

2A, 650V N-Channel MOSFET

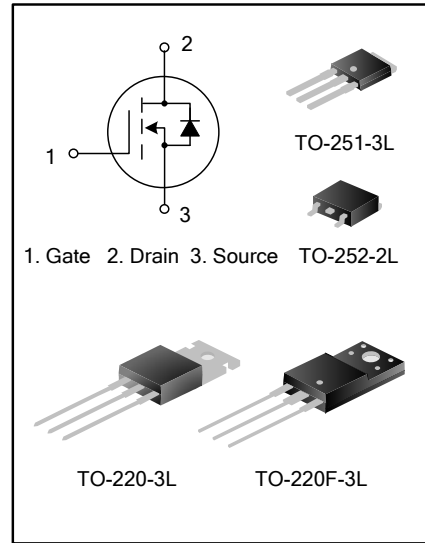
DESCRIPTION

SVD2N65M/F/T/D 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.

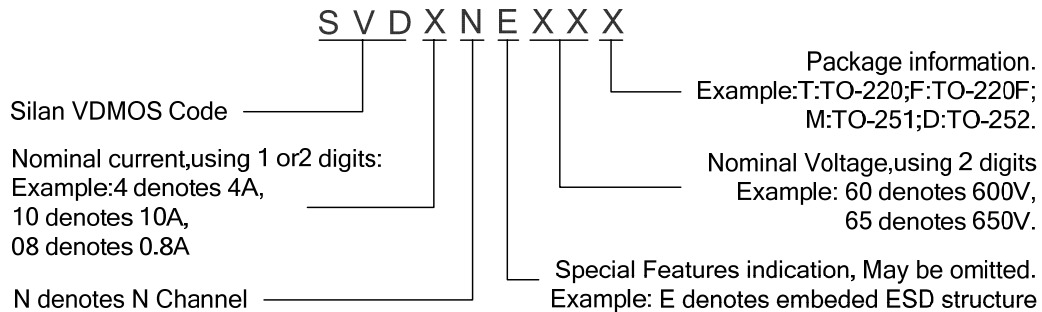
These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.

FEATURES

- * 2A, 650V, $R_{DS(on)}$ (typ.)=4.5Ω@VGS=10V
- * Low gate charge
- * Low Crss
- * Fast switching
- * Improved dv/dt capability



NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SVD2N65M	TO-251-3L	SVD2N65M	Pb free	Tube
SVD2N65F	TO-220F-3L	SVD2N65F	Pb free	Tube
SVD2N65T	TO-220-3L	SVD2N65T	Pb free	Tube
SVD2N65D	TO-252-2L	SVD2N65D	Pb free	Tube
SVD2N65DTR	TO-252-2L	SVD2N65D	Pb free	Tape & Reel

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

Characteristics	Symbol	SVD2N65M/D	SVD2N65T	SVD2N65F	Unit
Drain-Source Voltage	V _{DS}	650			V
Gate-Source Voltage	V _{GS}	±30			V
Drain Current	I _D	2.0			A
Power Dissipation (T _C =25°C) - Derate above 25°C	P _D	44	44	23	W
		0.22	0.22	0.18	W/°C
Single Pulsed Avalanche Energy (Note 1)	E _{AS}	60			mJ
Operation Junction Temperature	T _J	-55~+150			°C
Storage Temperature	T _{stg}	-55~+150			°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	SVD2N65D/M/T	SVD2N65F	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	2.87	5.5	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	110	62.5	°C/W

ELECTRICAL CHARACTERISTICS (unless otherwise noted, T_C=25°C)

Characteristics	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	--	--	1.0	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 =1.0A	--	4.5	5.6	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	--	320	380	pF
Output Capacitance	C _{oss}		--	30	45	
Reverse Transfer Capacitance	C _{rss}		--	3	5.6	
Turn-on Delay Time	t _{d(on)}	V _{DD} =300V, I _D =2.0A, R _G =25Ω (Note 2,3)	--	13	30	ns
Turn-on Rise Time	t _r		--	12	60	
Turn-off Delay Time	t _{d(off)}		--	73	100	
Turn-off Fall Time	t _f		--	14.3	70	
Total Gate Charge	Q _g	V _{DS} =480V, I _D =2.0A, V _{GS} =10V (Note 2,3)	--	9.3	13	nC
Gate-Source Charge	Q _{gs}		--	2.0	--	
Gate-Drain Charge	Q _{gd}		--	3.3	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Source Current	IS	Integral Reverse P-N Junction Diode in the MOSFET	--	--	2.0	A
Pulsed Source Current	ISM		--	--	8.0	
Diode Forward Voltage	VSD	IS=2.0A, VGS=0V	--	--	1.4	V
Reverse Recovery Time	Trr	IS=2.0A, VGS=0V, diF/dt=100A/μS	--	230	--	ns
Reverse Recovery Charge	Qrr		--	1.0	--	μC

Notes:

1. L=30mH, IAS=1.86, VDD=110V, starting TJ=25°C;
2. Pulse Test: Pulse width≤300μs, Duty cycle≤2%;
3. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

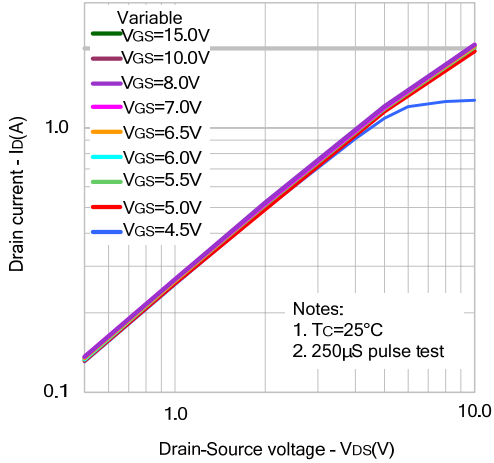


Figure 2. Transfer Characteristics

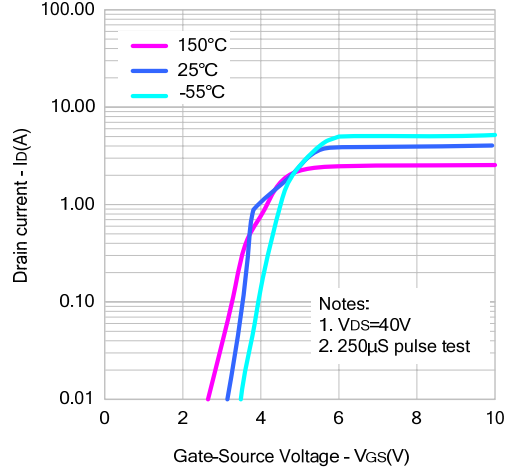


Figure 3. On-Resistance Variation vs. Drain current and Gate Voltage

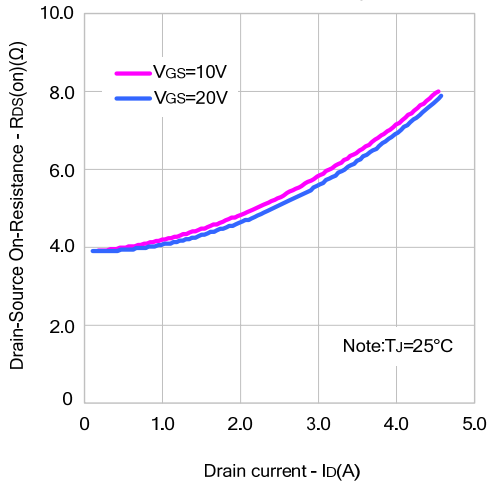


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

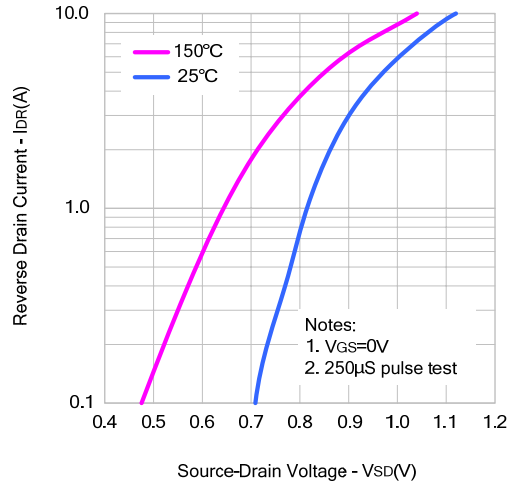
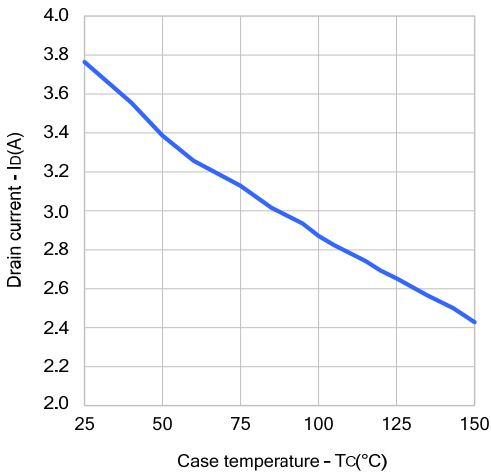
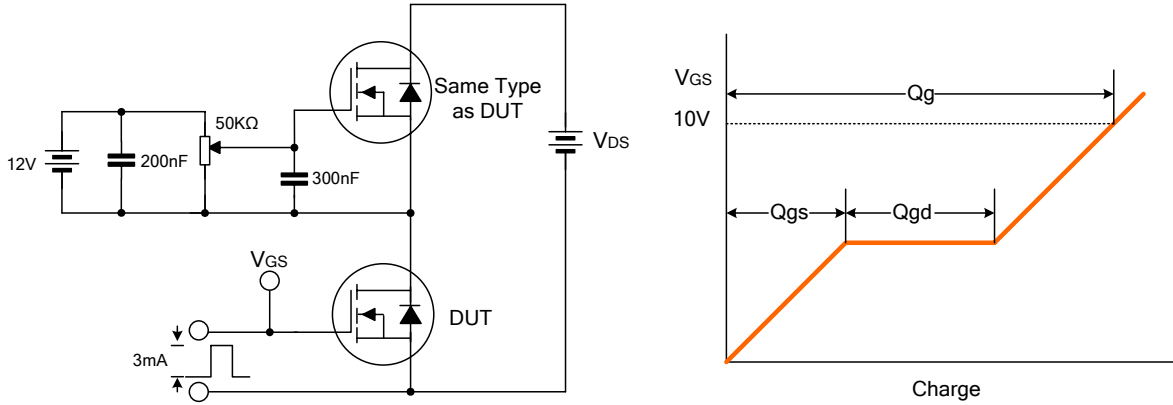


Figure 5. Drain Current vs. Case Temperature

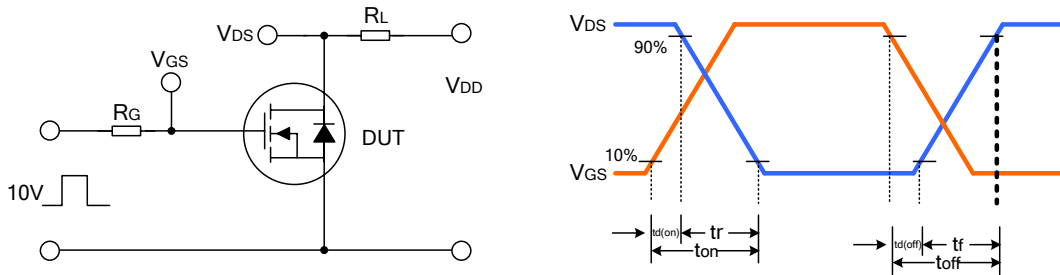


TYPICAL TEST CIRCUIT

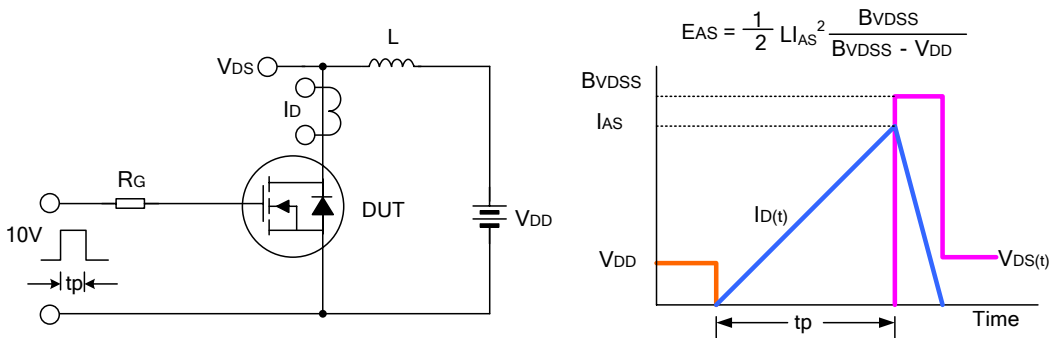
Gate Charge Test Circuit & Waveform



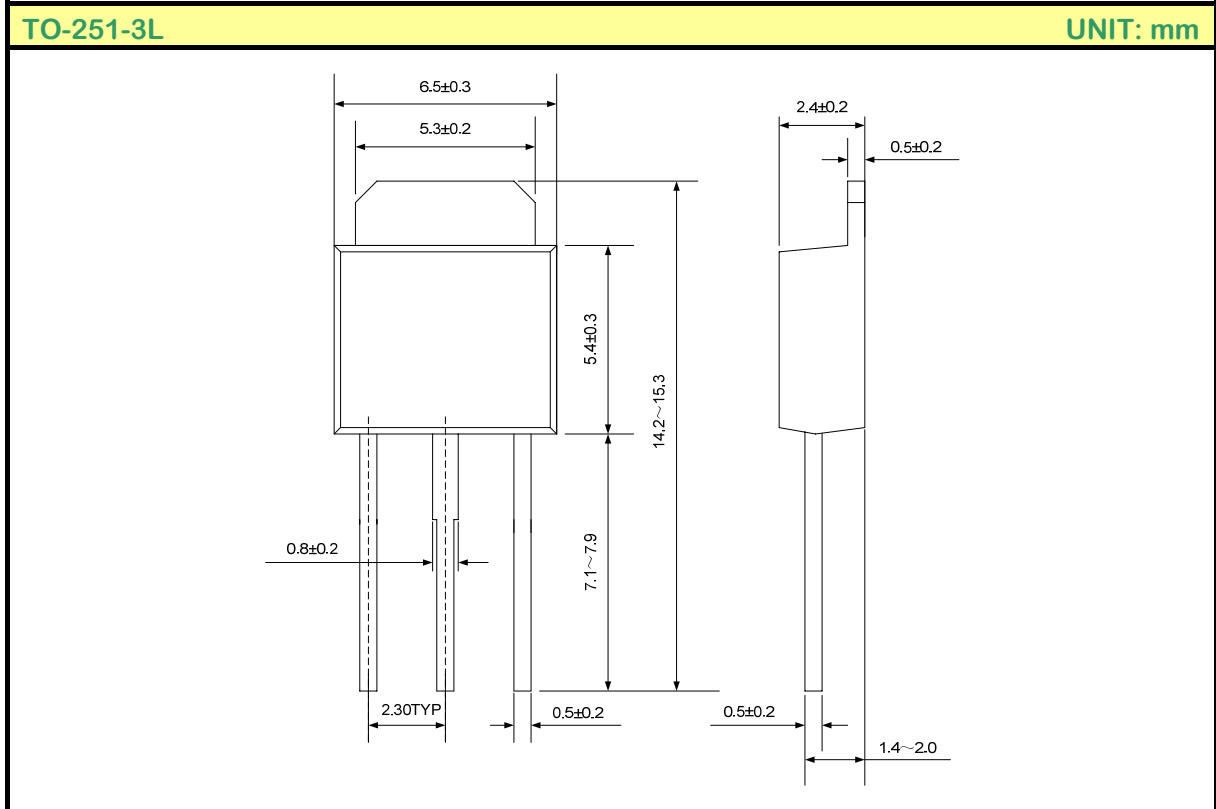
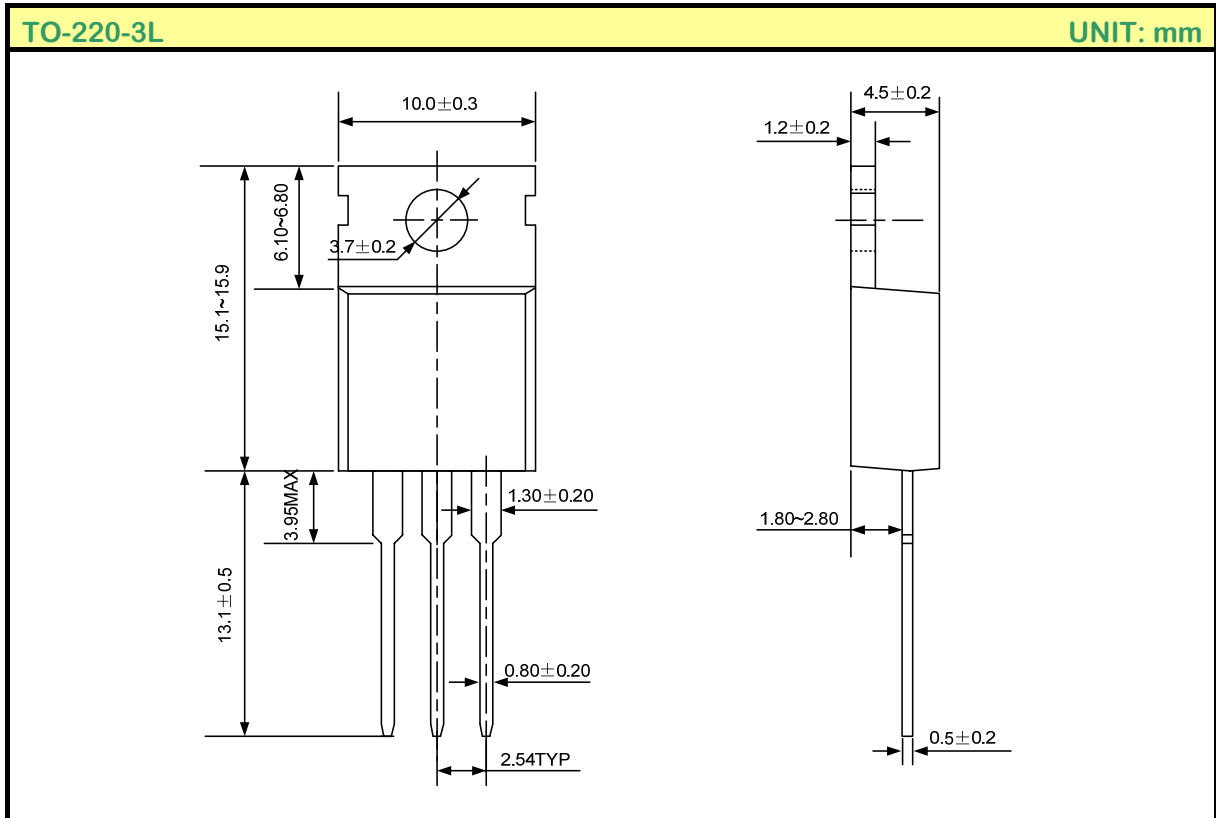
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



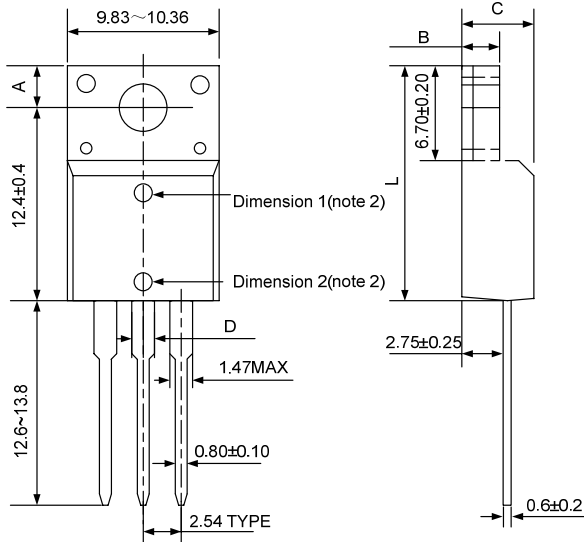
PACKAGE OUTLINE



PACKAGE OUTLINE (continued)

TO-220F-3L(1)

UNIT: mm

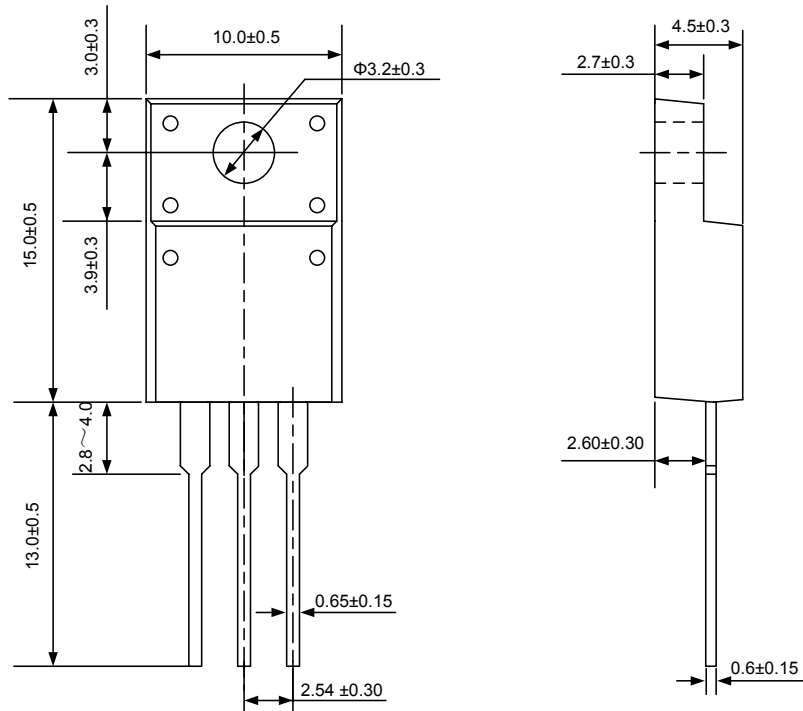


Symbol(note1)	Dimension1	Dimension2
A	3.3±0.15	2.70±0.15
B	2.55±0.20	3.0±0.20
C	4.72±0.2	4.5±0.20
D	1.47MAX	1.75MAX
L	15.75±0.30	15±0.30

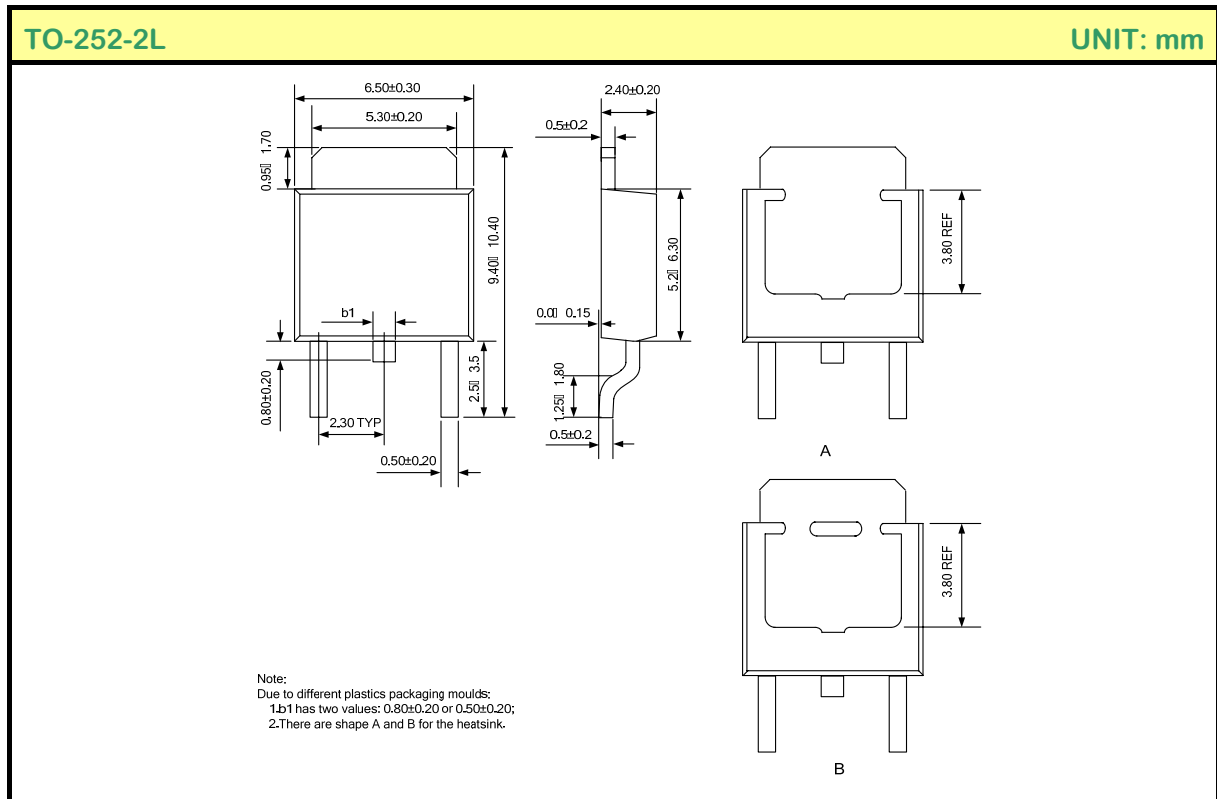
Note1: There may be two values for some products due to different plastic mould machine, so two dimensions of the same position are listed;
 Note2: When the product size is Dimension 1, the thimble hole is on top of the surface; when the size is Dimension2, the center hole is on bottom of the surface.

TO-220F-3L(2)

UNIT: mm



PACKAGE OUTLINE (continued)



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- Silan will supply the best possible product for customers!

ATTACHMENT**Revision History**

Date	REV	Description	Page
2010.06.25	1.0	Original	
2010.10.19	1.1	Modify the template of Datasheet	