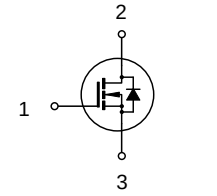
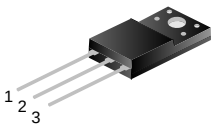
11A, 650V SUPER JUNCTION MOS POWER TRANSISTOR

GENERAL DESCRIPTION

SVS11N65FJHD2 is an N-channel enhancement mode high voltage power MOSFETs produced using Silan's Super Junction MOS technology. It achieves low conduction loss and switching losses. It leads the design engineers to their power converters with high efficiency, high power density, and superior thermal behavior. Furthermore, it's universal applicable, for example. it is suitable for hard and soft switching topologies.



1.Gate 2.Drain 3.Source



TO-220FJH-3L

FEATURES

- 11A,650V, $R_{DS(on)(typ.)}$=0.33Ω@V_{GS}=10V
- New revolutionary high voltage technology
- Ultra low gate charge
- Periodic avalanche rated
- Extreme dv/dt rated
- High peak current capability

NOMENCLATURE

S V S P X N E X X X X X X

- Silan Super-junction MOS products
  S denotes Silan
  VS denote Multilayer epitaxial process
- Process Version, P denotes PASSIVATION
- Nominal current, using 1 or 2 digits:
  Example:4 denotes 4A
- N denotes N Channel
- Special Features indication, May be omitted.
  Example: E denotes embedded ESD structure
- Process breakdown logo
  D2: second generation process, EMI version;
  E2: second generation, fast switching version
- Packageinformation.Examp:F:TO-220F.
- Specification mark, distinguish different gate oxygen thickness and different versions of products. It is usually default.
- Nominal Voltage, using 2 digits
  Example:60 denotes 600V,65 denotes 650V.

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVS11N65FJHD2	TO-220FJH-3L	11N65FJHD2	Halogen free	Tube

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current	T_C=25°C	I_D	11	A
	T_C=100°C		7	
Drain Current Pulsed		I_{DM}	44	A
Power Dissipation(T_C=25°C)		P_D	35	W
-Derate above 25°C			0.28	W/°C
Single Pulsed Avalanche Energy (Note 1)		E_{AS}	250	mJ
Body diode (Note 2)		dv/dt	15	V/ns
MOSFET dv/dt ruggedness (Note 3)		dv/dt	50	V/ns
Operation Junction Temperature Range		T_J	-55～+150	°C
Storage Temperature Range		T_{stg}	-55～+150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.57	°C/W
Thermal Resistance, junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W

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

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=5.5A	--	0.33	0.4	Ω
Gate resistance	R_g	f=1MHz	--	5.2	--	Ω
Input Capacitance	C_{iss}	f=1MHz,V_{GS}=0V, V_{DS}=100V	--	632	--	pF
Output Capacitance	C_{oss}		--	37	--	
Reverse Transfer Capacitance	C_{rss}		--	2.3	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=325V,V_{GS}=10V, R_G=24Ω, I_D=11A (Notes 4,5)	--	12	--	ns
Turn-on Rise Time	t_r		--	35	--	
Turn-off Delay Time	$t_{d(off)}$		--	64	--	
Turn-off Fall Time	t_f		--	31	--	
Total Gate Charge	Q_g	V_{DD}=520V, V_{GS}=10V, I_D=11A (Notes 4,5)	--	23	--	nC
Gate-Source Charge	Q_{gs}		--	5.3	--	
Gate-Drain Charge	Q_{gd}		--	11	--	

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	--	--	11	A
Pulsed Source Current	I_{SM}		--	--	44	
Diode Forward Voltage	V_{SD}	I_S=11A,V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_S=11A,V_{GS}=0V, dI_F/dt=100A/μs (Note 4)	--	361	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.9	--	μC

Notes:

1. L=79mH,I_{AS}=2.4A,V_{DD}=100V, R_G=25Ω, starting T_J=25°C;
2. V_{DS}=0~400V，I_{SD}<=11A, T_J=25°C;
3. V_{DS}=0~480V;
4. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
5. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

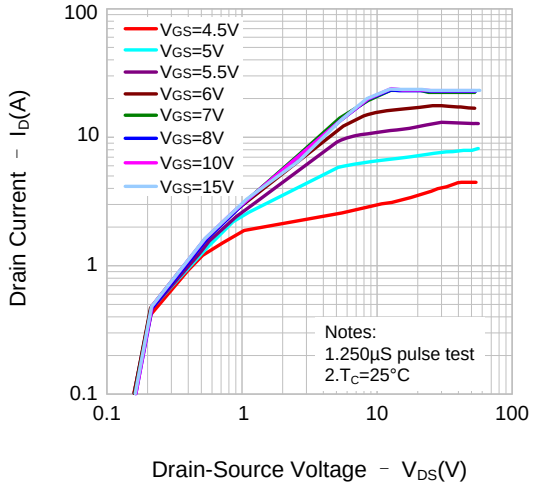


Figure 2. Transfer Characteristics

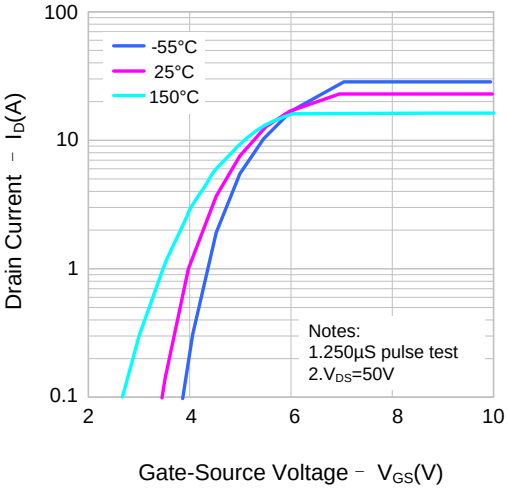


Figure 3. On-Resistance Variation vs. Drain Current

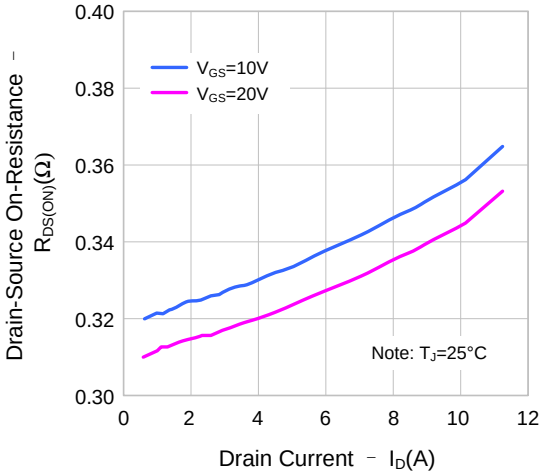


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

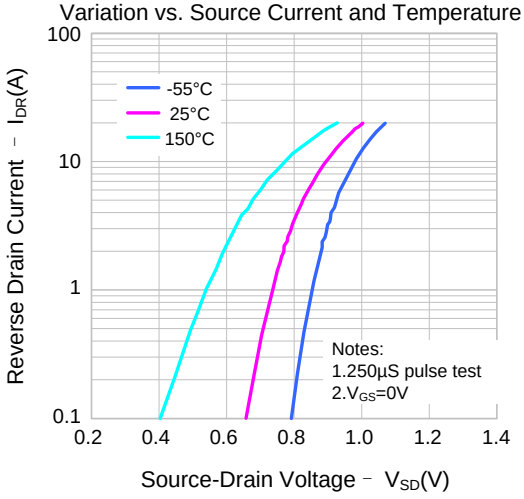


Figure 5. Capacitance Characteristics

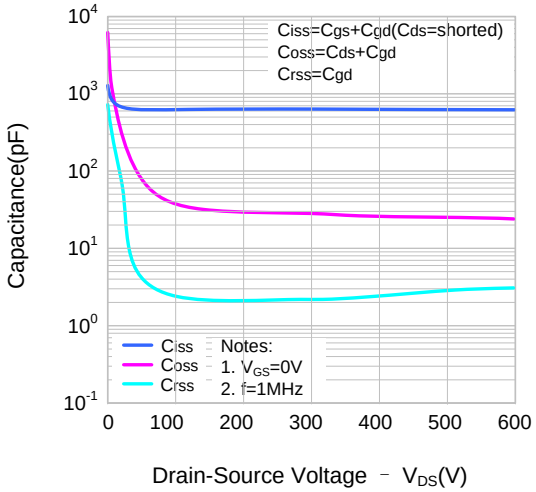
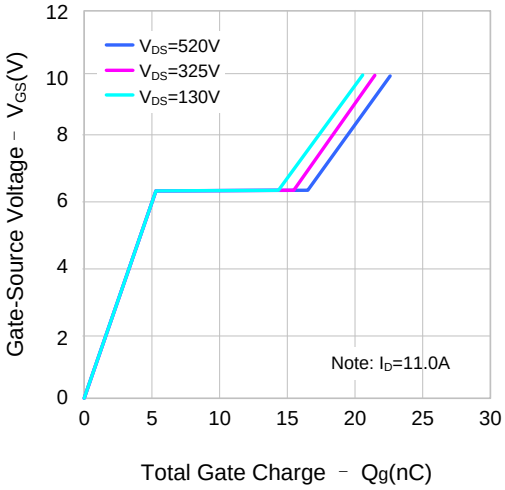


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS (continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

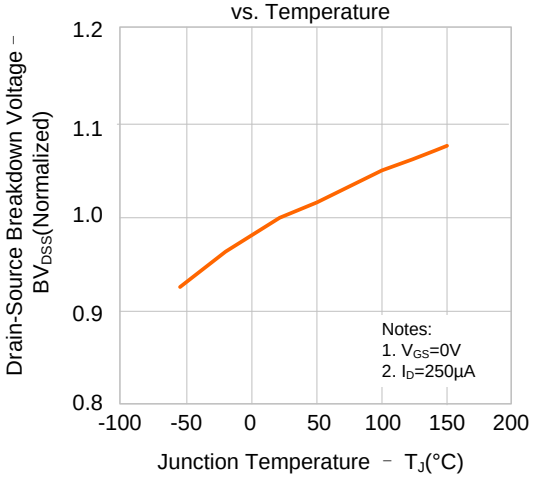


Figure 8. On-resistance Variation vs. Temperature

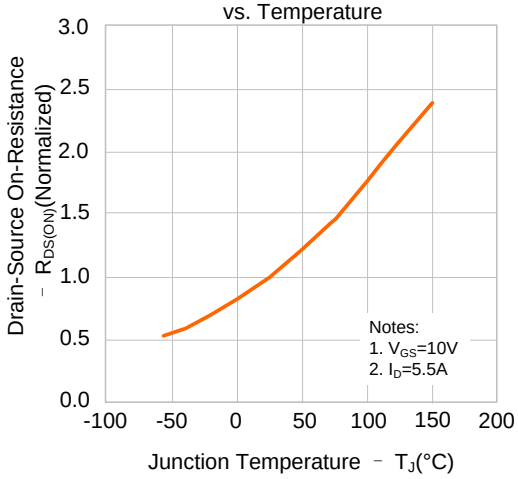
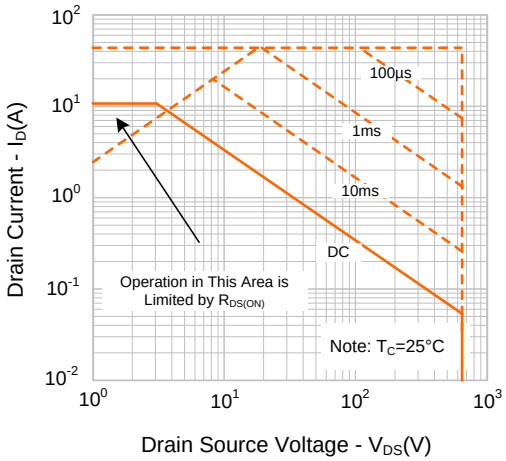
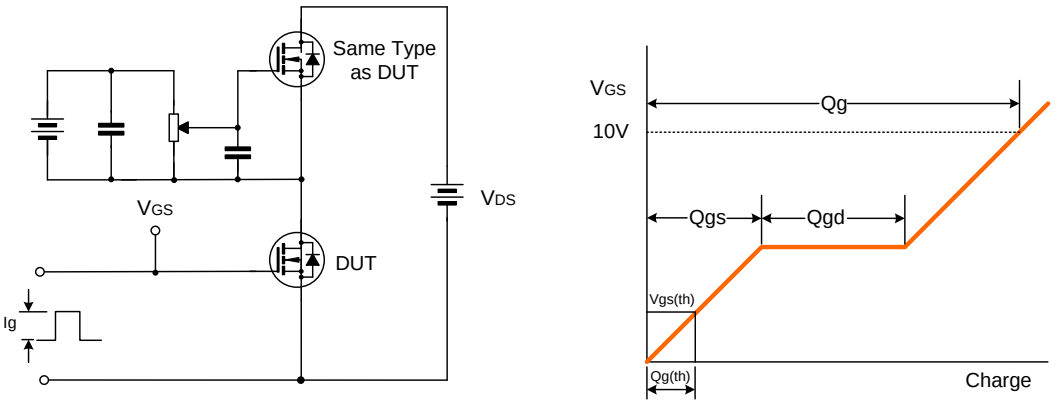


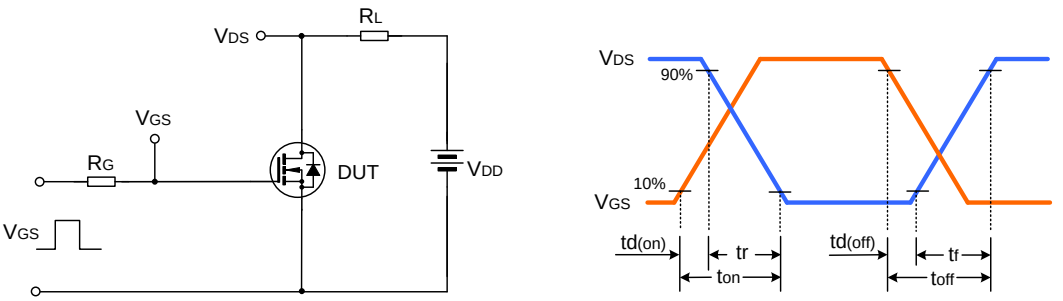
Figure 9. Max. Safe Operating Area



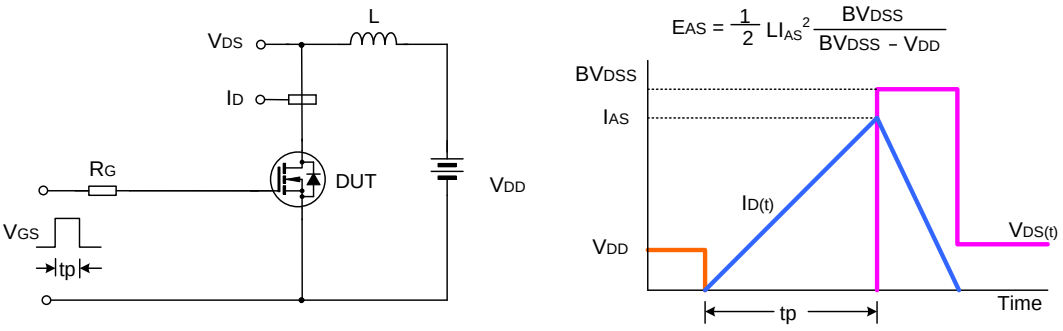
TYPICAL TEST CIRCUIT



Gate Charge Test Circuit & Waveform



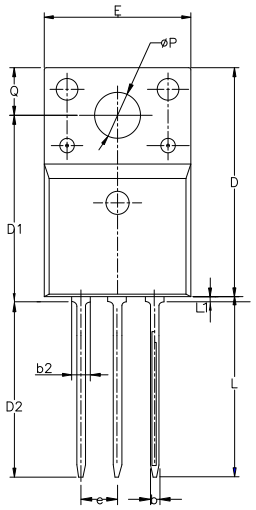
Resistive Switching Test Circuit & Waveform

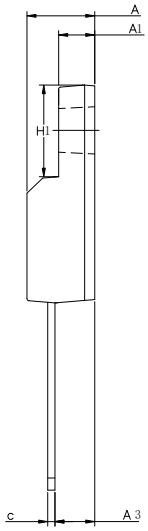


Unclamped Inductive Switching Test Circuit & Waveform

PACKAGE OUTLINE

TO-220FJH-3L **UNIT: mm**





SYMBOL	MIN	NOM	MAX
A	4.42	4.70	5.02
A1	2.30	2.54	2.80
A3	2.50	2.76	3.10
b	0.55	0.70	**0.80**
b2	—	—	1.29
c	0.35	0.50	0.65
D	15.25	15.87	16.25
D1	12.87	13.07	13.27
D2	12.28	12.48	12.68
E	9.73	10.16	10.36
e		2.54BCS	
H1	6.40	6.68	7.00
L	12.48	12.98	13.48
L1	—	—	0.85
øP	3.00	3.18	3.40
Q	3.05	3.30	3.55

Important notice :

- **The instructions are subject to change without notice！ Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.**
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Rev.: 1.1

Revision History:

1. Update Electrical schematic
2. Update Fig 5
3. Update TYPICAL TEST CIRCUIT
4. Update important notice

Rev.: 1.0

Revision History:

1. First release