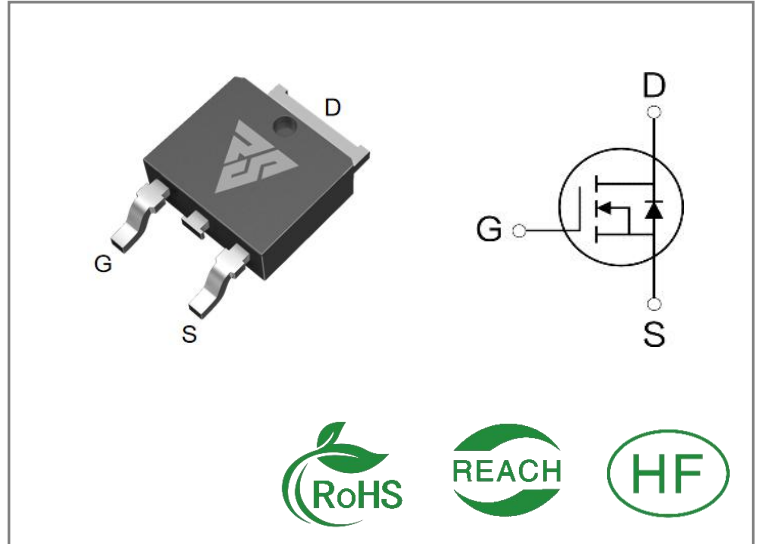


ID	R _{DS(ON)} (Typ)	VDSS
86A	4.7mΩ	30V


Applications:

- Load Switch
- PWM Applications
- Power Management

Features:

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

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS30N86D	T0-252	RS30N86D	Tape&reel	2500 PCS

Absolute Maximum Ratings T_c= 25°C unless otherwise specified

Symbol	Parameter	RS30N86D	Units
VDSS	Drain-to-Source Voltage	30	V
ID	Continuous Drain Current TC=25°C	86	A
ID	Continuous Drain Current TC=100°C	50	
IDM	Pulsed Drain Current	170	
PD	Power Dissipation	83	W
VGS	Gate- to- Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy L = 0.5mH, VDD = 15V, R _G = 25Ω, T _j = 25°C	306	mJ
TL TPKG	Maximum Temperature for Soldering	300	°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.
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Thermal Resistance

Symbol	Parameter	RS30N86D	Units	Test Conditions
R θ JC	Junction-to-Case	1.8	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C
R θ JA	Junction-to-Ambient	60		1 cubic foot chamber, free air.

OFF Characteristics T_J= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	30	--	--	V	V _{GS} =0V, I _D =250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	V _{DS} =30V, 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} =0 V

ON Characteristics T_J=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R _{DS(on)}	Static Drain- to- Source On-Resistance	--	4.7	5.5	mΩ	V _{GS} =10V, I _D =30A
		--	7.8	11	mΩ	V _{GS} =4.5V, I _D =24A
V _{GS(TH)}	Gate Threshold Voltage	1.0	1.5	3.0	V	V _{GS} =V _{DS} , 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	--	20	--	nS	V _{DS} =10V I _D =30A R _G =2.7Ω V _{GS} =10V
t _{rise}	Rise Time	--	15	--		
t _{d(OFF)}	Turn- OFF Delay Time	--	60	--		
t _{fall}	Fall Time	--	10	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2330	--	pF	VGS= 0V VDS=15V f=1.0MHz
Coss	Output Capacitance	--	460	--		
Crss	Reverse Transfer Capacitance	--	230	--		
Qg	Total Gate Charge	--	51	--	nC	VDS= 10V ID=30A VGS=10V
Qgs	Gate- to- Source Charge	--	14	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	11	--		

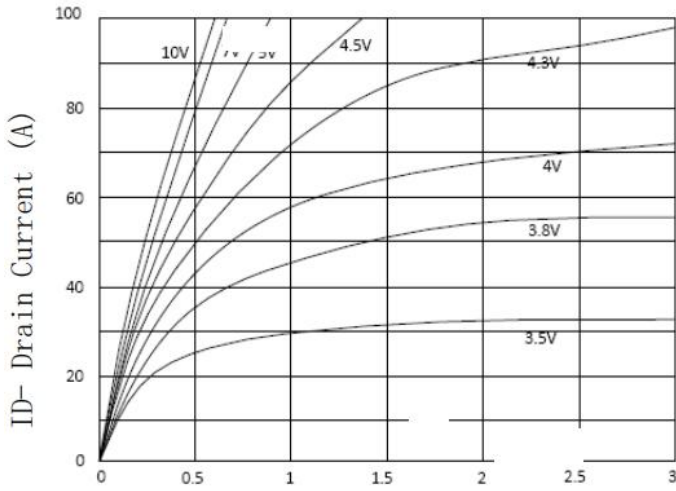
Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	86	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	170	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=24A,VGS=0V
trr	Reverse Recovery Time	--	32	50	nS	VGS=0V IS=80A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	12	20	nC	

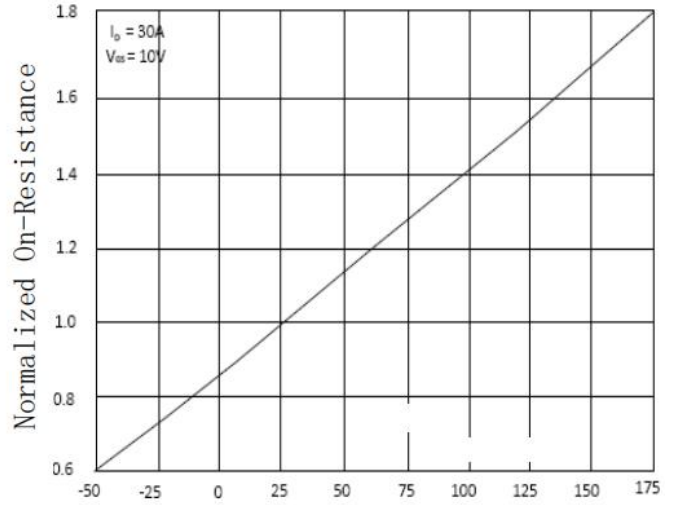
Notes:

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

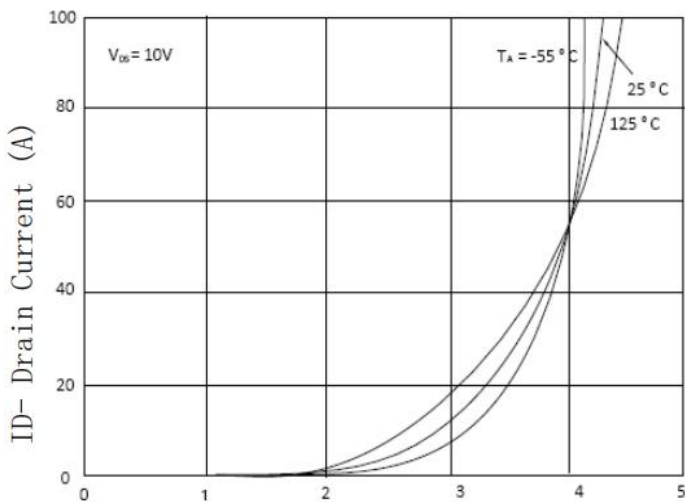
Typical Feature Curve



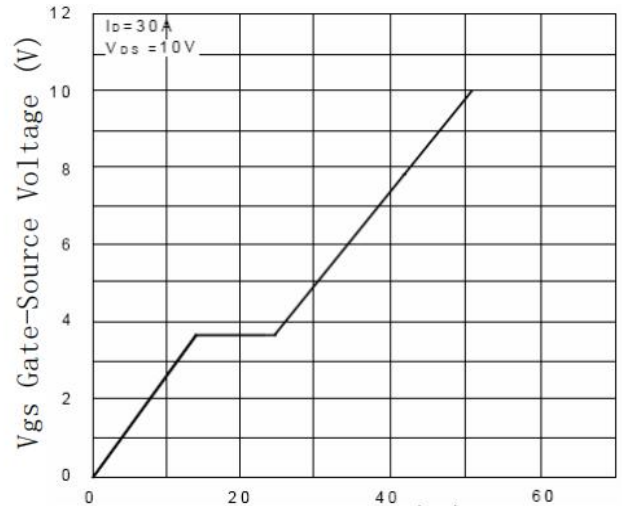
Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics



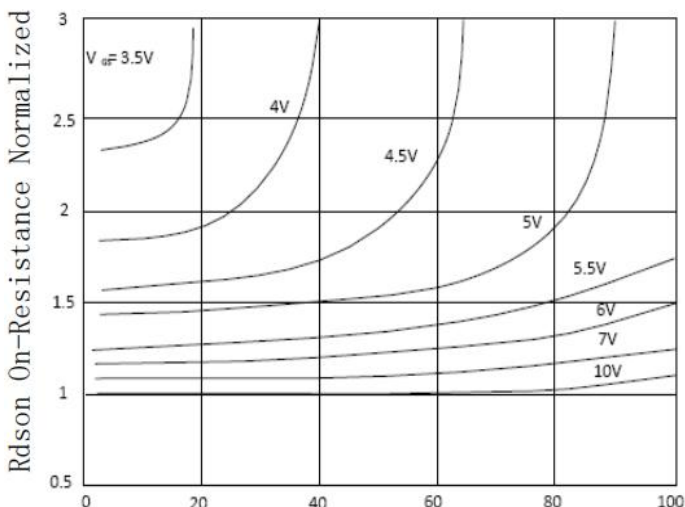
TJ-Junction Temperature (°C)
Figure 4 Rdson-Junction Temperature



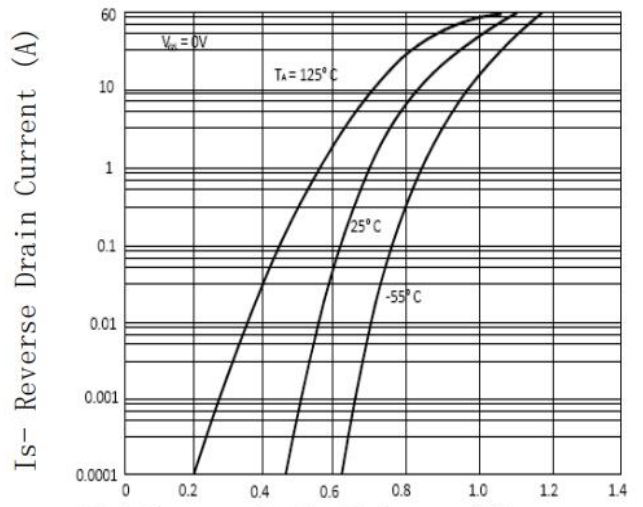
Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



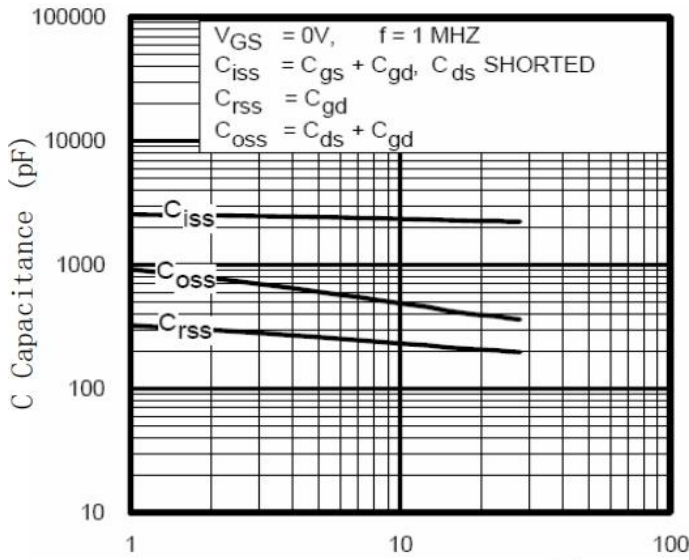
Qg Gate Charge (nC)
Figure 5 Gate Charge



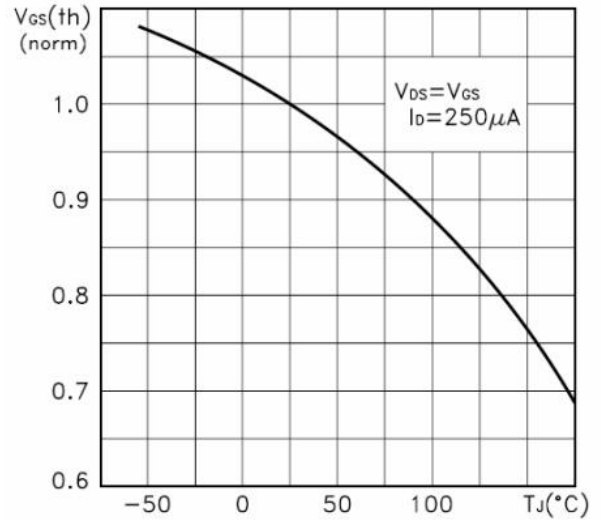
ID- Drain Current (A)
Figure 3 Rdson- Drain Current



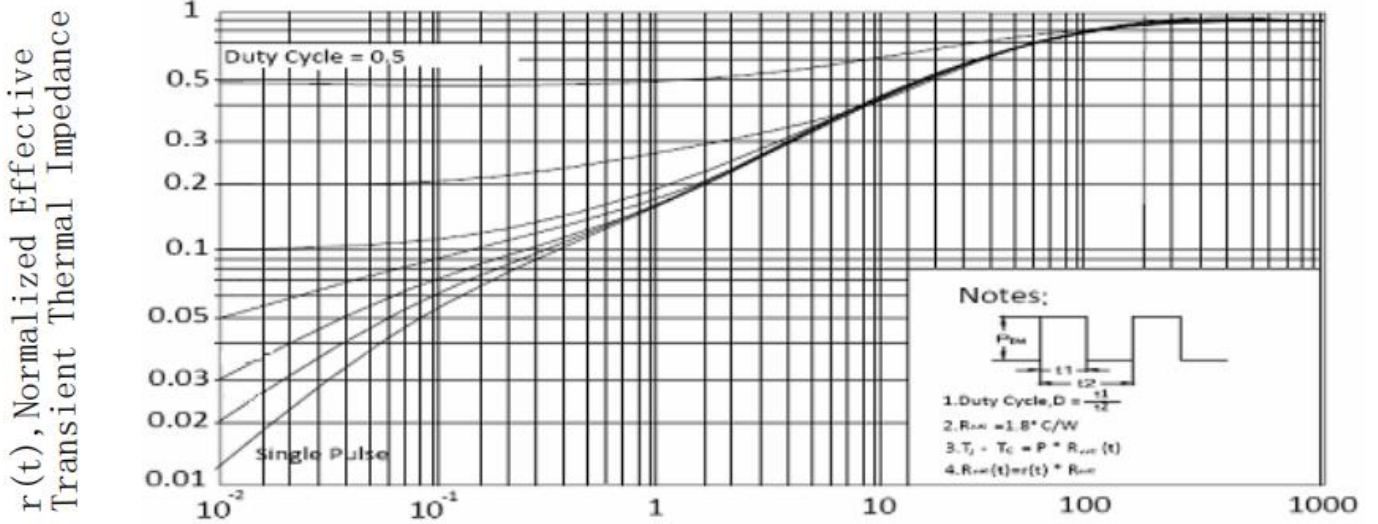
Vsd Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



TJ-Junction Temperature(°C)
Figure 8 VGS(th) vs Junction Temperature



Square Wave Pluse Duration(sec)
Figure 9 Normalized Maximum Transient Thermal Impedance

Test circuits and Waveforms

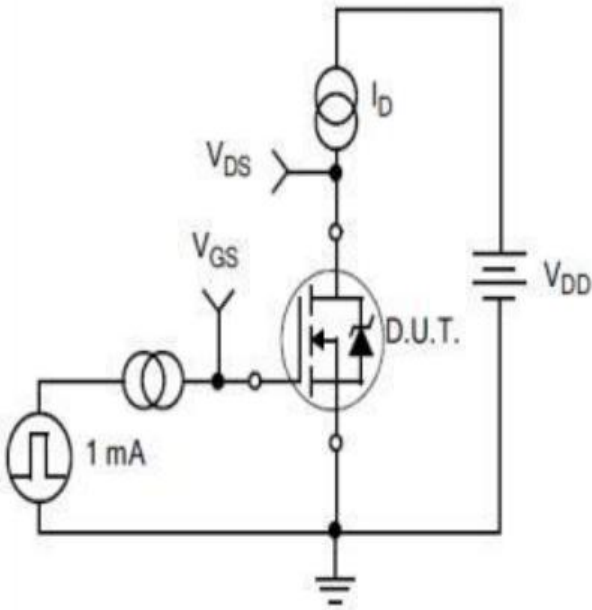


Figure A.
Gate Charge Test Circuit

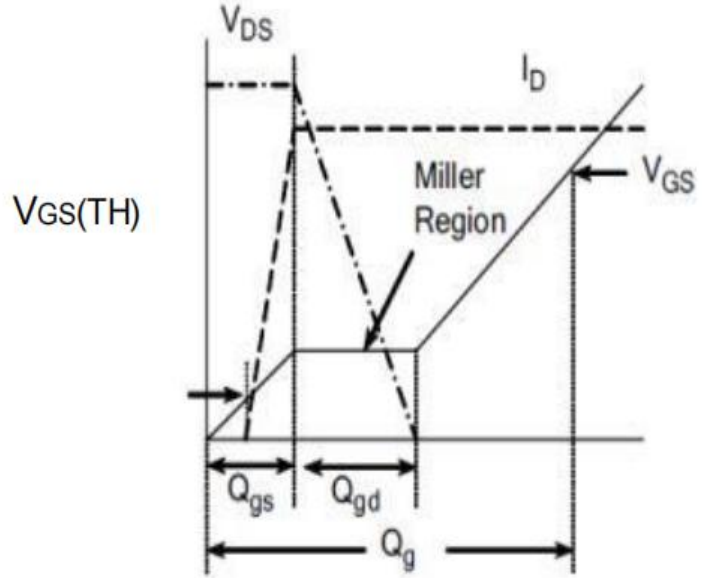


Figure B.
Gate Charge Waveform

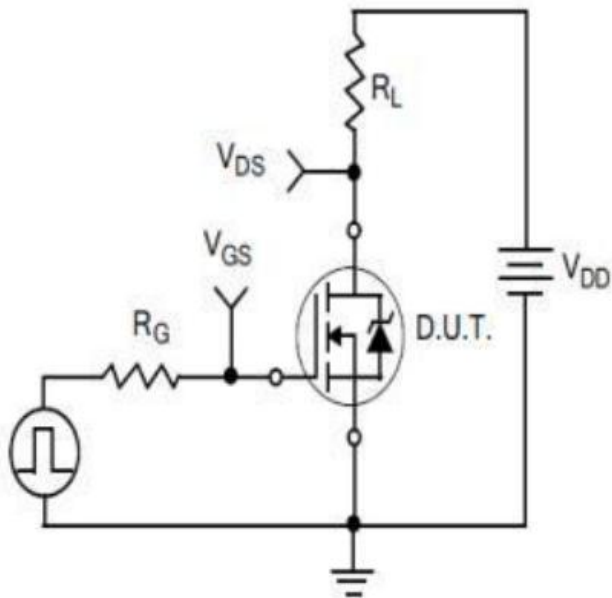


Figure C.
Resistive Switching Test Circuit

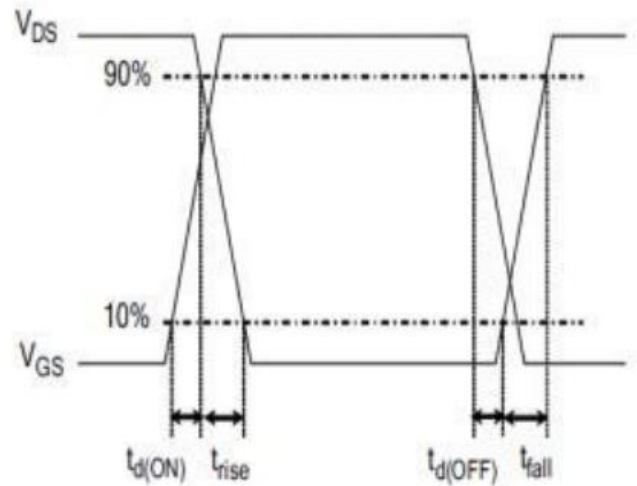


Figure D.
Resistive Switching Waveforms

Test Circuits and Waveforms

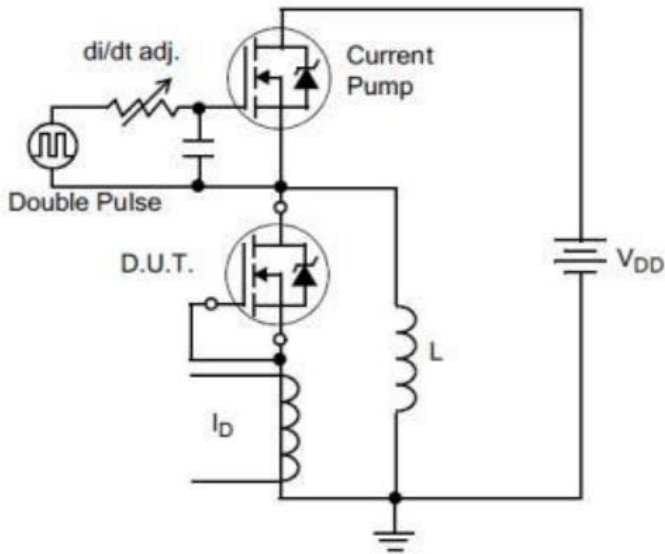


Figure E. Diode Reverse Recovery Test Circuit

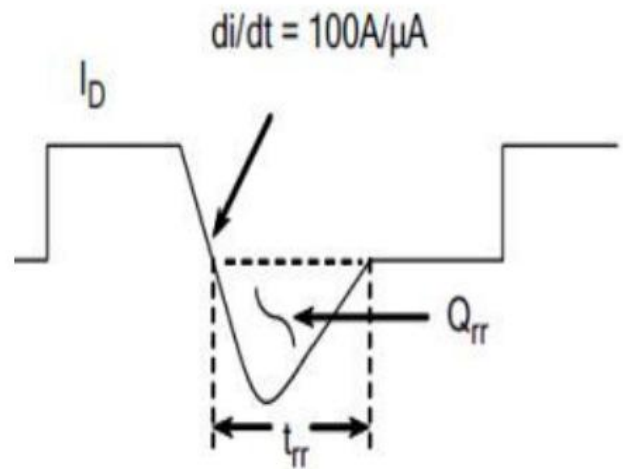


Figure F. Diode Reverse Recovery Waveform

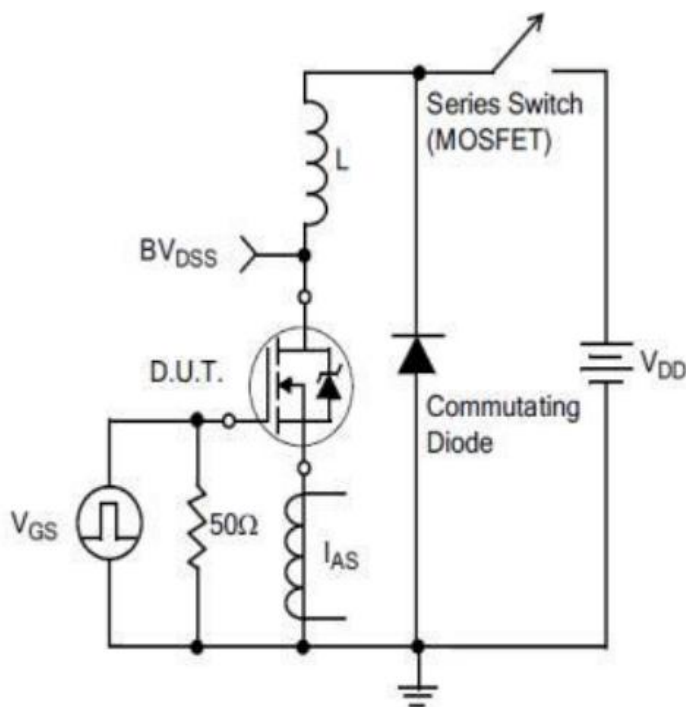
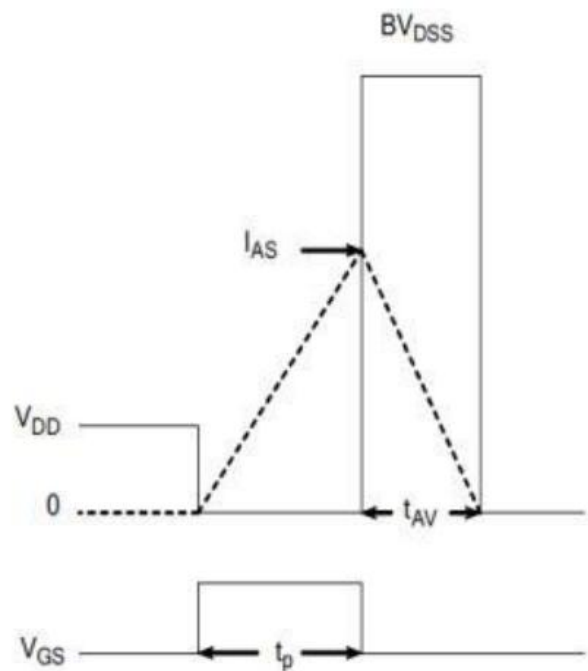


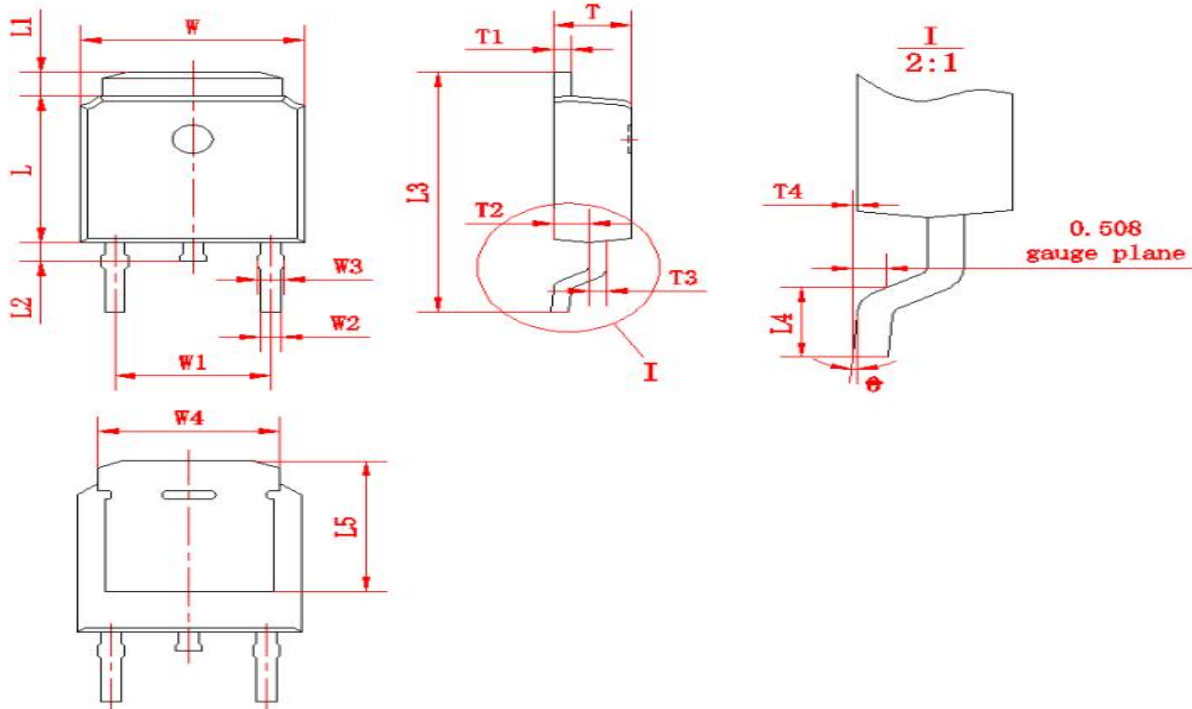
Figure G. Unclamped Inductive Switching Test Circuit



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

Figure H. Unclamped Inductive Switching Waveforms

Package outline drawing(TO-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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