FLASH ADC

EEE Project Presentation

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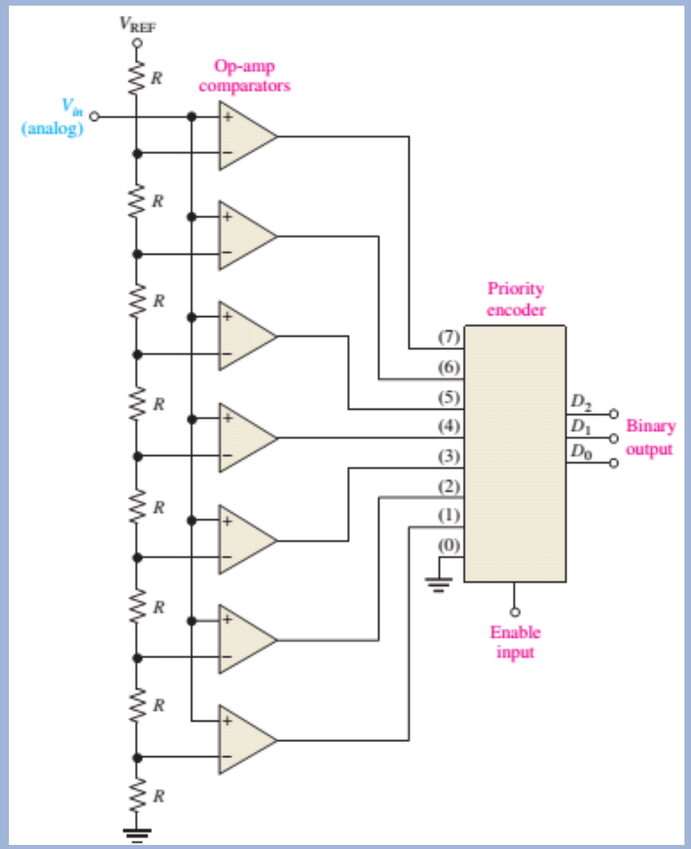
About Project

- Flash ADC uses parallel comparators to compare the linear input signal with various reference voltages developed by a voltage divider.
- When the input voltage exceeds the reference voltage for a given comparator, a high level is produced on that comparator's output
- In general, 2^n-1 comparators are required for conversion to an n-bit binary number.
- In this project, we used 3-bit Flash ADC, where we used 2^3-1= 7 comparators.

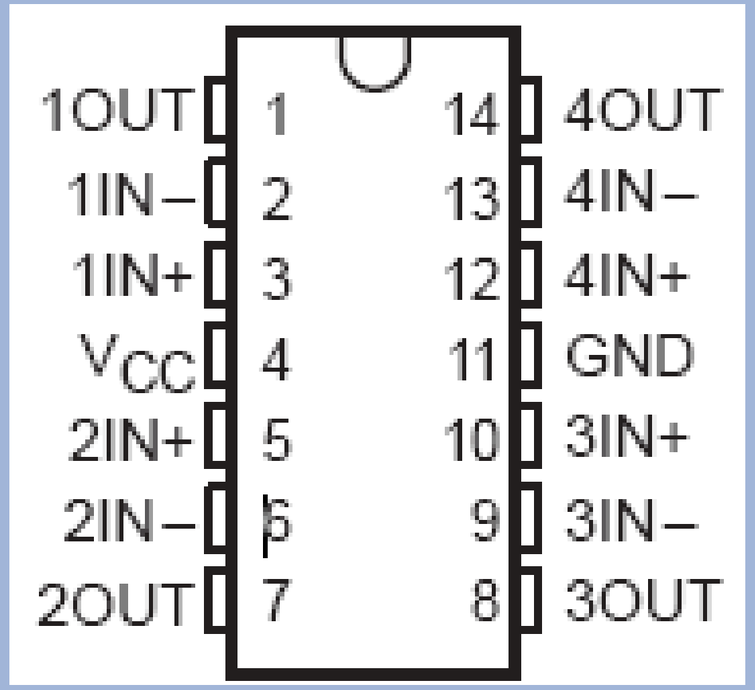
Circuit Diagram



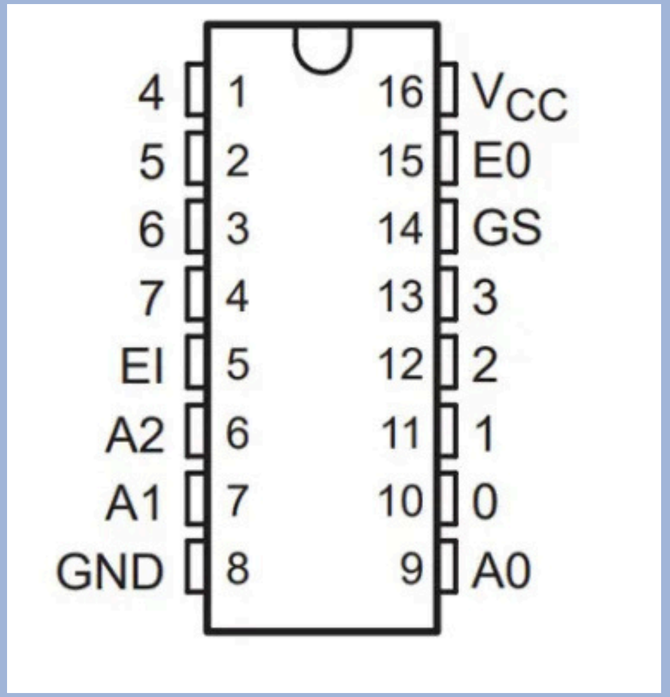
APPARATUS

- Veroboard
- Soldering iron and wire
- Copper wire (for connection)
- IC: Op Amp(LM324)(2), Prority Encoder(74LS148)(1)
- 1K resistor(8)
- 4K resitor(3)
- White LED (3)

PIN DIAGRAM



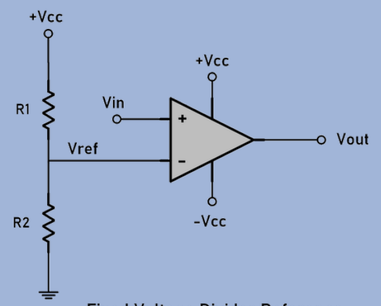
Op amp comparator(LM324)



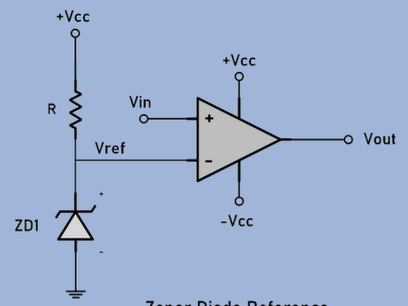
8-to-3 Priority encoder(74LS148)

ABOUT OP AMP

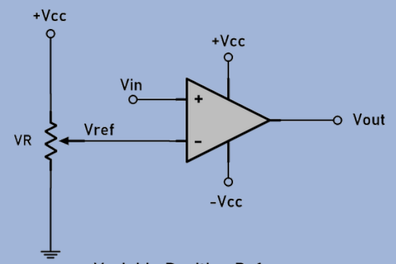
- Op amps are often used as comparators to compare the amplitude of one voltage with another.
- The op-amp is used in the open-loop configuration, with the input voltage on one input and a reference voltage on the other
- Fixed voltage divider reference was used in this project



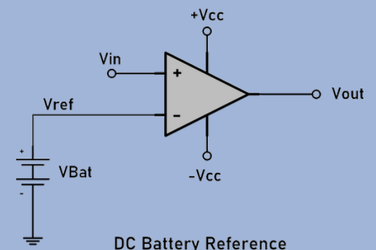
Fixed Voltage Divider Reference



Zener Diode Reference



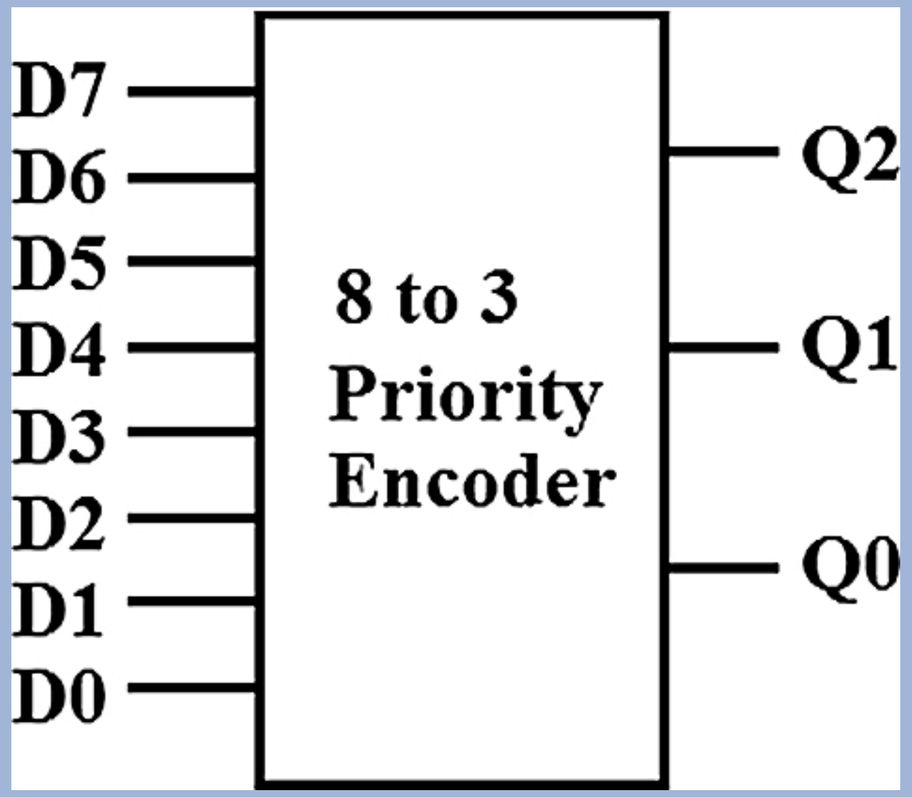
Variable Position Reference



DC Battery Reference

ABOUT PRIORITY ENCODER

- There are 2^3= 8 inputs and 3 outputs.
- A priority encoder is a combinational logic circuit that compresses multiple input lines into a smaller number of output lines, but unlike a standard encoder, it prioritizes inputs based on their significance

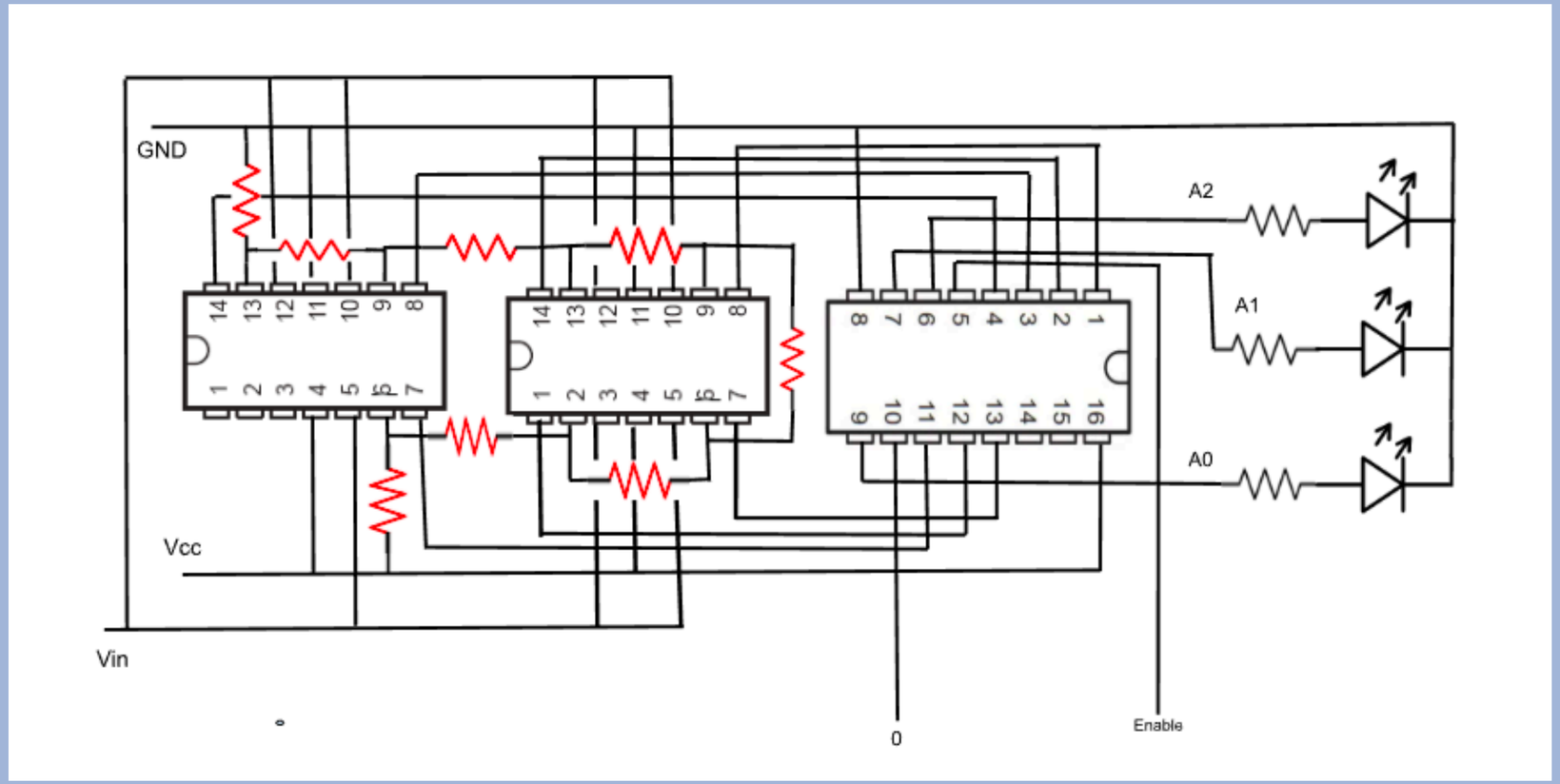


TRUTH TABLE

Inputs									Outputs				
$\overline{EI}$	0	1	2	3	4	5	6	7	A2	A1	A0	$\overline{GS}$	$\overline{EO}$
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	L	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

**We used active-low priority encoder in this project

CIRCUIT OUTLINE



THANK YOU!