N-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	60	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	3.9	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	5	mΩ
I_D(T_C=25℃)	68	A

Features

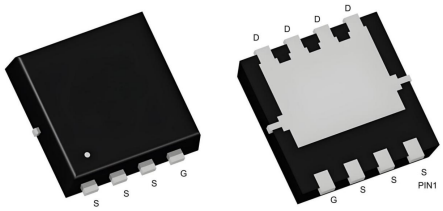
- Advanced Split Gate Trench Technology
- Low $R_{DS(ON)}$

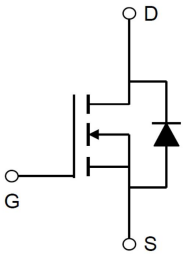
Applications

- Load switching
- PWM Applications
- Power Management

Pin Configuration

PDFN3X3-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAL68N06	PDFN3X3-8L	13″	5000pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	68	A
		T_C=100℃	43	A
I_{DM}	Pulse Drain Current Tested [A]		272	A
E_{AS}	Single Pulse Avalanche Energy [B]		100	mJ
P_D	Power Dissipation	T_C=25℃	37	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case max	3.4	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to ambient max [C]	27.8	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1.0	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [D]	V_{GS}=10V,I_D=20A	--	3.9	5.1	mΩ
		V_{GS}=4.5V,I_D=10A	--	5	6.5	mΩ
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V	--	--	1.2	V
Dynamic Parameters [E]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=30V f=1MHZ	--	2050	--	pF
C_{oss}	Output Capacitance		--	660	--	pF
C_{rss}	Reverse Transfer Capacitance		--	28	--	pF
Q_g	Total Gate Charge	V_{DS}=30V,I_D=20A V_{GS}=0 to 10V	--	35	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	nC
Q_{gd}	Gate-Drain Charge		--	7	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=30V ,R_{GEN}=4.5Ω, I_D=20A, V_{GS}=10V	--	12	--	ns
t_r	Turn-on Rise Time		--	34	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	25	--	ns
t_f	Turn-off Fall Time		--	30	--	ns
t_{rr}	Reverse recovery time	I_F=20A, di/dt=100A/us	--	38	--	ns
Q_{rr}	Reverse recovery charge		--	23	--	nC

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. EAS condition: T_J=25℃,V_{DD}=30V,R_G=25Ω, V_G=10V, L=0.5mH, I_{AS}=20A.

C. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 2OZ copper.

D. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

E. Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure 1: Output Characteristics

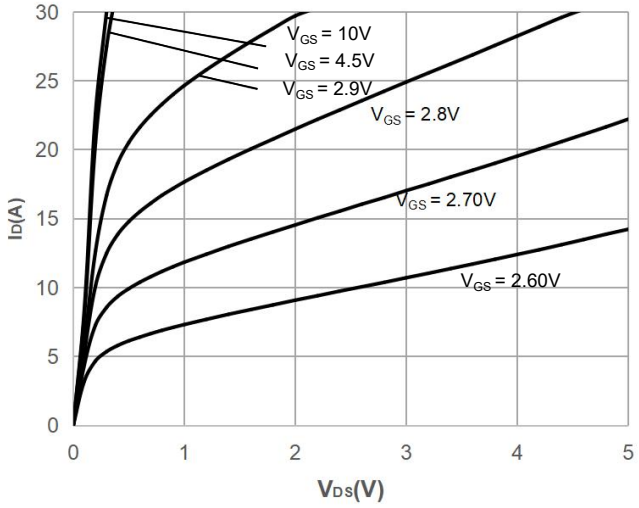


Figure 2: Typical Transfer Characteristics

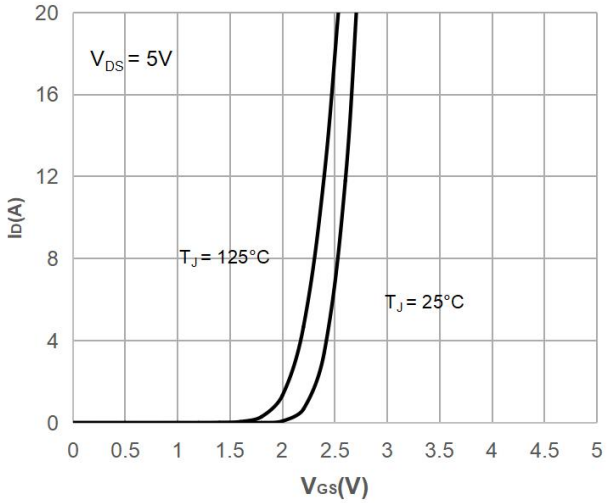


Figure 3: On-resistance vs. Drain Current

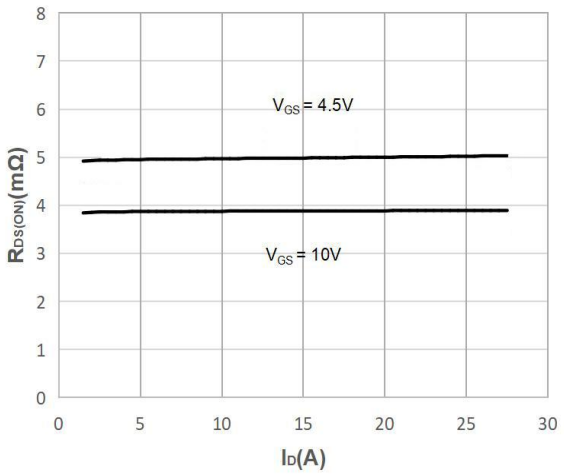


Figure 4: Body Diode Characteristics

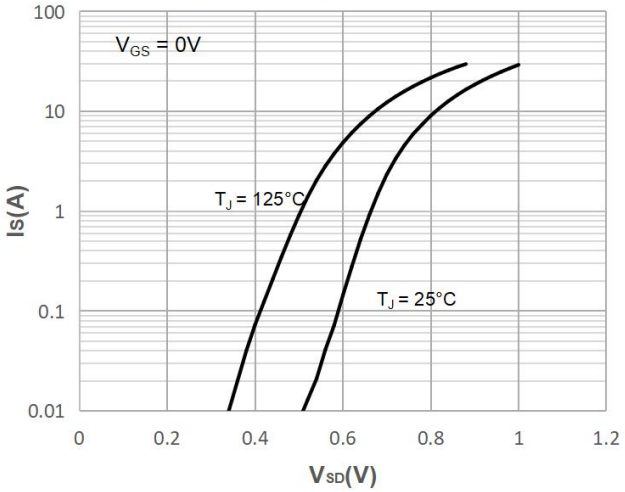


Figure 5: Gate Charge Characteristics

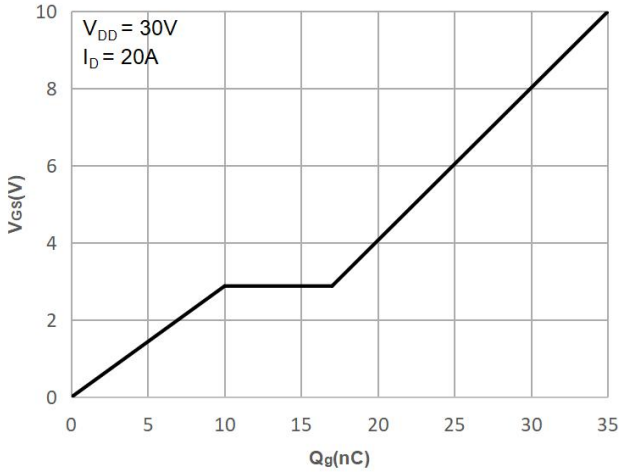
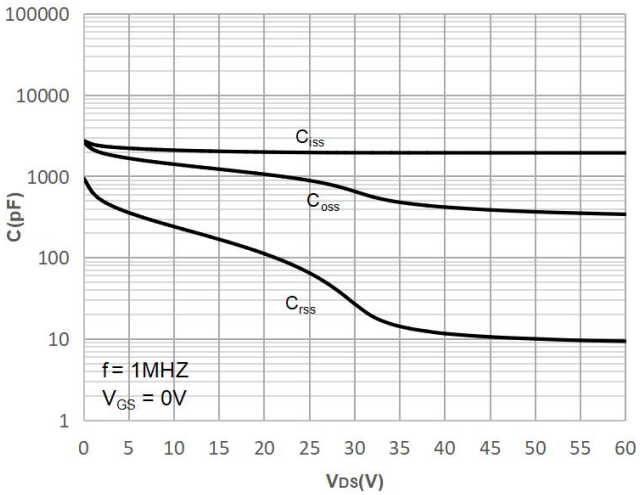


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

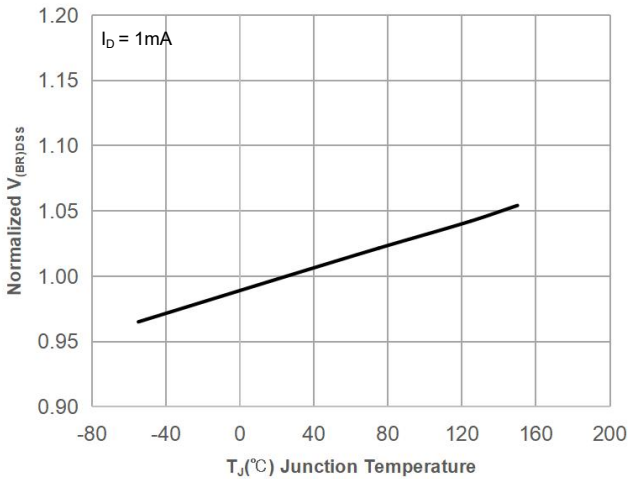


Figure 8: Normalized on Resistance vs. Junction Temperature

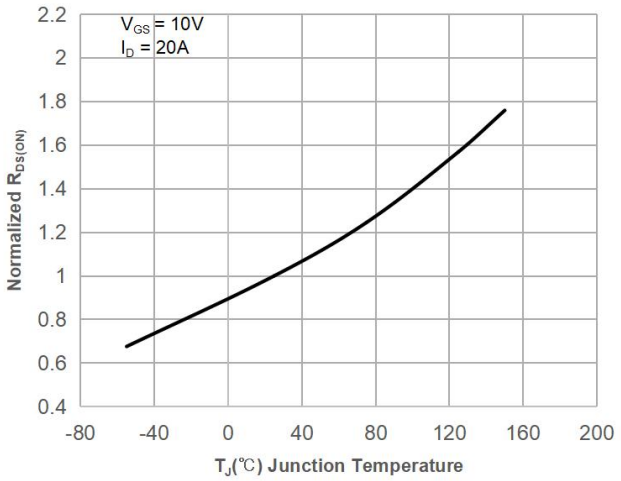


Figure 9: Maximum Safe Operating Area

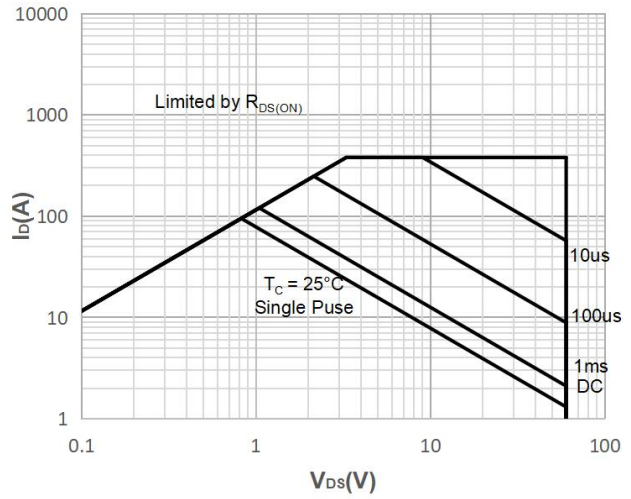


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

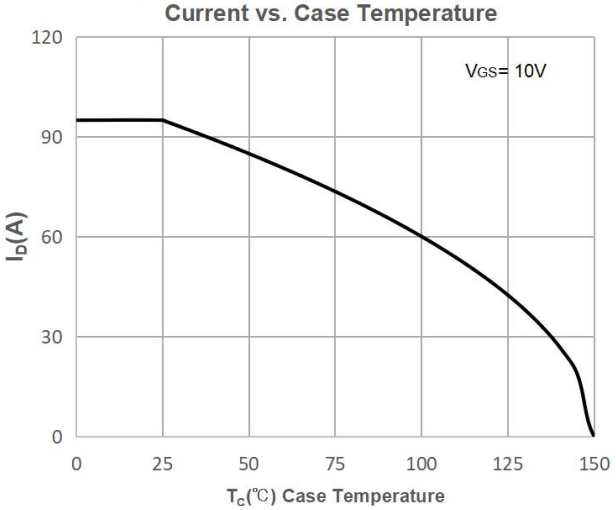


Figure 11: Normalized Maximum Transient Thermal Impedance

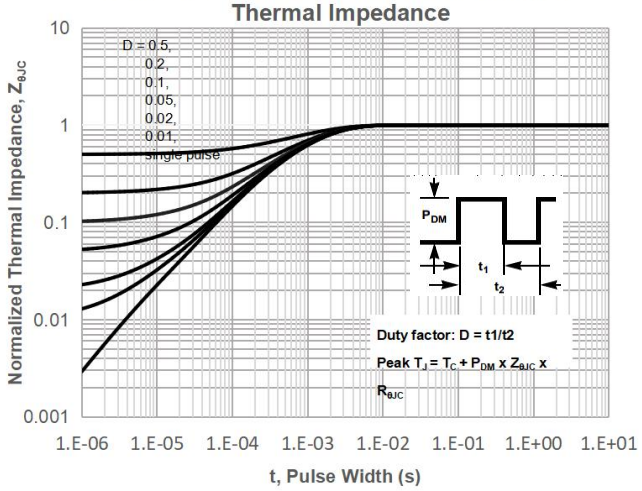
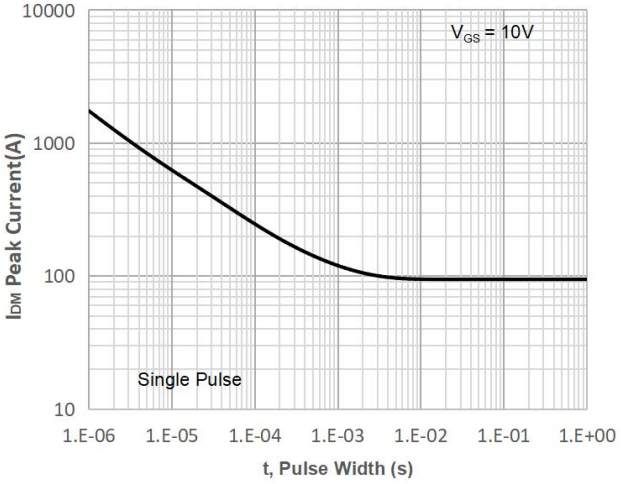


Figure 12: Peak Current Capacity



Test Circuit

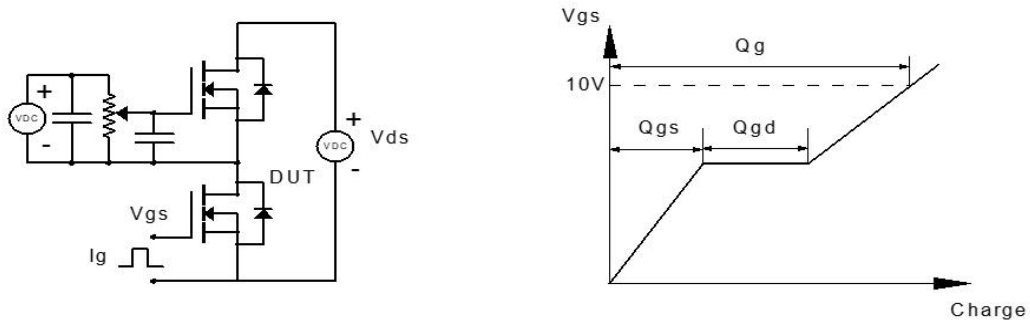


Figure 1: Gate Charge Test Circuit & Waveform

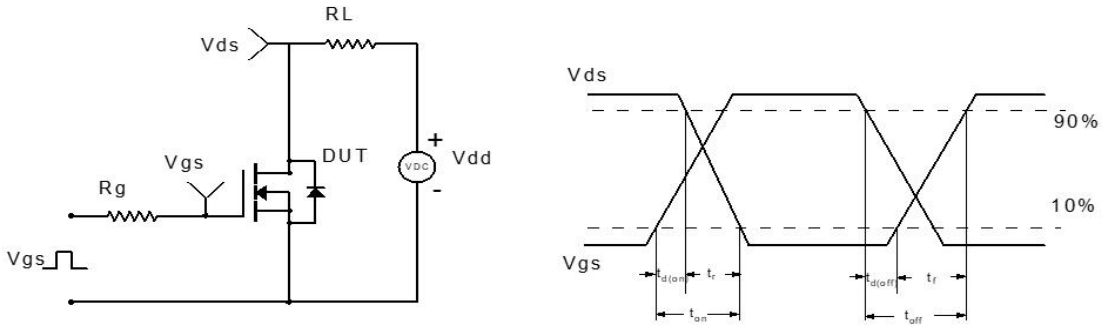


Figure 2: Resistive Switching Test Circuit & Waveform

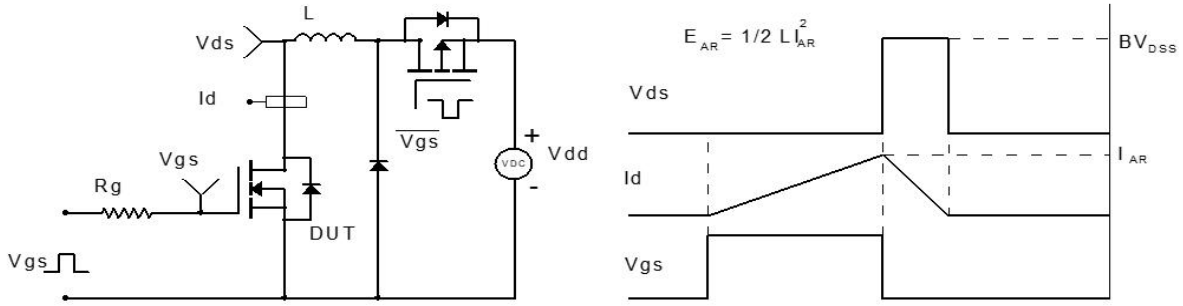


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

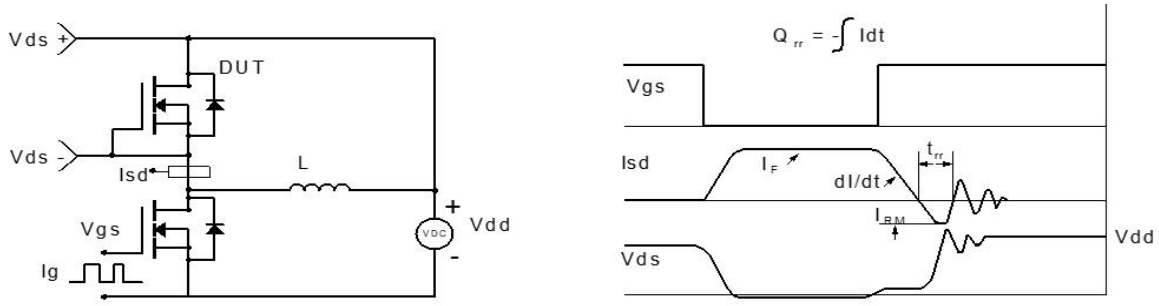
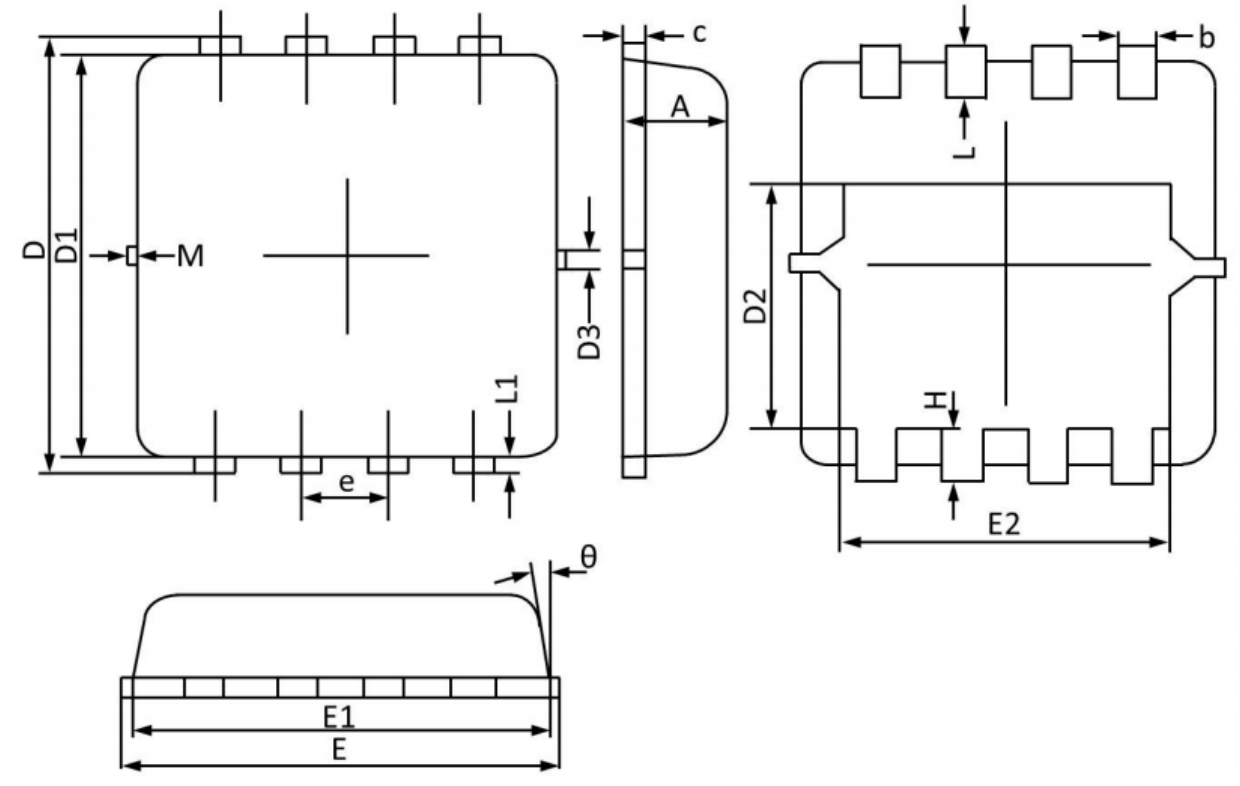


Figure 4: Diode Recovery Test Circuit & Waveform

PDFN3X3-8L Package Information (unit:mm)



DIMENSIONS

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	**b**	0.25	0.30	0.35
C	0.10	0.15	0.25	**D**	3.25	3.35	3.45
D1	3.00	3.10	3.20	**D2**	1.78	1.88	1.98
D3	--	0.13	--	**E**	3.20	3.30	3.40
E1	3.00	3.15	3.20	**E2**	2.39	2.49	2.59
e	0.65BSC			**H**	0.30	0.39	0.50
L	0.30	0.40	0.50	**L1**	--	0.13	--
θ	--	10°	12°	**M**	*	*	0.15