

Specifications

▼ Oscillator

Connector	Insulated BNC (front panel, OSC)
Frequency	10 μ Hz to 15 MHz Setting resolution : 10 μ Hz Accuracy : ± 10 ppm
AC signal amplitude	0 to 10 Vpk Setting resolution : 3 digits or 0.01 mVpk, whichever is greater
DC bias	-10 V to +10 V, Setting resolution : 10 mV
Output impedance	50 Ω $\pm 2\%$ (1 kHz)
Maximum output (AC + DC)	Voltage : ± 10 V Current : ± 100 mA
Sweep	Sweep density : 3 to 20,000 steps/sweep Sweep type : Linear or log, selectable Sweep time : Fastest 0.5 ms (per frequency point)
Output control	QUICK : immediately changes to the set voltage or to 0 V SLOW : changes to the set voltage or to 0 V gradually over a period of about 10 seconds Function for turning off at 0° phase Function for changing the frequency at 0° phase It is possible to turn the AC and DC on / off at the same time or to turn off the AC only. It is possible to turn on automatically at the start of measurement and to turn off automatically at the end of measurement.
Isolation	600 V CAT II or 300 V CAT III (BNC grounded to the enclosure)
Capacitance relative to the enclosure	150 pF or less
DC BIAS OUT (rear panel)	Connector : BNC Setting range : -10 V to +10 V Output resistance : 600 Ω $\pm 2\%$

▼ Analysis input

Input channels	2 (CH1, CH2)
Connectors	Insulated BNC
Input impedance	1 M Ω $\pm 2\%$, 20 pF ± 5 pF
Measurement range	10 ranges (30 m/100 m/300 m/1/3/10/30/100/300/600 Vrms), and AUTO. CH1 and CH2 can be set independently.
Maximum input voltage	600 V CAT II or 300 V CAT III
Maximum measurement voltage	600 Vrms (the bundled signal cable is used)
Over-level detection	0 to 600 Vrms (over lamp lights, buzzer warning sound, stop sweep measurement)
Dynamic range	140 dB (10 Hz to 1 MHz) 80 dB (1 MHz to 15 MHz)
IMRR	isolation mode rejection ratio 120 dB or more (DC to 60 Hz)
Isolation	600 V CAT II or 300 V CAT III (BNC ground to the enclosure)
Capacitance relative to the enclosure	200 pF or less

▼ Measurement processing

Measurement operations	UP SWEEP [In order of increasing frequency] DOWN SWEEP [In order of decreasing frequency] SPOT [At the current frequency (no sweep)] REPEAT [Repeatedly measurements] SINGLE [A single measurement]
Integration function	This function performs integration on measurement data to remove the effects of noise. 0 to 9,990 s or 1 to 9,999 cycles
Measurement delay function	This function delays the beginning of a measurement after the frequency is changed. 0 to 9,990 s or 0 to 9,999 cycles

Start delay function	This function delays the beginning of a measurement only from the start of a sweep or spot measurement. 0 to 9,990 s or 0 to 9,999 cycles
Automatic integration function	This function repeats the integration process until the variation in the measurement values falls below a set value. Setting : FIX, SHORT, MED, or LONG.
Amplitude compression	This function automatically adjusts the oscillator output amplitude so that the amplitude of the signal input to the reference channel satisfies the target amplitude. Target amplitude setting : 1 μ V to 600 Vrms Voltage limit for the oscillator : 1 mV to 10 Vpk Allowable error : 1 to 100% Maximum number of retries : 1 to 9,999 Correction factor : 1 to 100%
Automatic high density sweep	This function automatically increases the sweep density in the region just before and after a point where there is a large change in the measurement data. Variation : a, b, R (0 to 600 Vrms) dBR (0 to 1000 dB) Phase (0 to 180°)
Sequence measurement function	This function performs measurements according to the content of a measurement condition memory. UP SWEEP The first up sweep is performed over the frequency range that is set in memory number 1. The next up sweep is performed over the range that is set in memory number 2, and so on continuously up to the upper limit memory number. DOWN SWEEP The first down sweep is performed over the range set in the memory number specified by the upper limit memory number. The next down sweep is performed over the range that is set in the next lower memory number and so on continuously down to memory number 1. Upper limit memory number : 1 to 20

▼ Analysis processing

Display unit	Gain (ratio, unitless number) or impedance			
Measurement accuracy				
Fixed range				
Measurement accuracy = Relative accuracy + Calibration accuracy				
Relative accuracy = $\pm (\text{Basic accuracy} + \text{Dynamic accuracy} + \text{Inter-range accuracy} \times N)$				
Calibration accuracy : The accuracy of external equipment that is connected to the instrument, such as a shunt resistor or probe, or the accuracy of the calibration standard equipment.				
Basic accuracy Upper : gain (ratio) ; Middle : impedance Z ; Lower : phase				
Measurement range (rms)	Frequency			
	≤ 100 kHz	≤ 200 kHz	≤ 1 MHz	≤ 2 MHz
600 V	± 0.2 dB $\pm 2.4\%$ $\pm 1.2^\circ$	—	—	—
300 V	± 0.1 dB $\pm 1.2\%$ $\pm 0.6^\circ$	—	—	—
100 V	± 0.05 dB $\pm 0.58\%$ $\pm 0.3^\circ$	—	—	—
30 V to 30 mV	± 0.01 dB $\pm 0.12\%$ $\pm 0.06^\circ$	± 0.025 dB $\pm 0.29\%$ $\pm 0.15^\circ$	± 0.1 dB $\pm 1.2\%$ $\pm 0.6^\circ$	

▼ Analysis processing (continued)

Measurement range (rms)	Frequency	
	≤ 5 MHz	≤ 15 MHz
10 V to 30 mV	±0.2 dB ±2.4% ±1.2°	±0.5 dB ±5.9% ±3.0°

[Conditions]

- At least 30 cycles of integration
- Fixed measurement range and the same range for both channels.
- The gain, Z and phase error for when the signal input is at the full scale of the measurement range for both channels.

*For the cells that contain only " — ", either the measurement is not possible or there is no accuracy specification for it.

Dynamic accuracy (excerpt) : Gain (ratio) / Impedance Z / Phase
 ≤ 100 kHz and 300 mV to 600 V ranges : ±0.1 dB / ±1.2% / ±0.6°
 ≤ 15 MHz and 100 mV to 10 V ranges : ±0.5 dB / ±6.0% / ±3.0°

[Conditions]

- At least 30 cycles of integration
- Fixed measurement range and the same range for both channels.
- Gain, Z and phase variation for when the signal level changes from full-scale of measurement range to 1/10. The input signal level is 1:1 or 1:0.1 between channels.

Inter-range accuracy (excerpt) : Gain (ratio) / Impedance Z / Phase
 ≤ 100 kHz and ≤ 300 V range : ±0.05 dB / ±0.58% / ±0.3°
 ≤ 15 MHz and ≤ 10 V range : ±0.05 dB / ±0.58% / ±0.3°
 ≤ 100 kHz and 600 V range : ±0.1 dB / ±1.2% / ±0.6°

[Conditions]

- At least 30 cycles of integration
- Fixed measurement range for both channels
- The gain, Z and phase error for when the measurement range difference between channels is 1, the input signal levels of both channels are equal, and equal to the range full scale level of the smaller range.

Auto-range

Measurement accuracy = Relative accuracy + Calibration accuracy
 Relative accuracy = ± (|Basic accuracy| + |Dynamic accuracy|)
 Calibration accuracy : The accuracy of external equipment that is connected to the instrument, such as a shunt resistor or probe, or the accuracy of the calibration standard equipment.

Basic accuracy Upper : gain (ratio) ; Middle : impedance Z ; Lower : phase

Signal level (rms)	Frequency			
	≤ 100 kHz	≤ 200 kHz	≤ 1 MHz	≤ 2 MHz
7 V	±0.02 dB	±0.02 dB	±0.05 dB	±0.1 dB
	±0.24%	±0.24%	±0.58%	±1.2%
	±0.12°	±0.12°	±0.3°	±0.6°

Signal level (rms)	Frequency	
	≤ 5 MHz	≤ 15 MHz
7 V	±0.2 dB	±0.5 dB
	±2.4%	±5.9%
	±1.2°	±3.0°

[Conditions]

- At least 30 cycles of integration
- Auto-range for both channels
- The gain, Z and phase error for when the input signal level is the same for both channels.

Dynamic accuracy (excerpt) : Gain (ratio) / Impedance Z / Phase
 ≤ 100 kHz and signal level of 30 Vrms to 600 Vrms :
 ±0.1 dB / ±1.2% / ±0.6°
 ≤ 15 MHz and signal level of 100 mVrms to 20 Vrms :
 ±0.5 dB / ±6.0% / ±3.0°

[Conditions]

- At least 30 cycles of integration
- Auto-range for both channels
- The gain, Z and phase variation for when input signal level with the greater signal level channel changes from 7 Vrms to the value above, when the input signal level between channel is 1:1 or 1:0.1.

Error correction function	Corrects for measurement errors that arise within the instrument itself (Calibration).
---------------------------	--

▼ Gain

Analysis modes	Ratio : CH1/CH2, CH2/CH1 Amplitude : CH1, CH2
Graph types	Bode plot, Nyquist plot, Nichols plot
Measurement items	dBR (gain dB), θ (phase), GD (group delay), R (absolute gain/amplitude), a (real part of gain/real part of amplitude), b (imaginary part of gain/imaginary part of amplitude)
Error correction function (Equalizing)	Measuring the frequency characteristics of the measurement system (sensors, cables, etc.) in advance and then eliminate that error component.

▼ Impedance

Voltage and current input	Voltage is measured as the measurement amplitude at CH1 and current is measured as the measurement amplitude at CH2.
Analysis modes	Impedance : CH1/CH2 Admittance : CH2/CH1 Voltage : CH1 Current : CH2
Graph types	Bode plot, Nyquist plot, Cole-cole plot
Measurement items	Z (impedance) R, X (resistance, reactance) Y (admittance) G, B (conductance, susceptance) Ls, Lp (inductance) Cs, Cp (capacitance) Rs, Rp (resistance) V (voltage) I (current) θ (phase) D (dissipation factor) Q (quality factor)
Error correction function	Open correction Short correction Load correction Load standard value : Standard values can be entered for up to 10 frequency points. Port extension : Corrects the error due to phase delay in cables for 2-port measurements. Slope compensation This function performs analysis that is unaffected by the DC level for signals that have a superimposed DC level that varies linearly over time.

▼ Display

Display unit	8.4-inch color TFT-LCD (SVGA) with touch screen
Graph display styles	SINGLE : One graph is displayed on the screen. SPLIT : Two graphs are displayed on the screen, one above the other.
Data traces	Reference data trace (REF) Measurement data trace (MEAS)
Auto scaling	This function automatically optimizes the graph display scale.(on or off)
Marker display	Main marker, Delta marker
Marker search function	Search items Max, Min : The maximum and minimum values Peak, Bottom : The peak (maximal) and the bottom (minimal) values NextPeak : The next peak NextBottom : The next bottom Value : The marker value ΔValue : The difference between the delta marker and the main marker values X Value : Frequency *It is possible to automatically perform a search at the end of a sweep measurement.

▼ Memory

Measurement data (MEAS)	The data from the sweep measurement Up to 20 sets of data can be stored in internal memory.
Reference data (REF)	Data that can be displayed on a graph together with the measurement data (MEAS). This can be measurement data or data loaded from a USB memory device. (on/off)
Error correction data	Open correction, Short correction, Load correction, Equalize
Measurement conditions	20 sets
Data retention	Except for data that is not stored in internal memory yet, measurement data is retained, even if the power is turned off.

▼ External memory

Media	USB memory device
Connections	Front panel, USB-A
File system	FAT
Screen capture function	MS Windows bitmap file (extension : .BMP, image size: 800 × 600)

▼ External input/output function

Interface	GPIB : Standards conformance ; IEEE488.1 and IEEE488.2 USB : USB 2.0 HighSpeed LAN : 10/100Base-T RS-232 : Baud rate 4800 to 230400 bps
External monitor	Connector : VGA (mini D-sub15 pin, female) Signal : 800 × 600 pixels (SVGA), analog RGB component video signal

Reference clock input	Frequency : 10 MHz ±100 ppm or under Input waveform : Sinusoidal or square Input voltage : 0.5 Vp-p to 5 Vp-p
Reference clock output	Output impedance : 50 Ω (nominal), AC coupling Frequency : 10 MHz ±10 ppm (when operating on the internal reference clock) Output waveform : 1 Vp-p / 50 Ω, square waveform
DC power output	Power supply outlet that is used by the "5055 SIGNAL INJECTOR PROPE" (option) Connector : Rear panel, AUX Output voltage : Approximately ±24 V

▼ Miscellaneous specifications

Power input	Voltage : AC 100 V to 230 V ±10%, 250 V or less Frequency : 50 Hz/60 Hz ±2 Hz
Power consumption	100 VA or less
Range of ambient temperature and humidity	+5 °C to +40°C, 5 to 85% RH (absolute humidity 1 to 25 g/m ³ , no condensation)
Dimensions	430 mm (W) × 177 mm (H) × 350 mm (D) (excluding protruding parts)
Weight	Approximately 8.5 kg
Accessories	Instruction Manual (operation and remote control) Power Cord Set (2 m, with three-pin plug) Signal Cables (BNC-BNC, 50 Ω, 1 m, 600 V CAT II) ×3 Calibration Cables (BNC-BNC, 50 Ω, 20 cm) ×2 BNC Adapter (600 V CAT II)

Note : The contents of this catalog are current as of June 18th, 2019

•Products appearance and specifications are subject to change without notice.

•Before purchase contact us to confirm the latest specifications, price and delivery date.

NF Corporation

Head Office

6-3-20 Tsunashima Higashi, Kohoku-ku, Yokohama 223-8508, Japan

<http://www.nfcorp.co.jp/english/>

NF Techno Commerce Co., Ltd. International Sales Division

6-3-14 Tsunashima Higashi, Kohoku-ku, Yokohama 223-0052, Japan

Phone : +81-45-777-7604 Fax : +81-45-777-7605