
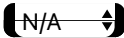


1	ACDC_TinySwitch-III_032514; Rev.1.27; Copyright Power Integrations 2014	INPUT	INFO	OUTPUT	UNIT	ACDC_TinySwitch-III_032514_Rev1-27.xls; TinySwitch-III Continuous/Discontinuous Flyback Transformer Design Spreadsheet	<input checked="" type="checkbox"/>
2	ENTER APPLICATION VARIABLES					Customer	<input checked="" type="checkbox"/>
3	VACMIN	195			Volts	Minimum AC Input Voltage	<input checked="" type="checkbox"/>
4	VACMAX	265			Volts	Maximum AC Input Voltage	<input checked="" type="checkbox"/>
5	fL	50			Hertz	AC Mains Frequency	<input checked="" type="checkbox"/>
6	VO	16.00			Volts	Output Voltage (at continuous power)	<input checked="" type="checkbox"/>
7	IO	0.65			Amps	Power Supply Output Current (corresponding to peak power)	<input checked="" type="checkbox"/>
8	Power			10.4	Watts	Continuous Output Power	<input checked="" type="checkbox"/>
9	n	0.80				Efficiency Estimate at output terminals. Under 0.7 if no better data available	<input checked="" type="checkbox"/>
10	Z	0.50				Z Factor. Ratio of secondary side losses to the total losses in the power supply. Use 0.5 if no better data available	<input checked="" type="checkbox"/>
11	tC	3.00			mSeconds	Bridge Rectifier Conduction Time Estimate	<input checked="" type="checkbox"/>
12	CIN	22.00		22.00	uFarads	Input Capacitance	<input checked="" type="checkbox"/>
13							<input checked="" type="checkbox"/>
14	ENTER TinySwitch-III VARIABLES						<input checked="" type="checkbox"/>
15	TinySwitch-III	<b>(TNY2↔)</b>		TNY275P		User defined TinySwitch-III	<input checked="" type="checkbox"/>
16	Chosen Device		TNY275P				<input checked="" type="checkbox"/>
17	Chose Configuration	<b>(STD↔)</b>		Standard Current Limit		Enter "RED" for reduced current limit (sealed adapters), "STD" for standard current limit or "INC" for increased current limit (peak or higher power applications)	<input checked="" type="checkbox"/>
18	ILIMITMIN			0.256	Amps	Minimum Current Limit	<input checked="" type="checkbox"/>
19	ILIMITTYP			0.275	Amps	Typical Current Limit	<input checked="" type="checkbox"/>
20	ILIMITMAX			0.294	Amps	Maximum Current Limit	<input checked="" type="checkbox"/>
21	fSmin			124000	Hertz	Minimum Device Switching Frequency	<input checked="" type="checkbox"/>
22	I^2fmin			8.98425	A^2kHz	I^2f (product of current limit squared and frequency is trimmed for tighter tolerance)	<input checked="" type="checkbox"/>
23	VOR	125.00		125.00	Volts	Reflected Output Voltage (VOR < 135 V Recommended)	<input checked="" type="checkbox"/>
24	VDS			10.00	Volts	TinySwitch-III on-state Drain to Source Voltage	<input checked="" type="checkbox"/>
25	VD	1.00		1.00	Volts	Output Winding Diode Forward Voltage Drop	<input checked="" type="checkbox"/>
26	KP			0.83		Ripple to Peak Current Ratio (KP < 6)	<input checked="" type="checkbox"/>
27	KP_TRANSIENT			0.57		Transient Ripple to Peak Current Ratio. Ensure KP_TRANSIENT > 0.25	<input checked="" type="checkbox"/>
28							<input checked="" type="checkbox"/>
29	ENTER BIAS WINDING VARIABLES						<input checked="" type="checkbox"/>
30	VB			22.00	Volts	Bias Winding Voltage	<input checked="" type="checkbox"/>
31	VDB			0.70	Volts	Bias Winding Diode Forward Voltage Drop	<input checked="" type="checkbox"/>
32	NB			19.41		Bias Winding Number of Turns	<input checked="" type="checkbox"/>
33	VZOV			28.00	Volts	Over Voltage Protection zener diode voltage.	<input checked="" type="checkbox"/>
34							<input checked="" type="checkbox"/>
35	UVLO VARIABLES						<input checked="" type="checkbox"/>
36	V_UV_TARGET			286.37	Volts	Target DC under-voltage threshold, above which the power supply with start	<input checked="" type="checkbox"/>
						Typical DC start-up voltage based on	<input checked="" type="checkbox"/>

37	V_UV_ACTUAL			277.20	Volts	standard value of RUV_ACTUAL	
38	RUV_IDEAL			11.37	Mohms	Calculated value for UV Lockout resistor	<input checked="" type="checkbox"/>
39	RUV_ACTUAL			11.00	Mohms	Closest standard value of resistor to RUV_IDEAL	<input checked="" type="checkbox"/>
40							<input checked="" type="checkbox"/>
41	ENTER TRANSFORMER CORE/CONSTRUCTION VARIABLES						<input checked="" type="checkbox"/>
42	Core Type			EFD20		Enter Transformer Core	<input checked="" type="checkbox"/>
43	Core		EFD20		P/N:	EFD20-3F3	<input checked="" type="checkbox"/>
44	Bobbin		EFD20_BOBBIN		P/N:	EFD20_BOBBIN	<input checked="" type="checkbox"/>
45	AE			0.31	cm^2	Core Effective Cross Sectional Area	<input checked="" type="checkbox"/>
46	LE			4.70	cm	Core Effective Path Length	<input checked="" type="checkbox"/>
47	AL			1200.00	nH/T^2	Ungapped Core Effective Inductance	<input checked="" type="checkbox"/>
48	BW			13.20	mm	Bobbin Physical Winding Width	<input checked="" type="checkbox"/>
49	M	3.00		3.00	mm	Safety Margin Width (Half the Primary to Secondary Creepage Distance)	<input checked="" type="checkbox"/>
50	L			3.00		Number of Primary Layers	<input checked="" type="checkbox"/>
51	NS	15		15		Number of Secondary Turns	<input checked="" type="checkbox"/>
52							<input checked="" type="checkbox"/>
53	DC INPUT VOLTAGE PARAMETERS						<input checked="" type="checkbox"/>
54	VMIN			260.34	Volts	Minimum DC Input Voltage	<input checked="" type="checkbox"/>
55	VMAX			374.77	Volts	Maximum DC Input Voltage	<input checked="" type="checkbox"/>
56							<input checked="" type="checkbox"/>
57	CURRENT WAVEFORM SHAPE PARAMETERS						<input checked="" type="checkbox"/>
58	DMAX			0.33		Duty Ratio at full load, minimum primary inductance and minimum input voltage	<input checked="" type="checkbox"/>
59	IAVG			0.05	Amps	Average Primary Current	<input checked="" type="checkbox"/>
60	IP			0.26	Amps	Minimum Peak Primary Current	<input checked="" type="checkbox"/>
61	IR			0.21	Amps	Primary Ripple Current	<input checked="" type="checkbox"/>
62	IRMS			0.11	Amps	Primary RMS Current	<input checked="" type="checkbox"/>
63							<input checked="" type="checkbox"/>
64	TRANSFORMER PRIMARY DESIGN PARAMETERS						<input checked="" type="checkbox"/>
65	LP			2982	uHenries	Typical Primary Inductance. +/- 10% to ensure a minimum primary inductance of 2683 uH	<input checked="" type="checkbox"/>
66	LP_TOLERANCE			10	%	Primary inductance tolerance	<input checked="" type="checkbox"/>
67	NP			110		Primary Winding Number of Turns	<input checked="" type="checkbox"/>
68	ALG			245	nH/T^2	Gapped Core Effective Inductance	<input checked="" type="checkbox"/>
69	BM			2564	Gauss	Maximum Operating Flux Density, BM<3000 is recommended	<input checked="" type="checkbox"/>
70	BAC			1062	Gauss	AC Flux Density for Core Loss Curves (0.5 X Peak to Peak)	<input checked="" type="checkbox"/>
71	ur			1448		Relative Permeability of Ungapped Core	<input checked="" type="checkbox"/>
72	LG			0.13	mm	Gap Length (Lg > 0.1 mm)	<input checked="" type="checkbox"/>
73	BWE			21.6	mm	Effective Bobbin Width	<input checked="" type="checkbox"/>
74	OD			0.20	mm	Maximum Primary Wire Diameter including insulation	<input checked="" type="checkbox"/>
75	INS			0.04	mm	Estimated Total Insulation Thickness (= 2 * film thickness)	<input checked="" type="checkbox"/>
76	DIA			0.15	mm	Bare conductor diameter	<input checked="" type="checkbox"/>
77	AWG			35	AWG	Primary Wire Gauge (Rounded to next smaller standard AWG value)	<input checked="" type="checkbox"/>
78	CM			32	Cmils	Bare conductor effective area in circular mils	<input checked="" type="checkbox"/>
79	CMA			298	Cmils/Amp	Primary Winding Current Capacity (200 < CMA < 500)	<input checked="" type="checkbox"/>
80							<input checked="" type="checkbox"/>
	TRANSFORMER						<input checked="" type="checkbox"/>

81	<b>SECONDARY DESIGN PARAMETERS</b>						
82	<b>Lumped parameters</b>						<input checked="" type="checkbox"/>
83	ISP			1.88	Amps	Peak Secondary Current	<input checked="" type="checkbox"/>
84	ISRMS			1.12	Amps	Secondary RMS Current	<input checked="" type="checkbox"/>
85	IRIPPLE			0.91	Amps	Output Capacitor RMS Ripple Current	<input checked="" type="checkbox"/>
86	CMS			223	Cmils	Secondary Bare Conductor minimum circular mils	<input checked="" type="checkbox"/>
87	AWGS			26	AWG	Secondary Wire Gauge (Rounded up to next larger standard AWG value)	<input checked="" type="checkbox"/>
88							<input checked="" type="checkbox"/>
89	<b>VOLTAGE STRESS PARAMETERS</b>						<input checked="" type="checkbox"/>
90	VDRAIN			657	Volts	Maximum Drain Voltage Estimate (Assumes 20% zener clamp tolerance and an additional 10% temperature tolerance)	<input checked="" type="checkbox"/>
91	PIVS			67	Volts	Output Rectifier Maximum Peak Inverse Voltage	<input checked="" type="checkbox"/>
92							<input checked="" type="checkbox"/>
93	<b>TRANSFORMER SECONDARY DESIGN PARAMETERS (MULTIPLE OUTPUTS)</b>						<input checked="" type="checkbox"/>
94	<b>1st output</b>						<input checked="" type="checkbox"/>
95	VO1			16.00	Volts	Main Output Voltage (if unused, defaults to single output design)	<input checked="" type="checkbox"/>
96	IO1			0.65	Amps	Output DC Current	<input checked="" type="checkbox"/>
97	PO1			10.4	Watts	Output Power	<input checked="" type="checkbox"/>
98	VD1			1.00	Volts	Output Diode Forward Voltage Drop	<input checked="" type="checkbox"/>
99	NS1			15.00		Output Winding Number of Turns	<input checked="" type="checkbox"/>
100	ISRMS1			1.117	Amps	Output Winding RMS Current	<input checked="" type="checkbox"/>
101	IRIPPLE1			0.91	Amps	Output Capacitor RMS Ripple Current	<input checked="" type="checkbox"/>
102	PIVS1			67	Volts	Output Rectifier Maximum Peak Inverse Voltage	<input checked="" type="checkbox"/>
103	Recommended Diodes			<b>BYV27-100</b>		Recommended Diodes for this output	<input checked="" type="checkbox"/>
104	CMS1			223	Cmils	Output Winding Bare Conductor minimum circular mils	<input checked="" type="checkbox"/>
105	AWGS1			26	AWG	Wire Gauge (Rounded up to next larger standard AWG value)	<input checked="" type="checkbox"/>
106	DIAS1			0.41	mm	Minimum Bare Conductor Diameter	<input checked="" type="checkbox"/>
107	ODS1			0.48	mm	Maximum Outside Diameter for Triple Insulated Wire	<input checked="" type="checkbox"/>
108							<input checked="" type="checkbox"/>
109	<b>2nd output</b>						<input checked="" type="checkbox"/>
110	VO2				Volts	Output Voltage	<input checked="" type="checkbox"/>
111	IO2				Amps	Output DC Current	<input checked="" type="checkbox"/>
112	PO2			0	Watts	Output Power	<input checked="" type="checkbox"/>
113	VD2			0.70	Volts	Output Diode Forward Voltage Drop	<input checked="" type="checkbox"/>
114	NS2			0.62		Output Winding Number of Turns	<input checked="" type="checkbox"/>
115	ISRMS2			0	Amps	Output Winding RMS Current	<input checked="" type="checkbox"/>
116	IRIPPLE2			0.00	Amps	Output Capacitor RMS Ripple Current	<input checked="" type="checkbox"/>
117	PIVS2			2	Volts	Output Rectifier Maximum Peak Inverse Voltage	<input checked="" type="checkbox"/>
118	Recommended Diode					Recommended Diodes for this output	<input checked="" type="checkbox"/>
119	CMS2			0	Cmils	Output Winding Bare Conductor minimum circular mils	<input checked="" type="checkbox"/>
120	AWGS2			N/A	AWG	Wire Gauge (Rounded up to next larger standard AWG value)	<input checked="" type="checkbox"/>
121	DIAS2			N/A	mm	Minimum Bare Conductor Diameter	<input checked="" type="checkbox"/>
122	ODS2			N/A	mm	Maximum Outside Diameter for Triple Insulated Wire	<input checked="" type="checkbox"/>
123							<input checked="" type="checkbox"/>
124	<b>3rd output</b>						<input checked="" type="checkbox"/>
125	VO3				Volts	Output Voltage	<input checked="" type="checkbox"/>
126	IO3				Amps	Output DC Current	<input checked="" type="checkbox"/>

127	PO3			0	Watts	Output Power	<input checked="" type="checkbox"/>
128	VD3			0.70	Volts	Output Diode Forward Voltage Drop	<input checked="" type="checkbox"/>
129	NS3			0.62		Output Winding Number of Turns	<input checked="" type="checkbox"/>
130	ISRMS3			0	Amps	Output Winding RMS Current	<input checked="" type="checkbox"/>
131	IRIPPLE3			0.00	Amps	Output Capacitor RMS Ripple Current	<input checked="" type="checkbox"/>
132	PIVS3			2	Volts	Output Rectifier Maximum Peak Inverse Voltage	<input checked="" type="checkbox"/>
133	Recommended Diode					Recommended Diodes for this output	<input checked="" type="checkbox"/>
134	CMS3			0	Cmils	Output Winding Bare Conductor minimum circular mils	<input checked="" type="checkbox"/>
135	AWGS3			N/A	AWG	Wire Gauge (Rounded up to next larger standard AWG value)	<input checked="" type="checkbox"/>
136	DIAS3			N/A	mm	Minimum Bare Conductor Diameter	<input checked="" type="checkbox"/>
137	ODS3			N/A	mm	Maximum Outside Diameter for Triple Insulated Wire	<input checked="" type="checkbox"/>
138							<input checked="" type="checkbox"/>
139	<b>Total power</b>			10.4	Watts	Total Output Power	<input checked="" type="checkbox"/>
140							<input checked="" type="checkbox"/>
141	Negative Output			N/A		If negative output exists enter Output number; eg: If VO2 is negative output, enter 2	<input checked="" type="checkbox"/>