

---

## HP 8923B DECT test solutions

Technical specifications

**no**  
compromise  
in  
measurement  
integrity



# Traceability to the ETSI CTR-06 standard

## Measurement traceability

The measurement techniques used in the HP 8923B test set have been derived from the ETSI CTR-06 standard. This table shows the capability of the HP 8923B test set and where it is compliant with the CTR-06 standard.

DECT CTR-06 tests	Measurement on HP 8923B test set	Notes
Accuracy and stability of RF carriers <i>CTR-06 Section 7</i>	✓	
Jitter <i>CTR-06 Section 8.3</i>	✓	
Transmission burst <i>CTR-06 Section 9</i>	✓	Top 40 dB of the power versus time template is displayed.
Transmitted power <i>CTR-06 Section 10</i>	✓	
Frequency drift <i>CTR-06 Section 11</i>	✓	
RF carrier modulation <i>CTR-06 Section 11</i>	✓	
Emissions due to modulation <i>CTR-06 Section 12.2</i>	No	External time gated spectrum analyzer required.
Emissions due to transmitter transients <i>CTR-06 Section 12.3</i>	No	External spectrum analyzer required.
Spurious emissions <i>CTR-06 Section 12.5</i>	No	External spectrum analyzer required.
Emissions due to intermodulation <i>CTR-06 Section 12.4</i>	No	External spectrum analyzer required.
Radio receiver sensitivity <i>CTR-06 Section 13.1</i>	✓	An external RF signal generator must be used to carry out BER at $\pm 50$ kHz offset.
Radio reference bit error rate <i>CTR-06 Section 13.2</i>	✓	
Radio receiver blocking: Case 1 <i>CTR-06 Section 13.4</i>	✓	An external CW RF signal generator (HP 83711A) is required for the measurement.
Radio receiver blocking: Case 2 <i>CTR-06 Section 13.5</i>	✓	An external DECT-like RF signal is required to act as the blocking source (such as the HP 8664A signal generator with options H10 and 008).
Receiver intermodulation performance <i>CTR-06 Section 13.6</i>	✓	An external DECT-like RF signal generator (HP 8664A option H10 and 008) and a CW RF signal generator (HP 83711A) are required for this.

# Specifications

## HP 8923B test set specifications

The following describe the instruments warranted performance and apply after a 30 minute warm-up period. These specifications are valid over its operating/environmental range unless otherwise noted.

### DECT source

#### RF carrier frequency <sup>1</sup>

**Range:** 1880 to 1900 MHz at DECT channels.

**Frequency drift across the burst:** Negligible (I/Q modulation technique used).

**Accuracy:** ±5 kHz.

#### RF carrier level

**Range:** -100 dBm to -10 dBm.

**Resolution:** 0.1dB.

**Accuracy:** ±1.0 dB.  
(Compliant to CTR-06 Section 5.8.4).

**Reverse power:** 2 W continuous.

**SWR:** 1.5:1.

#### CW mode

**Frequency accuracy:** ±5 kHz.  
(Compliant to CTR-06 Section 5.8.4).

**Amplitude accuracy:** ±1.0 dB.  
(Compliant to CTR-06 Section 5.8.4).

### Transmitter test

**Note:** The user is required to provide a signal from the device under test which matches the following criteria.

#### Frequency presented to the HP 8923B test set

Within ±200 kHz of DECT channel frequency.

#### Amplitude presented to the HP 8923B test set

Within ±6 dB of HP 8923B setting  
(Compliant to CTR-06 Section 5.8.5.1).

## Normal transmitted power (NTP) measurement <sup>1</sup>

**Range:** -10 dBm to +30 dBm.

**Accuracy:** ±0.6 dB ± noise effects (0.015 mW).  
(Compliant to CTR-06 Section 5.8.5.1).

## Power versus time template measurement

**Measurement range:** -10 dBm to +30 dBm.

**Dynamic range:** 40 dB.

**Accuracy:** Typically 0.5 dB +0.1 dB per dB.

## GFSK measurement <sup>1</sup>

**Level:** -10 dBm to +30 dBm

*Peak frequency deviation measurement error:*

Input amplitude setting uncertainty	Frequency deviation measurement uncertainty
±1 dB	10 kHz
±3 dB	12 kHz
±6 dB	16 kHz

**Center frequency measurement error <sup>2</sup>:** ±1 kHz.

**Frequency drift measurement error <sup>3</sup>:** <1 kHz for drift < 20 kHz.

**P0 detection accuracy:** Typically 0.1 µs.

## Timing jitter:

Measurement accuracy: 4 ns.

<sup>1</sup> Specifications also apply for CW measurement mode.

<sup>2</sup> Test pattern FACC should be used during this measurement.

<sup>3</sup> Test pattern FDEV2\_FS should be used during this measurement.

## Receiver test

### Residual bit error

**Ratio:** 10<sup>-6</sup> for PRBS 2<sup>9</sup> - 1 (ITU-T 0.153).

## Audio source

**Frequency range:** 20 Hz to 21 kHz.

**Accuracy:** 0.03% of setting.

**Resolution:** 0.1% Hz.

**Level range:** 0 V to 2 V.

**Output impedance:** Typically 70 ohm.

**Accuracy:** ±(4% of setting + resolution).

**Resolution:** ±1.3 mV peak.

**Residual distortion:** < 0.7 % for levels greater than 200 mV.

## Audio analyzer

### DC voltmeter

**Accuracy:** 1% of reading + DC offset.

**DC offset:** 45 mV.

**Range:** -5 V to +5 V.

### Audio frequency counter

**Input voltage range:** 30 mV to +5 V.

**Frequency range:** 30 Hz to 400 kHz.

**Accuracy:** (0.05% + resolution + reference accuracy) for input > 30 mV and between 30 Hz and 50 kHz and for input > 80 mV and between 50 kHz and 400 kHz.

**Resolution:** f < 10 kHz: 0.01 Hz,  
f < 100 kHz: 0.1 Hz, f = 100 kHz: 1Hz.

**Input range:** 100 mV to +5 V.

### AC voltmeter

**Frequency Range:** 50 Hz to 50 kHz.

**Input impedance:** Typically 100 ohm.

**Input range:** 10 mV to 5 V.

**Accuracy:** ±3% + noise.

**Noise:** < 1 mV peak.

### Digital oscilloscope

**Frequency range:** dc to 50 kHz.

**Accuracy:** ±1.5% of reading ±0.1 division.  
(For scale settings: 100 mV/div to 1 V/div).

## Reference

### Standard frequency reference

**Reference accuracy:**

$\pm$  (Time since calibration  $\times$  aging rate) + temperature stability + accuracy of calibration (0.01 ppm).

**Stability:** 1 ppm (0 to 55 °C).**Aging:** 2 ppm/year.**Warm-up time:** < 30 minutes to be within 2 ppm of final frequency.

### Precision frequency reference (Option 1D5)

**Stability:** <  $2.5 \times 10^{-3}$  ppm/°C (0 to 55 °C).**Aging:** <  $5 \times 10^{-4}$  ppm/day after 24 hour warm-up.  
< 0.1 ppm/year for continuous operation.**Warm up time:** Within  $5 \times 10^{-4}$  ppm of final value 10 minutes after turn on at 25 °C.

### Front panel

**RF in/out:** RF In/out through 50 ohm, Type-N connector. Maximum reverse power 2 W.**Trigger in:** External trigger input through BNC connector, impedance typically 2 to 3 kohm.**Audio in:** Input to built-in oscilloscope and audio analyzer through BNC connector.**Audio out:** 20 Hz to 21 kHz audio signal output through BNC connector.

### Rear panel

**HP-IB: IEEE 488.2 I-Basic/print serial port:** RS-232-C through RJ-11 connector used for serial input/output.**Logging port:** RS-232-C through RJ-45 connector used for serial logging.**Baud rates:** 300, 1200, 2400, 4800 and 9600 baud.**External signal generator control:** Data, clock and trigger signal to drive an external RF signal generator through BNC connectors.**Sync in/sync out:** Two RJ-45 connectors which allow multiple HP 8923B test sets to be connected in series to ensure that all transmissions are time synchronized.**Aux RF connector:** RF in/out through 50 ohm SMA connector, output level is Typically 12 dB lower than front panel setting. (Must be terminated in a 50 ohm load when not in use.)**Handset port:** Audio in/out through RJ-45 connector.**Input impedance:** 200 kohm.**Sensitivity:** 12 mV<sub>rms</sub> (typical) supplies bias to drive an electret microphone.**Output:** 110 ohm, 1 V<sub>rms</sub> differential.**Rx data:** Output of demodulated data from the EUT.**Tx data:**

TTL output of data transmitted by HP 8923B test set.

**Composite video output:** PAL compatible 15.625 kHz scan rate video output to drive an external monitor.**Meas trig:** TTL signal to trigger external test equipment eg a time gated spectrum analyzer. The trigger signal is derived from the trigger being used internally by the HP 8923B test set during measurements.**Ext ref in:** Allows the connection of an external 10 MHz frequency reference. The 10 MHz ref out may be connected instead of an external reference.**Opt 1D5 ref out:** Provides an output from the option 1D5 precision frequency reference.**10 MHz ref out:** Provides an output from the internal frequency reference.

## Internal programming

**Programming language:** Hewlett-Packard Instrument BASIC.

## General specifications

**Size (H  $\times$  W  $\times$  D) :** 177 mm  $\times$  426 mm  $\times$  574 mm (7 in  $\times$  16.75 in  $\times$  23 in).**Weight:** 32 kg (70 lb).**Operating temperature:** 0 °C to 55 °C.**Power:** 100, 120, 220 and 240 Vac, 48 to 440 Hz,  $\pm$ 10% of line voltage.

# Ordering Information

---

## HP 8923B DECT test set

<b>Option 0BF</b>	Programming reference manual (additional)
<b>Option AV4</b>	Users manual (additional)
<b>Option 0B3</b>	Servicemanual
<b>Option 1D5</b>	High stability frequency reference
<b>Option 1CP</b>	Rack mount and handle kit
<b>Option K06</b>	Serial printer connector and cable (RJ11 to D-type RS232) <sup>1</sup>

## Associated test equipment

### HP 8590E Series spectrum analyzer

(HP 8593E, 94E, 95E and 96E cover the DECT frequency band)

<b>Option 004</b>	Precision frequency reference
<b>Option 112</b>	DECT demodulator card
<b>Option 012</b>	DECT source
<b>Option 105</b>	Time gated spectrum analysis card
<b>Option 101</b>	Fast time domain sweep card

### HP 8664A/8665A/8665B synthesized signal generator

<b>Option H10</b>	DECT modulation
<b>Option 008</b>	Pulse modulation

### HP 6632A DC power supply

### HP 3488A switch unit

### HP 53131A 225 MHz universal counter

## Recommended HP accessories

<b>HP 10438A</b>	Miniature oscilloscope probe (high impedance/40pF 1:1 probe 08920-61060 antenna)
<b>HP 11667A</b>	DC - 18 GHz power splitter)
<b>HP 83230A</b>	64kbytes SRAM PCMCIA memory card <sup>2</sup>
<b>HP 83231A</b>	1Mbyte SRAM PCMCIA memory card

---

For further information on the HP 8923B DECT Test Set the following literature may be ordered: DECT test solutions photocard (5964-4110E).

<sup>1</sup> Cable may be used for connection to a serial printer or for protocol logging to a terminal emulator (e.g. a PC running the Microsoft Windows®, terminal program)

<sup>2</sup> A 64kb SRAM PCMCIA memory card is provided with every HP 8923B test set.



For more information on Hewlett-Packard Test & Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via Web through AccessHP at <http://www.hp.com>. If you do not have access to the internet please contact one of the HP centers listed below and they will direct you to your nearest HP representative.

**United States:**

Hewlett-Packard Company  
Test and Measurement Organization  
5301 Stevens Creek Blvd.  
Bldg. 51L-SC  
Santa Clara, CA 95052-8059  
1 800 452 4844

**Canada:**

Hewlett-Packard Canada Ltd.  
5150 Spectrum Way  
Mississauga, Ontario  
L4W 5G1  
(905) 206 4725

**Europe:**

Hewlett-Packard  
European Marketing Centre  
P. O. Box 999  
1180 AZ Amstelveen  
The Netherlands

**Japan:**

Hewlett-Packard Japan Ltd.  
Measurement Assistance Center  
9-1, Takakura-Cho, Hachioji-Shi  
Tokyo 192, Japan  
(81) 426 48 3860

**Latin America:**

Hewlett-Packard  
Latin American Region Headquarters  
5200 Blue Lagoon Drive  
9th Floor  
Miami, Florida 33126  
USA  
(305) 267 4245/4220

**Australia/New Zealand:**

Hewlett-Packard Australia Ltd.  
31-41 Joseph Street  
Blackburn, Victoria 3130  
Australia  
131 347 ext. 2902

**Asia Pacific:**

Hewlett-Packard Asia Pacific Ltd.  
17-21/F Shell Tower, Times Square  
1 Matheson Street, Causeway Bay  
Hong Kong  
(852) 2599 7070

© Hewlett-Packard Co. 1996

Printed in USA  
Data subject to change  
5964-4112E (10/97)