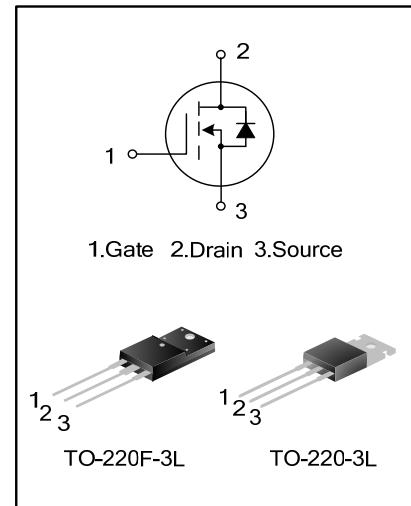


10A, 600V N-CHANNEL MOSFET

GENERAL DESCRIPTION

SVF10N60T/F is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary F-Cell™ structure VDMOS technology. The improved planar stripe cell and the improved guard 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.

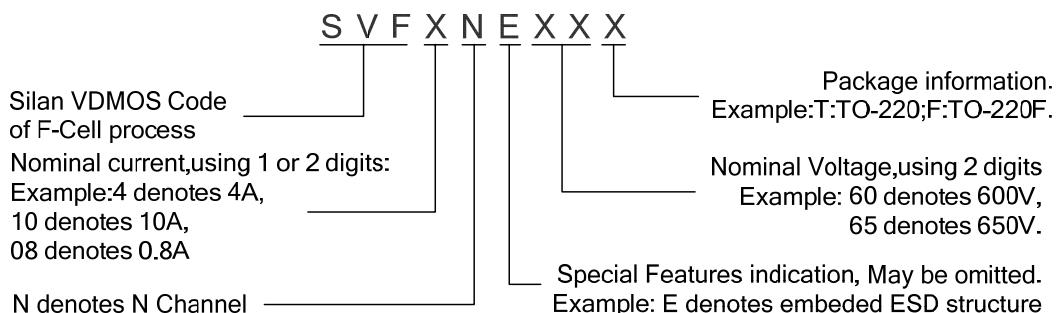
These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.



FEATURES

- * 10A,600V, $R_{DS(on)}(typ.)=0.75\Omega @ V_{GS}=10V$
- * Low gate charge
- * Low Crss
- * Fast switching
- * Improved dv/dt capability

NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVF10N60T	TO-220-3L	SVF10N60T	Pb free	Tube
SVF10N60F	TO-220F-3L	SVF10N60F	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Rating		Unit
		SVF10N60T	SVF10N60F	
Drain-Source Voltage	V_{DS}	600		V
Gate-Source Voltage	V_{GS}	± 30		V
Drain Current	I_D	10		A
$T_C=100^\circ\text{C}$		7		
Drain Current Pulsed	I_{DM}	40		A
Power Dissipation($T_C=25^\circ\text{C}$) -Derate above 25°C	P_D	156	50	W
		1.25	0.4	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	654		mJ
Operation Junction Temperature Range	T_J	-55~+150		$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~+150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Rating		Unit
		SVF10N60T	SVF10N60F	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.8	2.5	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	120	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	B_{VDSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	600	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=600\text{V}$, $V_{GS}=0\text{V}$	--	--	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30\text{V}$, $V_{DS}=0\text{V}$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{GS}=V_{DS}$, $I_D=250\mu\text{A}$	2.0	--	4.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=5.0\text{A}$	--	0.75	1.0	Ω
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHZ}$	--	1132	--	pF
Output Capacitance	C_{oss}		--	135	--	
Reverse Transfer Capacitance	C_{rss}		--	3.91	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=300\text{V}$, $I_D=10\text{A}$, $R_G=25\Omega$	--	32.33	--	ns
Turn-on Rise Time	t_r		--	60.40	--	
Turn-off Delay Time	$t_{d(off)}$		--	58.67	--	
Turn-off Fall Time	t_f		--	38.67	--	
Total Gate Charge	Q_g	$V_{DS}=480\text{V}$, $I_D=10\text{A}$, $V_{GS}=10\text{V}$	--	19.38	--	nC
Gate-Source Charge	Q_{gs}		--	6.26	--	
Gate-Drain Charge	Q_{gd}		--	6.55	--	

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	--	--	10	A
Pulsed Source Current	I _{SM}		--	--	40	
Diode Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V	--	--	1.3	V
Reverse Recovery Time	T _{rr}	I _S =10A, V _{GS} =0V, dI _F /dt=100A/μS (Note 2)	--	450	--	ns
Reverse Recovery Charge	Q _{rr}		--	4.2	--	μC

Notes:

1. L=30mH, I_{AS}=6.0A, V_{DD}=150V, 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

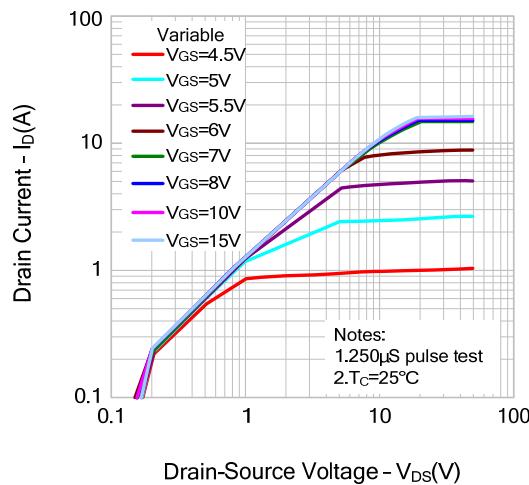


Figure 2. Transfer Characteristics

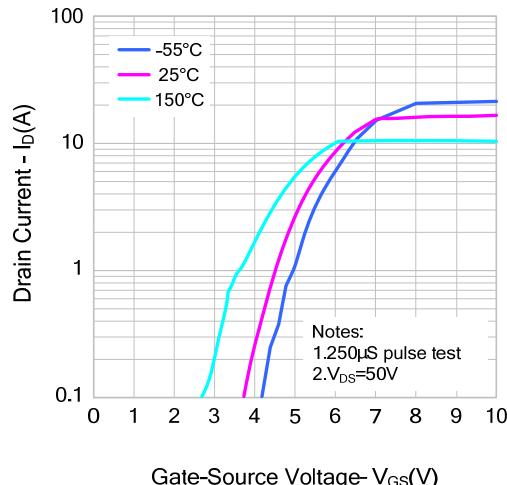


Figure 3. On-Resistance Variation vs.
Drain Current and Gate Voltage

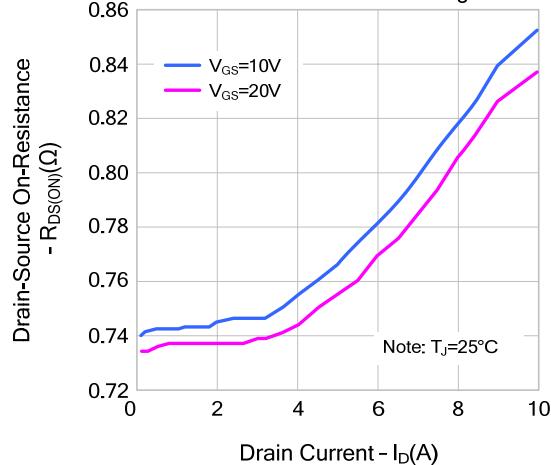


Figure 4. Body Diode Forward Voltage
Variation vs. Source Current and Temperature

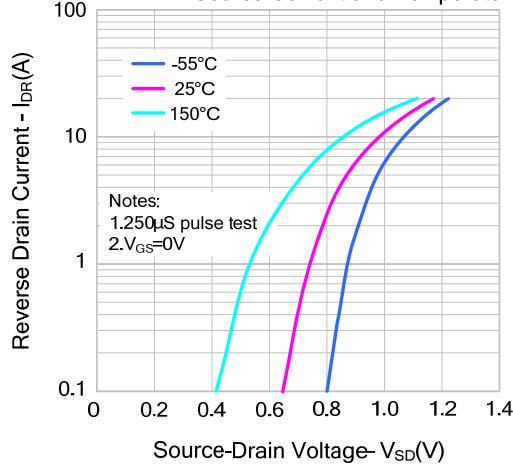


Figure 5. Capacitance Characteristics

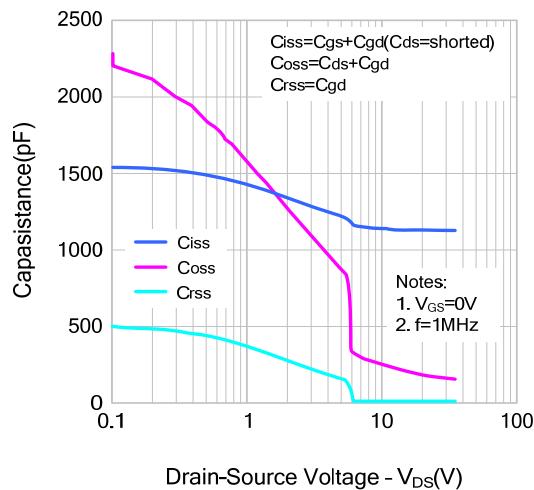
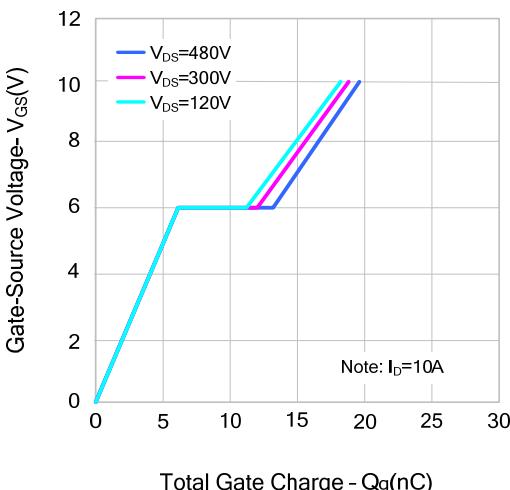


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS(continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

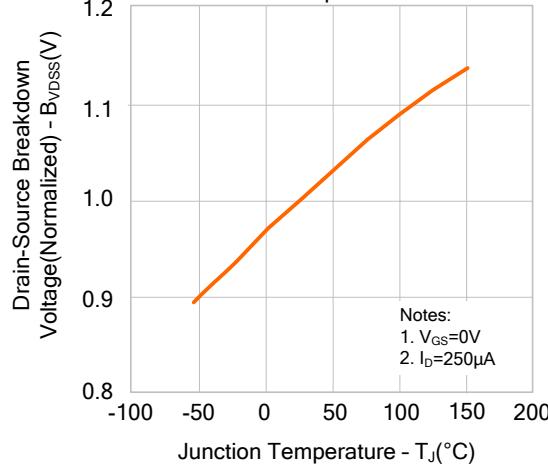


Figure 8. On-resistance Variation vs. Temperature

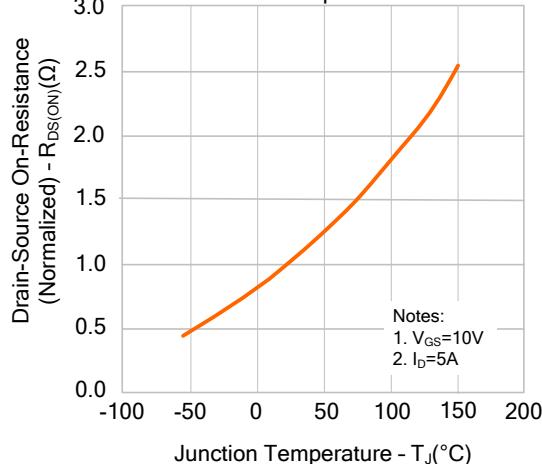


Figure 9-1. Max. Safe Operating Area(SVF10N60T)

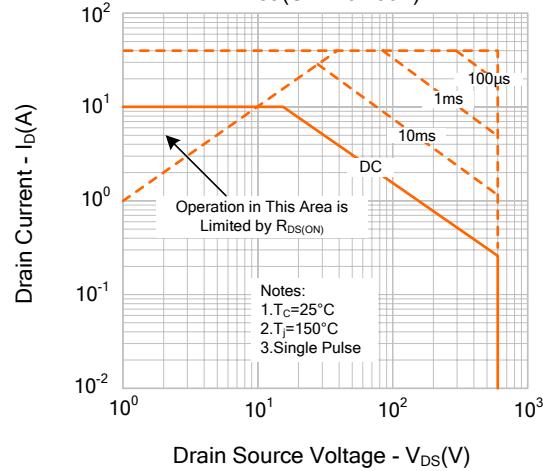


Figure 9-2. Max. Safe Operating Area(SVF10N60F)

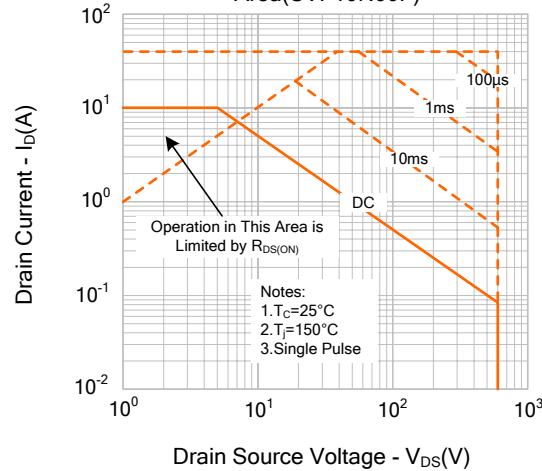
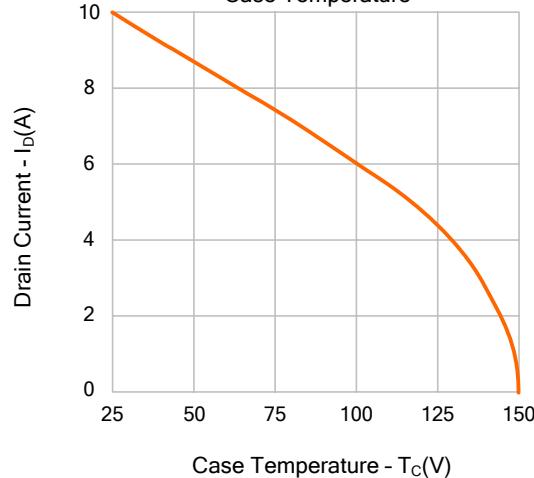
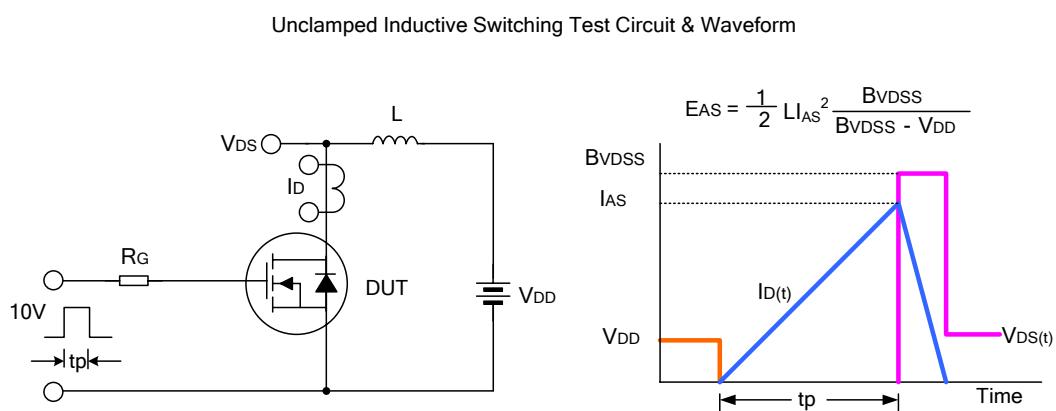
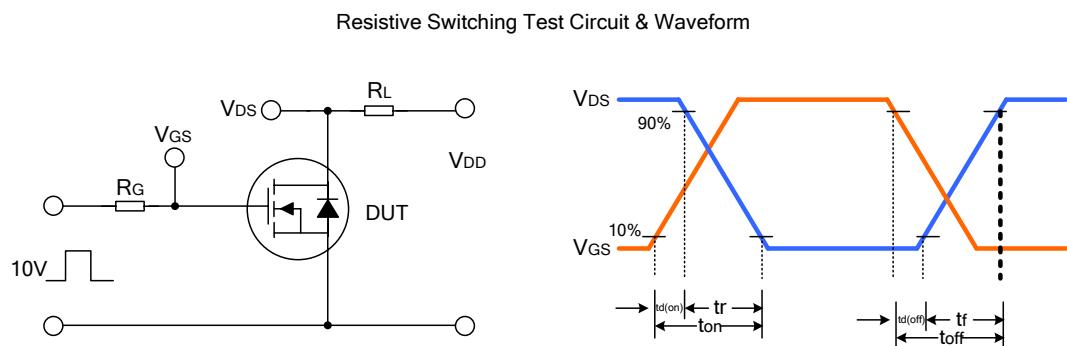
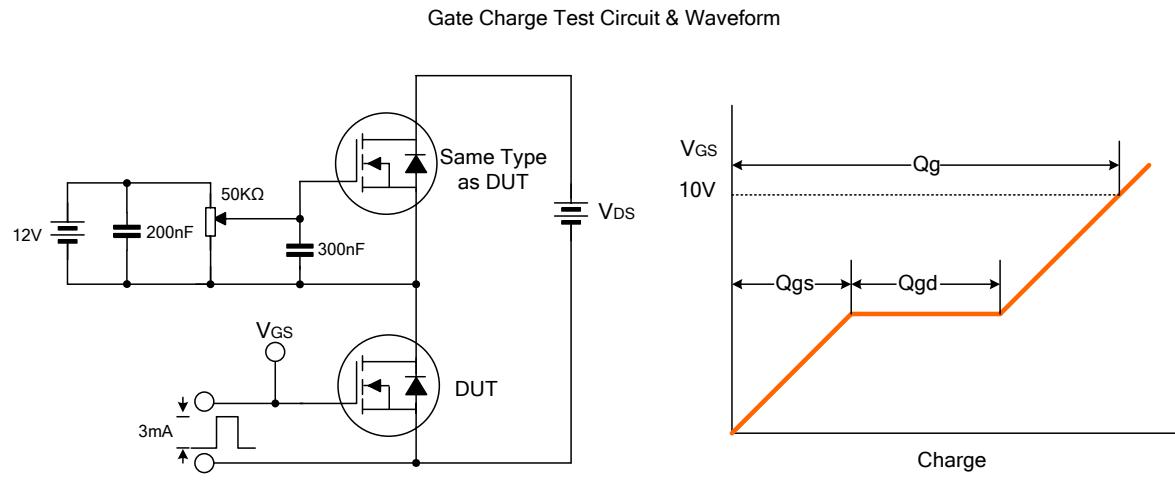


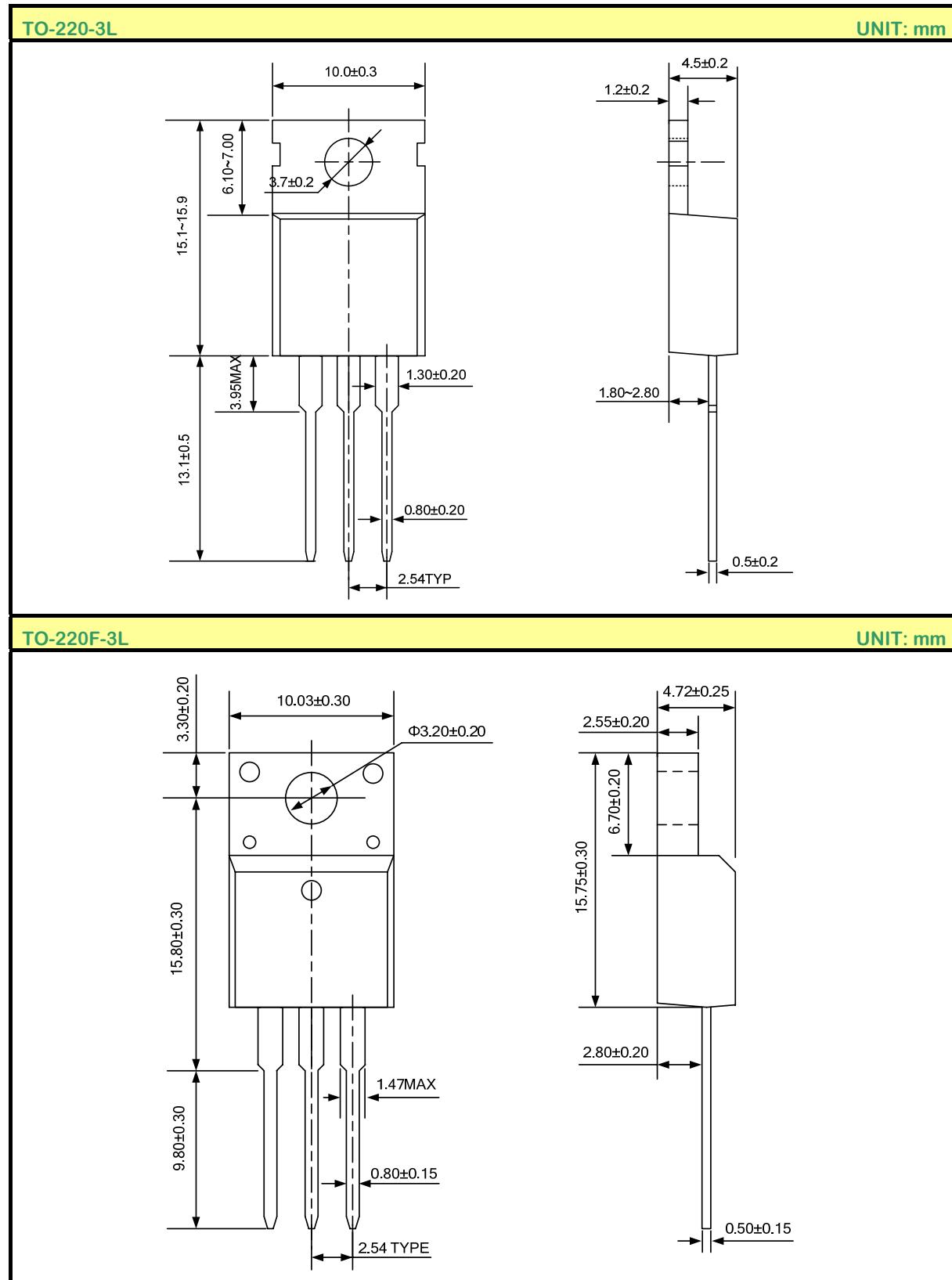
Figure 10. Maximum Drain Current vs. Case Temperature



TYPICAL TEST CIRCUIT



PACKAGE OUTLINE



Disclaimer:

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- Silan will supply the best possible product for customers!

ATTACHMENT**Revision History**

Date	REV	Description	Page
2011.01.24	1.0	Original	