N-Channel 100V MOSFET

E100N2P3OH1

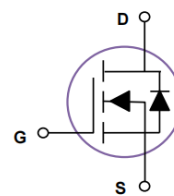| V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100V	2.3 @ V_{GS} = 10V	325

TOLL-8

Features

- Low $R_{DS(on)}$ trench technology

- Low thermal impedance

- Fast switching speed

- 100% avalanche tested

Applications

- DC/DC conversion

- Power switch

- PD charger

- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E100N2P3OH1	TOLL-8	E100N2P3OH1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TOLL-8	2000	1	2000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	100	V
ID, pulse	1160	A
RDS(ON), max @ VGS=10V	2.3	mΩ
Qg	203	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	325	A
	T_C=100°C		265	
Pulsed drain current		$I_{D,pulse}$	1160	
Avalanche energy, single pulse		E_{AS}	2209	mJ
Power dissipation	T_C=25°C	P_D	536	W
	T_A=25°C		-	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 175	°C

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.28	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	43	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	100			V	V_{GS} = 0, I_D = 250 µA
Gate-source threshold voltage	$V_{GS(th)}$	2.3	2.8	3.2	V	V_{DS} = V_{GS}, I_D = 250 µA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	µA	V_{DS} = 100 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		1.7	2.3	mΩ	V_{GS} = 10 V, I_D = 40 A
Gate resistance	Rg		0.9		Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		203			$V_{DS} = 50$ V, $I_D = 80$ A, $V_{GS} = 10$ V
Gate-source charge	Qgs		60		nC	
Gate-drain charge	Qgd		48			
Dynamic						
Turn-on delay time	$t_{d(on)}$		32			$V_{DS} = 50$ V, $I_D = 80$ A, $V_{GS} = 10$ V, $R_{GEN} = 3$ Ω
Rise time	t_r		96			
Turn-off delay time	$t_{d(off)}$		110		ns	
Fall time	t_f		71			
Input capacitance	C_{iss}		12560			$V_{DS} = 50$ V, $V_{GS} = 0$ V, f = 100kHz
Output capacitance	C_{oss}		1810			
Reverse transfer capacitance	C_{rss}		40		pF	
Body Diode						
Diode forward voltage	V_{SD}		0.86	1	V	$V_{GS} = 0$ V, $I_F = 80$ A
Reverse recovery time	t_{rr}		88		ns	$V_{DD} = 80$ V, $I_S = 80$ A, di/dt = 100 A/µs
Reverse recovery charge	Q_{rr}		138		nC	

Electrical Characteristics Diagrams
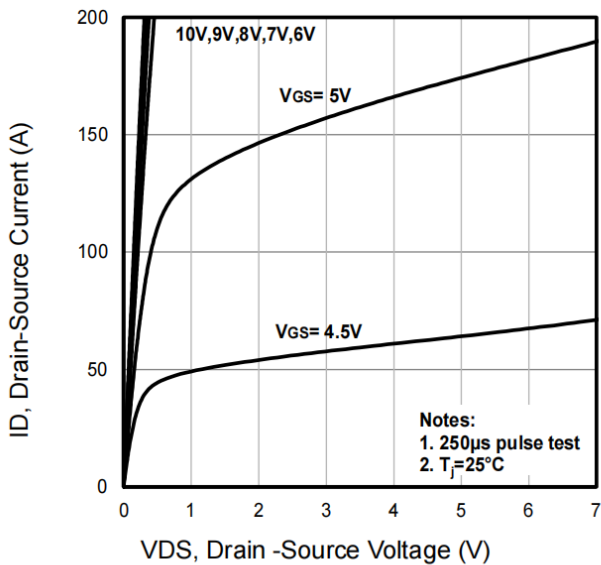
Fig1. Typical Output Characteristics
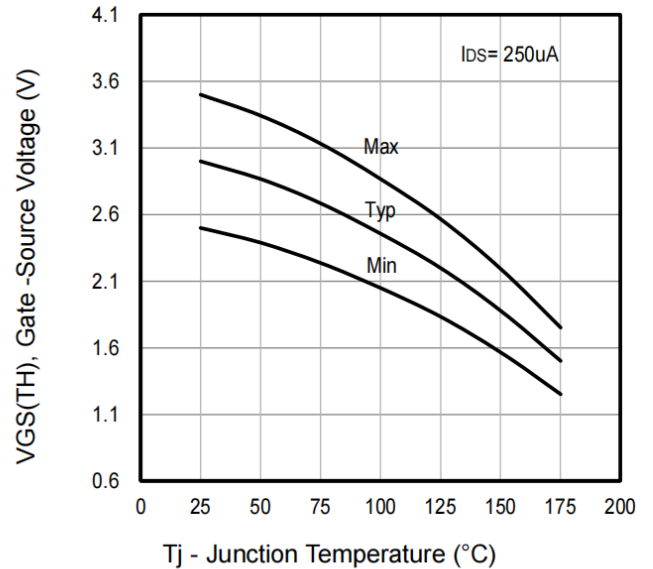
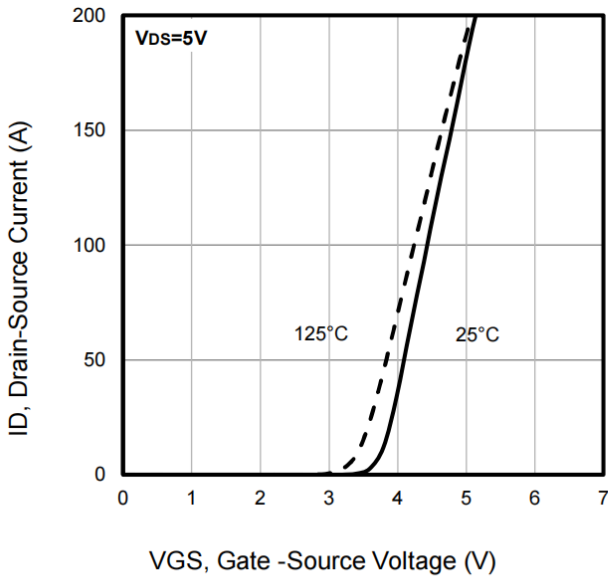**Fig2.** $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj
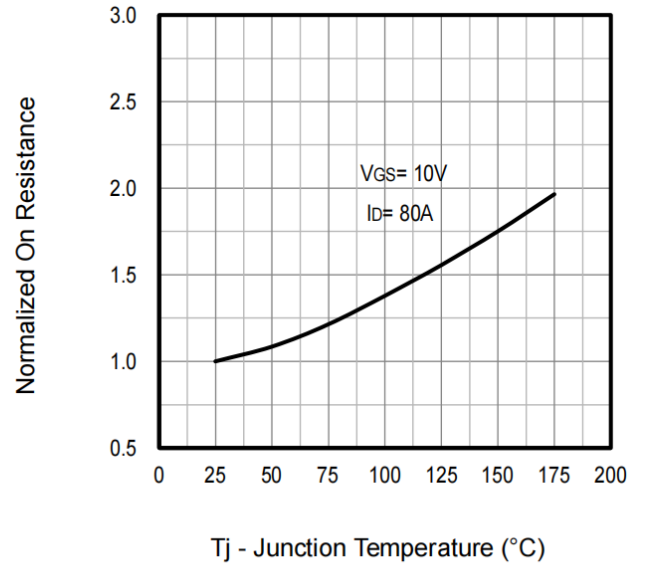
Fig3. Typical Transfer Characteristics

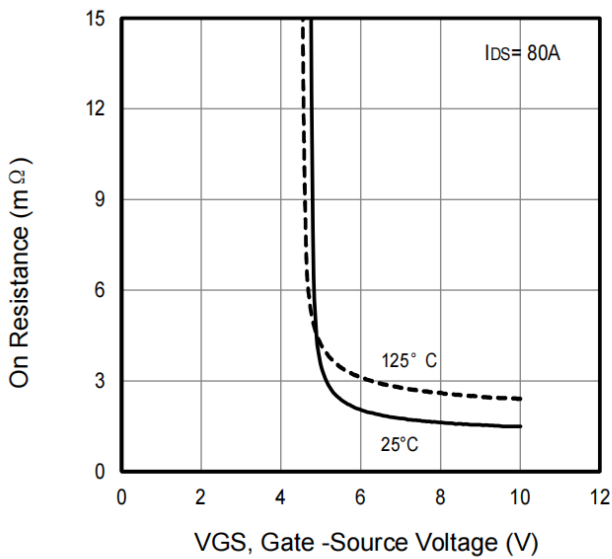Fig4. Typical Normalized On-Resistance Vs. Tj
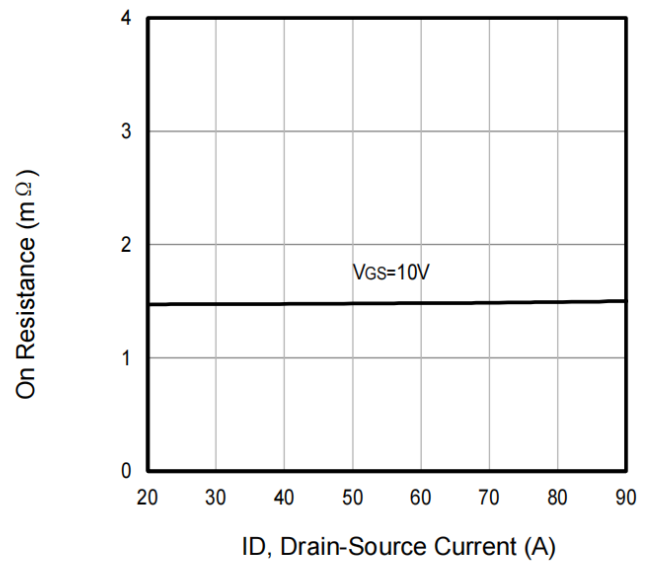
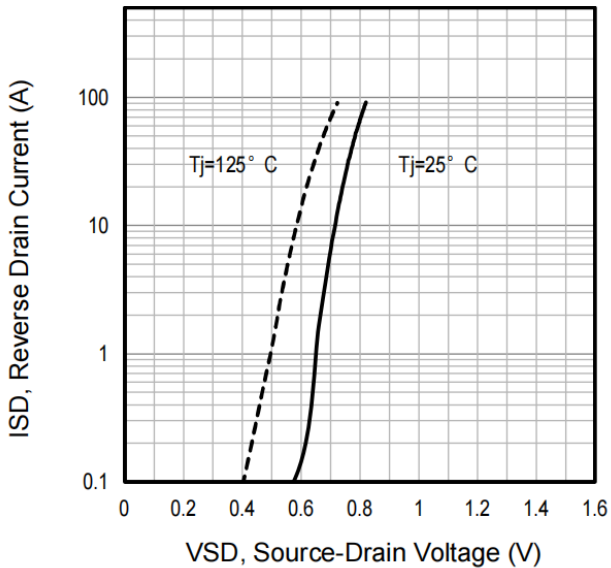Fig5. Typical On Resistance Vs Gate -Source Voltage

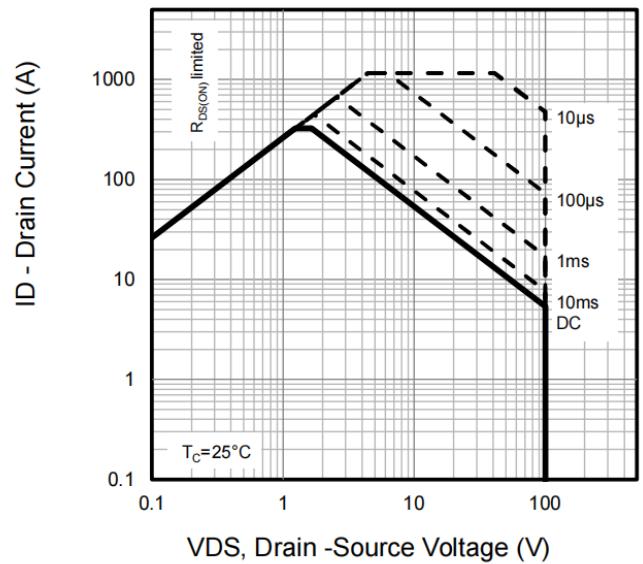Fig6. Typical On Resistance Vs Drain Current
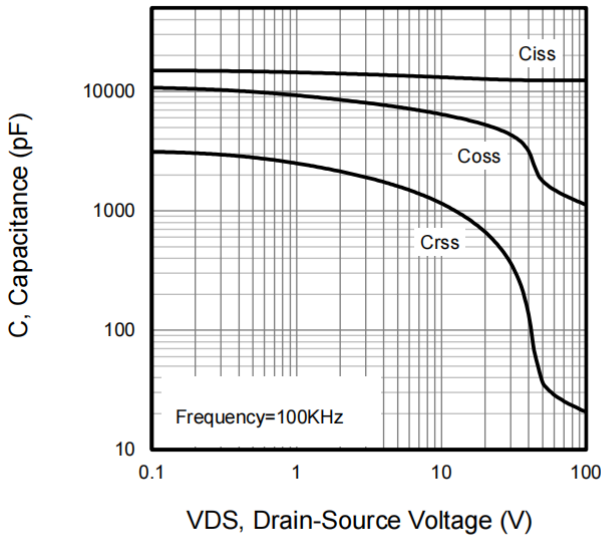
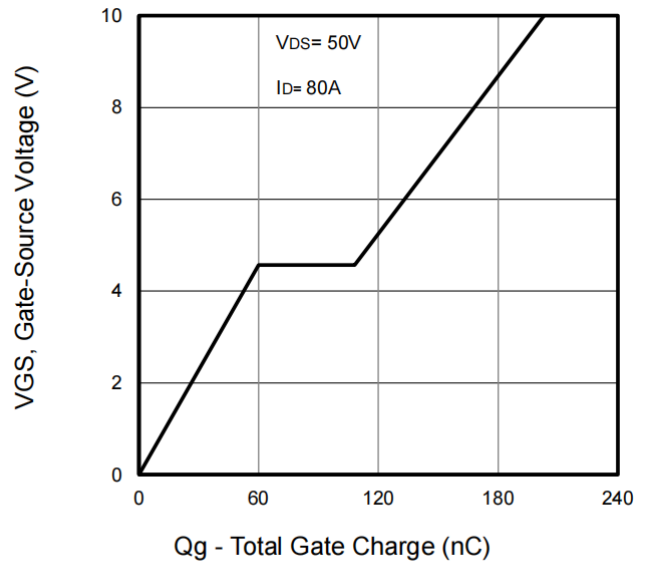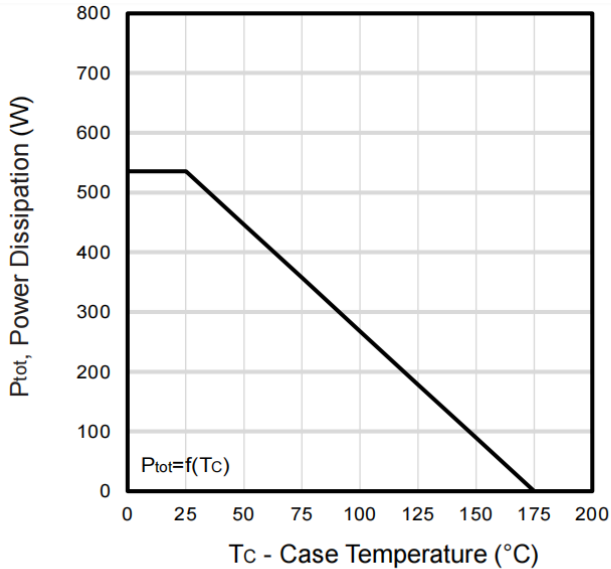Fig7. Typical Source-Drain Diode Forward Voltage
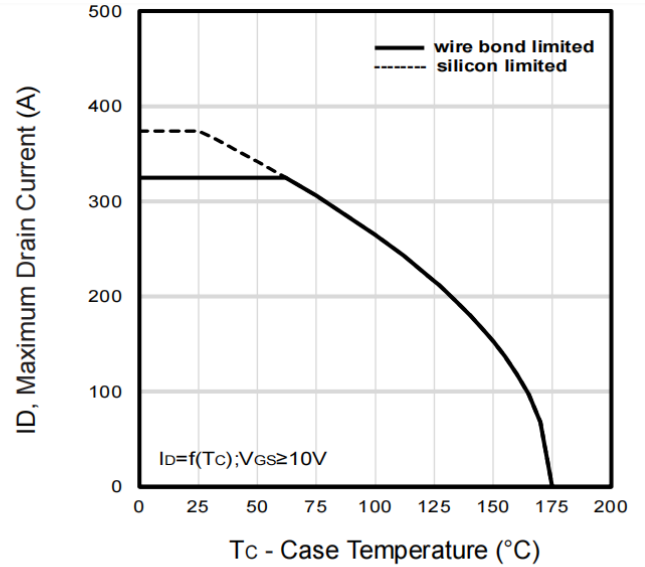
Fig8. Maximum Safe Operating Area

Fig9. Typical Capacitance Vs. Drain-Source Voltage
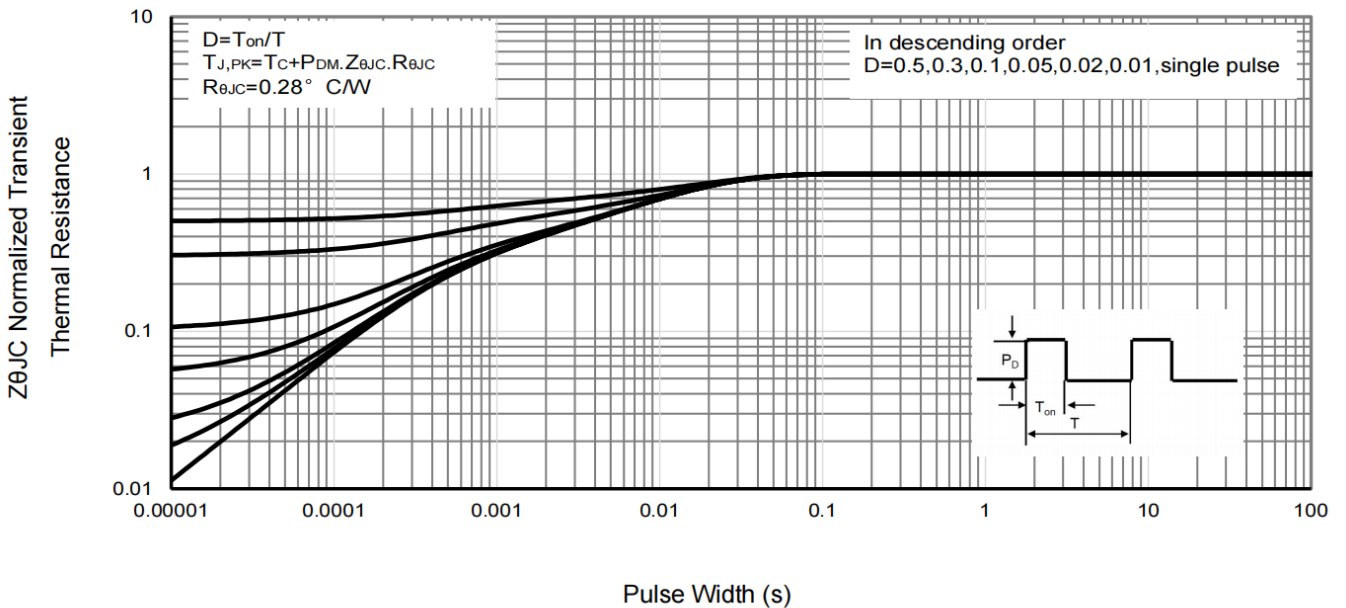

Fig10. Typical Gate Charge Vs. Gate-Source Voltage

Fig11. Power Dissipation Vs. Case Temperature

Fig12. Maximum Drain Current Vs. Case Temperature

Pulse Width (s)

Fig13 . Normalized Maximum Transient Thermal Impedance

Test circuits and waveforms
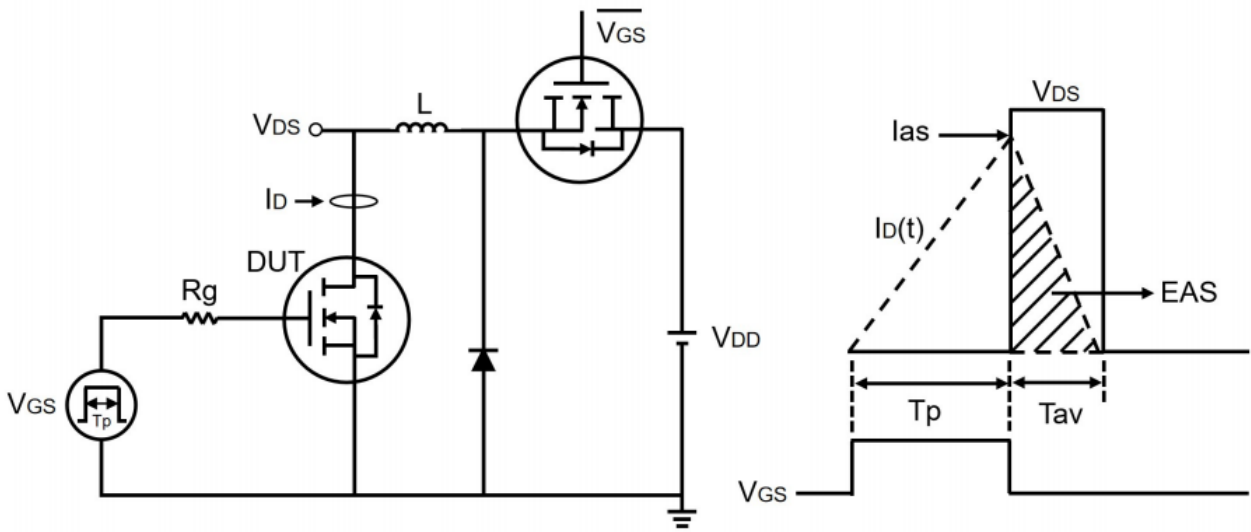
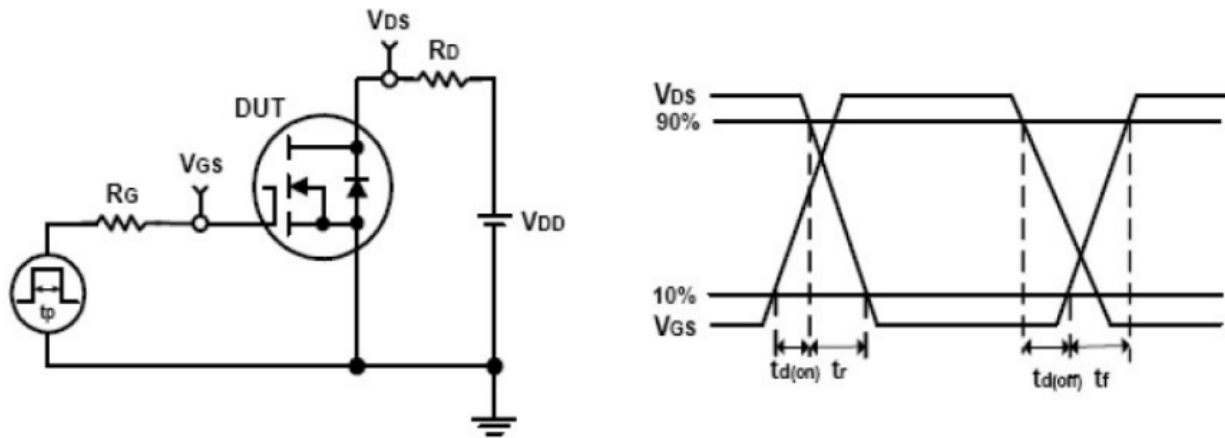

Fig14. Unclamped Inductive Test Circuit and waveforms

Fig15. Switching Time Test Circuit and waveforms

Package Outline Dimensions
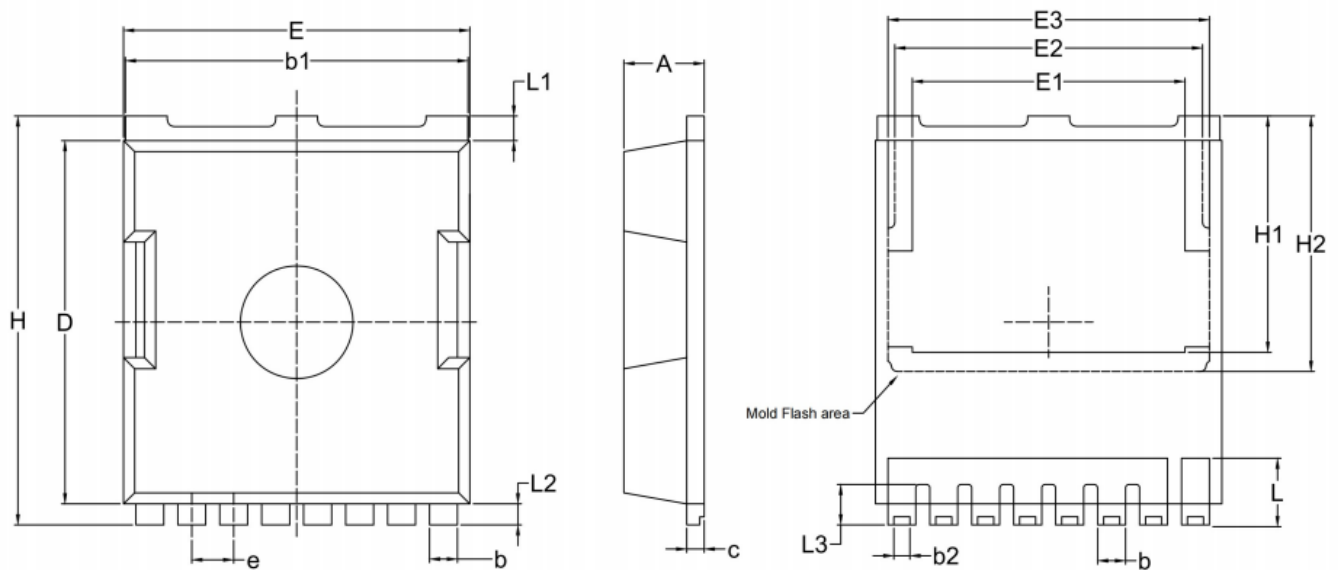
Symbol	DIMENSIONS (unit : mm)			Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.40	E3	--	9.20	--
b	0.70	0.80	0.90	e	1.20 BSC		
b1	9.70	9.80	9.90	H	11.58	11.68	11.78
b2	0.42	0.46	0.50	H1	6.65	6.75	6.85
c	0.492	0.500	0.508	H2	--	7.30	--
D	10.28	10.38	10.48	L	1.70	1.90	2.10
E	9.80	9.90	10.00	L1	--	0.70	--
E1	--	7.80	--	L2	--	0.60	--
E2	--	8.80	--	L3	1.05	1.15	1.25

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