The Expression:

Angle = (((gyro_angle * GYRO_SENSITIVITY * 5L) / (ADC_RANGE * ADC_UPDATE_RATE)) * GYRO_CAL_FACTOR)

The Units:
gyro_angle = bits
GYRO_SENSITIVITY = angle/(time*volt)
5L = volts
ADC_RANGE = bits
ADC_UPDATE_RATE = frequency
GYRO_CAL_FACTOR doesn't have a unit

Re-arranging The Original Expression:
angle = gyro_angle * GYRO_SENSITIVITY * 5L * 1/bits * 1/frequency

Converting To Units:
angle = bits * (angle/(time*volt)) * volt * 1/bits * 1/frequency

Re-arranging Again:
angle = (bits * 1/bits) * (volt * angle/volt) * (1/ time * 1/frequency)

Canceling:
angle = 1 * angle * 1

Leaving:
angle = angle