Understanding Contact Resistance Between Different Probe Tips and Contact Surfaces

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Contact Resistance Process Variables Examined

- Low Forcing Current versus High
- Probe Contact Force (overtravel)
- Probe Tip Geometry and Scrub
- Contact Surface Material
- Instantaneous Repeatability (Static) and Multiple Interface Reproducibility (Dynamic)

Test Apparatus and Setup

- PrecisionPoint PRVX$_2$
  - All data was gathered on the same system
  - Different probe card motherboards/PMBs were used
  - Four-wire Kelvin System
  - Single Expert Operator
  - Environment was a Semi Test Floor

Test Apparatus and Setup
(continued)

- Probe Cards
  - Membrane
  - Vertical
  - Radius-Tip
  - Tungsten-Rhenium
- Contact Surfaces
  - Tungsten-Carbide Checkplate
  - Gold Plate
  - Wafer

Static Cres (Checkplate)

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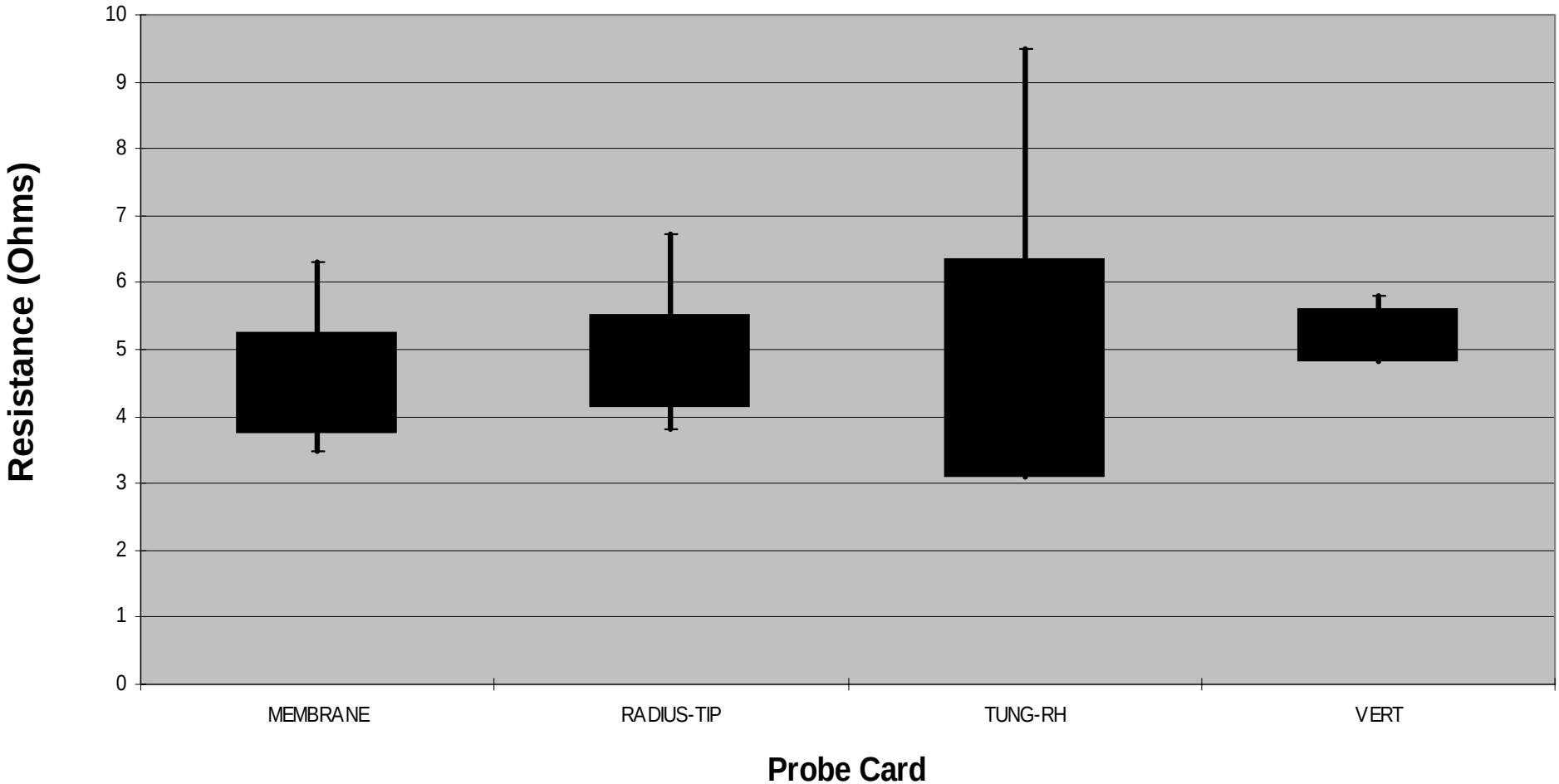

Dynamic Cres (Checkplate)

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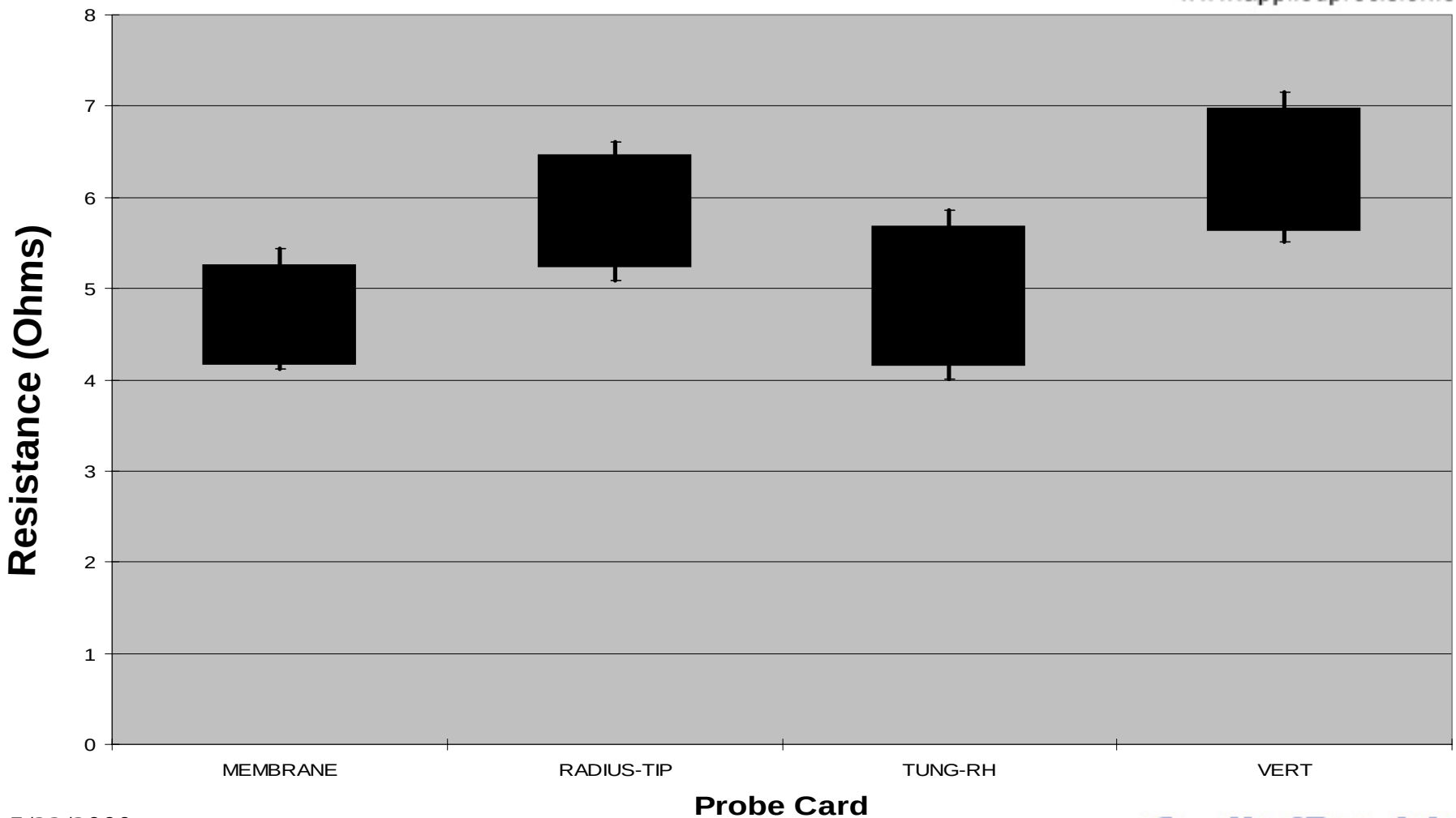
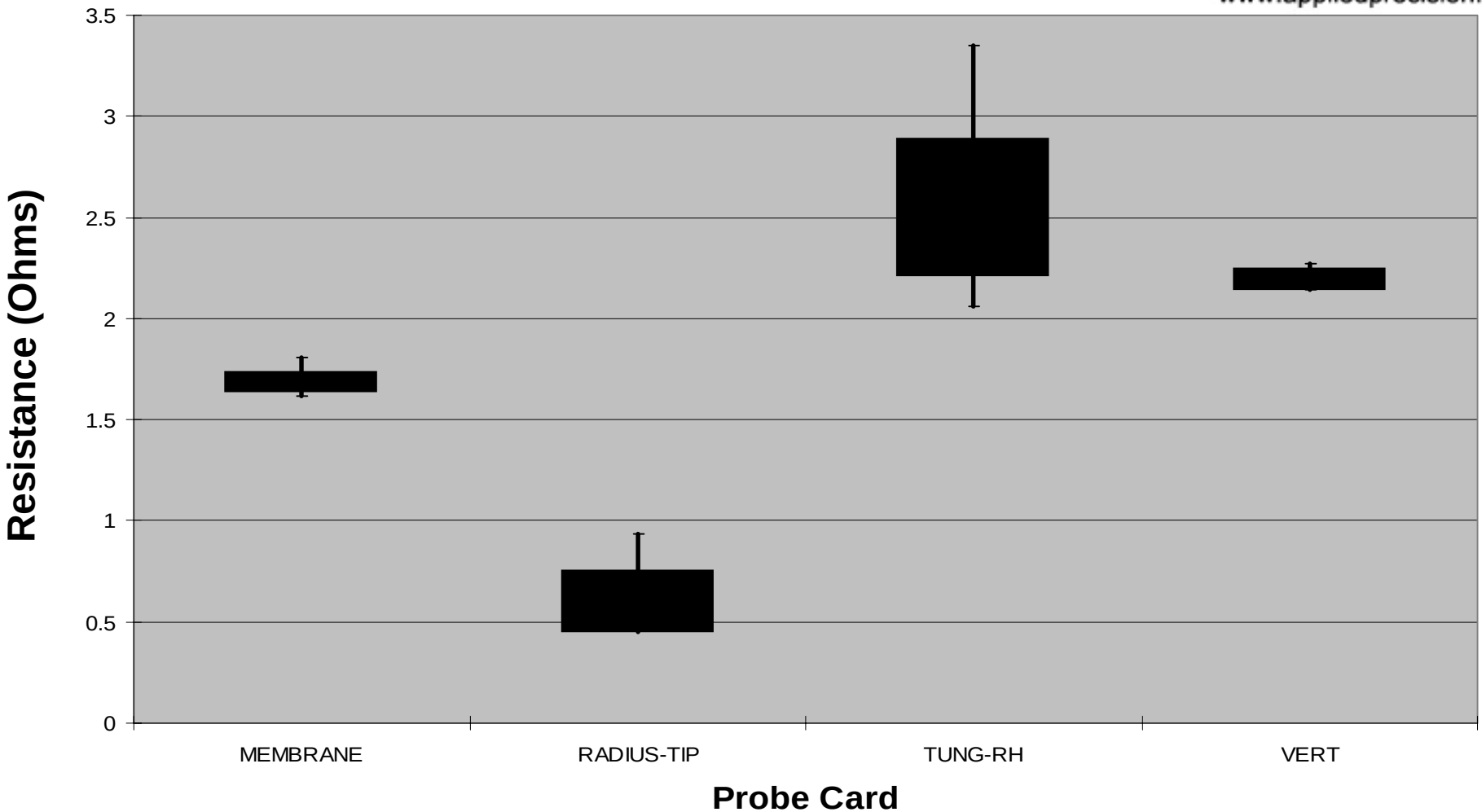
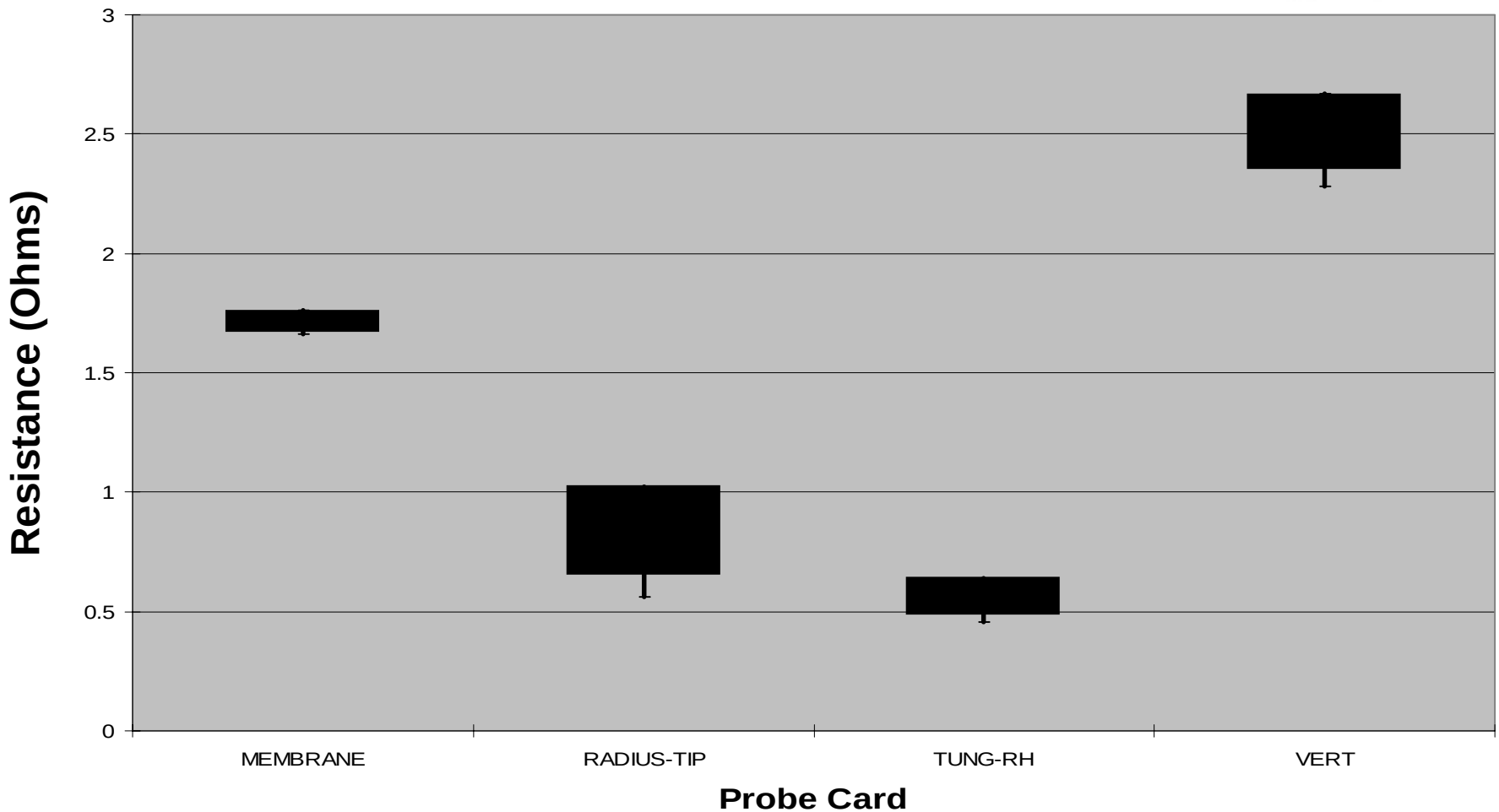


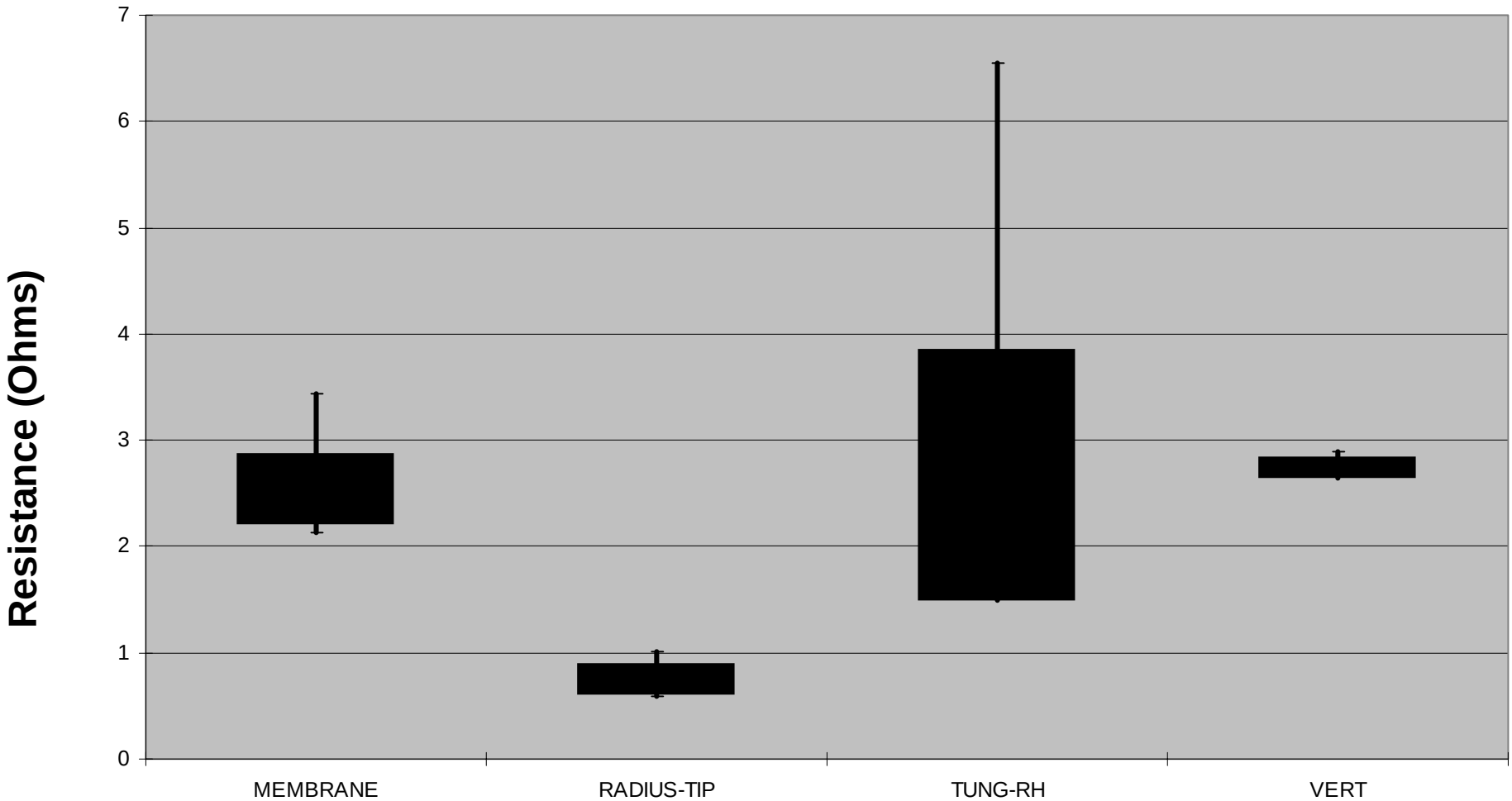
Static Cres (Gold Plate)



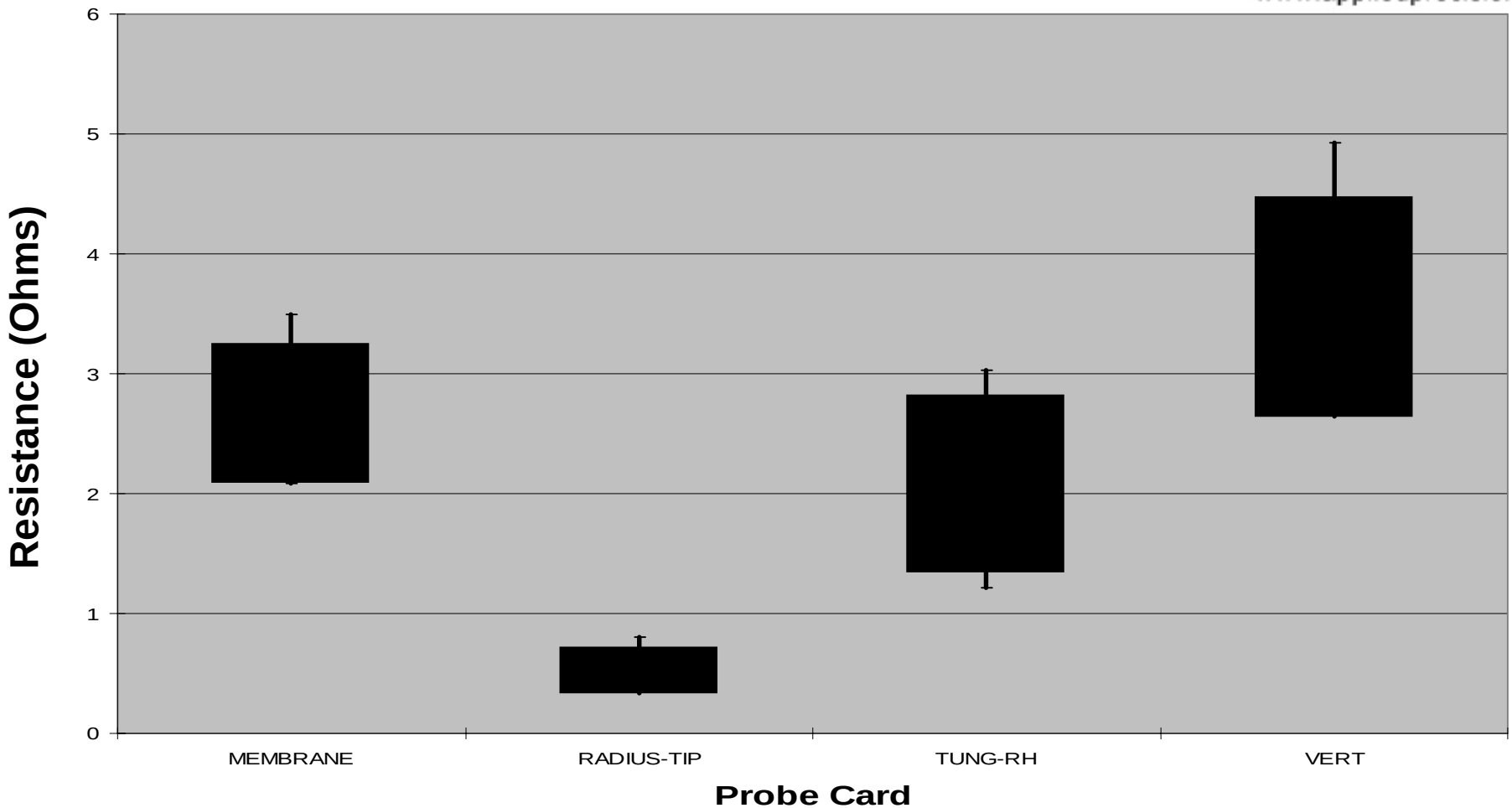
Dynamic Cres (Gold Plate)



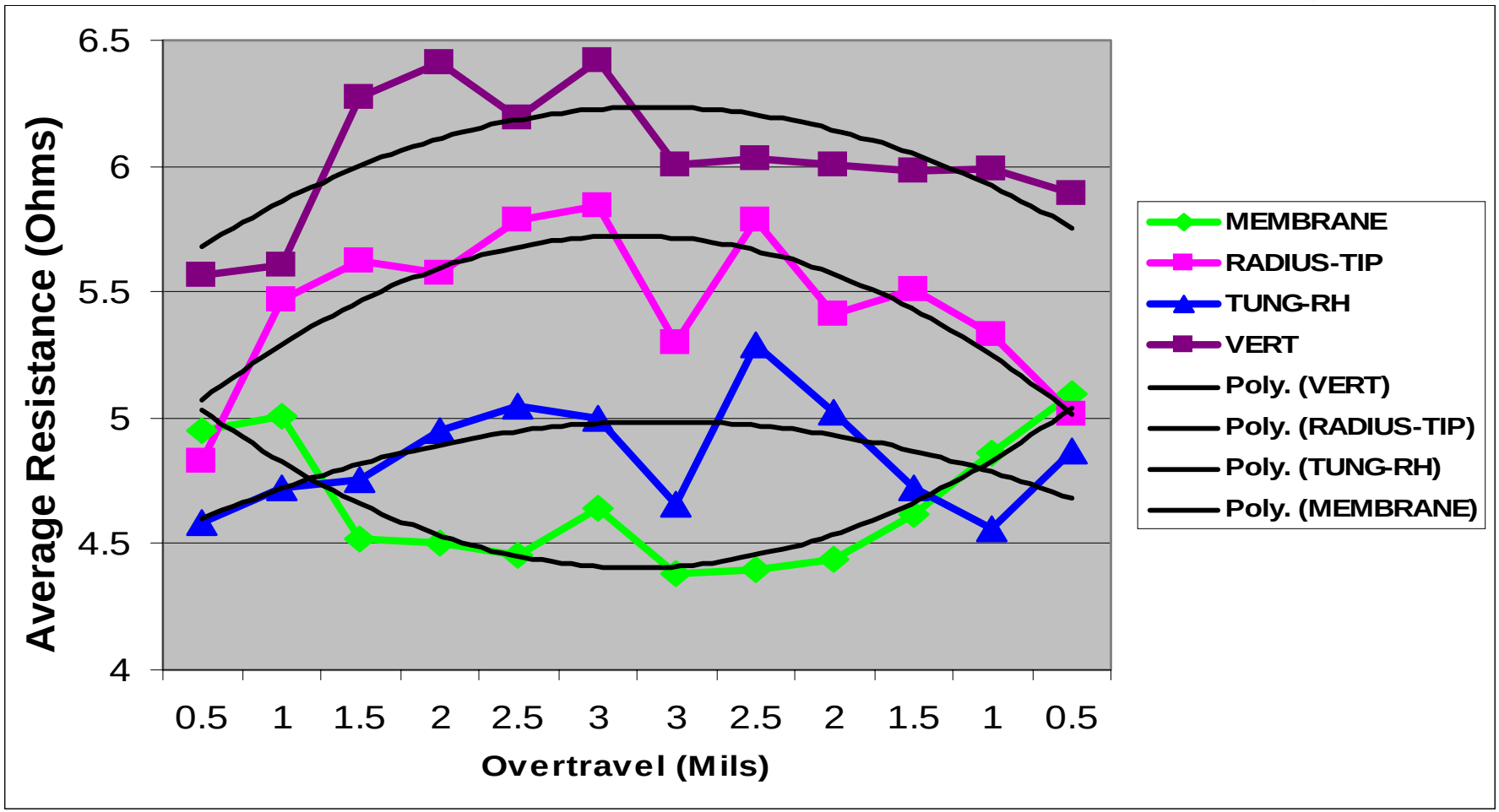
Static Cres (Wafer)



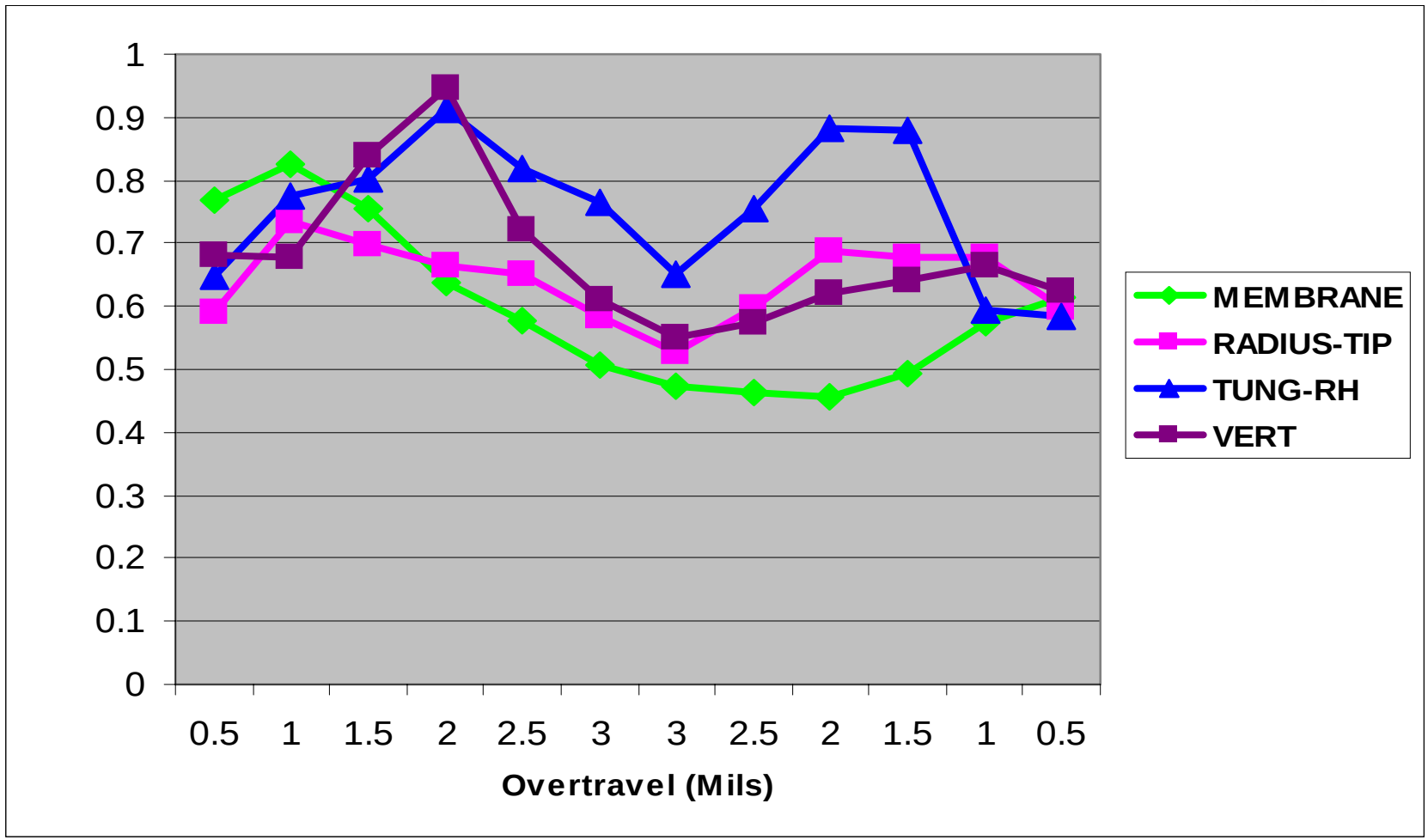
Dynamic Cres (Wafer)



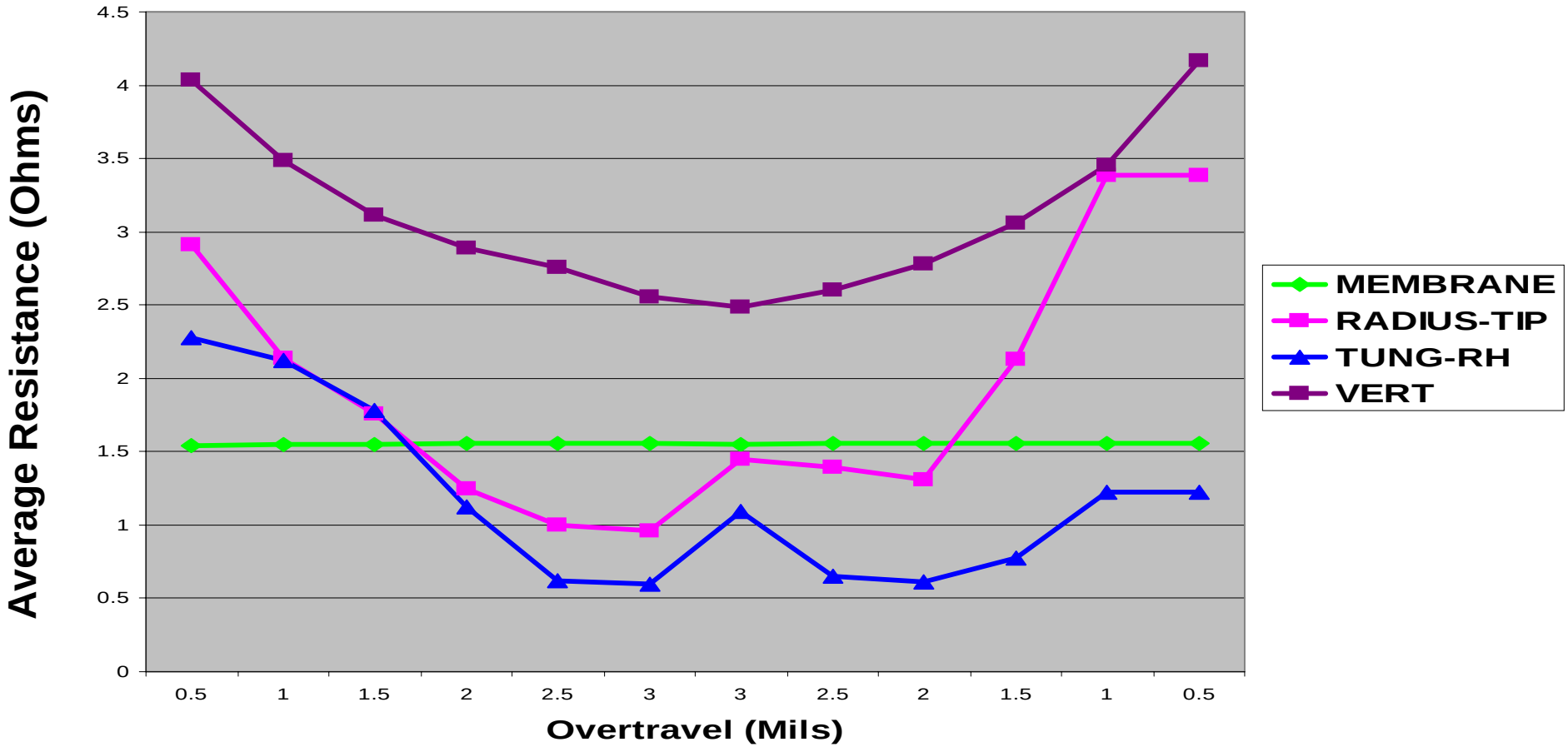
Effects of Overtravel on Cres (Checkplate)



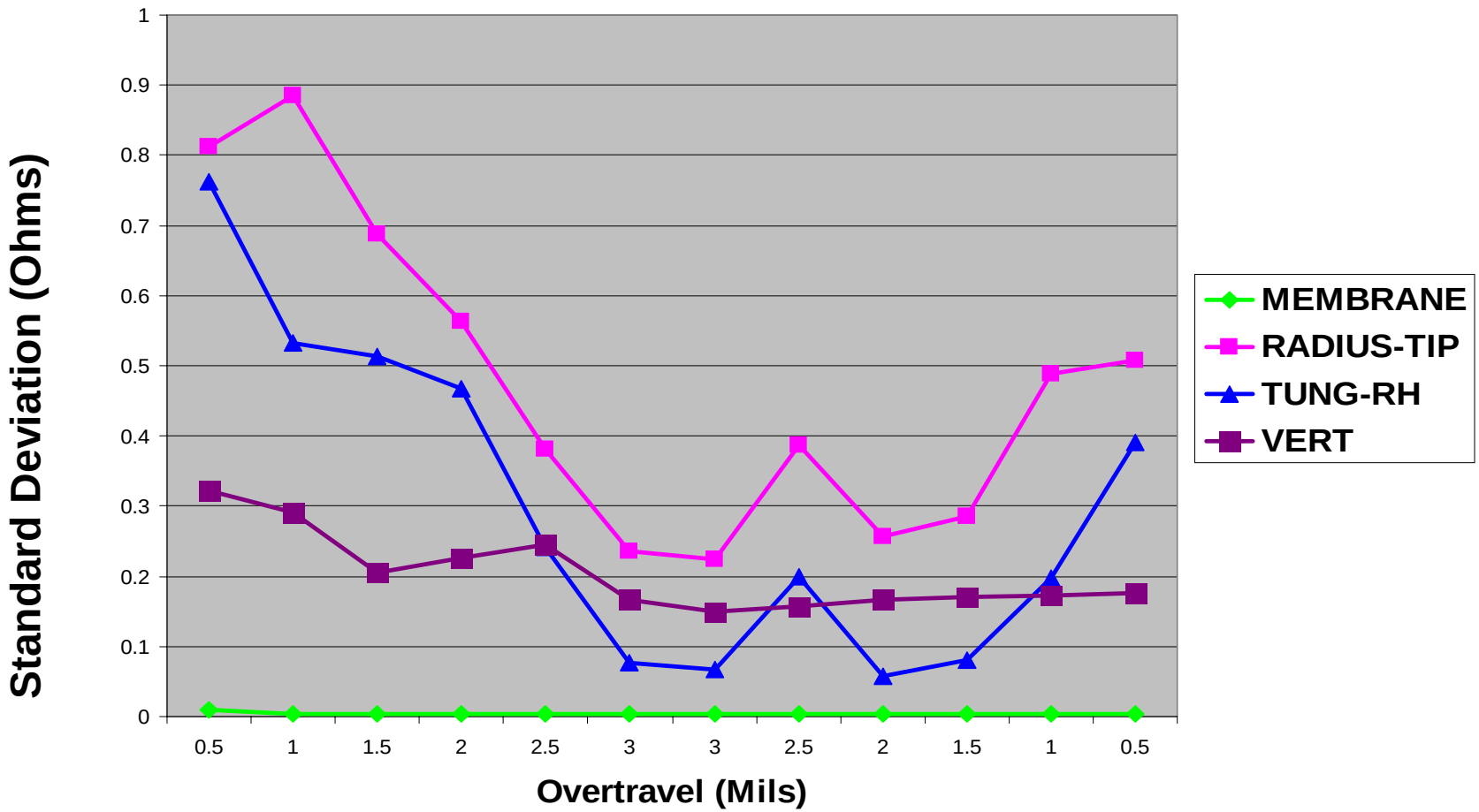
Cres Deviation with Overtravel (Checkplate)



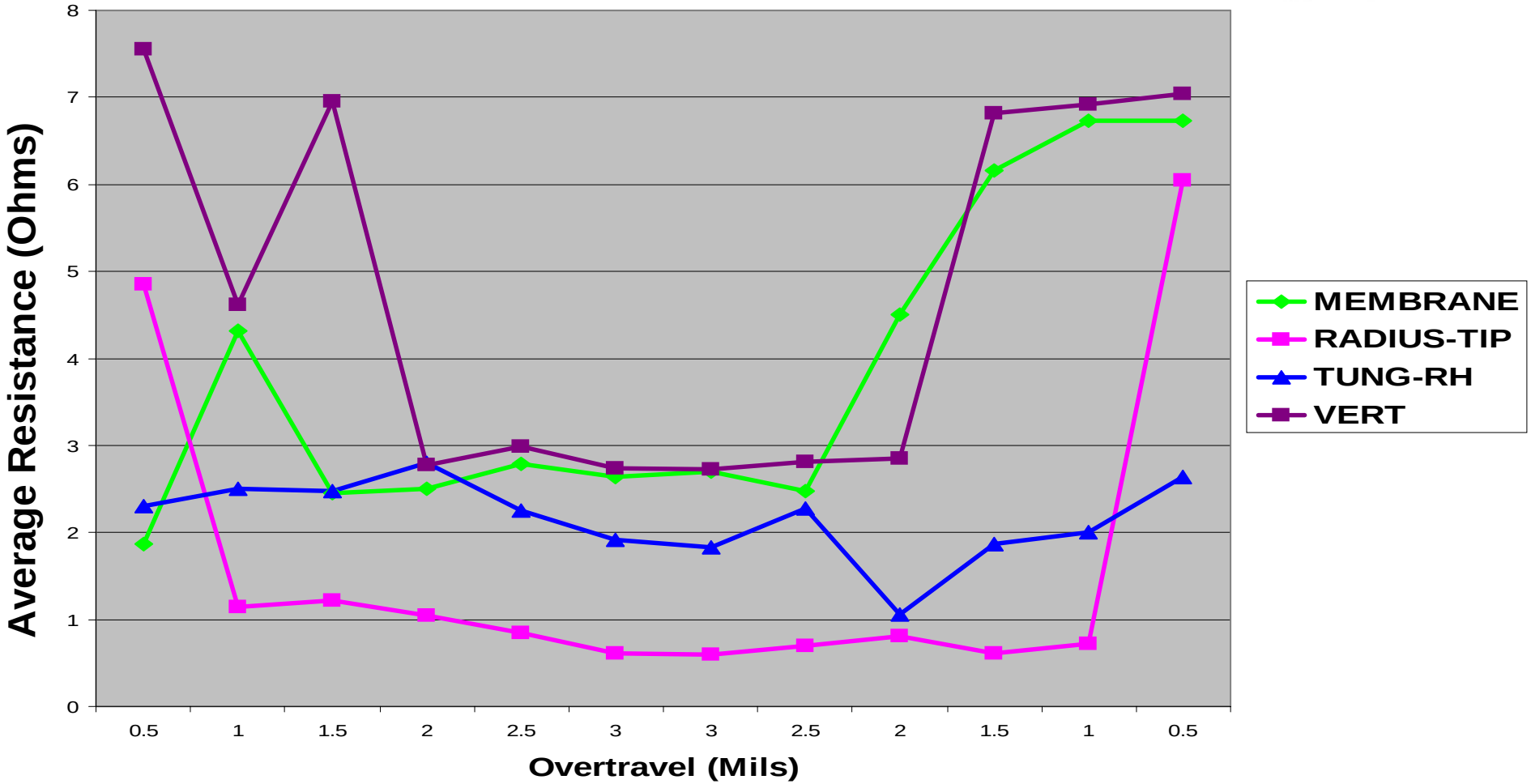
Effects of Overtravel on Cres (Gold Plate)



Cres Deviation with Overtravel (Gold Plate)



Effects of Overtravel on Cres (Wafer)



Cres Deviation with Overtravel (Wafer)