High Performance Reliability

3GHz Is Here

Cover measurement frequencies from 100 kHz to 3 GHz

Choose from 5 Models
High-stability Impedance Measurement up to 3 GHz*

Cover a wide range of measurement frequencies, from 1 MHz to 3 GHz, with a single device. High-stability measurement with minimal variability delivers outstanding cost performance for research and development.

SMD TEST FIXTURE IM9201 (option)

Use the 6-in-1 SMD Test Fixture IM9201 (option) to perform easy and reliable measurements.
Advanced Design for Reliable Testing

Stable measurement across a broad range

To achieve favorable frequency characteristics, we painstakingly carried out design true to our basic principles for the individual circuits, board patterning, and case structure. We also used numerical analysis and in-depth verification to optimize the shield structure and the shape of the internal board pattern, thus fitting all the technology necessary to achieve optimal frequency characteristics from 100 kHz to 3 GHz into a compact body.

For the test head measurement terminals, in order to improve their measurement accuracy over a wide range, we used 3.5 mm (0.14 in) connectors with a wide frequency range, which also boast better removability than other microwave connectors.

Measurement technology that adds to superior stability

The measurement portion uses a high resolution A/D converter. By controlling the input signal’s level and frequency, the A/D converter’s dynamic range can be utilized to the fullest, achieving measurement with a wide impedance range and minimum variability.

In the sub FPGA, built into analog circuits, the digital filter applied optimally for each circuit shuts out noise. At the main FPGA, the 64-bit floating point computation is put through a multi-layered pipeline to achieve high-speed computational processing with little margin of error. This helps increase the stability and speed of measurements.

Large solid shield for improved performance

Each section uses a solid shield carved to match the on-board pattern or IC shape, thus reducing internal coupling. The shield also reduces external radiation and improves noise resistance, meeting a high level of EMC, despite being the lightest in its class.
High-speed, highly stable measurement

Achieve measurement with both high speed and high stability. Cut takt time and increase productivity.

Repeatability and analog measurement time
(Reference data)

- IM7583, IM7585, IM7587
- IM7580A, IM7581

Measured frequency
- 3 GHz
- 500 MHz
- 200 kHz
- 100 MHz

Signal level: +1 dBm
Sample size: 100Ω

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(ES) Equipements Scientifiques SA - Département Tests Energie Mesures - 127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45 - Fax. 01 47 01 16 22 - e-mail: tem@es-france.com - Site Web: www.es-france.com
Space-saving Half-rack Size

Compact form factor – 2 analyzers fit side-by-side on a full-size rack. Remarkably lightweight and compact for a measuring instrument of this class.

Compact body for greater mobility
The half-rack compact body is light and fit not only for line use, but also when measuring various sites on the go.

Large display for easy operation
Customize the large screen according to desired brightness, color, and text size to fit your environment. Highly responsive touch screen makes measurement settings and adjustments even easier.

Test head fits in the palm of your hand
The slim profile of the test head lets you install it close to the measurement target to help minimize influence from noise and other effects and enabling more accurate measurement.
Select Your Testing Frequency from 5 Models

**IMPEDEANCE ANALYZER IM7580A**
- Measurement frequency: 1 MHz to 300 MHz
- Measurement range:
  - L: 0.0531 nH to 7.95 mH
  - C: 0.1061 pF to 1.59 μF
  (Depending on the measurement frequency)
- Measurement signal level: -40.0 dBm to +7.0 dBm
- Basic accuracy: Z: 0.72% rdg. θ: 0.41°

**IMPEDEANCE ANALYZER IM7581**
- Measurement frequency: 100 kHz to 300 MHz
- Measurement range:
  - L: 0.0531 nH to 7.95 mH
  - C: 0.1061 pF to 1.59 μF
  (Depending on the measurement frequency)
- Measurement signal level: -40.0 dBm to +7.0 dBm
- Basic accuracy: Z: 0.72% rdg. θ: 0.41°

**IMPEDEANCE ANALYZER IM7583**
- Measurement frequency: 1 MHz to 600 MHz
- Measurement range:
  - L: 0.0265 nH to 7.95 mH
  - C: 0.0531 pF to 1.59 μF
  (Depending on the measurement frequency)
- Measurement signal level: -40.0 dBm to +1.0 dBm
- Basic accuracy: Z: 0.65% rdg. θ: 0.38°

**IMPEDEANCE ANALYZER IM7585**
- Measurement frequency: 1 MHz to 1.3 GHz
- Measurement range:
  - L: 0.0123 nH to 7.95 mH
  - C: 0.0245 pF to 1.59 μF
  (Depending on the measurement frequency)
- Measurement signal level: -40.0 dBm to +1.0 dBm
- Basic accuracy: Z: 0.65% rdg. θ: 0.38°

**IMPEDEANCE ANALYZER IM7587**
- Measurement frequency: 1 MHz to 3 GHz
- Measurement range:
  - L: 0.0053 nH to 0.795 mH
  - C: 0.011 pF to 1.59 μF
  (Depending on the measurement frequency)
- Measurement signal level: -40.0 dBm to +1.0 dBm
- Basic accuracy: Z: 0.65% rdg. θ: 0.38°

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5 models support a wide variety of applications

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Tél. 01 47 95 99 45 - Fax. 01 47 01 16 22 - e-mail: tem@es-france.com - Site Web: www.es-france.com
Dual measurement modes

Display up to four measurement parameters simultaneously.

Z Impedance
Y Admittance
θ Phase angle
X Reactance

G Conductance
B Susceptance
Q Q-factor
Rs Equivalent series resistance (ESR)

Rp Equivalent series resistance
La Equivalent series inductance
Lp Equivalent parallel inductance
Ce Equivalent series capacitance

D Equivalent parallel capacitance

Use LCR Mode to make measurements by applying the desired frequency and level signal to the component being measured. This mode is ideal for evaluating passive samples such as capacitors and coils.

Comparator measurement: Yield a PASS/FAIL judgment for the target sample based on a single judgment criterion.

HI Upper limit - HI is displayed
IN Reference value - IN is displayed
LO Lower limit - LO is displayed

Upper and lower limit judgment: Set the upper and lower limits. Percentage judgment: Set the upper and lower limits as percentages of the reference value. Deviation percentage judgment: Set the upper and lower limits as percentages of the reference value. The impedance analyzer will display deviation of the measured value from the reference value (Δ%).

Bin measurement: Rank samples using multiple judgment criteria.

Display zoom function

Display measured values using larger text for better visibility on production lines and in other field applications.

Monitor function

Display the measurement signal level being applied to components in real time.

Analyzer Mode

Normal / segment sweep operation: Discover sample characteristics by sweeping through a range of frequencies and levels.

Perform measurement after setting the sweep parameter (frequency or level), sweep range, number of sweep points, and measurement conditions.

Segment sweep operation: Discover element characteristics over time under set conditions.

The graph display can be switched based on the type of measurement being performed. (with a total of 7 layouts available)

Sweep graph display (1-graph/4-graph display), XY graph display (1-graph/2-graph display), Multi-display (simultaneous display of sweep and XY), List display, Peak display
Intelligent measurement and analysis

Convenient functionality for performing measurement, reviewing measurement results, and judging measured values.

Continuous measurement function
Perform continuous measurement in the order of the measurement conditions saved with the panel save function. Measurements can combine LCR and Analyzer Mode measurement conditions.

Panel save and load function
Save or load the measurement conditions, compensation values, and compensation conditions set in LCR mode or analyzer mode.

Number of panels that can be saved
- LCR Mode measurement conditions: 30
- Analyzer Mode measurement conditions: 16

Measured value search function
The cursor can be moved automatically to a user-selected measured value point for one set of sweep measurement results.

Search options
- Maximum value: Moves the cursor to the maximum value.
- Minimum value: Moves the cursor to the minimum value.
- Target: Moves the cursor to a user-set measured value.
- L-Max value: Moves the cursor to the local maximum value (a filter can be set).
- L-Min value: Moves the cursor to the local minimum value (a filter can be set).

Auto search function
Move the cursor automatically according to user-configured settings once sweep measurement is complete.
Area and peak comparison functions

Check whether measured values fall inside a previously configured judgment area. These functions are ideal for use in verifying non-defective products.

Area judgment
- Obtaining an overall judgment for each sweep
  - Define a range by setting upper and lower limits and display the judgment results as IN or NG.

Peak judgment
- Identifying resonance points
  - Define a range by setting upper, lower, left, and right limits and display the judgment results as IN or NG.

Spot judgment
- For multiple-frequency simultaneous judgments
  - This function makes a judgment at a pre-set point during sweeping. (Up to 16 points)

Equivalent circuit analysis function

Analyze individual component values (L/C/R) for elements in the following five circuits based on measurement results.

Simulation function/residual error display

Perform simulations based on the result of equivalent circuit analyses, compare that to actual measured values, and check the validity of the analysis result.

Display the residual error to check the gap between the actual measurement and simulation numerically.
Functions for Efficient, Accurate Measurement

Fully equipped with a range of built-in functions necessary for accurate and stable measurement.

Compensation function

To truly measure accurately, all analyzers should first be set up to their optimal state.

Open, short, and load calibration

The compensation process involves calibrating the measurement setup, from the impedance analyzer to the reference surface (either the test head terminals or the sample connection terminals). Connect the calibration kit (standard for open, short, and load), measure each piece of calibration data, and remove the cause of the margin of error.

Electrical length compensation

Enter the length of the electrical connection between the reference surface and the measurement sample connection surface to allow compensation of error caused by phase shift. If mounting a fixture on the test head, it is necessary to enter the fixture’s electrical length.

Open and short compensation

Eliminate the causes of errors (such as fixtures or measurement cables) from the calibration standard surface to the sample connection terminal.

Contact check

Monitor the connection between the measurement terminals and the sample.

DCR measurement

Checking contact before and after measurement

This capability is ideal for carrying out contact checks of inductive components with low DC resistance values such as inductors, ferrite cores, and common-mode filters.

Judgments based on user-configured upper and lower contact resistance limits

- Guaranteed accuracy range: 0.1 Ω to 1000 Ω
- Measurement timing: from measurement, after measurement, or before and after measurement
- Output format: Screen display / EXT I/O Output

Waveform judgment function

Detecting chatter during measurement

Verify that components and terminals are in contact during measurement. The impedance analyzer will output an error if fluctuations in the RMS value exceed a user-configured range that has been set using the initially acquired RMS value waveform as the reference value.

Valid setting range: 0.01% to 100.0% of the reference value
- Output format: Screen error display or EXT I/O error output
**Handler Interface**
Perform intricate external control.

1. **Trigger input**
   - **Timing and enable/disable settings**
     - A. Choose to enable or disable trigger input during measurement. By disabling input, you can prevent erroneous input caused by chatter.
     - B. Select whether to base input timing on the trigger’s rising edge or falling edge.

2. **Reset judgment result**
   - You can set the timing at which judgment results are reset.
   - **On:** Reset the previous judgment results at the measurement complete signal’s rising edge.
   - **Off:** Retain previous judgment until next judgment is output.

3. **Measurement complete signal**
   - **Output method and output delay**
     - C. Select whether to use pulse or hold output for the measurement complete signal.
     - Pulse: You can set the duration for which the measurement complete signal is placed in the “on” state.
     - Hold: The measurement complete signal switches from “on” to “off” at trigger input.
     - D. You can set the duration of the delay from output of judgment results to output of the measurement complete signal.

4. **Analog measurement signal**
   - **Output delay**
     - When using trigger-synchronized output, you can ensure that the analog measurement signal is only output once the measurement signal has turned off.
     - Trigger-synchronized output: The measurement signal is only applied to the sample during measurement.

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**Software Full Keyboard**
The touch screen is equipped with a full keyboard function. Comfortably and reliably perform various input operations.

**Large Screen for Better Viewing and Control**
- Larger touch screen than legacy models for improved readability and comfort.
- Screen size comparison for the IM3570 and IM7580 at the same ratio

**Fast Measurement and Easy Screen Display**
The multicore CPU achieves both high-speed measurement and high-speed communication, as well as easy screen operation. It is equipped with a display mode that, even with the measurement screen displayed, achieves the same high-speed response as if the screen were off.
Expansive Interface

**Save measurement conditions and results in a USB flash drive**

Use the front USB terminal to save the measurement data, screen shots, or measurement conditions saved to the unit’s internal memory to a USB drive.

**Extensive range of interfaces for external control**

Use the IM7580’s LAN, USB, GP-IB, RS-232C, and EXT I/O interfaces to control the instrument from an external device.

*The GP-IB and RS-232C INTERFACE are optional*

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**LAN**
- **Connector:** RJ-45 connector
- **Transmission method:** 10Base-T, 100Base-Tx, 1000Base-T
- **Protocol:** TCP/IP

**USB (for PC connectivity)**
- **Connector:** USB Type B
- **Electrical specifications:** USB 2.0 (High Speed)

**GP-IB (optional)**
- **Connector:** 24-PIN
- **STANDARD:** IEEE 488.1 1987
- **REFERENCE STANDARDS:** IEEE 488.2 1987
- **TERMINATOR:** CR/LF, LF
- **RS-232C (optional)**
  - **Connector:** D-sub 9-pin
  - **Flow control:** Software
  - **Transmission speed:** 9600 / 19200 / 38400 / 57600 bps

**EXT I/O**
- **Connector:** D-sub 37-pin
  - **Female:** #4-40 inch thread
- **Compatible connectors:**
  - DC-3T-ULR (solder)
  - DCSP-JB37PR (crimp)
  - Japan Aviation Electronics Industry, Ltd.

*For more information, see page 15.*
Applications

Common-mode filter measurement Panel save and continuous measurement

Carry out measurement smoothly, automatically switching compensation values and measurement conditions, such as when measuring a single part with two different measurement methods, or when using different compensation values/measurement conditions for each measurement point.

If measuring a single part with two measurement methods.

Halve cycle times by using two instruments…
Compact design that fits two instruments into a full-size rack. Using two impedance analyzers simultaneously can dramatically reduce cycle times.

When compensation values and measurement conditions differ for each measurement point

PASS/FAIL judgments of power inductors Comparator function

By using the comparator function’s area and peak judgment functions, you can easily differentiate between defective and non-defective components.

Set the judgment area and then check whether component measurement results fall inside that area. This approach is well suited to differentiating between defective and non-defective components.

As illustrated to the left, you can set a range around the peak value and use it to make judgments.
SMD TEST FIXTURE IM9201
CALIBRATION KIT IM9905

All-in-One Fixture for 6 SMD Sizes - Definitive 3GHz High Frequency Analysis Made Easy.

SMD measurement procedure

1. Install the device guide and position the component
2. Release the stopper and anchor the pusher to secure the component

Instrument / Options

SMD TEST FIXTURE IM9201
TEST FIXTURE STAND IM9200
(includes magnifying glass)
ADAPTER (3.5 mm to 7 mm) IM9906
CALIBRATION KIT IM9905

Specifications

| Parameter                  | Value
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>DC to 3 GHz</td>
</tr>
<tr>
<td>Compatible package sizes</td>
<td>0201, 0402, 0603, 0805, 1206, 1210</td>
</tr>
<tr>
<td>Electrode structure</td>
<td>Bottom electrodes</td>
</tr>
<tr>
<td>Maximum voltage</td>
<td>±0.58 Vpeak (AC+DC)</td>
</tr>
<tr>
<td>Impedance</td>
<td>±Ze [%]</td>
</tr>
<tr>
<td>Phase</td>
<td>±(Ae + (Zae / Zx + Yoe × Zx)) × 100</td>
</tr>
<tr>
<td>Zx</td>
<td>Measured impedance value [Ω]</td>
</tr>
<tr>
<td>Ae</td>
<td>4 × 10² [%]</td>
</tr>
<tr>
<td>Zae</td>
<td>(100 + 500 × l) / 1000 [Ω]</td>
</tr>
<tr>
<td>Yoe</td>
<td>(10 + 100 × l) / 100000 [S]</td>
</tr>
<tr>
<td>l</td>
<td>1 [GHz]</td>
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Product / Order code

<table>
<thead>
<tr>
<th>Product name</th>
<th>Order code</th>
</tr>
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<tbody>
<tr>
<td>SMD TEST FIXTURE IM9201</td>
<td>IM9201</td>
</tr>
<tr>
<td>TEST FIXTURE STAND IM9200</td>
<td>IM9200</td>
</tr>
<tr>
<td>ADAPTER (3.5 mm to 7 mm) IM9906</td>
<td>IM9906</td>
</tr>
<tr>
<td>CALIBRATION KIT IM9905</td>
<td>IM9905</td>
</tr>
</tbody>
</table>
Measurement parameters and measurement conditions

**Measurement modes**
LCR mode: Measurement using a single set of conditions
Analyzer mode: Sweep measurement and equivalent circuit analysis
Continuous measurement mode: Continuous measurement using previously saved conditions

**Measurement parameters**
- **Z** Impedance  
  - Rs: Equivalent series resistance (ESR)
  - Rp: Equivalent parallel resistance
- **Y** Admittance  
  - Ls: Equivalent series inductance
  - Lp: Equivalent parallel inductance
- **X** Reactance  
  - C: Equivalent series capacitance
  - G: Equivalent parallel inductance
- **Q** Susceptance  
  - Q: Equivalent parallel inductance
- **D** Q-factor

**Display range**
- Z: 0.00 m to 999999 (G)
- Y: 0.00 m to 999999 (G)
- X: 0.00 m to 999999 (G)
- Q: 0.00 m to 999999 (G)
- D: 0.00 m to 999999 (G)

**Output impedance**
Approx. 50 Ohm

**Accuracy**
- ±0.01% of setting or less

**Resolution**
- ±0.012 dB (+ or −) at 20°C
- ±0.04 dB (0°C to 40°C)

**Continuous measurement mode**

**Measurements**
Continuous measurement using up to 46 combinations of the following measurement conditions:
- 30 LCR mode measurement conditions and 16 analyzer mode measurement conditions

**Speed and accuracy**

**Measurement speed (analog measurement)**
- Fast: 0.5 ms
- Med: 0.9 ms
- Slow: 2.1 ms
- Slow2: 3.7 ms

**Averaging**
Valid setting range: 1 to 256 (in steps of 1)

**Basic accuracy**
- IM75680 / IM75681: ± 0.05% rdg. ± 0.45% rdg.
- IM75683 / IM75685: ± 0.65% rdg. ± 0.38% rdg.

**Guaranteed accuracy range**
100 mΩ to 5 kΩ (Impedance)

**Accuracy guaranteed**
1 year, Post-adjustment accuracy guaranteed for 1 year

**Terminal design**
- 2-terminal design

**Supplementary functionality**

**Trigger function**
- Use selectable internal or external trigger (EXT, INT, interface, manual)
- Trigger delay: 0 sec. to 9 sec.
- Trigger synchronized output: Stabilization wait time of 0 sec. to 9 sec.
- INDEX signal delay time of 0 sec. to 1 sec.
- Trigger types: Sequential, repeat, step**

**Compensation function**
- Open/short load calibration: From Main unit to test head
- Open/load compensation: Compensation of fixture component
- Electrical length compensation: 0 mm to 100 mm
- Correlation compensation: Compensation of display values based on user-input compensation coefficient

**Contact check**
- DCR measurement, Hi-Z reject function, waveform judgment function

**Recording and interface**

**Number of measured values that can be stored in memory**
LCR Mode: 32000
Analyzer Mode: 100 sweeps

**Panel save and load functions**
Measurement conditions: 30 sets for LCR mode, 16 sets for Analyzer mode
Compensation values: 30 sets for LCR mode

**Interfaces**
- HANDLER, USB, LAN, GPIB (optional), RS-232C (optional)

**Command**
- HIOKI unique SCPI

**Display and sound**

**Key lock function**
Lock operation of the instrument using the panel. Unlock by entering a passcode

**Beep tone**
Enable or disable for judgment results and key operation

**Warm-up function**
The instrument will display a message 60 minutes after it is powered on

**Selection of number of display digits**
- 3, 4, 5, or 6 digits

**Display settings**
- LCD display on/off
- Backlight brightness adjustment
- Measurement screen background color (white or black)
- Switchable parameter colors

**Display**
- 8.4-inch color TFT with touch panel

**Other**

**Temperature range and humidity range**
- 0°C to 40°C (32°F to 104°F), 20% RH to 80% RH, non-condensing

**Dimension and mass**
- IM75680A / IM75681: Approx. 215 W x 200 H x 268 D mm (8.46 W x 7.87 H x 10.55 D in.), approx. 6.5 kg (23.8 oz)
- IM75683 / IM75685 / IM7587: Approx. 215 W x 200 H x 348 D mm (8.46 W x 7.87 H x 13.7 D in.), approx. 8.0 kg (28.2 oz)

**Accessories**
- Power cord x 1, Instruction manual x 1, Impedance analyzer application disc x 1
Measurement accuracy

\[ Z : \pm (Ea + Eb) \% \quad \theta : \pm 0.58 \times (Ea + Eb) \, [^\circ] \]

**Conditions**

**Guaranteed accuracy temperature and humidity range**

- 0°C to 40°C (32°F to 104°F), 20% rh to 80% rh (non-condensing)
- However, must be within ±5°C of the temperature at the time of calibration.

**Guaranteed accuracy period**

- 1 year (with open/short/load calibration enabled)

**Open/short/load calibration enabled period**

- Within 24 hours after calibration

**Warm-up time**

- At least 60 min.

**Measurement conditions**

- Frequency, power, and speed points at which open, short, and load calibration have been performed

**IM7580A / IM7581**

\[ Ea = 1.0 + Er \] (Frequency : 100kHz to 999.99kHz)

\[ Ea = 0.5 + Er \] (Frequency : 1MHz to 300MHz)

<table>
<thead>
<tr>
<th>Frequency to 999.99 kHz</th>
<th>Signal level</th>
<th>Er</th>
<th>( a )</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz to 100 MHz</td>
<td>-7 dBm to +7 dBm</td>
<td>0.24</td>
<td>0.18</td>
<td>0.15</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -71 dBm</td>
<td>1.3</td>
<td>-1.4</td>
<td>-1.5</td>
<td>-1.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ Eb = \left( \frac{Zs}{Zx} + Yo \right) \times 100 \% \quad (\text{ } Zx : Z \text{ measured value in } [\Omega]) \]

\[ Zs = \left( \frac{Zsk + Zsr + 0.5 \times F}{1000} \right) \quad (F : \text{measurement frequency [MHz]}) \]

<table>
<thead>
<tr>
<th>Frequency to 999.99 kHz</th>
<th>Zsk</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz to 100 MHz</td>
<td>50</td>
</tr>
<tr>
<td>1 MHz to 300 MHz</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency to 999.99 kHz</th>
<th>Signal level</th>
<th>Zsr</th>
<th>( a )</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz to 100 MHz</td>
<td>-7 dBm to +7 dBm</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -71 dBm</td>
<td>13.5</td>
<td>9</td>
<td>5.1</td>
<td>3.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ Yo = \left( \frac{Yok + Yor + 0.15 \times F}{1000000} \right) \quad (F : \text{measurement frequency [MHz]}) \]

<table>
<thead>
<tr>
<th>Frequency to 999.99 kHz</th>
<th>Yok</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz to 199.99 kHz</td>
<td>120</td>
</tr>
<tr>
<td>200 kHz to 300 MHz</td>
<td>30</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency to 999.99 kHz</th>
<th>Signal level</th>
<th>Yor</th>
<th>( a )</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz to 100 MHz</td>
<td>-7 dBm to +7 dBm</td>
<td>15</td>
<td>12</td>
<td>6.6</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -71 dBm</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**P :** Power setting [dBm]
### IM7583 / IM7585 / IM7587

**Ea :**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Signal level</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MHz to 100 MHz</td>
<td>+1 dBm</td>
<td>0.581</td>
<td>0.557</td>
<td>0.532</td>
<td>0.524</td>
</tr>
<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>1.005</td>
<td>0.815</td>
<td>0.71</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>3.622</td>
<td>2.501</td>
<td>1.7</td>
<td>1.43</td>
</tr>
<tr>
<td>100.1 MHz to 500 MHz</td>
<td>+1 dBm</td>
<td>0.652</td>
<td>0.634</td>
<td>0.621</td>
<td>0.616</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>0.858</td>
<td>0.769</td>
<td>0.71</td>
<td>0.678</td>
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<tr>
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<td>-40 dBm to -23 dBm</td>
<td>1.72</td>
<td>1.336</td>
<td>1.06</td>
<td>0.85</td>
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<tr>
<td>500.1 MHz to 1300 MHz</td>
<td>+1 dBm</td>
<td>0.86</td>
<td>0.841</td>
<td>0.823</td>
<td>0.818</td>
</tr>
<tr>
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<td>-22.9 dBm to +0.9 dBm</td>
<td>1.093</td>
<td>0.988</td>
<td>0.92</td>
<td>0.881</td>
</tr>
<tr>
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<td>-40 dBm to -23 dBm</td>
<td>2.068</td>
<td>1.625</td>
<td>1.31</td>
<td>1.16</td>
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<tr>
<td>1300.1 MHz to 1800 MHz</td>
<td>+1 dBm</td>
<td>2.066</td>
<td>2.037</td>
<td>2.02</td>
<td></td>
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<tr>
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<td>-22.9 dBm to +0.9 dBm</td>
<td>2.381</td>
<td>2.228</td>
<td>2.128</td>
<td>2.113</td>
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<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>5.773</td>
<td>4.156</td>
<td>3.423</td>
<td>3.133</td>
</tr>
<tr>
<td>1800.1 MHz to 3000 MHz</td>
<td>+1 dBm</td>
<td>4.539</td>
<td>4.5</td>
<td>4.46</td>
<td>4.437</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>4.867</td>
<td>4.753</td>
<td>4.608</td>
<td>4.547</td>
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<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>9.748</td>
<td>7.682</td>
<td>6.468</td>
<td>5.874</td>
</tr>
</tbody>
</table>

**Eb = \( \left( \frac{Z_x + Y_o}{Z_{x}} \right) \times 100 \text{ [%]} \) \((Z_x) : Z \text{ measured value in [} \Omega \text{]}\)

**Zs = \( \frac{Z_{o} + 0.5 \times F}{1000} \) \((O) \text{ : measurement frequency [MHz]}\)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Signal level</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MHz to 300 MHz</td>
<td>+1 dBm</td>
<td>41.7</td>
<td>37.6</td>
<td>34.3</td>
<td>32.3</td>
</tr>
<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>75.4</td>
<td>62.9</td>
<td>49.4</td>
<td>43.1</td>
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<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>495.66</td>
<td>293.25</td>
<td>185.7</td>
<td>142.05</td>
</tr>
<tr>
<td>300.1 MHz to 1000.0 MHz</td>
<td>+1 dBm</td>
<td>61.7</td>
<td>57.6</td>
<td>54.3</td>
<td>52.3</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>95.4</td>
<td>82.9</td>
<td>69.4</td>
<td>63.1</td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>515.66</td>
<td>313.25</td>
<td>205.7</td>
<td>162.05</td>
</tr>
<tr>
<td>1000.1 MHz to 1300 MHz</td>
<td>+1 dBm</td>
<td>111.7</td>
<td>107.6</td>
<td>104.3</td>
<td>102.3</td>
</tr>
<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>145.4</td>
<td>132.9</td>
<td>119.4</td>
<td>113.1</td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>565.66</td>
<td>363.25</td>
<td>255.7</td>
<td>212.05</td>
</tr>
<tr>
<td>1300.1 MHz to 1800 MHz</td>
<td>+1 dBm</td>
<td>112.8</td>
<td>108.7</td>
<td>104.7</td>
<td>103.9</td>
</tr>
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<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>145.4</td>
<td>132.9</td>
<td>119.4</td>
<td>113.1</td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>565.66</td>
<td>363.25</td>
<td>255.7</td>
<td>212.05</td>
</tr>
<tr>
<td>1800.1 MHz to 3000 MHz</td>
<td>+1 dBm</td>
<td>212.8</td>
<td>208.7</td>
<td>204.7</td>
<td>203.9</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>245.4</td>
<td>232.9</td>
<td>219.4</td>
<td>213.1</td>
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<tr>
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<td>-40 dBm to -23 dBm</td>
<td>665.66</td>
<td>463.25</td>
<td>355.7</td>
<td>312.05</td>
</tr>
</tbody>
</table>

**Yo = \( \frac{Y_{o} + 0.15 \times F}{1000000} \) \([S] \text{ : measurement frequency [MHz]}\)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Signal level</th>
<th>FAST</th>
<th>MED</th>
<th>SLOW</th>
<th>SLOW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MHz to 300 MHz</td>
<td>+1 dBm</td>
<td>15.6</td>
<td>13.8</td>
<td>12.3</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>48</td>
<td>35.6</td>
<td>25.5</td>
<td>21.7</td>
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<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>277.15</td>
<td>193.45</td>
<td>122.5</td>
<td>87.1</td>
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<tr>
<td>300.1 MHz to 1000.0 MHz</td>
<td>+1 dBm</td>
<td>35.6</td>
<td>33.8</td>
<td>32.3</td>
<td>31.8</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>68</td>
<td>55.6</td>
<td>45.5</td>
<td>41.7</td>
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<tr>
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<td>-40 dBm to -23 dBm</td>
<td>297.15</td>
<td>213.45</td>
<td>142.5</td>
<td>107.1</td>
</tr>
<tr>
<td>1000.1 MHz to 1300 MHz</td>
<td>+1 dBm</td>
<td>45.6</td>
<td>43.8</td>
<td>42.3</td>
<td>41.8</td>
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<tr>
<td></td>
<td>-22.9 dBm to +0.9 dBm</td>
<td>78</td>
<td>65.6</td>
<td>55.5</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>-40 dBm to -23 dBm</td>
<td>307.15</td>
<td>223.45</td>
<td>152.5</td>
<td>117.1</td>
</tr>
<tr>
<td>1000.1 MHz to 1300 MHz</td>
<td>+1 dBm</td>
<td>75.6</td>
<td>73.8</td>
<td>72.3</td>
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<td>-22.9 dBm to +0.9 dBm</td>
<td>108</td>
<td>95.6</td>
<td>85.5</td>
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<td>-40 dBm to -23 dBm</td>
<td>337.15</td>
<td>253.45</td>
<td>182.5</td>
<td>147.1</td>
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<tr>
<td>1000.1 MHz to 1300 MHz</td>
<td>+1 dBm</td>
<td>143.2</td>
<td>140.2</td>
<td>135.9</td>
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<tr>
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<td>-22.9 dBm to +0.9 dBm</td>
<td>168</td>
<td>155.6</td>
<td>145.5</td>
<td>141.7</td>
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<td>-40 dBm to -23 dBm</td>
<td>397.15</td>
<td>313.45</td>
<td>242.5</td>
<td>207.1</td>
</tr>
</tbody>
</table>
Basic measurement confirmation table

IM7580A / IM7581 (For -7dBm to +7dBm, SLOW2.)

IM7583 / IM7585 / IM7587 (For +1dBm, SLOW2.)

Range of measurements

Range of measurements L

Range of measurements C

Frequency [MHz]
External control

List of EXT I/O handler interface signals

<table>
<thead>
<tr>
<th>Pin</th>
<th>I/O</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IN</td>
<td>TRIG</td>
</tr>
<tr>
<td>2</td>
<td>IN</td>
<td>Unused</td>
</tr>
<tr>
<td>3</td>
<td>IN</td>
<td>Unused</td>
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<tr>
<td>4</td>
<td>IN</td>
<td>LD1</td>
</tr>
<tr>
<td>5</td>
<td>IN</td>
<td>LD3</td>
</tr>
<tr>
<td>6</td>
<td>IN</td>
<td>LD5</td>
</tr>
<tr>
<td>7</td>
<td>IN</td>
<td>Unused</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>ISO_5V</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>ISO_COM</td>
</tr>
<tr>
<td>10</td>
<td>OUT</td>
<td>ERR</td>
</tr>
<tr>
<td>11</td>
<td>OUT</td>
<td>PARA1-HI,BIN1,PARA1-NG</td>
</tr>
<tr>
<td>12</td>
<td>OUT</td>
<td>PARA1-LO,BIN2,PARA2-NG</td>
</tr>
<tr>
<td>13</td>
<td>OUT</td>
<td>PARA2-IN,BIN5,PARA3-NG</td>
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<tr>
<td>14</td>
<td>OUT</td>
<td>AND,BIN7</td>
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<tr>
<td>15</td>
<td>OUT</td>
<td>PARA3-IN,BIN9,PARA4-IN</td>
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<tr>
<td>16</td>
<td>OUT</td>
<td>PARA4-HI</td>
</tr>
<tr>
<td>17</td>
<td>OUT</td>
<td>PARA4-LO</td>
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<tr>
<td>18</td>
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<td>19</td>
<td>OUT</td>
<td>OUT_OF_BINS,CIRCUIT_NG</td>
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<td>20</td>
<td>IN</td>
<td>Unused</td>
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<tr>
<td>21</td>
<td>IN</td>
<td>Unused</td>
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<td>22</td>
<td>IN</td>
<td>LD0</td>
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<tr>
<td>23</td>
<td>IN</td>
<td>LD2</td>
</tr>
<tr>
<td>24</td>
<td>IN</td>
<td>LD4</td>
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<td>25</td>
<td>IN</td>
<td>LD6</td>
</tr>
<tr>
<td>26</td>
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<td>LDVALID</td>
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<td>28</td>
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<td>OUT</td>
<td>INDEX</td>
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<td>30</td>
<td>OUT</td>
<td>PARA1-IN,BIN2,PARA1-NG</td>
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<td>31</td>
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<td>PARA2-HI,BIN4,PARA2-NG</td>
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<td>32</td>
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<td>PARA2-LO,BIN6,PARA3-NG</td>
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<td>PARA3-HI,BIN8,PARA4-NG</td>
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<td>Unused</td>
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<tr>
<td>37</td>
<td>OUT</td>
<td>Unused</td>
</tr>
</tbody>
</table>

Timing chart

Example of LCR Mode measurement timing

*In this example, the TRIG signal’s active edge is the falling edge (ON).

Example of Analyzer Mode measurement timing

EOM: Off from trigger input to end of measurement processing
INDEX: Off during probe chuck (probe cannot be removed from target)
### Instrument

<table>
<thead>
<tr>
<th>Product / Order code</th>
<th>Model (Measurement frequency)</th>
<th>Connection cable length</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPEDANCE ANALYZER IM7580A</td>
<td>(1 MHz to 300 MHz)</td>
<td>1 m (3.28 ft)</td>
<td>IM7580A - 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 m (6.56 ft)</td>
<td>IM7580A - 2</td>
</tr>
<tr>
<td>IMPEDANCE ANALYZER IM7581</td>
<td>(100 kHz to 300 MHz)</td>
<td>1 m (3.28 ft)</td>
<td>IM7581 - 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 m (6.56 ft)</td>
<td>IM7581 - 02</td>
</tr>
<tr>
<td>IMPEDANCE ANALYZER IM7583</td>
<td>(1 MHz to 600 MHz)</td>
<td>1 m (3.28 ft)</td>
<td>IM7583 - 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 m (6.56 ft)</td>
<td>IM7583 - 02</td>
</tr>
<tr>
<td>IMPEDANCE ANALYZER IM7585</td>
<td>(1 MHz to 1.3 GHz)</td>
<td>1 m (3.28 ft)</td>
<td>IM7585 - 01</td>
</tr>
<tr>
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<td>2 m (6.56 ft)</td>
<td>IM7585 - 02</td>
</tr>
<tr>
<td>IMPEDANCE ANALYZER IM7587</td>
<td>(1 MHz to 3 GHz)</td>
<td>1 m (3.28 ft)</td>
<td>IM7587 - 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 m (6.56 ft)</td>
<td>IM7587 - 02</td>
</tr>
</tbody>
</table>

Composition: Main unit, Test Head, Connection cable

Accessories: Power cord, Instruction manual, Impedance analyzer application disc

#### Options

**Interfaces**

- GP-IB INTERFACE Z3000
- GP-IB CONNECTION CABLE 9151-02 Cable length: 2 m (6.56 ft)
- RS-232C INTERFACE Z3001
- RS-232C CABLE 9637 Cable length: 1.8 m (5.91 ft)

*Any interlink-compatible cross-cable can be used as the RS-232C CABLE.*

**Note:** Company names and Product names appearing in this catalog are trademarks or registered trademarks of various companies.