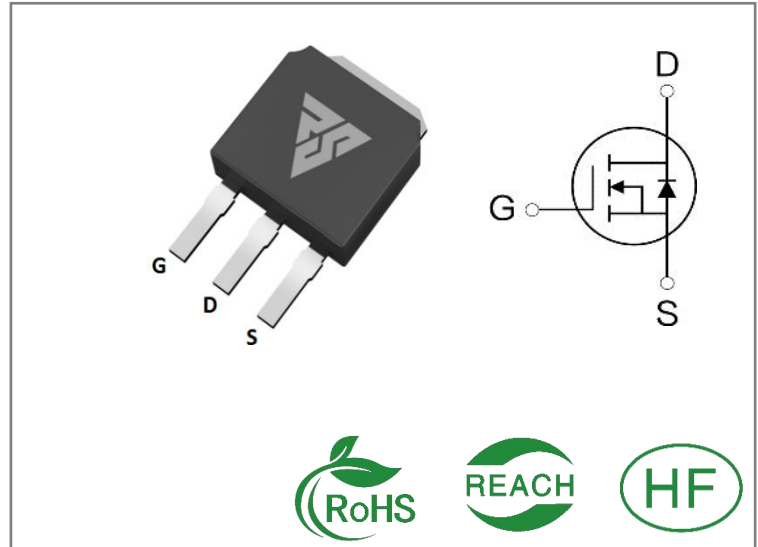| ID	$R_{DS}(ON)(Typ)$	VDSS
7A	1.1Ω	650V

Applications:
- Switch Mode Power Supply(SMPS)
- Adapter & Charger
- AC-DC Switching Power Supply

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

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS7N65MD	T0-251	RS7N65MD	Tube	80 PCS

Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RS7N65MD	Units
VDSS	Drain-to-Source Voltage	650	V
ID	Continuous Drain Current TC=25℃	7	A
IDM	Pulsed Drain Current (Note*1)	28	
PD	Power Dissipation	110	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Engergy L = 10mH, VDD = 50V, RG = 25 Ω	165	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	RS7N65MD	Units	Test Conditions
RθJC	Junction-to-Case	1.13	℃ / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃
RθJA	Junction-to-Ambient	80		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	650	--	--	V	VGS=0V,ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=650V,VGS=0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	VGS=30V ,VDS=0V
	Gate- to- Source Reverse Leakage	--	--	-100		VGS=-30V ,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(Note*2)	--	1.1	1.35	Ω	VGS=10V,ID=3.5A
VGS(TH)	Gate Threshold Voltage	3	--	4	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	--	39	--	nS	VDS=325V ID=7A RG=25Ω
trise	Rise Time	--	23	--		
td(OFF)	Turn- OFF Delay Time	--	137	--		
tfall	Fall Time	--	60	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	891	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	87	--		
Crss	Reverse Transfer Capacitance	--	10	--		
Qg	Total Gate Charge	--	32	--	nC	VDS=520V ID=7A VGS=10V
Qgs	Gate- to- Source Charge	--	4.6	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	7	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	28	A	
VSD	Diode Forward Voltage	--	--	1.4	V	IS=3.5A,VGS=0V
trr	Reverse Recovery Time	--	891	--	nS	VGS=0V IS=7A,di/dt=100A /μs
Qrr	Reverse Recovery Charge	--	87	--	μC	

Notes:

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

Typical Feature Curve

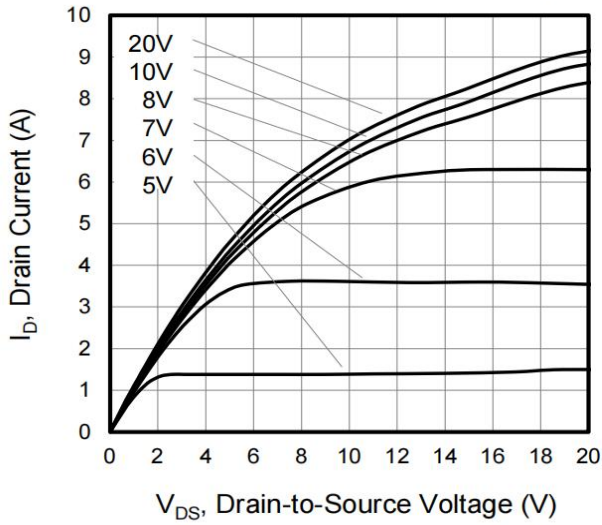### Figure 1. Output Characteristics (T_J = 25ºC)

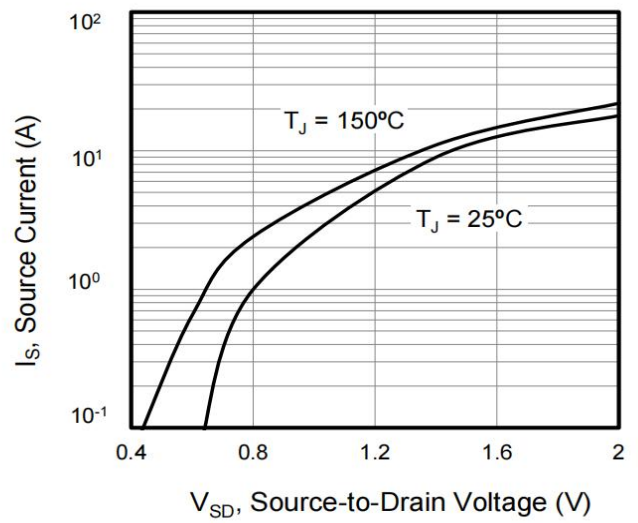### Figure 2. Body Diode Forward Voltage

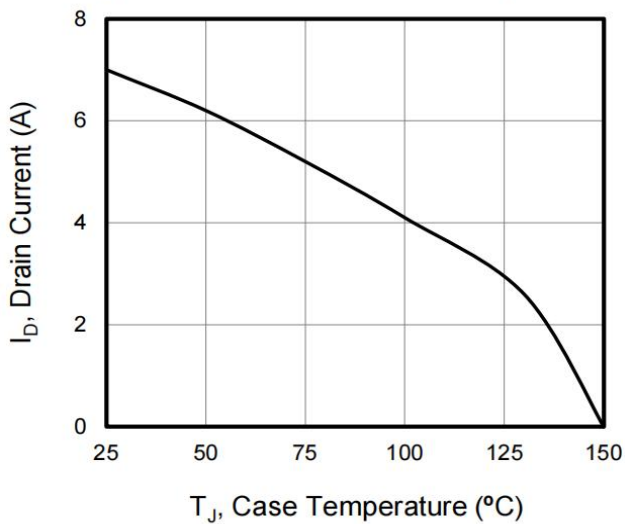### Figure 3. Drain Current vs. Temperature

Figure 4. BV$_{DSS}$ Variation vs. Temperature
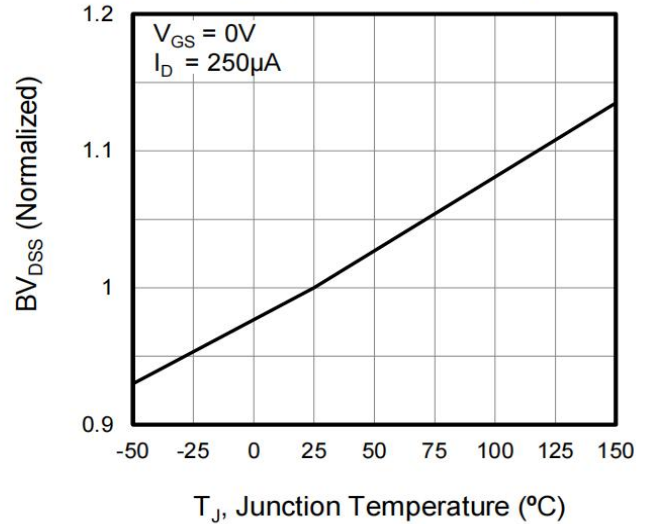

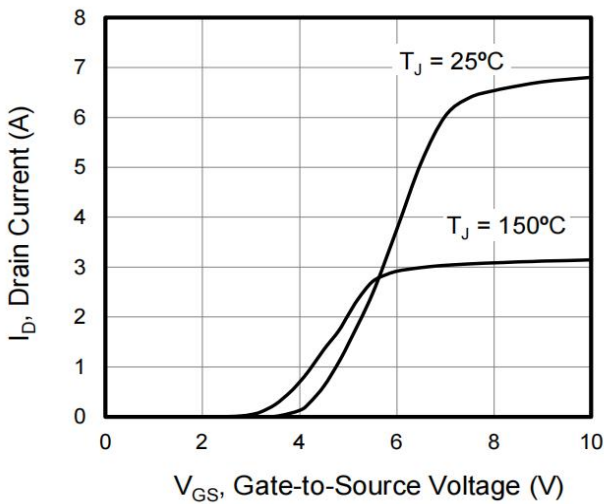### Figure 5. Transfer Characteristics
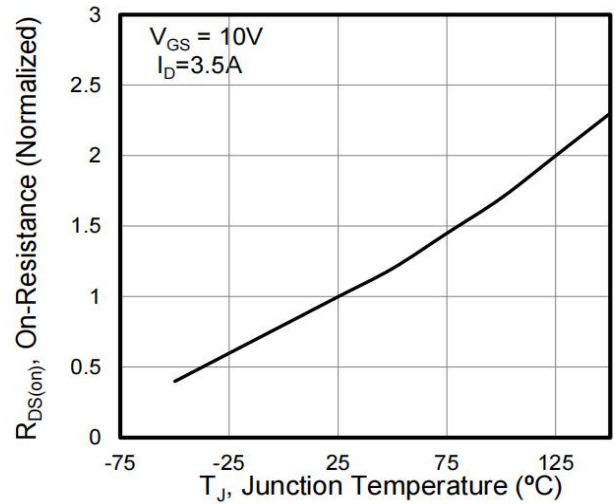

Figure 6. On-Resistance vs. Temperature
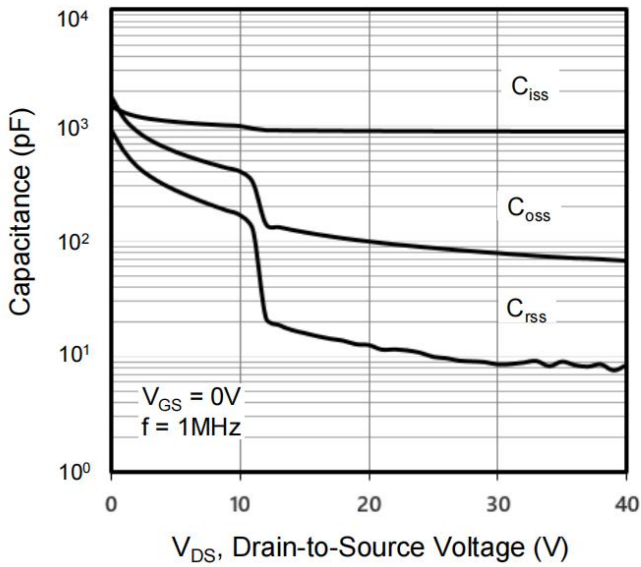
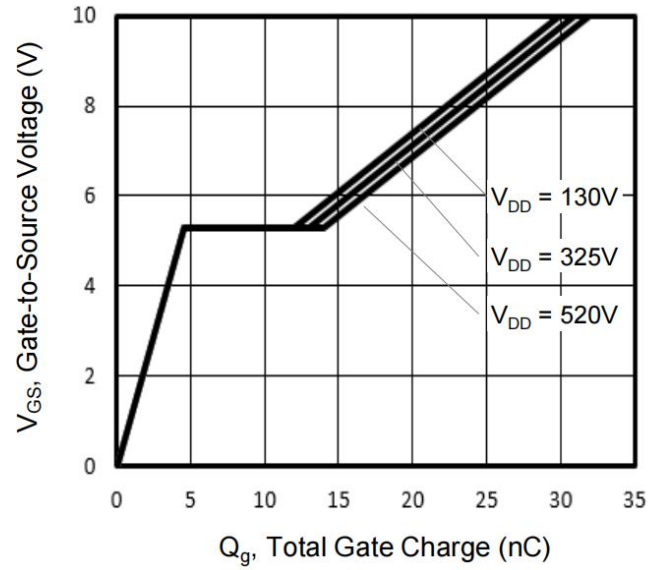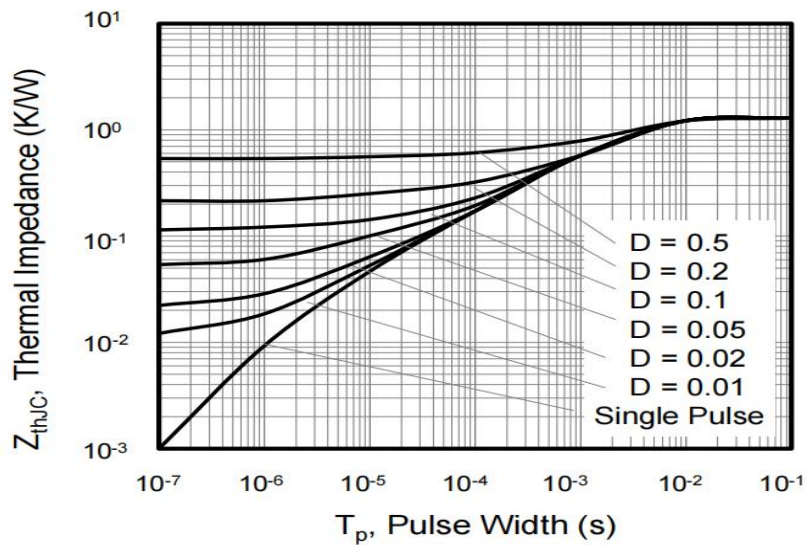**Figure 7. Capacitance**

Figure 8. Gate Charge

Figure 9. Transient Thermal Impedance
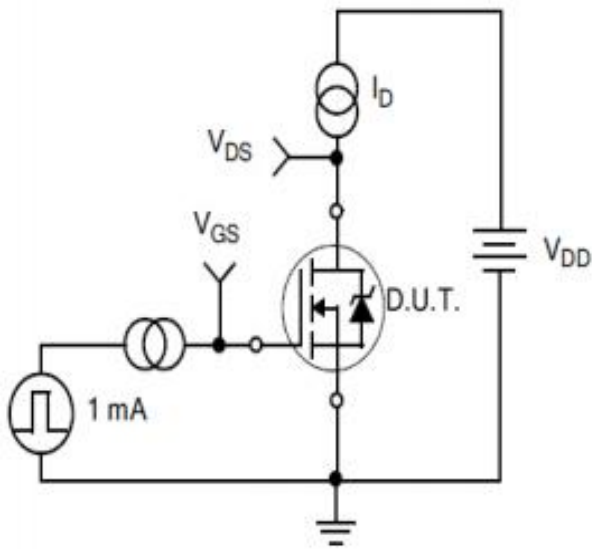
Test Circuits and Waveforms
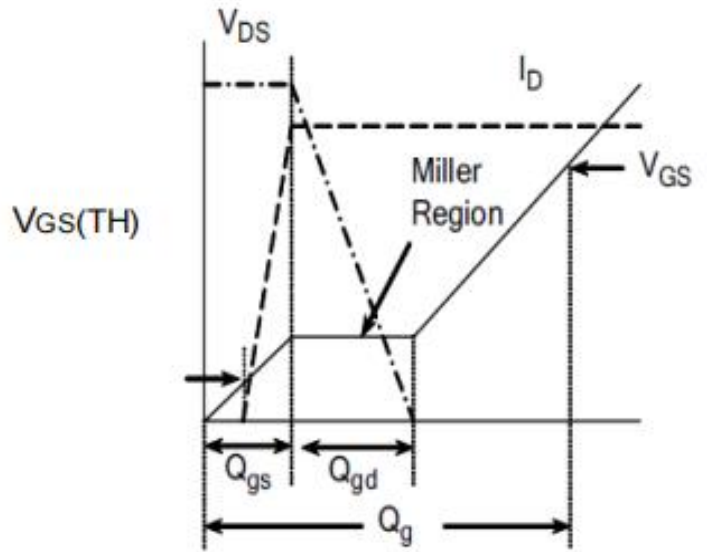

Figure10.
Gate Charge Test Circuit
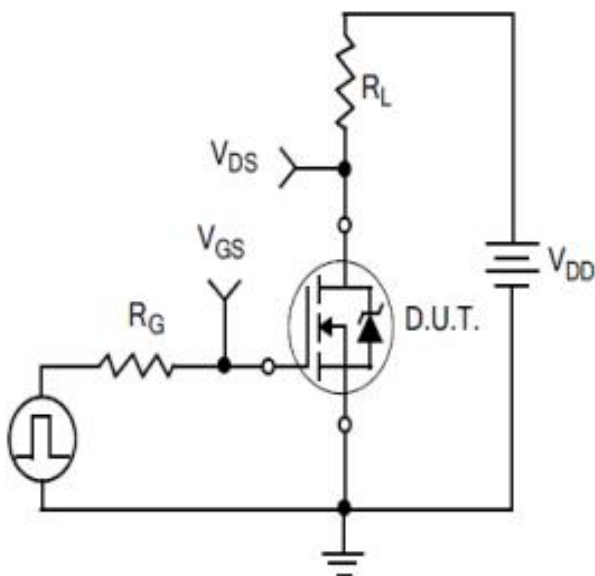

Figure11.
Gate Charge Waveform

Figure12.
Resistive Switching Test Circuit
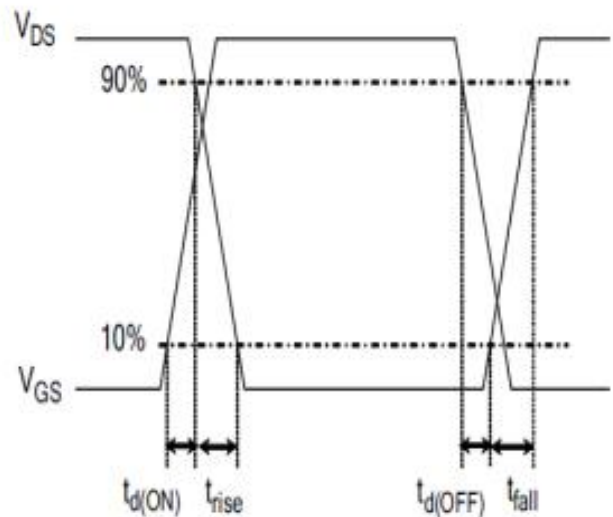
Figure13.
Resistive Switching Waveforms

Test Circuits and Waveforms

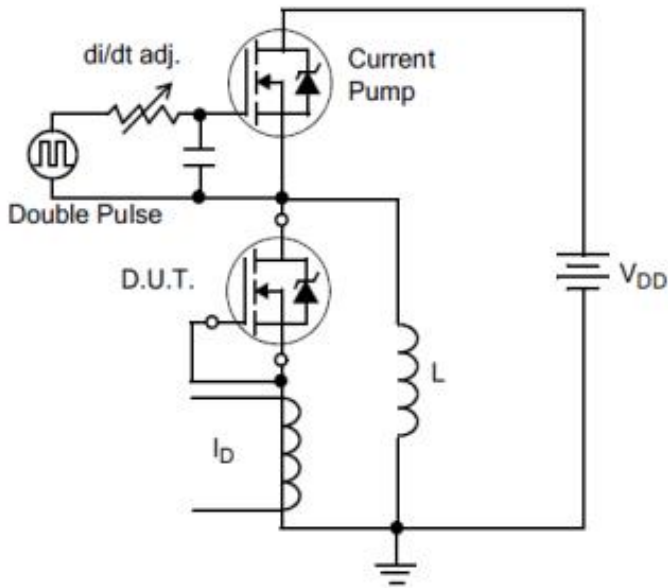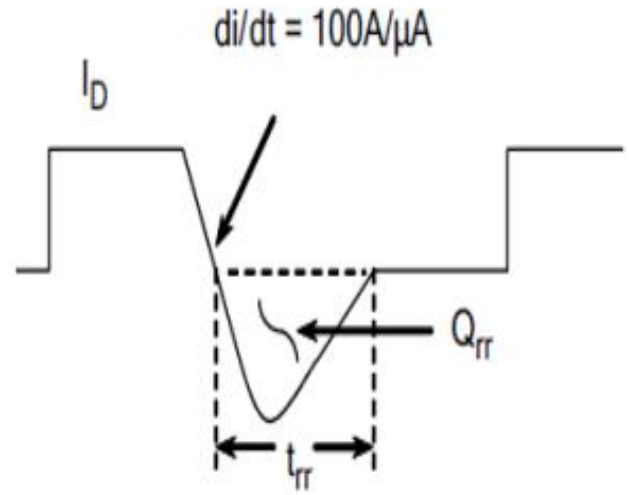Figure14.Diode Reverse Recovery Test Circuit

$$\text{di/dt} = 100A/\mu A$$

Figure15.Diode Reverse Recovery Waveform
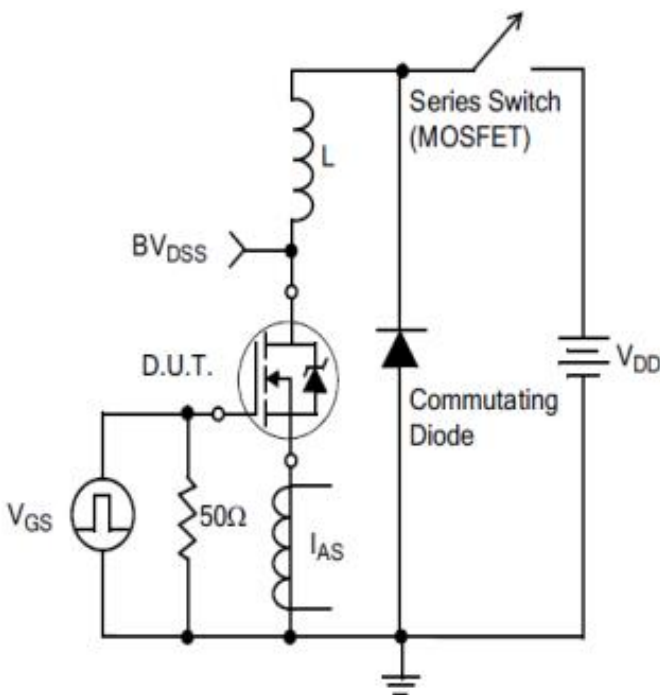
Figure16.Unclamped Inductive Switching Test Circuit
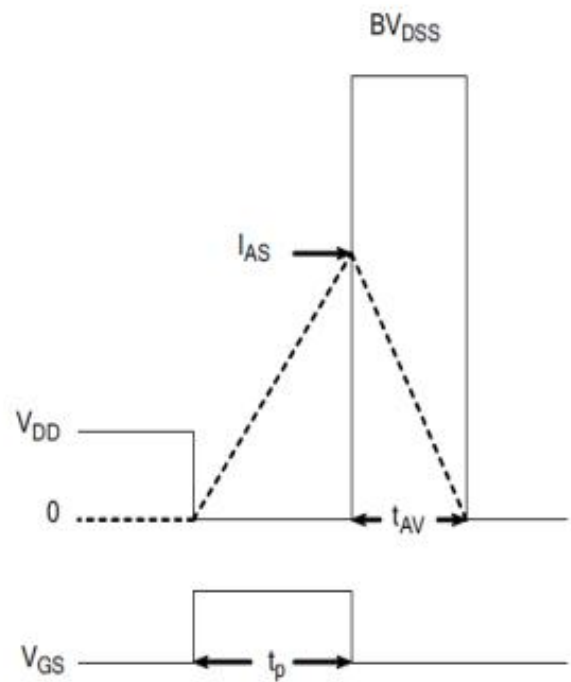
$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

Figure17.Unclamped Inductive Switching Waveforms

Package outline drawing(TO-251 Unit: mm)
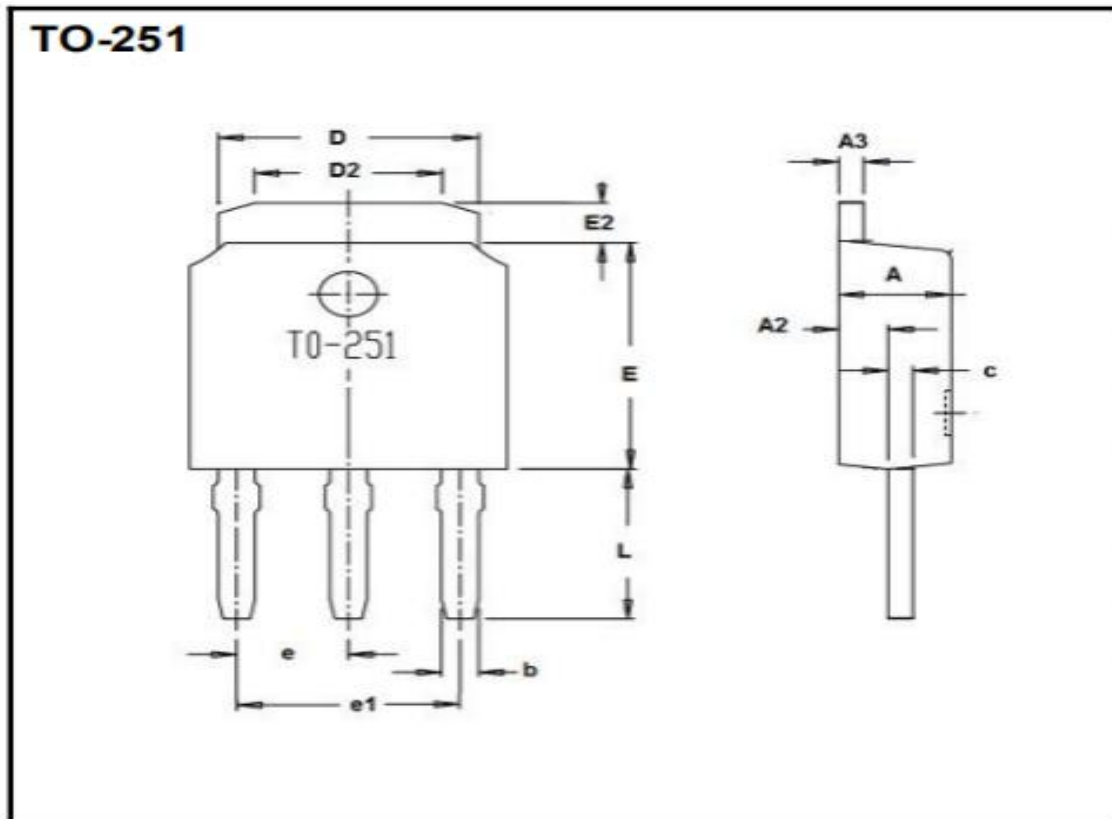
Dim.	Min.	Max.
A	2.15	2.45
A2	0.9	1.1
A3	Typ0.5	
b	0.74	0.86
c	0.9	1.1
D	5.33	5.53
D2	3.65	4.05
E	6.0	6.2
E2	0.91	1.36
e	Typ2.29	
e1	Typ4.58	
L	3.7	4.3
All Dimensions in millimeter		

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