



Economic Feasibility of supporting power on both pair sets in the DTE

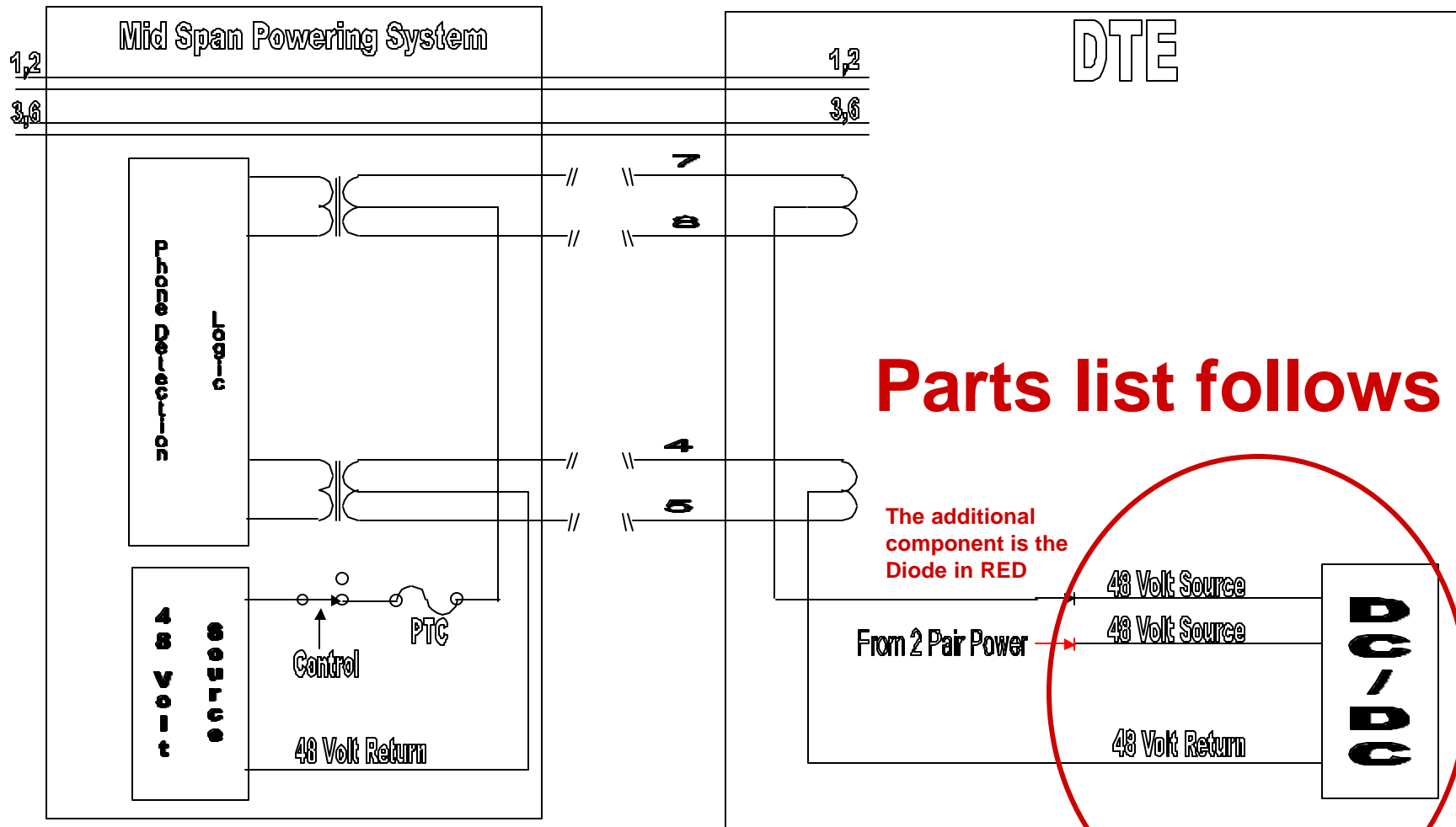
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Assumptions

- **6 Watt Switching Power Converter**
- **36-72V DC Input**
- **150% Start Up Surge**
- **Regulatory Compliance Achieved**
- **Power assumed to be delivered on Pairs A&B**

Power over pairs A&B Schematic reference design



Parts list follows

The additional component is the Diode in RED

Reference design parts list

ITEM DESCRIPTION	QTY ASY	MANUFACTURER Example	MANUFACTURER PART NUMBER Example
OPTO,ISOL,5000V/50% CTR,SO4	1	LITEON	LTV-817S-TA
CAP,TA, 10uF, 25V,20%,SM,2412	2	KOA	TMC1EC106M
CAP,CE, 1uF, 16V,80%,SM,0805	3	MURATA ERIE	GRM40Y5V105Z016
CAP,CE, .1uF, 50V,20%,SM,0805	6	PHILIPS	08052E104M9B
CAP,TA, 33uF, 20V,20%,SM,2816	2	AVX	TPSD336M020-R020
CAP,CE, .01uF, 50V,10%,SM,0603	3	TAIYO	UMK107B103KZ
CAP,CE,.047uF, 16V,10%,SM,0603	1	MURATA ERIE	GRM39X7R473K016A
CAP,CE,1000pF,100V,20%,SM,0805	5	AVX	08051C102MAT
CAP,CE, .56UF,100V,20%,SM,1210	3	NOVA CAP	1210Z564M101NT
RES,TF, 0,.100W, 5%,SM,0805	1	KOA	RM73Z2A
RES, Various 0805	12	IRC	CHF1/10-2R70-J
DIO,SW,1N4148 ,1.0V/0.1A,SOD12	4	DIODES INC	1N4148W
DIO,TS,SMBJ64CA,64V/5uA,DO214A	1	GENERAL INSTRUM	SMBJ64CA
DIO,SW,MBRD360,60V/3A,DPAK	2	MOTOROLA	MBRD360
IC,TLV431I,LOW ADJ VREG,SOT23-	2	TEXAS INSTRUMEN	TLV431IDBV
IC,CS5124,CM PWM CONT,SO8	1	CHERRY	CS5124D8
IC,74AHC1G04 ,INVR,SING,SOT353	1	TI	SN74AHC1G04DCK
XTR,NCH,IRFR210,200V/2.6,TO252	1	INTERNATIONAL R	IRFR210
XTR,NPN,25V/1A,SOT89	1	CENTRAL-SEMI	CBCX68
XTR,NCH,ZVN3310A,100V/500MA,TO	1	ZETEX	ZVN3310A
INDUCT,FERR,10uH,10%,500mA,AX	1	ALLIED COMPONEN	AC30-100K
XFMR,PWR,6.33/19.0/1.06/2.0:1,	1	TRANSPOWER TECH	TTI7509 (Rev 07/99)
FILTR,CMODE,47uH,.40R,SMD6(2-L	1	PULSE	PE-68624
CAP,CE, 1000pF,100V,20%,SM,0805	4	AVX	08051C102MAT
DIO,SW,MBRA4004,400V/1.0A,SMA	3	MOTOROLA	MRA4004
DIO,SW,1N4148 ,1.0V/0.1A,SOD12	2	DIODES INC	1N4148W
POLS,PTC,.50A/60V,SM,3121	2	RAYCHEM	SMD050

Additional Parts to support power over 2nd pair set

Additional Components for power over 2nd Pair Set

DIO,SW,MBRA4004,400V/1.0A,SMA	1	MOTOROLA	MRA4004
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Additional Components for detection over 2nd Pair Set

Bob Leonowich detection scheme

RES, Various 0805	1	IRC	CHF1/10-2R70-J
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Robert Muir detection scheme

RES, Various 0805	2	IRC	CHF1/10-2R70-J
DIO,SW,MBRA4004,400V/1.0A,SMA	1	MOTOROLA	MRA4004

Economic Comparison

- Total cost of 6W reference design = **1 Units**
- Additional costs to support power on 2nd pair set is **0.00584 Units**
- Additional cost to support the Bob Leonowich detection scheme on 2nd pair set is **0.0001 Units**
- Additional costs to support the Robert Muir detection scheme on 2nd pair set is **0.0061 Units**
- Note that these ratios become even more favorable for a 15 Watt Power Supply

Conclusion

- **The addition of power over 2nd pair set does not materially affect the economic feasibility of the power subsystem in the DTE**
- **The addition of an the detection scheme on the 2nd pair set does not materially affect the economic feasibility of the power subsystem in the DTE**
- **Power of both pair sets is economically feasible**