

# Consensus Proposal

for DTE-Power via MDI

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HP ProCurve Networks

**Invent!**

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# Consensus Proposal Solution Set



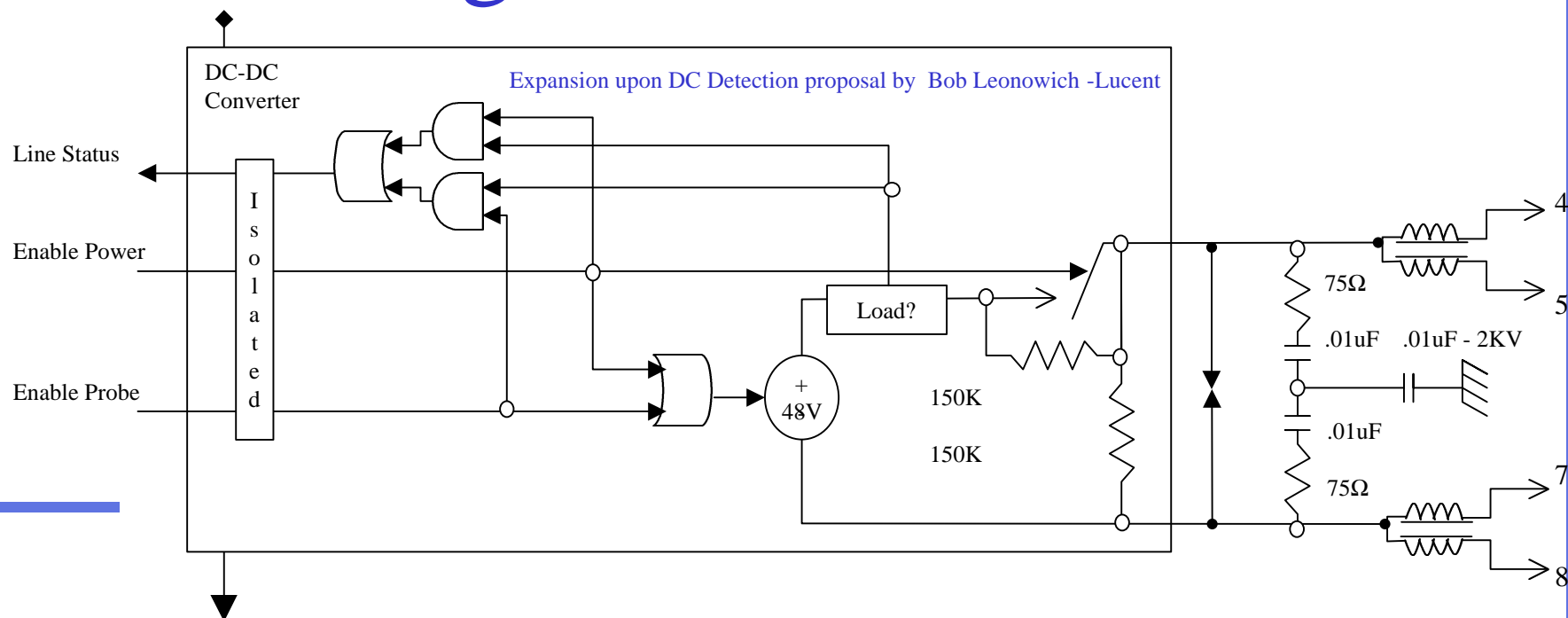
- ⇒ **Single Detection Scheme** for Mid-Span and Switch-End
- ⇒ **Simple** Protocol (Can be implemented with a shared uController)
- ⇒ **Safe** selection of 45-78 pairs to minimize impact on 100BASE-T
- ⇒ **Common-mode Detection** allows easy isolation at Mid-Span without breaking link
- ⇒ **Low Frequency** Detection Method limits EMC/EMI
  - ⇒ Bob Leonowich DC method
  - ⇒ Robert Muir adaptation of Dove's Diode method
  - ⇒ Amir Lehr DC I/V method
  - ⇒ High-Frequency AC termination controls EMC/EMI
- ⇒ **Mid-Span** is a **MUST**
  - ⇒ Using LC network or high-performance transformers can minimize IL,RL at Mid-Span for robust DSP based 1000BASE-T

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# Consensus Proposal

## Single Detection Circuit



Line Status = Enable\_Probe & Load (200uA - 300uA) + Enable\_Power & Load (10ma - 350mA)

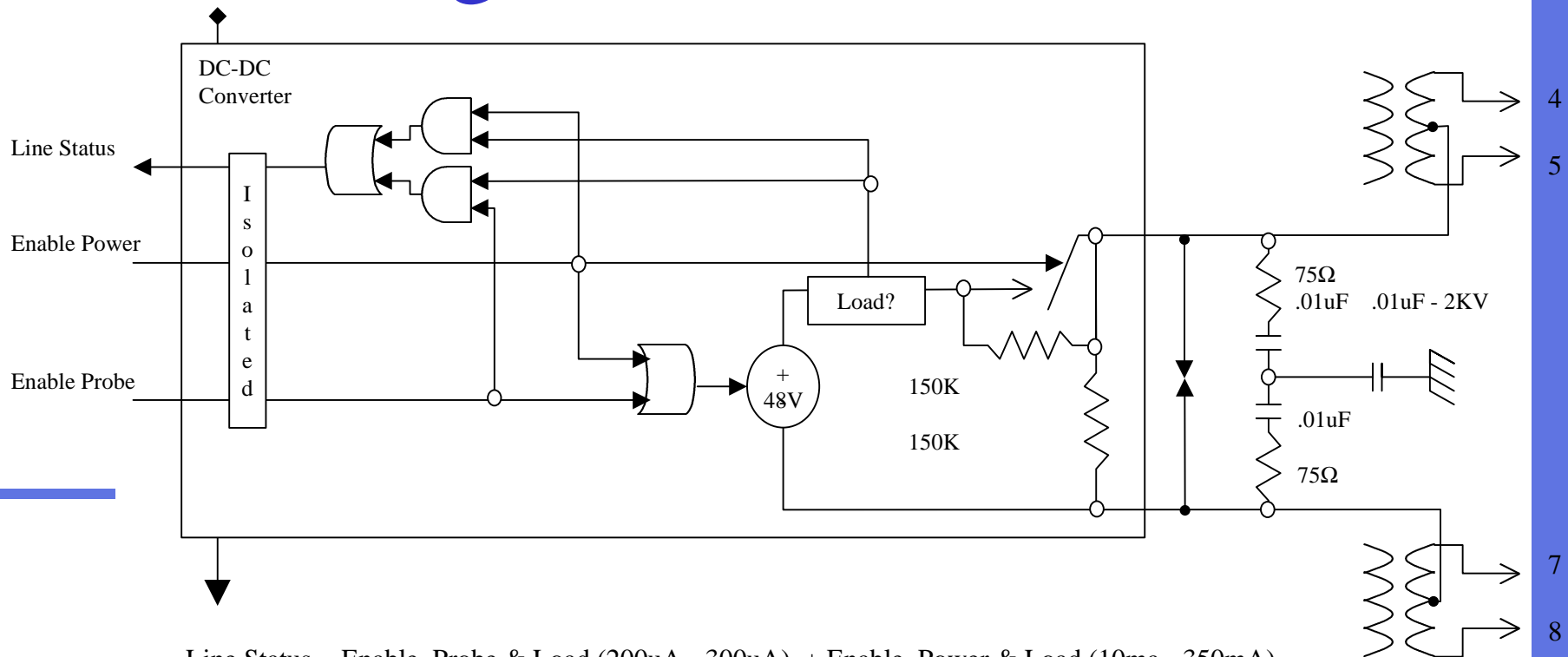
Isolation of control/status can be implemented via Opto-Isolators(DC) or magnetics(AC) signals

All control/status/logic functionality can be implemented in SOIC low-cost silicon solution

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# Consensus Proposal

## Single Detection Circuit



$$\text{Line Status} = \text{Enable\_Probe} \& \text{Load (200uA - 300uA)} + \text{Enable\_Power} \& \text{Load (10ma - 350mA)}$$

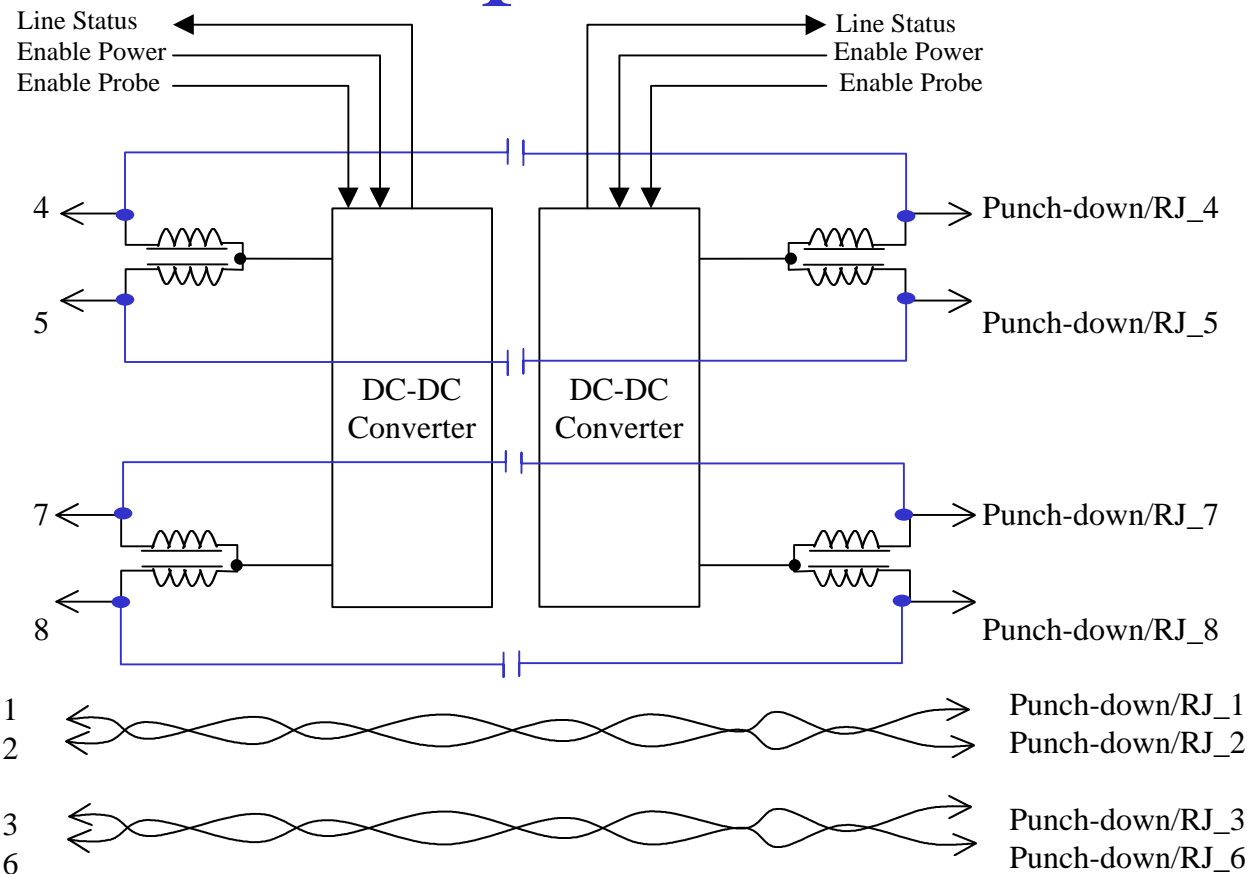
Isolation of control/status can be implemented via Opto-Isolators(DC) or magnetics(AC) signals

All control/status/logic functionality can be implemented in SOIC low-cost silicon solution

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# Consensus Proposal

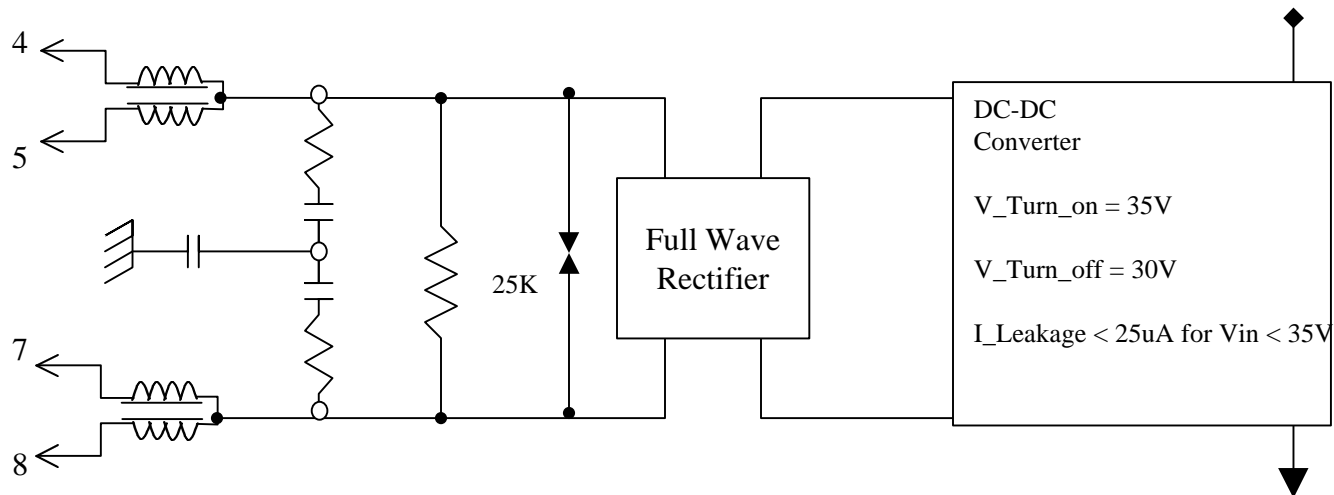
## Mid-Span Circuit



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- Caps can be implemented in parallel to improve frequency range (Low F || High F) for low I/L
- Inductors can be implemented in series to improve frequency range (Low F + High F) for low R/L
- May use high quality transformers instead

# Consensus Proposal Load Circuit

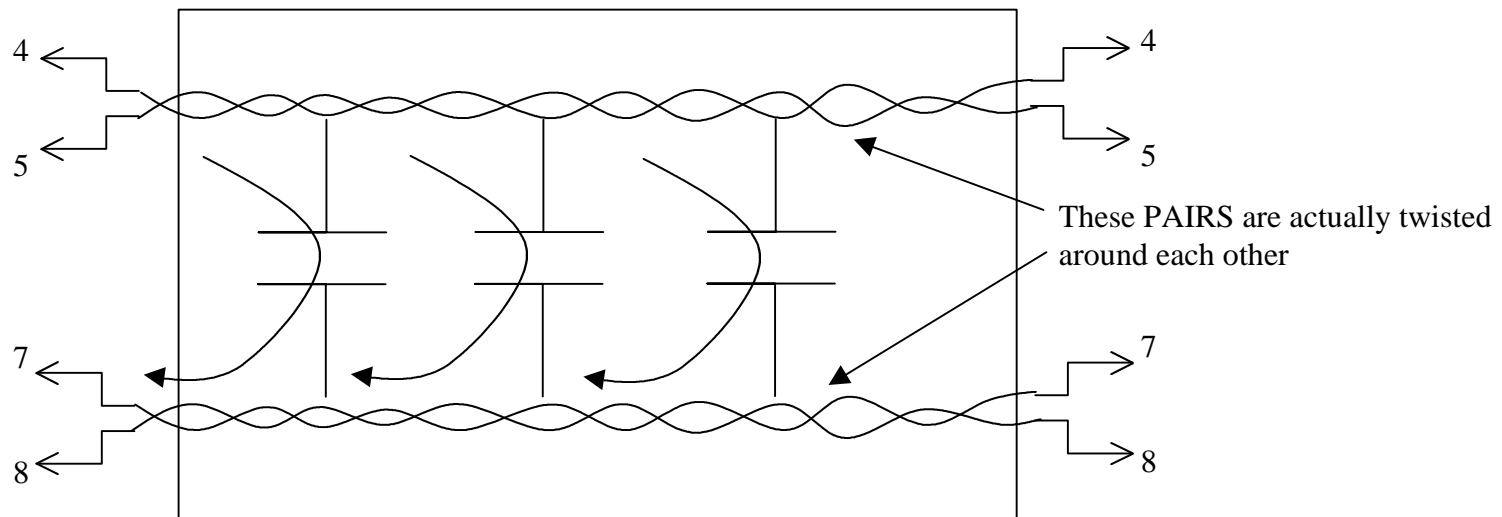


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# Consensus Proposal

## Common-Mode Concerns

- For **Low-Frequencies**, coupling between pairs will assist EMC/EMI concerns
- AC Common-Mode termination ( $\sim 150 \Omega$ ) will reduce reflections :ie EMC/EMI



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# Consensus Proposal Solution Set

## DTE POWER COMMITTEE OBJECTIVES

### LE/F-CM-45-78-Mid-Span

Economically support 10/100BASE-T  
Apply power on same pairs as detection circuit  
Use only 2 pairs for power transmission  
Not interfere with 10/100BASE-T operation  
**May impact 1000BASE-T operation?**  
Support Mid-Span Power Distribution  
\*\* One method of detection  
for end/mid-span detection!!

### DM -Fat-LP Switch-End Proposal 12-36

Economically support 10/100BASE-T  
Apply power on same pairs as detection circuit  
Use only 2 pairs for power transmission?  
**May interfere with 10/100BASE-T operation?**  
**May impact 1000BASE-T operation?**  
**No support for  
Mid-Span Power Distribution!!**

### DM-TONE Mid-Span Proposal 45-78

Economically support 10/100BASE-T  
Apply power on same pairs as detection circuit  
Use only 2 pairs for power transmission?  
Not interfere with 10/100BASE-T operation  
**Doesn't support 1000BASE-T  
Mid-Span operation?**  
**Poor support for Mid-Span  
Power Distribution!!**

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# Consensus Proposal Solution Set



- ⇒ **Single Detection Scheme** for **Mid-Span** and Switch-End
- ⇒ **Simple & Low Cost**
- ⇒ **Safe** selection of 45-78 pairs to minimize impact on 100BASE-T
- ⇒ **Common-mode Detection** allows easy isolation at Mid-Span without breaking link
- ⇒ **Low Frequency** Detection Method limits EMC/EMI

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# Consensus Proposal

## Possible Compromise Alternatives



- ⇒ **Single Detection Scheme** for **Mid-Span** and Switch-End
- ⇒ **Simple & Low Cost**
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- ⇒ **Common-mode Detection** allows easy isolation at Mid-Span without breaking link
- ⇒ **Low Frequency** Detection Method limits EMC/EMI

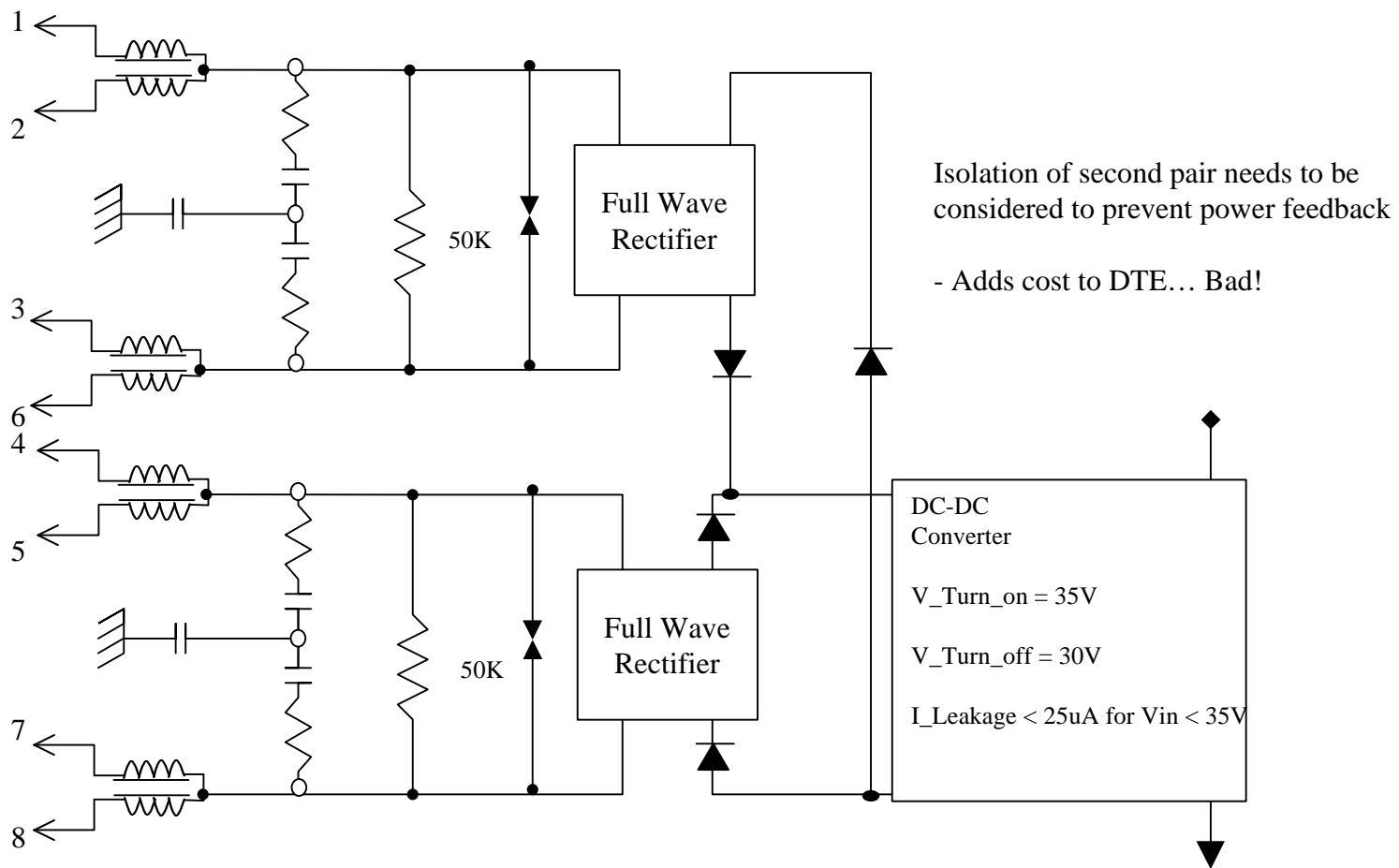
### **BUT:**

- ⇒ Make accommodation in DTE for detection & receiving power via 12,36 pairs
- ⇒ Leave transmission of power via 12-36 for future study
- ⇒ Possible that we may only allow Switch-End distribution on 12-36

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# Consensus Proposal

## Compromise Load Circuit



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