

COMPUTER TOOLS

EXAM

1. Task

From the basic functions and structures build a virtual instrument, which will generate one point of sinus shaped signal exactly every 100 ms. Period of the signal should be 10 s. Plot the signal on the front panel in a graphical form. Signal is to be generated until you press the STOP button on the front panel.

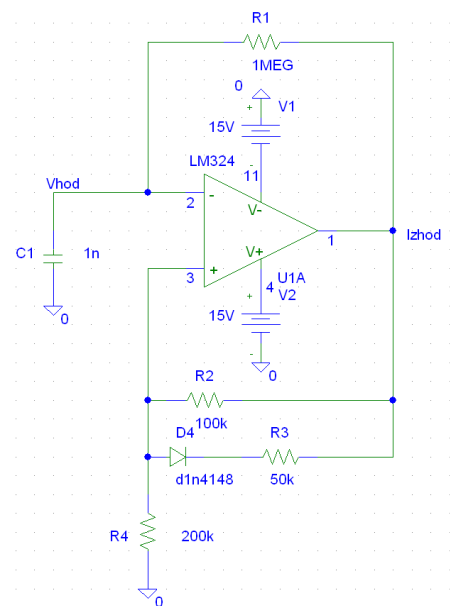
Add-Ins:

- Mathematical conversion to radians convert to a SubVI
- Stop the VI after 10 periods of signal
- Save the signal to the text file, where the first column represents the time and the second signal

2. Task

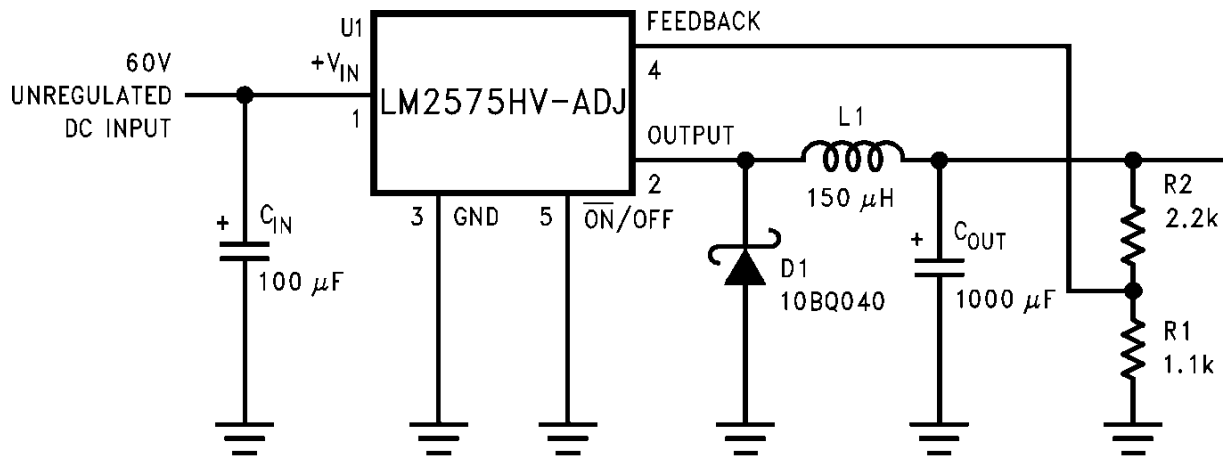
Plot the static input IV characteristics of a given oscillator with window comparator for input currents from -30 to + 30 μA .

- Specify the lower and upper threshold level of comparator.
- Specify the value of the resistance R_3 , that the lower threshold level is -12 V.
- Specify the frequency and duty cycle of the output signal.



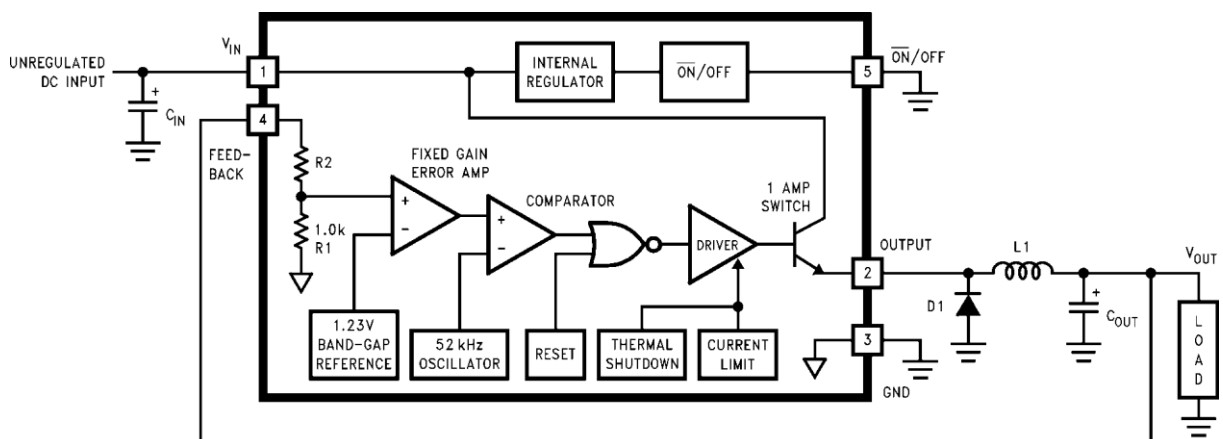
3. Task

Draw the scheme of switching regulator. At the input and output use double header connector (HDR1X2). Make new components for those, that are not in the library. Desing the PCB of size of 70 x 17 mm. The PCB should be one sided with top layer only.

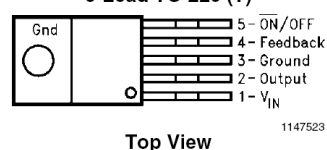


Designator	Value	Type	Manufacturer	Pattern
U1		LM2575HV	National Semiconductor	TO-220-5
C _{IN}	100 µF/63 V	Electrolytic		G
C _{OUT}	1000 µF/25 V	Electrolytic		G
D1	1 A / 40 V	10BQ040		0805
L1	150 µH/1 A	Ferrite Core		2220
R1	1,1 kΩ	Metal Film		0805
R2	2,2 kΩ	Metal Film		0805

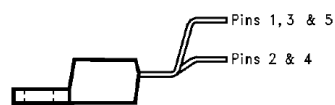
Datasheet of LM2575:



Bent, Staggered Leads
5-Lead TO-220 (T)



Top View



Side View
LM2575T-XX Flow LB03 or
LM2575HVT-XX Flow LB03
See NS Package Number T05D

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