HIOKI

RESISTANCE METER RM3542C

NEW

Measure Faster, Judge Smarter

Automation and quality assurance for the next generation of production testing

HIOKI RM3542C RESISTANCE METER

EXT 300Ω FAST

150.218 Ω   REF 150.0 Ω
+ 0.145 %   UPP +0.500 %
            LOW −0.400 %

CE   3 year Warranty

Proven Foundation

Trusted by production lines worldwide, delivering stable, stress-free, and reliable measurement

RESISTANCE METER RM3542C

Speed—Fast, Accurate, and Flexible

High-speed, high-accuracy testing

Customize Integration Time

- Set the integration time for each measurement range to meet your specific production needs.
- Short integration time: maximize takt time and throughput on production lines.
- Long integration time: ensure stability and repeatability for final inspection or high-precision applications.

Default Setting
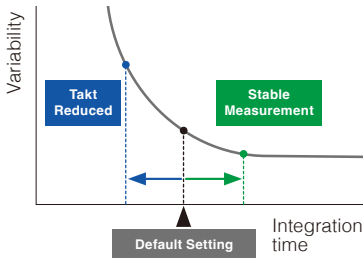
Range	Low power: off		
	Integration Time		
	Fast	Med.	Slow
100 mΩ	0.5 ms	5.0 ms	1 PLC
1000 mΩ	0.3 ms	2.5 ms	1 PLC
100 kΩ	0.5 ms	3.0 ms	1 PLC
1000 kΩ	1.5 ms	5.0 ms	1 PLC

Stability—Consistent Results in Every Environment

Stable and repeatable measurements, even in noisy production environments

Optimized Intermediate Ranges

Intermediate ranges (e.g., 3, 300 Ω) boost S/N ratio, cut variation, and ensure repeatable results—even in noisy lines.

- Achieve Stable Measurements in a Wide Measurement Range
- Intermediate range

Range	Measurement current
100 mΩ	100 mA
1000 mΩ	100 mA
3 Ω	33.3 mA
10 Ω	10 mA
100 Ω	10 mA
300 Ω	3.33 mA
1000 Ω	1 mA
10 kΩ	1 mA
30 kΩ	333 µA
100 kΩ	100 µA
300 kΩ	33.3 µA
1000 kΩ	10 µA
3 MΩ	3.33 µA
10 MΩ	1 µA
30 MΩ	333 nA
100 MΩ	100 nA

300 Ω range

1000 Ω range

150 Ω Measurement Comparison

Example of reduced variation with the improved range

Comparison data with the same sample

Measurement speed: fast

Number of measurements

Number of measurements
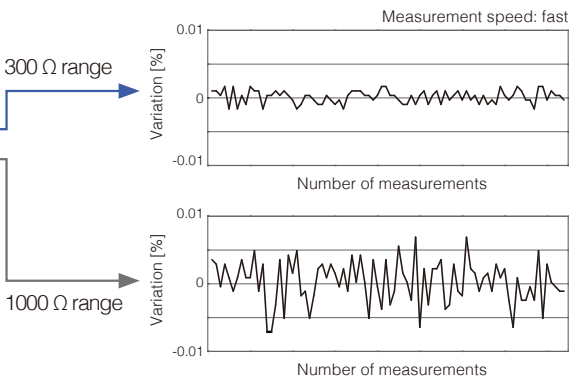
Noise-Resistant Galvanically Isolated Structure

Galvanically Isolated architecture minimizes the effect of external electrical interference. This ensures reliable data even in production lines with high noise levels.

Compliant with **EN61326 Class A** for industrial environments.

Communication area / Control area / Measurement area

PLC | PC
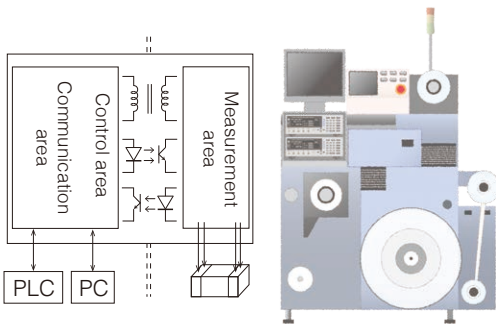
Reliability—Confidence in Every Measurement

Engineered to protect sensitive components and guarantee stable, trustworthy contact for consistent, accurate results

Safe, Stress-Free Testing for Micro-Components

The applied voltage limiter prevents damage by limiting applied voltage to 5 V or less, enabling safe and accurate testing of micro-components such as 008004 size resistors.
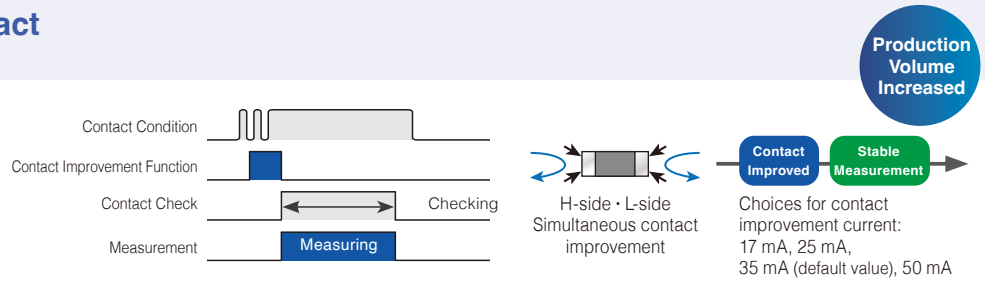
Applied Voltage Limit Function: On

Object under test	Measurement current	Applied voltage
1 kΩ	1 mA	1 V
2 kΩ		2 V
3 kΩ		3 V
4 kΩ		4 V
5 kΩ		5 V
6 kΩ	333 µA	2 V
7 kΩ		2.3 V
8 kΩ		2.6 V
9 kΩ		3 V
10 kΩ		3.3 V

Applied voltage limit function on — Applied voltage limit function off
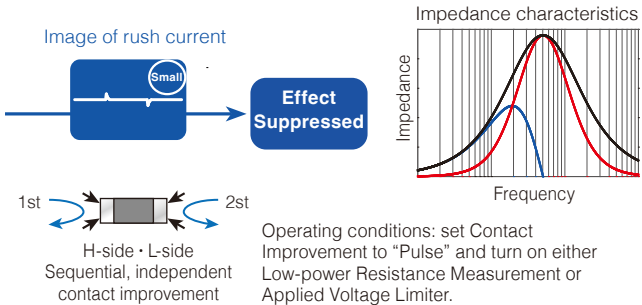
Limit: 5 V
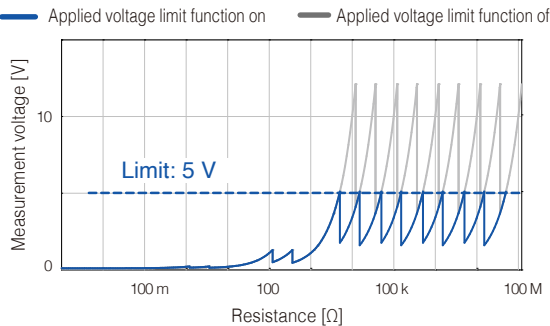
Optimized Probe Contact

Contact Improvement delivers stable probe contact by penetrating oxidation and impurities between probes and DUT, stabilizing measurements and reducing contact error rate. This leads to fewer re-measurements and higher productivity.

Production Volume Increased

H-side · L-side Simultaneous contact improvement

Choices for contact improvement current: 17 mA, 25 mA, 35 mA (default value), 50 mA

Configurable Contact Improvement Settings

By applying Contact Improvement sequentially to the H and L sides, inrush current is suppressed—preventing characteristics shifts in sensitive parts like ferrite beads.

Image of rush current

Effect Suppressed

Impedance characteristics

1st / 2st

H-side · L-side Sequential, independent contact improvement

Operating conditions: set Contact Improvement to "Pulse" and turn on either Low-power Resistance Measurement or Applied Voltage Limiter.

Contact Error Detection & Automatic Correction

Contact & anomaly monitoring: the instrument continuously monitors contact conditions during measurement.
- Contact Check detects probe chatter by monitoring changes in contact resistance.
- Voltage Monitor checks for changes in measured voltage caused by current terminal contact resistance shifts or mechanical noise.

Contact Check

- **Retry Function**
  When probe-bounces are detected, it automatically reinitiates measurement.

Voltage Monitor

Probe contact chattering
Probe deterioration
External noise

Notification on C.E.Volt display and ERR

Notification by outputting a signal
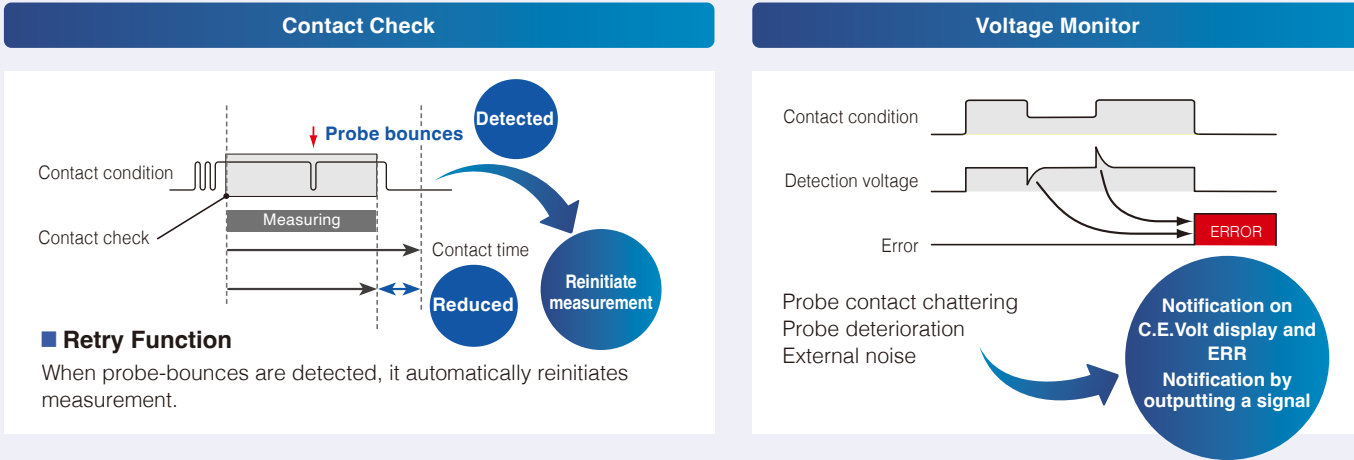
Three Benefits for Smart Testing

Three Innovations That Increase Throughput and Ensure Reliable Testing Results

1. **Shorten jumper resistor inspection time by up to 76 %**
2. **Improve grading and sorting efficiency**
3. **Increase inspection reliability and overall taping machine efficiency**

These three advanced capabilities enhance production efficiency and deliver stable, repeatable measurement quality—even under demanding line conditions.

1 Shorten jumper resistor inspection time by up to 76 % | RM3542C-1 | RM3542C-2 | RM3542C-3
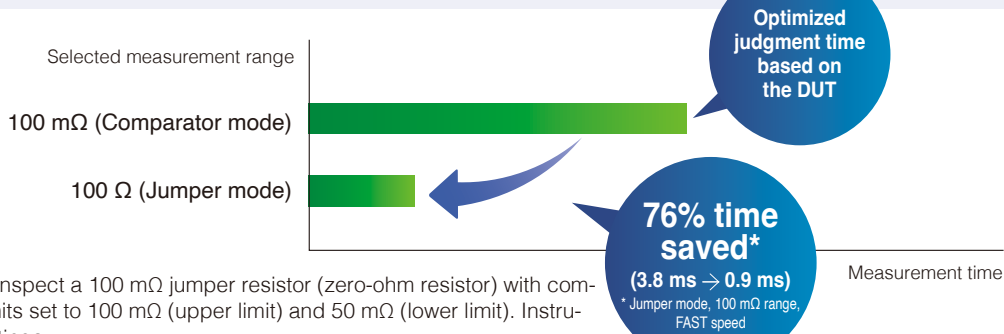
Jumper Resistance Measurement Support Function (Jumper Mode)

This is a feature that speeds up production testing for very low-resistance components, like zero-ohm resistors (jumpers). Normally, testing a component below 100 mΩ requires a long measurement time to ensure ultra-high accuracy. Because this delay can slow down your overall production speed (takt time), Jumper Mode skips the slower, high-accuracy measurement ranges at or below 100 mΩ. This lets you perform a quick, reliable "pass/fail" judgment on jumper resistors, keeping your production throughput high.

Selected measurement range

100 mΩ (Comparator mode)

100 Ω (Jumper mode)

Measurement time

Optimized judgment time based on the DUT

76% time saved*
(3.8 ms → 0.9 ms)
* Jumper mode, 100 mΩ range, FAST speed

Example: inspect a 100 mΩ jumper resistor (zero-ohm resistor) with comparator limits set to 100 mΩ (upper limit) and 50 mΩ (lower limit). Instrument's settings
Measurement speed: fast, Delay 2 (time between application start and measurement): 0 ms

Jumper mode: off

The upper-limit setting automatically selects the 100 mΩ measurement range, with OVC enabled by default.

Measurement time

= (integration time + internal delay + Delay 2) x OVC
= (0.5 ms + 1.4 ms + 0 ms) x 2
= 3.8 ms*

Accuracy

±0.023 mΩ

Jumper mode: on

In Jumper mode, the lower limit is 100 Ω, and the instrument selects the 100 Ω range with OVC turned off by default.
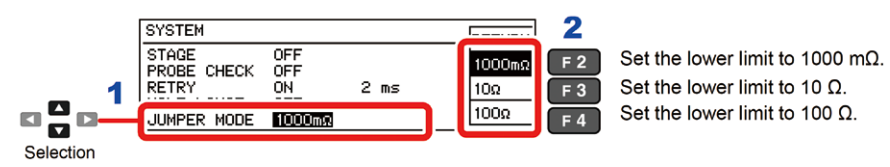
Measurement time

= (integration time + internal delay + Delay 2) x OVC*
= (0.3 ms + 0.6 ms + 0 ms) x 1
= 0.9 ms*

Accuracy

± 0.0030 Ω ± 3.0 mΩ in 100 Ω range
(sufficient for jumper pass/fail)

* OVC multiplier:
on = × 2, off = × 1

1 SYSTEM
STAGE   OFF
PROBE CHECK OFF
RETRY   ON   2 ms
JUMPER MODE 1000mΩ

1000mΩ
10Ω
100Ω

Selection

2
F 2 Set the lower limit to 1000 mΩ.
F 3 Set the lower limit to 10 Ω.
F 4 Set the lower limit to 100 Ω.

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2 Improve grading and sorting efficiency | RM3542C-3

Integrated BIN Measurement Function

Eliminates the complexity and delay of host-system-based grading. The automated function performs judgment and grading inside the instrument and outputs the result directly via I/O. This reduces system workload and response time, and improves efficiency on production lines with strict takt time requirements.

HIOKI RM3542C RESISTANCE METER

INT 100Ω FAST
120.0000 Ω   REF 120.00 Ω
+   UPP +1.000 %
   0.000 %   LOW −1.000 %
MENU
STAT

POWER   COMP Hi IN Lo
GUARD ⚠ L CUR   L POT   H POT   H CUR

■ Select and grade measurement targets using multiple criteria

| BIN0 | BIN1 | BIN2 | BIN3 | BIN4 | BIN5 | BIN6 |

IN   Judgment range
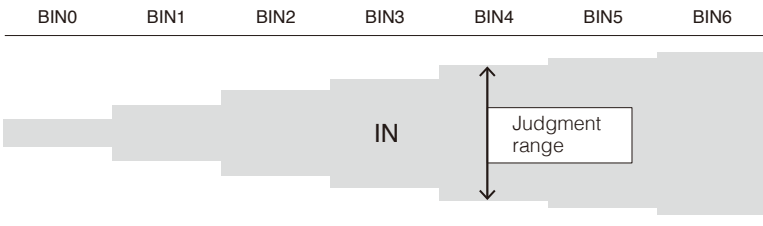
The upper and lower limits for each BIN are set as relative values (%) based on a reference value, enabling classification into a maximum of 7 ranks. Measurement results that do not fall into any BIN are judged as OB (Out of BIN). The judgment result can also be output via the EXT I/O.
(The upper and lower limits are set using communication commands.)

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3 Increase inspection reliability and overall taping machine efficiency | RM3542C-3

ΔR Function

This function compares measurement results from two stages (on one or between separate instruments). For high-reliability chip resistor testing, resistance values must not only fall within target ranges before and after rated voltage stress application but must also remain within a specified percentage difference. This cross-stage auto-judgment automatically compares measurement results from two separate instruments and flags defects when the difference exceeds a threshold. This strengthens inspection reliability and reduces system workload by eliminating complex cross-checks.

Measurement

1st inspection → Rated voltage application → 2nd inspection

Measurement value comparison

Compare ΔR value with threshold
$$\Delta R\ [\%] = (R_{2nd} - R_{1st}) / R_{REF2nd} \times 100$$
R_{REF2nd}: comparator reference value for Measurement 2

Judgment

In range → Good product

Automatic path selection based on test results

Hi/low → Defective product
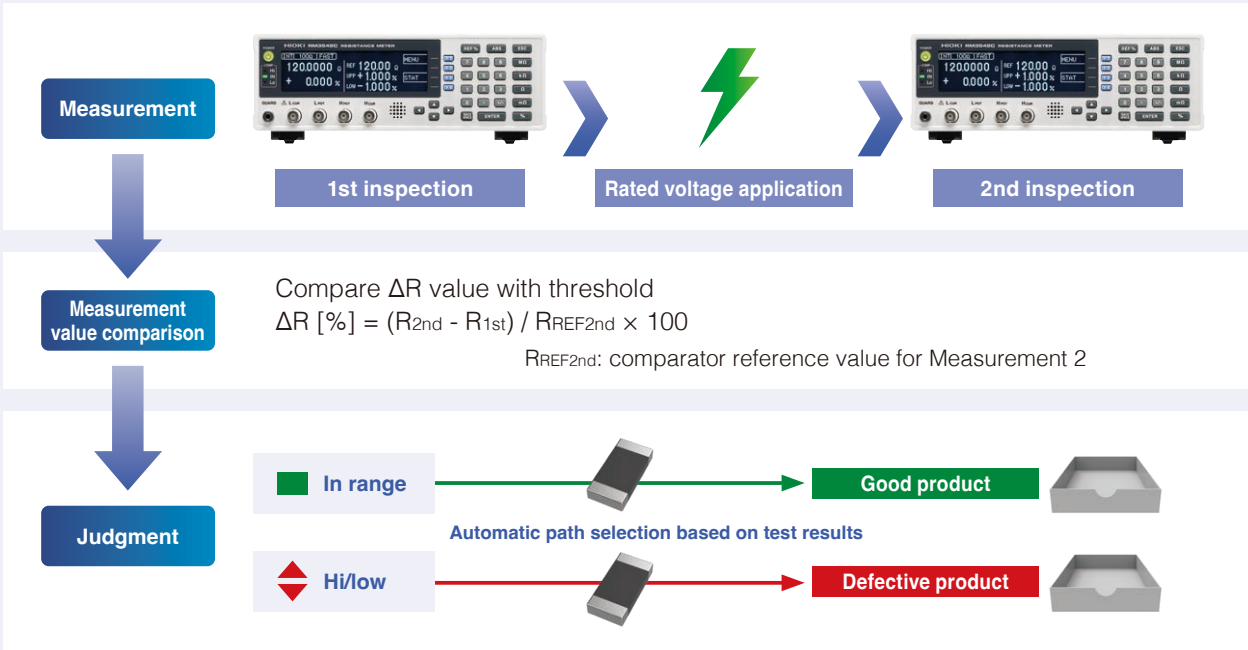
Smart Functions for Enhanced Precision

**Additional features strengthen precision and reliability
—delivering stricter inspection, consistent accuracy,
and reduced human error in daily operation.**

Fast, error-free changeover and consistent quality across production lines

`RM3542C-1` `RM3542C-2` `RM3542C-3`

Preset Function

Saves and recalls a single measurement setup in the instrument. This reduces changeover time, prevents operator setting errors, and ensures consistent measurement conditions for multi-product production lines.

```
SYSTEM                          RETURN
CLOCK(Y-M-D) 09-10-16 10:00:44
LINE FREQ    AUTO              LOAD
CONTRAST     25
                               SAVE
PRESET
```

Selection

SETTING ➤ **SAVE** ➤ **LOAD**

Settings

Range, Speed, Delay, etc.

Reduced risk of human error during calibration and maintenance

`RM3542C-1` `RM3542C-2` `RM3542C-3`

Stage Mismatch Prevention Function

/EOM outputs on Pin-14 (Stage 1) or Pin-28 (Stage 2)—instantly flagging miswiring. By assigning separate outputs for each stage, operators can quickly detect equipment installation errors after calibration or maintenance. This is especially useful when two instruments are installed on automated equipment. It prevents wrong-stage operation and ensures the production line resumes correctly.

1st stage EOM Pin-14

2nd stage EOM Pin-28

Prevents mix-up
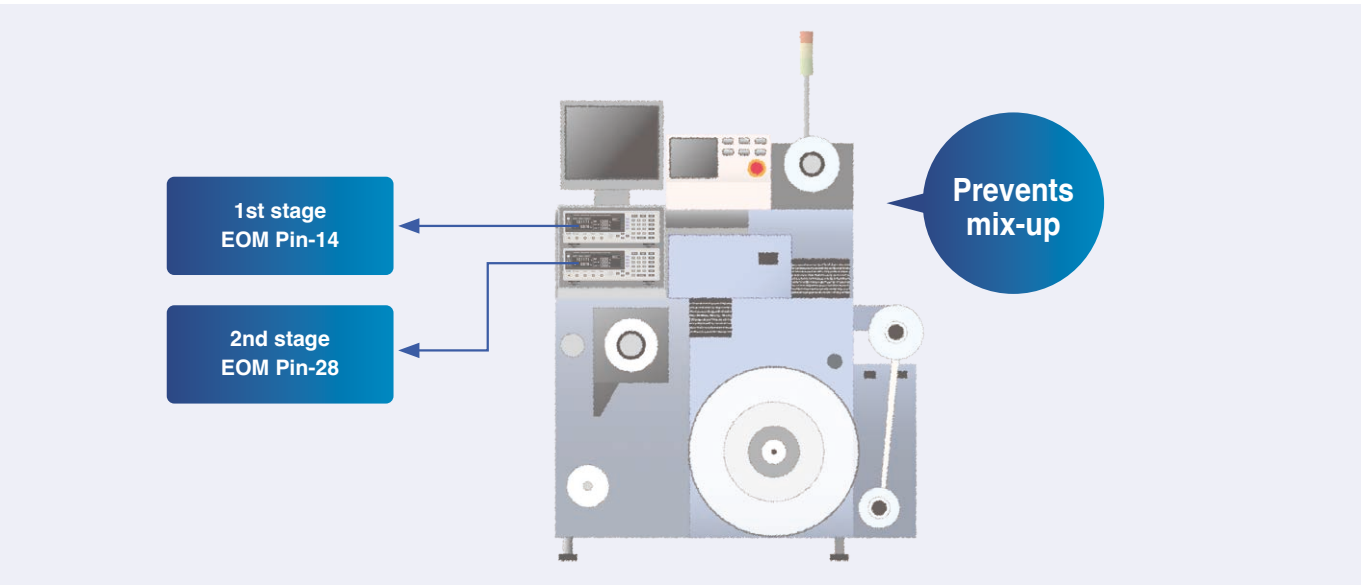
High-precision accuracy for tight-tolerance inspection

`RM3542C-3`

90-day Guaranteed Accuracy

Unlike conventional one-year accuracy specifications, this instrument guarantees measurement accuracy over a shorter 90-day period. By limiting the guarantee period, it achieves a higher accuracy specification, enabling reliable inspection of components with very narrow tolerance ranges even in high-volume production lines.

1-year accuracy

90-day accuracy

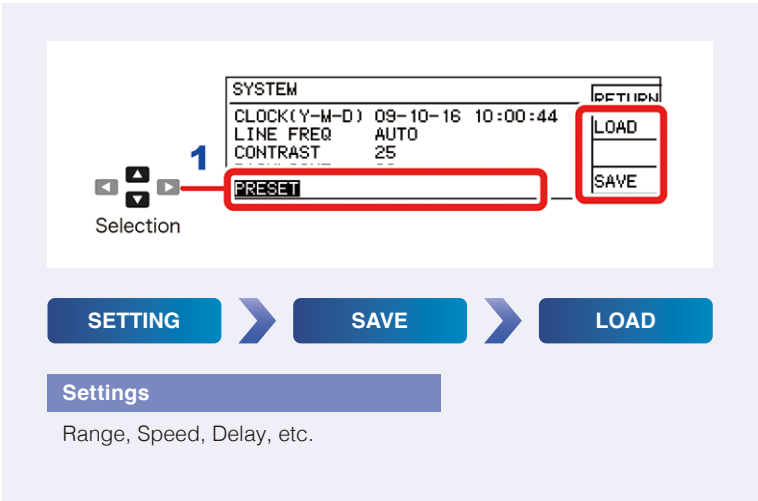Ultra narrow tolerance components

Narrow tolerance components
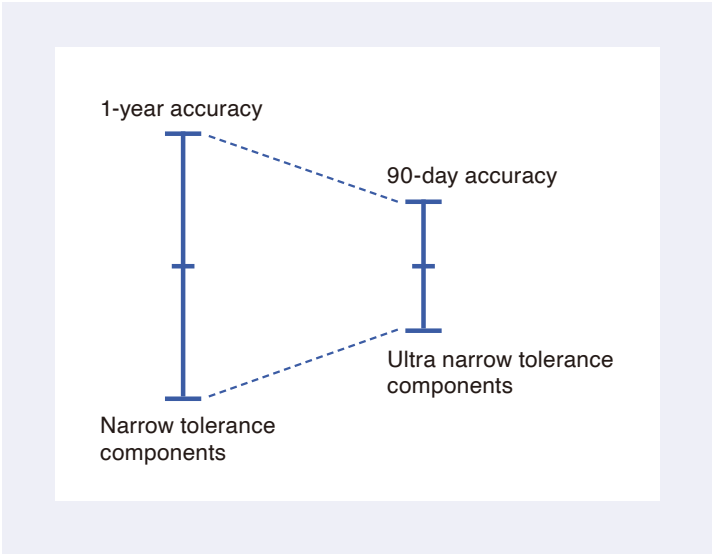
Efficient data management and enhanced traceability

Simplify data management and improve traceability with features that automatically capture, store, and output stable measurement data.

Data Storage Function

Saving to internal memory via trigger signal or key operation

Up to 30,000 measurement events are automatically saved to internal memory on every valid trigger:
• External trigger (EXT I/O or command)
• Internal periodic trigger (1 ms to 99.999 s interval)
• Manual trigger (TRIG key)

Auto-Memory Function

**Auto-save/auto-print of stable measurement values
(Individually selectable)**

When the Sampling Measurement Mode is set, the RM3542C-3 automatically saves 2–99 stable measurement values upon probe contact, then stops and displays statistical calculations (max/min/avg/σ/Cp/Cpk). If a printer is connected via RS-232C, it can also auto-print the statistical report.

**Printing example
(Normal mode)**

```
7    219.701 Ohm IN
8    220.031 Ohm IN
9    220.687 Ohm IN
10   150.119 Ohm Lo
11   330.065 Ohm Hi
12   OvrRng      Hi
13   C.E.Lo      --
14   C.E.Hi      --
```

**Printing example
(Sample mode: fixed-count statistical report)**

```
 -0.136%/IN  +0.014%/IN  +0.312%/IN
-31.764%/Lo +50.030%/Hi+999.999%/Hi
MEAS.ERR/--  MEAS.ERR/--
```

3 sets of data are printed on 1 line to save paper.

External Output

RM3542C

Connector

Connector used (on the main unit)	37-pin D-sub female connector with #4-40 inch screws
Compatible connectors	DC-37P-ULR (solder type), DCSP-JB37PR (crimped type) Japan Aviation Electronics Industry, Ltd.

Example of Typical EXT. I/O Timing

t0	Trigger pulse On	0.1 ms or greater	Rising/Falling edge selection possible
t1	Trigger pulse Off	0.1 ms or greater	
t2	Delay 1	0 to 100 ms	According to settings
t3	Delay 2	0 to 100 ms	According to settings (0.1 ms or 0.3 ms added when the contact Improvement function is set to pulse)
t4	Measurement time	0.1 ms to 100 ms	According to sampling speed, OVC settings, measurement range and power supply frequency
t5	Calculation time	0.1 ms	Delayed when statistical calculation and the memory function are on
t6	EOM pulse width	1 to 100 ms	According to settings

Requirement Specification (printer)

Interface	RS-232C
Characters per line	At least 45
Communication speed	9600bps
Data bits	8bit
Parity	None
Stop bits	1bit
Flow control	None

RM3542C Main unit connector

Function	Signal name	Pin
Receive data	RxD	2
Transmit data	TxD	3
Signal ground	GND	5

Electrical Specifications

Input signals	Input type	Optocoupler-isolation: Non-voltage contact inputs(Current sync output supported) (negative logic)
	Input On voltage	1 V or less
	Input Off voltage	OPEN or 5 V to 30 V
	Input On current	3 mA/ch
	Max. applied voltage	30 V
Output signals	Output type	Optocoupler-isolated NPN open-collector outputs (Current sync) (negative logic)
	Max. load voltage	30 V
	Max. output current	50 mA/ch
	Residual voltage	1 V (10 mA), 1.5 V (50 mA)
Built-in insulation power	+5 V power output	
	Output voltage	4.5 V to 5.0 V
	Max. output current	100 mA
	+12 V power output	
	Output voltage	11.0 V to 13.0 V
	Max. output current	20 mA
	External power input	None

EXT.I/O Signal List

Input Signals	
TRIG	External Trigger
0ADJ	Zero-Adjust
PRINT	Printing
CAL	Self-Calibration
HOLD	Hold
PRB_CHECK	Probe Short-Circuit Detection
KEY_LOCK	Key Lock

Output Signals	
ERR	Measurement Fault Output
CE_HI	Contact error (HCUR, HPOT side)
CE_LO	Contact error (LCUR, LPOT side)
PRB_SHORT	Probe short-circuit error
INDEX	End of Import
EOM	End of measurement During stage configuration Second-stage EOM
EOM1	During stage configuration First-stage EOM
HI, IN, LO	Comparator judgment
ISO_5 V	Isolated power +5 V output
ISO_12 V	Isolated power +12 V output
ISO_COM	Isolated power common

General Specifications

Operating environment	Indoors, pollution degree 2, altitude up to 2000 m (6562 ft.)
Operating temperature and humidity	0°C to 40°C (32°F to 104°F), 80% RH or less(no condensation)
Storage temperature and humidity	-10°C to 50°C (14°F to 122°F), 80% RH or less(no condensation)
Power supply/ maximum rated power consumption	100 V to 240 V AC (50 Hz/60 Hz)/30 VA
Dielectric strength	1.69 kV AC, 1 minute Between all mains supply terminals and protective ground, interfaces, and measurement jacks
Compliance standard	EMC: EN61326, EN61000 Safety: EN61010
Dimensions/mass	Approx. 260 mm (10.24 in.) W × 88 mm (3.46 in.) H × 300 mm (11.81 in.) D, approx. 2.9 kg (102.3 oz.)
Accessories	Startup guide x 1, Operation guide x 1, Power cord x 1, EXT I/O connector (male) x 1

Measurement Method

Measurement types	DC resistance
Measurement signal	Constant current
Measurement method	Four-terminal DC
Measurement terminals	22 mm pitch BNC female terminal
Measurement speed	FAST/MED/SLOW

Comparator Function (Determination method: REF% Mode/ABS Mode)

| Measurement range | REF% (Relative value determination) mode

•Reference value: Setting range 0.00 mΩ to 120.00 MΩ (Low power: off) 0.0 mΩ to 1200.0 Ω (Low power: on) •Upper/lower limit value: setting range -9.999% to 9.999% (when less than 10%) -99.99% to 99.99% (when 10% or greater)

ABS (Absolute value determination) Mode

•Upper/Lower limit value: Setting range 0.00 mΩ to 120.00 MΩ (Low power: off) 0.0 mΩ to 1200.0 Ω (Low power: on) |
|---|---|
| Judgment | COMP lamp (Hi/IN/LO), external output, beeping sound: In, Hi/low, low, HIGH (default setting off) |

BIN Measurement Function (RM3542C-3)

Operation	Comparison judgment between set values and measured values
Setting	On/off When the comparator function is enabled, forced off When the ΔR function is enabled, forced off
Comparator mode	REF% mode
BIN number	0 to 6

Contact Check Function

Operation details	Checks the connections between the HPOT-HCUR terminals and between the LPOT-LCUR terminals (for each range)
Threshold value	50 Ω/ 100 Ω/ 150 Ω/ 200 Ω (default value)/ 300 Ω/ 400 Ω/ 500 Ω
Judgment	Error display (CE_Hi/CE_Low), external output
Implementation timing	Before integration time (response time) until measuring is in progress

Trigger/Delay Function

Trigger (select)	Internal trigger (automatic continuous measurement) External trigger (measurements are triggered by an external signal)
Delay	DELAY 1: Common to all ranges Mechanical adjustment of stable time during probe contact
	Measurement range: 0.0 ms to 100.0 ms
	DELAY 2: each range Adjustment of time from the application of a measurement current (such as an inductor) until the value is stable
	Measurement range: 0.0 ms to 100.0 ms

Measurement Time: Power supply frequency 50 Hz/60 Hz, default settings

Range	Low power: off		
	FAST *3	MED *3	SLOW *3
10 mΩ *1	3.8 ms	13 ms	43 ms (36 ms)
100 mΩ	3.8 ms	13 ms	43 ms (36 ms)
1000 mΩ	2.0 ms	6.4 ms	41 ms (35 ms)
3 Ω *2	1.6 ms	6.0 ms	41 ms (34 ms)
10 Ω	1.6 ms	6.0 ms	41 ms (34 ms)
100 Ω	0.9 ms	3.6 ms	21 ms (17 ms)
300 Ω *2	0.9 ms	3.6 ms	21 ms (17 ms)
1000 Ω	0.9 ms	3.6 ms	21 ms (17 ms)
10 kΩ	1.0 ms	3.6 ms	21 ms (17 ms)
30 kΩ *2	0.9 ms	3.6 ms	21 ms (17 ms)
100 kΩ	1.3 ms	3.8 ms	21 ms (18 ms)
300 kΩ *2	1.3 ms	3.8 ms	21 ms (18 ms)
1000 kΩ	2.5 ms	6.0 ms	21 ms (18 ms)
3 MΩ *2	2.5 ms	6.0 ms	21 ms (18 ms)
10 MΩ	5.3 ms	23 ms (20 ms)	23 ms (20 ms)
30 MΩ *2	5.8 ms	23 ms (20 ms)	23 ms (20 ms)
100 MΩ	26 ms (22 ms)	46 ms (39 ms)	86 ms (72 ms)

Range	Low power : off		
	FAST	MED	SLOW *3
1000 mΩ	2.3 ms	12 ms	42 ms (35 ms)
3 Ω *2	2.3 ms	12 ms	42 ms (35 ms)
10 Ω	2.3 ms	12 ms	42 ms (35 ms)
100 Ω	1.7 ms	6.1 ms	41 ms (34 ms)
300 Ω *2	3.2 ms	7.6 ms	43 ms (36 ms)
1000 Ω	7.2 ms	12 ms	47 ms (40 ms)

Tolerance ±10 % ±0.2 ms
*1 RM3542C-3
*2 RM3542C-1, RM3542C-2, RM3542C-3
*3 (): 60 Hz

OVC Function (Offset Voltage Compensation)

Operation details	Inverts current polarity to remove offset caused by thermal EMF
Effective range	Low power : off: 10 mΩ range to 10 Ω range Low power : on: all ranges

Jumper Resistance Measurement Support Function

Operation	When using the comparator function in ABS mode, restricts the lower limit of the resistance measurement range selected by the range switching function.
Setting	Function on/off Lower limit range: 1000 mΩ/10 Ω/100 Ω

ΔR Function (RM3542C-3)

Operation	Uses measured values from another instrument to calculate the difference between the two values and performs a comparative judgment.
Setting	Function on/off Stage: First/second Stage shift: 1 to 99 Second-stage trigger when first stages yields FAIL result: on/off First-stage ERR: on/off Fail count: 1 to 99

Preset Function

Operation	SAVE Saves the instrument's settings to the reserved area. Load applies the settings saved in the reserved area to the instrument.

Stage Mismatch Prevention Function

Operation	To prevent use of the wrong stage, a stage number is assigned to the resistance meter. The output pin of the EXT. I/O EOM signal varies depending on the stage number setting. off, STG2nd :28 pin STG1st :14 pin
Setting	OFF/ STG1st/ STG2nd

GP-IB (RM3542C-2)

Connector	24-pin Centronics type connector
Compliance standard	IEEE-488.1 1987
Reference standard	IEEE-488.2 1987
Terminator	LF, CR+LF

Recording/Interface

| Memory storage	Measurement values are recorded by the EXT.I/O TRIG signal and F4 [MANU] button.
	Number of memory slots: 30000 (volatile memory, no backup)
	Statistical Calculation Functions: Statistical calculations are performed for measurement values saved to memory. (Calculation contents: Total data count, average value, minimum value, maximum value, sample standard deviation, population standard deviation, process capability index) Calculation results: Displayed on screen/printed
Auto-memory function	Loading when measured value is stable, with manual measurement by internal continuous trigger (A beeping sound is heard if the specified value is reached.)
	Memory slots: 1 to 99
Interface	EXT.I/O, RS-232C, Printer, Settings Monitor Function terminals (SET MONITOR terminals), GP-IB (RM3542C-2 only)

Measurement Specifications

Conditions of guaranteed accuracy

Warm-up time	30 minutes or more for 1-year accuracy
	60 minutes or more for 90-day accuracy (RM3542C-3)
Integration time	Longer than the default value for the Integration Time Setting Function (No regulation for settings in ms if the default value is set to PLC)
Temperature and humidity range for guaranteed accuracy	23°C ±5°C (73°F ±9°F), 80% RH or less

Temperature fluctuation after self-calibration must be within ±2°C (±3.6°F). Add Temperature Coefficient ±(1/10 of measurement accuracy)/°C for the following ranges: 0°C to 18°C (32°F to 64°F) and 28°C to 40°C (82°F to 104°F).

1-year accuracy (LOW POWER: OFF)

Range	Maximum display value *1	Resolution	Measurement accuracy:±(%rdg + %f.s.)			Measurement current *2	Open-circuit voltage
			Fast	Med.	Slow *3		
10 mΩ *7	12.00000 mΩ	10 nΩ	0.015 + 0.080	0.015 + 0.030	0.015 + 0.010*6	100 mA	
					0.015 + 0.020		
100 mΩ	120.0000 mΩ	100 nΩ	0.015 + 0.008	0.015 + 0.003	0.015 + 0.002	100 mA	
1000 mΩ	1200.000 mΩ	1 μΩ	0.012 + 0.003	0.012 + 0.002	0.012 + 0.001	100 mA	
3 Ω *8	3.60000 Ω	10 μΩ	0.012 + 0.003	0.012 + 0.002	0.012 + 0.001	33.3 mA	
10 Ω	12.00000 Ω	10 μΩ	0.012 + 0.003	0.008 + 0.002	0.008 + 0.001	10 mA	
100 Ω	120.0000 Ω	100 μΩ	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	10 mA	
300 Ω *8	360.000 Ω	1 mΩ	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	3.33 mA	20 Vmax *3*4*5
1000 Ω	1200.000 Ω	1 mΩ	0.009 + 0.003	0.007 + 0.002	0.006 + 0.001	1 mA	
10 kΩ	12.00000 kΩ	10 mΩ	0.009 + 0.003	0.007 + 0.002	0.006 + 0.001	1 mA	
30 kΩ *8	36.0000 kΩ	100 mΩ	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	333 μA	
100 kΩ	120.0000 kΩ	100 mΩ	0.010 + 0.003	0.007 + 0.002	0.007 + 0.001	100 μA	
300 kΩ *8	360.000 kΩ	1 Ω	0.010 + 0.003	0.007 + 0.002	0.008 + 0.001	33.3 μA	
1000 kΩ	1200.000 kΩ	1 Ω	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	10 μA	
3 MΩ *8	3.60000 MΩ	10 Ω	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	3.33 μA	
10 MΩ	12.00000 MΩ	10 Ω		0.030 + 0.004		1 μA	
30 MΩ *8	36.0000 MΩ	100 Ω		0.030 + 0.010		333 nA	
100 MΩ	120.0000 MΩ	100 Ω		0.100 + 0.020		100 nA	

1-year accuracy (LOWER: ON)

Range	Maximum display value *1	Resolution	Measurement accuracy: ±(%rdg + %f.s.)			Measurement current *2	Open-circuit voltage
			Fast	Med.	Slow *3		
1000 mΩ	1200.000 mΩ	1 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	10 mA	
3 Ω *8	3.60000 Ω	10 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	3.33 mA	
10 Ω	12.00000 Ω	10 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	1 mA	10 Vmax *3*5
100 Ω	120.0000 Ω	100 μΩ	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	1 mA	
300 Ω *8	360.000 Ω	1 mΩ	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	333 μA	
1000 Ω	1200.000 Ω	1 mΩ	0.020 + 0.003	0.008 + 0.002	0.008 + 0.001	100 μA	

*1. Negative values can be up to 10% of positive full scale.
*2. Measurement current accuracy is ±5%.
*3. 20 mV or less when not measuring, with Pulse current mode and Contact Improvement set to OFF or Pulse (by 10 MΩ input-impedance voltmeter)
*4. When VOLTAGE LIMIT is set to ON: 10 V max.
*5. The total of the allowable measurement probe, measurement target, and contact resistance will be less than the resistance value calculated by dividing the no-load voltage by the measurement current. Example: For a measurement current of 100 mA, measurements can be made under conditions such that the total of the measurement probe, measurement target, and contact resistance does not exceed 20 Ω.
*6. When the average function is ON and the average count is set to 16 or greater. Specified only for 10 mΩ range SLOW operation; otherwise, does not depend on the average setting. (RM3542C-3)
*7. RM3542C-3
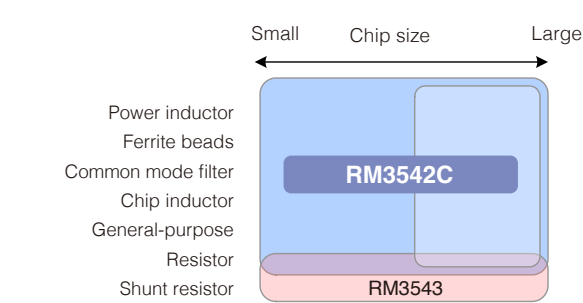*8. RM3542C-1, RM3542C-2 or RM3542C-3

90-day accuracy (Low power: off)

Range	Maximum display value *1	Resolution	Measurement accuracy: ±(%rdg + %f.s.)			Measurement current *2	Open-circuit voltage
			Fast	Med.	Slow *3		
10 mΩ	12.00000 mΩ	10 nΩ	0.015 + 0.080	0.015 + 0.030	0.012 + 0.010 *6	100 mA	
					0.012 + 0.020		
100 mΩ	120.0000 mΩ	100 nΩ	0.015 + 0.008	0.015 + 0.003	0.012 + 0.002	100 mA	
1000 mΩ	1200.000 mΩ	1 μΩ	0.012 + 0.003	0.012 + 0.002	0.011 + 0.001	100 mA	
3 Ω	3.60000 Ω	10 μΩ	0.012 + 0.003	0.012 + 0.002	0.011 + 0.001	33.3 mA	
10 Ω	12.00000 Ω	10 μΩ	0.010 + 0.003	0.008 + 0.002	0.007 + 0.001	10 mA	
100 Ω	120.0000 Ω	100 μΩ	0.009 + 0.003	0.007 + 0.002	0.005 + 0.001	10 mA	
300 Ω	360.000 Ω	1 mΩ	0.009 + 0.003	0.007 + 0.002	0.005 + 0.001	3.33 mA	
1000 Ω	1200.000 Ω	1 mΩ	0.008 + 0.003	0.006 + 0.002	0.005 + 0.001	1 mA	20 Vmax *3*4*5
10 kΩ	12.00000 kΩ	10 mΩ	0.009 + 0.003	0.007 + 0.002	0.006 + 0.001	1 mA	
30 kΩ	36.0000 kΩ	100 mΩ	0.009 + 0.003	0.007 + 0.002	0.006 + 0.001	333 μA	
100 kΩ	120.0000 kΩ	100 mΩ	0.010 + 0.003	0.007 + 0.002	0.006 + 0.001	100 μA	
300 kΩ	360.000 kΩ	1 Ω	0.010 + 0.003	0.007 + 0.002	0.006 + 0.001	33.3 μA	
1000 kΩ	1200.000 kΩ	1 Ω	0.010 + 0.003	0.008 + 0.002	0.007 + 0.001	10 μA	
3 MΩ	3.60000 MΩ	10 Ω	0.010 + 0.003	0.008 + 0.002	0.007 + 0.001	3.33 μA	
10 MΩ	12.00000 MΩ	10 Ω		0.030 + 0.004		1 μA	
30 MΩ	36.0000 MΩ	100 Ω		0.030 + 0.010		333 nA	
100 MΩ	120.0000 MΩ	100 Ω		0.100 + 0.020		100 nA	

90-day accuracy (Low power: on)

Range	Maximum display value *1	Resolution	Measurement accuracy: ±(%rdg + %f.s.)			Measurement current *2	Open-circuit voltage
			Fast	Med.	Slow *3		
1000 mΩ	1200.000 mΩ	1 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	10 mA	
3 Ω *8	3.60000 Ω	10 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	3.33 mA	
10 Ω	12.00000 Ω	10 μΩ	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	1 mA	10 Vmax *3*5
100 Ω	120.0000 Ω	100 μΩ	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	1 mA	
300 Ω	360.000 Ω	1 mΩ	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	333 μA	
1000 Ω	1200.000 Ω	1 mΩ	0.020 + 0.003	0.008 + 0.002	0.008 + 0.001	100 μA	

*1. Negative values can be up to 10% of positive full scale.
*2. Measurement current accuracy is ±5%.
*3. 20 mV or less when not measuring, with pulse current mode and contact Improvement set to off or pulse (by 10 MΩ input-impedance voltmeter)
*4. When VOLTAGE LIMIT is set to ON: 10 V max.
*5. The total of the allowable measurement probe, measurement target, and contact resistance will be less than the resistance value calculated by dividing the no-load voltage by the measurement current. Example: For a measurement current of 100 mA, measurements can be made under conditions such that the total of the measurement probe, measurement target, and contact resistance does not exceed 20 Ω.
*6. When the average function is ON and the average count is set to 16 or greater. Specified only for 10 mΩ range SLOW operation; otherwise, does not depend on the average setting.
*7. RM3542C-3
*8. RM3542C-1, RM3542C-2, RM3542C-3

Dimensions (units: mm)
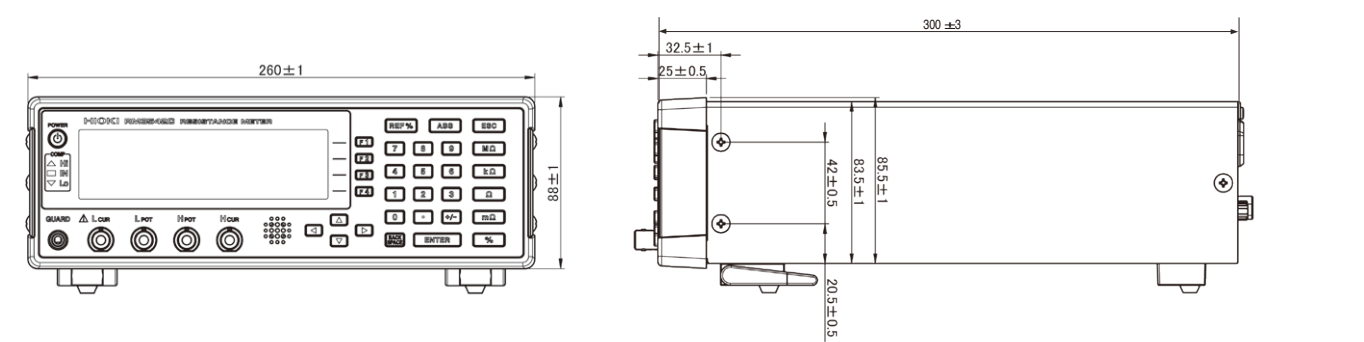
Recommended Model for Each Type of Measurement

RESITANCE METER RM3542C

| Model No. (order code)	GP-IB interface
RM3542C-1	Not supported
RM3542C-2	Supported
RM3542C-3	Not supported

Options

Probes and Fixtures (for connection to measurement terminals)

FOUR-TERMINAL PROBE 9140-10
(for RM3542C)
For test leaded parts
Diameter of supported measurement terminals: 0.3 to 5 mm (0.01 to 0.20 in.)
Cable length: 1 m (3.28 ft.)

TEST FIXTURE 9262
For test leaded parts
Diameter of supported measurement terminals: 0.3 to 2 mm (0.01 to 0.08 in.)
Pitch of test lead: 5 mm (0.20 in.) or greater
Connects directly to main unit
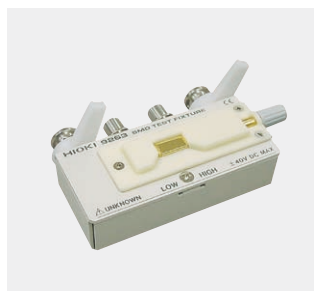
SMD TEST FIXTURE 9263
For SMD with electrodes on the sides
Supported sample sizes:
2012 to 5750 (JIS)
0805 to 2220 (EIA)
Sample width: 1 to 10 mm (0.04 to 0.39 in.)
Connects directly to main unit

World's first highly accurate 4-Terminal measurement

SMD TEST FIXTURE IM9100
For SMD with electrodes on the bottom
Supported sample sizes:
0402 to 1005 (JIS)
01005 to 0402 (EIA)
Connects directly to main unit

See the product catalogs for details.

Recommended Measurement Cable Specifications

Conductor resistance	500 mΩ/m or less
Capacitance	150 pF/m or less
Cable dielectric material	Polyethylene (PE), Teflon* (TFE), Polyethylene Foam (PEF) Insulation resistance: 10 GΩ or greater
Connector insulator material	Teflon* (TFE), Polybutylene Terephthalate (PBT) Insulation resistance: 10 GΩ or greater
Length	2 m (6.56 ft.) or less
Recommended cables (examples)	JIS standard 3C-2 V, 1.5D-2 V, MIL standard RG-58A/U

*Teflon is a registered trademark of DUPONT, Inc.

Communication Interfaces

RS-232C CABLE 9637
9pin-9pin, cross
Cord length: 1.8 m (5.91 ft.)

GP-IB CONNECTION CABLE 9151-02
Cord length: 2 m (6.56 ft.)

Related Products

Resistance Meter for the Ultra-Low Shunt Era

RM3543

- Inspection of 0.1 mΩ at a high accuracy of 0.16%, and a high resolution of 0.01 μΩ. Shunt resistor load inspection with superior accuracy and resolution.
- Excellent repetitive measurement accuracy
- Intuitive user interface and superb noise immunity ideal for use with automated equipment

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