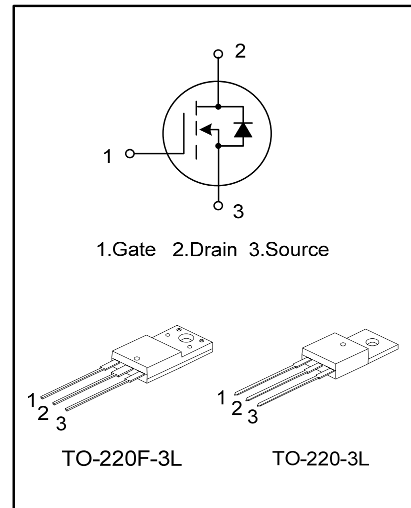
4A, 650V N-CHANNEL MOSFET

GENERAL DESCRIPTION

These N-channel enhancement mode power field effect transistors are produced using Silan's proprietary, planar stripe, DMOS technology. This advanced technology has 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,$R_{DS(on)}$=3.0Ω@V_{GS}=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
Power Dissipation(T_C=25°C)	P_D	100	33	W
-Derate above 25°C		0.8	0.26	W/°C
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	240		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	$R_{\theta JC}$	1.25	3.79	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	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	BV_{DSS}	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	--	--	3.0	Ω
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1.0MHZ	--	545	710	pF
Output Capacitance	C_{oss}		--	60	80	
Reverse Transfer Capacitance	C_{rss}		--	8.0	11	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=325V,I_D=4.0A, R_G=25Ω (Note 2,3)	--	10	30	ns
Turn-on Rise Time	t_r		--	35	80	
Turn-off Delay Time	$t_{d(off)}$		--	45	100	
Turn-off Fall Time	t_f		--	40	90	
Total Gate Charge	Q_g	V_{DS}=520V,I_D=4.0A, V_{GS}=10V (Note 2,3)	--	15	20	nC
Gate-Source Charge	Q_{gs}		--	2.8	--	
Gate-Drain Charge	Q_{gd}		--	6.2	--	

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}		--	--	1.6	
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 cycle≤2%;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. on-region characteristics

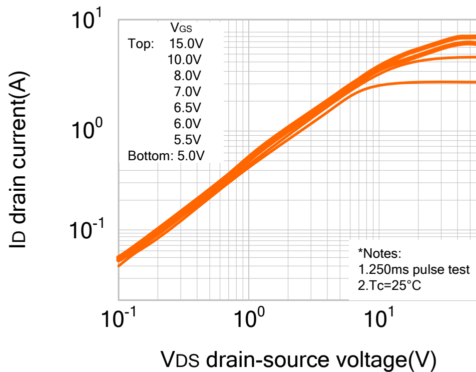


Figure2. transfer characteristics

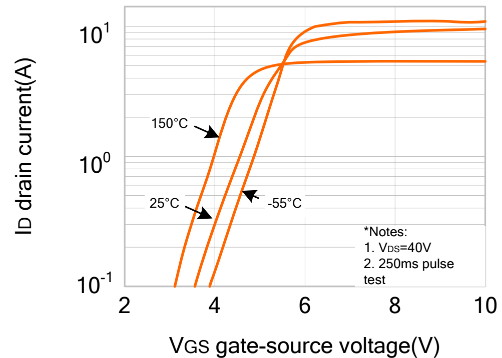


Figure 3. On-resistance variation vs drain current and gate voltage

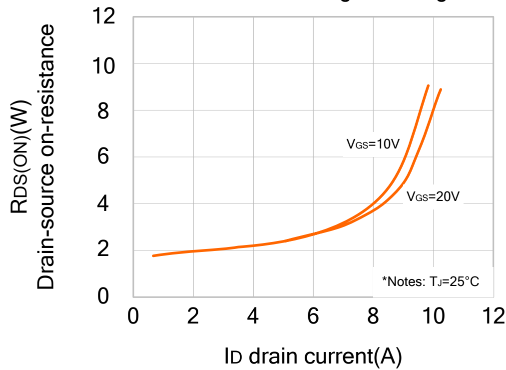


Figure 4. body diode forward voltage variation vs source current and temperature

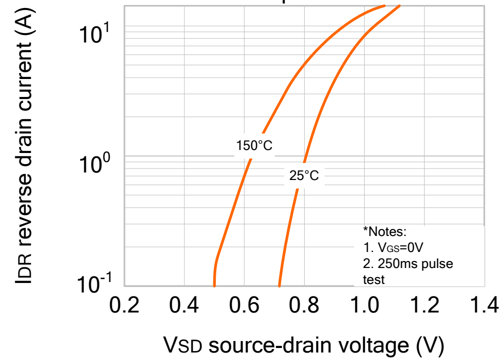


Figure 5. capacitance characteristics

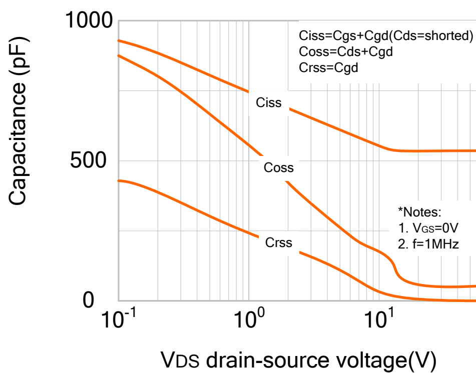
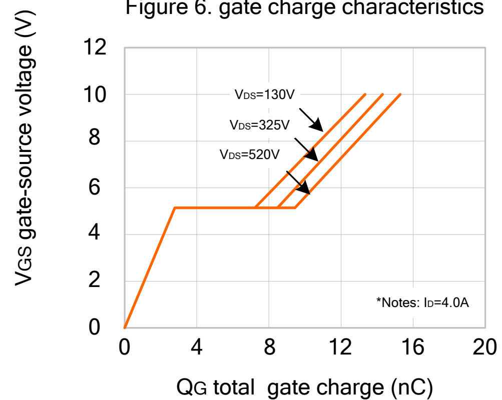
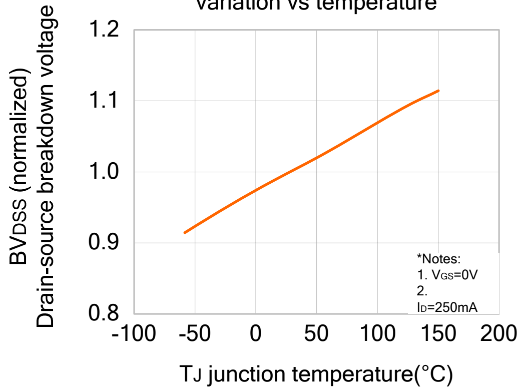
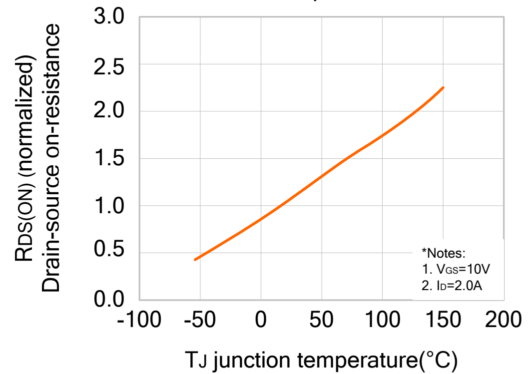


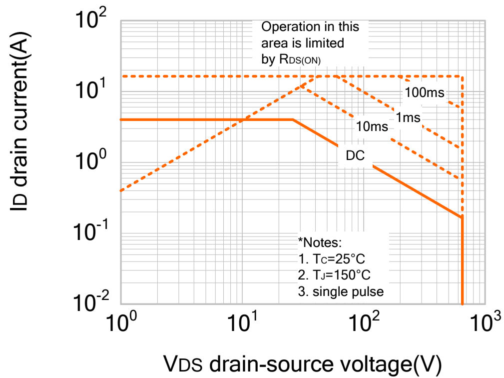
Figure 6. gate charge characteristics

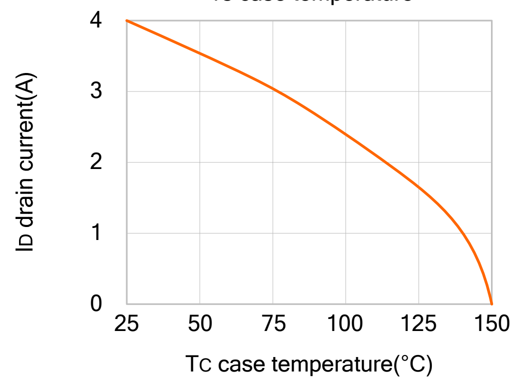


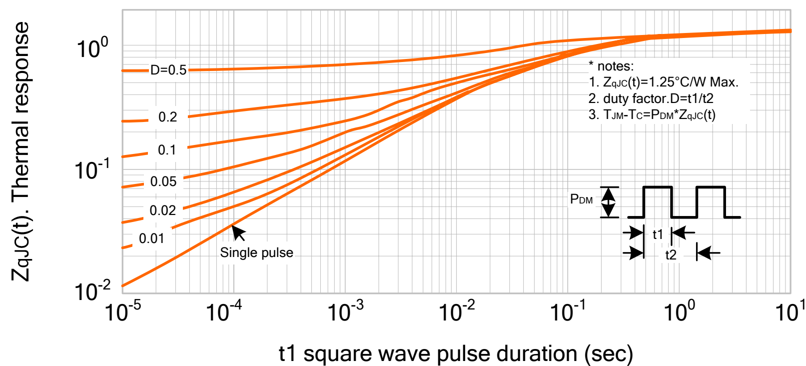
TYPICAL CHARACTERISTICS (continued)





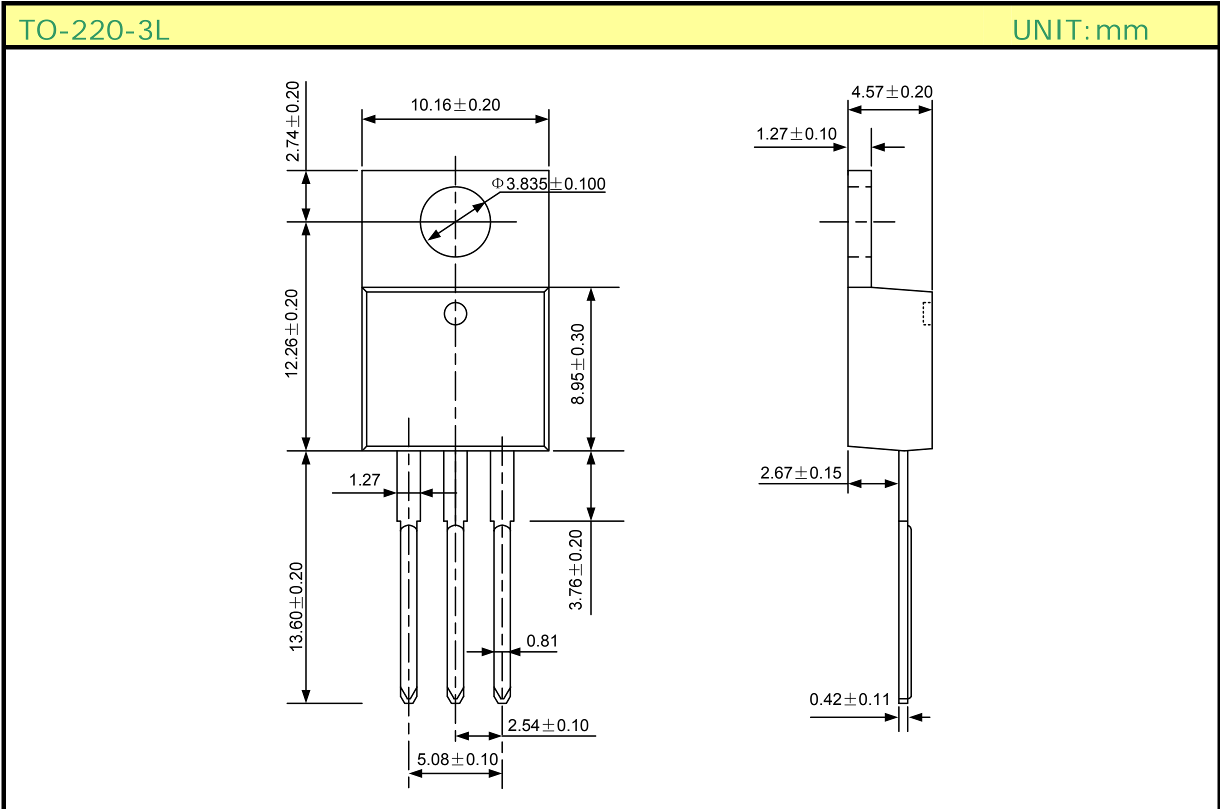






PACKAGE OUTLINE

TO-220-3L UNIT:mm



TO-220F-3L UNIT: mm