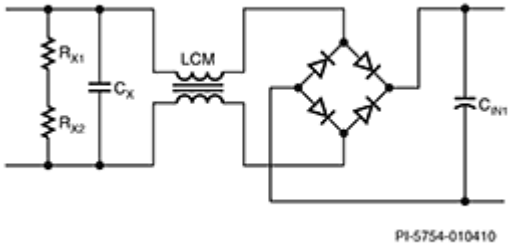
Power Supply Input

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	0,63		Loss Allocation Factor
η	82,0	%	Efficiency Estimate
IAVG	1,11	A	Average Diode Bridge Current (DC Input Current)
VMIN	230,7	V	Minimum DC Input Voltage
VMAX	374,8	V	Maximum DC Input Voltage

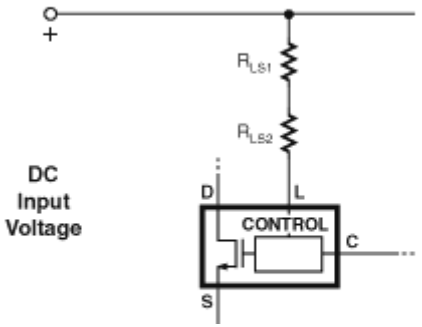
Input Section and EMI Filter

Var	*Value*	*Units*	*Description*
Fuse	1,60	A	Input Fuse Rated Current
Thermistor	10,00	Ω	Input Thermistor
Input Rectifier	2KBP06M		Recommended Input Diodes/Diode Bridge
CIN1	180,0	µF	Input Bulk Capacitor
LCM	6,0	mH	Common Mode Choke
CX	330,0	nF	X Capacitor
RX1	1,10	MΩ	Input Resistor
RX2	1,10	MΩ	Input Resistor
CY	2,20	nF	Y-Capacitor



Device Variables

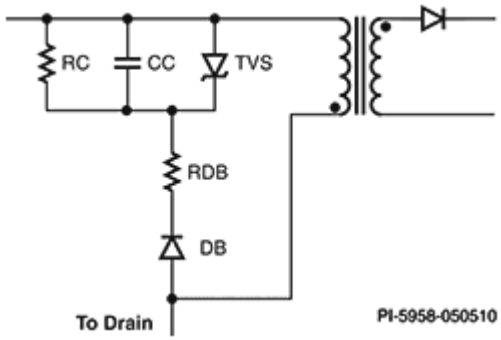
Var	*Value*	*Units*	*Description*
Device	TOP249YN		PI Device Name
PO	210,07	W	Total Output Power
VDRAIN Estimated	587,87	V	Actual Estimated Drain Voltage
VDS	12,68	V	On state Drain to Source Voltage
FS	132000	Hz	Switching Frequency
KP	0,79		Continuous/Discontinuous Operating Ratio
KI	1,00		Current Limit Reduction Factor
ILIMITEXT	5,02	A	Programmed Current Limit
ILIMITMIN	5,02	A	Minimum Current Limit
ILIMITMAX	5,78	A	Maximum Current Limit
CBP	0,10	µF	Device bypass capacitor
RLS	2,4	MΩ	Line sense resistor
RLS2	2,4	MΩ	Line sense resistor



IP	4,81	A	Peak Primary Current (at VMIN)
IRMS	1,92	A	Primary RMS Current (at VMIN)
P_NO_LOAD	500	mW	Estimated No Load Input Power
DMAX	0,38		Maximum Duty Cycle
RTH_DEVICE	5,80	°C/W	PI Device Maximum Thermal Resistance
DEV_HSINK_TYPE	Aluminum Extruded		PI Device Heatsink Type
DEV_HSINK_PN	529902B02100G		PI Device (Extruded) Heatsink Part Number

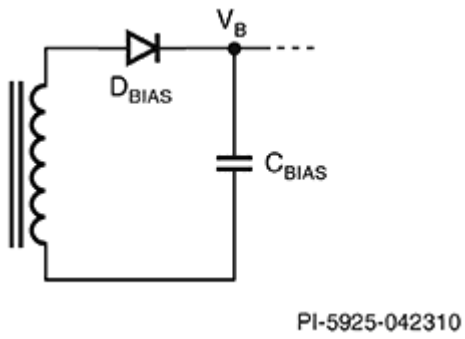
Clamp Circuit

Var	*Value*	*Units*	*Description*
DB	FR257		Recommended Blocking Diode
RCLAMP	24,00	kΩ	Clamping resistor
RC_NUM	3		Number of parallel Clamping resistors
CCLAMP	10,000	nF	Clamp Capacitor
RDB	5,10	Ω	Damping Resistor for Clamp Circuit
VCLAMP	176	V	Estimated average clamping voltage
VRZ	P6KE200A		Recommended Zener Clamp
Estimated Clamp Loss	3,67	W	Clamp Dissipation



Bias Variables

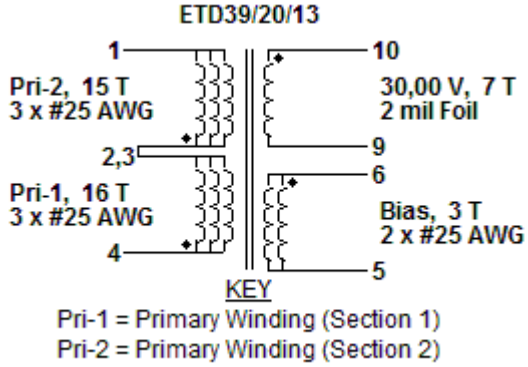
Var	*Value*	*Units*	*Description*
VB	12,0	V	Bias Voltage
IB	0,006	A	Bias Current
VDB	1,00	V	Bias Diode Forward Voltage Drop
PIVB	49	V	Bias Rectifier Max Peak Inverse Voltage
CBIAS	1,0	µF	Bias Capacitor
NB	3		Bias Winding Number of Turns
Wire Size	25	AWG	Wire size of Bias windings
Winding Type	Bifilar (x2)		Wire type of Bias windings
Layers	0,12		Bias Winding Layers
Start Pin(s)	6		Starting pin(s) for Bias winding
Termination Pin(s)	5		Termination pin(s) for Bias winding



Transformer Construction Parameters

Var	*Value*	*Units*	*Description*
Core Type	ETD39/20/13		Core Type
Core Material	NC-2H (Nicera) or Equivalent		Core Material

Bobbin Reference	Generic, 8 pri. + 8 sec.		Bobbin Reference
Bobbin Orientation	Vertical		Bobbin type
Primary Pins	6		Number of Primary pins used
Secondary Pins	2		Number of Secondary pins used
LP	163	µH	Primary Inductance
LP_Tol	10,0	%	Primary Inductance Tolerance
LP_nom	182	µH	Nominal Primary Inductance
NP	30,3		Calculated Primary Winding Total Number of Turns
NSM	7		Secondary Main Number of Turns
CMA	533	Cmils/A	Primary Winding Current Capacity
VOR	135,0	V	Reflected Output Voltage
BW	25,70	mm	Bobbin Winding Width
ML	0,00	mm	Safety Margin on Left Width
MR	0,00	mm	Safety Margin on Right Width
FF	51	%	Actual Transformer Fit Factor. 100% signifies fully utilized winding window
AE	125,00	mm²	Core Cross Sectional Area
ALG	178	nH/T²	Gapped Core Effective Inductance
BM	2074	Gauss	Maximum Flux Density
BP	2491	Gauss	Peak Flux Density
BAC	823	Gauss	AC Flux Density for Core Loss
LG	0,823	mm	Estimated Gap Length
L_LKG	2,72	µH	Estimated primary leakage inductance
LSEC	20	nH	Secondary Trace Inductance



Primary Winding Section 1

Var	*Value*	*Units*	*Description*
NP1	16		Rounded (Integer) Number of Primary winding turns in the first section of primary
Wire Size	25	AWG	Wire size of primary winding
Winding Type	Trifilar (x3)		Primary winding number of parallel wire strands
L	0,94		Primary Number of Layers
DC Copper Loss	0,10	W	Primary 1 DC Losses
PIN_S	4		Starting pin(s) for first section of primary winding
PIN_T	2,3		Termination pin(s) for first section of primary winding

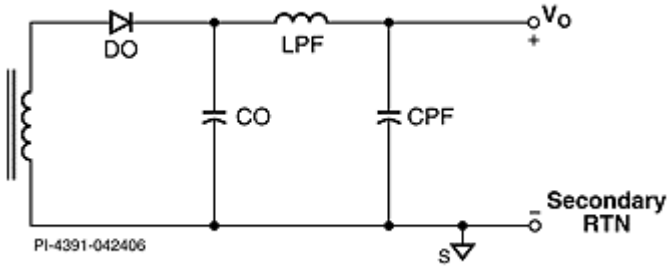
Primary Winding Section 2

Var	*Value*	*Units*	*Description*
NP2	15		Rounded (Integer) Number of Primary winding turns in the second section of primary

Wire Size	25	AWG	Wire size of primary winding
Winding Type	Trifilar (x3)		Primary winding number of parallel wire strands
L2	0,89		Primary Number of Layers in 2nd split winding
DC Copper Loss	0,15	W	Primary 2 DC Losses
PIN_S2	2,3		Starting pin(s) for the second section of primary winding
PIN_T2	1		Termination pin(s) for the second section of primary winding

Output 1

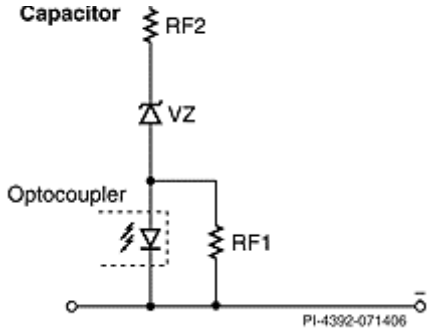
Var	*Value*	*Units*	*Description*
VO	30,00	V	Output Voltage
IO	7,00	A	Output Current
VOUT_ACTUAL	30,00	V	Actual Output Voltage
NS	7		Secondary Number of Turns
Foil Thickness	2	mil	Wire size of secondary winding
Winding Type	Foil		Output winding number of parallel strands
L_S_OUT	7,00		Secondary Output Winding Layers
DC Copper Loss	0,21	W	Secondary DC Losses
Start Pin(s)	10		Starting pin(s) for Output winding
Termination Pin(s)	9		Termination pin(s) for Output winding
VD	1,15	V	Output Winding Diode Forward Voltage Drop
PIVS	115	V	Output Rectifier Maximum Peak Inverse Voltage
ISP	20,85	A	Peak Secondary Current
ISRMS	10,57	A	Secondary RMS Current
DO	BYV32-200		Recommended Output Diode
RTH_DIODE	6,22	°C/W	Output Diode Maximum Thermal Resistance
OD_HSINK_TYPE	Aluminum Extruded		Output Diode Heatsink Type
OD_HSINK_PN	532702B02500G		Output Diode (Extruded) Heatsink Part Number
RSNUB	470,0	Ω	Snubber Resistor
CSNUB	22	pF	Snubber Capacitor
CO	330 x 5	µF	Output Capacitor
IRIPPLE	7,93	A	Output Capacitor RMS Ripple Current
Expected Lifetime	38895	hr	Expected Lifetime of Output Capacitor
LPF	3,30	µH	Post Filter Inductor
CPF	100,00	µF	Post Filter Capacitor



Feedback Circuit

Var	*Value*	*Units*	*Description*
Rated Voltage	27,0	V	Zener Rated Voltage

Zener Test Current	5,0	mA	Zener Test Current
RF1	1000,00	Ω	Zener Biasing resistor
RF2	590,0	Ω	Zener Compensation resistor



High output current flyback design.

Use parallel low ESR output capacitors, reduce secondary ripple currents by reducing VOR and KP.

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.