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## IEEE 802.3af DTE Power via MDI Derivation of Startup Mode Parameters

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Detailed discussion can be found at "Derivation of Startup parameters", located at "Document" folder of the 802.3af web site.



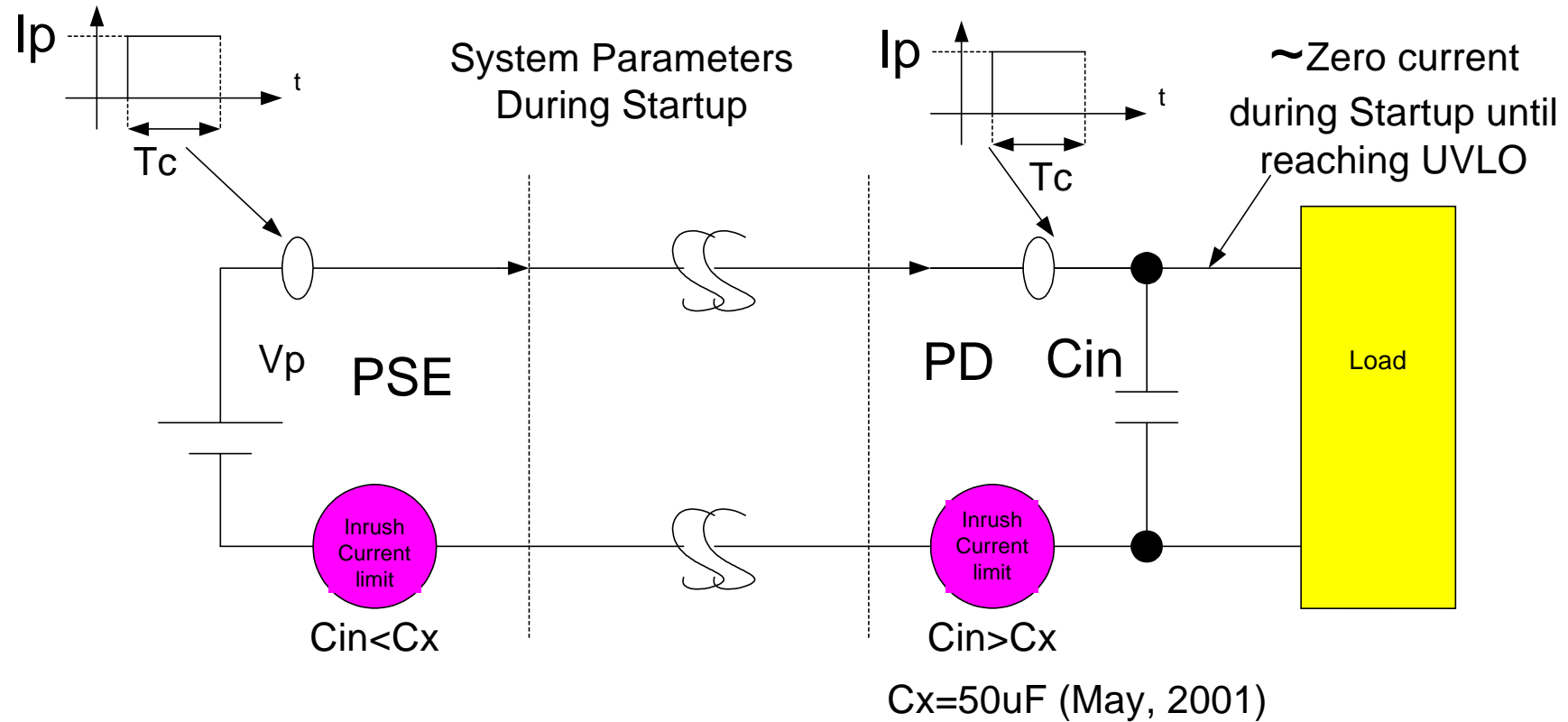
## Objectives

- Specify the inrush current parameters for PSE and PD
- Optimize the 50uF value decided in May/2001

## Strategy

- Using system worst case parameters which already defined
- Using chip package energy limitations to allow single and multi-port chip solutions.

## System Description at Startup Mode





# Suggested Numbers

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<b>Worst case calculations</b>							
	Vport	Iport	E <sub>max</sub>	Tc/ Pulse width	C <sub>in</sub>	N	Notes
Units	V <sub>dc</sub>	A <sub>p</sub>	Joule	msec	uF		
Single Port chip	57	0.5	1 (SO-8)	70.16	615	1	1. Actually may need SO-16 or eqv. 2. No need for N>1
Multi-Port chip	57	0.5	2.5 ÷ 5 (SSOP-QFP)	70.16	615	2 ÷ 5	3. Assuming Mosfets are spread around the pins. 4. No need for N>1
<b>Suggested Numbers for PSE</b>							
	44÷57	0.4min 0.45max		50 min			
<b>Suggested Numbers for PD</b>							
C <sub>in</sub> <350uF (*) C <sub>in</sub> <175uF (**) (***)		0.4 min 0.45 max		50 max			Inrush C.L is in PSE
C <sub>in</sub> >350uF (*) C <sub>in</sub> >175uF (**) (***)		0.4 max		50 max			Inrush C.L is in PD

- (\*) C<sub>in</sub>=350uF requires thermal protection in the chip to handle complete short and limiting to 1Joule.
- (\*\*) C<sub>in</sub>=175uF doesn't requires thermal protection.
- (\*\*\*) C<sub>in</sub>=50uF is the number set in May/2001



## Suggested spec for Startup mode - Summary

### ■ PSE specifications

- During startup, the PSE will limit its output current to:
- $I_p \text{ min} = 0.4$ ;  $I_p \text{ max} = 0.45$ . (The max. level range of  $I_{peak}$ )
- For a current  $> 350\text{mA}$  and for time duration of  $50\text{mSec min}$ ;  $70\text{mSec max}$ , the PSE may/shall/must disconnect the port
- Time between consecutive startup modes is  $1\text{sec min}$ . TBD max.

(Single port insertion time will not be affected by the above parameter since it is defined for 1<sup>st</sup> time insertion and not periodically trial of single port insertions)

### ■ PD specifications

- During startup, the PD allowed to consume  $0.4\text{A max}$ . for a time duration of  $50\text{mS max}$ .
- After  $50\text{mS}$ , the PD is restricted to the Normal Powering mode parameters.
- For the above numbers, PD input capacitor should be limited to  $350\mu\text{F max}$ .
  
- The PD will limit the inrush current if larger than  $350\mu\text{F}$  capacitor is used.
- In this case, the peak current will be limited to be less than  $0.4\text{A}$ .