LSG12N10TL-C 100V N-Channel MOSFET

Features

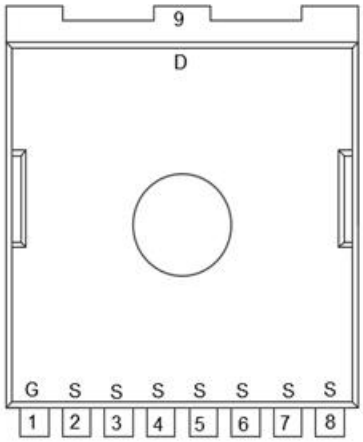
- Advanced SGT MOS technology
- Low Thermal Resistance
- Low Gate Charge
- Halogen-Free & Lead-Free
- 100% EAS Test
- 100% Rg Test

Applications

- Motor/Body Load Control
- Battery Management
- DC-DC converters and Off-line UPS

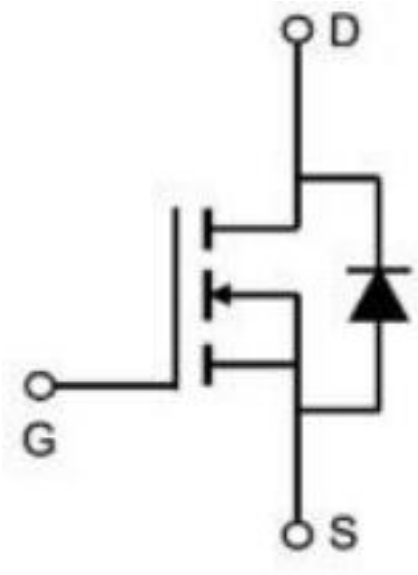
Pin Configuration

LSG12N10TL-C(TOLL)



Top View TOLL

Pin	Description	Pin	Description
1	Gate	6	Source
2	Source	7	Source
3	Source	8	Source
4	Source	9	Drain
5	Source		



Marking Information

Part Marking	Part Number	LFC code
12N10C YWWXXX	12N10C	YWWXXX

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25ºC	360	A
		T_C=100ºC	254.1	
I_{DM}	Pulsed Drain Current[1]		1440	A
E_{AS}	Single Pulse Avalanche Energy[2]		1806	mJ
P_D	Power Dissipation(T_C=25ºC)		500	W
T_J	Operating Junction Temperature Range		-50 to +150	ºC
T_{STG}	Storage Temperature Range		-50 to +150	ºC
$R_{\theta JC}$	Thermal Resistance-Junction to Case[3]		0.25	ºC/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient[3]		62.5	ºC/W

Note:

1. Pulse Test: Pulse Width ≦ 300us, Duty Cycle ≦ 2%, Repetitive rating, pulse width limited by $T_{J(MAX)}$ = 150ºC.
2. Limited by $T_{J(MAX)}$, starting T_J = 25ºC, L = 0.5mH, R_g = 25Ω, V_{DD} = 50V, V_{GS} = 10V.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Electrical Characteristics

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	100			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V			1	uA
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=50A		1.0	1.3	mΩ
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1MHz		14200		pF
C_{oss}	Output Capacitance			4000		
C_{rss}	Reverse Transfer Capacitance			935		
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_D=50A		240		nC
Q_{gs}	Gate-Source Charge			64		
Q_{gd}	Gate-Drain Charge			64		
$t_{d(on)}$	Turn-On Time	V_{DS}=50V, V_{GS}=10V, I_D=50A		45		ns
T_r				51		
$t_{d(off)}$	Turn-Off Time			123		
T_f				52		
Body-Diode						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1A			1.2	V

Typical Performance Characteristics

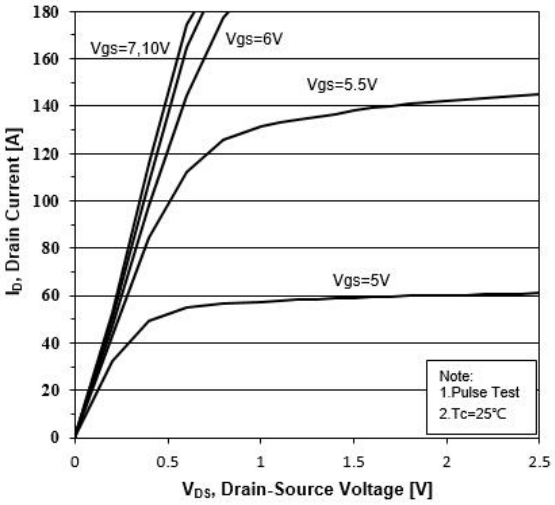


Fig.1 Typical Output Characteristics

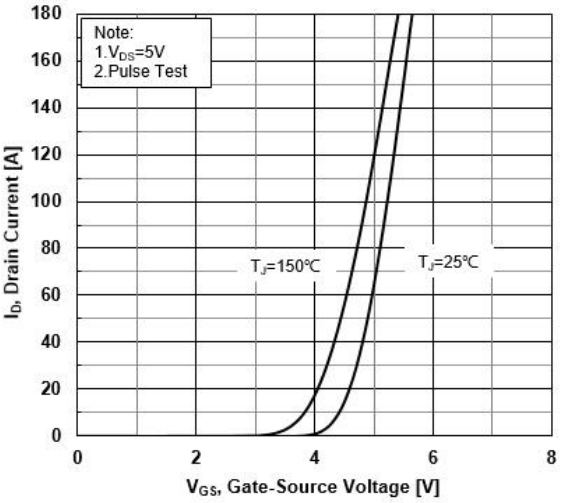


Fig.2 Typical Transfer Characteristics

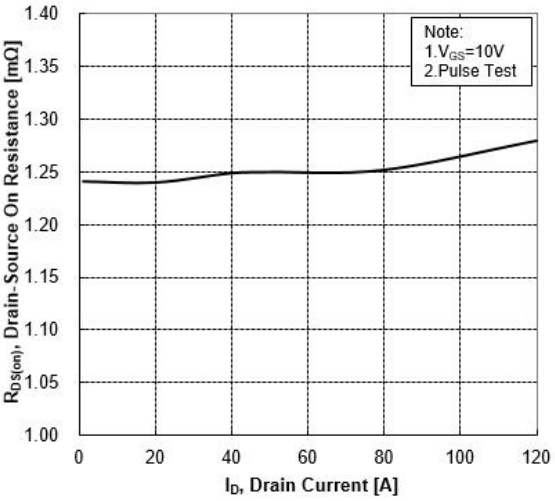


Fig.3 On-Resistance vs. Drain Current

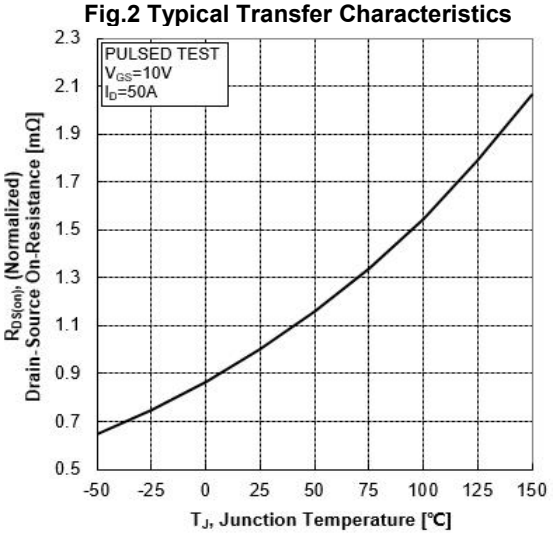


Fig.4 On-Resistance vs. Junction Temperature

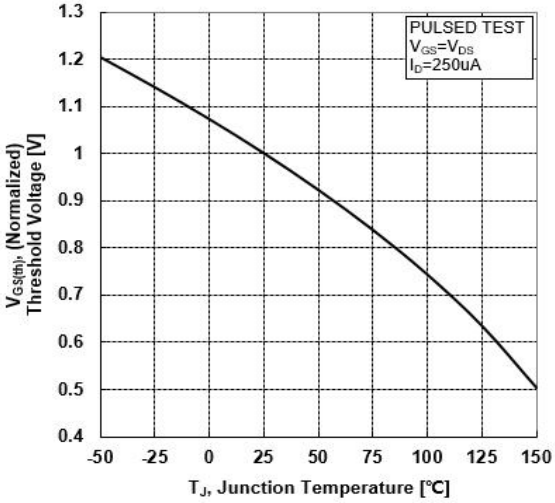


Fig.5 $V_{GS(th)}$ vs. Junction Temperature

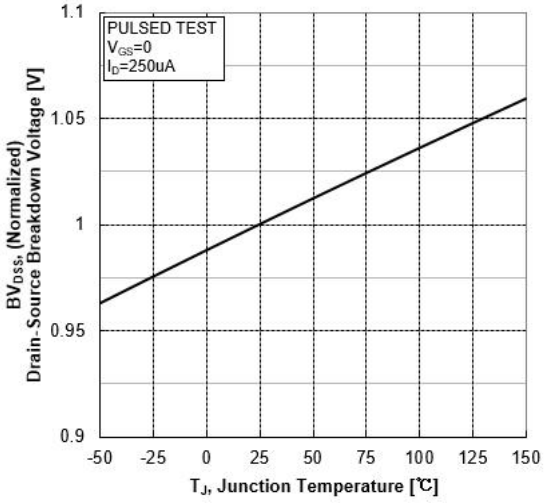


Fig.6 $V_{(BR)DSS}$ vs. Junction Temperature

Typical Performance Characteristics

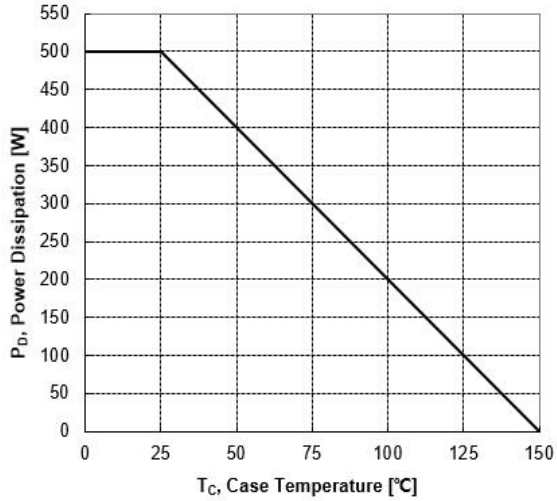


Fig.7 Maximum P_D vs. Case Temperature

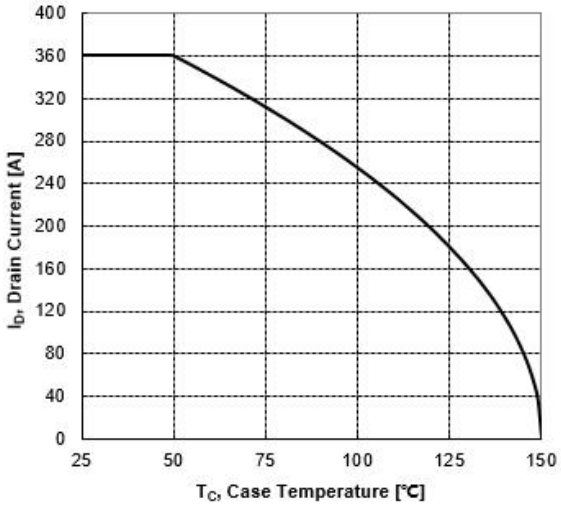


Fig.8 Maximum I_D vs. Case Temperature

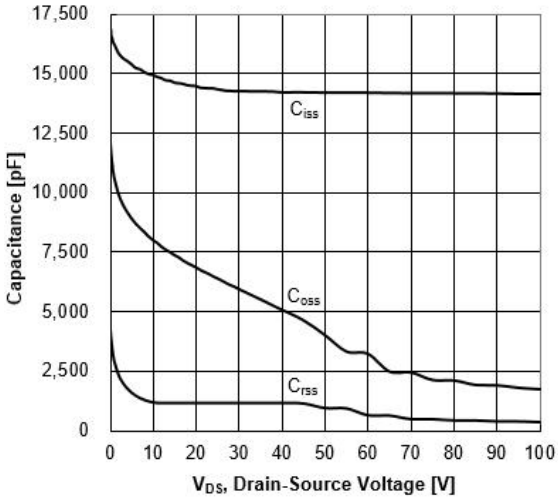


Fig.9 Capacitance Characteristics

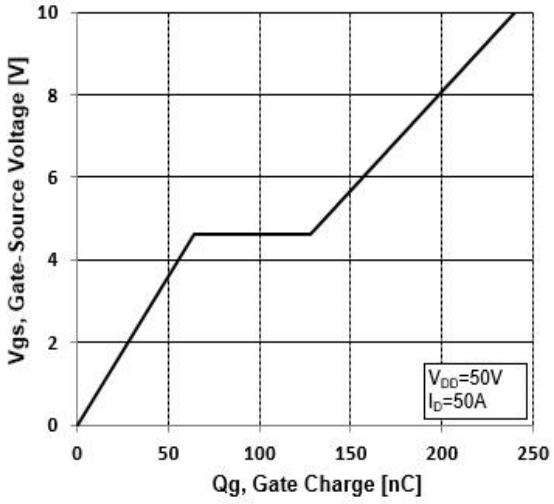


Fig.10 Typical Gate Charge vs. Gate-Source Voltage

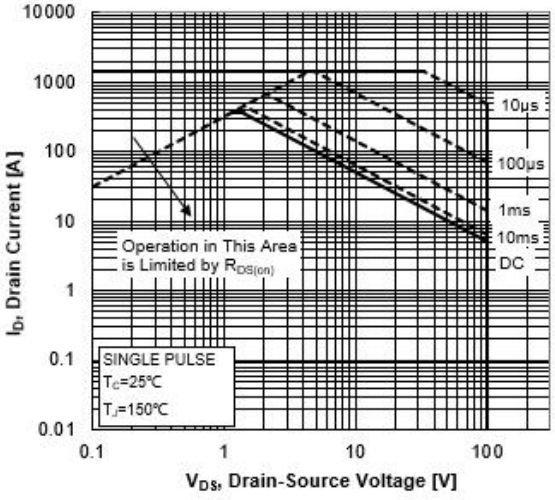


Fig.11 Safe Operating Area

Typical Performance Characteristics

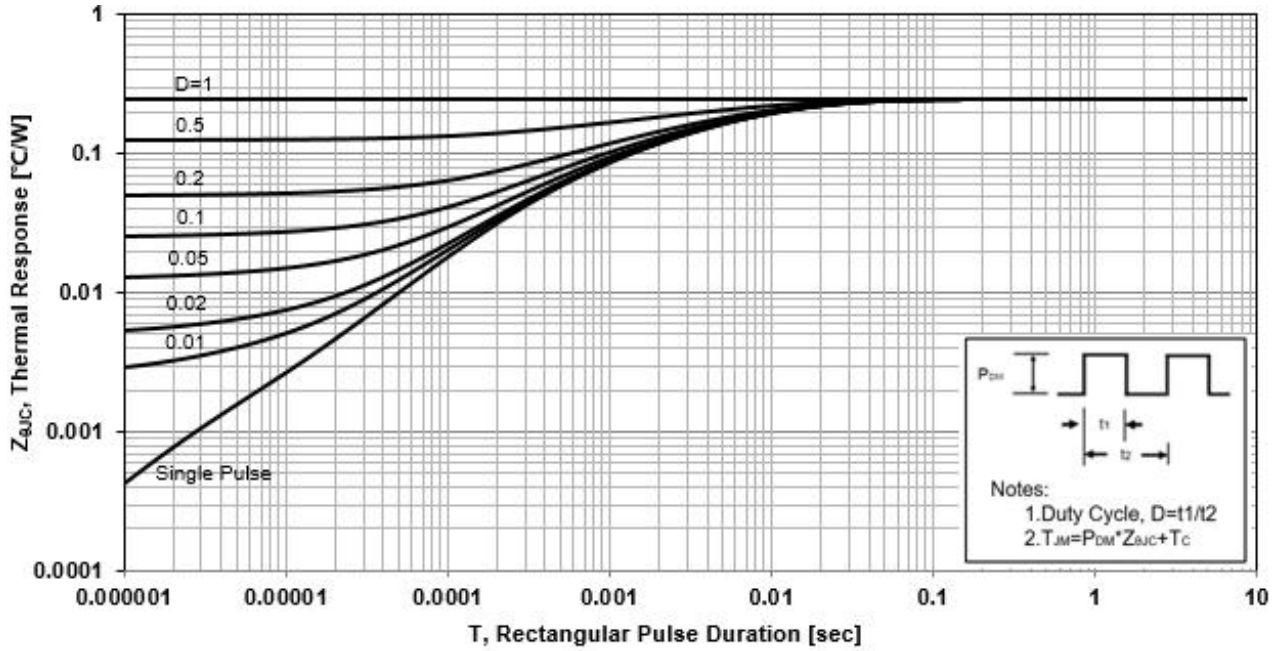
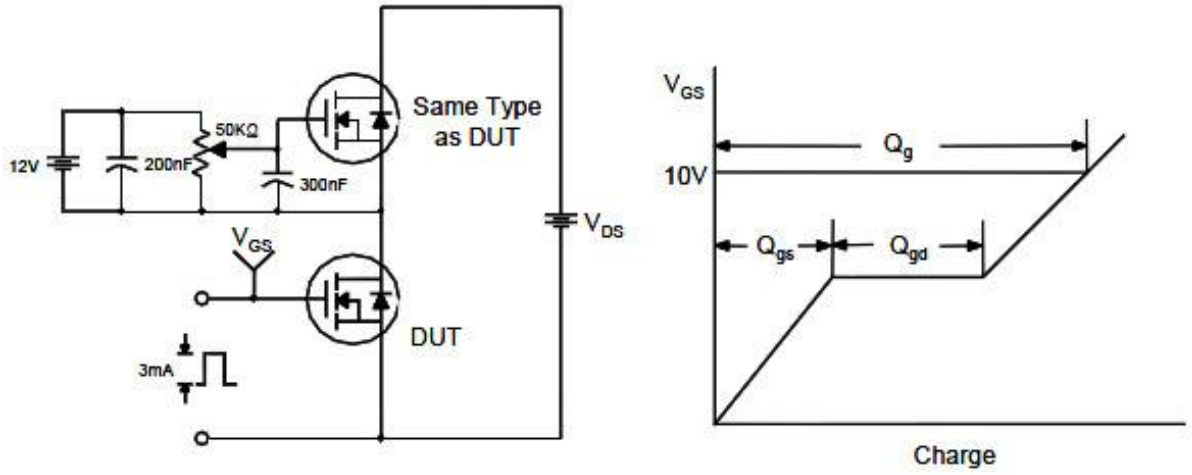


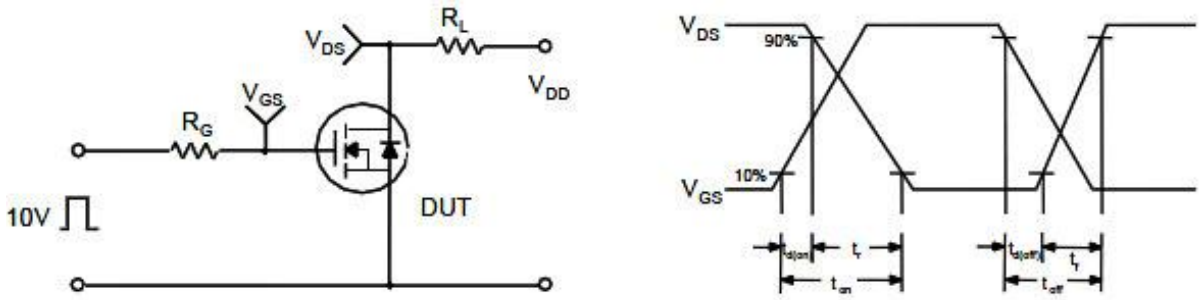
Fig.12 Transient Thermal Impedance

Typical Characteristics

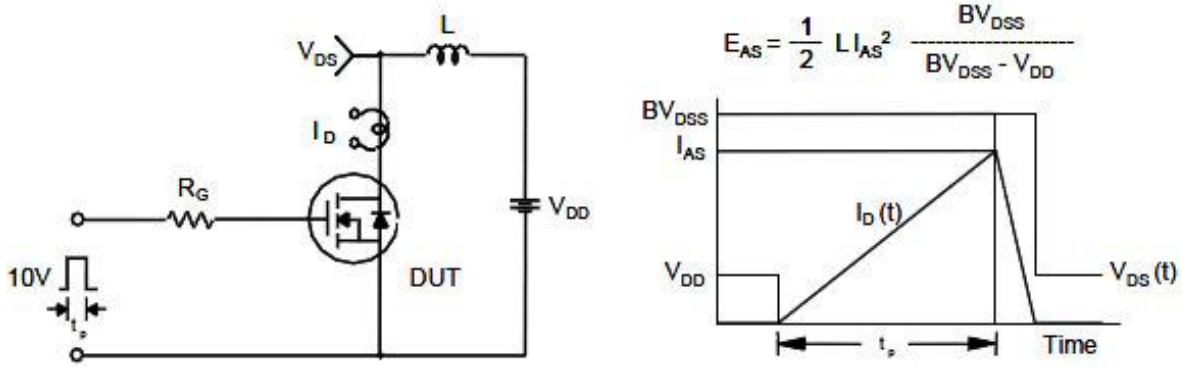
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

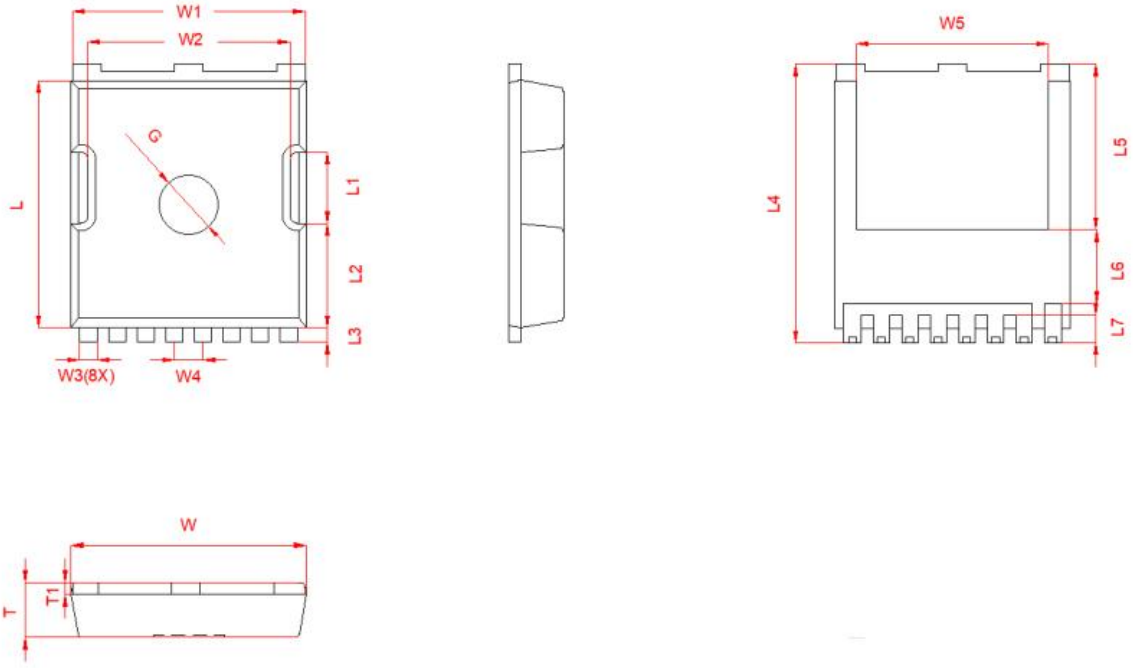


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension(Units:mm)

TOLL



Symbol	Min	Max	Symbol	Min	Max
W	9.70	10.10	**L3**	0.50	0.70
W1	9.70	9.90	**L4**	11.48	11.88
W2	8.50 BSC		**L5**	6.90 BSC	
W3	0.60	0.85	**L6**	3.10 BSC	
W4	1.10	1.30	**L7**	1.10	1.30
W5	8.10 BSC		**T**	2.20	2.40
L	10.28	10.58	**T1**	0.40	0.60
L1	3.00 BSC		**G(Φ)**	2.50 BSC	
L2	4.20	4.60			