
BTS-16110

Specifications

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ES France - Département NI
127 rue de Buzenval BP 26 - 92380 Garches



Tél. 01 47 95 99 71
Fax. 01 47 01 16 22



e-mail : ni@es-france.com
Site Web : www.es-france.com

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BTS-16110 Specifications

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical** specifications describe the performance met by a majority of models.
- **Nominal** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.
- **Measured** specifications describe the measured performance of a representative model.

Specifications are **Typical** unless otherwise noted.

Conditions

Specifications are valid under the following conditions unless otherwise noted.

- Operating temperature of 15 °C to 40 °C guaranteed, 40 °C to 50 °C extended operating range
- Recommended calibration interval of 2 years. The BTS-16110 will not meet specifications unless operated within the recommended calibration interval
- Background calibration enabled
- 30 minutes warm-up time before operation

Input Characteristics

Table 1. General input characteristics

Measurement signals	Voltage and current
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Internal data rate	1.25 MS/s
Internal ADC resolution	18 bits
Input voltage range	$\pm 1,500$ V DC
Input current ranges	± 10 V DC, ± 2 A DC, ± 667 mA DC
Data rates	1.25 MS/s, 1 kS/s
Data format	64-bit, double precision
-3 dB bandwidth, 1.25 MHz data rate	60 kHz, typical
-3 dB bandwidth, 1 kHz data rate	1 kHz, typical

Table 2. Data rates

1.25 MS/s	Voltage and current
1 kS/s	1 ms average voltage and current

Table 3. Nominal voltages

HI to LO	$\pm 1,500$ V DC, maximum
HI to Earth	$\pm 1,000$ V DC, maximum
LO to Earth	$\pm 1,000$ V DC, maximum

Accuracy Specifications

Table 4. DC voltage $\pm$ (% of reading + mV)

Range	Input resistance	Two year at 15 °C to 40 °C
1,500 V DC	10 M Ω	0.03 + 100, maximum 0.006 + 10, typical



Table 5. DC current $\pm$ (% of reading + % of range)

Range	Input resistance	Two year at 15 °C to 40 °C
10 V DC	$>1 \text{ G}\Omega$	0.01 + 0.001, maximum 0.0025 + 0.0003, typical
2 A DC	$0.5 \text{ }\Omega$	0.05 + 0.005, maximum 0.015 + 0.0015, typical
667 mA DC	$0.5 \text{ }\Omega$	0.05 + 0.0075, maximum 0.015 + 0.0015, typical



Note Ambient temperature variations faster than 1 °C/min may disrupt the BTS-16110 thermal regulation.



Note Forced airflow over the BTS-16110 reduces its ability to thermoregulate at low temperatures and low input voltages.



Note Warranted specifications are valid from 15 °C to 40 °C. The device can operate at the non warranted specifications from 40 °C to 50 °C.



Note Prolonged operation at temperatures above 40 °C might cause device accuracy to shift outside of warranted specifications and require recalibration to restore accuracy specifications. Take all precautions to maintain ambient air temperatures within guaranteed accuracy specifications.



Input Noise

Table 6. DC voltage noise

1 kS/s data rate with no averaging	1 mV RMS, typical
1.25 MS/s data rate	75 mV RMS with background calibration enabled, typical 15 mV RMS with background calibration disabled, typical

Table 7. DC current, voltage input noise

1 kS/s data rate	5 μ V RMS, typical
1.25 MS/s data rate	120 μ V RMS, typical

Table 8. DC current, amps input noise

1 kS/s data rate	1.2 μ A (2 A)/0.8 μ A (667 mA) RMS, typical
1.25 MS/s data rate	30 μ A (2 A)/15 μ A (667 mA) RMS, typical

Network/Ethernet Ports

Table 9. General network specifications

Number of ports	2
Network interface	10Base-T, 100Base-TX, 1000Base-T Ethernet
Compatibility	IEEE 802.3
Communication rates	10 Mb/s, 100 Mb/s, 1000 Mb/s auto-negotiated
Maximum cabling distance	100 m/segment

Network Timing and Synchronization

Table 10. Network timing and synchronization

Protocol	IEEE 802.1AS
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Network synchronization accuracy	<1 μ s
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USB Ports

Table 11. USB type-C device data port

USB interface	USB 2.0, Hi-Speed
Maximum data rate	480 Mb/s
Maximum current (from host)	250 mA

Table 12. USB type-C host display port

USB interface	USB 3.1 Gen1, SuperSpeed
Maximum data rate	5 Gb/s
Maximum current	900 mA
Alternate mode	DisplayPort

Calibration

Table 13. Calibration

Recommended warm-up time	30 minutes
Calibration interval	2 years

Power Requirements

Table 14. Power requirements

Voltage input range	19 V DC to 30 V DC
Input power consumption	Up to 150 W, maximum

Safety Voltages

Connect only voltages that are below these limits.

Table 15. Safety voltages

Input voltage range	±1,500 V DC
Input current ranges	±10 V DC, ±2 A DC, ±667 mA DC

Measurement Category

Table 16. Measurement category

CAT O and CAT I	±1,000 V DC
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Caution Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV.



Note Measurement Categories CAT O and CAT I are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Physical

Table 17. Physical specifications

Dimensions (L×W×H)	327 mm × 147 mm × 83 mm (12.94 in. × 5.80 in. × 3.27 in.)
Weight	3.63 kg (8.00 lb)

Environmental Characteristics

Table 18. Temperature specifications

Warranted specification operating	15 °C to 40 °C
Extended operating	40 °C to 50 °C
Storage	-40 °C to 85 °C

Table 19. Humidity specifications

Operating	15% RH to 75% RH, noncondensing
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Storage	5% RH to 95% RH, noncondensing
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Table 20. General environmental specifications

Pollution Degree	2
Maximum altitude	2,000 m

Table 21. Shock and vibration specifications

Operating vibration	5 Hz to 500 Hz, 0.3 g RMS
Non-operating vibration	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse