

Data Sheet

BV2021-8

LonWorks FT/LP Compatible Communications Transformer

Description

The *BV2021-8* is a Communications Transformer compatible with LonWorks Free Topology and Link Power networks using the ISO/IEC 14908-1 (ANSI/CTA-709.1-D or EN 14908-1) Control Network Protocol.

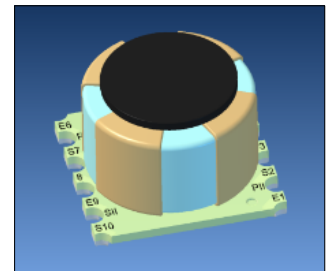
Originally, the *BV2021-8* was designed to be used with the Echelon FT 5000 Smart Transceiver. However, it can be used with the FT 6050 Smart Transceiver as well as with current state-of-the-art microcontrollers that incorporate the FetLON stack.

Due to its very small size the *BV2021-8* may be used as an alternative to the FT-X3 Communications Transformer in a broad range of applications, especially when the space available for the bus circuitry is limited.

The *BV2021-8* has been designed and tested according to the Echelon compatibility specification.

As a tribute to the small size of this surface-mounted part, the following deviations from the FT-X3 compatibility specification have to be observed:

- **HiPot:** The isolation test voltage of the *BV2021-8* between network and the Free Topology communications controller is restricted to maximum 1500 VAC, 50/60 Hz, 60 seconds according to EN 60650 ¹.
- **Coupling Capacitance:** The maximum coupling capacitance between primary and secondary winding of the *BV2021-8* is 8 pF at 10 kHz and therefore exceeds the Echelon compatibility limit. This may cause ramifications for EMC which must be verified during EMC testing of the product.
- **Operating Temperature:** The *BV2021-8* is designed for a nominal operating temperature range of -40 ... +85°C.



Application Notes

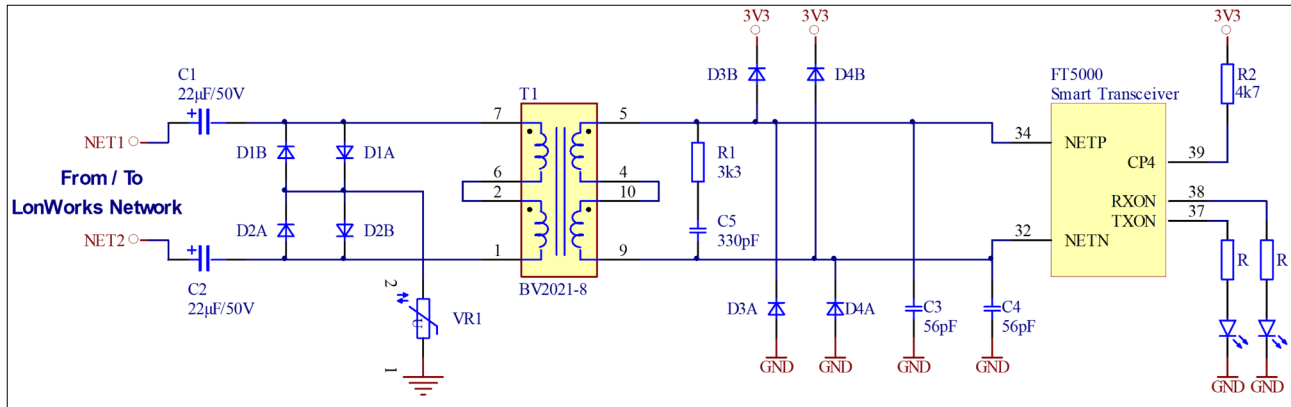
The manufacturer is responsible for verifying whether the *BV2021-8* is suitable for the intended application with regards to applicable regulatory and other specific technical requirements.

Further design details of the *BV2021-8* are shown on the drawings on the next pages.

Item number

<i>BV2021-8</i>	946-3-01-08-00
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¹ As specified for the FT-X3 safety agency hazardous voltage barrier requirements are not supported.



Name	Value	Description
VR1	470 V MOV, 5 mm, 40 pF (typical)	VARISTOR 300V RMS 3225 SMD, CU3225K300 or equivalent
C1, C2	22 µF, ≥ 50 V, polar	DC blocking capacitors
D1, D2		Differential network clamping diodes:
	BAV99, or 2 × 1N4148-equivalent	For up to 2 kV surge protection
	1N4934, 1N4935, FR1D, RS1D, RS1DB	For up to 6 kV surge protection
D3, D4	BAV99, or 2 × 1N4148-equivalent	ESD transient clamping diodes
R2	4.7 kΩ or 4.99 kΩ	Pull-up resistor
C3, C4	56 pF / 50 V	Common-mode noise immunity capacitors for EN 61000-4-6 Level 3
R1	3.3 kΩ	Recommendation:
C5	330 pF / 50 V	Use R1 and C5 for adaptation of the node's input impedance to the minimum value of locally powered nodes according to ISO/IEC 14908-2. A higher input impedance decreases the immunity to conducted high frequency interference (EN 61000-4-6), which may result in a loss of communication.

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Circuit example for devices using the FetLON stack

