

Power Supply Input



Var	Value	Units	Description
VACMIN	85	V	Minimum Input AC Voltage
VACMAX	265	V	Maximum Input AC Voltage
FL	50	Hz	Line Frequency
TC	2,69	ms	Diode Conduction Time
Z	0,65		Loss Allocation Factor
η	72,0	%	Efficiency Estimate
VMIN	88,3	V	Minimum DC Input Voltage
VMAX	374,8	V	Maximum DC Input Voltage

Input Section

Var	Value	Units	Description
Fuse	1,60	A	Input Fuse Rated Current
IAVG	1,13	A	Average Diode Bridge Current (DC Input Current)
Thermistor	10,00	Ω	Input Thermistor

Device Variables

Var	Value	Units	Description
Device	TOP249FN		PI Device Name
Device Mode	Default		Current Limit mode for device
PO	72,07	W	Total Output Power
VDRAIN Estimated	605,03	V	Actual Estimated Drain Voltage
VDS	10,00	V	On state Drain to Source Voltage
FS	132000	Hz	Switching Frequency
KP	0,85		Continuous/Discontinuous Operating Ratio
KI	0,72		Current Limit Reduction Factor
ILIMITTEXT	3,60	A	Programmed Current Limit
ILIMITMIN	5,02	A	Minimum Current Limit
ILIMITMAX	5,78	A	Maximum Current Limit
RLS	1,0	M Ω	Line sense resistor
RLS2	1,0	M Ω	Line sense resistor
PLIM_FLAG	NO		Enable Overload Power Limiting
IP	3,27	A	Peak Primary Current (at VMIN)
IRMS	1,59	A	Primary RMS Current (at VMIN)
P_NO_LOAD	500	mW	Estimated No Load Input Power
DMAX	0,60		Maximum Duty Cycle
RTH_DEVICE	6,19	$^{\circ}\text{C/W}$	PI Device Maximum Thermal Resistance
DEV_HSINK_TYPE	1 Oz (35 μ) Copper PCB		PI Device Heatsink Type
DEV_HSINK_AREA	1632698	mm ²	PI Device Heatsink Area

Clamp Circuit

Var	Value	Units	Description
Clamp Type	RCD + Zener Clamp		Clamp Circuit Type
VCLAMP	175	V	Estimated average clamping voltage
Estimated Clamp Loss	1,31	W	Clamp Dissipation

Bias Variables

Var	Value	Units	Description
VB	12,0	V	Bias Voltage
IB	0,006	A	Bias Current
PIVB	53	V	Bias Rectifier Max Peak Inverse Voltage
NB	2		Bias Winding Number of Turns

Transformer Construction Parameters

Var	Value	Units	Description
Core Type	Custom Transformer B65847A0000R030		Core Type
Core Material	NC-2H (Nicera) or Equivalent		Core Material
Bobbin Reference	Generic, 5 pri. + 5 sec.		Bobbin Reference
Bobbin Orientation	Horizontal		Bobbin type
Primary Pins	5		Number of Primary pins used
Secondary Pins	2		Number of Secondary pins used
USE_SHIELDS	NO		Use shield Windings
LP_nom	145	μH	Nominal Primary Inductance

LP_Tol	10,0	%	Primary Inductance Tolerance
NP	18,1		Calculated Primary Winding Total Number of Turns
NSM	1		Secondary Main Number of Turns
CMA	512	Cmils/A	Primary Winding Current Capacity
VOR	121,4	V	Reflected Output Voltage
BW	12,40	mm	Bobbin Winding Width
ML	0,00	mm	Safety Margin on Left Width
MR	0,00	mm	Safety Margin on Right Width
FF	95	%	Actual Transformer Fit Factor. 100% signifies fully utilized winding window
AE	78,00	mm²	Core Cross Sectional Area
ALG	400	nH/T²	Gapped Core Effective Inductance
BM	3033	Gauss	Maximum Flux Density
BP	3838	Gauss	Peak Flux Density
BAC	1289	Gauss	AC Flux Density for Core Loss
LG	0,230	mm	Estimated Gap Length
L_LKG	2,18	µH	Estimated primary leakage inductance
LSEC	10	nH	Secondary Trace Inductance

Primary Winding Section 1

Var	Value	Units	Description
NP1	10		Rounded (Integer) Number of Primary winding turns in the first section of primary
Wire Size	24	AWG	Wire size of primary winding
Winding Type	Bifilar (x2)		Primary winding number of parallel wire strands
L	0,91		Primary Number of Layers
DC Copper Loss	0,04	W	Primary 1 DC Losses

Primary Winding Section 2

Var	Value	Units	Description
NP2	9		Rounded (Integer) Number of Primary winding turns in the second section of primary
Wire Size	24	AWG	Wire size of primary winding
Winding Type	Bifilar (x2)		Primary winding number of parallel wire strands
L2	0,82		Primary Number of Layers in 2nd split winding
DC Copper Loss	0,06	W	Primary 2 DC Losses

Output 1

Var	Value	Units	Description
VO	6,00	V	Output Voltage
IO	12,00	A	Output Current
VOUT_ACTUAL	6,00	V	Actual Output Voltage
NS	1		Secondary Number of Turns
Foil Thickness	10	mil	Wire size of secondary winding
Winding Type	Foil		Output winding number of parallel strands
L_S_OUT	1,00		Secondary Output Winding Layers
DC Copper Loss	0,10	W	Secondary DC Losses
VD	0,57	V	Output Winding Diode Forward Voltage Drop (Manual Overwrite)
PIVS	26	V	Output Rectifier Maximum Peak Inverse Voltage
ISP	59,05	A	Peak Secondary Current
ISRMS	23,27	A	Secondary RMS Current
RTH_DIODE	5,47	°C/W	Output Diode Maximum Thermal Resistance
OD_HSINK_TYPE	Aluminum Extruded		Output Diode Heatsink Type
OD_HSINK_PN	532802B02500G		Output Diode (Extruded) Heatsink Part Number
CO	820 x 3	µF	Output Capacitor (Manual Overwrite)
IRIPPLE	19,94	A	Output Capacitor RMS Ripple Current
Expected Lifetime	17723	hr	Expected Lifetime of Output Capacitor (Manual Overwrite)

Feedback Circuit

Var	Value	Units	Description
PM	92,54	°	Estimated Phase Margin
FC_ACTUAL	1744,6	Hz	Estimated Crossover Frequency
DUAL_OUTPUT_FB_FLAG	NO		Dual Output Feedback regulations use flag
SF_FLAG	NO		Soft Finish Circuits use flag
TYPE_3CTRL_FLAG	NO		Phase Boost Network flag

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.