TS-15200 Specifications

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Contents

TS-15200 Specifications

Conditions

Specifications are typical under the following conditions unless otherwise noted.

- Ambient temperature of 0 °C to 55 °C. The ambient temperature is defined as the temperature at the enclosure fan inlet (air intake).
  - Refer to the **Thermal Considerations** topic in the **TestScale User Manual** on ni.com/docs for additional information on ambient temperature characteristics and cooling requirements.
  - Refer to individual module specifications for additional temperature considerations.
- 15 minutes warm-up time.
- All voltages relative to GND.

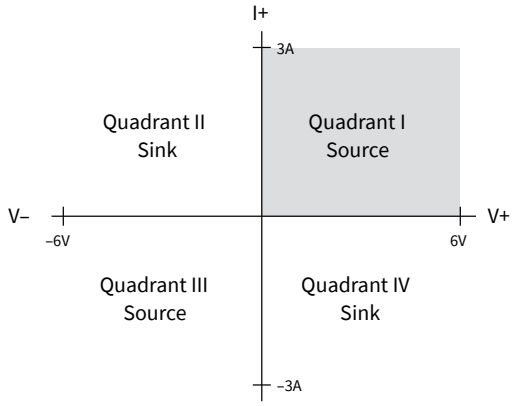
Device Capabilities

The TS-15200 is a single-quadrant power supply with one output channel.

DC voltage	
Voltage range	6 V
Minimum programmable voltage level/limit	0 V
DC current	
Current range	3 A
Minimum programmable current level/limit	0.03 A
Output power	18 W

The following figure illustrates the voltage and the current source capabilities of the TS-15200.

Figure 1. TS-15200 Quadrant Diagram



Programming and Measurement Accuracy

Table 5. Voltage Programming Accuracy

Measurement Conditions		Gain Error	Offset Error	Accuracy at Full Scale[1]
2-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.06%	±1.7 mV	±22.1 mV
	Maximum (0 °C to 55 °C)	±0.20%	±3.1 mV	±31.9 mV
10-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.08%	±1.8 mV	±23.4 mV
	Maximum (0 °C to 55 °C)	±0.26%	±3.5 mV	±35.9 mV

[1] Include load regulation error in remote sense configuration for full load condition.

Table 5. Voltage Measurement Accuracy

Measurement Conditions		Gain Error	Offset Error	Accuracy at Full Scale
2-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.04%	±0.6 mV	±3.0 mV
	Maximum (0 °C to 55 °C)	±0.18%	±2.5 mV	±13.3 mV
10-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.07%	±0.7 mV	±4.9 mV
	Maximum (0 °C to 55 °C)	±0.24%	±2.9 mV	±17.3 mV

Table 5. Current Programming Accuracy

Measurement Conditions		Gain Error	Offset Error	Accuracy at Full Scale
2-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.09%	±2.0 mA	±4.7 mA
	Maximum (0 °C to 55 °C)	±0.39%	±6.2 mA	±17.9 mA
10-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.13%	±2.9 mA	±6.8 mA
	Maximum (0 °C to 55 °C)	±0.45%	±8.2 mA	±21.7 mA

Table 5. Current Measurement Accuracy

Measurement Conditions		Gain Error	Offset Error	Accuracy at Full Scale
2-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.09%	±1.8 mA	±4.5 mA

Measurement Conditions		Gain Error	Offset Error	Accuracy at Full Scale
	Maximum (0 °C to 55 °C)	±0.38%	±6.1 mA	±17.5 mA
10-year Calibration Interval	Typical (23 °C ± 5 °C)	±0.12%	±2.7 mA	±6.3 mA
	Maximum (0 °C to 55 °C)	±0.44%	±8.1 mA	±21.3 mA

Table 5. Programming and Measurement Accuracy Drift

Specification	Gain Drift	Offset Drift
Voltage Programming & Measurement	±7 ppm/°C	±30 µV/°C
Current Programming & Measurement	±45 ppm/°C	±30 µA/°C

Programming and Measurement Resolution

Table 6. Programming and Measurement Resolution

Voltage programming	1.6 mV
Voltage measurement	400 µV
Current programming	900 µA
Current measurement	210 µA

Load Regulation

Voltage	
Device configured for local sense[2]	±3 mV per A of output load change
Device configured for remote sense[3]	±5.6 mV per A for 333 mΩ lead drop resistance

[2] Measured between local output terminals.
[3] Measured between remote terminals.

	±16.8 mV per A for 1 Ω lead drop resistance
Current	
Device configured for local sense	Load regulation effect is included in current programming and measurement accuracy specifications
Device configured for remote sense	Load regulation effect is included in current programming and measurement accuracy specifications

Voltage Output Speed

Rise time (measured from 10% to 90% of programmed voltage change from 0 V to 6 V with specified load)	
Full resistive load (2 Ω)	< 1 ms, with 3 A programmed current limit
No load	< 1 ms, with 3 A programmed current limit < 15 ms, with 0.03 A programmed current limit
Fall time (measured from 90% to 10% of programmed voltage change from 6 V to 0 V with specified load)	
Full resistive load (2 Ω)	< 1 ms, with 3 A programmed current limit
No load	< 55 ms, with 0.03 A to 3 A programmed current limit

Settling Time

Rise time (time to settle within ±0.3 V of final programmed voltage level from 0 V to 6 V with specified load)	
Full resistive load (2 Ω)	< 1 ms, with 3 A programmed current limit

No load	< 1 ms, with 3A programmed current limit < 20 ms, with 0.03 A programmed current limit
Fall time (time to settle within ±0.3 V of final programmed voltage level from 6 V to 0 V with specified load)	
Full resistive load (2 Ω)	< 5 ms, with 3 A programmed current limit
No load	< 100 ms, with 0.03 A to 3 A programmed current limit

Remote Sense

Maximum total output lead drop	Up to 1 V
Maximum total output lead resistance	Up to 1 Ω

Transient Response

Device configured for local sense[4]	
For load current step between 10% to 90% of 3 A current range	
With any capacitive load between 10 µF to 450 µF	< ±60 mV overshoot value < 50 µs to recover within ±50 mV of its final programmed voltage level
Device configured for remote sense[5][6]	
For load current step between 25% to 75% of 3A current range	
150 mΩ total lead resistance and minimum of 47 µF capacitive load	< ±300 mV overshoot value

[4] Measured between local output terminals.
[5] Measured between remote terminals.
[6] With total lead inductance up to 1 µH.

	< 1 ms to recover within ±50 mV of its final programmed voltage level
333 mΩ total lead resistance and minimum of 150 µF capacitive load	< ±300 mV overshoot value < 1 ms to recover within ±50mV of its final programmed voltage level
For load current step between 25% to 75% of 1A load current	
1 Ω total lead resistance and minimum of 22 µF capacitive load	< ±300 mV overshoot value < 1 ms to recover within ±50 mV of its final programmed voltage level

Notice A minimum of 10 µF capacitive load is recommended for output stability purpose.

Refer to each cable type below for the total lead resistance and inductance (across total output leads with 10 pins on each lead).

R37-37 Ribbon Cable (NI part numbers 779195-01, 779195-0R5, or 779195-0R25)	
Total lead resistance	50 mΩ per meter
Total lead inductance	0.9 µH per meter
SH37F-37M DSUB Shielded Cable (NI part numbers 778621-01 or 778621-02)	
Total lead resistance	30 mΩ per meter
Total lead inductance	0.3 µH per meter

Ripple and Noise

Output Voltage[7]

[7] Noise is measured up to 7.5 MHz bandwidth at output voltages of 0 V to 6 V.

Peak-to-peak	4.7 mV
RMS	0.7 mV
Voltage Measurement	
Peak-to-peak	3 mV
RMS	0.5 mV
Current Measurement	
Peak-to-peak	3 mA
RMS	0.5 mA

Measurement Timing Characteristics

Maximum measurement rate	10 kS/s

Auxiliary Power Supply (Vaux)

Voltage input range	11 V to 28 V
Sources[8]	Front IO connector or backplane power connector

Protection

Output channel protection	
Over-voltage	±30 V

[8] Selectable via jumper switch

Reverse voltage	Protected by sensing circuit to disconnect output. Output automatically disabled.
Over-temperature[9]	Output automatically disabled
Constant current limit range[10]	30 mA to 3 A
Remote sense miswiring	Automatic switch to local sense mode
Auxiliary power input protection	
Voltage out of range	Output automatically disabled
Overcurrent or reverse voltage	Fused
Isolation	None

Notice Do not insert more than two power supply modules into single backplane with maximum power output to avoid excess temperatures that automatically disable output.

Power Requirement

Power consumption from backplane Vsup	0.9 W, maximum
Power consumption from Vaux[11]	29.0 W, maximum
Thermal dissipation	11.9 W, maximum

[9] When the on-board temperature reading exceeds 100 °C
[10] Default constant current of 3 A.
[11] With 18 W maximum power output.

Physical Characteristics

Weight	53.3 g (1.88 oz)

Environmental Characteristics

Temperature	
Operating	0 °C to 55 °C
Storage	-40 °C to 71 °C
Humidity	
Operating	10% to 90%, noncondensing
Storage	5% to 95%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m
Shock and Vibration	
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