



IHLP Selection Example

IHLP-1616 APPLICATIONS																
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHLP-1616AB-01									IHLP-1616AB-11							
0.047	0.00325	13.00	32.00	63.11	0.63	0.02	0.14	0.00028								
0.10	0.00550	11.50	25.00	47.65	0.84	0.08	1.13	0.00028	0.0050	12.00	12.00	48.14	0.83	0.07	0.91	0.00032
0.22	0.01100	8.50	20.00	47.98	0.83	0.10	0.55	0.00077	0.0095	9.50	9.50	40.43	0.99	0.10	0.67	0.00026
0.47	0.02000	5.00	13.00	69.32	0.58	0.18	0.87	0.00067	0.0190	6.00	6.00	50.68	0.79	0.16	0.70	0.00067
1.00	0.05000	4.00	8.50	48.14	0.83	0.27	0.86	0.00053	0.0430	4.20	4.50	45.70	0.88	0.23	0.66	0.00053
									0.0556	3.75	3.75	49.30	0.81	0.22	0.47	0.00171
									0.0680	3.25	3.25	48.26	0.83	0.25	0.45	0.00171
									0.0794	2.75	3.00	50.93	0.79	0.32	0.53	0.00171
IHLP-1616BZ-01									IHLP-1616BZ-11							
0.10	0.0045	11.00	35.00	63.66	0.63	0.10	1.64	0.00032	0.0041	12.00	12.00	58.71	0.68	0.08	1.17	0.00032
0.22	0.0073	13.00	24.00	34.18	1.17	0.12	0.78	0.00097	0.0065	9.00	9.00	56.31	0.71	0.10	0.56	0.00097
0.47	0.0160	5.60	11.50	69.08	0.58	0.19	0.72	0.00083	0.0145	7.00	7.00	48.79	0.82	0.13	0.46	0.00083
1.00	0.0330	3.75	8.50	74.69	0.54	0.29	0.95	0.00077	0.0240	4.50	5.00	71.32	0.56	0.31	1.08	0.00077
2.20	0.0800	2.85	6.00	53.34	0.75	0.53	1.30	0.00053	0.0610	3.25	3.25	53.80	0.74	0.41	1.10	0.00060
									0.0950	2.00	1.75	61.90	0.65	0.53	0.75	0.00196

Notes

- (1) Thermal resistance of the part [$^{\circ}\text{C}/\text{W}$]
- (2) Total power loss that will cause an approximate ΔT of 40°C
- (3) $V\text{-}\mu\text{s}$ product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-2020 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾
IHLP-2020BZ-01									IHLP-2020BZ-11							
0.10	0.0036	17.0	45.0	33.32	1.20	0.16	3.47	0.00044	0.0027	21.0	25.0	29.11	1.37	0.13	2.47	0.00057
0.22	0.0049	15.0	22.0	31.44	1.27	0.13	0.98	0.00133	0.0041	17.0	13.0	29.25	1.37	0.11	0.83	0.00172
0.33	0.0076	12.0	25.0	31.67	1.26	0.22	1.97	0.00120	0.0055	13.0	7.5	37.29	1.07	0.14	0.81	0.00154
0.47	0.0089	11.5	21.0	29.45	1.36	0.28	2.06	0.00120	0.0071	12.5	8.0	31.24	1.28	0.20	1.10	0.00154
0.68	0.0112	10.0	15.0	30.95	1.29	0.29	1.51	0.00120								
1.0	0.0189	7.0	16.0	37.43	1.07	0.49	2.60	0.00097	0.0168	7.5	7.0	36.68	1.09	0.35	1.59	0.00113
2.2	0.0456	4.2	12.5	43.09	0.93	0.70	2.41	0.00077	0.0349	5.0	5.5	39.73	1.01	0.62	2.21	0.00091
3.3	0.0792	3.3	8.5	40.19	1.00	0.95	2.97	0.00060	0.0535	4.1	4.7	38.54	1.04	0.41	2.00	0.00083
4.7	0.1080	2.8	5.0	40.94	0.98	0.96	2.01	0.00196	0.0753	3.2	3.0	44.95	0.89	0.59	0.95	0.00304
5.6	0.1130	2.5	4.5	49.08	0.82	1.17	2.64	0.00196	0.0852	3.0	2.2	45.20	0.88	0.74	1.26	0.00273
6.8	0.1390	2.4	4.3	43.29	0.92	0.90	1.32	0.00196	0.1140	2.8	2.1	38.78	1.03	0.84	1.48	0.00242
10	0.1840	2.3	4.0	35.61	1.12	1.43	2.21	0.00196	0.1693	2.2	2.0	42.30	0.95	1.14	1.60	0.00242
IHLP-2020CZ-01									IHLP-2020CZ-11							
0.10	0.00300	23.00	27.00	21.84	1.83	0.07	0.51	0.00172	0.0026	21.00	25.00	30.23	1.32	0.12	2.28	0.00057
0.22	0.00430	15.50	21.00	33.55	1.19	0.11	0.60	0.00172	0.0035	21.00	15.40	22.46	1.78	0.10	0.59	0.00172
0.33	0.00530	13.70	19.00	34.84	1.15	0.17	1.02	0.00154	0.0045	16.50	9.00	28.29	1.41	0.14	0.75	0.00172
0.47	0.00670	12.20	16.00	34.76	1.15	0.22	1.23	0.00154	0.0054	14.00	9.00	32.75	1.22	0.23	1.51	0.00172
0.68	0.00853	10.20	13.50	39.06	1.02	0.30	1.44	0.00154								
0.82	0.01130	9.30	13.00	35.47	1.13	0.35	1.61	0.00139								
1.0	0.01310	9.20	12.00	31.26	1.28	0.43	1.95	0.00139	0.0100	10.00	6.50	34.66	1.15	0.40	2.02	0.00139
1.5	0.01970	7.20	11.00	33.94	1.18	0.55	2.36	0.00113	0.0171	7.50	7.00	36.04	1.11	0.53	2.47	0.00124
2.2	0.02780	5.80	10.00	37.06	1.08	0.73	2.65	0.00113	0.0225	6.75	5.50	33.81	1.18	0.75	3.34	0.00113
3.3	0.05210	5.00	8.50	26.61	1.50	0.87	2.41	0.00091	0.0364	5.50	7.00	31.48	1.27	0.99	3.68	0.00113
4.7	0.07380	3.50	8.20	38.34	1.04	1.22	3.52	0.00083	0.0540	4.50	5.20	31.70	1.26	1.20	3.89	0.00091
5.6	0.10300	3.00	4.10	37.39	1.07	0.61	0.66	0.00304	0.0630	4.25	3.50	30.46	1.31	1.43	4.56	0.00091
10	0.15200	2.50	4.00	36.49	1.10	1.16	1.43	0.00273	0.1221	2.75	2.25	37.54	1.07	0.97	1.14	0.00304
22	0.25200	1.90	2.50	38.10	1.05	1.37	1.29	0.00242	0.2600	1.90	1.70	36.93	1.08	1.41	1.21	0.00242

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant

APPLICATION NOTE



IHLP Selection Example

IHLP-2525 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} (1)	P _{HEAT} (2) (W)	ET ₁₀₀ (3)	K ₀ (4)	K ₁ (5)	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} (1)	P _{HEAT} (2) (W)	ET ₁₀₀ (3)	K ₀ (4)	K ₁ (5)
IHLP-2525AH-01									IHLP-2525AH-11							
0.100	0.0030	18.00	40.00	35.66	1.12	0.10	1.78	0.00050								
0.15	0.0047	15.00	38.00	32.78	1.22	0.23	4.85	0.00040								
0.22	0.0053	14.00	26.00	33.37	1.20	0.22	2.77	0.00120								
0.33	0.0066	12.00	18.00	36.47	1.10	0.26	2.37	0.00120								
0.47	0.0084	11.00	18.00	34.10	1.17	0.49	5.22	0.00120								
0.68	0.0127	9.00	17.00	33.69	1.19	0.52	4.08	0.00107								
0.82	0.0138	8.00	17.00	39.25	1.02	0.54	3.83	0.00306								
1.00	0.0175	7.00	14.00	40.42	0.99	0.74	5.51	0.00391								
1.50	0.0326	4.00	11.50	66.45	0.60	0.66	3.20	0.00077								
2.20	0.0403	3.75	13.00	61.16	0.65	0.76	2.63	0.00306								
2.50	0.0499	3.50	10.40	56.70	0.71	1.26	5.34	0.00281								
3.30	0.0562	3.25	10.00	58.39	0.69	1.32	5.07	0.00281								
4.70	0.0766	3.00	8.00	50.28	0.80	1.27	3.70	0.00281								
IHLP-2525BD-01									IHLP-2525BD-11							
0.10	0.0015	30.0	50.0	25.68	1.56	0.13	3.13	0.00071								
0.22	0.0029	21.0	34.0	27.10	1.48	0.24	3.46	0.00170								
0.33	0.0037	18.0	22.0	28.91	1.38	0.28	3.02	0.00170								
0.47	0.0060	13.5	21.0	31.70	1.26	0.33	2.78	0.00150								
0.68	0.0087	11.0	18.0	32.93	1.21	0.41	2.80	0.00133								
0.82	0.0106	10.0	17.0	32.70	1.22	0.49	3.29	0.00120								
1.00	0.0131	9.0	16.0	32.67	1.22	0.69	5.23	0.00120								
1.50	0.0185	7.5	15.0	33.31	1.20	0.92	6.01	0.00107								
2.20	0.0280	6.5	14.0	29.30	1.37	1.06	6.15	0.00107								
3.30	0.0365	5.0	13.0	37.99	1.05	1.39	6.03	0.00354								
4.70	0.0452	4.5	10.0	37.87	1.06	1.27	3.87	0.00354								
6.80	0.0725	3.5	9.0	39.03	1.02	2.01	5.82	0.00306								
8.20	0.0842	3.0	8.0	45.74	0.87	1.98	5.11	0.00306								
10.00	0.1156	2.5	7.0	47.98	0.83	2.55	7.08	0.00281								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant

APPLICATION NOTE



IHLP Selection Example

IHLP-2525 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾
IHLP-2525CZ-01									IHLP-2525CZ-11							
0.10	0.0015	32.5	60.0	21.88	1.83	0.11	2.42	0.00071								
0.15	0.0019	26.0	52.0	26.99	1.48	0.26	7.53	0.00063								
0.20	0.0024	24.0	41.0	25.07	1.60	0.26	4.00	0.00190								
0.22	0.0025	23.0	40.0	26.21	1.53	0.31	4.99	0.00190								
0.33	0.0035	20.0	30.0	24.76	1.62	0.35	4.15	0.00190								
0.47	0.0040	17.5	26.0	28.30	1.41	0.41	4.11	0.00190								
0.68	0.0050	15.5	25.0	28.85	1.39	0.61	5.88	0.00190								
0.82	0.0067	13.0	24.0	30.61	1.31	0.62	5.16	0.00150								
1.00	0.0090	11.0	22.0	31.83	1.26	0.68	4.99	0.00150	0.0076	12.5	9.5	29.19	1.44	0.68	5.44	0.00150
1.50	0.0140	9.0	18.0	30.57	1.31	1.04	7.65	0.00120								
2.20	0.0180	8.0	14.0	30.09	1.33	1.00	5.62	0.00120	0.0157	9.0	7.0	27.26	1.47	0.98	5.75	0.00120
3.30	0.0280	6.0	13.5	34.39	1.16	1.53	8.23	0.00107	0.0248	7.0	6.5	28.52	1.40	1.38	7.46	0.00107
4.70	0.0370	5.5	10.0	30.97	1.29	1.30	3.80	0.00391	0.0318	6.0	4.0	30.28	1.32	1.13	3.30	0.00391
6.80	0.0540	4.5	8.0	31.70	1.26	1.75	5.01	0.00354	0.0446	5.5	4.0	25.69	1.56	1.72	5.58	0.00354
8.2	0.0640	4.0	7.5	33.85	1.18	2.09	5.79	0.00354	0.0523	5.0	4.0	26.36	1.52	1.85	5.38	0.00354
10	0.1020	3.0	7.0	37.76	1.06	2.74	7.23	0.00281	0.0678	4.0	3.5	31.95	1.25	1.95	5.04	0.00306
22									0.1289	2.9	2.5	31.97	1.25	3.27	6.79	0.00281
IHLP-2525EZ-01									IHLP-2525EZ-11							
0.56	0.0034	20.0	12.0	25.49	1.57	0.42	3.81	0.00238								
0.68	0.0042	18.0	11.5	25.47	1.57	0.56	5.47	0.00214								
0.82	0.0046	16.5	13.0	27.68	1.45	0.78	8.81	0.00214								
1.00	0.0056	13.0	15.0	36.63	1.09	0.75	5.95	0.00172								
1.50	0.0086	12.0	12.0	27.99	1.43	1.28	12.9	0.00172								
2.20	0.0130	10.0	10.0	26.66	1.50	1.6	14.5	0.00154								
3.30	0.0199	8.0	8.0	27.22	1.47	1.98	13.61	0.00139								
4.70	0.0289	6.5	7.0	28.39	1.41	2.13	11.5	0.00124								
5.60	0.0327	6.0	7.0	29.40	1.36	2.53	13.39	0.00124								
6.80	0.0425	5.5	5.5	26.96	1.48	2.7	12.78	0.00113								
8.20	0.0483	5.5	5.5	26.34	1.52	2.9	14.11	0.00113								
10.00	0.0679	4.5	4.5	25.21	1.59	3.17	12.25	0.00101								
IHLP-2525CZ-5A																
0.47	0.0039	20.00	14.00	22.39	1.79	0.37	3.74	0.00214								
0.68	0.0054	16.50	17.00	23.66	1.69	0.58	6.51	0.00192								
0.82	0.0068	13.80	16.80	26.96	1.48	0.70	7.86	0.00172								
1.00	0.0079	12.00	13.00	30.47	1.31	0.76	7.16	0.00172								
2.20	0.0171	8.10	10.80	30.89	1.29	1.18	8.46	0.00139								
3.30	0.0265	6.80	8.30	28.29	1.41	1.41	7.93	0.00124								
4.70	0.0359	5.60	5.60	30.79	1.30	1.19	3.80	0.00456								
5.60	0.0426	5.30	4.80	28.97	1.38	1.33	3.81	0.00456								
6.80	0.0538	4.40	4.40	33.28	1.20	1.75	5.36	0.00413								
10.00	0.0719	4.00	2.90	30.13	1.33	1.80	4.42	0.00369								
15.00	0.1180	2.90	2.80	34.93	1.15	2.86	7.08	0.00335								
22.00	0.1630	2.80	2.20	27.12	1.47	3.14	6.64	0.00304								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-3232 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾
IHLP-3232CZ-01									IHLP-3232CZ-11							
0.22	0.00150	32.0	43.0	22.6	1.77	0.28	5.42	0.00297	0.00151	36.0	24.0	17.7	2.26	0.23	3.50	0.00297
0.33	0.00240	25.0	32.0	23.1	1.73	0.33	4.29	0.00266	0.00222	27.0	18.0	21.4	1.87	0.26	2.85	0.00266
0.47	0.00311	21.5	35.0	24.1	1.66	0.50	6.90	0.00238	0.00254	24.0	18.0	23.7	1.69	0.45	6.02	0.00266
0.68									0.00373	20.0	15.2	23.2	1.72	0.57	6.08	0.00238
0.82									0.00455	18.5	15.0	22.3	1.80	0.70	7.38	0.00214
1.0	0.00780	13.7	29.0	23.7	1.69	0.97	10.93	0.00172	0.00607	16.0	14.8	22.3	1.79	0.84	8.81	0.00192
1.5	0.01240	11.0	24.0	23.1	1.73	1.28	12.02	0.00154	0.00829	12.5	11.3	26.8	1.49	1.09	9.61	0.00172
2.2	0.01900	9.0	21.0	22.5	1.78	1.63	13.06	0.00139	0.01370	10.4	10.4	23.4	1.71	1.23	8.87	0.00154
3.3	0.02560	7.2	12.0	26.1	1.53	1.41	5.82	0.00509								
4.7	0.03200	6.6	10.5	24.9	1.61	1.52	4.91	0.00509	0.02670	7.6	5.4	22.5	1.78	1.21	4.02	0.00509
5.6	0.03470	6.3	10.0	25.2	1.59	1.68	5.60	0.00509								
6.8	0.04610	5.3	9.5	26.8	1.49	2.28	7.75	0.00456	0.03530	6.5	5.0	23.2	1.72	1.68	5.22	0.00509
8.2	0.05540	4.8	9.5	27.2	1.47	2.27	6.57	0.00456	0.04360	5.9	4.2	22.8	1.75	1.94	5.81	0.00456
10	0.06650	4.7	8.2	23.6	1.70	2.56	7.13	0.00413	0.05150	5.3	3.8	24.0	1.67	2.23	6.27	0.00456
15									0.07970	4.3	3.8	23.5	1.70	3.03	7.54	0.00413
22									0.12300	3.6	2.8	21.7	1.84	3.81	8.23	0.00369
33									0.19200	2.6	2.5	26.7	1.50	4.55	7.96	0.00335
IHLP-3232DZ-01									IHLP-3232DZ-11							
0.22	0.00157	30.7	34.0	23.4	1.71	0.19	2.03	0.00331	0.00126	34.0	22.0	23.8	1.68	0.18	2.45	0.00311
0.33	0.00200	29.5	36.0	19.9	2.01	0.35	4.55	0.00297	0.00201	27.5	16.0	22.8	1.75	0.23	2.29	0.00297
0.47	0.00245	25.0	31.5	22.6	1.77	0.47	5.52	0.00297	0.00222	25.0	14.0	25.0	1.60	0.32	2.98	0.00297
0.68	0.00343	21.0	24.5	22.9	1.75	0.56	5.47	0.00266	0.00301	22.2	14.5	23.4	1.71	0.53	5.51	0.00266
0.82	0.00413	19.0	24.2	23.2	1.72	0.64	5.91	0.00238	0.00363	19.5	15.0	25.1	1.59	0.68	7.30	0.00238
1.0	0.00540	18.0	24.0	19.8	2.02	0.88	8.59	0.00214	0.00433	18.2	12.0	24.2	1.66	0.71	6.36	0.00238
2.2	0.01280	10.5	23.0	24.6	1.63	1.78	14.50	0.00172	0.00880	14.5	10.2	18.7	2.14	1.58	14.13	0.00192
3.3	0.01650	9.2	20.0	24.8	1.61	2.09	14.33	0.00172	0.01400	10.5	9.7	22.5	1.78	1.79	12.06	0.00172
4.7	0.02990	7.5	18.7	20.6	1.94	2.90	17.70	0.00139	0.02110	8.0	8.7	25.7	1.56	2.38	14.87	0.00154
5.6	0.03320	6.8	16.7	22.6	1.77	3.02	17.06	0.00139	0.02670	7.4	7.6	23.7	1.69	2.78	17.29	0.00139
6.8	0.04460	5.7	15.2	23.9	1.67	3.35	16.98	0.00124	0.03120	7.0	6.7	22.7	1.76	2.73	13.95	0.00139
8.2	0.04750	5.5	10.0	24.1	1.66	2.71	9.27	0.00456	0.04210	5.7	6.6	25.3	1.58	3.39	17.54	0.00124
10	0.05600	5.2	9.0	22.9	1.75	2.79	8.11	0.00456	0.04840	5.4	6.4	24.6	1.63	3.56	15.87	0.00124
15									0.06100	4.9	3.7	23.7	1.69	2.99	7.54	0.00456
22									0.08800	4.3	3.3	21.3	1.88	3.93	9.05	0.00413
33									0.13500	3.2	3.2	25.1	1.60	5.61	11.75	0.00369
IHLP-3232DZ-5A																
0.22	0.00168	36.00	32.0	15.92	2.51	0.13	1.19	0.00297								
0.47	0.00238	27.00	19.0	19.98	2.00	0.42	4.99	0.00297								
0.68	0.00330	21.50	16.2	22.72	1.76	0.50	4.98	0.00266								
1.0	0.00458	19.00	16.2	20.96	1.91	1.01	11.81	0.00238								
2.2	0.01170	11.50	14.0	22.40	1.79	1.73	17.20	0.00172								
3.3	0.01540	11.30	11.8	17.63	2.27	2.13	17.44	0.00172								
4.7	0.02660	7.20	9.10	25.14	1.59	2.65	18.56	0.00139								
5.6	0.02960	6.90	9.00	24.60	1.63	2.89	20.88	0.00139								
10	0.05000	5.10	5.20	26.65	1.50	2.69	8.68	0.00456								
15	0.06200	4.80	3.60	24.26	1.65	3.37	9.77	0.00456								
22	0.10300	3.70	3.80	24.58	1.63	4.01	9.03	0.00413								
33	0.14900	3.10	3.20	24.21	1.65	6.19	14.43	0.00369								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-4040 APPLICATIONS																
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHLP-4040DZ-01									IHLP-4040DZ-11							
0.19	0.00088	40.0	90.0	24.76	1.62	0.68	35.45	0.00143	0.00070	40.00	46.00	30.95	1.29	0.35	13.75	0.00143
0.24									0.00085	33.00	44.00	37.45	1.07	0.68	33.05	0.00143
0.36	0.00130	31.5	60.0	26.87	1.49	0.39	6.66	0.00383	0.00105	32.00	30.00	32.24	1.24	0.53	12.79	0.00383
0.47									0.00153	30.00	30.00	25.17	1.59	0.50	8.67	0.00383
0.56	0.00170	27.5	49.0	26.96	1.48	0.88	18.31	0.00340	0.00161	32.00	22.00	21.84	1.83	0.72	13.04	0.00340
0.78									0.00180	27.00	22.00	26.42	1.51	1.09	22.84	0.00340
1.00	0.00370	17.5	36.0	30.59	1.31	1.57	26.68	0.00270	0.00230	25.00	20.00	24.11	1.66	1.12	18.87	0.00340
1.50	0.00530	15.0	27.5	29.07	1.38	1.90	26.24	0.00240								
1.80									0.00450	17.00	16.00	26.65	1.50	2.09	34.11	0.00240
2.00									0.00520	16.00	14.00	26.04	1.54	1.99	25.92	0.00240
2.20	0.00820	12.0	25.6	29.35	1.36	2.34	27.18	0.00213								
3.30	0.01370	10.0	18.6	32.09	1.25	2.08	12.95	0.00697								
4.70	0.01500	9.5	17.0	25.60	1.56	2.77	17.78	0.00697	0.01290	9.50	7.60	29.77	1.34	2.03	10.93	0.00782
5.6	0.01760	8.5	16.0	27.26	1.47	3.24	20.44	0.00697								
6.80	0.02120	8.0	13.5	25.55	1.57	3.30	17.44	0.00697	0.01750	9.00	7.50	24.45	1.64	2.75	14.23	0.00697
10.00	0.03320	6.8	12.0	22.58	1.77	4.30	20.87	0.00550	0.02780	7.50	7.10	22.17	1.80	4.52	25.56	0.00550
15.00									0.04090	6.25	6.00					
22.00									0.06040	5.00	4.50	22.96	1.74	6.05	21.46	0.00489
33.00									0.08750	4.40	4.00	24.80		8.01	25.10	0.00509
47.00									0.13200	3.30	3.00	18.29	2.19	10.63	31.11	0.00391
100.00									0.2490	2.50	2.25	22.27	1.80	13.98	25.70	0.00354
IHLP-4040DZ-5A																
0.47	0.00155	30.0	28.5	24.85	1.61	0.79	18.51	0.00413								
1.0	0.00287	23.5	24.0	21.87	1.83	1.45	27.70	0.00331								
2.2	0.00870	12.5	12.5	25.50	1.57	1.21	8.51	0.00872								
3.3	0.01100	11.0	12.0	26.04	1.54	1.80	12.26	0.00872								
4.7	0.01430	9.80	9.20	25.24	1.58	2.27	14.41	0.00785								
5.6	0.01650	9.30	9.00	24.29	1.65	2.76	17.48	0.00785								
6.8	0.02090	8.00	9.00	25.91	1.54	3.38	21.30	0.00705								
10	0.03090	6.50	8.50	26.55	1.51	4.36	24.02	0.00630								
15	0.04700	5.10	7.70	28.35	1.41	5.90	29.43	0.00565								
22	0.07050	4.10	6.40	29.25	1.37	7.38	31.34	0.00509								
33	0.11000	3.70	4.20	23.02	1.74	9.27	32.63	0.00456								
47	0.16700	2.50	4.50	33.21	1.20	11.56	36.16	0.00413								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V- μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-5050 APPLICATIONS																
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHLP-5050CE-01									IHLP-5050CE-11							
0.10	0.0008	43.0	84.0	23.43	1.71	0.09	2.38	0.00128								
0.15	0.0010	41.0	75.0	20.62	1.94	0.27	9.72	0.00128								
0.22	0.0011	38.5	65.0	21.26	1.88	0.71	32.14	0.00128								
0.33	0.0013	36.5	62.0	20.01	2.00	0.80	23.86	0.00383								
0.47	0.0016	32.0	55.0	21.16	1.89	0.86	18.94	0.00383								
0.60	0.0018	29.0	51.0	22.90	1.75	1.11	25.74	0.00383								
0.68	0.0023	28.0	49.0	19.22	2.08	1.12	24.57	0.00340								
0.82	0.0026	25.0	44.0	21.33	1.88	1.51	35.19	0.00340								
1.00	0.0033	24.0	40.0	18.24	2.19	1.32	21.69	0.00340								
1.50	0.0051	19.0	35.0	18.83	2.12	2.25	38.60	0.00270								
1.80	0.0065	16.5	30.0	19.59	2.04	1.55	14.19	0.00990								
2.20	0.0072	16.0	29.0	18.81	2.13	2.10	31.39	0.00990								
3.30	0.0110	12.0	27.0	21.88	1.83	2.71	25.18	0.00782								
4.70	0.0143	10.0	24.0	24.24	1.65	3.51	28.52	0.00782								
5.60	0.0183	9.5	19.0	20.99	1.91	4.33	34.66	0.00697								
6.80	0.0198	9.0	18.0	21.61	1.85	3.86	25.10	0.00697								
8.2	0.0246	8.5	16.0	19.50	2.05	4.82	33.66	0.00623								
10	0.0304	7.0	14.0	23.27	1.72	5.36	32.38	0.00623								
IHLP-5050EZ-01									IHLP-5050EZ-11							
0.10	0.0005	55.00	118.00	21.62	1.85	0.17	5.79	0.00161								
0.22	0.0006	51.00	110.00	20.82	1.92	0.92	53.68	0.00161								
0.33	0.0009	42.00	80.00	23.12	1.73	0.95	32.50	0.00161								
0.47	0.0011	38.00	65.00	21.82	1.83	1.11	29.00	0.00483								
0.56	0.0013	36.00	55.00	20.57	1.94	1.00	23.04	0.00430								
0.68	0.0015	34.00	54.00	19.99	2.00	1.55	42.08	0.00430								
0.82	0.0020	31.00	53.00	18.03	2.22	2.06	57.33	0.00383								
1.00	0.0021	29.00	50.00	19.63	2.04	1.96	41.82	0.00383								
1.50	0.0034	23.00	48.00	19.27	2.08	2.88	60.16	0.00303								
2.20	0.0046	20.00	32.00	18.84	2.12	2.91	49.82	0.00303								
3.30	0.0077	15.00	32.00	20.01	2.00	2.90	41.87	0.00303								
4.70	0.0128	12.00	27.00	18.81	2.13	4.49	65.07	0.00240								
5.60	0.0140	11.50	22.00	18.72	2.14	5.19	55.68	0.00213								
6.80	0.0154	11.00	21.00	18.60	2.15	5.63	61.71	0.00213								
7.80	0.0172	10.00	18.00	20.15	1.98	5.65	54.15	0.00213								
8.20	0.0189	9.50	18.00	20.32	1.97	5.67	39.43	0.00782								
10	0.0214	9.00	16.00	20.00	2.00	5.88	38.77	0.00782								
15	0.0280	8.25	14.50	18.19	2.20	5.69	34.19	0.00697								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-5050 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} ⁽¹⁾	P _{HEAT} ⁽²⁾ (W)	ET ₁₀₀ ⁽³⁾	K ₀ ⁽⁴⁾	K ₁ ⁽⁵⁾
IHLP-5050FD-01									IHLP-5050FD-11							
0.10	0.0005	60.0	120.0	20.49	1.95	0.17	5.86	0.00181								
0.15	0.0005	55.0	118.0	21.62	1.85	0.51	26.26	0.00181								
0.22	0.0006	53.0	112.0	19.59	2.04	0.92	54.32	0.00161								
0.30	0.0007	48.0	72.0	21.49	1.86	0.72	21.56	0.00543								
0.33	0.0008	46.0	65.0	19.74	2.03	0.83	24.79	0.00483								
0.40	0.0009	44.0	64.0	19.89	2.01	1.26	45.17	0.00483								
0.47	0.0010	41.0	63.0	20.62	1.94	1.43	50.92	0.00430								
0.56	0.0012	37.0	62.0	21.10	1.90	1.92	77.81	0.00430								
0.68	0.0014	35.0	60.0	20.21	1.98	1.47	36.64	0.00430								
0.82	0.0016	33.0	50.0	19.89	2.01	1.45	28.23	0.00430								
1.00	0.0017	32.0	49.0	19.91	2.01	1.96	42.83	0.00430								
1.20	0.0021	30.0	48.0	18.34	2.18	2.51	56.06	0.00383								
1.50	0.0025	27.0	45.0	19.02	2.10	2.60	48.64	0.00383								
1.80	0.0028	24.0	41.0	21.49	1.86	2.81	47.09	0.00383								
2.20	0.0035	22.0	40.0	20.46	1.95	3.25	52.53	0.00340								
3.30	0.0057	18.0	35.0	18.77	2.13	3.93	49.36	0.00303								
4.70	0.0093	13.5	30.0	20.45	1.96	6.01	80.59	0.00270								
5.6	0.0093	13.5	26.5	20.45	1.96	5.49	57.91	0.00270								
6.8	0.0131	11.5	16.5	20.01	2.00	4.56	29.07	0.00782								
8.2	0.0145	10.5	16.0	21.68	1.84	5.52	35.72	0.00782								
10	0.0164	10.0	15.5	21.14	1.89	5.92	39.12	0.00782								
IHLP-5050FD-5A																
1.0	0.00165	40.00	26.00	13.13	3.05	1.78	40.25	0.00461								
1.2	0.00198	29.00	24.50	20.82	1.92	1.82	35.34	0.00461								
1.5	0.00240	27.50	23.50	19.10	2.09	2.21	41.86	0.00413								
1.8	0.00275	26.00	22.50	18.65	2.15	2.40	40.85	0.00413								
2.2	0.00343	25.50	21.50	15.54	2.57	2.86	47.20	0.00370								
3.3	0.00508	20.20	16.70	16.72	2.39	3.87	57.81	0.00331								
4.7	0.00741	17.40	18.50	15.45	2.59	5.05	68.23	0.00297								
5.6	0.00851	13.80	13.80	21.39	1.87	5.48	68.40	0.00297								
6.8	0.01130	14.20	8.70	15.21	2.63	3.51	23.15	0.00975								
7.8	0.01260	13.50	8.50	15.09	2.65	4.17	27.56	0.00975								
8.2	0.01320	13.20	7.60	15.07	2.65	4.08	24.97	0.00975								
10	0.01660	10.90	7.20	17.57	2.28	4.46	25.37	0.00975								
12	0.01900	10.60	6.90	16.24	2.46	6.26	39.60	0.00872								
15	0.02400	8.70	6.80	19.08	2.10	8.11	56.98	0.00785								
22	0.03130	8.30	5.50	16.08	2.49	8.17	40.42	0.00872								

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-6767 APPLICATIONS																
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} (1)	P _{HEAT} (2) (W)	ET ₁₀₀ (3)	K ₀ (4)	K ₁ (5)	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} (1)	P _{HEAT} (2) (W)	ET ₁₀₀ (3)	K ₀ (4)	K ₁ (5)
IHLP-6767DZ-01									IHLP-6767DZ-11							
0.22	0.00080	75.0	92.0	7.70	5.19	0.72	36.25	0.00192								
0.33	0.00116	56.0	82.0	9.53	4.20	1.61	90.56	0.00154								
0.47	0.00131	49.0	77.0	11.02	3.63	1.51	55.60	0.00461								
0.56	0.00145	47.0	62.0	10.82	3.70	1.89	73.69	0.00461								
0.68	0.00190	41.0	60.0	10.85	3.69	2.38	92.99	0.00413								
0.82	0.00217	38.5	51.0	10.78	3.71	1.92	48.88	0.00413								
1.0	0.00253	31.5	58.0	13.81	2.90	2.70	73.48	0.00413	0.00186	41.0	27.5	11.09	3.61	2.44	89.35	0.00413
1.5	0.00450	23.5	40.0	13.95	2.87	3.30	63.42	0.00331	0.00312	31.0	21.0	11.56	3.46	3.05	75.73	0.00370
2.2	0.00610	19.0	30.0	15.74	2.54	4.11	80.00	0.00297	0.00457	26.0	19.0	11.22	3.57	2.71	43.48	0.01214
3.3	0.00906	18.5	28.0	11.18	3.58	4.81	72.95	0.00266	0.00664	20.5	14.0	12.42	3.22	3.67	50.78	0.01090
4.7	0.01070	16.0	27.0	12.65	3.16	5.56	61.96	0.01090	0.00847	18.0	12.0	12.63	3.17	4.09	44.05	0.01090
5.6	0.01340	14.0	26.0	13.20	3.03	6.28	67.19	0.00975	0.01109	15.0	11.5	13.89	2.88	5.88	74.79	0.00975
6.8	0.01520	13.2	21.0	13.09	3.06	5.63	47.86	0.00975	0.01254	14.5	10.5	13.15	3.04	6.40	72.40	0.00975
8.2	0.01680	11.5	20.0	15.60	2.56	6.89	60.83	0.00975								
10	0.02440	10.5	19.5	12.89	3.10	8.27	64.94	0.00872	0.01720	12.0	8.0	13.99	2.86	6.89	56.71	0.00975
15									0.02780	9.0	7.5	15.39	2.60	8.49	59.52	0.00785
22									0.04270	7.2	6.2	15.66	2.55	9.54	50.87	0.00705
33									0.06440	6.5	6.0	12.74	3.14	13.52	68.53	0.00630
47									0.09860	5.0	4.3	14.06	2.84	14.30	53.92	0.00565
IHLP-6767GZ-01									IHLP-6767GZ-11							
0.22	0.00063	80.0	129.0	8.60	4.65	0.51	23.87	0.00192								
0.33	0.00071	65.0	126.0	11.55	3.46	1.23	80.22	0.00192	0.00061	75.5	55.0	9.97	4.01	0.51	22.25	0.00192
0.47	0.00084	62.0	123.0	10.73	3.73	2.61	217.42	0.00192	0.00073	64.5	62.0	11.41	3.50	1.41	89.84	0.00192
0.56	0.00091	56.0	88.0	12.15	3.29	1.67	66.57	0.00577	0.00083	61.0	66.0	11.22	3.56	2.67	209.55	0.00192
0.82	0.00117	50.0	73.0	11.85	3.38	2.30	72.97	0.00577	0.00098	56.5	45.0	11.08	3.61	2.29	96.73	0.00577
1.0	0.00128	48.0	73.0	11.75	3.40	3.08	109.35	0.00577	0.00121	55.5	32.0	9.30	4.30	1.83	49.46	0.00577
1.5	0.00178	42.0	65.0	11.04	3.62	3.58	97.24	0.00516	0.00154	48.0	31.0	9.77	4.09	3.48	112.31	0.00516
1.8	0.00196	38.0	65.0	12.25	3.27	4.74	141.72	0.00516								
2.2	0.00240	35.0	62.0	11.79	3.39	4.94	122.99	0.00516	0.00185	43.5	28.0	9.90	4.04	4.28	115.27	0.00516
3.3	0.00368	28.0	54.0	12.01	3.33	7.03	170.20	0.00413	0.00279	35.0	27.0	10.14	3.94	5.33	117.80	0.00461
4.7	0.00484	25.0	41.0	11.46	3.49	7.15	125.58	0.00413	0.00398	30.0	21.0	9.68	4.13	6.33	116.62	0.00413
5.6	0.00668	21.0	41.0	11.77	3.40	7.97	118.95	0.00370	0.00423	28.0	21.0	10.45	3.83	7.20	137.75	0.00413
6.8	0.00837	19.0	32.0	11.47	3.49	8.02	98.99	0.01214	0.00586	22.5	18.5	11.68	3.42	7.78	123.60	0.00370
8.2	0.01010	18.0	25.0	10.59	3.78	8.27	77.61	0.01214	0.00771	21.0	18.0	10.19	3.92	9.84	158.43	0.00331
10	0.01105	16.5	25.0	11.52	3.47	9.39	86.12	0.01214	0.00889	19.0	17.0	10.80	3.70	10.48	150.18	0.00331
15	0.01880	12.5	25.0	11.80	3.39	12.01	96.62	0.00975	0.01370	14.0	12.0	12.91	3.10	10.99	99.86	0.01090
22	0.02510	11.0	23.0	11.41	3.50	14.16	90.80	0.00975	0.02000	12.0	9.5	12.04	3.32	12.53	89.24	0.00975
33.00									0.03510	10.7	9.0	8.63	4.64	18.78	136.48	0.00785
47.00									0.04070	8.7	8.6	11.25	3.55	19.23	98.48	0.00872
56.00									0.05500	7.2	4.2	12.16	3.29	17.75	63.3	0.01835
68.00									0.07210	6.1	4.5	12.92	3.10	21.38	79.06	0.01646
82.00									0.08730	5.5	4.5	13.13	3.05	22.17	66.74	0.01646
100.00									0.10500	5.0	4.0	13.20	3.03	25.42	73.04	0.01646

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHLP-6767 APPLICATIONS								
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHLP-6767GZ-5A								
0.47	0.00089	63.00	87.00	9.81	4.08	2.67	240.42	0.00192
1.0	0.00136	53.00	42.00	9.07	4.41	2.49	87.30	0.00577
2.2	0.00225	38.50	38.00	10.39	3.85	4.24	107.83	0.00516
3.3	0.00306	32.20	32.00	10.92	3.66	6.35	170.25	0.00461
4.7	0.00489	24.00	26.00	12.31	3.25	6.74	124.93	0.00413
10	0.01020	16.00	20.00	13.27	3.01	9.15	104.01	0.01214
15	0.01585	12.50	13.00	14.00	2.86	10.50	92.55	0.0109
22	0.02128	11.70	11.00	11.90	3.36	15.11	132.20	0.00975

Notes

- (1) Thermal resistance of the part [$^{\circ}\text{C}/\text{W}$]
- (2) Total power loss that will cause an approximate ΔT of 40 $^{\circ}\text{C}$
- (3) $V\text{-}\mu\text{s}$ product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant

IHLP-8787 APPLICATIONS								
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHLP-8787MZ-5A								
0.47	0.00056	80.0	100.0	9.67	4.14	3.38	398.86	0.00300
1.0	0.00082	69.0	71.0	8.88	4.51	2.22	79.72	0.00901
2.2	0.00123	58.0	48.0	8.38	4.77	9.59	430.14	0.00717
3.3	0.00163	49.0	41.0	8.86	4.52	11.02	490.25	0.00641
4.7	0.00169	47.0	37.0	9.28	4.31	12.06	417.29	0.00717
6.8	0.00284	36.0	36.0	9.42	4.25	17.60	606.41	0.00577
10	0.00404	28.0	28.0	10.94	3.66	23.70	588.74	0.00516
15	0.00562	23.5	24.0	11.17	3.58	25.22	533.87	0.00516
22	0.01060	17.5	16.0	10.68	3.75	25.75	411.39	0.00413
33	0.01570	15.5	10.5	9.19	4.35	28.90	308.45	0.01515
47	0.01730	13.5	10.0	10.99	3.64	33.92	313.14	0.01515
75	0.02976	12.0	12.0	8.09	4.95	55.08	499.39	0.01214
82	0.03146	10.2	9.0	10.59	3.78	57.44	491.52	0.01214
100	0.03625	9.1	7.0	11.55	3.46	59.84	458.08	0.01214

Notes

- (1) Thermal resistance of the part [$^{\circ}\text{C}/\text{W}$]
- (2) Total power loss that will cause an approximate ΔT of 40 $^{\circ}\text{C}$
- (3) $V\text{-}\mu\text{s}$ product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

IHTH-0750 APPLICATIONS								
L_0 μH	DCR Ω TYP.	I_{HEAT} (A)	I_{SAT} (A)	R_{TH} (1)	P_{HEAT} (2) (W)	ET_{100} (3)	K_0 (4)	K_1 (5)
IHTH-0750IZ-5A								
0.47	0.00047	83.0	44.0	10.71	3.74	1.40	60.32	0.00717
1.0	0.00087	66.0	44.0	9.15	4.37	3.88	243.72	0.00641
2.2	0.00151	45.0	38.0	11.34	3.53	5.75	232.68	0.00641
3.3	0.00228	40.0	33.0	9.50	4.21	6.34	201.07	0.00577
4.7	0.00285	30.0	26.0	13.51	2.96	7.19	185.96	0.00516
6.8	0.00397	24.5	22.0	14.55	2.75	7.09	137.20	0.00516
8.2	0.00570	20.0	14.5	15.20	2.63	8.30	107.63	0.01692
10	0.00732	17.7	13.0	15.11	2.65	8.99	107.87	0.01692
22	0.01256	12.7	11.5	17.11	2.34	14.49	149.40	0.01357
33	0.02261	9.5	10.0	16.99	2.35	21.69	215.22	0.01214
47	0.03534	6.8	6.5	21.21	1.89	18.47	100.36	0.02546
68	0.04647	6.2	6.2	19.40	2.06	23.88	119.25	0.02546
82	0.05520	5.2	6.0	23.22	1.72	31.58	174.55	0.02277
100	0.06080	5.0	5.2	22.80	1.75	33.56	168.74	0.02277
IHTH-0750JZ-5A								
0.47	0.00044	65.0	51.0	18.65	2.15	1.40	60.32	0.00717
1.0	0.00087	55.0	45.0	13.17	3.04	3.88	243.72	0.00641
2.2	0.00155	44.0	38.0	11.55	3.46	5.75	232.68	0.00641
3.3	0.00228	33.0	32.0	13.96	2.87	6.34	201.07	0.00577
4.7	0.00285	25.0	30.0	19.46	2.06	7.19	185.96	0.00516
6.8	0.00397	23.0	28.0	16.50	2.42	7.09	137.20	0.00516
8.2	0.00583	19.0	20.0	16.47	2.43	8.30	107.63	0.01692
10	0.00732	17.0	18.0	16.38	2.44	8.99	107.87	0.01692
22	0.01256	13.0	12.0	16.33	2.45	14.49	149.40	0.01357
33	0.02261	8.5	11.0	21.22	1.89	21.69	215.22	0.01214
47	0.03534	6.5	8.0	23.21	1.72	18.47	100.36	0.02546
68	0.04647	6.2	6.2	19.40	2.06	23.88	119.25	0.02546
82	0.05520	5.4	6.0	21.53	1.86	31.58	174.55	0.02277
100	0.06080	4.9	5.9	23.74	1.68	33.56	168.74	0.02277

Notes

- (1) Thermal resistance of the part [$^{\circ}\text{C}/\text{W}$]
(2) Total power loss that will cause an approximate ΔT of 40 $^{\circ}\text{C}$
(3) $V\text{-}\mu\text{s}$ product that corresponds to a peak flux density of 100 Gauss
(4) Core loss constant
(5) AC loss constant



IHLP Selection Example

IHTH-1125 APPLICATIONS								
L ₀ μH	DCR Ω TYP.	I _{HEAT} (A)	I _{SAT} (A)	R _{TH} (1)	P _{HEAT} (2) (W)	ET ₁₀₀ (3)	K ₀ (4)	K ₁ (5)
IHTH-1125KZ-5A								
0.47	0.00026	125.0	112.0	8.53	4.69	1.91	200.79	0.00376
1	0.00043	90.0	65.0	9.95	4.02	5.38	404.99	0.00898
2.2	0.00070	72.0	64.0	9.55	4.19	9.94	665.72	0.00898
3.3	0.00140	51.0	62.0	9.52	4.20	13.30	823.21	0.00717
4.7	0.00165	45.5	55.0	10.15	3.94	15.79	805.46	0.00717
6.8	0.00184	44.5	44.0	9.51	4.20	17.88	797.76	0.00717
8.2	0.00282	34.0	24.0	10.63	3.76	16.36	418.56	0.02350
10	0.00320	29.0	22.5	12.88	3.11	17.66	417.20	0.02350
15	0.00445	26.0	20.0	11.52	3.47	20.80	409.14	0.02350
22	0.00639	21.0	23.0	12.30	3.25	29.72	572.06	0.02117
33	0.01020	16.8	22.5	12.04	3.32	40.82	705.65	0.01891
47	0.01320	14.7	16.2	12.15	3.29	40.02	534.42	0.01891
68	0.02560	10.5	9.6	12.28	3.26	48.18	449.89	0.03540
100	0.03070	8.8	6.0	14.58	2.74	53.64	414.74	0.03540
IHTH-1125MZ-5A								
0.47	0.00026	105.0	80.0	12.09	3.31	1.91	200.79	0.00376
1	0.00043	86.0	69.0	10.90	3.67	5.38	404.99	0.00898
2.2	0.00070	71.5	64.0	9.69	4.13	9.94	665.72	0.00898
4.7	0.00165	44.5	62.0	10.61	3.77	15.79	805.46	0.00717
6.8	0.00181	42.0	52.0	10.86	3.68	17.88	797.76	0.00717
8.2	0.00282	33.5	36.0	10.95	3.65	16.36	418.56	0.02350
10	0.00320	32.0	32.0	10.58	3.78	17.66	417.20	0.02350
22	0.00639	21.0	23.0	12.30	3.25	29.72	572.06	0.02117
33	0.01020	16.8	22.0	12.04	3.32	40.82	705.65	0.01891
47	0.01320	14.7	16.0	12.15	3.29	40.02	534.42	0.01891
68	0.02560	11.2	9.1	10.79	3.71	48.18	449.89	0.03540
100	0.03070	9.2	11.0	13.34	3.00	53.64	414.74	0.03540

Notes

- (1) Thermal resistance of the part [°C/W]
- (2) Total power loss that will cause an approximate ΔT of 40 °C
- (3) V-μs product that corresponds to a peak flux density of 100 Gauss
- (4) Core loss constant
- (5) AC loss constant



IHLP Selection Example

INPUT

L_{REQ}	I_{DC}	ΔI	Freq.	T_{AMB}	V- μs	δ
0.54 μH	20 A	7.39 A	300 kHz	50 °C	4.14	0.46

IHLP SELECTED

Step 1.

IHLP-4040DZ-01 0.56 μH								
L	DCR	I_{HEAT}	I_{SAT}	R_{TH}	P_{HEAT}	ET_{100}	K_0	K_1
0.56 μH	0.0017 Ω	30 A	49 A	26.96 °C/W	1.48 W	0.88	18.31	0.00340

VERIFICATION

Step 2.

$$B_{PK_{OPER}} = \frac{4.14}{0.88} \times 100 = 470.5 \text{ G}$$

Step 3.

$$f_e = \frac{300\,000}{2\pi (0.46 - 0.46^2)} = 192\,216.1 \text{ Hz}$$

Step 4.

$$P_{CORE} = 18.31 \times 192\,216^{0.188} \times 470.5^{2.118} \times 300\,000 \times 10^{-14} = 0.248 \text{ W}$$

Step 5.

The core losses are 0.248 W which is less than $\frac{1}{3}$ of P_{HEAT} (0.493 W)

Step 6.

$$P_{CU_{allowed}} = 1.48 - 0.248 = 1.32 \text{ W}$$

Step 7.

$$R_{OPER} = 0.0017 \times \left[\frac{274.5 + 50}{259.5} \right] = 0.00213 \Omega$$

$$P_{DC} = 20^2 \times 0.00213 = 0.852 \text{ W}$$

$$P_{AC} = 0.00340 \times 7.39^2 \times \sqrt{300\,000} \times 0.00213 = 0.217 \text{ W}$$

Step 8.

$$P_{TOTAL} = 0.248 + 0.852 + 0.217 = 1.317 \text{ W}$$

Step 9.

$$\Delta T = 1.317 \times 26.96 = 35.51 \text{ °C}$$

$$T_{OPER} = 50 + 35.51 = 85.51 \text{ °C}$$

Step 10.

$$I_{PEAK} = 20 + \frac{7.39}{2} = 23.7 \text{ A}$$

$I_{SAT} = 49 \text{ A}$ which is greater than the required 23.7 A

IHLP Selection Example

SELECTION CRITERIA

1. Limit core losses (P_{CORE}) to $\leq 1/3$ of total losses for 40 °C temperature rise (P_{HEAT}).
2. Total copper losses allowed will be equal to $P_{HEAT} - P_{CORE}$.
3. Maximum component temperature should be kept ≤ 125 °C, 155 °C for -51 components.
4. Maximum ΔT should be ≤ 40 °C (this can be exceeded provided caution is taken to insure max. temperature ≤ 125 °C/155 °C).
5. $I_{PEAK} \leq I_{SAT}$ (recommended, I_{PEAK} can exceed I_{SAT} with caution due to soft saturation of IHLP product).

GOVERNING EQUATIONS

- | | |
|--|--|
| 1. $B_{PK_{OPER}} = \frac{ET_{ckt}}{ET_{100}} \times 100$ [G] | 6. $P_{DC} = I_{DC}^2 \times R_{OPER}$ [W] |
| 2. $f_e = \frac{f_0}{2\pi(\delta - \delta^2)}$ [Hz] | 7. $P_{TOTAL} = P_{CORE} + P_{DC} + P_{AC}$ [W] |
| 3. $P_{CORE} = K_0 f_e^{K_f - 1} B_{pk}^{K_b} \times f_0 \times 10^{-14}$ [W] | 8. $\Delta T = P_{TOTAL} \times R_{TH}$ [°C] |
| 4. $P_{AC} = K_1 \times \Delta I^2 \times \sqrt{f_0} \times R_{OPER}$ [W] | 9. $T_{OPER} = T_{AMB} + \Delta T$ [°C] |
| 5. $R_{OPER} = R_{TYP.} \times \left[\frac{274.5 + T_{AMB}}{259.5} \right]$ [A] | 10. $I_{PEAK} = I_{DC} + \frac{\Delta I}{2}$ [A] |

Notes

- (1) Equation #5 assumes a 40 °C temperature rise and will have the same units as $R_{TYP.}$.
- (2) For equations #3 f in Hz and B_{PK} in G.
- (3) R_{OPER} is based on a 40 °C temperature rise.
- (4) K_f is 1.188 for -01 material, 1.173 for -11 material, and 1.044 for -51 material.
- (5) K_b is 2.118 for -01 material, 2.213 for -11 material, and 2.497 for -51 material.
- (6) For IHLP-2525EZ-01 - $K_f = 1.181$ and $K_b = 2.166$.

SELECTION PROCESS

Note

- This process assumes that the following is known: Required inductance, frequency, I_{DC} , ΔI , T_{AMB} , and $V-\mu s$ (ET) required.

- | | |
|---|--|
| Step 1. Select inductor value based on controller data sheet recommendation and current (I_{DC}) rating. | Step 6. Use selection criteria #2 to determine allowable copper losses. |
| Step 2. Determine peak operational flux density in Gauss using equation #1. | Step 7. Determine actual copper losses using equations #4, #5 and #6. |
| Step 3. Calculate effective frequency using equation #2. | Step 8. Use equation #7 for total losses. |
| Step 4. Determine core loss using equation #3 (see notes #1 and #2) and compare to selection criteria #1. | Step 9. Determine ΔT using equation #8 and insure $T_{OPER} \leq 125$ °C (155 °C for -51 material) using equation #9. |
| Step 5. If core losses are $> 1/3 P_{HEAT}$ select a larger inductor. | Step 10. Verify I_{PEAK} is less then I_{SAT} using equation #10 for the selected part (see selection criteria #5). |

DEFINITIONS

- | | |
|---|---|
| ET_{ckt} V- μs product of the circuit | f_0 Switching frequency in Hz |
| ET_{100} V- μs product at 100 Gauss from table #1 | R_{TH} Thermal gradient of IHLP from Table #1 |
| P_{CORE} Core losses in W | f_e Effective frequency in Hz |
| P_{DC} Losses due to the D_{CR} of the inductor copper winding in W | δ Duty cycle |
| K_0 IHLP core constant from table #1 | P_{AC} Losses in the coil due to AC effects |
| | K_{1-} AC loss constant from Table #1 |