

# Electrical Pulse Generator

EPG-210

- Generate high-speed electrical pulses as short as 30ps
- 18ps fast rise-time enables 30-60ps gain-switched laser pulses
- Cost-effective solution for driving optical modulators



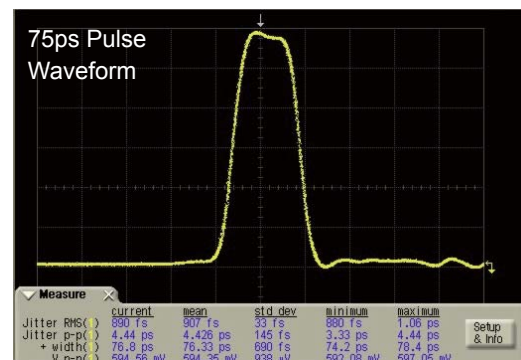
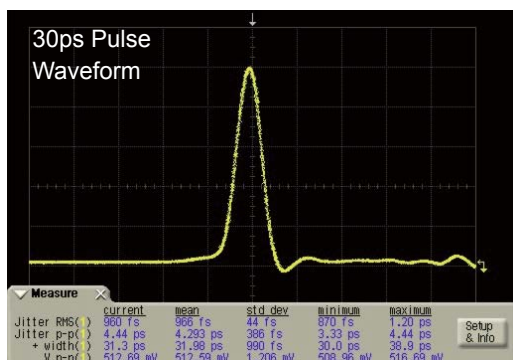
Shortest 30ps	Rise-Time 18ps	Tunable Pulse Width	Laser Driver	Modulator Driver
Single-Shot	Max. 5GHz	Tunable Rep. Rate	External Trigger	

## Specifications

Category	Parameter	FWHM = 30ps	FWHM > 50ps	Unit
Input Characteristics	Signal Type	Sine or Square		
	Input Level	0.3 ~ 0.5		Vpp
	Frequency Repetition Rate <sup>1</sup>	Single-shot ~ 5		GHz
Output Characteristics	Electrical Coupling	AC		
	Pulse Shape	Square		
	Pulse Width (FWHM) <sup>2</sup>	30	50 ~ 2500	ps
	Pulse Width Tunability (Optional)	-	+200	ps
	Rise/Fall Time (20%-80%)	14	18	ps
	Output Voltage <sup>3</sup> (Standard)	0.4	0.5	Vpp
	(High-Voltage: Optional) <sup>4</sup>		>5	Vpp
Electrical	Additive Timing Jitter <sup>5</sup>	<0.5		ps
	Electrical Connector	Advanced SMA		
	Output Impedance	50		Ohm
Physical	Power Supply	(Module)	DC 3.3V, 2A	
		(Benchtop)	AC 100-240 (50/60Hz)	
	Dimensions (W x H x D)	(Module) <sup>6</sup>	60 x 15 x 60	
		(Benchtop)	236 x 88 x 380	
Weight	(Module)	90		
	(Benchtop)	<5		

1. Max. repetition rate depends on pulse width. 2. The pulse width is fixed at a user-selected value, and is set at factory. This represents the minimum pulse width when combined with tunable pulse width option. 3. Voltage for single-ended output. 4. 30ps pulse width may broaden by ~10% with high-voltage option. 5. Actual jitter depends on clock/trigger source. 6. Module type is available for fixed pulse widths of 30, 50, 75 or 100ps, and with standard output voltage. Note: The above specifications may change without prior notice.

## Typical Performance



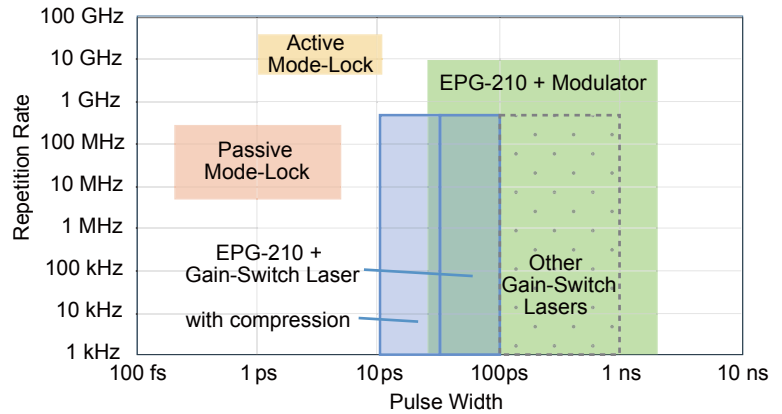
## Ordering Information

EPG-210  -    -  -  -  -

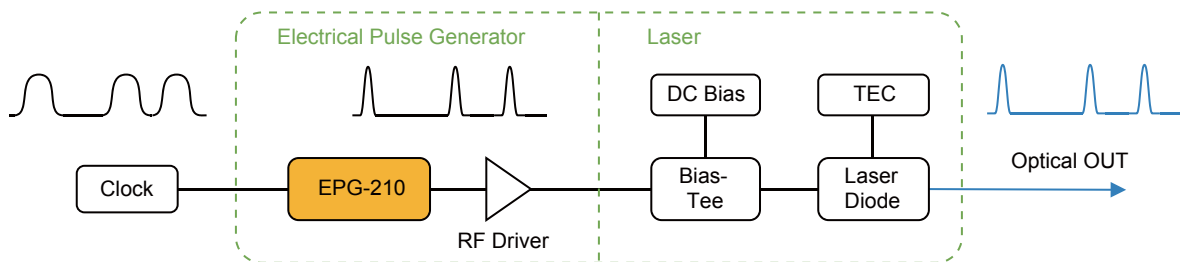
Type	Pulse width [ps]	Output	Pulse Polarity	Pulse Width Tunability	RF Amplification
M: Module		S: Single-End	P: Positive	T: Tunable	A: Amplifier
B: Benchtop		D: Differential	N: Negative	N: N/A	N: N/A

## Generating Optical Pulses with EPG-210

Optical pulses with <100ps width can be generated by driving lasers and optical modulators with high-speed electrical pulses from the EPG-210. The fast rise-time (<18ps) of the electrical pulse enables generation of optical pulses as short as ~30ps when driving 20-40Gb/s modulators, and 30-60ps pulses when driving gain-switched lasers. These pulses can be generated on-demand from single-shot up to a few GHz. They can also be further compressed externally.



### Driving a Gain-Switched Laser



Generate electrical pulses to drive laser

- Fixed pulse width (50ps)
- Fast rise time (18ps)
- RF amplification (up to 6Vpp)
- Repetition rate: DC – 1 GHz

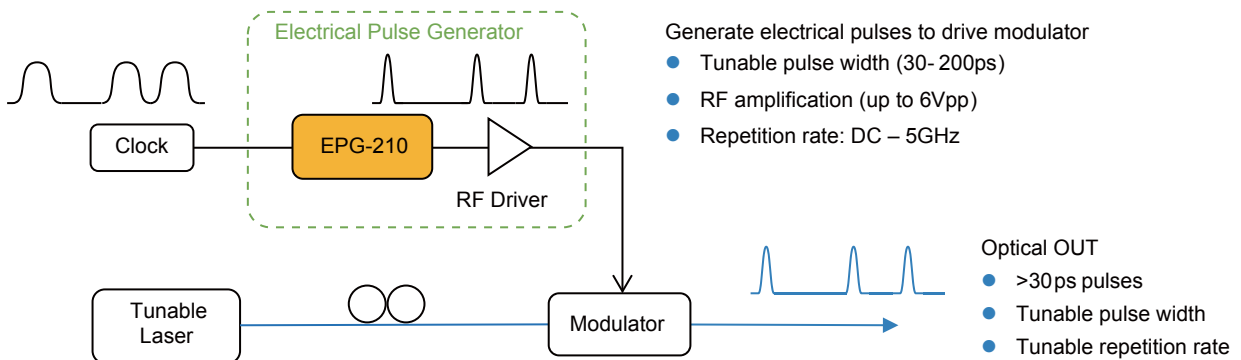
Generate optical pulses

- Wavelength: 980, 1030, 1064, 1550 nm
- Optical pulse width: Typ. 30 – 60 ps (compressible to 10ps)
- Low timing jitter

### Low-Jitter, Short Pulse

Fast rise-time of the driver electrical pulse, more than its pulse width, is important for generating <100ps optical pulses by laser gain-switching - a difficult challenge for conventional drivers. The 18ps rise-time of the EPG-210 enables gain-switched pulses as short as 30ps (which can be further compressed externally), while also suppressing jitter.

### Driving a LN Modulator



Generate electrical pulses to drive modulator

- Tunable pulse width (30- 200ps)
- RF amplification (up to 6Vpp)
- Repetition rate: DC – 5GHz

Optical OUT

- >30ps pulses
- Tunable pulse width
- Tunable repetition rate

### Cost-Effective Solution

Lasers and modulators need to be driven by high-speed electrical pulse generators, to generate <100ps optical pulses. Expensive 20-40Gb/s pulse pattern generators are often used, but in many cases the EPG-210 will serve the purpose, at only a fraction of the cost.