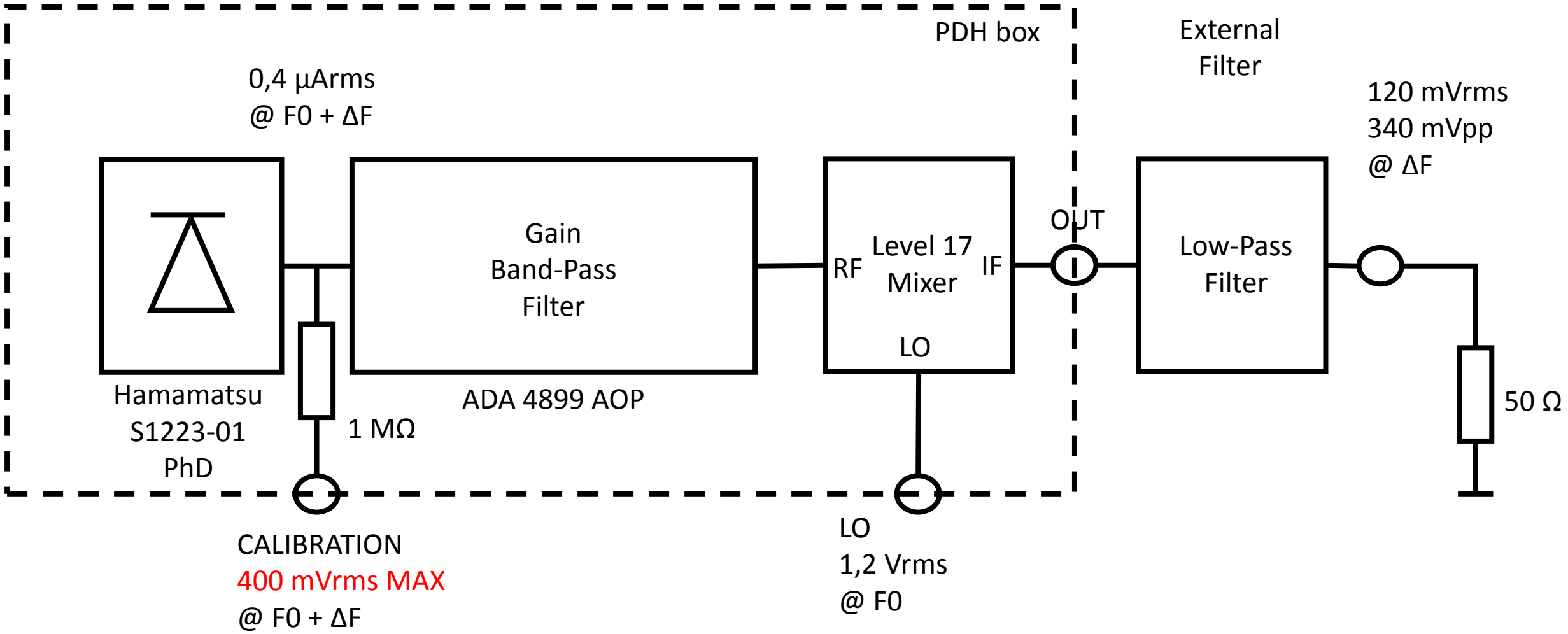
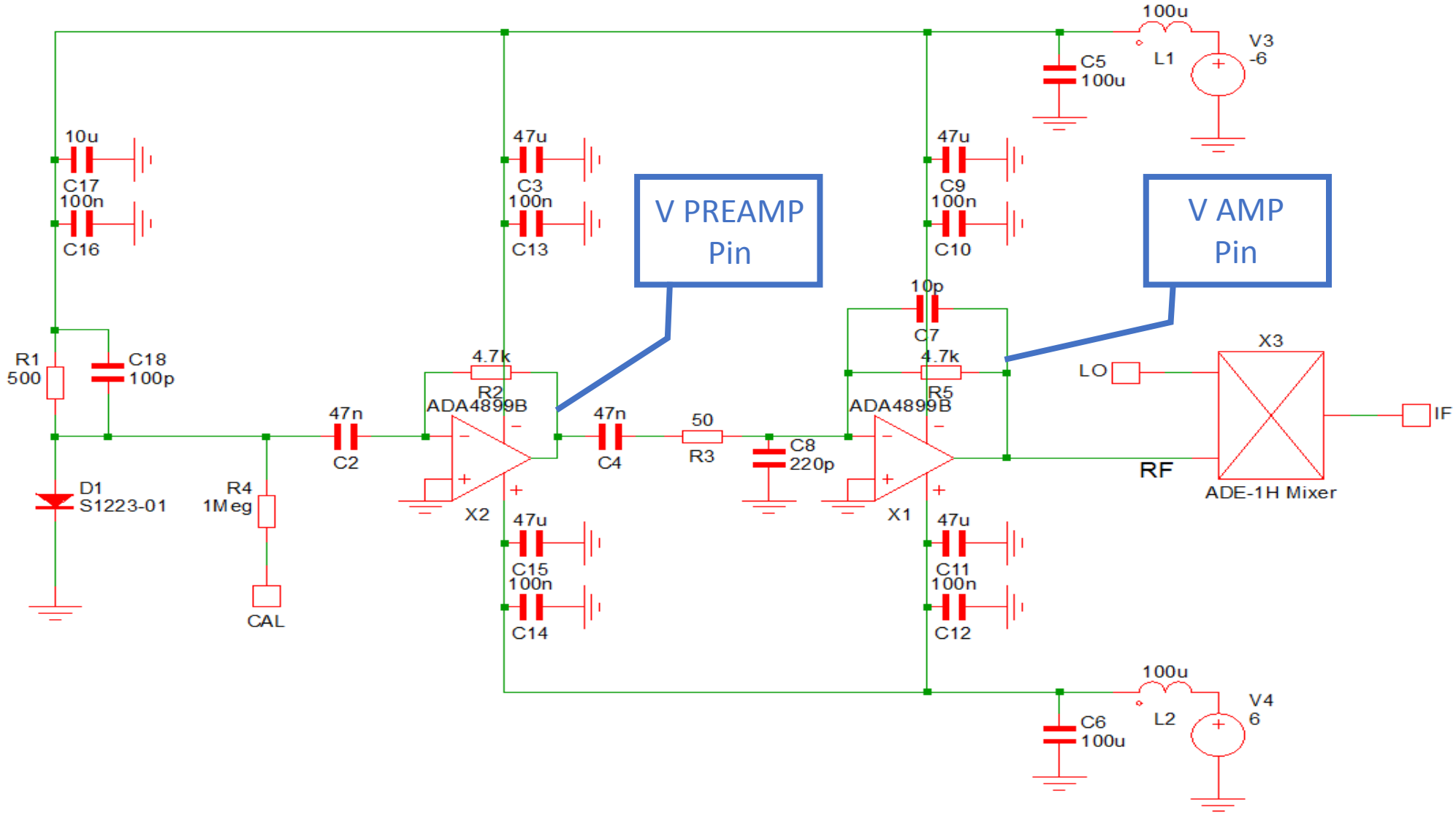
PDH Box

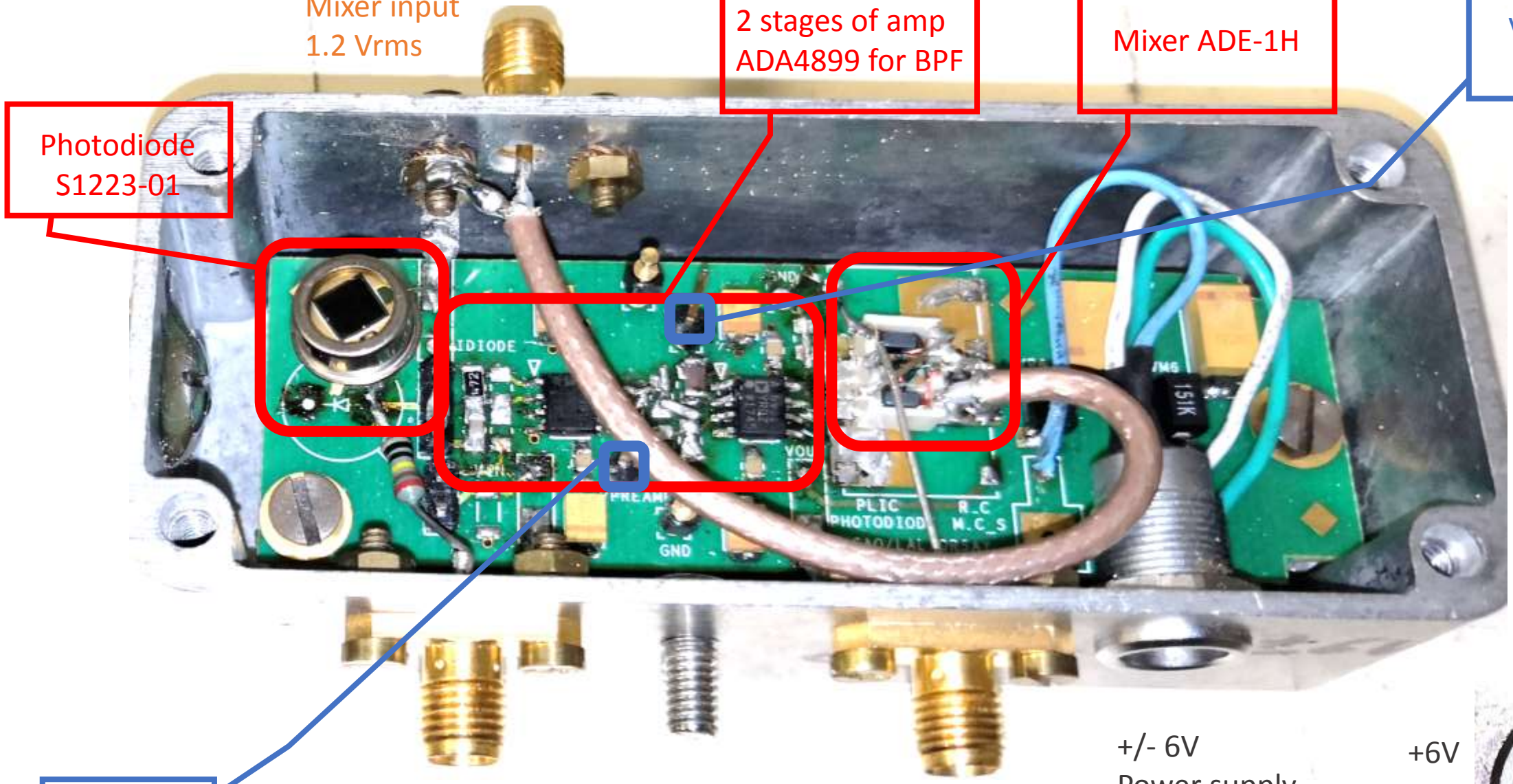
2019-07-04

Board fonctions

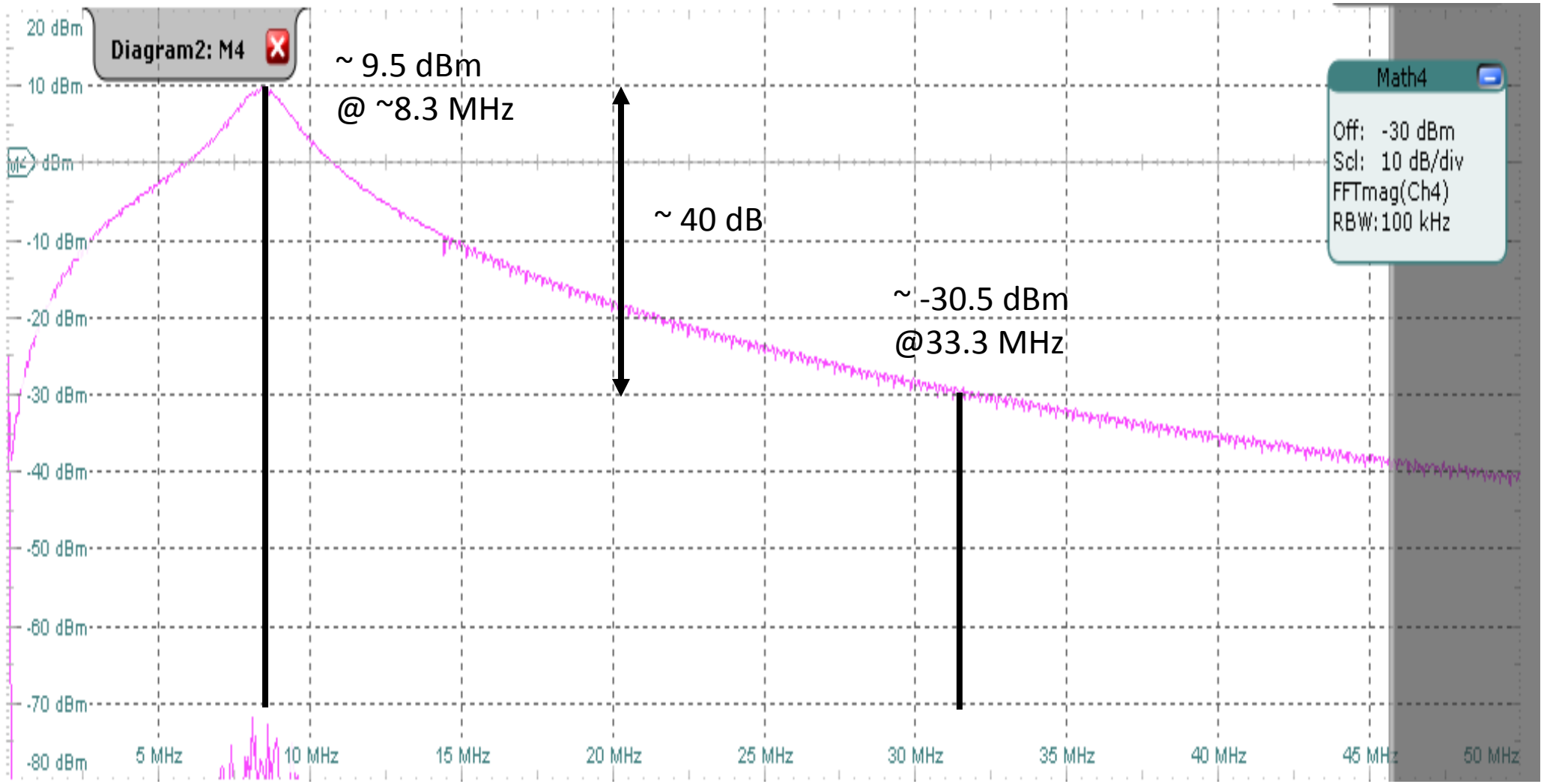


PDH box scheme

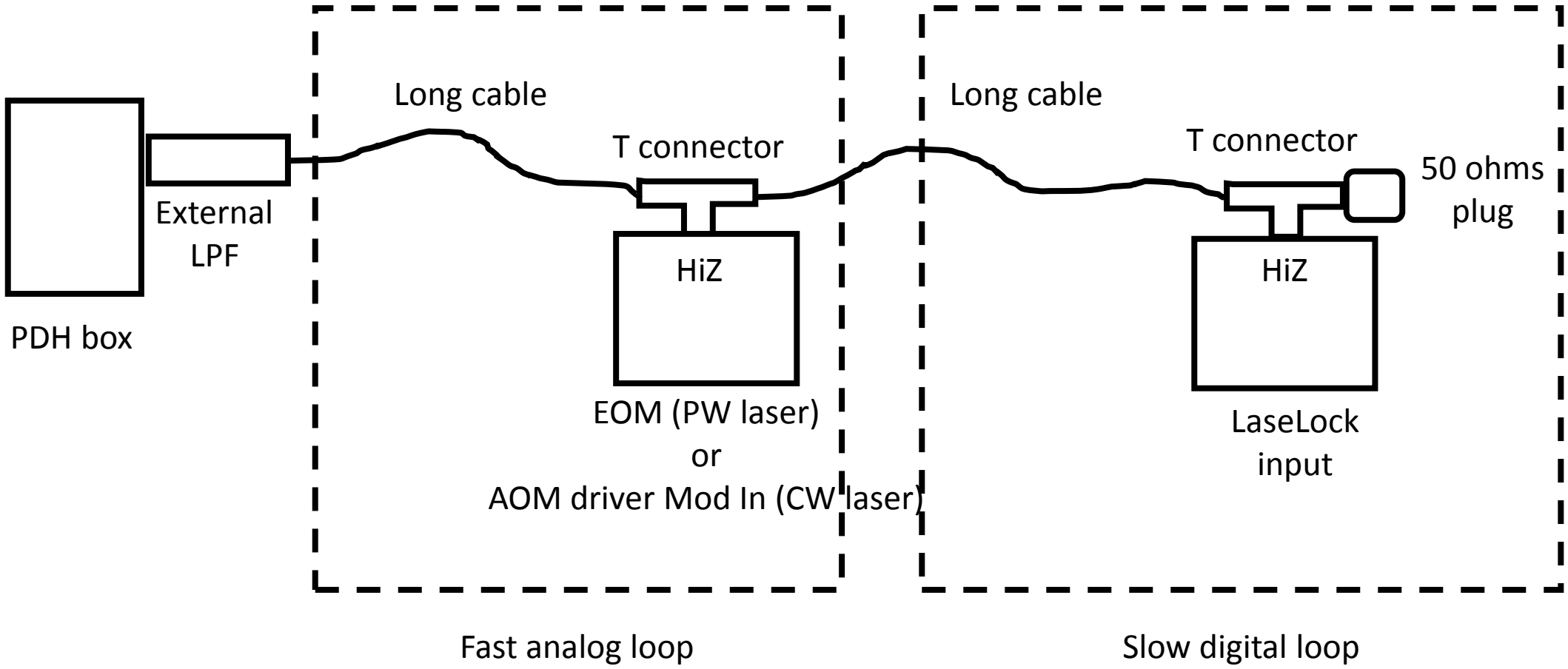



Local Oscillator (LO)
Mixer input
1.2 Vrms
2 stages of amp
ADA4899 for BPF
Mixer ADE-1H
V AMP
Pin
Photodiode
S1223-01
V PREAMP
Pin
Calibration input
400 mVrms MAX
PDH output
+/- 6V
Power supply
+6V
-6V

Gain Band-Pass filter Transfer Function



How to use the PDH box ?



Test Setup

Band-Pass filter transfer function:
- +/- 6V on power supply
- CAL : Connected to generator with sweep between 10kHz and 50MHz in 40s with 400 mVrms
- LO : Connected to generator but with signal OFF
- OUT : Connected to Minicircuits 1.9MHz Low-Pass Filter and to 50 ohms of a scope
- SCOPE PROBE : Pluged to VAMP pin from the PCB => this is the output signal

PDH transfer function :
- +/- 6V on power supply
- CAL : Connected to generator with sweep between « max freq - 5MHz » to « max freq + 5MHz » of the BPF (~ 8.3 MHz) with 400 mVrms
- LO : Connected to generator but with 1.2 Vrms at same frequency
- OUT : Connected to Minicircuits 1.9MHz Low-Pass Filter and to 50 ohms of a scope => this is the output signal
- SCOPE PROBE removed

PDH Noise and sensitivity :
- +/- 6V on power supply
- CAL : Connected to generator with 400 mVrms at maximum frequency of the BPF (~ 8.3 MHz)
- LO : Connected to generator but with 1.2 Vrms at same frequency
- OUT : Connected to Minicircuits 1.9MHz Low-Pass Filter and to 50 ohms of a scope => this is the output signal
- SCOPE PROBE removed

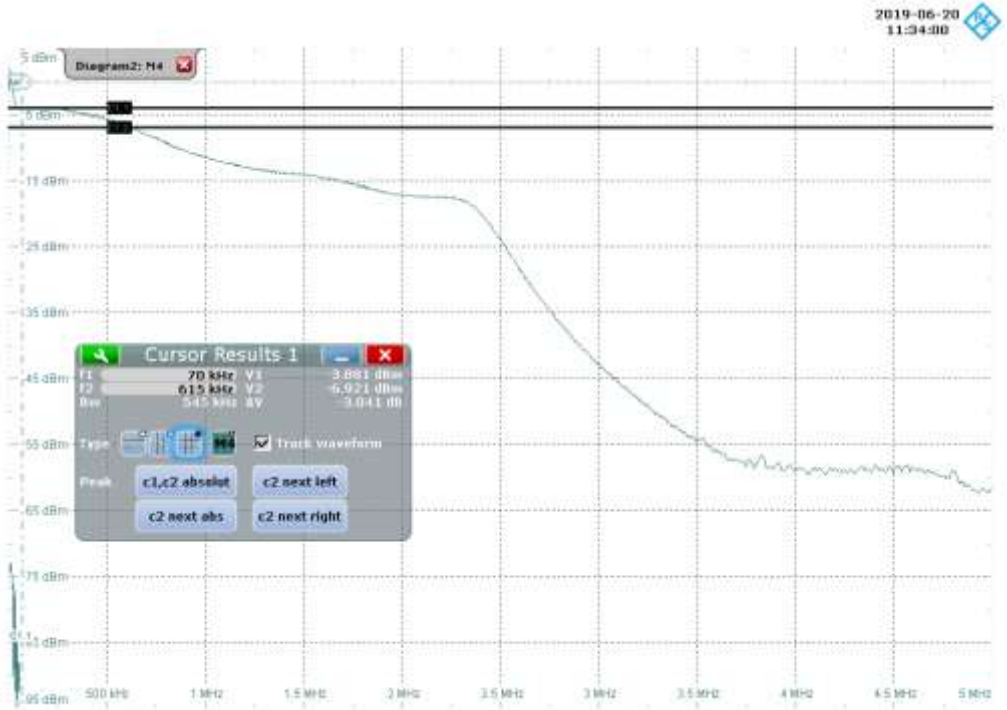
PDH Box N°1

BPF transfer function

Fmax = 8.2MHz
Gmax = 9,2 dBm
G @33,3MHz = -27.6 dBm
ΔG = 36.8 dB

Vpreamp = mVpp
Vamp = Vpp

PDH transfer function



BW = 600kHz
Noise = 0.9 mVrms
Sensitivity = 3.5 mV/deg
Vmin = -200mV
Vmax = +200 mV

PDH Box N°2

BPF transfer function

Fmax = 8.4MHz
Gmax = 9,8 dBm
G @33,3MHz = -28.4 dBm
ΔG = 38.2 dB

Vpreamp = 166 mVpp
Vamp = 1.9 Vpp

PDH transfer function

BW = 585 kHz
Noise = 1 mVrms
Sensitivity = 3.5 mV/deg
Vmin = -200 mV
Vmax = +189 mV

PDH Box N°3

BPF transfer function

Fmax = 8.3MHz
Gmax = 8.6 dBm
G @33,3MHz = -29.5 dBm
ΔG = 38.2 dB

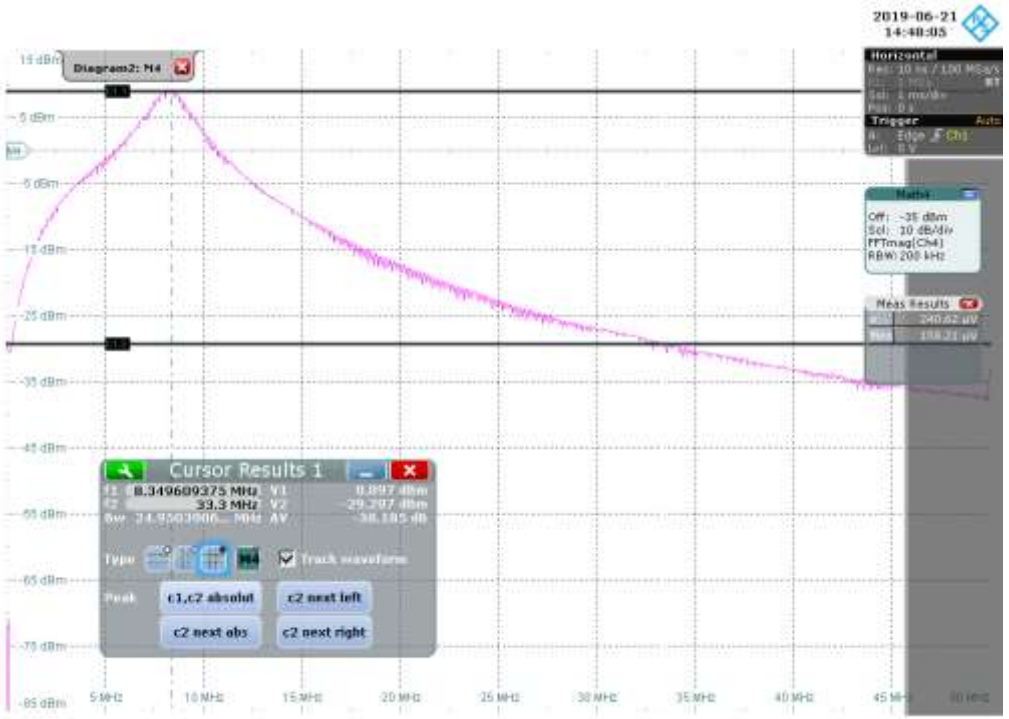
Vpreamp = mVpp
Vamp = Vpp

PDH transfer function

BW = 590 kHz
Noise = 0.76 mVrms
Sensitivity = 2.6 mV/deg
Vmin = - 177 mV
Vmax = + 146mV

PDH Box N°4

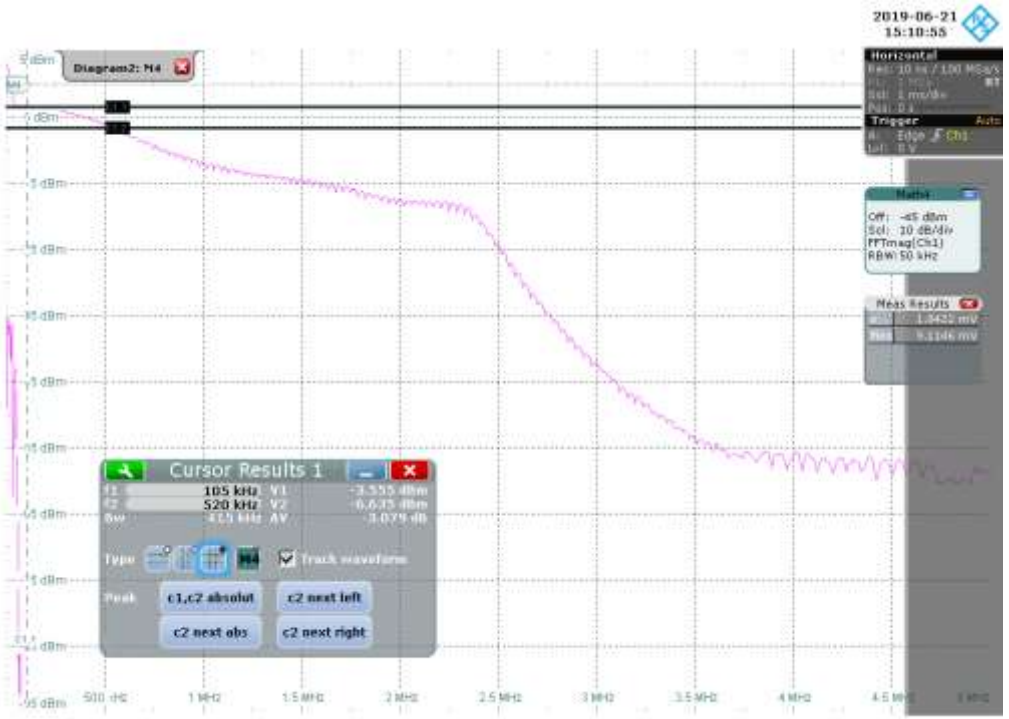
BPF transfer function



Fmax = 8.35 MHz
Gmax = 8.9 dBm
G @33,3MHz = -29.3 dBm
ΔG = 38.2dB

Vpreamp = mVpp
Vamp = Vpp

PDH transfer function



BW = 520 kHz
Noise = 0.94 mVrms
Sensitivity = 3.5 mV/deg
Vmin = -200 mV
Vmax = +230 mV

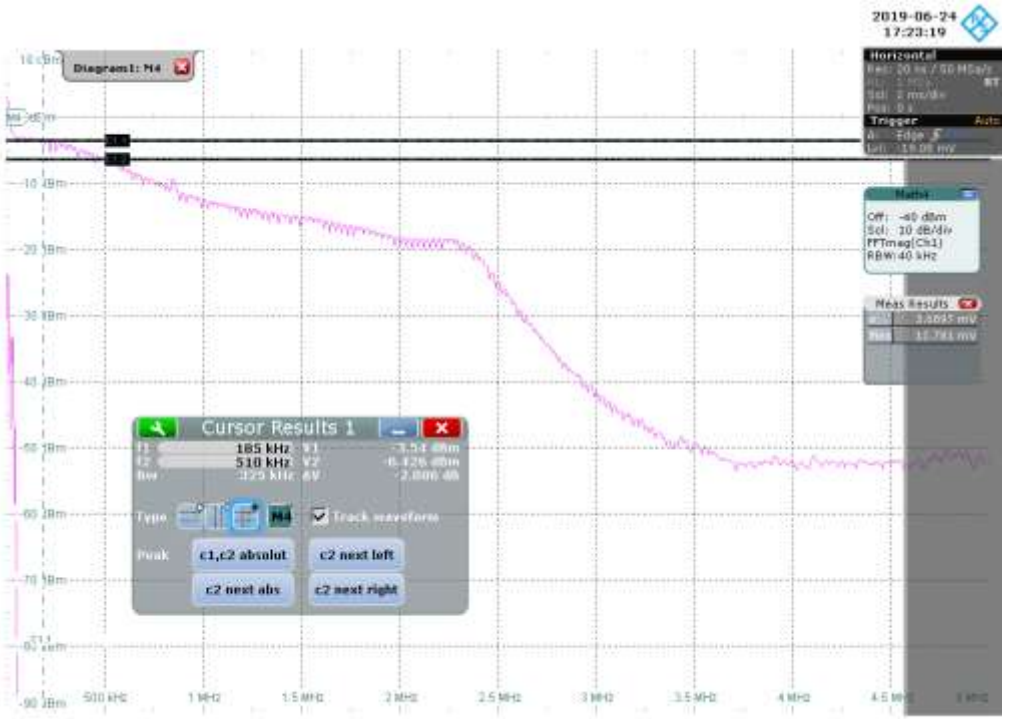
PDH Box N°5

BPF transfer function

Fmax = 8.26 MHz
Gmax = 9.2 dBm
G @33,3MHz = -30.5 dBm
ΔG = 39.7 dB

Vpreamp = 145 mVpp
Vamp = 1.86 Vpp

PDH transfer function



BW = 510 kHz
Noise = 0,94 mVrms
Sensitivity = 3.2 mV/deg
Vmin = -230 mV
Vmax = +178 mV