

PhotoDiode

Created by Jonathan Newman on 3/30/2014



PhotoDiode Design Report

Design Parameters Entered by User

Reverse Voltage(V_r): 5V

Photodiode Bias: negative

Capacitance: 70pF

Shunt Resistance: 5G Ω

Peak Current: 1mA

Q: 410m

Peak Voltage: 5V

Requested Bandwidth: 20MHz

Sensor: Custom

Stages: Two stages

Circuit

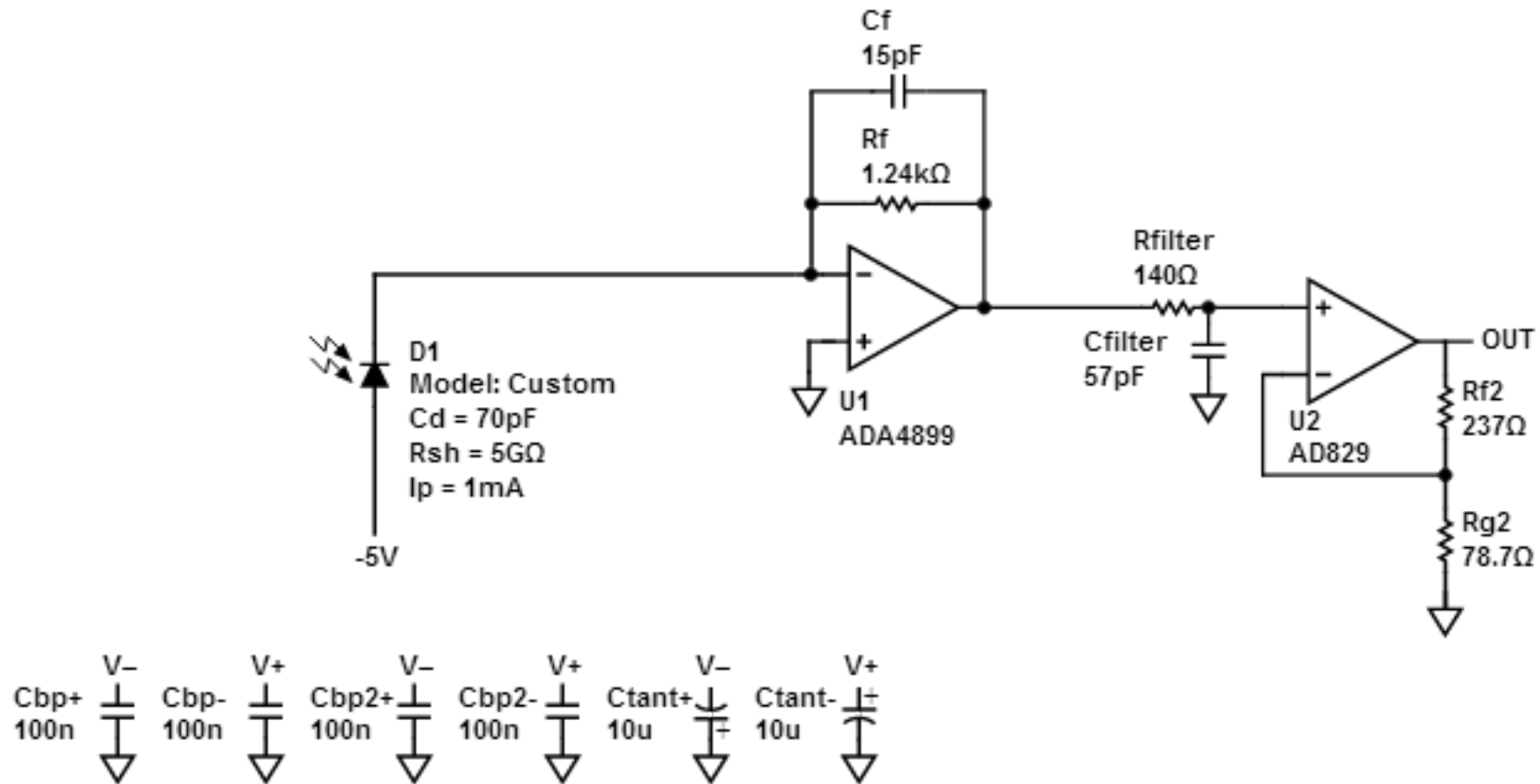
SUPPLY VOLTAGE

MIN: $\pm 6.4\text{V}$

MAX: $\pm 6\text{V}$

STAGE 1 TRANSMIMPEDANCE AMPLIFIER

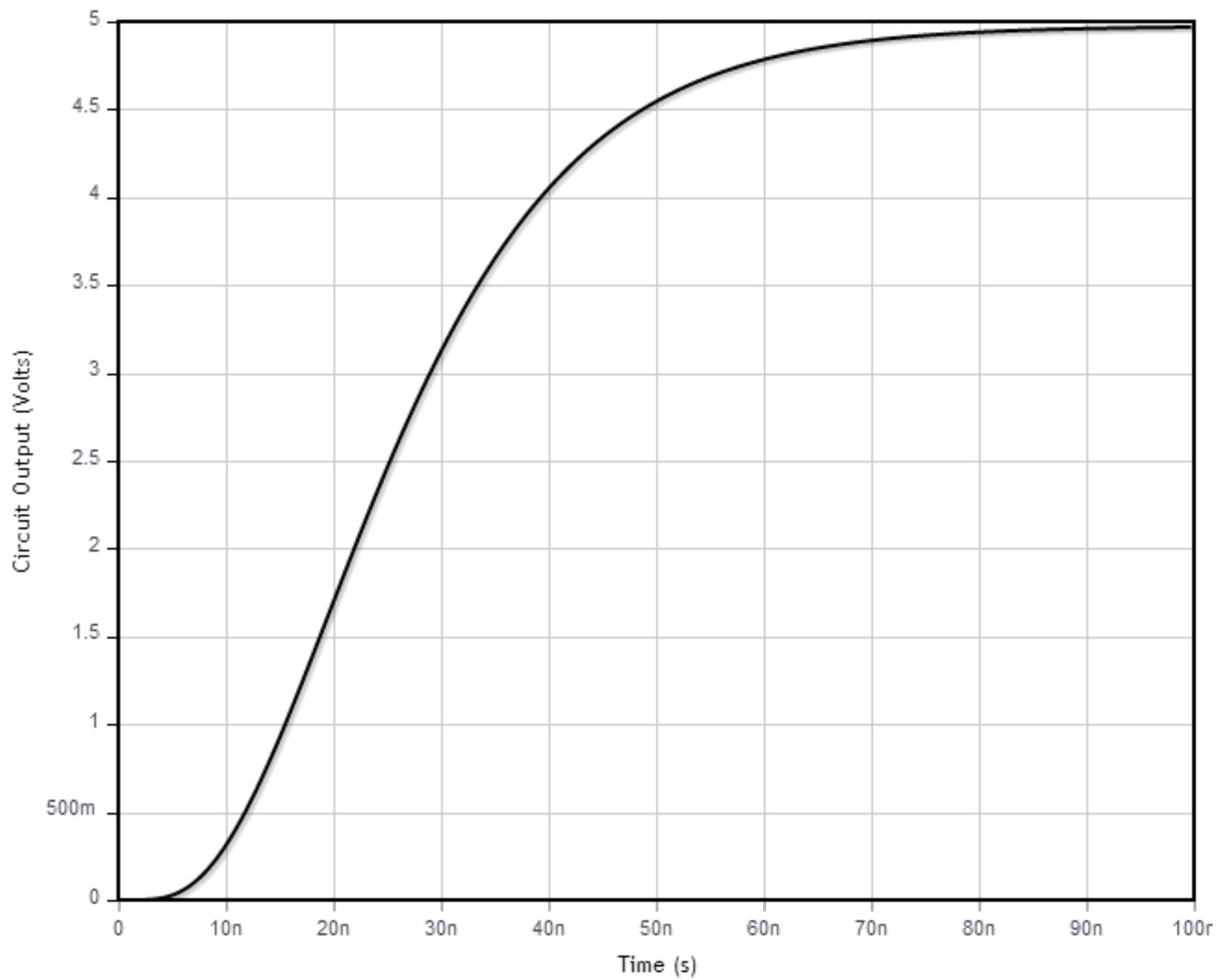
STAGE 2 ADDITIONAL GAIN AND FILTERING



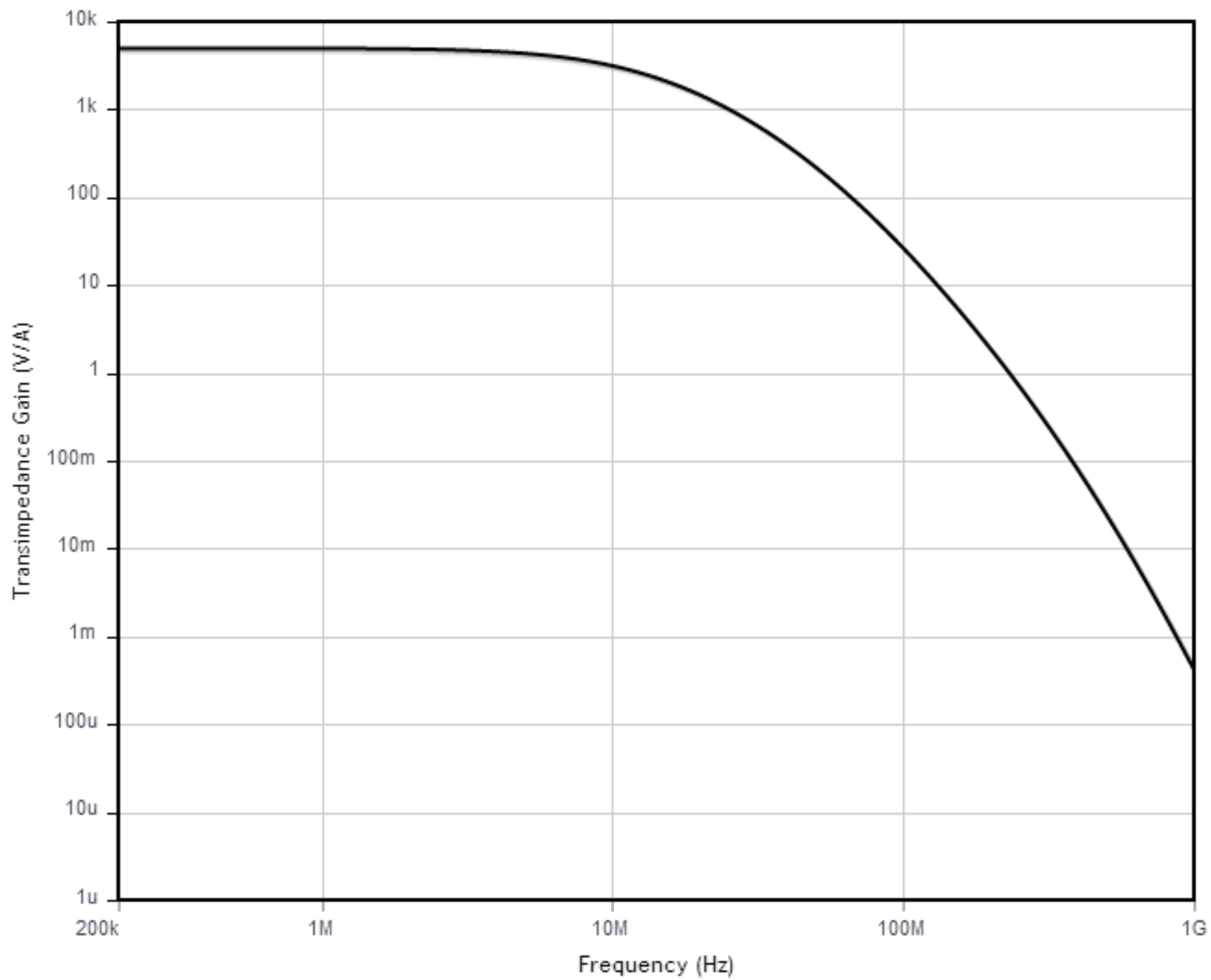
Bill of Materials

Quantity	Designator	Value	Package	Material	Tolerance
1	Rf	1.24k Ω	0603	Thin Film	0.5%
1	Rg2	78.7 Ω	0603	Thin Film	0.5%
1	Rf2	237 Ω	0603	Thin Film	0.5%
1	Rfilter	140 Ω	0603	Thin Film	0.5%
1	Cf	15pF	0603	C0G	5%
1	Cfilter	57pF	0603	C0G	5%
4	Cbp+, Cbp-, Cbp2+, Cbp2-	100nF	0603	X7R	20%
2	Ctant+, Ctant-	10uF	6032	tantalum	20%
1	U1	ADA4899			
1	U2	AD829			
1	D1	Custom			

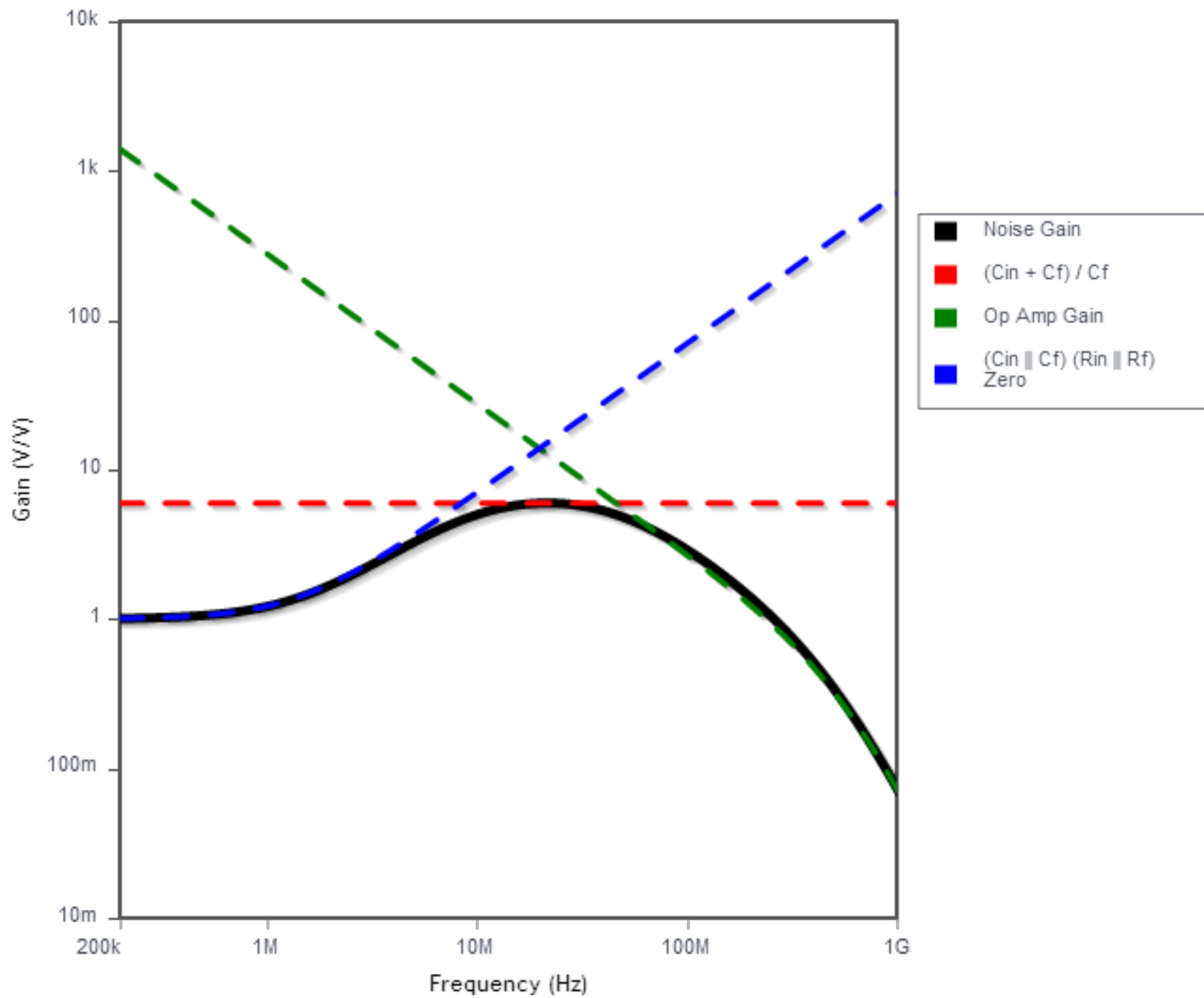
Step Response



Frequency Response



Noise Gain



Stability

