

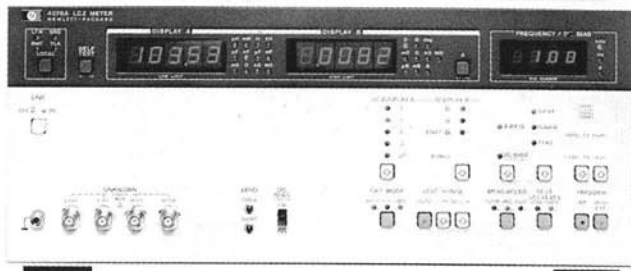
COMPONENT MEASUREMENT

LCZ Meters
HP 4276A, 4277A

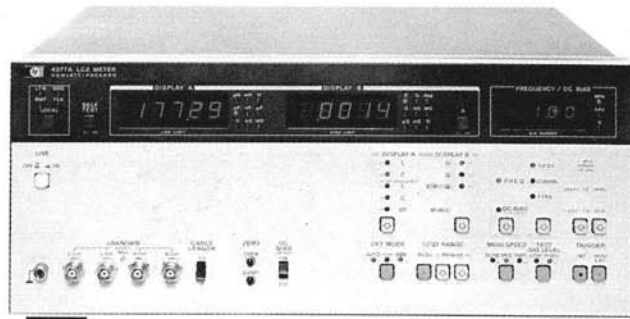
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- 3-digit frequency setting:
100 Hz to 20 kHz (801 spots)
10 kHz to 1 MHz (701 spots)
- High-speed measurements

- Measure L/C-D/Q/ESR/G, $|Z| - \theta$, high speed L/C
- 10-bin component sorting-comparator (Opt 002)
- 0.1% basic accuracy over impedance range of 100 m Ω to 10 M Ω (HP 4276A), 10 Ω to 1 M Ω (HP 4277A)



HP 4276A



HP 4277A



HP 4276A and 4277A LCZ Meters

HP's 4276A and 4277A LCZ Meters are general-purpose impedance-measuring instruments designed to measure circuit components such as capacitors and inductors using frequency and dc bias conditions identical to those of the intended application. Both HP 4276A and HP 4277A feature variable test frequency (100 Hz to 20 kHz and 10 kHz to 1 MHz respectively), optional dc bias variable from 0 to ± 40 V, multiple parameters (L • C • $|Z|$ • D • Q • ESR • G • θ) with fully automatic high speed measurements, and $\frac{4}{5}$ digit resolution. The HP 4276A has an impedance range of 100 m Ω to 10 M Ω and the HP 4277A 10 Ω to 1 M Ω .

Both instruments are ideal for production line, quality control, and circuit design applications, and are versatile enough for standalone use or systems use under HP-IB control (standard). An optional comparator for 10-bin sorting with measurement time of less than 100 ms makes the HP 4276A/4277A a good choice for production line testing of discrete components.

Specifications (Refer to data sheet for complete specifications.)
Common to HP 4276A and HP 4277A:

Parameters Measured: C • D • Q • ESR • G • L • D • Q • ESR • G
high speed L, high speed C
 $|z|$ - θ and Δ (deviation for any parameter)

Display: $\frac{4}{5}$ digits (max), maximum display 19999

Measurement Circuit Modes: Auto, Parallel, and Series

Frequency Control Modes: SPOT, COARSE (10 freq./decade), and FINE (max. freq. resolution)

Test Signal Level (Unknown terminal open)

	HIGH	LOW
HP 4276A	1 V rms $\pm 10\%$ @ 1 kHz	50 mV $\pm 20\%$ (CP only) @ 1 kHz
HP 4277A	1 V rms $\pm 10\%$	20 mV $\pm 15\%$

Test Frequencies:

HP 4276A: 100 Hz to 20 kHz $\pm 0.01\%$ (801 points)

HP 4277A: 10 kHz to 1 MHz $\pm 0.01\%$ (701 points)

Measurement Accuracy and Range: Specified at the front panel unknown connectors when all of the following conditions are satisfied:

- (1) warmup time ≥ 30 min.
- (2) test signal level is set to HIGH (1 V rms)
- (3) measurement speed mode: MED or SLOW
- (4) ambient temperature is 23 $^{\circ}$ C $\pm 5^{\circ}$ C
- (5) cable length switch is set to 0 m (HP 4277A)
- (6) OPEN and SHORT adjustments have been made
- (7) D ≤ 0.1

C Measurement Basic Accuracy:

HP 4276A: 0.1% + 17 counts to 3% + 2 counts

HP 4277A: 0.1% + 17 counts to 3% + 4 counts

dc Bias

Internal dc bias (opt.): 0 to ± 40 V

Reference Data

Measurement Speed (typical): (Circuit mode: AUTO, test signal level: HIGH, display digit: 3 digits, FAST mode)

Measurements	HP 4276A @ 1 kHz	HP 4277A @ 1 MHz
C-D • ESR • G	65 ms	75 ms
L-D • ESR • G	75 ms	65 ms
Z- θ	80 ms	75 ms
High Speed C	35 ms	40 ms

General Specifications

Operating Temperature and Humidity: 0 $^{\circ}$ to 55 $^{\circ}$ C, $\leq 95\%$ RH at 40 $^{\circ}$ C

Power Requirements: 100/120/220 Vac $\pm 10\%$, 240 V +5% -10%; 48 to 66 Hz

Power Consumption: 65 VA max (HP 4276A);

75 VA max (HP 4277A)

Size: 188 mm H \times 426 mm W \times 422 mm D (7 $\frac{1}{2}$ in \times 16 $\frac{1}{4}$ in \times 16 $\frac{1}{2}$ in)

Weight: Approx. 8.5 kg (18.7 lb)

Special Options

HP 4276A Opt H05: 1 kHz C-D measurement only (1V/100 mV)

HP 4276A Opt H06: 1 kHz C-D measurement only (1V/300 mV)

HP 4276A Opt H07: 1 kHz C-D measurement only (1V/500 mV)

HP 4277A Opt H03: Programmable dc bias for high speed C-V measurement (1V/20 mV, 1 MHz only)

HP 4277A Opt H04: Programmable dc bias for high speed C-V measurement (500 mV/20 mV, 1 MHz only)

HP 4277A Opt H07: High accuracy dc bias

Contact your nearest HP sales office for more information.

Accessories

Furnished Accessories: HP 16047A Direct Coupled Test Fixture

Accessories Available

HP 16064A: Retrofit Kit for Comparator (HP 4276A/HP 4277A, Opt 002)

Ordering Information

HP 4276A LCZ Meter \$6,230

HP 4277A LCZ Meter \$8,160

Opt 001 Internal dc bias, 0 to ± 40 V +\$241

Opt 002 10-bin sorting for L/C/ $|Z|$ and go/no-go testing for D/Q, interfaceable with component handler +\$840

Opt W30 Extended Repair Service (HP 4276A). +\$135

See page 636.

Opt W30 Extended Repair Service (HP 4277A). +\$185

See page 636.