

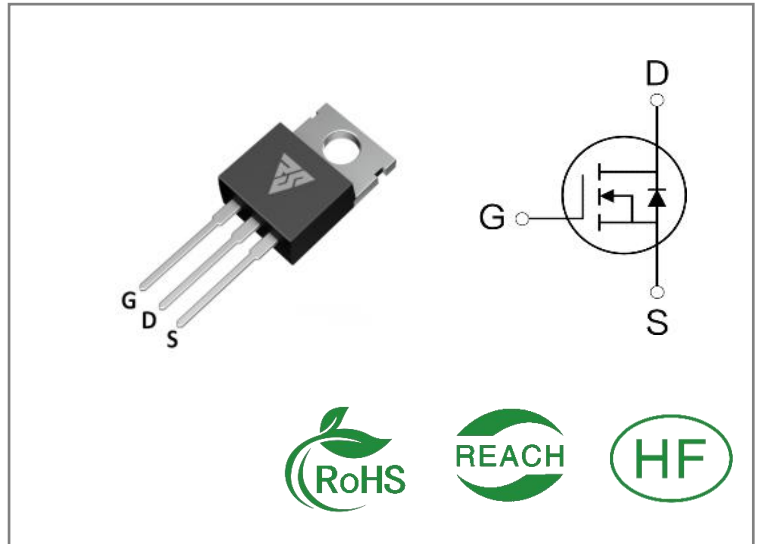
ID	$R_{DS(ON)}$ (Typ)	VDSS
100A	9mΩ	150V

Applications:

- Load Switch
- PWM Applications
- Power Managment

Features:

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


Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS150N100T	TO-220	RS150N100T	Tube	50 PCS

Absolute Maximun Ratings $T_c = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	RS150N100T	Units
VDSS	Drain-to-Source Voltage	150	V
ID	Continuous Drain Current $T_C=25^{\circ}\text{C}$	100	A
ID	Continuous Drain Current $T_C=100^{\circ}\text{C}$	61	
IDM	Pulsed Drain Current	320	
PD	Power Dissipation	188	W
VGS	Gate- to- Source Voltage	± 20	V
EAS	Single Pulse Avalanche Engergy $L = 0.5\text{mH}, V_{DS} = 50\text{V}, R_G = 25\Omega, T_j = 25^{\circ}\text{C}$	225	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	$^{\circ}\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds		
	Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 175	

* 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	RS150N100T	Units	Test Conditions
R θ JC	Junction-to-Case	0.8	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 150 °C
R θ JA	Junction-to-Ambient	60		1 cubic foot chamber, free air.

OFF Characteristics T_J= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	150	--	--	V	VGS=0V ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=120V VGS=0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	VGS=20V VDS=0V
	Gate- to- Source Reverse Leakage	--	--	-100		VGS=-20V VDS=0V

ON Characteristics T_J=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance	--	9	10	mΩ	VGS=10V ID=20A
VGS (TH)	Gate Threshold Voltage	2.5	3.2	4.5	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	--	12.8	--	nS	VDS=75V ID=20A VGS=10V
trise	Rise Time	--	24.5	--		
td(OFF)	Turn- OFF Delay Time	--	30.6	--		
tfall	Fall Time	--	26.5	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2195	--	pF	VGS= 0V VDS=75V f=1MHz
Coss	Output Capacitance	--	365	--		
Crss	Reverse Transfer Capacitance	--	8.3	--		
Qg	Total Gate Charge	--	85.2	--	nC	VDS= 75V ID=20A VGS=10V
Qgs	Gate- to- Source Charge	--	15.3	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	25.1	--		
Rg	Gate Resistance	--	4.0	--	Ω	VDS=VGS=0V f=1MHz

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	188	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	320	A	
VSD	Diode Forward Voltage	--	0.78	1	V	IS=1A VGS=0V
trr	Reverse Recovery Time	--	99	--	nS	VGS=0V IS=20A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	318	--	nC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1.5%

Typical Feature Curve

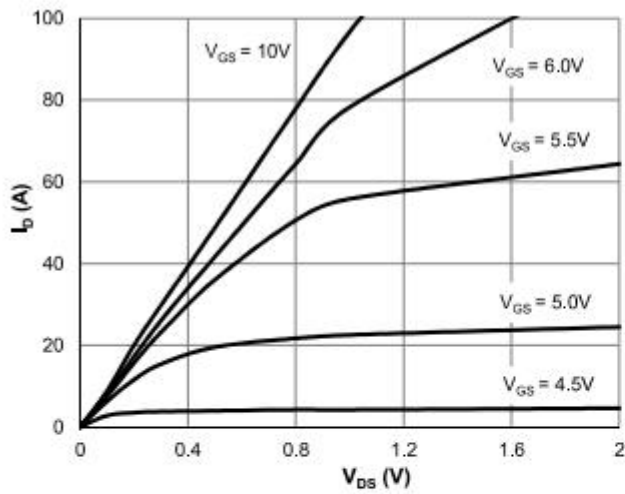


Figure 1: Saturation Characteristics

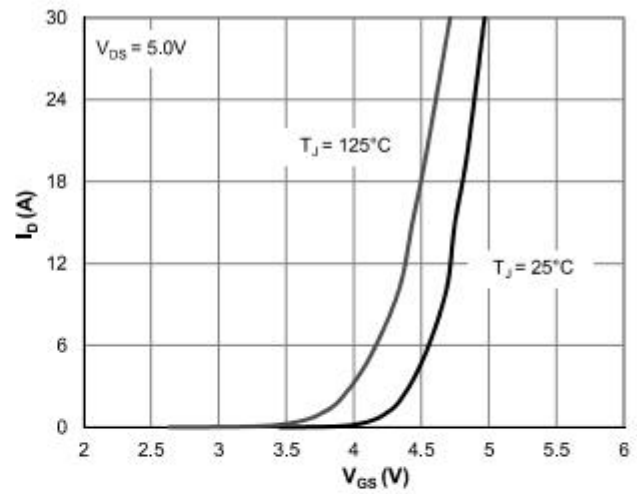


Figure 2: Transfer Characteristics

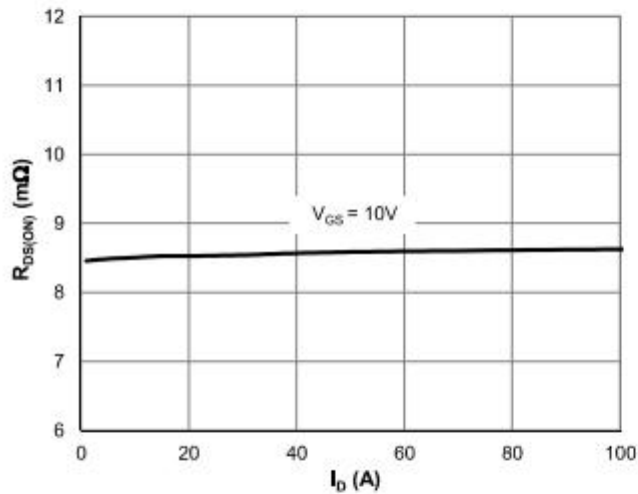


Figure 3: $R_{DS(ON)}$ vs. Drain Current

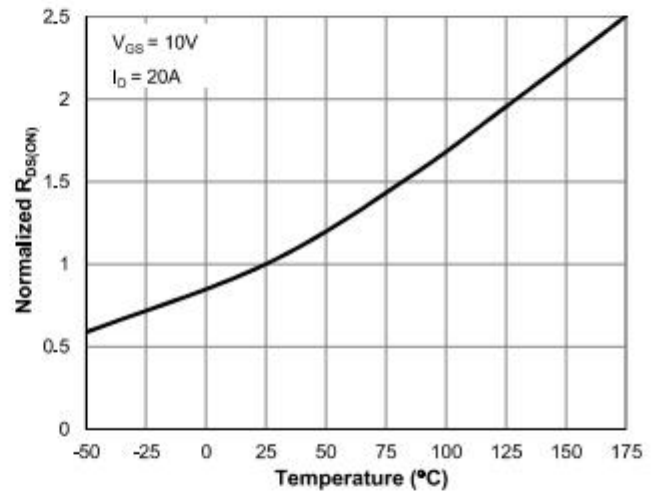


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

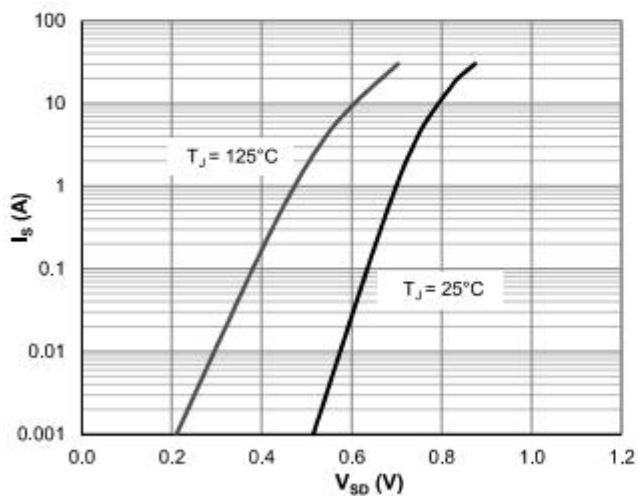


Figure 5: Body-Diode Characteristics

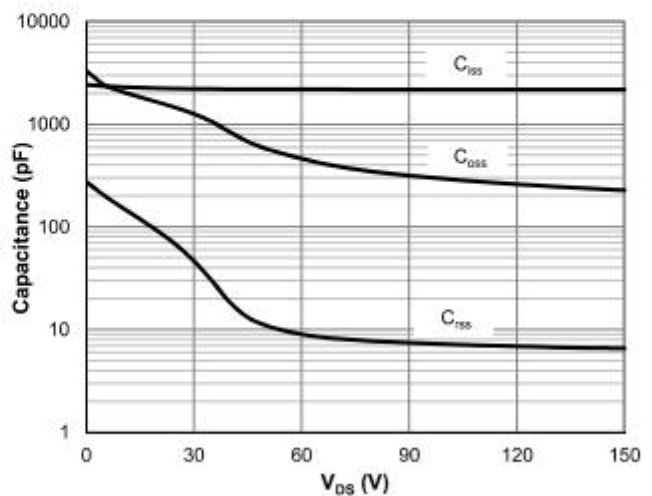
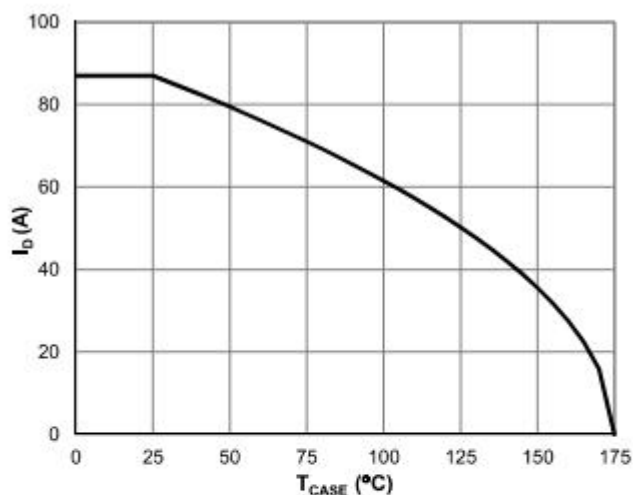
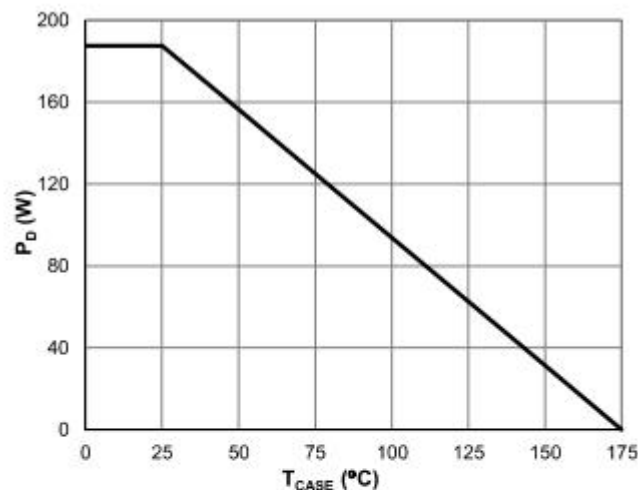
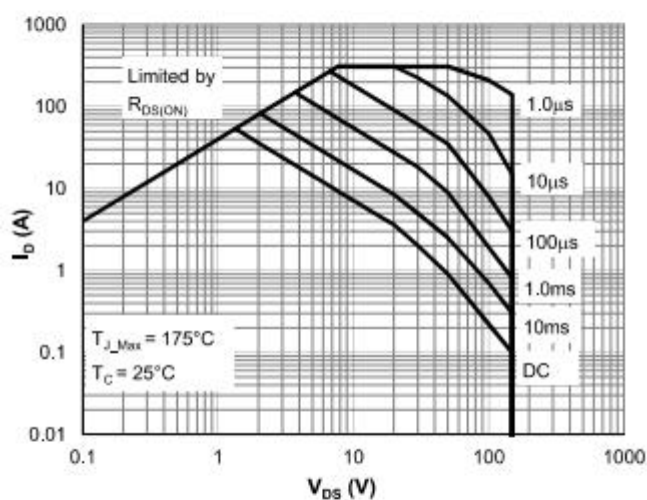
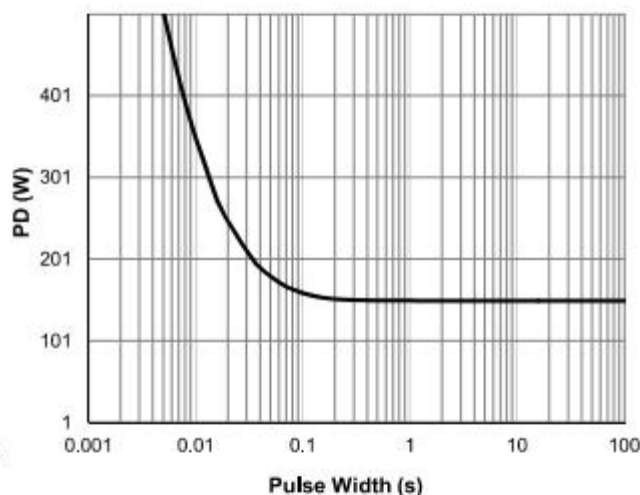
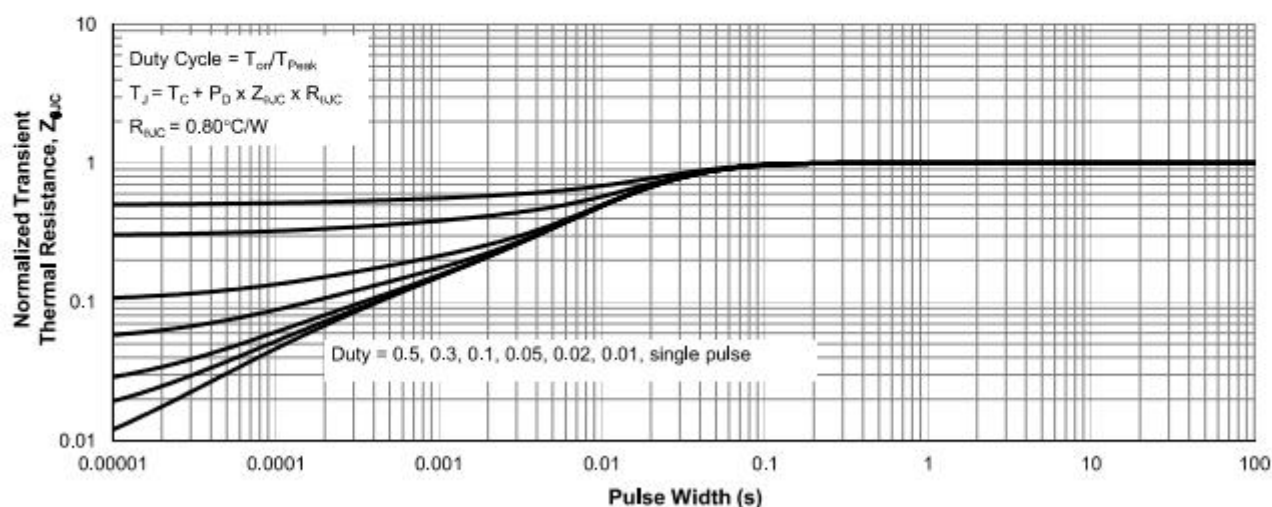


Figure 6: Capacitance Characteristics


Figure 7: Current De-rating

Figure 8: Power De-rating

Figure 9: Maximum Safe Operating Area

Figure 10: Single Pulse Power Rating, Junction-to-Case

Figure 11: Normalized Maximum Transient Thermal Impedance

Test ircuits and Waveforms

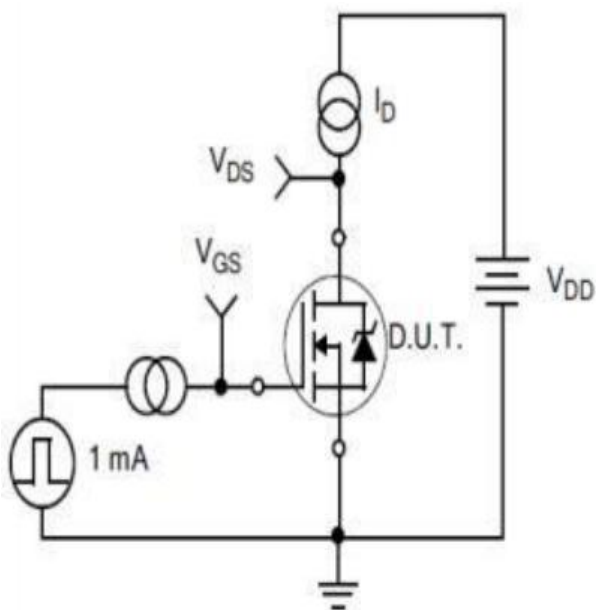


Figure A.
Gate Charge Test Circuit

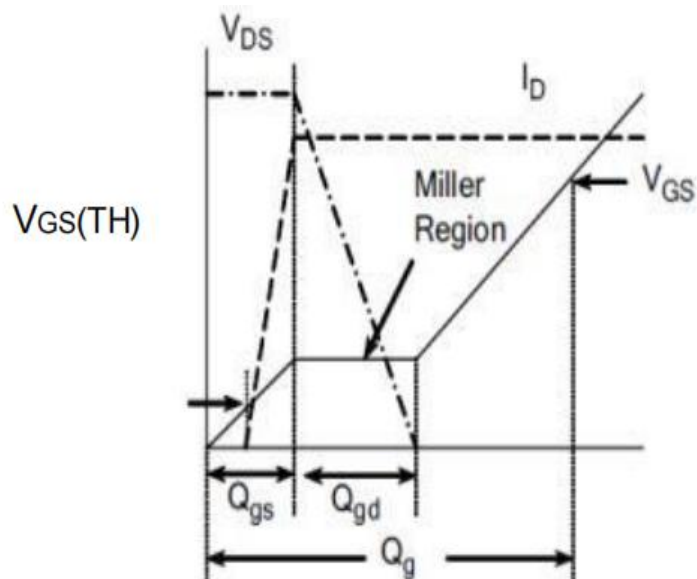


Figure B.
Gate Charge Waveform

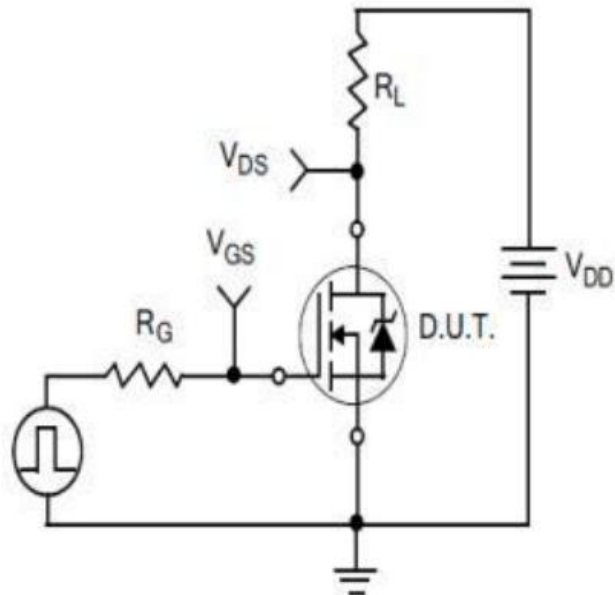


Figure C.
Resistive Switching Test Circuit

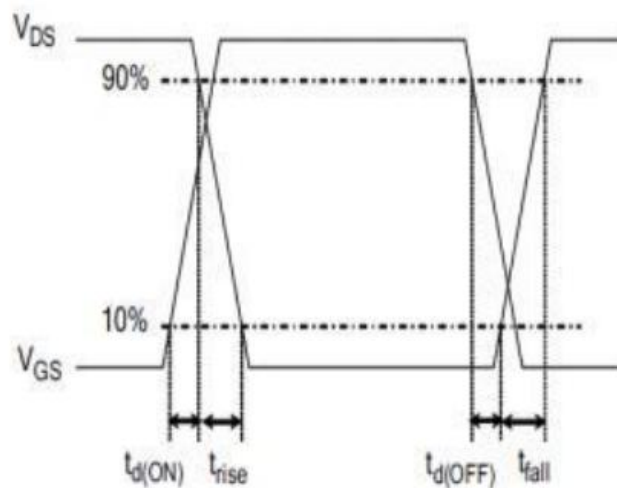


Figure D.
Resistive Switching Waveforms

Test ircuits and Waveforms

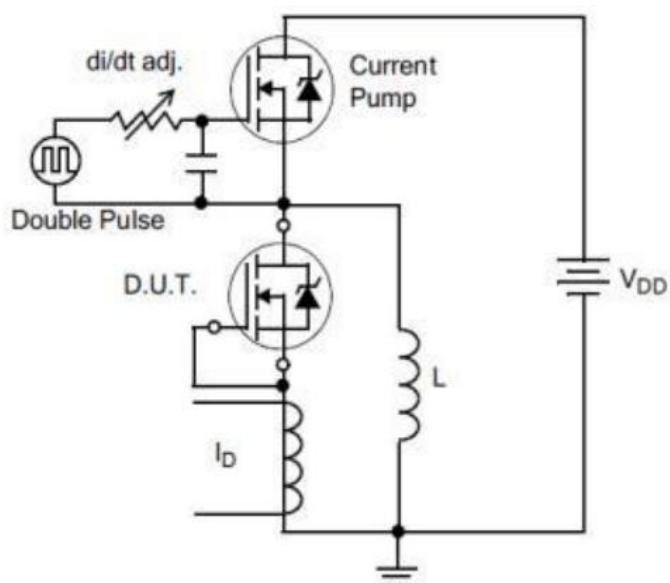


Figure E.Diode Reverse Recovery Test Circuit

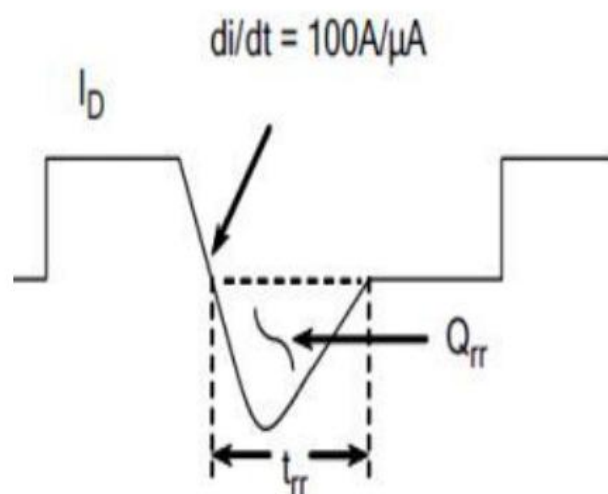


Figure F.Diode Reverse Recovery Waveform

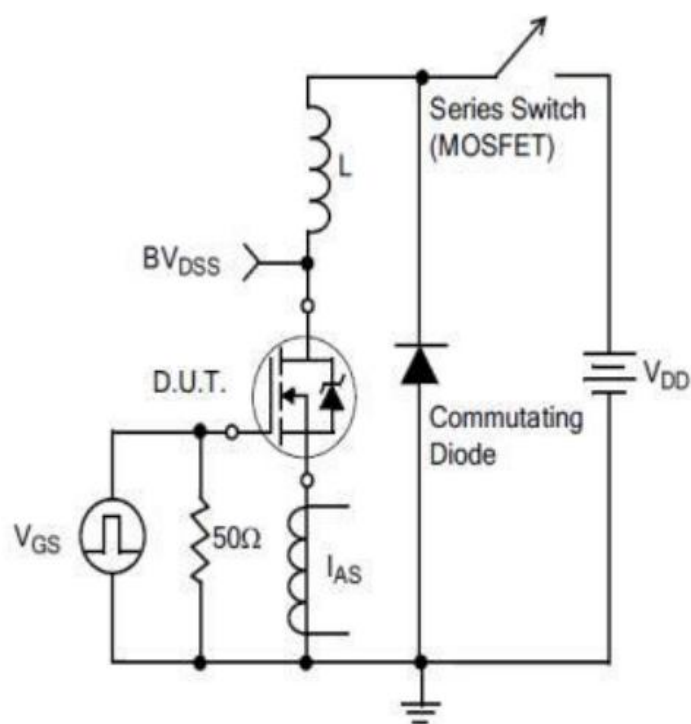
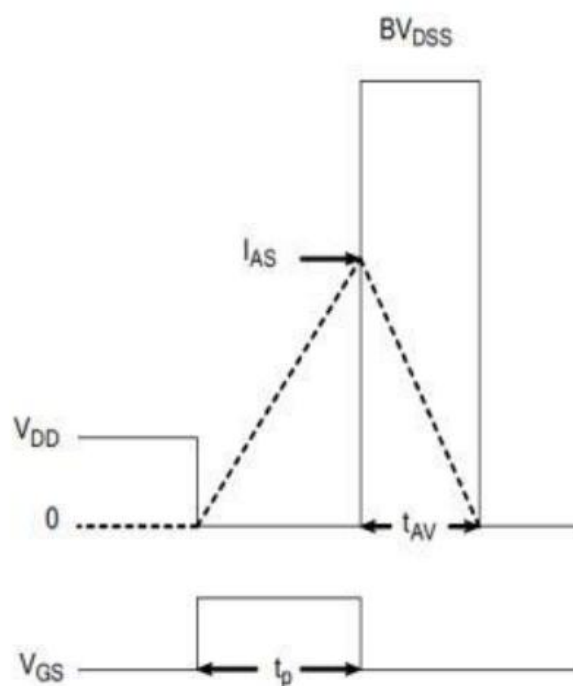
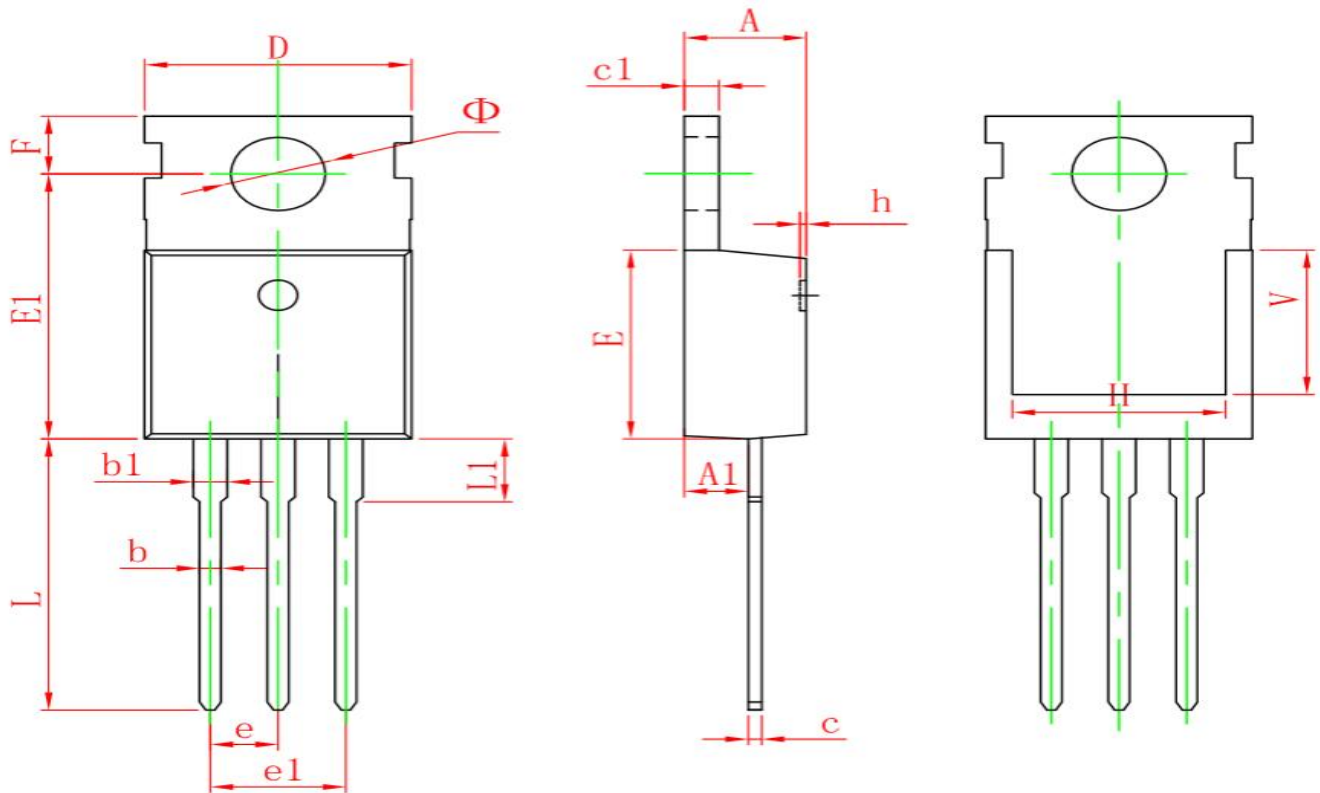


Figure G.Unclamped Inductive Switching Test Circuit



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

Figure H.Unclamped Inductive Switching Waveforms

Package outline drawing(TO-220 Unit: mm)


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

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