

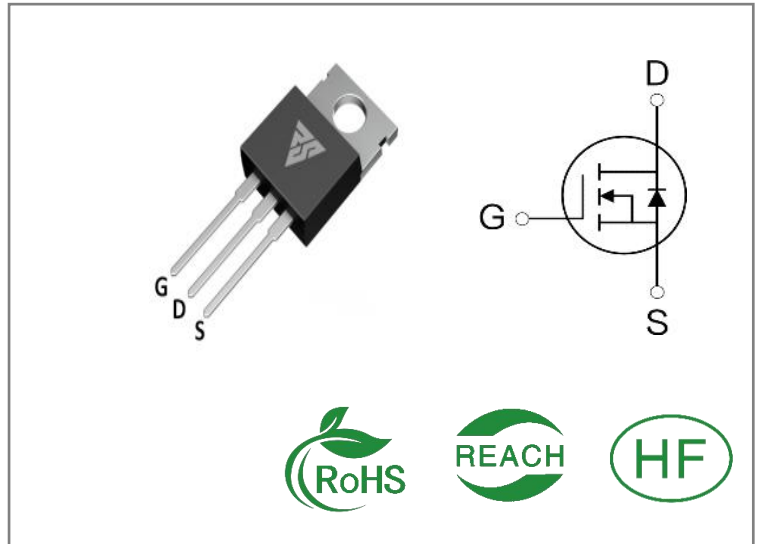
ID	R <sub>DS(ON)</sub> (Typ)	VDSS
160A	5.2mΩ	150V

**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.
RS150N160T	TO-220	RS150N160T	Tube	50 PCS

**Absolute Maximun Ratings** Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RS150N160T	Units
VDSS	Drain-to-Source Voltage	150	V
ID	Continuous Drain Current TC=25℃	160	A
ID	Continuous Drain Current TC=100℃	112	
IDM	Pulsed Drain Current	600	
PD	Power Dissipation	425	W
VGS	Gate- to- Source Voltage	±20	V
EAS	Single Pulse Avalanche Engergy L = 0.3mH, IS = 60A, RG = 25Ω, Tj = 25℃	540	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	℃
	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 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	RS150N160T	Units	Test Conditions
R $\theta$ JC	Junction-to-Case	0.42	$^{\circ}\text{C} / \text{W}$	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 150 $^{\circ}\text{C}$
R $\theta$ JA	Junction-to-Ambient	46		1 cubic foot chamber, free air.

**OFF Characteristics**  $T_J = 25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	150	--	--	V	VGS=0V ID=250 $\mu\text{A}$
IDSS	Drain- to- Source Leakage Current	--	--	1	$\mu\text{A}$	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**  $T_J = 25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance	--	5.2	6.5	m $\Omega$	VGS=10V, ID=20A
VGS(TH)	Gate Threshold Voltage	2.5	--	4.5	V	VGS=VDS ID=250 $\mu\text{A}$

**Resistive Switching Characteristics** Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	19	--	nS	VDS=75V RL=3.5 $\Omega$ RG=6 $\Omega$ VGS=10V
trise	Rise Time	--	31	--		
td(OFF)	Turn- OFF Delay Time	--	52	--		
tfall	Fall Time	--	40	--		

**Dynamic Characteristics** Essentially independent of operating temperature

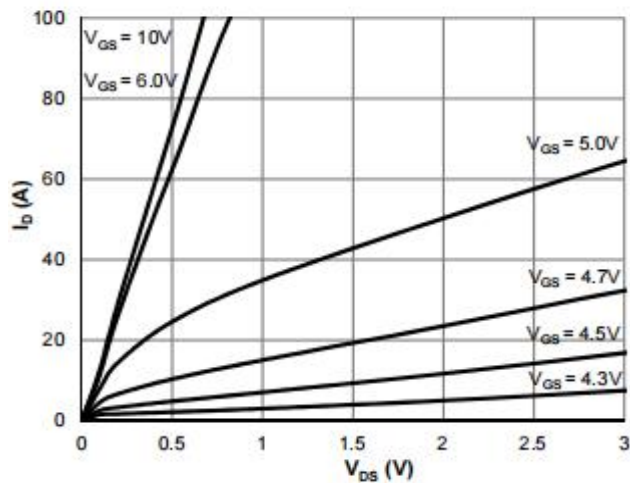
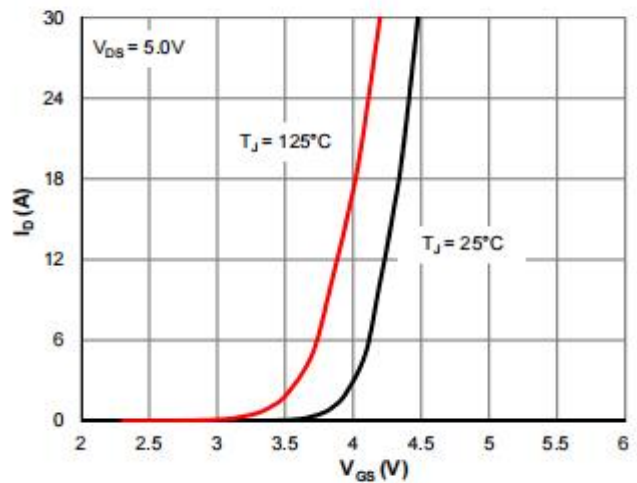
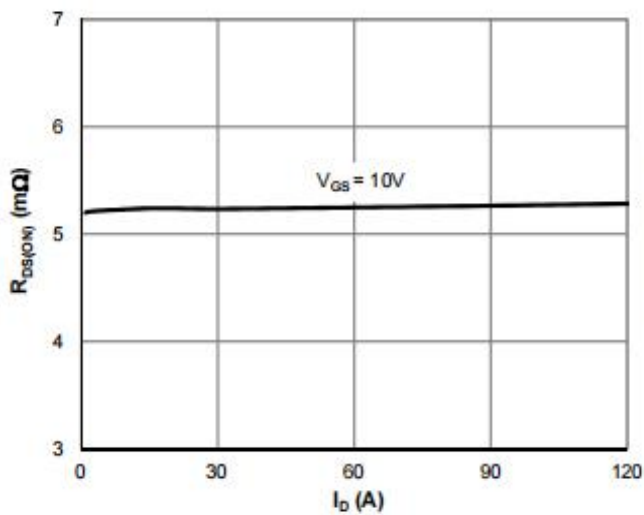
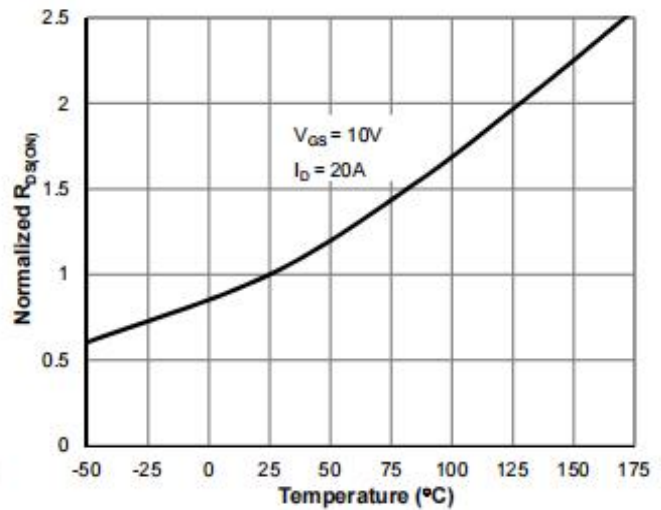
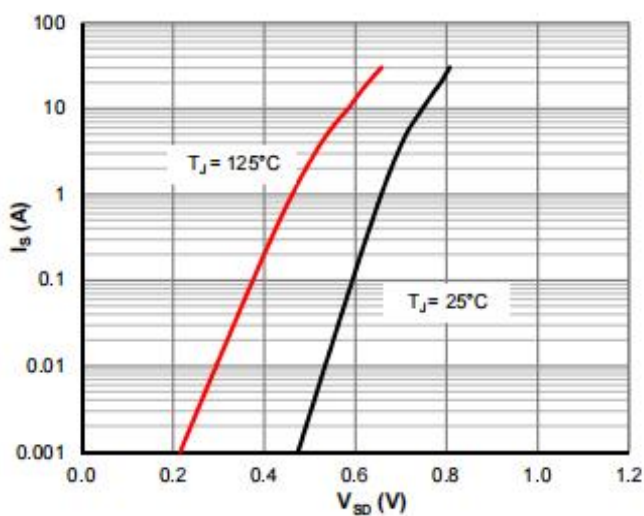
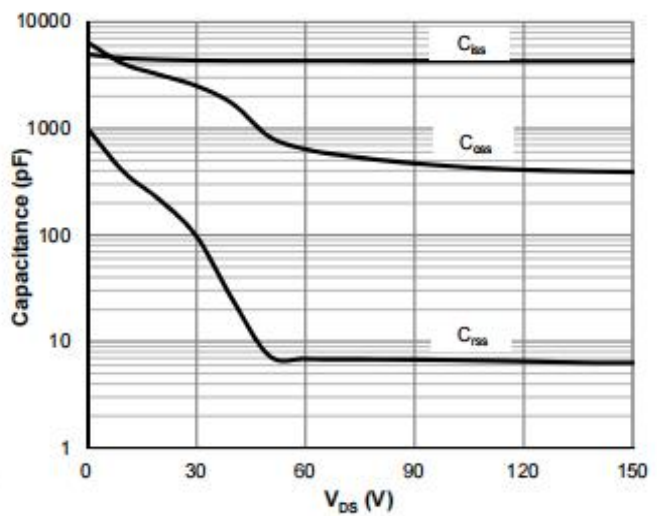
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	4300	--	pF	VGS= 0V VDS=75V f=1MHz
Coss	Output Capacitance	--	530	--		
Crss	Reverse Transfer Capacitance	--	7.5	--		
Qg	Total Gate Charge	--	68	--	nC	VDS= 75V ID=20A VGS=10V
Qgs	Gate- to- Source Charge	--	15	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

**Source- Drain Diode Characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	160	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	600	A	
VSD	Diode Forward Voltage	--	--	1.0	V	IS=1A,VGS=0V
trr	Reverse Recovery Time	--	100	--	nS	VGS=0V IS=15A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	150	--	nC	

**Notes:**

- \* 1. Repetitive rating,pulse width limited by maximum junction temperature.
- \* 2. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$

**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**

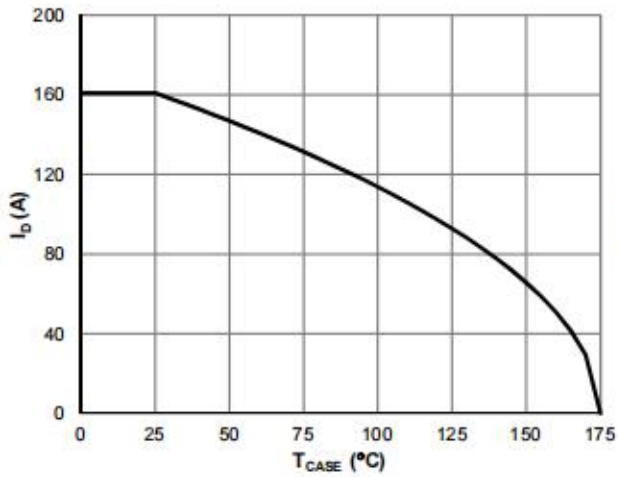


Figure 7: Current De-rating

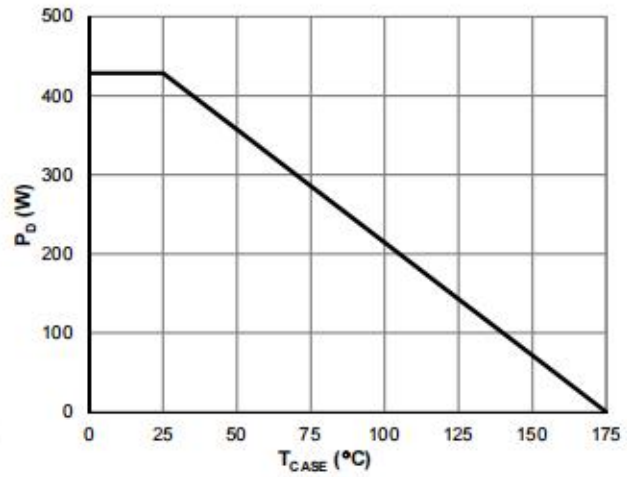


Figure 8: Power De-rating

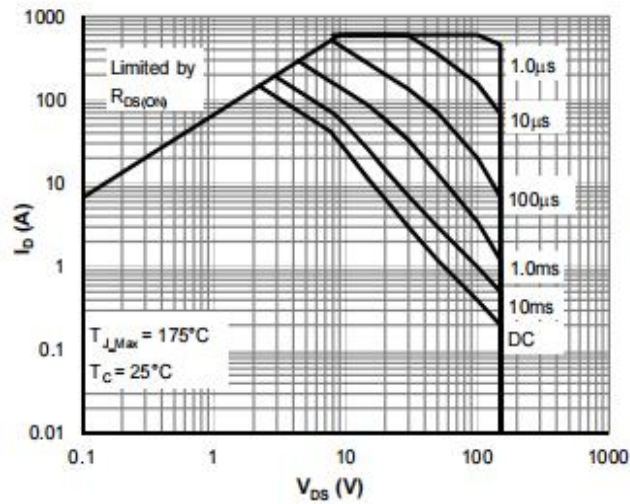


Figure 9: Maximum Safe Operating Area

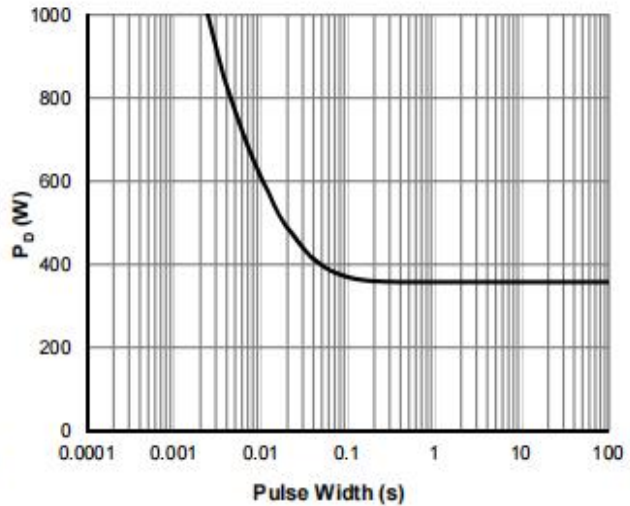


Figure 10: Single Pulse Power Rating, Junction-to-Case

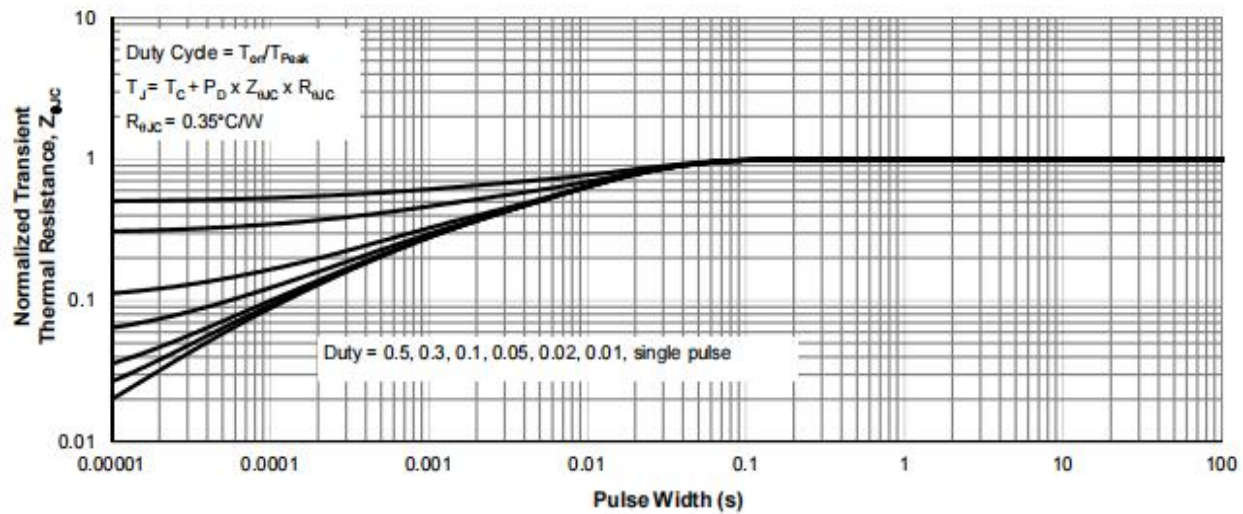


Figure 11: Normalized Maximum Transient Thermal Impedance



## Test ircuits and Waveforms

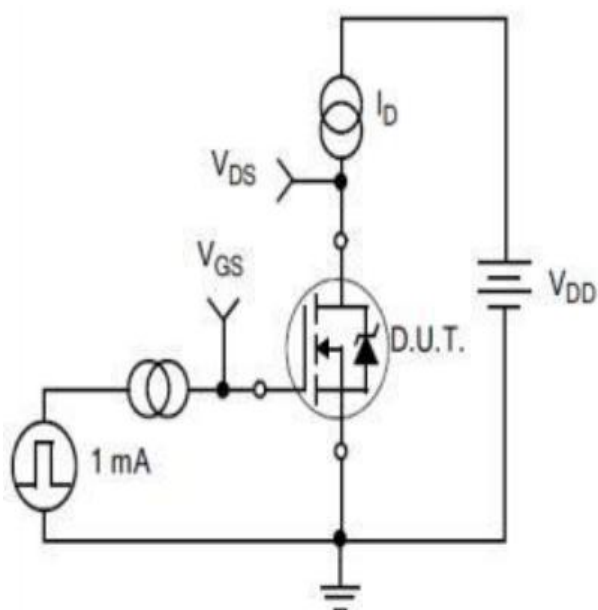


Figure A.  
Gate Charge Test Circuit

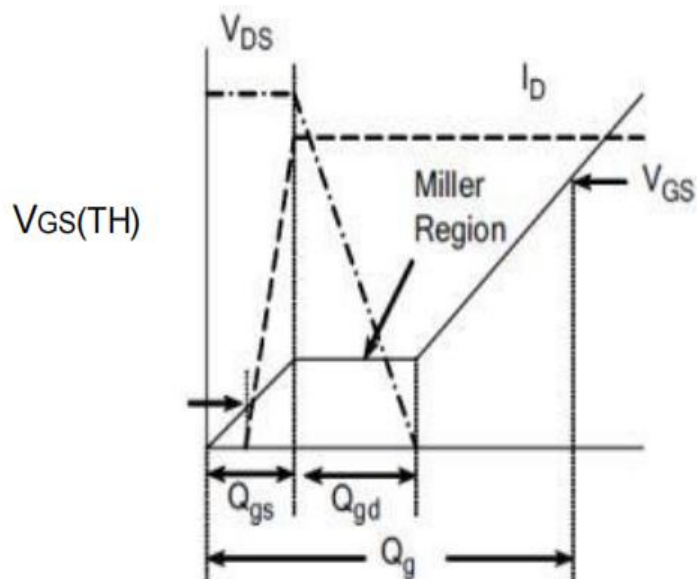


Figure B.  
Gate Charge Waveform

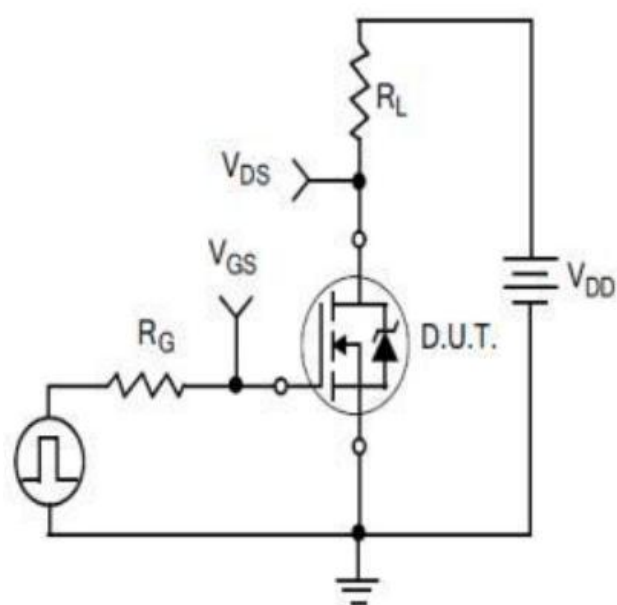


Figure C.  
Resistive Switching Test Circuit

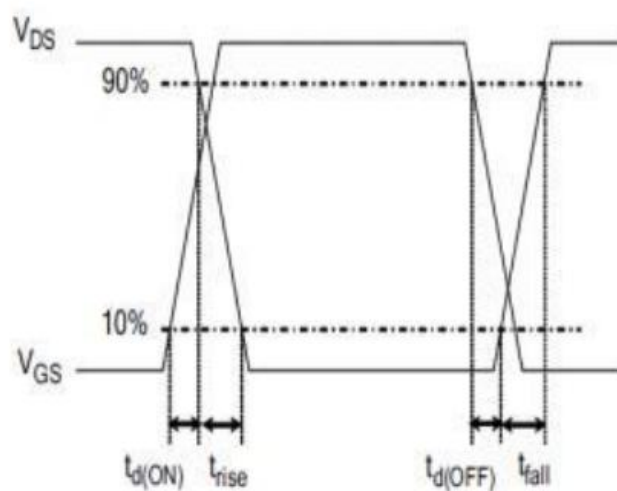


Figure D.  
Resistive Switching Waveforms

## Test ircuits and Waveforms

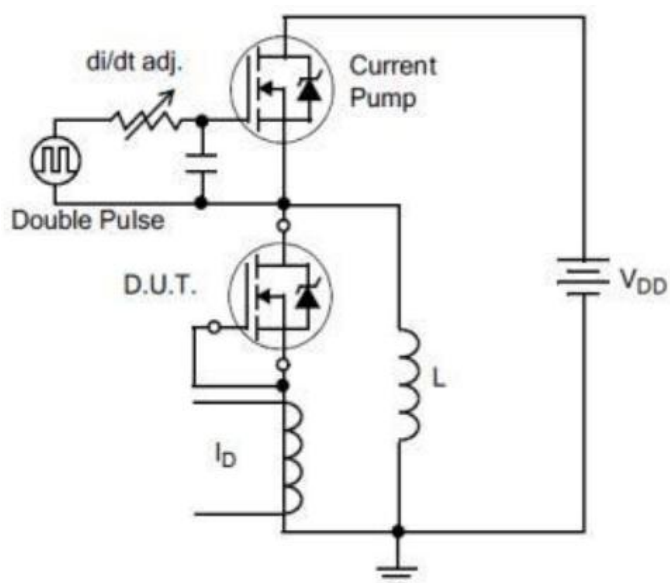


Figure E.Diode Reverse Recovery Test Circuit

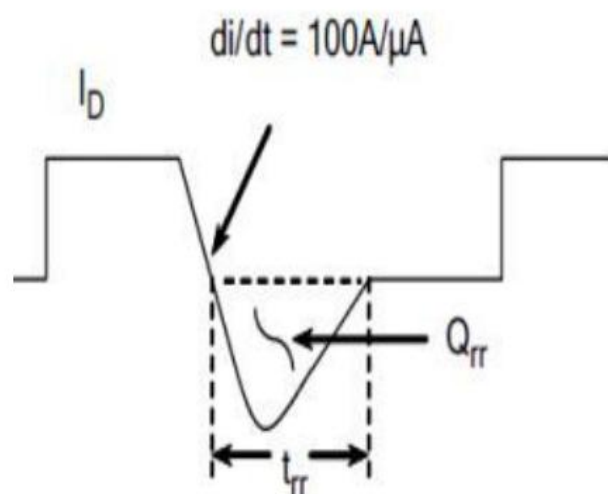


Figure F.Diode Reverse Recovery Waveform

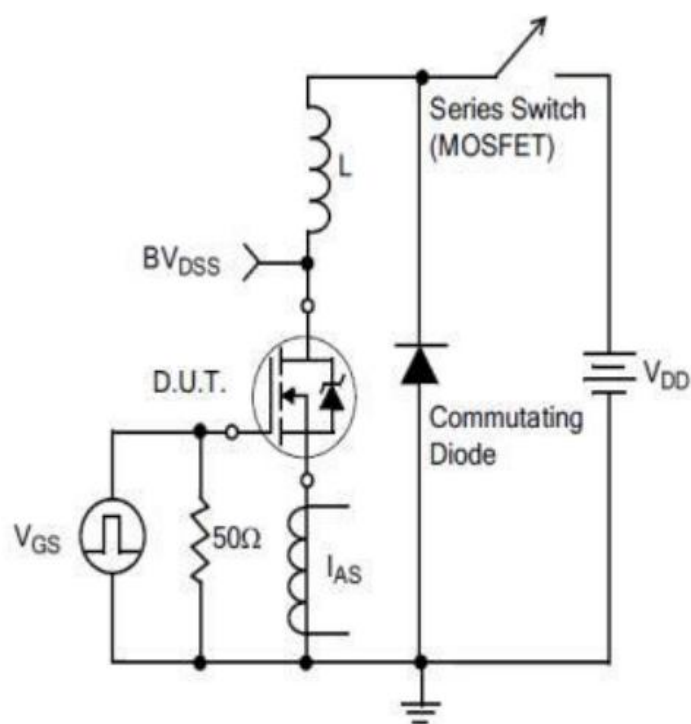
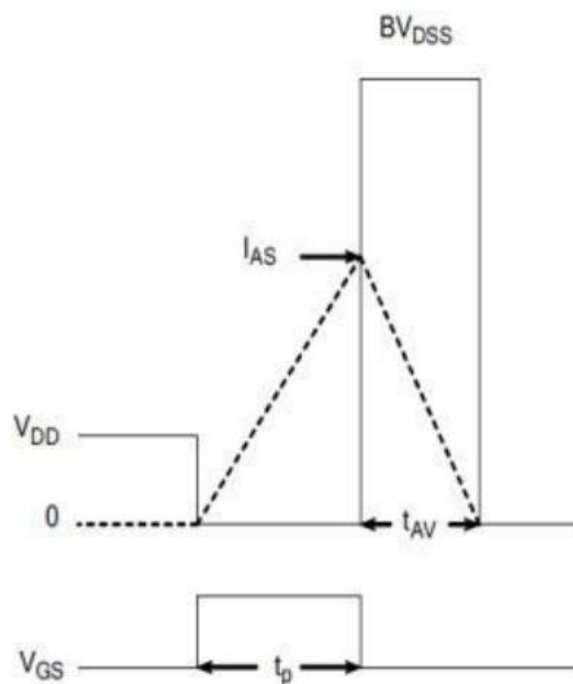
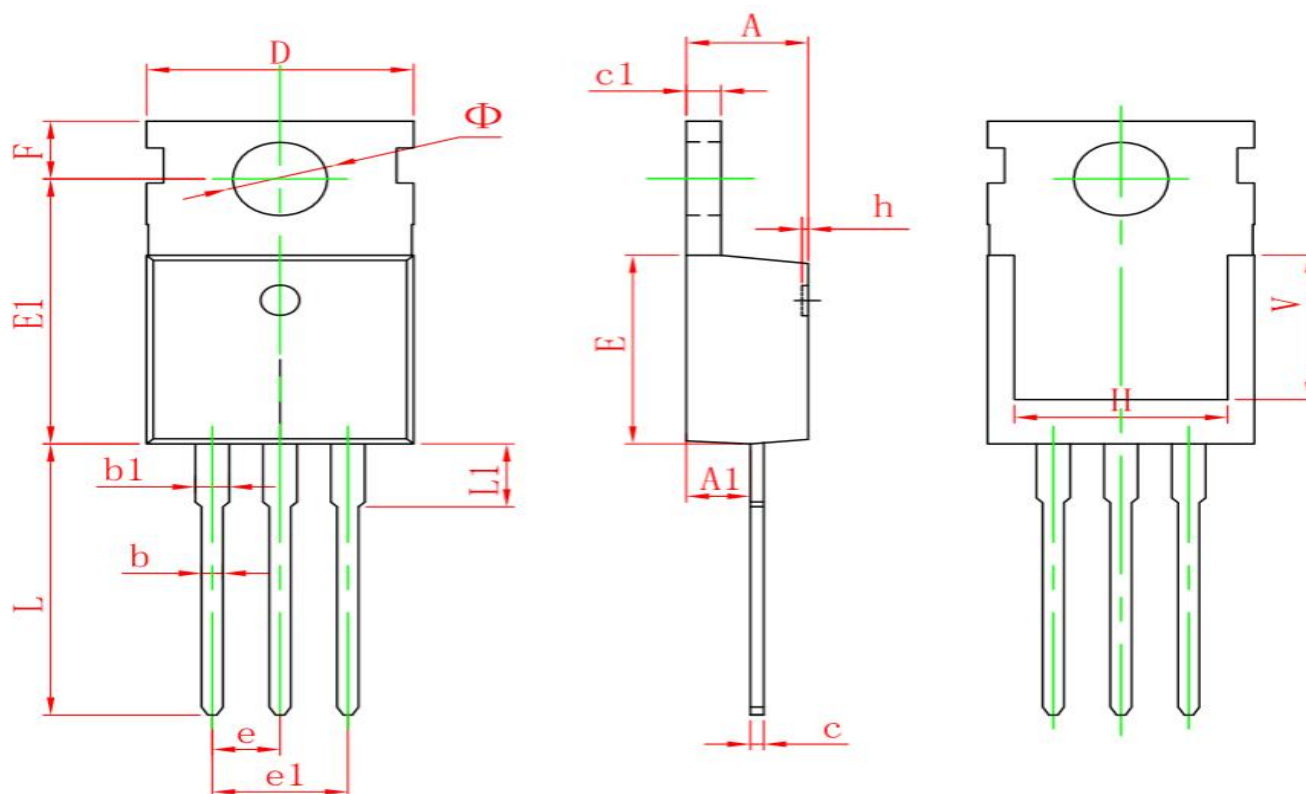


Figure G.Unclamped Inductive Switching Test Circuit



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

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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