

N-Channel Enhancement Mode Power MOSFET

General Description:

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.

Features:

- Fast switching Low
- on-resistance Low
- gate charge
- 100% Single Pulse Avalanche Energy Test

Mechanical Data:

- Case:TO-263-7L Package

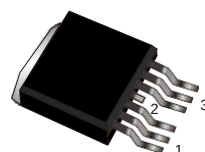
Product Summary

V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
80V	1.7@ 10V	250	201nc

Ordering Information

Part No.	Package Type	Package	Quality(box)
KU250N08D7	TO-263-7L	Tape & Reel	800

TO-263-7L



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

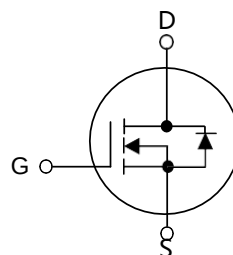


Table1 Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
Pulsed Drain Current (Note 1)	I_{DM}	1000	A
Single Pulse Avalanche Energy(Note 2)	E_{AS}	2000	mJ
Power Dissipation $T_C=25^\circ\text{C}$	P_D	300	W
Isolation Voltage	V_{ISO}	/	V
Operating Junction and Storage Temperature	T_J/T_{STG}	$-55 \sim +175$	$^\circ\text{C}$
Maximum Temperature for soldering	T_L	300	$^\circ\text{C}$

Table 2. Thermal Characteristics

Parameter	Symbol	TO-263-7	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$
Thermal resistance Junction to Case	$R_{\theta JC}$	0.5	$^{\circ}\text{C/W}$

Table 3. Electrical Characteristics($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V,I _D =250μA	80	--	--	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =80V,V _{GS} =0V	--	--	1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =20V,V _{DS} =0V	--	--	100	nA
	Reverse		V _{GS} = -20V,V _{DS} =0V	--	--	-100	nA
On Characteristics(Note 4)							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V,I _D =80A	--	1.7	2.2	mΩ
Dynamic Characteristics(Note 5)							
Input Capacitance		C _{ISS}	V _{DS} =90V,V _{GS} =0V,f=1MHz	--	13700	--	pF
Output Capacitance		C _{OSS}		--	2200	--	pF
Reverse Transfer Capacitance		C _{RSS}		--	48	--	pF
Switching Characteristics (Note 5)							
Turn-On Delay Time		t _d (on)	V _{DS} =45V,I _D =125A, V _{GS} =10V,R _{GEN} =4.7Ω	--	55	--	ns
Turn-On Rise Time		t _r		--	164	--	ns
Turn-Off Delay Time		t _d (off)		--	159	--	ns
Turn-Off Fall Time		t _f		--	145	--	ns
Total Gate Charge		Q _G	V _{DS} =45V,I _D =125A, V _{GS} =10V	--	201	--	nC
Gate-Source Charge		Q _{GS}		--	72.9	--	nC
Gate-Drain Charge		Q _{GD}		--	34.9	--	nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =250A	--	--	1.20	V
Maximum Continuous Drain-Source Diode Forward Current		I _S		--	--	250	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _F =I _S	--	96.5	--	ns
Reverse Recovery Charge		Q _{RR}	dI _F /dt=100A/μs (Note 1)	--	164.8	--	nC

Notes: 1 Repetitive Rating:Pulse width limited by maximum junction temperature 2

$L=0.5\text{mH}, I_D=90A, V_{DD}=50V, V_{GATE}=100V, \text{Starting } T_J=25^{\circ}\text{C}$

4 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

5 Guaranteed by design, not subject to production

Typical characteristics diagrams

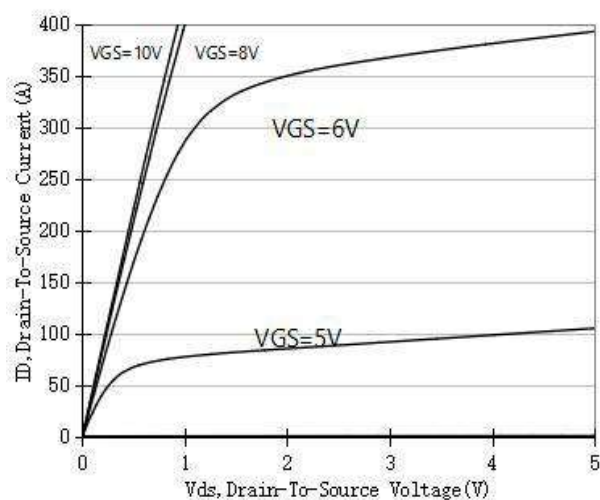


Fig 1. Output Characteristics

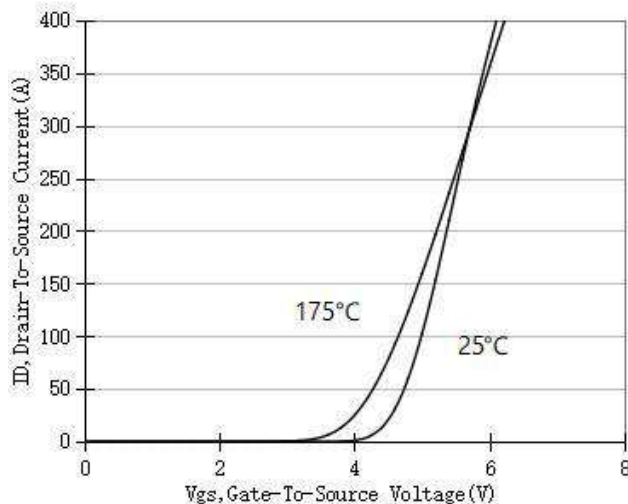


Fig 2. Transfer Characteristics

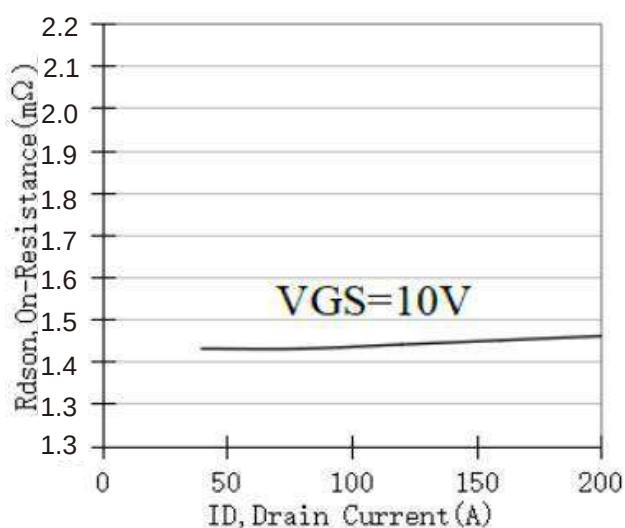


Fig 3. Rdson-Drain Current

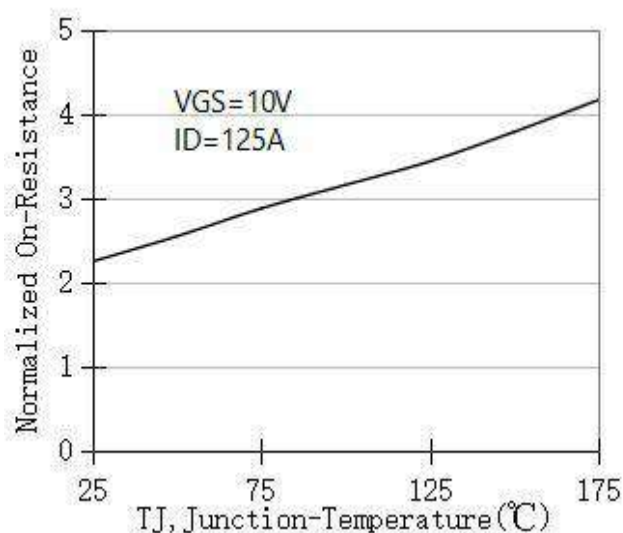


Fig 4. Rdson-Junction Temperature

Typical characteristics diagrams

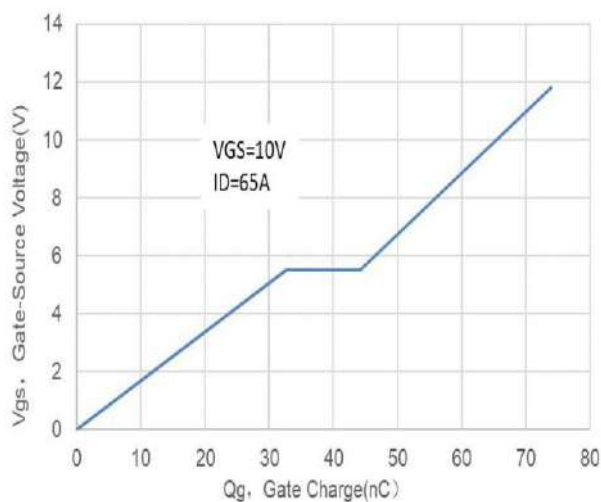


Fig 5. Gate Charge

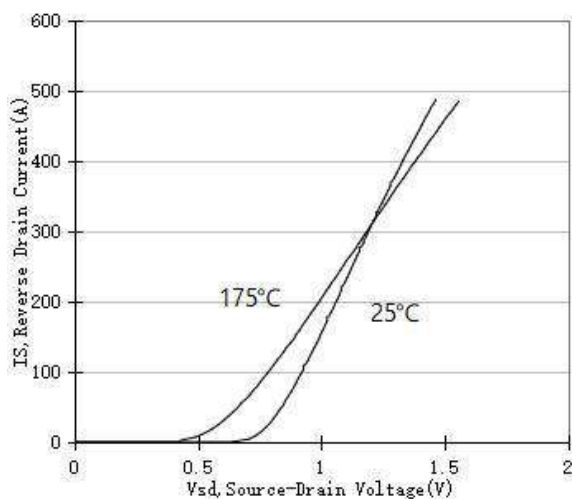


Fig 6. Source-Drain Diode Forward

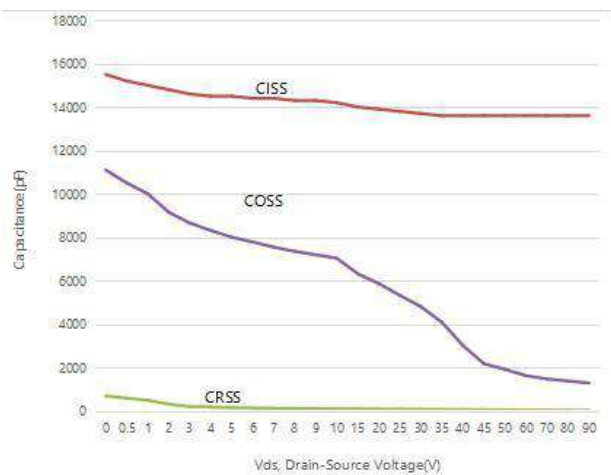


Fig 7. Capacitance vs Vds

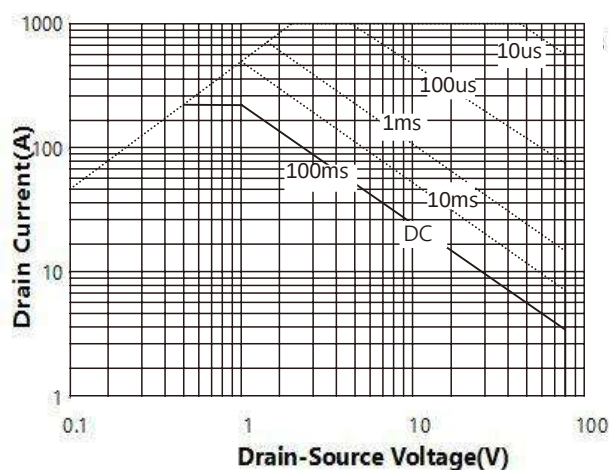


Fig 8. Safe Operation Area

Typical characteristics diagrams

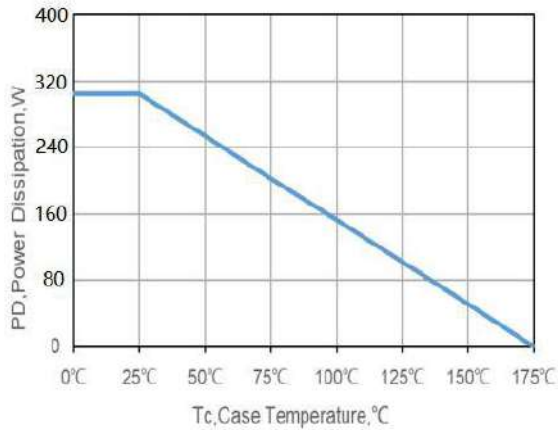


Fig 9. Power De-rating

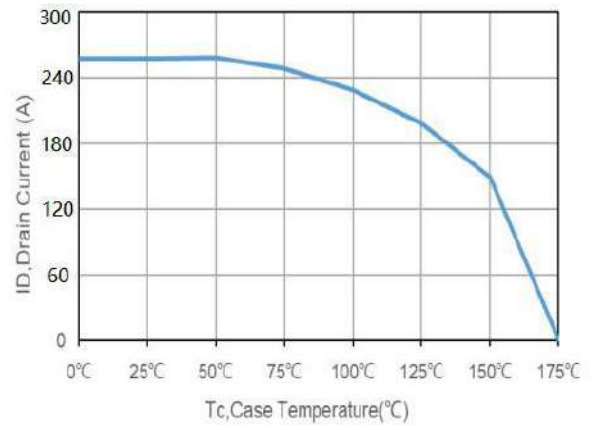


Fig 10. Current De-rating

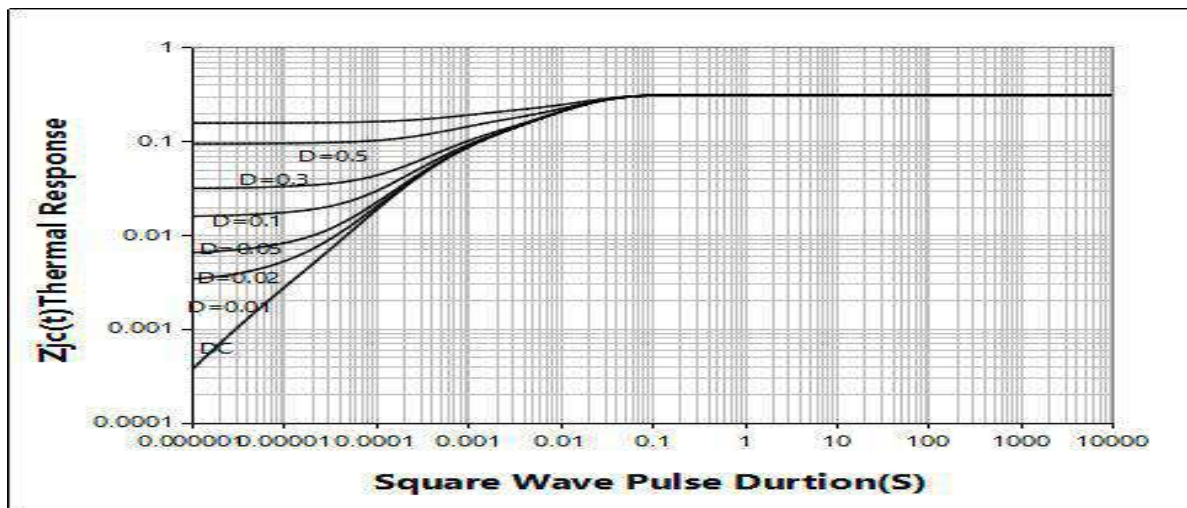
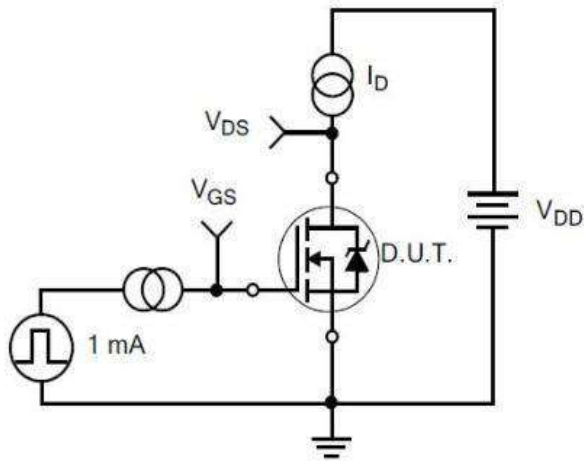
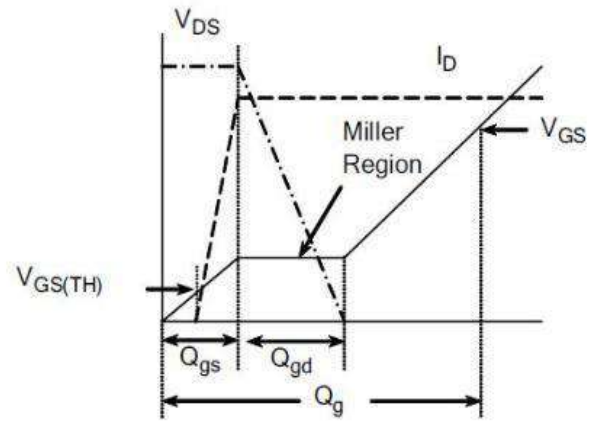


Fig 11. Normalized Maximum Transient Thermal Impedance

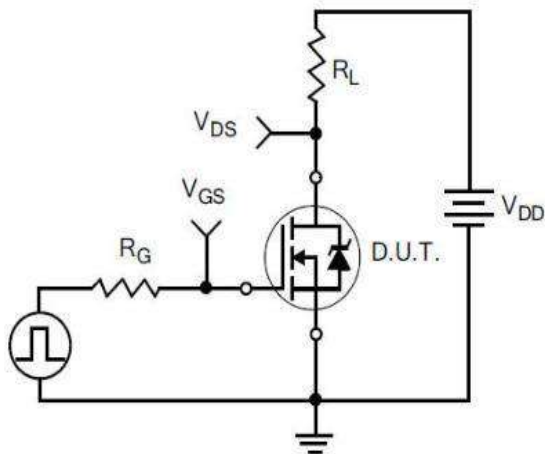
Typical Test Circuit



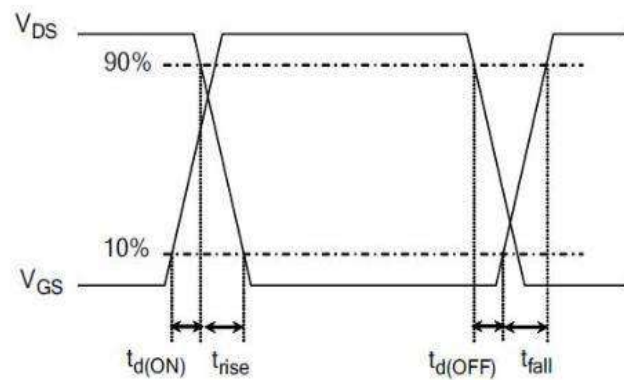
1) Gate Charge Test Circuit



2) Gate Charge Waveform

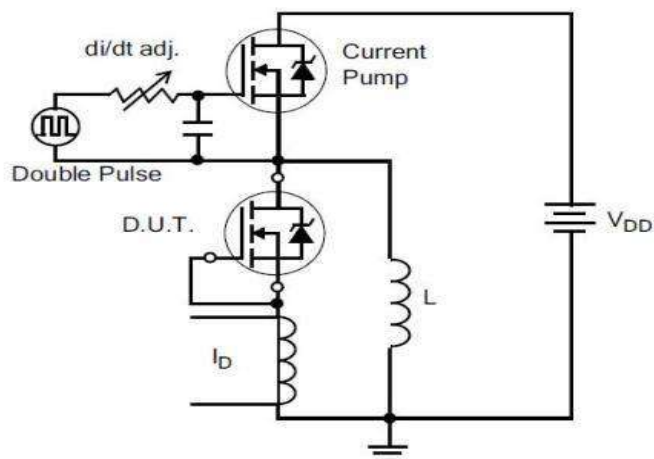


3) Resistive Switching Test Circuit

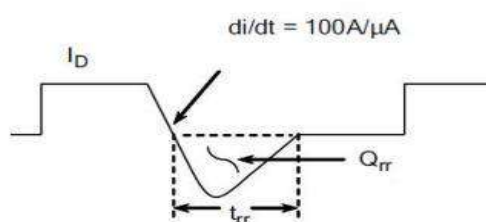


4) Resistive Switching Waveforms

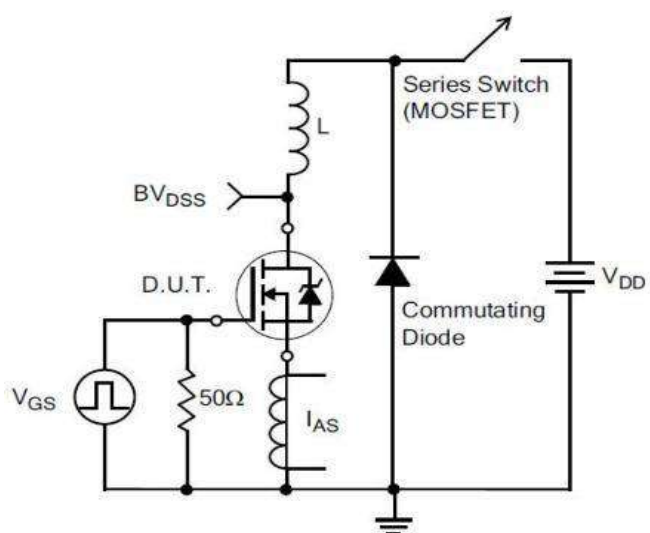
Typical Test Circuit



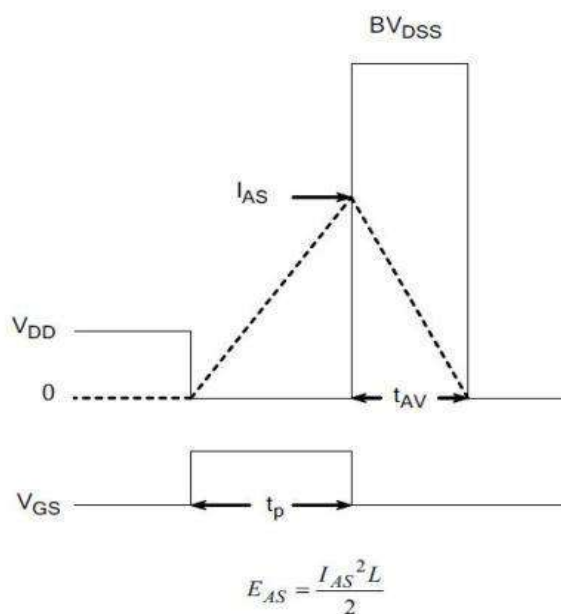
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



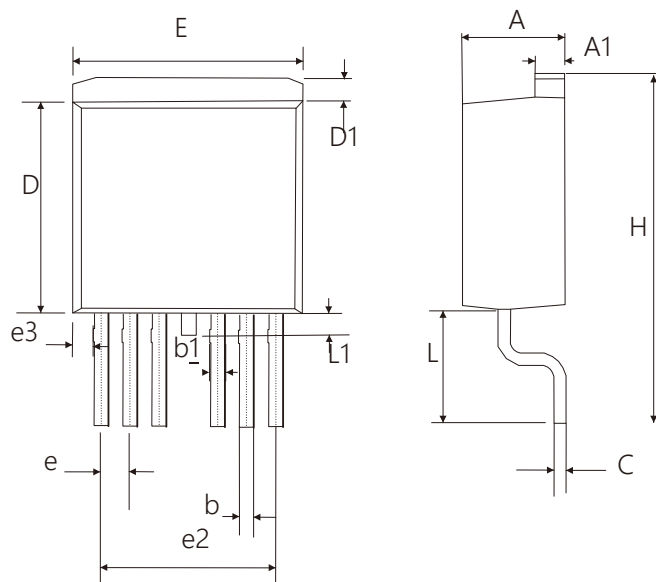
7) Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

Dimensions

TO-263-7L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.75	0.167	0.187
A1	1.2	1.4	0.047	0.055
b	0.5	0.7	0.020	0.028
b1	0.5	0.9	0.020	0.035
C	0.4	0.6	0.016	0.024
D	9.05	9.45	0.356	0.372
D1	0.7	1.3	0.028	0.051
E	9.8	10.2	0.386	0.402
e	1.07	1.47	0.042	0.058
e2	7.32	7.92	0.288	0.312
e3	0.64	1.04	0.025	0.041
H	14.65	15.65	0.577	0.616
L	4.47	5.47	0.176	0.215
L1	0.90	1.50	0.035	0.059

Suggested Pad Layout (TO-263-7L)

