

4A, 650V N-CHANNEL MOSFET

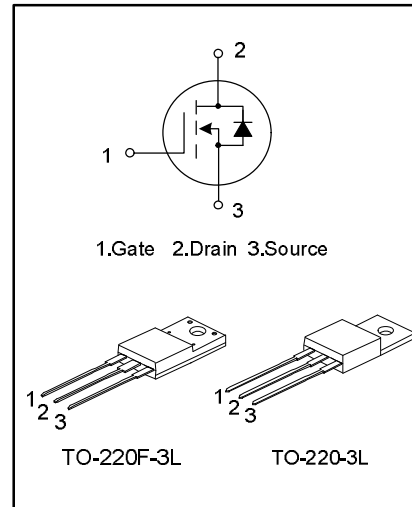
GENERAL DESCRIPTION

SVD4N65T/F is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary S-Rin™ structure DMOS technology. The improved planar stripe cell and the improved guarding ring terminal 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 suppliers, DC-DC converters and H-bridge PWM motor drivers.

FEATURES

- * 4A,650V, $R_{DS(on)}$ (typ) =2.3 Ω @VGS=10V
- * Low gate charge
- * Low Crss
- * Fast switching
- * Improved dv/dt capability



ORDERING SPECIFICATIONS

Part No.	Package	Marking	Shipping
SVD4N65T	TO-220-3L	SVD4N65T	50Unit/Tube
SVD4N65F	TO-220F-3L	SVD4N65F	50Unit/Tube

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

Parameter	Symbol	SVD4N65T	SVD4N65F	Unit
Drain-Source Voltage	V _{DS}	650		V
Gate-Source Voltage	V _{GS}	±30		V
Drain Current	I _D	4.0		A
Drain Current Pulsed	I _{DM}	16		A
Power Dissipation(Tc=25°C) -Derate above 25°C	P _D	100	33	W
		0.8	0.26	W/°C
Single Pulsed Avalanche Energy (Note 1)	E _{AS}	240		mJ
Repetitive Avalanche Energy	E _{AR}	10.6		mJ
Operation Junction Temperature	T _J	-55~+150		°C
Storage Temperature	T _{stg}	-55~+150		°C

THERMAL CHARACTERISTICS

Parameter	Symbol	SVD4N65T	SVD4N65F	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	1.25	3.79	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	62.5	°C/W

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

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BVDSS	V _{GS} =0V, I _D =250μA	650	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	--	--	10	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 =2A	--	2.3	3.0	Ω
Forward Transconductance	g _{FS}	V _{DS} = 50 V, I _D = 2 A	--	5.34	--	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	--	556	710	pF
Output Capacitance	C _{oss}		--	50	80	
Reverse Transfer Capacitance	C _{rss}		--	3	11	
Turn-on Delay Time	t _{d(on)}	V _{DD} =325V, I _D =4.0A, R _G =25Ω (Note 2,3)	--	20	30	ns
Turn-on Rise Time	t _r		--	19.3	80	
Turn-off Delay Time	t _{d(off)}		--	128	180	
Turn-off Fall Time	t _f		--	20	90	
Total Gate Charge	Q _g	V _{DS} =520V, I _D =4.0A, V _{GS} =10V (Note 2,3)	--	15.8	20	nC
Gate-Source Charge	Q _{gs}		--	3.5	--	
Gate-Drain Charge	Q _{gd}		--	5.6	--	

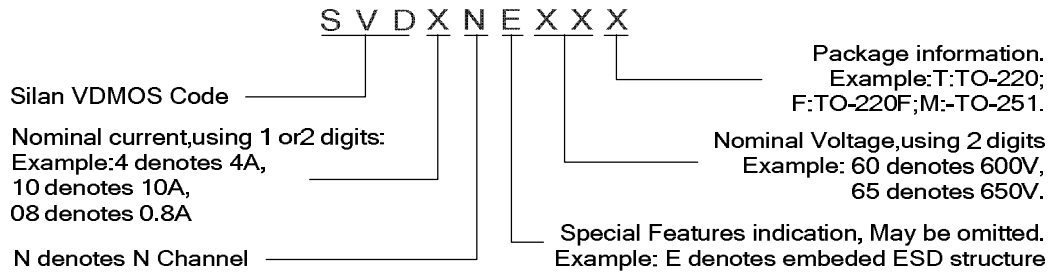
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	4.0	A
Pulsed Source Current	I _{SM}		--	--	16	
Diode Forward Voltage	V _{SD}	I _S =4.0A, V _{GS} =0V	--	--	1.4	V
Reverse Recovery Time	T _{rr}	I _S =4.0A, V _{GS} =0V, dI _F /dt=100A/μs	--	300	--	ns
Reverse Recovery Charge	Q _{rr}		--	2.2	--	μC

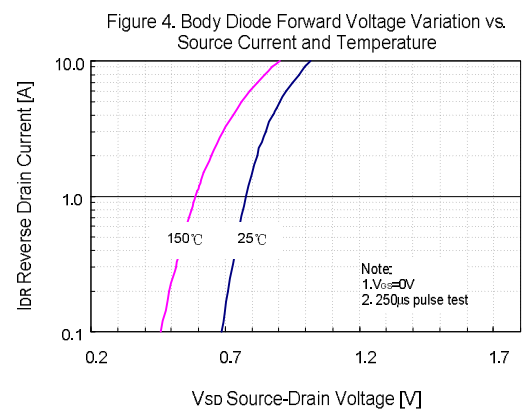
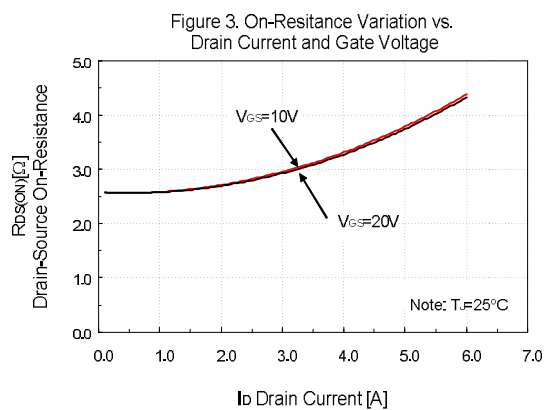
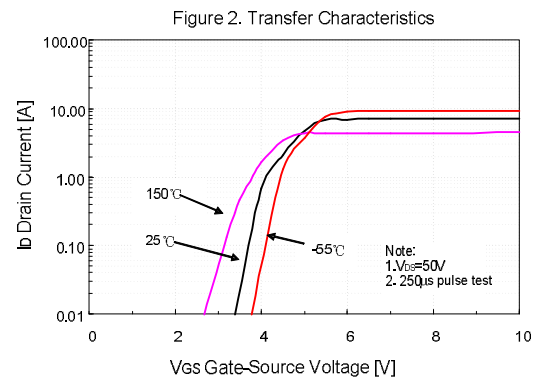
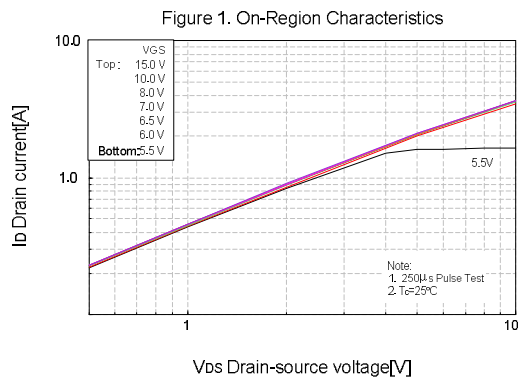
Notes:

1. L=27.5mH, I_{AS}=4.0A, V_{DD}=50V, R_G=25Ω, starting T_J=25°C;
2. Pulse Test: Pulse width ≤300μs, Duty cycles ≤2%;
3. Essentially independent of operating temperature.

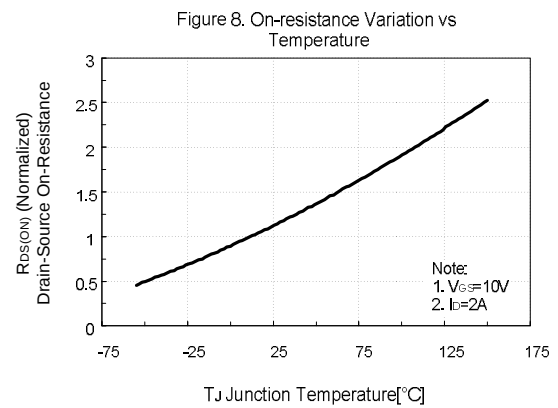
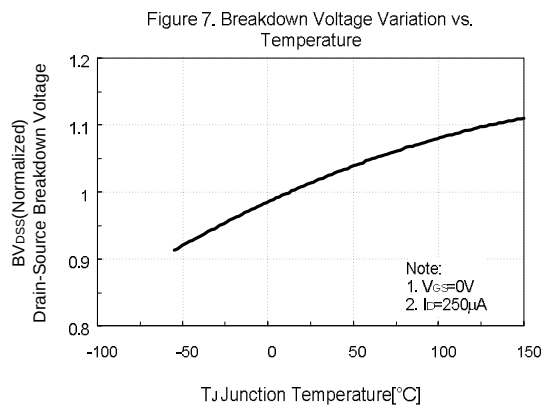
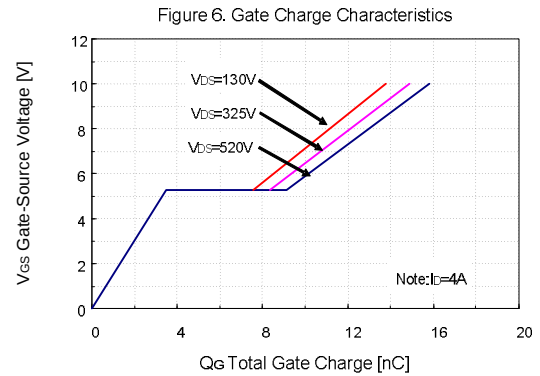
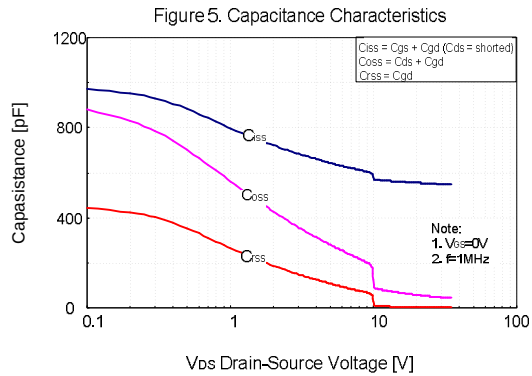
NOMENCLATURE



TYPICAL CHARACTERISTICS

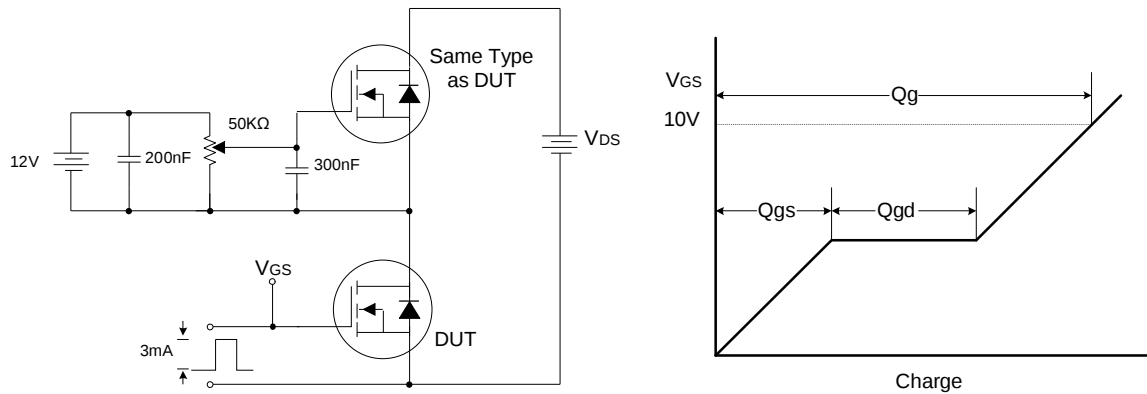


TYPICAL CHARACTERISTICS (continued)

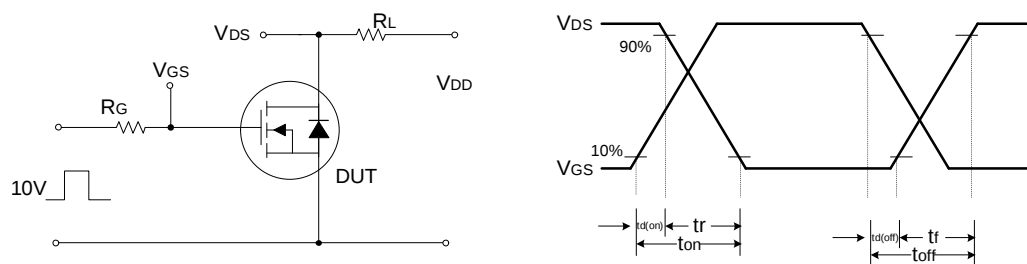


TYPICAL TEST CIRCUIT

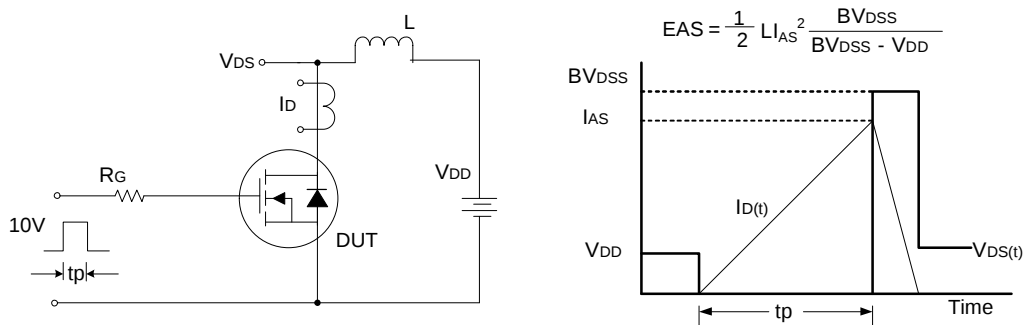
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



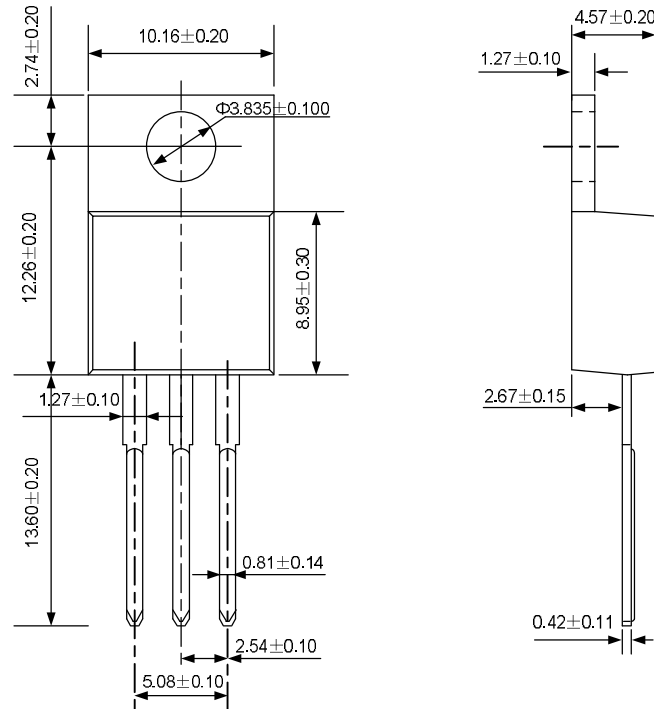
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

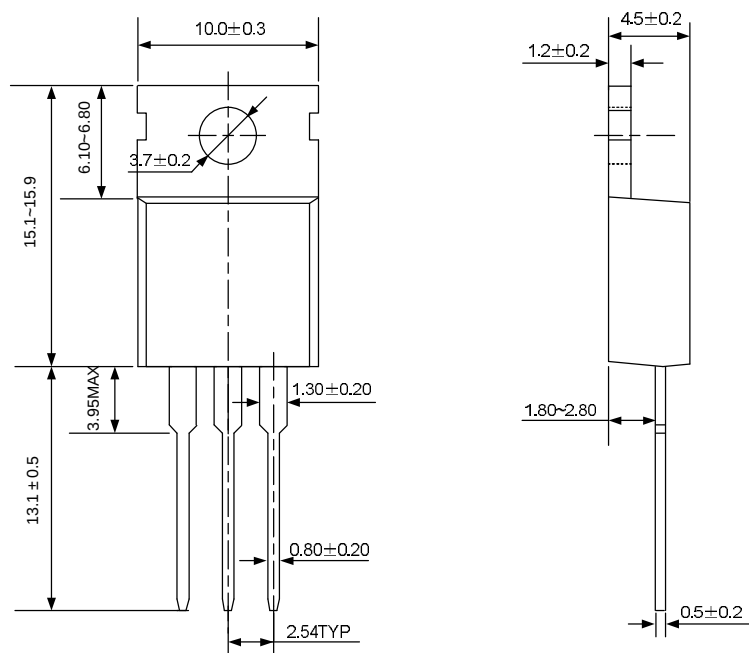
TO-220-3L(One)

UNIT: mm



TO-220-3L (Two)

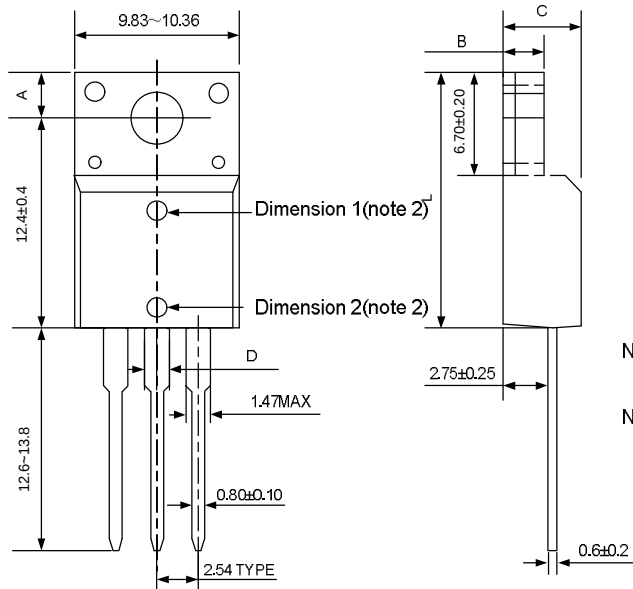
UNIT: mm



PACKAGE OUTLINE (continued)

TO-220F-3L(One)

UNIT: mm



Symbol(note1)	Dimension1	Dimension2
A	3.30 ± 0.15	2.70 ± 0.15
B	2.55 ± 0.20	3.0 ± 0.20
C	4.72 ± 0.2	4.50 ± 0.20
D	1.47 MAX	1.75 MAX
L	15.75 ± 0.30	15.00 ± 0.30

Note1: There may be two values for some products due to different plastic mould machine, so two dimensions of the same position are listed;

Note2: When the product size is Dimension1, the thimble hole is on top of the surface; when the size is Dimension2, the center hole is on bottom of the surface.

TO-220F-3L (Two)

UNIT: mm

