Bourns® Isolation Transformers

Critical Signal and Power Isolation Component Brochure

BOURNS®

Introduction

Bourns® offers a broad range of high-performance isolation transformers designed for critical signal and power isolation across a variety of topologies, including push-pull, flyback, half-bridge, and full-bridge.

Our transformers support safety-critical systems across automotive, industrial, medical, and energy applications — enabling compliance with stringent insulation, voltage, and thermal performance standards.

Key Features

- **High Isolation:** Up to 7640 V_{rms} with creepage up to 15 mm
- **Volt-µsec Ratings:** From 12 V-µsec to 375 V-µsec
- **Isolation Options:** Available with Functional, Basic, and Reinforced insulation
- **Safety Compliance:** Compliant with IEC 60950, IEC 61558, IEC 60601
- **Automotive-Grade:** AEC-Q200 compliance solutions available

Applications

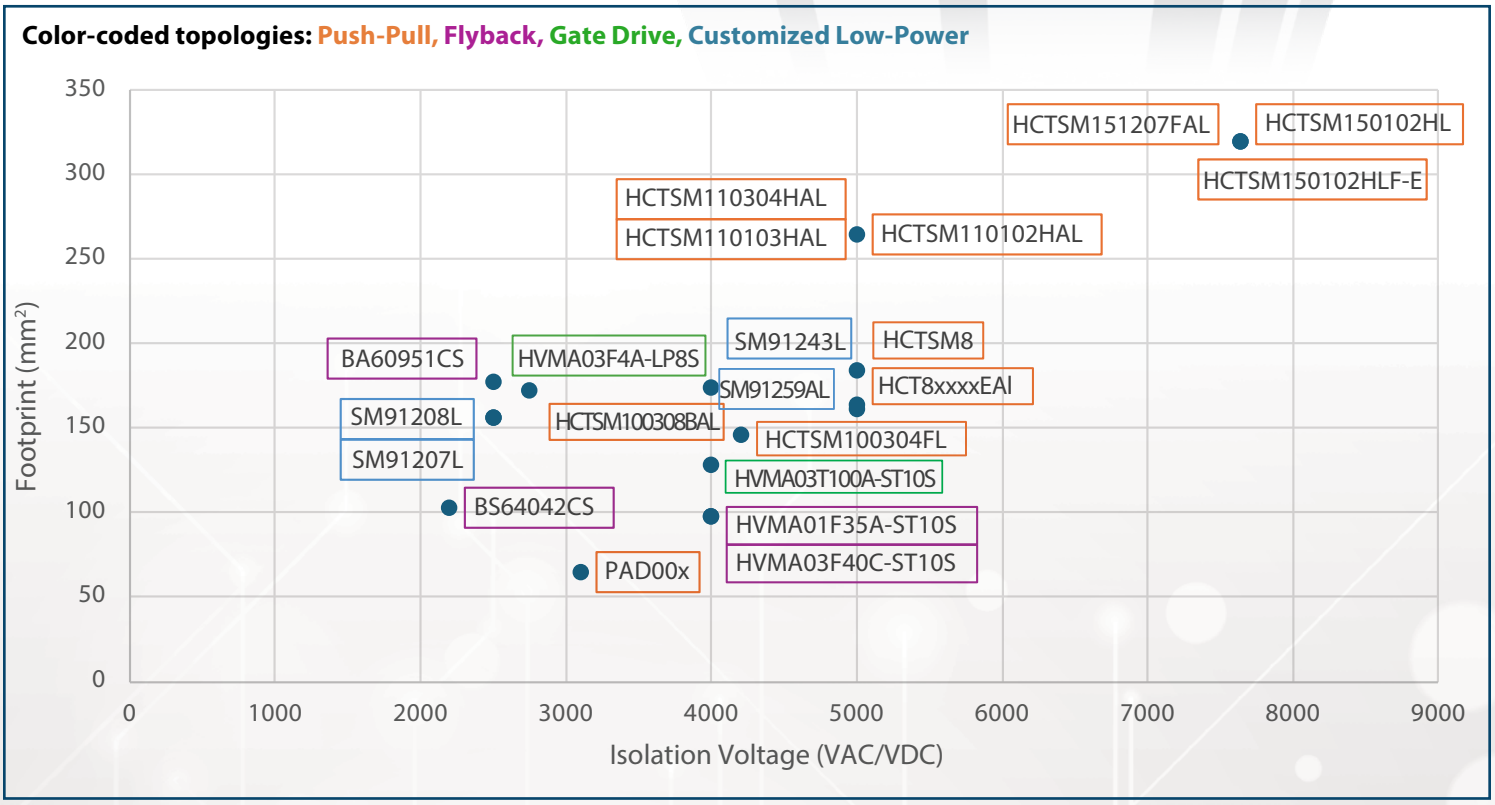
- High and low-side gate drive circuits
- Isolation for RS-232/RS-485, CAN, and other data interfaces
- Isolated DC-DC converters
- Battery Management Systems (BMS) and energy storage solutions
- Automotive and industrial isolation applications

Selection Parameters

When selecting the optimal Bourns® isolation transformer, consider the following critical parameters:

- **Turns Ratio:** Crucial for matching input/output voltages and enabling consistent circuit replication across systems. Multiple turns ratios are available.
- **Design:** Creepage, clearance, frequency range, and output power requirements.
- **Safety Compliance:** Choose based on application-specific isolation voltage, insulation class.
- **Topology:**
  - **Push-Pull:** Push-Pull: Ideal for applications with consistent power demands and stable input voltages (e.g., microcontroller bias, gate drivers). Open-loop design simplifies circuit complexity.
  - **Flyback/Forward:** Preferred in systems with variable loads or fluctuating voltage demands.
- **Space Constraint:** Push-pull transformers generally offer a smaller physical footprint and core size compared to flyback designs.

Power Isolation Transformers Overview



Custom Isolation Transformers Available

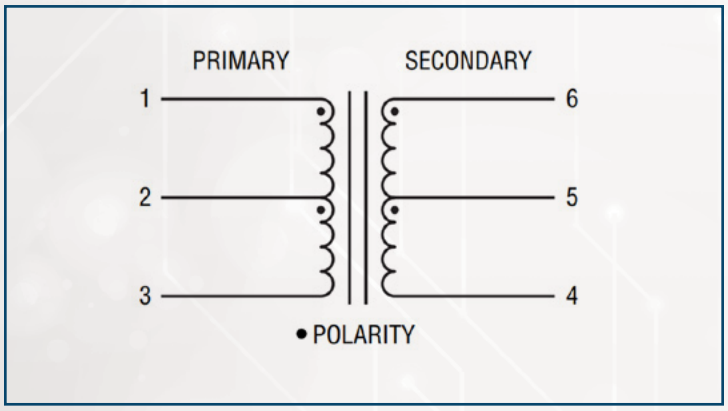
Need specific insulation, footprint, or performance? Bourns' Custom Magnetics team offers rapid-turn custom designs with advanced simulation, fast prototypes, custom materials, and support for unique safety/thermal/EMI requirements.

Contact us or fill out our custom power transformer worksheet to get started.

Push-Pull Transformers

Series	Photo	Working Voltage	Size (mm)	Creepage/ Clearance	Insulation Type	Isolation Voltage (Hi-pot)	Operating Temp (°C)	Certifications	Compliance	Design Compatibility	Schematic Reference
PAD00x-T764		400 V_{rms}	9.85 x 6.55 x 4	–	Functional	3100 VAC	-40 to +125	IEC 62368	RoHS**	Isolated RS-485/RS-232 power supplies	Schematic 1
HCT8 Series (800 V) AUTOMOTIVE GRADE		800 V	15.2 x 10.6 x 8.0	>8 mm	Reinforced	5000 VDC	-40 to +125	–	RoHS**, REACH, AEC-Q200	TI SN6501, SN6505B-Q1, SN6505D-Q1	Schematic 1
HCT8 Series (1000 V) AUTOMOTIVE GRADE		1000 V	15.2 x 10.6 x 8.0	>8 mm	Basic	5000 VDC	-40 to +125	–	RoHS**, REACH, AEC-Q200	TI SN6501, SN6505B-Q1, SN6505D-Q1	Schematic 1
HCTSM8 AUTOMOTIVE GRADE		800 V_{rms}, 1000 V_{peak}*	15.2 x 10.8 x 6.5	>8 mm	Reinforced	5000 VDC	-40 to +125	IEC 60950-1, IEC 62368-1, IEC 60664-1, UL 62368-1 recognized*	RoHS**, REACH, AEC-Q200	TI SN6501, SN6505B, Nexperia NXF6501DC-Q100	Schematic 1
HCTSM150102HL		1500 V	21.3 x 15 x 9.6	>15 mm	Reinforced	7640 VDC	-40 to +125	IEC/UL 60664-1, IEC/UL 62368-1*	RoHS**	TI SN6501, SN6505B	Schematic 1
HCTSM150102HLF-E		1500 V	21.3x 15.0 x 10.1 (max)	>15 mm	Reinforced Class F	7640 VDC	-40 to +150	IEC/UL 60664-1, IEC/UL 62368-1*	RoHS**	TI SN6501, SN6505B	Schematic 1
HCTSM151207FAL AUTOMOTIVE GRADE		1500 V	15.0 x 21.3 x 9.6	>15 mm	Reinforced	7640 VDC	-40 to +125	IEC 60664-1:2007, IEC/UL 62368-1:2018, UL 62368-1:2021	AEC-Q200 compliant, RoHS compliant**, Overvoltage Category II, Pollution Degree 2	TI SN6501, SN6505B	Schematic 1

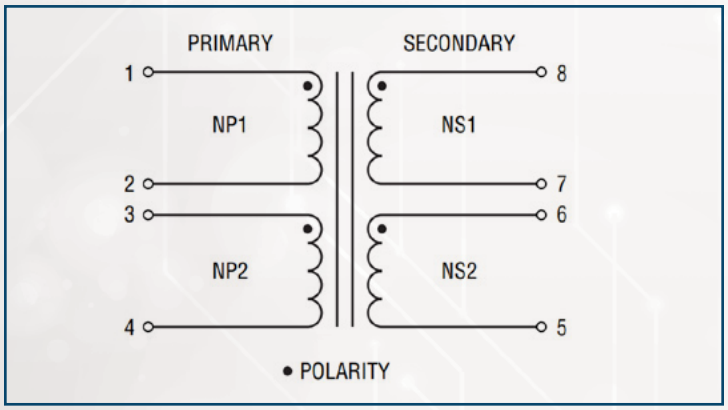
Schematic 1



Push-Pull Transformers

Series	Photo	Working Voltage	Size (mm)	Creepage/ Clearance	Insulation Type	Isolation Voltage (Hi-pot)	Operating Temp (°C)	Certifications	Compliance	Design Compatibility	Schematic Reference
HCTSM100304FL		1000 V	15.7 x 10.8 x 7.5	>10 mm	Reinforced	4200 VAC	-40 to +125	IEC 60950-1, IEC 62368-1	RoHS**	TI SN6501, SN6505B	Schematic 2
HCTSM110103HAL AUTOMOTIVE GRADE		1200 V	19.6 x 13.5 x 9.6	>11 mm	Reinforced	5000 VAC	-40 to +125	IEC/UL 60950-1, IEC/UL 62368-1, IEC 60664-1*	RoHS**, AEC-Q200	TI SN6501, SN6505B	Schematic 2
HCTSM110102HAL AUTOMOTIVE GRADE		1200 VDC	19.6 x 13.5 x 9.6	>11 mm	Reinforced	5000 VDC	-40 to +125	IEC 60664-1, IEC/UL 62368-1	AEC-Q200 compliant, RoHS compliant**, Overvoltage Category II, Pollution Degree 2	TI SN6501, SN6505B	Schematic 2
HCTSM110304HAL AUTOMOTIVE GRADE		1200 VDC	19.6 x 13.5 x 9.6	>11 mm	Reinforced	5000 VAC	-40 to +125	IEC 60664-1, IEC/UL 62368-1	AEC-Q200 compliant, RoHS compliant**, Overvoltage Category II, Pollution Degree 2	TI SN6501, SN6505B	Schematic 2
HCTSM100308BAL AUTOMOTIVE GRADE		1000 V_{rms}	15.7 x 10.8 x 7.5	>10 mm	Reinforced	4000 VDC/ 4400 VDC	-40 to +125	IEC/UL 60950-1, 62368-1	AEC-Q200 compliant, RoHS compliant**, Overvoltage Category II, Pollution Degree 2	TI SN6501, SN6505B	Schematic 2

Schematic 2

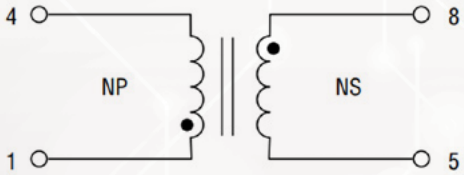


*See datasheets for details
**RoHS Directive 2015/863, Mar 31, 2015 and Annex.

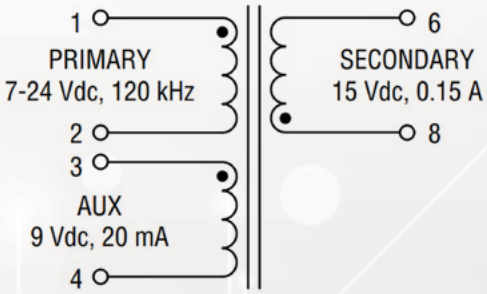
Flyback Transformers

Series	Photo	Working Voltage	Size (mm)	Creepage/ Clearance	Insulation Type	Isolation Voltage (Hi-pot)	Operating Temp (°C)	Certifications	Compliance	Design Compatibility	Schematic Reference
BS64042CS		4.5-60 V	9.8 x 10.5 x 11	>8 mm	Basic	2200 VAC	-40 to +125	–	RoHS*	Analog Devices ADP1031 Chipset	Schematic 3
BA60951CS AUTOMOTIVE GRADE		800 V	16.9 x 10.5 x 5.97	>8 mm	Basic	2500 VAC	-40 to +155	IEC 61558	RoHS*, AEC-Q200	–	Schematic 4
HVMA01F35A-ST10S (1 Watt) AUTOMOTIVE GRADE		800 – 1000 V	10.3 x 9.5 x 12.2	>10 mm/ >6 mm	Basic	4000 VAC	-40 to +125	IEC 61558-2, IEC 60664-1	RoHS*, AEC-Q200	–	Schematic 5
HVMA03F40C-ST10S (3 Watt) AUTOMOTIVE GRADE		800 V	12.8 x 10 x 7.0	>8 mm/ >2 mm	Basic	4000 VAC	-40 to +125	IEC 60664-1	RoHS*, AEC-Q200	–	Schematic 7

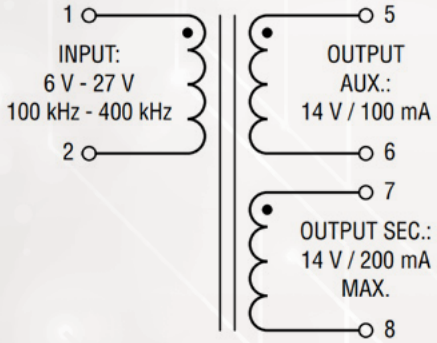
Schematic 3



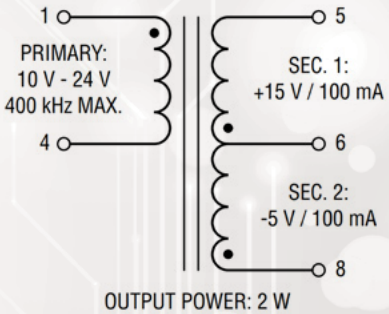
Schematic 4



Schematic 5



Schematic 7

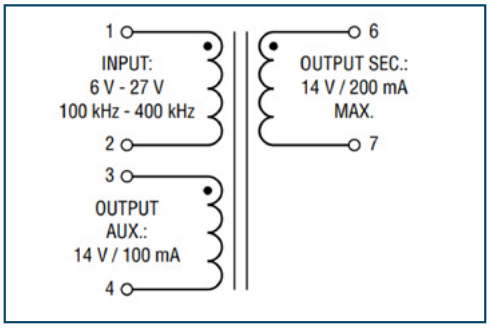


*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

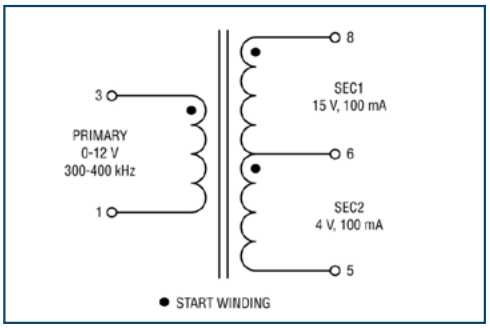
Gate Drive Transformers

Series	Photo	Working Voltage	Size (mm)	Creepage/ Clearance	Insulation Type	Isolation Voltage (Hi-pot)	Operating Temp (°C)	Certifications	Compliance	Design Compatibility	Schematic Reference
HVMA03F4A-LP8S (2 Watt) AUTOMOTIVE GRADE		900 V	10.3 x 9.5 x 12.2	>10 mm/ >6 mm	Basic	4000 VAC	-40 to +155	IEC 61558-2, IEC 60664-1	RoHS*, AEC-Q200	–	Schematic 6
HVMA03T100A-ST10S (3 Watt) AUTOMOTIVE GRADE		1000 V	12.8 x 10 x 7.0	>10 mm/ >6 mm	Basic	4000 VAC	-40 to +155	IEC 61558-2, IEC 60664-1	RoHS*, AEC-Q200	–	Schematic 10

Schematic 6



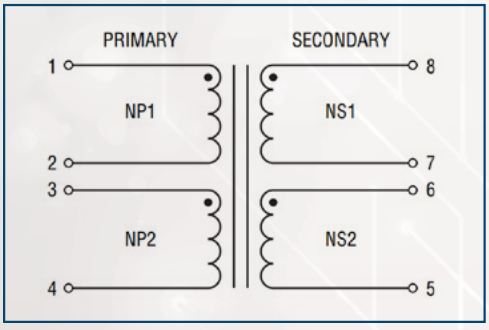
Schematic 10



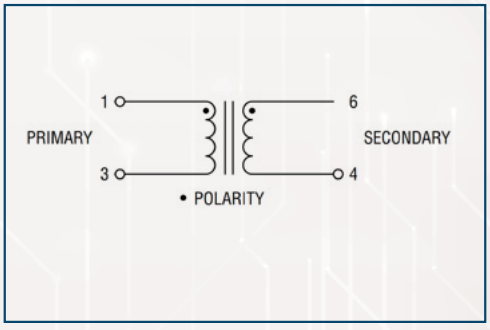
Customized Low-Power Transformers

Series	Photo	Working Voltage	Size (mm)	Creepage/ Clearance	Insulation Type	Isolation Voltage (Hi-pot)	Operating Temp (°C)	Certifications	Compliance	Design Compatibility	Schematic Reference
SM91207L		400 V	13.2 x 11.8 x 11.6	>2 mm	Functional	2500 VAC	-40 to +125	IEC/UL 62368-1	RoHS**, REACH	TI SN6507	Schematic 2
SM91208L		400 V	13.2 x 11.8 x 11.6	>2 mm	Functional	2500 VAC	-40 to +125	IEC/UL 62368-1	RoHS**, REACH	TI SN6507	Schematic 2
SM91243L		1000 VDC	17.4 x 10.6 x 8.1	>10 mm	Reinforced	5000 VDC	-40 to +125	IEC 60664-1 IEC 62368-1	RoHS*	Allegro Micro Model AHV85000, AHV85040	Schematic 8
SM91259AL AUTOMOTIVE GRADE		1000 V_{rms}	14.5 x 12 x 14	>10 mm	Reinforced	4000 VDC	-40 to +125	IEC 61558-1 UL 62368-1	RoHS*, AEC-Q200		Schematic 9

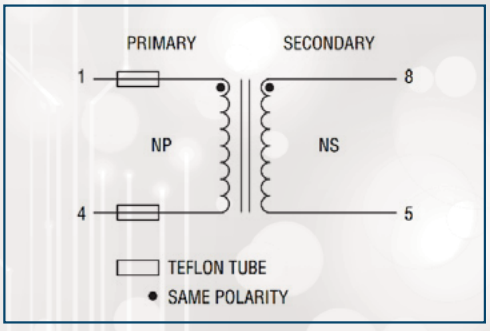
Schematic 2



Schematic 8



Schematic 9



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