瑞森半导体
REASUNOS

RS6N90S

N Channel MOSFET

Pb Lead Free Package and Finish

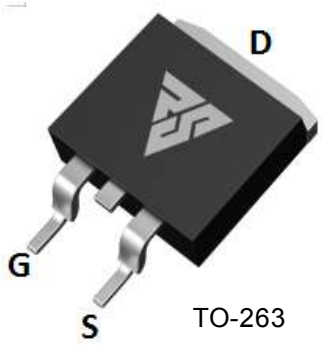
Applications:

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

I_D	$R_{DS(ON)}$(Typ)	V_{DSS}
6A	1.7Ω	900V

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability



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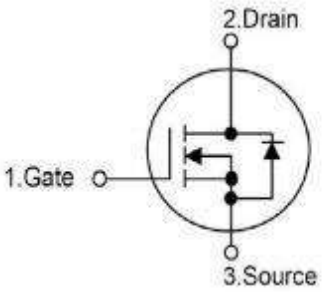


Not to Scale

Ordering Information

Part Number	Package	Marking
RS6N90S	TO-263	RS6N90S

Absolute Maximun Ratings Tc=25℃unless otherwise specified

Symbol	Parameter	RS6N90S	Units
VDSS	Drain-to-Source Voltage	900	V
ID	Continuous Drain Current	6	A
IDM	Pulsed Drain Current (Note*1)	24	
PD	Power Dissipation	160	W
VGS	Gate-to-Source Voltage	±30	V
EAS	Single Pulse Avalanche Engergy L=10mH VDD=50V RG=25Ω TJ=25°C	180	mJ
IAS	Avalanche Current (Note*1)	6	A
E_{AR}	Repetitive Avalanche Energy (Note*1)	0.72	mJ
TL	Maximum Temperature for Soldering	300	°C
TPKG	Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	260	
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	

* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RS6N90S	Units	Test Conditions
RθJC	Junction-to-Case	0.78	°C/ W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of +150°C
RθJA	Junction-to-Ambient	62.5		1 cubic foot chamber, free air.

OFF Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-source Breakdown Voltage	900	--	--	V	VGS=0V,ID=250μA
IDSS	Drain-to-Source Leakage Current	--	--	1.0	μA	VDS=900V,VGS=0V
IGSS	Gate-to-Source Forward Leakage	--	--	100	nA	VGS=+30V, VDS=0V
	Gate-to-Source Reverse Leakage	--	--	-100		VGS=-30V ,VDS=0V

ON Characteristics **TJ=25℃ unless otherwise specified**

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain-to-Source On-Resistance (Note*2)	--	1.7	2.05	Ω	VGS=10V,ID=3A
VGS(TH)	Gate Threshold Voltage	3.0	--	4.0	V	VGS=VDS,ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	43	--	nS	VDS=450V ID=6A RG=25Q
trise	Rise Time	--	26	--		
td(OFF)	Turn-OFF Delay Time	--	208	--		
tfall	Fall Time	--	47	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1215	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	115	--		
Crss	Reverse Transfer Capacitance	--	21	--		
Qg	Total Gate Charge	--	48	--	nC	VDS=720V ID=6A VGS=15V
Qgs	Gate-to-Source Charge	--	4.8	--		
Qgd	Gate-to-Drain("Miller") Charge	--	27	--		

Source-Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current	--	--	6	A	Integral pn-diode in MOSFET
I_{SM}	Maximum Pulsed Current	--	--	24	A	
V_{SD}	Diode Forward Voltage	--	--	1.4	V	I_S=3A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	567	--	nS	V_{GS}=0V I_S=6A,di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	--	1.6	--	μC	

Notes:

*1. Repetitive rating; pulse width limited by maximum junction temperature.

*2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Feature curve

Figure 1. Output Characteristics (T_J = 25°C)

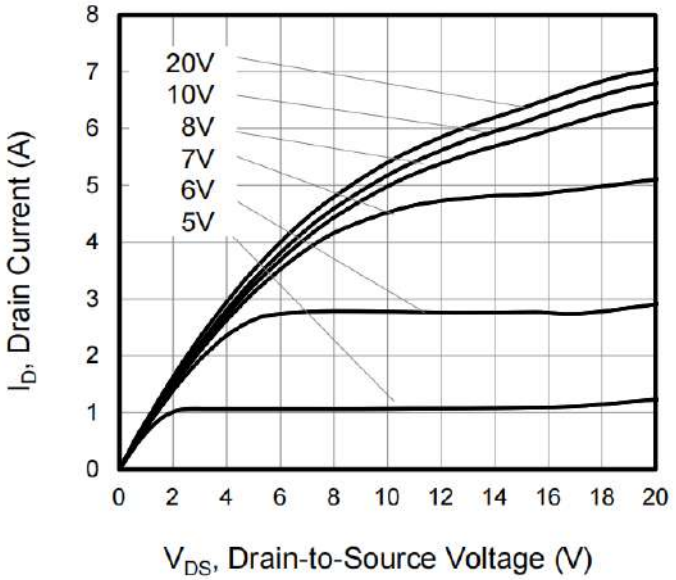


Figure 2. Body Diode Forward Voltage

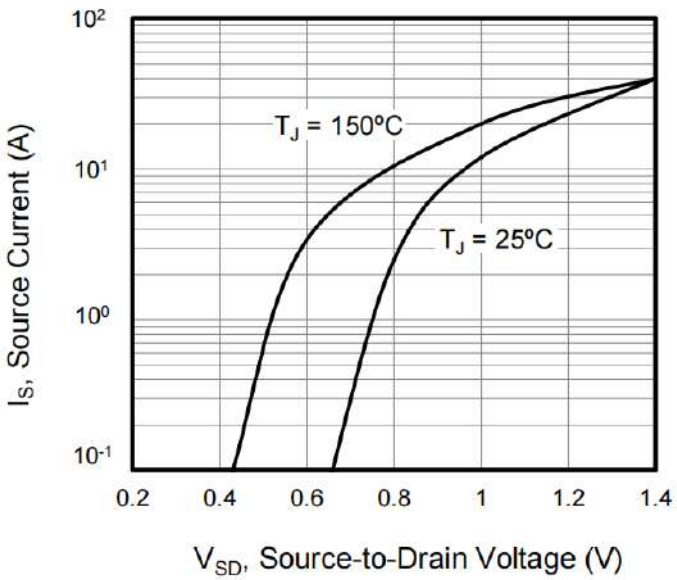


Figure 3. Drain Current vs. Temperature

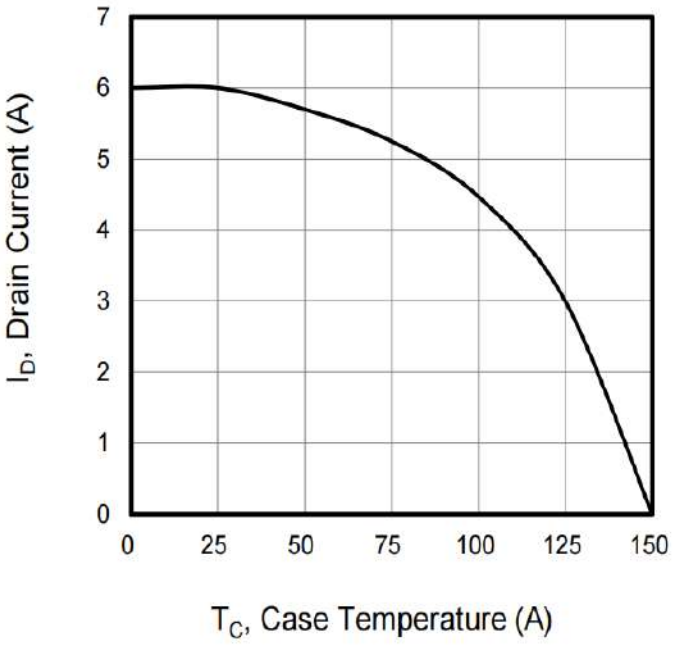


Figure 4. BV_{DSS} Variation vs. Temperature

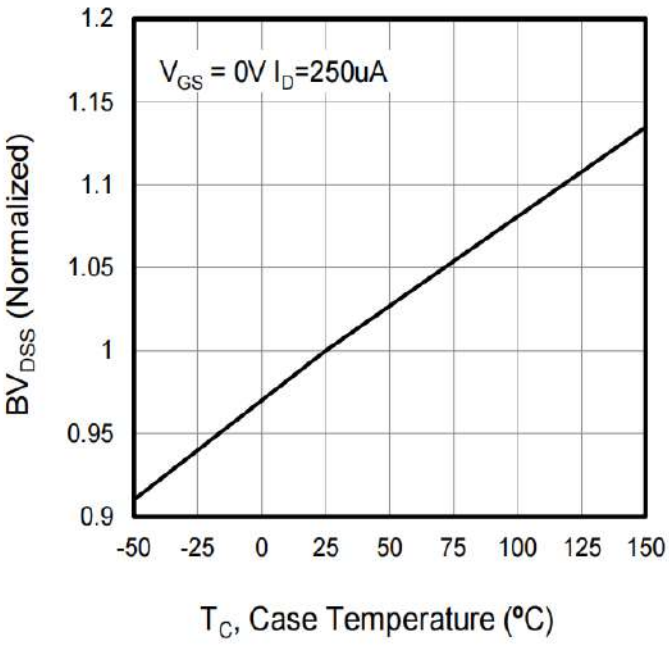


Figure 5. Transfer Characteristics

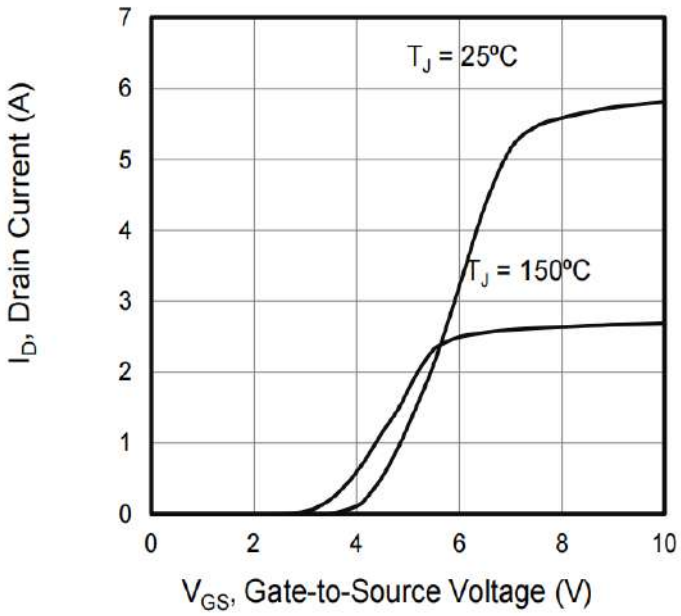


Figure 6. On-Resistance vs. Temperature

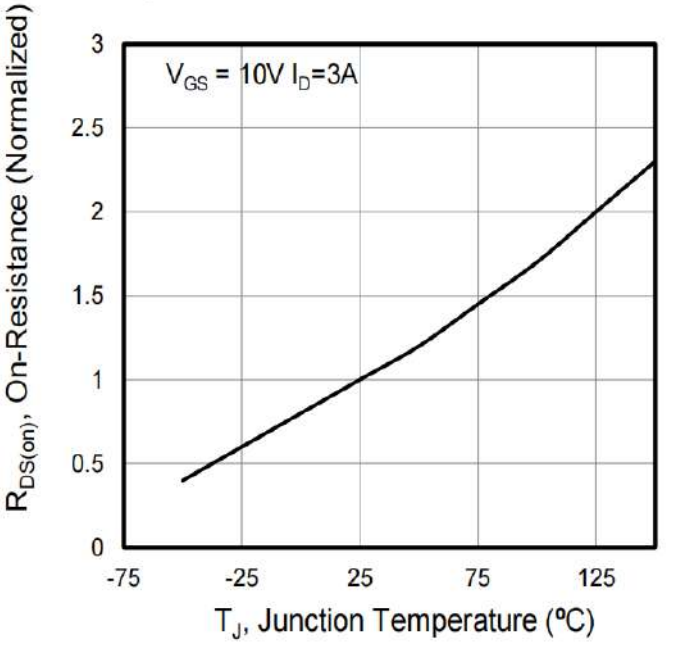


Figure 7. Capacitance

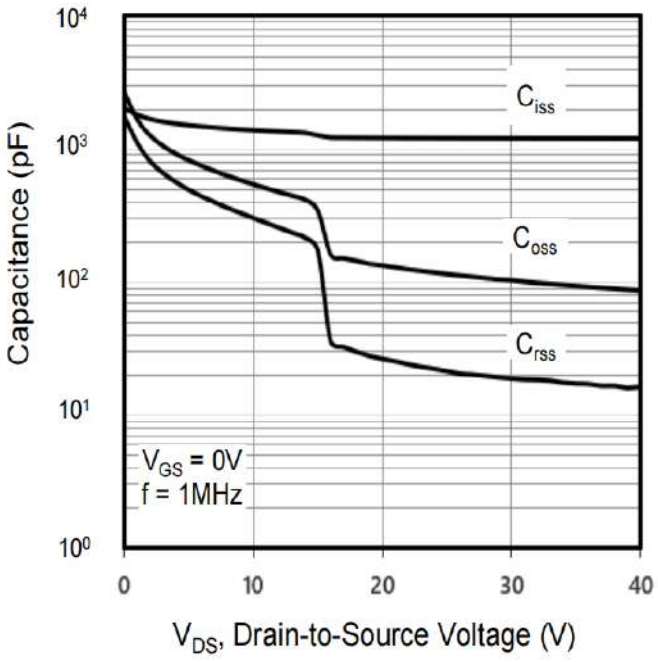


Figure 8. Gate Charge

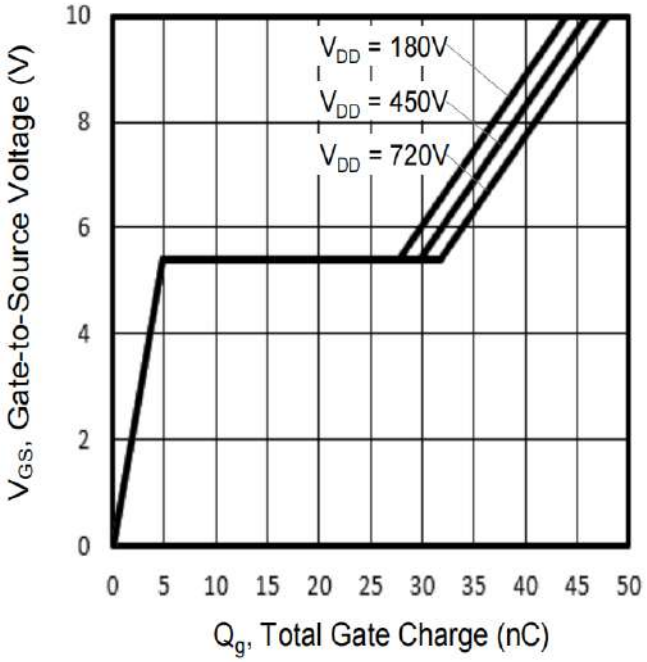
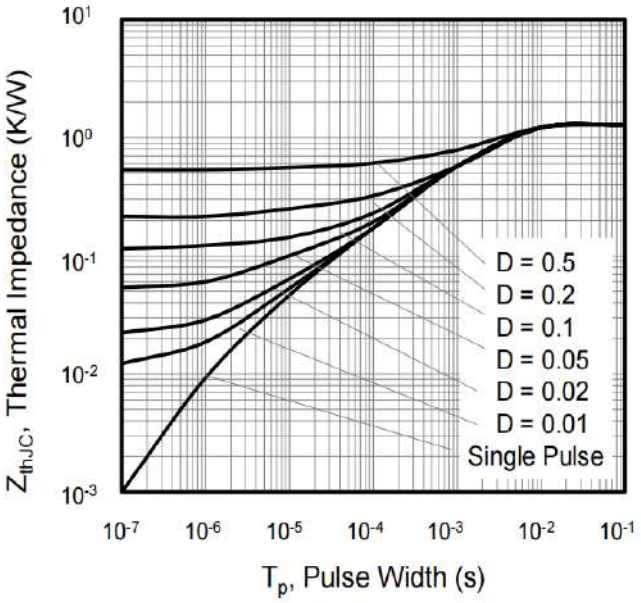


Figure 9. Transient Thermal Impedance



Test Circuits and Waveforms

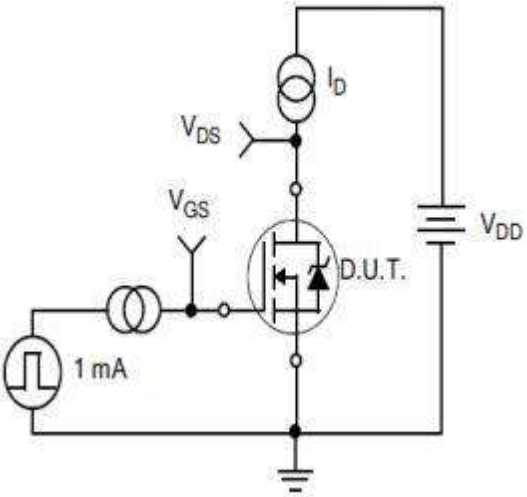


Figure A.
Gate Charge Test Circuit

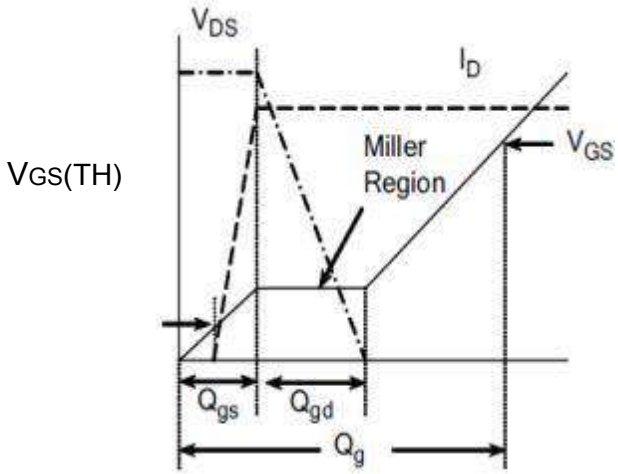


Figure B.
Gate Charge Waveform

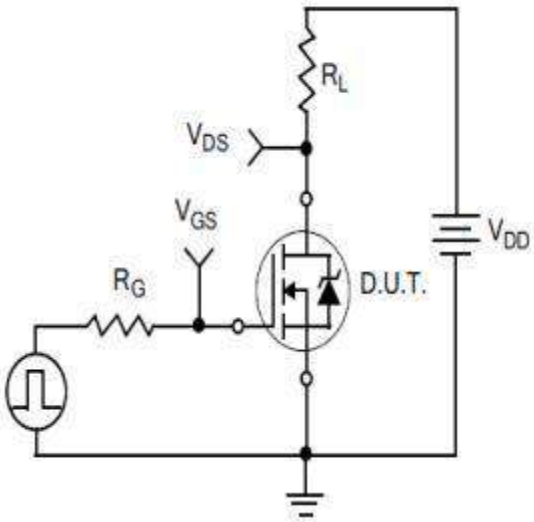


Figure C.
Resistive Switching Test Circuit

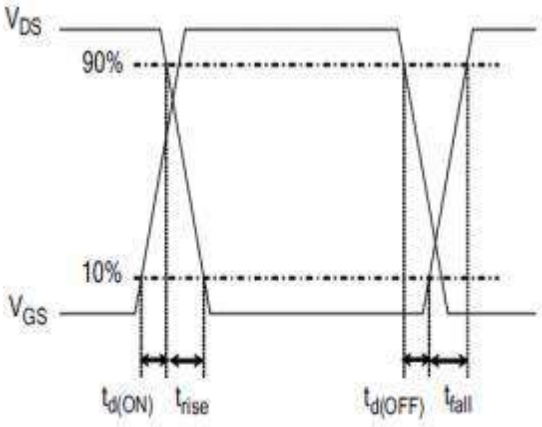


Figure D.
Resistive Switching Waveforms

Test Circuits and Waveforms

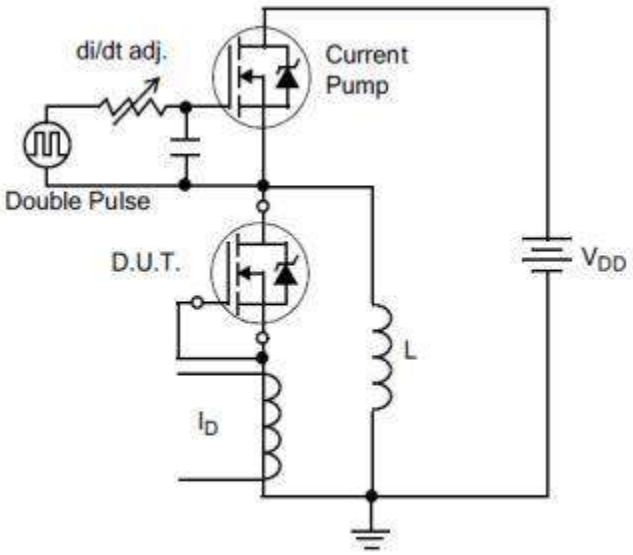


Figure E.Diode Reverse Recovery Test Circuit

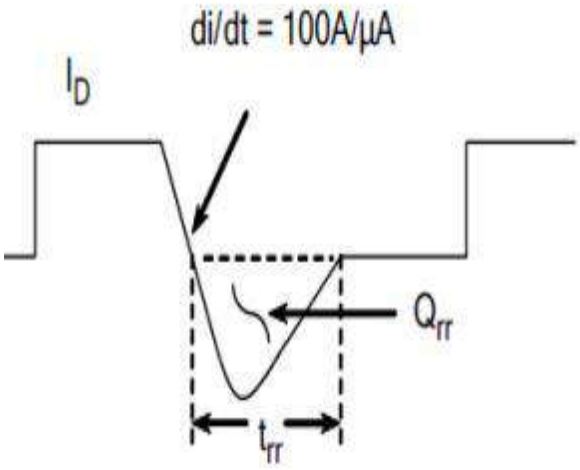


Figure F.Diode Reverse Recovery Waveform

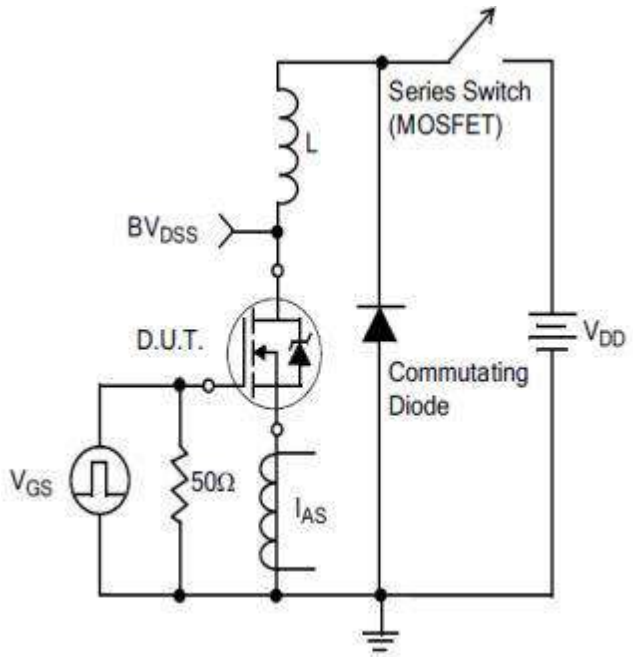
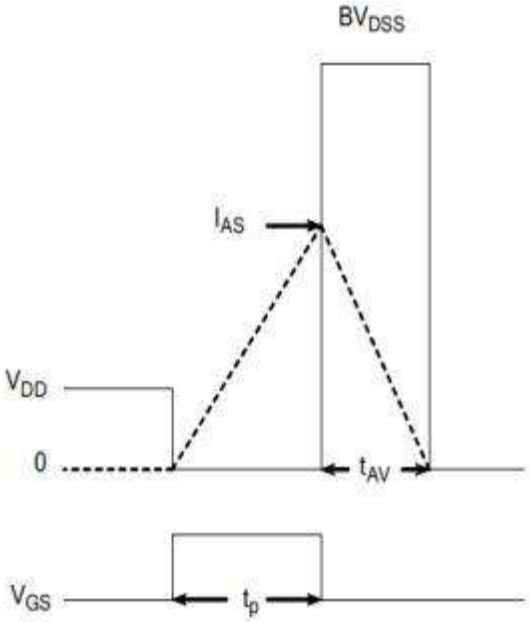


Figure G.Unclamped Inductive Switching Test Circuit



$$E_{AS}=\frac{I_{AS}^2 L}{2}$$

Figure H.Unclamped Inductive Switching Waveforms

Package outline drawing

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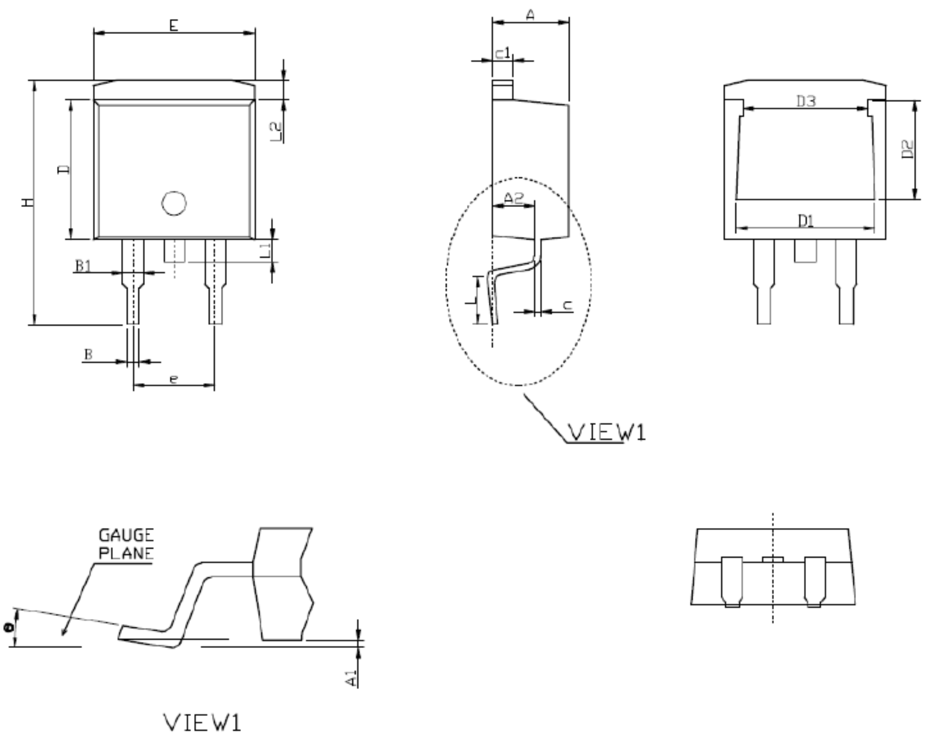
Unit:mm



SYMBOLS	MILLIMETERS	
	MIN	MAX
A	4.40	4.90
A1	0.05	0.30
A2	2.40	2.80
B	0.72	0.92
B1	1.12	1.45
c	0.28	0.48
c1	1.17	1.37
D	8.46	8.86
D1	7.90	8.40
D2	5.50	5.90
D3	7.10	7.50
E	9.85	10.45
e	5.08BCS	
H	14.75	15.55
L	2.30	2.80
L1	1.20	1.60
L2	1.01	1.50

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