

100A, 150V N-CHANNEL MOSFET

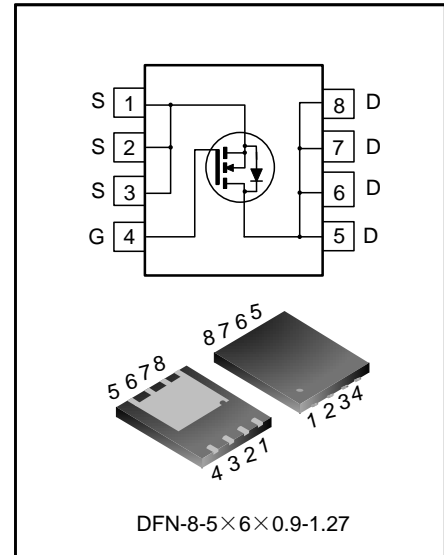
DESCRIPTION

SVGP15140NL5A 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 power management for UPS and Inverter Systems.

FEATURES

- ◆ 100A, 150V, $R_{DS(on)(typ.)}=12.5m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low Crss
- ◆ Fast switching
- ◆ Extreme dv/dt rated
- ◆ 100% avalanche tested
- ◆ Pb-free lead plating
- ◆ RoHS compliant



KEY PERFORMANCE PARAMETERS

Characteristics	Ratings	Unit
V_{DS}	150	V
$V_{GS(th)}$	2.0~4.0	V
$R_{DS(on),max.}$	14	$m\Omega$
I_D	100	A
$Q_{g,typ.}$	36	nC

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVGP15140NL5ATR	DFN-8-5X6X0.9-1.27	P15140N	Halogen free	Tape&reel

ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, T_J=25°C)

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-source Voltage	V _{DS}	--	150	--	--	V
Gate-source Voltage	V _{GS}	--	-20	--	20	V
Drain Current (Note 1)	I _D	T _C =25°C	--	--	100	A
		T _C =100°C	--	--	63	A
Drain Current Pulsed (Note 2)	I _{DM}	T _C =25°C	--	--	400	A
Power Dissipation (Note 3)	P _D	T _C =25°C	--	--	139	W
Single Pulsed Avalanche Energy	E _{AS}	L=0.1mH, V _{DD} =100V, R _G =25Ω, starting temperature T _J =25°C	--	--	162	mJ
Single Pulsed Avalanche Current	I _{AS}	--	--	--	57	A
Operation Junction Temperature Range	T _J	--	-55	--	150	°C
Storage Temperature Range	T _{stg}	--	-55	--	150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal Resistance, Junction-case, Bottom	R _{θJC}	--	--	--	0.9	°C/W
Thermal Resistance, Junction-ambient	R _{θJA}	--	--	--	50	°C/W
Soldering Temperature (SMD)	T _{sold}	Reflow soldering: 10±1 sec, 3times	--	--	260	°C

ELECTRICAL CHARACTERISTICS (UNLESS OTHERWISE NOTED, $T_J=25^{\circ}\text{C}$)

Static characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150	--	--	V
Drain-source Leakage Current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	--	--	1.0	μA
		$V_{DS}=150V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	--	5.0	--	
Gate-source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 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	$R_{DS(on)}$	$V_{GS}=10V, I_D=50A$	--	12.5	14	$m\Omega$
Gate Resistance	R_G	$f=1\text{MHz}$	--	1.6	--	Ω

Dynamic characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	$f=1\text{MHz}, V_{GS}=0V, V_{DS}=75V$	--	2614	--	pF
Output Capacitance	C_{oss}		--	328	--	
Reverse Transfer Capacitance	C_{rss}		--	15	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=75V, V_{GS}=10V, R_G=1.6\Omega, I_D=50A$ (Notes 4,5)	--	22	--	ns
Turn-on Rise Time	t_r		--	25	--	
Turn-off Delay Time	$t_{d(off)}$		--	25	--	
Turn-off Fall Time	t_f		--	11	--	
Total Gate Charge	Q_g	$V_{DD}=75V, V_{GS}=10V, I_D=50A$ (Notes 4,5)	--	36	--	nC
Gate-source Charge	Q_{gs}		--	24	--	
Gate-drain Charge	Q_{gd}		--	4.8	--	
Gate-plateau Voltage	$V_{plateau}$		--	8.0	--	

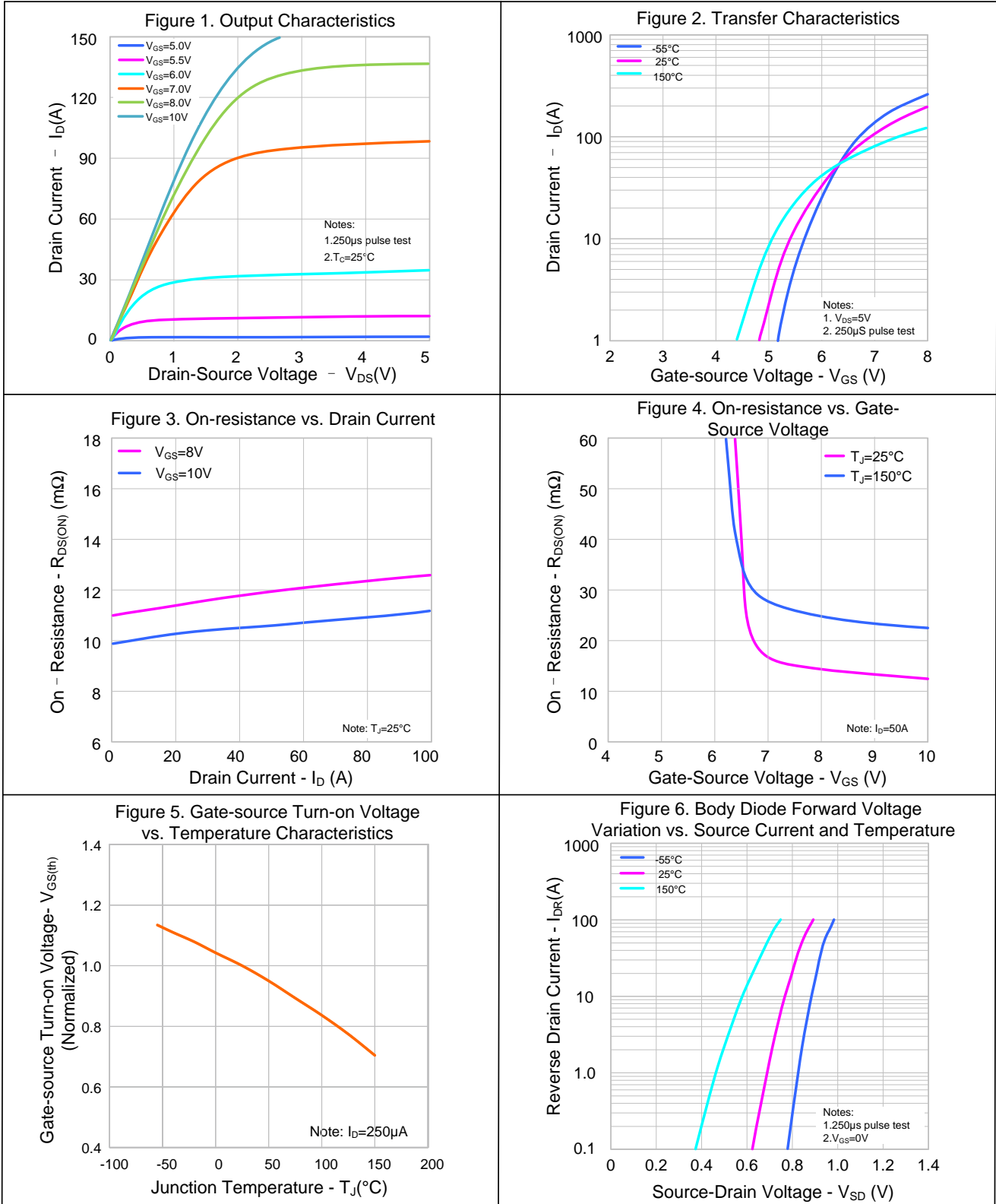
Reverse diode characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Continuous Source Current	I_S	$T_C=25^{\circ}\text{C}$, Integral Reverse P-N Junction Diode in the MOSFET	--	--	100	A
Diode pulse current	$I_{S,pulse}$		--	--	400	
Diode Forward Voltage	V_{SD}	$I_S=50A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=50A, V_{GS}=0V,$	--	96	--	ns
Reverse Recovery Charge	Q_{rr}	$di_f/dt=100A/\mu s$ (Note 4)	--	0.35	--	μC

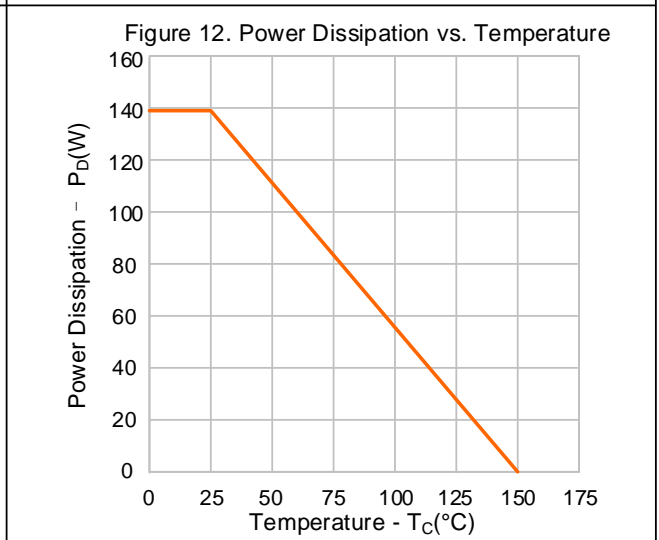
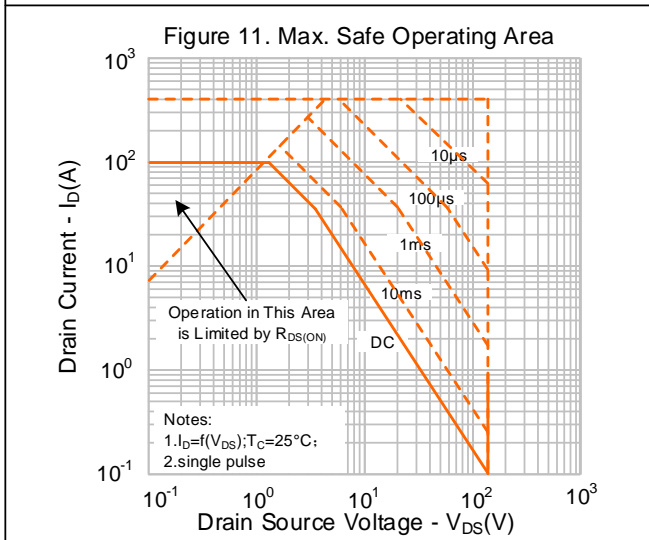
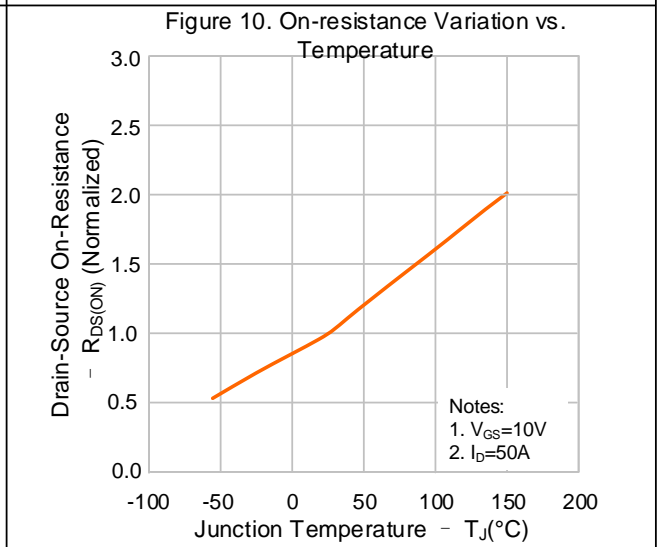
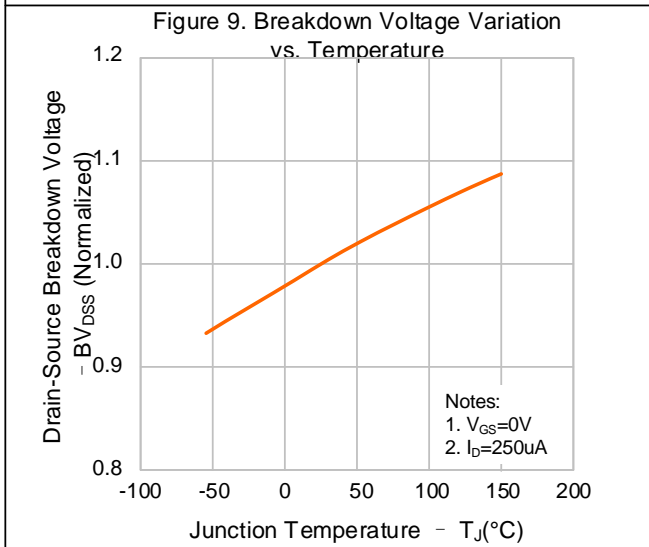
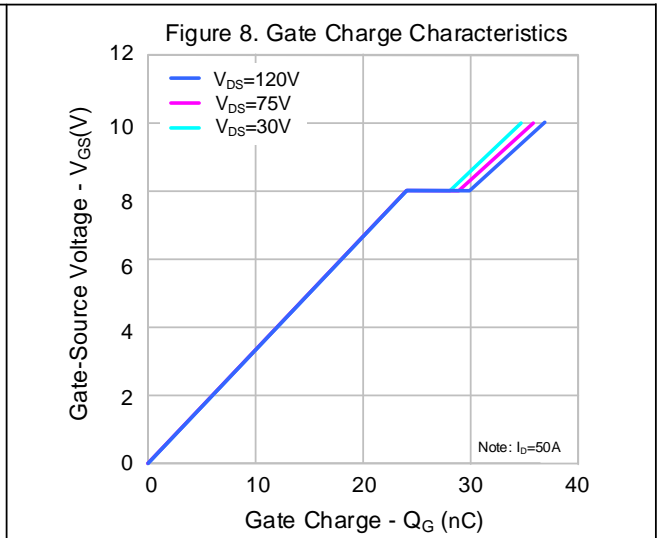
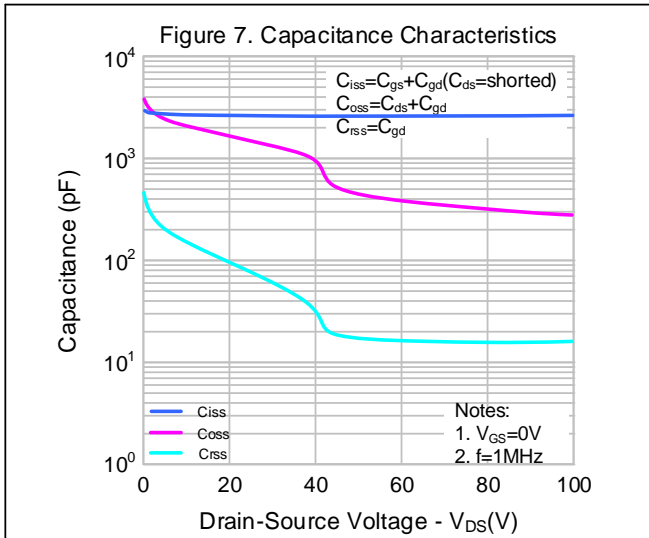
Notes:

- The rated value only refers to the maximum absolute value at the case temperature of 25°C in the specification. If the case temperature is higher than 25°C , it should be derated according to the actual environmental conditions;
- Pulse time $5\mu s$, pulse width is limited by the maximum junction temperature;
- The dissipation power will change with temperature, derating above 25°C : $1.11W/^{\circ}\text{C}$;
- Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;
- Essentially independent of operating temperature.

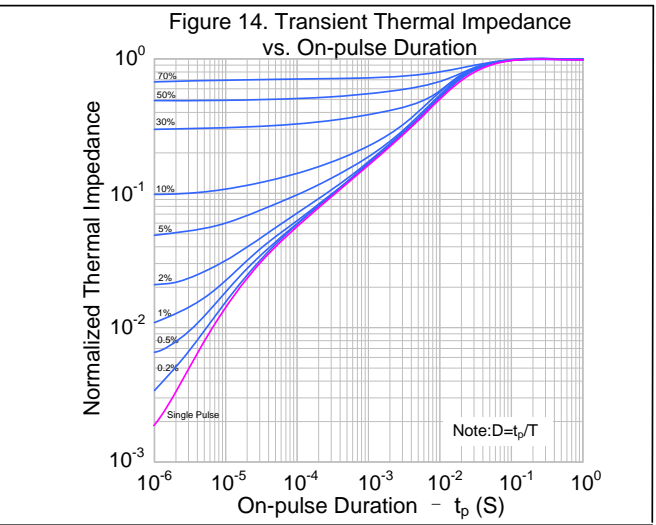
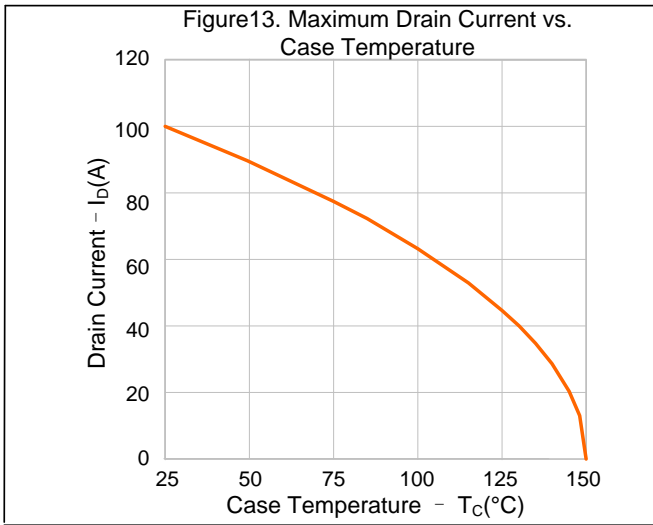
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (CONTINUED)

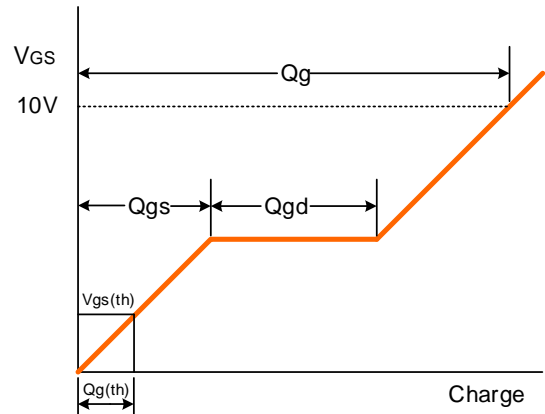
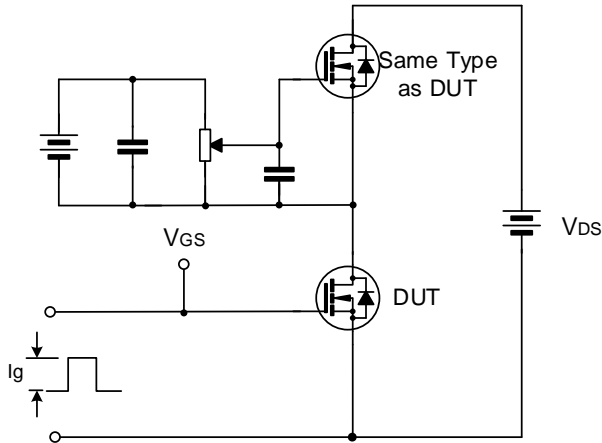


TYPICAL CHARACTERISTICS (CONTINUED)

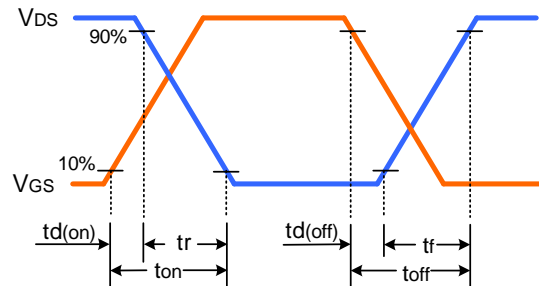
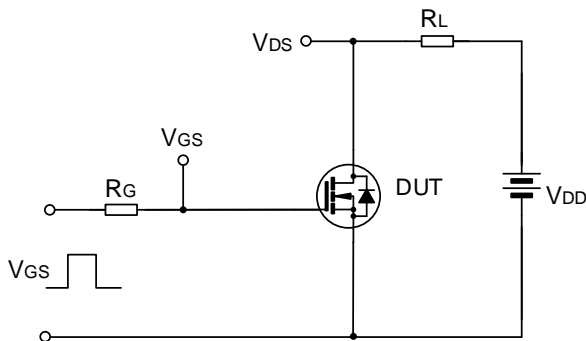


TYPICAL TEST CIRCUIT

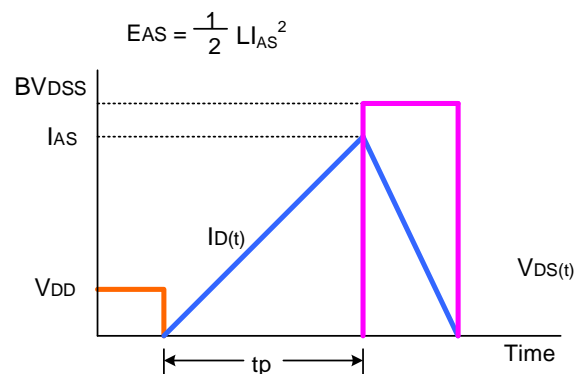
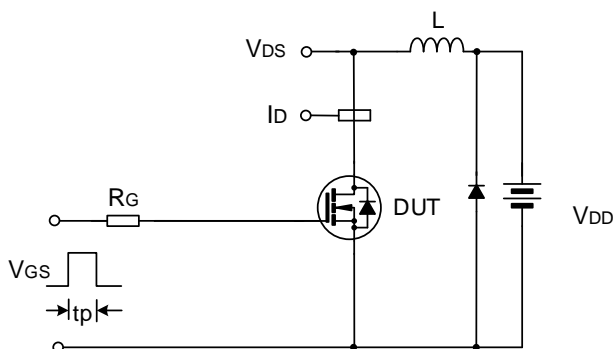
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



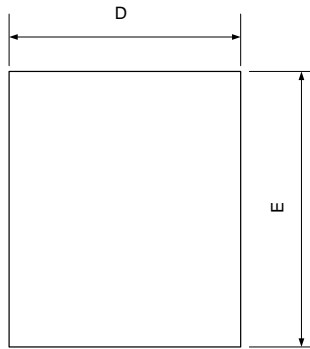
Unclamped Inductive Switching Test Circuit & Waveform



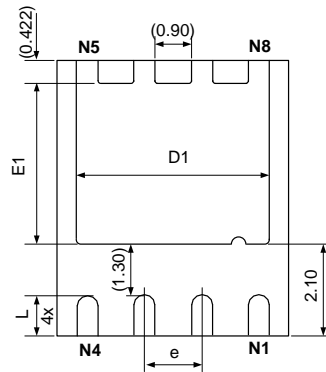
PACKAGE OUTLINE

DFN-8-5X6X0.9-1.27

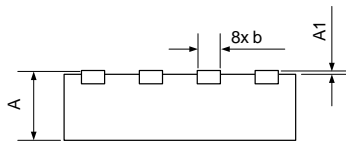
UNIT: mm



Top View



Bottom View



Side View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.800	0.900	1.000
A1	0.000	0.020	0.050
b	0.350	0.400	0.450
D	5.00 BSC		
D1	4.030	4.180	4.280
E	6.00 BSC		
E1	3.328	3.478	3.578
e	1.27 BSC		
L	0.700	0.800	0.900



MOS DEVICES OPERATE NOTES:

Electrostatic charges may exist in many things. Please take following preventive measures to prevent effectively the MOS electric circuit as a result of the damage which is caused by discharge:

- The operator must put on wrist strap which should be earthed to against electrostatic.
- Equipment cases should be earthed.
- All tools used during assembly, including soldering tools and solder baths, must be earthed.
- MOS devices should be packed in antistatic/conductive containers for transportation.

Important notice :

1. Silan reserves the right to make changes of this instruction without notice.
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Rev.: **1.2**

Revision History:

1. Delete the wave soldering condition
 2. Update the typical test circuit
 3. Update the important notice
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Rev.: **1.1**

Revision History:

1. Update SOA
 2. Update typical test circuit
 3. Update package outline
 4. Update important notice
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Rev.: **1.0**

Revision History:

1. First release
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