N-Channel Enhancement Mode Power MOSFET

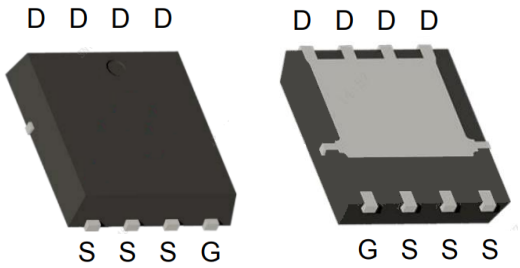
Description

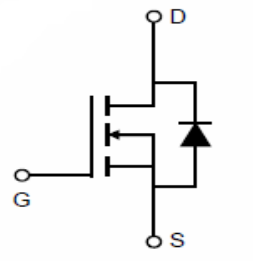
This Power MOSFET is produced using advanced Trench technology.
This devices provide an excellent gate charge and RDS(on), which leads to extremely communication and conduction losses. So it is very suitable for AC/DC power conversion, load switch and industrial power applications.

Features

- VDS=30V，ID=120A
- RDS（on）Typ=1.15mΩ@VGS=10V
- RDS（on）Typ=1.5mΩ@VGS=4.5V
- Low FOM RDS(on)×Qgd
- 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% ΔVds 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℃	I_D	120	A
	T_C=100℃		78	
Pulsed Drain Current(T_C=25℃,T_p Limited By T_{jmax}) (3)		I_{DM}	480	A
Maximum Power Dissipation(T_C=25℃)		P_D	120	W
Avalanche energy , single Pulse(L=0.5mH) (1)		E_{AS}	462	mJ
Operating Junction And Storage Temperature		T_j,T_{stg}	-55 To 150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	℃

* Drain current limited by maximum junction temperature.

Thermal Resistance

Parameter	Symbol	Max	Unit
Junction-to-Case	$R_{\theta JC}$	1.04	℃/W

Notes:

1) L=0.5mH, V_{DD}=30V, Start T_J=25℃.
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=250μA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0V， T_J=25℃
		-	-	50	μA	V_{DS}=24V, V_{GS}=0V， T_J=125℃
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±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=250μA
Drain-source on-state resistance	$R_{DS(on)}$	-	1.15	1.5	mΩ	V_{GS}=10V, I_D=20A
Drain-source on-state resistance	$R_{DS(on)}$	-	1.5	2.2	mΩ	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 = 1Ω, 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℃
Body Diode Forward Current	Is	-	-	120	A	-
Max Pulsed Drain-source diode forward current	I_{SM}	-	-	480	A	

N- Channel Typical Characteristics

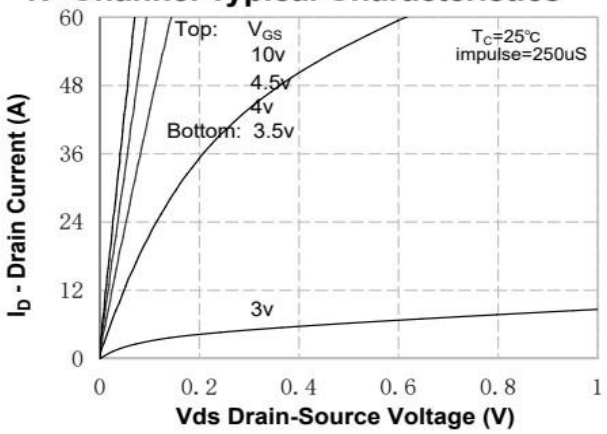


Figure 1. On-Region Characteristics

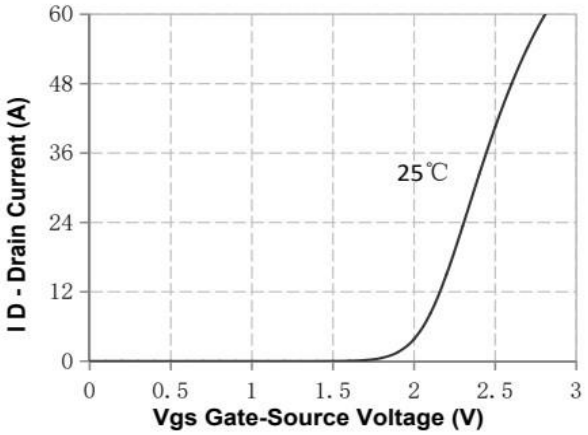


Figure 2. Transfer Characteristics

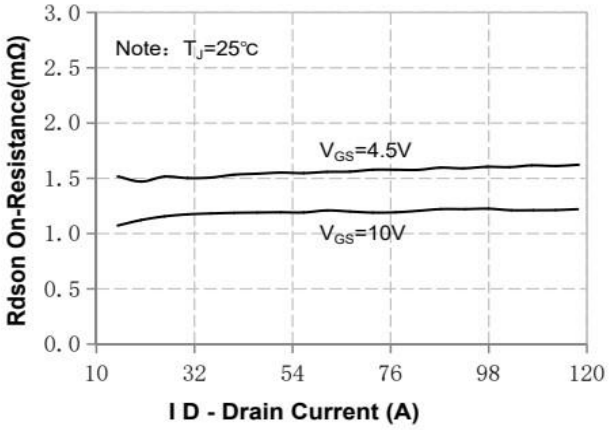


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

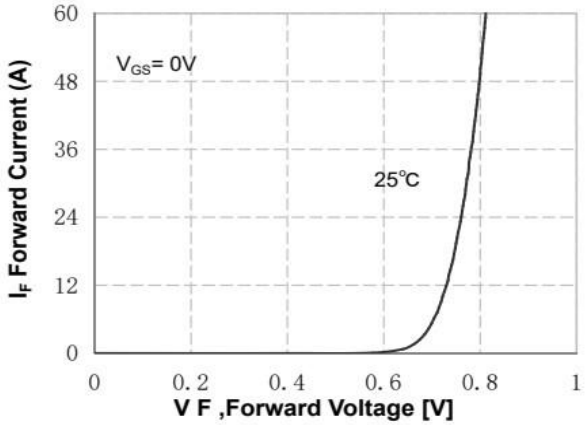


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

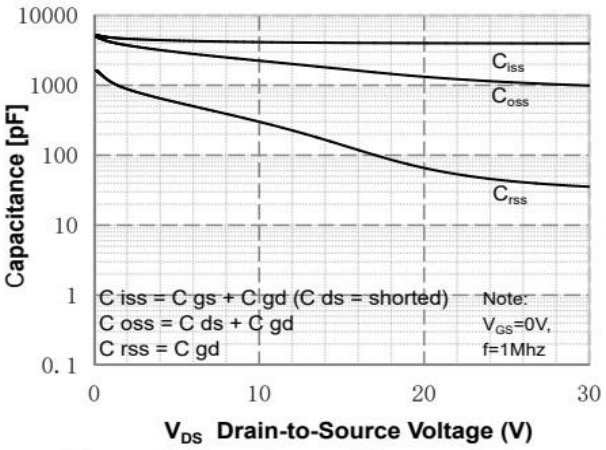


Figure 5. Capacitance Characteristics

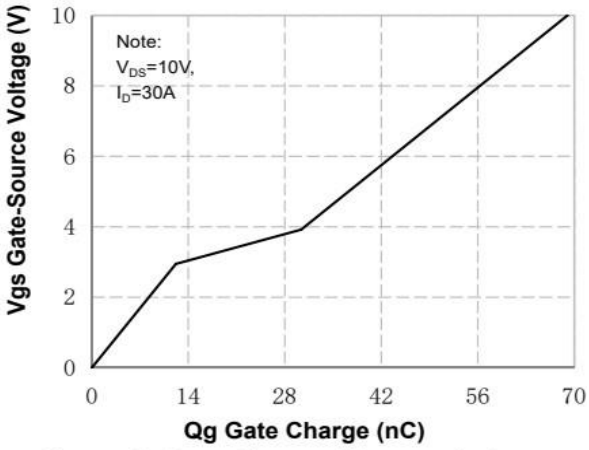


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

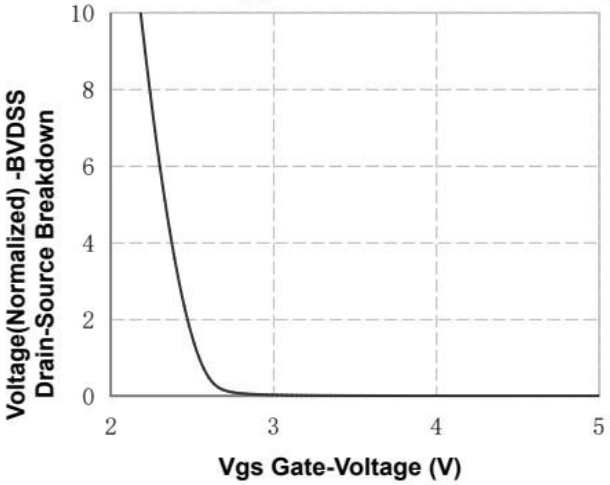


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

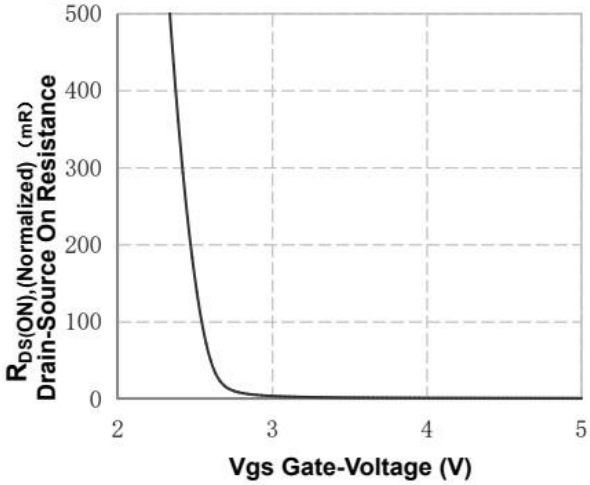


Figure 8. On-Resistance Variation vs Gate Voltage

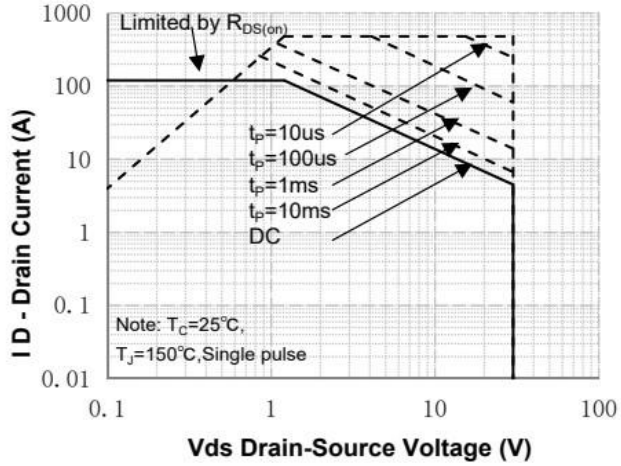


Figure 9. Maximum Safe Operating Area

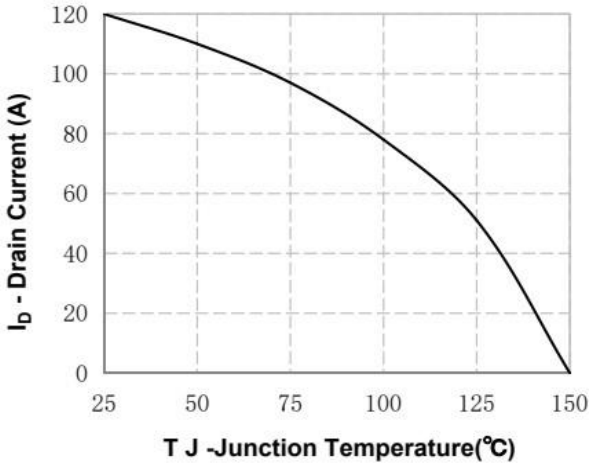


Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

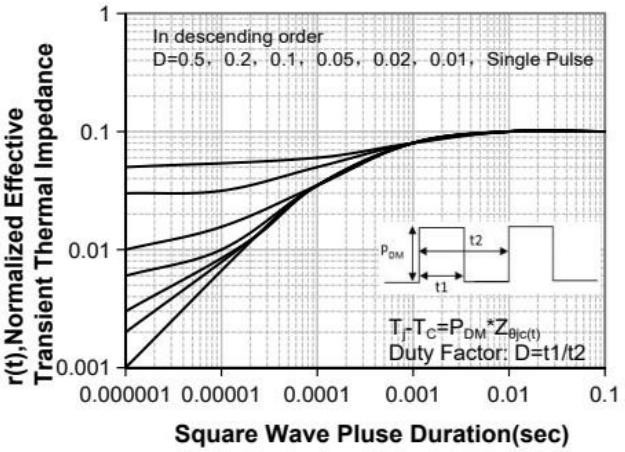
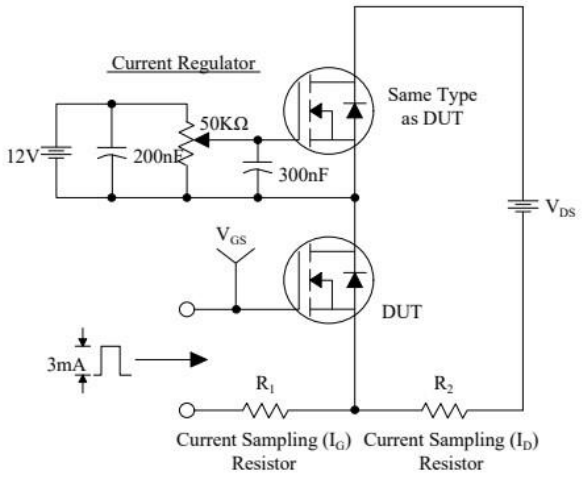
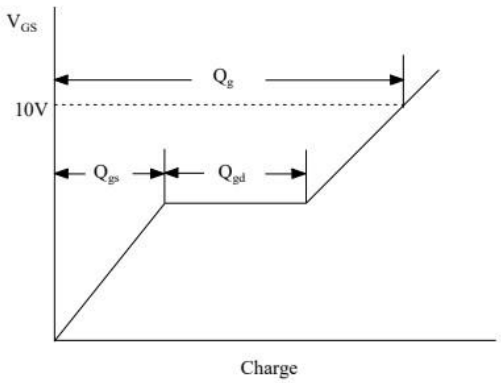


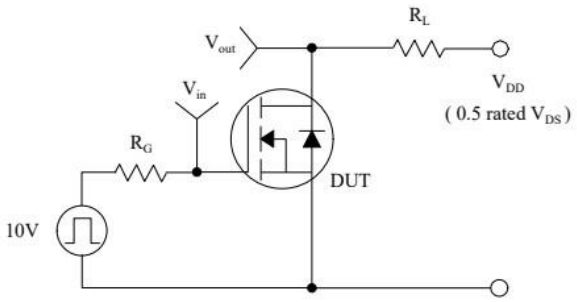
Figure 11. Transient Thermal Response Curve

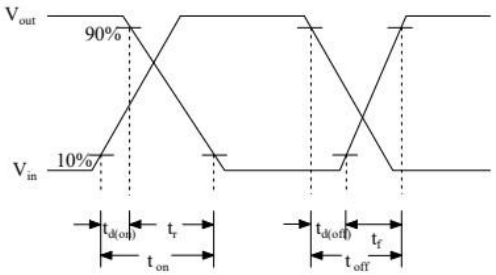
Gate Charge Test Circuit & Waveform



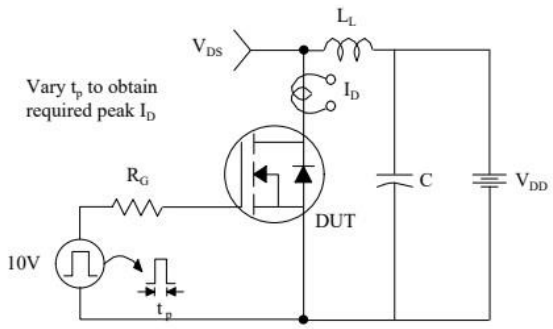


Resistive Switching Test Circuit & Waveforms

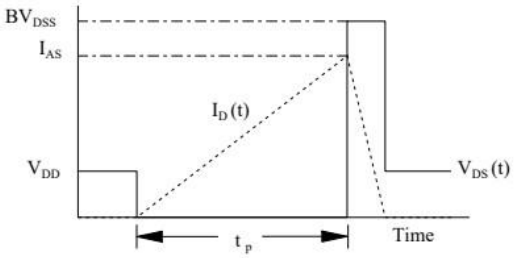




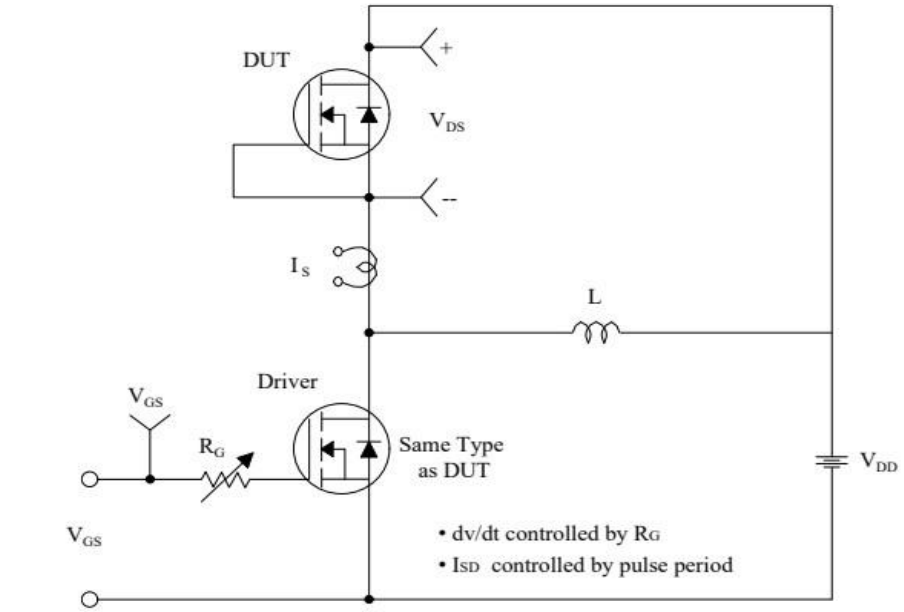
Unclamped Inductive Switching Test Circuit & Waveforms

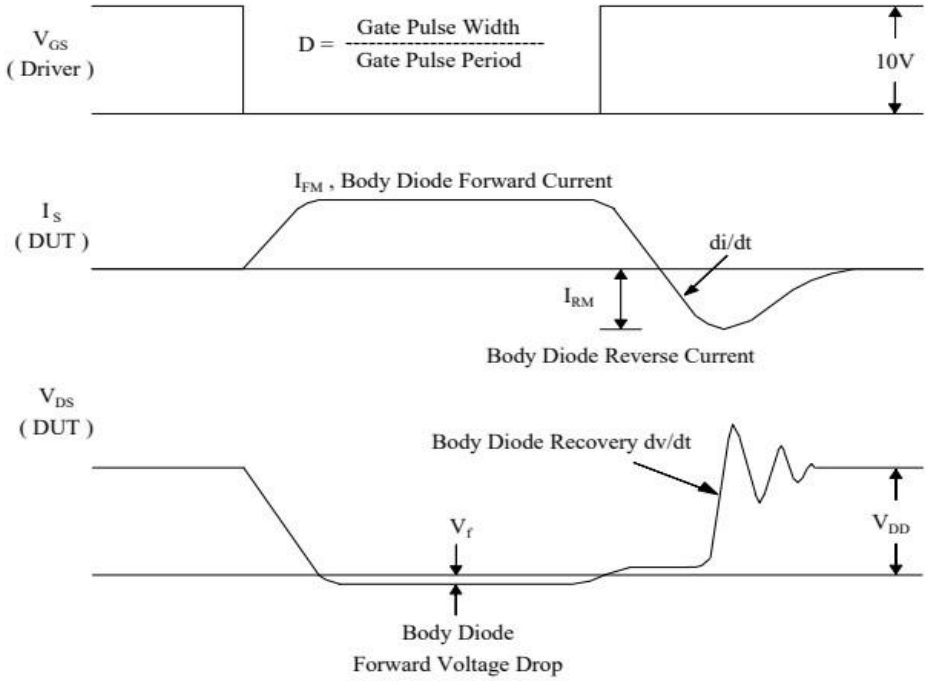


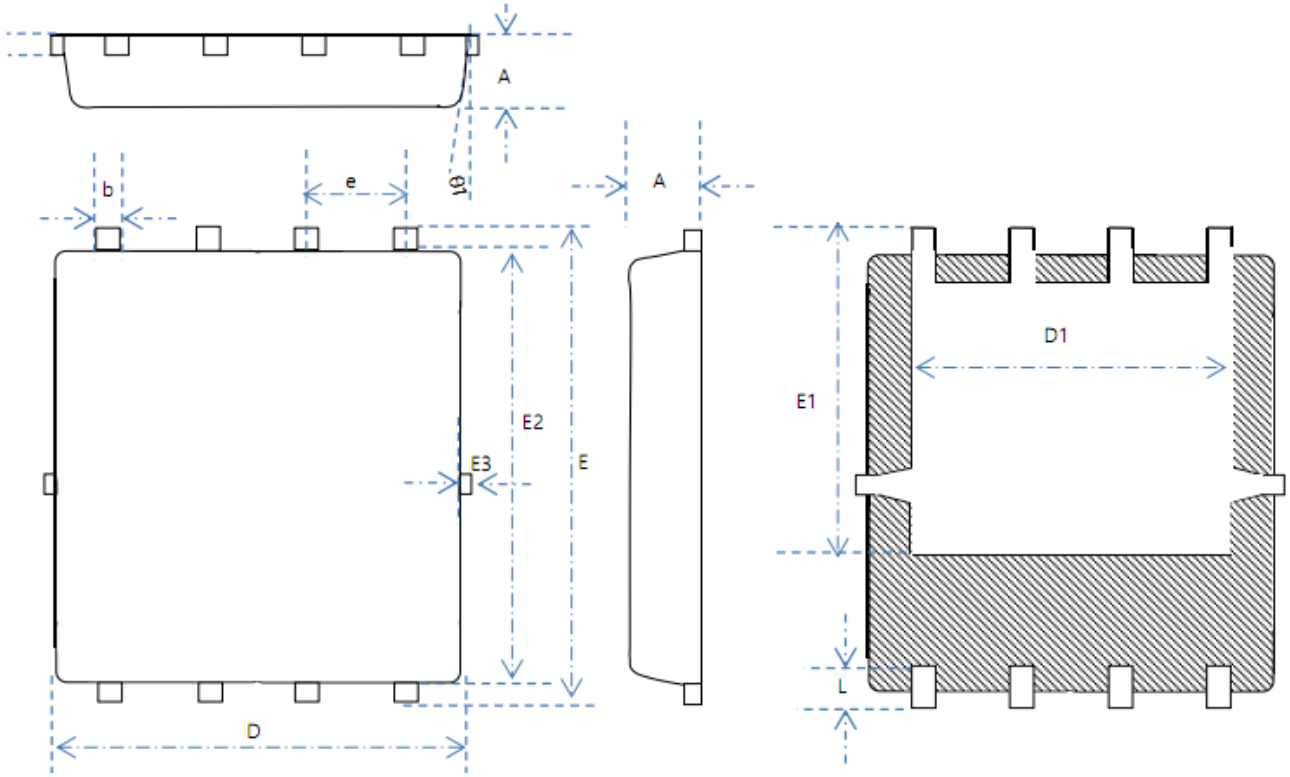
$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$



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	θ1	8^0	10^0	12^0
E3	-	-	0.15				