

TABLE of CONTENTS

ISOLATION TRANSFORMERS

10BASE-T

Electrical Specifications: Surface Mount and Through Hole2

ETHERNET

Electrical Specifications: Surface Mount and Through Hole3

APPLICATION CIRCUITS

10Base-T4

Ethernet5

SCHEMATICS6

MECHANICALS

Surface Mount8

Through Hole10

ISOLATION TRANSFORMERS FOR 10BASE-T

For Adapter Cards, MAUs, Hubs, and Motherboard Applications



- Designed to meet or exceed IEEE 802.3, 10Base-T specifications
- Available with common mode chokes for EMI suppression
- Surface mount, IC grade, transfer-molded package withstands 235°C peak temperature profile
- Through hole, auto-insertable, 16-pin DIP package

Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

Part Number	Turns Ratio (±5%)		Primary Pins	Common Mode Choke	Sine Wave Inductance OCL ¹ (μH MIN)	Interwinding Capacitance C _{ww} ¹ (pF MAX)	Leakage Inductance L _L ¹ (μH MAX)	DCR (Ω MAX)	Hi-Pot (Vrms)	Schem.	Mech.
	Transmit	Receive									
SURFACE MOUNT²										pp. 6-7	pp. 8-9
PE-65454	1:√2	1:1	3-4/1-2		140	12	0.2	0.4	2000	T1	SMT2
E5017	1CT:1CT	1CT:1CT	1-3/6-8	X	200	10	0.25	1.0	1500	T6	SMT4
PE-65726	1CT:1CT	1CT:1CT	1-3/6-8		200	10	0.2	0.3	2000	T4	SMT4
23Z114SM	1CT:1CT	1CT:1CT	1-3/6-8		200	12	0.3	0.3	2000	T4	SMT5
PE-68048	1CT:√2CT	1CT:1CT	6-8/1-3	X	110	15	0.4	1.0	1500	T5	SMT4
PE-65745	1CT:√2CT	1CT:1CT	6-8/1-3		140	12	0.2	0.3	2000	T4	SMT4
23Z128SM	1CT:√2CT	1CT:1CT	6-8/1-3		200	15	0.5	0.4	2000	T4	SMT5
23Z356SM	1CT:√2CT	1CT:1CT	6-8/1-3	X	200	12	0.5	0.6	2000	T7	SMT5
23Z435SM	2CT:1CT	1CT:1CT	1-3/6-8		100	10	0.4	0.5	2000	T4	SMT5
PE-68052	2CT:1CT	1CT:1CT	1-3/6-8	X	140	12	0.3	1.0	1500	T6	SMT4
E4001	1CT:2CT	1CT:1CT	6-8/1-3	X	112	8	0.3	0.8	1500	T5	SMT4
PE-68041	1CT:2CT	1CT:1CT	6-8/1-3		112	8	0.3	0.5	1500	T4	SMT4
23Z467SM	1CT:2CT	1CT:1CT	6-8/1-3	X	140	12	0.1	0.6	2000	T7	SMT5
PE-68023	1CT:2CT	1CT:1CT	1-3/6-8	X	200	12	0.3	1.0	1500	T6	SMT4
PE-68042	2√2CT:1	1:1	2-4/7-9		200	14	1	0.5	1500	T9	SMT1
PE-68810	—	1:1 (4X)	1-2/3-4		140	12	0.2	0.4	2000	T3	SMT4
PE-68820	1:√2 (4X)	—	1-2/3-4 5-6/7-8		140	12	0.2	0.4	2000	T3	SMT4
THROUGH HOLE										pp.6-7	p. 10
23Z435	2CT:1CT	1CT:1CT	1-3/6-8		80	10	0.4	0.5	2000	T4	TH3
23Z128	1CT:√2CT	1CT:1CT	6-8/1-3		140	15	0.5	0.4	2000	T4	TH3
PE-65263	1CT:1CT	1CT:1CT	1-3/6-8		200	15	0.25	0.3	2000	T4	TH4

NOTES:

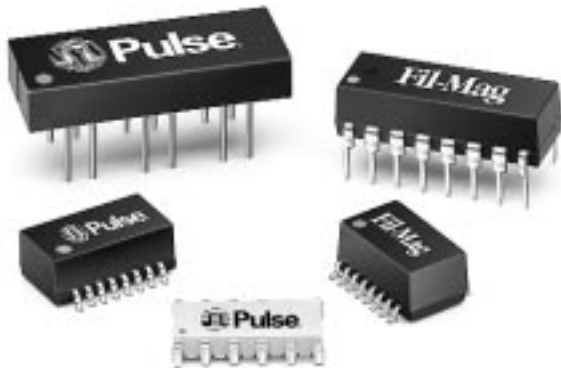
1. OCL, C_{ww} and L_L are measured at 20 mVrms, 100 KHz.

2. To order Tape & Reel packaging for surface mount parts, add the suffix "T" to the part number (Example: PE-65454T). The "T" will appear on all paper work, but will not be marked on parts.

Juniper Ex 1022 - 2
Juniper v Chrimar
IPR2016-01397

ISOLATION TRANSFORMERS FOR ETHERNET

AUI Transformers



- ⊕ Low leakage inductance and coupling capacitance for faster rise times
- ⊕ Small form factor, 50 mil lead spacing
- ⊕ Through hole, auto-insertable, 16-pin DIP package

Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

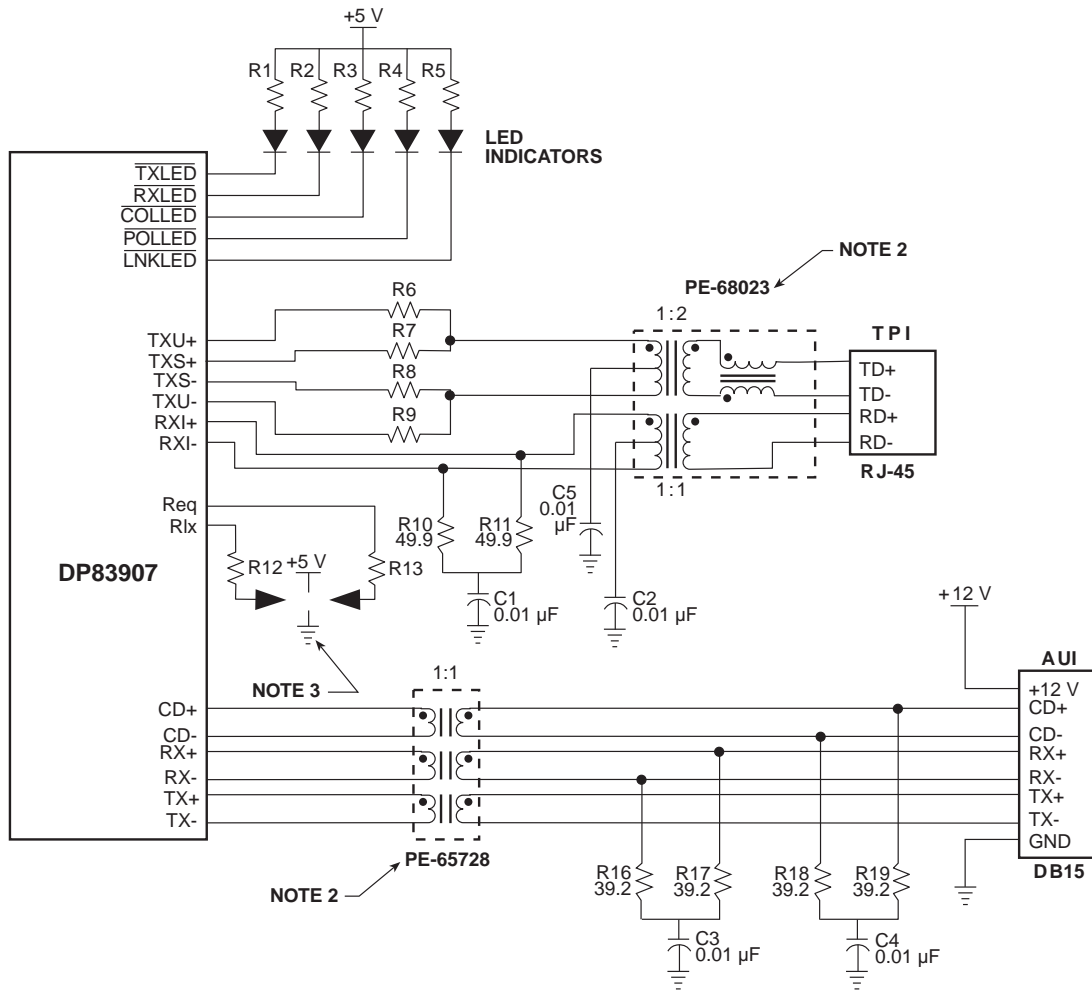
Part Number	Turns Ratio (±5%)	Primary Pins	Primary Sine Wave OCL ¹ (μH ±20%)	Primary ET-Constant (V-μs MIN)	Rise Time ² (ns MAX)	Interwinding Capacitance C _{ww} ¹ (pF MAX)	Leakage Inductance L _L ¹ (μH MAX)	DCR (Ω MAX)	Schem.	Mech.	Hipot (Vrms)
SURFACE MOUNT³									pp. 6-7	pp. 8-9	
E6002	1:1	1-2/4-5/7-8	40 (MIN)	2.1	3.0	8	0.20	0.25	T2	SMT4	2000
PE-65723	1:1	1-2/4-5/7-8	75	1.8	3.0	8	0.20	0.30	T2	SMT4	2000
PE-68801	1:1	1-2/3-4/5-6	75	1.8	3.0	12	0.20	0.30	T8	SMT3	2000
23Z90SM	1:1	1-2/4-5/7-8	75	2.4	3.0	10	0.20	0.20	T2	SMT5	2000
PE-65728	1:1	1-2/4-5/7-8	100	1.8	3.0	9	0.20	0.30	T2	SMT4	2000
23Z91SM	1:1	1-2/4-5/7-8	100	2.4	3.0	10	0.20	0.30	T2	SMT5	2000
PE-65727	1:1	1-2/4-5/7-8	150	1.2	3.0	12	0.20	0.30	T2	SMT4	2000
PE-65733	1:1	1-2/4-5/7-8	350	2.6	3.5	16	0.30	0.35	T2	SMT4	2000
23Z108SM	1:1	1-2/4-5/7-8	350	2.5	3.5	16	0.30	0.35	T2	SMT5	2000
THROUGH HOLE									pp. 6-7	p. 10	
PE-64102	1:1	1-2/4-5/7-8	75	2.1	3.0	10	0.20	0.20	T2	TH4	500
PE-64107	1:1	1-2/4-5/7-8	75	2.4	3.5	10	0.25	0.30	T2	TH2	2000
PE-64502	1:1	1-2/4-5/7-8	75	2.1	3.0	10	0.20	0.20	T2	TH4	2000
PE-64103	1:1	1-2/4-5/7-8	100	2.1	3.0	10	0.20	0.30	T2	TH4	500
PE-64108	1:1	1-2/4-5/7-8	100	2.1	3.5	10	0.25	0.40	T2	TH2	2000
PE-64503	1:1	1-2/4-5/7-8	100	2.1	3.0	10	0.20	0.30	T2	TH4	2000
PE-64104	1:1	1-2/4-5/7-8	150	2.1	3.5	12	0.20	0.30	T2	TH4	500
PE-64109	1:1	1-2/4-5/7-8	150	3.0	3.0	15	0.20	0.45	T2	TH2	2000

NOTES:

1. OCL, C_{ww} and L_L are measured at 20 mVrms, 100 KHz.
2. Rise time is measured in 75 Ω systems.
3. To order Tape & Reel packaging for surface mount parts, add the suffix "T" to the part number. Example: PE-65723T. The "T" will appear on all paper work, but will not be marked on parts.

Juniper Ex 1022 - 3
Juniper v Chrimar
IPR2016-01397

Typical Application Circuit

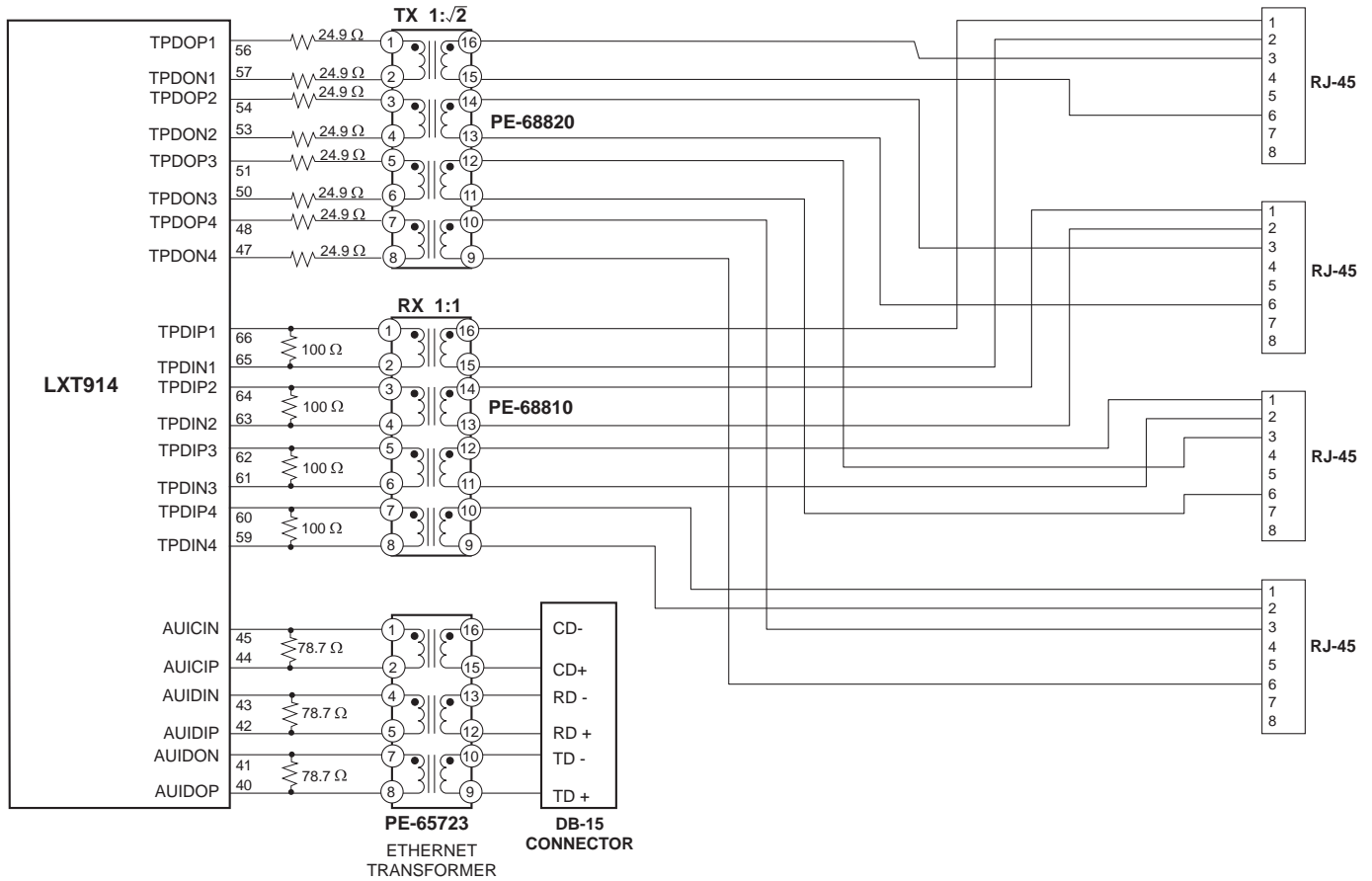


NOTES:

1. Connections at pins 12 and 13 apply to PE-68023 only. These are test points. **Do not ground.**
2. For specific information, see pages 2 and 3 in this catalog.
3. For specific connection, refer to National's Application Notes.

Juniper Ex 1022 - 4
 Juniper v Chrimar
 IPR2016-01397

Typical 10Base-T Application Circuit



Juniper Ex 1022 - 5
 Juniper v Chrimar
 IPR2016-01397

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.