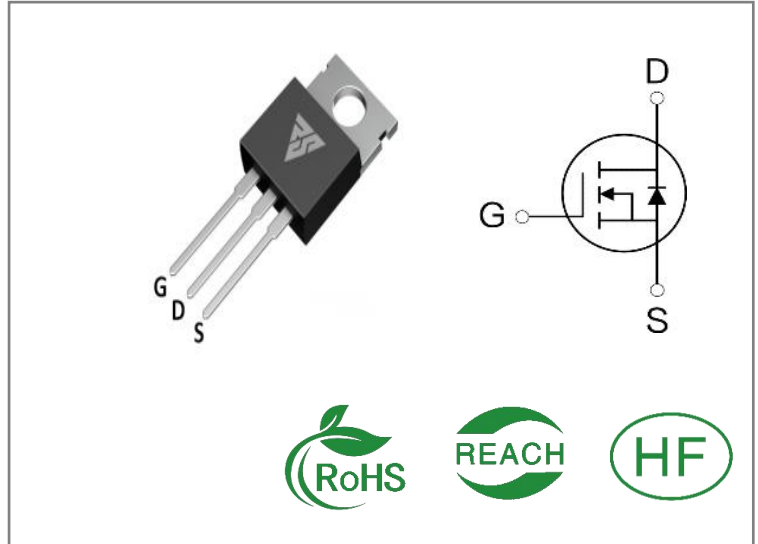


ID	R _{DS(ON)} (Typ)	VDSS
18A	0.12Ω	200V


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.
RS640T	TO-220	RS640T	Tube	50 PCS

Absolute Maximun Ratings Tc= 2 5°C unless otherwise specified

Symbol	Parameter	RS640T	Units
VDSS	Drain-to-Source Voltage	200	V
ID	Continuous Drain Current TC=25°C	18	A
IDM	Pulsed Drain Current	72	
PD	Power Dissipation	98	W
VGS	Gate- to- Source Voltage	±20	V
EAS	Single Pulse Avalanche Engergy L = 0.5mH,VDD = 30V, VG = 10V, Tj = 25°C	248	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	°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 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	RS640T	Units	Test Conditions
R θ JC	Junction-to-Case	1.2	$^{\circ}\text{C} / \text{W}$	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 $^{\circ}\text{C}$
R θ JA	Junction-to-Ambient	60		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	200	--	--	V	V _{GS} =0V, I _D =250 μ A
IDSS	Drain- to- Source Leakage Current	--	--	1	μ A	V _{DS} =200V, V _{GS} =0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	V _{GS} =20V , V _{DS} =0V
	Gate- to- Source Reverse Leakage	--	--	-100		V _{GS} =-20V , V _{DS} =0V

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R _{DS(on)}	Static Drain- to- Source On-Resistance	--	0.12	0.15	Ω	V _{GS} =10V, I _D =4.5 A
V _{GS(TH)}	Gate Threshold Voltage	2.0	--	4.0	V	V _{GS} =V _{DS} , I _D =25 0 μ A

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
t _{d(ON)}	Turn- on Delay Time	--	40	--	nS	V _{DD} =100V I _D =18A R _G =25 Ω
t _{rise}	Rise Time	--	33	--		
t _{d(OFF)}	Turn- OFF Delay Time	--	166	--		
t _{fall}	Fall Time	--	60	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1200	--	pF	VGS= 0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	161	--		
Crss	Reverse Transfer Capacitance	--	70	--		
Qg	Total Gate Charge	--	38	--	nC	VDS= 160V ID=9A VGS=18V
Qgs	Gate- to- Source Charge	--	6	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	16	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	18	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	72	A	
VSD	Diode Forward Voltage	--	--	1.4	V	IS=9A,VGS=0V
trr	Reverse Recovery Time	--	182	--	nS	VGS=0V IS=18A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	1.29	--	μC	

Notes:

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

Typical Feature Curve

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

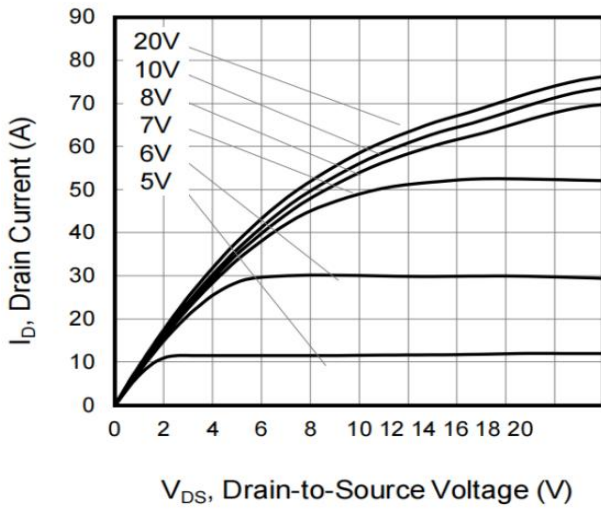


Figure 2. Body Diode Forward Voltage

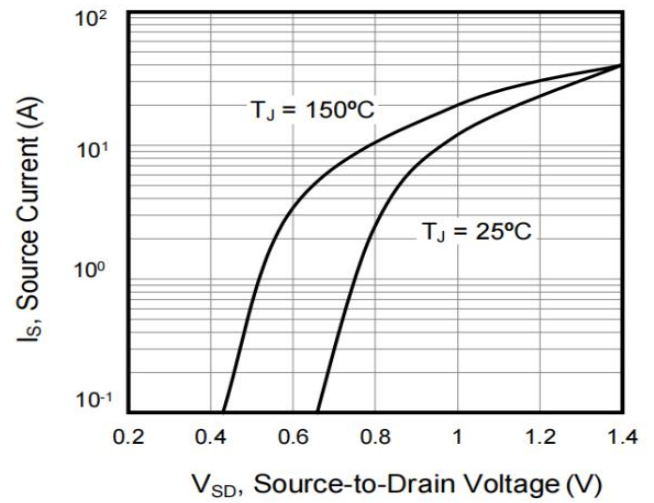


Figure 3. Drain Current vs. Temperature

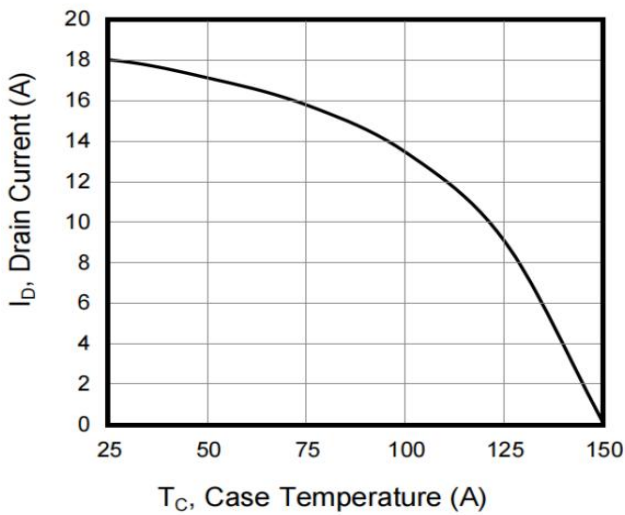


Figure 4. BV_{DSS} Variation vs. Temperature

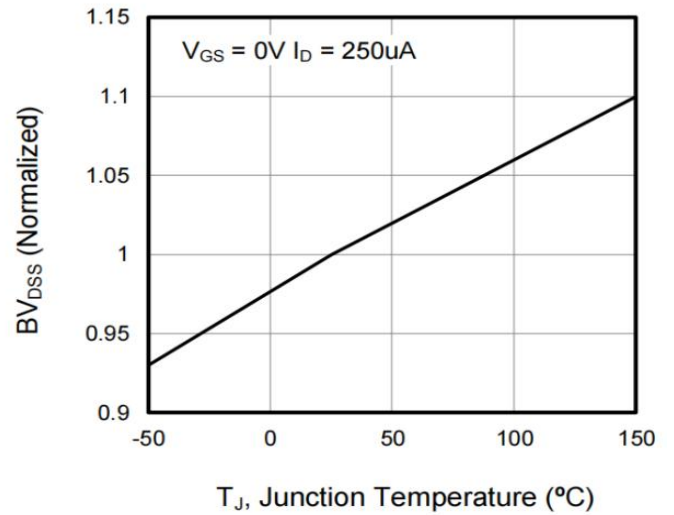


Figure 5. Transfer Characteristics

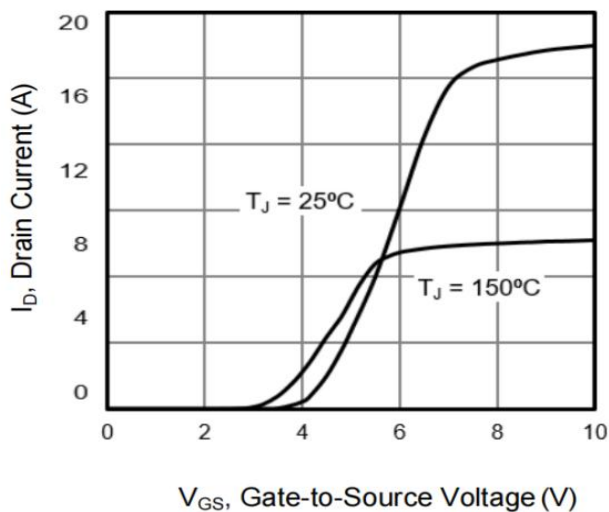


Figure 6. On-Resistance vs. Temperature

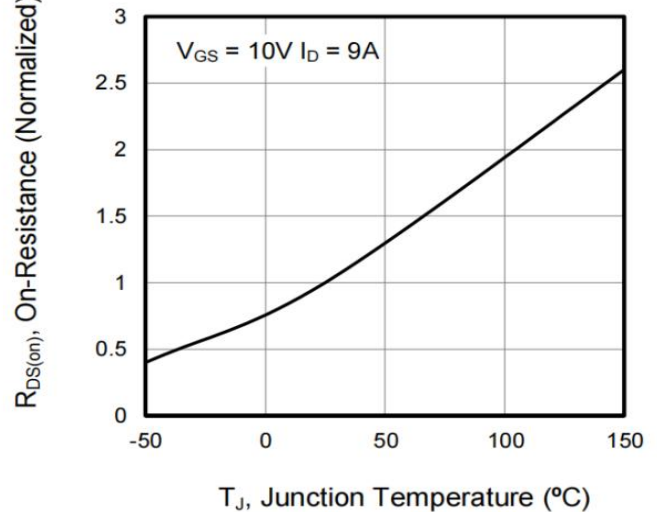


Figure 7. Capacitance

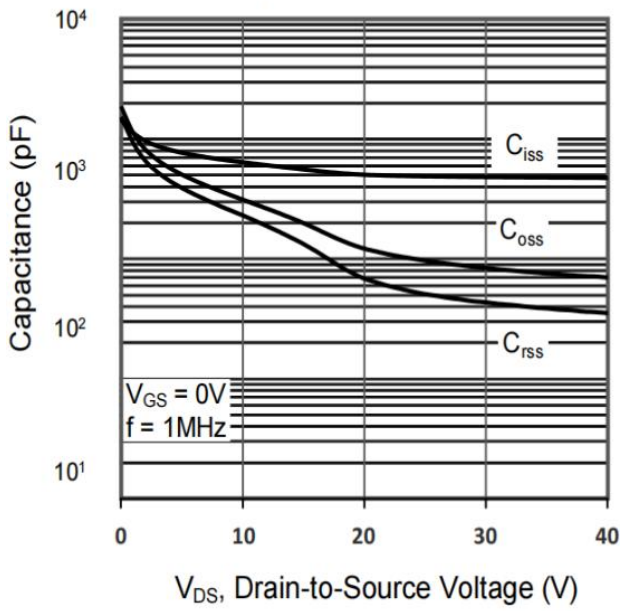


Figure 8. Gate Charge

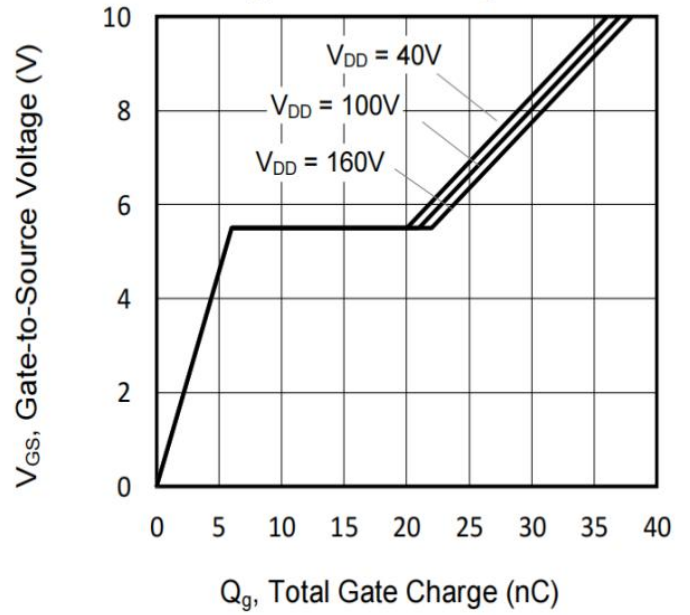
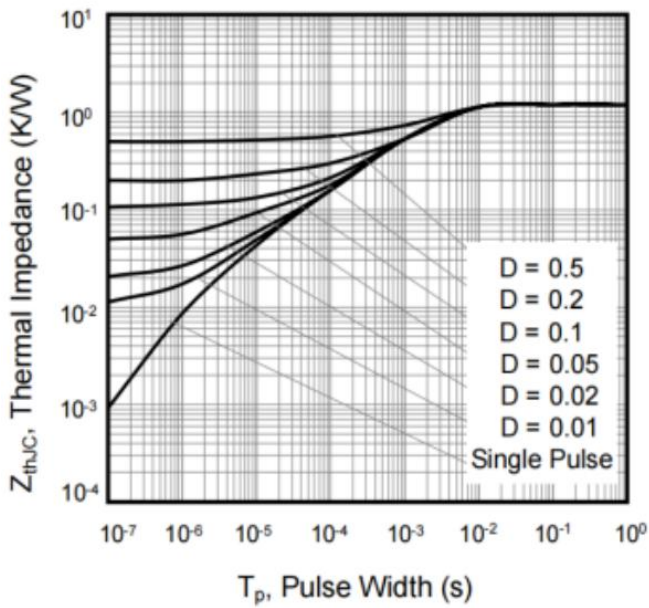


Figure 9. Transient Thermal Impedance



Test circuits and Waveforms

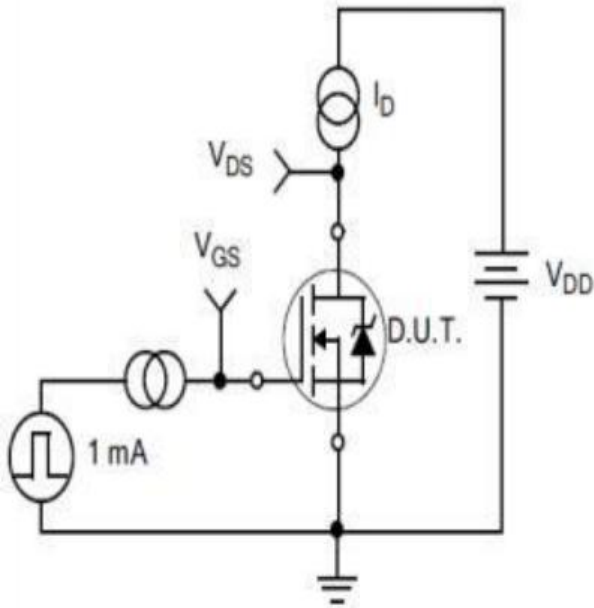


Figure A.
Gate Charge Test Circuit

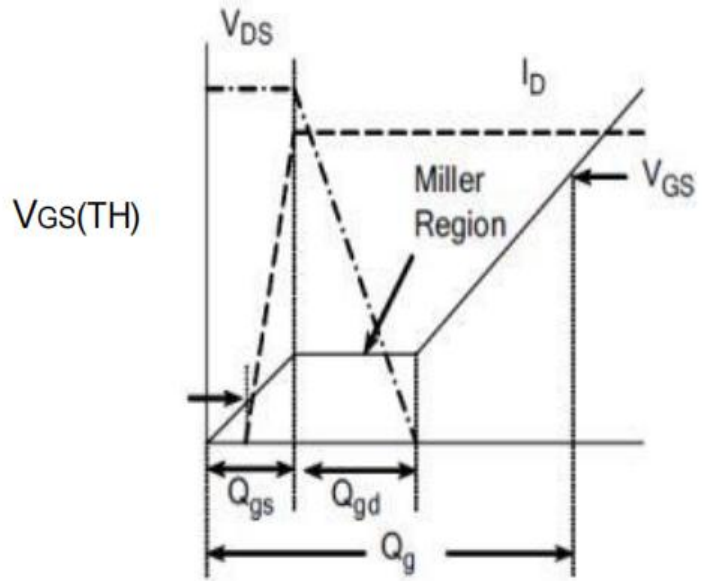


Figure B.
Gate Charge Waveform

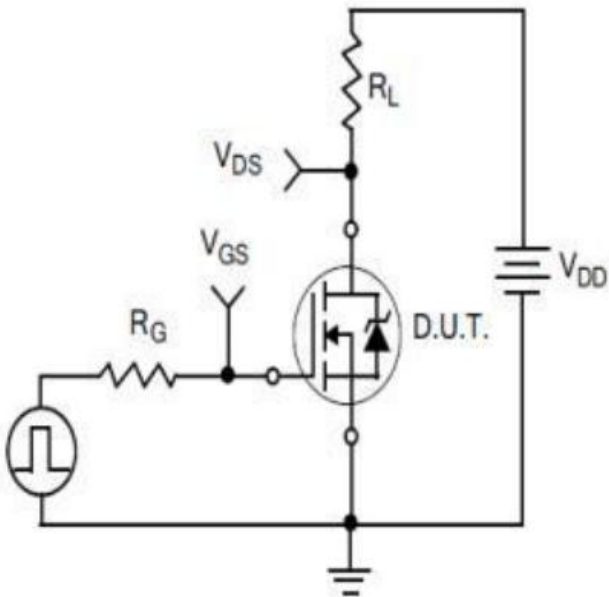


Figure C.
Resistive Switching Test Circuit

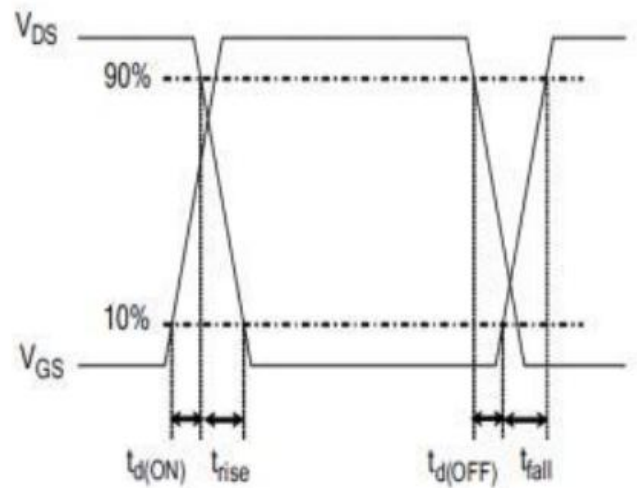


Figure D.
Resistive Switching Waveforms

Test circuits and Waveforms

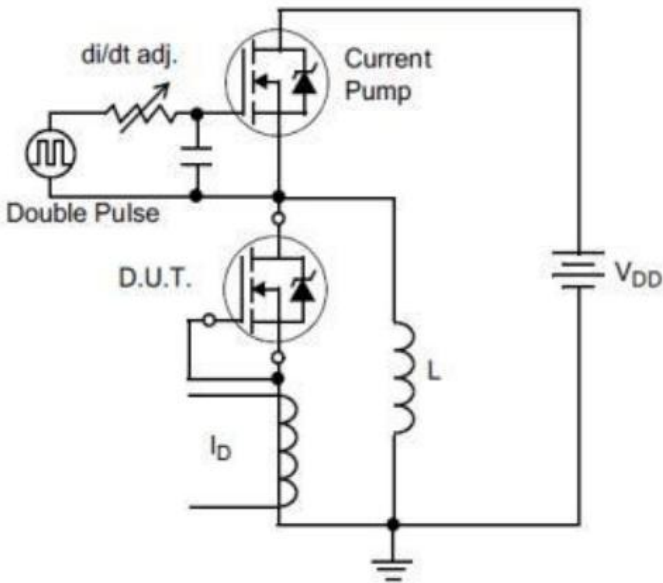


Figure E. Diode Reverse Recovery Test Circuit

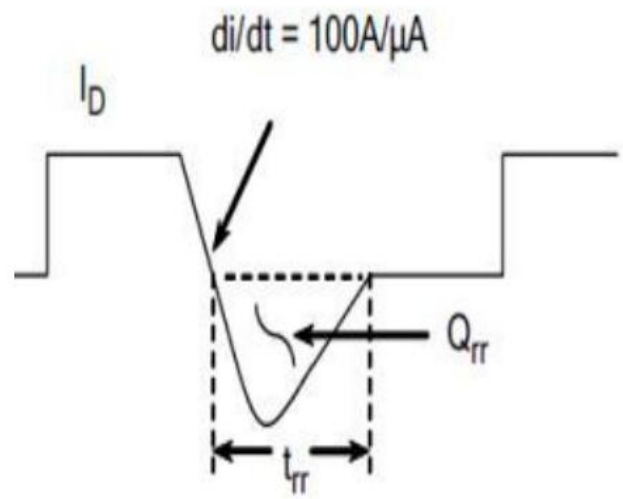


Figure F. Diode Reverse Recovery Waveform

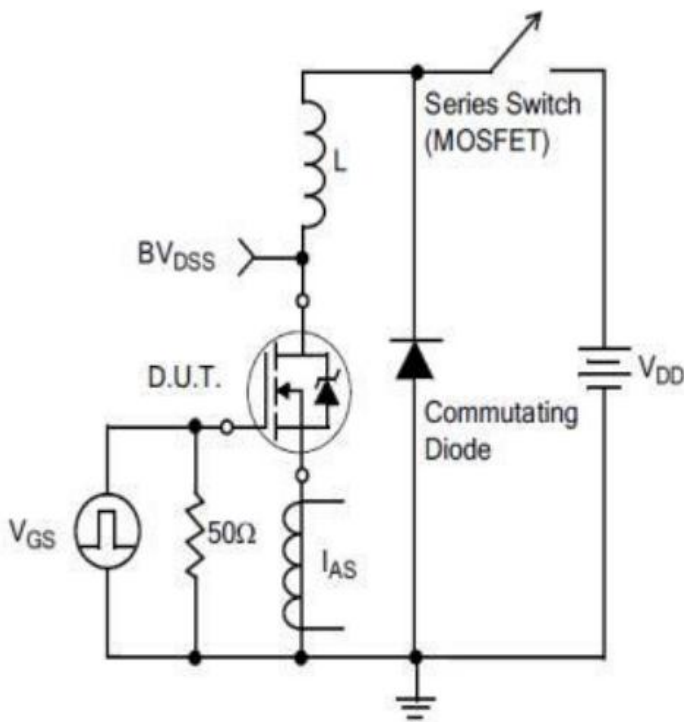
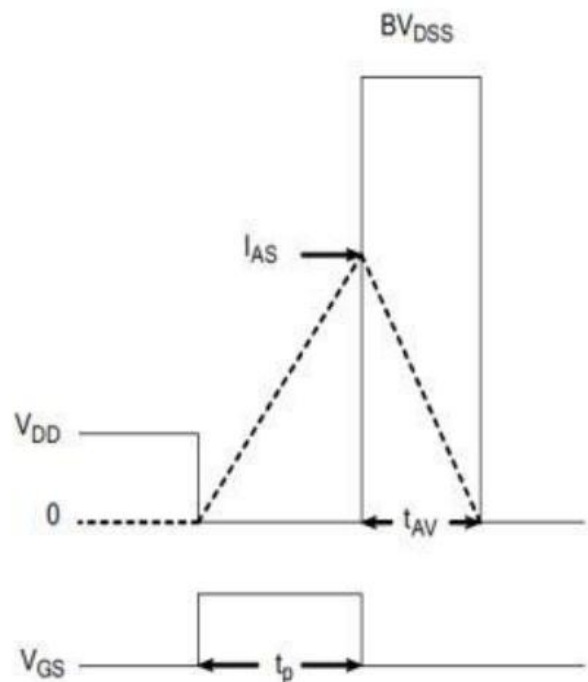


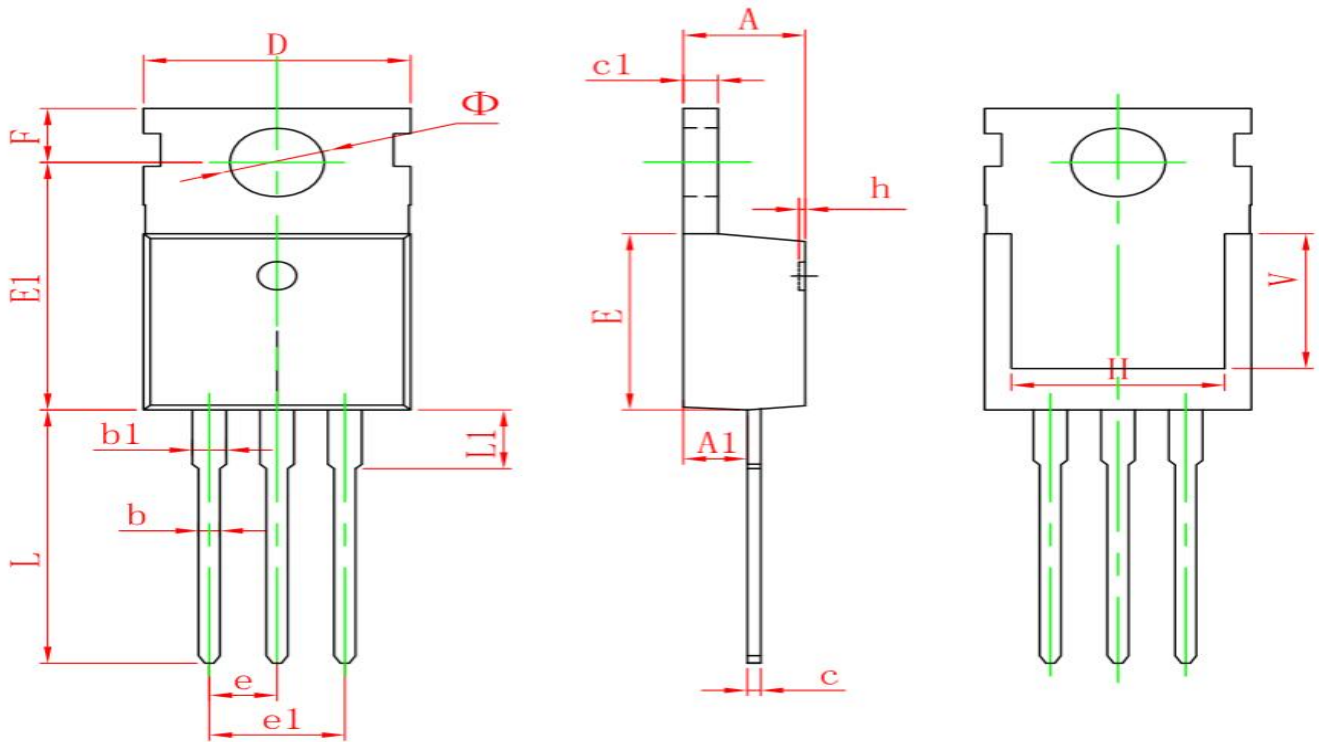
Figure G. Unclamped Inductive Switching Test Circuit



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

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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