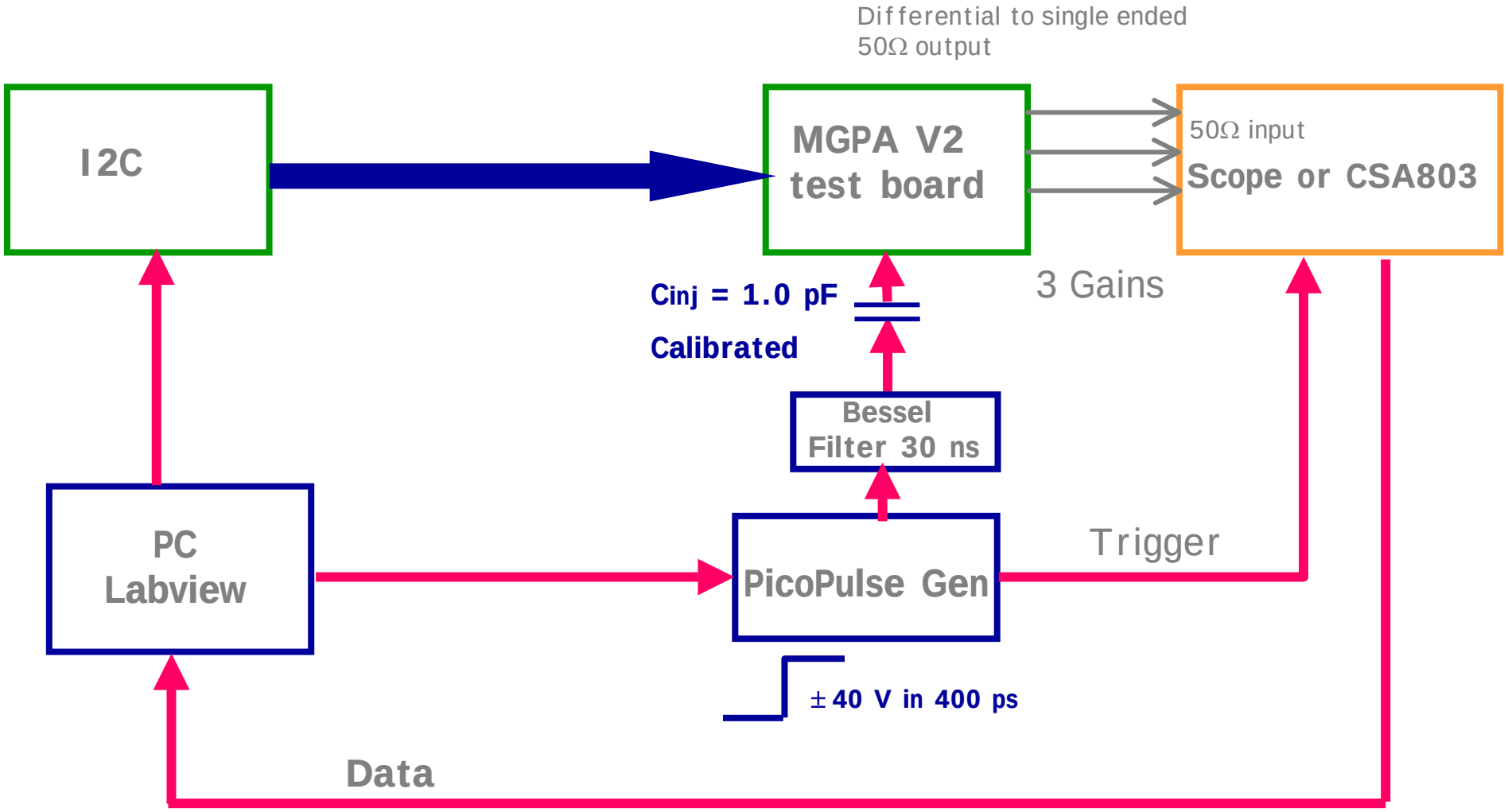
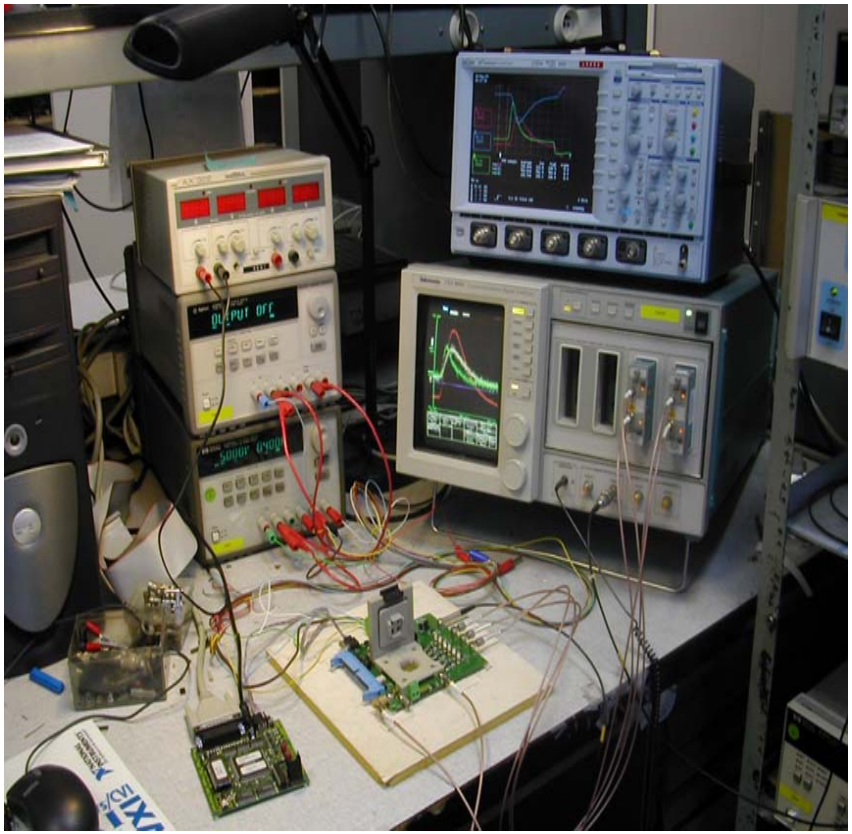
FIRST MGPA V2 TEST RESULTS with **IPNL** SETUP And MGPA V2 TEST PRODUCTION

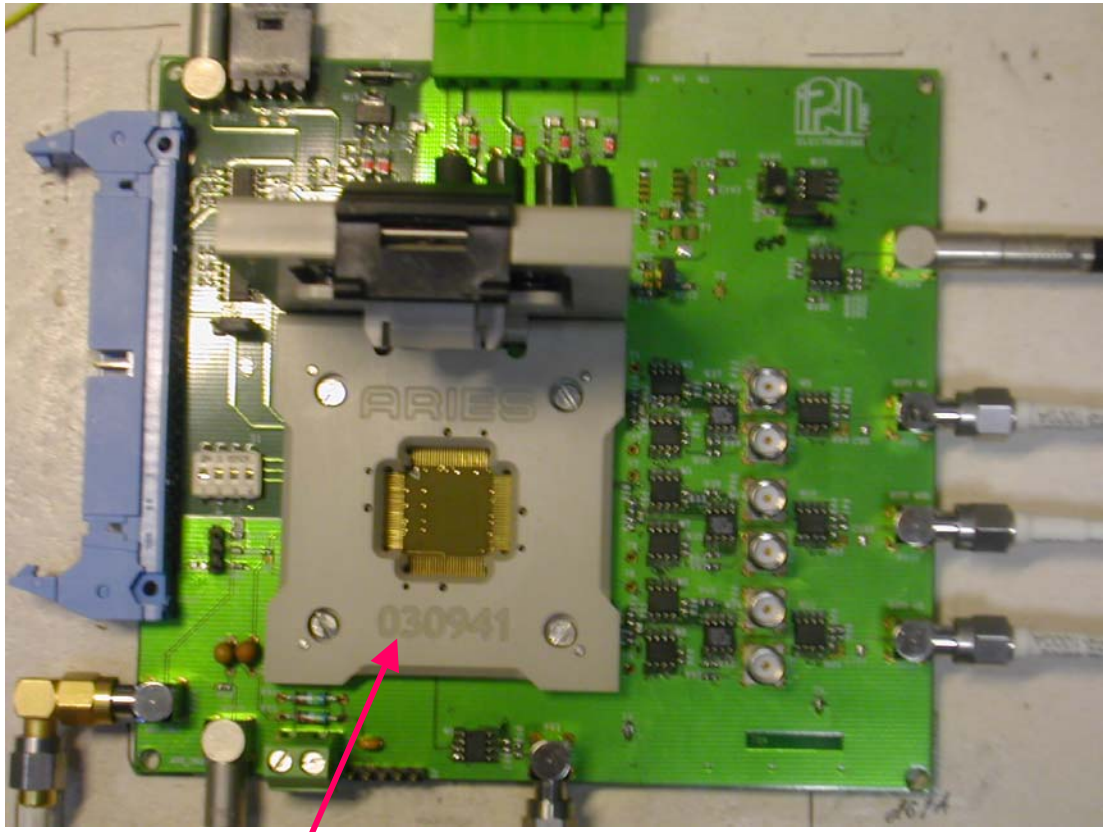
R. Della-Negra, M. Dupanloup, J. Fay, S. Gascon, H. El Mamouni, B. Ille, H. Mathez

MGPA V2 TEST SETUP (0)



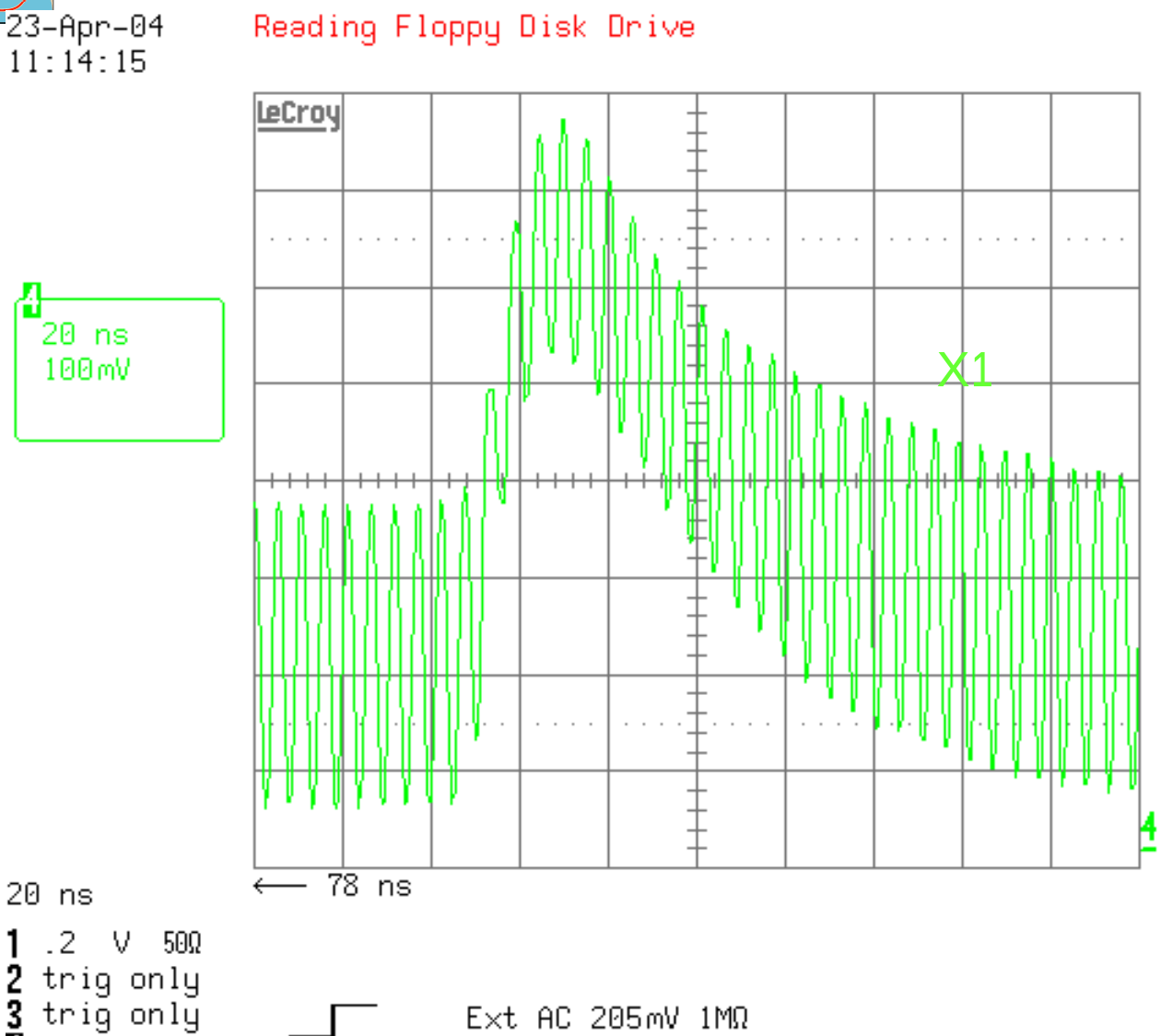
MGPA V2 TEST SETUP (1)





ARIES SOCKET

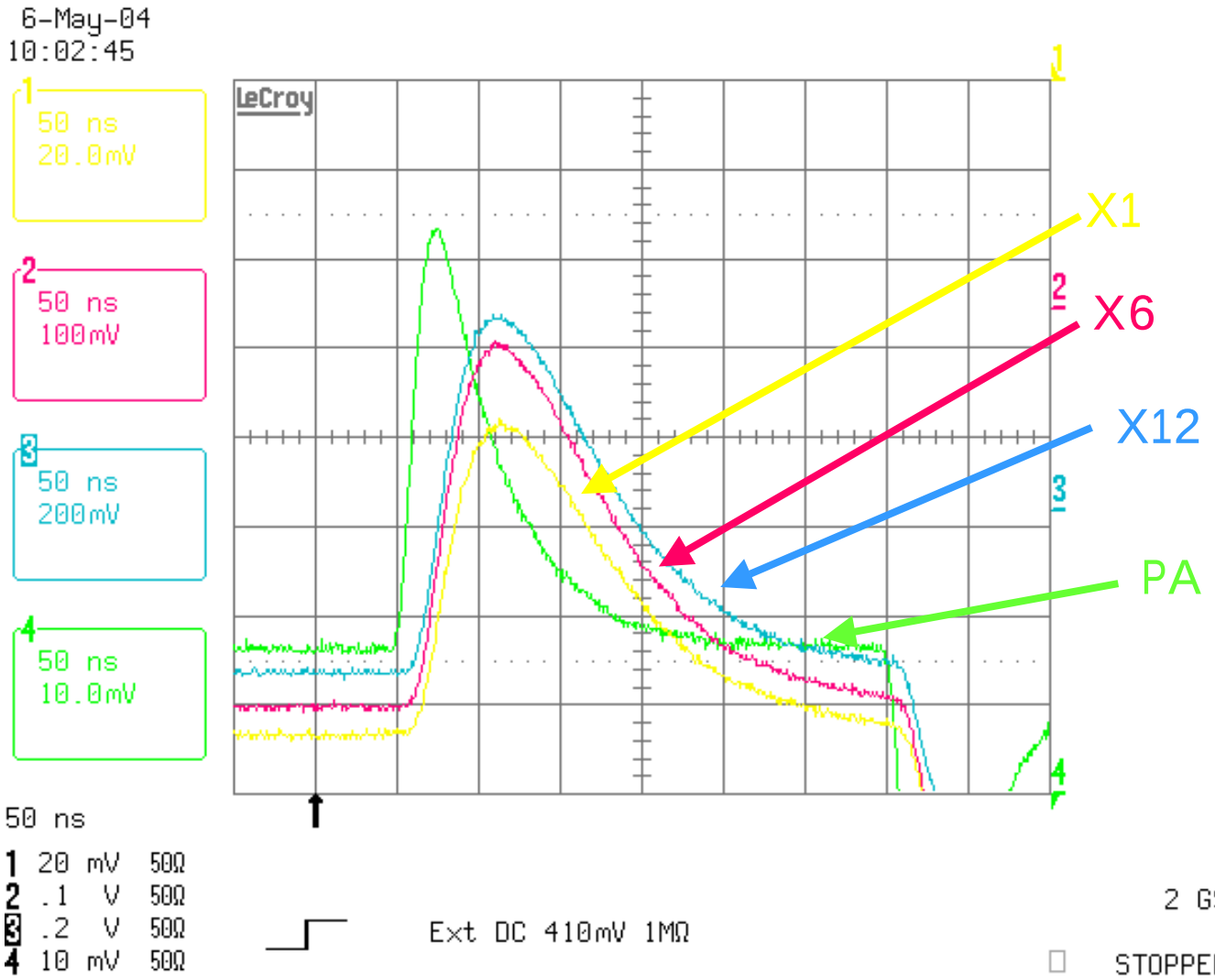
FEW PLOTS (0)



Q=40pC, Gain X1
Rs1 = 3.3 Ohms
Rs2 = 4.7 Ohms

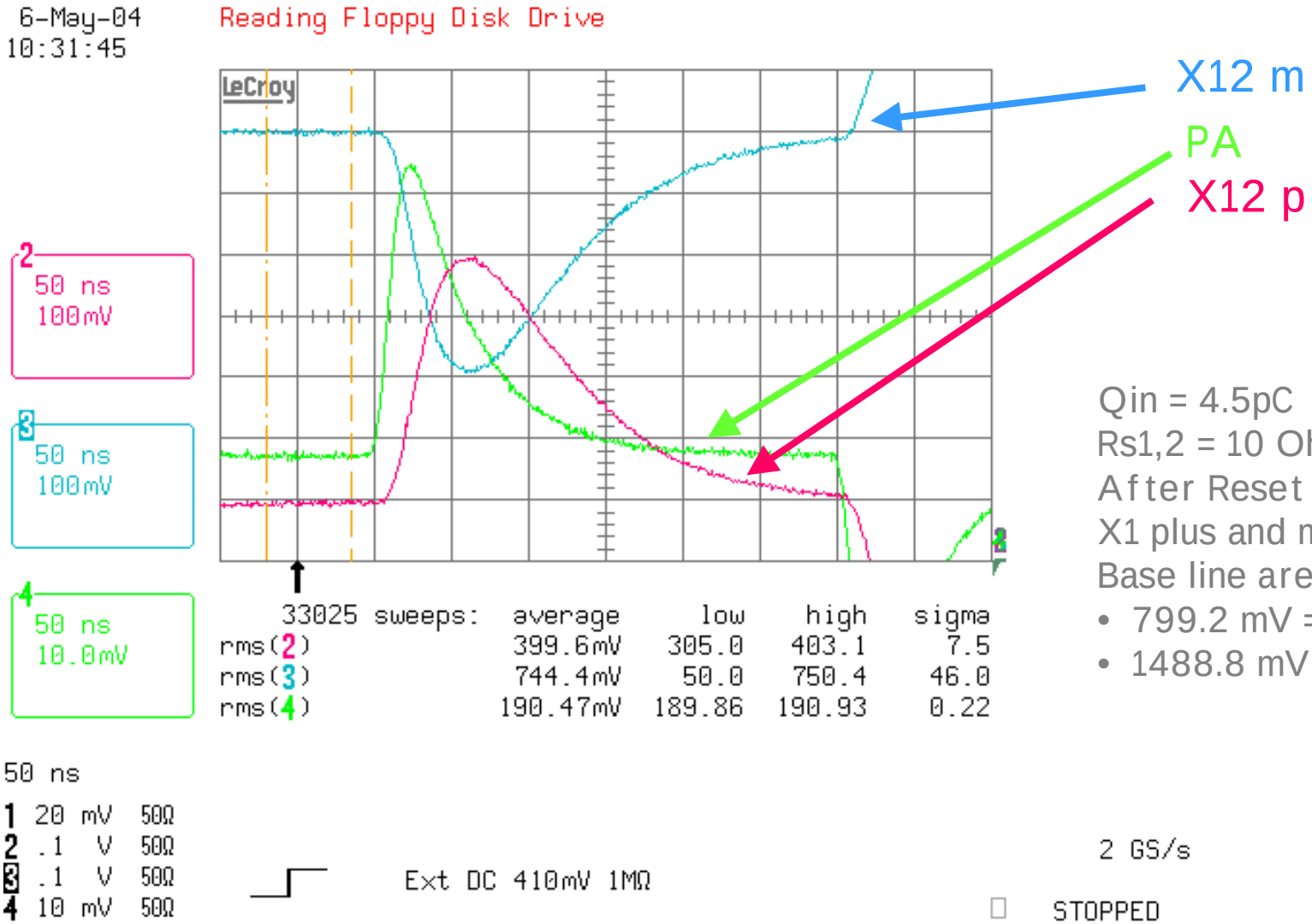
Rs1 = 10 Ohms
Rs2 = 10 Ohms

FEW PLOTS (1)



Qin = 4.5pC
Rs1,2 = 10 Ohms
After Reset, I2C = 64
Pkt X1 ≈ 50ns
Pkt X6 ≈ 50ns
Pkt X12 ≈ 50ns
Pkt PA ≈ 25ns

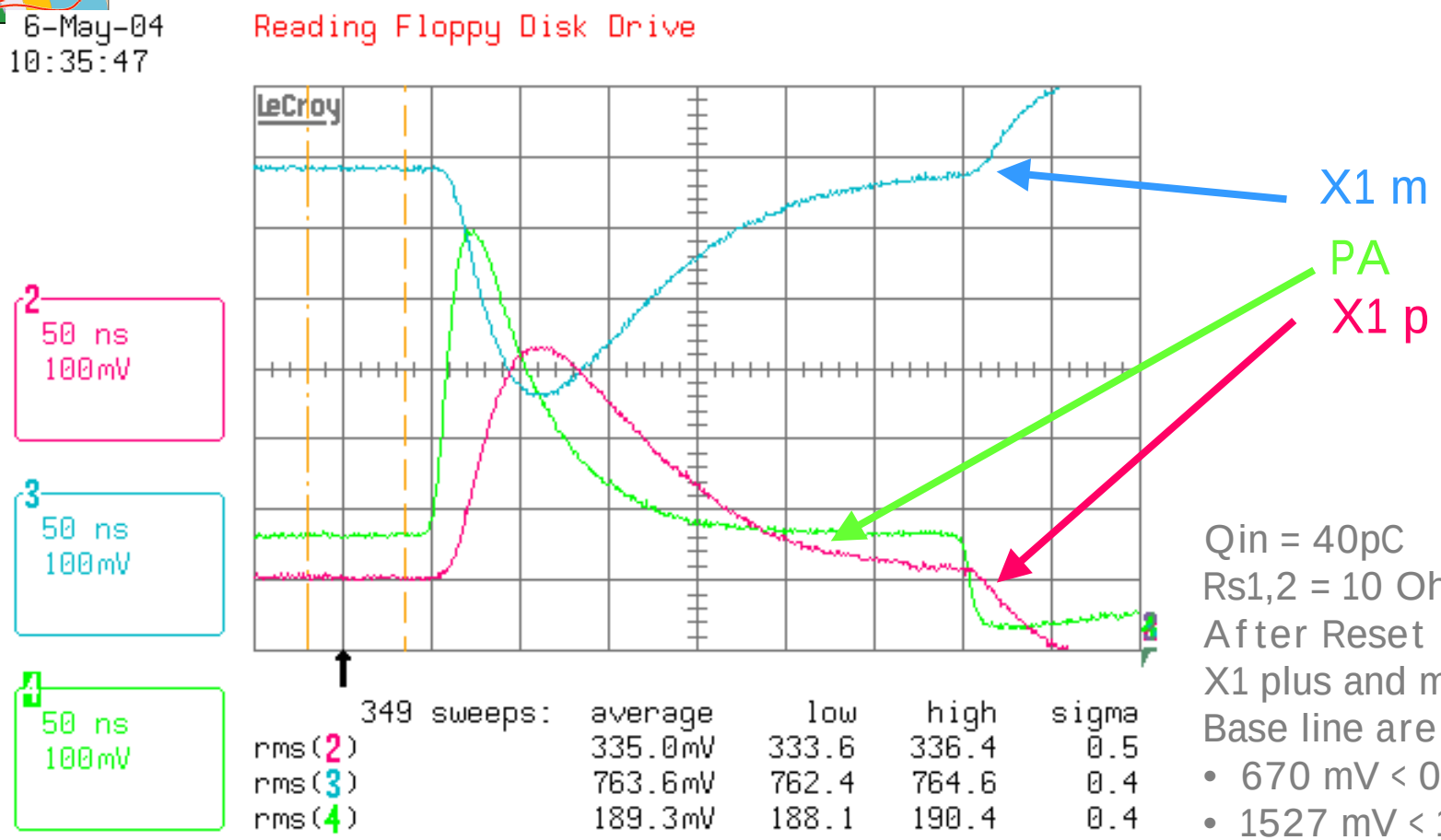
FEW PLOTS (2)



Qin = 4.5pC
Rs1,2 = 10 Ohms
After Reset I2C = 64
X1 plus and minus output
Base line are :

- 799.2 mV = 0.8 V (ADC input)
- 1488.8 mV < 1.7 V (ADC input)

FEW PLOTS (3)



X1 m

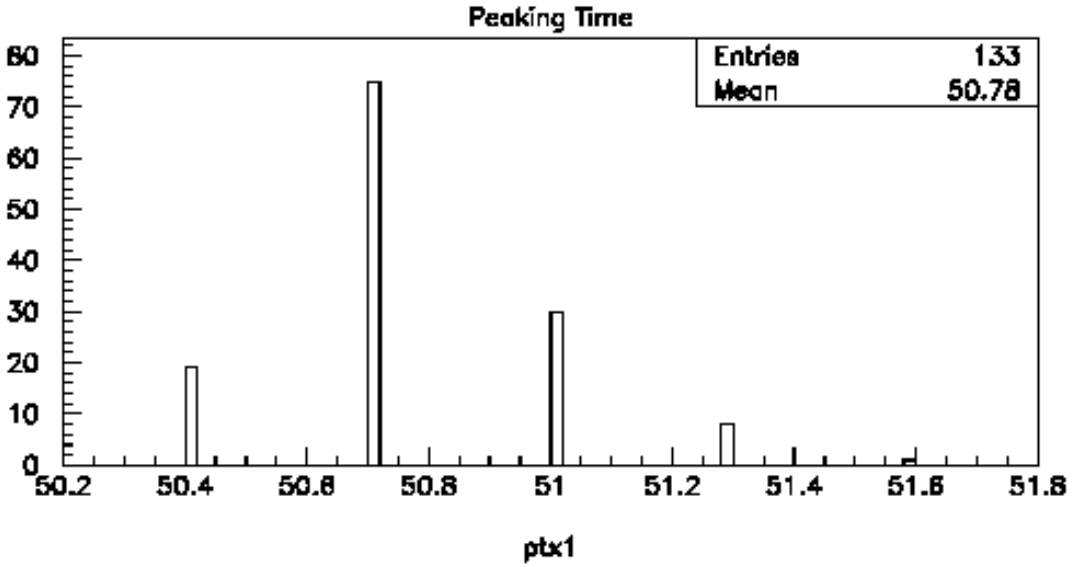
PA

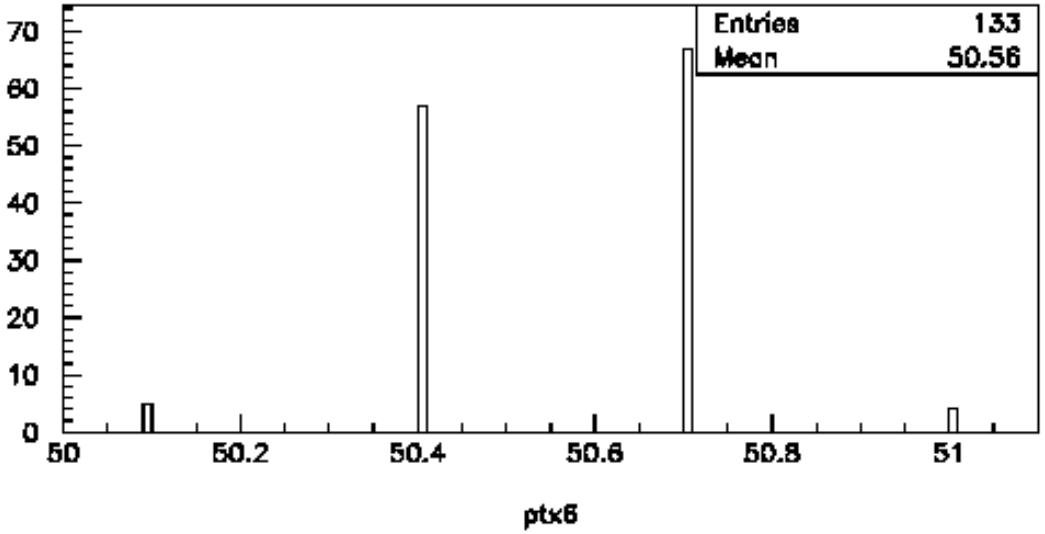
X1 p

Qin = 40pC
Rs1,2 = 10 Ohms
After Reset I2C = 64
X1 plus and minus output
Base line are :

- 670 mV < 0.8 V (ADC input)
- 1527 mV < 1.7 V (ADC input)

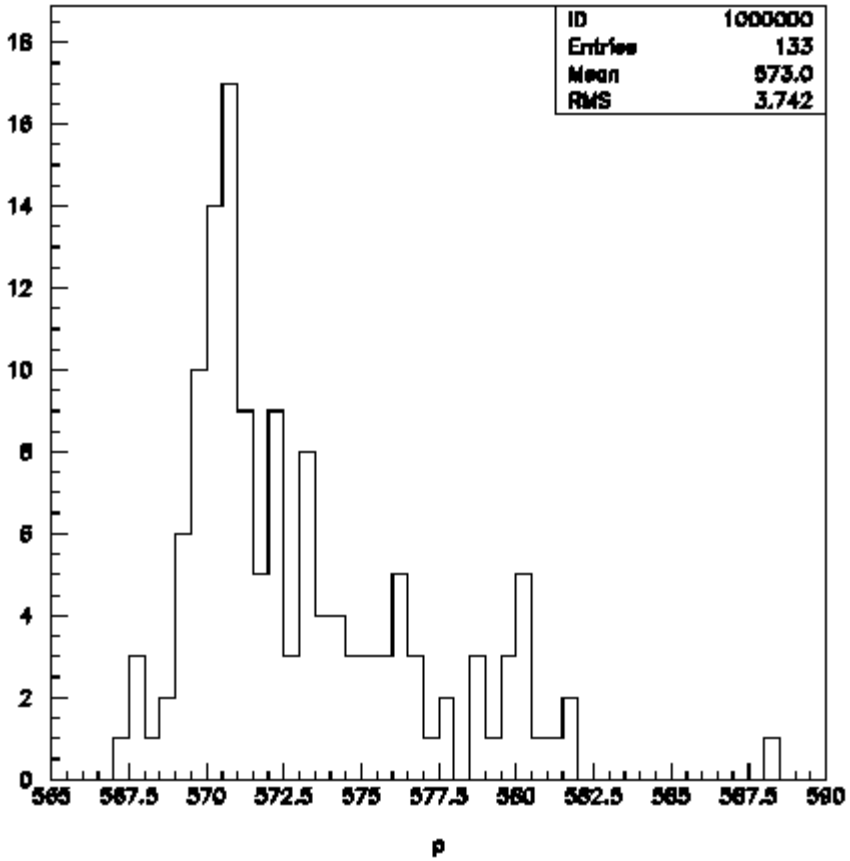
FEW PLOTS (4)





Peaking Time
Gain X1 and X6

FEW PLOTS (5)



Power Supplies
573 mW

PRELIMINARY YIELD

Chips tested :133
Bad chips : 7

YIELD ~ 95%

MECHANICAL PROBLEMS (0)

Socket : with microstrip, same technology as previous (FPPA)
package EDQUAD 52 pins ASAT → NO problems

New problems with Aries socket and ASAT TQFP100 package

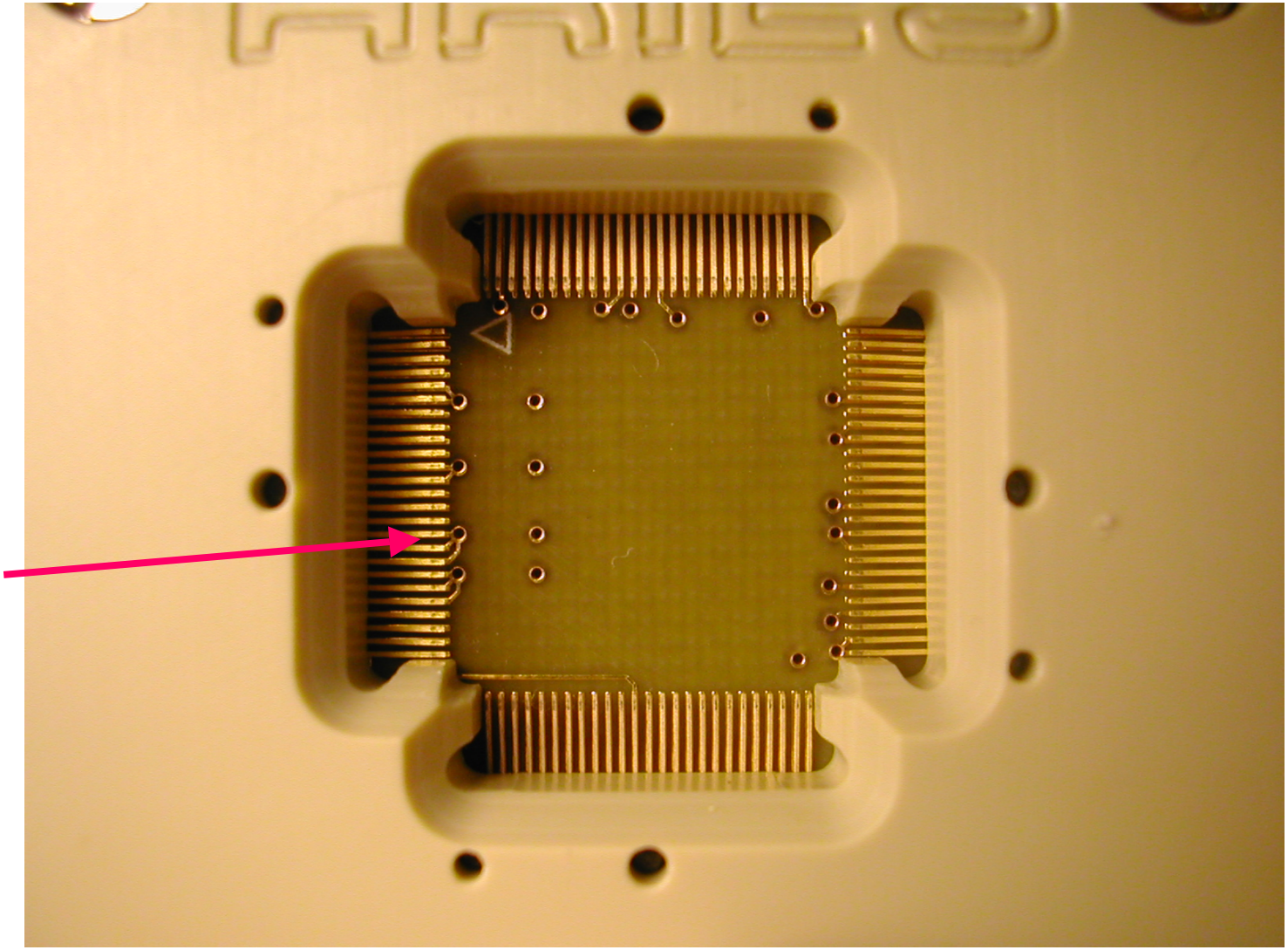
- The socket was tested with Atlantic package at ARIES house :
  Some devices present an excess of plastic in the corners
  - Some small chips goes under the microstrip : no electrical contact, the MGPA does not work !
  - Microstrips could be twisted due to this small chips, the MGPA does not work !

Solutions

- Very carefully clean up the PCB and the socket

MECHANICAL PROBLEMS (1)

Microstrip



MGPA V2 TEST PRODUCTION

MGPA V2 TESTING PRODUCTION REQUIREMENTS

PARAMETER	*MEASUREMENTS TO BE DONE*
DC power supply	**Current**
I2C register	**Internal Default Value (64) after reset**
Scan Chain Functionality	**Put some logic input to several values and clock them**
Offset Current Generation **I2C register** **3 I2C values must be tested**	**Base line on 3 differentials gains amplifiers**
Calibration Pulse Generator **3 I2C values which represents 3 different charge injection** **(with lookup table values)**	**Output amplitude on 3 differentials gains amplifiers**
Qin = 4.5 pC	**Rise and Fall Time and peak amplitude on G12 differential gain amplifier**
Qin = 8 pC	**Rise and Fall Time and peak amplitude on G6 differential gain amplifier**
Qin = 50 pC	**Rise and Fall Time and peak amplitude on G1 differential gain amplifier**
Noise	**RMS output amplitude on G12 differential gain amplifier**

Start testing production : middle of September
(if production starts on middle of june)

TESTING HOUSES SUM UP (0)

	MICROTEC	ASAT	EDGETEK
TEST PROGRAM DEVELOPMENT	*€ 15 500,00*	*?*	*€ 12 000,00*
HARDWARE DEVELOPMENT	*€ 6 900,00*	*?*	
PRICE PER COMPONENT	*€ 0,27*	*?*	*€ 0,28*
TIME PER COMPONENT [s]	*10,00*	*?*	
TOTAL TIME [h]	*361,11*	*?*	
TOTAL COST	*€ 57 500,00*	*?*	*€ 48 400,00*
FORECAST TIME SCHEDULE after hardware dev	*5/6 weeks*		*>= 8 weeks*
Chip to be tested	*130 000*		*130 000*

TESTING HOUSES SUM UP (1)

- ASAT Europe business contact is currently overloaded
- Microtec and Edgetek appear to be very good candidates

	Strength	Weakness
Microtec	• Experienced • Already used inside CERN	•Flexibility ?
Edgetek	• IN2P3 partner for small quantities • French company • Flexibility for custom services • Price	• Background for high volume production

We would suggest to give to Microtec the MGPA production tests

TESTING CONCLUSION (MEETING 10 MAY CERN)

Buffer

Testing House : EDGETEK

Forecast Schedule :

- 100 buffers for June 10th
- 5000 buffers for July 15th

MGPA

Microtec or Edgetek but we are waiting the Asat's answer

Edgetek seems to be the best way to test the MGPA

Forecast Schedule :

- 1700 MGPA for july 15th
- Start testing production : middle of September