Diode Datasheet Example : 1N4007

https://www.onsemi.com/pdf/datasheet/1n4001-d.pdf

1N4001, 1N4002, 1N4003, 1N4004, 1N4005, 1N4006, 1N4007

Electrical Parameters.

MAXIMUM RATINGS

Rating	Symbol	1N4001	1N4002	1N4003	1N4004	1N4005	1N4006	1N4007	Unit
†Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	200	400	600	800	1000	V
†Non–Repetitive Peak Reverse Voltage (halfwave, single phase, 60 Hz)	V_{RSM}	60	120	240	480	720	1000	1200	V
†RMS Reverse Voltage	$V_{R(RMS)}$	35	70	140	280	420	560	700	V
†Average Rectified Forward Current (single phase, resistive load, 60 Hz, T_A = 75°C)	I_O	1.0							A
†Non–Repetitive Peak Surge Current (surge applied at rated load conditions)	I_{FSM}	30 (for 1 cycle)							A
Operating and Storage Junction Temperature Range	T_J T_{stg}	–65 to +150							°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
†Indicates JEDEC Registered Data

Thermal Parameters.

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Maximum Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	Note 1	°C/W

$$T_J = T_A + (R_{\theta JA} \times P_D)$$

T_A : Ambient
P_D : Power Dissipation
$R_{\theta JA}$:

NPTEL

Diode Datasheet Example : 1N4007

https://www.onsemi.com/pdf/datasheet/1n4001-d.pdf

1N4001, 1N4002, 1N4003, 1N4004, 1N4005, 1N4006, 1N4007

Electrical Parameters.

MAXIMUM RATINGS

Rating	Symbol	1N4001	1N4002	1N4003	1N4004	1N4005	1N4006	1N4007	Unit
†Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	200	400	600	800	1000	V
†Non–Repetitive Peak Reverse Voltage (halfwave, single phase, 60 Hz)	V_{RSM}	60	120	240	480	720	1000	1200	V
†RMS Reverse Voltage	$V_{R(RMS)}$	35	70	140	280	420	560	700	V
†Average Rectified Forward Current (single phase, resistive load, 60 Hz, T_A = 75°C)	I_O	1.0							A
†Non–Repetitive Peak Surge Current (surge applied at rated load conditions)	I_{FSM}	30 (for 1 cycle)							A
Operating and Storage Junction Temperature Range	T_J T_{stg}	–65 to +150							°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
†Indicates JEDEC Registered Data

Thermal Parameters.

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Maximum Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	Note 1	°C/W

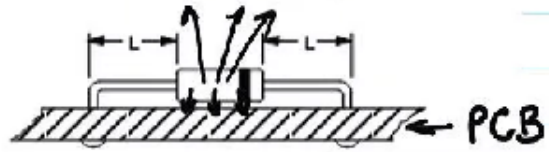
$$T_J = T_A + (R_{\theta JA} \times P_D)$$

T_A : Ambient
P_D : Power Dissipation
$R_{\theta JA}$:

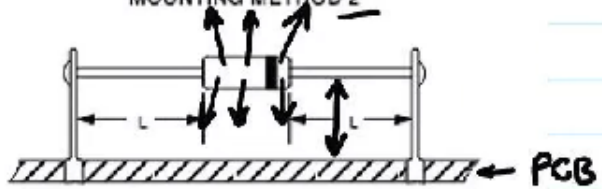
TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

Mounting Method		Lead Length, L			Units
		1/8	1/4	1/2	
1	$R_{\theta JA}$	52	65	72	°C/W
2		67	80	87	°C/W
3		50			°C/W

MOUNTING METHOD 1

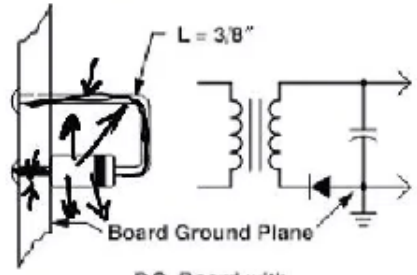


MOUNTING METHOD 2



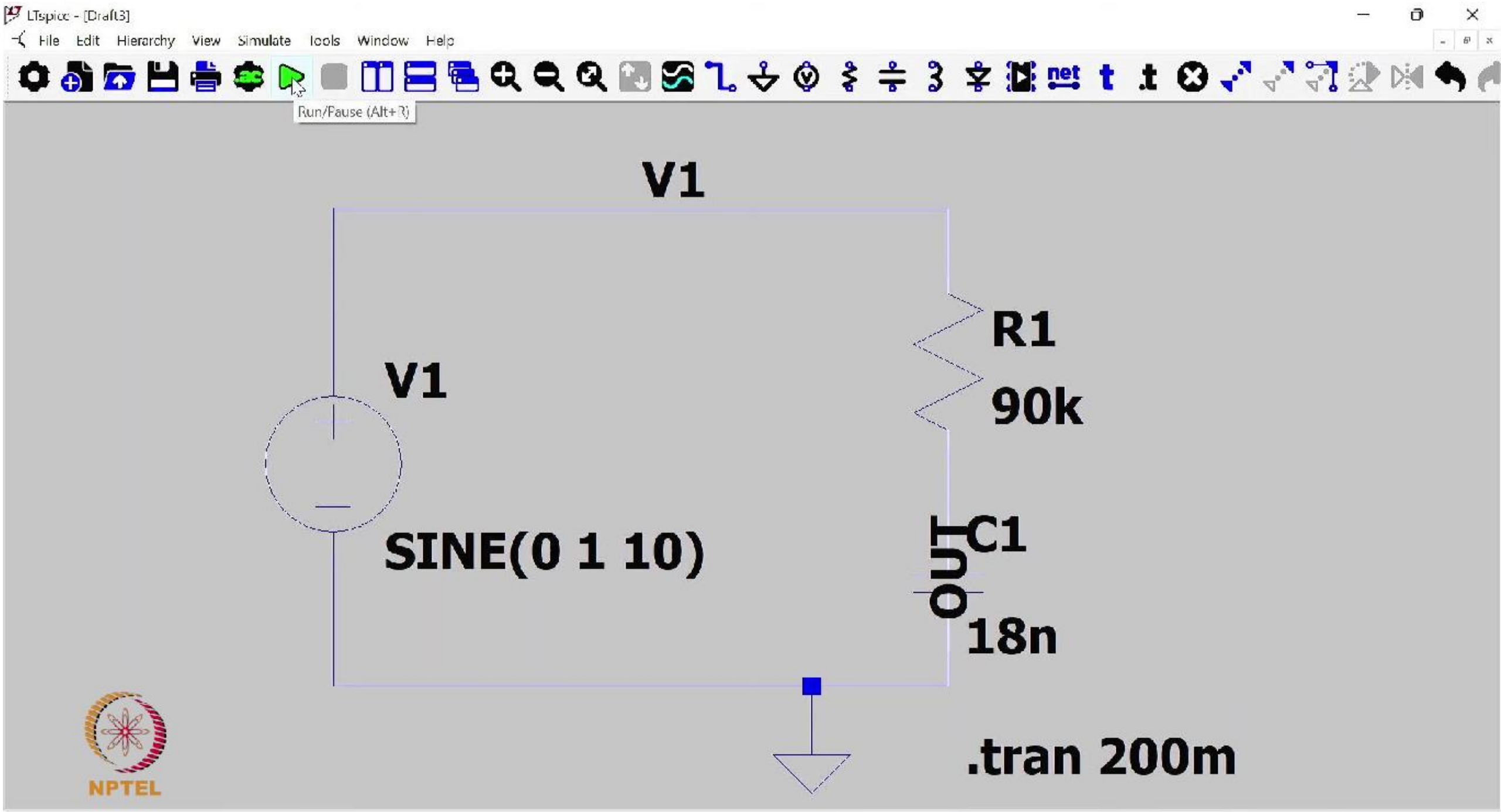
Vector Pin Mounting

MOUNTING METHOD 3



P.C. Board with
1–1/2" X 1–1/2" Copper Surface

NPTEL



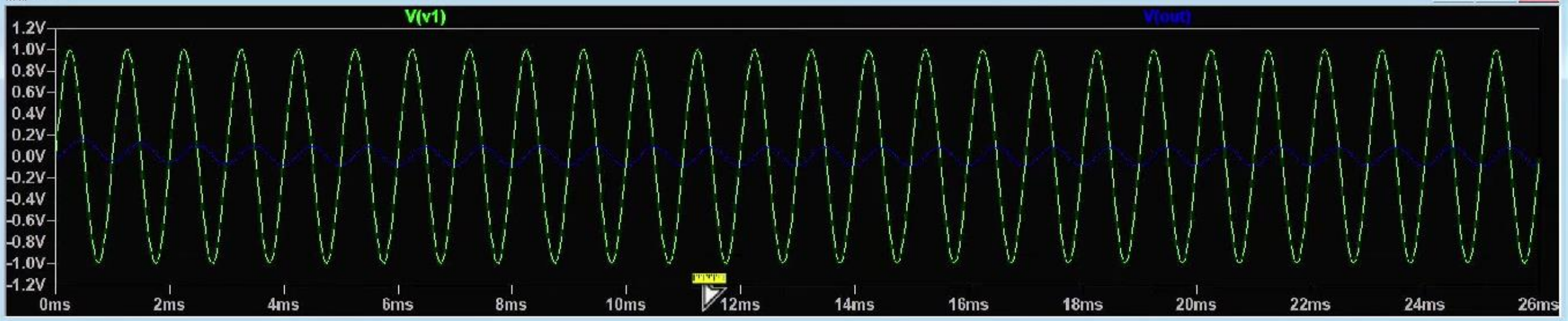
Run/Pause LTspice

LTspice - Draft3

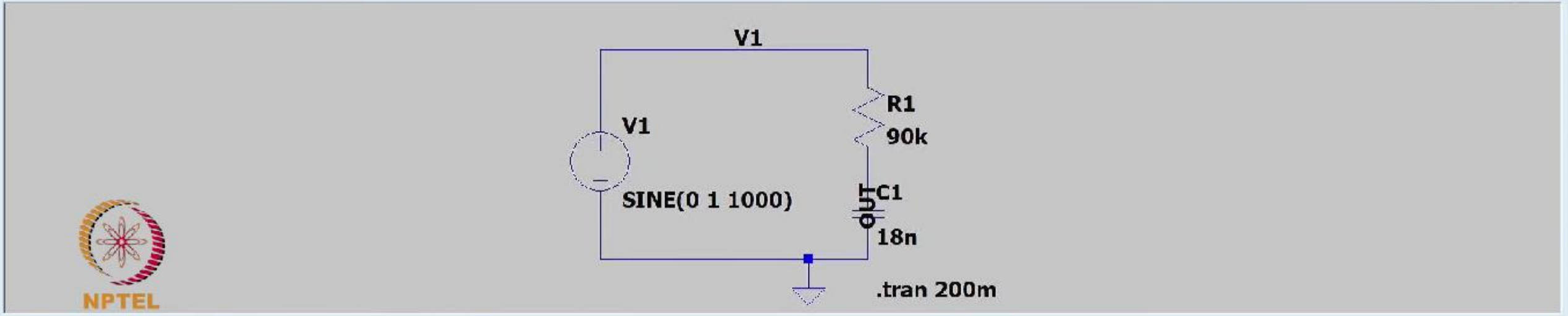
File View Plot Settings Simulation Tools Window Help

Draft3 Draft3

Draft3



Draft3



NPTEL

Right-Click to manually enter Horizontal Axis Limits

Frequency Domain Simulations :

- So far, we worked on time-domain analysis and dc analysis.

Now lets enter the frequency domain.

→ Frequency domain analysis

The frequency domain refers to the analysis of mathematical functions or signals with respect to frequency.

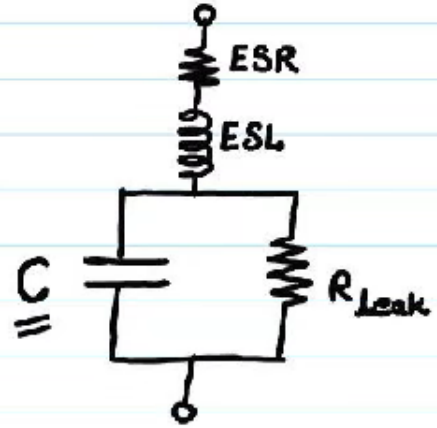
→ Small-signal analysis

Linearization of circuit characteristics at certain dc bias point. with small magnitude of variables.

→ AC analysis

AC means alternative-current signals in frequency domain

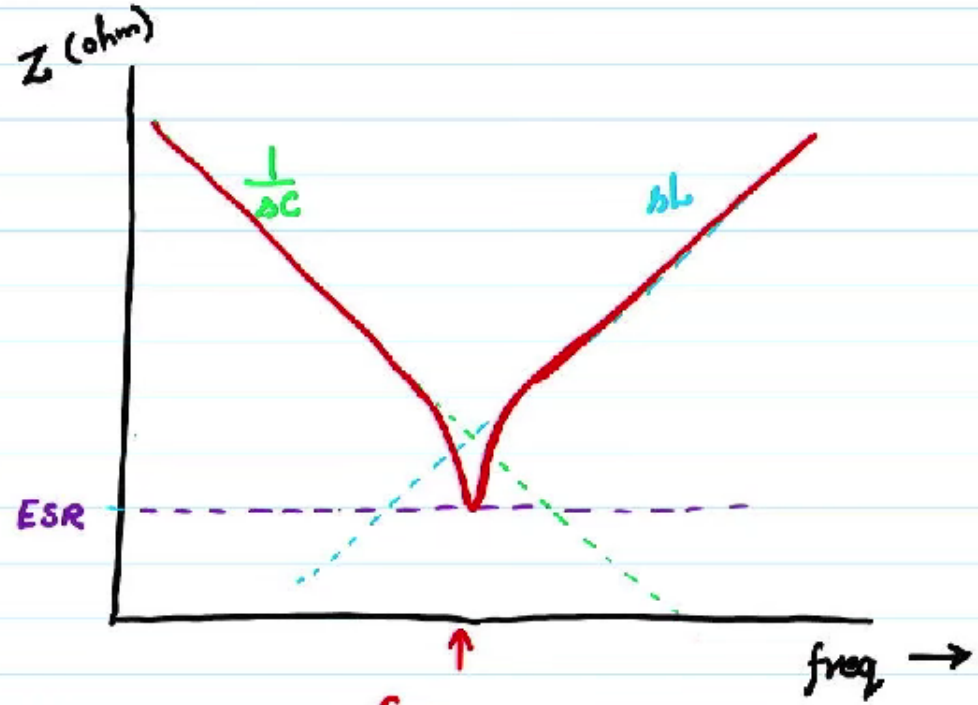
Real Capacitor Circuit model :



$$Z = Z_C \parallel Z_{RLeak} + Z_{ESL} + ESR$$

$$\approx \frac{1}{sC} + sL + ESR$$

at $\omega = \omega_0$



Fast Fourier Transform :

it computes the discrete Fourier Transform of a sequence.