

# HIOKI

3801, 3802 (High-accuracy)  $\text{C}\text{E}$

3803, 3804, 3805 (Economically priced)  $\text{C}\text{E}$    $\text{US}$  &  $\text{C}\text{E}$

## DIGITAL HiTESTER

Field measuring instruments

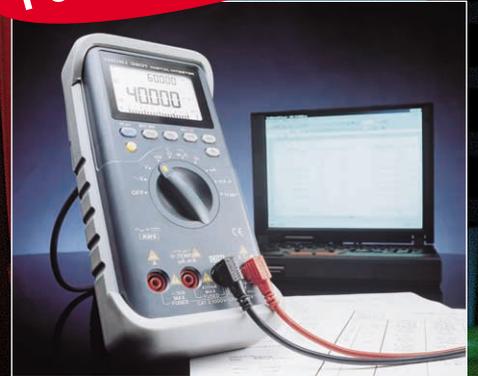


Support efficient data collection

# RS-232C

communication

All HiTESTERS  
For Personal Computer



Actual-size 3805.



ISO14001  
JQA-E-90091



<http://www.hioki.co.jp/>

Hioki company overview, new products, environmental considerations and other information are available on our website.

CAT III 600V  
CAT II 1000V



# A line up of 5 HiTESTERs that support

Offers efficient maintenance of equipment and outstanding performance in electronic

## 3801, 3802 DIGITAL HiTESTER

True RMS type units provide high accuracy and high resolution



3801

### ■ The 3801 meets a variety of measurement and analysis needs.

In addition to basic functions such as measuring AC/DC voltage and current, frequency, capacitance, resistance, diode checking, and continuity checking, the 3801 features functions such as an AC + DC mode, temperature measurement, and pulse output. DC voltage measurements are accurate to within  $\pm 0.06\%$  rdg.  $\pm 3$  dgt. (in the 4000 count mode), assuring accurate measurement for all types of electrical equipment checks. Display can also be switched to the high-resolution 40000-count mode.

For details on 3801 functions, see page 4.

### ■ The 3802 provides the same high accuracy with simpler functions.

The 3802 is a low-price model that features a simplified selection of 3801 functions, performing basic measurement of voltage and current, resistance, frequency, capacitance, diode checking, and continuity checking.

### ■ The 3801 and 3802 both feature dual displays.

- Two different parameters can be displayed simultaneously.

AC voltage, frequency and so forth can be displayed simultaneously with other parameters for quick verification.



3802

## 3803, 3804, 3805 DIGITAL HiTESTER

The design of these basic units pursues cost performance without compromising safety

Two types of average value rectification systems



3803

3804

### ■ The economically priced 3803.

This economically priced Model 3803 features measurement of AC/DC voltage and current, resistance, diode checking, and continuity checking. The unit also conforms to CAT III 600 V standards, and has been designed with ample consideration for safety by adopting a 600 V fast blow fuse in the current input connector.

### ■ The versatile 3804 adds recording and capacitance.

In addition to the capacitance measurement function, the 3804 is an all-purpose unit that comes with handy auxiliary functions, such as max/min/average value recording and relative value display for analyzing measured data.

The 3805 features true RMS measurement, providing greater utility for facility maintenance

### ■ True RMS system supports measurement of harmonic wave.

A true RMS system accurately measures harmonic wave components generated by inverters and provides the following functions in addition to frequency and temperature measurement.

- For instrument maintenance ... 4-20mA % display (possible with the 3804)

Displays 4mA as 0.00% and 20mA as 100.0% - useful for intuitively grasping deflection of instrument meters.

- Power supply voltage waveform distortion check ... harmonic wave percentage display

Can display proportion of non-sinusoidal waves superimposed on sine waves that do not include any harmonic waves as a percentage from 0.0 to 99.9%. The higher the displayed percentage, the greater the harmonic wave component. This helps identify and avoid potential harmonic interference in advance. ● Usable with voltages ranging from AC 100 mV to 1000 V. (The 3805 meets CAT III 600 V requirements and CAT II 1000 V requirements. Please follow appropriate precautions according to the place of use.)

- HVAC/ R maintenance ... simultaneous 2-point temperature measurement (see page 6)  
(Heating Ventilation of Air Conditioning/ Refrigeration)



3805

# Computer communication.

## instrument evaluation tests

For detailed specifications of each model, refer to pages 5 and 6.

■ A full model line-up to best suit your needs based on price and application.

(Model)	Low cost ← (3803)	(3804)	(3805)	(3802)	→ High grade (3801)
Rectification method	Average value measurement		True RMS value measurement		
Display resolution	4000	4000 (9999, V range only)		40000 or 4000 (with dual display)	
DC V (resolution)	400 m to 1000 V (100 $\mu$ to 1V)	1000 m to 1000 V (100 $\mu$ to 0.1V)		40 m to 1000 V (1 $\mu$ to 0.1V)	
Basic accuracy	$\pm 0.6$ % rdg. $\pm 2$ dgt.	$\pm 0.3$ % rdg. $\pm 2$ dgt.	$\pm 0.1$ % rdg. $\pm 2$ dgt.	$\pm 0.06$ % rdg. $\pm 3$ dgt. (at 4000 counts)	
AC V (resolution)	400 m to 1000 V (100 $\mu$ to 1V)	1000 m to 1000 V (100 $\mu$ to 0.1V)		40 m to 750 V (1 $\mu$ to 0.1V)	
Basic accuracy	$\pm 2.0$ % rdg. $\pm 2$ dgt.	$\pm 1.2$ % rdg. $\pm 5$ dgt.	$\pm 1.1$ % rdg. $\pm 5$ dgt.	$\pm 0.7$ % rdg. $\pm 5$ dgt.	
AC/DC A (resolution)	400 $\mu$ to 10 A (3801, 3802; 10 n to 1 mA, 3803 - 3805; 100 n to 10 mA)				
DC A Basic accuracy	$\pm 1.5$ % rdg. $\pm 2$ dgt.	$\pm 0.2$ % rdg. $\pm 3$ dgt.	$\pm 0.1$ % rdg. $\pm 3$ dgt.	$\pm 0.2$ % rdg. $\pm 3$ dgt. (at 4000 counts)	
AC A Basic accuracy	$\pm 2.0$ % rdg. $\pm 2$ dgt.	$\pm 1.2$ % rdg. $\pm 5$ dgt.	$\pm 1.0$ % rdg. $\pm 5$ dgt.	$\pm 1.0$ % rdg. $\pm 5$ dgt. (at 4000 counts)	
Resistance (resolution)	400 $\Omega$ to 40 M $\Omega$ (3801, 3802; 10 m to 1 k $\Omega$ , 3803 - 3805; 100 m to 10 k $\Omega$ )			40nS (0.01nS) range; 3801 only	
Basic accuracy	$\pm 0.6$ % rdg. $\pm 3$ dgt.	$\pm 0.6$ % rdg. $\pm 3$ dgt.	$\pm 0.5$ % rdg. $\pm 3$ dgt.	$\pm 0.2$ % rdg. $\pm 3$ dgt. (at 4000 counts)	
Continuity buzzer	Less than 345 dgt.	Less than 100 dgt.		Less than 100 dgt. (1000 dgt. at 4000 counts)	
Diode	○ (3 V/1.65 mA)	○ (Measured voltage and current: 3.3 V/0.7 mA)		○ (Measured voltage and current: 3.3 V/1.65 mA)	
Frequency	—	—	1 Hz to 50 kHz	10 Hz to 200 kHz	1 Hz to 10 MHz
Capacitance (resolution)	—	4 $\mu$ to 10 mF (1 n to 1 $\mu$ F)		4 n to 10 mF (1 p to 1 $\mu$ F)	
Basic accuracy	—	$\pm 2.0$ % rdg. $\pm 4$ dgt.		$\pm 2.0$ % rdg. $\pm 4$ dgt. (at 4000 counts)	
Temperature (K)	—	—	-40 to 850 °C (-40 to 1562°F)	—	-40 to 1372 °C (-40 to 2502°F)
(J)	—	—	-40 to 650 °C (-40 to 1202°F)	—	—
RS-232C	○ (Optional 3854 required)			○ (Optional 3852 required)	
MAX/MIN/AVE	—	○	○	○	○
Relative value	—	○	○	○	○
4-20 mA percentage	—	○	○	—	—
Harmonic percentage	—	—	○	—	—
2-point temp. difference	—	—	○	—	—
dBm	—	—	—	—	○
AC+DC mode	—	—	—	—	○
1ms peak hold	—	—	—	—	○
Pulse and timer output	—	—	—	—	○
Power source	6F22 manganese battery $\times 1$ (approx. 200 hours continuous DC V use with the 3803, approx. 100 hours use with the 3804 and 3805, and approx. 50 hours use with the 3801 and 3802)				
Model	3803	3804	3805	3802	3801

## Models 3801 to 3805 have been designed with emphasis on safety.

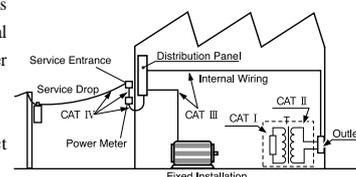
Models 3801 to 3805 bear CE markings and conform to standards such as the IEC61010-1 international safety standard and EMC related standards. Further, these handy units have been designed with an emphasis on safety, and come equipped with a standard 600 V fast blow fuse in the current connector and a cushioned holster that provides protection against shock in the event of accidental droppage.

### Overvoltage category (CAT)

In order to promote the safe use of measuring instruments, safety level standards are classified under IEC60664 into overvoltage categories CAT I through IV, depending on the location where the instrument is to be used. Categories with a higher number indicate an electrical environment that has high levels of instantaneous energy. Therefore, a measuring instrument designed for CAT III can endure higher instantaneous energy than an instrument designed for CAT II. The 3801 to 3805 are rated as CAT II at 1000 V and as CAT III at 600 V.

CATII: Primary electrical circuits in equipment connected to a wall outlet via a power cord.

CATIII: Circuits between primary and distribution panels and outlets in equipment that reads electricity from the direct distribution panel via electrical reads (fixed equipment).



# All units suitable for use with (3801 to 3805) Computer measurement! (RS-232C communication)



## 3852 (for the 3801 and 3802), 3854 (for the 3803 to 3805) RS-232C PACKAGE

Example of data fetch screen for the 3852 RS-232C PACKAGE (optional)

Record : Stop Buffer Size : 32700 Count : 40 Interval : 1 Sec COM 1

Primary AC Voltage  
MAX : 14:40:25 104.61 V  
MIN : 14:38:22 101.87 V

Secondary Frequency  
MAX : 14:39:53 60.044 Hz  
MIN : 14:38:19 59.988 Hz

	AC Voltage	Frequency
00031 14:40:50	104.41 V	60.042 Hz
00032 14:40:51	104.41 V	60.042 Hz
00033 14:40:52	104.36 V	60.042 Hz
00034 14:40:53	104.38 V	60.040 Hz
00035 14:40:54	104.42 V	60.034 Hz
00036 14:40:55	104.42 V	60.027 Hz
00037 14:40:56	104.18 V	60.027 Hz
00038 14:40:57	104.18 V	60.027 Hz
00039 14:40:58	104.51 V	60.031 Hz
00040 14:40:59	104.36 V	60.033 Hz

3852, 3854 specifications  
(Optional, provided with the 3801-01)



- Operating system: Windows 95, 98, 4.0 NT\*1
- Connector: D-sub 9 pin
- Cable length: approximately 2 m
- Fetch interval: 1 to 999 sec
- F buffer size: Maximum 32700
- Additional: Header setting / file saving in text file format

\*1. Windows is a registered trademark of Microsoft Corporation.

The optional 3852 and 3854 RS-232C packages consist of a communication cable and software for transferring data captured by the 3800 series. This facilitates efficient data management by allowing test data to be saved in text format, meaning that the difficult and demanding work of creating tables of test results can now be done on a personal computer equipped with commercially available spreadsheet software.

Example of data fetch screen for the 3801 dual display.

Files can be saved in text file format

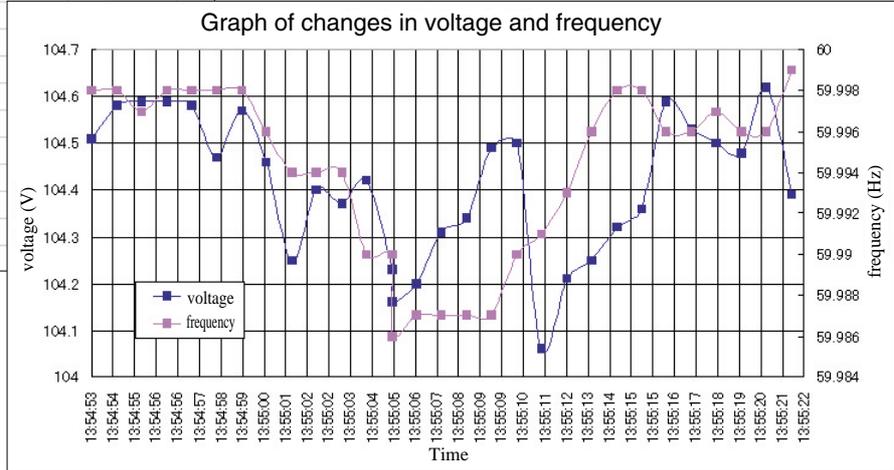
```

Multi-Display MultiMeter Test Report
-----
File Path = C:\USERS\YHI-HIRO\TEMP\YESCORT\F
Record Date and Time: Start = 06-22-1998 10:51:05 End = 0
Sample Interval = 1 Second
Sampling Mode = Auto Mode
Records = 30
Primary : AC Voltage
Secondary : Frequency
Count Time Primary Secondary
00001 10:51:05 104.63 V 60.012 Hz
00002 10:51:05 104.60 V 60.012 Hz
00003 10:51:06 104.69 V 60.011 Hz
00004 10:51:07 104.63 V 60.010 Hz
00005 10:51:08 104.75 V 60.019 Hz
    
```

### An example of spreadsheet management in EXCEL\*

	A	B	C	D	E
1	1	13:59:56	103.9 V		60.041 Hz
2	2	13:59:57	103.95 V		60.041 Hz
3	3	13:59:58	103.95 V		
4	4	13:59:59	103.88 V		
5	5	14:00:00	103.88 V		
6	6	14:00:01	103.77 V		
7	7	14:00:02	103.65 V		
8	8	14:00:03	103.8 V		
9	9	14:00:04	103.75 V		
10	10	14:00:05	103.64 V		
11	11	14:00:06	103.84 V		
12	12	14:00:06	104.03 V		

\*EXCEL is a registered trademark of Microsoft Corporation.



## The 3801 is suitable for various measurement and analysis needs

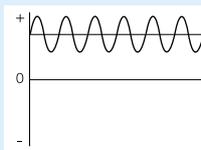


The 3801 provides the following measurement functions in addition to those of the 3802.

- AC+DC measurement function
- Peak hold function
- LCD panel with backlight
- Hz (frequency) [measurement range: 1 Hz to 10 MHz]
- Duty [measurement range: 0.1% to 99.9%]
- Pulse width [measurement range: 0.1 ms to 1999 ms]
- dBm [measurement range: -80.79 to 81.48 dBm]
- Temperature [meter measurement range: -40°C to 1372°C (-40 to 2502°F)]  
Temperature measurement requires the optional 9180 to 9475 temperature probe.
- Pulse output [setting range: 0.5 Hz to 4800 Hz]
- Timer output [setting range: 1 s to 99.999 s]

### ■ AC+DC Measurement Function

Measures the AC components in direct current.

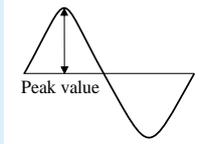


(AC+DC)V accuracy:  
(AC V accuracy  $\pm 0.1\%$  rdg.  $\pm 5$  dgt.)  
(AC+DC)A accuracy:  
(AC A accuracy  $\pm 0.2\%$  rdg.  $\pm 5$  dgt.)

The number of digits error is 10 times greater when in the 40000 count mode

### ■ 1 ms Peak Hold Mod

This mode makes it possible to capture the peak value of a waveform, allowing measurement of instantaneous peak values when motors are turned on and enabling calculation



of crest factors by calculating true RMS values.

● (V-A accuracy  $\pm 2\%$  rdg.  $\pm 43$  dgt.)

The number of digits error is 10 times greater when in the 40000 count mode

### ■ dBm Display Mode

Range	Resolution	Accuracy
-80.79~81.48dBm	0.01dBm	$\pm 0.3$ dBm

● Reference impedance:

4/8/16/32/50/75/93/110/125/135/150/200/250/300/500/600/800/900/1000/1200Ω

Expression by which values measured by the voltage measurement function are converted to dBm:  $\text{dBm} = 10 \log_{10} [1000 \times V \times V / (\text{reference impedance})]$

### ■ Temperature Measurement Function

Temperature can be measured by connecting the optional 9180 to 9183 or 9472 to 9476 temperature probe.

Range	Resolution	Meter accuracy
-40°C~1372°C	1°C	$\pm 0.3\%$ rdg. $\pm 3^\circ\text{C}$
-40°F~2502°F	1°F	$\pm 0.3\%$ rdg. $\pm 6^\circ\text{F}$

### ■ Frequency Functions

In addition to frequency measurement with voltage functions, frequency functions are provided to enable high accuracy measurements of a wide range of frequencies.

Division ratio 1 When 2nd display shows "-1-"

Range	Resolution (@ 4000 f.s.)	Accuracy at 4000 f.s.	Sensitivity	Min. measurement
100 Hz	0.01Hz (0.001Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	1Hz
1 kHz	0.1Hz (0.01Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	1Hz
10 kHz	1Hz (0.1Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	1Hz
100 kHz	10Hz (1Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	1Hz
200 kHz	100Hz (10Hz)	is not rated	100mV rms	1Hz

Division ratio 2 When 2nd display shows "-100-"

Range	Resolution (@ 4000 f.s.)	Accuracy at 4000 f.s.	Sensitivity	Min. measurement
100 Hz	0.01Hz (0.001Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	50Hz
1 kHz	0.1Hz (0.01Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	50Hz
10 kHz	1Hz (0.1Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	50Hz
100 kHz	10Hz (1Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	100mV rms	50Hz
1 MHz	100Hz (10Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	500mV rms	50Hz
10 MHz	1 kHz (100Hz)	$\pm 0.002\%$ rdg. $\pm 1$ dgt.	500mV rms	50Hz

Duty ratio (0.1 to 99.9%):  $\pm 0.3\%$ /kHz  $\pm 0.3\%$  (at respect to f.s.)

Pulse duration (0.1ms to 1999ms):  $\pm 0.2\%$ rdg.  $\pm 3$ dgt. (rating for a pulse width at least 10μs)

Accuracy rating pertains to a square wave of 5Vp-p.

The number of digits error is 10 times greater when in the 40000 count mode.

### ■ Pulse / Timer Output Function

This function is capable of providing control and reference signals for use with design installation systems and electronic circuits.

- Frequency settings: 0.5/1/2/10/50/60/75/100/150/200/300/600/1200/1600/2400/4800Hz
- Range of duty ratio variability: 1% to 99%
- Maximum timer setting: 99.999s
- Timer output signal: 1. High  $\rightarrow$  Low Level (3V $\rightarrow$ 0V) / 2. Low pulse output (pulse duration: 0.8 ms to 6.67 ms) / 3. Low  $\rightarrow$  High Level / 4. High pulse output
- Frequency/timer setting accuracy:  $\pm 0.4\%$
- Amplitude: +3V  $\pm$  0.2V (fixed)
- Output impedance: 3.5kΩ (Max.)

## ■ 3801/3802 common specifications (accuracy at 23°C±5°C (73°F±9°F), 80% rh or less)

Measurement accuracy is rated for the 4000 count mode. The accuracy of rdg. for the 40000 count mode is as shown in the table, but the dgt. error is greater by a factor of 10.

### ●DC voltage (V)

Range	Resolution (at 40000 f.s.)	Accuracy at 4000 f.s.	Input impedance
40 mV	10μV (1μV)	±0.08%rdg.±5dgt.	Approx. 1000MΩ
400 mV	0.1mV (1μV)	±0.06%rdg.±3dgt.	Approx. 1000MΩ
4 V	1mV (0.1mV)	±0.06%rdg.±3dgt.	Approx. 10MΩ
40 V	10mV (1mV)	±0.06%rdg.±3dgt.	Approx. 10MΩ
400 V	0.1V (10mV)	±0.06%rdg.±3dgt.	Approx. 10MΩ
1000 V	1V (0.1V)	±0.06%rdg.±3dgt.	Approx. 10MΩ

### ●AC voltage (V)

Range	Resolutio (nat 40000 f.s.)	Accuracy at 4000 f.s.		
		50Hz/60Hz	45Hz to 5kHz	5kHz to 20kHz
40 mV	10μV (1μV)	±0.7%rdg.±5dgt.	±1.5%rdg.±5dgt.	±2.0%rdg.±5dgt.
400 mV	0.1mV (1μV)	±0.7%rdg.±5dgt.	±1.5%rdg.±5dgt.	±2.0%rdg.±5dgt.
4 V	1mV (0.1mV)	±0.7%rdg.±5dgt.	±1.5%rdg.±5dgt.	±2.0%rdg.±5dgt.
40 V	10mV (1mV)	±0.7%rdg.±5dgt.	±1.5%rdg.±5dgt.	±2.0%rdg.±5dgt.
400 V	0.1V (10mV)	±0.7%rdg.±5dgt.	±1.5%rdg.±5dgt.	±2.0%rdg.±5dgt.
750 V	1V (0.1V)	±0.7%rdg.±5dgt.	±3.0%rdg.±5dgt.	±2.0%rdg.±5dgt.

For the 3802, frequency accuracy is rated for the range 45 Hz to 1 kHz. For this range of frequencies, accuracy in all ranges is ±1.5% rdg. ±5 dgt. For 50/60 Hz, accuracy is ±0.7% rdg. ±5 dgt. Input impedance: Approx. 1000 MΩ (in mV range, Approx 10 MΩ (in V range)

### ●AC/DC current (A)

Range	Resolution (at 40000 f.s.)	Accuracy at 4000 f.s.	Internal resistance
400 μA	0.1μA (10nA)	±0.2%rdg.±3dgt.	Approx. 100Ω
4000μA	1μA (0.1μA)		Approx. 100Ω
40 mA	10μA (1μA)	±1.0%rdg.±5dgt.	Approx. 1Ω
400 mA	0.1mA (10μA)		Approx. 1Ω
4 A	1mA (0.1mA)	3801 ; 45 to 2kHz 3802 ; 45 to 1kHz	Approx. 0.01Ω
10 A	10mA (1mA)		Approx. 0.01Ω

Accuracy of AC current measurements is rated for inputs greater than 5% of full scale.

### ●Resistance (Ω) / Continuity check

Range	Resolution (at 40000 f.s.)	Accuracy at 4000 f.s.	Open-circuit terminal voltage
400 Ω	0.1Ω (0.01Ω)	±0.2%rdg.±3dgt.	Approx. 3.3 V
4 kΩ	1Ω (0.1Ω)	±0.2%rdg.±3dgt.	Approx. 1.28V
40 kΩ	10Ω (1Ω)	±0.2%rdg.±3dgt.	Approx. 1.28V
400 kΩ	100Ω (10Ω)	±0.2%rdg.±3dgt.	Approx. 1.28V
4 MΩ	1kΩ (100Ω)	±0.2%rdg.±3dgt.	Approx. 1.28V
40 MΩ	10kΩ (1kΩ)	±1.0%rdg.±5dgt.	Approx. 1.28V
40 n S	0.01nS (0.01nS)	±1.0%rdg.±10dgt.	Approx. 1.28V

A built-in buzzer sounds (the continuity check function operates) when the resistance value is less than 100 dgt. in any range (1000 dgt. at 40000 f.s.).

The 3802 does not have a 40nS range.

## ■ 3801 to 3805 general specifications

●Measurement method: double integration ●AC measurement: average value system (3803, 3804), true RMS value measurement (3801, 3802, 3805) ●Crest factor: 3.0 max. ●Ancillary functions: common to all 5 units - auto range, hold, auto power save, battery life warning; 3801, 3802 only - current input terminal connection error warning ●Display: 3801, 3802 - 40000 max. or 4000, 21-dot bar graph; 3803, 3804, 3805 - 4000 max. (9999 with the V range of the 3804, 3805), 41-dot bar graph display ●Sampling rate: 2.5 samples/sec (3803), 3 samples/sec (3801, 3802 with the 4000-count mode in other than the Hz position, or 3803/3804/3805 in other than the Hz position), 1 sample/sec (3801, 3802 with the 4000-count mode in the Hz position, or 3805 in the Hz position), 4 sec/sample to 4 samples/sec (when measuring pulse width/duty with the 3801), 20 samples/sec (3801, 3802 bar graph), approx. 13 samples/sec (3803, 3804, 3805 bar graph) ●Range selection: auto and manual ●Overload protection: 3801, 3802; DC V / AC V / AC + DC V / dBm / peak hold; 600 V DC / 600 VAC rms (sin) or 10<sup>6</sup> VHz in mV range, 1200 VDC / 850 VAC rms (sin) or 10<sup>6</sup> VHz, Ω / °C / continuity / diode; 600 VDC / AC rms (sin), DC A / AC A / AC +DC A; 1A / 600 V fuse for the ranges from 400 μA to 400 mA, 15A / 600 V fuse for A range, °C; 600 VDC/AC rms (sin), 3803 to 3805; V range; 1000 V DC / AC rms (sin) or 10<sup>6</sup> VHz, Ω / C / continuity / diode / °C ; 600 V DC / AC rms (sin), DC A / AC A; 0.5A / 600 V fuse for the ranges from 400 μA to 400 mA, 10A / 600 V fuse for the range 4, 10A ●Applicable standards: safety; EN61010-1:1993+A2: 1995 CAT II (1000V), CAT III (600V), 3803, 3804, 3805; UL 3111-1, CAN/CSA-C22.2 No.1010-1-92, CAN/CSA-C22.2 No.1010.2.031-94 EMC; EN61326 ●Ambient temperature of use: 0 to 50°C (32°F to 122°F) 80%rh (no condensation) ●Storage temperature range: -20 to 60°C (-4°F to 140°F) 80%rh (no condensation) ●Power source: 6F22 manganese battery×1 ●Dimensions and mass: 3801/3802; Approx. 90 W×192 H×37 D mm, 640g (Approx 3.5" W×7.6" H×1.5" D, 22.6 oz.), 3803 to 3805; Approx. 76 W×167 H×33 D mm, approx. 400g (Approx 3.0" W×6.6" H×1.3" D, 14.2 oz.) (including holster and battery)

### ●capacitance (C)

Range	Resolution	Accuracy	Overload protection
4 nF	1 pF	±2.5%rdg.±6dgt.	600V DC/AC rms(sin)
40 nF	10 pF	±2.5%rdg.±6dgt.	600V DC/AC rms(sin)
400 nF	100pF	±2.0%rdg.±4dgt.	600V DC/AC rms(sin)
4 μF	1 nF	±5.0%rdg.±4dgt.	600V DC/AC rms(sin)
40 μF	10 nF	±5.0%rdg.±4dgt.	600V DC/AC rms(sin)
400 μF	100nF	±5.0%rdg.±4dgt.	600V DC/AC rms(sin)
9999μF	1 μF	±6.0%rdg.±4dgt.	600V DC/AC rms(sin)

Accuracy in the 9999μF range is rated to 2000μF. Accuracy above 2000μF is not rated.

### ●Frequency at V function (Hz)

Range	Resolution (at 40000 f.s.)	Accuracy at 4000 f.s.	Min. measurement
100 Hz	0.01Hz (0.001Hz)	±0.02%rdg.±1dgt.	10 Hz
1 kHz	0.1Hz (0.01Hz)	±0.02%rdg.±1dgt.	10 Hz
10 kHz	1Hz (0.1Hz)	±0.02%rdg.±1dgt.	10 Hz
100 kHz	10Hz (1Hz)	±0.02%rdg.±1dgt.	10 Hz
200 kHz	100Hz (10Hz)	±0.02%rdg.±1dgt.	10 Hz

Input range	Input level (rms-sinwave)	
	40Hz to 20kHz	10Hz to 200kHz
40 mV	10mV to 400mV	(not rated) to 400mV
400 mV	30mV to 4V	40mV to 400mV
4 V	0.3V to 40V	0.4V to 40V
40 V	3V to 400V	4V to 400V
400 V	30V to 1000V	40V (100kHz or less) to 1000V
1000 V	300V to 1000V	400V (100kHz or less) to 1000V

### ●Diode check

Range	Resolution (with 40000 f.s.)	Accuracy at 4000 f.s.	current	voltage
Diode	1mV (0.1mV)	±1.0%rdg.±2dgt. Beeps at 100mV or less	Approx. 1.65 mA	Approx. 3.3V

### ■ Only with the 3801

●Duty ratio (5.0 to 95.0%): ±0.3%/kHz±0.3% (at respect to f.s.)

●Pulse duration (0.1 ms to 1999 ms): ±0.2%rdg.±3dgt.  
(rated for pulse durations of at least 10μs)

Accuracy rating pertains to a square wave of 5Vp-p.

■ 3803/3804/3805 common specifications (accuracy at 23°C±5°C (73°F±9°F), 80% rh or less)

●3803 AC / DC voltage (V)

Range	Resolution	3803 DC V accuracy	3803 AC V accuracy	Input impedance
400 mV	0.1mV	±0.6%rdg.±2dgt.	±2.0%rdg.±10dgt.	10MΩ
4 V	1mV	±0.6%rdg.±2dgt.	±2.0%rdg.±2dgt.	10MΩ
40 V	10mV	±0.6%rdg.±2dgt.	±2.0%rdg.±2dgt.	10MΩ
400 V	0.1V	±0.6%rdg.±2dgt.	±2.0%rdg.±2dgt.	10MΩ
1000 V	1V	±0.6%rdg.±2dgt.	±2.2%rdg.±5dgt.	10MΩ

●3805 Frequency at V function (Hz)

Range	accuracy	Min. measurement	Input range	Input level (ms-sinwave)
9.999 Hz	±0.05%rdg.±4dgt.	1 Hz	20Hz to 15kHz	
99.99 Hz	±0.05%rdg.±4dgt.	1 Hz	999.9mV	0.7V
999.9 Hz	±0.05%rdg.±4dgt.	1 Hz	9.999 V	0.8V
9.999 kHz	±0.05%rdg.±4dgt.	1 Hz	99.99 V	8 V
50.00kHz	±0.05%rdg.±4dgt.	1 Hz	999.9 V	100V

AC V accuracy is rated for the frequency ranges 40 Hz to 500 Hz.

Ampere functions also available

●3804, 3805 AC / DC voltage (V)

Range	Resolution	3804 DC V accuracy	3805 DC V accuracy	3804 AC V accuracy		3805 AC V accuracy			Input impedance
				40Hz to 200Hz	200Hz to 500Hz	40Hz to 200Hz	200Hz to 500Hz	500Hz to 2kHz	
999.9 mV	0.1mV	±0.3%rdg.±5dgt.	±0.2%rdg.±5dgt.	±2.5%rdg.±5dgt.	not rated	±2.5%rdg.±5dgt.	not rated	not rated	15MΩ
9.999 V	1mV	±0.3%rdg.±2dgt.	±0.1%rdg.±2dgt.	±1.2%rdg.±5dgt.	±1.5%rdg.±5dgt.	±1.1%rdg.±6dgt.	±1.1%rdg.±6dgt.	±2.0%rdg.±6dgt.	10MΩ
99.99 V	10mV	±0.3%rdg.±2dgt.	±0.1%rdg.±2dgt.	±1.2%rdg.±5dgt.	±1.5%rdg.±5dgt.	±1.1%rdg.±5dgt.	±1.1%rdg.±5dgt.	±2.0%rdg.±6dgt.	10MΩ
999.9 V	0.1V	±0.5%rdg.±5dgt.	±0.4%rdg.±5dgt.	±1.2%rdg.±5dgt.	±1.5%rdg.±5dgt.	±1.1%rdg.±5dgt.	±1.1%rdg.±5dgt.	not rated	10MΩ

Accuracy of 3805 AC V is rated for inputs greater than 5% of full scale. When inputs are less than 5mV, 20 dgt. (3804)/45 dgt. (3805) are added.

●AC/DC current (A)

Range	Resolution	3803 DC A accuracy	3804 DC A accuracy	3805 DC A accuracy	3803 AC A accuracy	3804 AC A accuracy	3805 AC A accuracy	Internal resistance
400 μA	0.1μA	±1.5%rdg.±2dgt.	±0.3%rdg.±3dgt.	±0.2%rdg.±3dgt.	40Hz to 500Hz ±2.0%rdg.±2dgt.	40Hz to 500Hz ±1.2%rdg.±5dgt.	40Hz to 500Hz ±1.0%rdg.±5dgt.	100(500)Ω
4000 μA	1μA	±1.5%rdg.±2dgt.	±0.2%rdg.±3dgt.	±0.1%rdg.±3dgt.				100(50)Ω
40 mA	10μA	±1.5%rdg.±2dgt.	±0.3%rdg.±3dgt.	±0.2%rdg.±3dgt.	no range	500Hz to 2kHz ±1.8%rdg.±5dgt.	500Hz to 2kHz ±1.5%rdg.±5dgt.	1 (5) Ω
400 mA	0.1mA	±1.5%rdg.±2dgt.	±0.2%rdg.±3dgt.	±0.1%rdg.±3dgt.				1 (0.5) Ω
4 A	1mA	no range	±0.4%rdg.±4dgt.	±0.3%rdg.±3dgt.	no range	500Hz to 2kHz ±1.8%rdg.±5dgt.	500Hz to 2kHz ±1.5%rdg.±5dgt.	0.01 Ω
10 A	10mA	±1.5%rdg.±5dgt.	±0.5%rdg.±4dgt.	±0.3%rdg.±3dgt.				0.01(0.05)Ω

AC A accuracy is rated for inputs greater than 5% of full scale.

( ) : 3803

●Resistance (Ω) / Continuity check

Range	Resolution	3803 accuracy	3804 accuracy	3805 accuracy	Open-circuit terminal voltage
400 Ω	0.1Ω	±0.6%rdg.±3dgt.	±0.6%rdg.±3dgt.	±0.5%rdg.±3dgt.	Approx. 3.3 V <sup>*1</sup>
4 kΩ	1Ω	±0.6%rdg.±3dgt.	±0.6%rdg.±3dgt.	±0.5%rdg.±3dgt.	Approx. 3.3 V <sup>*1</sup>
40 kΩ	10Ω	±0.6%rdg.±3dgt.	±0.6%rdg.±3dgt.	±0.5%rdg.±3dgt.	Approx. 1.28V <sup>*2</sup>
400 kΩ	100Ω	±0.6%rdg.±3dgt.	±0.6%rdg.±3dgt.	±0.5%rdg.±3dgt.	Approx. 1.28V <sup>*2</sup>
4 MΩ	1kΩ	±1.2%rdg.±3dgt.	±1.0%rdg.±3dgt.	±0.8%rdg.±3dgt.	Approx. 1.28V <sup>*2</sup>
40 MΩ	10kΩ	±2.0%rdg.±3dgt.	±2.0%rdg.±3dgt.	±1.2%rdg.±3dgt.	Approx. 1.28V <sup>*2</sup>

A built-in buzzer sounds (the continuity check function is triggered) when the resistance value is less than 100 dgt. (less than 345 dgt. with the 3803).

\*1. Approx. 1.2 V with the 3803 \*2. Approx. 0.45 V with the 3803

●Diode check

Range	Resolution	Accuracy	current	voltage
Diode	1mV	±1.0%rdg.±2dgt.	0.7mA (3803:1.65mA)	3.3V (3803:3V)

With the 3804/3805, a built-in buzzer sounds at voltages less than 100 mV

●3804, 3805 capacitance (C)

Range	Resolution	Accuracy
4 μF	1 nF	±2.0%rdg.±4dgt.
40 μF	10 nF	±2.0%rdg.±4dgt.
400 μF	100nF	±3.5%rdg.±4dgt.
9999μF	1 μF	±3.5%rdg.±5dgt.

Accuracy in the 9999μF range is rated to 2000μF. Accuracy above 2000μF is not rated.

■ The 3805 is ideal for maintenance of refrigerating systems and air conditioners



■ Simultaneous measurement of temperatures at two points

Temperatures may be measured simultaneously at two points by thermocouple (K or J type); (with the display switchable between the two measurements). Further, 2-point temperature differences (Δt) can be displayed, making the unit ideal for measuring temperature differences such as those between the air conditioner's cooling unit (liquid) and air outlet (gas).

Thermocouple	Range	Resolution	Meter accuracy
K	-40°C~850°C	1°C	±0.3%rdg.±3°C
	-40°F~1562°F	1°F	±0.3%rdg.±6°F
J	-40°C~650°C	1°C	±0.3%rdg.±3°F
	-40°F~1202°F	1°F	±0.3%rdg.±6°F

Accuracy of the optional temperature probe is additive.

For details on the temperature probe (thermocouple K type: optional), refer to the separate 3441, 3442 TEMPERATURE HITESTER catalog.

Item	9472	9473	9474	9475	9183	9180	9476	9181	9182	
Thermocouple material	K type (Chromel/Almel)									
Tolerance	The greater of ±1.5°C(2.7°F) or ±0.4% of measured temperature					The greater of ±2.5°C(4.5°F)* <sup>1</sup>				
Response (90%)*	About 5 sec	About 10 sec	About 5 sec	About 10 sec	About 5 sec		About 3 sec		About 5 sec	
Compensation conductor	General use (-20°C to 90°C, -4°F to 194°F) 1 m									
Grip heat resistance	80°C (176°F)				150°C (302°F)		80°C (176°F)	150°C (302°F)	90°C (194°F)	
Max use temperature	300°C (572°F)	800°C (1472°F)	300°C (572°F)	500°C (932°F)	750°C (1382°F)		500°C (932°F)	400°C (752°F)	750°C (1382°F)	

\* Sheath type: Responsiveness in ice water at 0°C (32°F) and in boiling water at 100°C(212°F), Surface type: Responsiveness on a metal surface at 0°C (32°F) and at 100°C(212°F)

\*<sup>1</sup> 9180, 9182: The greater of ±2.5°C(4.5°F) or ±0.75% of measured temperature

9476: (-0.03 × T)<sup>2</sup>°C to +2.5°C at 100°C<(T - Ts)

9181: (-0.035 × T)<sup>2</sup>°C to +2.5°C at 100°C<(T - Ts)

T: measured temperature, Ts: environmental temperature

## ■ Introducing related products

The DMM features a terminal shutter to prevent incorrect operation.



average value true RMS value

**3256-51 • 3257-51 DIGITAL HiTESTER**

### V range

Only V and COM terminals are open.



### μmA range

Only mA and COM terminals are open.



CAT III 600V  
(3256 only)  
CAT III 1000V  
(3257 only)

### ■ specifications

DC voltage	: 420 m/4.2/42/420/1000 V (±0.5%rdg.±2dgt.)
DC current	: 42 μ/420 μ/4200 μ/42 m/420 m/10 A (±1.5%rdg.±4dgt.)
AC voltage	: 420 m/4.2/42/420/1000 V (±1.2%rdg.±3dgt./50 to 500 Hz/4.2 V)
AC current	: 42 μ/420 μ/4200 μ/42 m/420 m/10 A (±2.5%rdg.±5dgt./50 to 500 Hz)
Resistance	: 420/4.2 k/42 k/420 k/4.2 M/42 MΩ(±0.7%rdg.±2dgt./4.2 k to 420 kΩ)
Continuity check	: A built-in buzzer sounds when the resistance value is less than 50±30 Ω in any range
Frequency	: 0.5 Hz to 500 kHz (±0.02%rdg.±1dgt.)
Duty ratio	: 5 to 95% (±1.0%rdg.±15dgt./10 Hz to 1 kHz, ±1.0% rdg.)
(3257 only)	: ±50dgt./1 kHz to 10 kHz
Sampling rate	: 2.5 samples/s

## A signal generator with multi-function DMM



**7015 SIGNAL SOURCE**



CAT II 250V

### As a signal generator

- Regulated DC voltage [range: ±1.5000 V/ ±15.000 V]
- Regulated DC current [range: ±25.000 mA]
- Pulse [0.5 Hz to 4800 Hz, 5 V/12 V/ ±5 V/ ±12 V]

### As a DMM

- DC voltage [range: 40 mV to 300 V]
- AC voltage [range: 40 mV to 300 V]
- AC/DC voltage [range: 40 mA to 400 mA]
- Resistance [range: 400 Ω to 40 M Ω]
- Frequency [measurement range: 1 Hz to 200 kHz]
- Continuity/Diode checking
- Temperature [-40°C to 1000°C (-40°F to 1832°F)]
- AC + DC value measurement, 1 ms peak hold function, etc.

## 3801 DIGITAL HiTESTER

3801-01 DIGITAL HiTESTER (with 3852 included)

## 3802 DIGITAL HiTESTER

## 3803 DIGITAL HiTESTER

## 3804 DIGITAL HiTESTER

## 3805 DIGITAL HiTESTER

(All include 3851-10 TEST LEAD and holster)



cord length 1m

3851-10 TEST LEAD (include)



3853 CARRYING CASE (optional)

### Option (\*No CE marking)

3852 RS-232C PACKAGE (For 3801, 3802)

3853 CARRYING CASE

3854 RS-232C PACKAGE (For 3803, 3804, 3805)

9180 SHEATH TYPE TEMPERATURE PROBE (3801 only)

9181 SURFACE TYPE TEMPERATURE PROBE (3801 only)

9182 SHEATH TYPE TEMPERATURE PROBE (3801 only)

9183 SHEATH TYPE TEMPERATURE PROBE (3801 only)

9472 SHEATH TYPE TEMPERATURE PROBE

9473 SHEATH TYPE TEMPERATURE PROBE

9474 SHEATH TYPE TEMPERATURE PROBE

9475 SHEATH TYPE TEMPERATURE PROBE

9476 SURFACE TYPE TEMPERATURE PROBE

\*9617 CLIP ON BASE (For capacitance measurement with the 3801, 3802, 3804, 3805)

\*9618 CLIP TYPE LEAD (For capacitance measurement with the 3801, 3802, 3804, 3805)

\*9014 HIGH VOLTAGE PROBE

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