






## Major specifications

### Oscillator section

Output waveform	 Sine wave,  Square wave,  Triangular wave
Frequency range	 : <b>FRA5087</b> 0.1mHz to 10MHz <b>FRA5097</b> 0.1mHz to 15MHz  : 0.1mHz to 100kHz Setting resolution : 0.1mHz Accuracy : $\pm 10$ ppm
AC amplitude	0V to 10V <sub>peak</sub> (no load) Setting resolution : Three digits or 0.01mV <sub>peak</sub> , whichever is greater
DC bias	-10V to 10V (no load) Resolution : 10mV
Output control	Quick : Goes to a set voltage or 0V instantaneously. Slow : Goes to a set voltage or 0V slowly. Phase control : Sets the start and stop phases of oscillation in 1° steps. AC/DC simultaneous ON/OFF and AC only OFF possible.
Frequency sweep	Logarithmic sweep : 3 to 20,000 steps/sweep or 1 to 20,000 steps/decade (3 steps/sweep minimum ; 20,000 steps/sweep maximum). Linear sweep : 3 to 20,000 steps/sweep or 0.1mHz to 10MHz/step ( <b>FRA5087</b> ), 0.1mHz to 15MHz/step ( <b>FRA5097</b> ) (where, 3 steps/sweep minimum and 20,000 steps/sweep maximum). Frequency axis high density sweep : When measured data changes greatly, sweep density is made higher around the frequency area automatically for accurate measurement.
Isolation	Withstand voltage : 250Vrms (to chassis, to analysis section input) Measurement category : I

### Analysis section input

Number of input channels	Two (CH1 and CH2)
Isolation	250Vrms (signal and ground to oscillator section and analysis section input channel) Measurement category : I
Maximum input voltage	$\pm 350$ V <sub>peak</sub> (AC+DC)
Maximum measuring voltage	250Vrms
Dynamic range	140dB typ. (10Hz to 1MHz)
Measuring mode	REPEAT, SINGLE, SWEEP
Analysis mode	Ratio : CH1/CH2, CH2/CH1 Level : CH1, CH2
Harmonic measurement	2 <sup>nd</sup> to 10 <sup>th</sup> order (up to 10MHz for <b>FRA5087</b> and 15MHz for <b>FRA5097</b> )
Harmonic wave and noise rejection ratio	Normal mode DC : 60dB or greater Wide band white noise : 50dB or greater (noise band width 500kHz) Harmonic (10 <sup>th</sup> or less) : 60dB or greater (100kHz or less) 40dB or greater (100kHz or greater)
Auto ranging function	Switches the input range according to the input signal level.
Delay function	Delays time until a start of measurement following switching the frequency. 0 to 9,999 seconds or 0 to 9,999 cycles.
Integration function	Integrates data for measurement, eliminating the noise. 0 to 9,999 seconds or 0 to 9,999 cycles.
Auto integration function	Repeats integration until a certain reliability is obtained. 0 to 9,999 seconds or 2 to 9,999 cycles.
Amplitude compression function	Controls the level of oscillation so that the amplitude level of DUT may stay at a certain value in order to keep the DUT from saturation and damage.
Equalize function	Measures the frequency characteristics of measuring systems such as the sensors and cables beforehand and then removes the error of the system in measurement to obtain the characteristics of the DUT only.
Operation function	Arithmetic operation (data to data, data to logarithmic value, value to value), differentiation of data, second differentiation, integration, second integration, open-loop to closed-loop conversion, closed-loop to open-loop conversion.

### Measurement error

CH1/CH2 or CH2/CH1	$\leq 20$ kHz	$\leq 500$ kHz	$\leq 2.2$ MHz	$> 2.2$ MHz
a, b, R	$\pm 0.5\%$	$\pm 1\%$	$\pm 10\%$	$\pm 25\%$
dBR	$\pm 0.05$ dB	$\pm 0.1$ dB	$\pm 1$ dB	$\pm 2$ dB
Phase (deg.)	$\pm 0.3^\circ$	$\pm 0.5^\circ$	$\pm 2^\circ$	$\pm 5^\circ$

In case analysis input voltage is 100mV<sub>peak</sub> to 10V<sub>peak</sub> (2V<sub>peak</sub> maximum when exceeding 2.2MHz) immediately after calibration

### Display section

Display	6.5 inches, color TFT LCD
Graph display	Bode, Nyquist, Nicols, and Cole-Cole plots Interconversion is also available. (reading and auto-scale are available with use of the cursor)
Measured data display	Gain (linear, logarithmic), phase enlarged display possible
Other functions	Auto scaling as well as marker, measurement condition, title, date and time displays

### External memory

Media	USB memory (USB 1.1 or USB 2.0)
Connector	Front panel, USB-A connector
File format	FAT (compatible with Windows 98SE or later, compatible with IBM PC/AT)
Recorded contents	Setting conditions, measured data, screen data (bit map format)
File operation function	Directory, rename, delete, save, load

### External I/O

Interface	GPIB : Condition setting, condition and data inquiry, operation command USB : USB 1.1 (low speed, full speed), TMC rear panel, USB-B connector
Thermosensitive printer	Takes hard copy of LCD screen image on the internally stored thermosensitive paper
DC power supply output	5055 connector (optional), $\pm 24$ V, 100mA maximum

### Impedance display function (optional for **FRA5087**)

Display items	Impedance, resistance, reactance, admittance, conductance, and susceptance are displayed on linear and logarithmic graphs.
Current shunt input convert coefficient	0 to 1.0E+6 (five digit resolution or 0.01E-9), phase inversion function
Open/short correction functions	Sets the open and short correction memories and displays a graph with open/short correction at measurement.
Maximum, minimum search functions	Searches the maximum and minimum values of vertical axis parameters on a bode diagram, moves the marker, and displays the calculated values.

### Other

Power supply	AC 100V/120V/230V $\pm 10\%$ Where, 250V or less and 50Hz/60Hz $\pm 2$ Hz
Power consumption	100 VA maximum
Guaranteed temperature and humidity ranges	+5 to +35°C, 5 to 85% relative humidity (Absolute humidity of 1 to 25g/m <sup>3</sup> with no condensation)
Dimensions	434 (W) $\times$ 177 (H) $\times$ 453 (D) mm (not including projections)
Weight	Approx. 12kg
Accessories	1 instruction manual, 1 GPIB/USB instruction manual, 1 power supply cable (3-pin, 2m), 3 signal cables (BNC-BNC), 1 T-type divider, 1 roll of thermosensitive paper

### Optional accessories

Product name	Type
● High withstand voltage clip set (3 per set)	PA-001-0419
● High withstand voltage alligator clip cable set (small) (3 per set)	PA-001-0420
● High withstand voltage alligator clip cable set (large) (3 per set)	PA-001-0421
● Alligator clip cable set (3 per set)	PA-001-0422
● High withstand voltage BNC adapter (T-branch)	PC-001-4503
● High withstand voltage BNC cable	PC-002-3347
● High withstand voltage extension BNC cable	PC-007-0364
● Replacement printer paper (ten rolls)	PC-007-0382
● Loop gain measuring adapter clip cable (for replacement)	PC-007-1922