MP309

Experiment 11

RC Frequency Response

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Roll no. :- I18PH037

Part 1 :- RC Frequency Response-LPF

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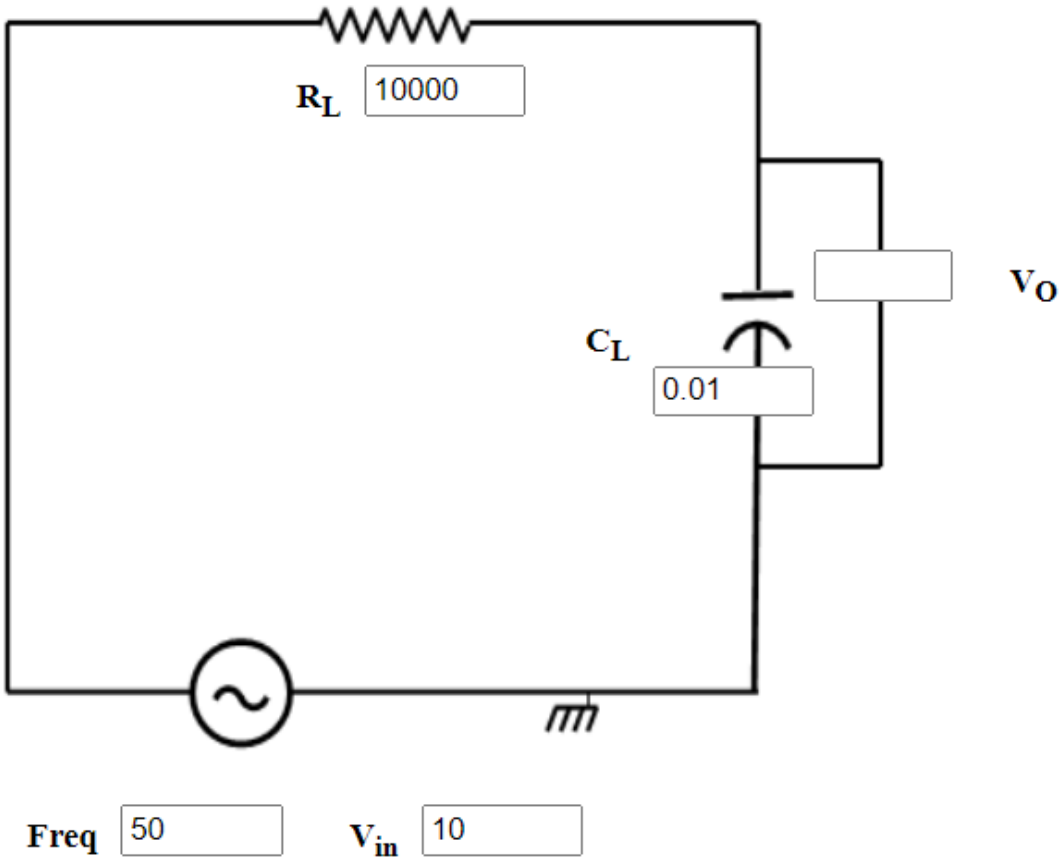

Figure 1: Low Pass Filter Circuit

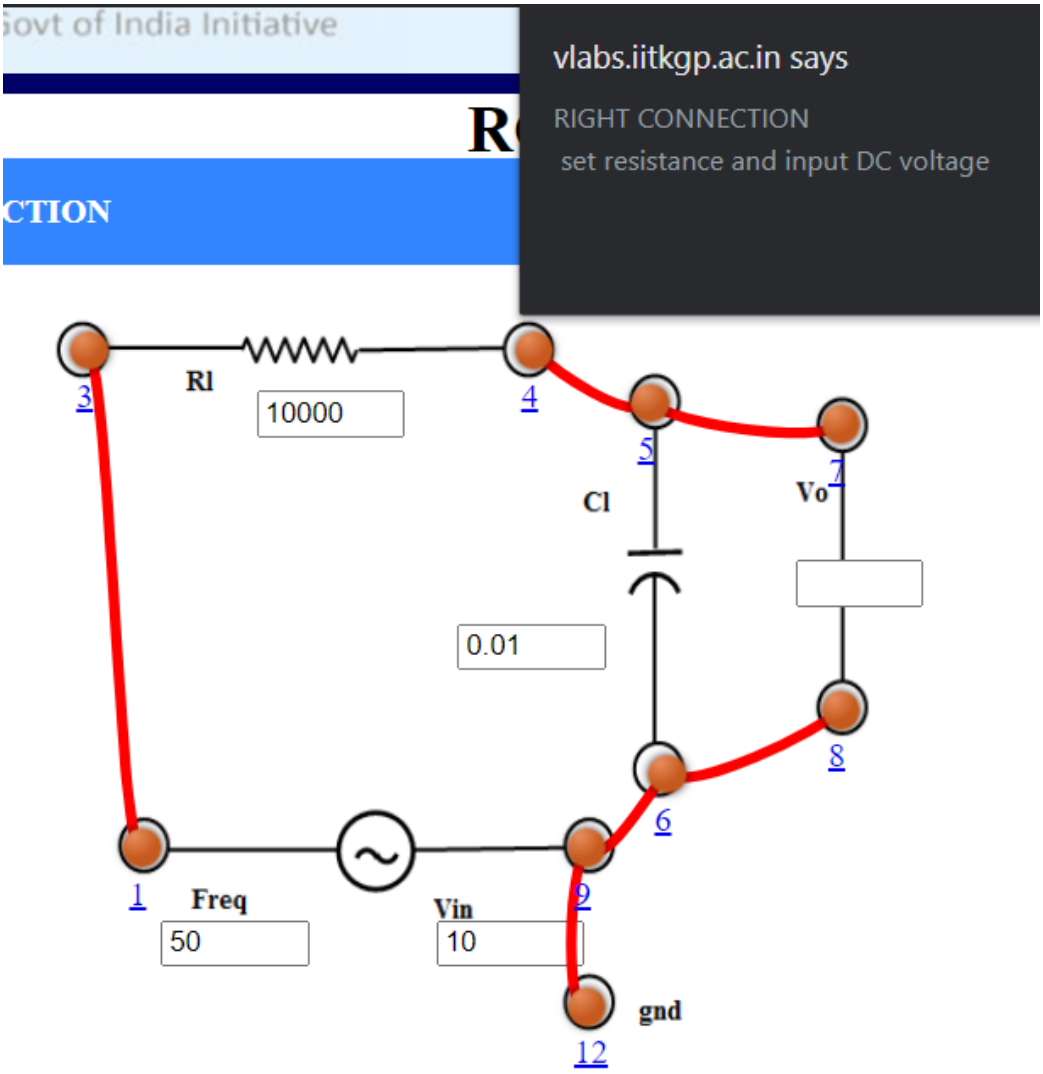

Figure 2: Low Pass Filter Connections

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.0001752778	-0.364177	9.9998
2	149	-0.001526368	-1.07465	9.9982
3	438	-0.01327614	-3.16866	9.9847
4	1294	-0.1142902	-9.27903	9.8693
5	3818	-0.90698	-25.7434	9.0085
6	11267	-4.80408	-54.9163	5.7517
7	98134	-21.8878	-85.4279	0.80466
8	289614	-31.2628	-88.478	0.27344
9	2522440	-50.0596	-89.8656	0.031407
10	7444240	-59.4596	-89.9846	0.010642
11	21969500	-68.8596	-90.025	0.003606
12	64836600	-78.2596	-90.0386	0.0012219
13	564703000	-97.0596	-90.0448	0.00014029

Figure 3: Low Pass Filter Table for C=2.01nF

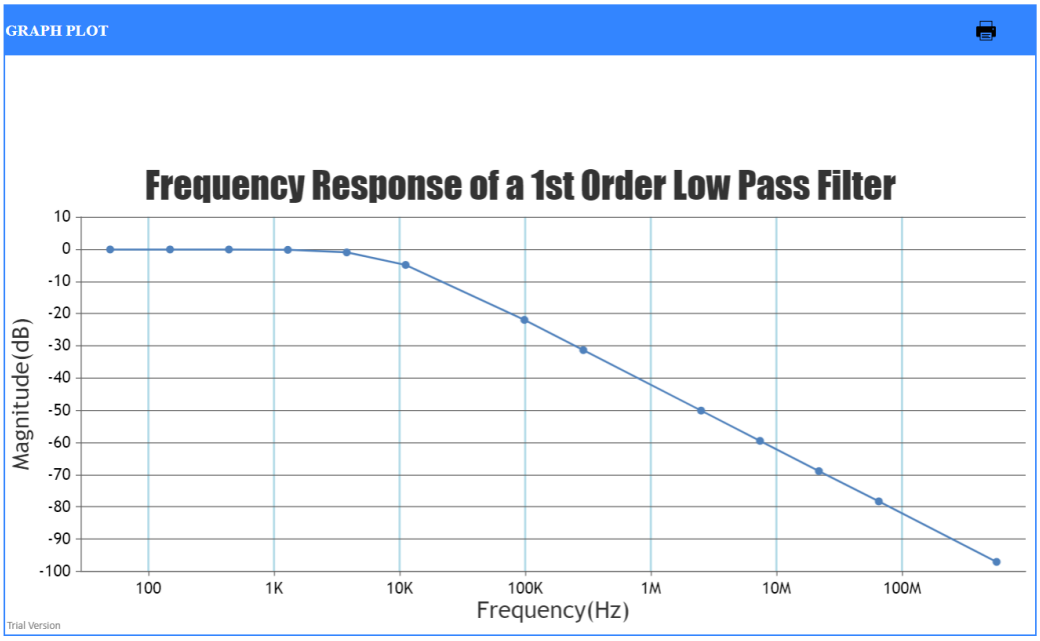

Figure 4: Frequency Response for C=2.01nF

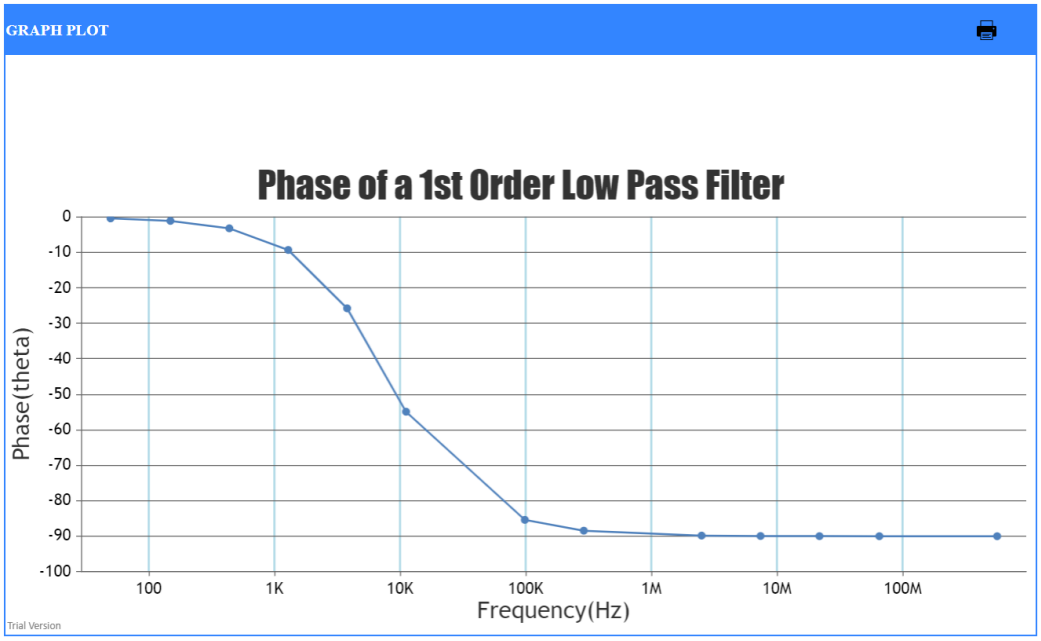

Figure 5: Phase Response for C=2.01nF

$f = 50Hz$, $C = 2.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 1.58M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 1.58M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.99V$

$f = 564703000Hz$, $C = 2.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.140\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.140 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.001088842	-0.907662	9.9987
2	149	-0.00947426	-2.67698	9.9891
3	438	-0.0818316	-7.8565	9.9062
4	1294	-0.665744	-22.1586	9.2622
5	3818	-3.87904	-50.2482	6.398
6	11267	-11.32486	-74.2846	2.7149
7	33252	-20.4318	-84.5829	0.9515
8	98134	-29.7968	-88.1897	0.32371
9	289614	-39.1928	-89.4166	0.10974
10	854713	-48.5924	-89.8325	0.037186
11	2522440	-57.9924	-89.9734	0.0126
12	7444240	-67.3924	-90.0212	0.0042696
13	21969500	-76.7924	-90.0374	0.0014467
14	64836600	-86.1924	-90.0428	0.00049021
15	191346000	-95.5924	-90.0447	0.00016611
16	564703000	-104.9924	-90.0453	0.000056284

Figure 6: Low Pass Filter Table for C=5.01nF

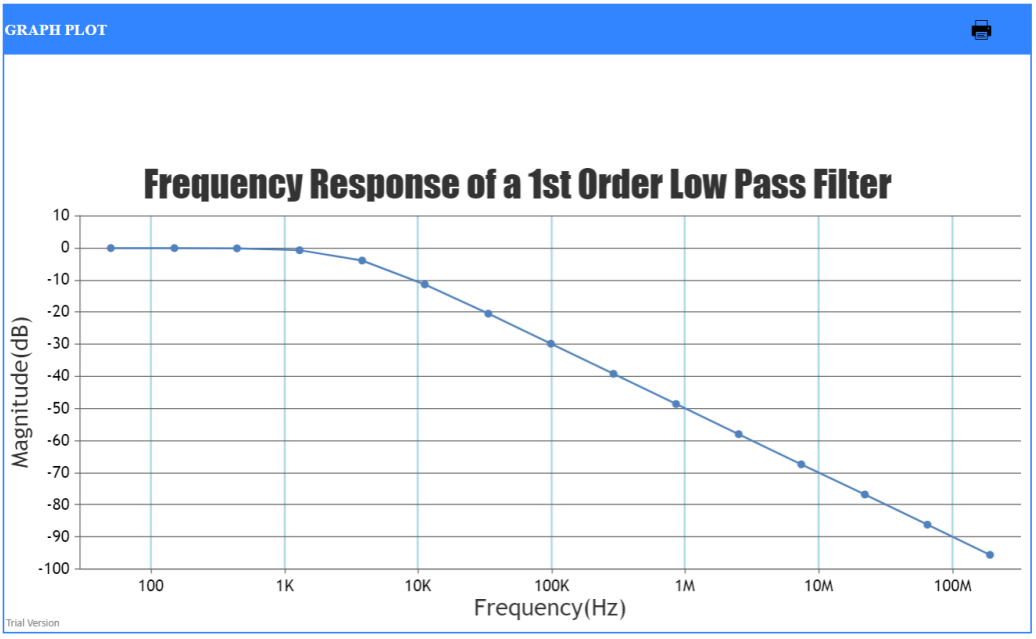

Figure 7: Frequency Response for C=5.01nF

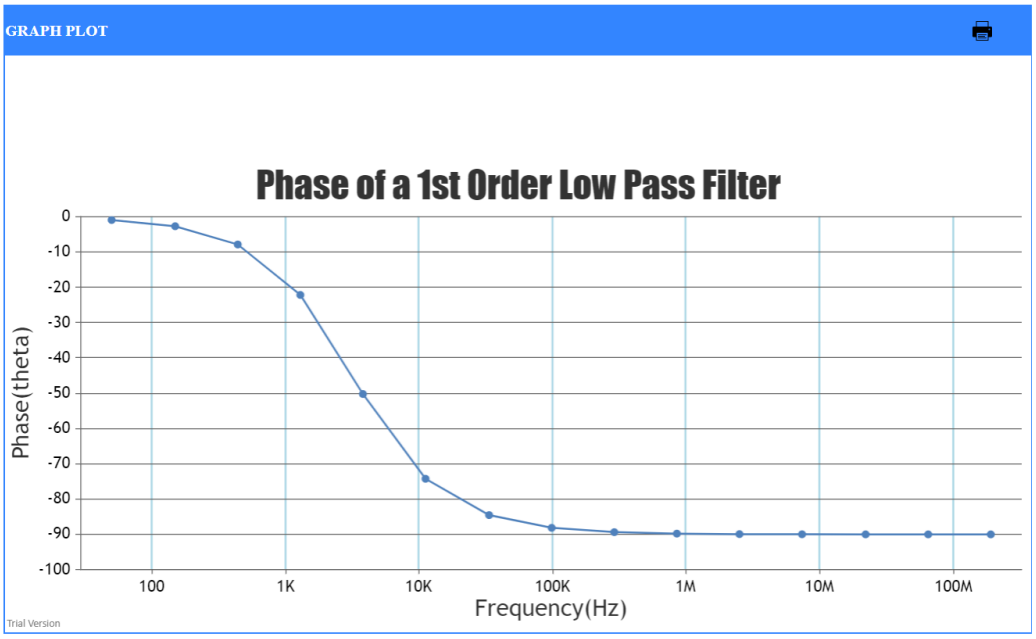

Figure 8: Phase Response for C=5.01nF

$f = 50Hz$, $C = 5.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.635M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.635M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.99V$

$f = 564703000Hz$, $C = 5.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.056\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.056 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.00434504	-1.81306	9.995
2	149	-0.0376986	-5.33703	9.9567
3	438	-0.31785	-15.4138	9.6407
4	1294	-2.2046	-39.1389	7.7584
5	3818	-8.2995	-67.4144	3.8461
6	11267	-17.08998	-82.0054	1.398
7	98134	-35.8054	-89.1165	0.16208
8	854713	-54.6042	-89.939	0.018612
9	2522440	-64.0042	-90.0095	0.0063065
10	7444240	-73.4042	-90.0334	0.0021369
11	21969500	-82.8042	-90.0415	0.00072408
12	64836600	-92.2042	-90.0442	0.00024535
13	191346000	-101.6042	-90.0452	0.000083136
14	564703000	-111.0042	-90.0455	0.00002817

Figure 9: Low Pass Filter Table for C=10.01nF

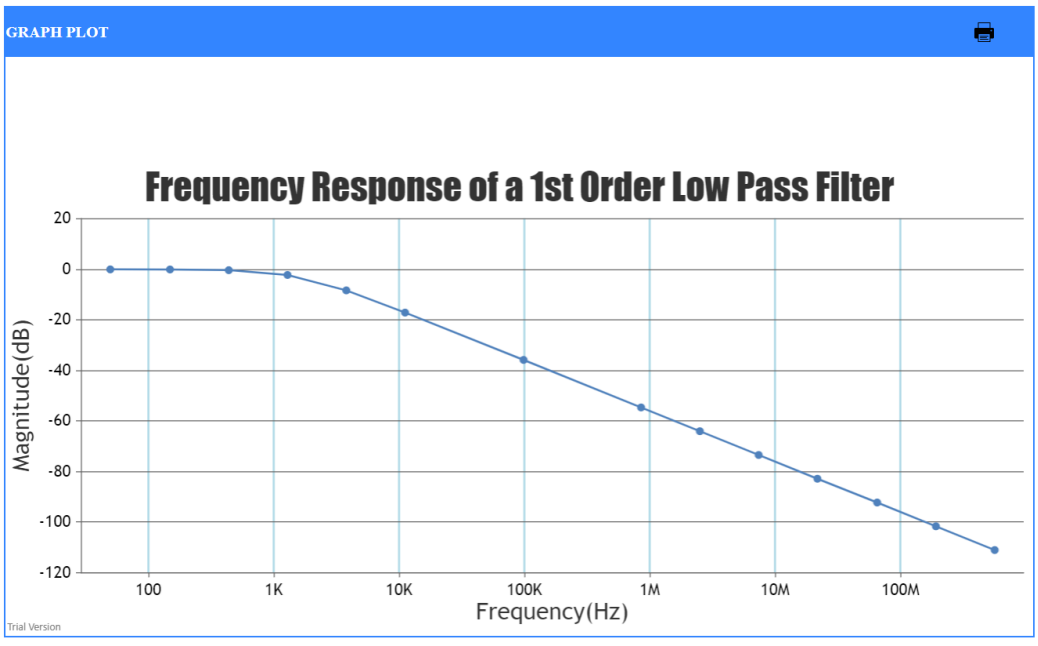

Figure 10: Frequency Response for C=10.01nF

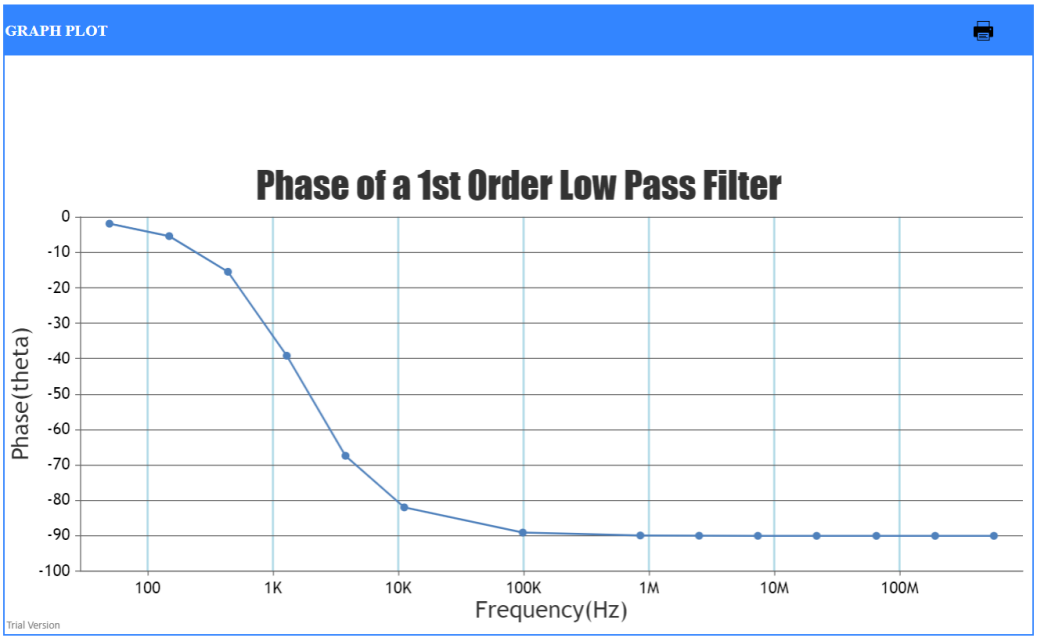

Figure 11: Phase Response for C=10.01nF

$f = 50Hz$, $C = 10.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.317M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.635M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.99V$

$f = 564703000Hz$, $C = 10.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.028\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.028 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.01733688	-3.62069	9.9801
2	149	-0.1487238	-10.5779	9.8302
3	438	-1.150866	-28.8624	8.759
4	1294	-5.61428	-58.4323	5.2395
5	3818	-13.80524	-78.2657	2.0405
6	11267	-23.0422	-86.0037	0.70452
7	98134	-41.8208	-89.5808	0.081088
8	289614	-51.2206	-89.8881	0.027477
9	854713	-60.6206	-89.9923	0.0093105
10	2522440	-70.0206	-90.0276	0.0031548
11	7444240	-79.4206	-90.0395	0.001069
12	21969500	-88.8206	-90.0436	0.00036222
13	64836600	-98.2206	-90.0449	0.00012274
14	564703000	-117.0206	-90.0456	0.000014092

Figure 12: Low Pass Filter Table for C=20.01nF

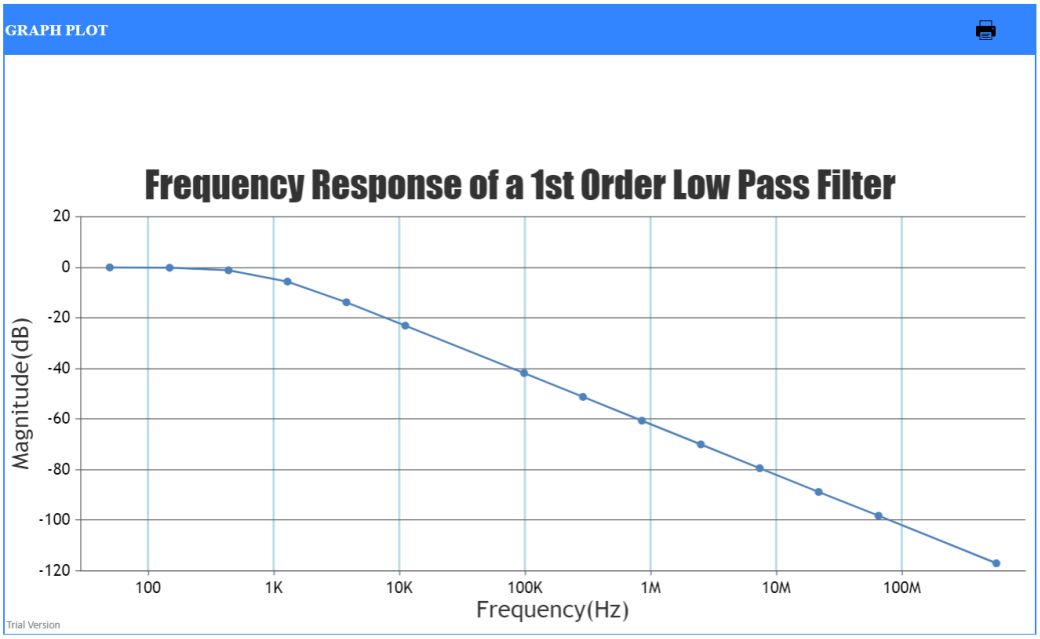

Figure 13: Frequency Response for C=20.01nF

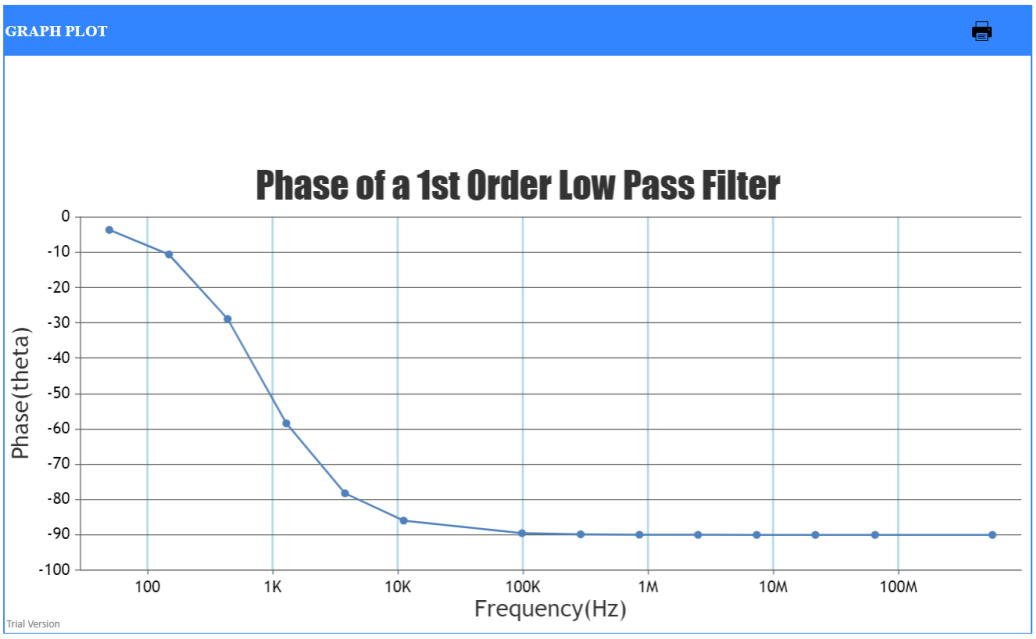

Figure 14: Phase Response for C=20.01nF

$f = 50Hz$, $C = 20.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.159M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.159M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.98V$

$f = 564703000Hz$, $C = 20.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.0140\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.0140 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.0388982	-5.42115	9.9553
2	149	-0.327636	-15.6463	9.6298
3	438	-2.2595	-39.581	7.7095
4	1294	-8.4162	-67.7328	3.7948
5	3818	-17.224	-82.1293	1.3766
6	11267	-26.5506	-87.3481	0.47041
7	33252	-35.942	-89.131	0.15955
8	98134	-45.341	-89.7357	0.054069
9	289614	-54.741	-89.9406	0.018321
10	854713	-64.141	-90.0101	0.006208
11	2522440	-73.541	-90.0336	0.0021036
12	7444240	-82.941	-90.0416	0.00071278
13	21969500	-92.341	-90.0443	0.00024152
14	64836600	-101.741	-90.0452	0.000081838
15	191346000	-111.141	-90.0455	0.00002773
16	564703000	-120.541	-90.0456	0.0000093962

Figure 15: Low Pass Filter Table for C=30.01nF

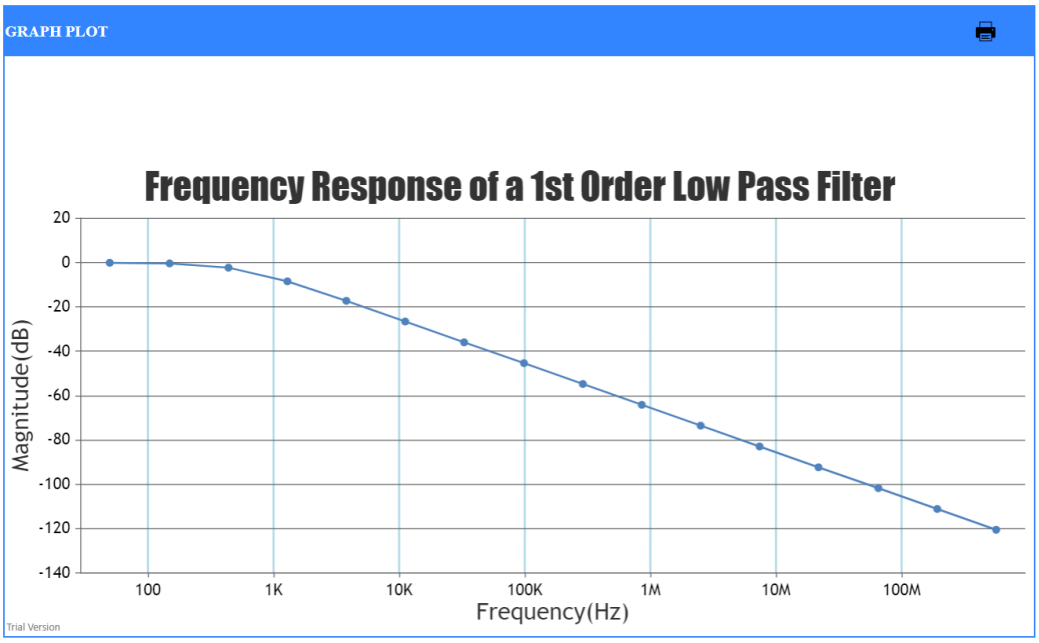

Figure 16: Frequency Response for C=30.01nF

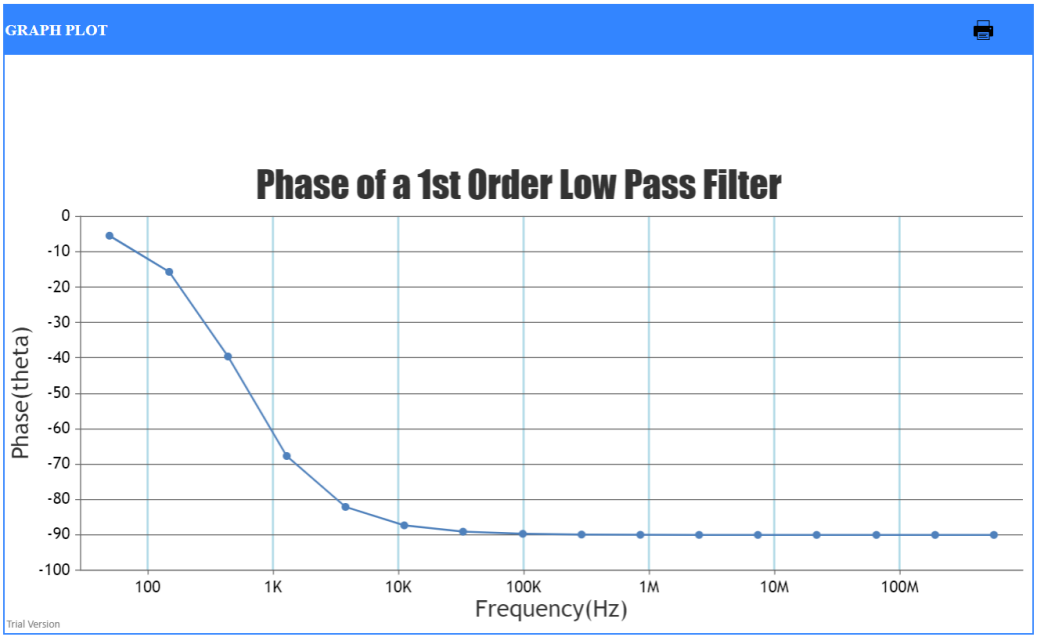

Figure 17: Phase Response for C=30.01nF

$f = 50Hz$, $C = 30.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.106M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.106M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.955V$

$f = 564703000Hz$, $C = 30.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.00939\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.0093 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.0689018	-7.21094	9.921
2	149	-0.566314	-20.4762	9.3688
3	438	-3.45	-47.787	6.722
4	1294	-10.6317	-72.9367	2.9405
5	3818	-19.6859	-84.0914	1.0368
6	11267	-29.0444	-88.0216	0.35301
7	33252	-38.4396	-89.3596	0.11968
8	98134	-47.839	-89.8132	0.040555
9	289614	-57.239	-89.9669	0.013742
10	854713	-66.639	-90.019	0.0046564
11	2522440	-76.039	-90.0366	0.0015778
12	7444240	-85.439	-90.0426	0.00053463
13	21969500	-94.839	-90.0446	0.00018116
14	64836600	-104.239	-90.0453	0.000061383
15	191346000	-113.639	-90.0455	0.000020799
16	564703000	-123.039	-90.0456	0.0000070478

Figure 18: Low Pass Filter Table for C=40.01nF

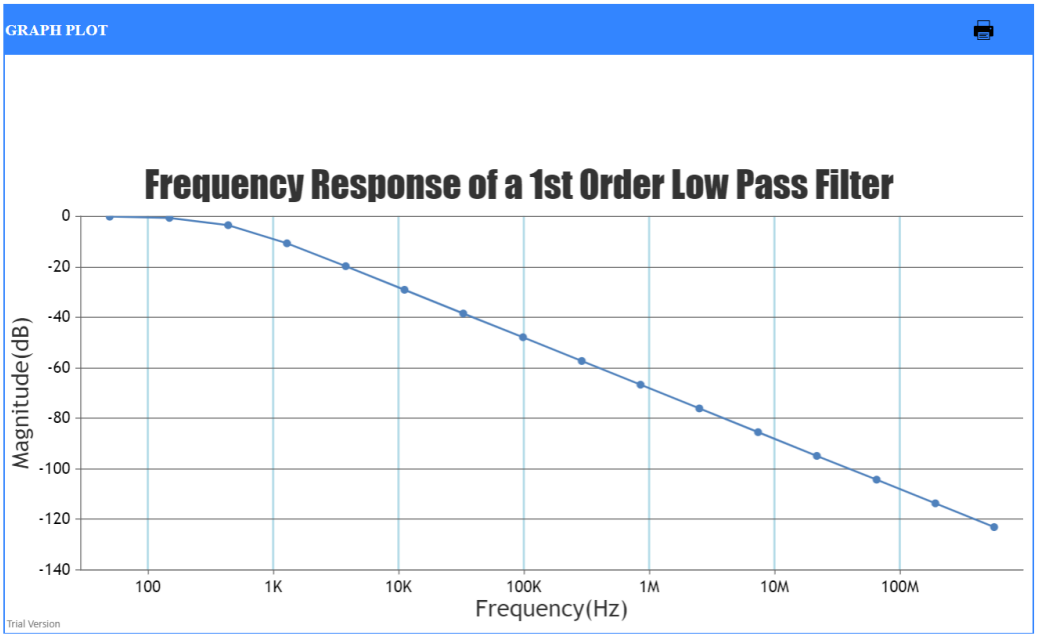

Figure 19: Frequency Response for C=40.01nF

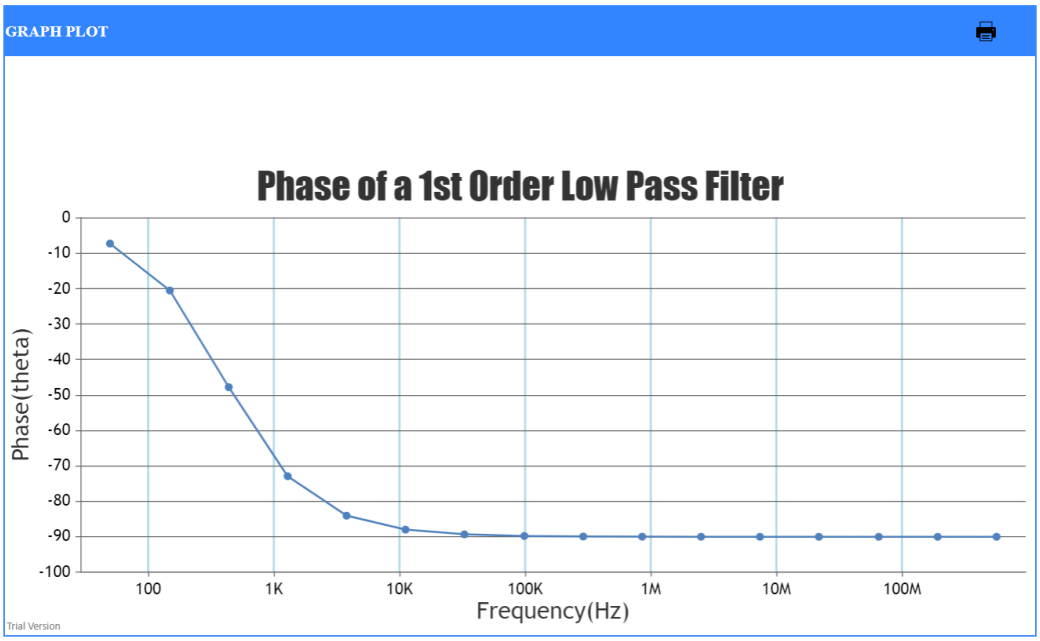

Figure 20: Phase Response for C=40.01nF

$f = 50Hz$, $C = 40.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.079M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.080M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.92V$

$f = 564703000Hz$, $C = 40.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.007\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.007 \times 10^{-3}V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-0.0944374	-8.43792	9.8919
2	149	-0.760814	-23.6446	9.1613
3	438	-4.2612	-52.273	6.1227
4	1294	-11.91008	-75.3355	2.538
5	3818	-21.055	-84.9622	0.88562
6	11267	-30.4248	-88.3191	0.30113
7	33252	-39.8214	-89.4605	0.10208
8	98134	-49.221	-89.8474	0.03459
9	289614	-58.6208	-89.9785	0.011721
10	854713	-68.021	-90.0229	0.0039715
11	2522440	-77.421	-90.0379	0.0013457
12	7444240	-86.821	-90.043	0.00045599
13	21969500	-96.221	-90.0448	0.00015451
14	64836600	-105.621	-90.0453	0.000052355
15	191346000	-115.0208	-90.0455	0.00001774
16	564703000	-124.421	-90.0456	0.0000060111

Figure 21: Low Pass Filter Table for C=46.91nF

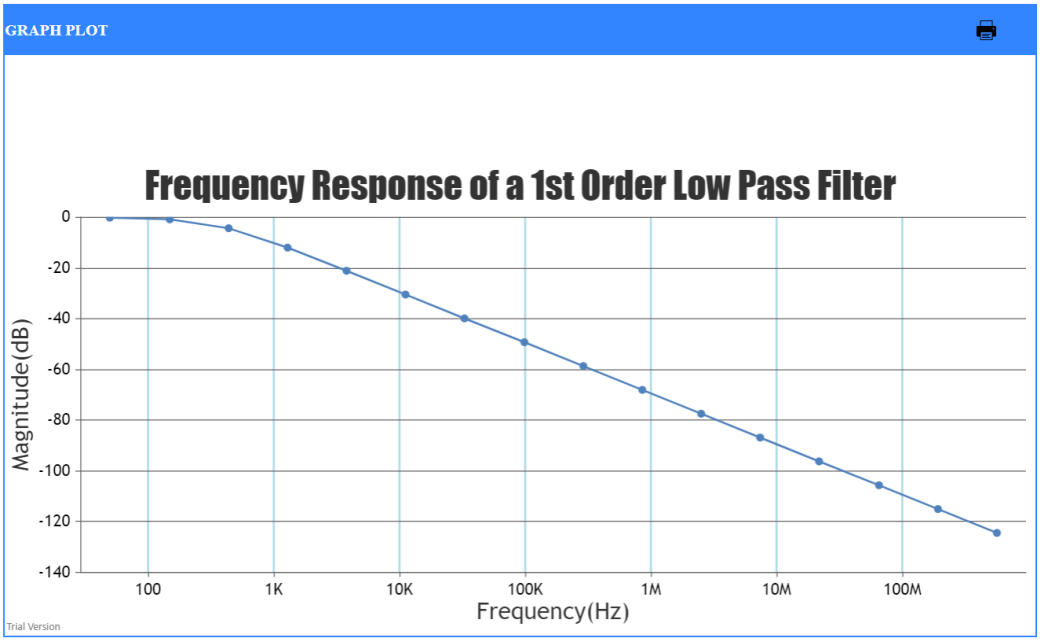

Figure 22: Frequency Response for C=46.91nF

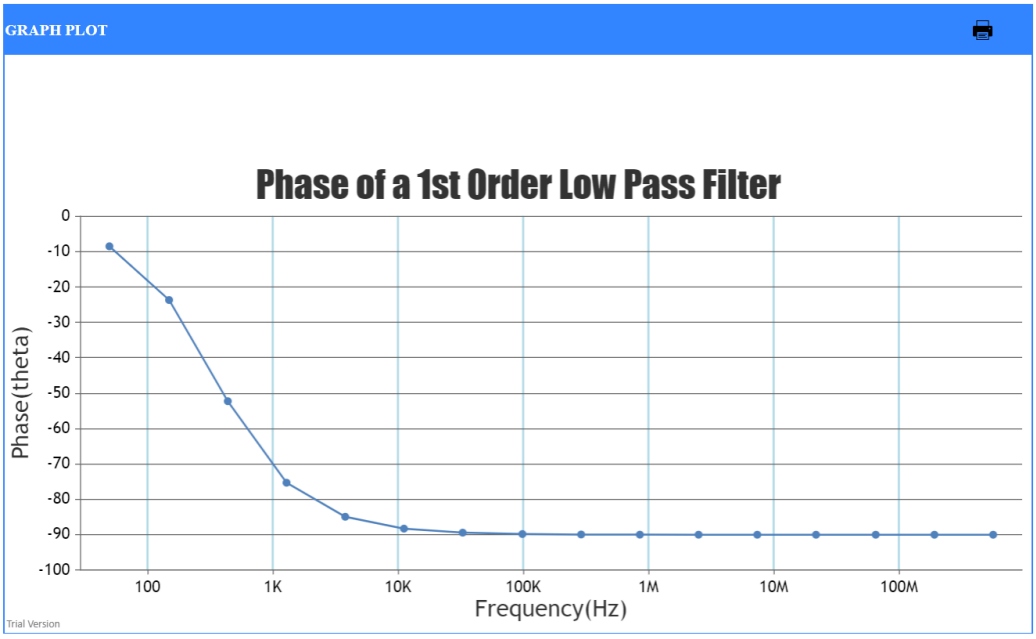

Figure 23: Phase Response for C=46.91nF

$f = 50Hz$, $C = 46.91nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.068M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.069M\Omega$
$V_{out} = V_{in} \times (X_C/Z1) = 9.89V$

$f = 564703000Hz$, $C = 46.91nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.0061\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (X_C/Z2) = 0.0061 \times 10^{-3}V$

Part 2 :- RC Frequency Response-HPF

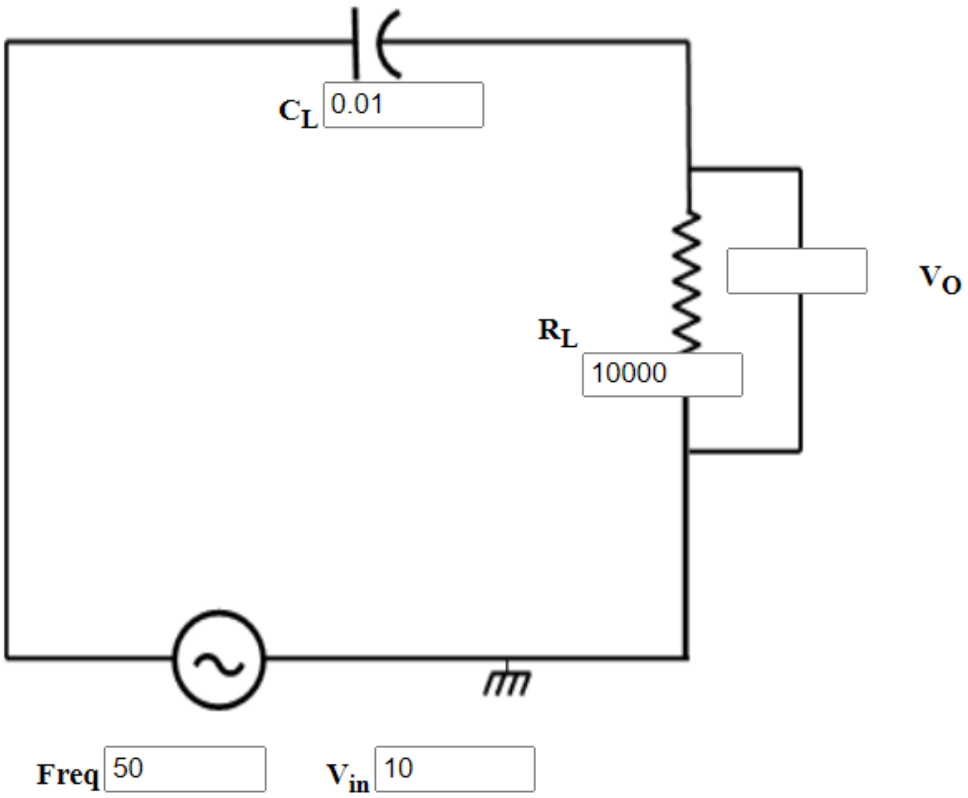

Figure 24: High Pass Filter Circuit

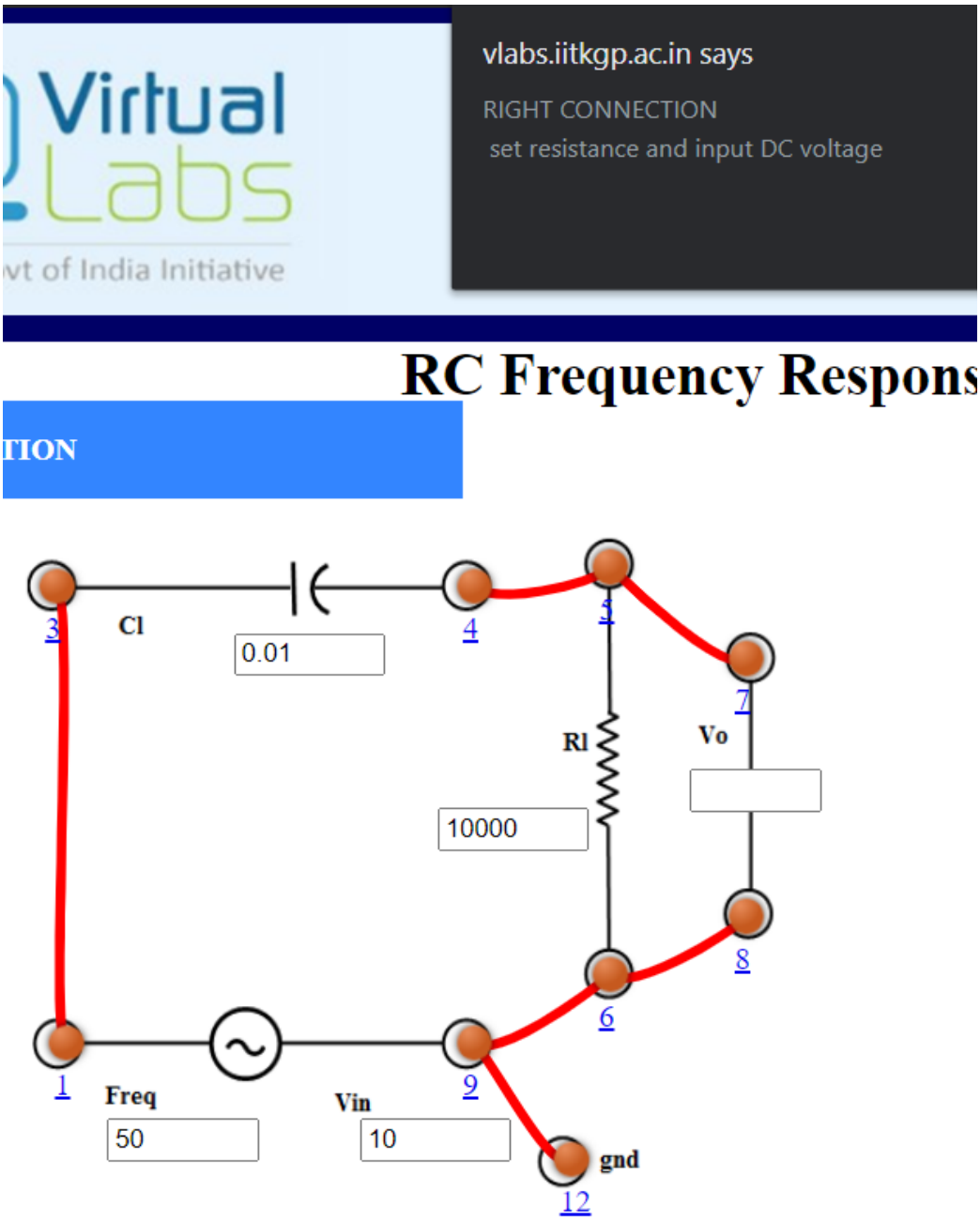

Figure 25: High Pass Filter Connections

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-49.918	89.8627	0.031923
2	149	-40.5184	89.5056	0.094207
3	438	-31.1214	88.4522	0.27793
4	1294	-21.7472	85.3524	0.81779
5	3818	-12.56546	76.4261	2.3536
6	11267	-4.70988	54.4757	5.8144
7	33252	-0.880654	25.38	9.0358
8	98134	-0.1106718	9.13159	9.8734
9	289614	-0.0128511	3.11755	9.9852
10	854713	-0.001477432	1.05729	9.9983
11	2522440	-0.0001696572	0.358291	9.9998
12	7444240	-0.00001947962	0.121406	10
13	21969500	-0.00000223656	0.0411379	10
14	64836600	-2.57E-07	0.0139393	10
15	191346000	-2.95E-08	0.00472327	10
16	564703000	-3.39E-09	0.00160045	10

Figure 26: High Pass Filter Table for C=1.01nF

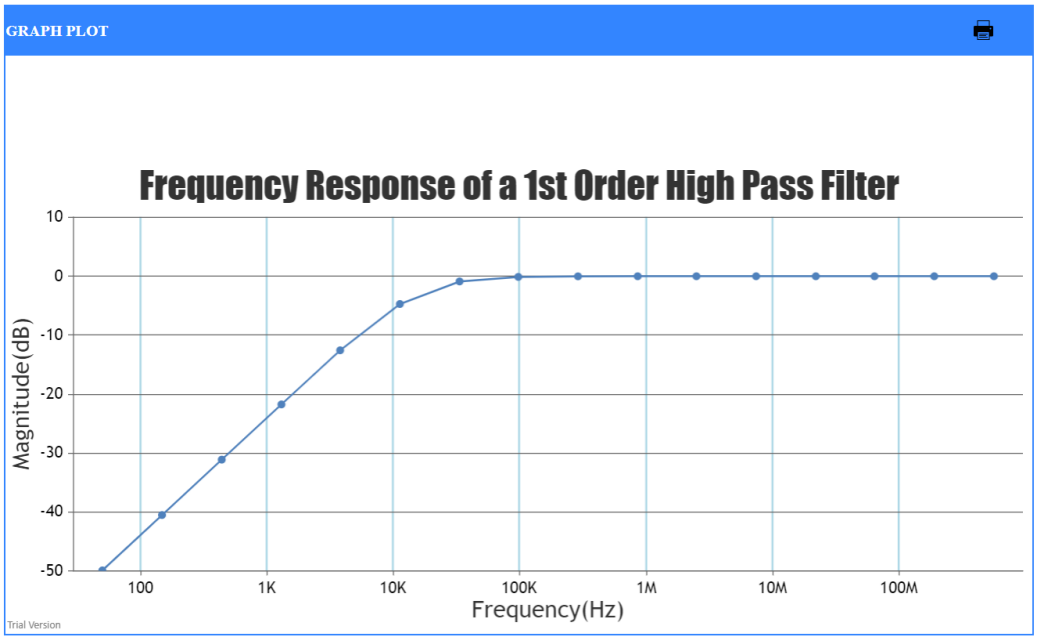

Figure 27: Frequency Response for C=1.01nF

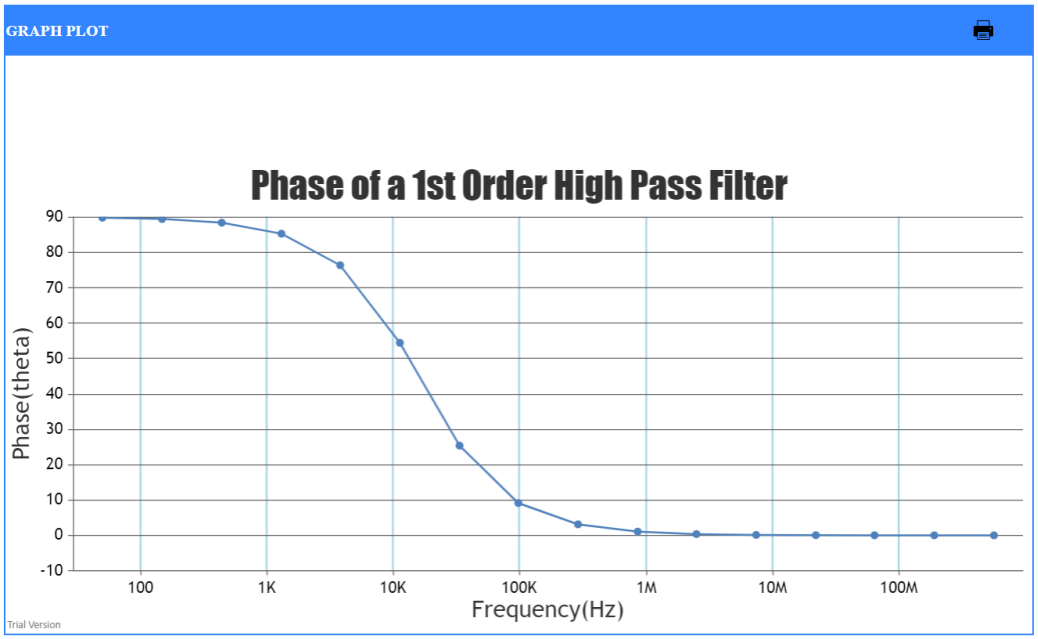

Figure 28: Phase Response for C=1.01nF

$f = 50Hz$, $C = 1.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 3.15M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 3.15M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 0.03V$

$f = 564703000Hz$, $C = 1.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.279\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-36.0088	89.138	0.15833
2	149	-26.6172	87.3687	0.46681
3	438	-17.28948	82.1891	1.3662
4	1294	-8.4734	67.887	3.7699
5	3818	-2.2867	39.7975	7.6854
6	11267	-0.33252	15.761	9.6244
7	33252	-0.0394978	5.4627	9.9546
8	98134	-0.00455326	1.85598	9.9948
9	289614	-0.000523028	0.629084	9.9994
10	854713	-0.0000600546	0.213169	9.9999
11	2522440	-0.00000689522	0.0722311	10
12	7444240	-7.92E-07	0.0244751	10
13	21969500	-9.09E-08	0.00829326	10
14	64836600	-1.04E-08	0.00281012	10
15	191346000	-1.20E-09	0.000952195	10
16	564703000	-1.38E-10	0.000322645	10

Figure 29: High Pass Filter Table for C=5.01nF

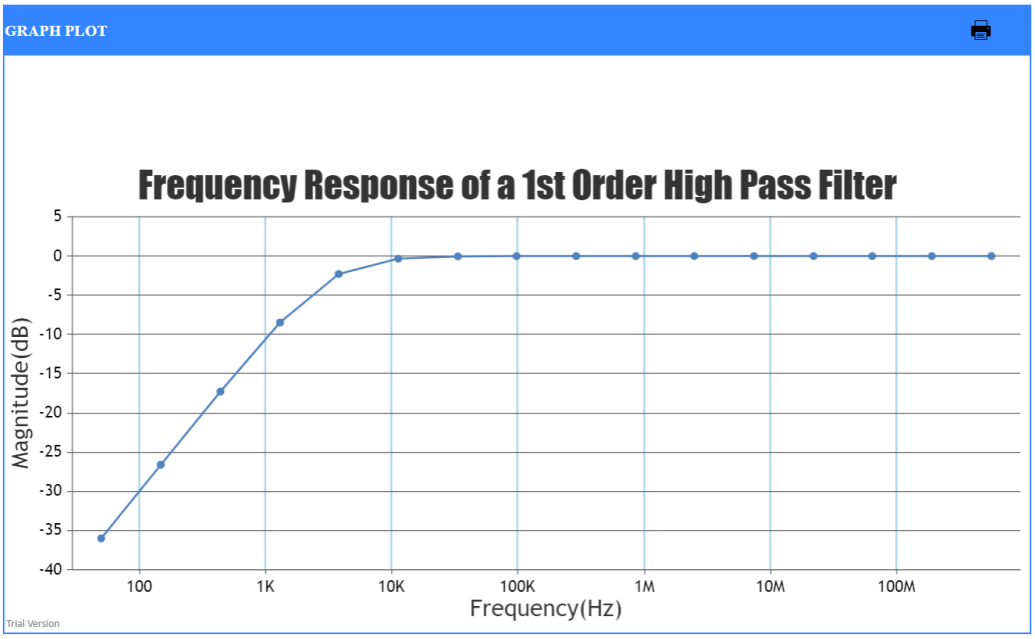

Figure 30: Frequency Response for C=5.01nF

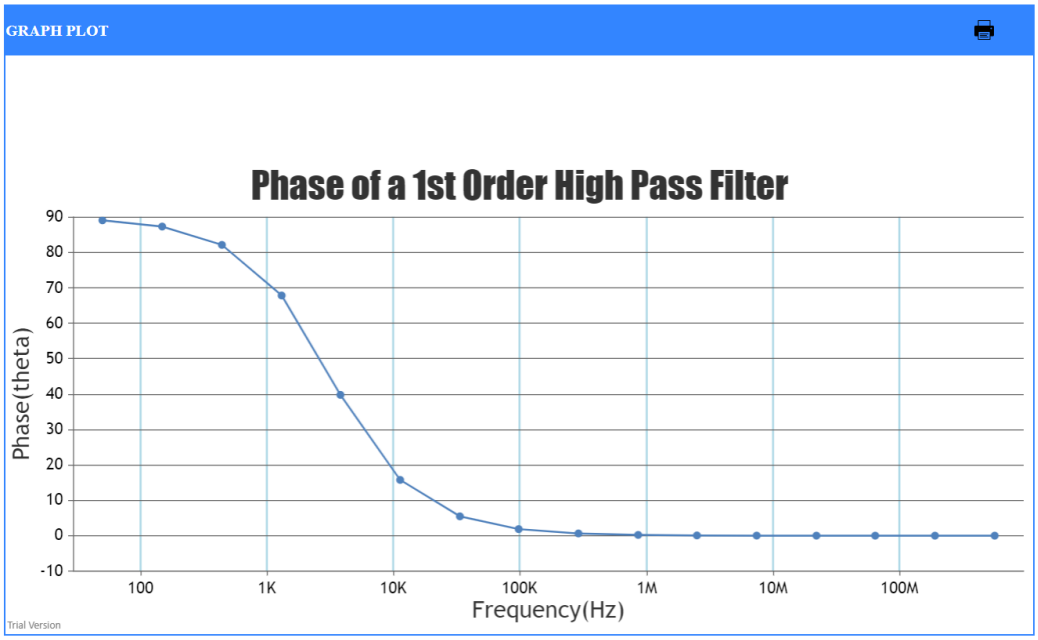

Figure 31: Phase Response for C=5.01nF

$f = 50Hz$, $C = 5.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.6353M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.6354M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 0.157V$

$f = 564703000Hz$, $C = 5.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.056\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-30	88.2326	0.31623
2	149	-20.6334	84.7086	0.92967
3	438	-11.51358	74.6318	2.6566
4	1294	-4.00032	50.9067	6.3093
5	3818	-0.695234	22.6312	9.2308
6	11267	-0.0857164	8.04023	9.9018
7	33252	-0.00992796	2.7403	9.9886
8	98134	-0.001141038	0.929161	9.9987
9	289614	-0.0001310242	0.314866	9.9998
10	854713	-0.00001504372	0.106691	10
11	2522440	-0.00000172725	0.0361517	10
12	7444240	-1.98E-07	0.0122498	10
13	21969500	-2.28E-08	0.00415077	10
14	64836600	-2.61E-09	0.00140646	10
15	191346000	-3.00E-10	0.000476573	10
16	564703000	-3.45E-11	0.000161484	10

Figure 32: High Pass Filter Table for C=10.01nF

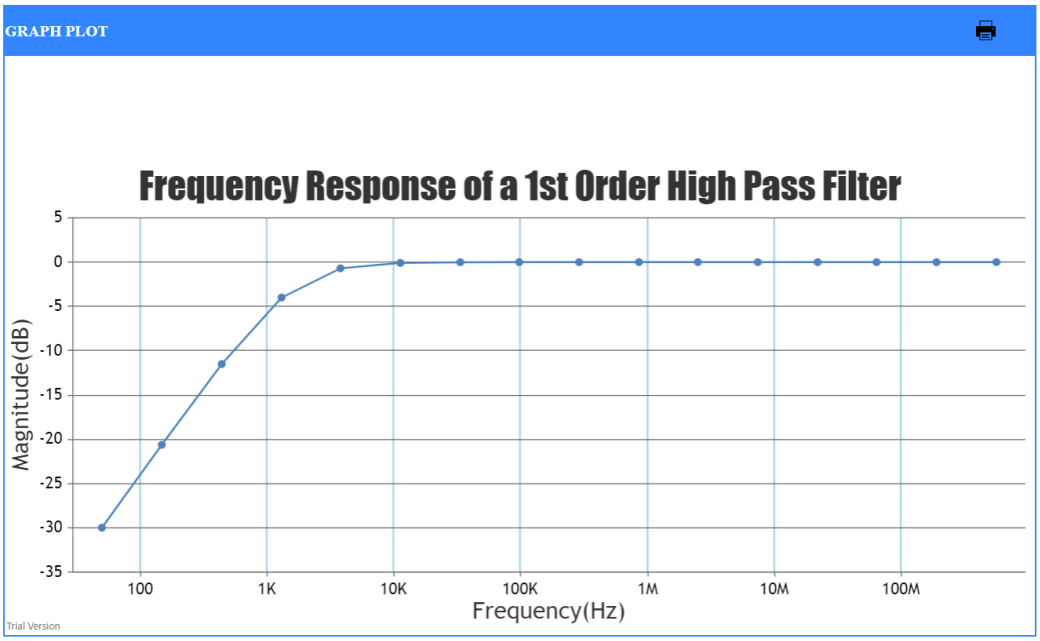

Figure 33: Frequency Response for C=10.01nF

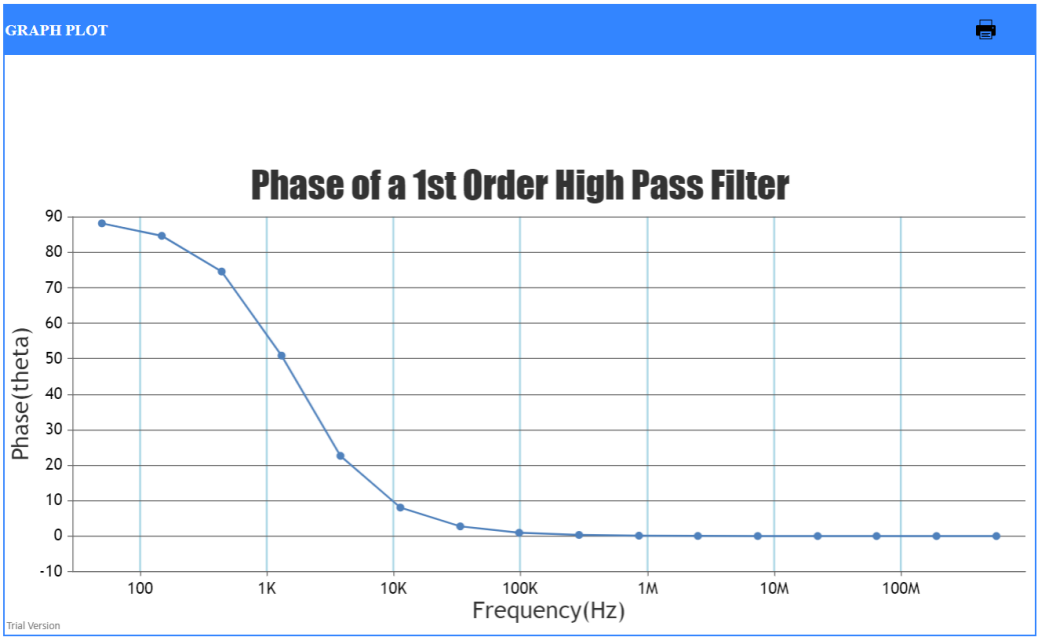

Figure 34: Phase Response for C=10.01nF

$f = 50Hz$, $C = 10.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.317M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.318M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 0.31V$

$f = 564703000Hz$, $C = 10.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.02\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-23.9968	86.425	0.63119
2	149	-14.72818	79.4677	1.8348
3	438	-6.33034	61.1832	4.8248
4	1294	-1.39374	31.6133	8.5175
5	3818	-0.1846984	11.7799	9.7896
6	11267	-0.0216098	4.04199	9.9752
7	33252	-0.0024866	1.37162	9.9971
8	98134	-0.000285572	0.464843	9.9997
9	289614	-0.0000327892	0.157513	10
10	854713	-0.0000037647	0.0533723	10
11	2522440	-4.32E-07	0.0180849	10
12	7444240	-4.96E-08	0.00612796	10
13	21969500	-5.70E-09	0.00207642	10
14	64836600	-6.54E-10	0.000703584	10
15	191346000	-7.51E-11	0.000238406	10
16	564703000	-8.62E-12	0.0000807823	10

Figure 35: High Pass Filter Table for C=20.01nF

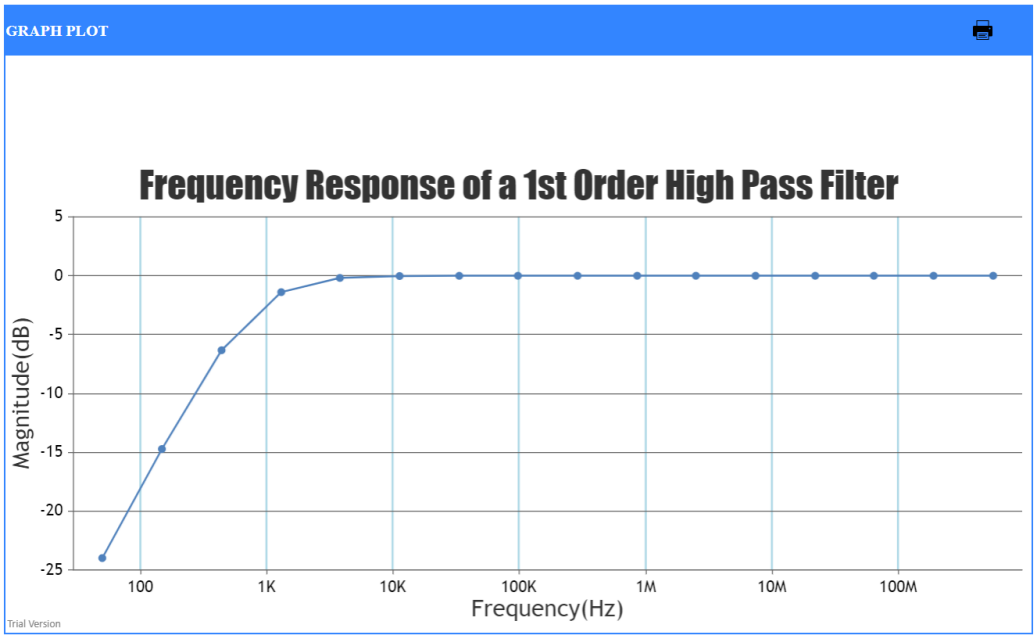

Figure 36: Frequency Response for C=20.01nF

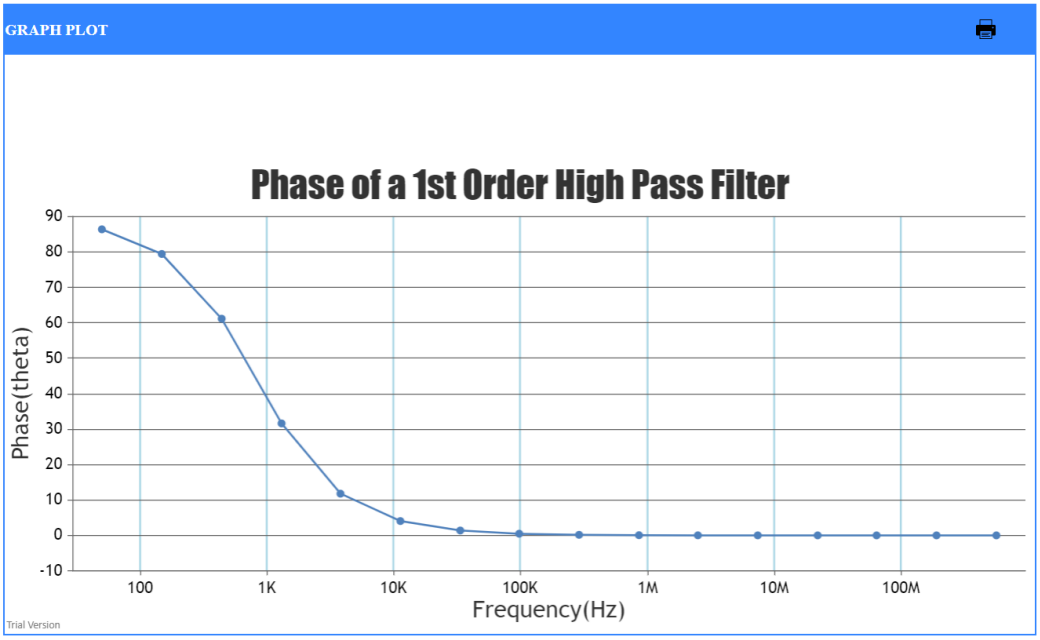

Figure 37: Phase Response for C=20.01nF

$f = 50Hz$, $C = 20.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.159M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.159M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 0.62V$

$f = 564703000Hz$, $C = 20.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.014\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-20.498	84.6245	0.94428
2	149	-11.38672	74.3993	2.6957
3	438	-3.9186	50.4646	6.369
4	1294	-0.67529	22.3128	9.252
5	3818	-0.0830868	7.91633	9.9048
6	11267	-0.00962082	2.69759	9.9889
7	33252	-0.0011057	0.914661	9.9987
8	98134	-0.0001269658	0.309951	9.9999
9	289614	-0.00001457784	0.105026	10
10	854713	-0.000001673756	0.0355874	10
11	2522440	-1.92E-07	0.0120586	10
12	7444240	-2.21E-08	0.00408599	10
13	21969500	-2.53E-09	0.00138451	10
14	64836600	-2.91E-10	0.000469134	10
15	191346000	-3.34E-11	0.000158964	10
16	564703000	-3.83E-12	0.0000538638	10

Figure 38: High Pass Filter Table for C=30.01nF

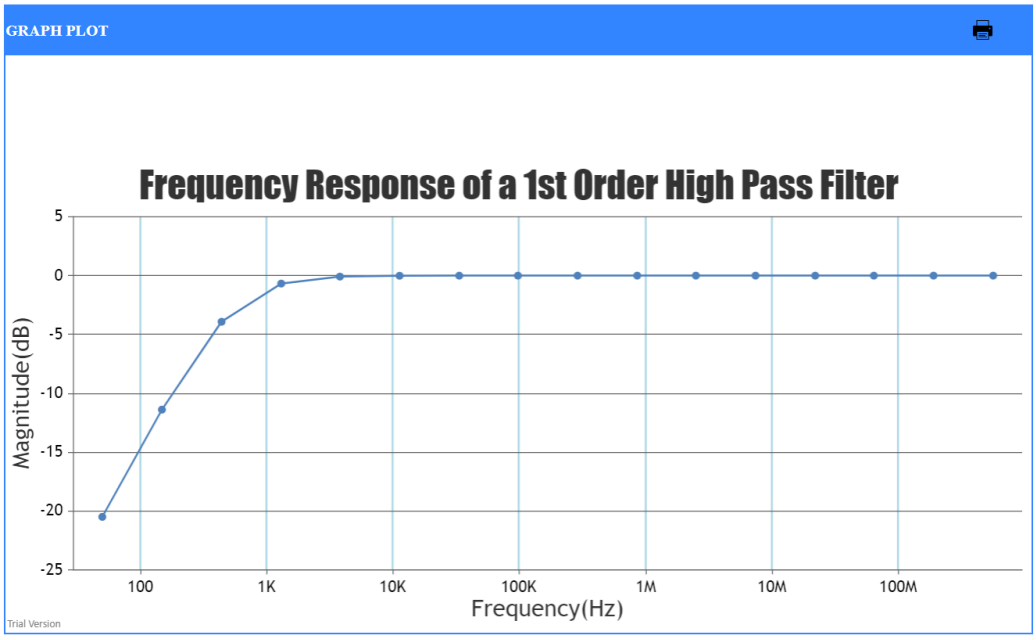

Figure 39: Frequency Response for C=30.01nF

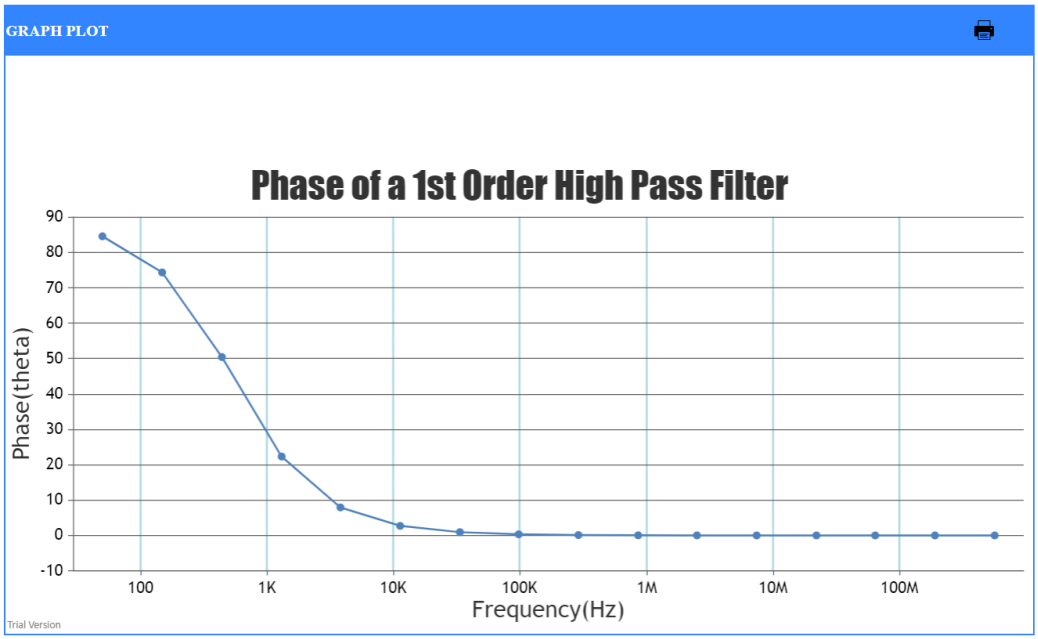

Figure 40: Phase Response for C=30.01nF

$f = 50Hz$, $C = 30.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.106M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.106M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 9.95V$

$f = 564703000Hz$, $C = 30.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.0093\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-18.02994	82.8347	1.2546
2	149	-9.12734	69.5694	3.4965
3	438	-2.61104	42.2586	7.4037
4	1294	-0.392738	17.109	9.5579
5	3818	-0.0469396	5.95427	9.9461
6	11267	-0.00541524	2.02402	9.9938
7	33252	-0.000622094	0.686078	9.9993
8	98134	-0.0000714306	0.232484	9.9999
9	289614	-0.0000082014	0.0787762	10
10	854713	-9.42E-07	0.0266928	10
11	2522440	-1.08E-07	0.00904469	10
12	7444240	-1.24E-08	0.00306474	10
13	21969500	-1.43E-09	0.00103847	10
14	64836600	-1.64E-10	0.00035188	10
15	191346000	-1.88E-11	0.000119233	10
16	564703000	-2.16E-12	0.0000404012	10

Figure 41: High Pass Filter Table for C=40.01nF

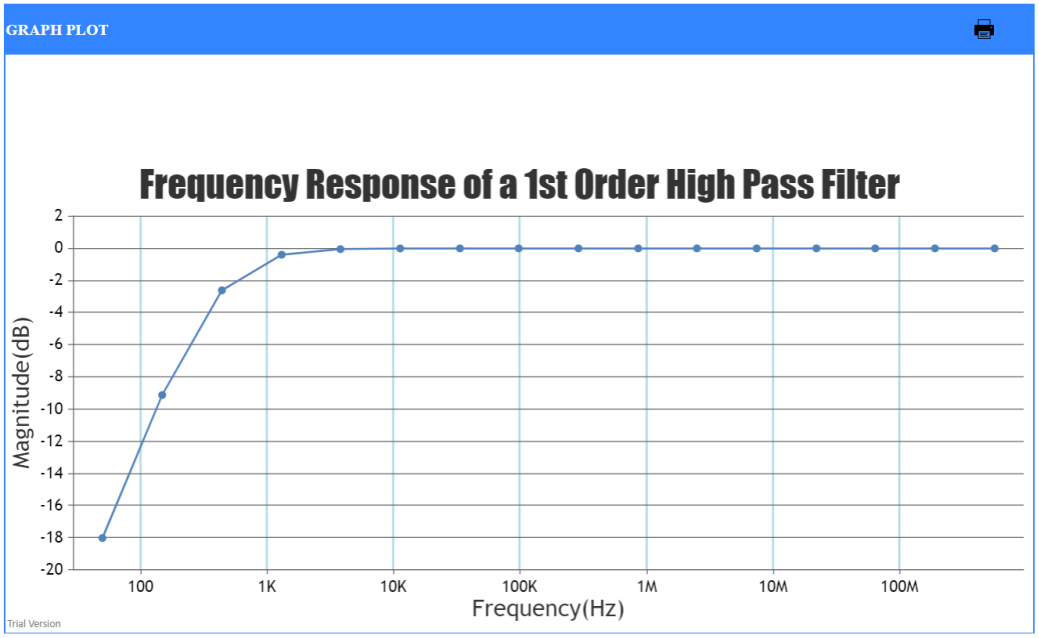

Figure 42: Frequency Response for C=40.01nF

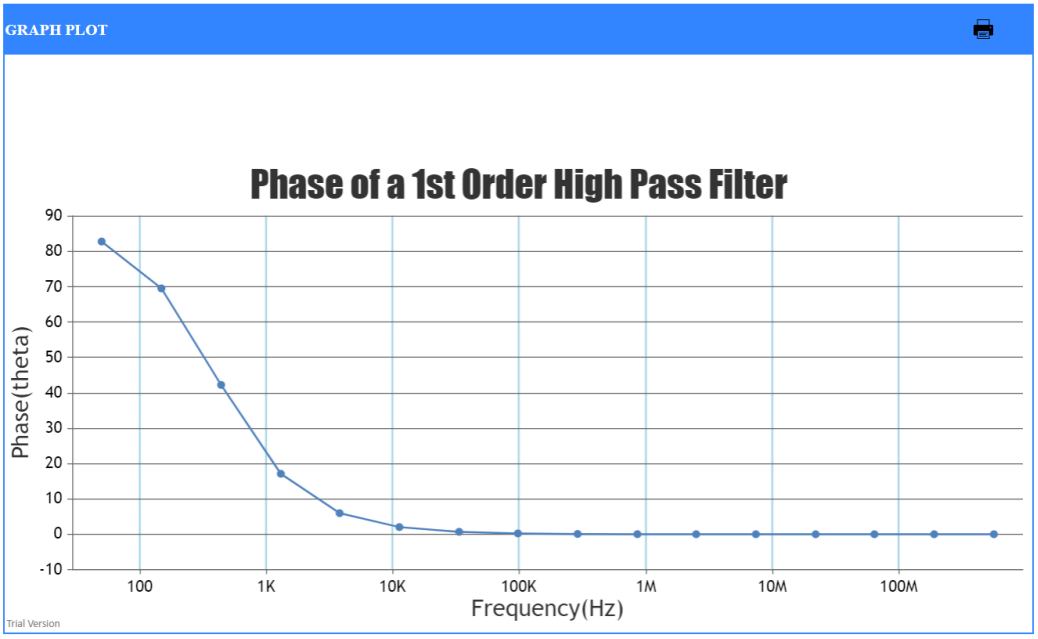

Figure 43: Phase Response for C=40.01nF

$f = 50Hz$, $C = 40.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.079M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.08M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 1.247V$

$f = 564703000Hz$, $C = 40.01nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.007\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$

Serial No.	Frequency(Hz)	Magnitude(dB)	Phase(theta)	Output Voltage(V)
1	50	-16.67354	81.6077	1.4666
2	149	-7.93992	66.401	4.0087
3	438	-2.0403	37.7727	7.9065
4	1294	-0.289172	14.7101	9.6726
5	3818	-0.0341966	5.08344	9.9607
6	11267	-0.00394002	1.7265	9.9955
7	33252	-0.000452554	0.58517	9.9995
8	98134	-0.0000519626	0.198288	9.9999
9	289614	-0.00000596616	0.067189	10
10	854713	-6.85E-07	0.0227666	10
11	2522440	-7.86E-08	0.00771431	10
12	7444240	-9.03E-09	0.00261395	10
13	21969500	-1.04E-09	0.000885722	10
14	64836600	-1.19E-10	0.000300122	10
15	191346000	-1.37E-11	0.000101695	10
16	564703000	-1.57E-12	0.0000344586	10

Figure 44: High Pass Filter Table for C=46.91nF

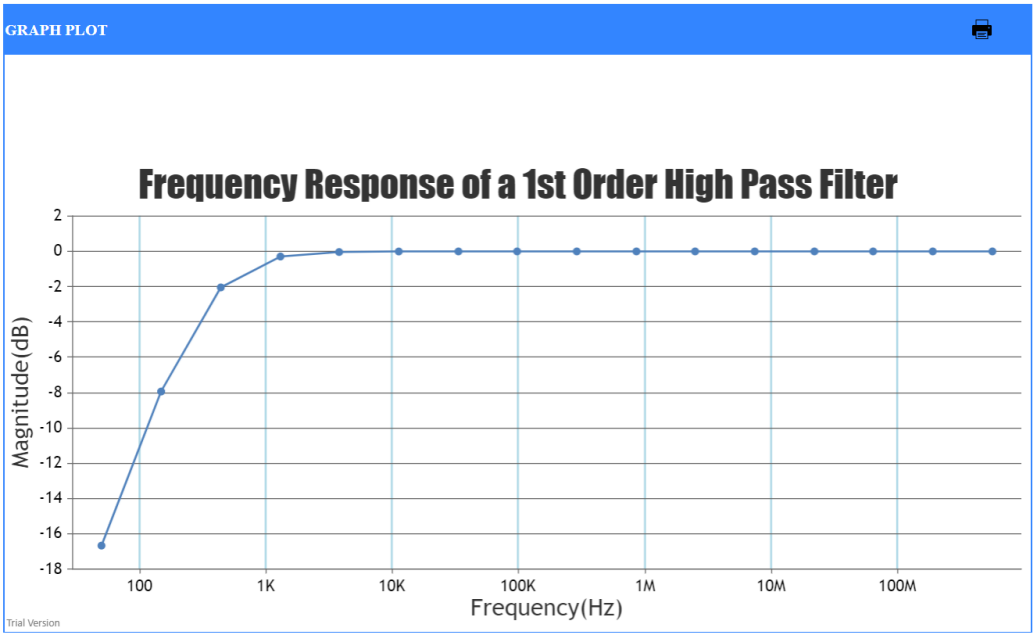

Figure 45: Frequency Response for C=46.91nF

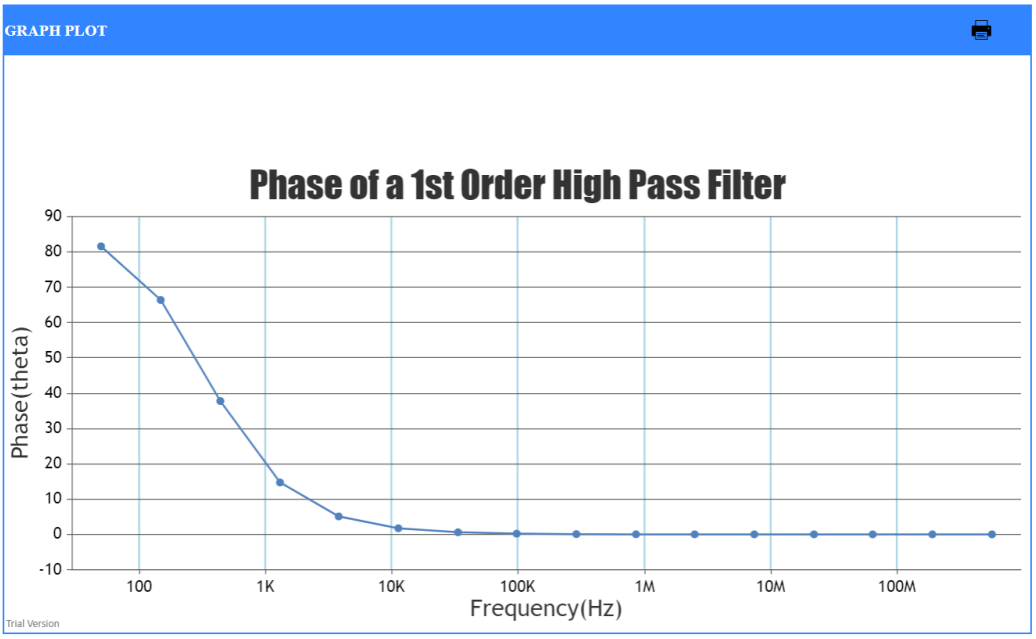

Figure 46: Phase Response for C=46.91nF

$f = 50Hz$, $C = 46.91nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.068M\Omega$
$Z1 = \sqrt{R_L^2 + X_C^2} = 0.0696M\Omega$
$V_{out} = V_{in} \times (R/Z1) = 1.436V$

$f = 564703000Hz$, $C = 46.91nF$, $R = 10K\Omega$, $V_{in} = 10V$
$X_C = \frac{1}{2\pi f C_L} = 0.0064\Omega$
$Z2 = \sqrt{R_L^2 + X_C^2} = 1.00 \times 10^4\Omega$
$V_{out} = V_{in} \times (R/Z2) = 9.99V$