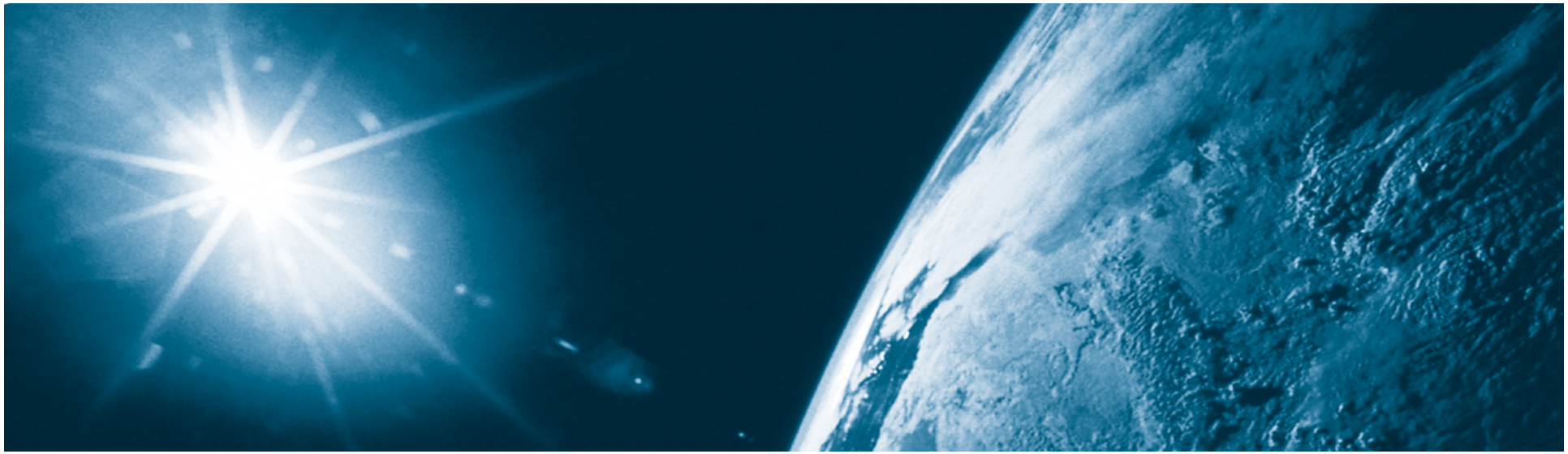
Nuvonyx Europe

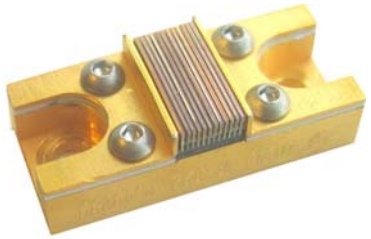


Stacked Arrays:
New performances and Reliability

Content

- Introduction: main objectives
- Endurance
- Thermal cycling
- Conclusion

Expertise on QCW Stacks for Space



- **Endurance tests: QCW, ‘burst,…**
- **Vibrations & Shocks**
- **Tests under Vacuum**
- **Test under radiations**

Developement of stacked QCW arrays for Space applications

Reliability: endurance and robustness

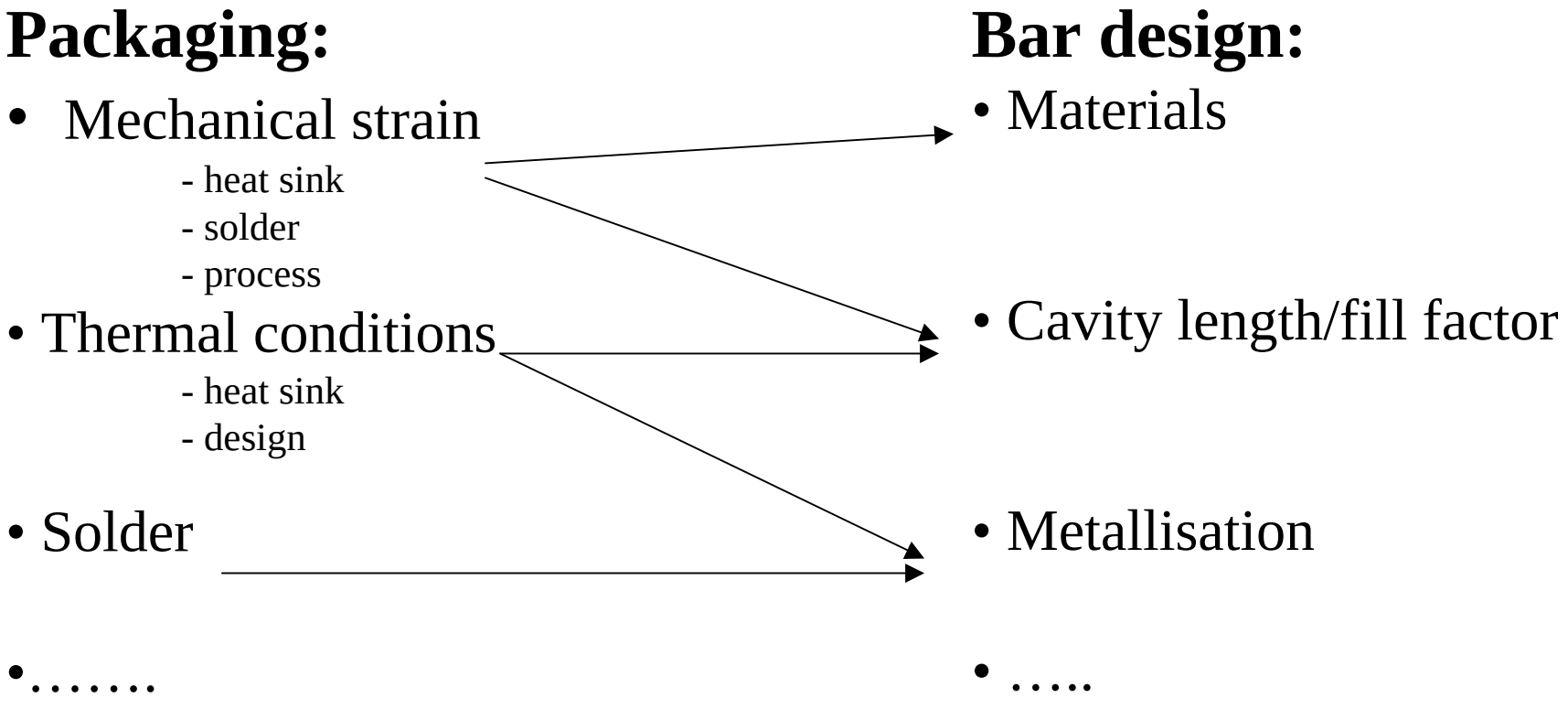
- lifetime
- robustness: environemental conditions (temperature, chocs, vibrations, vacuum, radiations)
- « burst mode »

Performance: minimize electrical power consumption

- electro-optical efficency
- homogeneity of performances

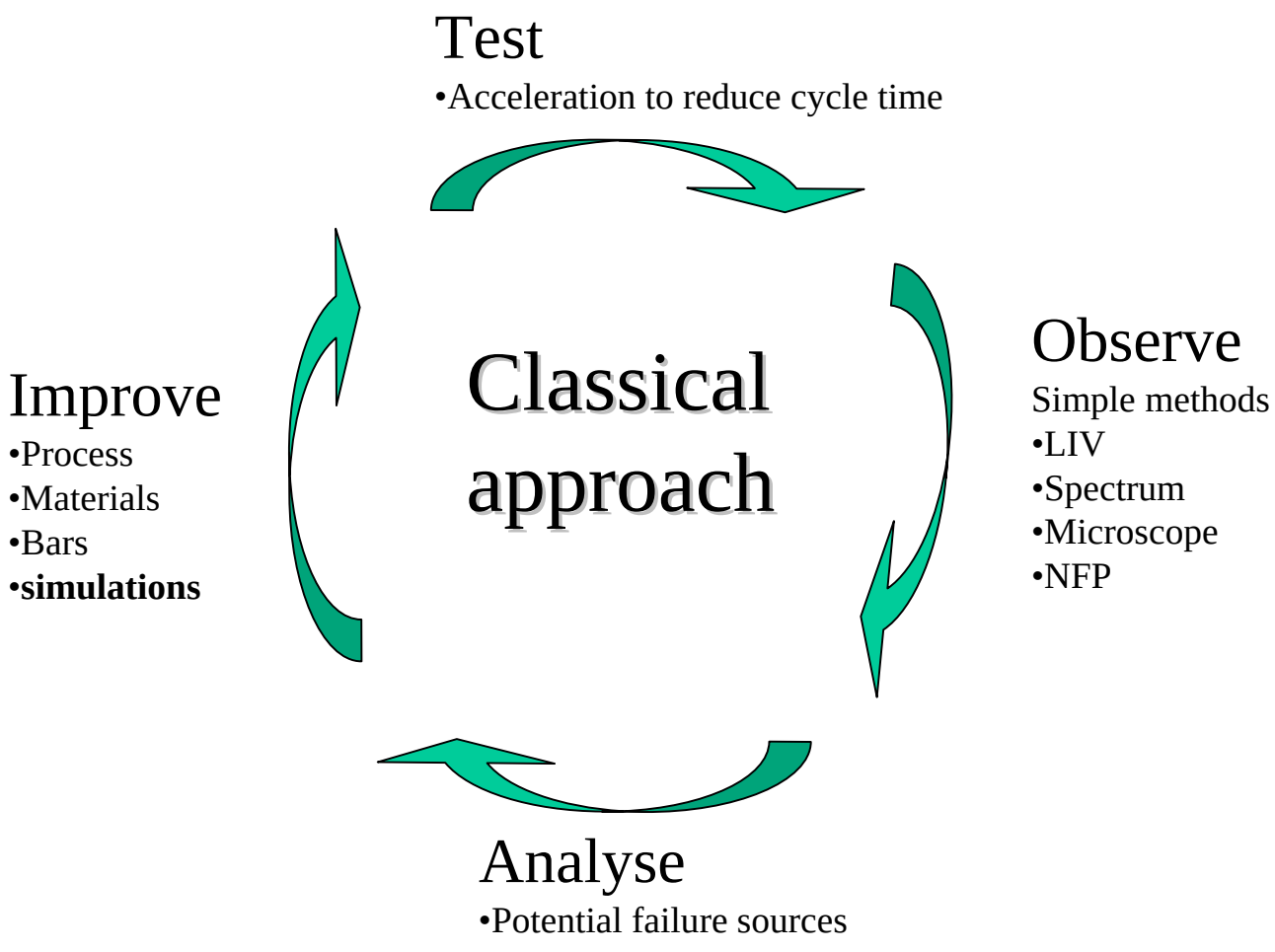
Developement of stacks for Space applications

Taking into account packaging and diode bars

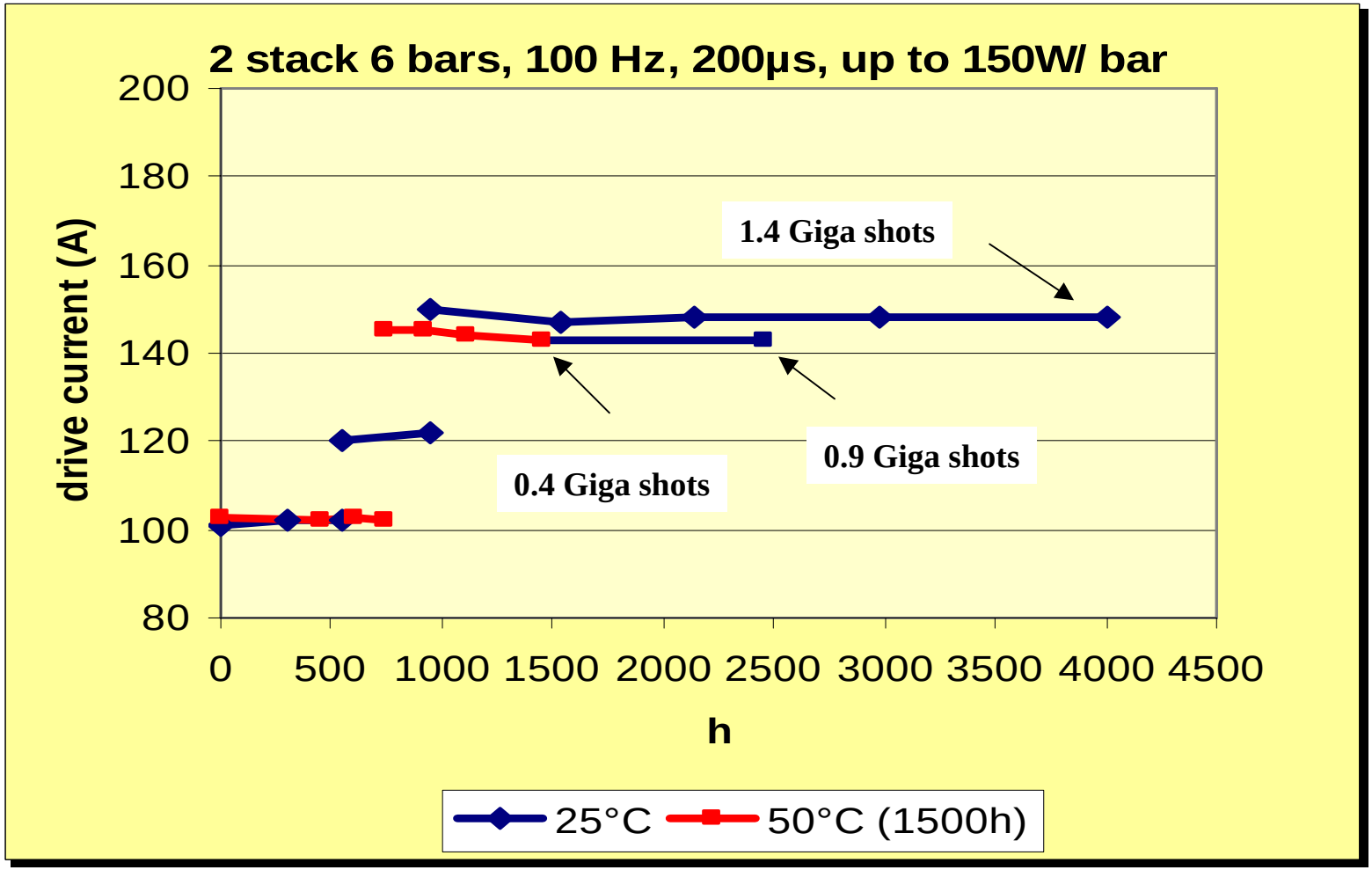


Improvement of endurance

Permanent improvements rather than disruptive changes



Endurance Tests at 25°C and 50°C



Endurance Tests

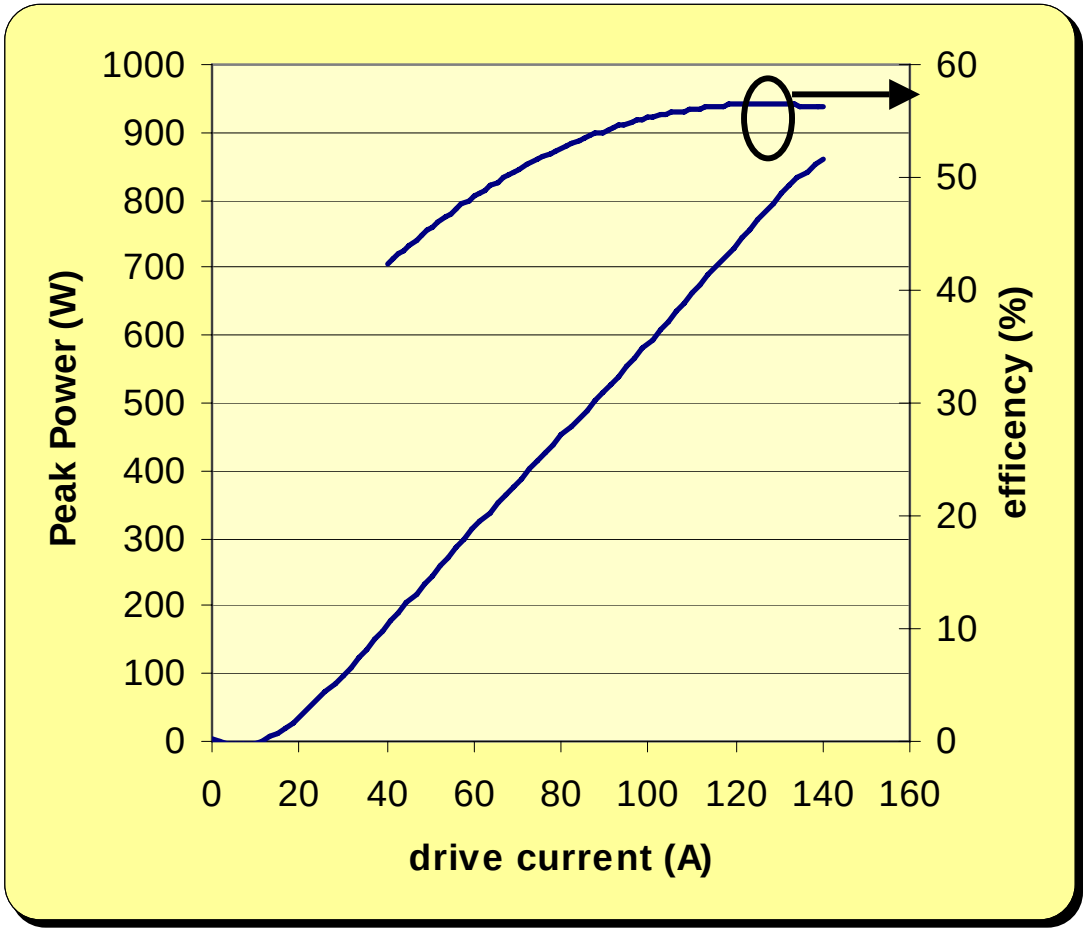
Near Field pattern **AFTER** aging

After 1.4 Giga shots
With up to 150 W/bar
at 25°C

After 0.9 Giga shots
With up to 150 W/bar
and up to 50°C

LIV AFTER Endurance Test

25°C, 100Hz, 200 µs

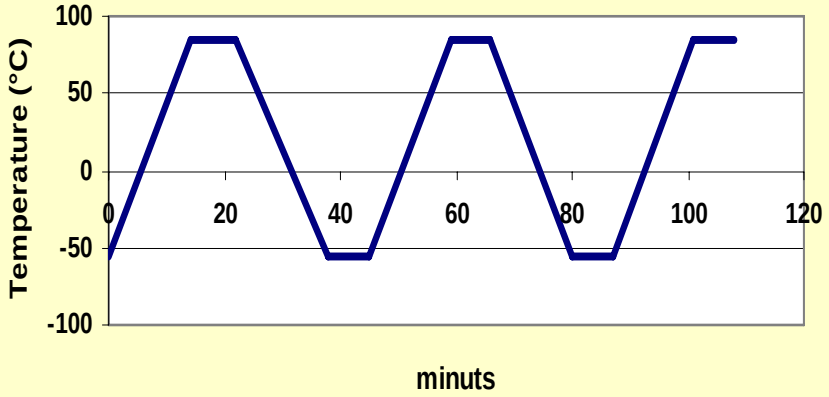


56 % Efficency

Cumulative Tests: Thermal cycling & Endurance

1- Thermal Cycling:

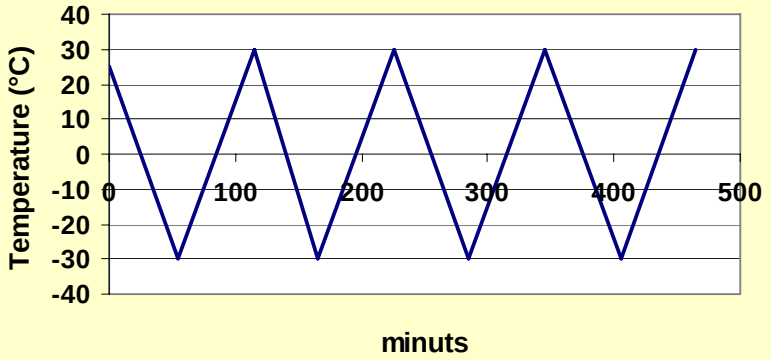
600 cycles: -55°C/+85°C
10°C/min



2- Endurance Test:

QCW = 200µs/10Hz
Optical Power: 100W & 125W QCW /bar

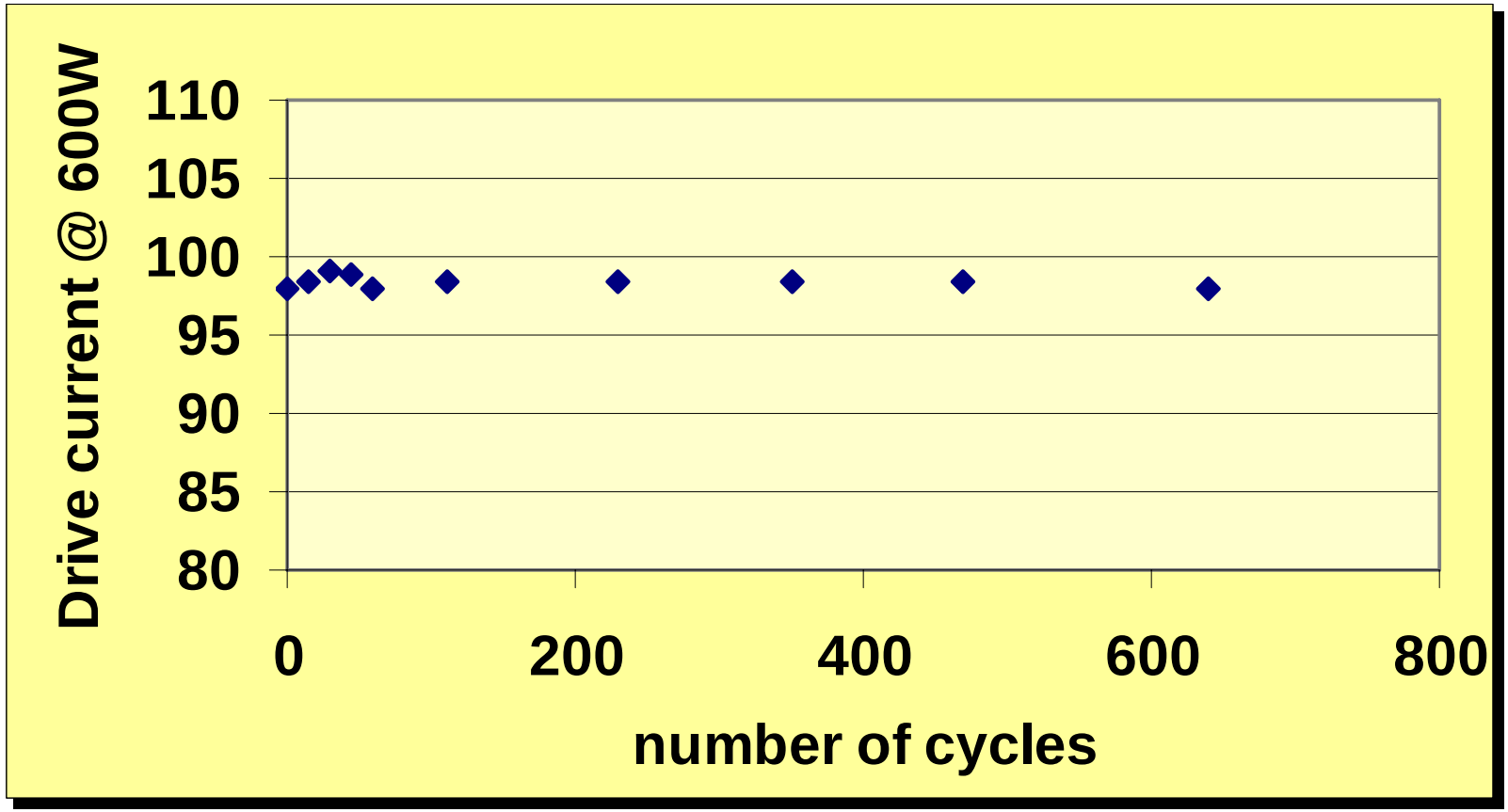
under Thermal cycling :
-30°C / +30°C
1°C /min.



1- Thermal cycling

Stack 6 bars

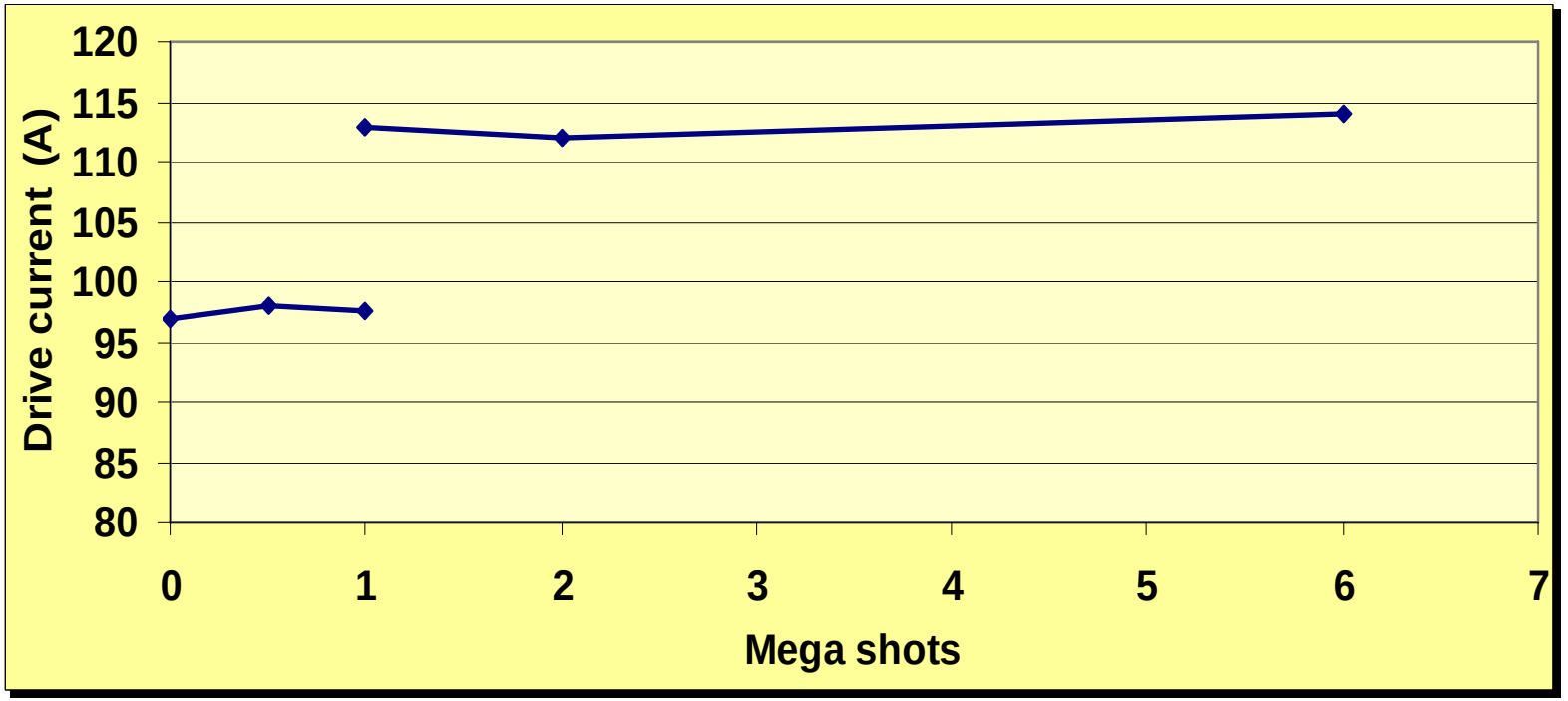
600 cycles: -55°C/+85°C, 10°C/min



2- Endurance under Thermal cycling

Endurance: 600W QCW & 720W QCW, 6 Bar stack
QCW= 200µs/10Hz

Thermal Cycles: -30°C / +30°C _ 1°C/min.



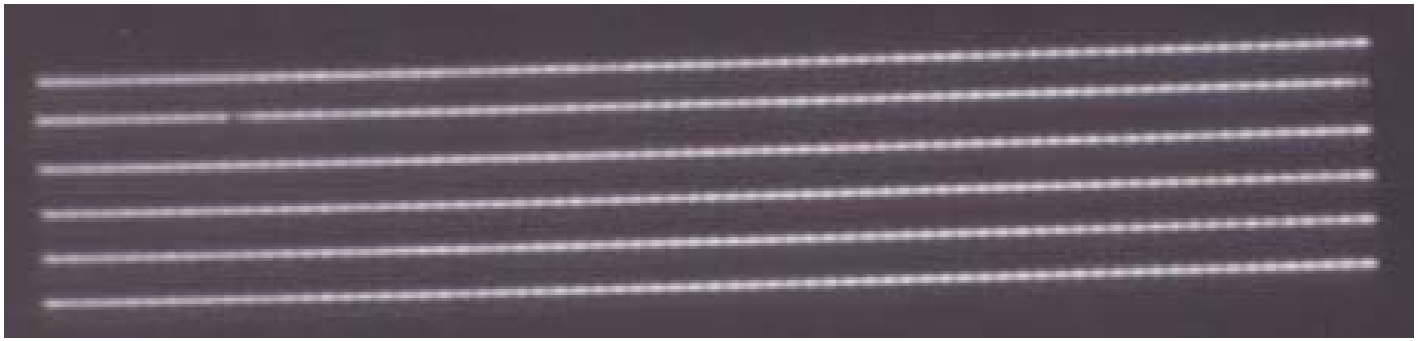
Far Field

after

600 cycles –55°C/85°C

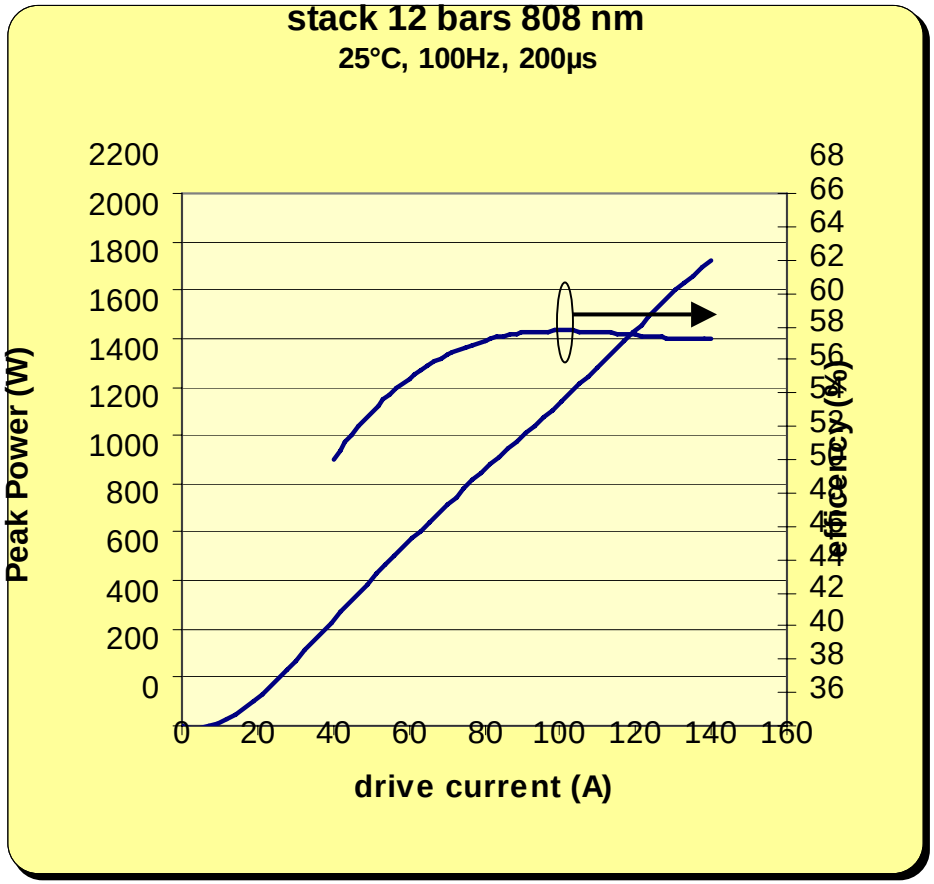
+

3 Mega shots under temperature variation
(with up to 120W/bar)



Power consumption

Optimisation: bar design ↔ packaging (compliant with space requirements)



60 % efficency

Improvements in Packaging led to

-Highly reliable stacks

-Compatible with severe environemental conditions and operation in « burst mode »

-High electro optical efficency