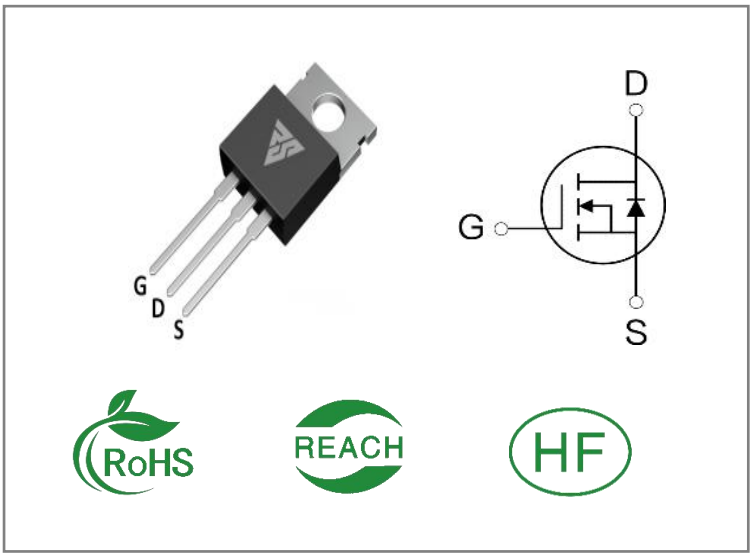
I_D	$R_{DS(ON)(Typ)}$	V_{DSS}
80A	4.4mΩ	40V



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.
RS40N80T	TO-220	RS40N80T	Tube	50 PCS

Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RS40N80T	Units
V_{DSS}	Drain-to-Source Voltage	40	V
I_D	Continuous Drain Current T_C=25℃	80	A
I_D	Continuous Drain Current T_C=100℃	50	
I_{DM}	Pulsed Drain Current (Note*1)	320	
P_D	Power Dissipation	154	W
V_{GS}	Gate- to- Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Engergy L = 0.5mH, V_{DD} = 20V, R_G = 25 Ω,T_C=25℃	155	mJ
T_L T_{PKG}	Maximum Temperature for Soldering	300	℃
	Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	260	
T_J and T_{STG}	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.

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Thermal Resistance

Symbol	Parameter	RS40N80T	Units	Test Conditions
$R_{\theta JC}$	Junction-to-Case	0.81	℃/ W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃
$R_{\theta JA}$	Junction-to- Ambient	31		1 cubic foot chamber,free air.

OFF Characteristics TJ= 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain- to- source Breakdown Voltage	40	--	--	V	V_{GS}=0V I_D=250μA
I_{DSS}	Drain- to- Source Leakage Current	--	--	1	μA	V_{DS}=40V V_{GS}=0V
I_{GSS}	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 TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$R_{DS(on)}$	Static Drain- to- Source On-Resistance(Note*2)	--	4.4	5.5	mΩ	V_{GS}=10V I_D=30A
		--	6.5	7.8	mΩ	V_{GS}=4.5V I_D=20A
$V_{GS(TH)}$	Gate Threshold Voltage	1.3	1.9	2.5	V	V_{GS}=VDS I_D=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$t_{d(ON)}$	Turn- on Delay Time	--	12	--	nS	V_{DS}=20V I_D=30A R_G=3Ω
t_{rise}	Rise Time	--	30	--		
$t_{d(OFF)}$	Turn- OFF Delay Time	--	60	--		
t_{fall}	Fall Time	--	17	--		

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Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
C_{iss}	Input Capacitance	--	3760	--	pF	V_{GS}=0V V_{DS}=20V f=1.0MHz
C_{oss}	Output Capacitance	--	260	--		
C_{rss}	Reverse Transfer Capacitance	--	222	--		
Q_g	Total Gate Charge	--	73	--	nC	V_{DS}=20V I_D=30A V_{GS}=10V
Q_{gs}	Gate- to- Source Charge	--	15	--		
Q_{gd}	Gate-to-Drain(" Miller") Charge	--	16	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current	--	--	80	A	Integral pn- diode in MOSFET
I_{SM}	Maximum Pulsed Current	--	--	320	A	
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_S=30A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	16	--	nS	V_{GS}=0V I_S=20A di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	--	10	--	nC	

Notes:

* 1. Repetitive rating, pulse width limited by maximum junction temperature.
* 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 0.5%

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Typical Feature Curve

Figure 1: Output Characteristics

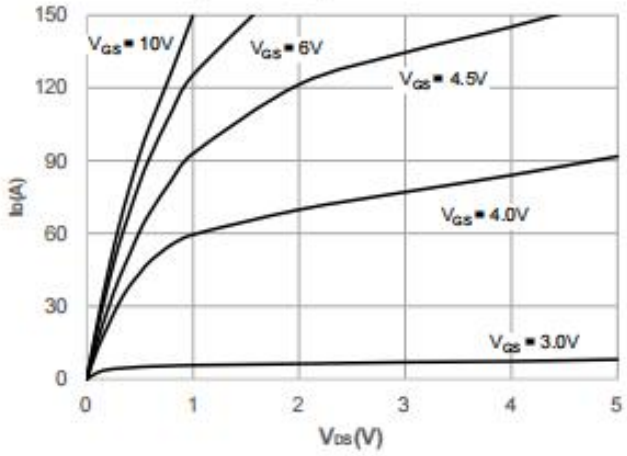

Figure 2: Typical Transfer Characteristics

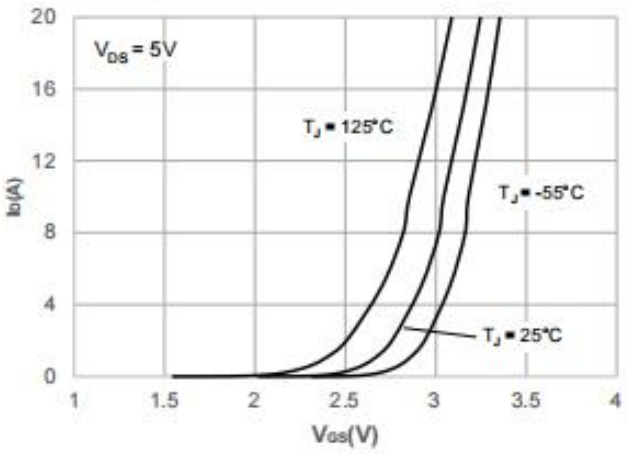

Figure 3: On-resistance vs. Drain Current

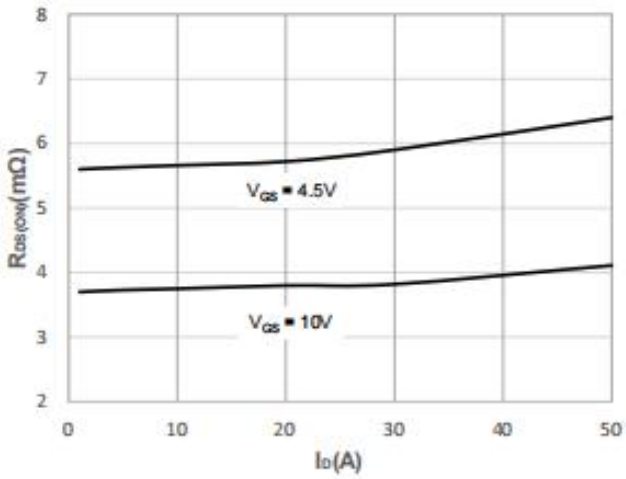

Figure 4: Body Diode Characteristics

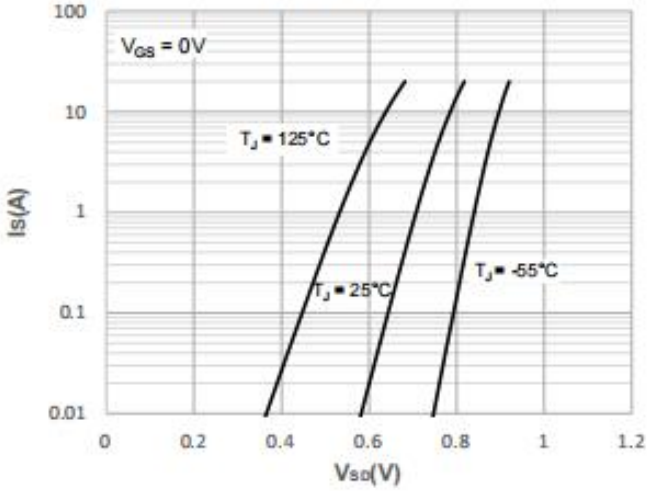

Figure 5: Gate Charge Characteristics

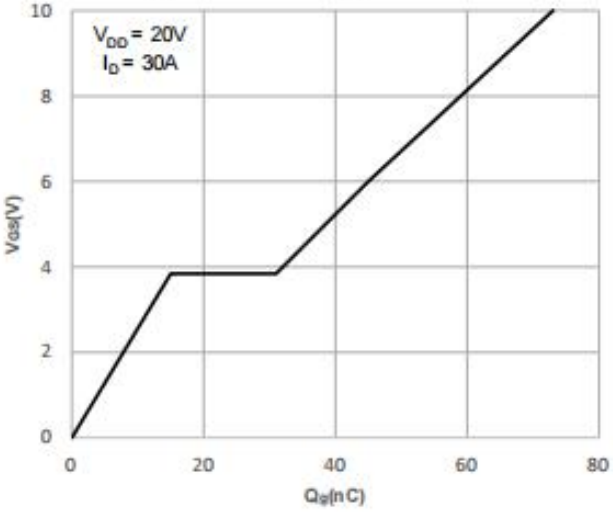

Figure 6: Capacitance Characteristics

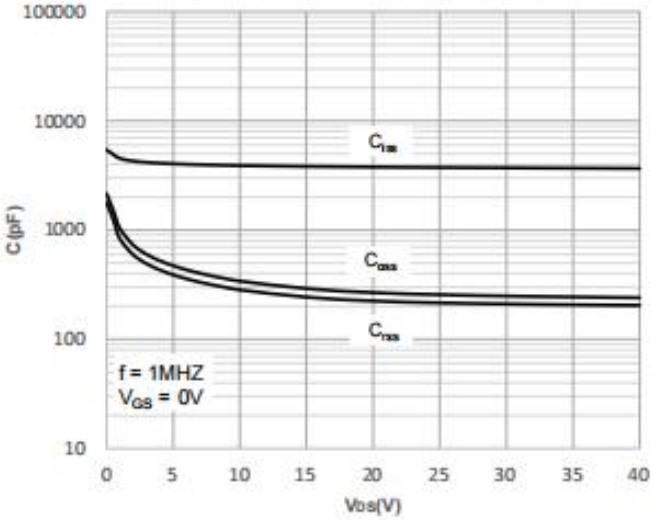

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Figure 7: Normalized Breakdown voltage vs. Junction Temperature

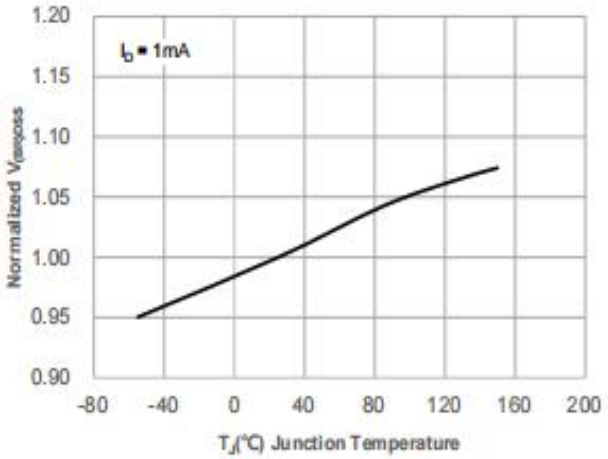


Figure 8: Normalized on Resistance vs. Junction Temperature

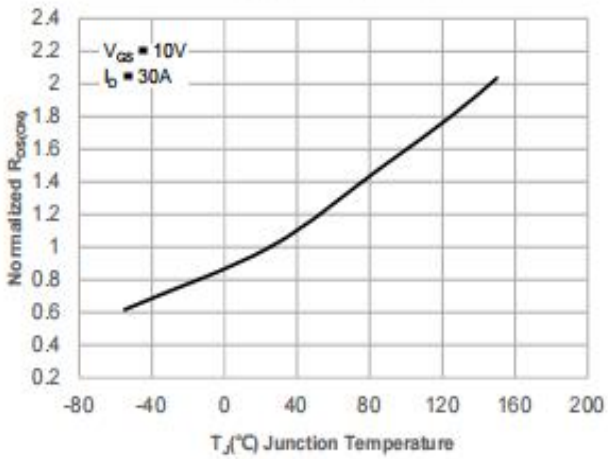


Figure 9: Maximum Safe Operating Area

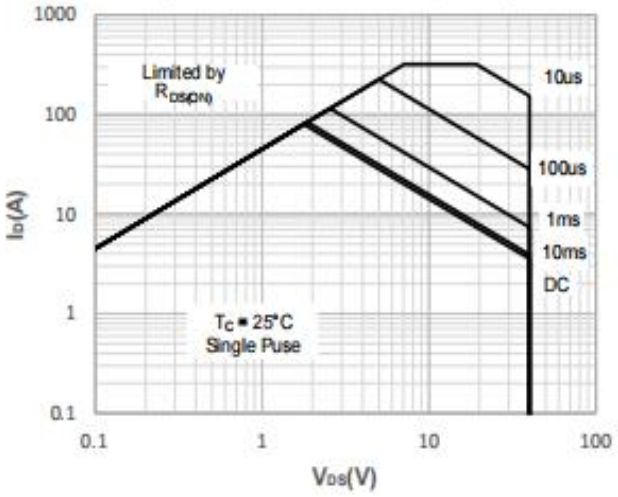


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

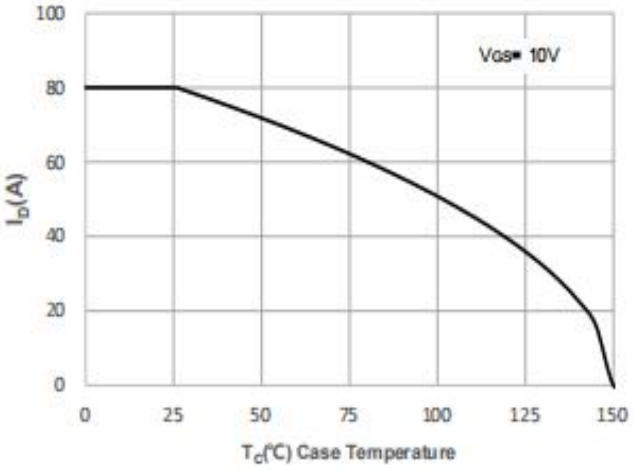


Figure 11: Normalized Maximum Transient Thermal Impedance

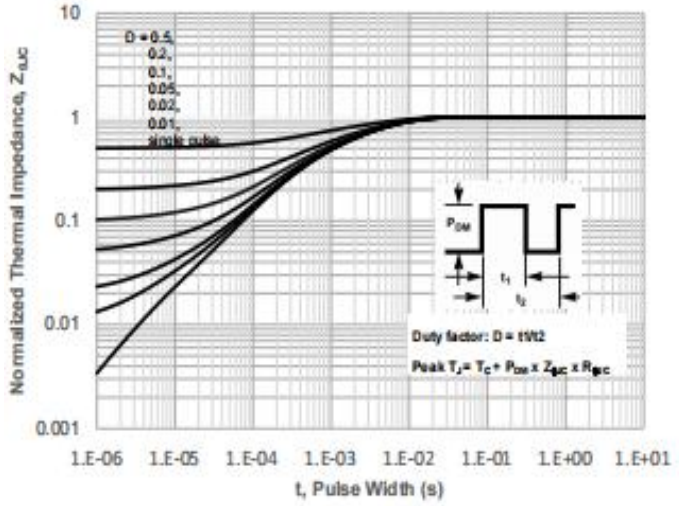
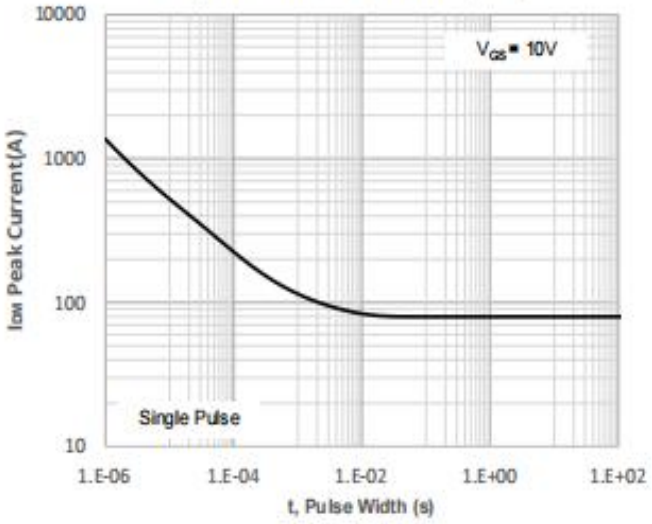


Figure 12: Peak Current Capacity



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Test ircuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

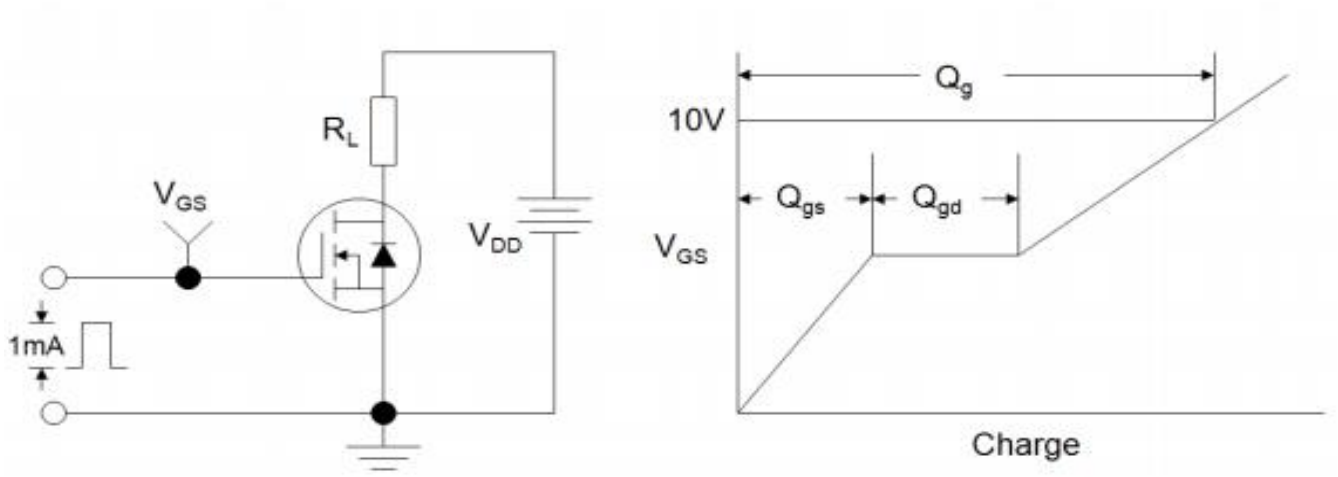


Figure B: Resistive Switching Test Circuit and Waveform

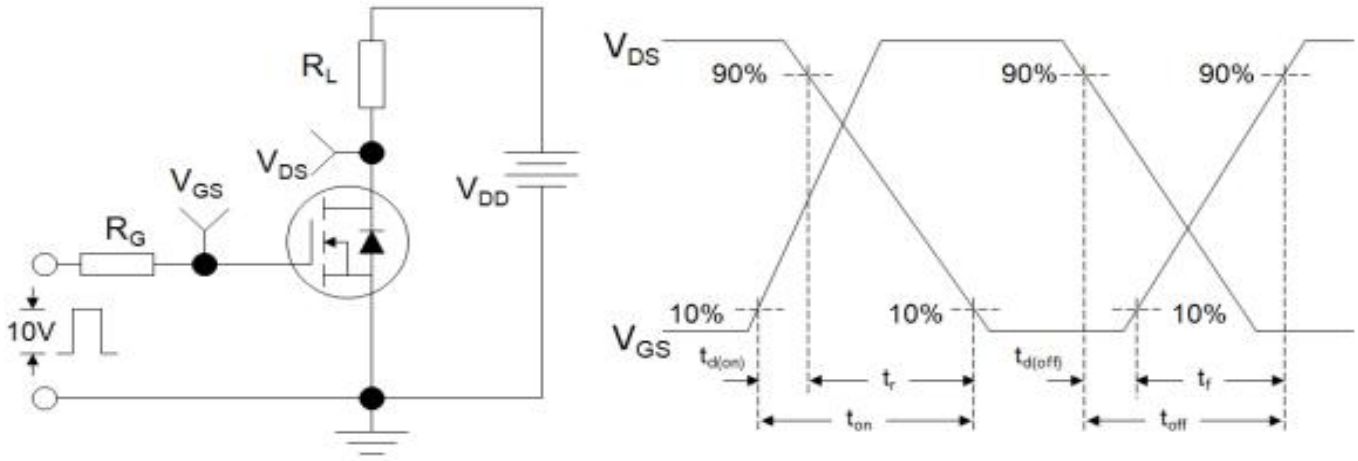
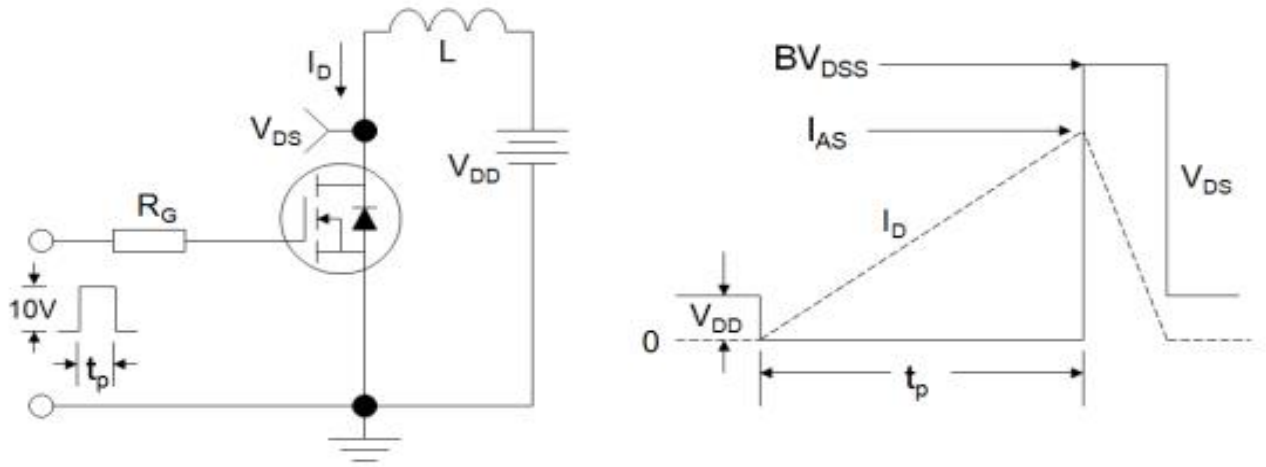


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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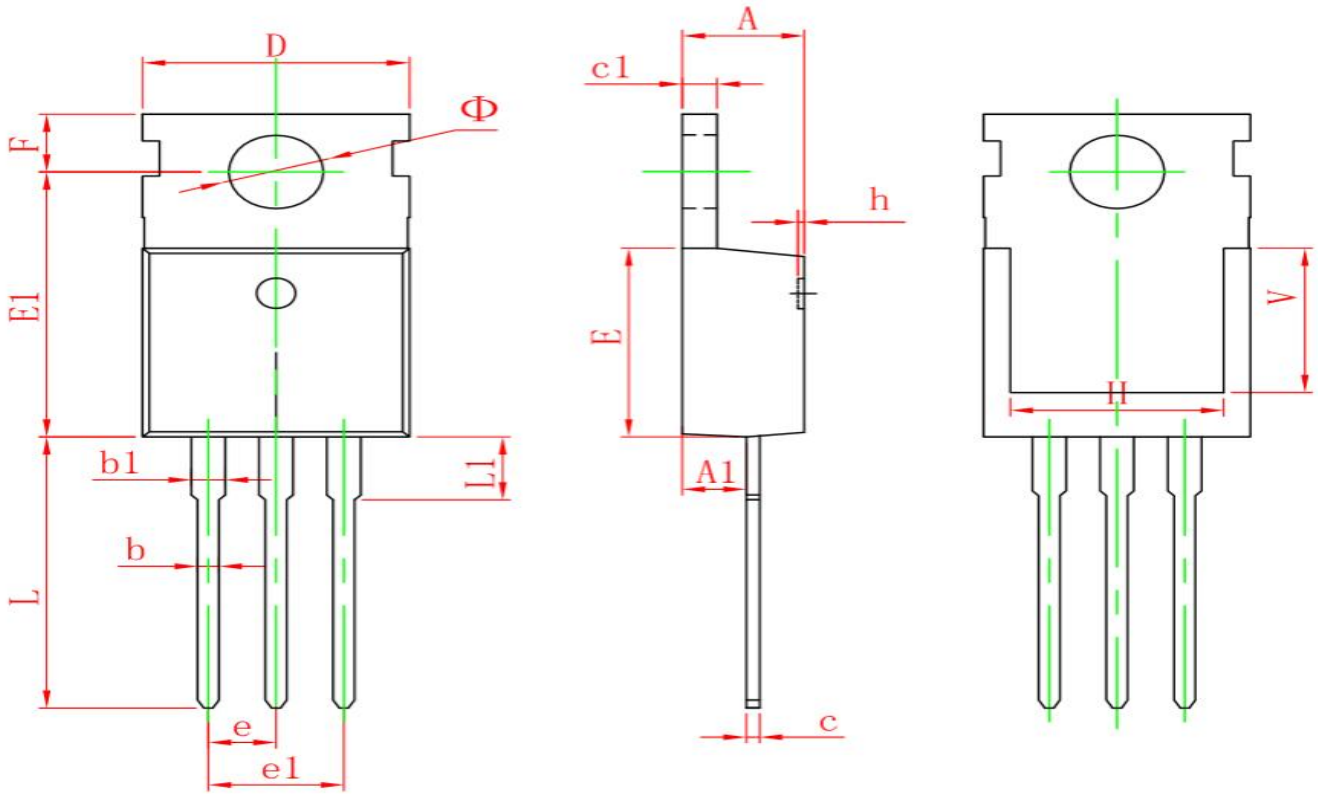
Package outline drawing(TO-220 Unit: mm)



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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