# Agilent 81100 Family of Pulse/Pattern Generators

# The Dual Clock Gbit Chip Test

Product Note 2

## Introduction

Agilent Technologies pulse generators are a necessity in the world of semiconductor test clocks and digital communication clocks.

Many customers need the ability to generate more than one clock signal simultaneously and at multiple frequencies. The 81110A is a perfect fit for functional tests of the Gbit chip in the dual clock mode. Using the pattern capability, it is easy to create the necessary clock signals, one at 150 MHz and the other at 30 MHz.

With 0.01% in PLL mode frequency, accuracy is ten times better than the clock requirement of 0.1%.

For additional margin testing, the 81110A offers you glitch free change of any timing parameter.

## Required equipment for Lab 2:

- 1x Pulse/Pattern generator (81110A + 2x 81111A or 2x 81112A)
- 1x Infiniium oscilloscope
- 3x BNC cables

## How to hook up the instruments:

1. Connect STROBE OUT (pulse/pattern generator) to Trig In (scope).
2. Connect OUTPUT 1 (pulse/pattern generator) to Channel 1 (scope).
3. Connect OUTPUT 2 (pulse/pattern generator) to Channel 2 (scope).

**Figure 1: The setup of an Agilent pulse generator and Infiniium oscilloscope**

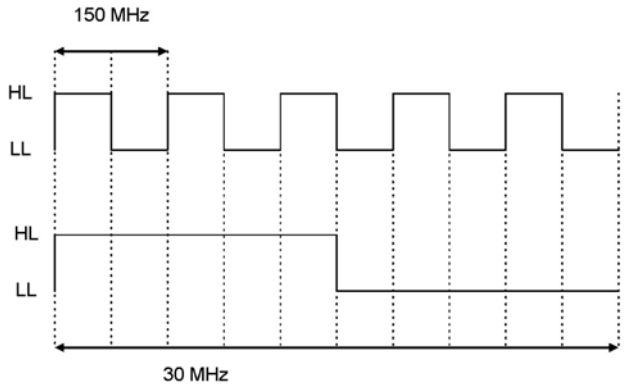


**Figure 2: Different frequencies at each output channel**

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## So what do you expect from a pulse generator during a functional test of a Gbit chip?

**You need:**

- two output channels (figure 3)

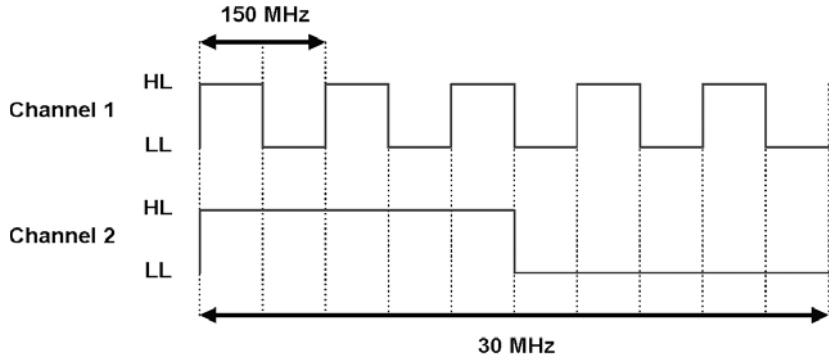



**Figure 3**

- programmable patterns of NRZ-Pulses (figure 4)

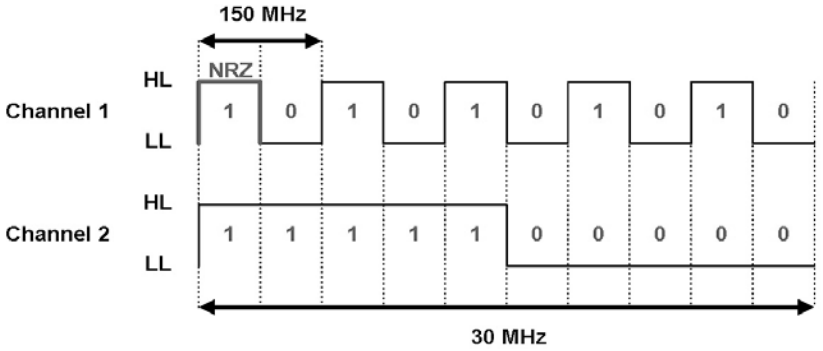



**Figure 4**

- 300 MHz maximum frequency
- a high frequency accuracy of at least 0.1% (figure 5)

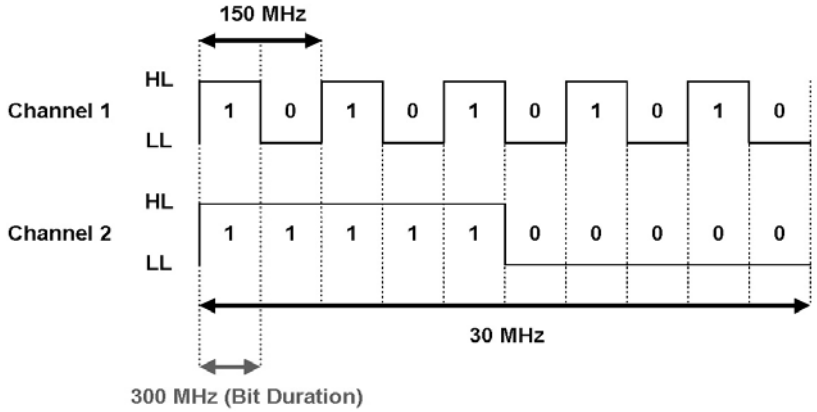
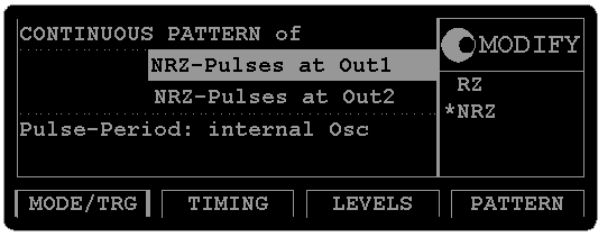


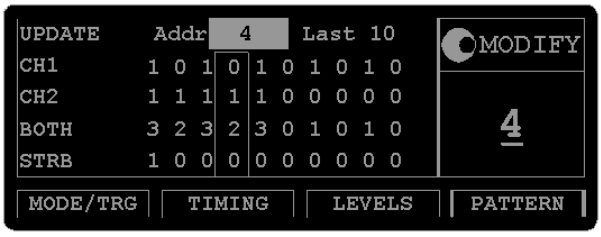

**Figure 5**

Now let's set up the signal for the Gbit test (as shown in the screen shots) and have a look at the resultant pulse on the scope.

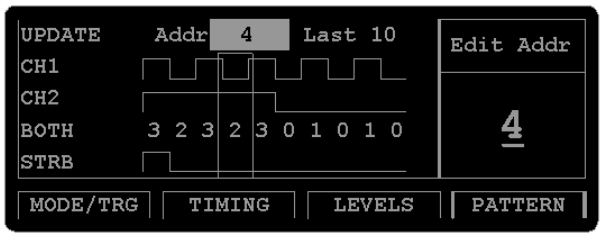



**Step 1:** First, reset the instrument by selecting RECALL + 0 (SHIFT, STORE + 0).

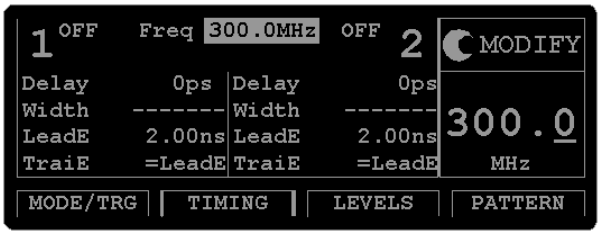
Select CONTINUOUS PATTERN of NRZ-PULSES at both Outputs in the TRG-MODE menu.



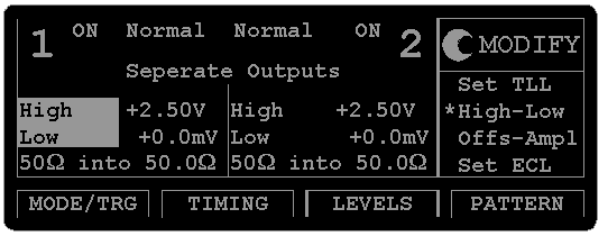

**Step 2:** Set up the above bit pattern in the PATTERN menu. Start with setting the LAST bit to 10



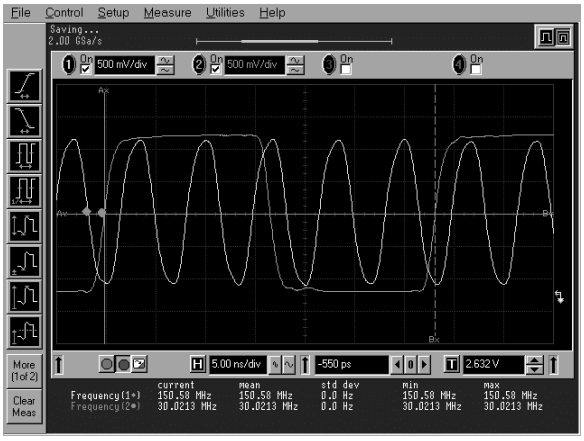

**Step 3:** You can press the PATTERN key again to view the pulses.




**Step 4:** Set the frequency to 300 MHz in the TIMING menu. This is the frequency of the bit stream when in the PATTERN mode.




**Step 5:** Go to the LEVELS menu to set the appropriate clock output voltages and switch on both outputs.




**Step 6:** View the resultant pulse on a 54845A Infiniium Oscilloscope.

The 81111A output channel goes up to 165 MHz and the timing system of the 81110A has a frequency up to 330 MHz. In this application, if the 81111A is installed and the frequency is set to 330 MHz, then you will receive a warning that the 81110A has been over-programmed (in this mode, the specs. are no longer guaranteed). In this case it is not critical, because the actual bit frequency is 150 MHz. The warning does not appear if the 81112A output channels (330 MHz) have been installed.

Over-programmed values can only be entered with DATA ENTRY keys or by using SHIFT + MODIFY knob.

| Related Literature | Pub. Number |
|---|---|
| *Agilent Family of Pulse/Pattern Generators,* brochure | 5980-0489E |
| *Agilent 81130A Pulse/Data Generator,* data sheet | 5967-6237E |
| *Agilent 81110A/ 81104A Pulse/Pattern Generators,* data sheet | 5967-5984E |
| *Agilent 81101A Pulse Generator,* data sheet | 5967-6274E |
| *Radar Distance Test to Airborne Planes,* product note 1 | 5968-5843E |
| *Magneto-Optical Disk Drive Research,* product note 3 | 5968-5845E |
| *Simulation of Jittering Synchronization Signals for Video Interfaces,* product note 4 | 5968-5846E |

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