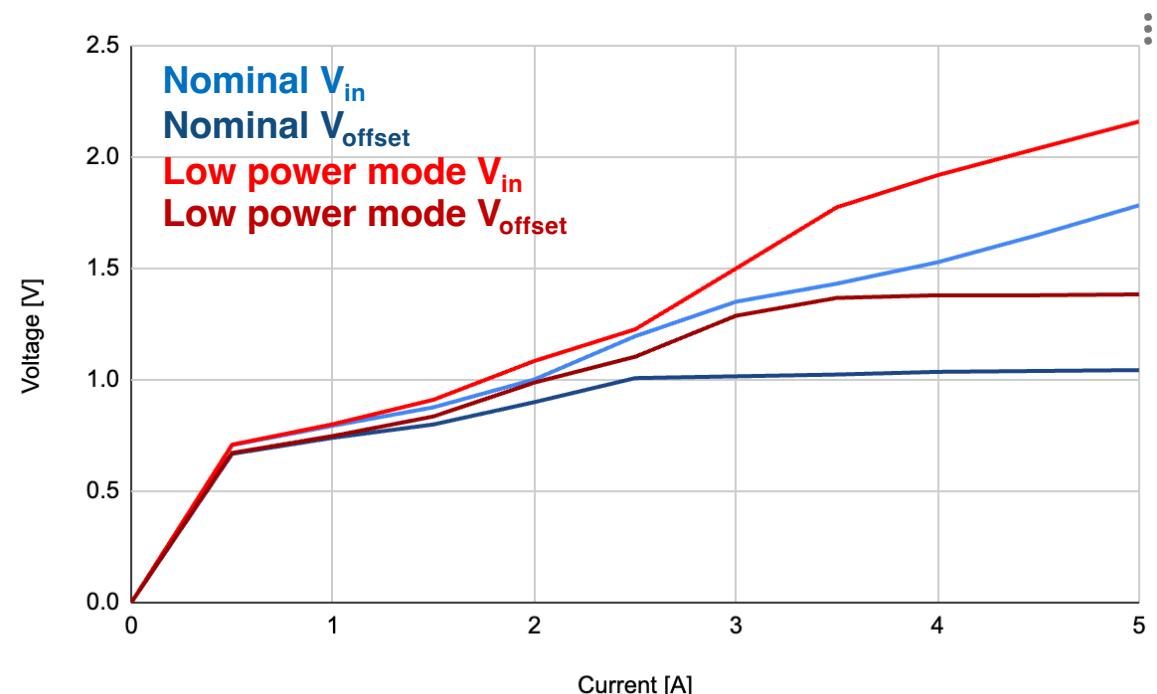
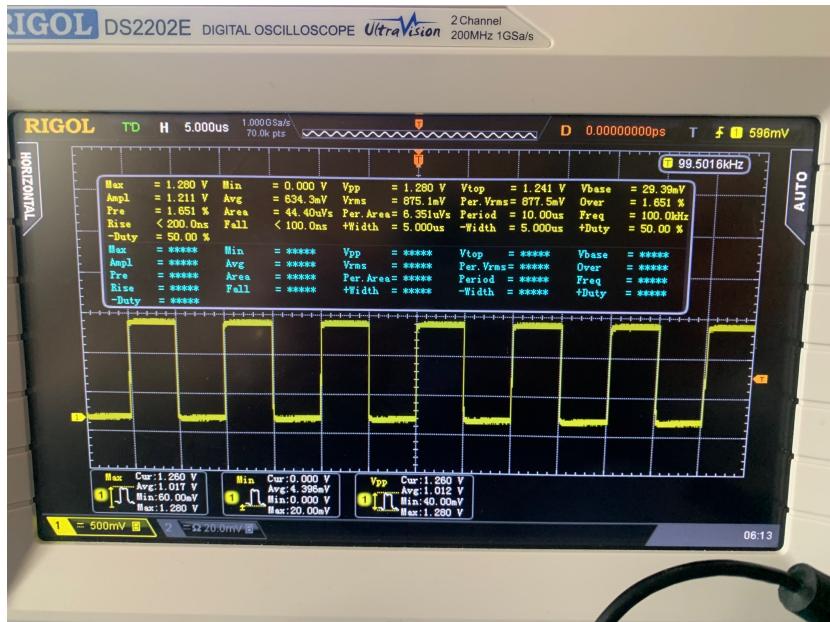


# Low power enable

- Wrote firmware for enabling low power mode by providing AC signal on one of the DP pins
- Can be switched on and off using dedicated tool:

```
./bin/switchLPM on/off
-e <int>: enabled TX channels (from binary number, e.g. for 1111 provide 15)
-s <int> spec number
-f <int> AC signal frequency in kHz
```
- MRs here for [software](#) and [firmware](#)



# Injection capacitance

Injection capacitance measured in waferprobing and QC tools does not match → QC tools value is consistently lower

$$\text{Injection capacitance: } C_{pix} = \frac{C_{meas} - C_{par}}{100} - \Delta C$$

## QC tools

Everything measured via VMUX and IMUX:

- $C_{meas} = \left| \frac{I_{capmeasure}}{10MHz \times VDDA_{capmeasure}} \right|$
- $C_{par} = \left| \frac{I_{cappar}}{10MHz \times VDDA_{capmeasure}} \right|$ 
  - $I_{capmeas} = \frac{IMUX(10) - IMUX(63)}{R_{IMUX}}$
  - $I_{cappar} = \frac{IMUX(11) - IMUX(63)}{R_{IMUX}}$
  - $VDDA_{capmeasure} = (VMUX(4) - VMUX(30)) * 2$
- $\Delta C = 0.48 \text{ fF}$

	Waferprobing [fF]	QC tools [fF]
0x15455	7.762	7.1378
0x15465	7.618	7.0172
0x15475	7.628	7.0342
0x15485	7.679	7.0741

## BDAQ

Most values measured via probe card

- $C_{meas} = \left| \frac{I_{capmeasure}}{10MHz \times VDDA} \right|$
- $C_{par} = \left| \frac{I_{cappar}}{10MHz \times VDDA} \right|$ 
  - $I_{capmeas}$  measured current using SMU, applying voltage with a value of GNDA\_REF
  - $I_{cappar}$  measured current using SMU, applying voltage with a value of GNDA\_REF
  - VDDA voltage measured using SMU, subtracting GNDA\_REF
- $\Delta C = 0.48 \text{ fF}$