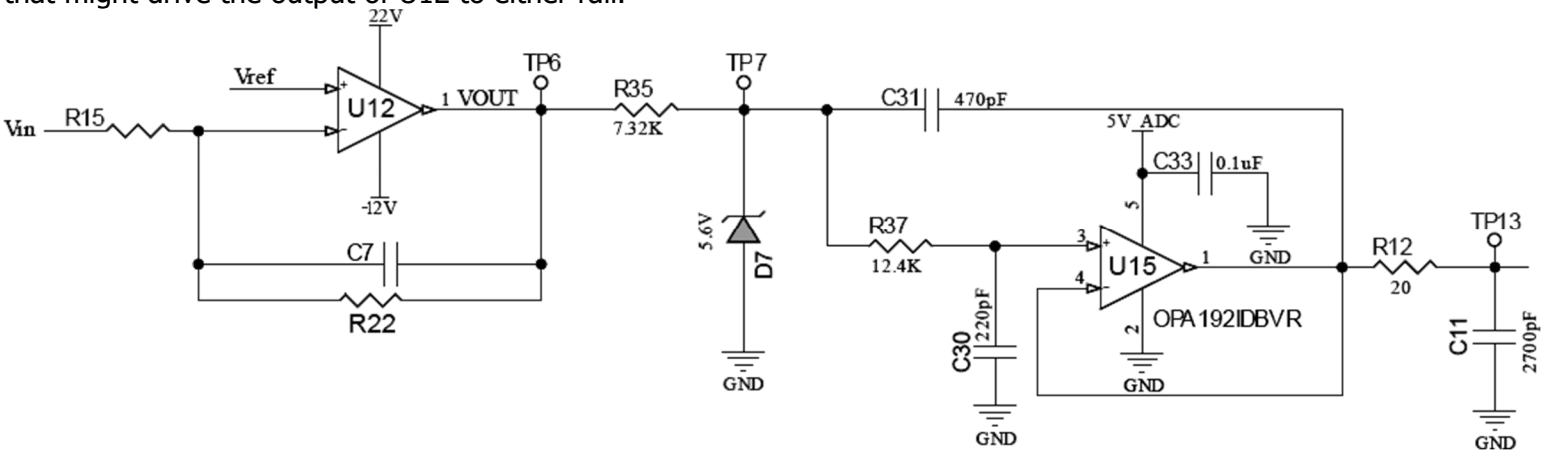
2/11/2022

Hi,

We are currently using the TI opamp OPA192IDBVR in the circuit below (U15) as a low pass filter feeding an ADC. Its input comes from an attenuator U12 with adjustable offset and gain to center the signal from 0-5V. it has been working well except we are finding issues with leakage current in D7 in some cases. The only function of D7 is to protect the +input of U15 for a momentary abnormal condition of Vin exceeding its range due to a cable short, etc that might drive the output of U12 to either rail.



Based on your datasheet, we would like to know if removal of D7 would create any reliability issues given the large resistance in series with the +input. Please note that since this would be a momentary abnormal condition, expected output of U12 is not critical, only that output would be correct when inputs return to normal common mode range.

Calculated worst inputs current to +input of U15 if D7 were removed is:

- input current for U12 output at positive rail = (22V – 5V)/(7.32k + 12.4k) = 223ua
- input current for U12 output at negative rail = (-12V)/(7.32k + 12.4k) = -609ua

Given that either of these currents are well below the ±10ma limit in the table below, can you please confirm that removal of D7 would be acceptable for our application and cause no damage to the part or long term reliability?

6.1 Absolute Maximum Ratings[1]

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
Supply voltage, V_S = (V+) – (V–)				±20 (40, single supply)	V
Signal input pins	Voltage	Common-mode	(V–) – 0.5	(V+) + 0.5	V
		Differential		(V+) – (V–) + 0.2	
	Current			±10	mA

Tom Greene