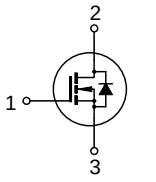
100A, 150V N-CHANNEL MOSFET

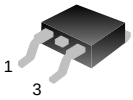
DESCRIPTION

SVGP157R2NS 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 and Power Management for Inverter Systems.



1.Gate 2.Drain 3.Source



TO-263-2L

FEATURES

- 100A, 150V, $R_{DS(on)(typ.)}$=6.2mΩ@V_{GS}=10V
- Low gate charge
- Low Crss
- Fast switching
- Improved dv/dt capability

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVGP157R2NSTR	TO-263-2L	P157R2NS	Halogen free	Tape&Reel

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_C=25°C	I_D	100	A
	T_C=100°C		93	
Drain Current Pulsed (Note 1)		I_{DM}	400	A
Power Dissipation (T_C=25°C)		P_D	313	W
-Derate above 25°C			2.1	W/°C
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	825	mJ
Operation Junction Temperature Range		T_J	-55～+175	°C
Storage Temperature Range		T_{stg}	-55～+175	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-case, Bottom	$R_{\theta JC}$	--	0.35	0.48	°C/W
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	--	--	62.5	°C/W

ELECTRICAL CHARACTERISTICS (UNLESS OTHERWISE NOTED, T_J=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	150	165	--	V
Drain-source Leakage Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V, T_j=25°C	--	--	1.0	μA
		V_{DS}=150V, V_{GS}=0V, T_j=125°C	--	10	--	μA
Gate-source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=250μA	2.0	3.0	4.0	V
Static Drain-source On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=100A	--	6.2	7.2	mΩ
		V_{GS}=8V, I_D=50A	--	6.4	7.7	mΩ
Transconductance	g_{fs}	V_{DS}=2V, I_D=20A	31	61	--	S
Gate Resistance	R_G	f=1MHz	--	4.6	--	Ω
Input Capacitance	C_{iss}	f=1MHz, V_{GS}=0V, V_{DS}=75V	4018	5223	6790	pF
Output Capacitance	C_{oss}		530	689	896	
Reverse Transfer Capacitance	C_{rss}		9.3	14	21	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=75V, V_{GS}=10V, R_G=1.6Ω, I_D=50A (Notes 3,4)	18	23	30	ns
Turn-on Rise Time	t_r		37	48	62	
Turn-off Delay Time	$t_{d(off)}$		47	61	79	
Turn-off Fall Time	t_f		17	22	29	
Total Gate Charge	Q_g	V_{DD}=75V, V_{GS}=10V, I_D=100A (Notes 3,4)	57	74	96	nC
Gate-source Charge	Q_{gs}		26	34	44	
Gate-drain Charge	Q_{gd}		10	13	17	
Gate-plateau Voltage	Vplateau		--	6.5	--	V

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	--	--	100	A
Pulsed Source Current	I_{SM}		--	--	400	
Diode Forward Voltage	V_{SD}	I_S=100A,V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_S=100A,V_{GS}=0V, dIF/dt=100A/μs (Note 3)	92	119	155	ns
Reverse Recovery Charge	Q_{rr}		324	421	547	nC

Notes:

1. Pulse width=5μs;
2. L=0.5mH, V_{DD}=100V, R_G=25Ω,starting T_J=25°C;
3. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
4. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

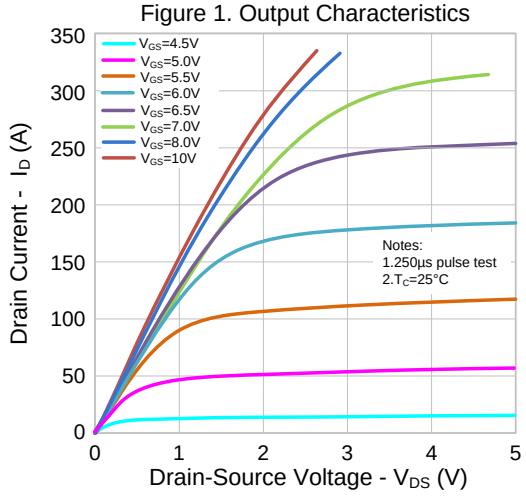


Figure 2. Transfer Characteristics

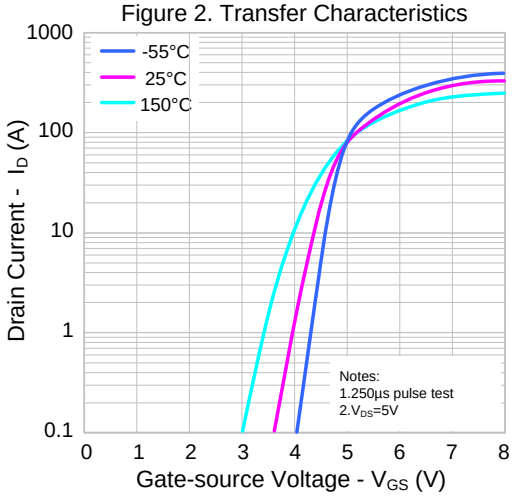


Figure 3. On-resistance vs. Drain Current

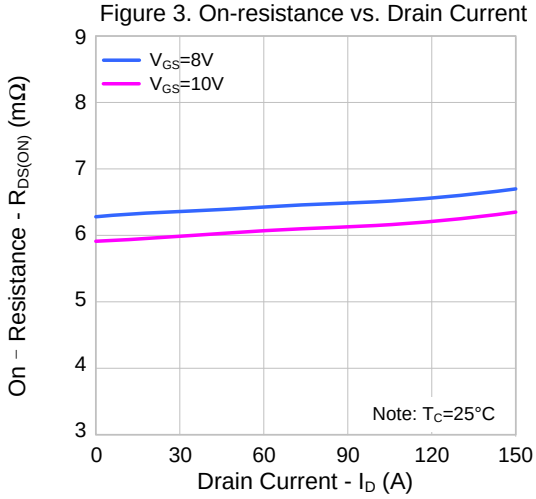


Figure 4. On-resistance vs. Gate-source Voltage

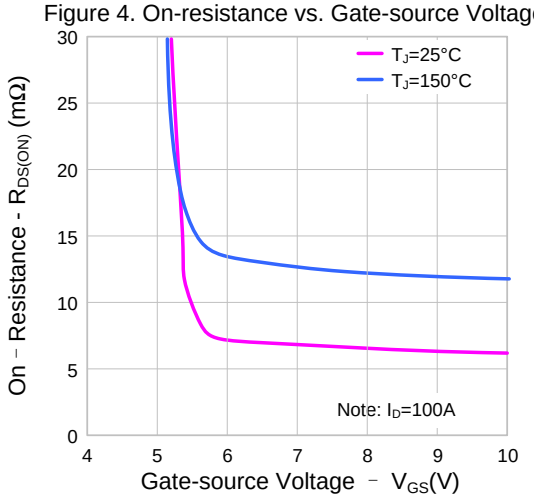


Figure 5. Gate-source Turn-on Voltage vs. Temperature Characteristics

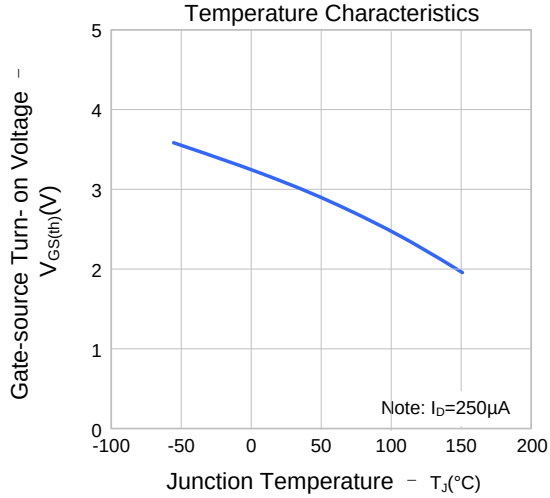
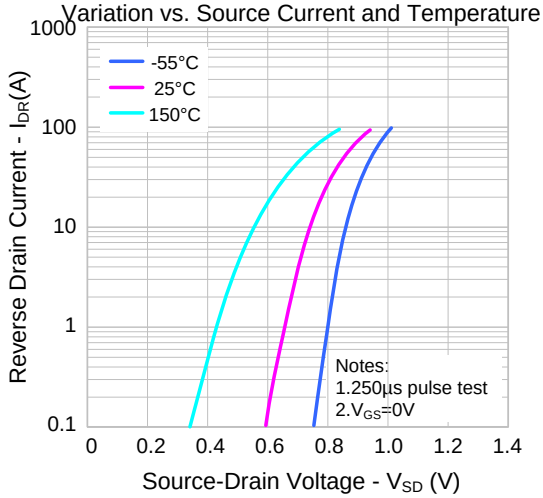


Figure 6. Body Diode Forward Voltage Variation vs. Source Current and Temperature



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 7. Capacitance Characteristics

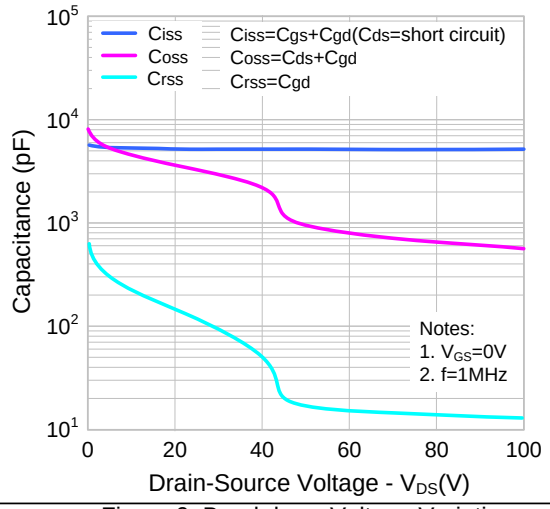


Figure 8. Gate Charge Characteristics

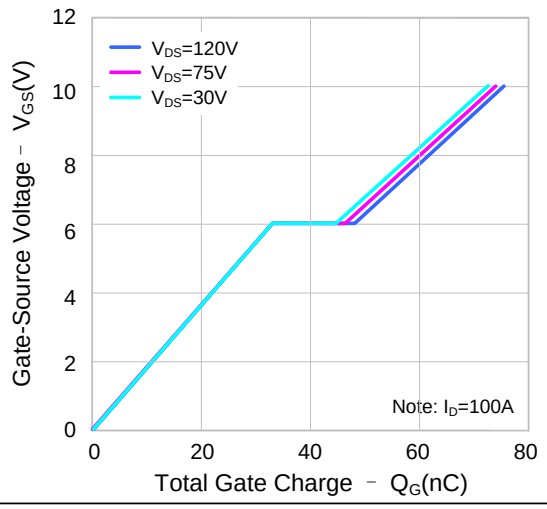


Figure 9. Breakdown Voltage Variation vs. Temperature

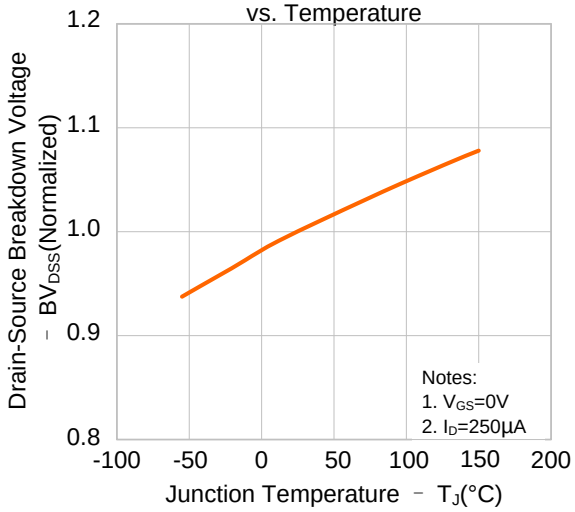


Figure 10. On-resistance Variation vs. Temperature

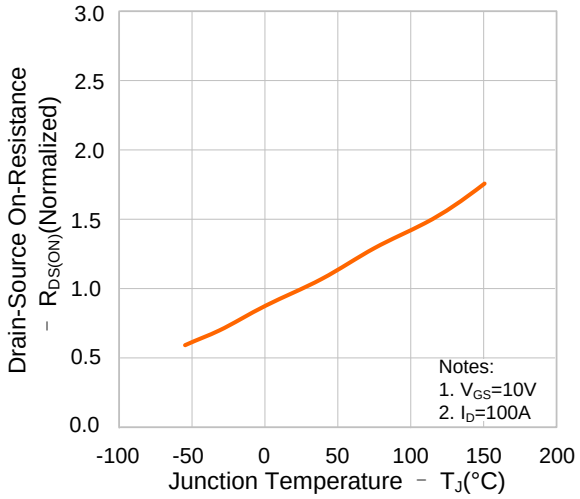


Figure 11. Max. Safe Operating Area

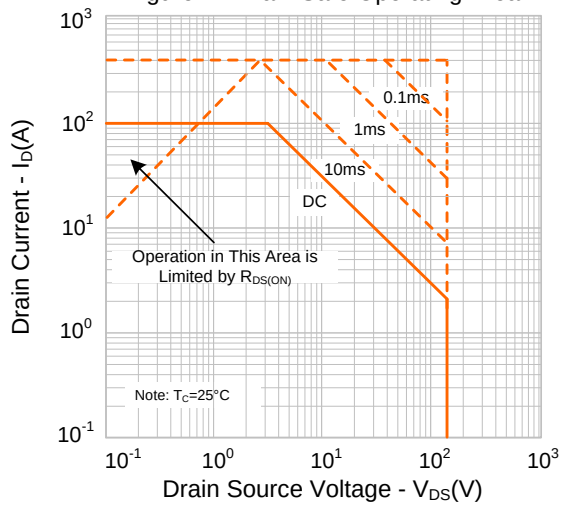
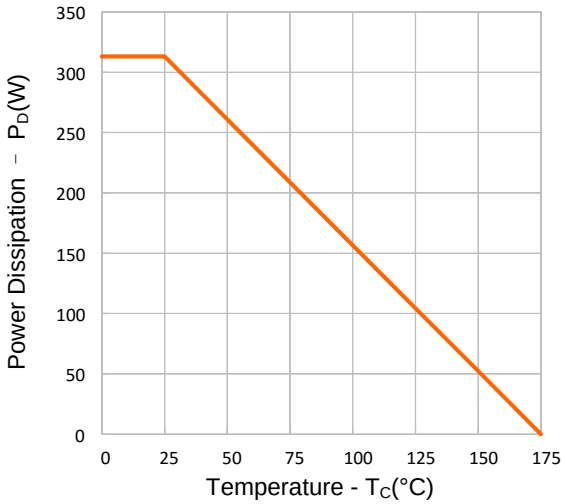


Figure 12. Power Dissipation vs. Temperature



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 13. Max. Drain Current vs. Case Temperature

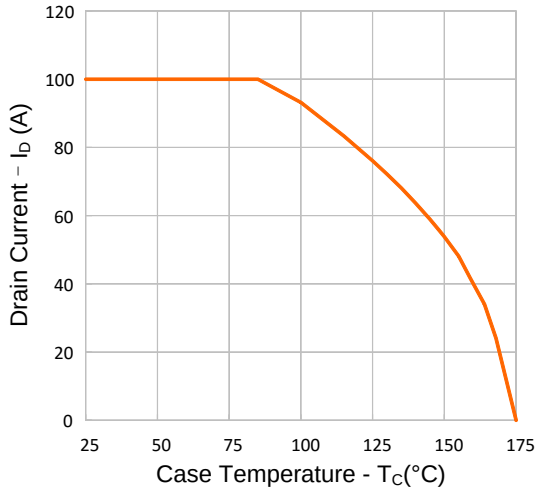


Figure 14. Transient Thermal Impedance vs. On-pulse Duration

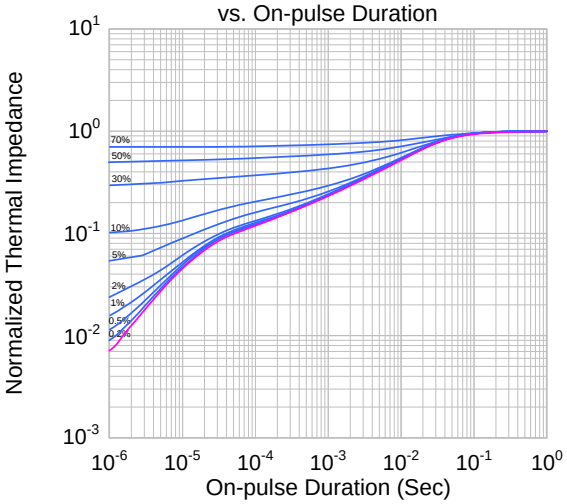


Figure 15. Transconductance vs. Drain Current

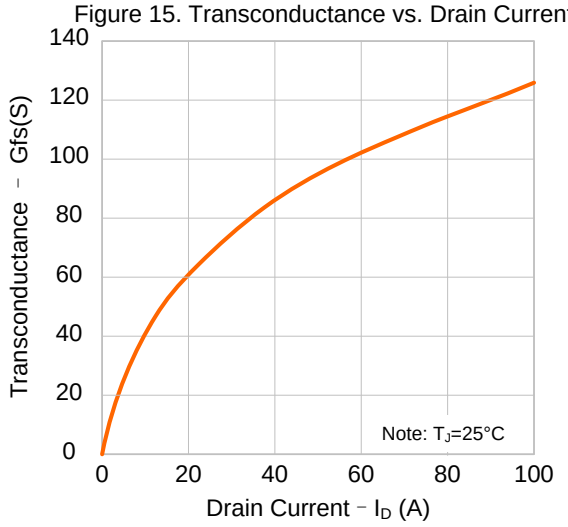
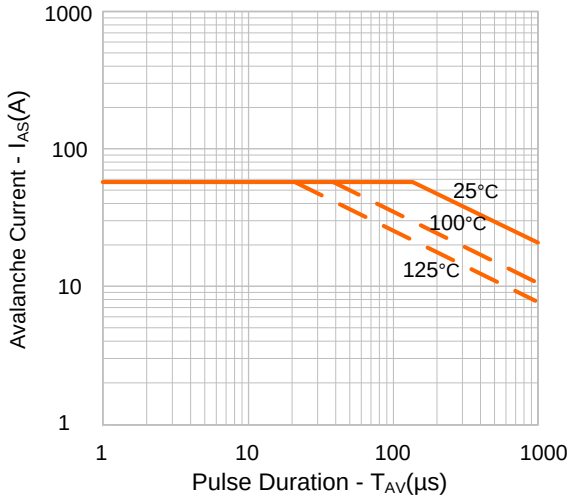
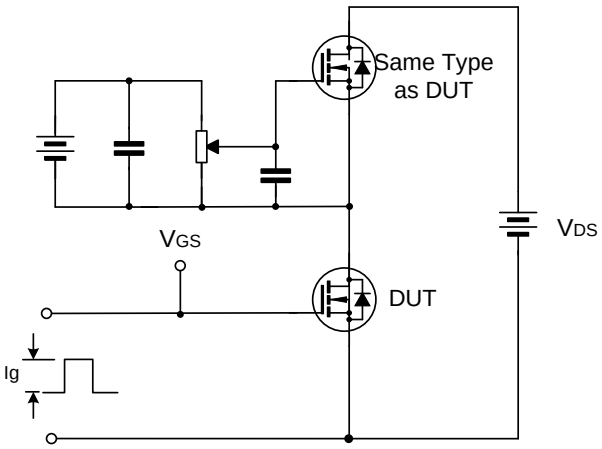


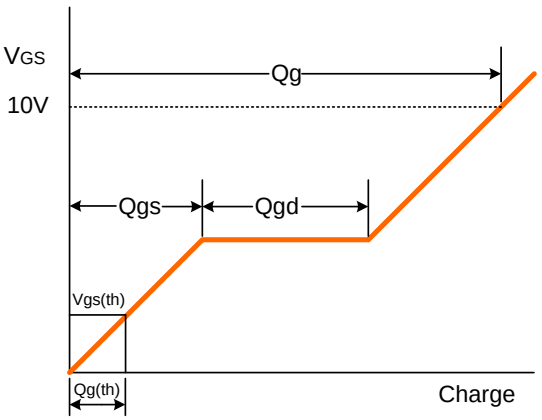
Figure 16. Avalanche Characteristics



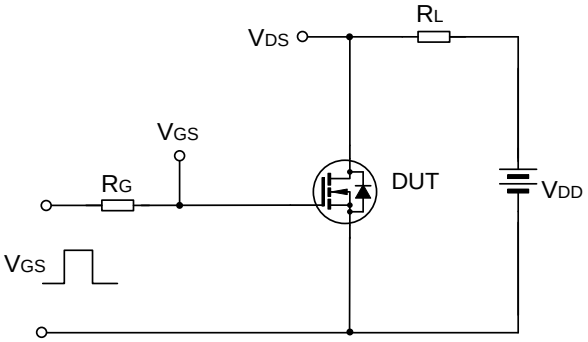
TYPICAL TEST CIRCUIT

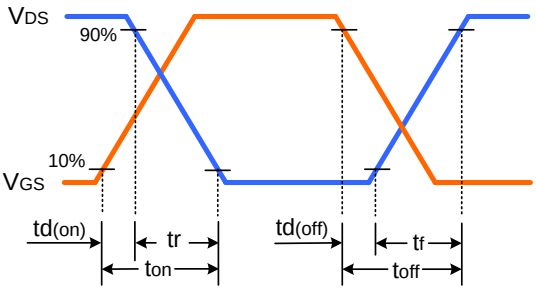
Gate Charge Test Circuit & Waveform



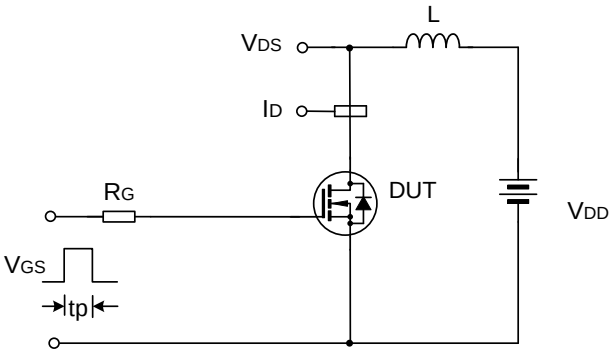


Resistive Switching Test Circuit & Waveform

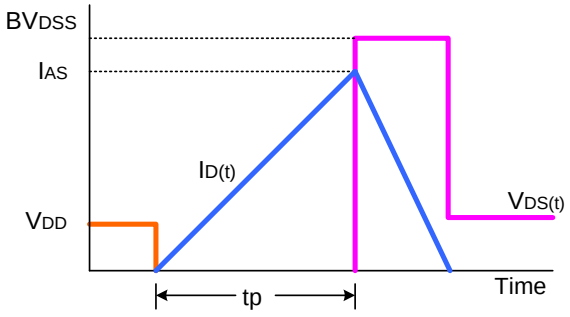




Unclamped Inductive Switching Test Circuit & Waveform

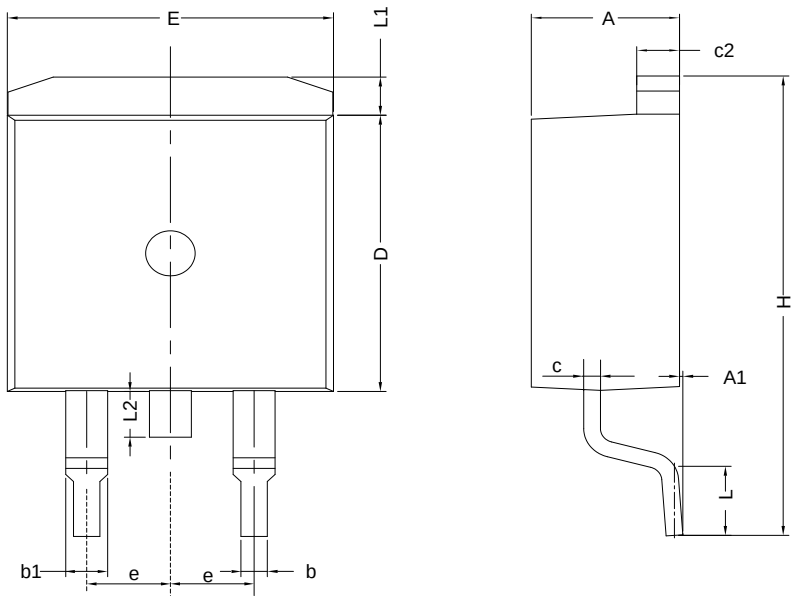


$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



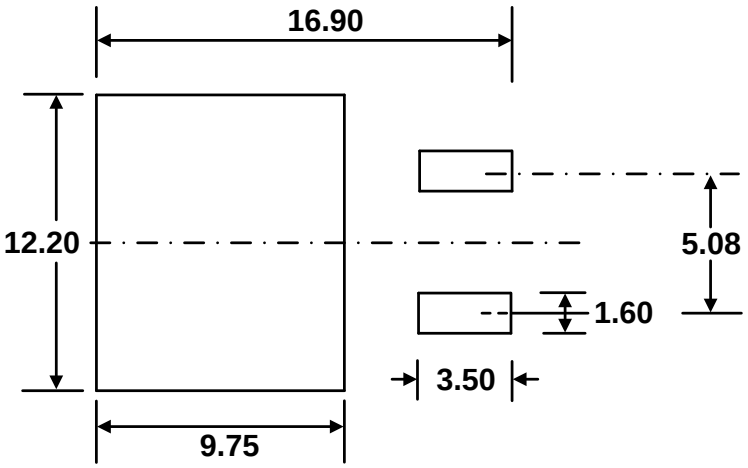
PACKAGE OUTLINE

TO-263-2L **UNIT: mm**



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
b1	1.17	—	1.50
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

FOOT PRINT



Important notice:

1. **The instructions are subject to change without notice!**
2. **Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current. Please read the instructions carefully before using our products, including the circuit operation precautions.**
3. **Our products are consumer electronic products or the other civil electronic products.**
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Rev.: 1.1

Revision History:

1. Update package outline

Rev.: 1.0

Revision History:

1. First release