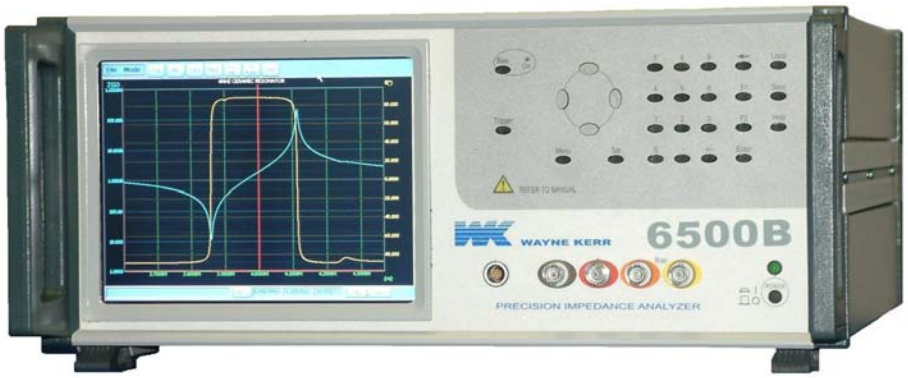
Wayne Kerr Electronics

Technical data sheet

Precision Impedance Analyzers



6505B 5MHz

6510B 10MHz

6515B 15MHz

6520B 20MHz

6530B 30MHz

6550B 50MHz

65120B 120MHz

- Precise high frequency impedance measurements
- Characterize components to 120 MHz (65120B)
- 0.05% basic measurement accuracy
- Comprehensive measurement functions
- Easy to use with large TFT touch screen
- Clear graphic displays
- Intuitive user interface
- Fully programmable over GPIB
- Equivalent Circuit Analysis function
- Competitively priced

The 6500B series of Precision Impedance Analyzers provide precise and fast testing of devices at frequencies up to 120 MHz. Basic measurement accuracy is ±0.05% making the instruments the best in their class.

The accuracy and versatility makes these precision instruments the ideal choice for many different tasks and applications including passive component design, dielectric material testing and resonant frequency characterisation.

Engineers need to evaluate component characteristics at high frequencies with very high levels of accuracy. The 65120B 120MHz Precision Impedance Analyzer is therefore ideal for many demanding tasks, combining accuracy and ease of use at an affordable price. If a maximum frequency less than 120MHz is required, other models are available in this range.

AC Measurement parameters

- Impedance (Z)
- Phase Angle (Ø)
- Capacitance (C)
- Dissipation Factor (D)
- Inductance (L)
- Quality Factor (Q)
- Resistance (R)
- Reactance (X)
- Conductance (G)
- Susceptance (B)
- Admittance (Y)

High measurement accuracy

Capacitance, inductance and impedance basic accuracy are all an excellent ±0.05%. Dissipation factor accuracy is ±0.0005 and the quality factor accuracy is ±0.05%.

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Graphical sweep of components

The 6500B series of Precision Impedance Analyzers are highly accurate high frequency component analyzers with a host of useful features.

Graphical sweep of two measured parameters is available and displayed on the large clear colour display. Swept parameters are frequency, drive level and DC bias.

Display formats available include series or parallel equivalent circuit.

An Equivalent Circuit Analysis function is available. This allows modelling and curve fitting to various models of equivalent circuits. 4 types of 3-component model and 1 type of 4-component model can be selected. The instrument will calculate the nearest equivalent circuit parameters for the measurement traces and revise the results for the different models instantly. Alternatively the parameters can be entered by the user and the instrument will plot the resulting frequency characteristics and revise the plot between the various models instantly.

For single frequency measurements a meter mode is available.

Variable drive and bias levels

AC drive levels up to 1V or 20 mA can be selected to evaluate components in realistic operating environments. /D1 DC bias option provides 0 to +40V dc bias voltage and 0 to +100mA dc bias current. /D2 option provides -40V to +40V dc bias voltage.

External control

The GPIB interface is used to control the instrument and read back measured values for applications such as quality control or for archiving purposes.

An Ethernet interface similarly allows the instrument to be controlled and to send out data, allowing it to be integrated into many test environments.

Wide range of interfaces

An external monitor or projector may be connected to the instrument's VGA output. The ability to provide a large screen display of measurement results is invaluable in production environments or for teaching and training.

Instrument control from both a keyboard and mouse is available. Any keyboard or mouse, with either a PS/2 or USB interface, can simply be connected to provide an alternative method of instrument control and operation.

Data storage and retrieval

All measurement and setup data can be stored using the Ethernet interface or a USB flash memory (supplied as standard).

Setup Data

Up to 20 instrument setups may be locally stored for each mode.

Bin handling option

/B1 option (non-isolated 5V) or /B2 option (isolated 24V) signals are available through a 25-way D-type connector. 10 bins can be set using absolute or percentage limits.

Printer outputs

Hard copy printouts can be obtained in a number of ways including direct to an HP-PCL compatible graphics printer or Epson compatible text/ticket printer. A networked HP-PCL compatible printer may also be used via the Ethernet connection.

Component connections

Four front panel BNC connectors permit three or four terminal connections with the screens at ground potential.

The 1J1011 Component Fixture, supplied as standard, ensures optimum performance when measuring a wide range of leaded components and devices.

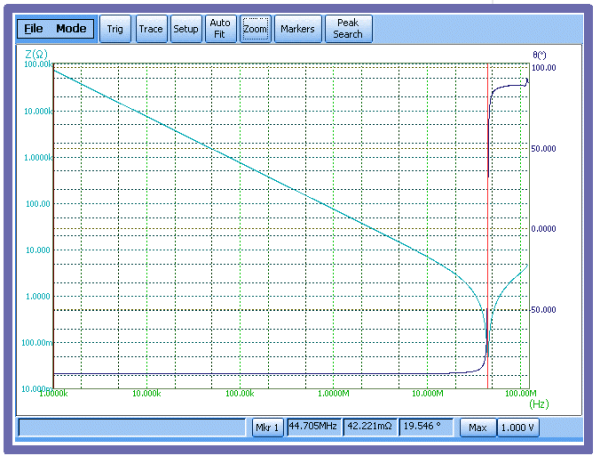
1J1012 (2 terminal) and 1J1014 (4 terminal) Fixtures allow connection to surface mount devices.

Protection against charged capacitors

High precision measuring instruments can be damaged by charged capacitors which can cause costly repairs and unacceptable downtime. All the models in the range incorporate protection against charged capacitors.

Comprehensive and precise component tests at higher frequencies

The 6500B series is best summarised by "Comprehensive and precise component tests at higher frequencies". The instrument is the perfect solution for those who have demanding component measurement needs.



Simultaneous plot of impedance and phase displayed against frequency on a clear colour display

Technical specifications

Measurement parameters

Any of the following parameters can be measured and displayed:

AC functions

- Impedance (Z)
- Phase Angle (Ø)
- Capacitance (C)
- Dissipation Factor (D)
- Inductance (L)
- Quality Factor (Q)
- Resistance (R)
- Reactance (X)
- Conductance (G)
- Susceptance (B)
- Admittance (Y)

Display format

Series or parallel equivalent circuit – all parameters

3 and 4-element models (R, L & C)

Test conditions

Frequency range

6505B 20Hz to 5MHz
6510B 20Hz to 10MHz
6515B 20Hz to 15MHz
6520B 20Hz to 20MHz
6530B 20Hz to 30MHz
6550B 20Hz to 50MHz
65120B 20Hz to 120MHz
Frequency step size: 0.1mHz
Accuracy of set frequency ±0.005%

AC drive level

10mV to 1Vrms*
200µA to 20mArms*

*Varies with frequency

Signal source impedance: 50Ω nominal

DC bias

D1 option

0 to +100mAdc bias current; 0 to +40Vdc bias voltage

D2 option

-40V to +40Vdc bias voltage

Binning (optional)

10 bins with absolute and percentage limits.
25 way D-type interface connector.

Option /B1 (non-isolated)

Common 0V. Bin outputs 0 to 5V(nominal) with >10mA current sink capability.

Option /B2 (isolated)

Common 24V input. Outputs 0 to 24V with >10mA current source capability.

Mode of operation

Graphical sweep mode

Allows graphical sweep of any two measurement parameters

Swept parameters: - frequency, drive level or DC bias

Meter mode

Allows the instrument to be used as a standard LCR meter

Setup Data

Up to 20 instrument setups may be locally stored for each mode.

Equivalent Circuit Analysis

4 types of 3-component model and 1 type of 4-component model.

Measurement connections

Four front panel BNC connectors permit three or four terminal connections with the screens at ground potential.

Measurement accuracy

Dissipation factor

$\pm 0.0005\ (1+D^2)$*

Quality factor

±0.05 %(Q+1/Q)*

Capacitance / Inductance / Impedance

±0.05%*

*Varies with frequency, drive level and measured impedance

General

Power Supply

Input voltage 90VAC to 264VAC (Autoranging)

Mains frequency

47Hz to 63Hz

Display

8.4″ VGA (640 x 480) colour TFT with touch screen

Local Printer

HP-PCL compatible graphics printing
Centronics / parallel printer port, Epson compatible text / ticket printing

Network Printer

HP-PCL compatible graphics printing

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GPIB interface
External instrument control. 24 pin IEEE 488 connector

Remote trigger
Rear panel BNC with internal pull-up, operates on logic low or contact closure

USB interface
Two Universal Serial Bus Interfaces
USB 1.1 compliant

VGA interface
15-way D-type connector to drive an external monitor in addition to the instrument display

Network interface
10/100-BASE-TX Ethernet controller. RJ45 connector

Keyboard interface
Standard USB or PS/2 keyboard port. Instrument front panel remains active with keyboard plugged in

Mouse interface
Standard USB or PS/2 mouse port. Touch screen remains enabled when the mouse is connected.

Bin handler (option)
/B1 option (non-isolated 5V) or /B2 option (isolated 24V).
25-way D-type connector

Environmental conditions
This equipment is intended for indoor use only in a non-explosive and non-corrosive atmosphere

Temperature range
Storage -20°C to 60°C
Operating 0°C to 40°C
Full Accuracy 18°C to 28°C

Relative humidity
Up to 80% non-condensing

Altitude
Up to 2000 m

Installation category
II in accordance with IEC664

Safety
Complies with the requirements of EN61010-1

EMC
Complies with EN61326 for emissions and immunity

Mechanical
Height 190 mm (7.5″) Depth 525 mm (20.5″)
Width 440 mm (17.37″) Weight 14.5 kg (32 lb)

Order codes

Description	Order code
6505B	**1J6505B**
5MHz Precision Impedance Analyzer	
6510B	**1J6510B**
10MHz Precision Impedance Analyzer	
6515B	**1J6515B**
15MHz Precision Impedance Analyzer	
6520B	**1J6520B**
20MHz Precision Impedance Analyzer	
6530B	**1J6530B**
30MHz Precision Impedance Analyzer	
6550B	**1J6550B**
50MHz Precision Impedance Analyzer	
65120B	**1J65120B**
120MHz Precision Impedance Analyzer with /EC option and either /D1 or /D2 option as standard	

All models supplied with:-
User manual AC power cable
Universal component fixture (1J1011) USB memory

Options

Description	Order code
Bin handler (non-isolated)	/B1
Bin handler (isolated 24V)	/B2
DC Bias (0 to +40V, 0 to +100mA)	/D1
DC Bias (-40V to +40V)	/D2
Equivalent Circuit Analysis	/EC

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