

## 30ps Fast Risetime Pulse Generator

### FEATURES

- 10MHz 2.5ppm output with 50% duty ratio
- **Rise time and fall time of 30ps or better**
- Output signal amplitude 50mVpp to 1.2Vpp (set via USB.) DC coupled, negative going.
- Trigger output with 1.5Vpp amplitude into 50Ω load. AC coupled
- SMA socket output (BNC With adaptor)
- USB powered - requires 200mA at 5V. Can be used with USB charger or powerbank
- Each device is individually tested for rise/fall times and supplied with high speed scope trace
- 50Ω Output impedance

### APPLICATIONS

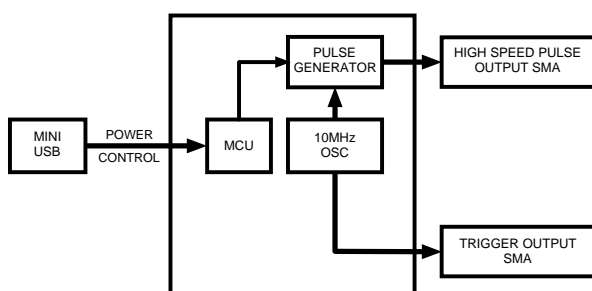
- Testing lab instruments and probes frequency bandwidth and risetime
- Time domain reflectometry (TDR)
- Generating wide spectral contents signal with harmonics extending into tens of GHz

### DESCRIPTION

The LBE-1320 is a compact testing device which can output a signal with a rise time less than 30ps. This speed makes it ideal for a wide range of applications, from testing lab instruments and probes to conducting time domain reflectometry (TDR) experiments. With harmonics extending into the tens of GHz, it delivers a compact solution for exploring frequency bandwidth and risetime characteristics.

The device is powered by a USB A to mini USB cable which is supplied in the kit. Also supplied in the kit is a SMA male to SMA male coupler, and SMA male to BNC male coupler for direct connection to the device under test.

### BLOCK DIAGRAM



### SPECIFICATIONS

#### POWER

Connector	USB Mini Socket
Voltage	5V ±10%
Current	250mA ±10% @ 5V

#### PULSE OUTPUT

Connector	SMA Female (Supplied with M/M coupler)
Amplitude	0.6V - 1.1V Adjustable via software
Coupling	AC
Signal Shape	Square Wave
Frequency	10MHz
Duty Cycle	50% ±2%
Impedance	50Ω
Timing	Within 0.5ns of pulse output
Connector	SMA Female

#### TRIGGER OUTPUT

Voltage	1.6V into 50Ω
Coupling	DC
Signal Shape	Square Wave
Frequency	10MHz

#### DIMENSIONS

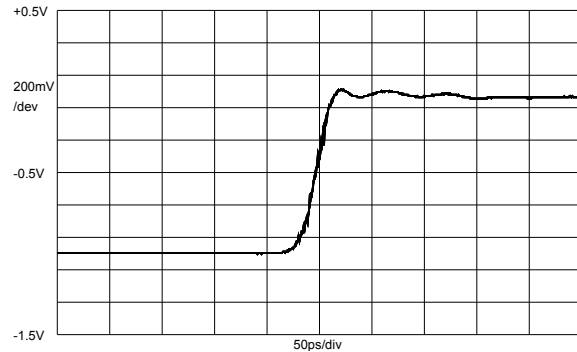
With Connectors	43x32x15.6mm
Weight	0.3kg
With Connectors	63.6x32x15.6mm

## TYPICAL PERFORMANCE CHARACTERISTICS

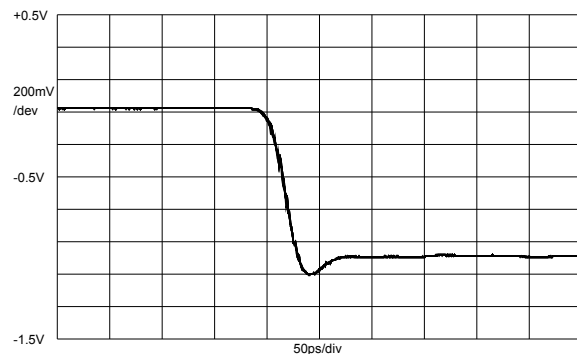
### MEASUREMENTS

Falltime	24.7ps
Risetime	27.4ps
Overshoot	4.0%
Undershoot	11.8%
Amplitude	0.97V (Optimised for fastest risetime)

### Typical Rise Trace



### Typical Fall Trace



Traces measured from Tektronix CSA 803

## CONFIGURATION APPLICATION

The optimum settings are preset in the device when shipped. However a configuration application can be downloaded from [www.leobodnar.com](http://www.leobodnar.com) to control the parameters of the device.

Datasheet Version: V1.0-17-05-2024

## OPERATIONAL INSTRUCTIONS

### Scope Bandwidth Measurement

To eliminate movement on device front panel connectors, connect the trigger out (if needed for sampling scopes etc) and the USB connector first, before attaching to the front end connector of the device under test. For modern digital oscilloscopes with a fast roll-off filter, the bandwidth can be calculated with the following formula

$$0.45 / \text{rise time} = \text{bandwidth}$$

For example, a scope with a measured rise time of 1ns would give the following

$$0.45 / (1 \times 10^{-9}\text{s}) = 450 \text{ MHz}$$