



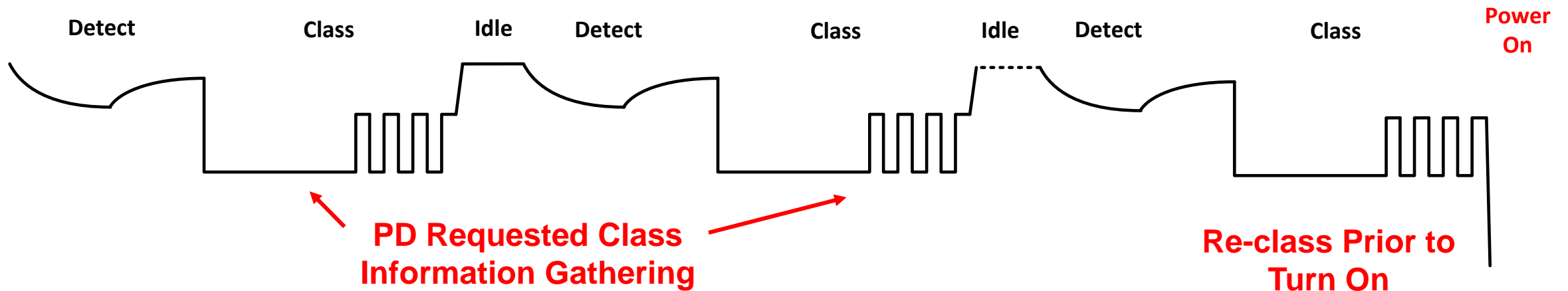
Class Probe Optimization

Heath Stewart

David Stover

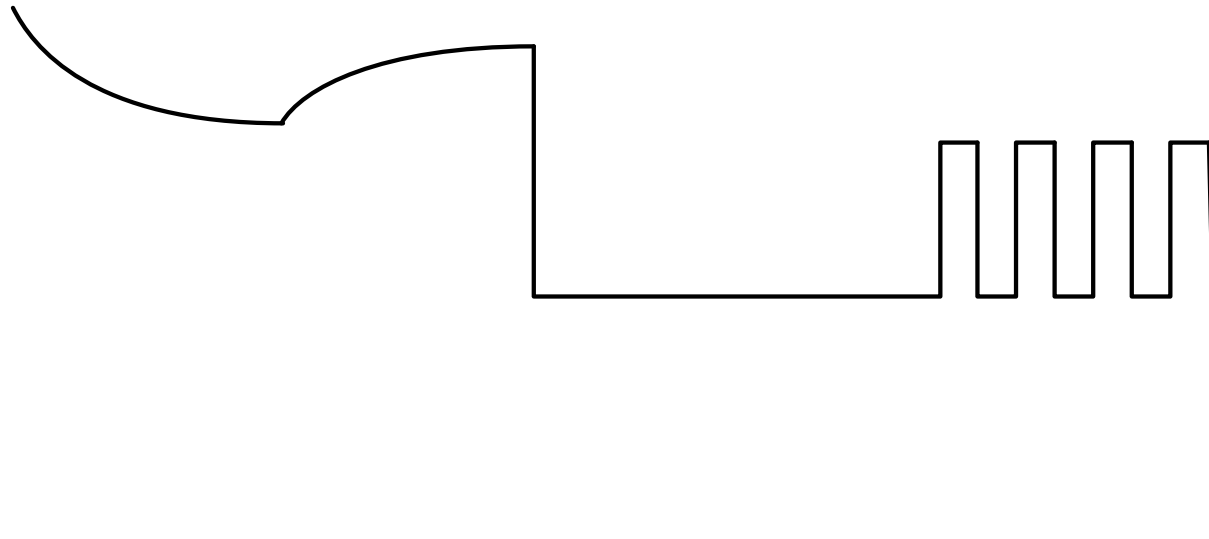
PSE Usage Model

- Many Class cycles *may* be performed prior to powering on a PD
- PSEs may:
 - DET-CLASS
 - Then provide PD Requested Class information to host
 - Host then implements POWER_ON command at its leisure
 - After repeating DET-CLASS as necessary



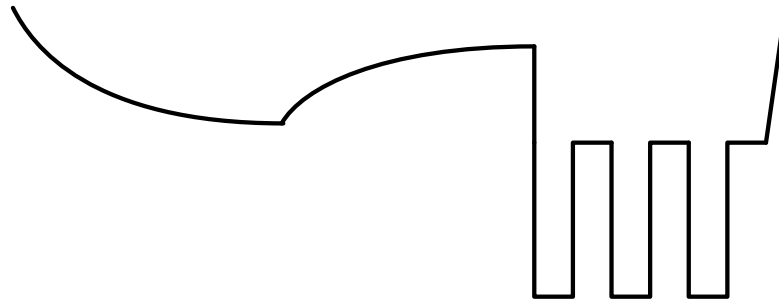
Long Class Event Generates Heat

- Assume Long 1st class event are 96ms
- Assume subsequent class events are 3*12ms=36ms
- Total Class Energy = 54V * 40mA * 132ms = 285 mJoules



Class Probe Minimizes Heat

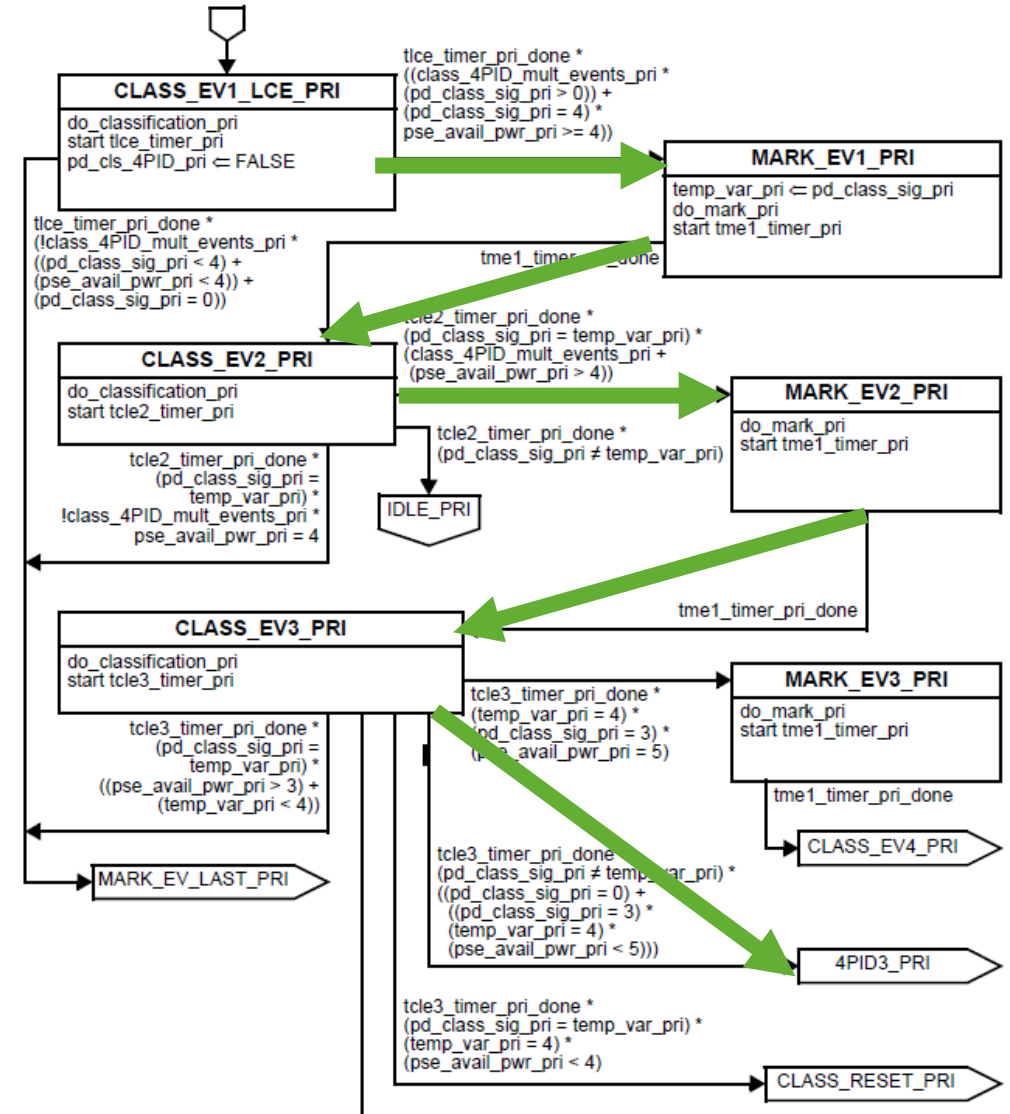
- Three class probes required to determine PD Requested Class
- Assume three class events are $3 * 12\text{ms} = 36\text{ms}$
- Total Class Energy = $54\text{V} * 40\text{mA} * 36\text{ms} = 78 \text{ mJoules}$



**73% Reduction in
Power Consumption**

Recommendation

- Implement do_class_probe for single and dual-signature PSE state machines
 - Currently only implemented for single-signature state machine
 - Dual-signature “do class probe” equivalent is implemented explicitly
 - Does not allow for short 1st Class event
- Allow single and dual-signature state machines to return to IDLE after do_class_probe completion



Recommended Change

- Replicate CLASSIFICATION pre-state and CLASS_PROBE in primary and secondary state machines
- Allow exit to IDLE after CLASS_PROBE completion
- No changes to downstream logic

