



# **1PPS Pulse Width**

**Notes about the 1PPS pulse width  
and a method to enlarge it**

## **Application Note**

**Version 1.0  
Hardware Revisions: all**

## Revision History

Rev.	Date	Description
0.1	01-24-08	Initial draft
1.2	09-18-08	New style; moved to Vincotech
	mm-dd-yy	

## **Disclaimer**

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF VINCOTECH GMBH. IT MAY NOT BE COPIED OR TRANSMITTED BY ANY MEANS, PASSED TO OTHERS, OR STORED IN ANY RETRIEVAL SYSTEM OR MEDIA, WITHOUT PRIOR CONSENT OF VINCOTECH OR ITS AUTHORIZED AGENTS.

THE INFORMATION IN THIS DOCUMENT IS, TO THE BEST OF OUR KNOWLEDGE, ENTIRELY CORRECT. HOWEVER, VINCOTECH CAN NEITHER ACCEPT LIABILITY FOR ANY INACCURACIES, OR THE CONSEQUENCES THEREOF, NOR FOR ANY LIABILITY ARISING FROM THE USE OR APPLICATION OF ANY CIRCUIT, PRODUCT, OR EXAMPLE SHOWN IN THE DOCUMENT.

THE PRODUCT (HARD- AND SOFTWARE) DESCRIBED IN THIS DOCUMENTATION IS NOT AUTHORIZED FOR USE IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF VINCOTECH.

THIS DOCUMENT MAY PROVIDE LINKS TO OTHER WORLD WIDE WEB SITES OR RESOURCES. BECAUSE VINCOTECH HAS NO CONTROL OVER SUCH SITES AND RESOURCES, VINCOTECH SHALL NOT BE RESPONSIBLE FOR THE AVAILABILITY OF SUCH EXTERNAL SITES OR RESOURCES, AND DOES NOT ENDORSE AND IS NOT RESPONSIBLE OR LIABLE FOR ANY CONTENT, ADVERTISING, PRODUCTS, OR OTHER MATERIALS ON OR AVAILABLE FROM SUCH SITES OR RESOURCES. VINCOTECH SHALL NOT BE RESPONSIBLE OR LIABLE, DIRECTLY OR INDIRECTLY, FOR ANY DAMAGE OR LOSS CAUSED OR ALLEGED TO BE CAUSED BY OR IN CONNECTION WITH USE OF OR RELIANCE ON ANY SUCH CONTENT, GOODS OR SERVICES AVAILABLE ON OR THROUGH ANY SUCH SITE OR RESOURCE.

VINCOTECH RESERVES THE RIGHT TO CHANGE, MODIFY, OR IMPROVE THIS DOCUMENT OR THE PRODUCT DESCRIBED HEREIN, AS SEEN FIT BY VINCOTECH WITHOUT FURTHER NOTICE.

## Table of Contents

<b>1 Introduction .....</b>	<b>5</b>
<b>2 The electrical characteristics of the 1PPS pulse.....</b>	<b>5</b>
<b>3 Extending the Pulse Width.....</b>	<b>5</b>
<b>4 References.....</b>	<b>6</b>
<b>5 Related Information .....</b>	<b>7</b>
5.1 Contact.....	7
5.2 Related Documents.....	7

## 1 Introduction

This document briefly describes the electrical characteristics of the 1PPS output signal of the GPS receiver module A1080 and a simple way to extend the pulse width.

## 2 The electrical characteristics of the 1PPS pulse

Compared to other GPS modules (e.g. based on SiRFstar II or STM chipsets) the 1PPS output signal of the SiRFstar III based A1080 receiver features a very short pulse width. Figure 2-1 shows typical 1PPS pulse measured with a digital oscilloscope (Agilent 54615B).

The rising edge of the pulse indicates the start of a new UTC second. The high level of the output is approximately 2.5 volt and the pulse width is in the range of  $1\mu\text{s}$ .

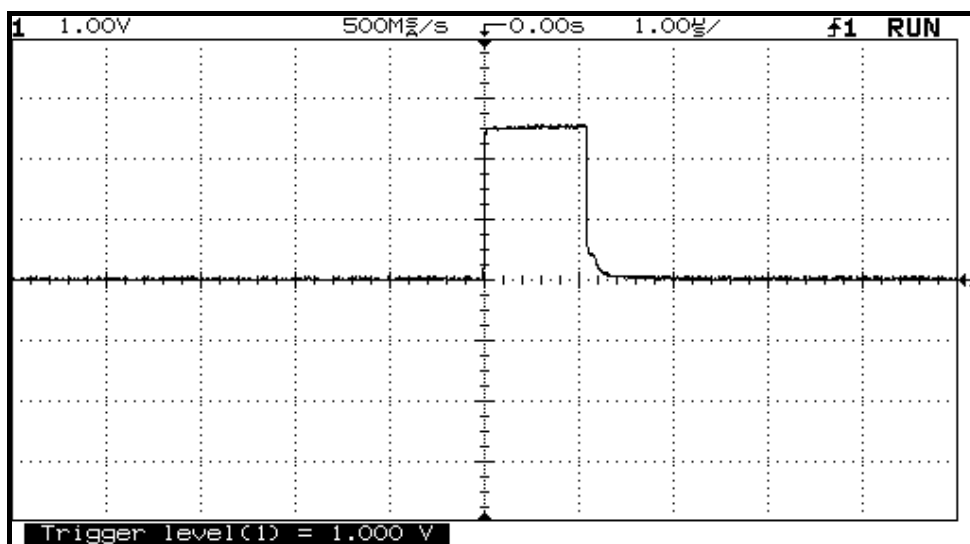


Fig. 1: 1PPS Pulse

## 3 Extending the Pulse Width

For some applications the original pulse width of  $1\mu\text{s}$  might be too short to be used properly. In such cases a small extension according to figure 2 can be used to prolong the on-time of the pulse.

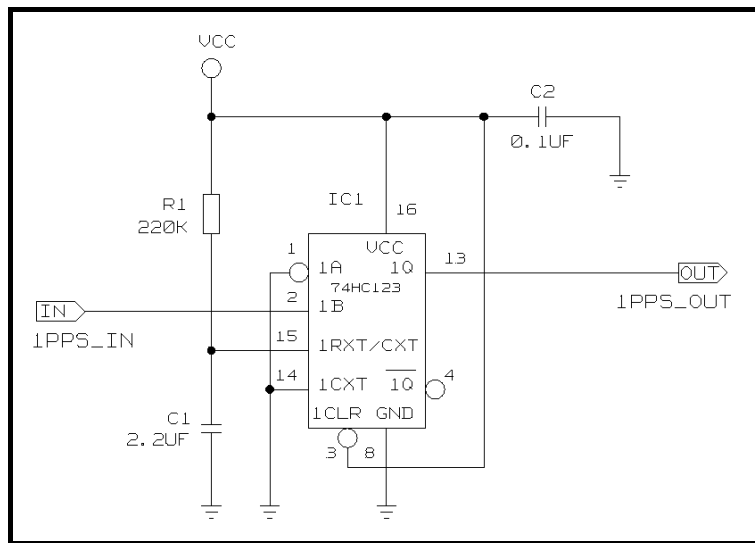


Fig. 2: Extending the pulse width

The circuit is based on a retriggerable monostable multivibrator IC and some passive components to set the timing constant. In the proposed example a 74HC123 is used. This device is available in different package options from various suppliers (e.g. [2], [3], [4], [5]). The actual pulse width is determined mainly by R1 and C1. With the component values specified in figure 2 an on-time of approximately 250 ms is achieved. Please consult the datasheet of the actual IC chosen for a more precise calculation of the timing. Furthermore make sure to terminate all dangling open inputs of the IC properly if the device contains more than the one multivibrator section needed.

## 4 References

- [1] Vincotech: GPS Receivers A1080, A1035-D, A1084, A1035-H
- [2] NXP Semiconductor (<http://www.nxp.com/>): 74HC123 Datasheet
- [3] Fairchild Semiconductor (<http://www.fairchildsemi.com/>): MM74HC123A Datasheet
- [4] Texas Instruments (<http://www.ti.com/>): CD74HC123 Datasheet
- [5] ST Microelectronics (<http://www.st.com/>): M74HC123 Datasheet

## **5 Related Information**

### **5.1 Contact**

This manual was created with due diligence. We hope that it will be helpful to the user to get the most out of the GPS module.

Anyway, inputs about errors or mistakable verbalizations and comments or proposals to Vincotech, Germany, for further improvements are highly appreciated.

#### **Vincotech GmbH**

Bibergerstr. 93  
82008 Unterhaching (Munich)  
Germany

Tel.: +49 89 8780 67 0

Fax: +49 89 8780 67 351

[gps@vincotech.com](mailto:gps@vincotech.com)

[www.vincotech.com/gps](http://www.vincotech.com/gps)

### **5.2 Related Documents**

- GPS Receiver A1080 (Vincotech)