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مایترونیک

فروشگاه قطعات الکترونیک

تخصص، کیفیت، قیمت مناسب

تهران - خیابان جمهوری - نرسیده به پل حافظ - پاساژ توکل - طبقه زیر همکف - پلاک B34

## 7A, 650V N-CHANNEL MOSFET

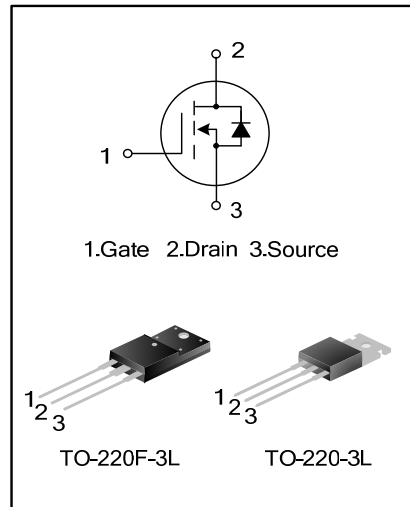
### GENERAL DESCRIPTION

SVF7N65T/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.

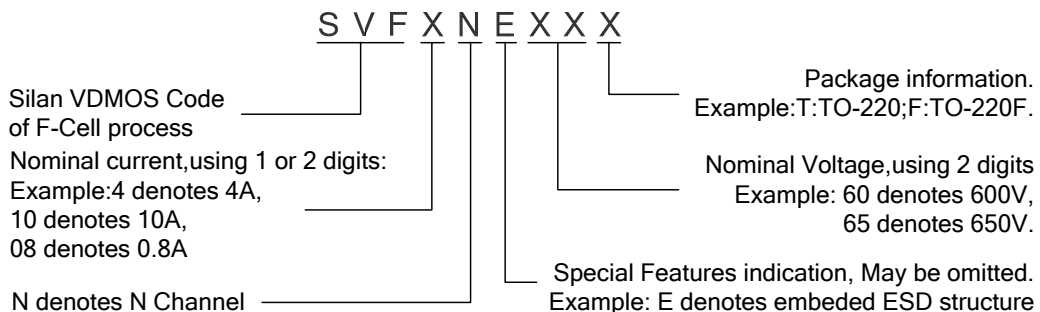
These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.

### FEATURES

- \* 7A,650V, $R_{DS(on)(typ)}=1.1\ \Omega@V_{GS}=10V$
- \* Low gate charge
- \* Low Crss
- \* Fast switching
- \* Improved dv/dt capability



### NOMENCLATURE



### ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVF7N65T	TO-220-3L	SVF7N65T	Pb free	Tube
SVF7N65F	TO-220F-3L	SVF7N65F	Pb free	Tube

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

Characteristics	Symbol	Ratings		Unit
		SVF7N65T	SVF7N65F	
Drain-Source Voltage	$V_{DS}$	650		V
Gate-Source Voltage	$V_{GS}$	$\pm 30$		V
Drain Current	$I_D$	$T_C = 25^\circ\text{C}$		A
		$T_C = 100^\circ\text{C}$		
Drain Current Pulsed	$I_{DM}$	28		A
Power Dissipation( $T_C=25^\circ\text{C}$ ) -Derate above $25^\circ\text{C}$	$P_D$	145	46	W
		1.16	0.37	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy (Note 1)	$E_{AS}$	435		mJ
Operation Junction Temperature Range	$T_J$	$-55 \sim +150$		$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-55 \sim +150$		$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Characteristics	Symbol	Ratings		Unit
		SVF7N65T	SVF7N65F	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.86	2.7	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	120	$^\circ\text{C}/\text{W}$

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	$B_{VDSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	650	--	--	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=650\text{V}, V_{GS}=0\text{V}$	--	--	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}, V_{DS}=0\text{V}$	--	--	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	2.0	--	4.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=3.5\text{A}$	--	1.1	1.4	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1.0\text{MHZ}$	--	917.7	--	pF
Output Capacitance	$C_{oss}$		--	98.6	--	
Reverse Transfer Capacitance	$C_{rss}$		--	1.90	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10\text{V}, R_G=25\Omega, I_D=7.0\text{A}$  (Note 2,3)	--	29.00	--	ns
Turn-on Rise Time	$t_r$		--	48.00	--	
Turn-off Delay Time	$t_{d(off)}$		--	39.00	--	
Turn-off Fall Time	$t_f$		--	33.00	--	
Total Gate Charge	$Q_g$	$V_{DS}=520\text{V}, I_D=7.0\text{A},$ $V_{GS}=10\text{V}$  (Note 2,3)	--	15.50	--	nC
Gate-Source Charge	$Q_{gs}$		--	5.40	--	
Gate-Drain Charge	$Q_{gd}$		--	4.50	--	

## 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	--	--	7.0	A
Pulsed Source Current	$I_{SM}$		--	--	28.0	
Diode Forward Voltage	$V_{SD}$	$I_S=7.0A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	$T_{rr}$	$I_S=7.0A, V_{GS}=0V,$ $dI_F/dt=100A/\mu S$ (Note 2)	--	365	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	3.4	--	$\mu C$

### Notes:

1.  $L=30mH, I_{AS}=5.0A, V_{DD}=100V, R_G=25\Omega,$  starting  $T_J=25^\circ C$ ;
2. Pulse Test: Pulse width  $\leq 300\mu s,$  Duty cycle  $\leq 2\%$ ;
3. Essentially independent of operating temperature.

**TYPICAL CHARACTERISTICS**

Figure 1. On-Region Characteristics

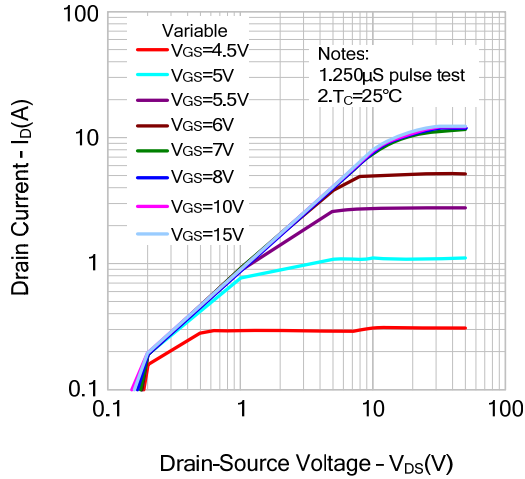


Figure 2. Transfer Characteristics

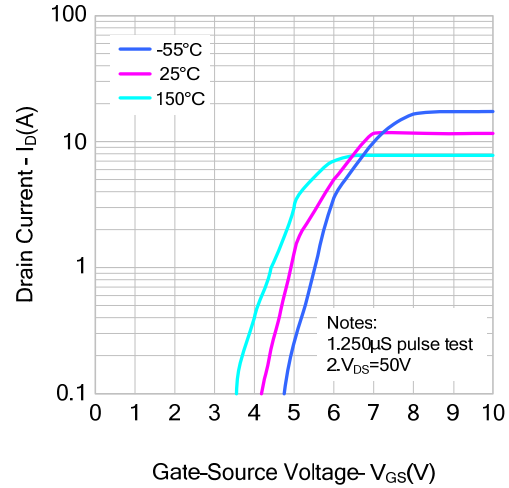


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

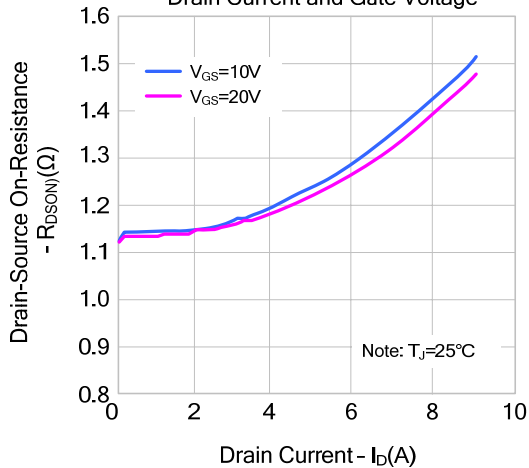


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

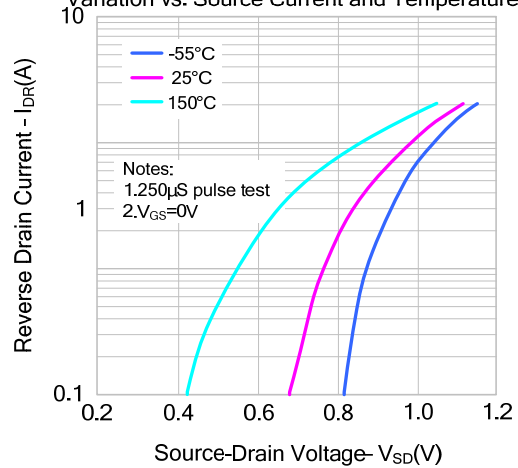


Figure 5. Capacitance Characteristics

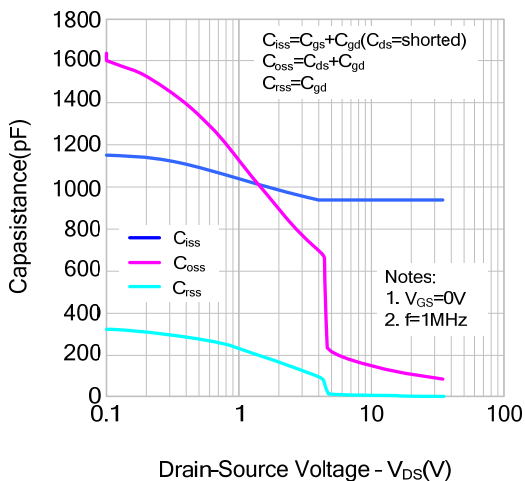
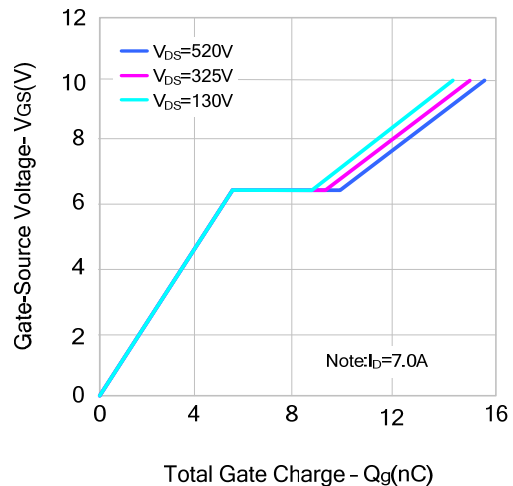


Figure 6. Gate Charge Characteristics



**TYPICAL CHARACTERISTICS(continued)**

Figure 7. Breakdown Voltage Variation vs. Temperature

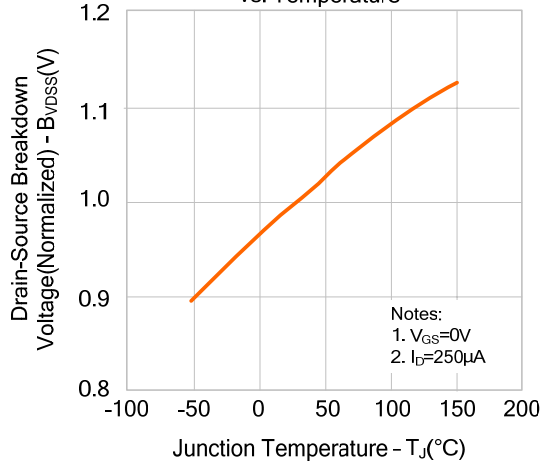


Figure 8. On-resistance Variation vs. Temperature

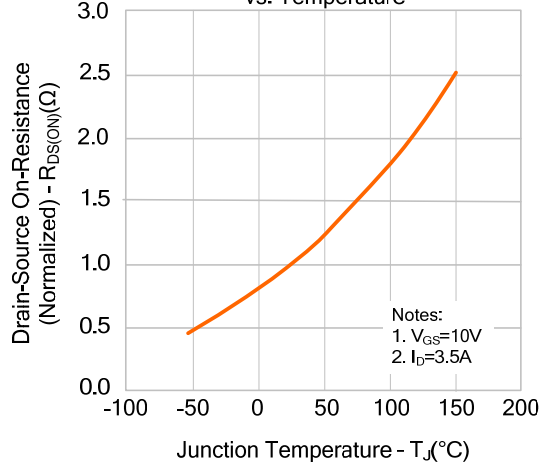


Figure 9-1. Max. Safe Operating Area(SVF7N65T)

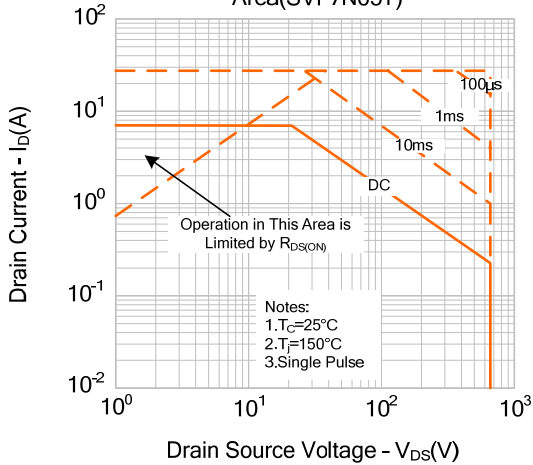


Figure 9-2. Max. Safe Operating Area(SVF7N65F)

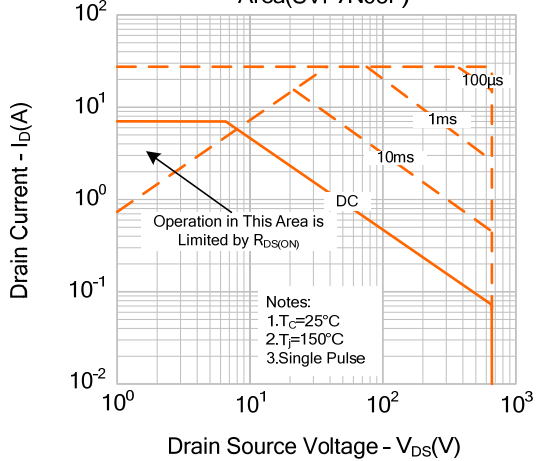
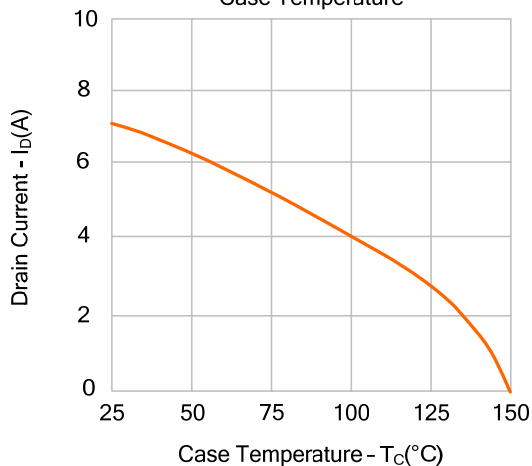
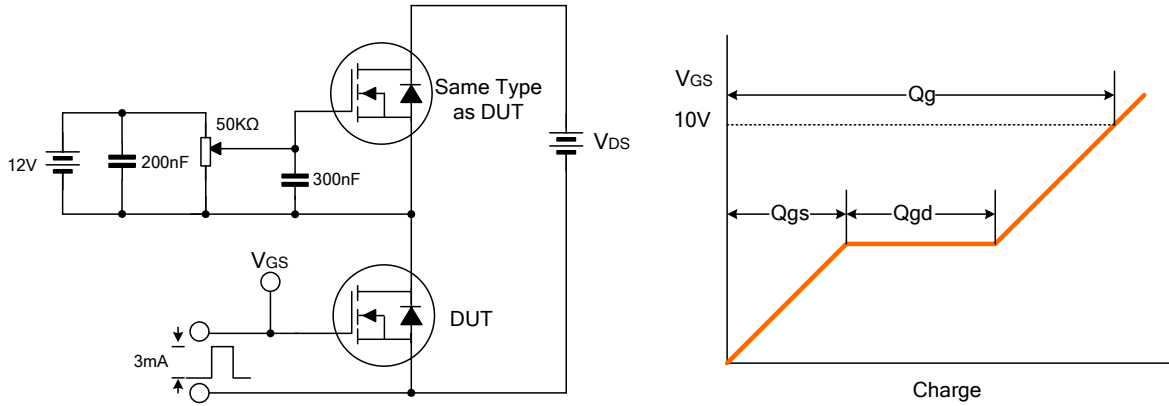


Figure 10. Maximum Drain Current vs. Case Temperature

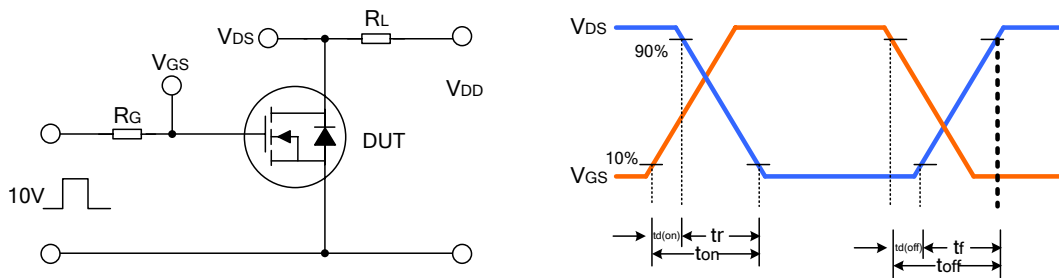


**TYPICAL TEST CIRCUIT**

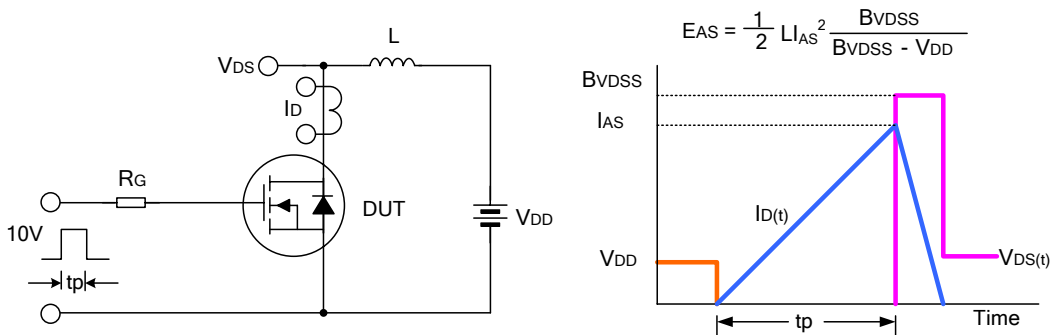
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



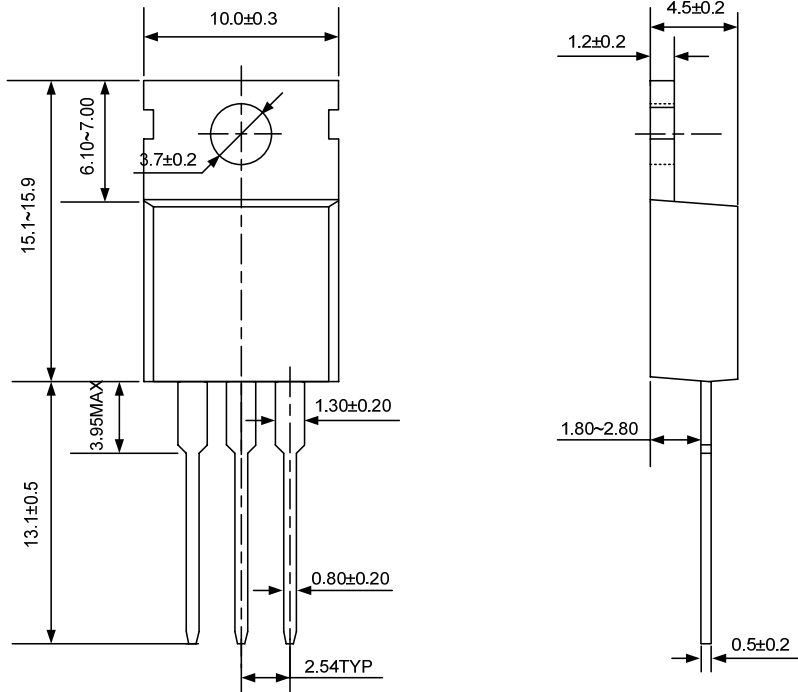
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

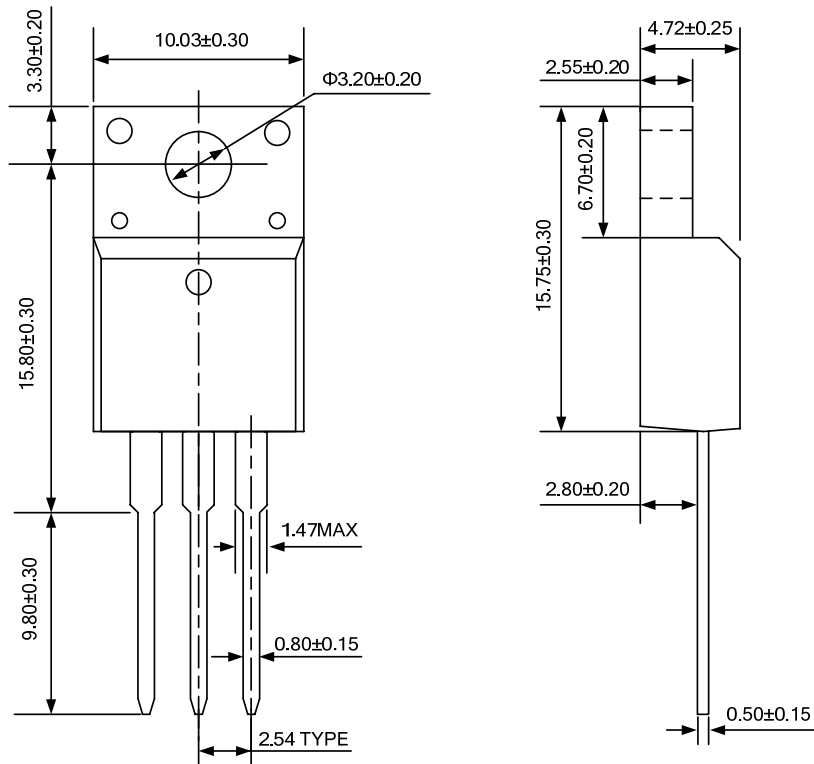
TO-220-3L

UNIT: mm



TO-220F-3L

UNIT: mm







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- Silan will supply the best possible product for customers!

## ATTACHMENT

### Revision History

Date	REV	Description	Page
2010.12.13	1.0	Original	
2011.02.15	1.1	Modify "ABSOLUTE MAXIMUM RATINGS" and "ELECTRICAL CHARACTERISTICS"	