CHIPLINK N-Channel Enhancement Mode SGT Power MOSFET

Description

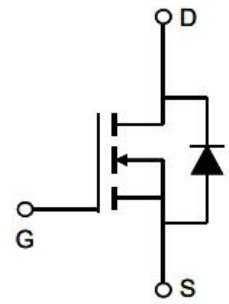
The LXS1H230Q combines advanced SGT technology to provide excellent RDS(ON), technology which reduce the conduction loss, enhance the avalanche energy. This is suitable device for BMS and high current switching applications.

Features

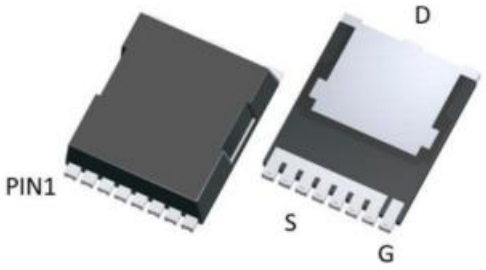
- V_{DS} = 100V, I_D = 326A
  $R_{DS(ON)typ.}$ = 1.4mΩ@V_{GS} = 10V
- Fast switching
- Excellent gate charge x $R_{DS(ON)}$ product (FOM)
- High avalanche ruggedness
- Termination is Lead-free and RoHS Compliant

Applications

- High Current Switching Applications
- BMS



Schematic Diagram



TOLL8 Package

Maximum Ratings

(T_A = 25℃, unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D (T_C = 25℃)	326	A
	I_D (T_C = 100℃)	206	A
Pulsed Drain Current [A]	I_{DM}	1304	A
Maximum Power Dissipation	P_D	416.6	W
Derating Factor above 25℃		3.33	W/℃
Single Pulse Avalanche Energy [B]	E_{AS}	1225	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	150, -55 to 150	℃
Maximum Temperature for Soldering	T_L	260	℃

Thermal Characteristic

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	℃/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.3	℃/W

Electrical Characteristics

(T_A = 25℃, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100			V
Gate-Threshold Voltage	$V_{th(GS)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 50A		1.4	1.8	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 50V, V_{GS} =0V, f=1MHz		11260		pF
Output Capacitance	C_{oss}			1715		
Reverse Transfer Capacitance	C_{rss}			328		
Switching Capacitance						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 50V, I_D=10A V_{GS} = 10V, R_{GEN}=3Ω		34		ns
Turn-On Rise Time	t_r			26		ns
Turn-Off Delay Time	$t_{d(off)}$			78		ns
Turn-Off Fall Time	t_f			30		ns
Total Gate Charge	Q_g	V_{DS} = 50V, I_D=100A, V_{GS} =10V		224		nC
Gate-Source Charge	Q_{gs}			80		nC
Gate-Drain Charge	Q_{gd}			38		nC
Gate resistance	R_G	V_{GS} =0V, V_{DS} =0V		3.6		Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} =0V, I_D=50A			1.2	V
Diode Reverse Recovery Time	t_{rr}	T_J = 25℃, I_S = 100A di/dt = 100A/μs		100		ns
Diode Reverse Recovery Charge	Q_{rr}			280		nC
Diode Forward Current	I_S	T_C = 25℃			326	A
Maximum Pulsed Current	I_{SM}				1304	A

NOTES:

A. Repetitive rating, pulse width limited by maximum junction temperature.

B. L = 0.5mH, Ias = 70A, Start TJ = 25℃.

Typical Electrical and Thermal Characteristics

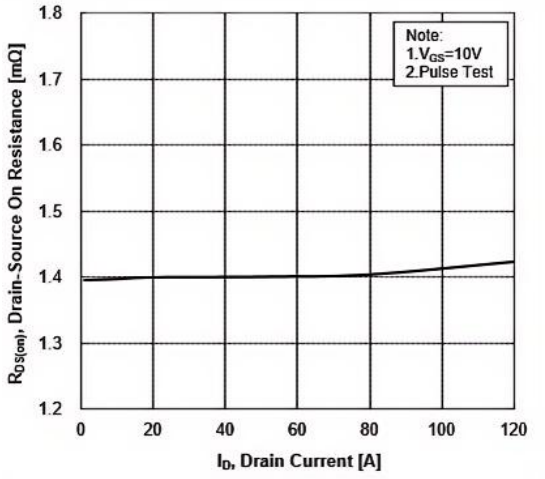


Figure 1. Drain-Source On-Resistance vs. Drain Current

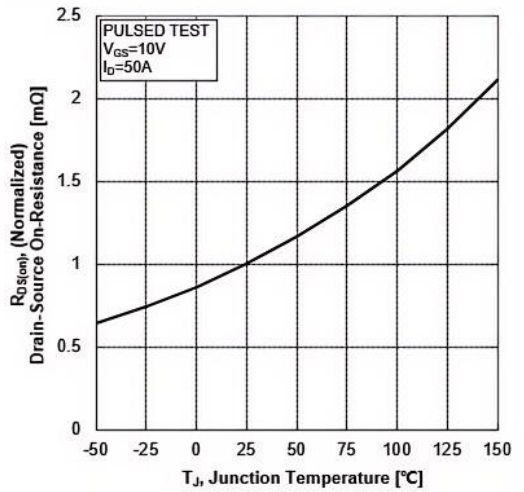


Figure 2. Normalized On-Resistance vs. Junction Temperature

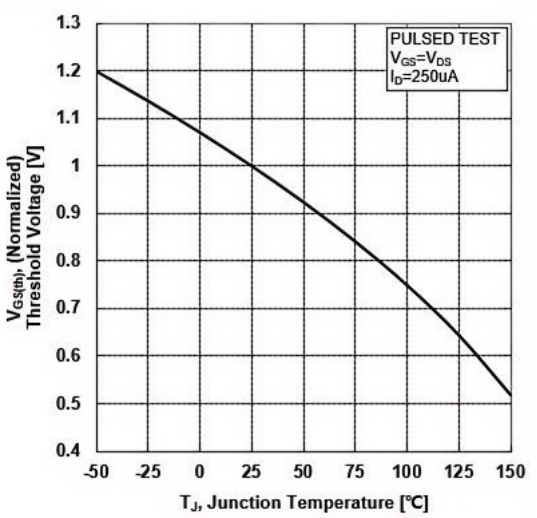


Figure 3. Normalized Threshold Voltage vs. Junction Temperature

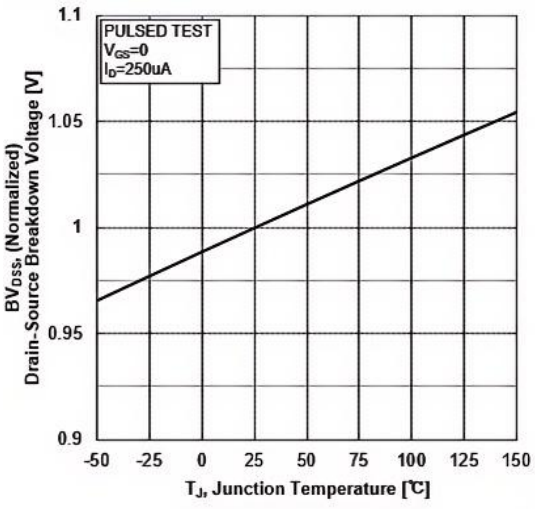


Figure 4. Normalized Breakdown Voltage vs. Junction Temperature

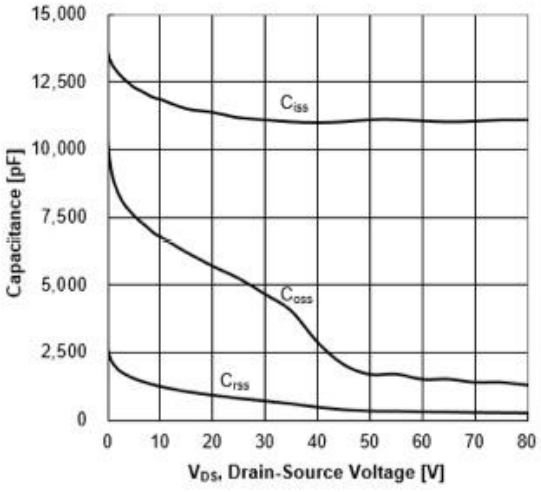


Figure 5. Capacitance Characteristics

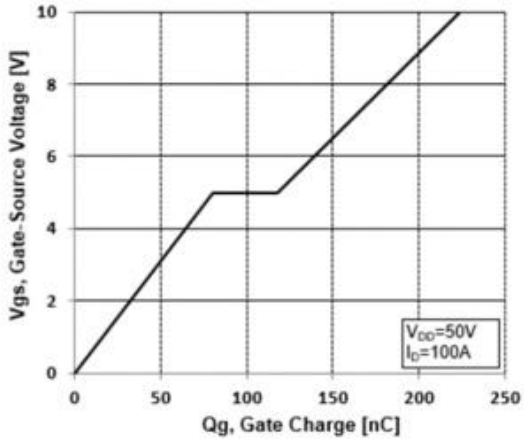


Figure 6. Typical Gate Charge vs. Gate -Source Voltage

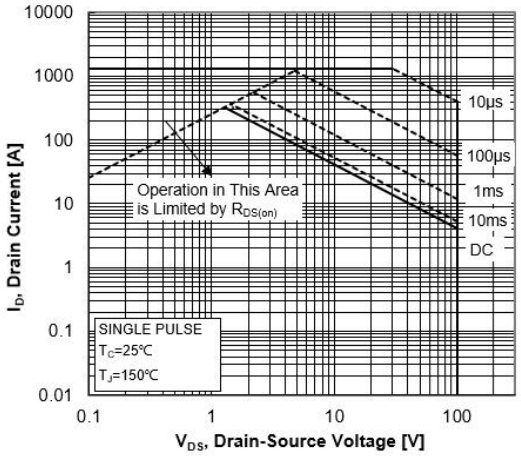


Figure 7. Safe Operating Area

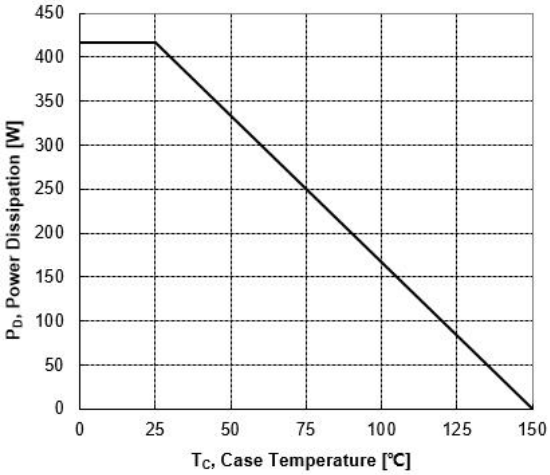


Figure 8. Maximum Power Dissipation vs. Case Temperature

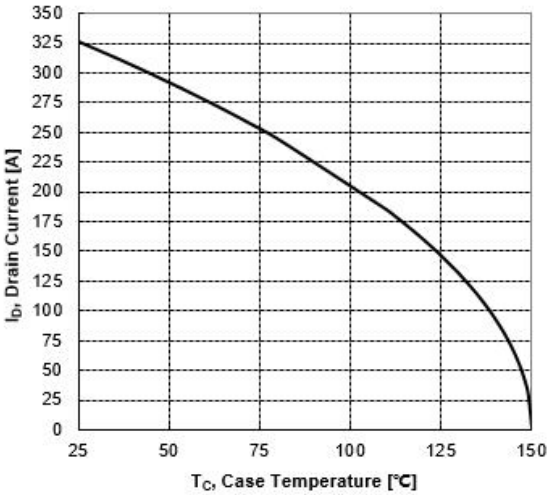


Figure 9. Maximum Continuous Drain Current vs Case Temperature

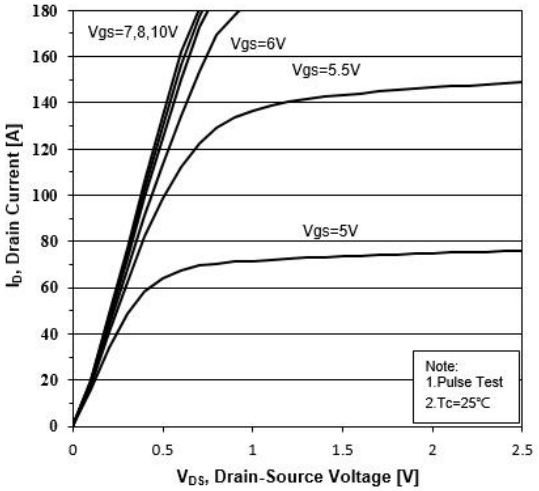


Figure 10. Typical Output Characteristics

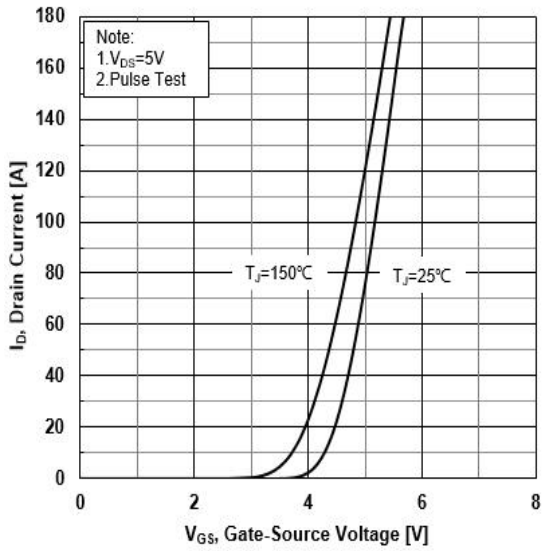


Figure 11. Typical Transfer Characteristics

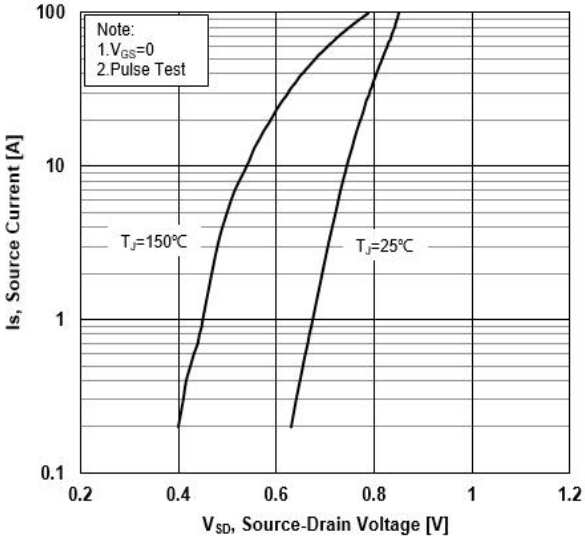


Figure 12. Source-Drain Diode Forward Characteristics

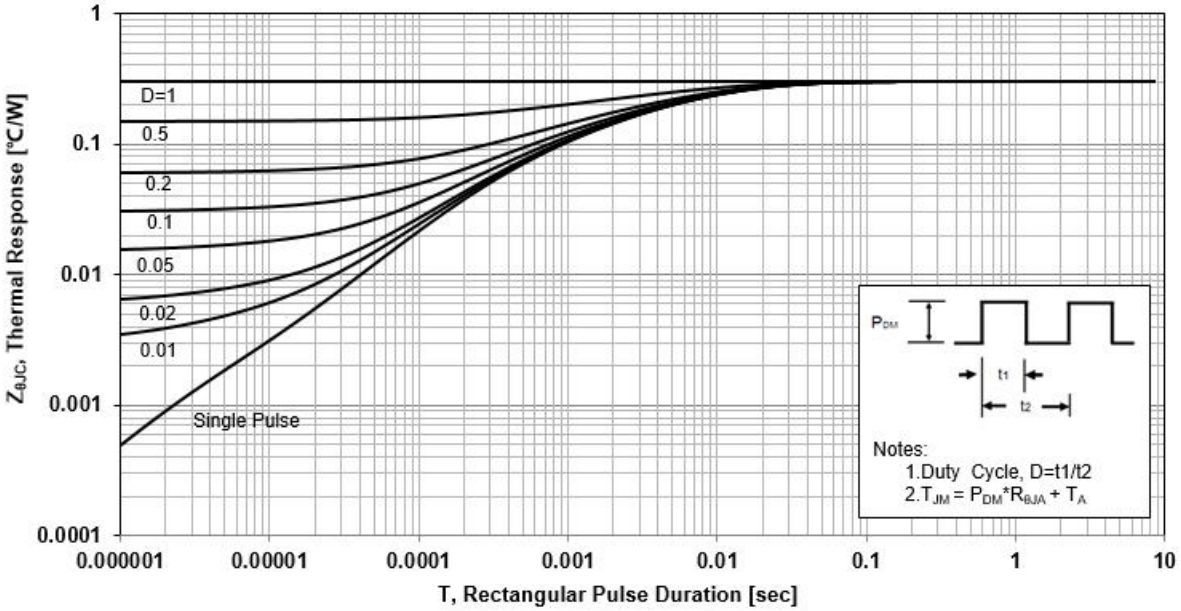


Figure 13. Maximum Continuous Drain Current vs. Case Temperature

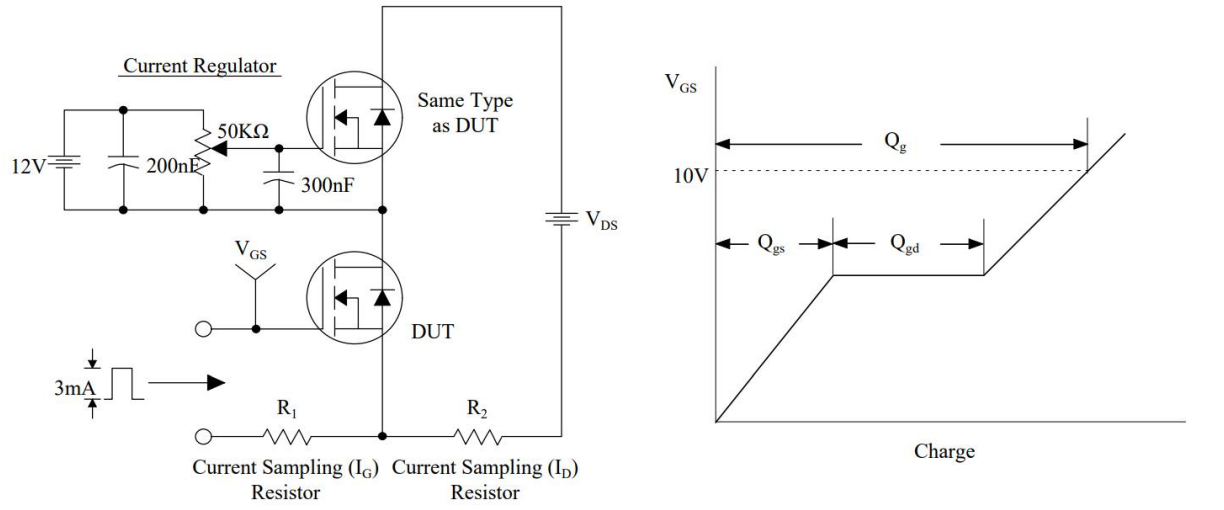


Figure 14. Gate Charge Test Circuit & Waveform

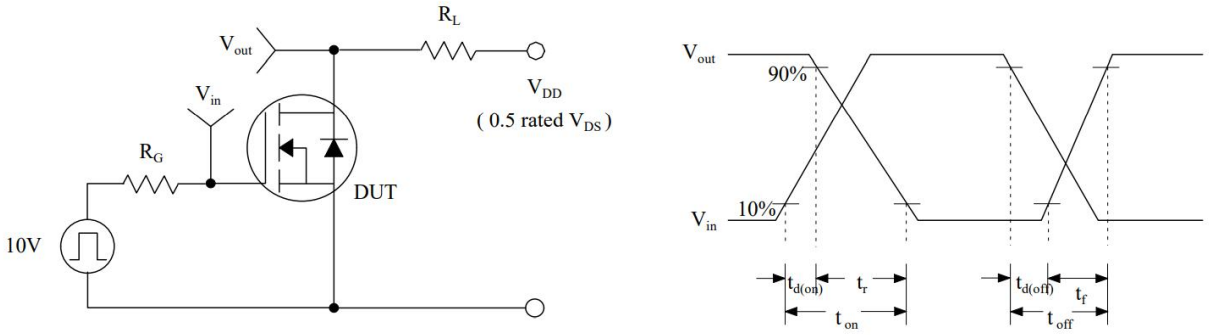


Figure 15. Resistive Switching Test Circuit & Waveforms

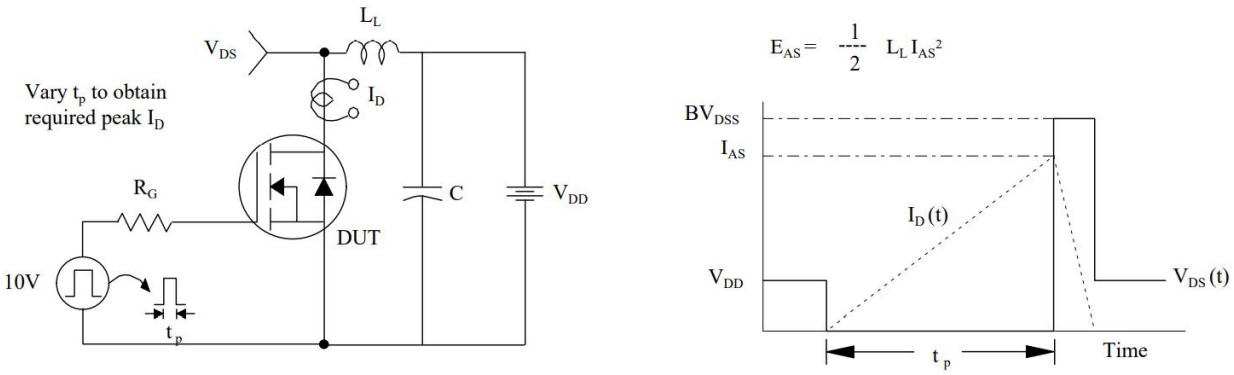
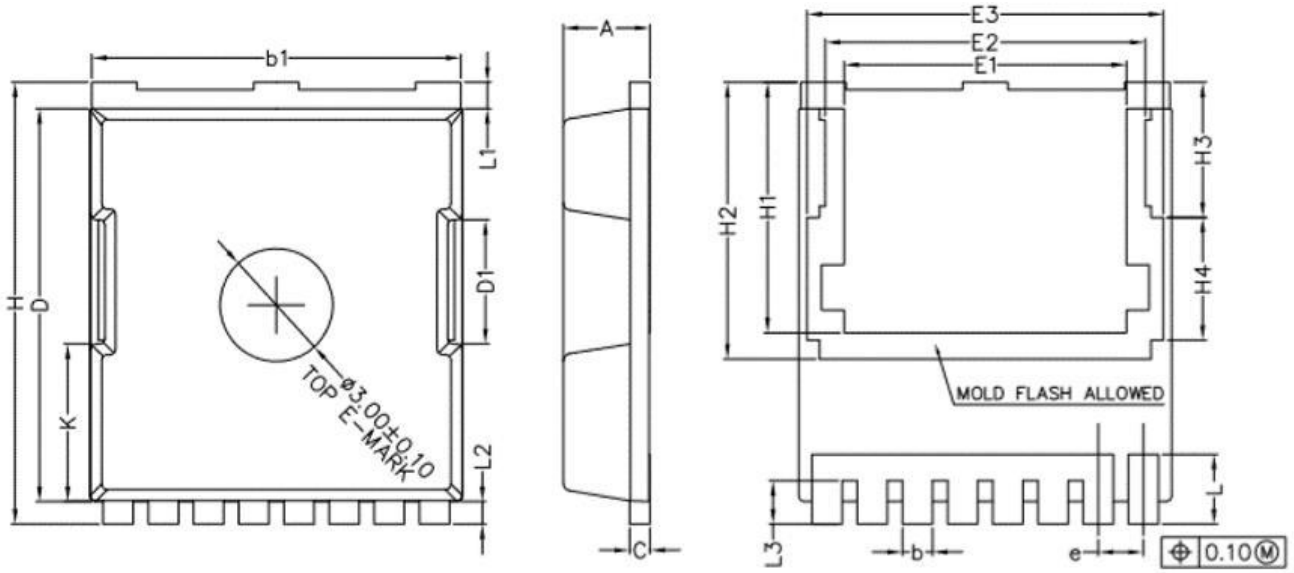
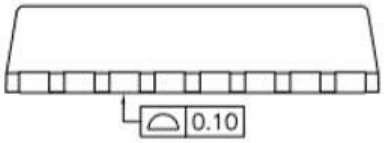


Figure 16. Unclamped Inductive Switching Test Circuit & Waveforms

TOLL8 Package Information



TOP VIEW SIDE VIEW BOTTOM VIEW



SIDE VIEW

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
c	0.40	0.50	0.60
D	10.28	10.43	10.58
D1	3.15	3.30	3.45
E	9.70	9.90	10.10
E1	7.35	7.50	7.65
E2	8.35	8.50	8.65
E3	9.31	9.46	9.61
e	1.10	1.20	1.30
H	11.48	11.73	11.88
H1	6.55	6.65	6.75
H2	7.20	7.35	7.50
H3	3.44	3.59	3.74
H4	3.11	3.26	3.41
K	4.03	4.18	4.33
L	1.60	1.85	2.10
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.00	1.15	1.30

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