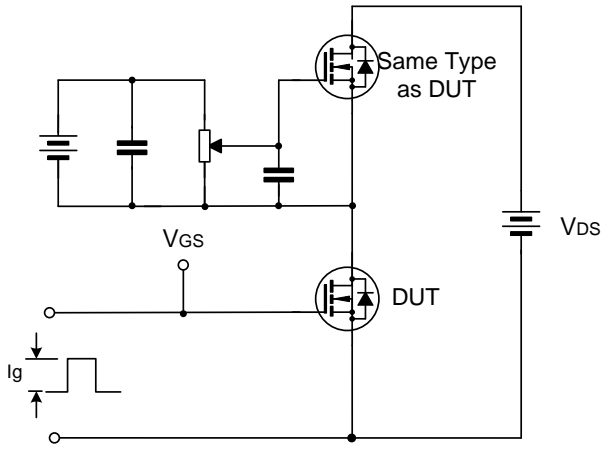


TYPICAL CHARACTERISTICS(CONTINUED)

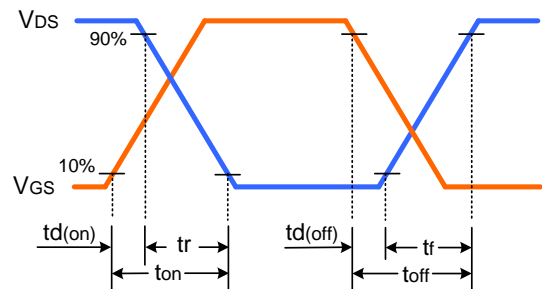
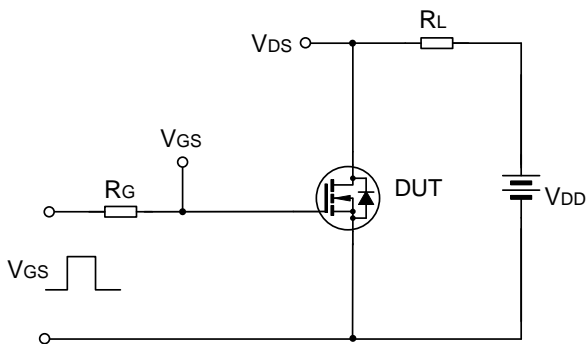


TYPICAL TEST CIRCUIT

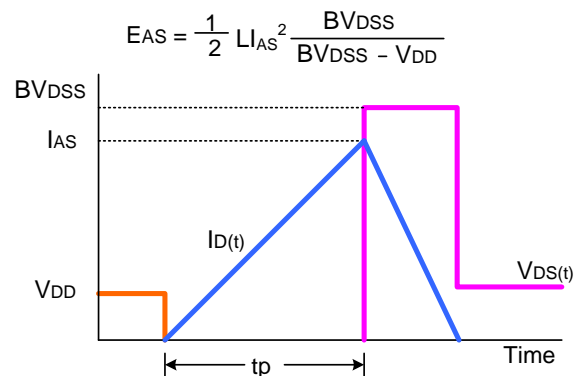
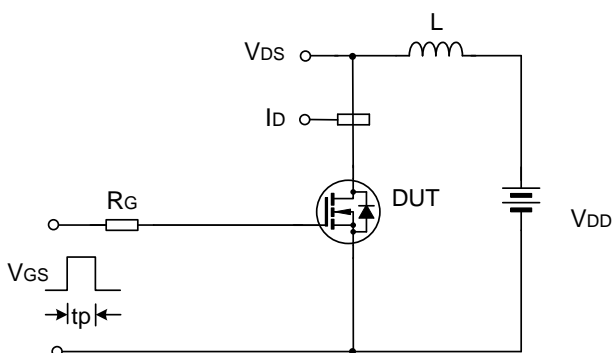
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



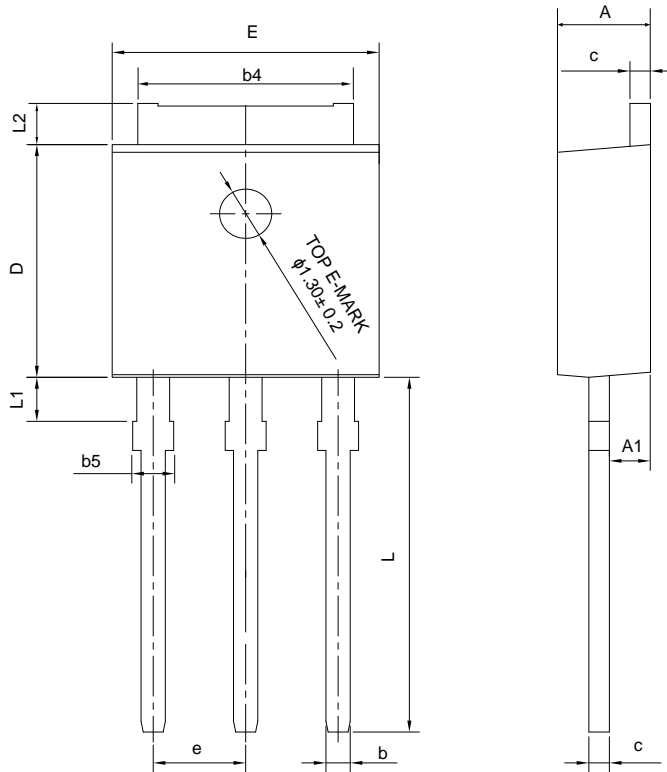
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-251J-3L

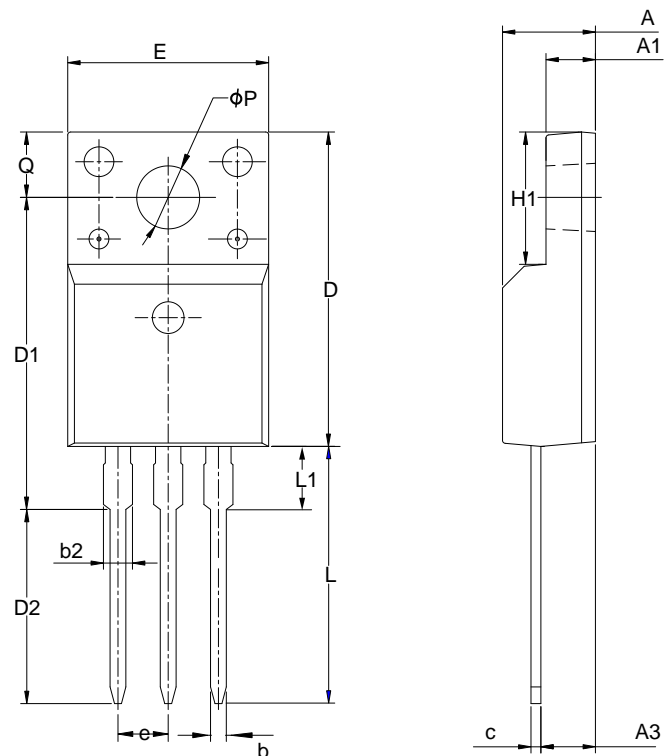
Unit: mm



SYMBOL	MILLIMETER		
	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

TO-220F-3L

Unit: mm

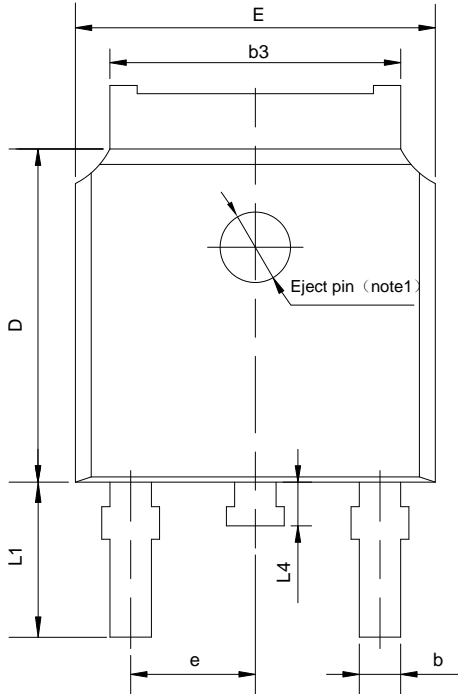


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.42	4.70	5.02
A1	2.30	2.54	2.80
A3	2.50	2.76	3.10
b	0.70	0.80	0.90
b2	—	—	1.47
c	0.35	0.50	0.65
D	15.25	15.87	16.25
D1	15.30	15.75	16.30
D2	9.30	9.80	10.30
E	9.73	10.16	10.36
e	2.54 BCS		
H1	6.40	6.68	7.00
L	12.48	12.98	13.48
L1	—	—	3.50
ΦP	3.00	3.18	3.40
Q	3.05	3.30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

PACKAGE OUTLINE (CONTINUED)

TO-252-2L

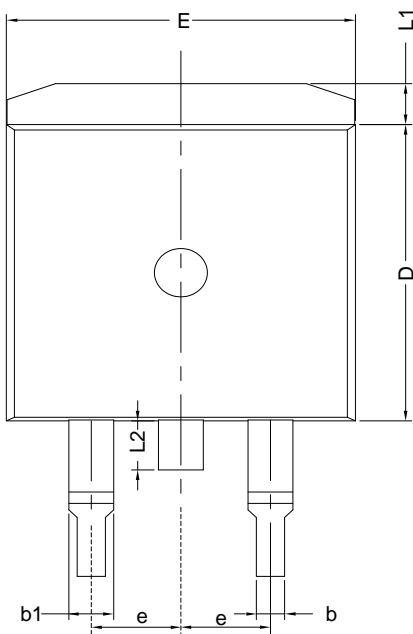
Unit: mm



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

TO-263-2L

Unit: mm

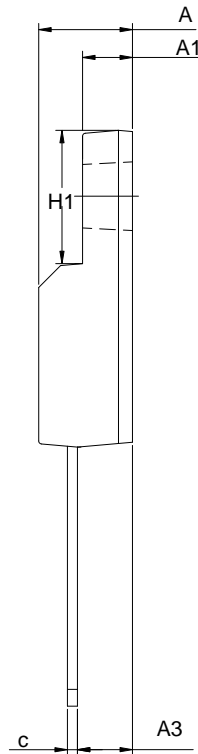
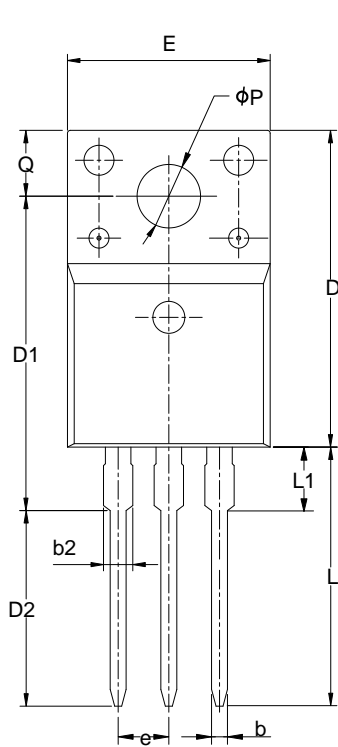


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
c	0.30	—	0.60
c2	1.17	1.27	1.37
D	8.50	—	9.35
E	9.80	—	10.45
e	2.54BSC		
H	14.70	—	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	—	—	1.75

PACKAGE OUTLINE (CONTINUED)

TO-220FD-3L

Unit: mm



SYMBOL	MILLIMETER		
	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	2.54BSC		
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

Important notice :

- The instructions are subject to change without notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.
- Our products are consumer electronic products, and / or civil electronic products.
- 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.
- It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
- When exporting, using and reselling our products, buyer must comply with the international export control laws and regulations of China, the United States, the United Kingdom, the European Union and other countries & regions.
- Product promotion is endless, our company will wholeheartedly provide customers with better products!
- Website: <http://www.silan.com.cn>

Part No.: **SVF840F/D/S/MJ/FD** Document Type: **Datasheet**
Copyright: **HANGZHOU SILAN MICROELECTRONICS CO.,LTD** Website: **<http://www.silan.com.cn>**

Rev.: **2.7**

Revision History:

1. Add the package outline of TO-220FD-3L
 2. Update the template of the datasheet
-

Rev.: **2.6**

Revision History:

1. Delete the package outline of TO-220-3L
-

Rev.: **2.5**

Revision History:

1. Add another solid figure of TO-220-3L
-

Rev.: **2.4**

Revision History:

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

Rev.: **2.3**

Revision History:

1. Modify the Typical Characteristics
-

Rev.: **2.2**

Revision History:

1. Modify the ordering information
-

Rev.: **2.1**

Revision History:

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

Rev.: **2.0**

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.: **1.9**

Revision History:

1. Modify the ordering information
-

Rev.: **1.8**

Revision History:

1. Modify the thermal characteristics
-

Rev.: **1.7**

Revision History:

1. Modify the ordering information
-

Rev.: **1.6**

Revision History:

1. Modify the ordering information
-

Rev.: 1.5

Revision History:

1. Change the schematic diagram of MOS
-

Rev.: 1.4

Revision History:

1. Modify the values of T_{rr} and Q_{rr}
-

Rev.: 1.3

Revision History:

1. Add the package of TO-263-2L
-

Rev.: 1.2

Revision History:

1. Add the package of TO-252-2L
-

Rev.: 1.1

Revision History:

1. Modify "PACKAGE OUTLINE"
-

Rev.: 1.0

Revision History:

1. Original
-
-