

7A, 600V N-CHANNEL MOSFET

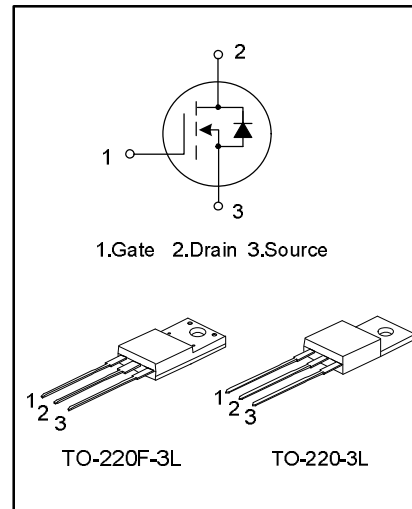
GENERAL DESCRIPTION

SVD7N60T/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

- * 7A,600V, $R_{DS(on)}$ (typ) =0.96 Ω @ $V_{GS}=10V$
- * Low gate charge
- * Low Crss
- * Fast switching
- * Improved dv/dt capability



ORDERING SPECIFICATIONS

Part No.	Package	Marking	Shipping
SVD7N60T	TO-220-3L	SVD7N60T	50Unit/Tube
SVD7N60F	TO-220F-3L	SVD7N60F	50Unit/Tube

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

Parameter	Symbol	SVD7N60T	SVD7N60F	Unit
Drain-Source Voltage	V _{DS}	600		V
Gate-Source Voltage	V _{GS}	±30		V
Drain Current	I _D	7.0		A
Drain Current Pulsed	I _{DM}	28		A
Power Dissipation(T _C =25°C) -Derate above 25°C	P _D	147	48	W
		1.18	0.38	W/°C
Single Pulsed Avalanche Energy (Note 1)	E _{AS}	530		mJ
Repetitive Avalanche Energy	E _{AR}	14.2		mJ
Operation Junction Temperature	T _J	-55~+150		°C
Storage Temperature	T _{stg}	-55~+150		°C

THERMAL CHARACTERISTICS

Parameter	Symbol	SVD7N60T	SVD7N60F	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	0.85	2.6	°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	600	--	--	V
Breakdown Voltage Temperature coefficient	ΔBVDSS/ ΔT _J	I _D =250uA, referenced to 25°C	--	0.72	--	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =600V, 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 =3.5A	--	0.96	1.2	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	--	1095	1430	pF
Output Capacitance	C _{oss}		--	93	175	
Reverse Transfer Capacitance	C _{rss}		--	2	21	
Turn-on Delay Time	t _{d(on)}	V _{DD} =300V, I _D =7.0A, R _G =25Ω (Note 2,3)	--	39	60	ns
Turn-on Rise Time	t _r		--	29	70	
Turn-off Delay Time	t _{d(off)}		--	248	300	
Turn-off Fall Time	t _f		--	36	90	
Total Gate Charge	Q _g	V _{DS} =480V, I _D =7.0A, V _{GS} =10V (Note 2,3)	--	26.8	37	nC
Gate-Source Charge	Q _{gs}		--	5.1	--	
Gate-Drain Charge	Q _{gd}		--	8.5	--	

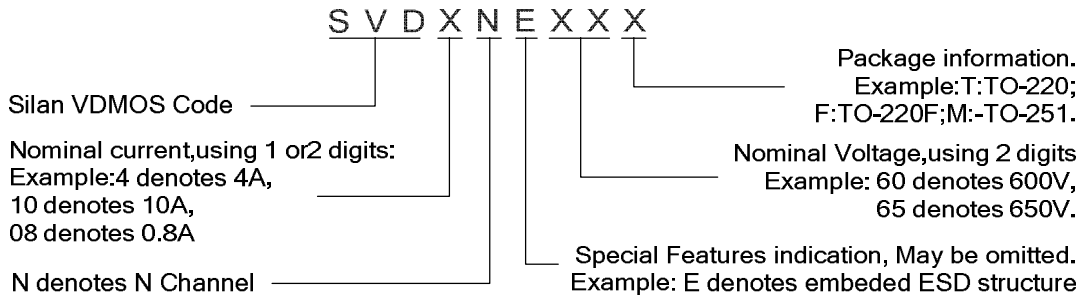
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	7.0	A
Pulsed Source Current	I _{SM}		--	--	28	
Diode Forward Voltage	V _{SD}	I _S =7.0A, V _{GS} =0V	--	--	1.4	V
Reverse Recovery Time	T _{rr}	I _S =7.0A, V _{GS} =0V, dI _F /dt=100A/μS	--	365	--	ns
Reverse Recovery Charge	Q _{rr}		--	3.4	--	μC

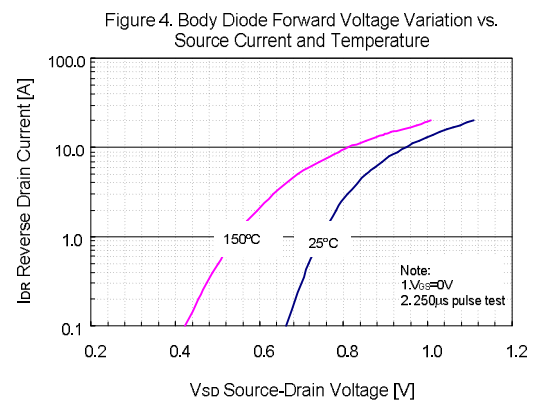
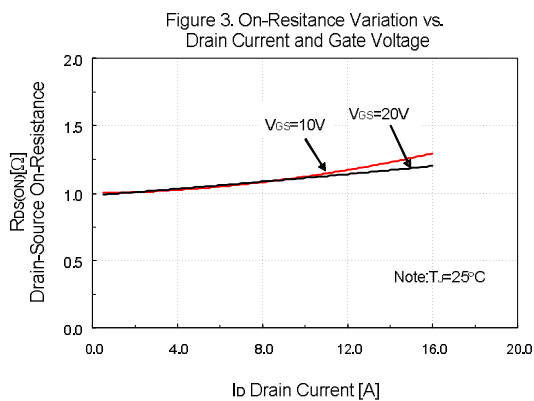
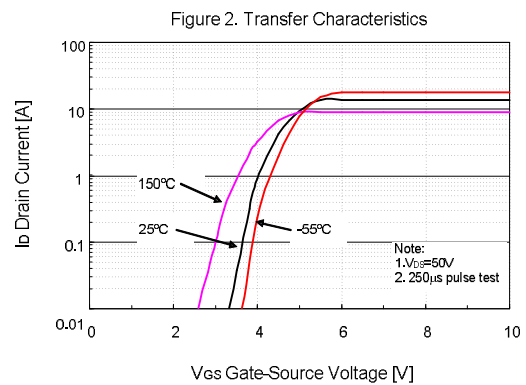
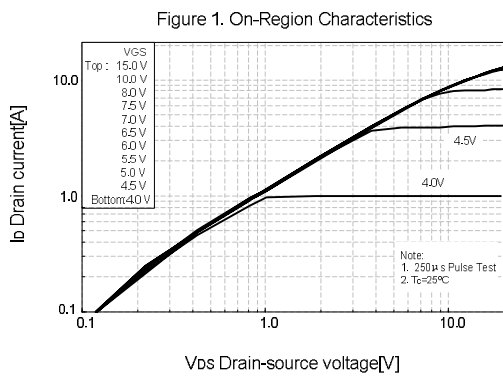
Notes:

1. L=19.5mH, I_{AS}=7.0A, V_{DD}=50V, R_G=25Ω, starting T_J=25°C;
2. Pulse Test: Pulse width ≤300μs, Duty cycle ≤2%;
3. Essentially independent of operating temperature.

NOMENCLATURE



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (continued)

Figure 5. Capacitance Characteristics

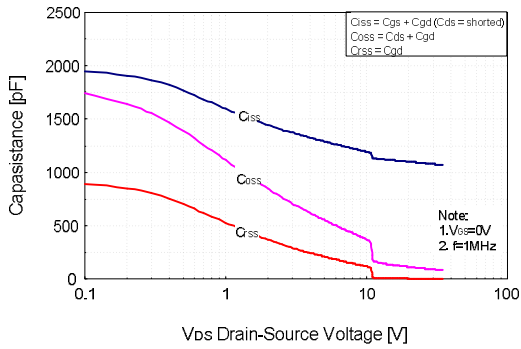


Figure 6. Gate Charge Characteristics

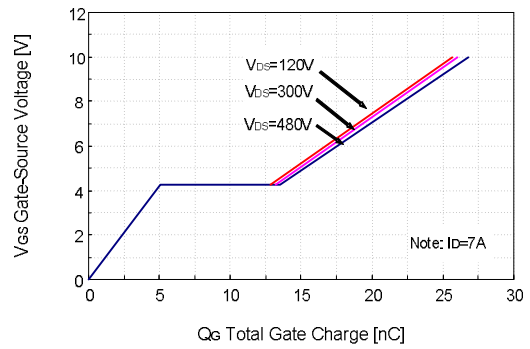


Figure 7. Breakdown Voltage Variation vs. Temperature

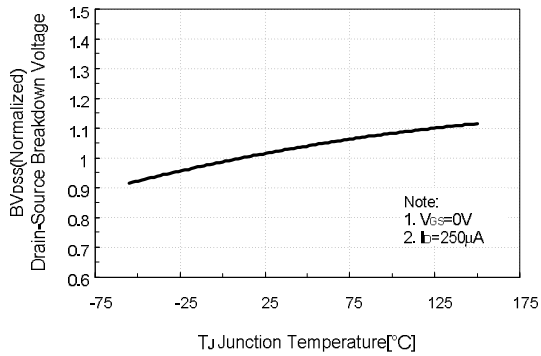
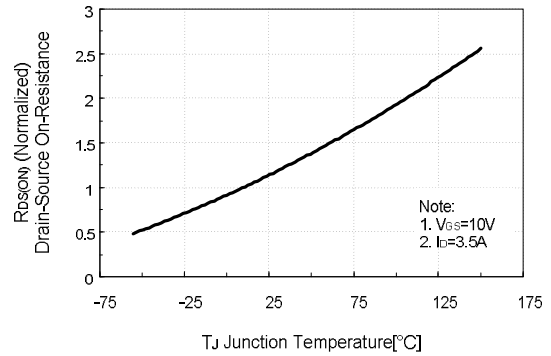
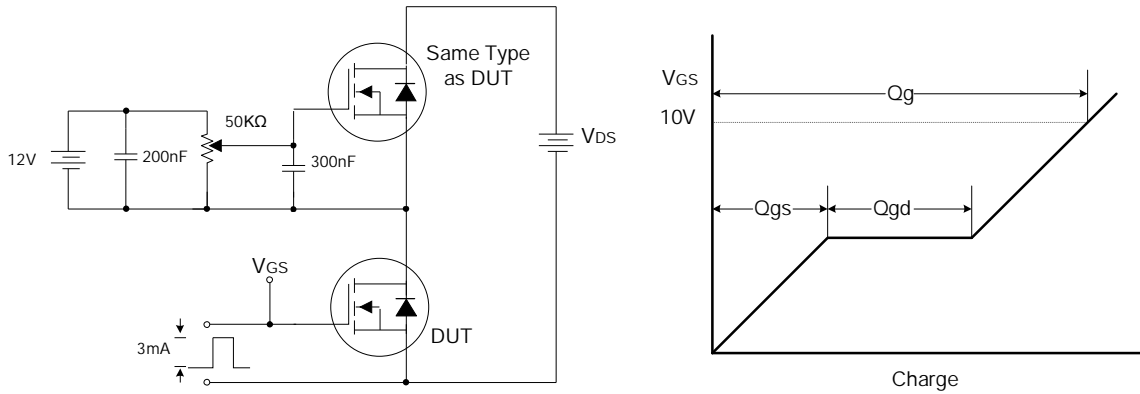


Figure 8. On-resistance Variation vs Temperature

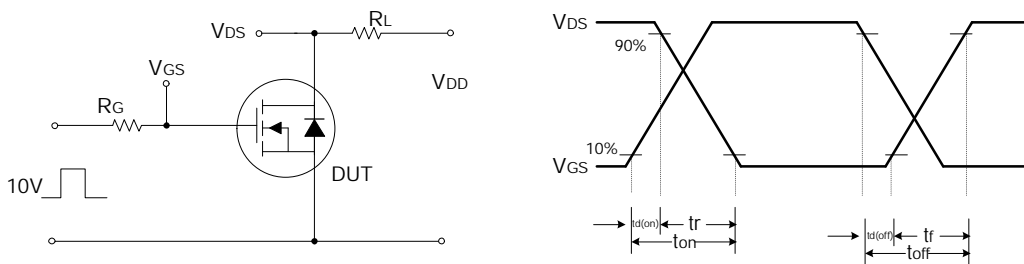


TYPICAL TEST CIRCUIT

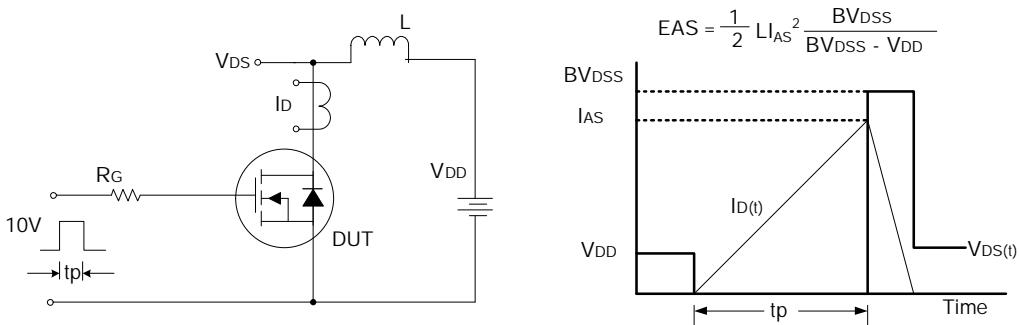
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



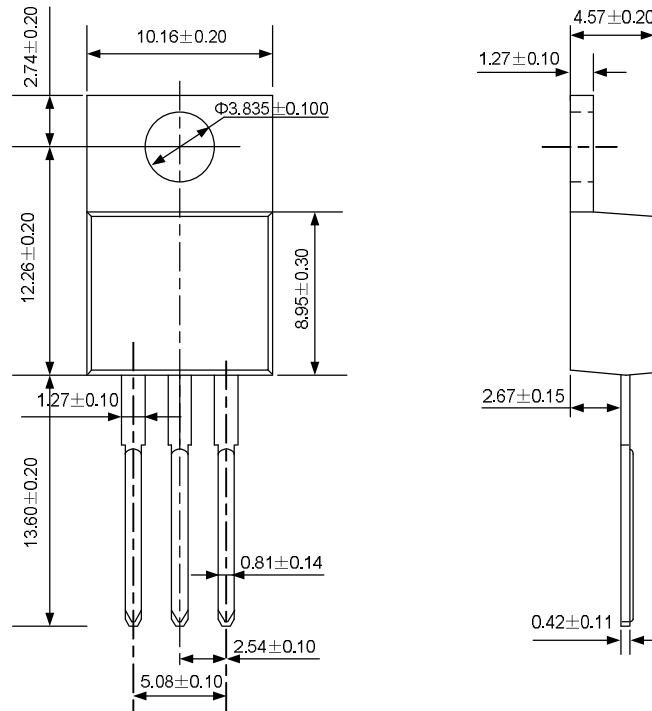
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

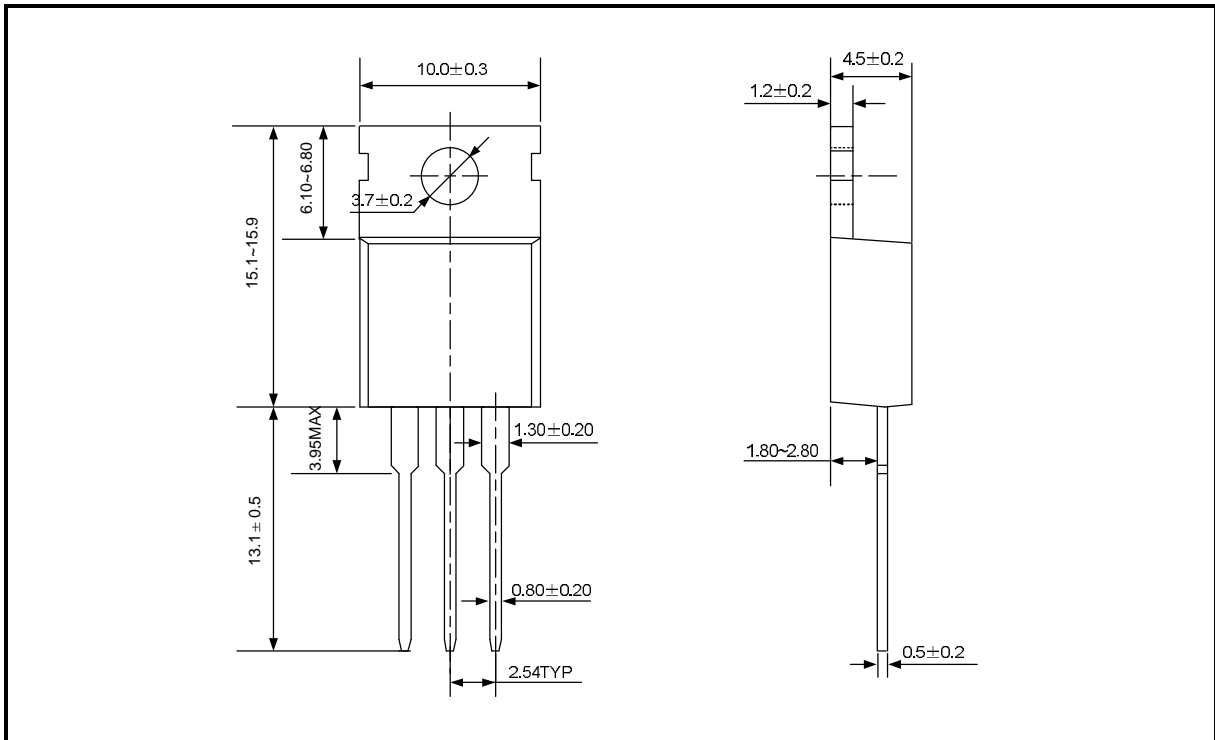
TO-220-3L(One)

UNIT:
mm



TO-220-3L (Two)

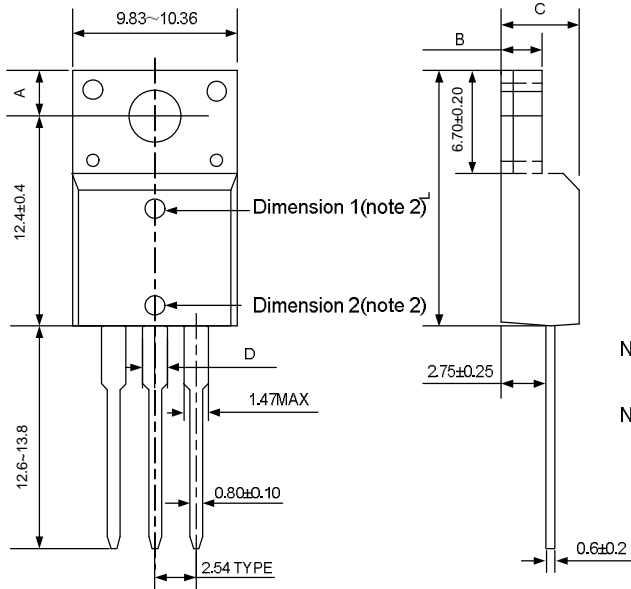
UNIT:
mm



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	1.47MAX	1.75MAX
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

