INTERFACING ELECTRONIC FOR MEASUREMENT, SIGNAL PROCESSING AND WIRELESS COMMUNICATION

Edited by

Sheroz Khan, International Islamic University Malaysia

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Chapter 19

A MATHEMATICAL STUDY OF A THERMISTOR ASTABLE MULTIVIBRATOR IN A LINEARIZATION TECHNIQUE

NURUL ARFAH BINTI CHE MUSTAPHA, AHM ZAHIRUL ALAM, SHEROZ KHAN

19.1. INTRODUCTION

Negative temperature coefficient (NTC) thermistors have found its way in a great numbers of applications in measurements and control devices. Applications such as measuring flow, measurement instruments and for temperature compensations of electronic components open the thermistors to a wide audience especially in resistance temperature detectors and thermocouples (Zvezditza & Toshko, 2009). The thermistors is known to have high sensitivity and allow for the detection of small changes in temperature. On top of that, the low cost and the simple preparation technology made thermistors desirable in many applications. In this work, a study on timer has been done based on the work in (Zvezditza & Toshko, 2009). The Eq. (4) of (Zvezditza & Toshko, 2009) was derived using the knowledge of a stable vibrator.

19.2. THEORETICAL BACKGROUND

Fig.19.1 shows a 555 connected as an astable multivibrator. Both the trigger and threshold inputs (pins 2 and 6) to the two comparators are connected with external capacitor, C_T. The capacitor charges from the supply voltage through the two resistors, R_T and R_T.

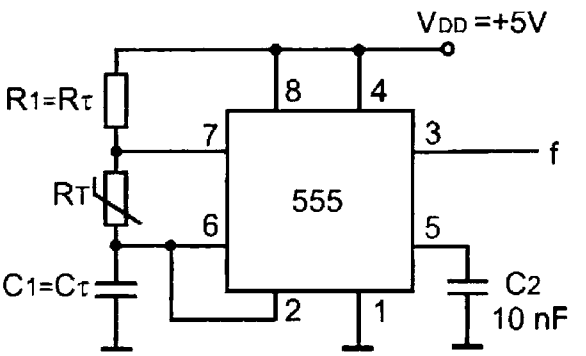

Fig.19.1: Thermistor Connection Circuit with Frequency Output