HIGH–FREQUENCY PLANAR TRANSFORMERS

Ruggedized

PL103XX Series

- Power Rating up to 140 W
- Height: 8.6mm to 9.7mm Max
- Footprint: 23.4mm x 21.6mm Max
- Frequency Range: 200kHz to 700kHz
- Isolation (Primary to Secondary & Core): 1750V_{DC}
- Moisture Sensitivity Level: 1

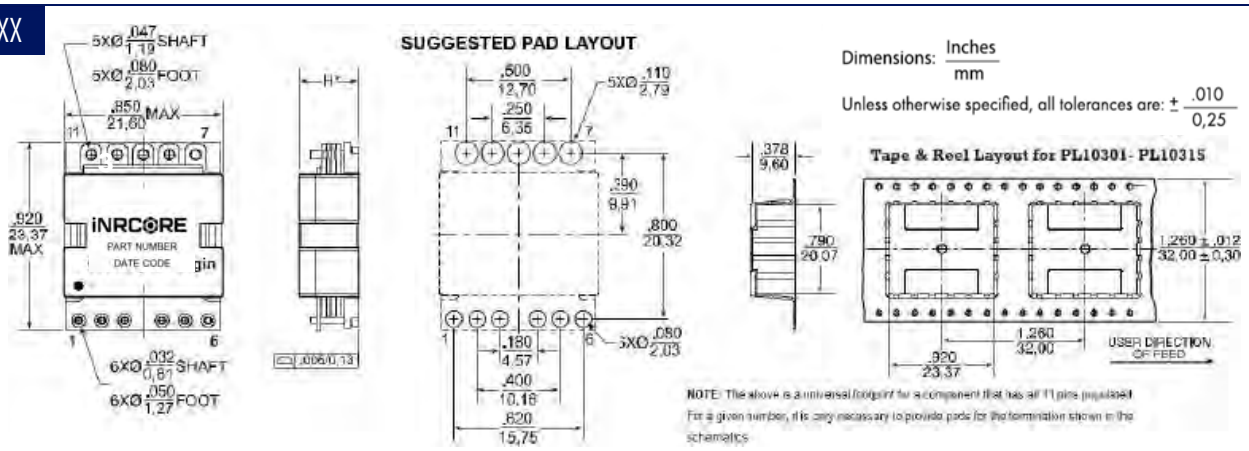
Electrical Specifications @ 25 °C – Operating Temperature – 40°C to +125 °C

Part [3,4] Number:	Turns Ratio		Secondary	Schematic	Primary 1 Inductance (µH MIN)	Leakage Inductance (µH MAX)	DCR (mΩ MAX)			Maximum Height (mm)
	Primary A	Primary B					Primary A	Primary B	Secondary	
PL10301	4T	5T	4T	A1	153	0.45	17.5	17.5	7	8.6
PL10302	4T	5T			194	0.45	17.5	20	7	8.6
PL10303	5T	5T			240	0.55	20	20	7	8.6
PL10304	5T	6T			290	0.60	20	25	7	8.6
PL10305	6T	6T			345	0.65	25	25	7	8.6
PL10306	4T	4T	1T & 1T	A2	153	0.45	17.5	17.5	.875 & .875	8.6
PL10307	4T	5T			194	0.45	17.5	20	.875 & .875	8.6
PL10308	5T	5T			240	0.55	20	20	.875 & .875	8.6
PL10309	5T	6T			290	0.60	20	25	.875 & .875	8.6
PL10310	6T	6T			345	0.65	25	25	1.75 & 1.75	8.6
PL10311	4T	4T	2T & 1T	A3	153	0.45	17.5	17.5	1.75 & 1.75	8.6
PL10312	4T	5T			194	0.45	17.5	20	1.75 & 1.75	8.6
PL10313	5T	5T			240	0.45	20	20	1.75 & 1.75	8.6
PL10314	5T	6T			290	0.50	20	25	1.75 & 1.75	9.7
PL10315	6T	6T			345	0.55	25	25	1.75 & 1.75	9.7

Notes:
1. Inductance is measured where applicable, with north primary windings connected in series (2 to 5, with 3 and 4 shorted).
2. Leakage inductance is measured on windings (2-5) with (3-4) and (7, 8, 9, 10, 11) shorted.
3. Optional Tape & Reel packaging can be ordered by adding a "T" suffix at the end of the part number (i.e. **PL10301T**)
4. Parts can be ordered Non-Lead by adding "NL" to the part number (i.e. **PL10303NL**)

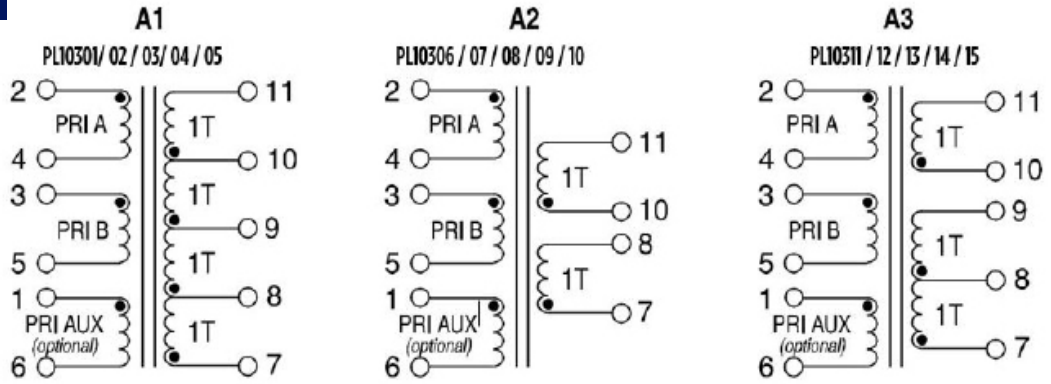
Mechanicals

PL103XX



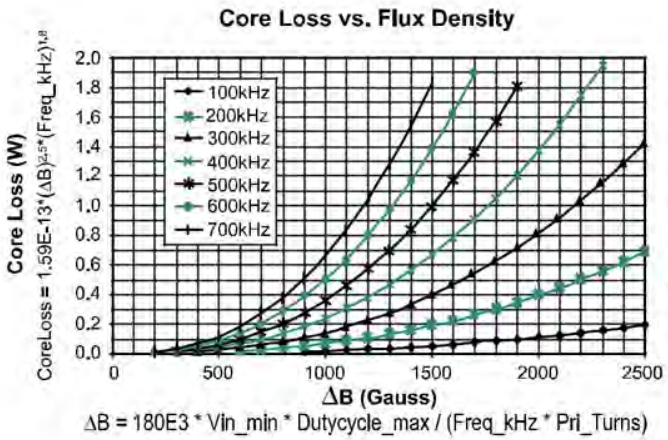
Electrical Schematics

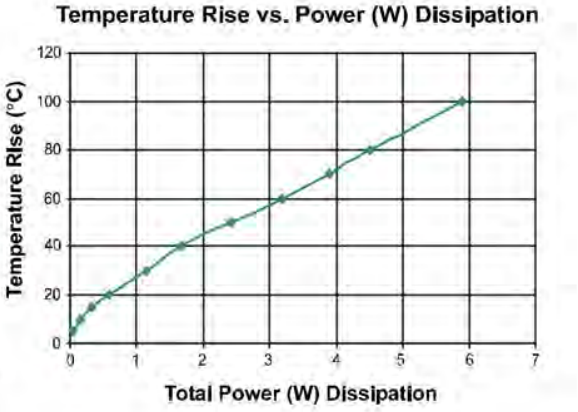
PL103XX



Notes:

1. The above transformers have been tested and approved by iNRCORE's IC partners and are cited in the appropriate datasheet or evaluation board documentation at these companies. See Spy glass transformer matrix on the next page for the other winding configuration that can be made available.
2. To detrmine if the transformer is suitbable for your application. it is neccessary to ensure that the temperature rise of the component(Ambient plus temperature reise) does not exceed its operating temperature. To determine the approximate temperature rise of the transformer, refer to the graphs below.





PL103XX Transformer Winding Configuration Matrix

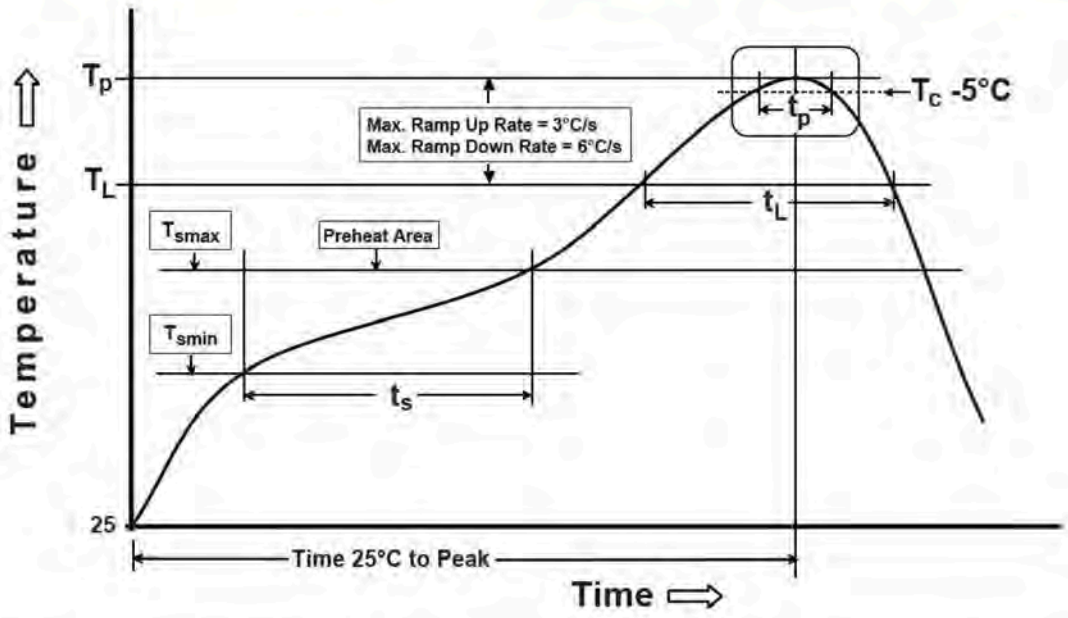
The following is a matrix of the winding configurations that are possible with the iNRCORE PL103XX Planar Transformer platform. The package is typically capable of handing between 80-140w of power depending on the application, ambient conditions cooling.
Once a configuration is selected, the formulae and charts can be used to determine the approximate power dissipation and temperaturerise of the component in a given application.

			SECONDARY WINDINGS									
			Single Winding				Tapped Winding				Dual Winding	
		Turns	1T	2T	3T	4T	1:1	1:2	1:3	2:2	1T & 1T	1T & 2T
		DCR (mΩ)	0.44	1.3	3.5	7	1.3	3.5	7	7	1.3	3.5
PRIMARY WINDINGS	Single Winding	4T	10	PL10306	PL10306	PL10311	PL10301	PL10306	PL10311	PL10301	PL10301	PL10306	PL10311
		5T	12.5	PL10308	PL10308	PL10313	PL10303	PL10308	PL10313	PL10303	PL10303	PL10308	PL10313
		6T	15	PL10310	PL10310	PL10315	PL10305	PL10310	PL10315	PL10305	PL10305	PL10310	PL10315
		8T	40	PL10306	PL10306	PL10311	PL10301	PL10306	PL10311	PL10301	PL10301	PL10306	PL10311
		9T	45	PL10307	PL10307	PL10312	PL10302	PL10307	PL10312	PL10302	PL10302	PL10307	PL10312
		10T	50	PL10308	PL10308	PL10313	PL10303	PL10308	PL10313	PL10303	PL10303	PL10308	PL10313
		11T	55	PL10309	PL10309	PL10314	PL10304	PL10309	PL10314	PL10304	PL10304	PL10309	PL10314
		12T	60	PL10310	PL10310	PL10315	PL10305	PL10310	PL10315	PL10305	PL10305	PL10310	PL10315
	Dual Winding	4T/4T	20/20	PL10306	PL10306	PL10311	PL10301	PL10306	PL10311	PL10301	PL10301	PL10306	PL10311
		4T/5T	20/25	PL10307	PL10307	PL10312	PL10302	PL10307	PL10312	PL10302	PL10302	PL10307	PL10312
		5T/5T	25/25	PL10308	PL10308	PL10313	PL10303	PL10308	PL10313	PL10303	PL10303	PL10308	PL10313
		5T/6T	25/30	PL10309	PL10309	PL10314	PL10304	PL10309	PL10314	PL10304	PL10304	PL10309	PL10314
		6T/6T	30/30	PL10310	PL10310	PL10315	PL10305	PL10310	PL10315	PL10305	PL10305	PL10310	PL10315

NOTES:

1. The primary inductance for any configuration can be calculated as:Primary Inductance (µH Min) = 2.4 * (Primary Turns)^2
2. The above base part numbers (PL103XX) are available from stock.
3. It is possible to add a small gap to the transformer. Gapped transformers are non-standard and can be made available upon request, but are not typically available from stock. To request a gapped version of the transformer, add a suffix "G" to the base number (ie: **PL10301G** or **PL10301GNL**). The nominal inductance with a gap can be calculated as: Primary Inductance (µH Nominal) = 0.69 (Primary Turns)^2
4. It is possible to add a primary side aux. winding to any of the above configurations as shown in the schematics. Transformers with primary size aux. windings are non-standard and can be made available upon request, but are not typically available from stock. The primary aux. winding can be between 2 and 16 turns. To add a primary aux. winding to a given base, use the extension .0XX. For example, to add a 4T aux. winding to the base part number PL10301NL, use the part number **PL10301.004NL**. To add a 16T aux. winding, use the part number **PL10301.016NL**.
5. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the complete part number (i.e. PL10301 becomes **PL10301T** for no AUX- PL10301.009 becomes **PL10301.009NLT** for 9T AUX).

Tin/Lead Recommended Reflow Profile (Based on J-STD-020D)



T_{SMIN} (°C)	T_{SMAX} (°C)	T_L (°C)	T_P (°C MAX)	t_S (s)	t_L (s)	t_P (s MAX)	Ramp-up rate (T_L to T_P)	Ramp-down rate (T_P to T_L)	Time 25°C to peak temperature (s MAX)
100	150	183	235	60-120	60-150	20	3°C/s MAX	6°C/s MAX	360

Notes:

1. All temperatures measured on the package leads.
2. Maximum times of reflow cycle: 2.

For More Information

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