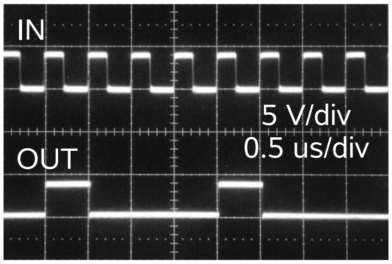
AVTECH

AVX-FD SERIES

10, 100 AND 250 MHz
TTL, ECL & SMALL-SIGNAL
FREQUENCY DIVIDERS



- Input frequencies to 250 MHz
- Output frequencies to 5, 50, or 125 MHz
- Division factor up to 255, 999, or 65535
- Variable output pulse widths
- Reset switch and input
- Low jitter
- TTL and ECL models available
- Sine-wave input option

The AVX-FD series of digital frequency dividers will divide the pulse repetition frequency of an input pulse train by a factor (N) which is variable (in steps of 1) up to 255, 999, or 65535, depending on the model.

All three models will accept input frequencies of up to 250 MHz. The AVX-FD1-PS and AVX-FD2-PS models are designed to work with TTL logic-level input signals (an ECL logic-level option is available). The output pulse width for Model AVX-FD1-PS is variable from 50 ns to 50 us using a three-position range switch and a one-turn control, and the output frequency is limited to 5 MHz. The output pulse width for Model AVX-FD2-PS is also controlled by a 3-position range switch and a one-turn control but is variable from 6.5 ns to 5 us, with a 50 MHz output frequency limit. If the divisor (N) is set to 1, these models will act as pulser-stretchers, with the output pulse width controlled by the front-panel controls. For both models the input impedance may be set at either 50 Ω or 1 kΩ by means of a two-position switch.

The AVX-FD3-PS uses ECL logic-level inputs and outputs. This model offers two outputs. OUT1 is simply the input frequency divided by the factor set on the front-panel thumbwheel switches. The pulse width of this output is equal to one period of the input. (For example, for an input frequency of 125 MHz, the output pulse width would be 8 ns.) The instrument also divides this output by a factor of 2, and the resulting signal is available on OUT2. OUT2 is a square-wave output, with 50% duty cycle. If the divisor (N) is set to 1, the instrument acts as a buffer, with the output pulses having approximately the same pulse width as the input pulses.

A TTL "RESET" input and an OPERATE/RESET switch are also provided on all models. A logic-high level on the TTL input resets the internal counters to a default state. This input is useful for synchronization purposes. The OPERATE/RESET switch performs a similar function when it is set to the RESET position. After the reset condition is removed, the first output pulse will occur after N input pulses, where N is the divisor setting.

All models feature a very low jitter of less than 100 ps. All models require 100-240 Volts, 50-60 Hz prime power and have BNC input and output connectors.

The following options are available:

-EP option: Provides complementary output pulses.

-IP option: Accepts sine wave (or 50% duty cycle square wave) input, from 0.2 to 5.0 Volts peak-to-peak. Input is AC-coupled.

-XN option: Extends the maximum division factor of models AVX-FD1-PS or AVX-FD2-PS to 65535.

This product family can be adapted to meet your particular requirements (custom trigger levels, for example). Call or email us (info@avtechpulse.com) for further information.

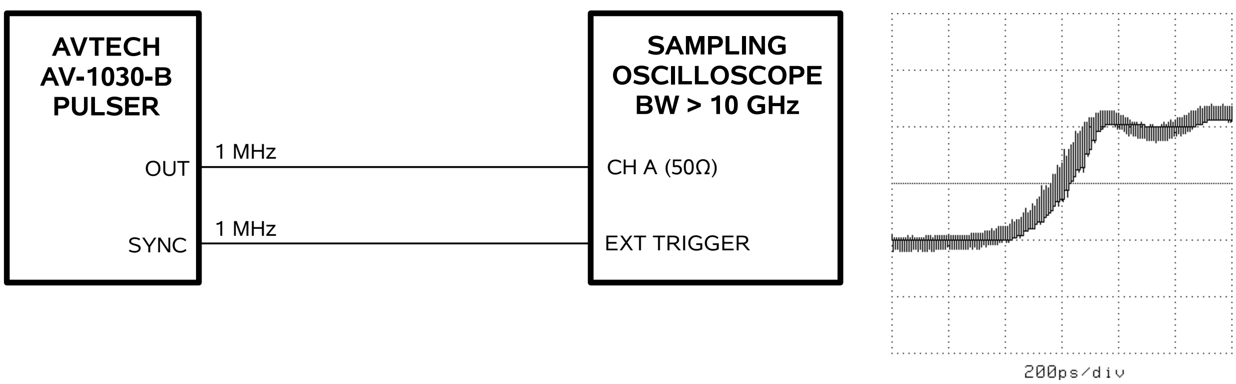
AVX-FD2-PS

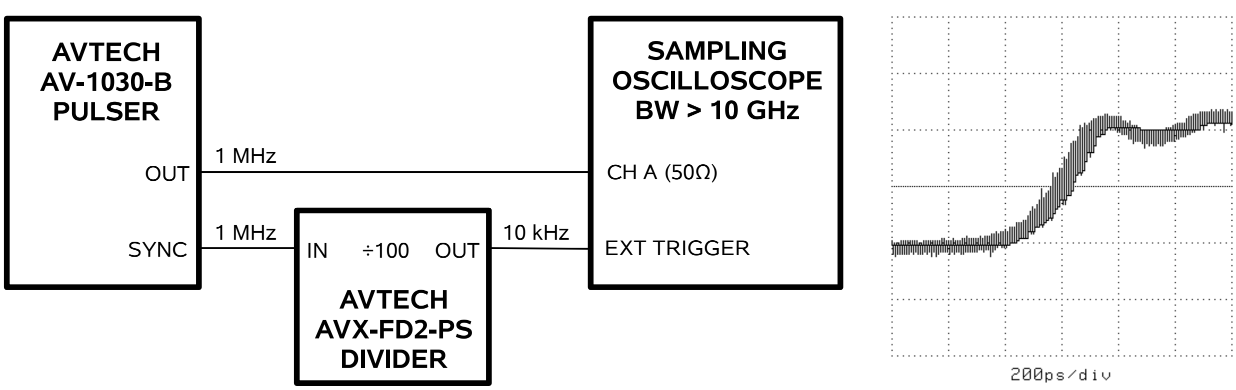
SPECIFICATIONS

Model:	AVX-FD1-PS	AVX-FD2-PS	AVX-FD3-PS
Maximum input frequency:	250 MHz		
Maximum output frequency:	5 MHz	50 MHz	125 MHz
Division factor (N):	0 to 999 (optional[1]: 0 to 65535)	0 to 255 (optional[1]: 0 to 65535)	0 to 65535
Input level:	TTL (0 and 3-5V)		ECL (-0.8 and -1.6V)
Input termination:	50 Ω or 1 kΩ to ground, switchable		50 Ω to -2V
Input pulse width:	≥ 200 ps		
Output level:	TTL (0 and 3-5V)		ECL (-0.8 and -1.6V)
Outputs:	Main Output: $f_{OUT} = f_{IN}/N$		OUT1: $f_{OUT1} = f_{IN}/N$ OUT2: $f_{OUT2} = f_{OUT1}/2$
Output pulse width:	< 50 ns to 50 us	< 6.5 ns to 5.0 us	OUT1: one input period, i.e. $PW_{OUT1} = 1/f_{IN}$ OUT2: 50% duty cycle, i.e. $PW_{OUT2} = 1/f_{OUT1}$
Maximum output duty cycle:	50%. There must also be at least 13.5 ns between the falling edge of one pulse and the rising edge of the next pulse.		50%
Jitter:	≤ 100 ps		
Connectors:	BNC		
Prime power:	100 - 240 Volts, 50 - 60 Hz		
Dimensions (H x W x D):	100 mm x 215 mm x 375 mm (3.9" x 8.5" x 14.8")		
Temperature range:	+5°C to +40°C		

1) Add the suffix -XN to the model number for an extended division factor range of 0 to 65535.

CHARACTERIZING JITTER PERFORMANCE





In the first setup, a high-speed pulser with 300 ps rise times triggers an oscilloscope directly, using the SYNC output of the pulser connected to the oscilloscope's external trigger input.

In the second setup, an AVX-FD2-PS is inserted in the line used to externally trigger the oscilloscope, with the divisor set to N=100.

The oscilloscope waveforms show the "envelope" function accumulated over 512 complete waveforms (~ 30 seconds). The broadening of the waveform provides a measure of the jitter. The broadening is roughly the same in the 2 photos. The line is ~80 ps wide. This tells us that the AVX-FD2-PS is not introducing significant jitter, compared to the jitter present in the AV-1030-B. It is certainly well below the specification of 100 ps.