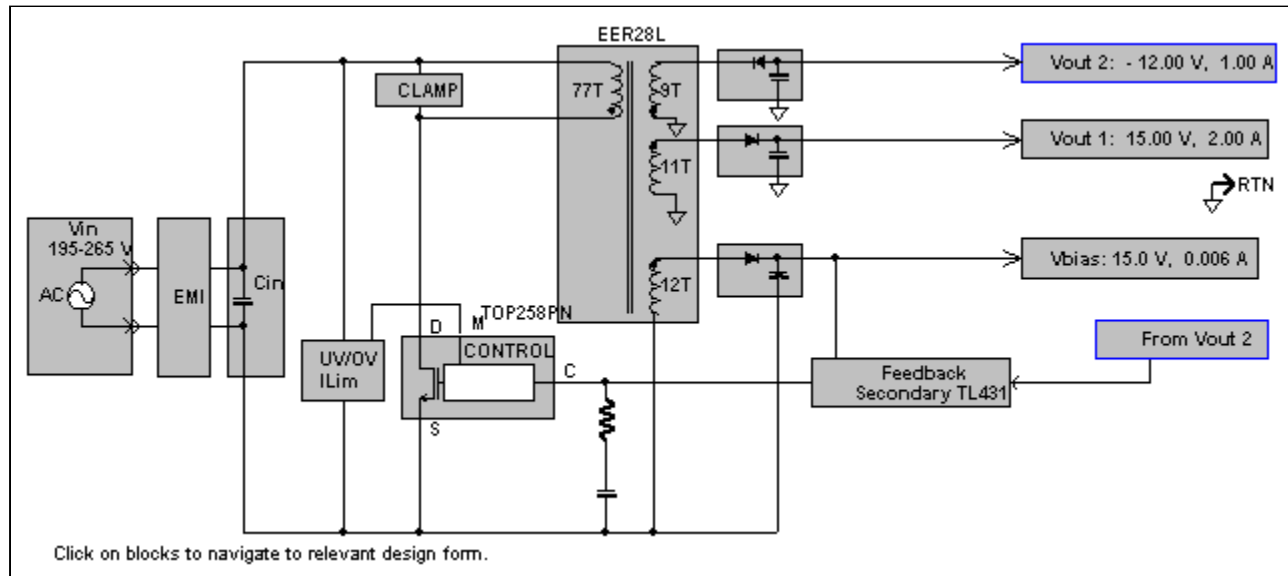




## Design Passed (Optimization Done)

### Design Report



### Design Results

#### Power Supply Input

Var	Value	Units	Description
VACMIN	195	V	Minimum Input AC Voltage
VACMAX	265	V	Maximum Input AC Voltage
FL	50	Hz	Line Frequency
TC	1.98	ms	Diode Conduction Time
Z	0.56		Loss Allocation Factor
$\eta$	83.0	%	Efficiency Estimate
Iavg	0.22	A	Average Diode Bridge Current
Input Rectifier	1N4007GP		Recommended Input Diodes
VMIN	226.7	V	Minimum DC Input Voltage
VMAX	374.8	V	Maximum DC Input Voltage

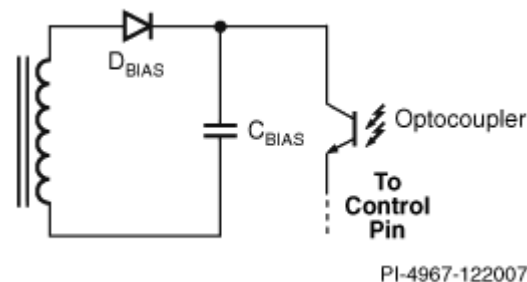
#### EMI Filter

Var	Value	Units	Description
CIN1	33.00	$\mu$ F	Input Bulk Capacitor
LCM	6.00	mH	Common Mode Choke
CX	0.10	$\mu$ F	X Capacitor

#### Device Variables



VDB      **0.95**      V      Bias Diode Forward Voltage Drop



PIVB      **74**      V      Bias Rectifier Max Peak Inverse Voltage  
 NB      **12**           Bias Winding Number of Turns  
 Wire Size      **27**      AWG      Wire size of Bias windings  
 Winding Type      **Bifilar (x2)**      Wire type of Bias windings  
 Layers      **0.61**      Bias Winding Layers  
 Start Pin(s)      **5**      Starting pin(s) for Bias winding  
 Termination Pin(s)      **4**      Termination pin(s) for Bias winding

### Transformer Construction Parameters

Var	Value	Units	Description
Core Type	<b>EER28L</b>		Core Type
Core Material	<b>NC-2H (Nicera) or Equivalent</b>		Core Material
Bobbin Reference	<b>Generic, 6 pri. + 6 sec.</b>		Bobbin Reference
Bobbin Orientation	<b>Horizontal</b>		Bobbin type
Primary Pins	<b>5</b>		Number of Primary pins used
Secondary Pins	<b>3</b>		Number of Secondary pins used
LP	<b>860</b>	$\mu\text{H}$	Primary Inductance
NP	<b>76.4</b>		Calculated Primary Winding Total Number of Turns
NSM	<b>9</b>		Secondary Main Number of Turns
CMA	<b>467</b>	Cmils/A	Primary Winding Current Capacity
VOR	<b>110.00</b>	V	Reflected Output Voltage
BW	<b>22.40</b>	mm	Bobbin Winding Width
ML	<b>3.20</b>	mm	Safety Margin on Left Width
MR	<b>3.20</b>	mm	Safety Margin on Right Width
FF	<b>72</b>	%	Actual Transformer Fit Factor. 100% signifies fully utilized winding window
AE	<b>81.40</b>	$\text{mm}^2$	Core Cross Sectional Area
ALG	<b>147</b>	$\text{nH/T}^2$	Gapped Core Effective Inductance
BM	<b>1743</b>	Gauss	Maximum Flux Density
BP	<b>2217</b>	Gauss	Peak Flux Density
BAC	<b>805</b>	Gauss	AC Flux Density for Core Loss
LG	<b>0.655</b>	mm	Estimated Gap Length
L_LKG	<b>23.6</b>	$\mu\text{H}$	Primary Leakage Inductance
LSEC	<b>20</b>	nH	Secondary Trace Inductance

### Primary Winding Section 1

Var	Value	Units	Description
NP1	<b>39</b>		Rounded (Integer) Number of Primary winding turns in the first section of primary
Wire Size	<b>27</b>	AWG	Wire size of primary winding
Winding Type	<b>Single (x1)</b>		Primary winding number of parallel wire strands

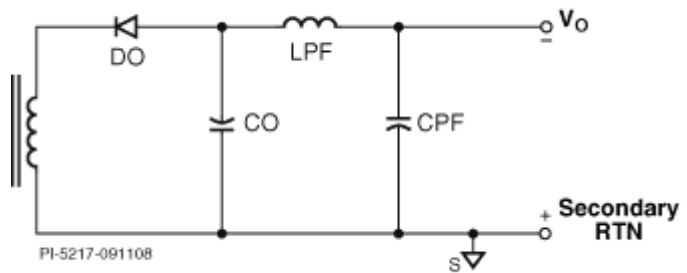
## Primary Winding Section 2

## ▼ Output 1

## ▼ Output 2

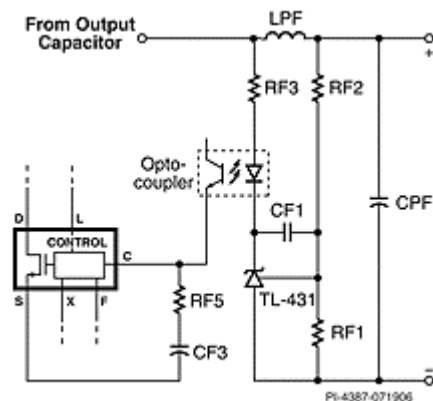
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IO	1.00	A	Output Current
VOUT_ACTUAL	-12.00	V	Actual Output Voltage
NS	9		Secondary Number of Turns
Wire Size	25	AWG	Wire size of secondary winding
Winding Type	Single (x1)		Output winding number of parallel strands
L_S_OUT	0.28		Secondary Output Winding Layers
DC Copper Loss	0.16	W	Secondary DC Losses
Start Pin(s)	7		Starting pin(s) for Output winding
Termination Pin(s)	9		Termination pin(s) for Output winding
VD	0.95	V	Output Winding Diode Forward Voltage Drop
PIVS	56	V	Output Rectifier Maximum Peak Inverse Voltage
ISP	3.05	A	Peak Secondary Current
IS RMS	1.50	A	Secondary RMS Current
DO	MUR120		Recommended Output Diode
CO	470 x 1	μF	Output Capacitor
IRIPPLE	1.12	A	Output Capacitor RMS Ripple Current
Expected Lifetime	27523	hr	Expected Lifetime of Output Capacitor
LPF	2.2 - 10	μH	Post Filter Inductor
CPF	100 - 680	μF	Post Filter Capacitor



### Feedback Circuit

Var	Value	Units	Description
RF1	11.30	kΩ	Feedback Resistor to bias the error Amplifier
RF2	43.20	kΩ	Compensation resistor
RF3	412.00	Ω	Gain limiting Resistor
RF5	6.81	Ω	TOPSwitch Control Pin Resistor
CF1	100.00	nF	Compensation Capacitor
CF3	47.00	μF	TOPSwitch Control Pin Capacitor
Opto CTR	80.00		Optocoupler Current Transfer Ratio
Error Amp Gain	55.00	dB	Error Amplifier Open Loop Gain
PM	77.23	Deg	Estimated Phase Margin
FC_ACTUAL	1019.5	Hz	Estimated Crossover Frequency



The regulation and tolerances do not account for thermal drifting and component tolerance of the output diode forward voltage drop and voltage drops across the LC post filter. The actual voltage values are estimated at full load only.

Please verify cross regulation performance on the bench.

## Errors, Warnings, Information

<i>Description</i>	<i>Fix</i>	<i>Show me</i>	<i>Ref. #</i>
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