

Japanese Activity

2003, 9, 16 GLAST meeting at ROME
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Japanese Responsibility:

*** Development and Design of LAT SSD: (1998, 1999)**

*** Optimized the performance and productivity**

(Mar. 2000)

*** Flight Model Design (2001)**

*** Production and Quality Monitor including
radiation hardness (2001 ~ 2003)**

Status

We have successfully finished the production of LAT SSD on schedule!

(9535 delivered, 2000 stocked in HPK, total=11,535)

- **Thanks for the HPK's friendly collaboration with us.**
- **Thanks for the HPK's excellent concentration on achieving magnificent level of quality!**
- **Thank for the HPK's great efforts to keep on the production schedule!**

- **HPK contribution is great and beautiful.**

SSD Quality

Leakage current (much better than the standard value)

Peak: 0.5 nA / channel

Average: 0.55 nA

Dead channel rate (magnificent achievement)

Perfect sensor: 97.7% (9314 / 9535)

Average dead channel rate = 0.0083%

Depletion voltage distribution

95% < 100V, 5% > 100V

- **Bias Resister:** (sampling measurement)
Minimum, Maximum and Average value

Production Yield

HPK top secret ? 60% → 90% (Guess)

What causes the significant amount of loss?

Radiation Sensitivity

(Monitor of process quality)

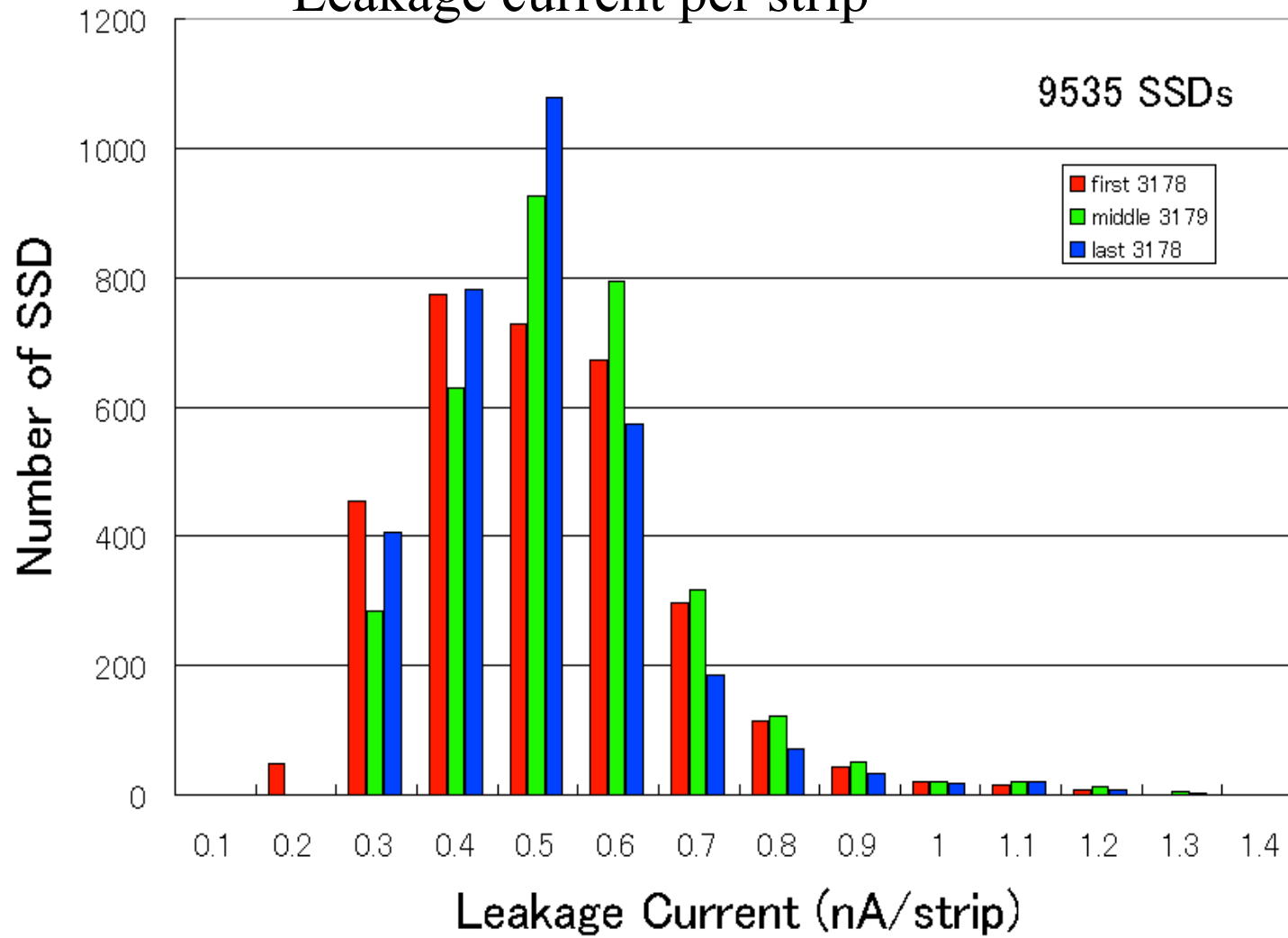
One cutoff sample in every production lot

→ Irradiated by γ -rays with 10k rad.

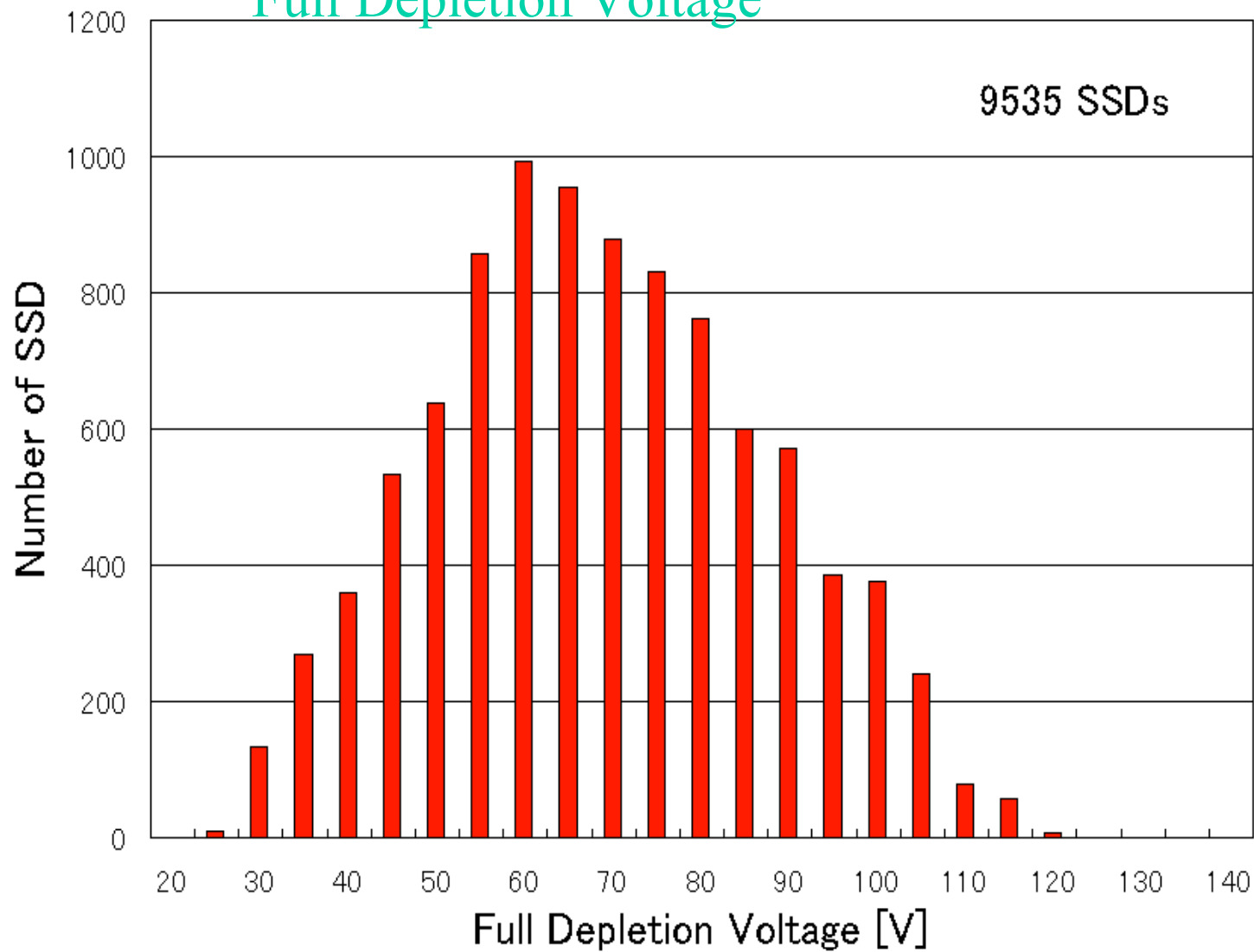
Leakage current : ~ X 25 (0.5 → 10~15nA/strip
(~50nA/cm²))

Isolation between strips : No sizable effect

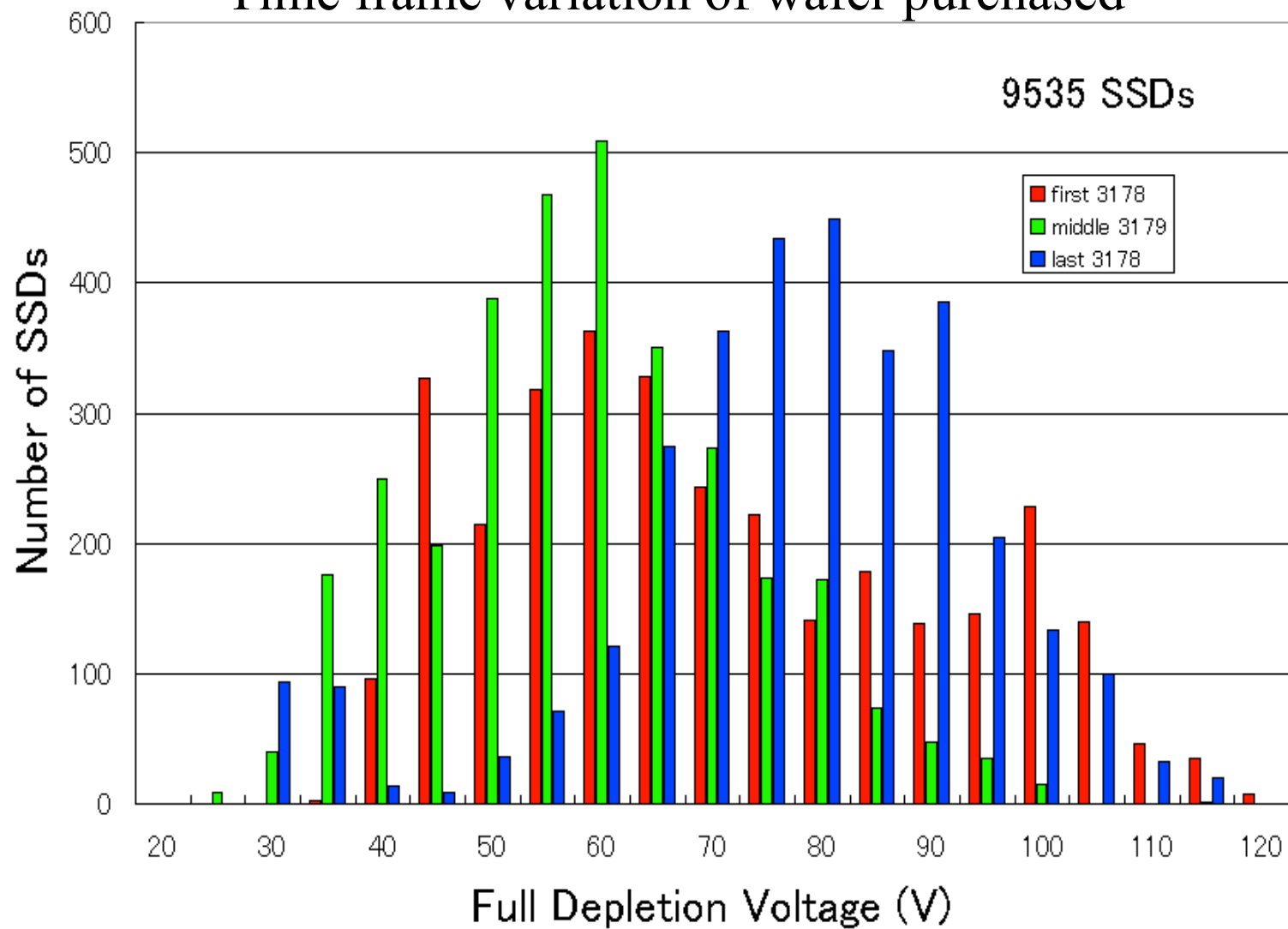
Leakage current per strip



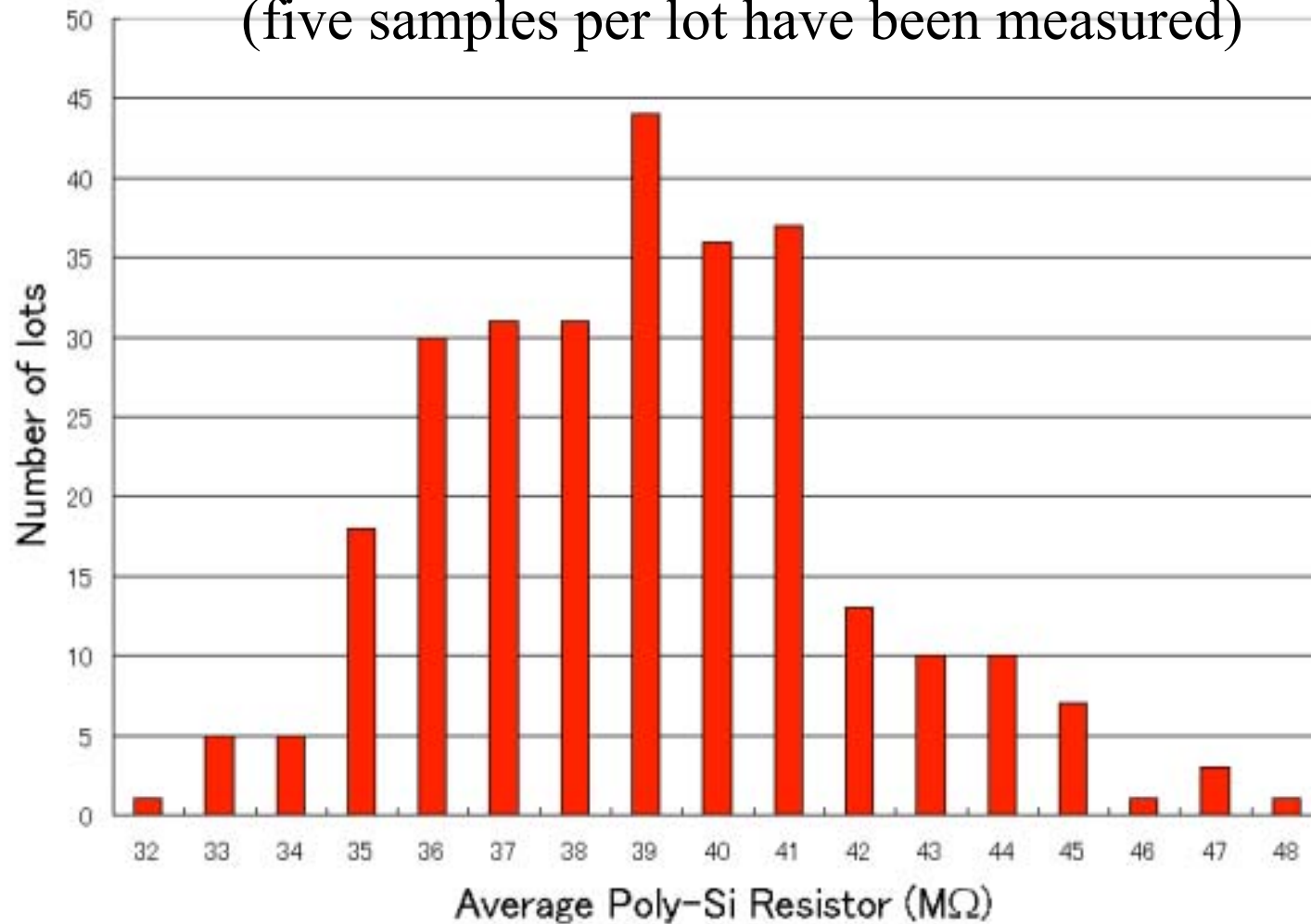
Full Depletion Voltage



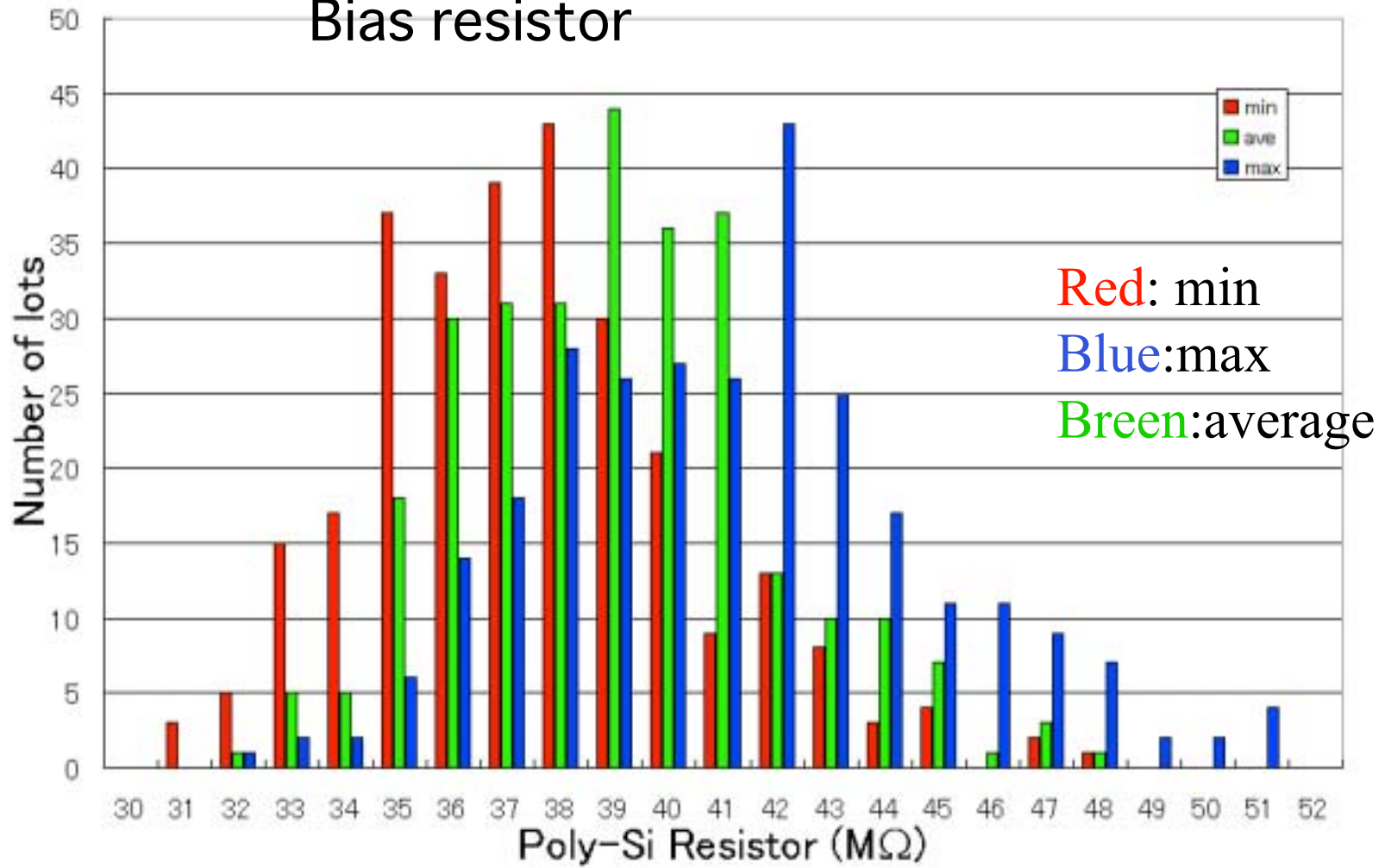
Time frame variation of wafer purchased



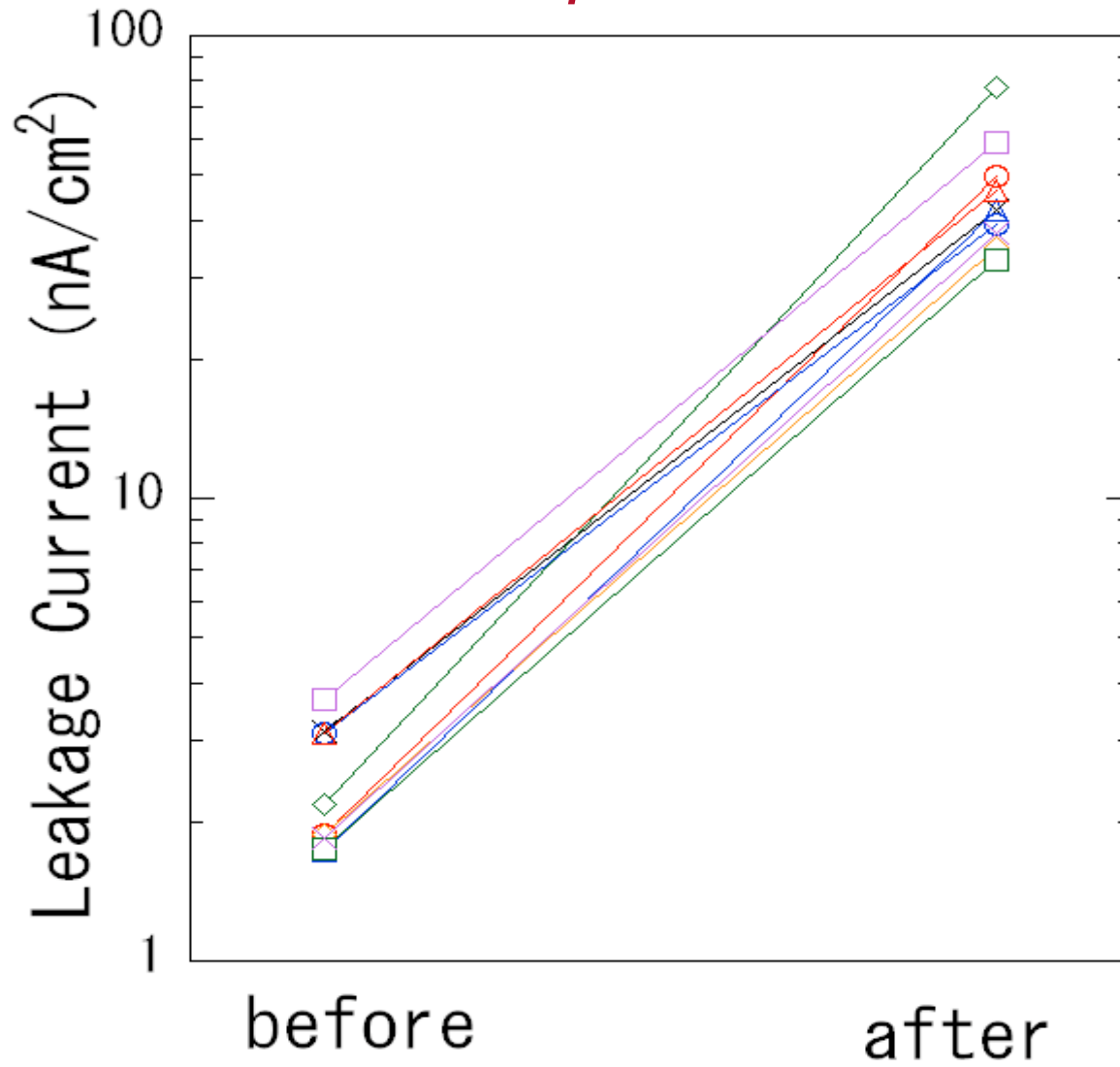
Resistance distribution of bias resistor (five samples per lot have been measured)



Bias resistor



10k rad γ irradiation



Summary

- *We have successfully finished the production of SSD on schedule.
- *The quality achieved is the world highest record.
- *I would like to state that
“Great thanks for HPK’s excellent collaboration with us.”