

Supplementary Information

Photonic-electronic integrated circuit-based coherent LiDAR engine

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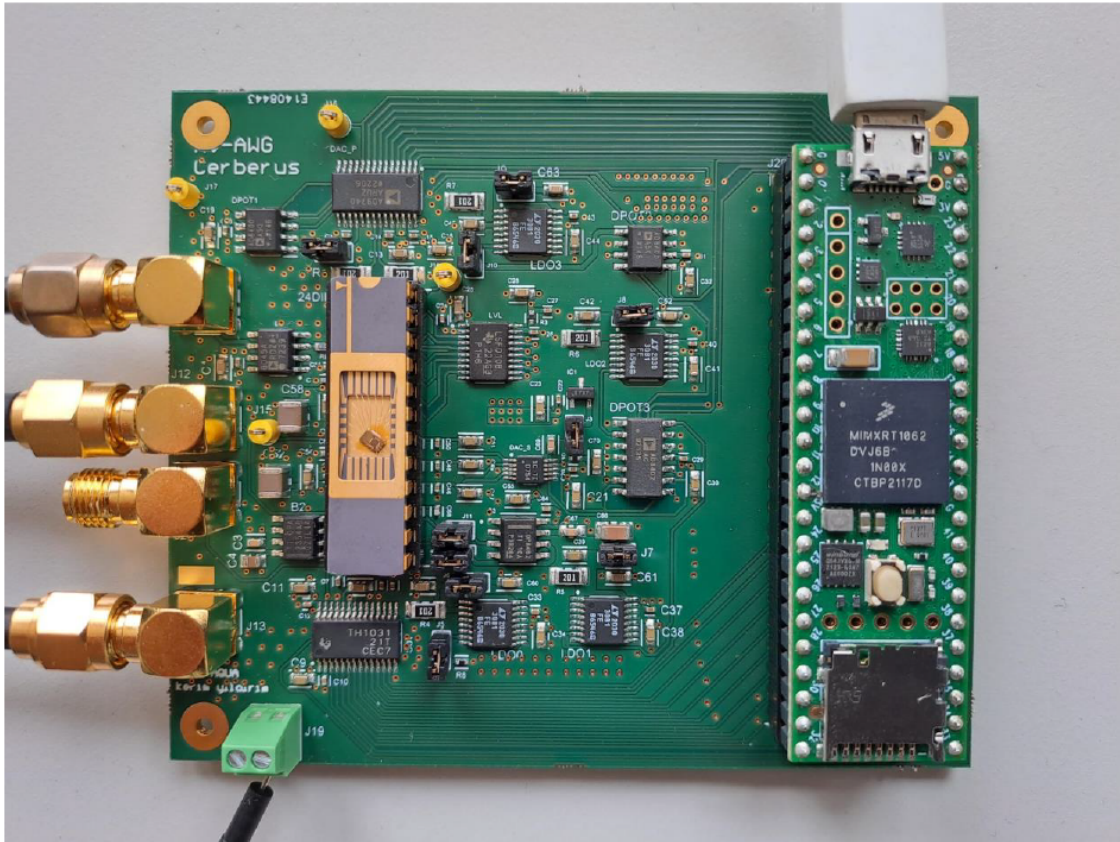
	This work [Arbitrary*/ Sawtooth**]	[1]	[2]	[3]	[4]
Process	0.13 μm BiCMOS	0.18 μm CMOS	0.18 μm HV-BCD	0.35 μm HVCMOS	Discrete IGBTs
HV technology / supply	No	No	Yes	Yes	Yes
Arbitrary Waveform generation	Yes	No	No	Yes	Yes
Architecture	Charge Pump	Stacked switches	Current Driver	Current Driver	H bridge Multilevel
V_{pp} [stdev***]	22.3 V [93 mV] / 15.4 V [46.5mV]	13.2 V	60 V	19.75 V	28.8 kV
Frequency [stdev***]	13.7 kHz [36.6 Hz] / 43.1 kHz [81.2 Hz]	5 MHz	7 MHz	-	20 kHz
Load	Capacitive 26 pF	Capacitive 15.4 pF	Capacitive 15 pF	Resistive 10 k Ω	Series RC $R_s = 6\text{k}\Omega$ $C_s = 32\text{ pF}$
Power consumption	1.28 mW**** / 2.35 mW****	12.8 mW	6.26 mW	-	480 W

*Arbitrary waveform in Fig. 2c second from top. **Sawtooth waveform in Fig. 2d.

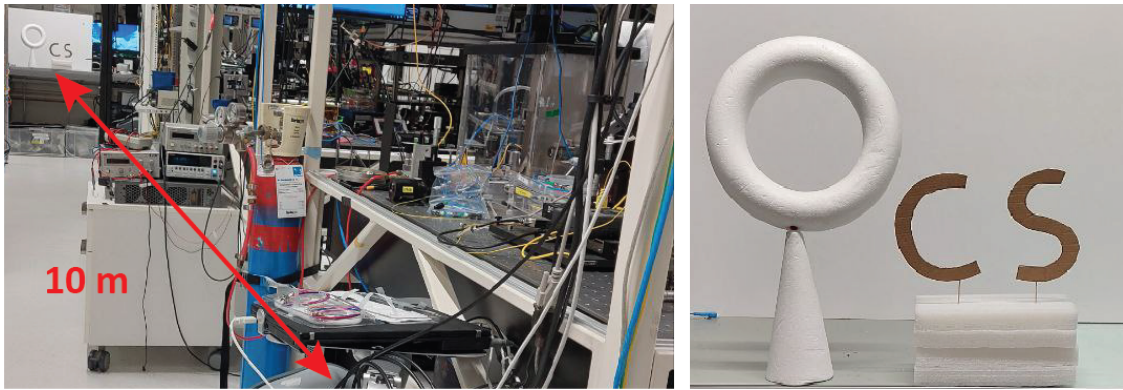
***Measured over 20k samples.

****Power consumption of AWG with 26 pF load.

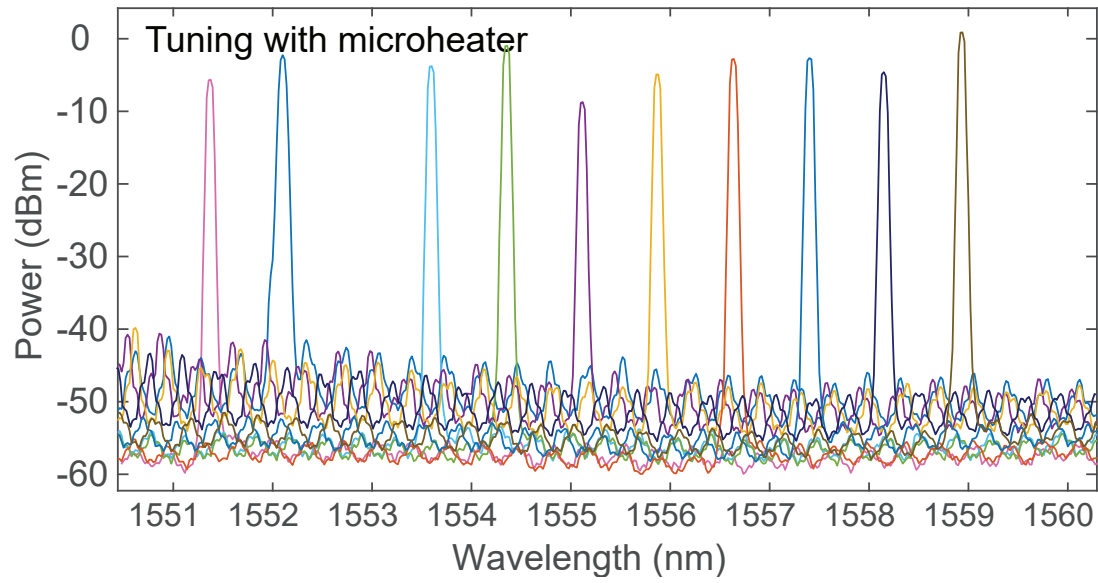
Supplementary Figure 1: HV-AWG comparison table ¹⁻⁴



Supplementary Figure 2: Printed circuit board (PCB) of the HV-AWG The output voltage is connected to a unity-gain voltage buffer on the PCB through the package, and the buffer output is used to drive the SMA connector that is used for the measurements.



Supplementary Figure 3: Imaging scene.



Supplementary Figure 4: Optical spectra of Vernier laser emission at different microheater power with 30 mW electrical power steps.

References

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