

## BPIX Module Testing Status - Week 15

16th April 2007

# Production overview

**Production Status:** 554 modules produced (483 / 71)

- 340/77 graded as A/B → 86% || 55/10 → 92%
- 66 graded as C → 14% || 6 → 8%

## Module Testing Report of Week 15:

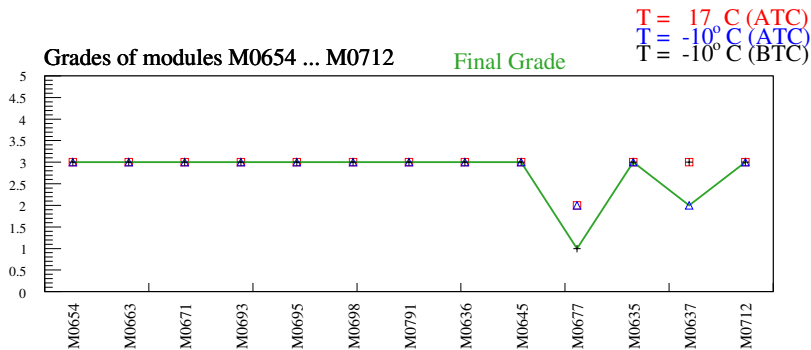
- 13/0 modules fully tested and therm. cycled (0 retested)

|                    | Modules |   |   | Half-Modules |   |   |
|--------------------|---------|---|---|--------------|---|---|
| Grade              | A       | B | C | A            | B | C |
| T = -10° C, BTC*   | 12      | 0 | 1 | 0            | 0 | 0 |
| T = -10° C, ATC    | 11      | 2 | 0 | 0            | 0 | 0 |
| T = +17° C, ATC    | 12      | 1 | 0 | 0            | 0 | 0 |
| <b>Final Grade</b> | 11      | 1 | 1 | 0            | 0 | 0 |

- no retests with new DAC settings

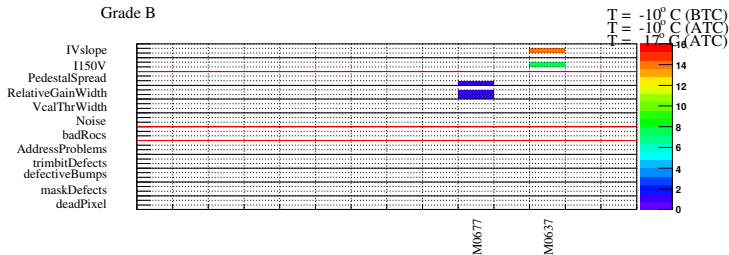
\*without IV-criteria

# Production summary

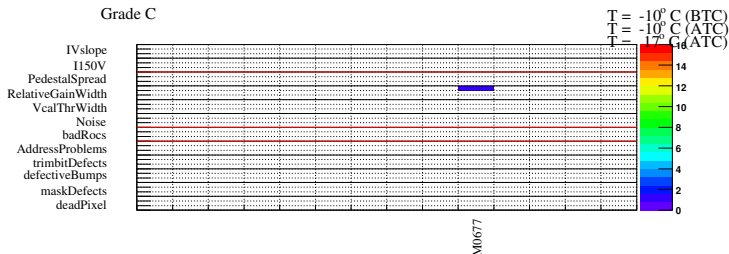


# Module Failures Overview

Grade B



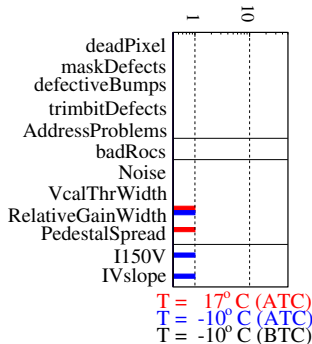
Grade C



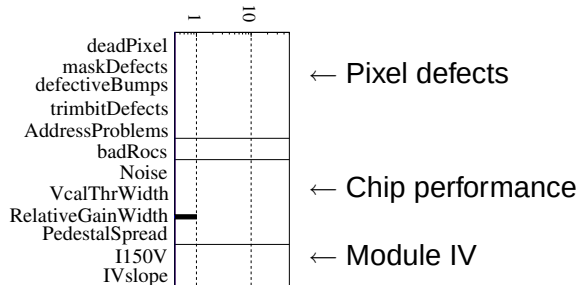
# Production quality

## Chip Failures

Grade B  
Grade B



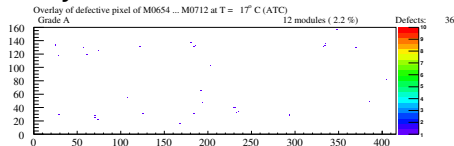
Grade C  
Grade C



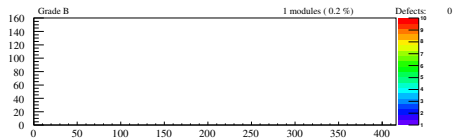
# Defective pixel $T = 17^{\circ}\text{C}$ (ATC)

Overlay of all fully tested modules at  $T = +17^{\circ}\text{C}$  (ATC)

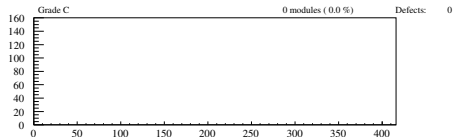
Grade A  
(12 modules)



Grade B  
(1 modules)



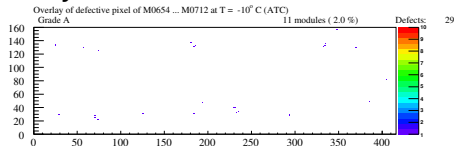
Grade C  
(0 modules)



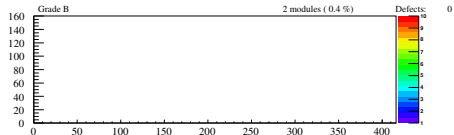
# Defective pixel $T = -10^{\circ}\text{C}$ (ATC)

Overlay of all fully tested modules at  $T = -10^{\circ}\text{C}$  (ATC)

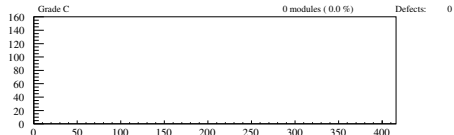
Grade A  
(11 modules)



Grade B  
(2 modules)



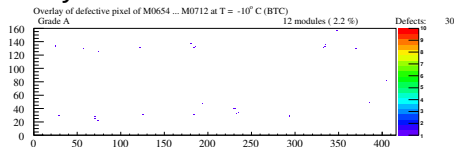
Grade C  
(0 modules)



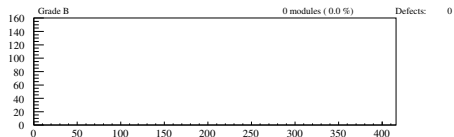
# Defective pixel $T = -10^{\circ}\text{C}$ (BTC)

Overlay of all fully tested modules at  $T = -10^{\circ}\text{C}$  (BTC)

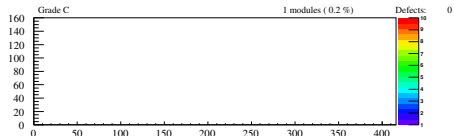
Grade A  
(12 modules)



Grade B  
(0 modules)



Grade C  
(1 modules)

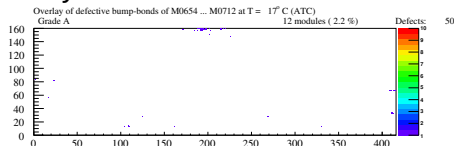




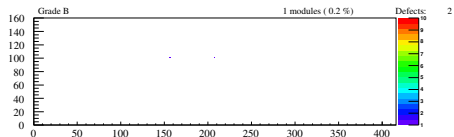
# Defective bump-bonds $T = 17^{\circ}\text{C}$ (ATC)

Overlay of all fully tested modules at  $T = +17^{\circ}\text{C}$  (ATC)

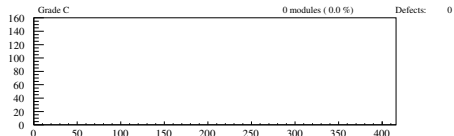
Grade A  
(12 modules)



Grade B  
(1 modules)



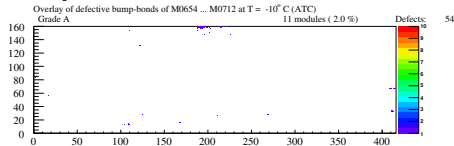
Grade C  
(0 modules)



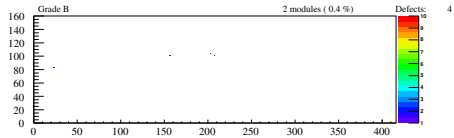
# Defective bump-bonds $T = -10^{\circ}\text{C}$ (ATC)

Overlay of all fully tested modules at  $T = -10^{\circ}\text{C}$  (ATC)

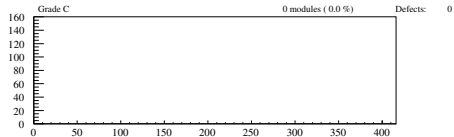
Grade A  
(11 modules)



Grade B  
(2 modules)



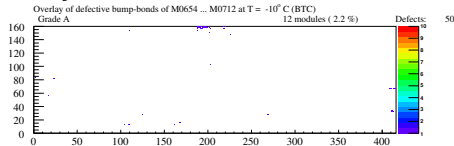
Grade C  
(0 modules)



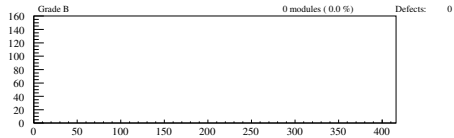
# Defective bump-bonds $T = -10^{\circ}\text{C}$ (BTC)

Overlay of all fully tested modules at  $T = -10^{\circ}\text{C}$  (BTC)

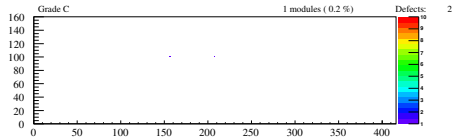
Grade A  
(12 modules)



Grade B  
(0 modules)



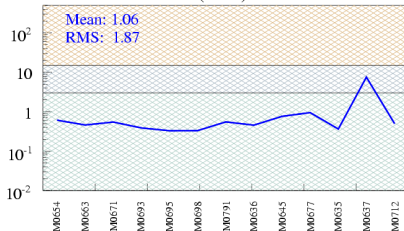
Grade C  
(1 modules)



# Current at 150 V

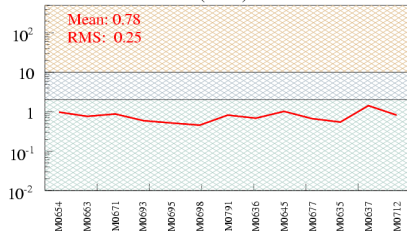
Current at 150 V (in  $\mu\text{A}$ ) at  $T = 17^\circ\text{C}$  and  $T = -10^\circ\text{C}$

I150V at T =  $-10^\circ\text{C}$  (ATC)



recalculated

I150V at T =  $17^\circ\text{C}$  (ATC)

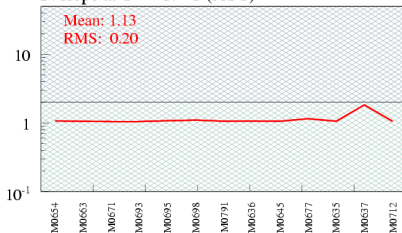


measured

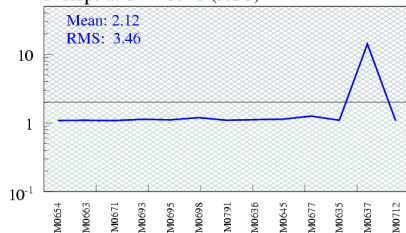
# Slope of IV-Curve

Slope of IV-Curve at  $T = 17^{\circ}\text{C}$  and  $T = -10^{\circ}\text{C}$

IVslope at  $T = 17^{\circ}\text{C}$  (ATC)

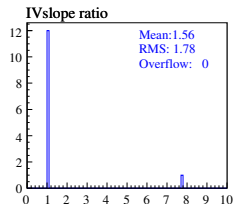
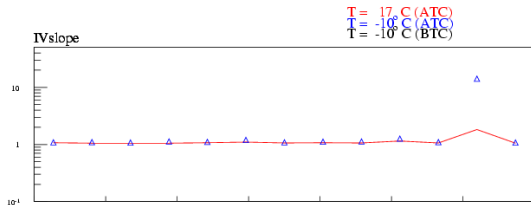
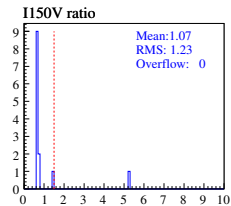
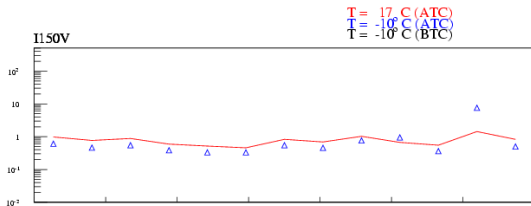


IVslope at  $T = -10^{\circ}\text{C}$  (ATC)



# Current recalculation to $T = 17^{\circ}\text{C}$

## Cross check of recalculated values with measured values

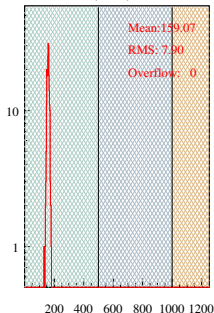


# Noise

## MeanNoise of chips

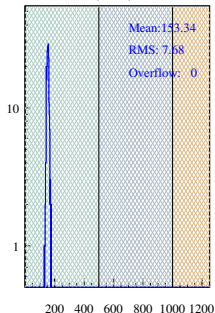
Noise

T = 17° C (ATC)

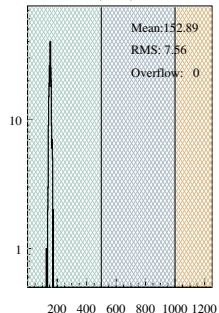


Modules: M0654 ... M0712

T = -10° C (ATC)



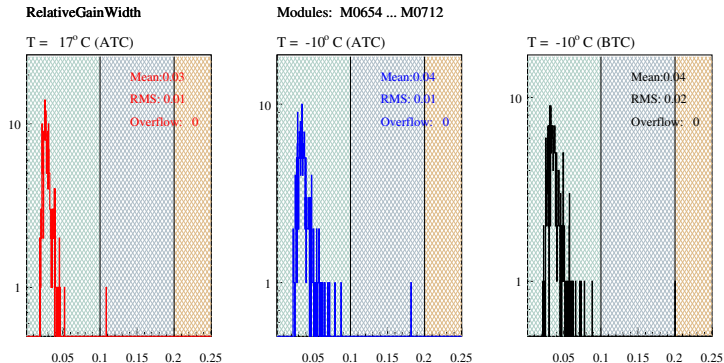
T = -10° C (BTC)



Noise in  $e^-$

# Relative Gain Width

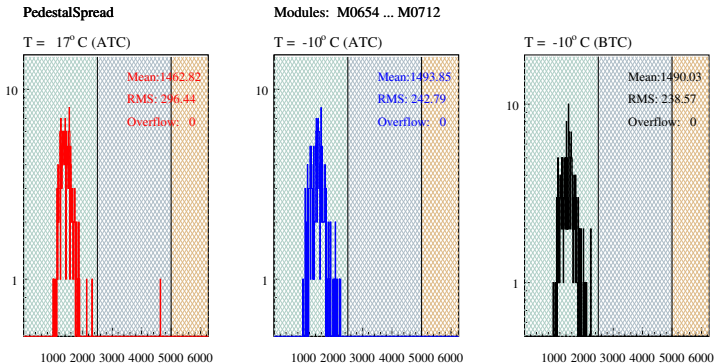
## RelativeGainWidth of chips





# Pedestal Spread

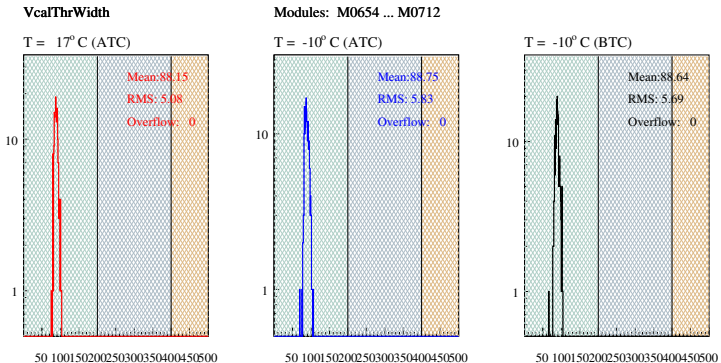
## PedestalSpread of chips



Pedestal Spread in  $e^-$

# Vcal Threshold Width

## VcalThresholdWidth of chips

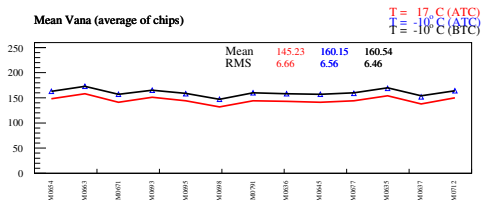


Vcal Thr. Width in  $e^-$

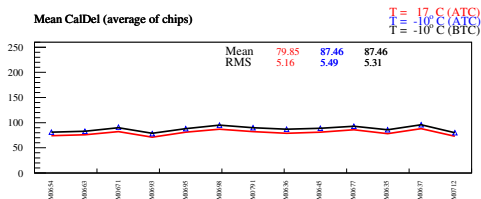
# Operational parameters I

## Mean DACs I

Mean Vana (average of chips)



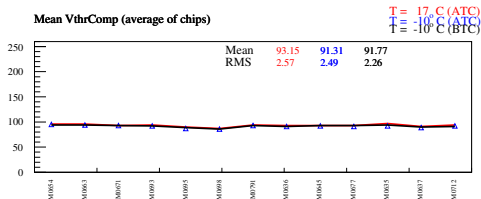
Mean CalDel (average of chips)



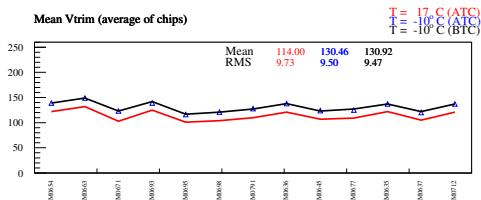
# Operational parameters II

## Mean DACs II

Mean VthrComp (average of chips)



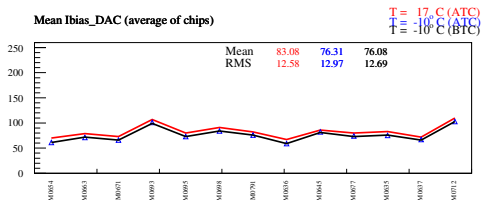
Mean Vtrim (average of chips)



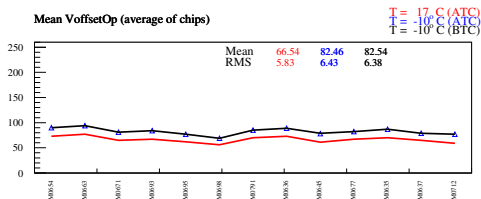
# Operational parameters III

## Mean DACs III

Mean Ibias\_DAC (average of chips)

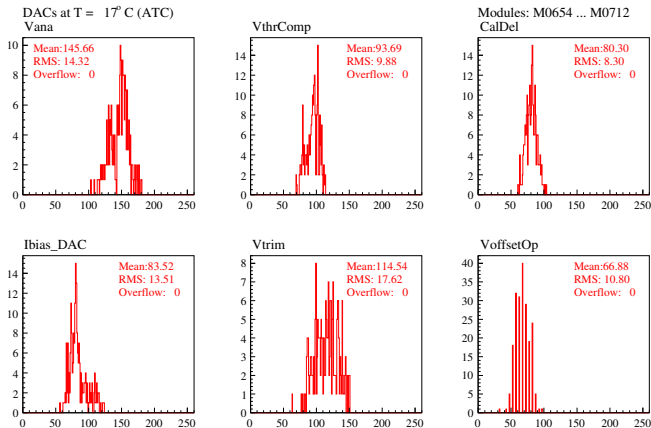


Mean VoffsetOp (average of chips)



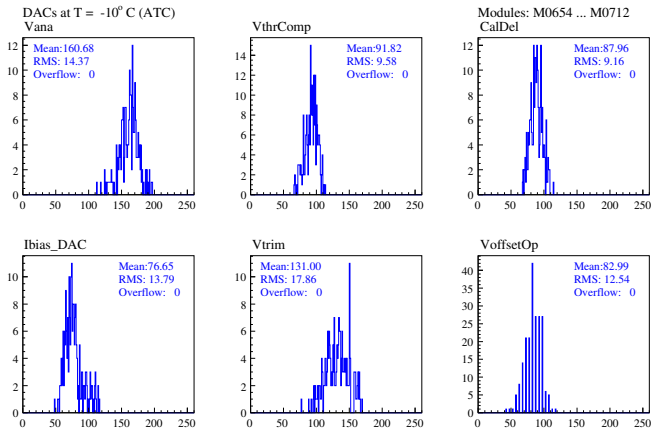
# Operational parameters at $T = +17^{\circ}\text{C}$ (ATC)

## DAC distribution (of chips)



# Operational parameters at $T = -10^{\circ}\text{C}$ (ATC)

## DAC distribution (of chips)



# Operational parameters at $T = +17^{\circ}\text{C}$ (BTC)

## DAC distribution (of chips)

