

N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	8.5	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ.	11.4	m Ω
$I_D(T_C=25^{\circ}C)$	17	A

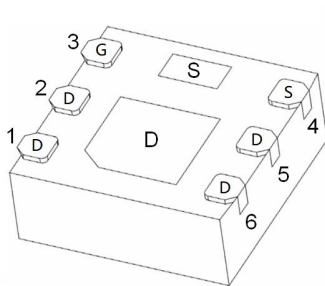
Features

- Trench Power LV MOSFET technology
- Low $R_{DS(ON)}$
- RoHS and Halogen-Free compliant

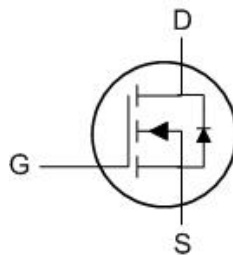
Applications

- Load switch
- PWM application

Pin Configuration



DFN2X2-6L



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAF3108	DFN2X2-6L	7"	3000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	17	A
		$T_C=70^{\circ}C$	13.6	A
I_{DM}	Pulse Drain Current Tested ^A		68	A
P_D	Power Dissipation	$T_C=25^{\circ}C$	6.5	W
T_J, T_{STG}	Junction and Storage Temperature Range		-55 to +150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to Case	19.5	$^{\circ}C/W$

Electrical Characteristics (at $T_J = 25^{\circ}\text{C}$ Unless Otherwise Noted)

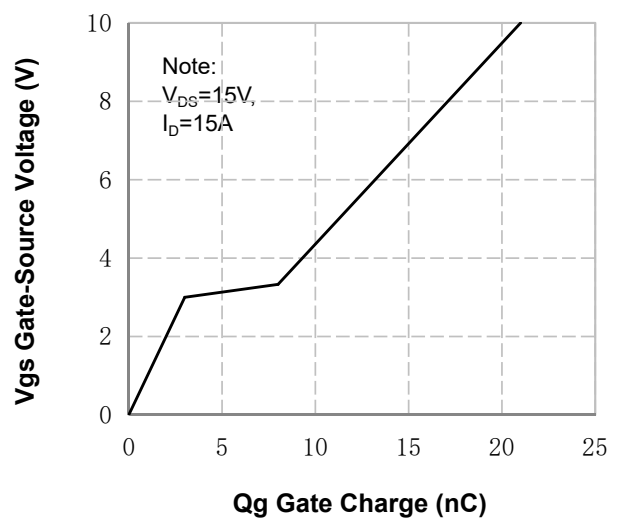
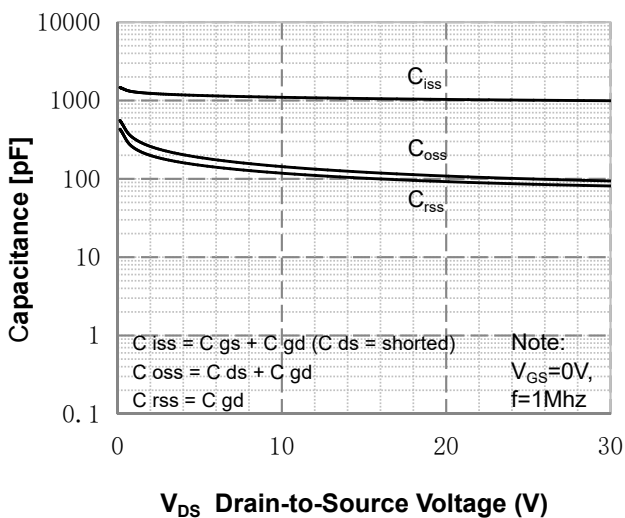
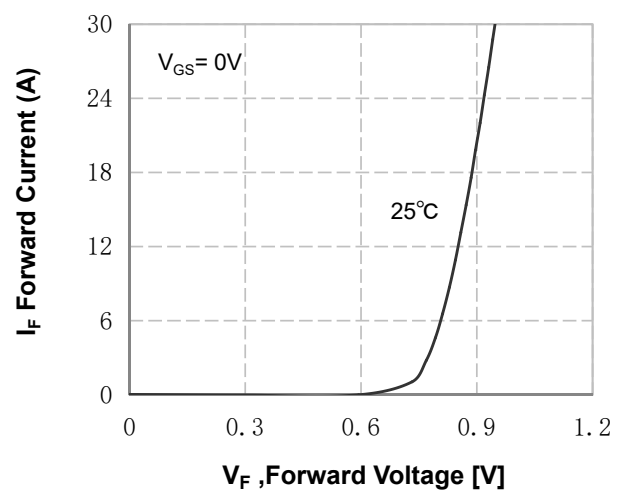
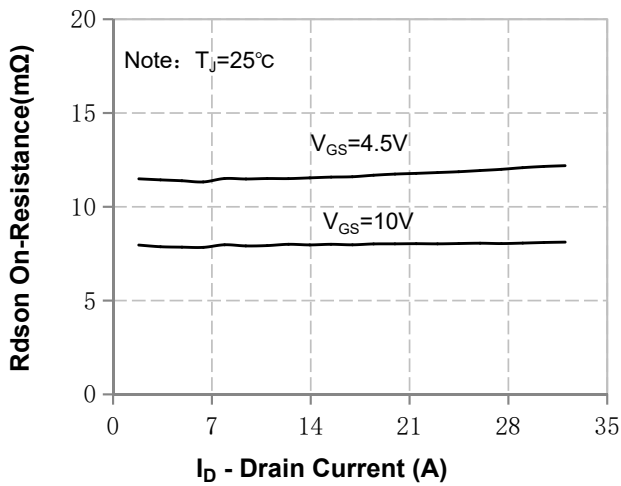
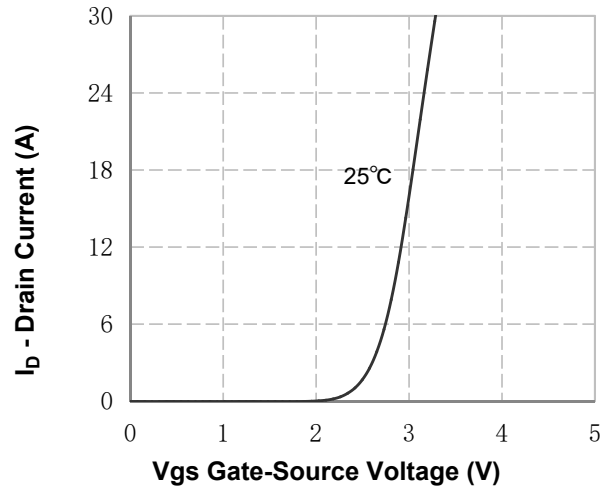
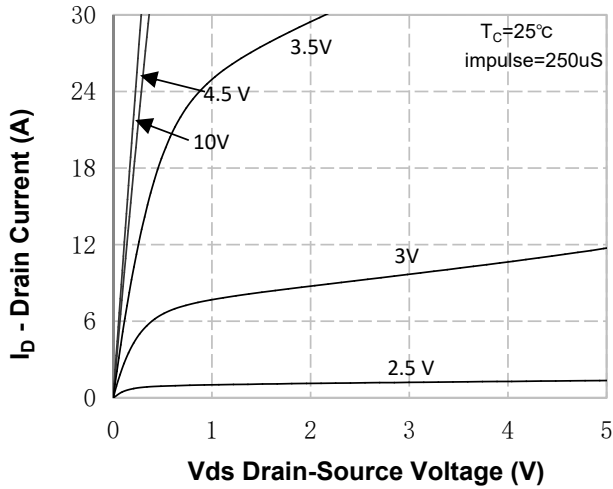
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance ^B	$V_{GS}=10V, I_D=10A$	--	8.5	10.8	m Ω
		$V_{GS}=4.5V, I_D=8A$	--	11.4	15	m Ω
V_{SD}	Diode Forward Voltage	$I_S=10A, V_{GS}=0V$	--	--	1.2	V
Dynamic Parameters ^C						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V$ $f=1\text{MHz}$	--	1050	--	pF
C_{oss}	Output Capacitance		--	125	--	pF
C_{rss}	Reverse Transfer Capacitance		--	108	--	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=10A$ $V_{GS}=10V$	--	22	--	nC
Q_{gs}	Gate-Source Charge		--	3	--	nC
Q_{gd}	Gate-Drain Charge		--	5	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=15V$ $I_D=30A, R_L=1.6\Omega,$ $V_{GS}=10V$	--	4	--	ns
t_r	Turn-on Rise Time		--	2	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	13	--	ns
t_f	Turn-off Fall Time		--	7	--	ns

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

B. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 0.5\%$.

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

Typical Characteristics



Typical Characteristics

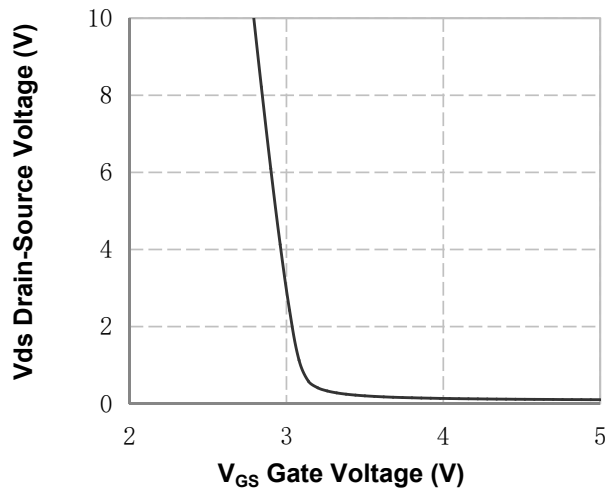


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

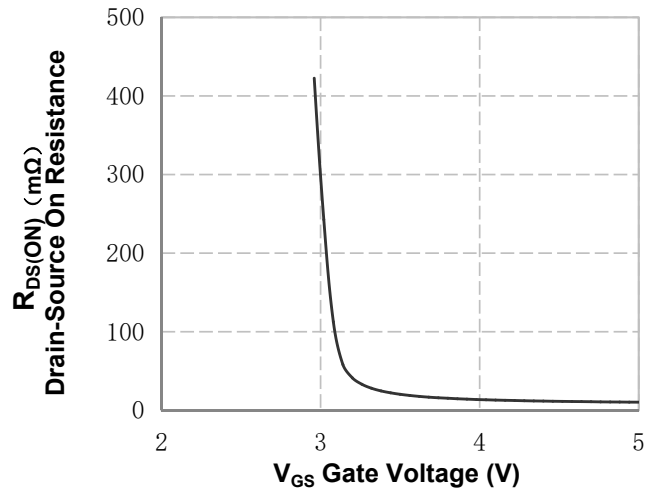


Figure 8. On-Resistance vs Gate Voltage

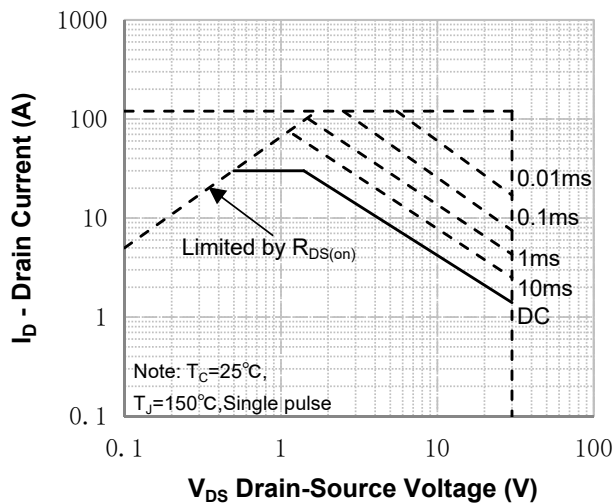


Figure 9. Maximum Safe Operating Area

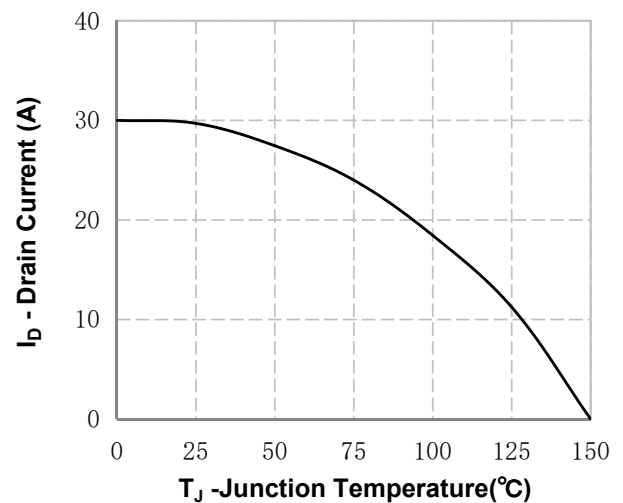


Figure 10. Maximum Continuous Drain Current vs Temperature

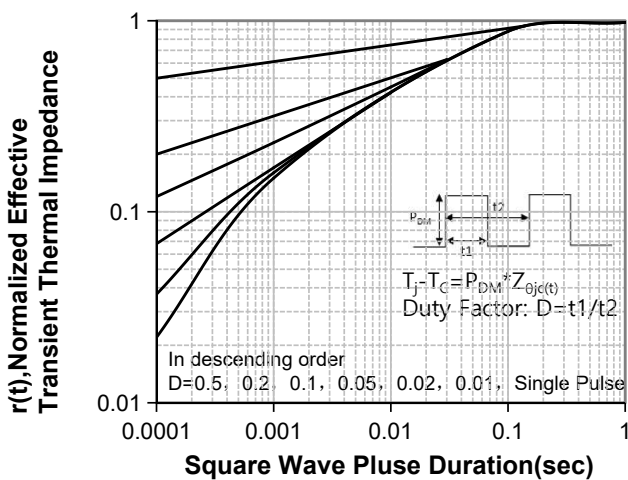
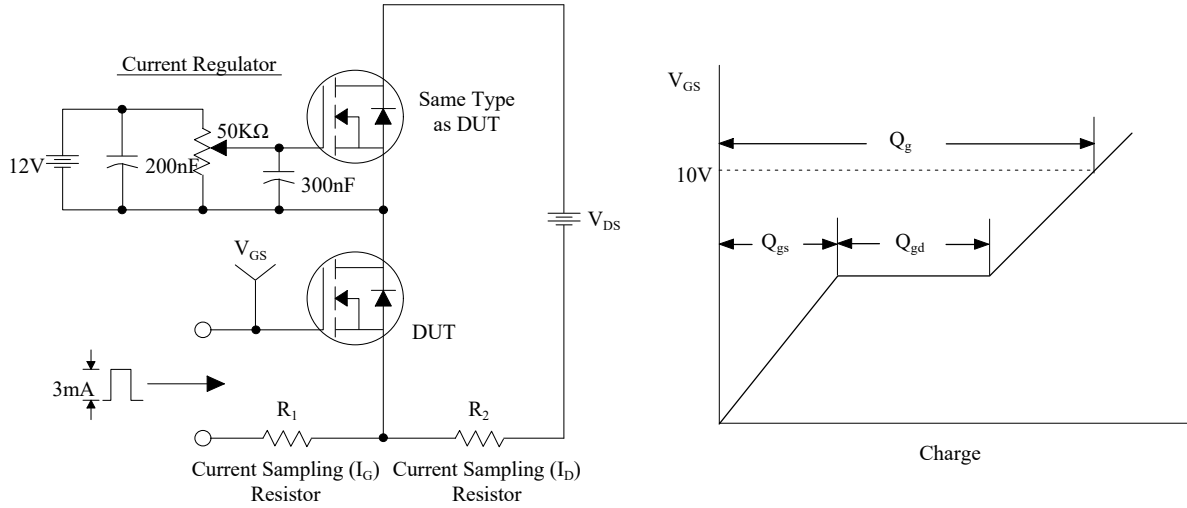


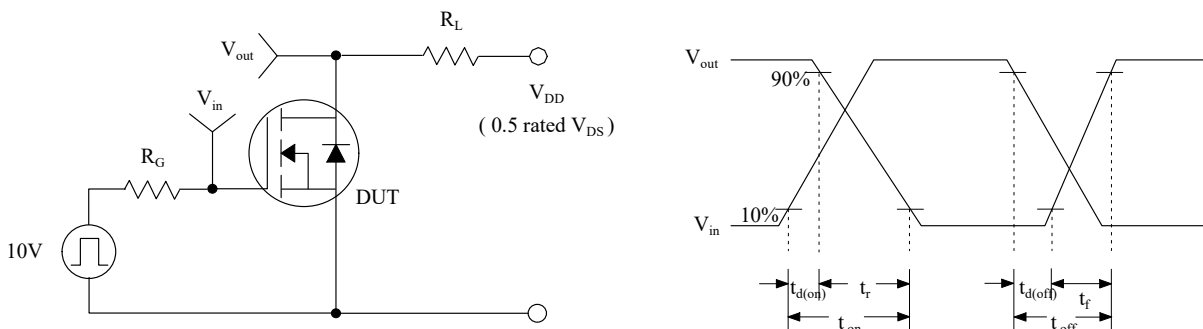
Figure 11. Transient Thermal Response Curve

Test Circuit

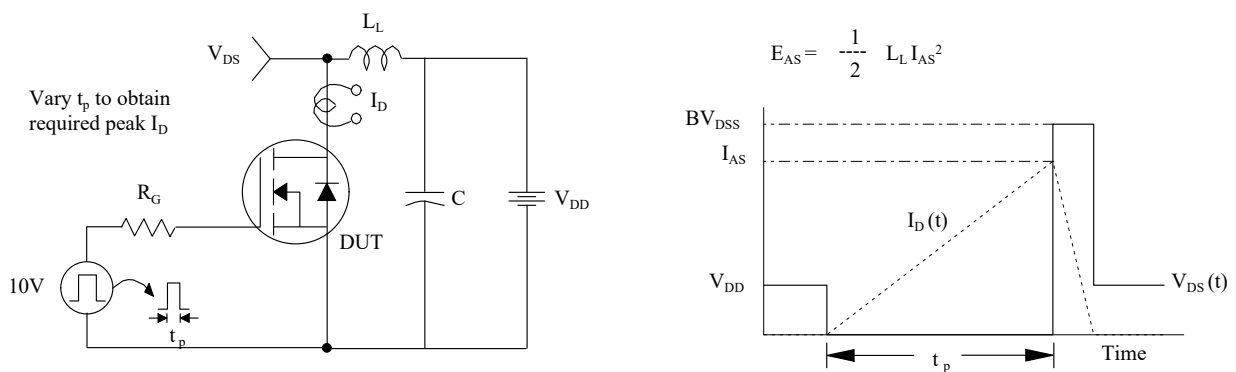
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

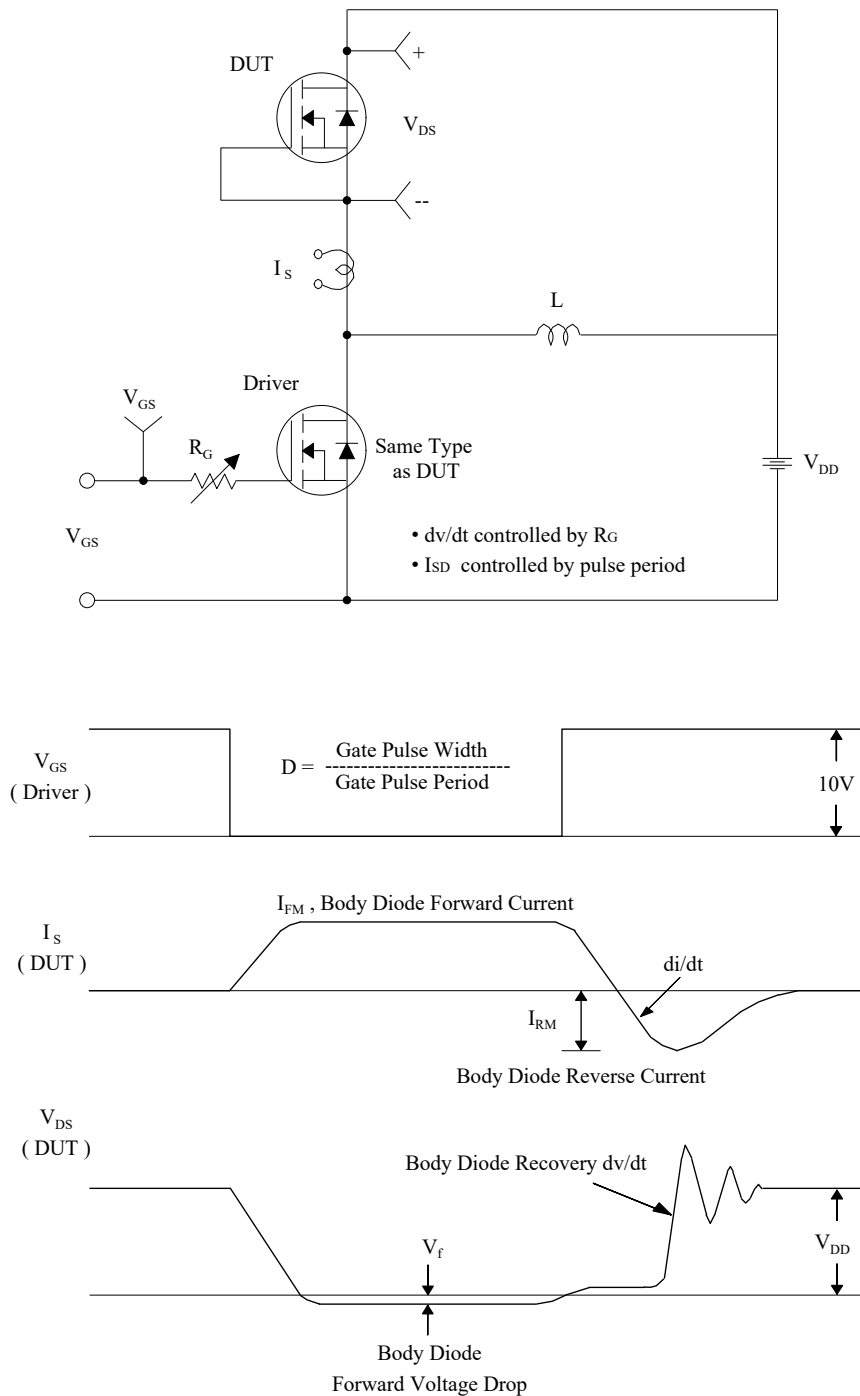


Unclamped Inductive Switching Test Circuit & Waveforms

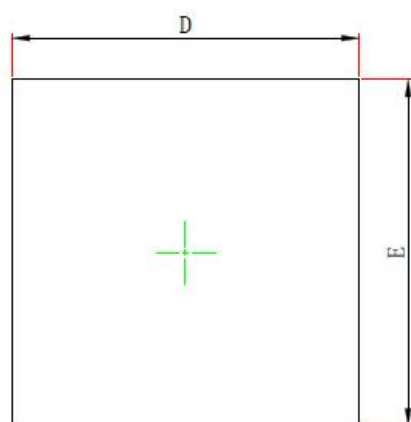


Test Circuit

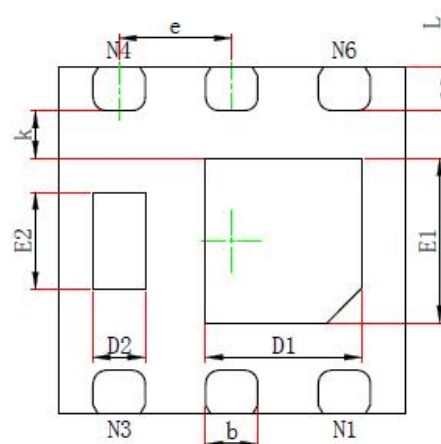
Peak Diode Recovery dv/dt Test Circuit & Waveforms



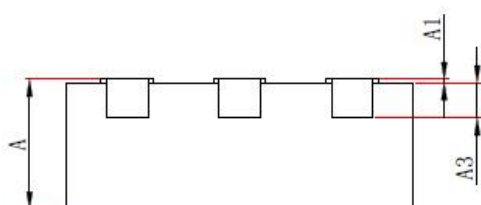
DFN2X2-6L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013