6. SPECIFICATIONS

Note: Unless otherwise described, these specifications are guaranteed in the temperature range of 25°C ± 5°C.

(1) Measure function

Amplitude ratio	A/R, B/R, A/B (dB, linear ratio)		R3753A
	A/R		R3753B
Phase	θ (deg)		
Group delay time	τ		
Absolute amplitude	R, A, B (V, dBm)	R3753A	
	R, A	R3753B	
	A	R3753E	

(2) Signal source section

Frequency		
Range	5Hz to 500MHz	
Resolution	0.1Hz	
stability	$\pm 5 \times 10^{-6}$/Day	
Accuracy	± 20ppm	
Output level		
Range	+ 21.0dBm to -63.0dBm (Output port 1)	
Resolution	0.1dB	
Accuracy	± 0.5dB (0dBm, 50MHz)	
Linearity	+ 21dBm to -35dBm	± 0.5dB
	-35dBm to -63dBm	± 1.5dB
Flatness	5Hz to 1MHz	± 2.0dB (0dBm output)
	1MHz to 300MHz	± 1.5dB
	300MHz to 500MHz	± 2.0dB
Output Impedance	50Ω	
	Return loss: 13dB or more (Typ) (0dBm output)	
Signal purity		
Harmonic distortion	≤ -20dBc	
Non harmonic spurious	Larger one either < -30dBc or -70dBm	
Phase noise	< -75dBc/Hz (10kHz offset)	

Sweep function	
Sweep parameter	Frequency, Signal level
Maximum sweep range	Frequency: 5Hz to 500MHz
	Signal level: -43dBm to +21dBm
Range setting	Start/Stop or Center/Span
Sweep type	Linear, Logarithm, program sweep
Sweep trigger	Repeat, Single, EXT
Sweep mode	2ch simultaneous sweep, alternate sweep
Sweep speed	0.1ms/point (RBW 10kHz)
Measuring point	3, 6, 11, 21, 51, 101, 201, 301, 401, 601, 801,1201 point
Output format	
Output	Single, Dual R3753A/B
	Single R3753E
Connector	(Internal splitter is used for Dual.)
Internal power splitter	50Ω, BNC
Insertion loss (Typ)	
Output tracking (Typ)	6dB
5Hz to 100MHz	
100MHZ to 500MHz	<0.1dB, <1° R3753A/B only
Equivalent output SWR (Typ)	<0.2dB, <1°
	<100MHz, 1. 2
	≥100MHz, 1. 4

(3) Analysis section

Input characteristic	
Input terminal	3-channel (Rch, Ach, Bch) R3753A
	2-channel (Rch, Ach) R3753B
	1-channel (Ach) R3753E
Input impedance	50Ω, 1MΩ/20pF or less
Return loss	5Hz to 300MHz: 20dB or more (ATT 0dB)
	23dB or more (ATT 20dB)
	300MHz to 500MHz: 15dB or more (ATT 0dB)
Connector	20dB or more (ATT 20dB)
	50Ω, BNC

Maximum input level

	Attenuator	
	0dB	20dB
50Ω 1MΩ	-20dBm 22.4mV	0dBm 224mV

Input heat damage level

50Ω: +23dBm or ±0VDC
1MΩ: +3V

Crosstalk (between inputs)

ATT AUTO (For 0dB ATT at 100kHz or less), 25±5°C
20kHz to 500kHz 105dB or more (R3753A/B only)
500kHz to 300MHz 115dB or more
300MHz to 500MHz 110dB or more

(between inputs/outputs)

Output level +15dBm, ATT 0dB
5Hz to 500kHz 105dB or more (R3753A/B only)
500kHz to 300MHz 110dB or more
300MHz to 500MHz 105dB or more

Resolution bandwidth

10kHz to 3Hz (Variable at 1 and 3 step)

Noise floor

Noise level; [ATT AUTO (For 0dB ATT at 100kHz or less), 25±5°C]

RBW / FREQ	10kHz	3kHz	1kHz	300Hz	100Hz
5Hz to 500kHz	min f 200kHz -90dBm	min f 60kHz -95dBm	min f 20kHz -100dBm	min f 6kHz -100dBm	min f 2kHz -100dBm
500kHz to 300MHz	-105dBm	-110dBm	-115dBm	-115dBm	-115dBm
300MHz to 500MHz	-105dBm	-110dBm	-110dBm	-110dBm	-110dBm

Automatic offset calibration

Normalize function

Frequency characteristic reduction for measurement system.

Electrical length calibration

Equivalent electric length or delay time can be added to measured phase and group delay time.

Range

-3×10^{9}m to $+3\times10^{9}$m, or -10sec to +10sec

Amplitude characteristic	
Measurement range (RBW 1kHz)	Attenuator AUTO, 0dBm to -120dBm
Absolute amplitude	Attenuator 0dB, -20dBm to -120dBm
	Attenuator 20dB, 0dBm to -100dBm
Amplitude ratio	0 ± 120dB
Amplitude resolution	0.001dB
Frequency response	
Absolute value measurement(R, A, B)	50Ω input: 2dBp-p (5Hz to 300MHz)
	3dBp-p (300MHz to 500MHz)
Ratio measurement (A/R, B/R, A/B)	1MΩ input: 10dBp-p (5Hz to 1kHz)
(when attenuation value is the same)	1.5dBp-p (1kHz to 100MHz)
	50Ω input: 1.0dBp-p (5Hz to 100MHz)
	2.0dBp-p (100MHZ to 300MHz)
Dynamic accuracy	3.0dBp-p (300MHZ to 500MHz)
	1MΩ input 5dBp-p (5Hz to 1kHz)
	1.5dBp-p (1kHz to 100MHz)
	0dB to -10dB ± 0.10dB
	-10dB to -50dB ± 0.05dB
	-50dB to -60dB ± 0.05dB
	-60dB to -70dB ± 0.10dB
	-70dB to -80dB ± 0.30dB
	-80dB to -90dB ± 0.90dB
Phase characteristic	
Ratio measurement	(A/R, B/R, and A/B) are available
Measurement range	± 180°
	(Long display function enables continuous display.)
Phase resolution	0.01°
Frequency response	50Ω input: 5°p-p (5Hz to 100MHz)
(when attenuation value is the same)	15°p-p (100MHZ to 300MHz)
	20°p-p (300MHZ to 500MHz)
	1MΩ input 20°p-p (5HZ to 1kHz)
Dynamic accuracy	10°p-p (1kHz to 100MHz)
	0dB to -10dB ± 1.0°
	-10dB to -50dB ± 0.3°
	-50dB to -60dB ± 0.5°
	-60dB to -70dB ± 1.0°
	-70dB to -80dB ± 3.0°
	-80dB to -90dB ± 8.0°

Group delay time characteristic (Linear frequency sweep, When the ratio measurement, When the 50Ω input is available)	Solve expression $\tau = \frac{\Delta\phi}{360 \times \Delta f}$ $\Delta\phi$: Phase Δf: Aperture frequency (Hz)
Measurement range	1ps to 250s
Group delay time resolution	1ps
Aperture frequency	0.01% to 50% of the frequency span (equivalents to Δf)
Accuracy	$\frac{\text{Phase accuracy}}{360 \times \text{Aperture frequency (Hz)}}$

(4) Specification of display

Display section	
TFT color liquid crystal display	7.8-inch
Resolution	640×480 dots
Display mode	Character, Graphic display

(5) Others function

System function	
Error calibration function	
Normalize	Corrects the frequency response (Both amplitude and phase) for transmission and reflection measurement.
One port calibration	Corrects the bridge directivity, frequency response, and source match for reflection measurement. Requires short, open, and load standards.
Two port calibration	Corrects the directivity, source match, load match, frequency response and isolation for the two port device measurement. Requires short, open, and load standards.

System function	
Data averaging	Data (vector value) is averaged every sweep. An averaging factor can be set, ranging from 2 to 999.
Data smoothing	Performs moving averaging between adjacent measurement points.
External equipment	
External monitor output	VGA conforms
GPIB	Supports common commands complied with IEEE standards 488.2. Enables to correspond with SCPI.
24bits input/output	TTL level
RS-232	Serial output conforms to RS-232.
Programming function	
Internal BASIC controller function	Standard equipped Includes Built-in function

(6) General specification

External trigger	PIO 18pin, TTL level, LOW enable
External reference frequency input	Frequency: 1, 2, 5, 10MHz Connector: BNC Input level range: 0dBm to 20dBm
Operating environment	+5°C to 40°C, RH85% or less (when floppy disk used.) 0°C to 50°C, RH85% or less (when floppy disk not used.)
Storage temperature range	-20°C to 60°C
Power source	AC100V to 120V / AC220V to 240V (Automatic switching) 48Hz to 66Hz 300VA or less
Outside dimension	About 424 (W)×220 (H)×400 (D) mm
Dimensions	About 15kg or less

(7) The calibration period: 1 year.
It is necessary to execute the calibration every 1 year period for the guarantee to the measurement accuracy of R3753.
Regarding to the calibration service, contact the dealer or the nearest sales branch.