EE 673, Power Electronics and Power System Laboratory

Indian Institute of Technology, Bombay

Experiment – 02: ADC Module

Date- 17/01/2025 ***Duration: 3 hours***

Activity 01: Use the 3.3V power supply on the Launch Pad to create a voltage divider circuit on a breadboard using the provided potentiometer and a fixed resistor. Connect the output of the voltage divider to the ADC input pin (ADCINA0) on the Launch Pad. Configure the ADC to sense the voltage and use the potentiometer to vary the input voltage . verify the ADC readings by generating a PWM on pin PWM1A at a frequency of 10 kHz (same as sampling frequency) ,view it on oscilloscope and back calculate the analog value by measuring the duty ratio of PWM. (60min)

Activity 02 - Generate a 20khz triangular using function generator, use dc bias and voltage divider to ensure that voltage is between 0 and 3.3v for the safety of launchpad. Using ADC sample at the middle of the rising edge of the triangular wave. To ensure sampling instant is as mentioned, generate an epwm with same frequency as that of the triangular waveform and pull the epwm pin high when SOC is generated. View the epwm in oscilloscope calculate the sampling instant from duty ratio of the epwm signal. (60min)

Activity 03 – For the same triangular wave as used in activity 3 sense using 2 ADC channels where the 1st channel samples at 20Khz (1 sample per cycle) ,2nd channel samples at 4Khz (1 sample every 5 cycle). Generate EPWM signals corresponding to 2 ADC channels and make the PWM signal high at SOC (Start of conversion) to verify the sampling instant and sampling frequency. (60min)