Technical data sheet

Inductance Analyzers - 3255BL 3255B and 3255BQ

- Frequency ranges from 20 Hz to 1 MHz
- Fast measurement speed - up to 20 measurements per second
- 0.1% basic accuracy
- Up to 125 A of DC bias current
- Comprehensive measurement functions
- Straightforward intuitive operation
- Print test results
- GPIB control with LabVIEW™ driver

Completely characterize components with comprehensive parametric tests

The 3255B range of inductance analyzers are able to accurately characterise devices in a clear and simple manner. The inductance analyzers are available in three versions 3255BL (200kHz), 3255B (500kHz) and 3255BQ (1 MHz).

At the design stage of component development it is very important to analyse how components performs under different operating conditions. This includes operation over a range of frequencies, AC drive levels or DC bias currents.

The AC drive level can be set between 1 mV and 10 V. DC bias current can be set to 1 A or 2 A (internal options). Using the external 3265B range of DC Bias Units bias currents can be set to a maximum of 125 A.

Specification summary

Measurement functions	Z, Ø, L, C, Rac, Rdc, Q, D, turns ratio
Frequency ranges	20 Hz to 200kHz (3255BL) 20 Hz to 500 kHz (3255B) 20 Hz to 1 MHz (3255BQ)
Basic accuracy	0.1%
Modes	Impedance Multi frequency Bin handler (/D option)
DC bias current	0 to 1 A - internal (/A option) 0 to 2A - internal (/U option)
Interface	GPIB (/B option)
Measurement speed	Up to 20 measurements/sec

Printed output of test results

Using the parallel Centronics interface the user can directly print all test results for further analysis and archiving.

In addition, via the optional GPIB interface, the instrument can be controlled from a PC and results can be read back for analysis and storage.

LabVIEW™ drivers are available on request or can be downloaded from the web site, www.waynekerrtest.com, providing a base from which a user can develop a specific test application.

Bin sort

The binning function allows component manufacturers to sort components in up to ten bins. Sorting is carried out either by absolute values or by percentage of values.

Component tests with up to 125 A DC bias current

The 3255B and 3255BQ enable components to be measured at up to 125 A when optional 3265B DC Bias Units are used.

Up to five of the DC Bias Units can be used in parallel to give a wide range of DC bias currents.

Internal DC bias is available as one of two options giving DC bias currents from 1 mA to 1 A (/A option) or 2 mA to 2 A (/U option).

The 3265B has a number of safety and protection features including a safety interlock system to protect users against back EMFs. It is also fully protected against over-temperature, excess voltage drop and sense lead failure.

3265B DC Bias Unit can deliver up to 25 A of DC bias current in steps of 0.025 A

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Technical specifications

Operation modes

Impedance mode

Inductance (L), Impedance (Z), DC Resistance (Rdc) and Capacitance (C).
Series or parallel equivalent circuit
Loss term: Quality factor (Q), Dissipation factor (D),
AC Resistance (Rac) and Phase Angle (Ø) Turns Ratio
Percentage difference mode and relative mode on major terms.

Multi-frequency mode

Measurement parameters and test conditions set using measurement mode. Up to eight frequencies with absolute or percentage limits on major term with PASS/FAIL indications.

Test conditions

Low level AC drive

For measurement of L + Q, Ls + Rs,
C, Z, Turns Ratio

Frequency ranges

20 Hz to 200 kHz (3255BL)
20 Hz to 500 kHz (3255B)
20 Hz to 1 MHz (3255BQ)

Steps

At least 800 frequency steps are available which may be selected via the keypad or GPIB.
Basic accuracy of selected frequency ±0.01%

Drive level

Source impedance 50 Ω
1 mV to 10 V rms into open circuit
50 µA to 200 mA rms into short circuit
Automatic Level Control (ALC) maintains level applied to Device Under Test (DUT) at ±2%, ±1 mV of set voltage or ±2% ±0.1 mA of set current, reduces to ±4% below 100 Hz.

DC bias current (option)

1 mA to 1 A (/A option) or 2 mA to 2 A (/U option) is available from internal, fast settling bias supply over full frequency range.
Voltage compliance 14 V minimum
DC Accuracy ±2.5 % ±0.25 mA
Enabling DC bias inherently reduces measurement accuracy.
Safety interlock eliminates operator exposure to high currents.

DC resistance

Low test level of 100 mV minimises heating of the DUT
Short circuit current 10 mA.

Bin handler mode (D option)

Sort to 1 of 10 bins using absolute or percentage limits.
Separate Pass/Fail output.
Up to 100 bin limit set-ups stored in non-volatile memory.
TTL interface to external bin handler via 25 way D type connector.
Common 0 V. Bin outputs 0 to 5 V(nominal) with >10 mA current sink capability.

Measurement speeds

For Impedance, Turns Ratio, DC Resistance
4 speeds selectable for all functions: MAXimum, FAST, MEDium and SLOW

Maximum for remote control. Up to 20 measurements per second for test frequency ≥100 Hz. Selecting slower speeds improves accuracy and display resolution.

Measurement ranges

L: 1 nH to >1000 H
C: 0.01 pF to > 250 mF
R: 0.05 mΩ to >2 MΩ
Turns Ratio: 100:1 to 1:100
Rdc: 0.1 mΩ to 50 kΩ

Basic Accuracy

L: ±0.1% (12 µH to 50 H)
C: ±0.1% (500 pF to 2 mF)
R: ±0.1% (75 mΩ to 300 kΩ)
Q: ±0.1%*(Q+1/Q) (12 µH to 50 H)
D: ±0.001*(1+D^2) (500 pF to 2 mF)
Turns Ratio: ±0.1% (<20 kHz)
Rdc: ±0.5% ±1 mΩ (1 Ω to 5 kΩ)
Note: Ranges and accuracy vary with measurement speed, frequency and options chosen

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General data

Input specification
Power supply
230 V AC ±10% or
115 V AC ±10% (user-selected)
50 to 400 Hz
150 VA maximum consumption

Display
High contrast monochrome LCD
320 x 240 dot with back lighting.
Visible area 115 x 86mm.
Viewing angle 45°

Measurement connections
4 front panel BNC sockets
4-wire (Kelvin) measurements with screen at ground potential
Equivalent circuit symbols on screen

Remote control (option)
Conforms with GPIB IEEE-488.2 and SCPI 1992.0

Printer output
Centronics/parallel printer port

Environmental conditions
Temperature range
Storage -40°C to 70°C
Operating 0°C to 40°C
Full Accuracy 15°C to 35°C

Altitude up to 2000m
Relative humidity: up to 80% non-condensing
Installation category: II (in accordance with IEC664)
Pollution degree: 2 (mainly nonconductive)
This equipment is intended for indoor use only in non-explosive, non-corrosive atmosphere.

Safety
Complies with the requirements of EN61010-1

EMC
Complies with the requirements of EN61326-1

Mechanical (approx. overall)
Height 150 mm (6″)
Width 440 mm (17 3/8″)
Depth 520 mm (20 1/2″)
Weight 11 kg (24 lb 4 oz)

Order codes and options

Description	*Order code*
3255BL Inductance Analyzer (200 kHz) Supplied with user manual and power cable	**1J3255BL**
3255B Inductance Analyzer (500 kHz) Supplied with user manual and power cable	**1J3255B**
3255BQ Inductance Analyzer (1 MHz) Supplied with user manual, power cable and HF Transfer Standard Capacitors	**1J3255BQ**

Options

1 mA to 1 A internal DC bias current source	**/A**
GPIB (IEEE-488) interface	**/B**
Bin handler (non-isolated)	**/D**
1 mA to 2 A internal DC bias current source	**/U**

DC Bias Unit

25A DC bias unit 3265B (Not compatible with 3255BL)	**1J3265B**

All DC Bias units are supplied with user manual, power cable, spare fuses, 4 x BNC to BNC link cables and a control cable.

Accessories

Description	*Order code*
Kelvin clips (fine jaws).	**1EVA40100**
Kelvin clips (large jaws)	**1EVA40180**
4-terminal lead set	**1EV1505**
SMD Tweezers	**1EVA40120**
Rack mounting kit, 3U x full width (Unit needs rear support)	**1EXA20230**