1	ACDC_LinkSwitch-HP_101714; Rev.2.0; Copyright Power Integrations 2014	INPUT	INFO	OUTP	UNIT	ACDC_LinkSwitchHP_101714 Rev 2-0.xls: LinkSwitch-HP Flyback Continuous/Discontinuous Transformer Design Spreadsheet
2	**ENTER APPLICATION VARIABLES**					**Customer**
3	VACMIN			85	V	Minimum AC Input Voltage
4	VACMAX			265	V	Maximum AC Input Voltage
5	fL			50	Hz	AC Mains Frequency
6	VO	5		5	V	Output Voltage (main)
7	PO	9		9	W	Load Power
8	n			0,80		Efficiency Estimate
9	Z			0,50		Loss Allocation Factor
10	VB	15		15	V	Bias Voltage
11	tC			3	ms	Bridge Rectifier Conduction Time Estimate
12	CIN			27	uF	Input Filter Capacitor
13	Package	**K**		K		K Package Selected
14	Enclosure	**Open Frame**		Open Frame		Open Frame type enclosure
15	Heatsink	**PCB-R**		PCB-R		PCB heatsink with IR reflow soldering (Exposed pad thermally connected to PCB)
16						
17						
18	**ENTER LinkSwitch-HP VARIABLES**					
19	**LinkSwitch-HP**	**LNK6663K**		**LNK6663K**		Manual Device Selection
20	ILIMITMIN			0,716	A	Minimum Current limit
21	ILIMITMAX			0,824	A	Maximum current limit
22	ILIMITMIN_EXT			0,430	A	External Minimum Current limit
23	ILIMITMAX_EXT			0,494	A	External Maximum current limit
24	KI	**Auto**		0,600		Current limit reduction factor
25	Rpd			23,20	k-ohm	Program delay Resistor
26	Cpd			33,00	nF	Program delay Capacitor
27	Total programmed delay			0,18	sec	Total program delay
28	fS			132	kHz	LinkSwitch-HP Switching Frequency
29	fSmin			120	kHz	LinkSwitch-HP Minimum Switching Frequency
30	fSmax			136	kHz	LinkSwitch-HP Maximum Switching Frequency
31	KP	0,50		0,50		Ripple to Peak Current Ratio (0.4 < KP < 6.0)
32	VOR			80,47	V	Reflected Output Voltage
33	**Voltage Sense**					
34	VUVON			93,50	V	Undervoltage turn on
35	VUVOFF			38,88	V	Undervoltage turn off
36	VOV			427,64	V	Overvoltage threshold
37	FMAX_FULL_LOAD			136,00	kHz	Maximum switching frequency at full load
38	FMIN_FULL_LOAD			120,00	kHz	Minimum switching frequency at full load
39	TSAMPLE_FULL_LOAD			3,74	us	Minimum available Diode conduction time at full load. This should be greater than 2.5 us
40	TSAMPLE_LIGHT_LOAD			2,33	us	Minimum available Diode conduction time at light load. This should be greater than 1.4 us
41	VDS			1,86	V	LinkSwitch-HP on-state Drain to Source Voltage.

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42	VD			0,50	V	Output Winding Diode Forward Voltage Drop
43	VDB	1,30		1,30	V	Bias Winding Diode Forward Voltage Drop
44						
45						
46						
47	**FEEDBACK SENSING SECTION**					
48	RFB1			75,00	k-ohms	Feedback divider upper resistor
49	RFB2			10,50	k-ohms	Feedback divider lowerr resistor
50						
51						
52	**ENTER TRANSFORMER CORE/CONSTRUCTION VARIABLES**					
53	**Select Core Size**	**EF20**		EF20		Manual Core Selected
54	Core			EF20		Selected Core
55	Custom Core					Enter name of custom core is applicable
56	AE			0,34	cm^2	Core Effective Cross Sectional Area
57	LE			4,49	cm	Core Effective Path Length
58	AL			1570	nH/T^2	Ungapped Core Effective Inductance
59	BW			12,2	mm	Bobbin Physical Winding Width
60	M	3,10		3,10	mm	Safety Margin Width (Half the Primary to Secondary Creepage Distance)
61	L	3		3		Number of Primary Layers
62	NS	6		6		Number of Secondary Turns
63						
64						
65	**DC INPUT VOLTAGE PARAMETERS**					
66	VMIN	85		85	V	Minimum DC Input Voltage
67	VMAX			375	V	Maximum DC Input Voltage
68						
69						
70	**CURRENT WAVEFORM SHAPE PARAMETERS**					
71	DMAX			0,49		Maximum Duty Cycle
72	IAVG			0,13	A	Average Primary Current
73	IP			0,36	A	Peak Primary Current
74	IR			0,18	A	Primary Ripple Current
75	IRMS			0,19	A	Primary RMS Current
76						
77						
78	**TRANSFORMER PRIMARY DESIGN PARAMETERS**					
79	LP_TYP			1942	uH	Typical Primary Inductance
80	LP_TOL			10	%	Primary inductance Tolerance
81	NP			88		Primary Winding Number of Turns
82	NB			18		Bias Winding Number of Turns
83	ALG			252	nH/T^2	Gapped Core Effective Inductance
84	BM			2369	Gauss	Maximum Flux Density at PO, VMIN (BM<3100)
85	BP			3591	Gauss	Peak Flux Density (BP<3700)
86	BAC			592	Gauss	AC Flux Density for Core Loss Curves (0.5 X Peak to Peak)
87	ur			1675		Relative Permeability of Ungapped Core

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88	LG			0,14	mm	Gap Length (Lg > 0.1 mm)
89	BWE			18	mm	Effective Bobbin Width
90	OD			0,21	mm	Maximum Primary Wire Diameter including insulation
91	INS			0,04	mm	Estimated Total Insulation Thickness (= 2 * film thickness)
92	DIA			0,16	mm	Bare conductor diameter
93	AWG			34	AWG	Primary Wire Gauge (Rounded to next smaller standard AWG value)
94	CM			40	Cmils	Bare conductor effective area in circular mils
95	CMA			210	Cmils/ Amp	Primary Winding Current Capacity (200 < CMA < 500)
96						
97						
98						
99	**TRANSFORMER SECONDARY DESIGN PARAMETERS (SINGLE OUTPUT EQUIVALENT)**					
100	**Lumped parameters**					
101	ISP			5,25	A	Peak Secondary Current
102	ISRMS			2,86	A	Secondary RMS Current
103	IO			1,80	A	Power Supply Output Current
104	IRIPPLE			2,22	A	Output Capacitor RMS Ripple Current
105	CMS			572	Cmils	Secondary Bare Conductor minimum circular mils
106	AWGS			22	AWG	Secondary Wire Gauge (Rounded up to next larger standard AWG value)
107	DIAS			0,65	mm	Secondary Minimum Bare Conductor Diameter
108	ODS			1,00	mm	Secondary Maximum Outside Diameter for Triple Insulated Wire
109	INSS			0,18	mm	Maximum Secondary Insulation Wall Thickness
110						
111						
112	**VOLTAGE STRESS PARAMETERS**					
113	VDRAIN			564	V	Peak voltage acoss drain to source of Linkswitch-HP
114	PIVS			31	V	Output Rectifier Maximum Peak Inverse Voltage
115	PIVB			91	V	Bias Rectifier Maximum Peak Inverse Voltage
116						
117						
118	**TRANSFORMER SECONDARY DESIGN PARAMETERS (MULTIPLE OUTPUTS)**					
166						