Specifications

Measurement Function

Measurement channel:	2 channels (4-trace display)
Measurement parameter:	R A/R, R, A (Option 10) A/R, B/R, A/B, R, A, B (Option 11)

Measurement format

AC/DC display:	Logarithmic/linear amplitude, phase, group delay, real and imaginary portions of complex number parameters Z, R, X (impedance conversion measurement) Y, G, B (admittance conversion measurement) Phase extension display
Smith chart:	Logarithmic/linear amplitude and phase for marker reading, real and imaginary portions, R+jX, G+jB
Polar coordinates display:	Logarithmic/linear amplitude and phase for marker reading, real and imaginary portions

Signal Source Characteristics (23 ±5°C)

Frequency characteristics

Range:	10 kHz to 150 MHz	
Resolution:	0.1 Hz	
Accuracy:	±5 ppm (Typ.)	
	±1 ppm (Option 20)*	
	(1 MHz or more, when 0 to +50°C, after 30 minutes warm-up)	
Stability:	±2 x 10⁻⁸/day (Option 20)*	
	(after 48 hours warm-up)	

Output characteristics

Output characteristics:	+21 dBm to -43 dBm	
Resolution:	0.1 dB	
Accuracy:	±0.5 dB (0 dBm, 10 MHz)	
Linearity (50 MHz):	+21 dBm to -35 dBm	±0.5 dB
	-35 dBm to -43 dBm	±1.5 dB
Flatness (at 0 dBm output):	10 kHz to 300 kHz	±2.0 dB
	300 kHz to 150 MHz	±1.5 dB
Impedance (output port 1):	Nominal 50 Ω	
	Return loss 13 dB or more	
	(at 0 dBm output, Typ.)	

Signal purity

Harmonic wave distortion:	≤-15 dBc
Non-harmonic wave spurious:	≤-20 dBc or -60 dBm, whichever is larger
Phase noise:	≤-95 dBc/Hz (10 kHz offset)

Sweep characteristics

Sweep parameter:	Frequency, signal level
Range:	Same as the frequency sweep frequency characteristic Level sweep +21 dBm to -43 dBm
Range setting:	Start/Stop or Center/Span
Sweep type:	Linear/logarithmic frequency sweep, level sweep, sweep of a user-defined segment
Sweep time:	Max. 0.05 ms/point (RBW 15 kHz)
Measurement point:	3, 6, 11, 21, 51, 101, 201, 301, 401, 501, 601, or 1201 points
Sweep trigger:	Continuous, Single, External
Sweep mode:	Dual sweep (2-channel sweep in the same frequency range), alternate sweep (2-channel sweep in different frequency ranges)

Output form

Output:	Single Single, dual (Option 10, Option 11)
Connector:	BNC (female), 50 Ω

Power splitter (output port 2):	Option 10, Option 11	
Insertion loss : (Option 10, Option 11)	6 dB (Typ.)	
Level tracking : (Option 10, Option 11)	<100 MHz ≥100 MHz	0.1 dB (Typ.) 0.2 dB (Typ.)
Equivalent output SWB : (Option 10, Option 11)	<100 MHz ≥100 MHz	1.2 (Typ.) 1.4 (Typ.)

*BNC-BNC cable (A01036-0150) will be attached.

Reception Section Characteristics (23 ±5°C)

Input characteristics

Input channel:	1 ch, 2 ch (Option 10), 3ch (Option 11)		
Frequency range:	10 kHz to 150 MHz		
Impedance:	Nominal 50 Ω		
Return loss:	ATT 0 dB	20 dB or more	
	ATT 25 dB	25 dB or more	
Max. input level:	ATT 25 dB	AMP 0 dB	+5 dBm
	ATT 0 dB	AMP 0 dB	-20 dBm
	ATT 0 dB	AMP 16 dB	-36 dBm
Input destruction level:	+24 dBm, ±3 VDC		
Average noise level: (ATT 0 dB, AMP 16 dB)	RBW 10 kHz	200 kHz to 500 kHz	-102 dBm
		500 kHz to 150 MHz	-112 dBm
	RBW 3 kHz	60 kHz to 500 kHz	-107 dBm
		500 kHz to 150 MHz	-117 dBm
	RBW 1 kHz	20 kHz to 500 kHz	-112 dBm
		500 kHz to 150 MHz	-122 dBm
	RBW 300 Hz	10 kHz to 500 kHz	-117 dBm
		500 kHz to 150 MHz	-127 dBm
Resolution bandwidth (RBW):	3 Hz to 15 kHz (1, 1.5, 2, 3, 4, 5, or 7 steps)		
Input cross-talk:	10 kHz to 500 kHz	105 dB	
	500 kHz to 150 MHz	120 dB	
Signal source cross talk:	10 kHz to 500 kHz	105 dB	
	500 kHz to 150 MHz	120 dB	
Input connector:	BNC (female) 50 Ω		

Automatic offset correction

Normalization function:	Compensates the frequency characteristics of the measurement system.
Electric length correction:	Equivalent electric length or group delay time can be added to the measured phase or group delay time.
Range:	-3 X 10⁸m to +3 X 10⁸m or +10 sec. to -10 sec.

Amplitude characteristics (absolute characteristics)

Measurement range: (RBW 1 kHz) (100 kHz or more)	ATT AUTO AMP 0 dB	+5 dBm to -115 dBm	
	ATT 25 dB AMP 0 dB	+5 dBm to -90 dBm	
	ATT 0 dB AMP 0 dB	-20 dBm to -115 dBm	
	ATT 0 dB AMP 16 dB	-36 dBm to -122 dBm	
Display resolution:	0.001 dB/div		
Accuracy:	±0.5 dB (10 MHz, max. input level)		
Frequency response (at 0 dBm input):	10 kHz to 1 MHz	4 dBp-p	
	1 MHz to 150 MHz	3.5 dBp-p	
Dynamic accuracy: (ATT 25 dBm, AMP 0 dB) (100 kHz or more)	0 to -10 dBm	±0.4 dB	
	-10 to -60 dBm	±0.1 dB	
	-60 to -70 dBm	±0.2 dB	
	-70 to -80 dBm	±0.6 dB	

Amplitude characteristics (relative characteristics): Option 10, Option 11

Measurement range: (100 kHz or more)	ATT AUTO	AMP 0 dB	±120 dB
	ATT 20 dB AMP 0 dB	AMP 0 dB	±95 dB
	ATT 0 dB	AMP 0 dB	±95 dB
	ATT 0 dB	AMP 16 dB	±86 dB
Display resolution:	0.001 dB/div		
Accuracy:	±0.5 dB (10 MHz, max. input level)		
Frequency response (at 0 dBm input)	10 kHz to 1MHz	3 dBp-p	
	1 MHz to 150 MHz	2 dBp-p	
Dynamic accuracy: (ATT 25 dB, AMP 0 dB) (100 kHz or more)	0 to -10 dBm	±0.1 dB	
	-10 to -60 dBm	±0.05 dB	
	-60 to -70 dBm	±0.1 dB	
	-70 to -80 dBm	±0.3 dB	
	-80 to -90 dBm	±0.9 dB	

Phase characteristics (relative characteristics)**

Measurement range:	±180° Continuous display possible for more than ±180° by the display expansion function	
Resolution:	0.01°	
Dynamic accuracy: (ATT 25 dB, AMP 0 dB) (100 kHz or more)	0 to -10 dBm ±3.0°	
	-10 to -50 dBm	±1.5°
	-50 to -60 dBm	±2.0°
	-60 to -70 dBm	±2.4°
	-70 to -80 dBm	±3.6°

** With a measurement range setting which includes 32.5 MHz, absolute measured phase characteristic values for are not guaranteed.
They are guaranteed when the unit is used with a measurement range setting between 10 kHz and 32.5 MHz, or between 32.5 MHz and 150 MHz.

Phase characteristics (relative)	Option 10, Option 11
Measurement range:	±180˚
	Continuous display possible for more than ±180 deg. by the display expansion function
Resolution:	0.01˚
Frequency response :	10 kHz to 1 MHz 20˚ p-p
(at 0 dBm input)	1 MHz to 150 MHz 15˚ p-p
Dynamic accuracy:	0 to -10 dBm ±1.0˚
(ATT 25 dB, AMP 0 dB)	-10 to -50 dBm ±0.3˚
(100 kHz or more)	-50 to -60 dBm ±0.5˚
	-60 to -70 dBm ±1.0˚
	-70 to -80 dBm ±3.0˚
	-80 to -90 dBm ±8.0˚

Delay characteristics	
Range:	Calculated using the following equation:

$$r = \frac{\Delta\emptyset}{360 \times \Delta f} \quad \Delta\emptyset: \text{Phase} \quad \Delta f: \text{Aperture frequency (Hz)}$$

Measurement range:	1 ps to 250 s
Group delay time resolution:	1 ps
Aperture frequency:	Equivalent to Δf

$$\frac{100 \times 2\%}{\text{Measurement point - 1}}$$

$$\frac{100 \times 2\%}{\text{Measurement point - 1}}$$

With this resolution, it is possible to set from this value through about 100% of the frequency span.

Accuracy:	$\dfrac{\text{Phase accuracy}}{360 \times \text{Aperture frequency (Hz)}}$

Error correction functions	
Normalization:	Corrects the frequency response (amplitude, phase) during transfer measurement.
1-port calibration:	Corrects the bridge direction, the frequency response, and the source matching error. Error correction requires Short, Open, and Load.
Data averaging:	Averages data (vector values) for each sweep. Averaging count can be set from 2 to 999.
Transfer full calibration:	High accuracy measurement possible using transfer normalization in transfer measurement. Error correction requires Short and Load.

Connection with External Equipment

External display signal output:	15-pin D-sub connector (VGA)
GPIB data output and remote control:	Conforming to IEEE 488
Printer port:	25-pin D-sub
Serial port:	Based on RS-232
Keyboard:	IBM-PC/AT compatible
External reference frequency input:	Available frequencies 1, 2, 5 and 10 MHz ±10 ppm, 0 dBm (50 Ω) or more
Parallel I/O output : (Option 01)	TTL level, 8-bit output (2 ports), 4-bit I/O (2 ports)
Probe power: (Option 10, Option 11)	±12 V
External trigger signal input:	BNC connector (female)

Display Section

Display unit:	R3754A 5-inch STN monochrome LCD R3754B 6.5-inch color TFT LCD
Resolution:	640 X 640 dots
Display mode:	AC-DC logarithmic/linear coordinates, polar coordinates, Smith chart (inductance/admittance indication)
Display format:	Single channel, dual channel (overlay display, split display)
Measurement condition display:	Start/stop, center/span, scale/DIV reference level, marker value, soft key functions, warning message.
Reference line position:	Vertical axis memory top section (100%) to bottom section (0%)

Auto scale:	The optimum reference level and scale value are automatically set for the current measurement.
Backlight:	ON/OFF, no adjustment for the R3754A
Contrast:	Contrast control provided for R3754A

Marker Functions

Marker display:	Marker readings can be converted to display values corresponding to the respective measurement formats.
Multi-marker:	10 individual markers can be set for each channel.
Delta marker:	Any of the 10 markers can be specified as the reference marker enabling delta value measurements between markers.
Marker couple:	Markers of each channel can be set in coupled or independent form.
Specific section analysis:	Marker search possible for a section specified by the delta marker.
MKR search:	MAX search, MIN search, NEXT search
Marker track:	Search is performed for each sweep.
Target search:	It is possible to calculate the bandwidth, center frequency, Q at the X dB down point. It is also possible to search the phase 0 degree frequency value and the ±X˚ frequency width. deg. frequency width.
MKR→:	MKR→Reference value, MKR→START, MKR→STOP, MKR→CENTER
Limit line function:	Limit line can be set for up to 31 segments. Pass/Fail judgments can be performed for each segment.
Direct analysis function:	Resonator analysis, etc.

Instrument State Functions

Save register:	Allows storing condition settings and CAL data in battery backed internal memory.
Data save/recall:	Allows storing/loading data to/from FDD

Programming Functions

BASIC control function:	Standard control function allows the control of the main unit as well as other measurement equipment with the GPIB interface.
Built-in functions:	Allows high-speed analysis of measurement data.
FDD function:	Based on the MS-DOS format FD. Storage capacity (DD: 720 Kbytes, HD: 1.2 Mbytes, 1.44 Mbytes)

General Specifications

Operating environment FDD used:	Temperature range +5 to +40˚C, humidity range 80% or less (no condensation)
No FDD used:	Temperature range 0 to +50˚C, humidity range 80% or less (no condensation)
Storage environment:	-20˚C to +60˚C
Power supply:	100 VAC to 120 VAC, 220 VAC to 240 VAC, 48 Hz to 66 Hz, 100 VAC and 200 VAC systems are automatically changed.
Power consumption:	200 VA or less
External dimensions:	Approx. 424 (W) X 177 (H) X 300 (D)
Mass:	12 kg or less