

SBC-I

Single Board Comparator

The Single Board Comparator (SBC-I) is a single printed circuit chassis located in the Terminal Selector/ATA Assembly. It is a quantizing and comparison-to-limit instrument capable of measuring resistance, voltage or capacitance and comparing these values to programmable limits and detecting Hi-Potential breakdowns. The SBC-I is not ground referenced enabling you to test grounded products easily and effectively.

The SBC-I gives you the flexibility to program test stimuli as a constant voltage from 0.225 volt to 1500 volts or as a constant current from 0.005 to 2.0 amps. See the following chart:

Stimulus	Range	Step
Constant current	5mA to 2.0A	2.5mA
High voltage	30VDC to 1500VDC	2.0 V
Low voltage	0.225VDC to 29.75VDC	0.075 V

Resistance Measurement

The SBC-I can also measure resistance in a range from 0.01 ohm to 1,000 megohms, digitizing the value at the applied stimulus. The following charts show a summary of the stimuli, ranges, and accuracies:

Constant Current

Stimulus (Amps)	Range (Ohms)	Accuracy
0.005A to 0.0975A	10 to 99.9K	±10%, ±1 ohm
0.1A to 0.997A (4-Wire only)	0.1 to 9.99	±3%, ±0.03 ohm
1A to 2A (4-Wire only)	0.01 to 9.99	±3%, ±0.003 ohm
0.1A to 2.0A	1 to 99.9K	±3%, ±0.5 ohm

Constant Voltage

Stimulus (Volts)	Range (ohms)	Accuracy
0.225 to 5.00	10 to 9.99K	±20%, ±10 ohm
5.1 to 29.8	10 to 99.9K	±20%, ± 10 ohm
30 to 98	100K to 9.99M	±5%
100 to 500	100K to 99.9M	±5%
500 to 1500	100M to 1000M	±10%



DC Voltage Measurement

The SBC-I can measure DC voltage from 0.01 volt to 1500 volts with the accuracies shown. See the DC Voltage Measurement table for accuracy specifications.

DC Voltage Measurement	
Voltage	Accuracy
10mV to 990mV	$\pm 10\%$ $\pm 10\text{mV}$
1V to 9.99V	$\pm 5\%$ $\pm 10\text{mV}$
10V to 99.9V	$\pm 5\%$ $\pm 0.1\text{V}$
100V to 1500V	$\pm 5\%$ $\pm 1\text{V}$

Hi-Potential Breakdown

The SBC-I can detect momentary (10 microseconds or longer) breakdowns in the UUT, when the current exceeds a programmed limit of 0.5mA, 1mA, 1.5mA, 2mA, or 2.5mA. The maximum voltage stimulus is 1500 volts DC with an accuracy of $\pm 5\%$ (open circuit). Accuracy of the programmed current value is $\pm 20\%$ and the system has a maximum short circuit current of 6.0mA.

Hi-Potential Breakdown	
Current	Accuracy
0.5mA to 2.5mA	$\pm 20\%$

Programmable Dwell Times

When a circuit path receives a stimulus, the time it takes to charge the circuit demands a minimum and maximum dwell time. These are programmable over the range of 0.001 to 1638 seconds. If you enable the dwell time bypass mode, then anytime you reach a test pass decision before the programmed maximum dwell time has elapsed, the analyzer will go to the next instruction. Otherwise, it waits out the programmed dwell time.

Discharge Wait Circuit

The SBC-I also has a “discharge wait” circuit that monitors the voltage until it discharges to a set level. This keeps the system from opening the switch relays when any charge is present, protecting the switching devices from being switched “hot”. This preserves the switch life and saves on maintenance costs.

Capacitance Measurements

The SBC-I provides the capability to measure capacitance from 10nF to 999 μF . The accuracy of the measurements is as follows:

Capacitance Measurements	
Value	Accuracy
10nF to 99nF	$\pm 20\%$
100nF to 1000 μF	$\pm 10\%$

You can perform these measurements using time domain techniques and a low-voltage constant current source. This method prevents damage to low-voltage electrolytic capacitors.

