

BPIX Module Testing Status - Week 47

10th January 2007

Production Status: 251 modules produced (248 / 3)

- 172/32 graded as A/B → 81%
- 47 graded as C → 19%

Module Testing Report of Week 47:

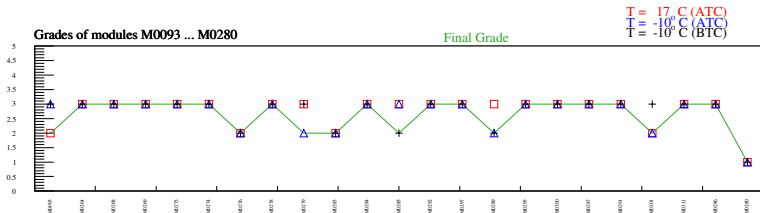
- 23/— modules fully tested and therm. cycled (3 retested)

	Modules			Half-Modules		
Grade	A	B	C	A	B	C
T = -10° C, BTC*	18	4	1	—	—	—
T = -10° C, ATC	17	5	1	—	—	—
T = $+17^{\circ}$ C, ATC	18	4	1	—	—	—
Final Grade	15	7	1	—	—	—

- 8 were retested with new DAC settings (1 change)
+ M0090: B → A → overall grades

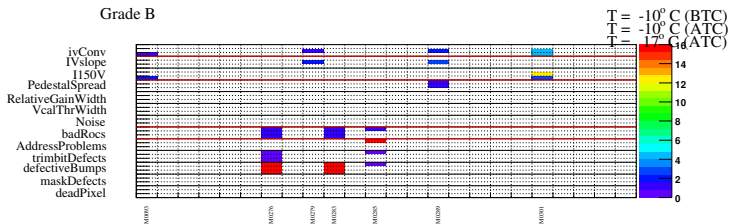
*without IV-criteria

Production summary

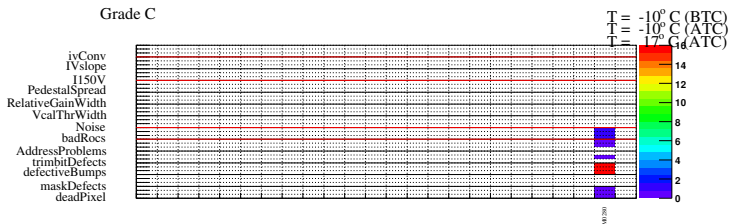


Module Failures Overview

Grade B



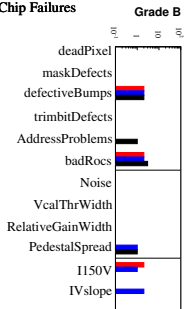
Grade C



Production quality

Grade B

Chip Failures

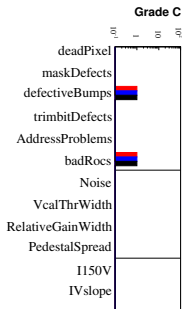


T = 17° C (ATC)

T = -10° C (ATC)

T = -10° C (BTC)

Grade C Failures



← Pixel defects

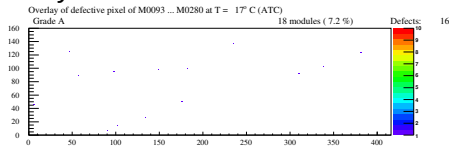
← Chip performance

← Module IV

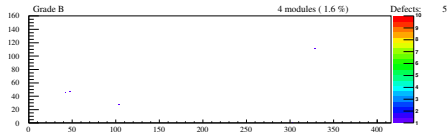
Defective pixel $T = 17^{\circ}\text{C}$ (ATC)

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

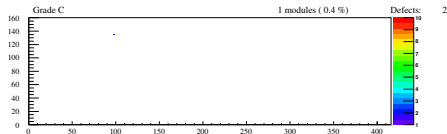
Grade A
(18 modules)



Grade B
(4 modules)



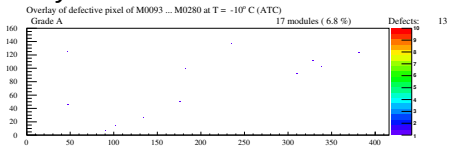
Grade C
(1 modules)



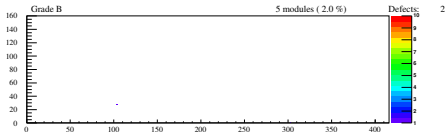
Defective pixel $T = -10^{\circ}\text{C}$ (ATC)

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

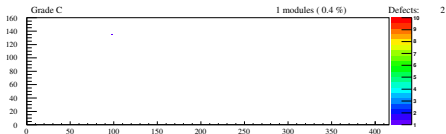
Grade A
(17 modules)



Grade B
(5 modules)



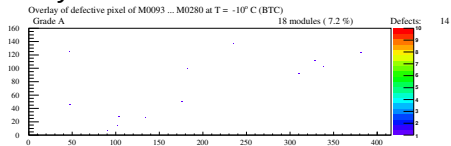
Grade C
(1 modules)



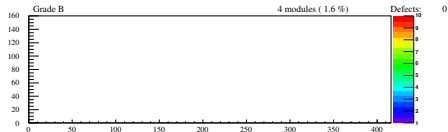
Defective pixel $T = -10^{\circ}\text{C}$ (BTC)

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

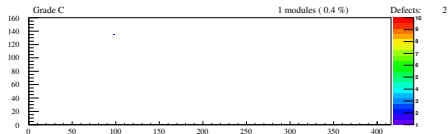
Grade A
(18 modules)



Grade B
(4 modules)



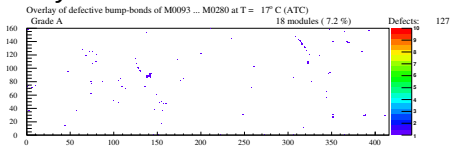
Grade C
(1 modules)



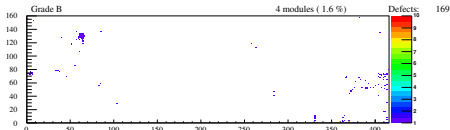
Defective bump-bonds $T = 17^{\circ}\text{C}$ (ATC)

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

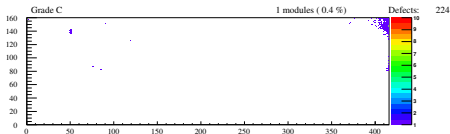
Grade A
(18 modules)



Grade B
(4 modules)



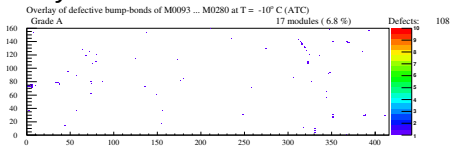
Grade C
(1 modules)



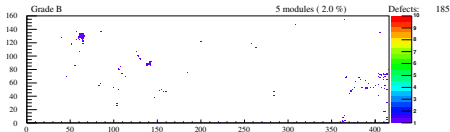
Defective bump-bonds $T = -10^{\circ}\text{C}$ (ATC)

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

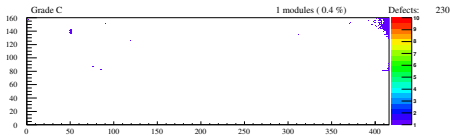
Grade A
(17 modules)



Grade B
(5 modules)



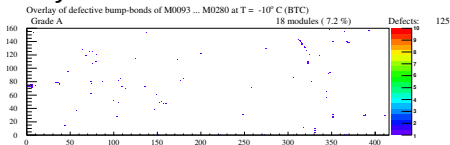
Grade C
(1 modules)



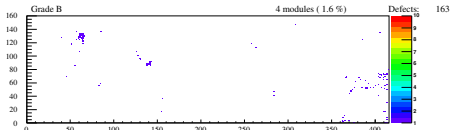
Defective bump-bonds $T = -10^{\circ}\text{C}$ (BTC)

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

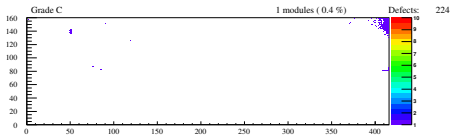
Grade A
(18 modules)



Grade B
(4 modules)



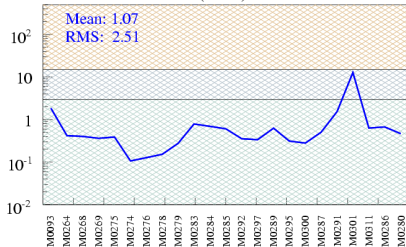
Grade C
(1 modules)



Current at 150 V

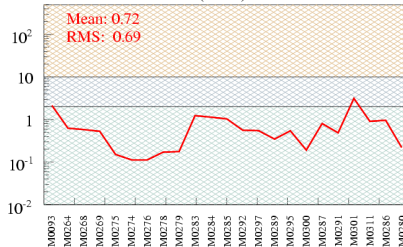
Current at 150 V (in μA) at $T = 17^\circ\text{C}$ and $T = -10^\circ\text{C}$

I150V at T = -10°C (ATC)



recalculated

I150V at T = 17°C (ATC)

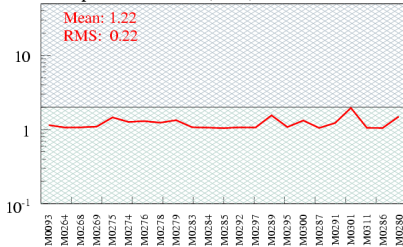


measured

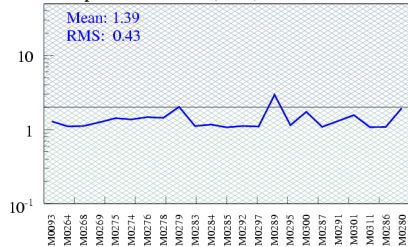
Slope of IV-Curve

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)

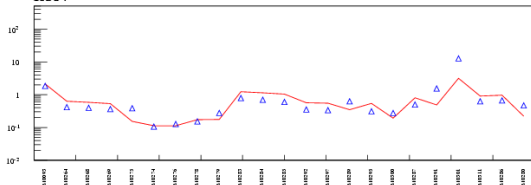


Current recalculation to $T = 17^{\circ}\text{C}$

Cross check of recalculated values with measured values

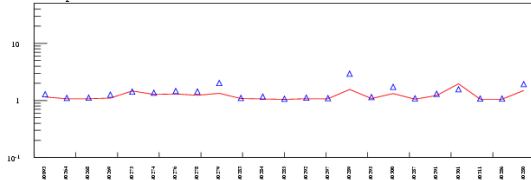
$T = 17^{\circ}\text{C}$ (ATC)
 $T = -10^{\circ}\text{C}$ (ATC)
 $T = -10^{\circ}\text{C}$ (BTC)

I150V

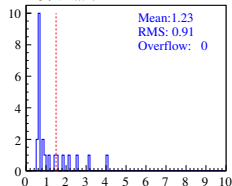


$T = 17^{\circ}\text{C}$ (ATC)
 $T = -10^{\circ}\text{C}$ (ATC)
 $T = -10^{\circ}\text{C}$ (BTC)

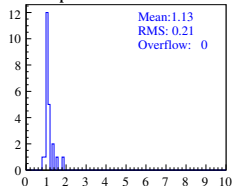
IVslope



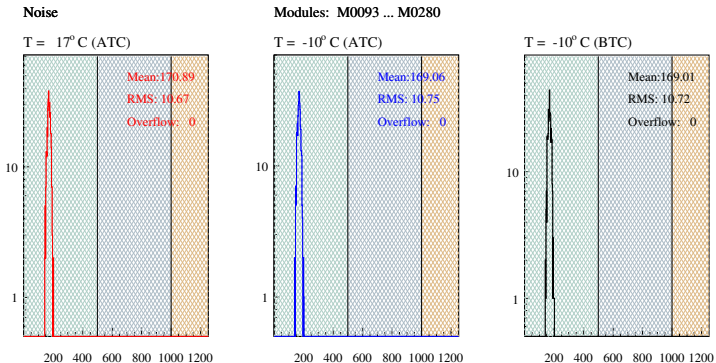
I150V ratio



IVslope ratio

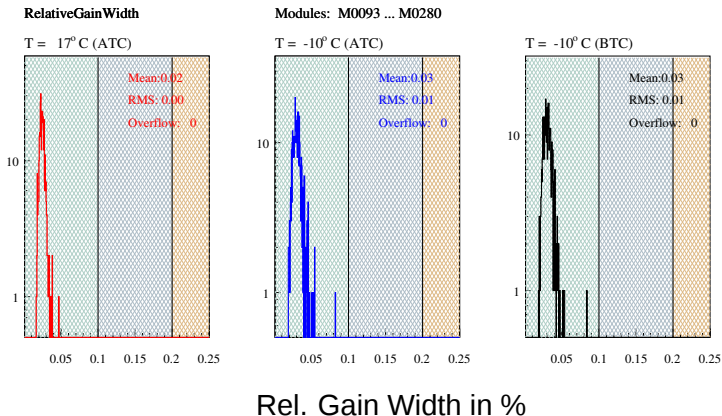


MeanNoise of chips

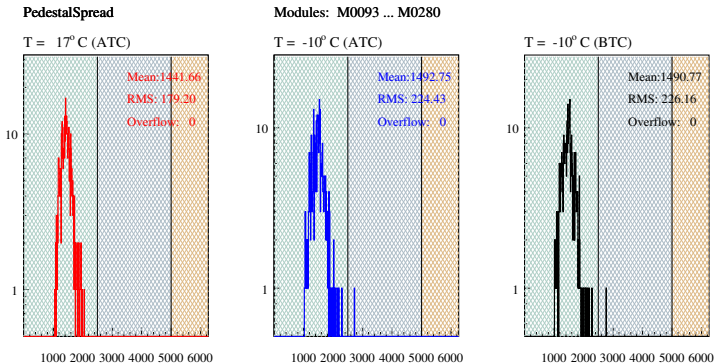


Noise in e^-

RelativeGainWidth of chips



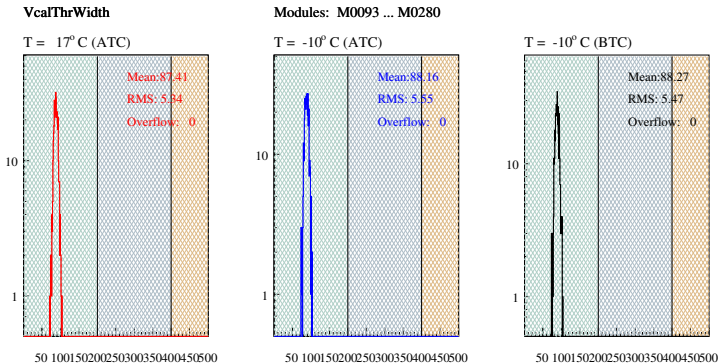
PedestalSpread of chips



Pedestal Spread in e^-

Vcal Threshold Width

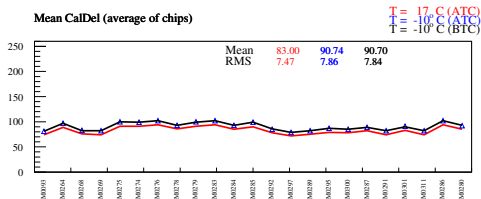
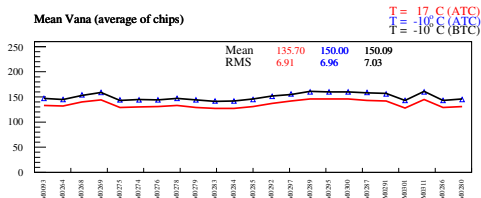
VcalThresholdWidth of chips



Vcal Thr. Width in e^-

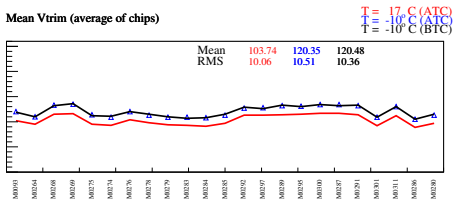
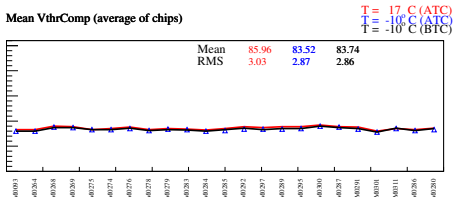
Operational parameters I

Mean DACs I



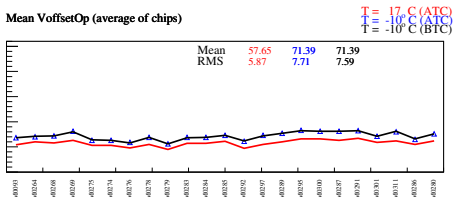
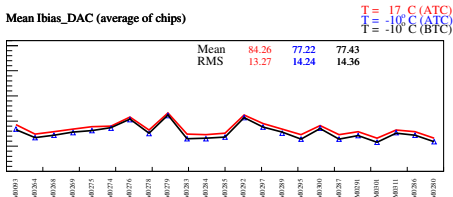
Operational parameters II

Mean DACs II



Operational parameters III

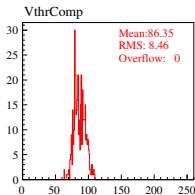
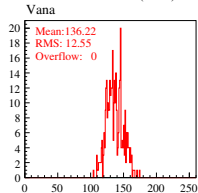
Mean DACs III



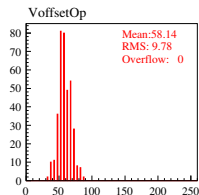
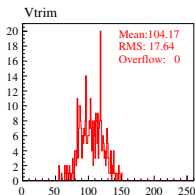
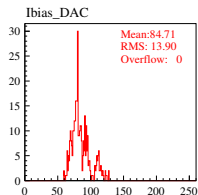
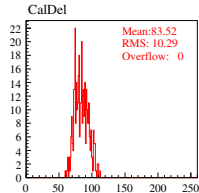
Operational parameters at $T = +17^{\circ}\text{C}$ (ATC)

DAC distribution (of chips)

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

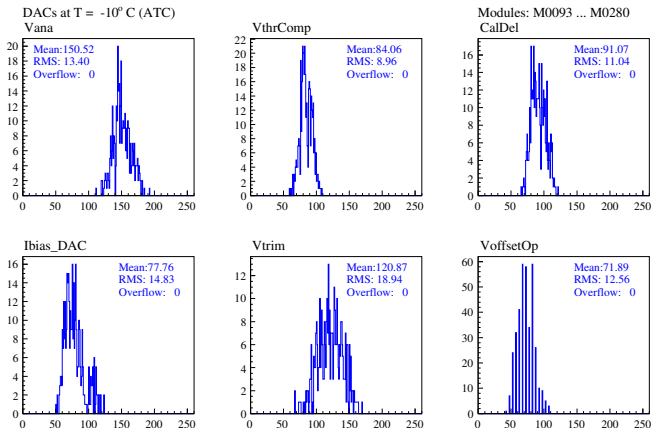


Modules: M0093 ... M0280



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

DAC distribution (of chips)

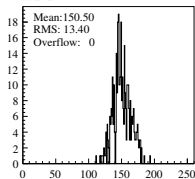


Operational parameters at $T = +17^{\circ}\text{C}$ (BTC)

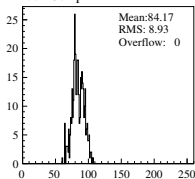
DAC distribution (of chips)

DACs at $T = -10^{\circ}\text{C}$ (BTC)

Vana

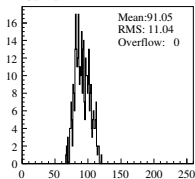


VthrComp

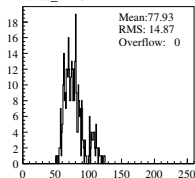


Modules: M0093 ... M0280

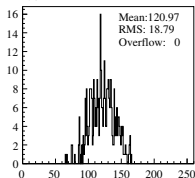
CalDel



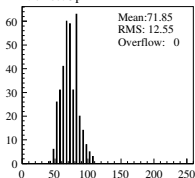
Ibias_DAC



Vtrim

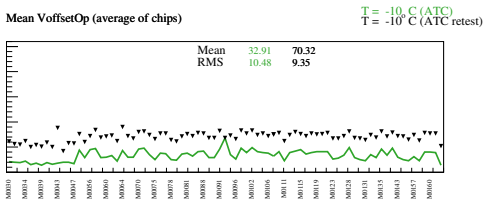
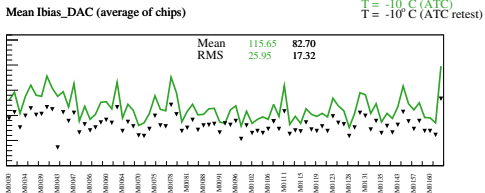


VoffsetOp



Operational parameters

Mean DACs I

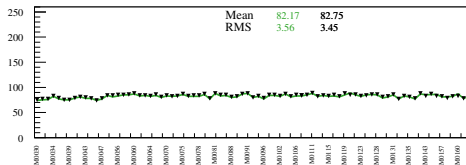


Operational parameters

Mean DACs II

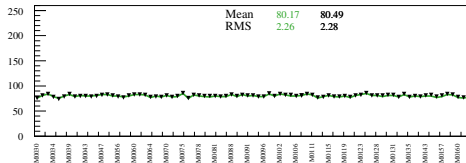
Mean VthrComp (average of chips)

T = -10. C (ATC)
T = -10° C (ATC retest)



Mean CalDel (average of chips)

T = -10. C (ATC)
T = -10° C (ATC retest)

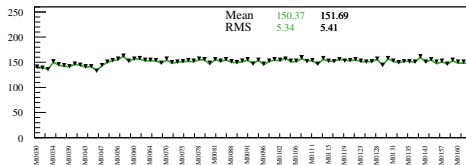


Operational parameters

Mean DACs III

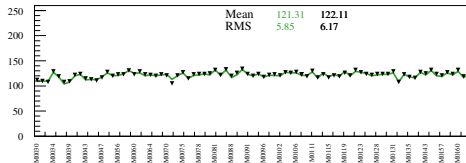
Mean Vana (average of chips)

T = -10° C (ATC)
T = -10° C (ATC retest)



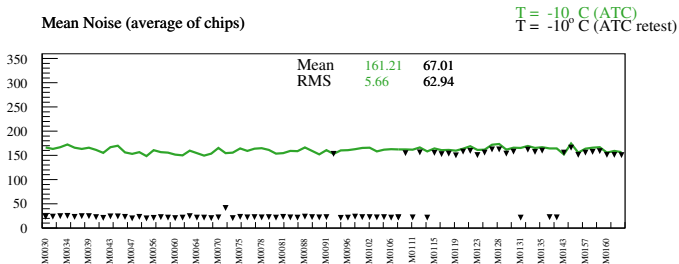
Mean Vtrim (average of chips)

T = -10° C (ATC)
T = -10° C (ATC retest)



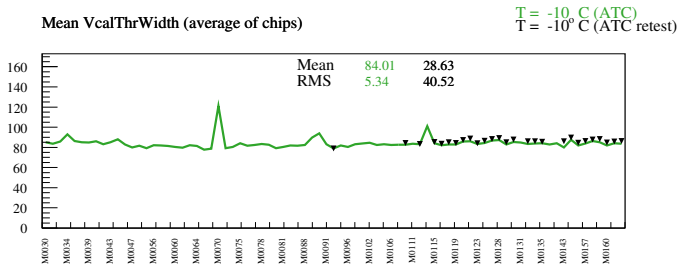
Performance parameters

Mean **Noise** [e^-] vs. Module Nr.



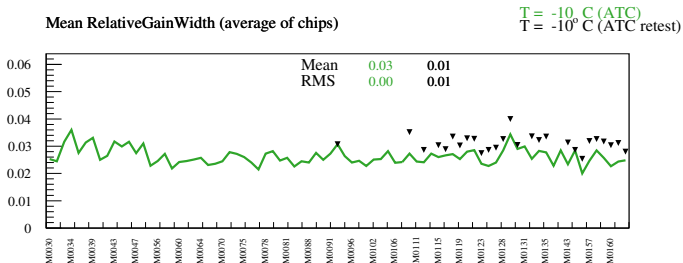
Performance parameters

Mean **VcalThresholdWidth** [e^-] vs. Module Nr.



Performance parameters

Mean **RelativeGainWidth** [%] vs. Module Nr.



Performance parameters

Mean **PedestalSpread** in $[e^-]$ vs. Module Nr.

