

N-Channel Enhancement Mode Power MOSFET

Description

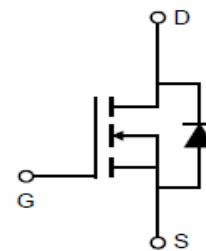
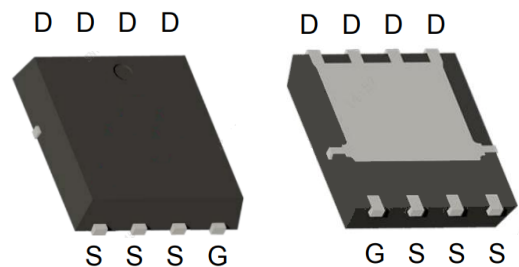
This Power MOSFET is produced using advanced Trench technology.

This devices provide an excellent gate charge and $R_{DS(on)}$, which leads to extremely communication and conduction losses. So it is very suitable for AC/DC power conversion, load switch and industrial power applications.

Features

- $V_{DS}=30V$, $I_D=120A$
- $R_{DS(on)}$ Typ= $1.15m\Omega$ @ $V_{GS}=10V$
- $R_{DS(on)}$ Typ= $1.5m\Omega$ @ $V_{GS}=4.5V$
- Low FOM $R_{DS(on)} \times Q_{gd}$
- 100% avalanche tested
- Easy to use/drive
- RoHS compliant

PDFN5*6-8L



Schematic diagram

Applications

- Power Management
- PWM Application
- Load Switch

100% UIS TESTED!

100% ΔV_{ds} TESTED!

Package Marking and Ordering Information

Device	Marking	Package	Reel (pcs)
SL120N03R		PDFN5*6	5000

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽²⁾	$T_C=25^\circ\text{C}$	I_D	120	A
	$T_C=100^\circ\text{C}$		78	
Pulsed Drain Current($T_C=25^\circ\text{C}, T_p$ Limited By T_{jmax}) ⁽³⁾		I_{DM}	480	A
Maximum Power Dissipation($T_C=25^\circ\text{C}$)		P_D	120	W
Avalanche energy , single Pulse($L=0.5\text{mH}$) ⁽¹⁾		E_{AS}	462	mJ
Operating Junction And Storage Temperature		T_j, T_{stg}	-55 To 150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	$^\circ\text{C}$

* Drain current limited by maximum junction temperature.

Thermal Resistance

Parameter	Symbol	Max	Unit
Junction-to-Case	$R_{\theta JC}$	1.04	$^\circ\text{C}/\text{W}$

Notes:

- 1) $L=0.5\text{mH}$, $V_{DD}=30\text{V}$, Start $T_j=25^\circ\text{C}$.
- 2) Limited by maximum junction temperature.
- 3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Off Characteristic						
Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ C$
		-	-	50	μA	$V_{DS}=24V, V_{GS}=0V, T_J=125^\circ C$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
On Characteristics						
Gate threshold voltage	$V_{GS(th)}$	1.2	1.5	2.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Drain-source on-state resistance	$R_{DS(on)}$	-	1.15	1.5	m Ω	$V_{GS}=10V, I_D=20A$
Drain-source on-state resistance	$R_{DS(on)}$	-	1.5	2.2	m Ω	$V_{GS}=4.5V, I_D=20A$
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	4050	-	PF	$V_{GS}=0V, V_{DS}=15V, f=1.0MHz$
Output Capacitance	C_{oss}	-	1710	-		
Reverse Transfer Capacitance	C_{rss}	-	140	-		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	-	18	-	nS	$V_{DS} = 15V, V_{GS} = 10V$ $R_G = 1\Omega, I_D = 50A$
Turn-on Rise time	t_r	-	11	-		
Turn-off delay time	$t_{d(off)}$	-	64	-		
Turn-off Fall time	t_f	-	11	-		
Gate Total Charge	Q_G	-	69	-	nC	$V_{GS}=10V, V_{DS}=10V,$ $I_D=30A$
Gate-Source Charge	Q_{gs}	-	12	-		
Gate-Drain Charge	Q_{gd}	-	17	-		
Drain-Source Diode Characteristics						
Body Diode Forward Voltage	V_{SD}	-	-	1.2	V	$V_{GS}=0V, I_{SD}=20A, T_J = 25^\circ C$
Body Diode Forward Current	I_S	-	-	120	A	-
Max Pulsed Drain-source diode forward current	I_{SM}	-	-	480	A	

N- Channel Typical Characteristics

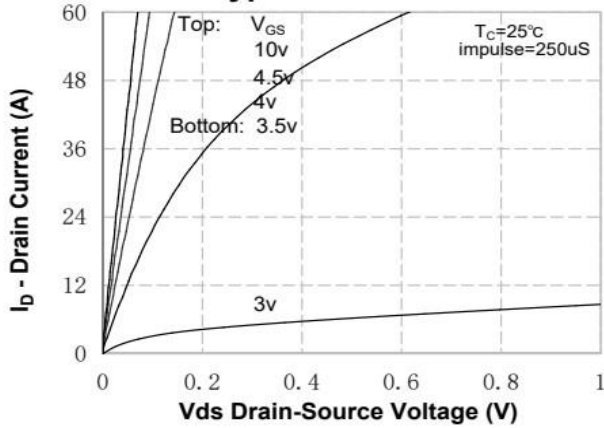


Figure 1. On-Region Characteristics

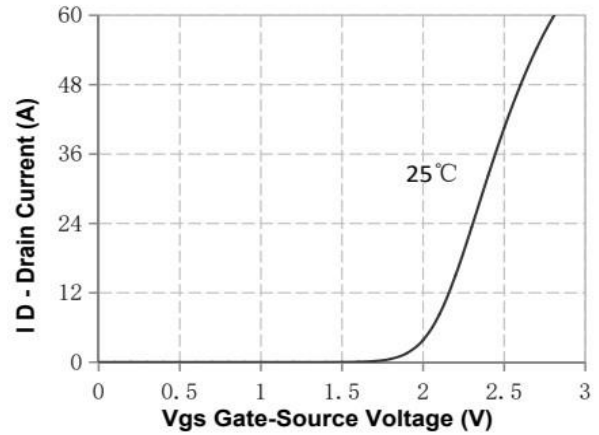


Figure 2. Transfer Characteristics

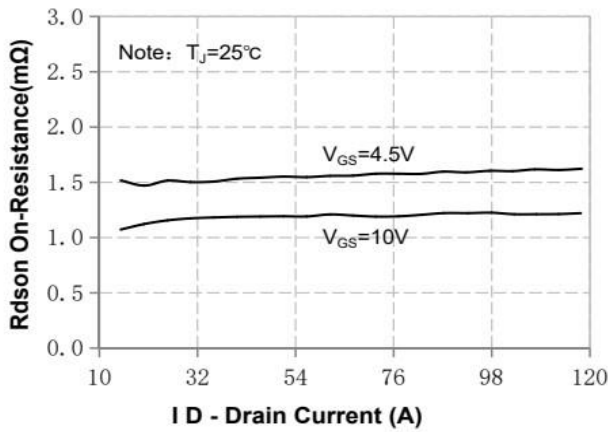


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

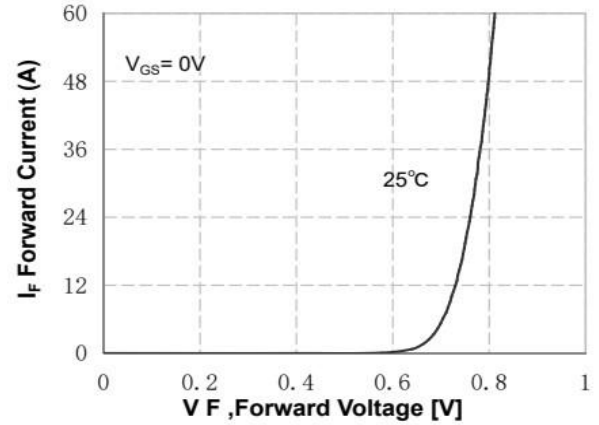


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

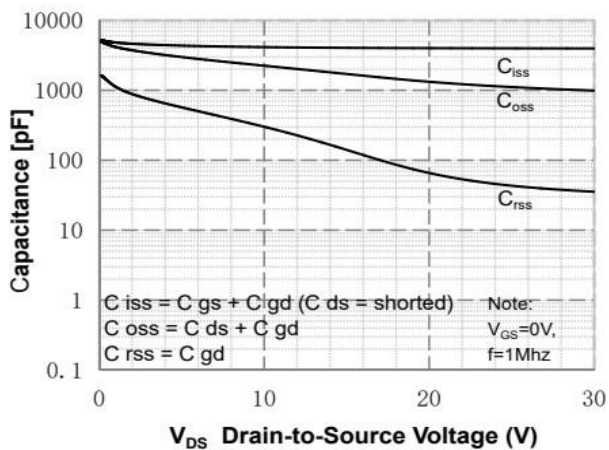


Figure 5. Capacitance Characteristics

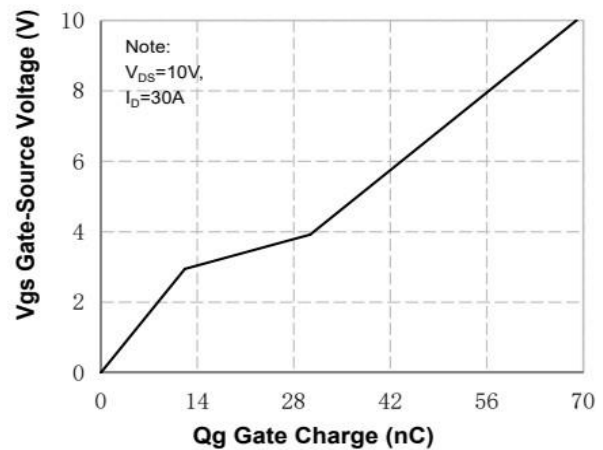


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

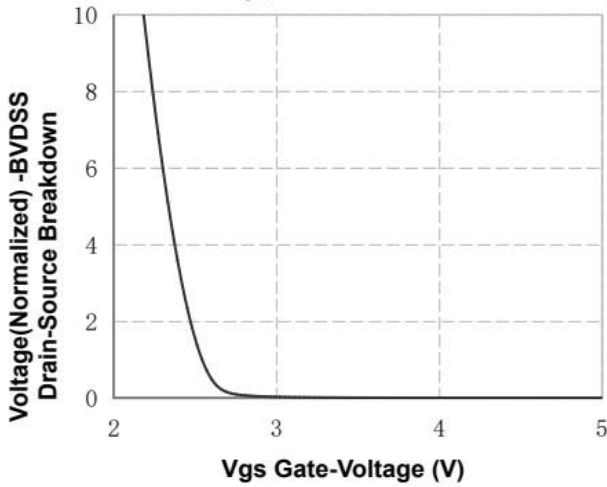


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

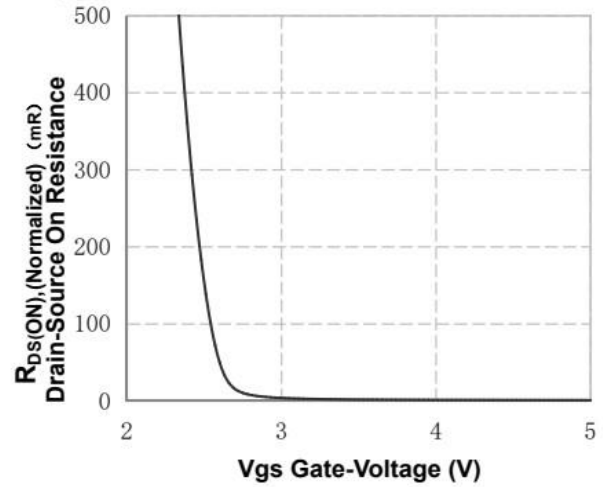


Figure 8. On-Resistance Variation vs Gate Voltage

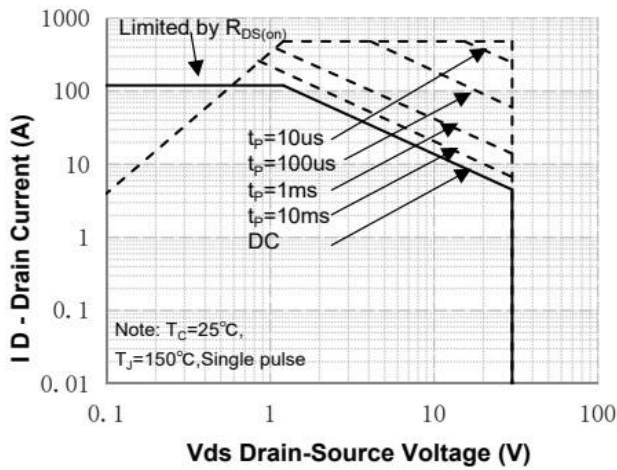


Figure 9. Maximum Safe Operating Area

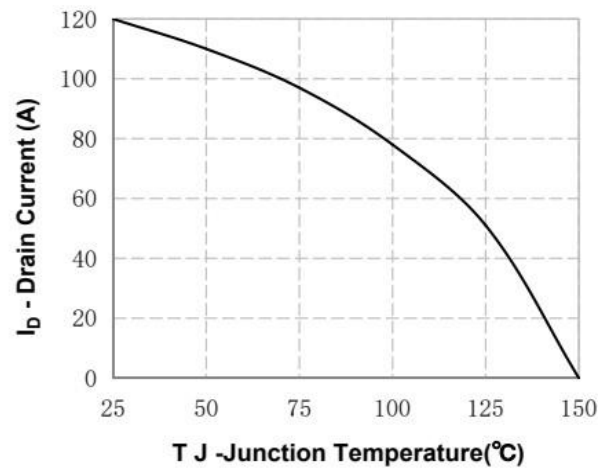


Figure 10. Maximum PContinuous Drain Current vs Case Temperature

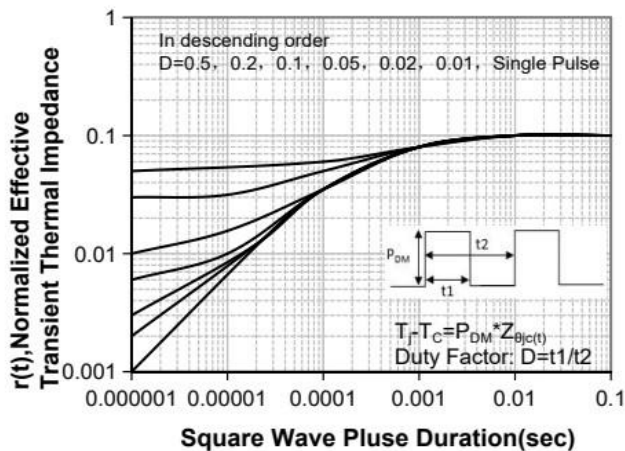
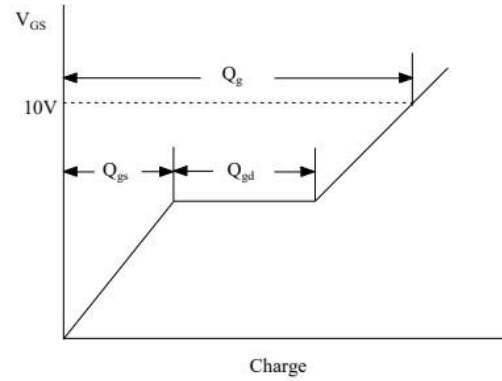
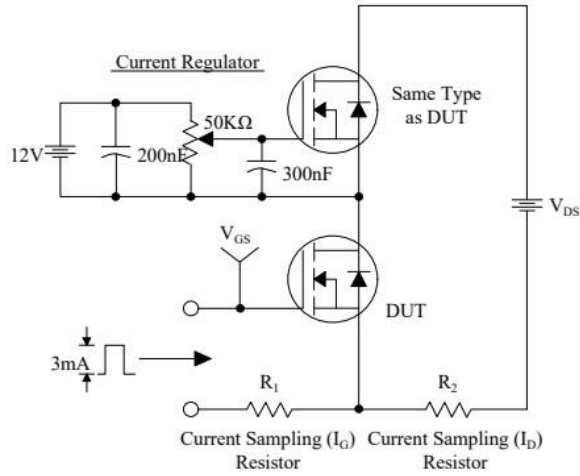
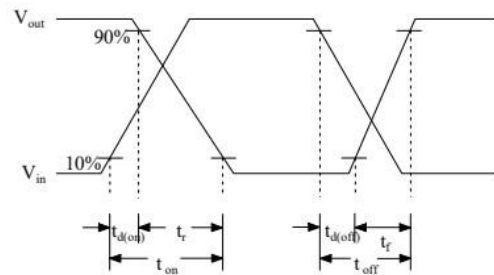
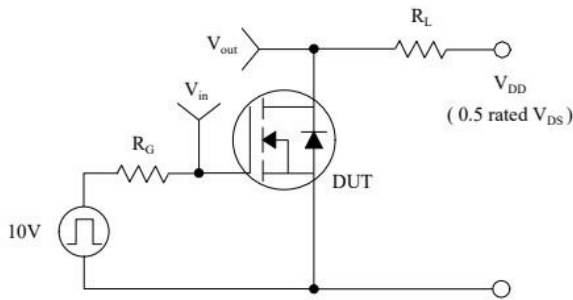


Figure 11. Transient Thermal Response Curve

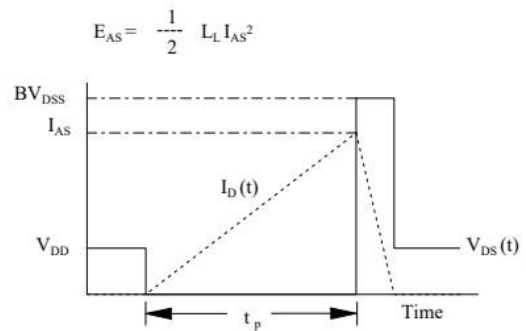
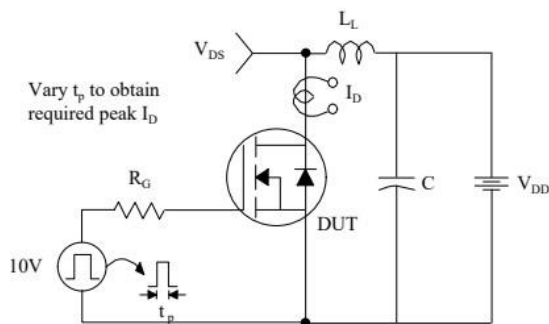
Gate Charge Test Circuit & Waveform



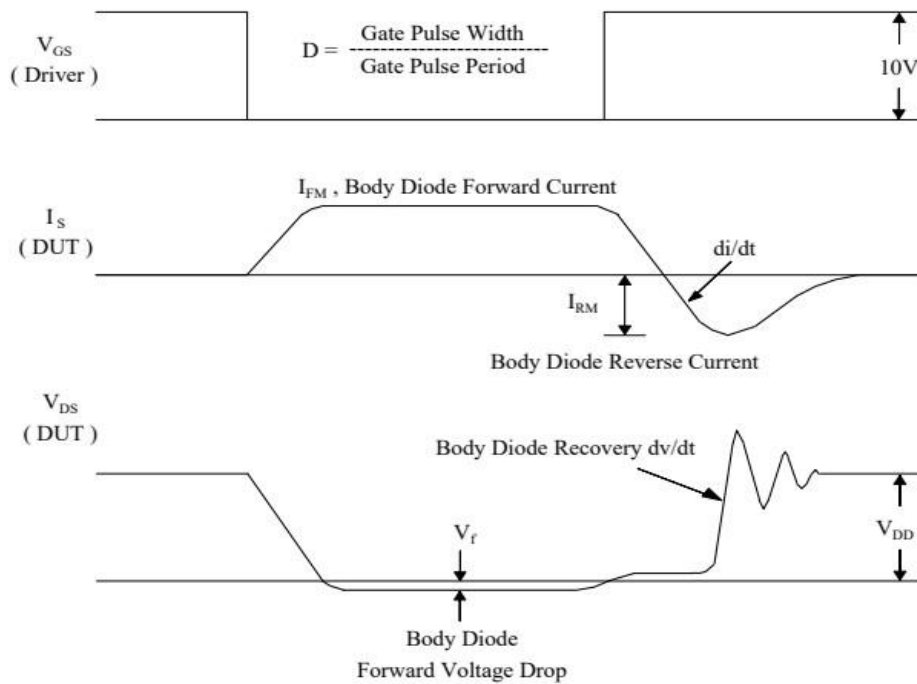
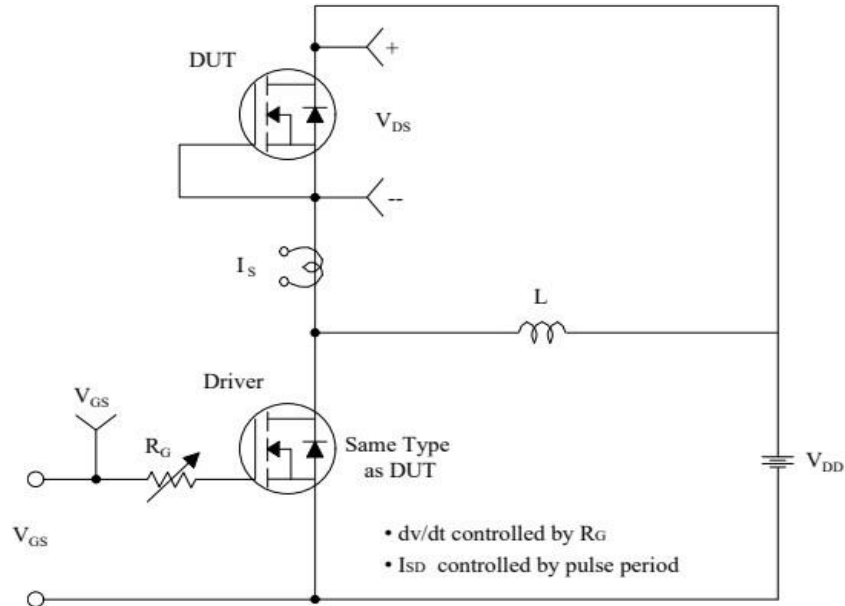
Resistive Switching Test Circuit & Waveforms

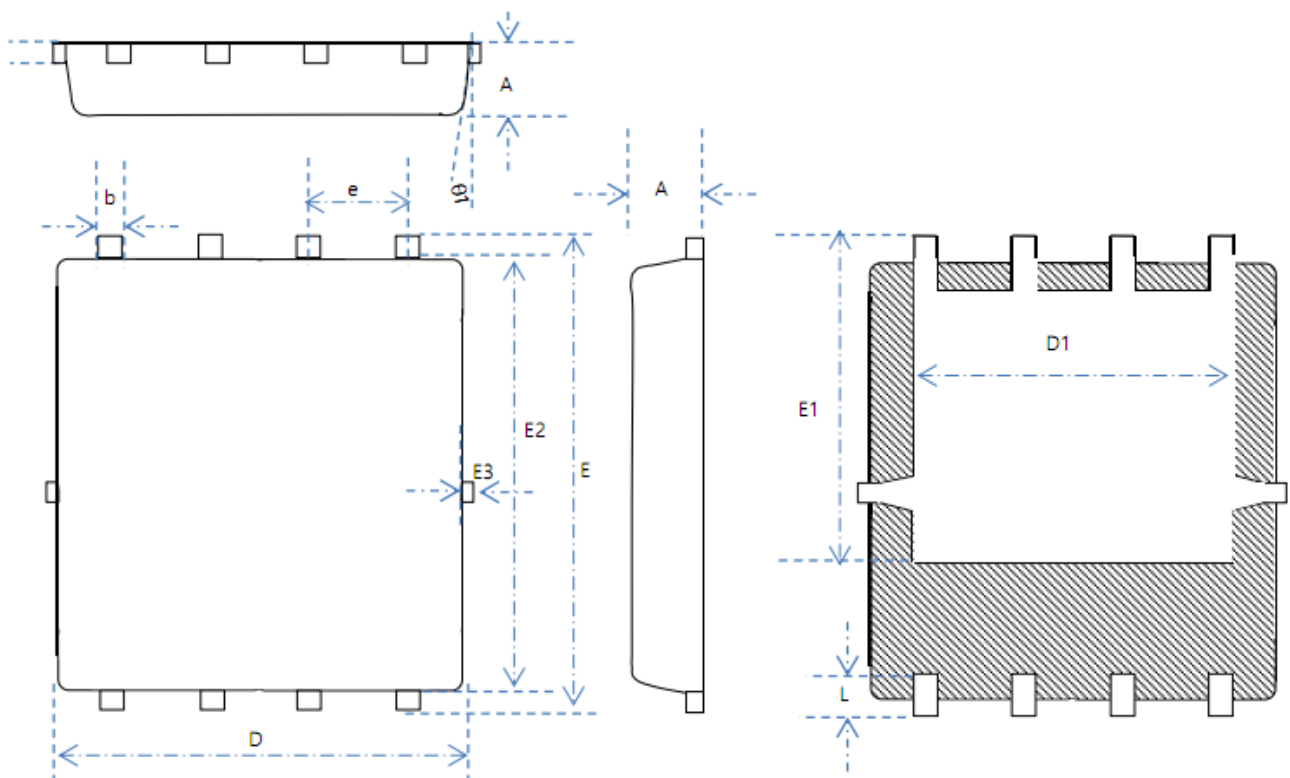


Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms





SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.85	0.95	1.05	D	5.10	5.20	5.30
A1	0.254 REF			e	1.270 TYPE		
b	-	0.30	-	D1	3.90	4.0	4.10
E	5.85	6.05	6.25	L	0.54	0.64	0.74
E1	3.90	4.10	4.30				
E2	5.45	5.55	5.65	theta1	8°	10°	12°
E3	-	-	0.15				

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