

Features

- $R_{DS(on)_{typ.}} = 0.85m\Omega @ V_{GS}=10V$
- Low gate Charge (typical 145nC)
- Low Crss(typical 108pF)
- Low On-Resistance
- Excellent FoM(figure of merit)
- 100% UIS and R_g tested

Applications

- Motor Driver
- DC/DC Converter
- Battery Management System

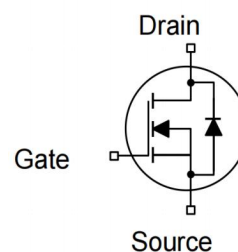
Product Summary

V_{DS}	40 V
$R_{DS(on)_{typ.}}$	0.85 m Ω
I_D	395 A

100% DVDS Tested
100% Avalanche Tested



TOLL-8L



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
KCT010N04N	KCT010N04N	TOLL	Tape&Reel	N/A	N/A	2000pcs

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage($V_{GS}=0V$)	V_{DS}	40	V
Continuous Drain Current ¹⁾	I_D	$T_C = 25^\circ\text{C}$ 395	A
		$T_C = 100^\circ\text{C}$ 276	
Pulsed Drain Current ²⁾	$I_{D,pulse}$	1580	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy ³⁾	E_{AS}	1369	mJ
Power Dissipation	P_D	272	W
Continuous Diode Forward Current	I_S	395	A
Diode Pulsed Current ²⁾	$I_{S,pulse}$	1580	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case	R_{thJC}	0.46	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	45	

Electrical Characteristics T _J = 25°C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250uA	40	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V V _{GS} = 0V, T _J = 25°C	--	--	1	uA
		V _{DS} = 40V, V _{GS} = 0V, T _J = 150°C	--	--	100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	2	--	4	V
Drain-Source On-State-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 70A	--	0.85	1	mΩ
Gate Resistance	R _G	f = 1.0MHz	--	2	--	Ω
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{GS} = 0V, V _{DS} = 20V, f = 1.0MHz	--	8780	--	pF
Output Capacitance	C _{oss}		--	3429	--	
Reverse Transfer Capacitance	C _{rss}		--	108	--	
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DD} = 20V I _D = 70A	--	145	--	nC
Gate-Source Charge	Q _{gs}		--	35	--	
Gate-Drain Charge	Q _{gd}		--	30	--	
Gate Plateau Voltage	V _{Plateau}		--	4.2	--	V
Turn-on Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 20V I _D = 70A, R _G = 1.6Ω	--	32	--	ns
Turn-on Rise Time	t _r		--	65	--	
Turn-off Delay Time	t _{d(off)}		--	75	--	
Turn-off Fall Time	t _f		--	40	--	
Drain-Source Body Diode Characteristics						
Body Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 70A T _J = 25°C	--	--	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 70A, diF/dt = 100A/us	--	68	--	ns
Reverse Recovery Charge	Q _{rr}		--	120	--	nC

Notes

- 1) Limited by maximum junction temperature.
- 2) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 3) $L=0.5mH, R_G=25\Omega, V_{GS}=10V, V_{DD}=20V$, Start $T_J=25^\circ\text{C}$.

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

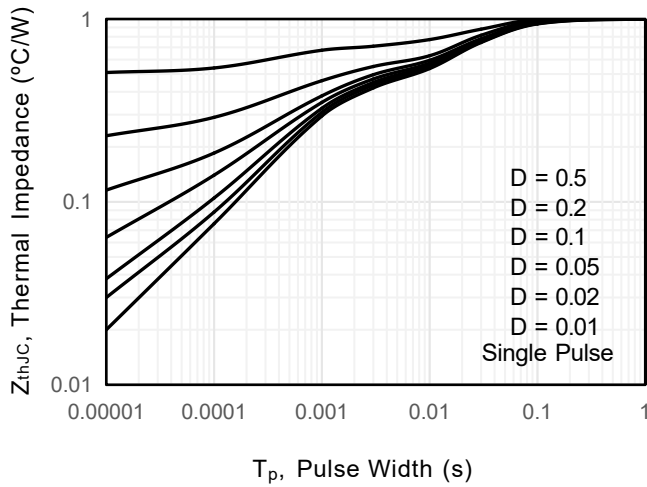


Figure 1. Transient Thermal Impedance

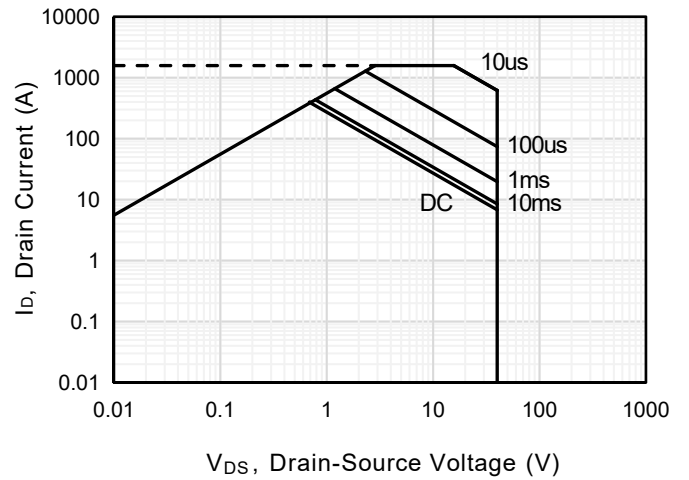


Figure 2 . Safe Operation Area

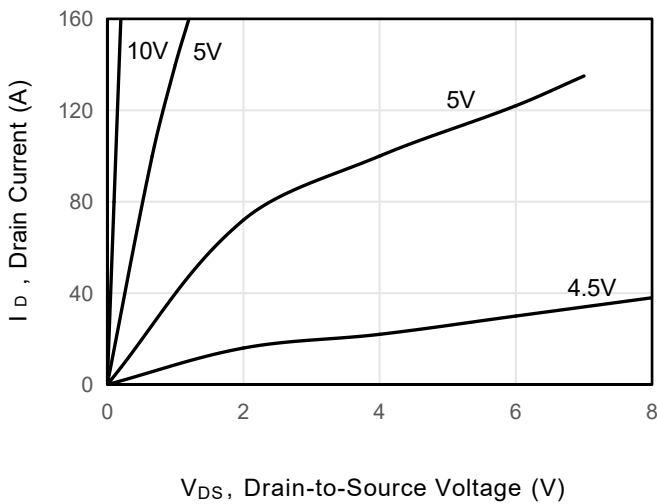


Figure 3 . Output Characteristics

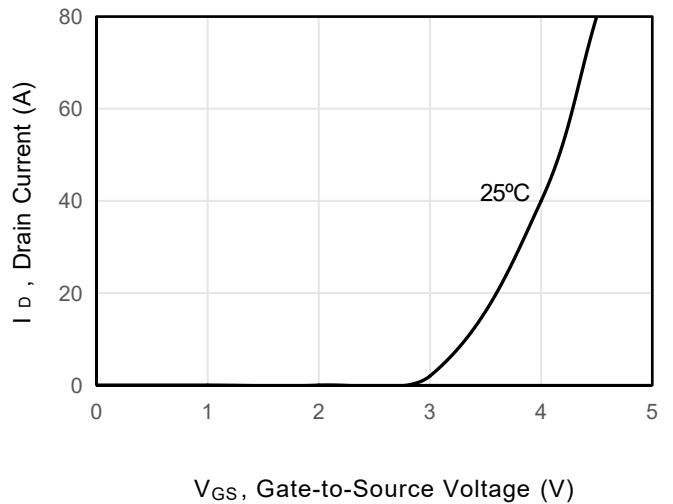


Figure 4 . Transfer Characteristics

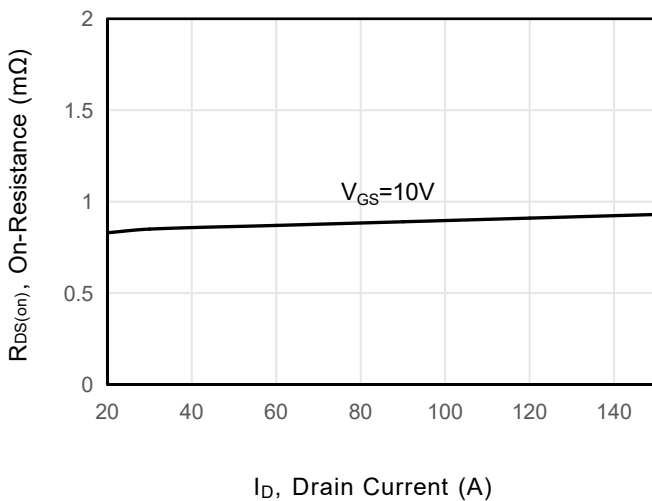


Figure 5 . On-Resistance vs Drain Current

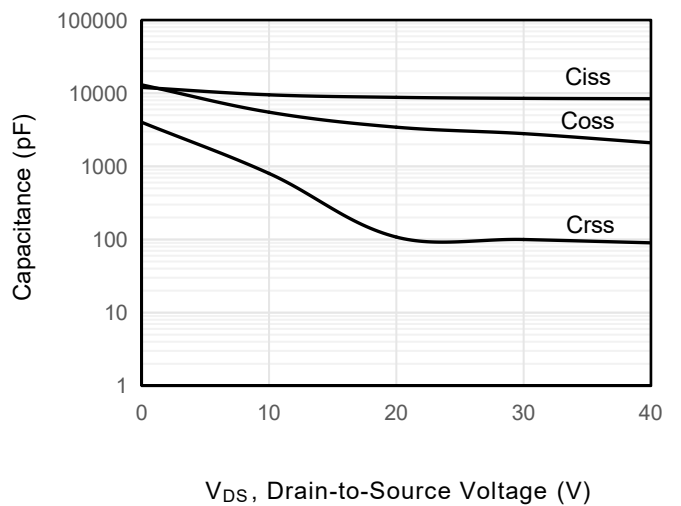


Figure 6 . Capaticance

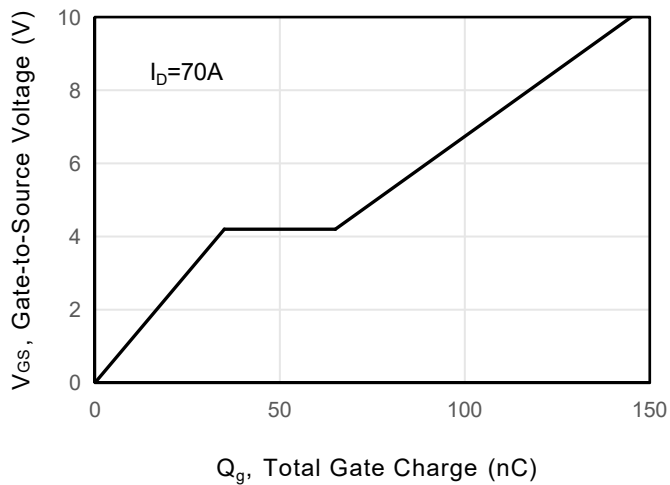


Figure 7 . Gate Charge

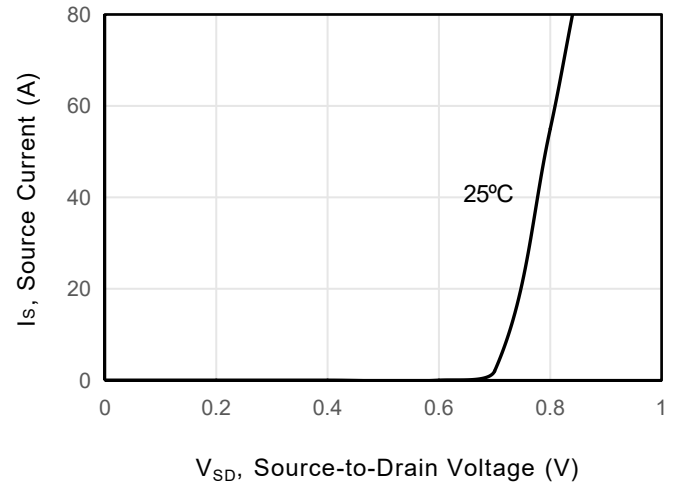


Figure 8 . Body Diode Forward Voltage

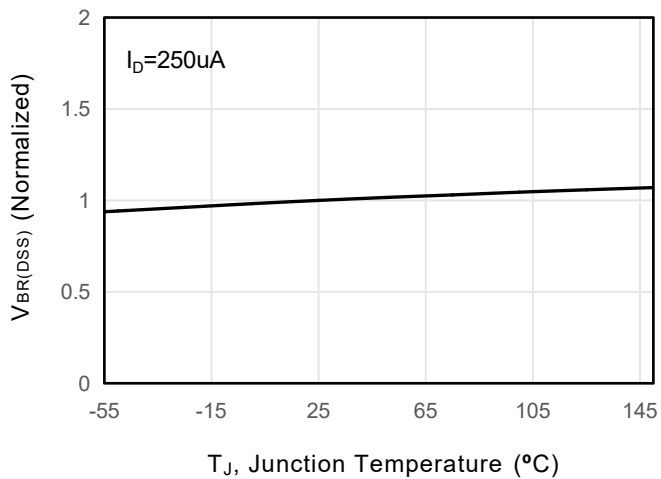


Figure 9. Breakdown Voltage vs Junction Temperature

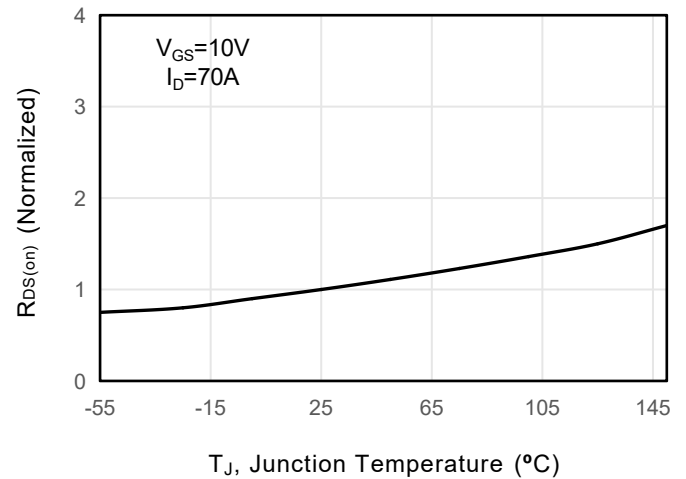


Figure 10. On-Resistance vs Temperature

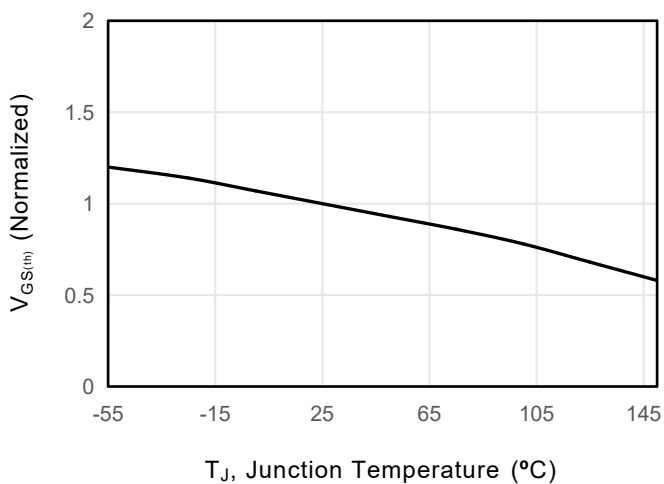


Figure 11. $V_{GS(th)}$ vs Junction Temperature

Figure A: Gate Charge Test Circuit and Waveform

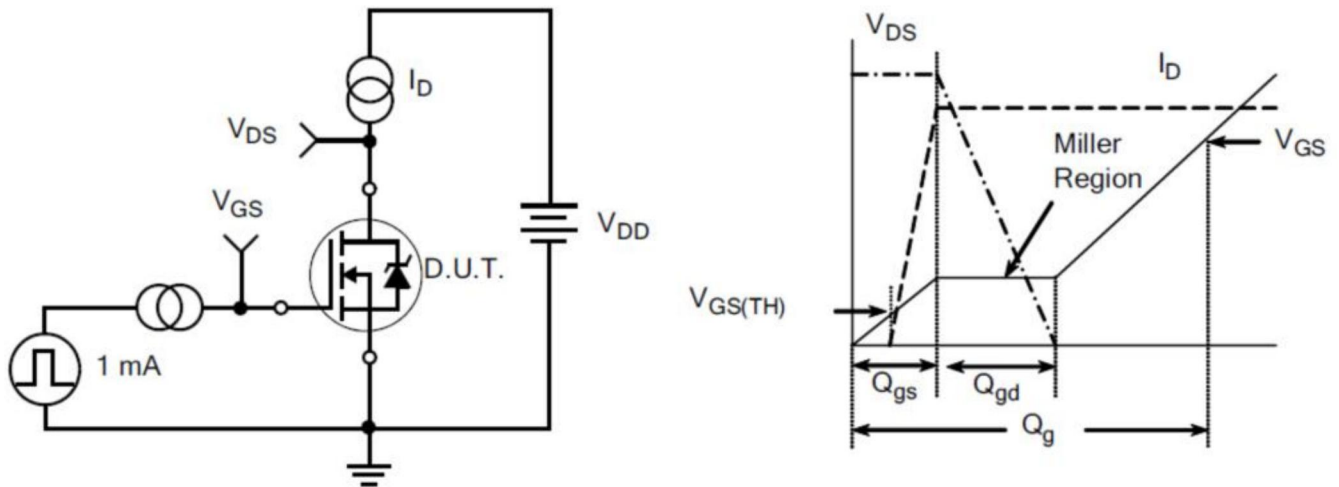


Figure B: Resistive Switching Test Circuit and Waveform

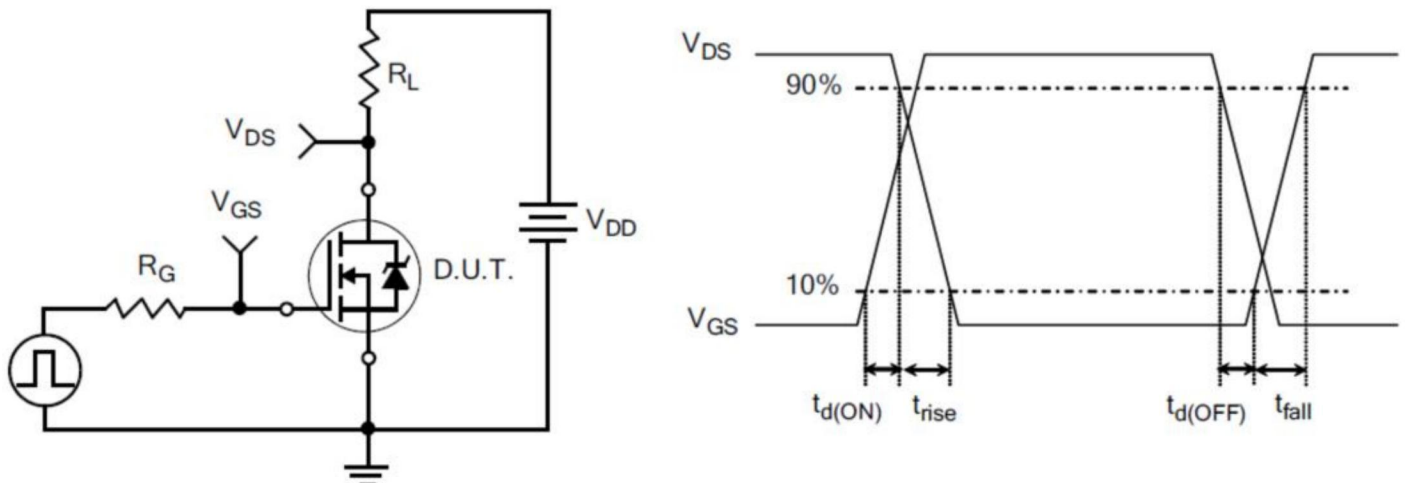
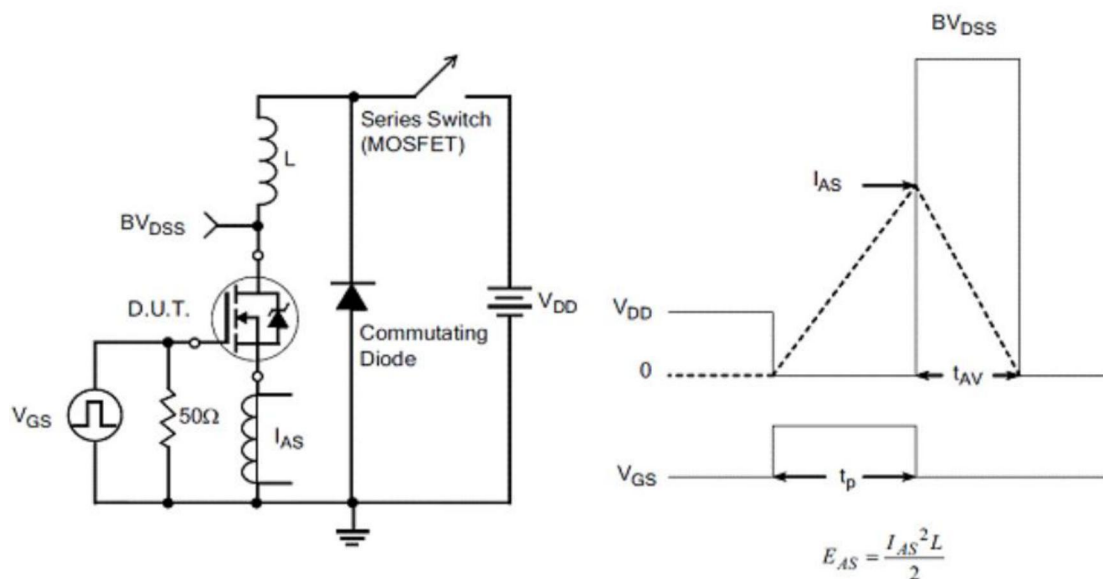
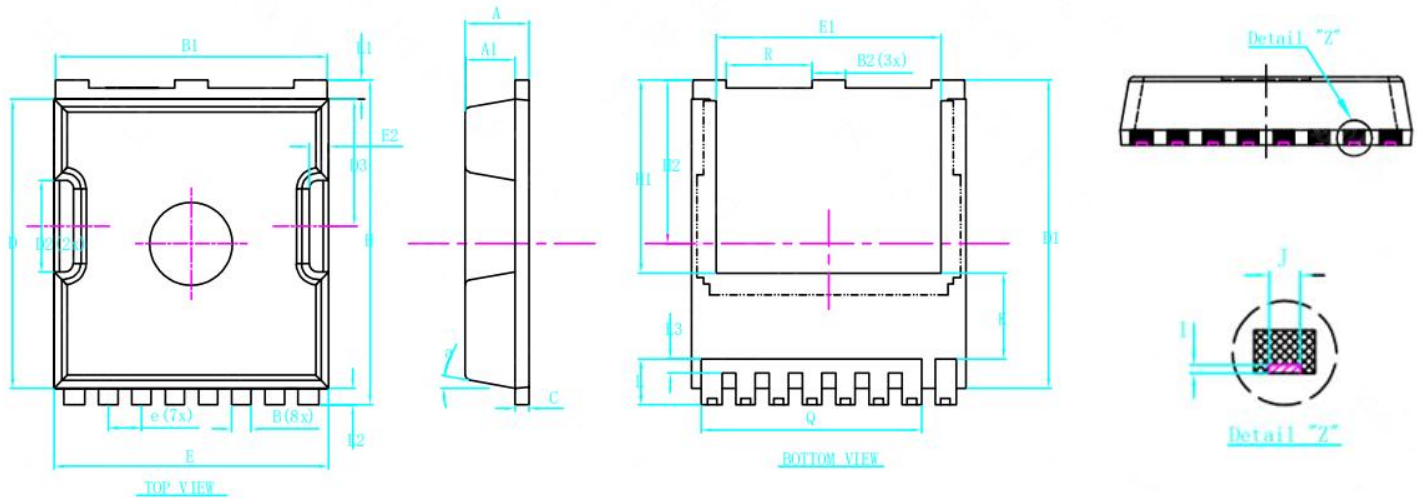


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Package Outline: TOLL-8L

SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	1.700	1.800	1.900
B	0.700	0.800	0.900
B1	9.700	9.800	9.900
B2	1.100	1.200	1.300
C	0.400	0.500	0.600
D	10.300	10.400	10.500
D1	11.000	11.100	11.200
D2	3.200	3.300	3.400
D3	4.470	4.570	4.670
E	9.800	9.900	10.000
E1	8.000	8.100	8.200
E2	0.500	0.600	0.700
e	1.200 BSC		
H	11.600	11.700	11.800
H1	6.950 BSC		
H2	5.900 BSC		
I	0.050	0.100	0.15
J	0.350 REF.		
K	3.100 REF.		
L	1.550	1.650	1.750
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.400	0.500	0.600
Q	8.000 REF.		
R	3.000	3.100	3.200
a	10° REF.		