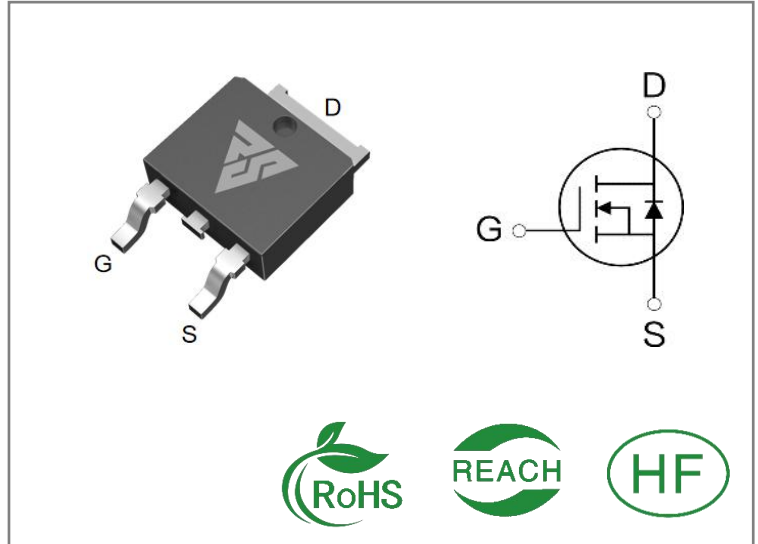| ID	$R_{DS}(ON)(Typ)$	VDSS
86A	4.7mΩ	30V

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.
RS30N86D	T0-252	RS30N86D	Tape&reel	2500 PCS

Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RS30N86D	Units
VDSS	Drain-to-Source Voltage	30	V
ID	Continuous Drain Current TC=25℃	86	A
ID	Continuous Drain Current TC=100℃	50	A
IDM	Pulsed Drain Current	170	A
PD	Power Dissipation	83	W
VGS	Gate- to- Source Voltage	±20	V
EAS	Single Pulse Avalanche Engergy L = 0.5mH,VDD = 15V, RG = 25Ω, Tj = 25℃	306	mJ
TL TPKG	Maximum Temperature for Soldering	300	℃
	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	RS30N86D	Units	Test Conditions
RθJC	Junction-to-Case	1.8	℃ / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃
RθJA	Junction-to-Ambient	60		1 cubic foot chamber,free air.

OFF Characteristics TJ= 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	30	--	--	V	VGS=0V,ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=30V,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 TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance	--	4.7	5.5	mΩ	VGS=10V,ID=30A
		--	7.8	11	mΩ	VGS=4.5V,ID=24A
VGS(TH)	Gate Threshold Voltage	1.0	1.5	3.0	V	VGS=VDS,ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	20	--	nS	VDS=10V ID=30A RG=2.7Ω VGS=10V
trise	Rise Time	--	15	--		
td(OFF)	Turn- OFF Delay Time	--	60	--		
tfall	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.
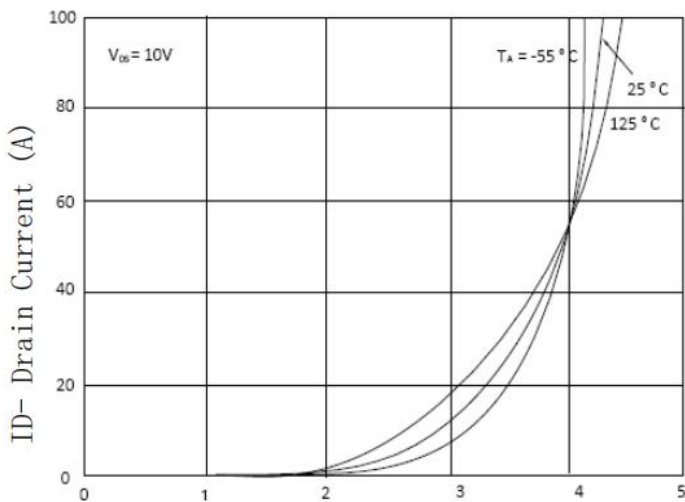
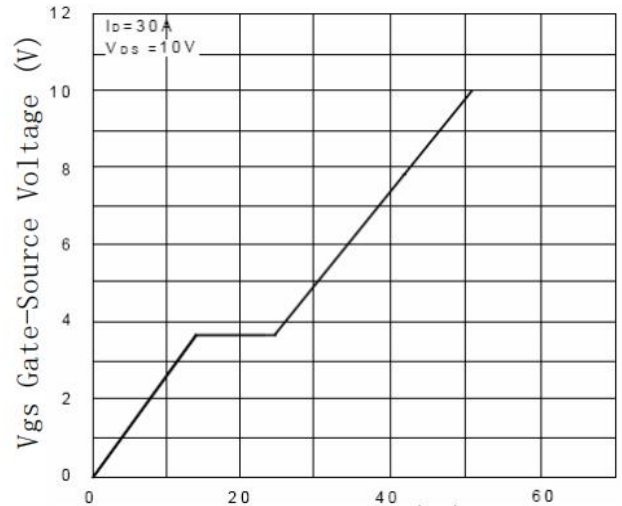* 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Feature Curve
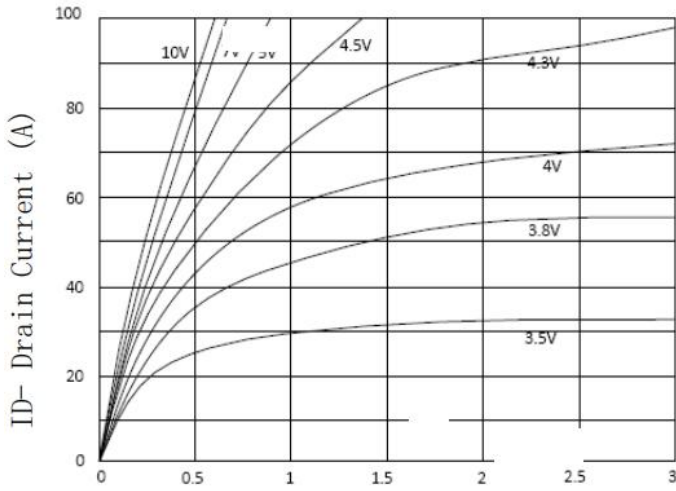
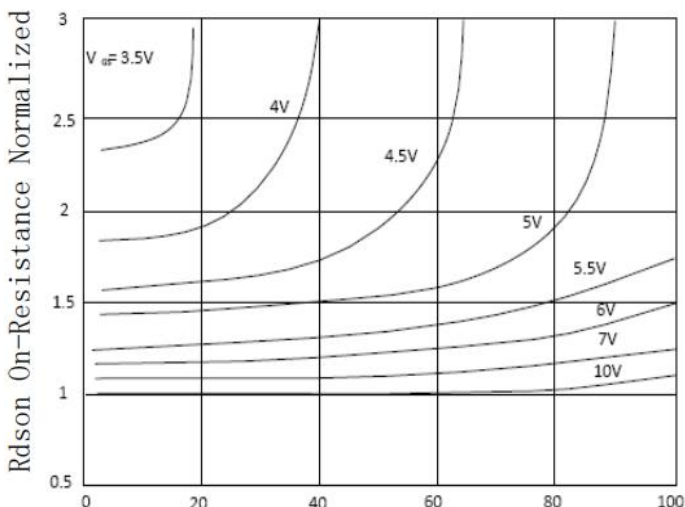Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics
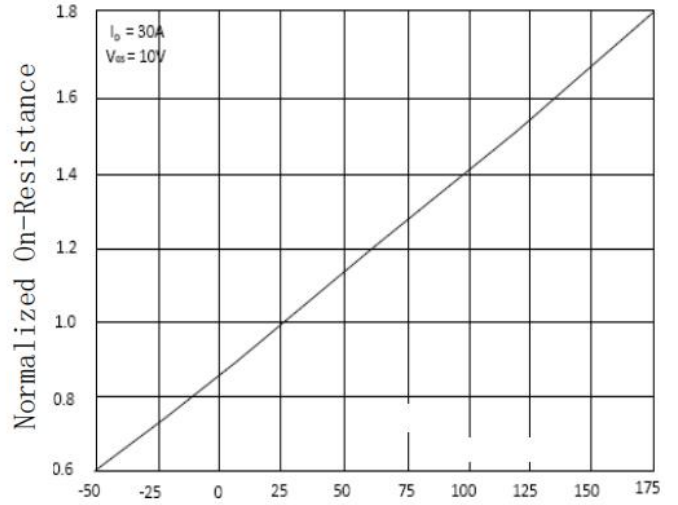
TJ-Junction Temperature(℃)
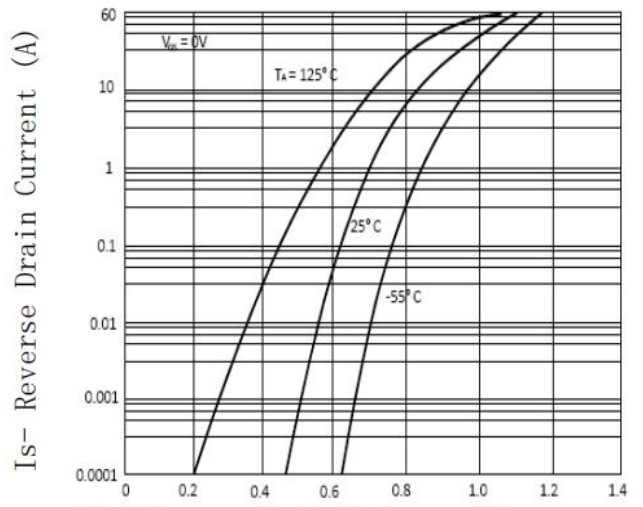Figure 4 Rdson-JunctionTemperature

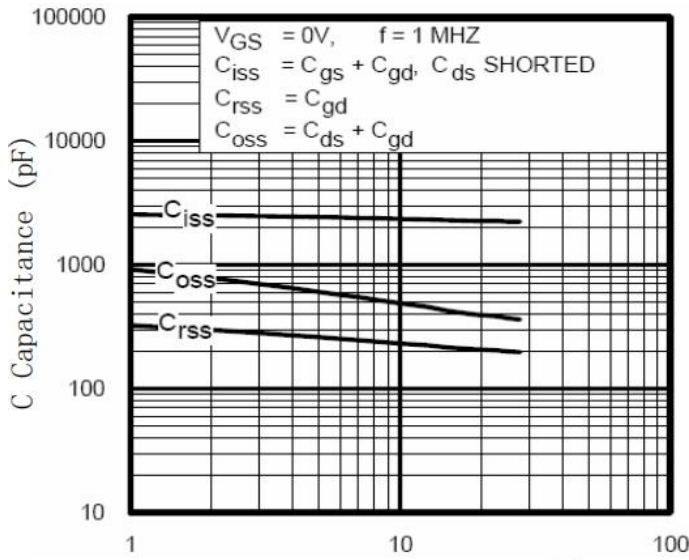Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics

Qg Gate Charge (nC)
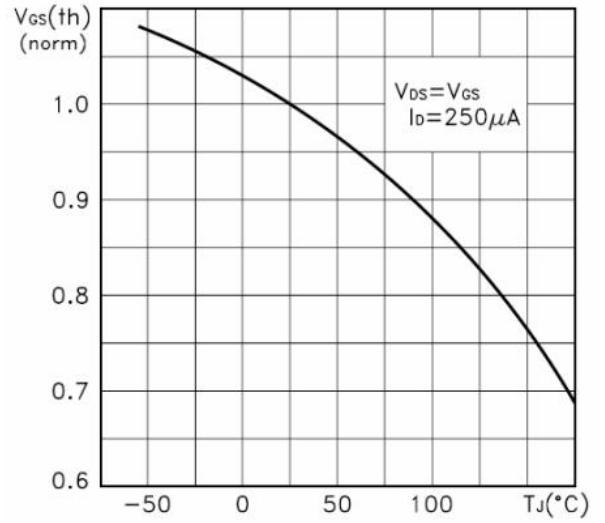Figure 5 Gate Charge
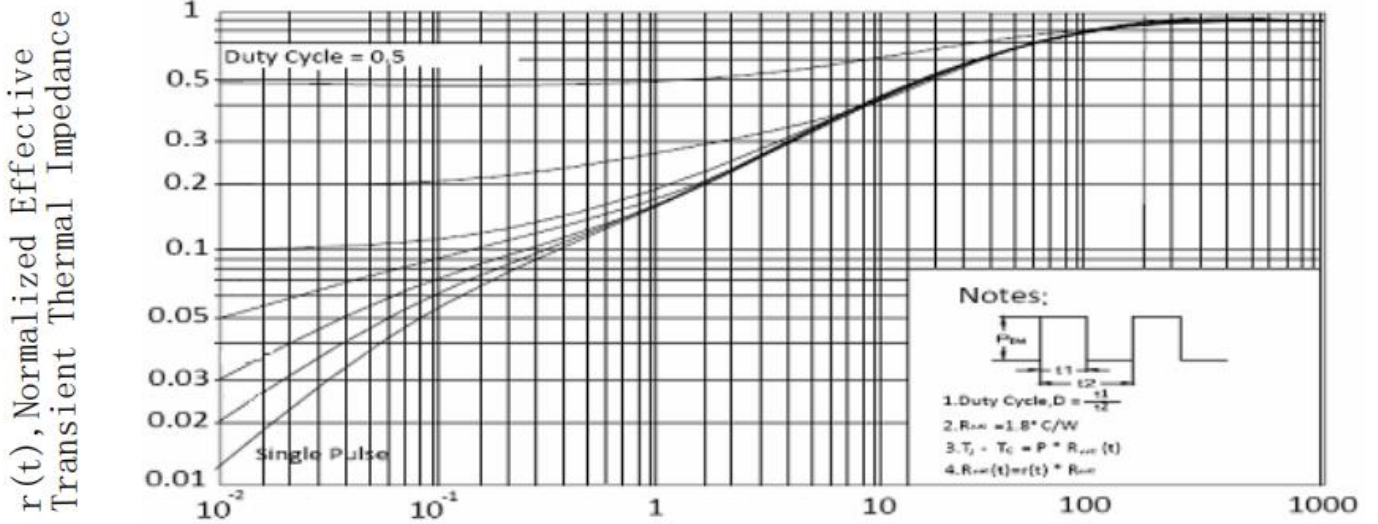
ID- Drain Current (A)
Figure 3 Rdson- Drain Current

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

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

TJ-Junction Temperature(℃)
Figure 8 VGS(th) vs Junction Temperature

Square Wave Pluse Duration(sec)
Figure 9 Normalized Maximum Transient Thermal Impedance
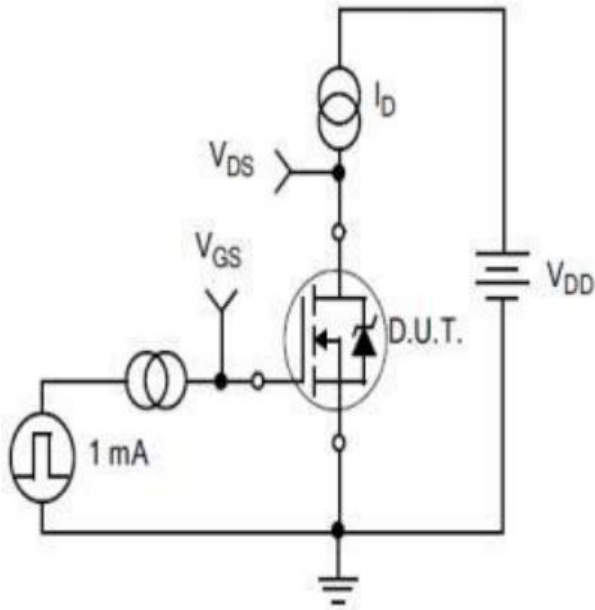
Test ircuits and Waveforms

Figure A.
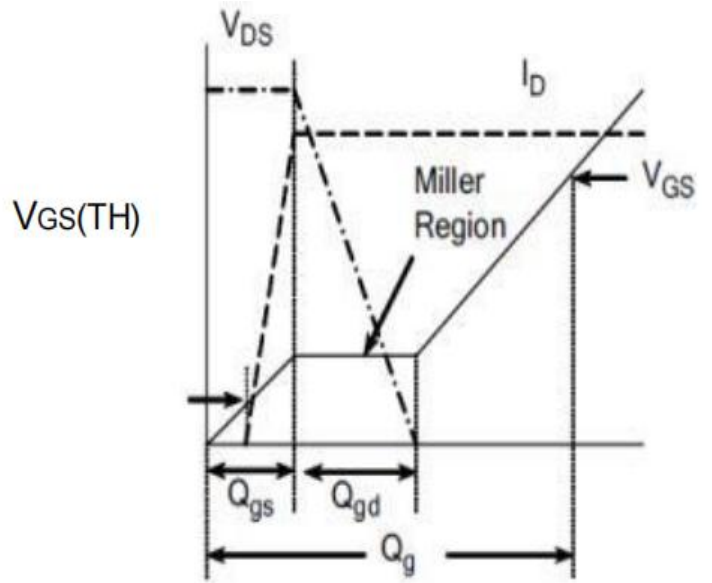Gate Charge Test Circuit

Figure B.
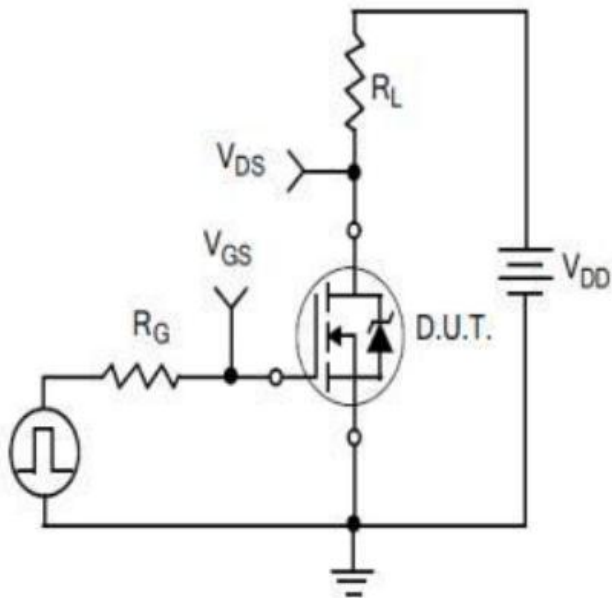Gate Charge Waveform

Figure C.
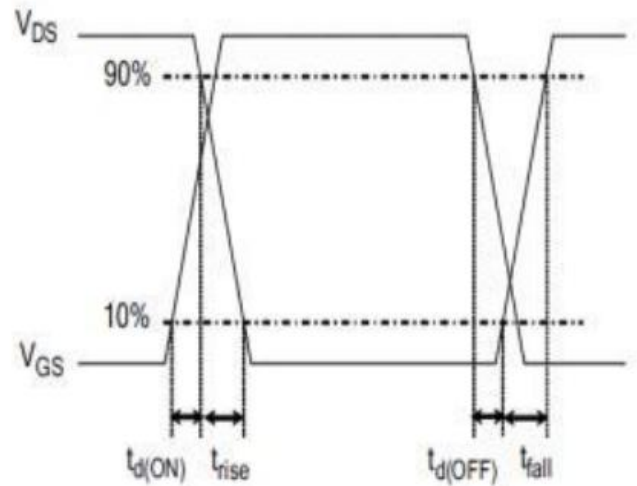Resistive Switching Test Circuit

Figure D.
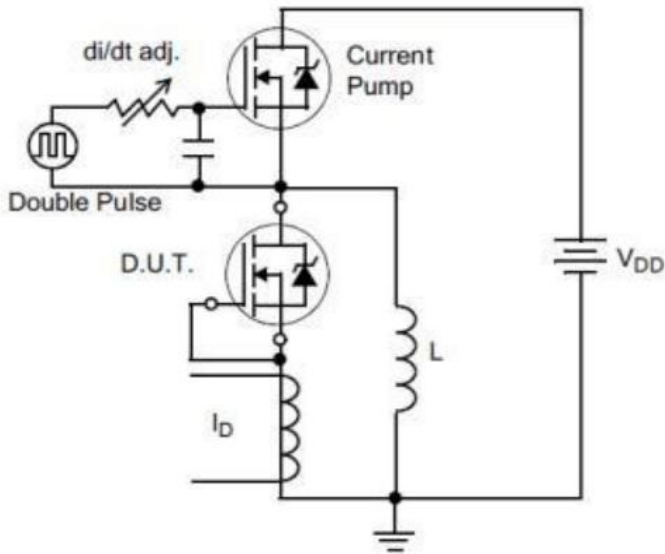Resistive Switching Waveforms

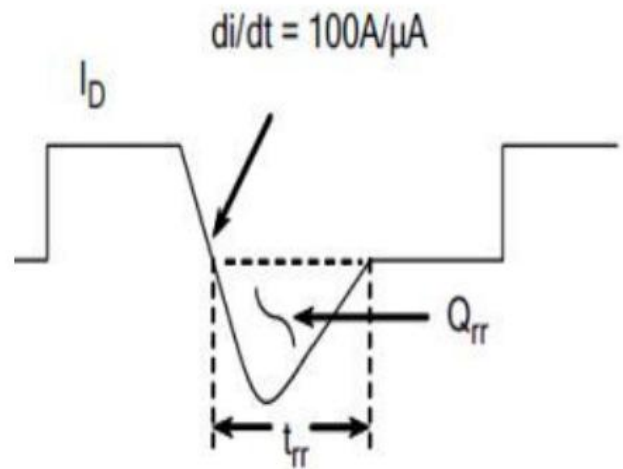## Test ircuits and Waveforms

Figure E.Diode Reverse Recovery
Test Circuit
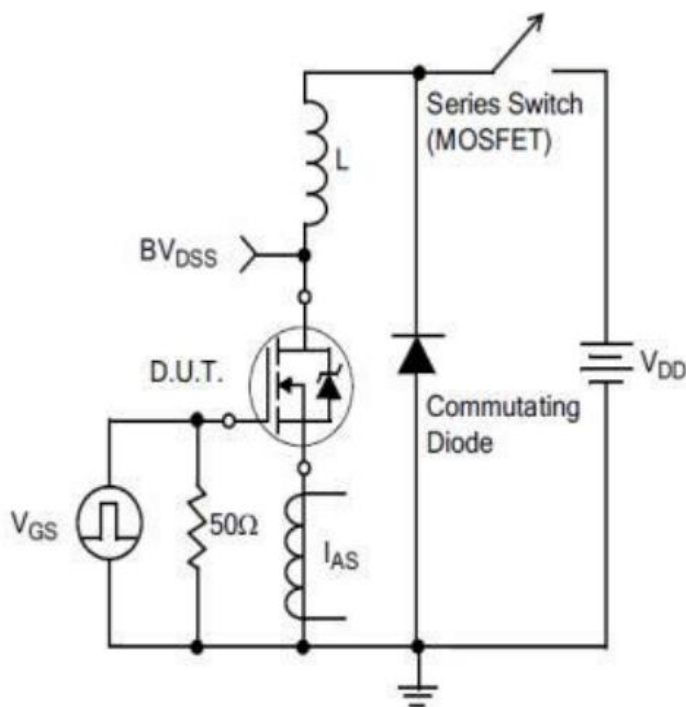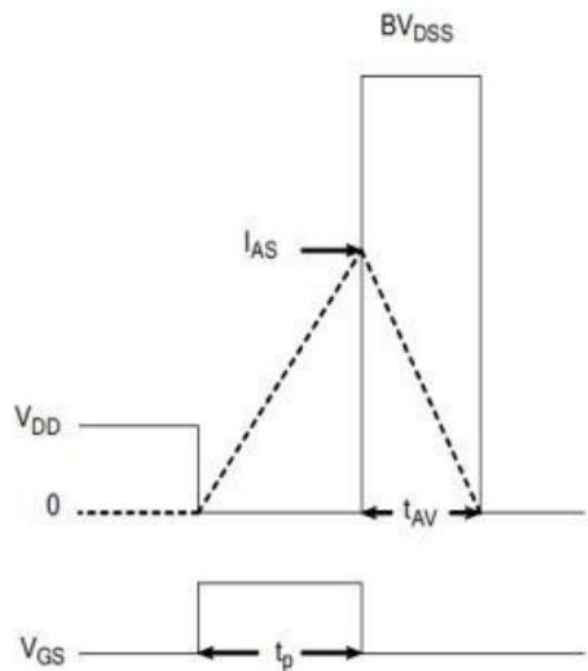

Figure F.Diode Reverse Recovery
Waveform

Figure G.Unclamped Inductive
Switching Test Circuit

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

Figure H.Unclamped Inductive
Switching Waveforms

Package outline drawing(TO-252 Unit: mm)
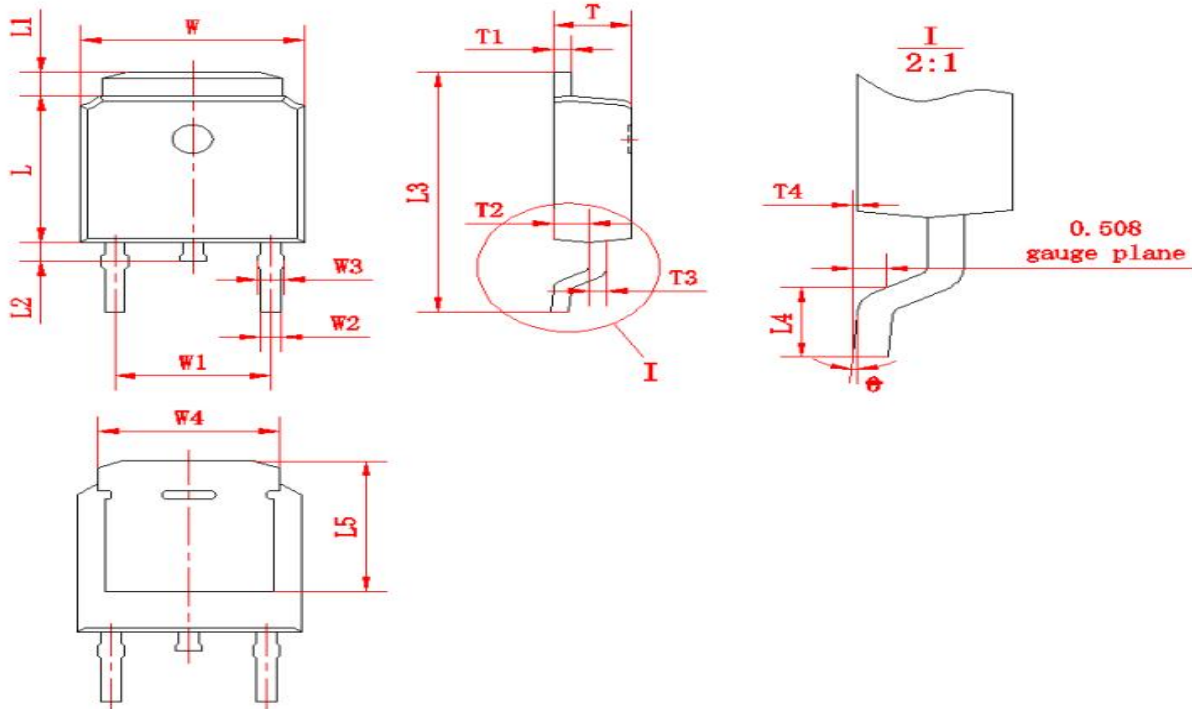
符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
W	6.50	6.70	L1	0.80	1.20	T1	0.48	0.58
W1	(4.572)		L2	0.60	1.00	T2	0.95	1.15
W2	0.6	0.8	L3	9.70	10.30	T3	0.48	0.58
W3	0.68	0.88	L4	1.30	1.70	T4	0.00	0.12
W4	(5.3)		L5	(5.20)		0	0	8
L	6.00	6.20	T	2.20	2.40			

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