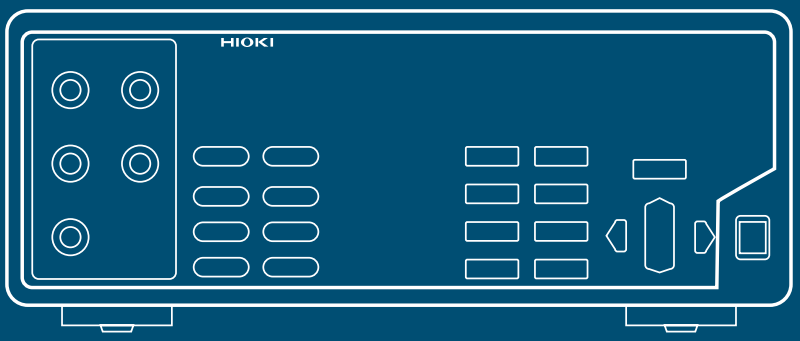
CATALOGO STRUMENTI

Ricerca & Sviluppo

MISURE PRIMARIE

MULTIMETRI



TECNOLOGIA

HIOKI

asita

TECNOLOGIE DI MISURA

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  - MULTIMETRI
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- **SENSORI e ACCESSORI**

HIOKI

DIGITAL HiTESTER 3237, 3238, 3239

4-terminal Ω function 3239
Advanced model 3238
Economically priced 3237

Outstanding performance for production lines with a sampling rate of 3.3 ms

High-speed 5 1/2 digit DMM

The DIGITAL HiTESTERs 3237, 3238, and 3239 can perform 3.3 ms high-speed sampling, and come equipped with a comparator, external input and output, and an RS-232C interface. These three high-performance DMMs can be used not only in laboratories, but in production lines that require the minimal tact time.

The 3237 is the basic model, and is equipped with the basic necessary functions. The 3238 is a high-precision, broadband model that also features current measurement terminals and a frequency measurement function. The 3239 includes the functions of the 3238 plus the 4-terminal resistance measurement function. All three units are designed with emphasis on measurement speed and safety.

CE

3.3 ms/sample High-speed Performance and Reliability

Features

■ Samples at rates of up to 300 samples/sec. (3.3 ms/sample)
■ Comparator function provides high-speed pass/fail evaluation
■ Equipped with external input and output for sequence control
■ Useful Save/Load function helps work go faster

The 3237, 3238 and 3239 are equipped with a variety of functions that help minimize tact time in production lines.

For details, see page 2.

■ Low power resistance measurement function prevents sample deterioration

The 3237, 3238 and 3239 use a low power Ω function to minimize sample degradation when measuring resistance. With this function, open terminal voltage never goes over 0.45 V DC, and measurement current never surpasses 100 µA DC.

For specifications, see pages 5 and 6.

Sampling speed Values in the ( ) show samples/second.

Frequency	FAST*	MEDIUM	SLOW
50 Hz	3.3 ±1 ms (300)	130 ±5 ms (8)	1,040 ±50 ms (1)
60 Hz	3.3 ±1 ms (300)	108 ±5 ms (9)	1,080 ±50 ms (1)

* Approximately 55 ms required for self-calibration at 30-minute intervals. Does not apply at resistances higher than 2MΩ, or LPΩ higher than 200kΩ (see page 5).
For the 3238 and 3239's frequency function gate time, see page 5.

■ True RMS value measurement

Both the 3237 and 3238 use true RMS measurement for determination of distorted waveforms. In fact, HIOKI guarantees accuracy of the 3238 and 3239 for AC voltage of 10 Hz to 300 kHz, and AC current of 10 Hz to 30 kHz.

For specifications, see pages 5 and 6.

■ Interface supports full remote operation

Measurement can be automated by using a controller to operate the 3237 or 3238 through the GP-IB or RS-232C interface.

For details, see page 3.

■ Select from 3 types of units

The basic and economical 3237

✓ DC V basic accuracy: ±0.025% rdg.±2dgt.

The high-accuracy & multi-functional 3238

✓ DC V basic accuracy: ±0.01% rdg.±2dgt.
✓ Includes frequency measurement for AC and DC A

For 4-terminal resistance measurement 3239

✓ DC V basic accuracy: ±0.01% rdg.±2dgt.
✓ All the functions of the 3238, plus 4-terminal Ω measurement

		3237	3238	3239
⎓V	DC voltage [5 ranges, 199.999 mV to 1000.00 V]	✓	✓	✓
~V	AC voltage [4 ranges, 1999.99 mV to 700.00 V]	✓	✓	✓
Ω 2-terminal	Resistance [7 ranges, 199.999 Ω to 100.000 MΩ]	✓	✓	✓
LPΩ 2-terminal	Resistance LP [4 ranges, 1999.99 Ω to 1999.99 MΩ]	✓	✓	✓
	Continuity check [A buzzer sounds when resistance is less than 50.00 Ω]	✓	✓	✓
	Diode check [Anode-cathode voltage in the 1999.99 mV range]	✓	✓	✓
~CLAMP	Current measurement by clamp sensor	✓	✓	✓
⎓A ~A	AC/DC current [2 ranges, 199.999 mA and 1999.99 mA]		✓	✓
Hz	Frequency [5 ranges, 99.9999 Hz to 300.000 kHz]		✓	✓
Ω 4-terminal	Resistance [5 ranges,199.999 Ω to 1999.99 kΩ]			✓
LPΩ 4-terminal	Resistance LP [4 ranges,1999.99 Ω to 1999.99 MΩ]			✓

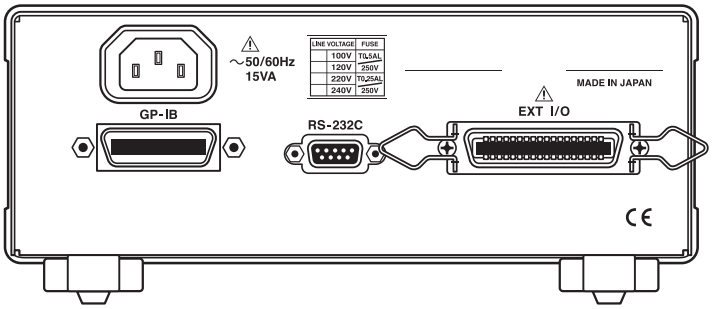
For clamp specifications, see page 4
For DIGITAL HiTESTER specifications, see pages 5 and 6

■ Reliable resistance measurement using the 4-terminal measurement method

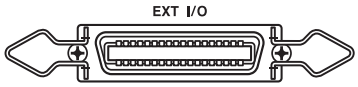
Using 4-terminal resistance measurement, which is unaffected by variables such as measurement lead wiring resistance, the 3239 displays outstanding resistance measurement capabilities.

Minimizing tact time with sequence control

High-speed comparator and external input/output

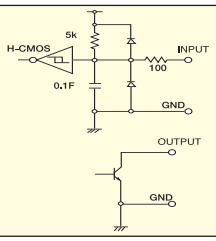


■ EXT.I/O



Connector used: 57RE-40360-730B (D29) (DDK Ltd.)
Conforming connector: ADS-HC360001-010 (Honda Tsushin Kogyo Co., Ltd.), 57-30360 (DDK Ltd.) and other suitable connectors

Loading of saved settings from panel.....LOAD 0 to 4
Measurement start trigger input.....TRIG
Measurement end signal output.....EOC
Comparator output.....Hi, IN, Lo
Internal power supply +5 V (max. 50 mA).....INT. DC V
Internal GND.....INT. GND



Input type: CMOS level
Signal voltage: Hi 3.8 V to 5.0 V, Lo 0 V (shorted) to 1.2 V
Logic: Negative logic (Low active)

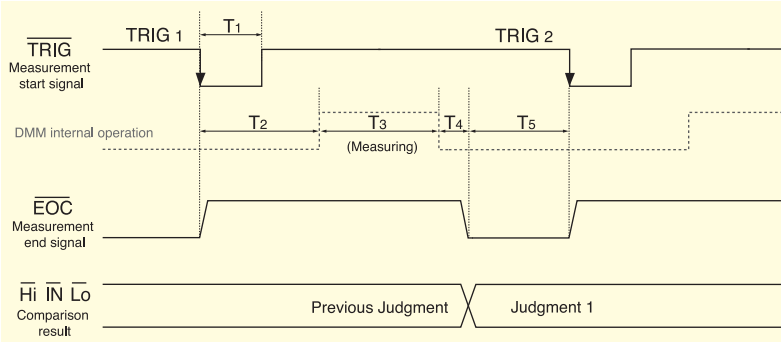
Output type: Open collector
Applied voltage: Max. 35 V DC, 50 mA
Logic: Negative logic (Low active)

● Comparator with external output COMP

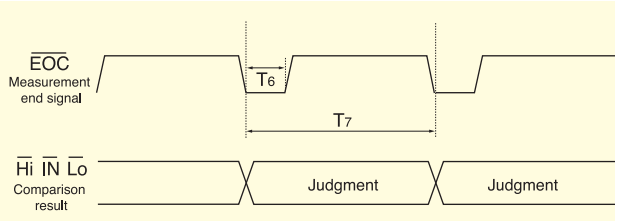
You can set the upper and lower limits, and display one of 3 results: Hi, IN or Lo. In addition to LED and buzzer results, open collector output results are provided through the external input/output terminals.

X: measurement value, H: Upper limit, L: Lower limit
X > H.....Hi
H ≧ X ≧ L.....IN
L > X.....Lo

M.TRIG With external control



INT. TRIG With free running measurement



			Time MIN.	TYP.	MAX.
T1	Measurement trigger pulse width		500 μs	…	…
T2	Trigger delay time		See below		
T3	Sampling time using external control	FAST	See the table at the top right of page 1.		
		MEDIUM			
		SLOW			
T4	Internal operation time		…	2.0 ms	…
T5	From the end of measurement until the next trigger		500 μs	…	…
T6	EOC Lo level time for free running measurement	FAST	…	1.7 ms	…
		MEDIUM	…	50 ms	…
		SLOW	…	500 ms	…
T7	Sampling time for free running measurement	FAST	See the table at the top right of page 1.		
		MEDIUM			
		SLOW			

■ Save/Load function for rapid response to various work situations

You can save and recall a maximum of 30 DMM setting conditions for various range and comparator values.

SAVE LOAD

■ A trigger delay designed for measurement safety

The 3237, 3238 and 3239 are equipped with a trigger delay function that can be set to manual or automatic for the time period between trigger input and the display of the comparator result (see T2 in the figure above).

Manual settings: Designate periods in terms of millisecond intervals between 0.000 s and 9.999 s
Automatic settings:

	FAST	MEDIUM	SLOW
DC V	3 ms	3 ms	3 ms
AC V	500 ms	800 ms	1.5 s
Ω (200Ω to 200 kΩ)	3 ms	3 ms	3 ms

Automation of Line Inspection

Available interfaces

GP-IB

■ GP-IB (option –01 specifications)

Purpose: Remote control and measurement value output

Standards conformance : IEEE -488.1 1987

Reference standard : IEEE –488.2 1987

Transmission speed

(reference data)

Power line frequency: 60Hz

TRIG: EXT.Trig

Command: [:READ ?]

	FAST	MEDIUM	SLOW
Transmission speed	7.0 ms	108 ms	1,080 ms

Controller: PC-9801 RA (NEC)

OS: MS-DOS Ver. 3.30, N88-BASIC Ver. 6.0

Interface function:

SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, CO

User code : ASCII code

User connector : 24-pin IEEE488 interface bus connector

RS-232C

■ RS-232C (standard)

Purpose: Remote control and measurement value output

Transmission system : Asynchronous method Full duplex

Transmission speed : 9600 bps (fixed)

Data bit length : 8 bits

Stop bits : 1

Parity bits : None

Delimiter : CR+LF

Handshaking : Hardware

XON/XOFF : Not used

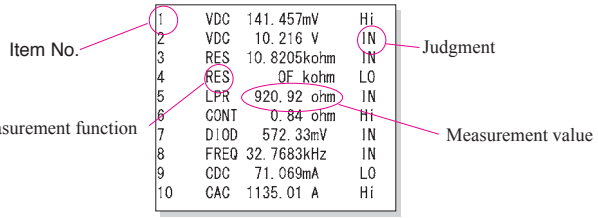
Connector : 9-pin D-sub connector

All functions except switching the power on and off can be completely remote controlled and measurement data collected via either the GP-IB or RS-232C interface

Please inquire regarding compatibility with the command sets of other manufacturers.

■ Output data to a printer (option)

When an RS-232C compatible PRINTER 9442 is connected, you can print measurements by pressing the M.TRIG key if in manual trigger mode, or the ENT key if in internal trigger (free run) mode.



■ The printer can also be controlled using a foot switch.

As an alternative to pressing the M.TRIG key or the ENT key, you can also connect a foot switch to the external I/O TRIG terminal. You can then initiate printing by stepping on the foot switch (closing the circuit).

PRINTER 9442

CONNECTOR CABLE 9444

Cord length approx 1.5m

AC ADAPTER 9443

9443-02 (For the EU)

9443-01 (For Japan)

Please specify appropriate model number suffix when ordering.

Printing method : Thermal serial dot matrix

Paper width : 112 mm

Printing speed : 52.5cps

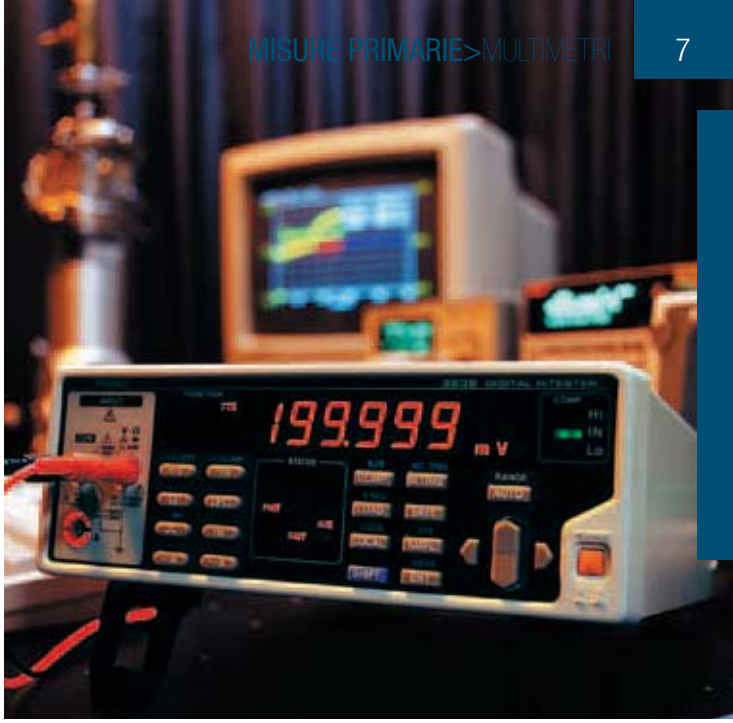
Power supply : AC ADAPTER 9443 or supplied nickel-hydride battery (capable of printing about 3000 lines on full charge from 9443)

Dimensions and mass : Approx. 160W × 66.5H × 170D mm; approx. 580 g

When you purchase a PRINTER 9442, you must also purchase a CONNECTION CABLE 9444 and a AC ADAPTER 9443 to connect it to the DMM.

Efficient Evaluation Testing

PC measurement using the high accuracy and broad coverage of the 3238 and 3239



Example of data processing with Microsoft Excel

■ Highly accurate measurement with minimal drift

The unit uses self-regulation to suppress drift. Also, the DMM is ideal for collecting data over extended periods of time.

■ Using Excel for efficient data processing

The DMM supports fast data processing by allowing you to transfer data directly to a worksheet through either the GP-IB or RS-232C interface.

Consult your nearest HIOKI dealer for details on software

■ Supports large AC current measurement by clamp sensor

■ Easy setup ～CLAMP

Both the 3237, 3238 and 3239 can measure live line currents using an optional clamp sensor. Enter the name of the clamp sensor being used and display current values simply by selecting a range.

CLAMP ON SENSOR	9010-50	9018-50	9132-50
CONVERSION ADAPTER 9704 Receive: BNC Output: Banana	 CE cord length 3m (requires the 9704)	 CE cord length 3m (requires the 9704)	 CE cord length 3m (requires the 9704)
Rated current	10/20/50/100/200/500 A AC		20/50/100/200/500/1000 A AC
Accuracy (23°C ±3°C, 45 to 66Hz)	±2 %rdg. ±1 %f.s.	±1.5 %rdg. ±0.1 %f.s.	±3 %rdg. ±0.2 %f.s.
Frequency characteristics (deviation from the basic accuracy)	at 40 Hz to 1 kHz ±6 % (10, 20A range) ±3 % (50 to 500A range)	at 40 Hz to 3 kHz ±1 % max	at 40 Hz to 1 kHz ±1 % max
Max. permissible input (cont.) (45 to 66Hz)	150 Arms (10 to 50A ranges) 400 Arms (100, 200A ranges) 650 Arms (500A range)		1000 Arms
Maximum rated voltage to earth	600 Vrms (850 Vpeak) insulated conductor		
Measurable conductor diameter	ϕ46 mm		ϕ55 mm or 80×20 mm bus bar
Dimensions and mass	Approx. 78W×188H×35D mm, 420g		Approx. 100W×224H×35D mm, 600g

Clamp sensor settings screen

From the menu's clamp sensor selection screen, select the name of the sensor with the cursor key and press the ENT key. Then, select the same range as you set for the sensor with the cursor key.

* The accuracy of the clamp sensors shown on the left (when used with the DMM) is calculated by taking: the difference in the AC V accuracy for the DMM (dgt.) × 10 (dgt.).
For the AC V accuracy of the DMM, see page 6.

■ 3237, 3238, 3239 common specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

● DC voltage (DC V)

Range	Resolution	Full scale	Input impedance	Overload protection
200 mV	1 µV	199.999mV	Greater than 100MΩ	1000 V DC 750 V AC However, less than 10^7 V Hz
2000 mV	10 µV	1999.99mV	Greater than 100MΩ	
20 V	100 µV	19.9999 V	Appox. 11 MΩ	
200 V	1 mV	199.999 V	Appox. 10 MΩ	
1000 V	10 mV	1000.00 V	Appox. 10 MΩ	

● AC voltage (AC V)

Range	Resolution	Full scale	Input impedance	Overload protection
2000 mV	10 µV	1999.99mV	Appox. 1 MΩ	600 V DC 750 V rms, 1000Vpeak However, less than 10^7 V Hz
20 V	100 µV	19.9999 V	Appox. 1 MΩ	
200 V	1 mV	199.999 V	Appox. 1 MΩ	
700 V	10 mV	750.00 V	Appox. 1 MΩ	

● Resistance (Ω) 2-terminal measurement

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
200 Ω	1 mΩ	199.999 Ω	Appox. 1 mA	6V DC max.	500Vpeak
2000 Ω	10 mΩ	1999.99 Ω	Appox. 1 mA	6V DC max.	
20 kΩ	100 mΩ	19.9999kΩ	Appox. 100µA	6V DC max.	
200 kΩ	1 Ω	199.999kΩ	Appox. 10µA	6V DC max.	
2000 kΩ	10 Ω	1999.99kΩ	Appox. 1 µA	6V DC max.	
20 MΩ	100 Ω	19.9999MΩ	Appox. 100nA	6V DC max.	
100 MΩ	1 kΩ	100.000MΩ	Appox. 20nA	6V DC max.	

For fast sampling in the 20 MΩ range or higher.

Frequency	FAST*	MEDIUM	SLOW
50 Hz	20 ±1 ms	170 ±5 ms	1,360 ±50 ms
60 Hz	16.7 ±1 ms	142 ±5 ms	1,420 ±50 ms

For sampling at in the 2 MΩ range or the LPΩ 200 kΩ.range or higher

Frequency	FAST*
50 Hz	20 ±1 ms
60 Hz	16.7 ±1 ms

* Approximately 55 ms required for self-calibration at 30-minute intervals.

● Resistance (Ω) at Low Power function 2-terminal measurement

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
2000 Ω	10 mΩ	1999.99 Ω	Appox. 100µA	0.45V DC max.	500Vpeak
20 kΩ	100 mΩ	19.9999kΩ	Appox. 10µA	0.45V DC max.	
200 kΩ	1 Ω	199.999kΩ	Appox. 1 µA	0.45V DC max.	
2000 kΩ	10 Ω	1999.99kΩ	Appox. 100nA	0.45V DC max.	

● Continuity check

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
2000 Ω	10 mΩ	1999.99 Ω	Appox. 100µA	0.45V DC max.	500 Vpeak

A built-in buzzer sounds when the resistance value is less than 50.00 Ω.

● Diode check

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
2000 mV	10 µV	1999.99mV	Appox. 1 mA	6V DC max.	500 Vpeak

■ 3238, 3239 specifications (Accuracy at 23˚C±5˚C (73˚F±9˚F), 80% rh or less)

● AC/DC current (A)

Range	Resolution	Full scale	Internal resistance	Overload protection
200 mA	1 µA	199.999mA	Appox. 1 Ω	250V, 2A fuse
2000 mA	10 µA	1999.99mA	Appox. 100 m Ω	

● DC current (DC A) Accuracy %, ppm=reading error, d=digit error

Range	Sampling			Thermal coefficient
	SLOW	MEDIUM	FAST	
200 mA	±0.1 %±6d	±0.1 %±10d	±0.1 %±300d	±100ppm±0.6d
2000 mA	±0.15%±6d	±0.15%±10d	±0.15%±300d	±150ppm±0.6d

● AC current (AC A) 200mA range Accuracy %, ppm=reading error, d=digit error

● AC current (AC A) 2000mA range Accuracy

Range	Frequency	Sampling			Thermal coefficient	Sampling			Thermal coefficient
		SLOW	MEDIUM	FAST		SLOW	MEDIUM	FAST	
All Ranges	10 Hz to 20 Hz	±1.0%±200d	undefined	undefined	±0.1 %±20d	±1.2%±200d	undefined	undefined	±0.12%±20d
	20 Hz to 45 Hz	±0.4%±200d	undefined	undefined	±400ppm±20d	±0.6%±200d	undefined	undefined	±600ppm±20d
	45 Hz to 300 Hz	±0.3%±100d	±0.5%±200d	undefined	±300ppm±10d	±0.4%±100d	±0.6%±200d	undefined	±400ppm±10d
	300 Hz to 1 kHz	±0.3%±100d	±0.4%±200d	±0.4%±300d	±300ppm±10d	±0.4%±100d	±0.6%±200d	±0.6%±300d	±400ppm±10d
	1 kHz to 3 kHz	±0.3%±100d	±0.4%±200d	±0.4%±300d	±300ppm±10d	±0.6%±200d	±0.6%±200d	±0.6%±300d	±600ppm±20d
	3 kHz to 10 kHz	±0.5%±300d	±0.5%±300d	±0.5%±400d	±500ppm±30d	±1.2%±300d	±1.2%±300d	±1.2%±400d	±0.12%±30d
	10 kHz to 30 kHz	±1.0%±300d	±1.0%±300d	±1.0%±400d	±0.1 %±30d	undefined	undefined	undefined	undefined

Specified input is 16 mA or higher

Specified input is 160 mA or higher

Additional error due to crest factor: 1<CF≦2: ±200d, 2<CF≦3: ±500d, 3<CF: Outside the assured accuracy range

● Frequency (Hz) Source is AC V only and input level is higher than 8% of full scale

Range	Resolution	Full scale	Internal resistance	Min. measurement	Overload protection
100 Hz	0.1 mHz	99.9999 Hz	Appox. 1M Ω	10 Hz	600 V DC 750 V rms, 1000Vpeak However, less than 10^7 V Hz
1 kHz	1 mHz	999.999 Hz	Appox. 1M Ω	10 Hz	
10 kHz	10 mHz	9.99999kHz	Appox. 1M Ω	10 Hz	
100 kHz	100mHz	99.9999kHz	Appox. 1M Ω	10 Hz	
300 kHz	1 Hz	999.999kHz	Appox. 1M Ω	10 Hz	

● Frequency (Hz) Accuracy %, ppm=reading error, d=digit error

Range	For all gate times	Thermal coefficient
	Square-wave input between 10 Hz to 300 kHz, 10 V p-p.	
All Ranges	±0.015% ±2d	±5 ppm

Frequency gate time

FAST	MEDIUM	SLOW
15 ±6 ms	110 ±10 ms	1,010 ±20 ms

Measurement time: from gate time to the input signal period × 2

■ 3239 specifications (Accuracy at 23˚C±5˚C (73˚F±9˚F), 80% rh or less)

● Resistance (Ω) 4-terminal measurement

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
200 Ω	1 mΩ	199.999 Ω	Appox. 1 mA	6V DC max.	V, Ω terminal 500Vpeak SENSE terminal 400Vpeak
2000 Ω	10 mΩ	1999.99 Ω	Appox. 1 mA	6V DC max.	
20 kΩ	100 mΩ	19.9999kΩ	Appox. 100µA	6V DC max.	
200 kΩ	1 Ω	199.999kΩ	Appox. 10µA	6V DC max.	
2000 kΩ	10 Ω	1999.99kΩ	Appox. 1 µA	6V DC max.	

● Resistance (Ω) at Low Power function 4-terminal measurement

Range	Resolution	Full scale	Current	Open terminal voltage	Overload protection
2000 Ω	10 mΩ	1999.99 Ω	Appox. 100µA	0.45V DC max.	V, Ω terminal 500Vpeak SENSE terminal 400Vpeak
20 kΩ	100 mΩ	19.9999kΩ	Appox. 10µA	0.45V DC max.	
200 kΩ	1 Ω	199.999kΩ	Appox. 1 µA	0.45V DC max.	
2000 kΩ	10 Ω	1999.99kΩ	Appox. 100nA	0.45V DC max.	

● 3237 DC voltage (DC V) Accuracy %, ppm=reading error, d=digit error

Range	Sampling			Thermal coefficient
	SLOW	MEDIUM	FAST	
200 mV	±0.026%±6d	±0.026%±10d	±0.035%±300d	±20ppm±0.6d
2000mV	±0.025%±2d	±0.025%±8d	±0.03%±100d	±15ppm±0.2d
20 V	±0.028%±5d	±0.028%±10d	±0.035%±100d	±20ppm±0.5d
200 V	±0.028%±2d	±0.028%±8d	±0.035%±100d	±20ppm±0.2d
1000 V	±0.028%±2d	±0.028%±8d	±0.035%±100d	±20ppm±0.2d

CMRR (50/60Hz Rl=1kΩ): SLOW 130dB, MEDIUM 90dB, FAST 20dB NMRR (50/60Hz): SLOW 70dB, MEDIUM 50dB, FAST 0dB

● 3238, 3239 DC voltage (DC V) Accuracy %, ppm=reading error, d=digit error

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
±0.012%±6d	±0.012%±10d	±0.02%±300d	±12ppm±0.6d
±0.01 %±2d	±0.01 %±8d	±0.015%±100d	±10ppm±0.2d
±0.016%±5d	±0.016%±10d	±0.02%±100d	±16ppm±0.5d
±0.016%±2d	±0.016%±8d	±0.02%±100d	±16ppm±0.2d
±0.016%±2d	±0.016%±8d	±0.02%±100d	±16ppm±0.2d

● 3237 AC voltage (AC V) Accuracy %, ppm=reading error, d=digit error

Range	Frequency	Sampling			Thermal coefficient
		SLOW	MEDIUM	FAST	
All Ranges	10 Hz to 20 Hz	±1.5%±200d	undefined	undefined	±0.15%±20d
	20 Hz to 45 Hz	±0.5%±200d	undefined	undefined	±500ppm±20d
	45 Hz to 300 Hz	±0.2%±100d	±0.5%±300d	undefined	±200ppm±10d
	300 Hz to 3 kHz	±0.2%±100d	±0.2%±200d	±0.2%±300d	±200ppm±10d
	3 kHz to 10 kHz	±0.3%±200d	±0.3%±200d	±0.3%±300d	±300ppm±20d
	10 kHz to 30 kHz	±1.5%±600d	±1.5%±600d	±1.5%±700d	±0.15%±60d
	30 kHz to 50 kHz	undefined	undefined	undefined	undefined
	50 kHz to 100kHz	undefined	undefined	undefined	undefined
	100kHz to 300kHz	undefined	undefined	undefined	undefined

● 3238, 3239 AC V Accuracy %, ppm=reading error, d=digit error

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
±0.8%±200d	undefined	undefined	±800ppm±20d
±0.2%±200d	undefined	undefined	±200ppm±20d
±0.1%±100d	±0.3%±200d	undefined	±100ppm±10d
±0.1%±100d	±0.1%±200d	±0.1%±300d	±100ppm±10d
±0.1%±100d	±0.1%±200d	±0.1%±300d	±100ppm±10d
±0.3%±400d	±0.3%±400d	±0.3%±500d	±300ppm±40d
±0.3%±400d	±0.3%±400d	±0.3%±500d	±300ppm±40d
±1.5%±1000d	±1.5%±1000d	±1.5%±1100d	±0.15%±100d
±5.0%±5000d	±5.0%±5000d	±5.0%±5000d	±0.5%±500d

The accuracy above is standard for inputs higher than 8% of full scale (higher than 160 V for a range of 750 V).
Additional error due to crest factor: 1<CF<2: ±200d, 2<CF<3: ±0.2%rdg.±500d(3237), ±500d(3238, 3239), 3<CF: Outside the assured accuracy range

● 3237 Resistance (Ω) Accuracy %, ppm=reading error, d=digit error

Measure-ment	Range	Sampling			Thermal coefficient
		SLOW	MEDIUM	FAST	
2-terminal measurement	200 Ω	±0.05 %±8d	±0.05 %±18d	±0.05%±300d	±50ppm±0.8d
	2000 Ω	±0.05 %±2d	±0.05 %±12d	±0.05%±100d	±50ppm±0.2d
	20 kΩ	±0.05 %±2d	±0.05 %±12d	±0.05%±100d	±50ppm±0.2d
	200 kΩ	±0.05 %±2d	±0.05 %±12d	±0.05%±200d	±50ppm±0.2d
	2000 kΩ	±0.05 %±2d	±0.05 %±12d	±0.05%±200d	±50ppm±0.2d
	20 MΩ	±0.3 %±4d	±0.3 %±20d	±0.3 %±200d	±300ppm±0.4d
	100 MΩ	±3.0 %±10d	±3.0 %±50d	±3.0 %±500d	±0.3%±1d

● 3238, 3239 Resistance (Ω) Accuracy %, ppm=reading error, d=digit error

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
±0.03 %±8d	±0.03 %±18d	±0.03%±300d	±30ppm±0.8d
±0.02 %±2d	±0.02 %±12d	±0.02%±100d	±20ppm±0.2d
±0.02 %±2d	±0.02 %±12d	±0.02%±100d	±20ppm±0.2d
±0.02 %±2d	±0.02 %±12d	±0.02%±200d	±20ppm±0.2d
±0.03 %±2d	±0.03 %±12d	±0.03%±200d	±30ppm±0.2d
±0.2 %±4d	±0.2 %±20d	±0.2 %±200d	±200ppm±0.4d
±3.0 %±10d	±3.0 %±50d	±3.0 %±500d	±0.3%±1d

After zero adjustment. When measuring high resistance, use a shielded cable such as the 9236 CONNECTION CORD (1.7m).

● 3237 Resistance (Ω) Accuracy at Low Power function

Measure-ment	Range	Sampling			Thermal coefficient
		SLOW	MEDIUM	FAST	
2-terminal measurement	2000 Ω	±0.05 %±6d	±0.05 %±14d	±0.05 %±300d	±50ppm±0.6d
	20 kΩ	±0.05 %±6d	±0.05 %±14d	±0.05 %±300d	±50ppm±0.6d
	200 kΩ	±0.05 %±6d	±0.05 %±14d	±0.05 %±300d	±50ppm±0.6d
	2000 kΩ	±0.3 %±6d	±0.3 %±20d	±0.3 %±500d	±300ppm±0.6d

● 3238, 3239 Resistance (Ω) Accuracy at Low Power function

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.2 %±6d	±0.2 %±20d	±0.2 %±300d	±200ppm±0.6d

After zero adjustment. When measuring high resistance, use a shielded cable such as the 9236 CONNECTION CORD (1.7m).

● 3237 Continuity check Accuracy %, ppm=reading error, d=digit error

Range	Sampling	Thermal coefficient
	FAST only	
2000 Ω	±0.05 %±300d	±50ppm±0.6d

● 3238, 3239 Continuity check Accuracy %, ppm=reading error, d=digit error

Sampling	Thermal coefficient
FAST only	
±0.02 %±300d	±20ppm±0.6d

● 3237 Diode check Accuracy %, ppm=reading error, d=digit error

Range	Sampling			Thermal coefficient
	SLOW	MEDIUM	FAST	
2000 Ω	±0.025% ±2d	±0.025% ±8d	±0.03% ±100d	±15ppm±0.2d

● 3238, 3239 Diode check Accuracy %, ppm=reading error, d=digit error

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
±0.01 %±2d	±0.01 %±8d	±0.015%±100d	±10ppm±0.2d

4-terminal measurement
● Resistance (Ω) Accuracy %, ppm=reading error, d=digit error

Measure-ment	Range	Sampling			Thermal coefficient
		SLOW	MEDIUM	FAST	
4-terminal measurement	200 Ω	±0.03 %±8d	±0.03 %±18d	±0.03 %±300d	±30ppm±0.8d
	2000 Ω	±0.02 %±2d	±0.02 %±12d	±0.02 %±100d	±20ppm±0.2d
	20 kΩ	±0.02 %±2d	±0.02 %±12d	±0.02 %±100d	±20ppm±0.2d
	200 kΩ	±0.02 %±2d	±0.02 %±12d	±0.02 %±200d	±20ppm±0.2d
	2000 kΩ	±0.03 %±2d	±0.03 %±12d	±0.03 %±200d	±30ppm±0.2d

4-terminal measurement
● Resistance (Ω) Accuracy at Low Power function

Sampling			Thermal coefficient
SLOW	MEDIUM	FAST	
No range	No range	No range	No range
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.02 %±6d	±0.02 %±14d	±0.02%±300d	±20ppm±0.6d
±0.2 %±6d	±0.2 %±20d	±0.2 %±300d	±200ppm±0.6d

The accuracy quoted above is for a contact resistance of 100 Ω or less.

■ 3237, 3238, 3239 General Specifications

- **AC measurement:** True RMS value measurement
- **Crest factor:** 3.0 max.
- **Ancillary functions:** Comparator, Average (0 to 99 times), Zero Adjust, Trigger (the display changes when the trigger is activated), and the Save/Load functions. (Up to 30 types of setting conditions)
- **Interface:** External input/output, RS-232C and GP-IB (option -01 specifications)
- **Display:** LED max. 199999 (999999 for frequency)
- **Sampling rate** (see page 1): SLOW approx. 1 samples/s
  MEDIUM approx. 8 to 9 samples/s
  FAST approx. 300 samples/s (Does not apply at resistances higher than 2MΩ, or LPΩ higher than 200kΩ)
  (self-calibration takes place for approximately 55 ms at 30-minute intervals for FAST sampling only.)
- **Range selection:** Auto and Manual
- **Applicable standards: Safety:** EN61010-1, EN61010-031
  Lo terminal: CAT II (300V)
  Hi terminal: CAT II (600V)
  EMC: EN61326-1
- **Ambient temperature of use:** 0 to 40 ˚C(32˚F to 104˚F) 80%RH (no condensation)
- **Storage temperature range:** -10 to 50˚C(-14˚F to 122˚F) 70%RH (no condensation)
- **Power supply:** Select from AC 100 V/120 V/220 V/240 V, (50/60 Hz) specify when ordering
- **Maximum rated power:** 15 VA
- **Dimensions and mass:** Approx. 215 mm (8.46 in) W × 80 mm (3.15 in) H × 265 mm (10.43 in) D, 2.6 kg (91.7 oz)

DIGITAL HiTESTER **3237, 3238, 3239**

(Economical Type)
Model : DIGITAL HiTESTER 3237

Model No. (Order Code)	(Note)
3237	(built-in RS-232C)
3237-01	(built-in RS-232C & GP-IB)

(Advanced Type)
Model : DIGITAL HiTESTER 3238

Model No. (Order Code)	(Note)
3238	(built-in RS-232C)
3238-01	(built-in RS-232C & GP-IB)

(4-terminal Ω function & Advanced Type)
Model : DIGITAL HiTESTER 3239

Model No. (Order Code)	(Note)
3239	(built-in RS-232C)
3239-01	(built-in RS-232C & GP-IB)

Accessories (each models) : Test lead L9170-10 ×1, Instruction manual ×1, Power cord ×1, Spare fuse each 1

*L9170-10 is a bundled accessory. *Requires the 9704 to connect a Clamp-on probe

Input Probes


TEST LEAD L9170-10
70 cm (2.30 ft) length


CLAMP ON PROBE
9132-50 ... 1000 A AC
9010-50 ... 500 A AC
9018-50 ... 500 A AC


CONVERSION ADAPTER 9704
*Receiving end: Female BNC; Output end: Male banana-plug *Not compatible with older generation Memory Hicorders with banana input terminals*

Printer options


PRINTER 9442
For printing numerical values 112 mm (4.41 in) paper width


AC ADAPTER 9443-02
For the Printer 9442, EU type


CONNECTION CABLE 9444
9 pin - 9 pin straight, 1.5 m (4.92 ft) length


RECORDING PAPER 1196
For the Printer 9442, 112 mm (4.41 in) × 25 m (82.03 ft), 10 rolls/set

PC communication

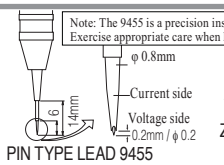

RS-232C CABLE 9637
For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length


RS-232C CABLE 9638
For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length


GP-IB CONNECTOR CABLE 9151-02
2 m (6.56 ft) length

4-Terminal measurement probes


PIN TYPE LEAD 9461
A:240 mm (9.45 in), B:132 mm (5.20 in), L:804 mm (2.64 ft)



PIN TYPE LEAD 9455
A:260 mm (10.24 in), B:136 mm (5.35 in), L:890 mm (2.92 ft)

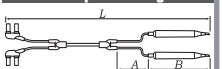

ZERO ADJUSTMENT BOARD 9454
For the L2100, 9465-10, 9465, 9461


FOUR TERMINAL LEAD 9453
A:280 mm (11.02 in), B:118 mm (4.65 in), L:1360 mm (4.46 ft), 60V DC


CLIP TYPE LEAD 9452
A:220 mm (8.66 in), B:197 mm (7.76 in), L:1360 mm (4.46 ft)


CLIP TYPE LEADS L2107
A:130 mm (5.12 in), B:83 mm (3.27 in), L:1100 mm (3.61 ft), 70 VDC

About probe length



A: From junction to probe
B: Probe part
L: Whole length

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HIOKI E.E. CORPORATION

TECNOLOGIA

HIOKI

Le tecnologie di misura Hioki sono ampiamente e globalmente utilizzate per manutenzione, controllo qualità, ricerca e sviluppo, in ambito industriale, aziendale e delle infrastrutture, contribuendo alla sicurezza ed alla protezione del nostro vivere quotidiano.
L'azienda supporta inoltre lo sviluppo delle tecnologie di nuova generazione nei settori automotive ed energie rinnovabili, favorendo la diffusione di prodotti di elevata qualità a prezzi competittivi.
La mission di Hioki è di pordurre e divulgare tecnologie di misura volte a proteggere la sicurezza delle persone e consentire, attraverso il supporto alla ricerca, il progresso della scienza e della tecnica.

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10% del fatturato investito in R&S
250 ingegneri impiegati nella ricerca
30 nuovi prodotti all'anno
100 brevetti depositati all'anno
1200 prodotti a catalogo
800.000 pezzi venduti all'anno
50 ppm (pezzi per milione) indice di difettosità
10.000 prove di apertura e chiusura per testare la durata dei toroidi
1 metro di caduta per testare la resistenza degli strumenti

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