

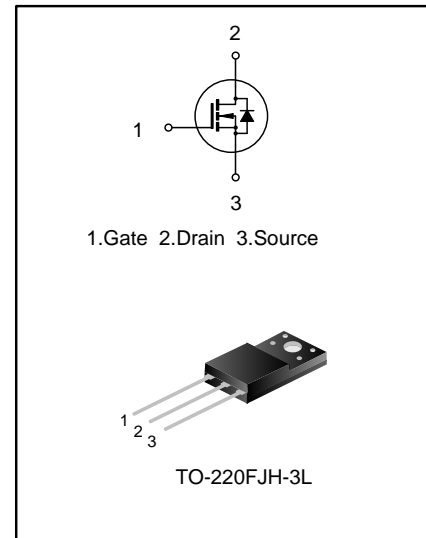
14A, 650V SUPER JUNCTION MOS POWER TRANSISTOR

DESCRIPTION

SVSP14N65FJHE2 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, i.e., suitable for hard and soft switching topologies.

FEATURES

- ◆ 14A,650V, $R_{DS(on)(typ.)}=0.26\Omega@V_{GS}=10V$
- ◆ New revolutionary high voltage technology
- ◆ Ultra low gate charge
- ◆ Periodic avalanche rated
- ◆ Extreme dv/dt rated
- ◆ High peak current capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVSP14N65FJHE2	TO-220FJH-3L	P14N65FJHE	Halogen free	Tube

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	± 30	V
Drain Current	$T_C=25^{\circ}\text{C}$	I_D	14	A
	$T_C=100^{\circ}\text{C}$		8.8	
Drain Current Pulsed		I_{DM}	56	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)		P_D	39	W
- Derate above 25°C			0.3	
Single Pulsed Avalanche Energy (Note1)		E_{AS}	593	mJ
Reverse diode dv/dt (Note 2)		dv/dt	15	V/ns
MOSFET dv/dt ruggedness (Note 3)		dv/dt	50	V/ns
Operation Junction Temperature Range		T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	$-55 \sim +150$	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.2	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	--	--	1.0	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	--	4.0	V
Static Drain- Source on State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=7.0A$	--	0.26	0.31	Ω
Gate resistance	R_g	$f=1\text{MHz}$	--	7.1	--	Ω
Input Capacitance	C_{iss}	$f=1\text{MHz}, V_{GS}=0V, V_{DS}=100V$	--	768	--	pF
Output Capacitance	C_{oss}		--	46	--	
Reverse Transfer Capacitance	C_{rss}		--	1.6	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=325V, V_{GS}=10V, R_G=24\Omega, I_D=14A$ (Note 4,5)	--	14	--	ns
Turn-on Rise Time	t_r		--	37	--	
Turn-off Delay Time	$t_{d(off)}$		--	47	--	
Turn-off Fall Time	t_f		--	34	--	
Total Gate Charge	Q_g	$V_{DD}=520V, V_{GS}=10V, I_D=14A$ (Note 4,5)	--	19	--	nC
Gate-Source Charge	Q_{gs}		--	5.9	--	
Gate-Drain Charge	Q_{gd}		--	7.7	--	

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	--	--	14	A
Pulsed Source Current	I_{SM}		--	--	56	
Diode Forward Voltage	V_{SD}	$I_S=14A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=14A, V_{GS}=0V, di/dt=100A/\mu s$ (Note 4)	--	365	--	ns
Reverse Recovery Charge	Q_{rr}		--	4.4	--	μC

Notes:

- $L=79\text{mH}, I_{AS}=3.6A, V_{DD}=100V, R_G=25\Omega$, starting temperature $T_J=25^\circ\text{C}$;
- $V_{DS}=0\sim 400V, I_{SD}\leq 14A, T_J=25^\circ\text{C}$;
- $V_{DS}=0\sim 480V$;
- Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;
- Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. On-Region Characteristics

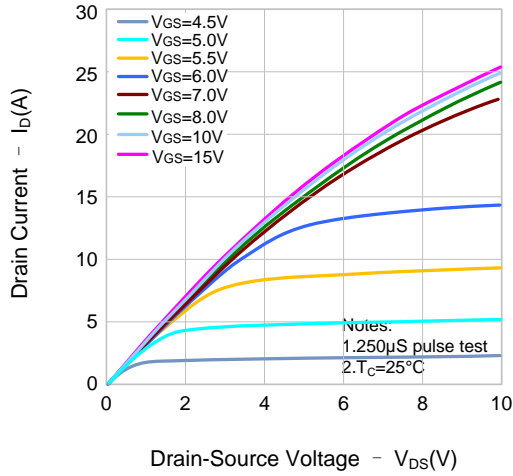


Figure 2. Transfer Characteristics

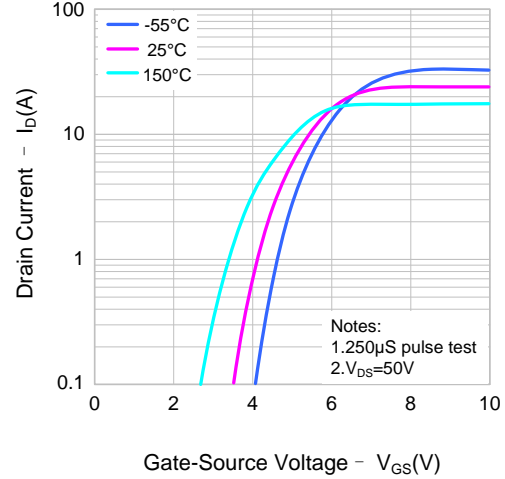


Figure 3. On-Resistance Variation vs. Drain Current

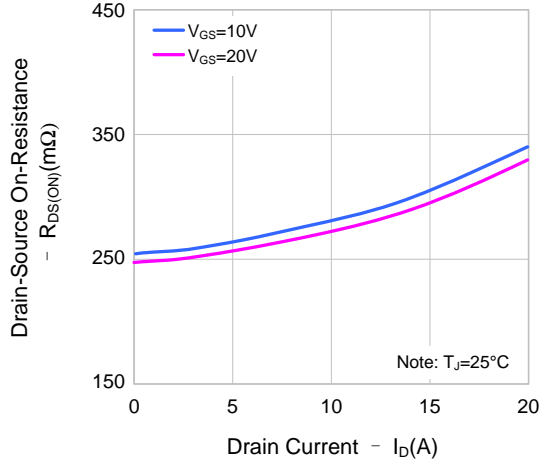


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

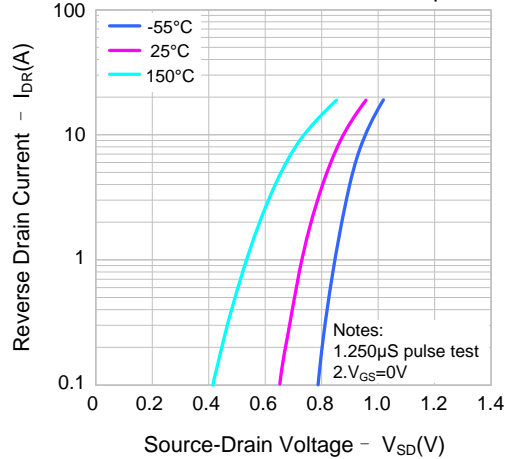


Figure 5. Capacitance Characteristics

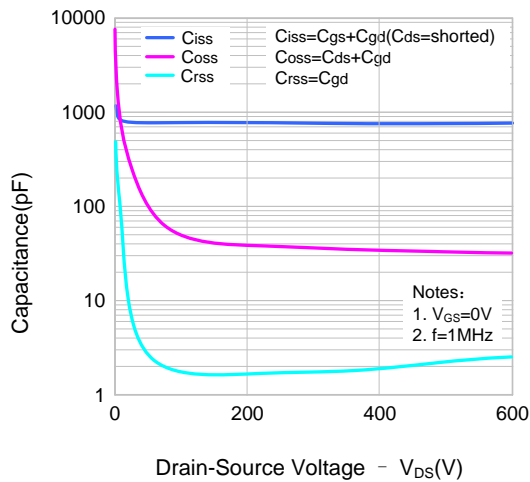
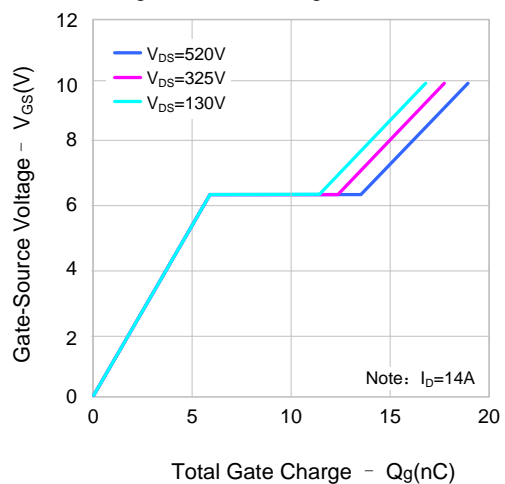


Figure 6. Gate Charge Characteristics



TYPICAL CHARACTERISTICS(continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

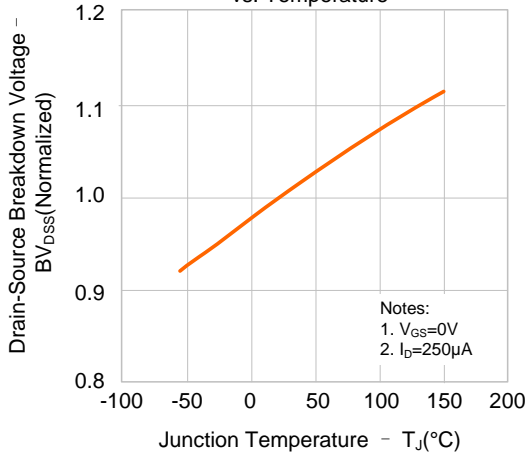


Figure 8. On-resistance Variation vs. Temperature

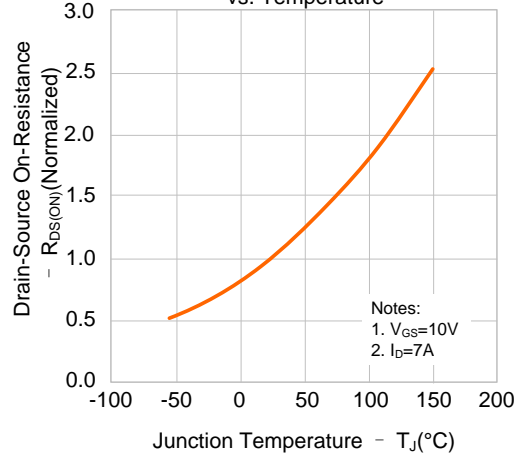
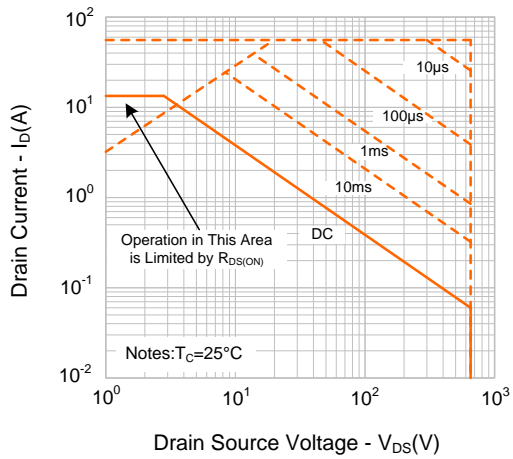
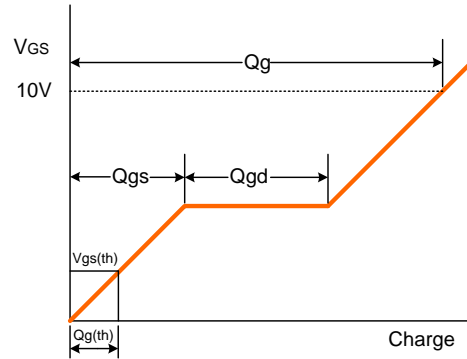
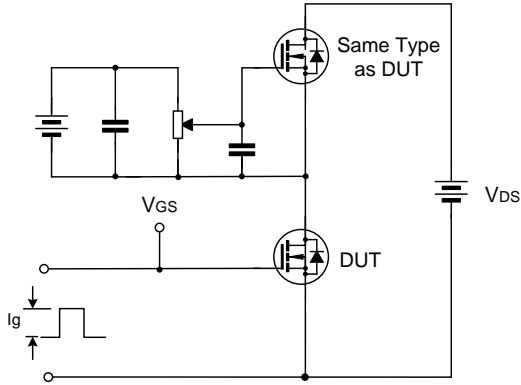


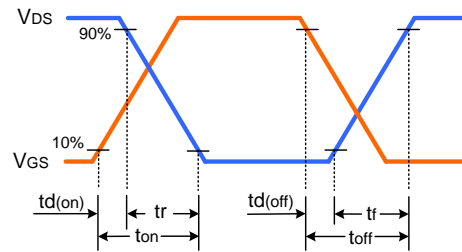
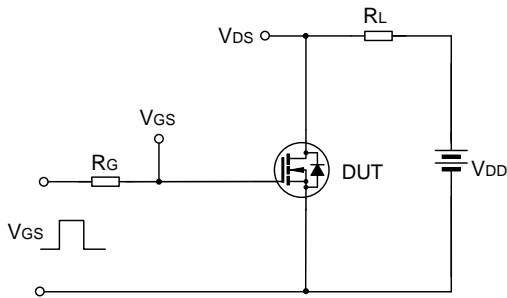
Figure 9. Max. Safe Operating Area



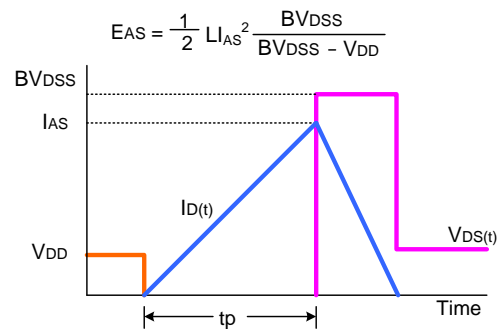
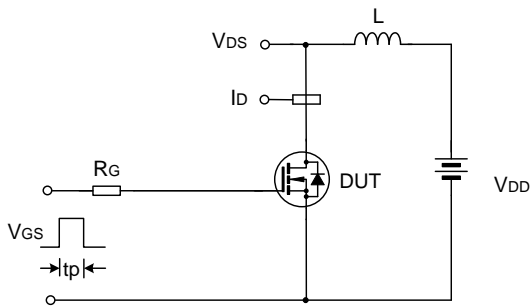
TYPICAL TEST CIRCUIT



Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

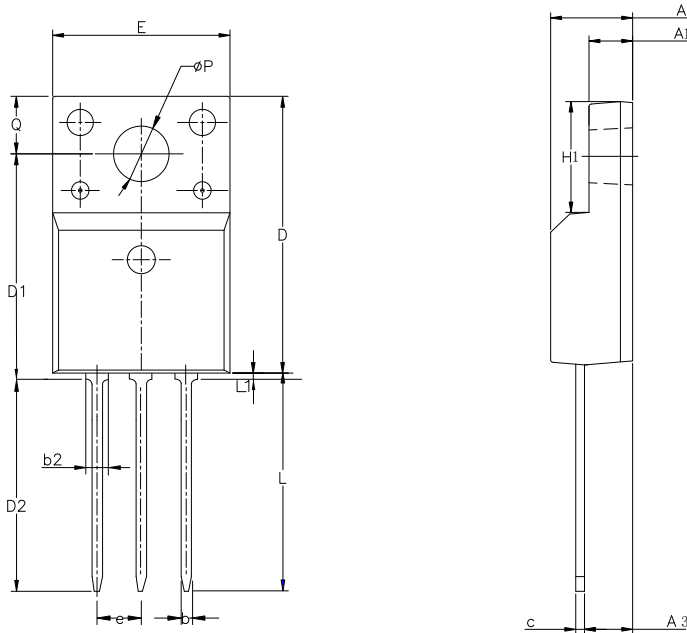


Unclamped Inductive Switching Test Circuit & Waveform

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.
- Our products are consumer electronic products, and / or civil electronic products.
- When using our products, please do not exceed the maximum rating of the products, otherwise the reliability of the whole machine will be affected. There is a certain possibility of failure or malfunction of any semiconductor product under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design, sample and whole machine manufacturing, so as to avoid potential failure risk that may cause personal injury or property loss.
- It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
- When exporting, using and reselling our products, buyer must comply with the international export control laws and regulations of China, the United States, the United Kingdom, the European Union and other countries & regions.
- Product promotion is endless, our company will wholeheartedly provide customers with better products!
- Website: <http://www.silan.com.cn>

Part No.: SVSP14N65FJHE2 Document Type: Datasheet
Copyright: HANGZHOU SILAN MICROELECTRONICS CO.,LTD Website: <http://www.silan.com.cn>

Rev.: 1.1

Revision History:

1. Update Electrical schematic and typical test circuit
-

Rev.: 1.0

Revision History:

1. First release
-