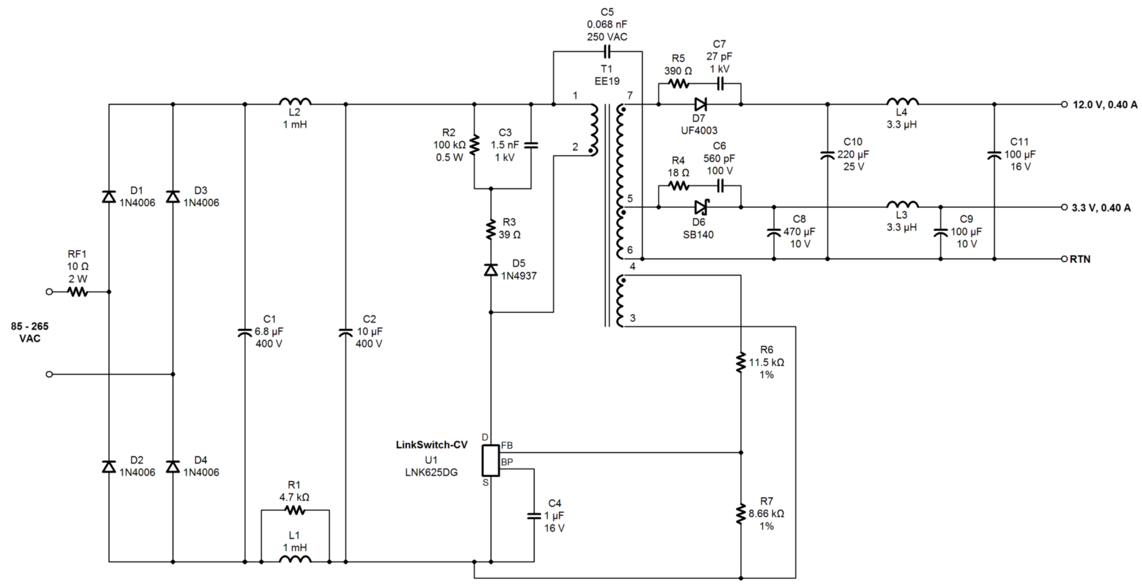

C5
0.068 nF
250 VAC
T1
EE19
R5
390 Ω
C7
27 pF
1 kV
D7
UF4003
12.0 V, 0.40 A
L4
3.3 µH
C10
220 µF
25 V
C11
100 µF
16 V
L2
1 mH
R2
100 kΩ
0.5 W
C3
1.5 nF
1 kV
R4
18 Ω
C6
560 pF
100 V
D6
SB140
3.3 V, 0.40 A
C8
470 µF
10 V
L3
3.3 µH
C9
100 µF
10 V
RTN
D1
1N4006
D3
1N4006
R3
39 Ω
D5
1N4937
RF1
10 Ω
2 W
85 - 265
VAC
C1
6.8 µF
400 V
C2
10 µF
400 V
R6
11.5 kΩ
1%
LinkSwitch-CV
U1
LNK625DG
D
FB
BP
S
D2
1N4006
D4
1N4006
R1
4.7 kΩ
L1
1 mH
C4
1 µF
16 V
R7
8.66 kΩ
1%

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	Input Rectifier Conduction Time
Z	0.54		Loss Allocation Factor
η	72.0	%	Efficiency Estimate (Target)
VMIN	**84.0**	V	Minimum DC Input Voltage
VMAX	**374.8**	V	Maximum DC Input Voltage

Input Section

Var	Value	Units	Description
RFUSE	**10.00**	Ω	**Fusible Resistor. See Information section for detail**
IAVG	**0.10**	A	Average Diode Bridge Current (DC Input Current)

Device Variables

Var	Value	Units	Description
Device	LNK625DG		PI Device Name
BVDSS	**700**	V	Drn-Src Bkdn Voltage
Current Limit Mode	**Default**		Device Current Limit Mode
PO	**6.12**	W	Total Output Power
VDRAIN Estimated	**539.33**	V	Estimated Drain Voltage
VDS	13.46	V	On state Drain to Source Voltage
I2F_MIN	**9.80**	A^2kHz	Minimum I2F
I2F_MAX	**12.74**	A^2kHz	Maximum I2F
FS_AT_ILIMMIN	**103990**	Hz	Switching Frequency at Current Limit Minimum
KP	**0.58**		Continuous/Discontinuous Operating Ratio (at VMIN and full load)
KP_TRANSIENT	**0.33**		Transient Ripple to Peak Current Ratio
DMAX	**0.47**		Maximum Duty Cycle (at VMIN and full load)
ILIMITMIN	**0.307**	A	Minimum Current Limit
ILIMITMAX	**0.353**	A	Maximum Current Limit
IRMS	**0.16**	A	Primary RMS Current (at VMIN and full load)
RTH_DEVICE	**61.79**	°C/W	PI Device Heatsink Maximum Thermal Resistance
DEV_HSINK_TYPE	**2 Oz (70 µ) 2-Sided Copper PCB**		PI Device Heatsink Type
DEV_HSINK_AREA	**86**	mm^2	PI Device Heatsink Area

Clamp Circuit

Var	Value	Units	Description
Clamp Type	**RCD Clamp**		Clamp Circuit Type
VCLAMP	**101**	V	Average Clamping Voltage
Estimated Clamp Loss	**0.27**	W	Clamp Dissipation

Feedback Winding

Var	Value	Units	Description
NFB	**8**		Feedback Winding Number of Turns
Layers	**0.95**		Feedback Winding Layers

Transformer Construction Parameters

Var	Value	Units	Description
Core Type	EE19		Core Type
Core Material	3F3		Core Material
Bobbin Reference	**Generic, 4 pri. + 5 sec.**		Bobbin Reference
Bobbin Orientation	**Vertical**		Bobbin type
Primary Pins	**4**		Number of Primary pins used
Secondary Pins	**3**		Number of Secondary pins used
USE_SHIELDS	YES		Use shield Windings
LP_nom	**2040**	µH	Nominal Primary Inductance
LP_Tol	10.0	%	Primary Inductance Tolerance
NP	**117.4**		Calculated Primary Winding Total Number of Turns
NSM	7		Secondary Main Number of Turns
CMA	**322**	Cmils/A	Primary Winding Current Capacity
VOR	63.7	V	Reflected Output Voltage
BW	**9.00**	mm	Bobbin Winding Width
ML	**0.00**	mm	Safety Margin on Left Width
MR	**0.00**	mm	Safety Margin on Right Width
FF	**59**	%	Actual Transformer Fit Factor. 100% signifies fully utilized winding window
AE	**23.00**	mm²	Core Cross Sectional Area
ALG	**133**	nH/T²	Gapped Core Specific Inductance
BM	**2462**	Gauss	Maximum Flux Density
BAC	**619**	Gauss	AC Flux Density for Core Loss
LG	**0.194**	mm	Estimated Gap Length
L_LKG	81.59	µH	Estimated primary leakage inductance
LSEC	15	nH	Secondary Trace Inductance

Primary Winding Section 1

Var	Value	Units	Description
NP1	**118**		Number of Primary Winding Turns in the First Section of Primary
Wire Size	**33**	AWG	Primary Winding - Wire Size
Winding Type	**Single (x1)**		Primary Winding - Number of Parallel Wire Strands
L	**2.83**		Primary Winding - Number of Layers
DC Copper Loss	**0.06**	W	Primary Section 1 DC Losses

Output 1

Var	Value	Units	Description
VO	**3.30**	V	Typical Output Voltage
IO	**0.40**	A	Output Current
VOUT_ACTUAL	**3.30**	V	Actual Output Voltage
NS	**7**		Secondary Number of Turns
Wire Size	**26**	AWG	Wire size of secondary winding
Winding Type	**Single (x1)**		Output winding number of parallel strands
L_S_OUT	**0.47**		Secondary Output Winding Layers
DC Copper Loss	**0.06**	W	Secondary DC Losses
OD_VD	**0.50**	V	Output Winding Diode Forward Voltage Drop
PIVS	**26**	V	Output Rectifier Maximum Peak Inverse Voltage
ISP	**1.11**	A	Peak Secondary Current
ISRMS	**0.59**	A	Secondary RMS Current
RTH_RECTIFIER	**203.60**	°C/W	Output Rectifier Heatsink Maximum Thermal Resistance
OR_HSINK_TYPE	**2 Oz (70 µ) 2-Sided Copper PCB**		Output Rectifier Heatsink Type
OR_HSINK_AREA	**52**	mm²	Output Rectifier Heatsink Area
CO	**470 x 1**	µF	Output Capacitor - Capacitance
IRIPPLE	**0.43**	A	Output Capacitor - RMS Ripple Current
Expected Lifetime	**38451**	hr	Output Capacitor - Expected Lifetime

Output 2

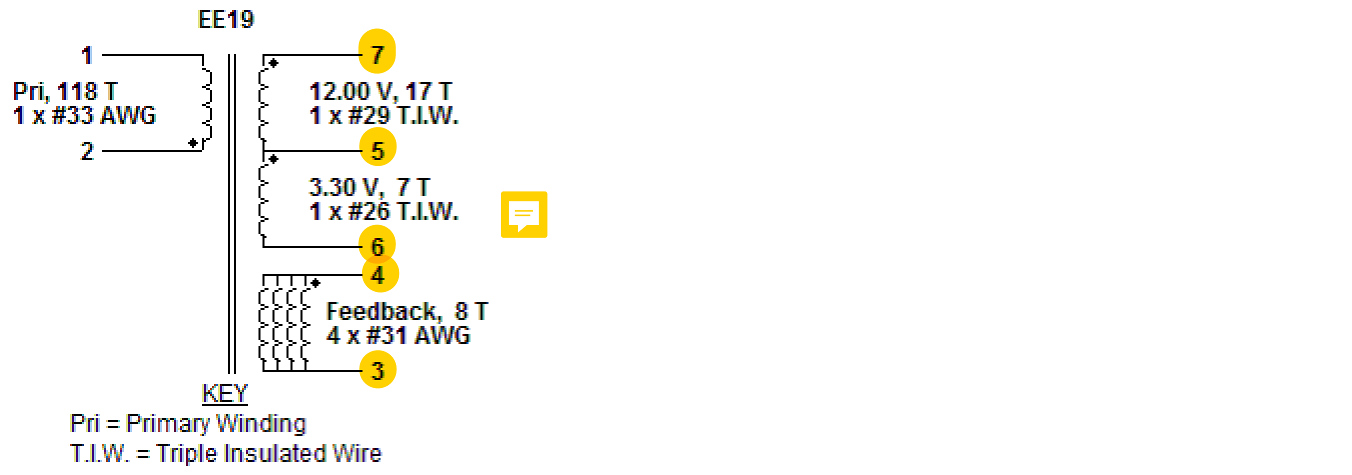
Var	*Value*	*Units*	*Description*
VO	**12.00**	V	Typical Output Voltage
IO	**0.40**	A	Output Current
VOUT_ACTUAL	**12.03**	V	Actual Output Voltage
NS	**17**		Secondary Number of Turns
Wire Size	**29**	AWG	Wire size of secondary winding
Winding Type	**Single (x1)**		Output winding number of parallel strands
L_S_OUT	**0.91**		Secondary Output Winding Layers
DC Copper Loss	**0.08**	W	Secondary DC Losses
OD_VD	**1.00**	V	Output Winding Diode Forward Voltage Drop
PIVS	**88**	V	Output Rectifier Maximum Peak Inverse Voltage
ISP	**1.11**	A	Peak Secondary Current
ISRMS	**0.59**	A	Secondary RMS Current
RTH_RECTIFIER	**95.88**	°C/W	Output Rectifier Heatsink Maximum Thermal Resistance
OR_HSINK_TYPE	**2 Oz (70 µ) 2-Sided Copper PCB**		Output Rectifier Heatsink Type
OR_HSINK_AREA	**52**	mm^2	Output Rectifier Heatsink Area
CO	**220 x 1**	µF	Output Capacitor - Capacitance
IRIPPLE	**0.43**	A	Output Capacitor - RMS Ripple Current
Expected Lifetime	**38451**	hr	Output Capacitor - Expected Lifetime

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.

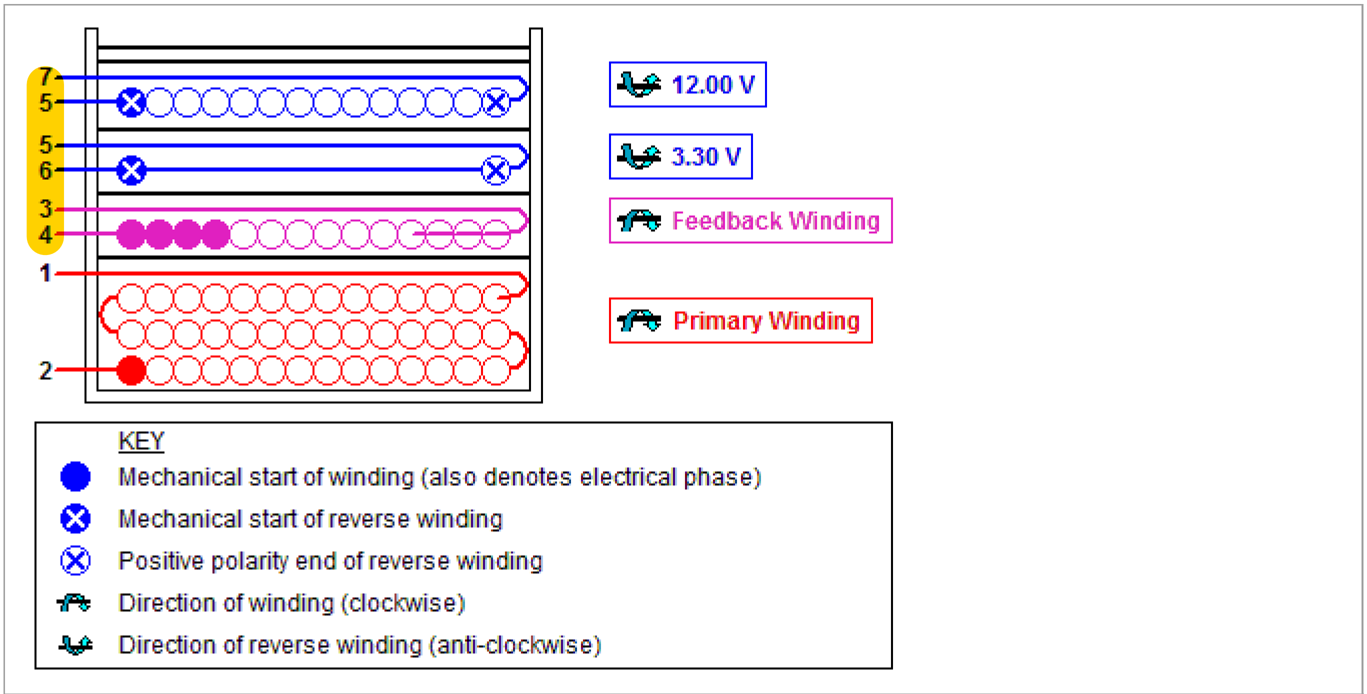
Bill Of Materials

Item #	Quantity	Part Ref	Value	Description	Mfg	Mfg Part Number
1	1	C1	6.8 µF	6.8 µF, 400 V, High Voltage Al Electrolytic, (16 mm x 10 mm)	Nippon Chemi-Con	EKXG401ELL6R8MJ1
2	1	C2	10 µF	10 µF, 400 V, High Voltage Al Electrolytic, (20 mm x 10 mm)	United Chemi-Con	EKMX400VB10RM10X20LL
3	1	C3	1.5 nF	1.5 nF, 1 kV, High Voltage Ceramic	Panasonic	ECK-D3A152KBN
4	1	C4	1 µF	1 µF, 16 V, Ceramic, X7R	TDK	C1608X7R1C105K
5	1	C5	0.068 nF	0.068 nF, 250 VAC, Ceramic, Y Class	Vishay Cera-Mite	440LQ68-R
6	1	C6	560 pF	560 pF, 100 V, Ceramic, C0G	Epcos	B37979N1561J000
7	1	C7	27 pF	27 pF, 1 kV, High Voltage Ceramic	Panasonic	ECC-D3A270JGE
8	1	C8	470 µF	470 µF, 10.0 V, Electrolytic, Super Low ESR, 72 mΩ, (11.5 mm x 8 mm)	United Chemi-Con	EKZE100ELL471MHB5D
9	1	C9	100 µF	100 µF, 10.0 V, Electrolytic, Low ESR, 500 mΩ, (11.5 mm x 5 mm)	United Chemi-Con	ELXZ100ELL101MEB5D
10	1	C10	220 µF	220 µF, 25 V, Electrolytic, Super Low ESR, 72 mΩ, (11.5 mm x 8 mm)	United Chemi-Con	EKZE250ELL221MHB5D
11	1	C11	100 µF	100 µF, 16 V, Electrolytic, Low ESR, 250 mΩ, (11.5 mm x 6.3 mm)	United Chemi-Con	ELXZ160ELL101MFB5D
12	4	D1, D2, D3, D4	1N4006	800 V, 1 A, Standard Recovery, DO-41	Vishay	1N4006
13	1	D5	1N4937	600 V, 1 A, Fast Recovery, 200 ns, DO-41	Vishay	1N4937
14	1	D6	SB140	40 V, 1 A, Schottky, DO-41	Vishay	SB140
15	1	D7	UF4003	200 V, 1 A, Ultrafast Recovery, 50 ns, DO-41	Vishay	UF4003
16	2	L1, L2	1 mH	1 mH, 0.19 A	TDK	TSL0709RA-102KR19-PF
17	2	L3, L4	3.3 µH	3.3 µH, 2.66 A	Bourns Inc.	RL822-3R3K-RC
18	1	R1	4.7 kΩ	4.7 kΩ, 5 %, 0.25 W, Carbon Film	Generic	
19	1	R2	100 kΩ	100 kΩ, 5 %, 0.5 W, Carbon Film	Generic	
20	1	R3	39 Ω	39 Ω, 5 %, 0.25 W, Carbon Film	Generic	
21	1	R4	18 Ω	18 Ω, 5 %, 0.25 W, Carbon Film	Generic	
22	1	R5	390 Ω	390 Ω, 5 %, 0.25 W, Carbon Film	Generic	
23	1	R6	11.5 kΩ	11.5 kΩ, 1 %, 0.125 W, Metal Film	Generic	
24	1	R7	8.66 kΩ	8.66 kΩ, 1 %, 0.125 W, Metal Film	Generic	
25	1	RF1	10 Ω	10 Ω, 2 W, Flameproof Wire-Wound Resistor	Vitrohm	CRF253-4 10R
26	1	T1	EE19	3F3 Core Material See Transformer Construction's Materials List for complete information	TDK	PC40EE19-Z
27	1	U1	LNK625DG	LinkSwitch-CV, LNK625DG, SO-8C	Power Integrations	LNK625DG
28	1			52 mm² area on Copper PCB. 2 oz (70 µm) thickness. Heatsink for use with Rectifier D6.	Custom	
29	1			52 mm² area on Copper PCB. 2 oz (70 µm) thickness. Heatsink for use with Rectifier D7.	Custom	
30	1			86 mm² area on Copper PCB. 2 oz (70 µm) thickness. Heatsink for use with Device U1.	Custom	

Electrical Diagram



Mechanical Diagram



Winding Instruction

Primary Winding
Start on pin(s) 2 and wind 118 turns (x 1 filar) of item [5]. in 3 layer(s) from left to right. Winding direction is clockwise. At the end of 1st layer, continue to wind the next layer from right to left. At the end of 2nd layer, continue to wind the next layer from left to right. On the final layer, spread the winding evenly across entire bobbin. Finish this winding on pin(s) 1.
Add 1 layer of tape, item [3], for insulation.
Feedback Winding
Start on pin(s) 4 and wind 8 turns (x 4 filar) of item [6]. Winding direction is clockwise. Spread the winding evenly across entire bobbin. Finish this winding on pin(s) 3.
Add 1 layer of tape, item [3], for insulation.
Secondary Winding
Start on pin(s) 6 and reverse wind 7 turns (x 1 filar) of item [7]. Spread the winding evenly across entire bobbin. Winding direction is counter-clockwise. Finish this winding on pin(s) 5.
Add 1 layer of tape, item [3], for insulation.

Start on pin(s) 5 and reverse wind 17 turns (x 1 filar) of item [8]. Spread the winding evenly across entire bobbin. Winding direction is counter-clockwise. Finish this winding on pin(s) 7.
Add 2 layers of tape, item [3], for insulation.
Core Assembly
Assemble and secure core halves. Item [1].
Varnish
Dip varnish uniformly in item [4]. Do not vacuum impregnate.

Comments

1. For non margin wound transformers use triple insulated wire for all secondary windings.

Materials

Item	*Description*
[1]	**Core: EE19, 3F3, gapped for ALG of 133 nH/T²**
[2]	**Bobbin: Generic, 4 pri. + 5 sec.**
[3]	**Barrier Tape: Polyester film [1 mil (25 µm) base thickness], 9.00 mm wide**
[4]	**Varnish**
[5]	**Magnet Wire: 33 AWG, Solderable Double Coated**
[6]	**Magnet Wire: 31 AWG, Solderable Double Coated**
[7]	**Triple Insulated Wire: 26 AWG**
[8]	**Triple Insulated Wire: 29 AWG**

Electrical Test Specifications

Parameter	*Condition*	*Spec*
Electrical Strength, VAC	**60 Hz 1 second, from pins 1,2,3,4 to pins 5,6,7.**	**3000**
Nominal Primary Inductance, µH	**Measured at 1 V pk-pk, typical switching frequency, between pin 1 to pin 2, with all other Windings open.**	**2040**
Tolerance, ±%	**Tolerance of Primary Inductance**	**10.0**
Maximum Primary Leakage, µH	**Measured between Pin 1 to Pin 2, with all other Windings shorted.**	**81.59**