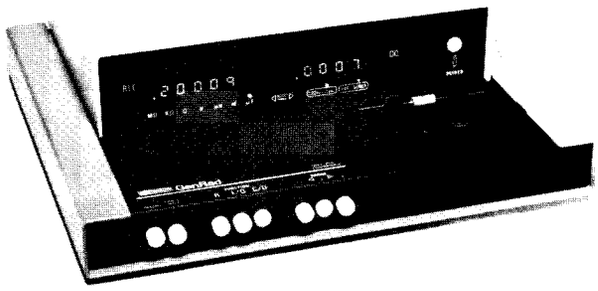
GenRad

Component Test Division



The GenRad 1657 RLC Digibridge®

The 1657 model of the GenRad Digibridge® family is a full performance microprocessor-based instrument for the measurement of passive components and devices. The lowest-cost member of the GenRad Digibridge family, the 1657 offers a combination of accuracy, flexibility, and ease-of-use unequaled by any other low-cost impedance measurement instrument.

An excellent choice for engineering labs or small incoming inspection departments, the 1657 provides many features usually found only in high-priced models:

- 0.2% accuracy for R, L, and C measurements
- 1 kHz and 120 Hz (or 100 Hz) test frequencies
- Dual displays
- Built-in Kelvin test fixture
- Series and parallel measurement selection
- Wide measurement ranges

Unparalleled Accuracy for Improved Test Reliability

Accuracy is a primary performance requirement for RLC measurement instruments. The 1657—with its basic accuracy of 0.2%—offers incomparable accuracy for the price.

The 1657's **full five-digit RLC readout** ensures that the basic 0.2% accuracy is not compromised by the ±1 digit readout uncertainty associated with most digital displays. With the 3½ digit display commonly found on low-cost bridges, ±1 digit translates to as much as ±0.5%. That means a unit with a basic accuracy of ± [.25% + 1 digit] really provides an accuracy of only ±.75%, resulting in a potential measurement error nearly four times greater than the ±.2% provided by the 1657.

The test frequency and waveform used to test components can compromise the validity and accuracy of component tests. The 1657 avoids such compromises. While most low-cost units provide only one test frequency and some don't even utilize sinusoidal measurement techniques, the 1657 gives you **a choice of two sinusoidal test frequencies** (1 kHz and 120 Hz or 100 Hz). As a result, the 1657 can test components at the two frequencies most often specified by manufacturer and industry standards.

The **guarded Kelvin (5-terminal) measurement techniques** provided by the 1657's unique built-in test fixture ensure a high level of measurement accuracy for both axial and radial lead components. These Kelvin techniques eliminate the errors that could be caused by shunt impedance in the test fixture or the optional extender cables.

Extraordinary Flexibility for a Wider Range of Tests

The 1657 may be the lowest-cost member of the Digibridge family, but that doesn't mean it's limited to one set of test conditions.

For full flexibility, series or parallel measurement modes are operator selectable across the full measurement range of every measurement parameter.

Another flexibility feature—automatic decimal point positioning—enables the 1657 to offer measurements in three ranges with each range covering two full decades of measurement values. Combined with the use of a full digit for the most significant digit, automatic decimal point positioning means, for example, that the 1657 can measure D from .0001 to 9.999.

Ease of Use for Higher Productivity

Digibridge ease of use increases productivity in two ways: reduced labor costs and reduced time-to-test.

Like all members of the Digibridge family, the 1657 can be run by operators with little or no technical training. That pays off in higher production throughput with lower payroll and training costs.

The 1657's microprocessor-directed range selection feature takes the guesswork out of selecting the proper measurement range. If the component under test is out of the range in which the 1657 is operating, a control panel indicator prompts the operator to push the range buttons until the appropriate range has been selected.

Time-to-test is further reduced by the 1657's dual displays that simultaneously show primary and secondary characteristics, so time is not lost while the operator switches measurement functions to check first one characteristic and then the other on a single display.

The 1657 also eliminates the need for time-consuming periodic tweaking or setting of internal controls. Under microprocessor control, it automatically compensates for the drifts and offsets associated with active components in critical measurement circuits.

The GenRad Digibridge Family for a Cost-Effective Choice

The 1657 Digibridge impedance measurement instrument is one of GenRad's family of automatic bridges that give you a choice of instruments for RLC testing. Each provides unmatched accuracy, flexibility, and ease of use in its class. You can choose the one that provides the capabilities your application requires, without being forced to pay for features that you may have no use for.

For more information on how the GenRad 1657 can improve your productivity, call GenRad's Digibridge Support Group today. Call toll-free 1-800-343-4470. (In Arizona, Washington, Oregon, and Colorado, call toll-free 1-800-538-9424. In Massachusetts, call 617-890-4900, ext. 378. In California, call 408-727-0127, ext. 29.)

1657 Specifications

Measurement Modes

Measures R series or parallel; L and Q series or parallel; C and D series or parallel. All measurement modes are pushbutton selectable.

Measurement Speed

Greater than three measurements per second, unqualified.

Test Frequencies

1 kHz and 120 Hz. Also 100 Hz in place of 120 Hz. Pushbutton selectable.

Displays

Two LED numerical displays with automatically positioned decimal points and illumination of units. For RLC, five digits (99999) and simultaneously for DQ, four digits (9999).

Applied Voltage

0.3 V rms maximum.

Ranges

Pushbutton selection with automatic front-panel guidance. Three basic ranges (best accuracy, see table) of 2 decades each for each parameter. Automatic extensions to min and max, as tabulated.

Parameter	Minimum Low Extension	Basic Ranges	Maximum High Extension
R:120 Hz*	00.001Ω	2Ω to 2 MΩ	99.999 MΩ
R:1 kHz	00.001Ω	2Ω to 2 MΩ	9.9999 MΩ
L:1 kHz	0.0001 mH	0.2 mH to 200 H	999.99 H
L:100 Hz*	00.001 mH	2 mH to 2000 H	9999.9 H
C:1 kHz	0.0001 nF	0.2 nF to 200 μF	999.99 μF
C:120 Hz*	00.001 nF	2 nF to 2000 μF	99999 μF
D (with C)		.0001 to 9.999	
Q (with L)		00.01 to 999.9	

*120 Hz or 100 Hz, depending on the instrument.

Detailed Accuracy Specifications

Accuracy: For R, L, and C, ± 0.2% of reading in basic ranges, if quadrature component is small (D < 0.1, Q > 10)
D accuracy: ± .001 in basic ranges, for D < 0.1
Q accuracy: ± .01 in basic ranges, for Q < 1

Parameter	Low Extension	Basic Ranges	High Extension	Cross-Term Factor
R:either frequency	± [4 mΩ,	0.2% of rdg,	(R/10 MΩ)% of rdg]	(1 + Q)
L:1 kHz	± [0.4 μH,	0.2% of rdg,	(L/1000 H)% of rdg]	(1 + 1/Q)
L:120 Hz*	± [4 μH	0.2% of rdg,	(L/10 kH)% of rdg]	(1 + 1/Q)
C:1 kHz	± [0.4 pF**	0.2% of rdg,	(C/1000 μF)% of rdg]	(1 + D)
C:120 Hz*	± [4 pF**	0.2% of rdg,	(C/.01 F)% of rdg]	(1 + D)
D (with C)	± [	0.001 + 0.002(1 + D) D	]	K†
Q (with L)	± [	0.01 + 0.002(1 + Q) Q	]	K†

*120 Hz or 100 Hz. **Fixed offset "zero" capacitance is 1.5 pF.
†K = (LC basic accuracy as % of rdg)/0.2%. Therefore, K = 1 on basic ranges.

Supplied

Power cord, axial-lead adaptors, instruction manual.

Power

90 to 125 or 180 to 250 V, 48 to 62 Hz.
Voltage selected by rear-panel switch. 25 W maximum.

Dimensions (W × H × D)

14.78 × 4.4 × 13.5 in. (37.5 × 11.2 × 34.2 cm).

Weight

12.5 lb. (5.7 kg) net; 22 lb. (10 kg) shipping.

Environment

Temperature: 0 to 50°C, operating; −40 to +75°C, storage. Humidity: 0 to 85% R.H., operating.

Description	Catalog Number
1657 RLC Digibridge®	
120-Hz and 1-kHz Test Frequencies	1657-9700
100-Hz and 1-kHz Test Frequencies	1657-9800
Extender Cable (for remote measurements)	1657-9600

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