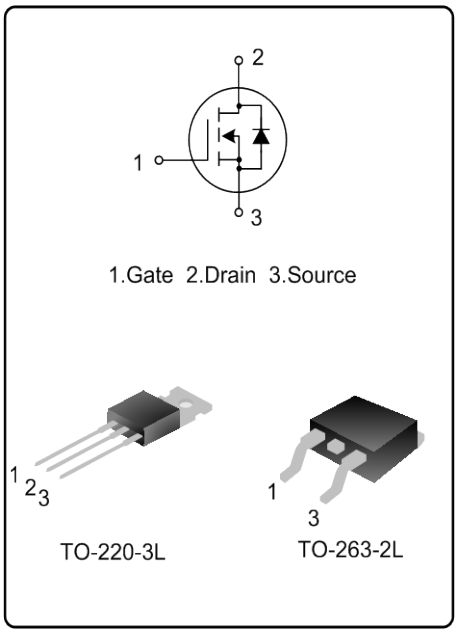
120A, 80V N-CHANNEL MOSFET

DESCRIPTION

SVT120N08T/S is an N-channel enhancement mode power MOS field effect transistor which is produced using Silan's LVMOS technology. The improved process and cell structure have been especially tailored to minimize on-state resistance, provide superior switching performance.

This device is widely used in UPS, Power Management for Inverter Systems .



FEATURES

- 120A,80V, $R_{DS(on)(typ.)}$=7mΩ@V_{GS}=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing
SVT120N08T	TO-220-3L	120N08T	Pb free	Tube
SVT120N08S	TO-263-2L	120N08S	Halogen free	Tube
SVT120N08STR	TO-263-2L	120N08S	Halogen free	Tape&Reel

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	±25	V
Drain Current	T_C=25°C	I_D	120	A
	T_C=100°C		85	
Drain Current Pulsed		I_{DM}	480	A
Power Dissipation(T_C=25°C)		P_D	220	W
-Derate above 25°C			1.47	W/°C
Single Pulsed Avalanche Energy(Note 1)		E_{AS}	635	mJ
Operation Junction Temperature Range		T_J	-55～+175	°C
Storage Temperature Range		T_{stg}	-55～+175	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.68	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	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	80	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V	--	--	1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±25V, 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=60A	--	7	8.5	mΩ
Input Capacitance	C_{iss}	f=1MHz,V_{GS}=0V, V_{DS}=25V	--	3109	--	pF
Output Capacitance	C_{oss}		--	457	--	
Reverse Transfer Capacitance	C_{rss}		--	223	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V, V_{GS}=10V, R_G=24Ω, I_D=60A (Note 2,3)	--	40	--	ns
Turn-on Rise Time	t_r		--	104	--	
Turn-off Delay Time	$t_{d(off)}$		--	101	--	
Turn-off Fall Time	t_f		--	96	--	
Total Gate Charge	Q_g	V_{DD}=64V, V_{GS}=10V, I_D=60A (Note 2,3)	--	65	--	nC
Gate-Source Charge	Q_{gs}		--	21	--	
Gate-Drain Charge	Q_{gd}		--	24	--	

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	--	--	120	A
Pulsed Source Current	I_{SM}		--	--	480	
Diode Forward Voltage	V_{SD}	I_S=60A,V_{GS}=0V	--	--	1.3	V
Reverse Recovery Time	T_{rr}	I_S=60A,V_{GS}=0V, dIF/dt=100A/μs	--	39	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.08	--	μC

Notes:

1.L=0.5mH, I_{AS}=50.4A, V_{DD}=50V, R_G=10Ω,starting T_J=25°C;

2.Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;

3.Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

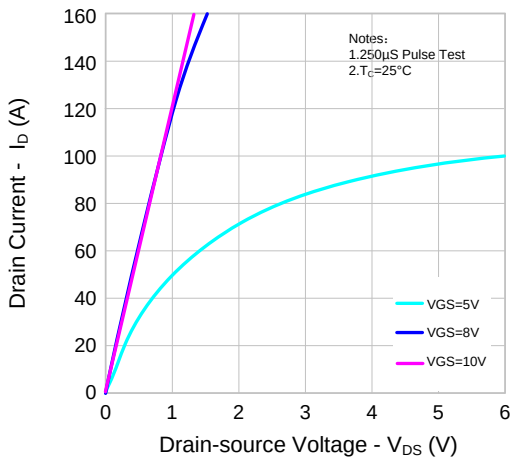


Figure 2. Transfer Characteristics

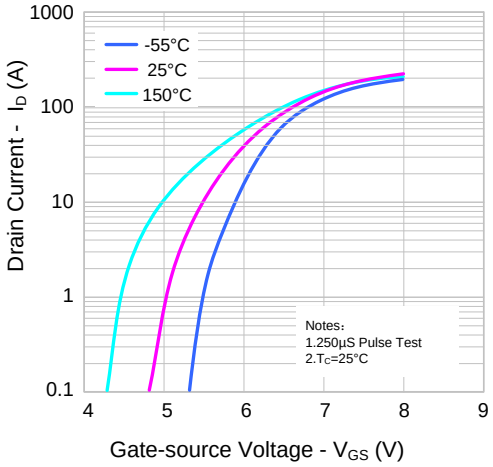


Figure 3. On-resistance vs. Drain Current

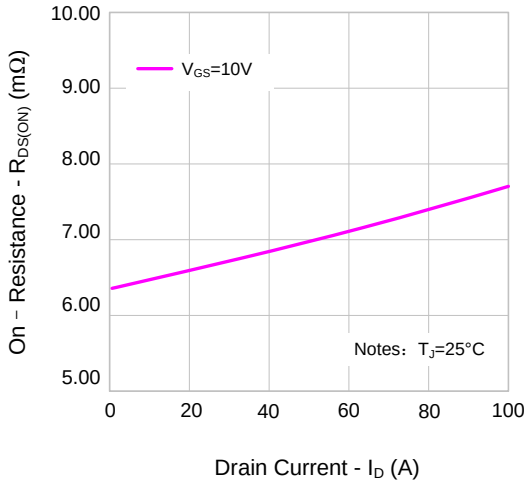


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

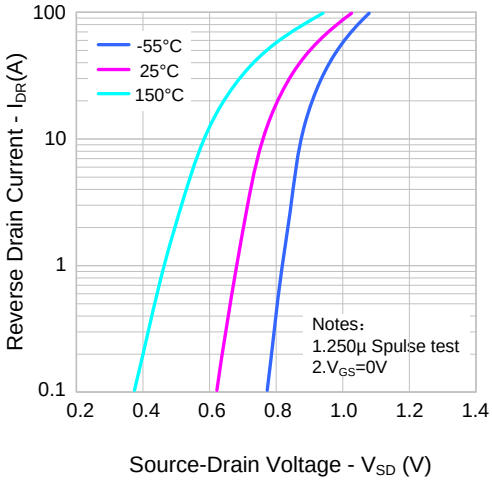


Figure 5. Capacitance Characteristics

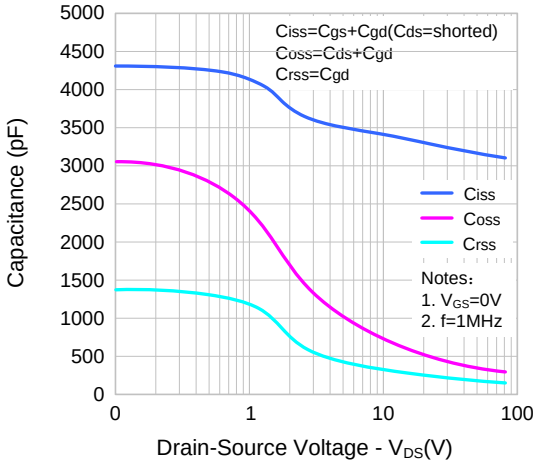
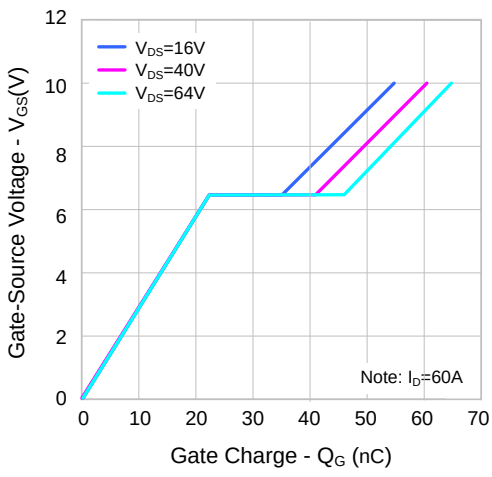


Figure 6. Gate Charge



TYPICAL CHARACTERISTICS(continued)

Figure 7. Breakdown Voltage vs. Temperature Characteristics

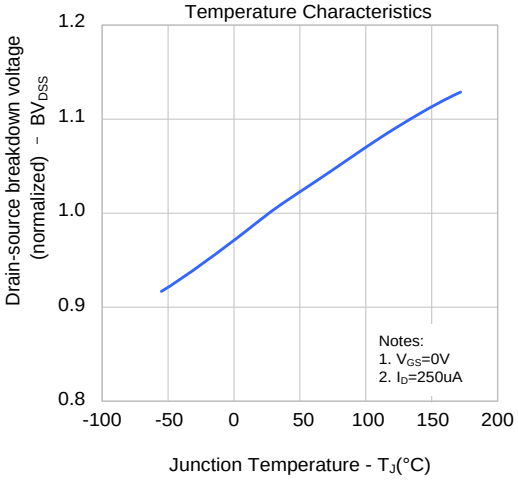


Figure 8. On-resistance vs. Temperature Characteristics

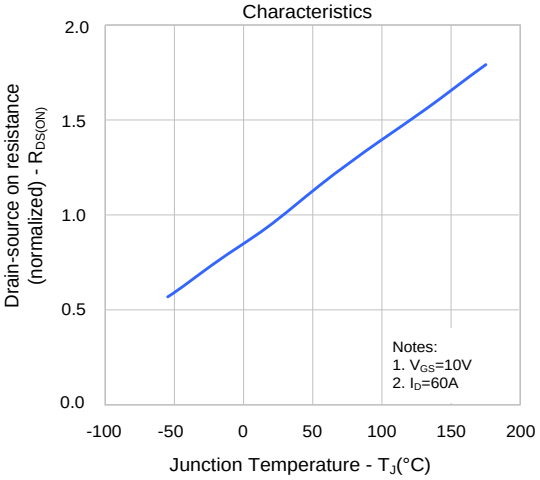
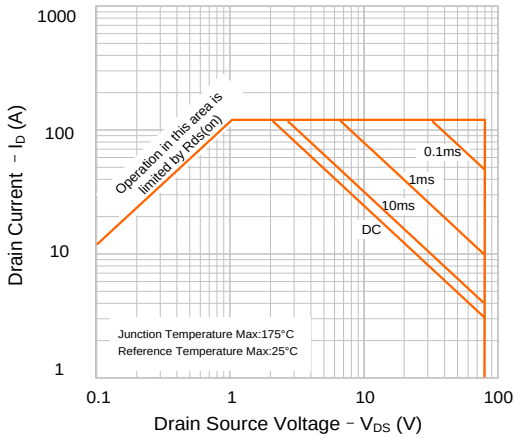
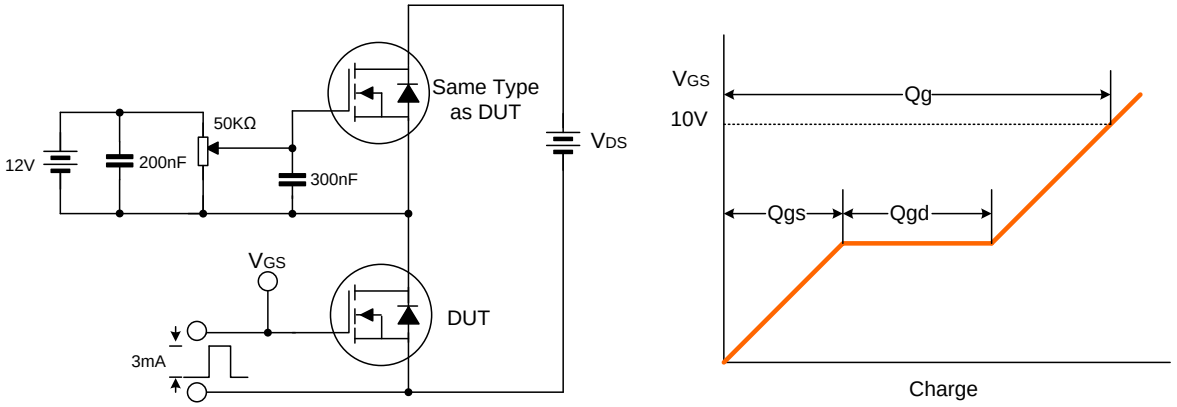


Figure 9. Max. Safe Operating Area

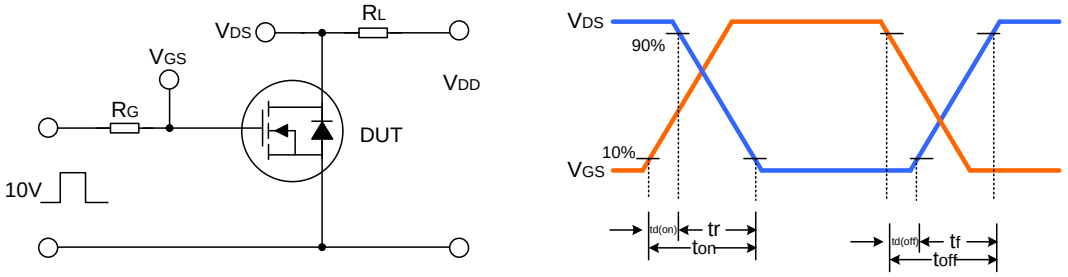


TYPICAL TEST CIRCUIT

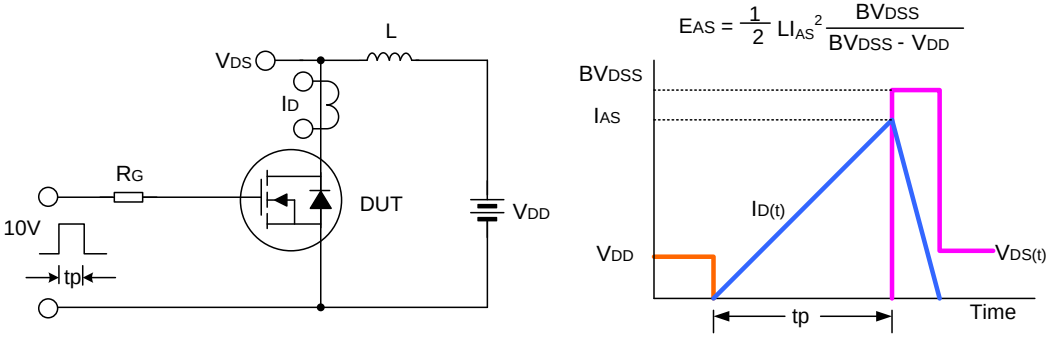
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



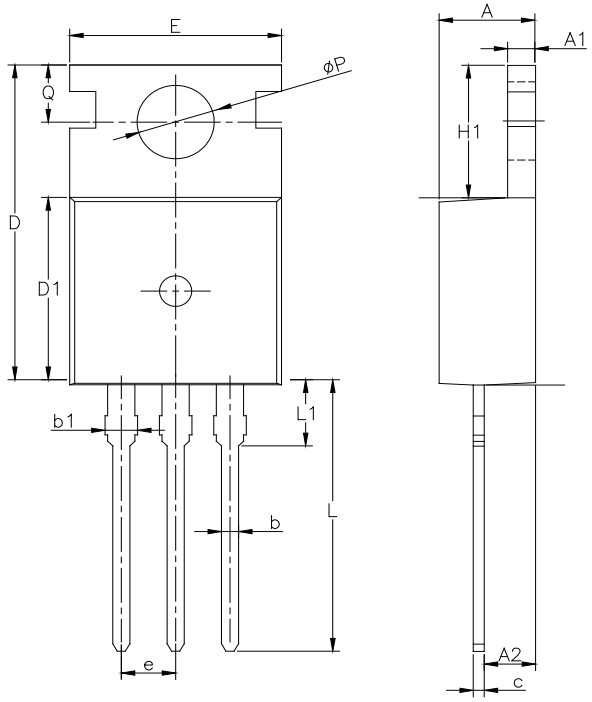
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-220-3L

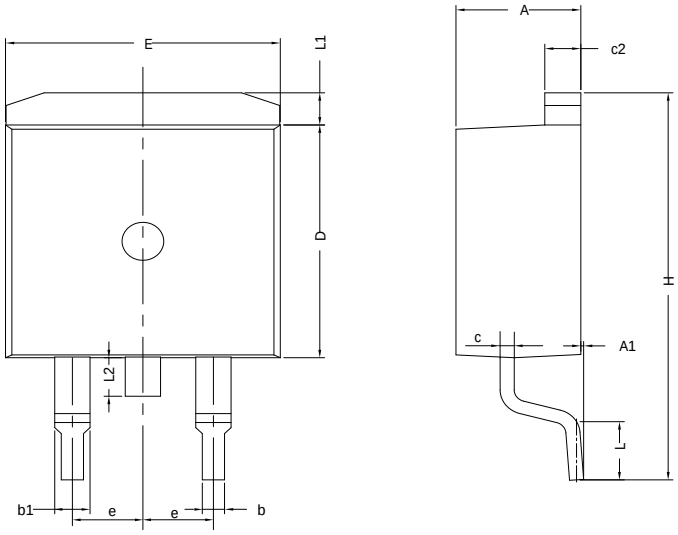
UNIT: mm



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.00	1.30	1.50
A2	1.80	2.40	2.80
b	0.60	0.80	1.00
b1	1.00	—	1.60
c	0.30	—	0.70
D	15.10	15.70	16.10
D1	8.10	9.20	10.00
E	9.60	9.90	10.40
e		2.54BSC	
H1	6.10	6.50	7.00
L	12.60	13.08	13.60
L1	—	—	3.95
ϕP	3.40	3.70	3.90
Q	2.60	—	3.20

TO-263-2L

UNIT: mm



SYMBOL	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
c	0.30	---	0.60
c2	1.17	1.27	1.37
D	8.50	---	9.35
E	9.80	---	10.45
e		2.54BSC	
H	14.70	---	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	---	---	1.75

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Rev.: 1.5

Revision History:

1. Modify Electrical characteristics
2. Update Fig5 and 6

Rev.: 1.4

Revision History:

1. Modify the I_D value of Fig6
2. Update Fig8

Rev.: 1.3

Revision History:

1. Modify the package outline of TO-220-3L

Rev.: 1.2

Revision History:

1. Add the package outline of TO-263-2L

Rev.: 1.1

Revision History:

1. Modify test condition of V_{SD} and Trr to 60A

Rev.: 1.0

Revision History:

1. First release