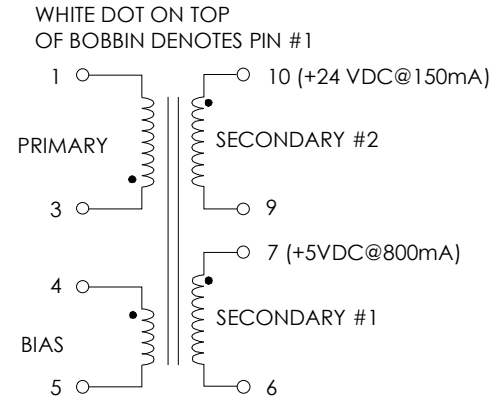


**TABLE 1: ELECTRICAL SPECIFICATIONS AT 25 °C**

PARAMETER	SPEC LIMITS			UNITS
	MIN.	TYP.	MAX.	
PRIMARY INDUCTANCE (3-1) FREQ. = 100 KHZ @ 0.250Vrms	550	600	650	μHY
TURN RATIO'S: SEC #1 (7-6) : PRIMARY (3-1) SEC #2 (10-9) : PRIMARY (3-1) BIAS (4-5) : PRIMARY (3-1)	-----	1: 8.4 1: 2.0 1: 3.82	-----	± 3% ± 3% ± 3%
PRI LEAKAGE INDUCTANCE SECONDARIES SHORTED FREQ. = 100 KHZ @ 0.250Vrms	-----	-----	10	μHY
HIPOT: PRIMARY & BIAS TO SECONDARY PRIMARY TO BIAS SECONDARY#1 TO SECONDARY#2	3000 500 500	----- ----- -----	----- ----- -----	Vrms Vrms Vrms
APP CIRCUIT PARAMETERS: SEE FIGURE 3				
AC LINE VOLTAGE 47/400 Hz	85	-----	265	Vac
OPTION: DC INPUT (HOT RAIL)	48	-----	375	Vdc
SEC #1 OUTPUT VOLTAGE		+ 5		Vdc
OUTPUT CURRENT CONTINUOUS	50	-----	+800	mA
SEC #2 OUTPUT VOLTAGE		+ 24		Vdc
OUTPUT CURRENT CONTINUOUS	20	-----	150	mA

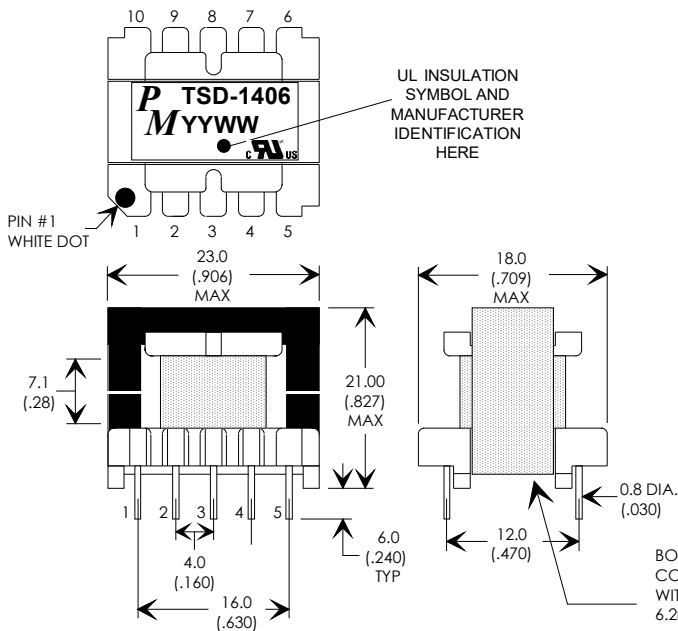
**FIGURE 1: SCHEMATIC DIAGRAM**



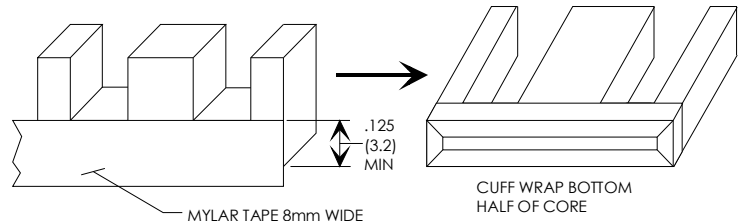
**NOTE1:**  
**REINFORCED INSULATION, UL1950, IEC950, CSA-950:**  
 A) ALL MATERIALS MEET "UL", "CSA" & "IEC" REQUIREMENTS  
 B) ALL MATERIALS RATED 130 °C (CLASS B) OR BETTER.  
 C) TRIPLE INSULATED SECONDARY.  
 D) DESIGNED FOR >6.2mm CREEPAGE REQUIREMENTS.  
 E) VARNISH FINISHED ASSEMBLY.  
 F) UL CLASS (B) 130 INSULATION SYSTEM PM130-R1, PM130-H1, PM130-H1A (UL FILE #E177139) OR ANY UL AUTHORIZED CLASS (B) INSULATION SYSTEM.



**FIGURE 2: PHYSICAL DIMENSIONS mm**



**NOTE2:**  
 A) BOTTOM HALF OF CORE IS CUFF WRAPPED PRIOR TO ASSEMBLY. THIS GAURANTEES >6.2mm CREEPAGE PIN-CORE-PIN



**RoHS**

REV.	DESCRIPTION OF CHANGES	BY
05/11/99	UPDATE RELEASE	PP
06/09/99	CHANGED DESIGN TO 24V OUTPUT	PP
07/28/99	UPDATE LEAKAGE INDUCTANCE FROM TBD TO 10uH	PP
09/23/99	CORRECT PIN NUMBER ON TEST SPEC.	PP
01/19/01	UPDATE TO UL CLASS (B) 130 INSULATION SYSTEM	MD
02/12/01	ADDED UL RECOGNIZED SYMBOL - NO OTHER CHANGES	MD



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM DIMENSIONAL TOLERANCES ARE: DECIMALS ANGLES  
 .X ± .25 ±0° 30'  
 .XX ± .15  
 DO NOT SCALE DRAWING

**FLYBACK TRANSFORMER CONTROL DRAWING**

PREMIER P/N: TSD-1406	REVISION: 02/12/01
DRAWN BY: PETER PHAM	REF: TOP-223P
SCALE: NONE	SHEET: 1 OF 3

# APPLICATION NOTES

Premier Magnetics' TSD-1406 Switch Mode Transformer was designed for use with Power Integrations, Inc. TOP223P three terminal off-line PWM switching regulator in a low cost Isolated Flyback Buck-Boost circuit configuration. The feedback implementation is accomplished indirectly by regulating the bias winding voltage. This is the lowest cost topology but has the drawback of poor load regulation. As such this topology is intended for use where load power is fairly constant. Resistor R2 provides an output clamp to prevent output voltage runaway and possible circuit damage under a no load condition.

The TOPXXX series from Power Integrations, Inc. are self contained 100KHz three terminal voltage controlled PWM switching regulators. This series contains all necessary functions for an off-line switch mode controlled DC power source. These switching regulators provide a very simple solution to off-line designs. The inductors and transformer used with the TOPXXX are critical to the performance of the circuit. They define the overall efficiency, output power and overall physical size.

Below is a universal input 8 watt application circuit utilizing Power Integrations TOP223P switching regulator in the isolated flyback buck-boost configuration. The component values listed are intended for reference purposes only.

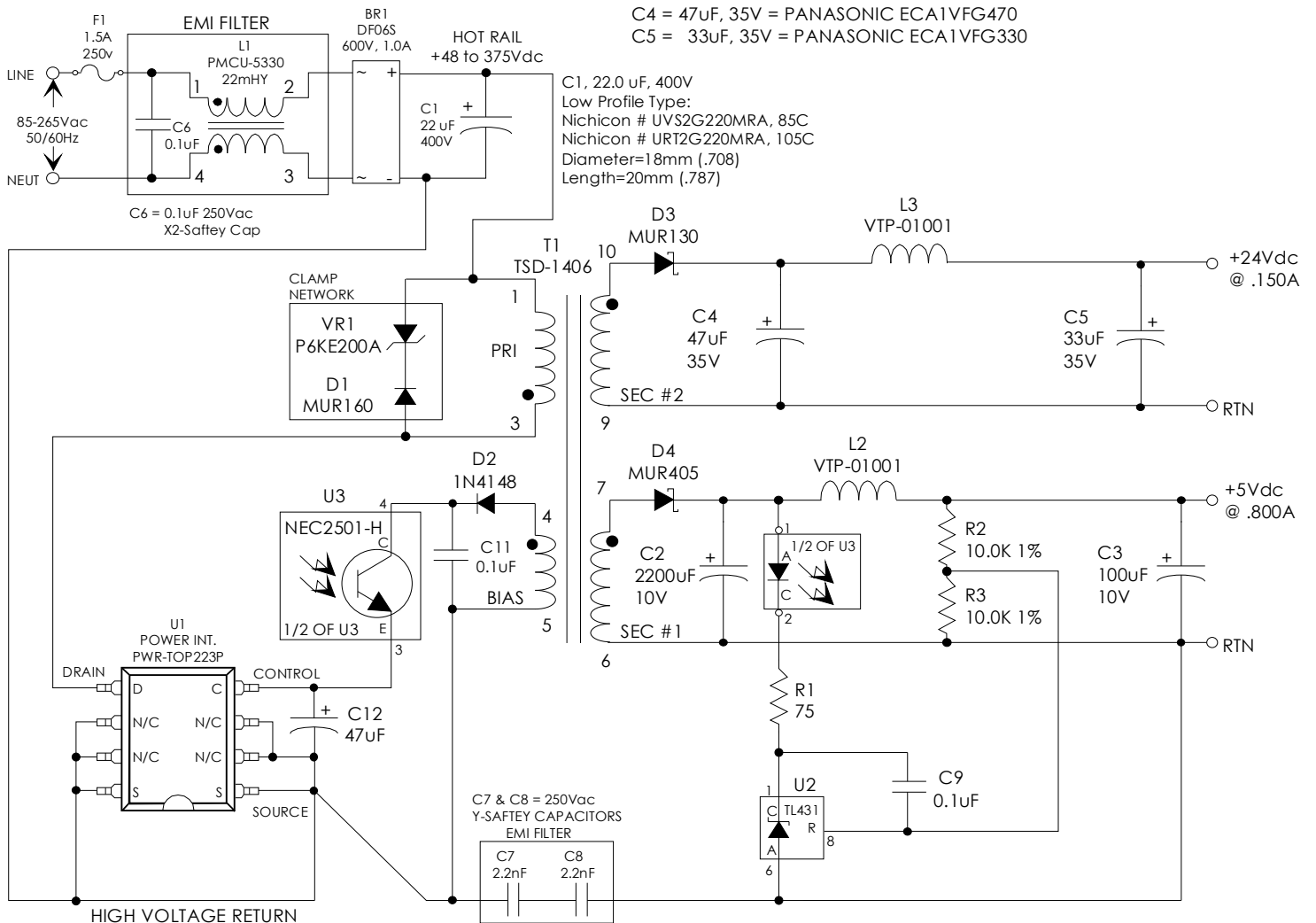
**FIGURE 3: TYPICAL APPLICATION CIRCUIT**

PREMIER MAGNETICS PART NUMBERS:  
(REQUEST DATA SHEETS BY PART #)

- L1 = PMCU-0220 22mHy EMI/RFI CMC
- T1 = TSD-1406 MAIN SWITCHING TRANSFORMER
- L2 = VTP-01001 10uHy, 1.0Amp INDUCTOR

ALUMINUM ELECTROLYTIC FILTER CAPACITOR RATINGS:

- +5V OUTPUT: C2 ≥ 10V, Ripple Rated ≥ 980mA @ 100KHz @ Max. Op. Temp.
- +24V OUTPUT: C4 ≥ 35V, Ripple Rated ≥ 150mA @ 100KHz @ Max. Op. Temp.
- PANASONIC HFG SERIES: LOW IMPEDANCE RADIAL SERIES
- C2 = 2200uF, 10V = PANASONIC ECA1AFG222
- C3 = 100uF, 10V = PANASONIC ECA1AFG101
- C4 = 47uF, 35V = PANASONIC ECA1VFG470
- C5 = 33uF, 35V = PANASONIC ECA1VFG330



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN MM  
DIMENSIONAL TOLERANCES ARE:  
DECIMALS ANGLES  
.X ± .25 ±0° 30'  
.XX ± .15  
DO NOT SCALE DRAWING

FLYBACK TRANSFORMER CONTROL DRAWING	
PREMIER P/N: TSD-1406	REVISION: 02/12/01
DRAWN BY: PETER PHAM	REF: TOP-223P
SCALE: NONE	SHEET: 2 OF 3

# APPLICATION NOTES

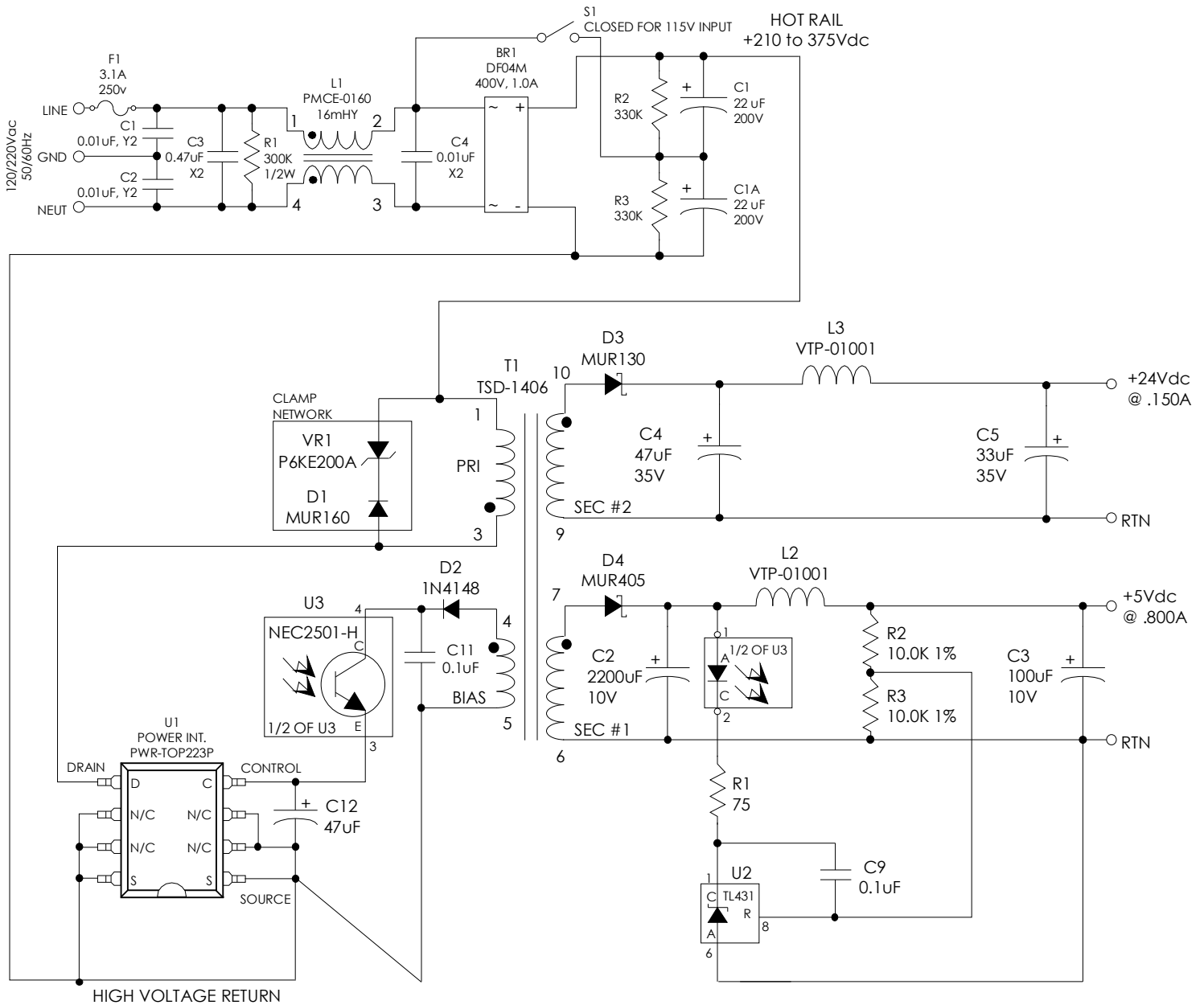
Below is voltage doubler input high precision 8 watt application circuit utilizing Power Integrations TOP223P switching regulator in the flyback buck-boost configuration. The component values listed are intended for reference purposes only. Properly sized heat sinks for the TOP223P as well as proper thermal management of the clamp network are critical requirements for efficient and reliable operation.

PREMIER MAGNETICS PART NUMBERS:  
(REQUEST DATA SHEETS BY PART#)

- L1 = PMCU-0220 22mHy EMI/RFI CMC
- T1 = TSD-1406 MAIN SWITCHING TRANSFORMER
- L2 = VTP-01001 10uHy, 1.0Amp INDUCTOR

ALUMINUM ELECTROLYTIC FILTER CAPACITOR RATINGS:

- +5V OUTPUT: C2 ≥ 10V, Ripple Rated ≥ 980mA @ 100KHz @ Max. Op. Temp.
- +24V OUTPUT: C4 ≥ 35V, Ripple Rated ≥ 150mA @ 100KHz @ Max. Op. Temp.
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- C5 = 33uF, 35V = PANASONIC ECA1VFG330



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN MM  
DIMENSIONAL TOLERANCES ARE:  
DECIMALS ANGLES  
.X ±.25 ±0° 30'  
.XX ±.15  
DO NOT SCALE DRAWING

FLYBACK TRANSFORMER CONTROL DRAWING	
PREMIER P/N: TSD-1406	REVISION: 02/12/01
DRAWN BY: PETER PHAM	REF: TOP-223P
SCALE: NONE	SHEET: 3 OF 3