

ID	$R_{DS(ON)}$ (Typ)	VDSS
80A	4.2m Ω	40V

Applications:

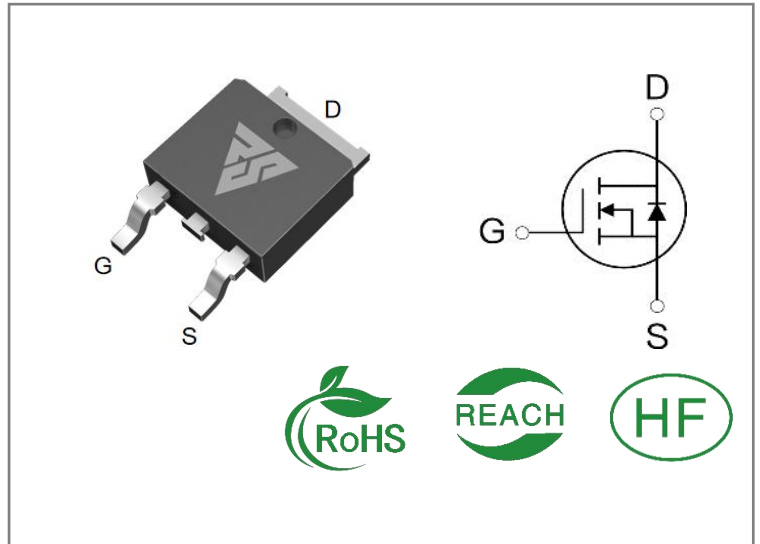
- Load Switch
- PWM Applications
- Power Managment

Features:

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

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS40N80D	T0-252	RS40N80D	Tape&reel	2500 PCS


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

Symbol	Parameter	RS40N80D	Units
VDSS	Drain-to-Source Voltage	40	V
ID	Continuous Drain Current $T_C = 25^{\circ}\text{C}$	80	A
ID	Continuous Drain Current $T_C = 100^{\circ}\text{C}$	50	
IDM	Pulsed Drain Current (Note*1)	320	
PD	Power Dissipation	125	W
VGS	Gate- to- Source Voltage	± 20	V
EAS	Single Pulse Avalanche Engergy $L = 0.5\text{mH}$, $V_{DD} = 20\text{V}$, $R_G = 25\ \Omega$, $T_C = 25^{\circ}\text{C}$	155	mJ
TL TPKG	Maximum Temperature for Soldering	300	$^{\circ}\text{C}$
	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	RS40N80D	Units	Test Conditions
R θ JC	Junction-to-Case	0.88	$^{\circ}\text{C} / \text{W}$	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 150 $^{\circ}\text{C}$
R θ JA	Junction-to- Ambient	31		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	40	--	--	V	VGS=0V ID=250 μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=40V 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(Note*2)	--	4.2	5.5	m Ω	VGS=10V ID=30A
		--	6.5	7.8	m Ω	VGS=4.5V ID=20A
VGS(TH)	Gate Threshold Voltage	1.3	1.9	2.5	V	VGS=VDS ID=250 μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	12	--	nS	VDS=20V ID=30A RG=3 Ω
trise	Rise Time	--	30	--		
td(OFF)	Turn- OFF Delay Time	--	60	--		
tfall	Fall Time	--	17	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	3760	--	pF	VGS=0V VDS=20V f=1.0MHz
Coss	Output Capacitance	--	260	--		
Crss	Reverse Transfer Capacitance	--	222	--		
Qg	Total Gate Charge	--	73	--	nC	VDS=20V ID=30A VGS=10V
Qgs	Gate- to- Source Charge	--	15	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	16	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	80	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	320	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=30A,VGS=0V
trr	Reverse Recovery Time	--	16	--	nS	VGS=0V IS=20A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	10	--	nC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$

Typical Feature Curve

Figure 1: Output Characteristics

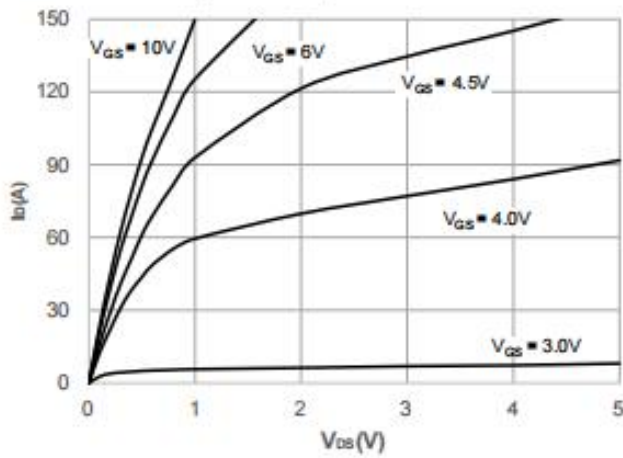


Figure 2: Typical Transfer Characteristics

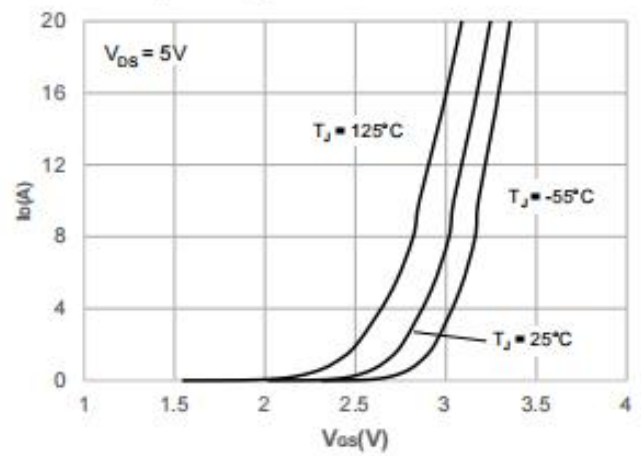


Figure 3: On-resistance vs. Drain Current

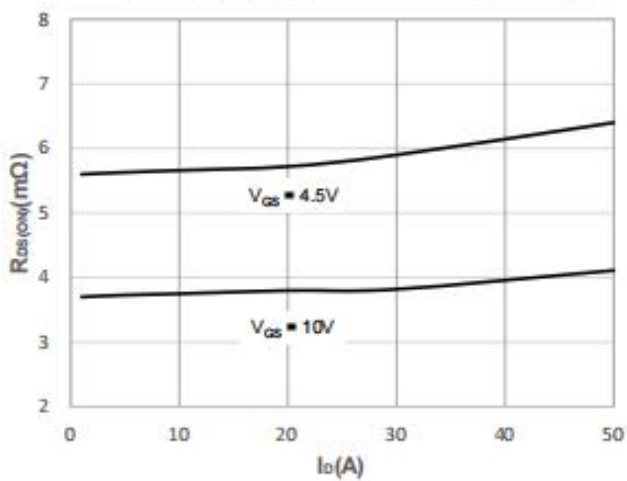


Figure 4: Body Diode Characteristics

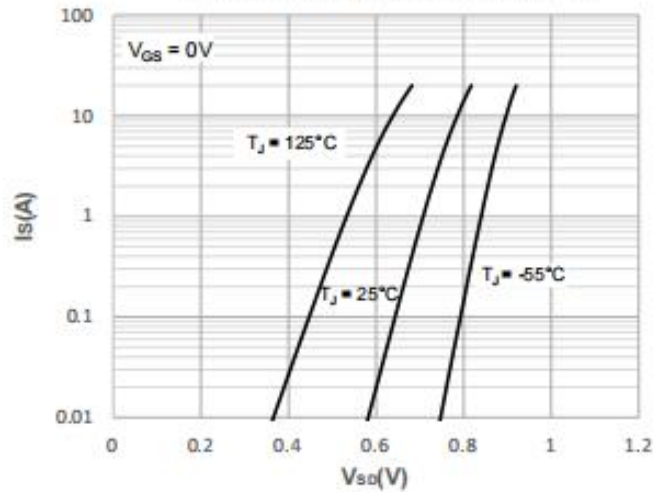


Figure 5: Gate Charge Characteristics

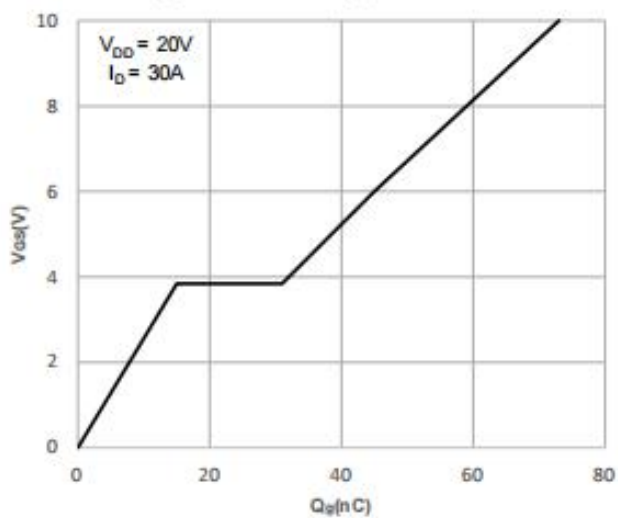


Figure 6: Capacitance Characteristics

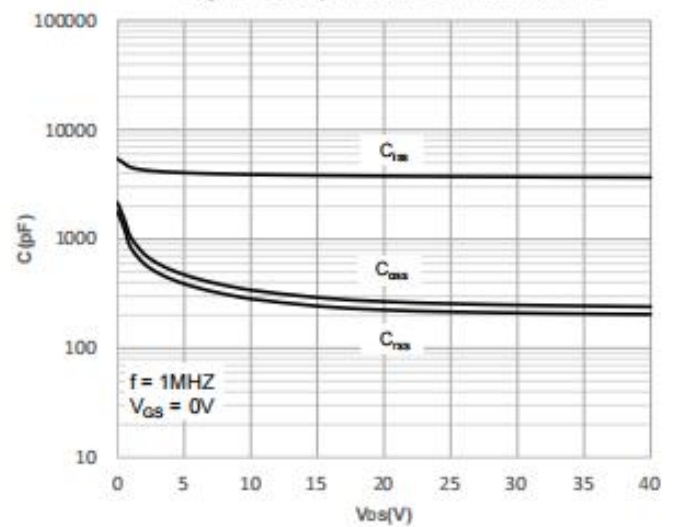


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

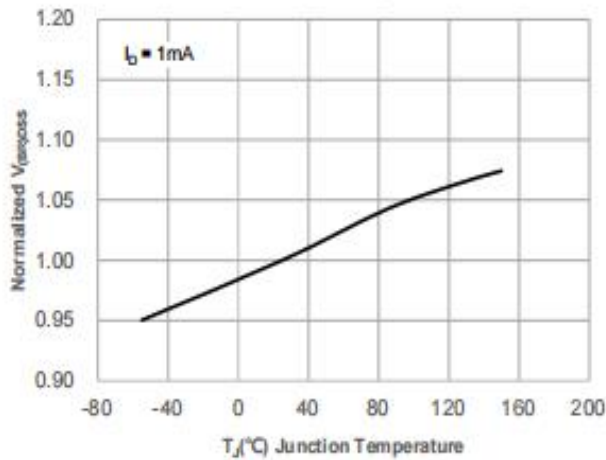


Figure 8: Normalized on Resistance vs. Junction Temperature

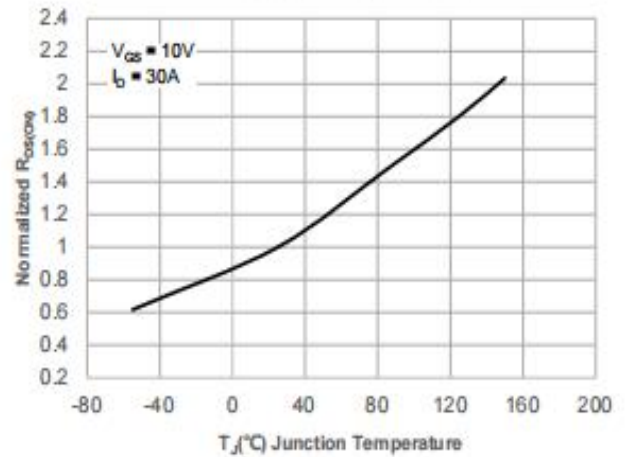


Figure 9: Maximum Safe Operating Area

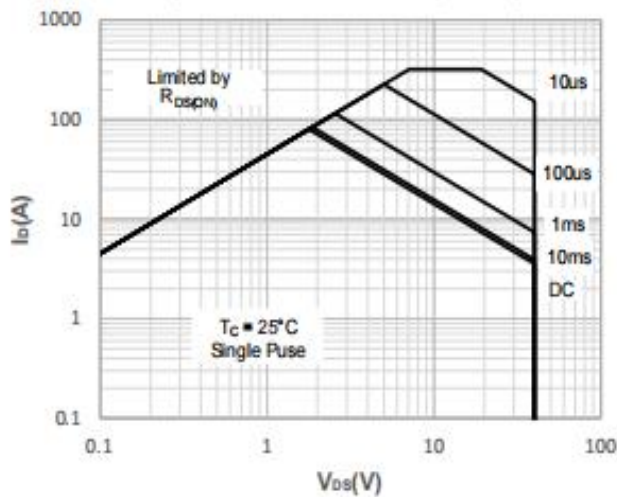


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

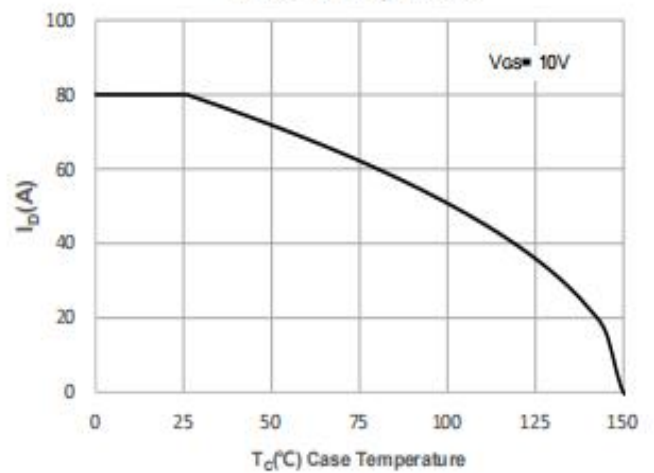


Figure 11: Normalized Maximum Transient Thermal Impedance

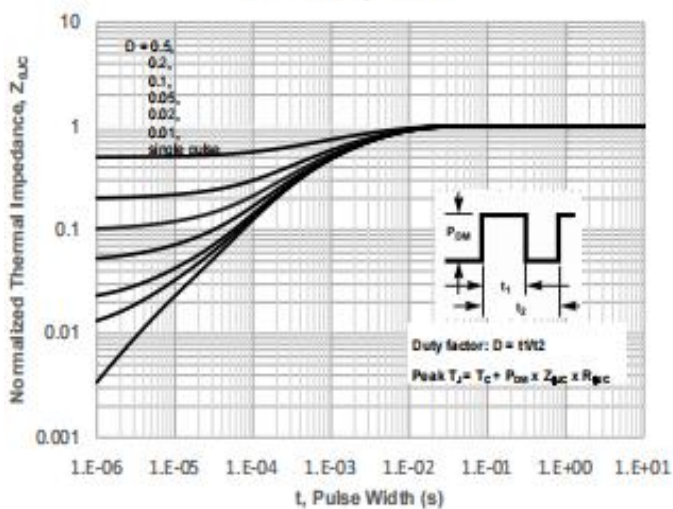
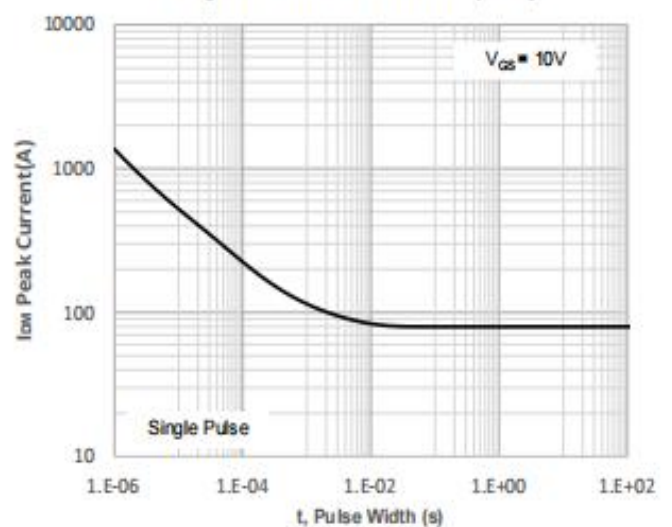


Figure 12: Peak Current Capacity



Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

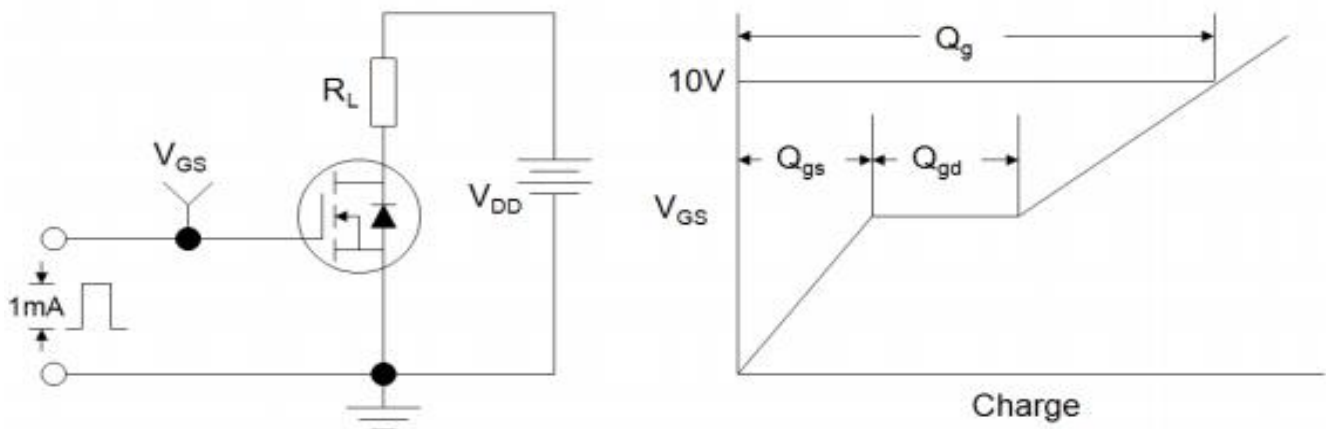


Figure B: Resistive Switching Test Circuit and Waveform

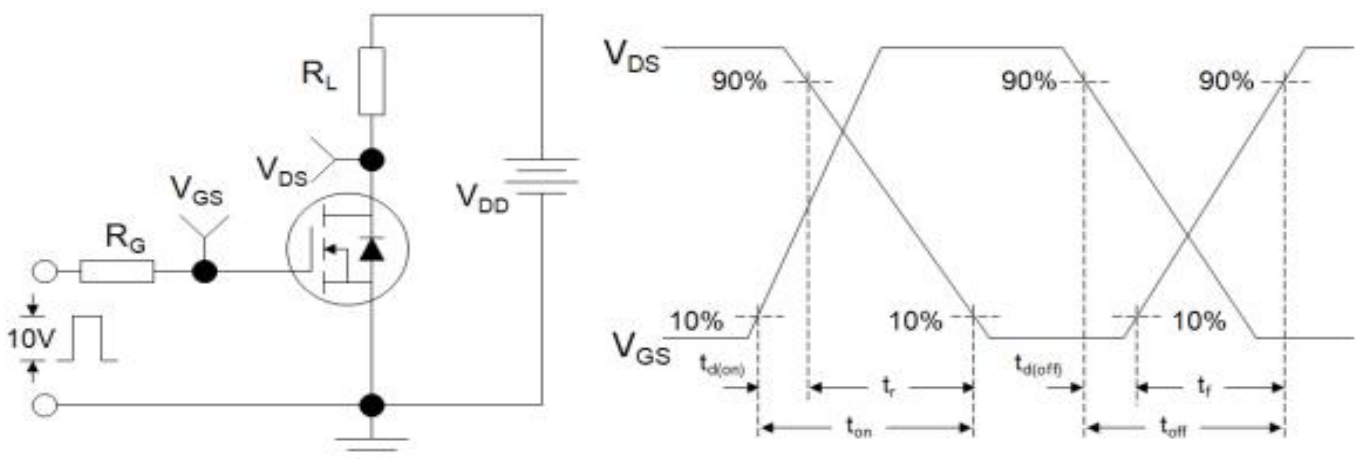
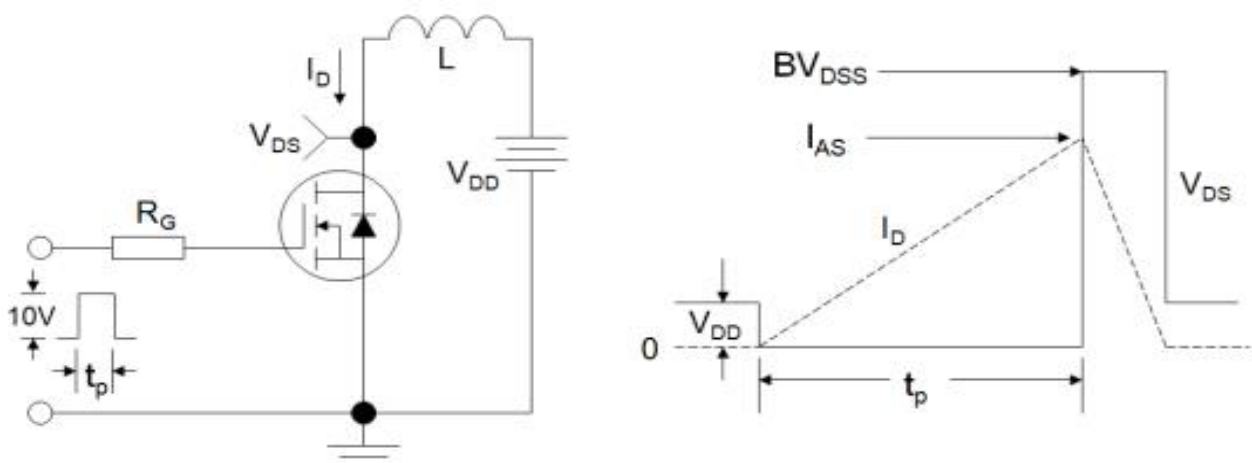
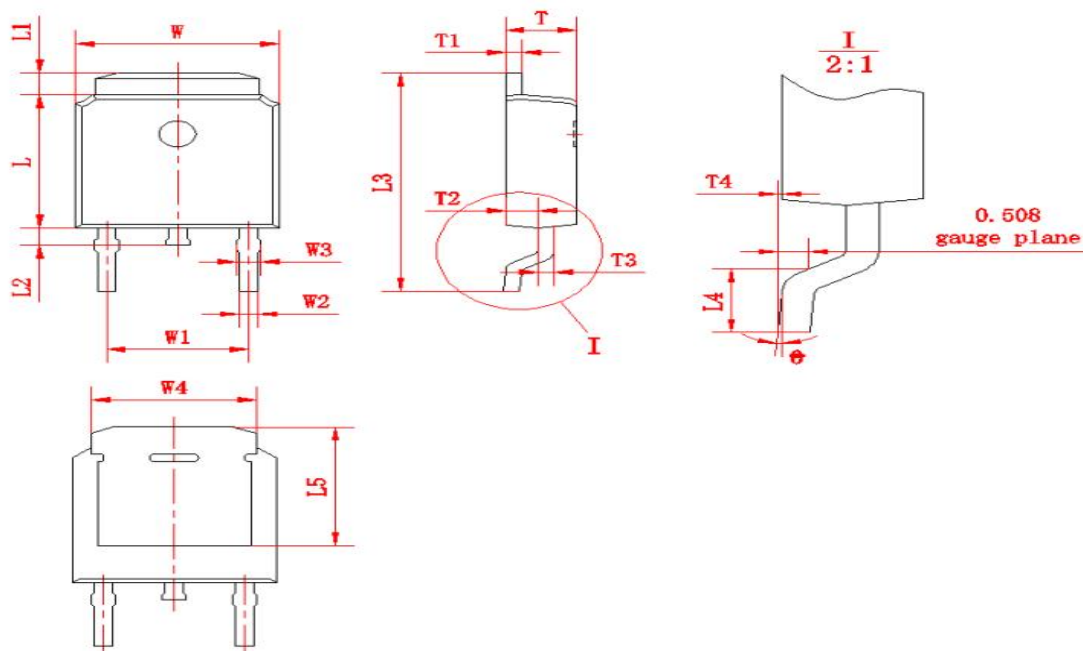


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Package outline drawing(TO-252 Unit: mm)



符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
W	6.50	6.70	L1	0.80	1.20	T1	0.48	0.58
W1	(4.572)		L2	0.60	1.00	T2	0.95	1.15
W2	0.6	0.8	L3	9.70	10.30	T3	0.48	0.58
W3	0.68	0.88	L4	1.30	1.70	T4	0.00	0.12
W4	(5.3)		L5	(5.20)		0	0	8
L	6.00	6.20	T	2.20	2.40			

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