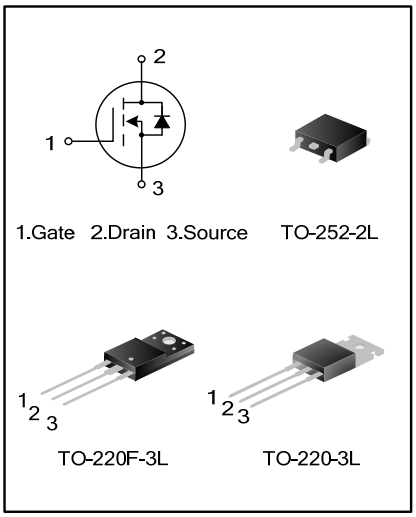
5.5A, 400V N-CHANNEL MOSFET

GENERAL DESCRIPTION

SVD730D/F/T is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan proprietary S-Rin™ 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

- 5.5A,400V,$R_{DS(on)}$ (typ) =0.9Ω@V_{GS}=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVD730T	TO-220-3L	SVD730T	Pb free	Tube
SVD730F	TO-220F-3L	SVD730F	Pb free	Tube
SVD730D	TO-252-2L	SVD730D	Pb free	Tube
SVD730DTR	TO-252-2L	SVD730D	Pb free	Tape & Reel

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

Characteristics	Symbol	Ratings			Unit
		SVD730D	SVD730F	SVD730T	
Drain-Source Voltage	V_{DS}	400			V
Gate-Source Voltage	V_{GS}	±30			V
Drain Current	I_D	5.5			A
Power Dissipation(T_C=25°C, TO-220)	P_D	77	33	100	W
-Derate above 25°C		0.62	0.26	0.8	W/°C
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	313			mJ
Operation Junction Temperature	T_J	-55～+150			°C
Storage Temperature	T_{stg}	-55～+150			°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings			Unit
		SVD730D	SVD730F	SVD730T	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.61	3.85	1.25	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	110	120	62.5	°C/W

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V, I_D=250μA	400	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=400V, 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=3A	--	0.9	0.95	Ω
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1.0MHZ	--	546	--	pF
Output Capacitance	C_{oss}		--	69	--	
Reverse Transfer Capacitance	C_{rss}		--	6	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=200V,I_D=5.5A, R_G=12Ω (Note 2,3)	--	16	--	ns
Turn-on Rise Time	t_r		--	16	--	
Turn-off Delay Time	$t_{d(off)}$		--	106	--	
Turn-off Fall Time	t_f		--	18	--	
Total Gate Charge	Q_g	V_{DS}=320V,I_D=5.5A, V_{GS}=10V (Note 2,3)	--	15.5	--	nC
Gate-Source Charge	Q_{gs}		--	3	--	
Gate-Drain Charge	Q_{gd}		--	6.1	--	

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	--	--	5.5	A
Pulsed Source Current	I_{SM}		--	--	22	
Diode Forward Voltage	V_{SD}	I_S=5.5A,V_{GS}=0V	--	--	1.5	V
Reverse Recovery Time	T_{rr}	I_S=5.5A,V_{GS}=0V, dI_F/dt=100A/μs(Note 2)	--	220	--	ns
Reverse Recovery Charge	Q_{rr}		--	2.0	--	μC

Notes:

1. L=30mH,I_{AS}=4.0A,V_{DD}=130V, 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

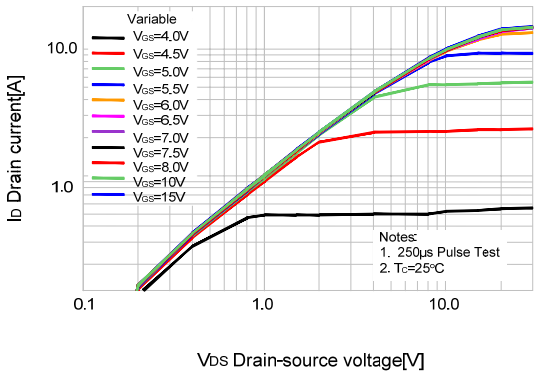


Figure 2. Transfer Characteristics

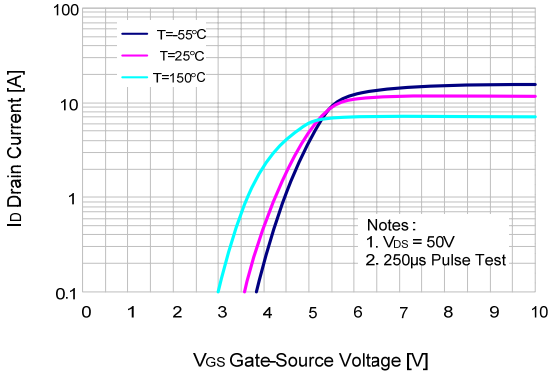


Figure 3. On-Resitance Variation vs. Drain Current and Gate Voltage

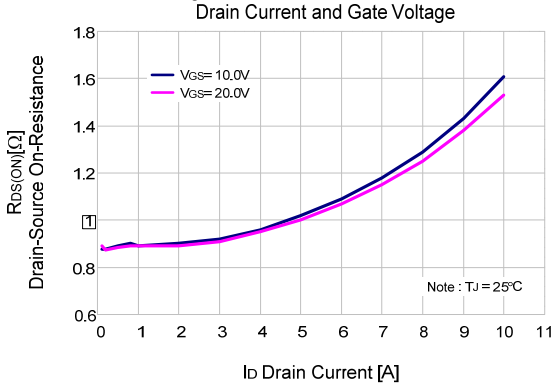


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

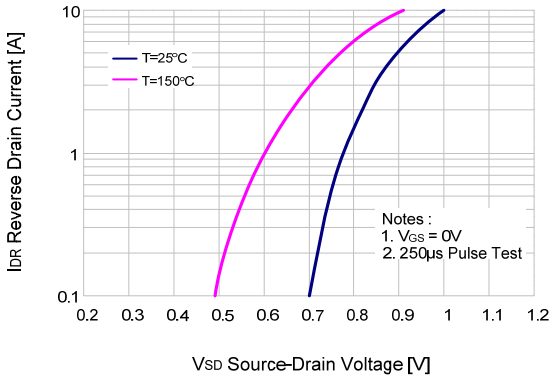


Figure 5. Capacitance Characteristics

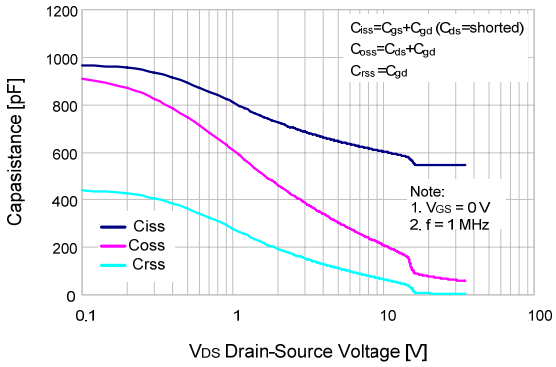
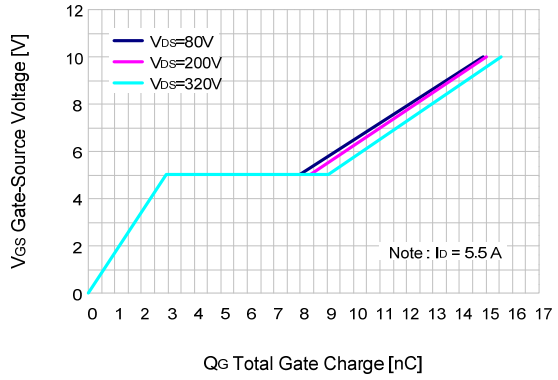


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS (continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

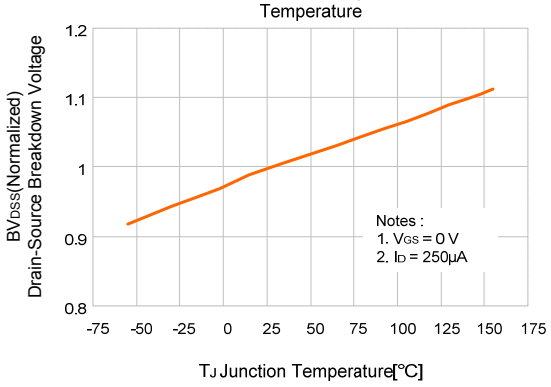


Figure 8. On-resistance Variation vs Temperature

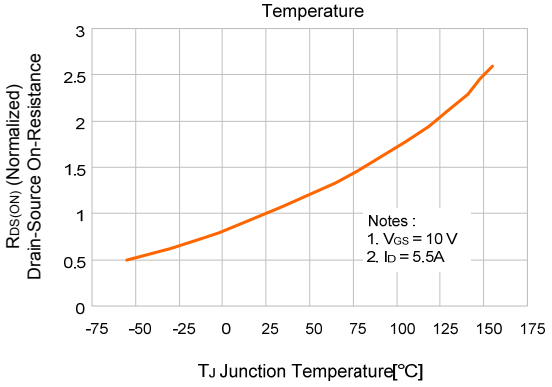


Figure 9-1. Max. Safe Operating Area(SVD730D)

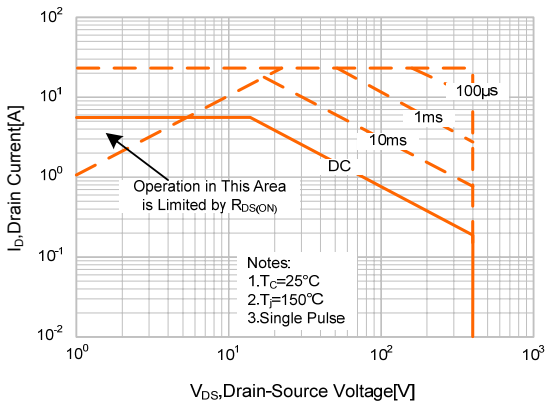


Figure 9-2. Max. Safe Operating Area(SVD730F)

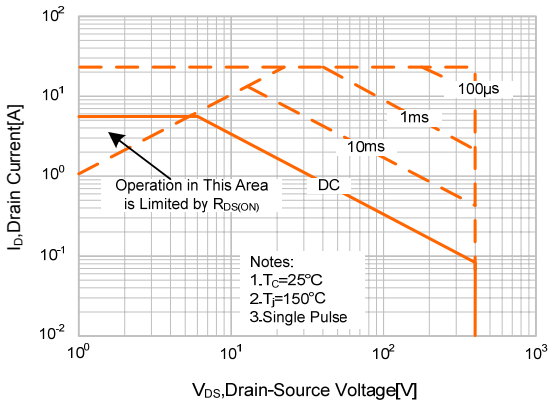


Figure 9-3. Max. Safe Operating Area(SVD730T)

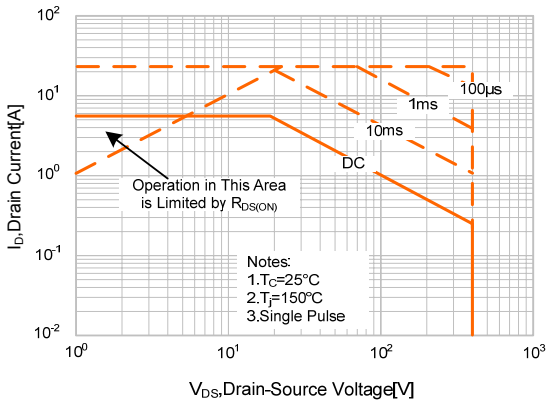
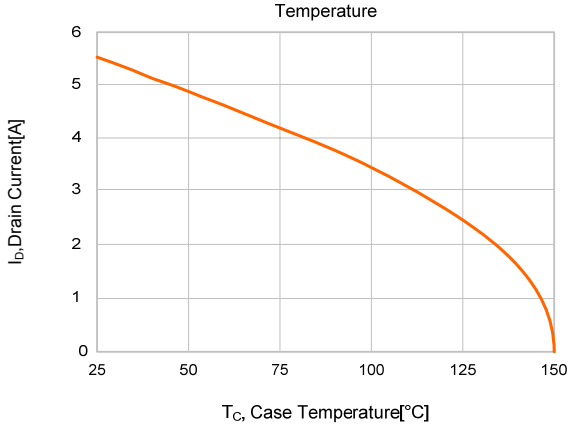
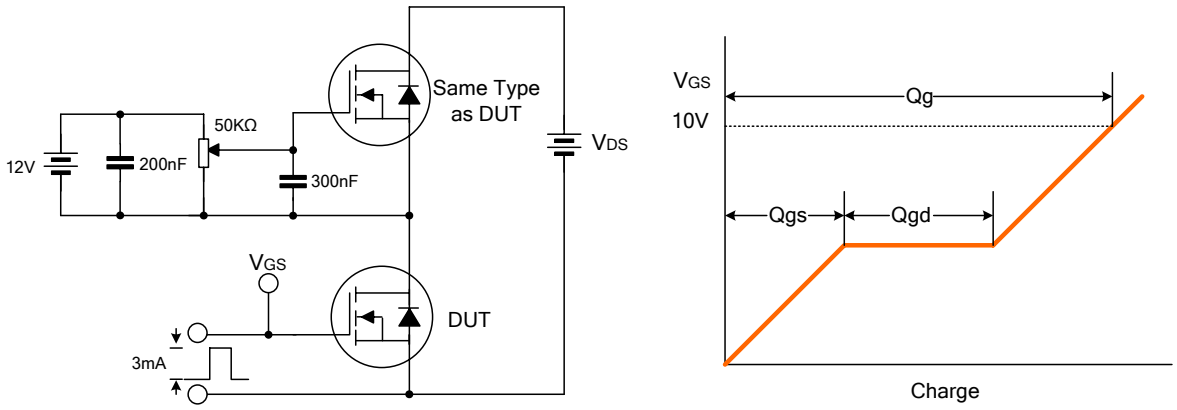


Figure 10. Maximum Drain Current vs. Case Temperature

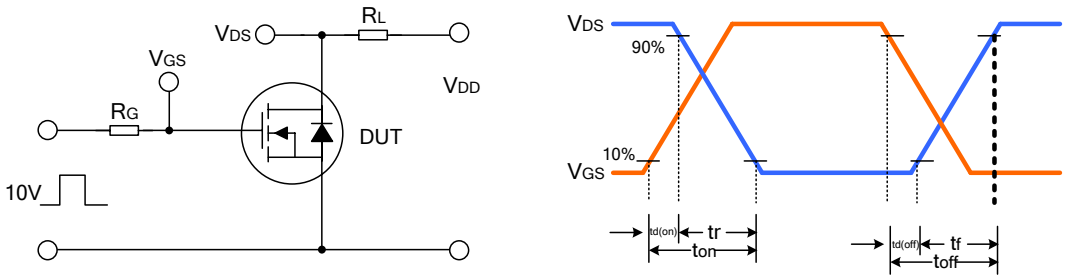


TYPICAL TEST CIRCUIT

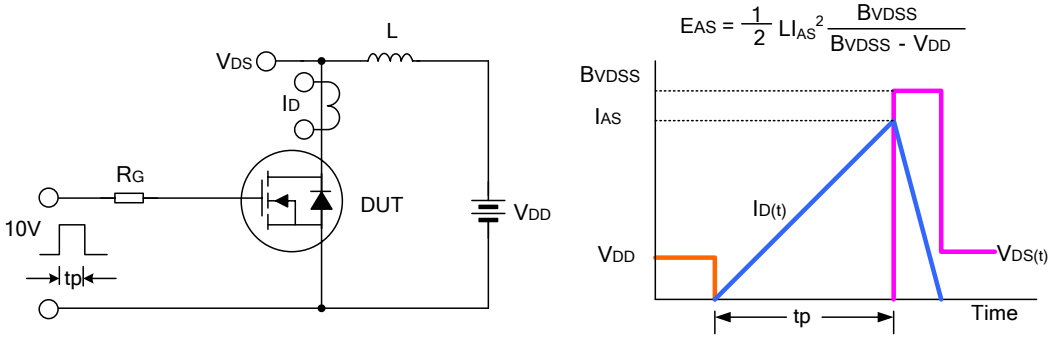
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

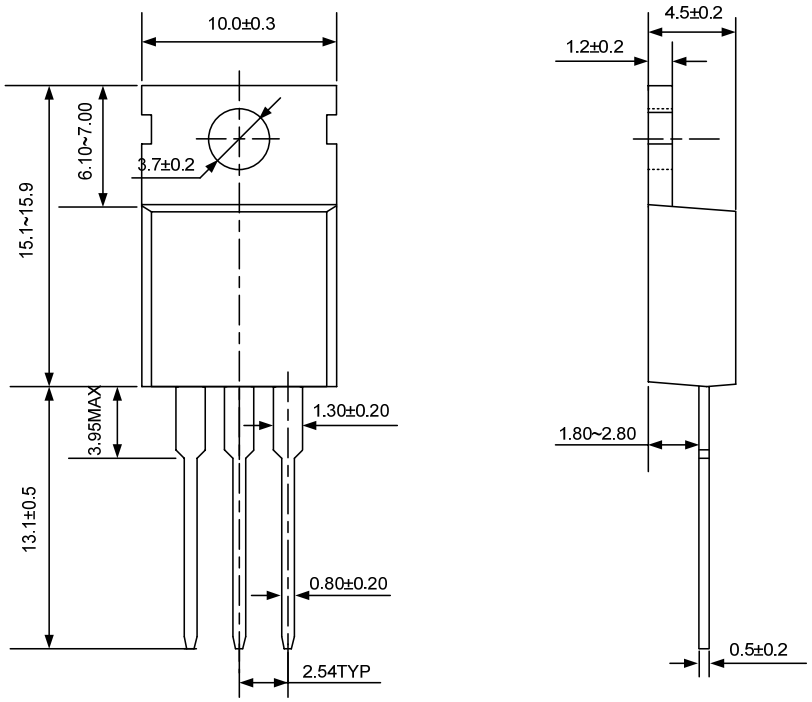


Unclamped Inductive Switching Test Circuit & Waveform

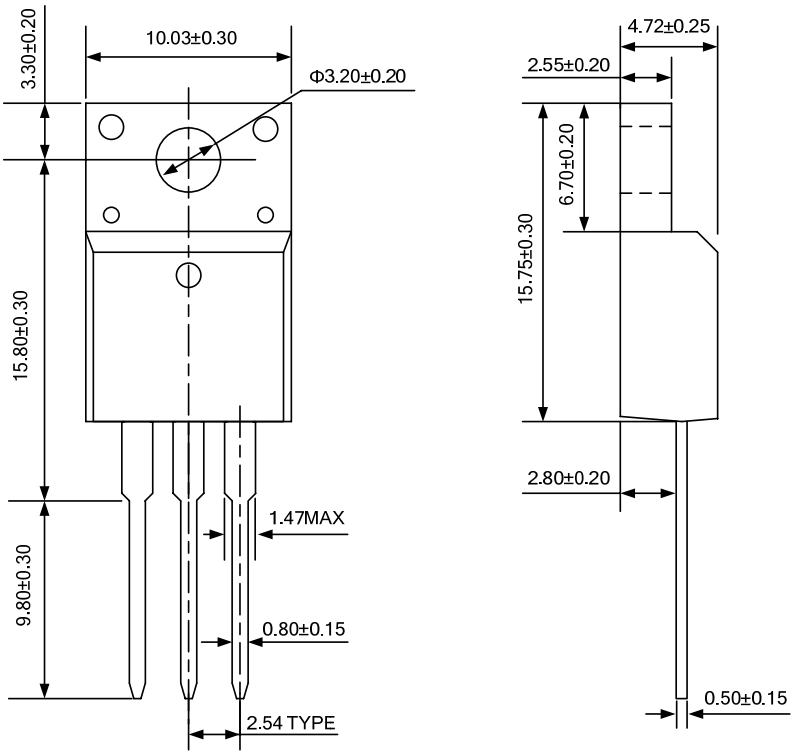


PACKAGE OUTLINE

TO-220-3L UNIT: mm

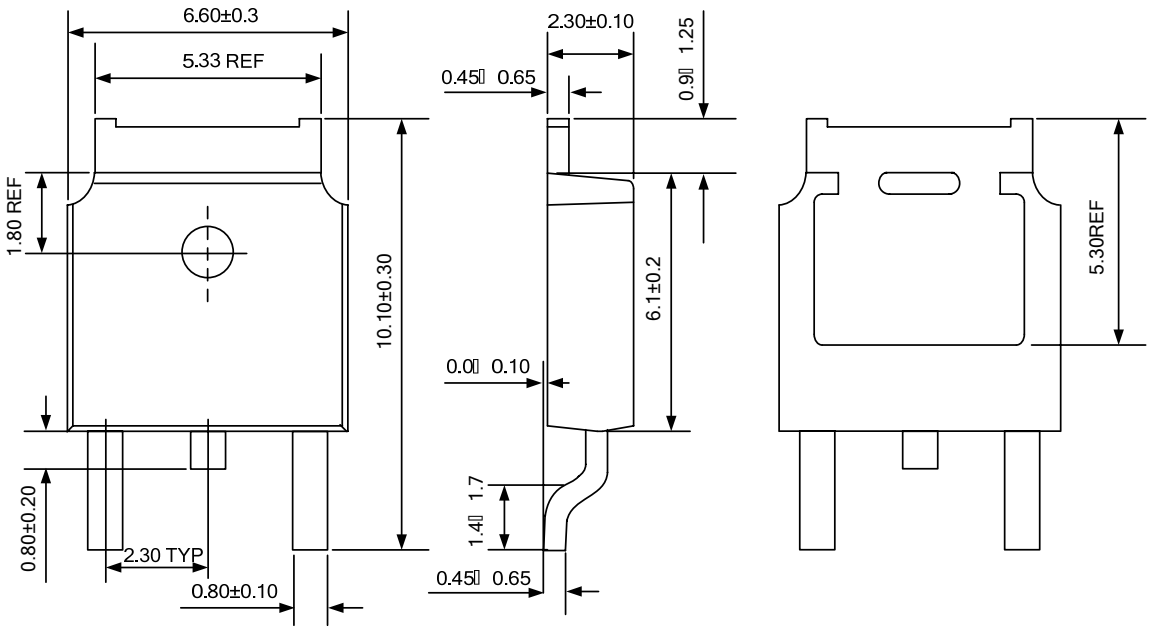


TO-220F-3L UNIT: mm



PACKAGE OUTLINE (continued)

TO-252-2L UNIT: mm



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ATTACHMENT

Revision History

Date	REV	Description	Page
2010.12.10	1.0	Original	