IEEE 802.3af DTE Power via MDI

AC disconnect detection-

Immunity to load transients- ad hoc A.I. 5.2
Immunity to PSE voltage transients- ad hoc A.I. 5.3

- Yair Darshan, PowerDsine
- yaird@powerdsine.com

- Acknowledgments to Pavlik Rimboim and Asher Biton/PowerDsine

Objectives

- Sensitivity of Vac_close to load changes
- Sensitivity of Vac_close to PSE voltage transients

Test setup – PSE side

PARAMETERS:

Cpse = 0.22uF

Cprobe = 10uF

Rpse = 400k

Rprobe = 7.5K

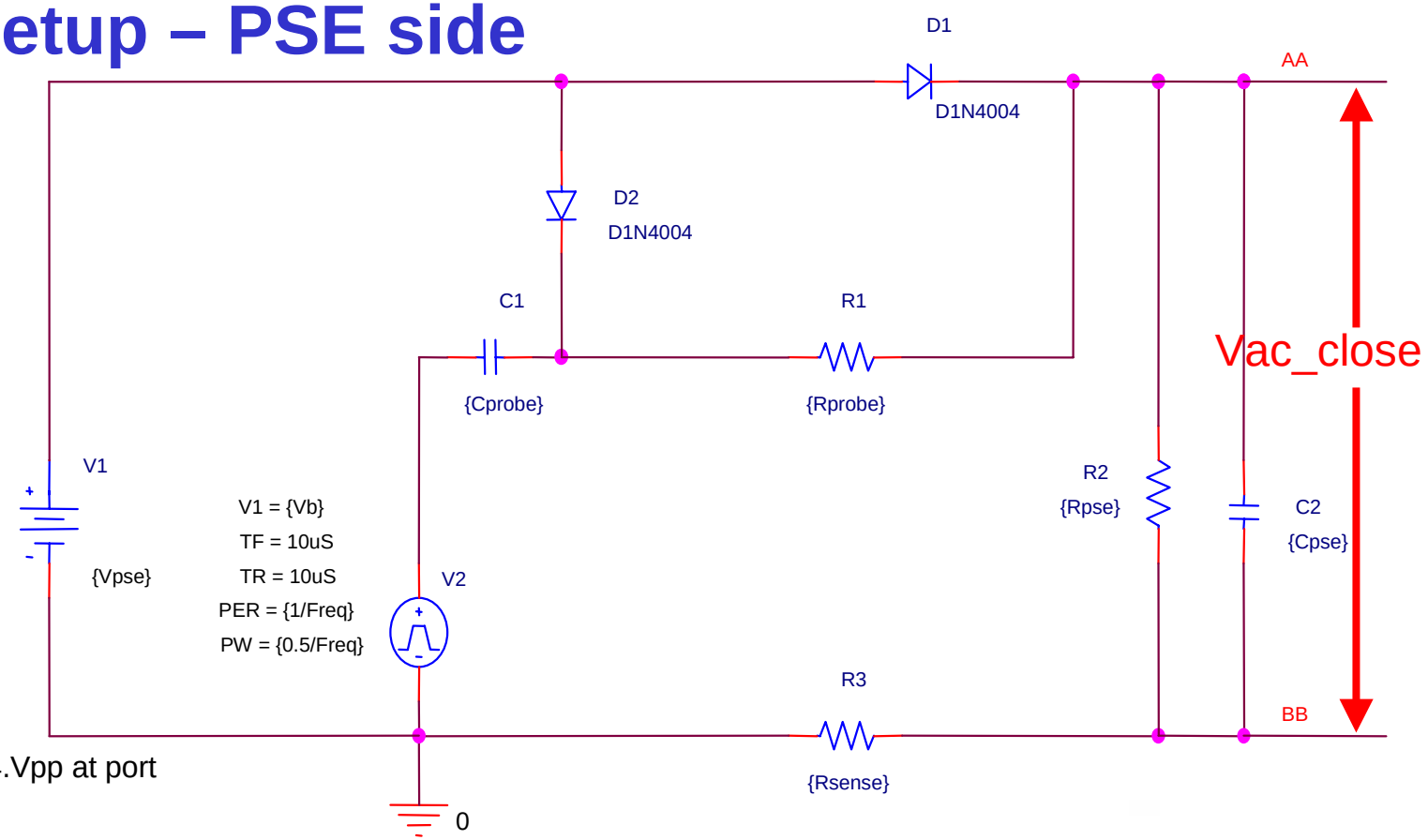
Rsense = 2

Freq = 125

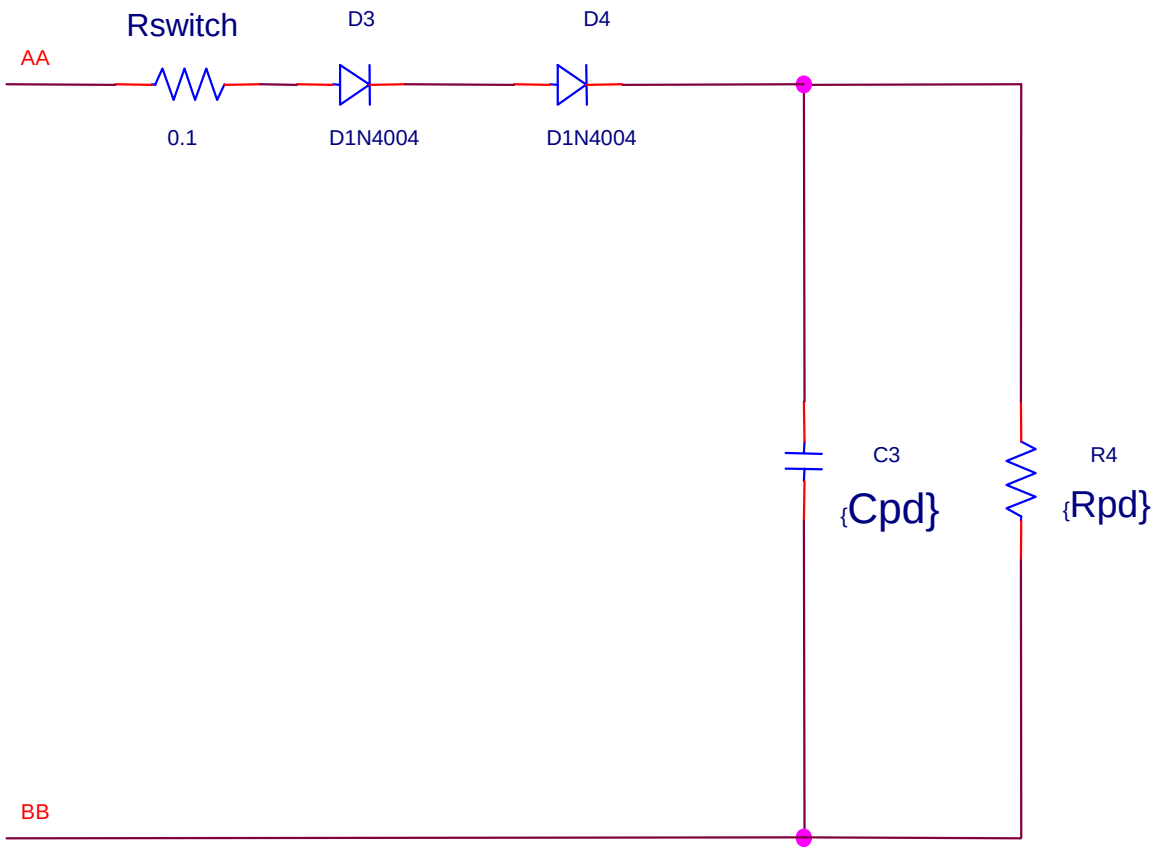
Vpse = 49

D1,D2 =1N4004

Vb = set to have 4.4.Vpp at port



Test setup – PD side



Test conditions and setup – load transients

- PSE was connected to a PD through 0m, 120m CAT 5 cable.
- The load was changed from:
- 4.8K to 125 Ohm, Cpd=5uF
- 125 Ohm to 4.8K, Cpd=5uF
- 4.8K to 125 Ohm, Cpd=570uF
- 125 Ohm to 4.8K, Cpd=570uF

  frequency of load changes= 2Hz.

- PSE port was monitored to test stabilization time for load changes when PD is connected in order to evaluate Vac_open level and its steady state time.

Test results: Load transients

Load	Min ➔ Max	Min ➔ Max	Max ➔ Min	Max ➔ Min
Cpd	5uF	570uF	5uF	570uF
Td (with DC bias)	100ms	85ms	100ms	100ms
Td (w/o DC bias)	<100ms	<85ms	<100ms	<100ms

Test conditions and setup–PSE voltage transients

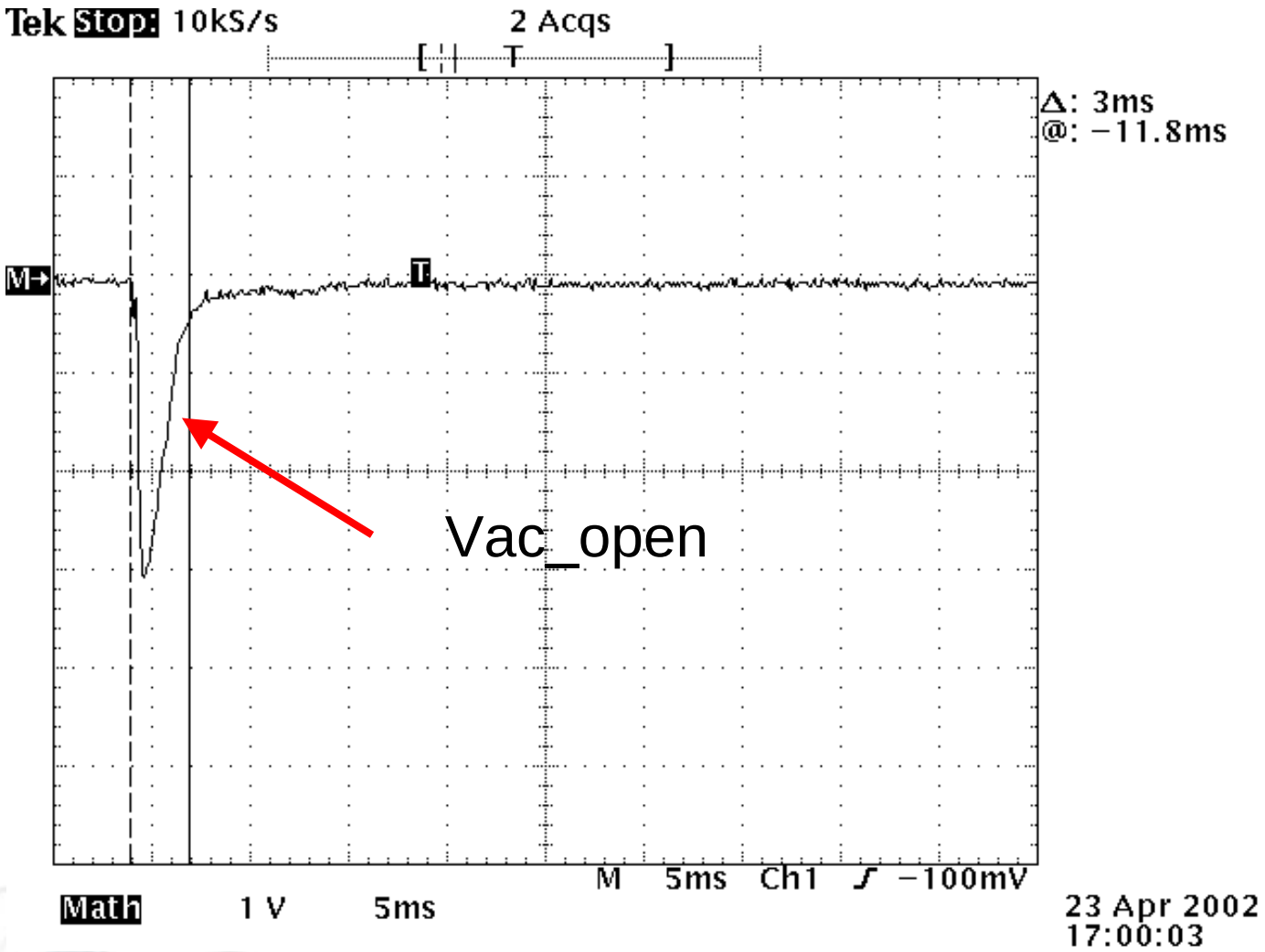
- PSE was connected to a PD through 0m, 120m CAT 5 cable.
- PSE voltage was changed from:
- 57V to 44V. Rpd=162 Ohm, Cpd=220uF
- 57V to 44V. Rpd=3.7K, Cpd=220uF
- 57V to 44V. Rpd=1.2K, Cpd=570uF

PSE port was monitored to test for false disconnect detection during false under-load conditions when PD is connected.

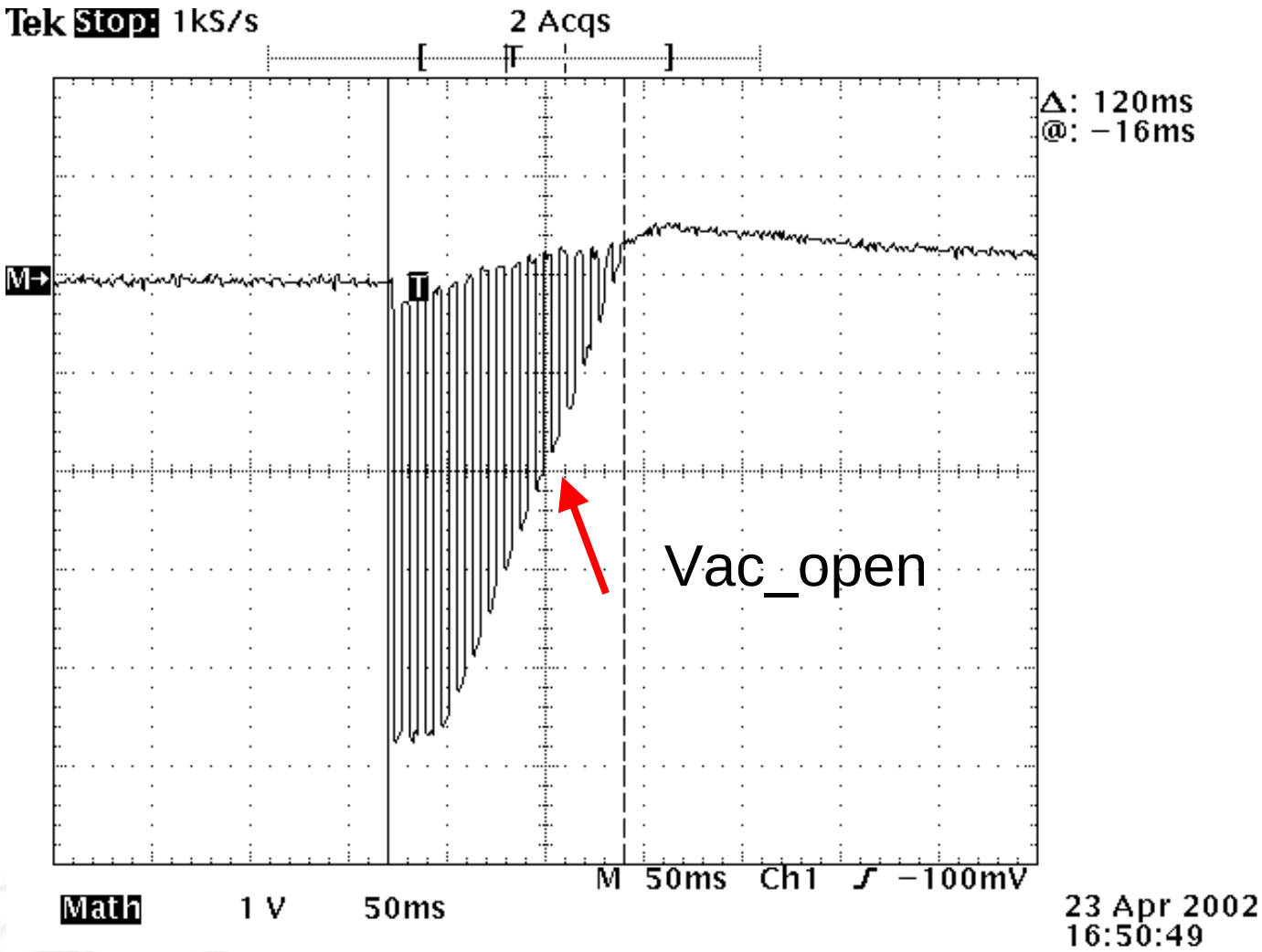
Test results: PSE transient voltage

PSE voltage	Max → Min	Max → Min	Max → Min
Cpd	220uF	220uF	570uF
Rpd	162 Ohm	3.7K	1.2K
Td	3ms	120ms	123ms

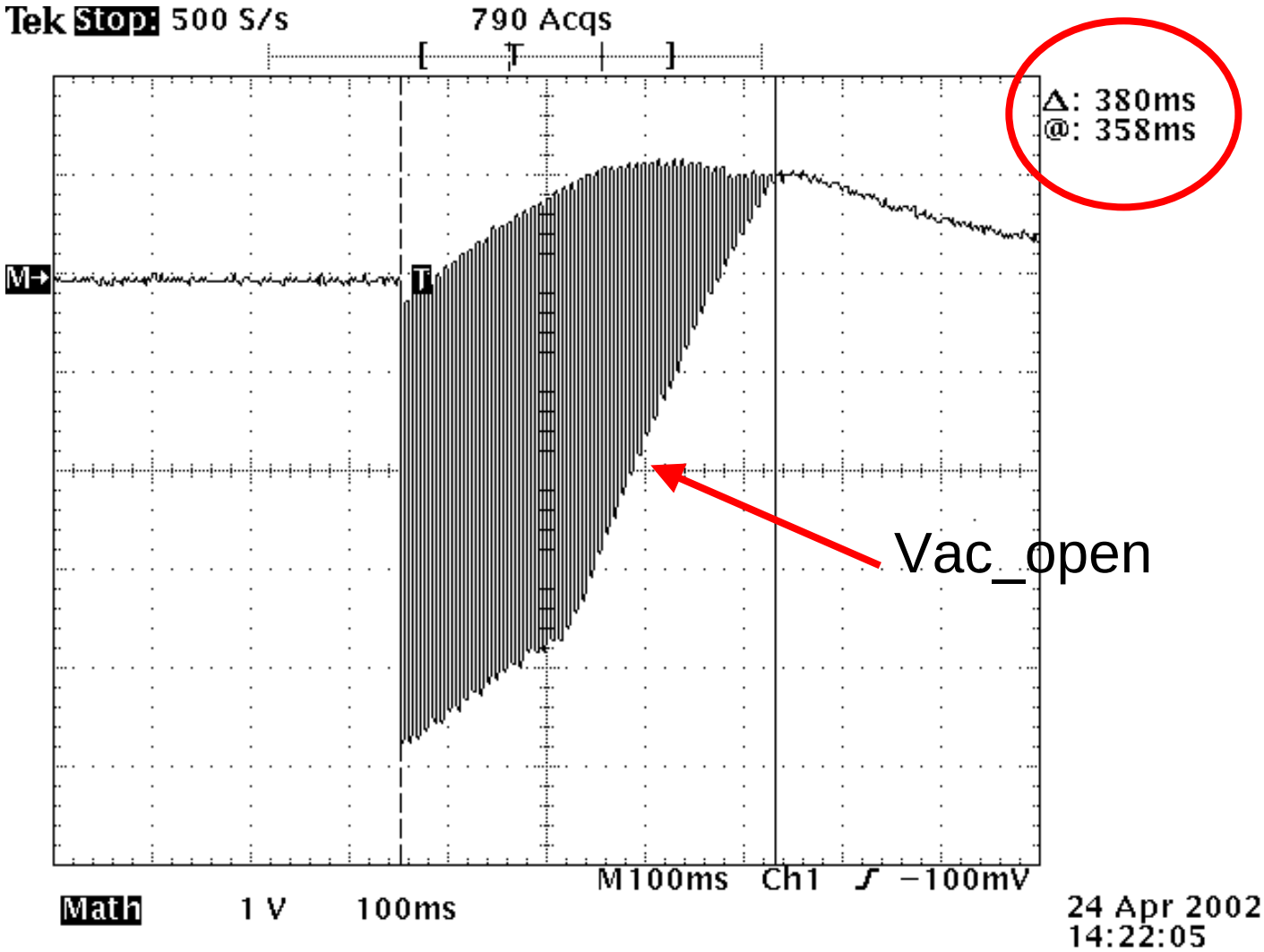
Test results - 57V to 44V. Rpd=162 Ohm, Cpd=220uF



Test results - 57V to 44V. Rpd=3.7K, Cpd=220uF
Rpd=1.2K, Cpd=570uF



What will happen if your PD is not meeting table 12? Rpd=3.7K and, Cpd=570uF…..



Summary

- Stabilization time is similar to the results received in DC disconnect concept.
- Timing vs. min/max load and
- Timing vs. min/max capacitance and min load values as specified in table 12, are still valid.
  - Disconnect time =400ms max
  - Shall not remove power if Vac_open>Vth for < 300ms