First Express Line Resuls

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IV before bonding

Express line hybrid behaviour
pedestals, noise & calibration

Bonding statistics

Overview of module behaviour
pedestals, noise & calibration

Conclusions

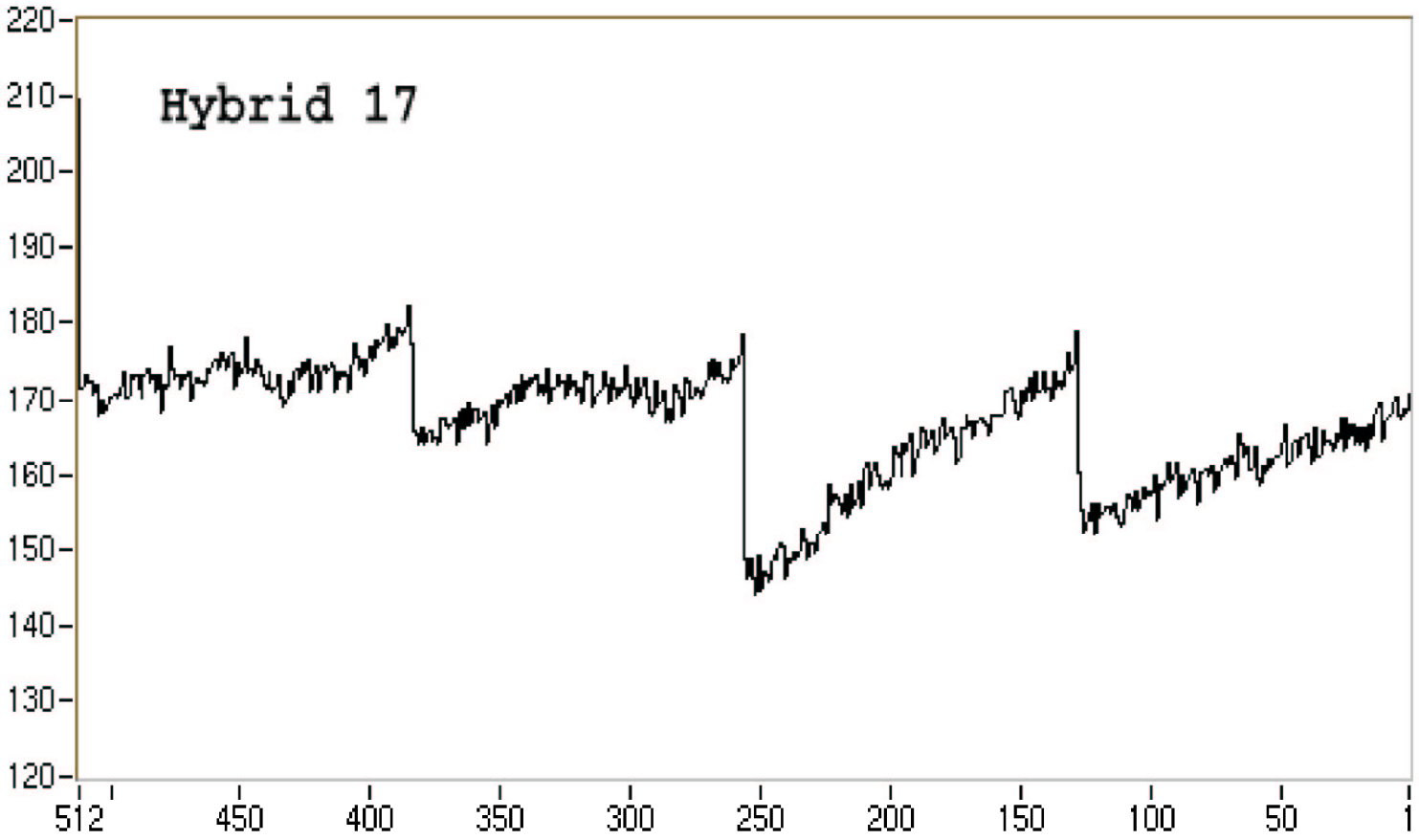
IV before bonding

Leakage current at bias voltage of 550 V

Module	Hybrid	W6B [uA]	W6A [uA]
EL 01	17	0,29	0,30
EL 06	48	0,76	0,34
EL 13	22	4,00	0,90
EL 04	20	0,27	0,33
EL 14	23	0,95	0,31
EL 09	56	0,26	0,32
EL 07	27	0,29	0,33
EL 08	26	0,31	0,42
EL 05	12	1,28	0,81
EL 02	29	**11,60**	0,30

Taken at QTC station

Hybrid Pedestals

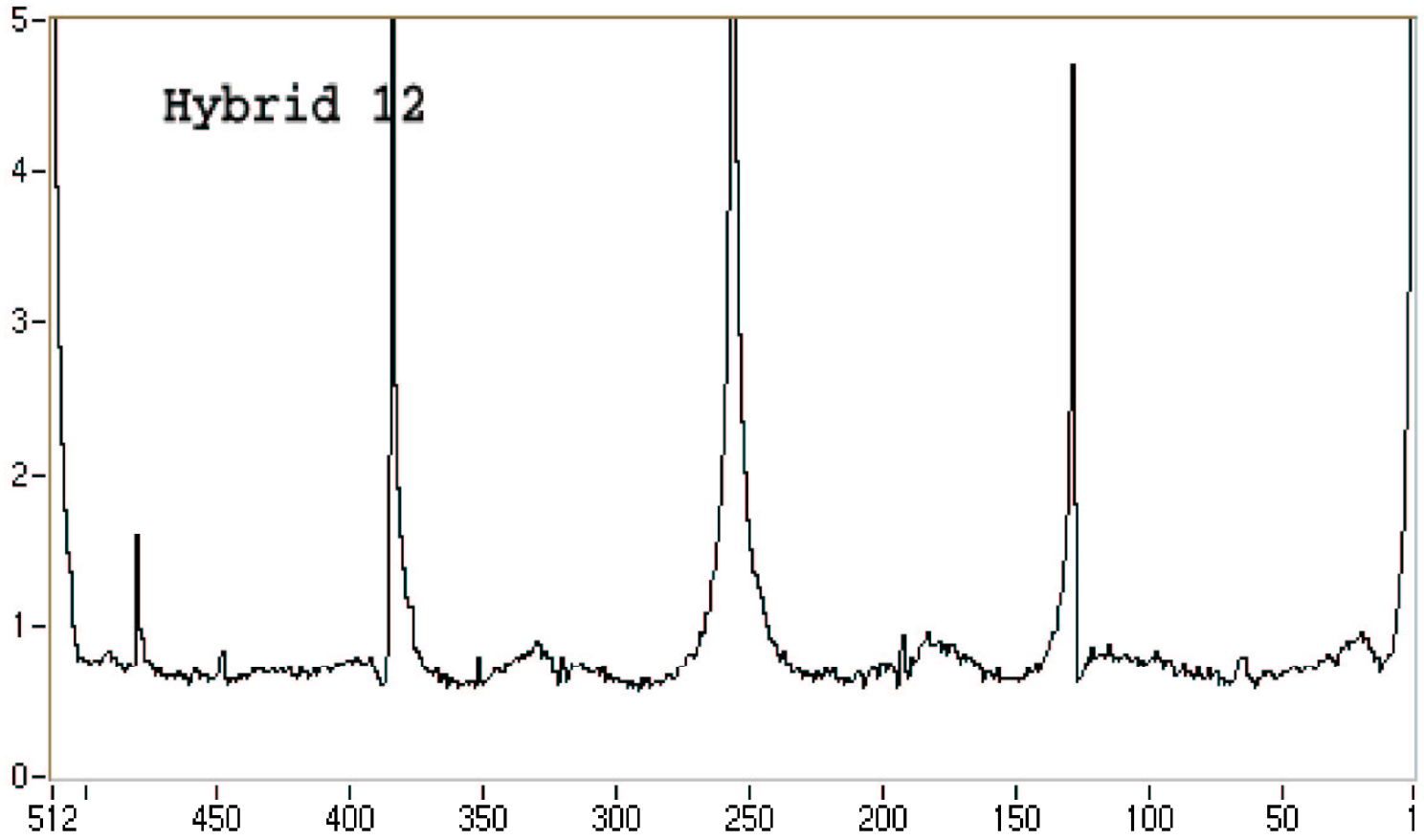


Taken with

- default apv25 settings

Peak mode

Hybrid Noise

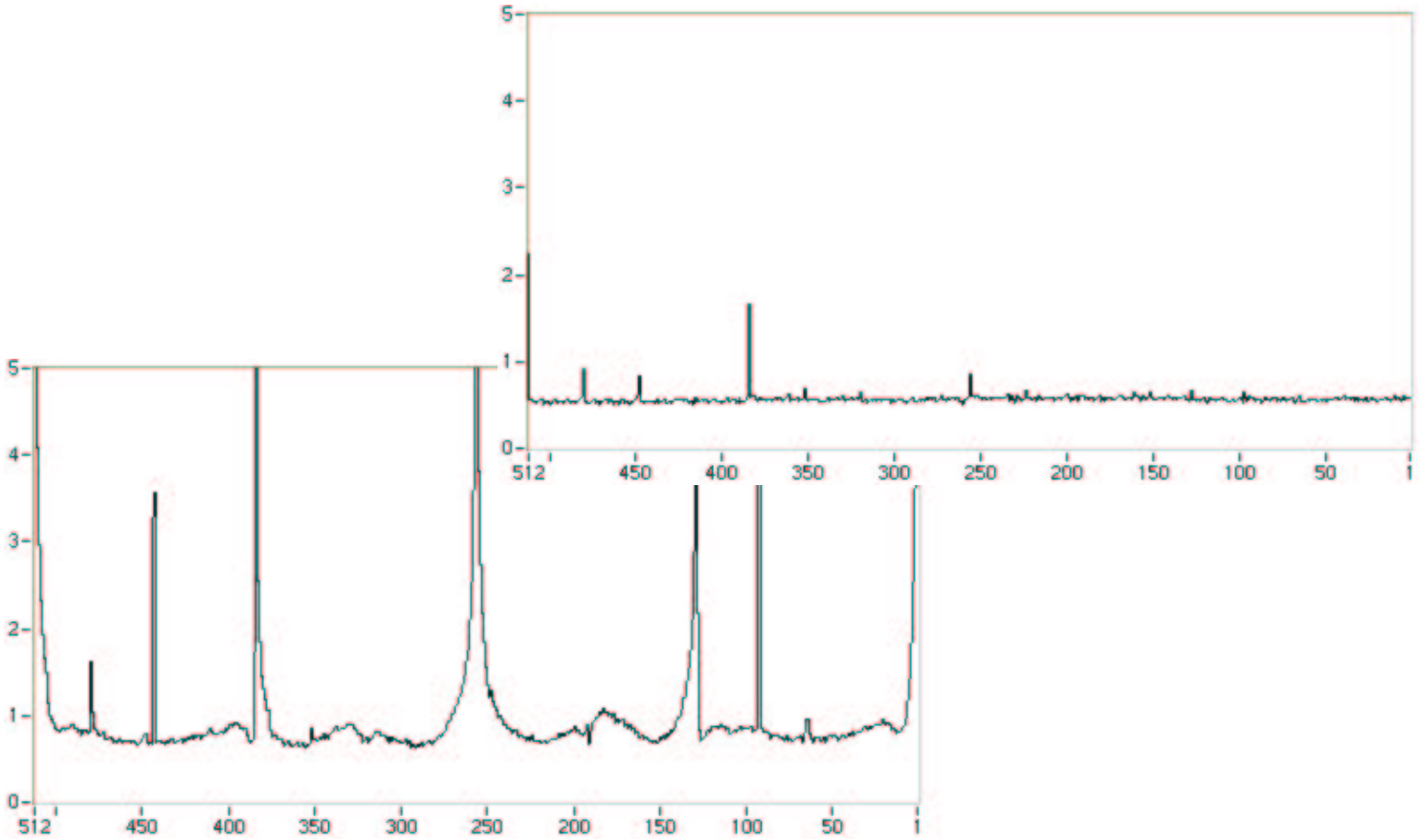


Taken with

- Default apv25 settings

Peak mode

Hybrid noise
with and without Pitchadapter



Taken with

- Default apv25 settings

Peak mode

Bonding statistics

Leakage currents

Module	Module	Bonding		Comments
		Sen−Sen	Sen−PA	
EL 01	17	17 redone	Ok	
EL 06	48	8 redone	Ok	
EL 13	22	4 redone	Ok	
EL 04	20	Ok	Ok	
EL 14	23	11 redone	Ok	
EL 09	56	12 redone	Ok	
EL 07	27	11 redone	1 redone	
EL 08	26	Ok	Ok	Sen−PA 480 missing
EL 05	12	Ok	2 redone	Sen−PA 1 **?** 2missing
EL 02	29	3redone	2 redone	

Sensor currents
taken at QTC station

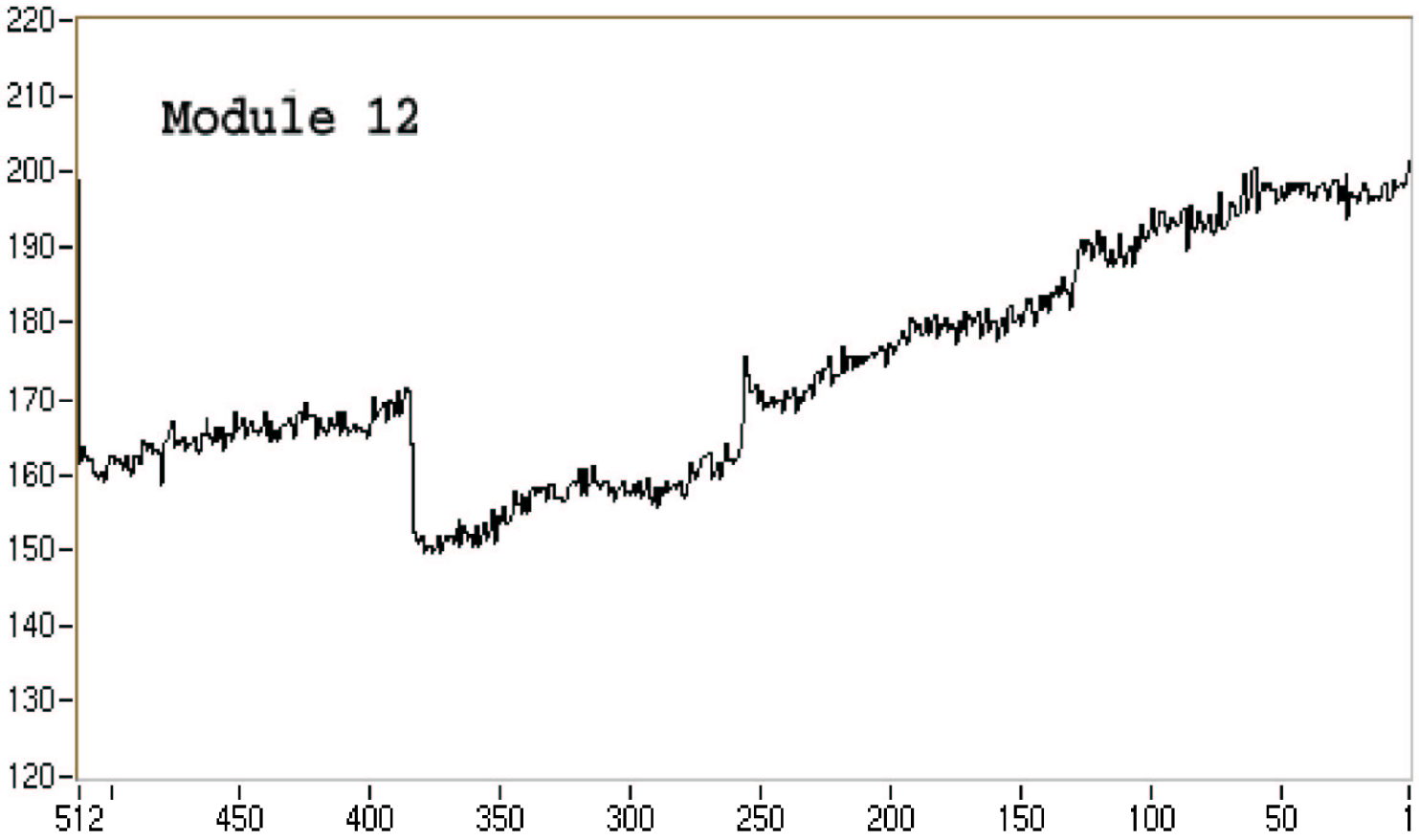
IV after bonding

Leakage currents

Module	Hybrif	W6B [uA] 550 V	W6A [uA] 550 V	Ileak [uA] 500 V	Ileak [uA] 300 V
EL 01	17	0,29	0,30	1,45	0,62
EL 06	48	0,76	0,34	1,09	0,96
EL 13	22	4,00	0,90	1,32	1,41
EL 04	20	0,27	0,33		0,84
EL 14	23	0,95	0,31	0,96	0,92
EL 09	56	0,26	0,32	**Break down**	0,81
EL07	27	0,29	0,33		0,78
EL 08	26	0,31	0,42		0,72
EL 05	12	1,28	0,81		0,93
EL 02	29	**11,60**	0,30		0,76

Sensor currents
taken at QTC station

Module Pedestals

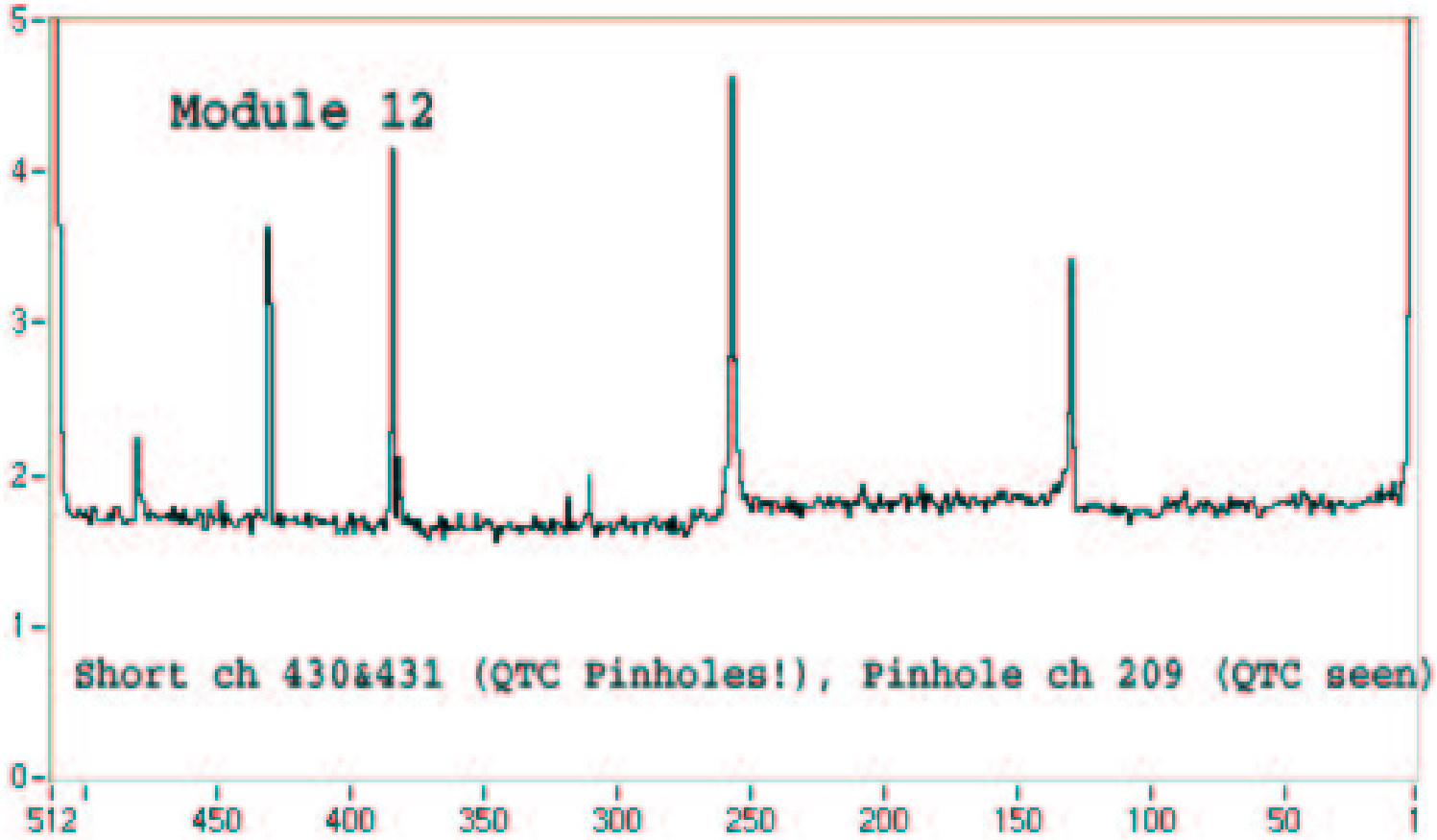


Peak mode

Taken with

- default apv25 settings
- depleation voltage of 300 V
- Ileak below 1 uA

Module Noise

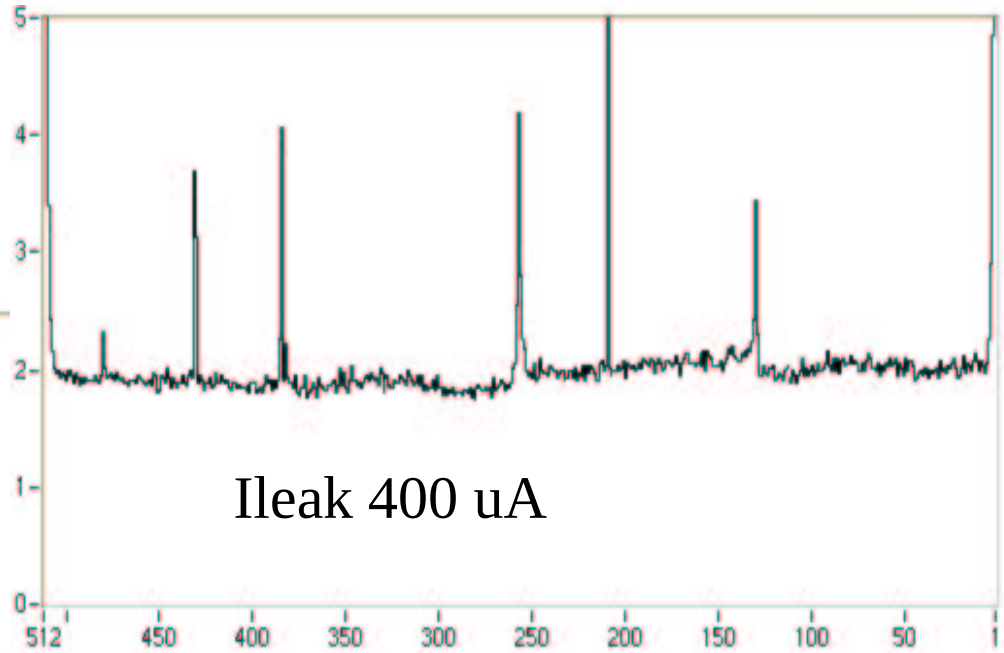


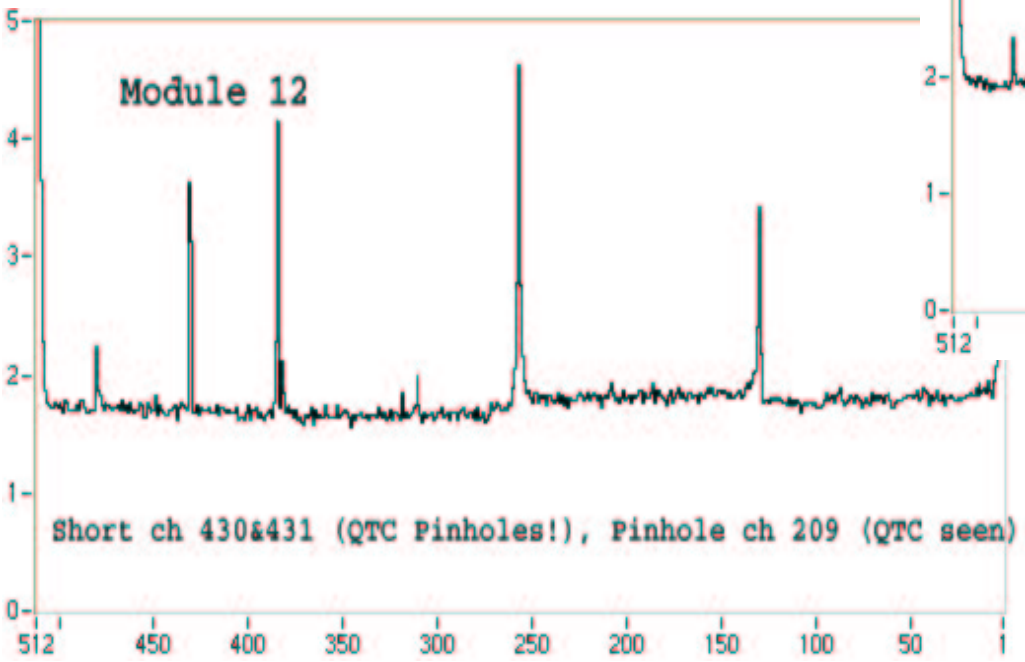
Peak mode

Taken with

- Default apv25 settings
- depleation voltage of 300 V
- Ileak below 1 uA

Module Noise



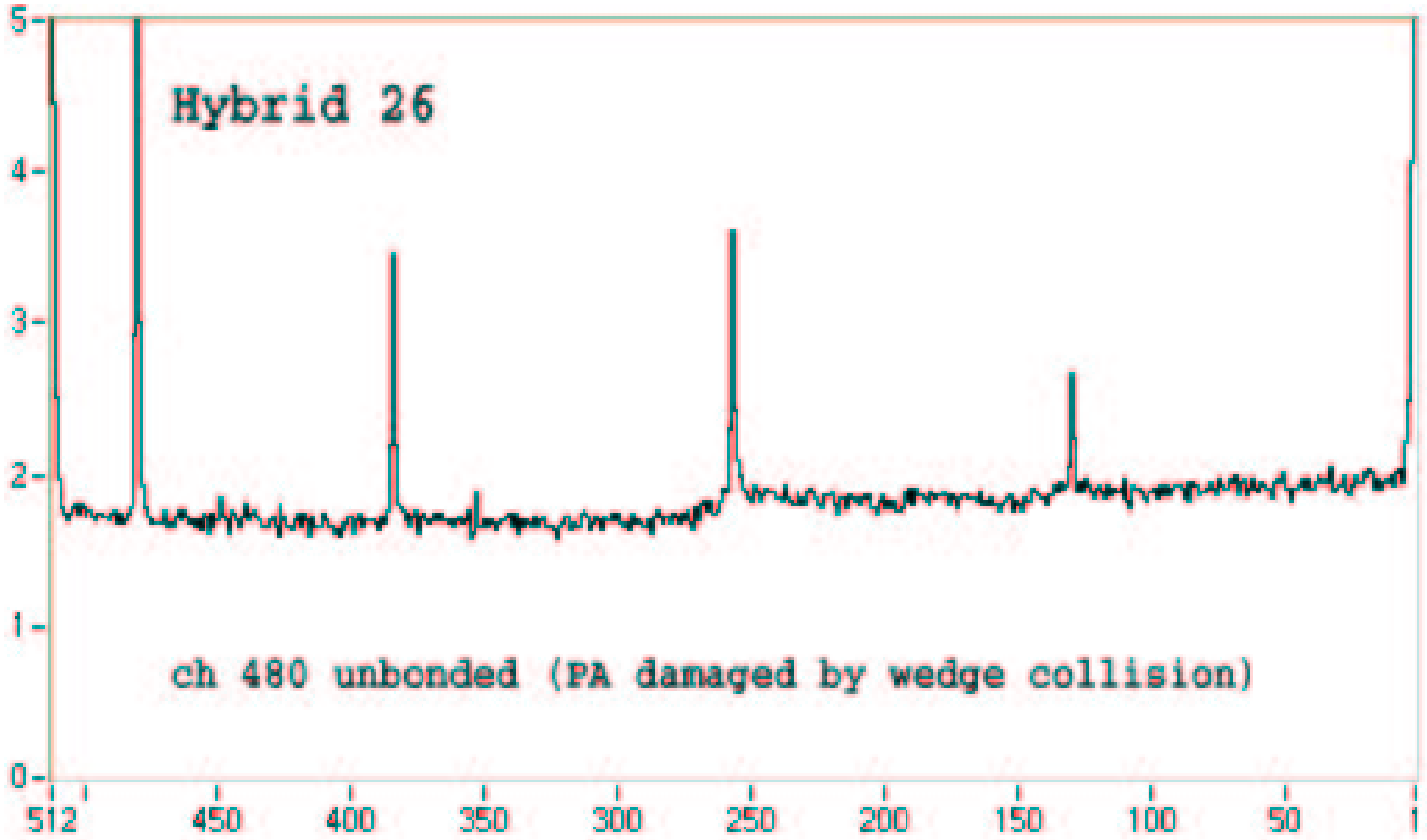


Peak mode

Taken with

- Default apv25 settings
- depleation voltage of 300 V
- Ileak below 1 uA

Module Noise

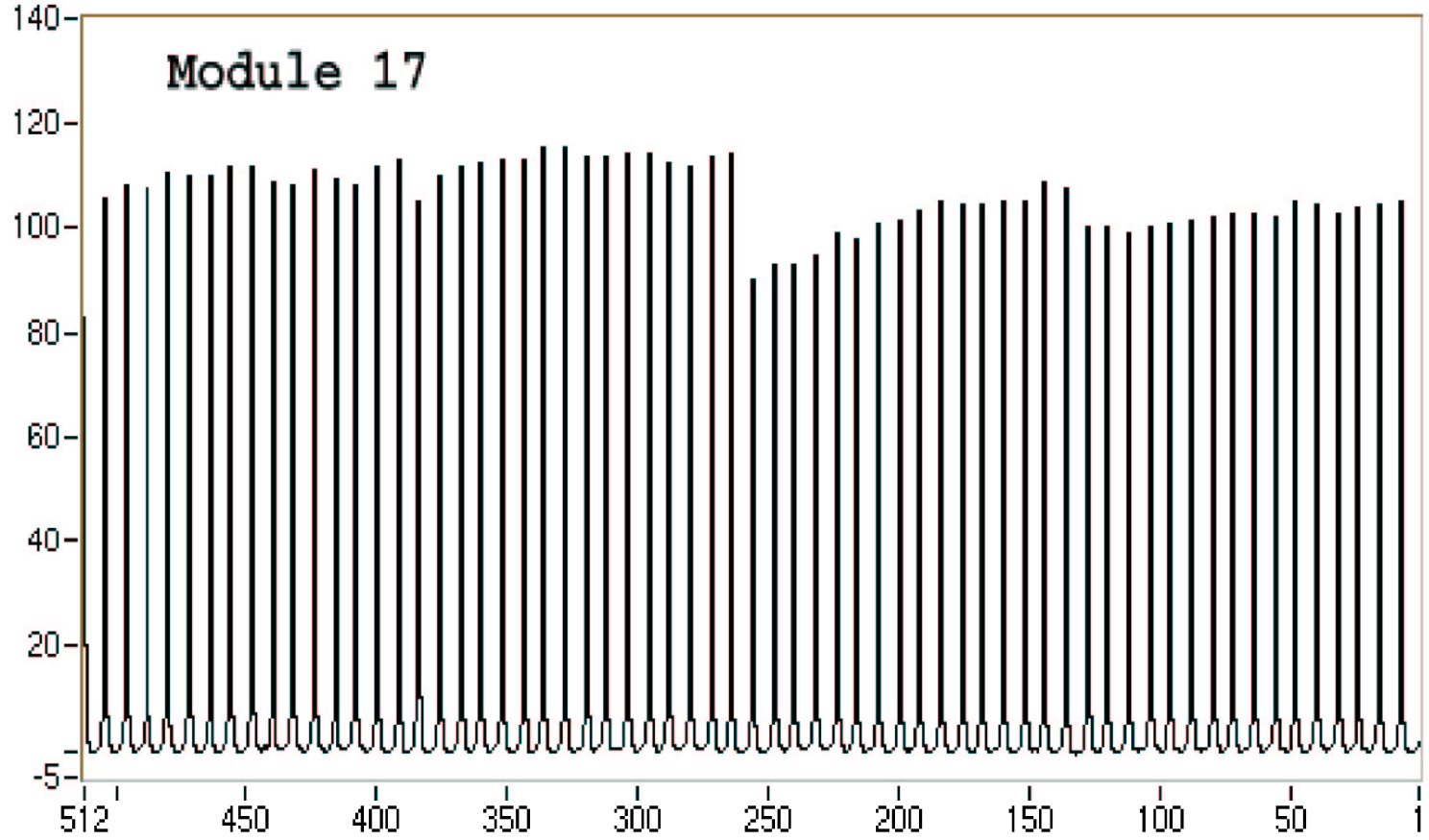


Peak mode

Taken with

- Default apv25 settings
- depleation voltage of 300 V
- Ileak below 1 uA

Module Calibration



Peak mode

Taken with

- Default apv25 settings
- depleation voltage of 300 V
- Ileak below 1 uA

Noise statistics

of noisy strips (1.6 sigma cut)

Module	Module	Peak	Decon.	Grad
EL 01	17	16	11	Failed
EL 06	48	12	9	B
EL 13	22	12	9	Failed
EL 04	20	13	8	B
EL 14	23	8	8	B
EL 09	56	8	8	B
EL 07	27	17	13	Failed
EL 08	26	10	11	Failed
EL 05	12	14	10	B
EL 02	29	12	13	Failed

Defect statistics

Module	Hybrid	Defect description
EL 01	17	2 shorts on hybrid
EL 06	48	Pinhole ch 9 W6B (QTC seen)
EL 13	22	Pinhole ch 318 W6A (unbonded)
EL 04	20	
EL 14	23	
EL 09	56	
EL 07	27	Pinhole ch 93, 248
EL 08	26	Ch 480 Sen−PA missing Wedge collision
EL 05	12	Short 430,431 (QTC pinholes) Pinhole ch 209 (QTC seen)
EL 02	29	Pinhole ch 7 (QTC seen) Missing bond ch 189

Conclusion

- Module test system is running stable
- Hybrids have too many noisy channels at apv25 borders

  −> Will grade all modules B or out of specs !
- Only one defect showed up:

  Channel 318 on module 22 got a pinhole
- Leakage currents under control

  But IV during Fast Test has only limited significance