

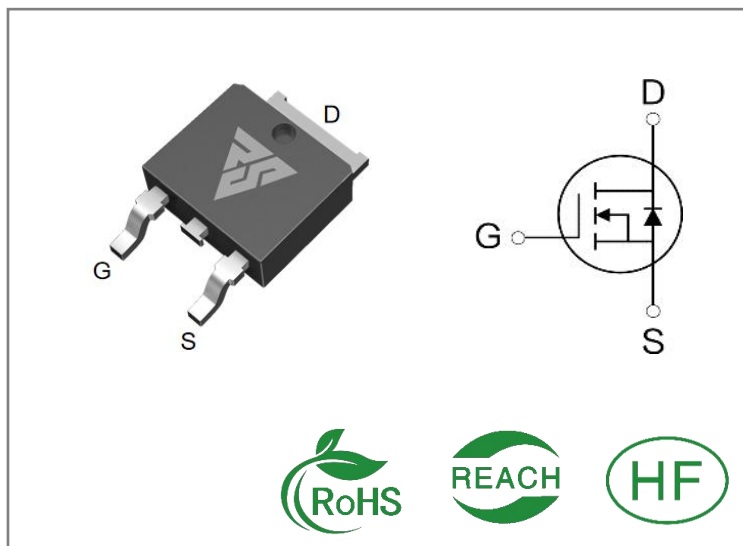
ID	$R_{DS(ON)}$ (Typ)	VDSS
60A	4.8m Ω	20V

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.
RS20N60D	T0-252	RS20N60D	Tape&reel	2500 PCS

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

Symbol	Parameter	RS20N60D	Units
VDSS	Drain-to-Source Voltage	20	V
ID	Continuous Drain Current $T_C=25^{\circ}\text{C}$	60	A
ID	Continuous Drain Current $T_C=100^{\circ}\text{C}$	39	
IDM	Pulsed Drain Current	240	
PD	Power Dissipation	38	W
VGS	Gate- to- Source Voltage	± 12	V
EAS	Single Pulse Avalanche Engergy $L = 0.5\text{mH}, V_{DD} = 15\text{V}, R_G = 25\Omega, T_j = 25^{\circ}\text{C}$	65	mJ
TL TPKG	Maximum Temperature for Soldering	300	$^{\circ}\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds	260	
	Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	
ESD	HBN JESD22-A114	1000	V
	CDM JESD22-C101	1000	

* 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	RS20N60D	Units	Test Conditions
R θ JC	Junction-to-Case	3.3	$^{\circ}\text{C} / \text{W}$	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	32		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	20	--	--	V	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	$V_{GS}=12\text{V}, V_{DS}=0\text{V}$
	Gate- to- Source Reverse Leakage	--	--	-100		$V_{GS}=-12\text{V}, V_{DS}=0\text{V}$

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	--	4.8	6.2	m Ω	$V_{GS}=4.5\text{V}, I_D=25\text{A}$
		--	6.5	8.5	m Ω	$V_{GS}=2.5\text{V}, I_D=15\text{A}$
VGS(TH)	Gate Threshold Voltage	0.5	0.9	1.1	V	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	12	--	nS	$V_{DS}=10\text{V}$ $I_D=20\text{A}$ $R_G=3\Omega$ $V_{GS}=4.5\text{V}$
trise	Rise Time	--	32	--		
td(OFF)	Turn- OFF Delay Time	--	48	--		
tfall	Fall Time	--	93	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2007	--	pF	VGS= 0V VDS=10V f=1.0MHz
Coss	Output Capacitance	--	278	--		
Crss	Reverse Transfer Capacitance	--	252	--		
Qg	Total Gate Charge	--	23	--	nC	VDS= 10V ID=20A VGS=4.5V
Qgs	Gate- to- Source Charge	--	4	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	7	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	60	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	240	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=30A,VGS=0V
trr	Reverse Recovery Time	--	12	--	nS	VGS=0V IS=20A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	2.5	--	nC	

Notes:

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

Typical Feature Curve

Figure 1: Output Characteristics

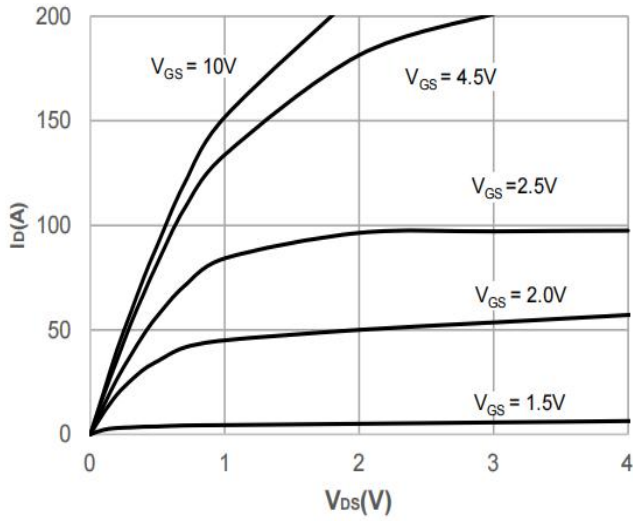


Figure 2: Typical Transfer Characteristics

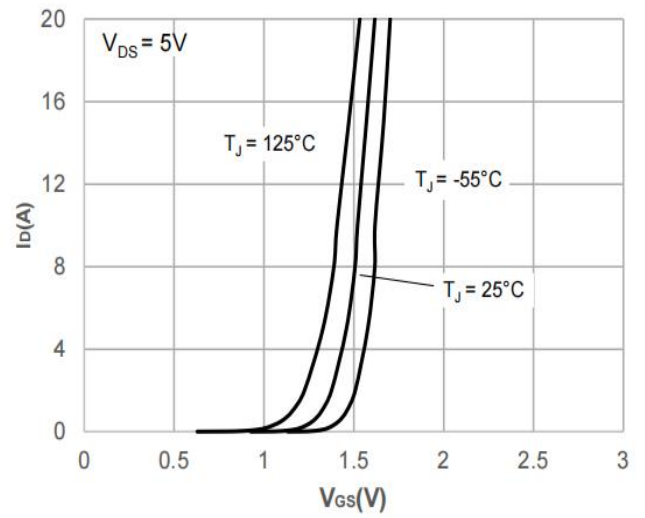


Figure 3: On-resistance vs. Drain Current

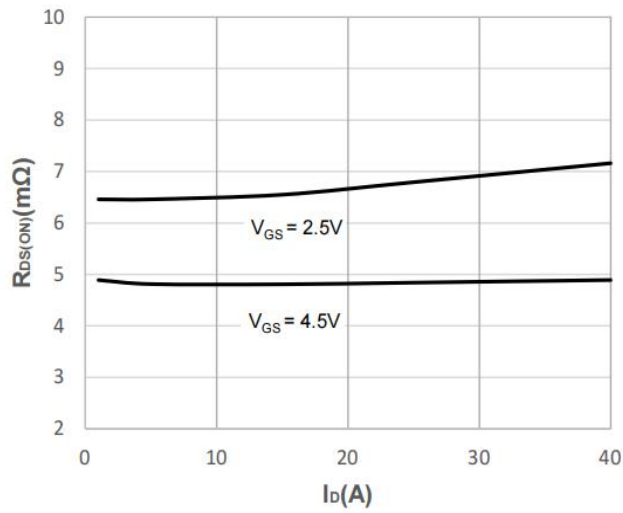


Figure 4: Body Diode Characteristics

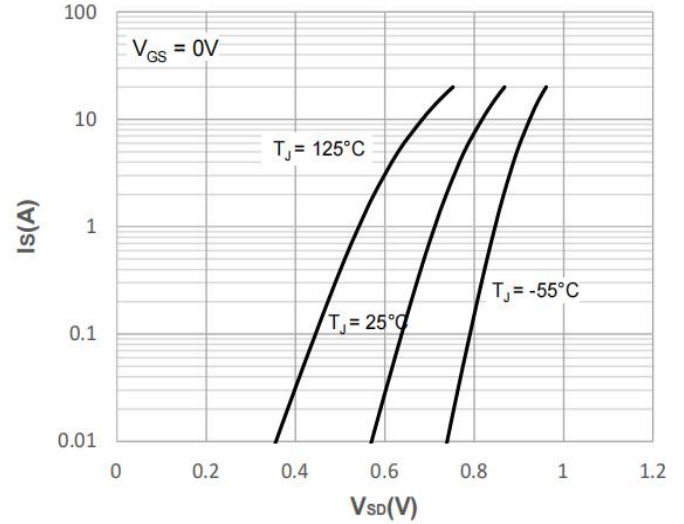


Figure 5: Gate Charge Characteristics

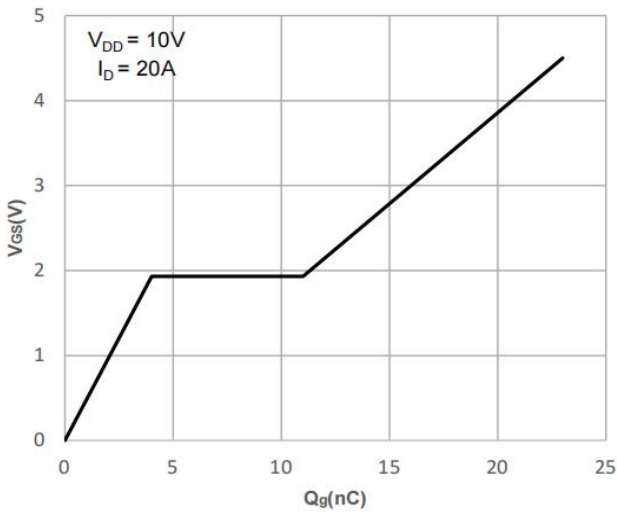


Figure 6: Capacitance Characteristics

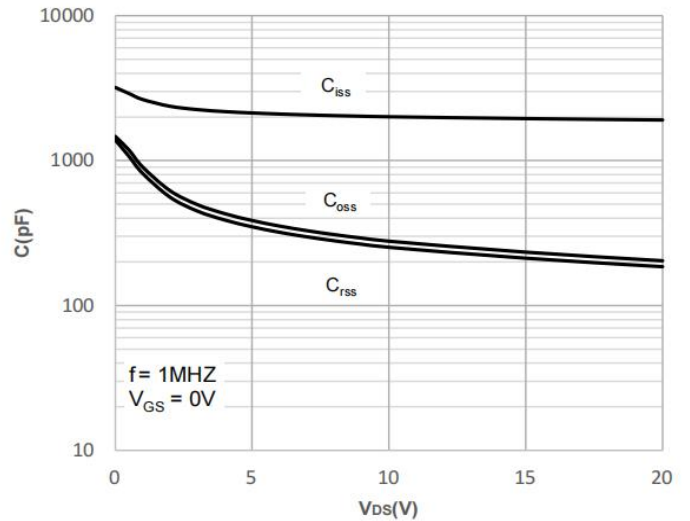


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

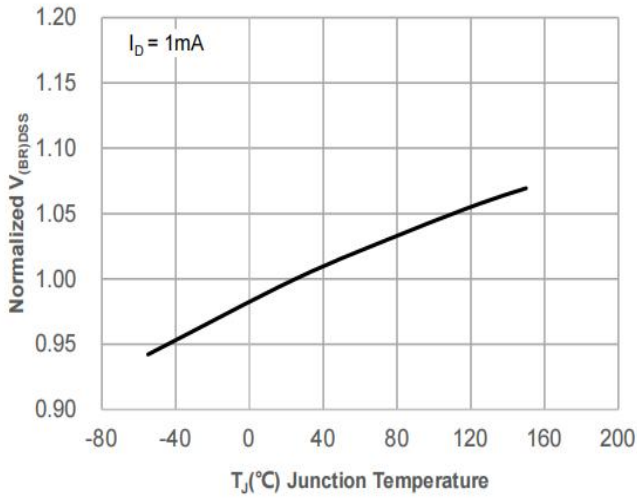


Figure 8: Normalized on Resistance vs. Junction Temperature

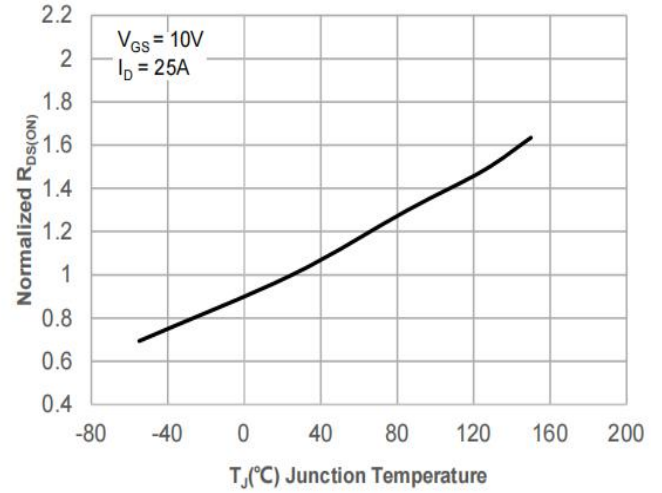


Figure 9: Maximum Safe Operating Area

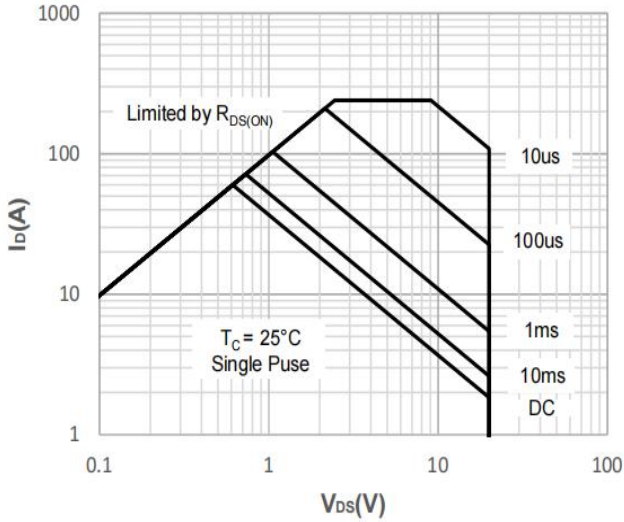


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

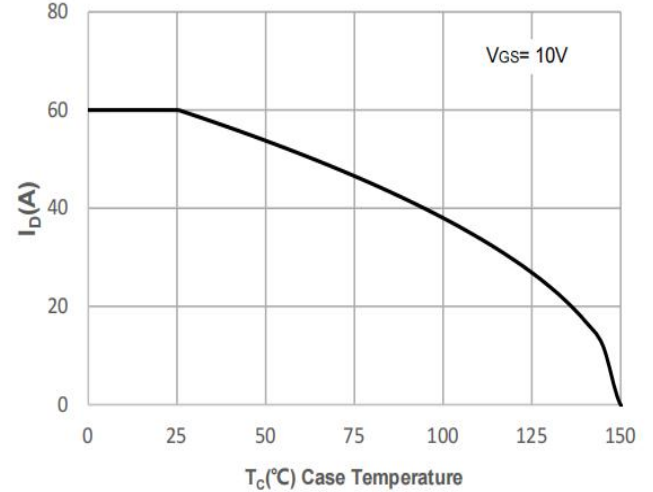


Figure 11: Normalized Maximum Transient Thermal Impedance

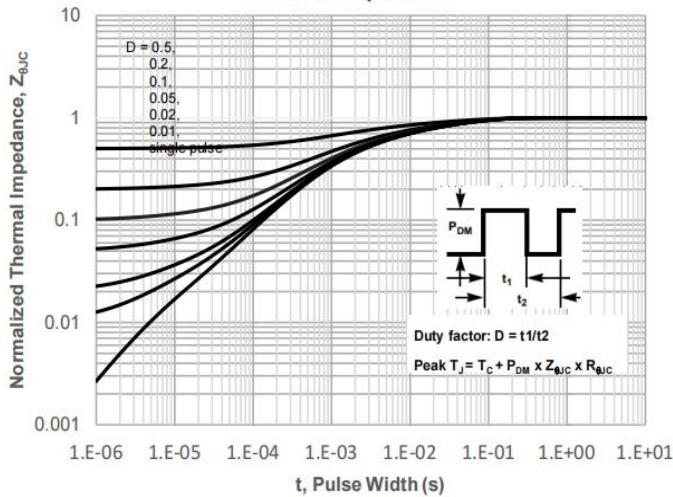
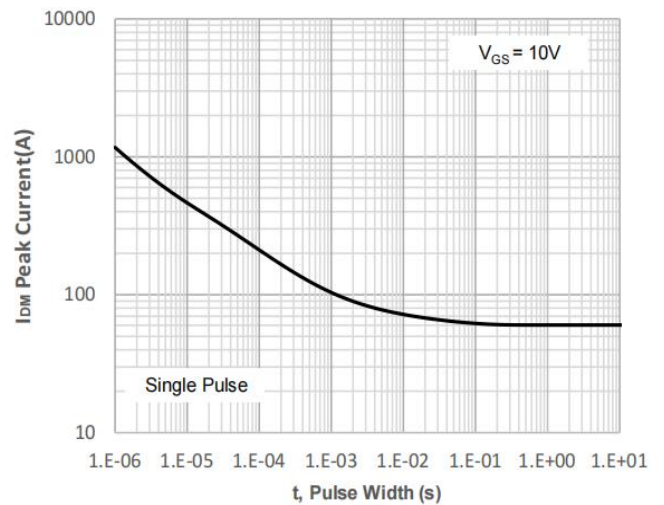


Figure 12: Peak Current Capacity



Test ircuits and Waveforms

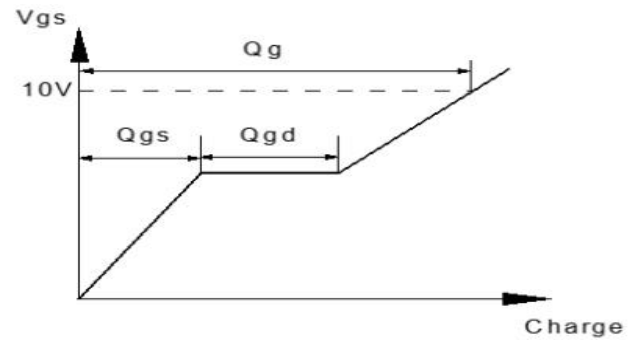
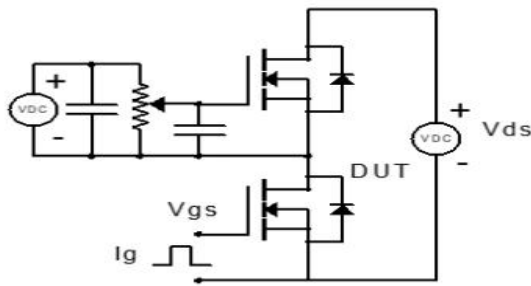


Figure 1: Gate Charge Test Circuit & Waveform

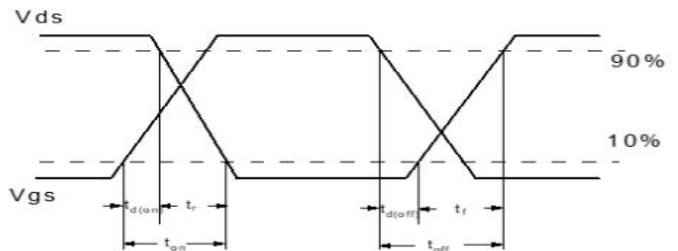
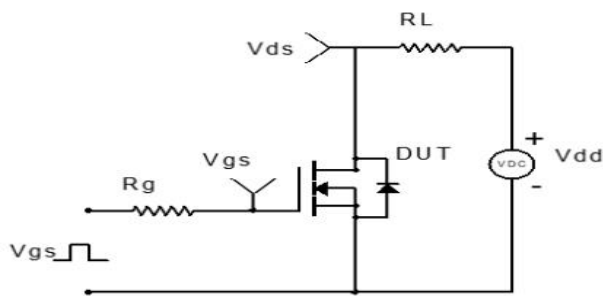


Figure 2: Resistive Switching Test Circuit & Waveform

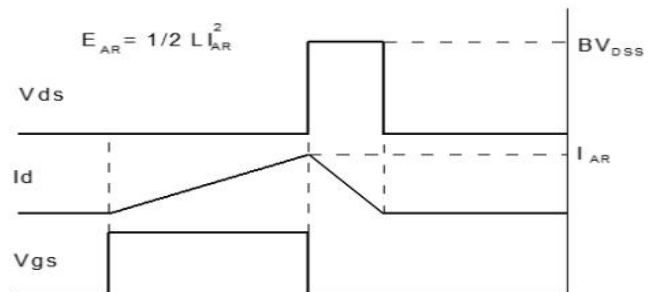
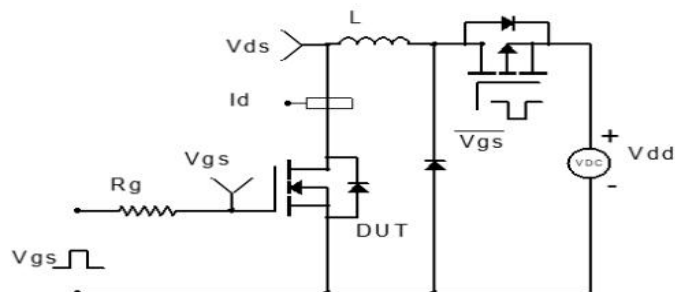


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

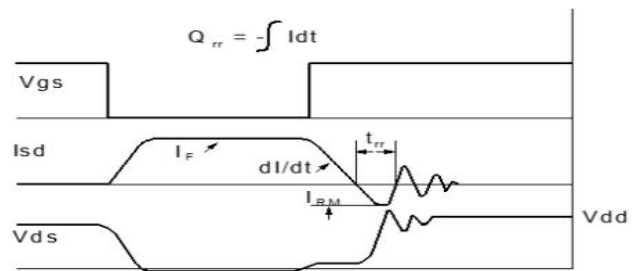
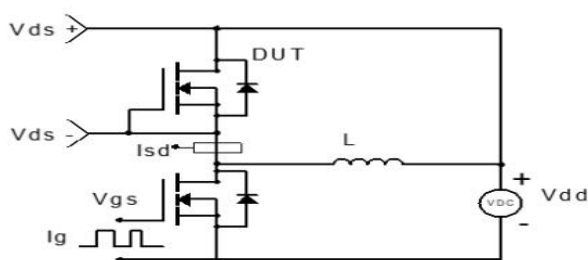
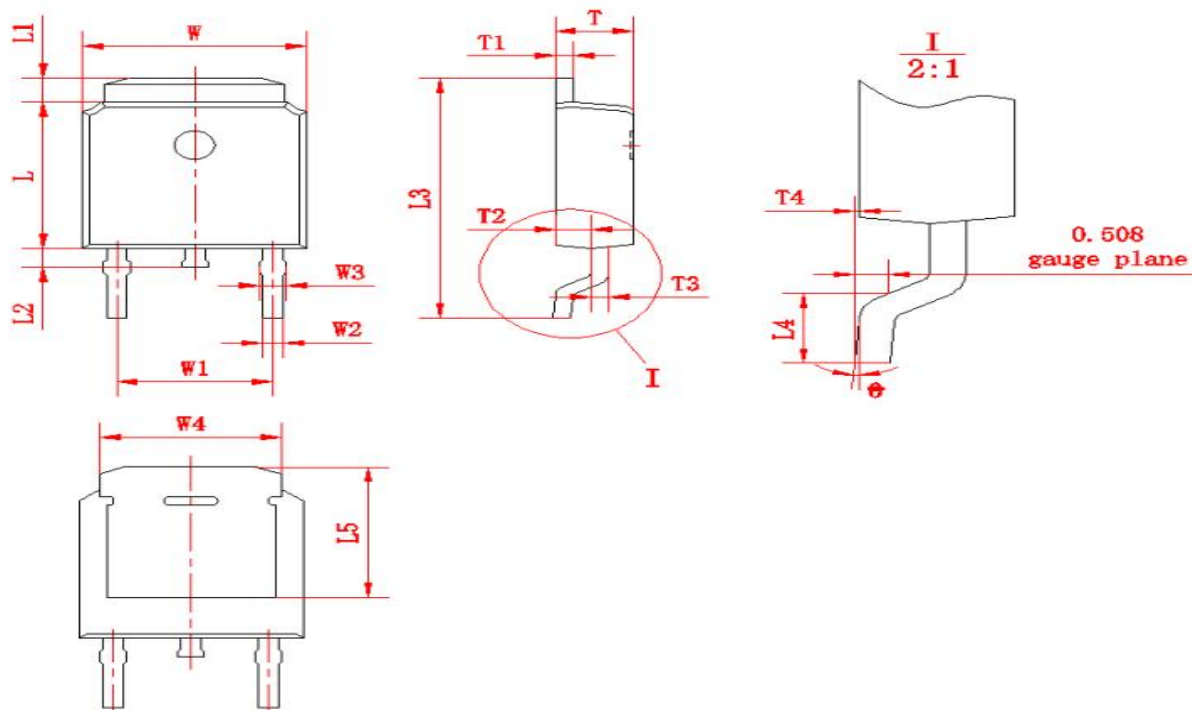


Figure 4: Diode Recovery Test Circuit & Waveform

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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