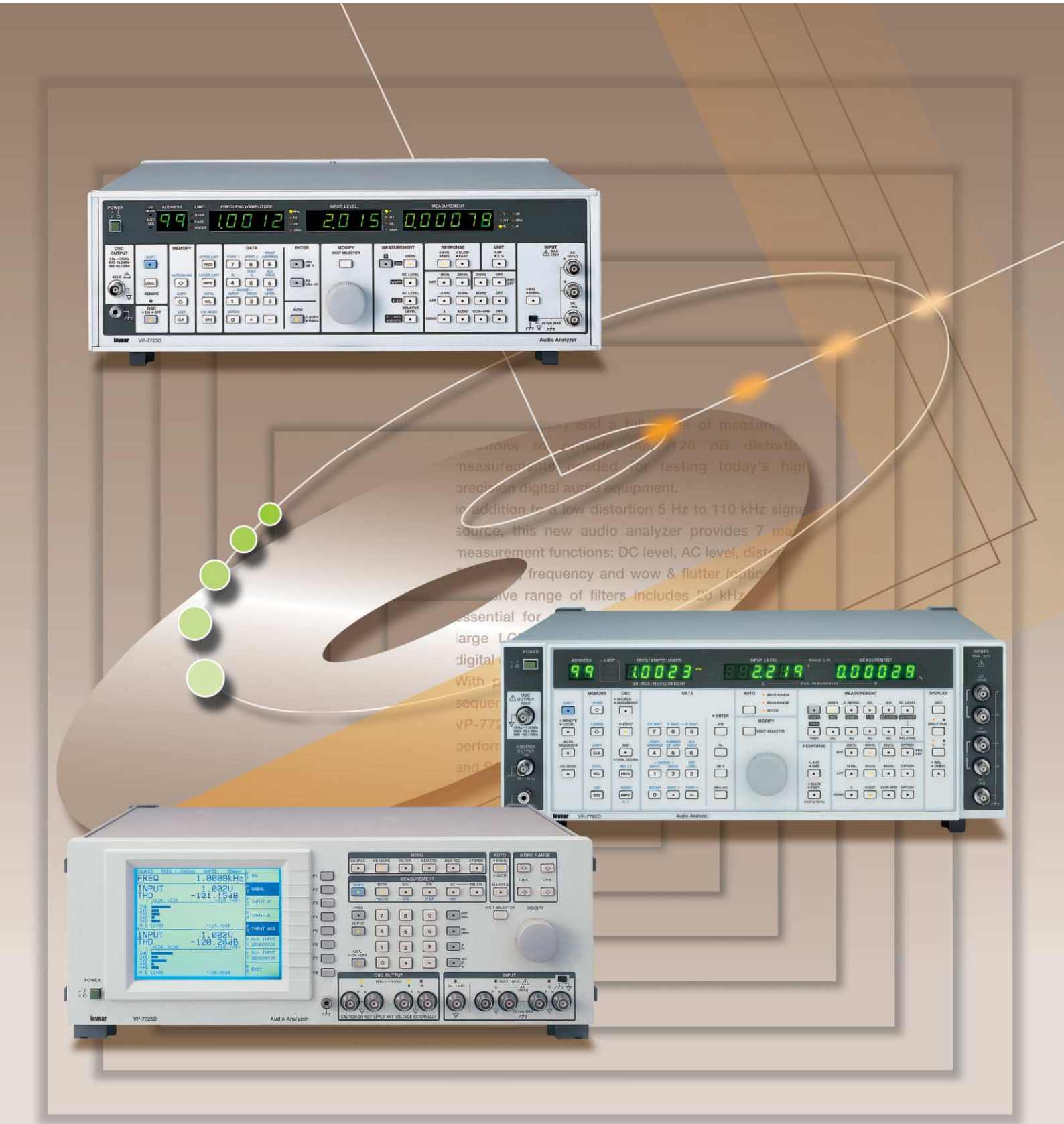
levear

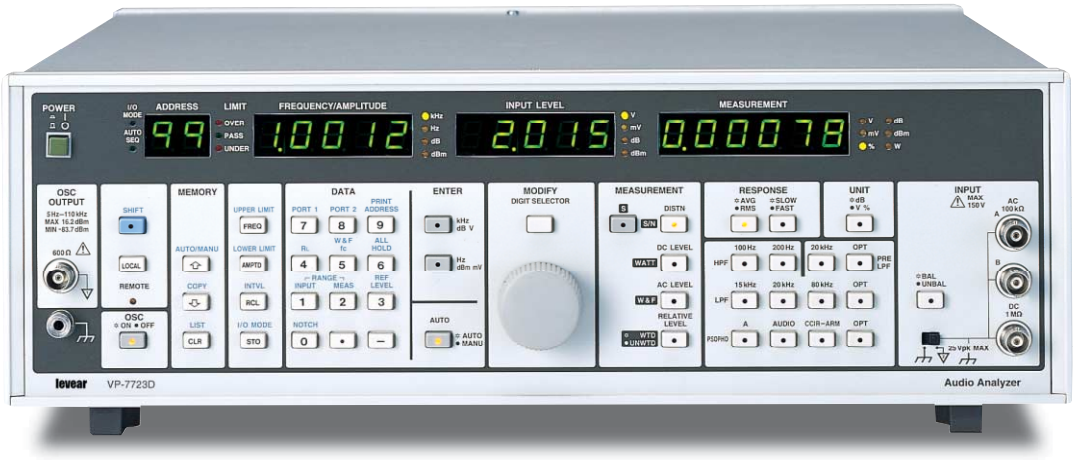
Audio Analyzer Series

VP-7723D / VP-7782D / VP-7725D



VP-7723D

VP-7723D is equipped with pre-LPF for evaluation of audio signal providing high performance, and multi functions for your measur



Audio Analyzer VP-7723D

This Audio Analyzers is equipped with a low distortion signal source, measurement functions of AC level, DC level, Distortion, Frequency and Wow & Flutter (Factory Option).
In addition to various filters including 20 kHz pre-LPF which are essential for digital audio measurement, the audio analyzers have pre-set memory, judgment function, auto sequence function, GP-IB and remote control interface.

Features

Audio signal oscillator

- 5 Hz to 110 kHz, 16.2 dBm (14.0 dBV, 10 V at open end)
- 0.000 5 % distortion (1 kHz typical value) high performance signal source

AC Measurement

- AC level measurement: The audio analyzer has a highly sensitive AC level measurement function with indication response selectable from V [rms] or V [avg]. Seven measurement ranges are provided; 0.316 mV, 3.16 mV, 31.6 mV, 316 mV, 3.16 V, 31.6 V and 100 V full range.
- Relative level measurement: Deviation measurement against reference level is available. It is applied to frequency characteristics and level ratio measurement.
- Watt indication: By setting the imaginary load resistance (R_L) across the input voltage, the power value is calculated and displayed.
  Power = (Measured AC level value)^2 / R_L [watt]
- S/N measurement: In this mode, the oscillator is turned on for a length of time (1.5 to 3 s) and the signal component (S component level) is measured. Then, the oscillator turns off and the noise component (N component level) is measured when the input terminal of the D.U.T. is terminated with the characteristic impedance.
  The S/N ratio is obtained automatically by calculating the outputsignal (S component level) and N component level ratio.

DC Measurement

- 0.316 to 100 V full scale
- Available for D.U.T.supply voltage measurement.

Distortion Measurement

- The audio analyzer is capable of measuring distortion factors of the fundamental signal over the frequency range of 5 Hz to 110 kHz.
- Input level ranges from 0.1 V to 100 V [rms]. Also a high sensitivity 3.16 mV range is provided for the dynamic range measurement of digital audio equipment.

Frequency Measurement

- Reciprocal type high speed counter is installed.
- This function is available in AC level, Distortion and Wow & Flutter measurement modes.

Wow & Flutter measurement (Factory Option)

- Wow & flutter measurement meeting the quasi-peak and rms response requirement specified by the CCIR/DIN (Option 01) or JIS (Option 02) specifications can be installed optionally.

from digital sources, CD, MD and DVD, ements.

Measurement filters

• Nine filters are installed as standard and seven kinds of filters as options.

Standard filters

1. Pre-LPF 20 kHz: Filters for digital audio. It is applicable to CD,MD,DVD and semiconductors.(ADC)
One optional filter is available.

2. LPF 15 kHz: For DAT, BS and FM tuner

20 kHz: For digital audio.

80 kHz: For high frequency elimination.

One optional filter is available.

3. HPF 100 Hz: For eliminating AM stereo pilot signal(25 Hz).

200 Hz: For low band elimination in IHF-BPF.

4. PSOPHO A: IEC-A filter. CCIR/ARM: Dolby.* AUDIO: IEC AUDIO.
One optional filter is available.
(*Dolby is a registered trademark of Dolby Laboratory Inc.)

Optional filters VQ-071H Series

• One option can be installed in LPF part and Psopho part respectively.

• VQ-071H01 CCITTP53: For telecommunication(mainly Europe).

• VQ-071H02 C-MESSAGE: For telecommunication(mainly USA).

• VQ-071H03 1 kHz BPF: For crosstalk measurement.

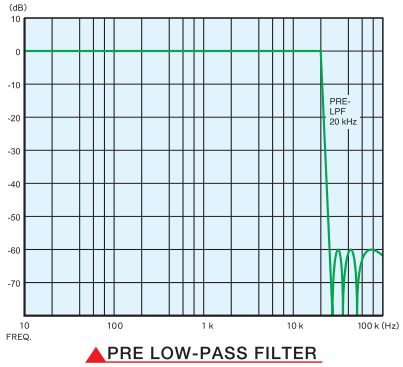
• VQ-071H04 3 kHz BPF: For crosstalk measurement.
(Mainly for audio tape)

• VQ-071H05 IEC-C: For audio equipment.

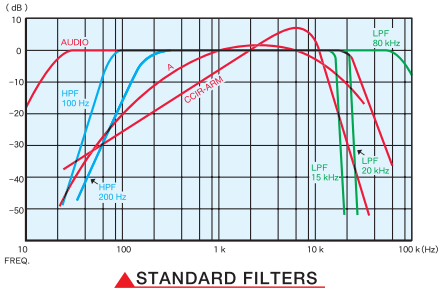
• VQ-071H06 315 Hz BPF: For audio tape evaluation.

• VQ-071H07 30 kHz LPF : For high frequency elimination.

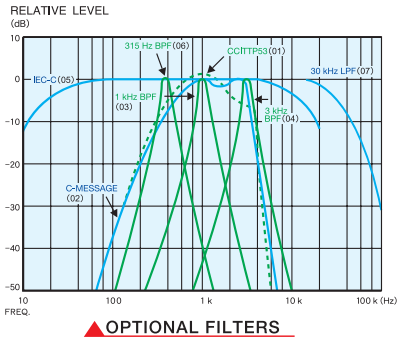
Filter Characteristics



▲PRE LOW-PASS FILTER



▲STANDARD FILTERS



▲OPTIONAL FILTERS

Versatile interfaces are useful for construction of automated testing system

1. 100 points memory:	Grouping function is included (max.10 groups).
2. Auto sequence:	Sequence time can be set for each memory address.
3. Judgment function:	Auto judgment function by UNDER/OVER/PASS.
4. External control:	Remote control is available for memory address. 8 bits 2 ports input/output function for controlling the jigs, etc.
5. GP-IB:	It is used for controlling peripheral equipment, transmitting measurement data, synchronized operation by talk only/ listen only mode and memory dumping.

Audio Analyzer VP-7723D

SIGNAL SOURCE

OSCILLATOR

Frequency Range	5 Hz to 110 kHz 4 ranges
Resolution (4 digits display)	0.1 Hz (5.0 to 200.9 Hz)
	1 Hz (0.201 to 2.009 kHz)
	10 Hz (2.01 to 20.09 kHz)
	100 Hz (20.1 to 110.0 kHz)
Accuracy	±2 % of setting (0.201 to 20.09 kHz)
	±3 % of setting (all ranges)
Output Range	14.0 to −85.9 dBV (0 dB=1 V [rms], load end)
	16.2 to −83.7 dBm (0 dBm= 1 mW, 600 Ω load)
Resolution	0.1 dB
Accuracy	±0.5 dB of setting at 1 kHz (>−37.1 dBV)
	±0.8 dB of setting at 1 kHz (≤−37.2 dBV)
	600 Ω load
Flatness	±0.05dB (20.0 Hz to 20.09 kHz)
	±0.3 dB (all ranges)
Noise level	Less than 10 μV [rms] (with output off)
Distortion	≤ 0.001 % (−100 dB) (20 Hz to 15 kHz, 80 kHz BW)
	≤ 0.01 % (−80 dB) (All ranges)

ANALYZER

MEASUREMENT FUNCTIONS

Frequency measurement, AC level measurement (Includes the relative level measurement function), DC level measurement, S/N measurement, Distortion (THD+N), Wow & Flutter (factory option)

FREQUENCY MEASUREMENT

Range	5 Hz to 110 kHz (operates in AC level, Distortion, Wow & Flutter measurement mode)
Display resolution	5 digits, 0.01 Hz< 100 Hz
Accuracy	$\pm 5 \times 10^{-5} \pm 1$ digit
Measuring system	Reciprocal counter

AC LEVEL MEASUREMENT

Full range display 0.316 0 mV to 100 V full range (7 ranges)

Unit: (m)V	Unit: dB	Unit: dBm
100.0 V	40.0 dBV	42.2 dBm
31.60 V	30.0 dBV	32.2 dBm
3.160 V	10.0 dBV	12.2 dBm
316.0 mV	−10.0 dBV	−7.8 dBm
31.60 mV	−30.0 dBV	−27.8 dBm
3.160 mV	−50.0 dBV	−47.8 dBm
0.316 0 mV	−70.0 dBV	−67.8 dBm

Note: Apporoximate 10 % of overrange is provided for each range except the 100.0 V range

Accuracy	±2 % of full range display (at 1 kHz)
Frequency range	±5 % (20 Hz to 20 kHz)
	±10% (5 Hz to 110 kHz)
Residual noise	< 4 μV [rms] (with 80 kHz BW)
	< 10 μV [rms] (with 500 kHz BW)
Relative level range	±130 dB
Detection response	RMS or average response

WATTAGE DISPLAY FUNCTION

Method	Calculated by AC level measurement and imaginary load resistance. (Actual load is not equipped.)
Display resolution	Max. 5 digits 0.01 W
RL setting range	2 to 5 000 Ω (1 Ω resolution)

DC LEVEL MEASUREMENT

Range	100.0/31.60/3.160/316.0 mV 4 ranges
Over range	Approx. 10 % (except 100 V range)
Accuracy	± (0.3 % fs+0.75 % reading)

S/N MEASUREMENT

Input level range	30 μV to 100 V [rms]
	(N component has to be lower than S component in amplitude)
Measurement range	0 to 130 dB

S component level (freq ≤ 10 kHz)	S/N Limit
≥ 31.6 V (30 dBV)	> 130 dB
≥ 3.16 V (10 dBV)	> 110 dB
≥ 316 mV (−10 dBV)	> 90 dB
≥ 31.6 mV (−30 dBV)	> 70 dB
≥ 3.16 mV (−50 dBV)	> 50 dB
≥ 0.316 mV (−70 dBV)	> 30 dB

Accuracy	±1 dB
Detection response	RMS or average response
S/N delay time	3 s (SLOW Response mode)
	1.5 s (FAST Responce mode)
S component accuracy	±2 % of full scale (1 kHz)

DISTORTION MEASUREMENT

Fundamental frequency range	5 Hz to 110 kHz
Measurement range	31.6/10.00/1.000/0.100 0/0.0100 0 %
	(−10.00/−20.00/−40.00/−60.00/−80.00 dB)

Display of measurement units

Selection of unit key	Input signal level	Distortion display
V, %	mV, V	%
dB, dBm	dB, dBm	dB

Detection characteristics	Input signal level : RMS responding
	Distortion : RMS or average responding
Second harmonic accuracy	±1 dB (20 Hz to 20.09 kHz)
	±3 dB (all ranges)

Residual distortion detection

Input range	100、31.6、10、3.16、1V		0.316 V		Band width renge
Input level	Full scale input	1/3 input of full scale	Full scale input	1/3 input of full scale	
5 Hz to 20 kHz	≤ −100 dB, 0.001 %	≤ −90 dB, 0.0032 %	≤ −94 dB, 0.002 %	≤ −85 dB, 0.0056 %	80 kHz BW
5 Hz to 110 kHz	≤ −80 dB, 0.01 %	≤ −80 dB, 0.01 %	≤ −76 dB, 0.016 %	≤ −74 dB, 0.02 %	500 kHz BW

	3.16 mV range: <−45 dB (0.56 %) against 2 mV [rms]
	(Fundamental freq.: 20 Hz to 10 kHz, 20 kHz BW)
Input signal level range	0.1 to 100 V [rms] /1 to 3.16 mV [rms]
Measurement range	7 ranges

Display unit (m)V	Unit: dBV	Unit: dBm
100.0 V	40.0 dBV	42.2 dBm
31.6 V	30.0 dBV	32.2 dBm
10.0 V	20.0 dBV	22.2 dBm
3.16 V	10.0 dBV	12.2 dBm
1.00 V	0 dBV	2.2 dBm
0.316 V	−10.0 dBV	−7.8 dBm
*3.16 mV	−50.0 dBV	−47.8 dBm

	*manual range setting only
Input signal level measurement accuracy	±2 % of full scale (1 kHz)
Input signal frequency range	±5 % (5 Hz to 110 kHz, except 100 V range)
	±10 % (3.16 mV range, 10 Hz to 20 kHz,1 kHz full scale reference)

WOW & FLUTTER MEASUREMENT (factory option)

Measurement center Frequency range	3 kHz, 3.15 kHz ± 200 Hz
Measurement range	10.00/1.000/0.100 0 %
Detection characteristics	Q-peak, DIN-CCIR (VP-7723D01)
	RMS, JIS (VP-7723D02)
Frequency characteristics	Psophometric characteristics based on DIN45507, (WTD)
	0.5 Hz to 300 Hz (UNWTD)
Accuracy	± 5 % of full scale (4 Hz)
Input signal level range	Same as input range of distortion, measurement.

Specifications

COMMON FOR ALL MEASUREMENT

Input Impedance

100 kΩ shunted by< 250 pF (A, B terminal to common)

1 MΩ (DC terminal to common)

Filters

HPF	100 Hz (less than −40 dB at 25 Hz for AM stereo pilot signal elimination)
	200 Hz (Cut-off frequency 180 Hz, 60 dB roll off/decade)
LPF	15 kHz (less than −30 dB at 19 kHz, 15 kHz cut-off frequency/ for elimination of FM pilot signal)
	20 kHz (less than −30 dB at 24.1 kHz, 20 kHz cut-off frequency/ for digital audio)
	80 kHz (Cut-off frequency 80 kHz, 60 dB roll off/decade)
	OPT (Option)
PSOPHO	A (IEC-A)
	CCIR ARM (DOLBY)
	AUDIO (Based on DIN 45405-1978)
	OPT (Option)

AC output

0.2 V [rms] (full scale input of AC, DISTN, S/N), output impedance 1 kΩ

MEMORY FUNCTION

100 points (Memory address 00 to 99)

Memorizes panel condition, EXT control I/O, and limit data are stored as one point.

MODIFY FUNCTION

1) Modification of oscillator frequency and output amplitude

2) Modification of Input range/Measurement range in manual mode

LIMIT FUNCTION

One of three modes are predetermined (Upper limit only, Lower limit only, Upper and Lower limits) LED alarm is given when a result exceeded the limit.

I/O FUNCTION

GP-IB

- SH1, AH1, T7, L3, SR0, RL1, PR0, DC1, DT1, C0
- Memory copy (Talk/Listen only mode)
- Memory synchronizing function (Talk/Listen only mode)

EXT control I/O

1) Memory remote sequential recall 2) Memory remote direct recall

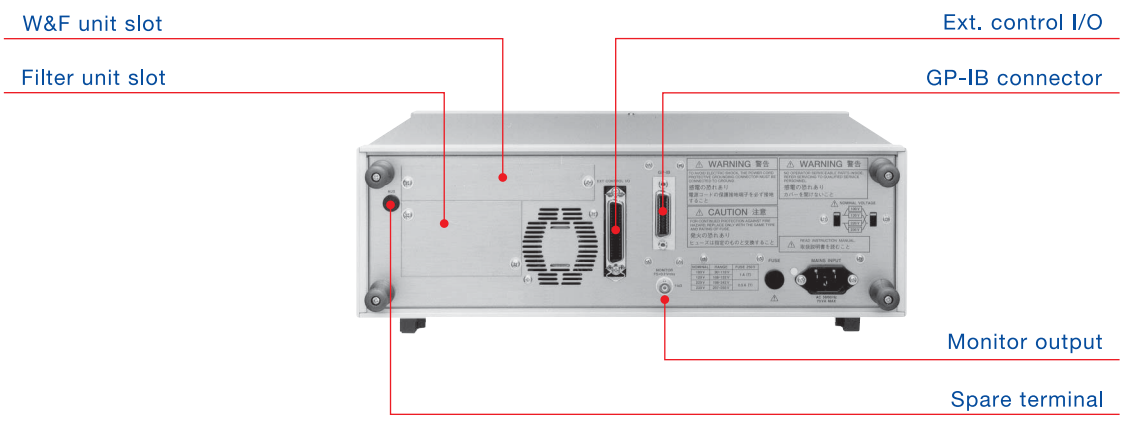
3) Control output 4) Comparison result output 5) 8 bits data read

6) Measured data printout

OTHERS

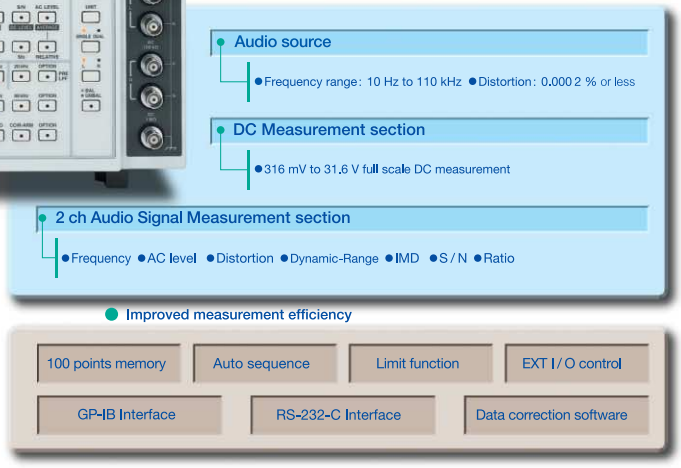
Power requirements	100 V/120 V/220 V/230 V, 50 or 60 Hz, Approx.70 VA
Dimension & Weight	W 426 mm × H 132 mm × D 400 mm approx.13 kg
Accessories	Power cable ---1, GP-IB connector cap ---1,
	Spare fuse ---1, Instruction manual ---1
Option	Wow & Flutter: Opt.01 (Q-Peak) Opt.02 (RMS)
	Optional filters: VQ-071H01/CCITT P53 TEL
	VQ-071H02/C-MESSAGE
	VQ-071H03/1 kHz BPF
	VQ-071H04/3 kHz BPF
	VQ-071H05/IEC-C
	VQ-071H06/315 Hz BPF
	VQ-071H07/30 kHz LPF
	Rack mount kit: VQ-069H32 EIA
	VQ-069H31 JIS/Metric

Rear Panel



Sufficient basic performance, easy and simple operation and hig for use in R&D, QA and automated system application for produc

Audio Analyzer VP-7782D



Optimum Measurement Solution for Versatile Audio Signal

This Audio Analyzer is designed for optimum measurement solution for digital audio age of applications. This is sufficient basic performance, friendly operation and high speed operation for system applications.
Signal source and analyzer section has drastically reduced internal noise for better basic performance and host versatile filters, Dynamic Range, and DC level measurement functions. High speed measurement achieves 80 ms at AC level measurement and equipped foreseeing auto-range greatly improved total measurement speed.

Features

Audio Analyzer

· Multi-Function and Enhanced Basic Performance

The analyzer 2-channel measurement section has a full range of functions including, AC/DC level, frequency, distortion, S/N, dynamic range, and L/R ratio, while the DSP function supports total harmonic distortion (THD) 0.000 1 % order measurements and harmonic component (2 f_o to 5 f_o) measurements.

Oscillator section

· Ultra-low Distortion/High Output and IMD Signal Source

A bridged-T RC oscillator gives high 14 dBV output over a wide 10 Hz to 110 kHz band, and a unique ALC circuit with an ultra-low distortion ratio of 0.000 1 % or less (THD) is used to achieve high-speed stabilization with a flat output level. There is also a built-in SMPTE signal source for intermodulation distortion measurements (IMD).

h speed 2-channel Audio Analyzer
tion line.

Operation

- **Operation Improvement from Production Purpose to R&D.**

Improved panel operation makes settings simpler and a convenient additional indication shows whether auto range or fixed range is selected when making analyzer input section, measurement section or notch filter settings. GP-IB, EXT I/O and RS-232-C control interface offers a wide range of system application .

High Speed

- **Improved Total Measurement Speed**

In audio signal testing, measurements are normally required to cover a wide dynamic range from very small amplitude of a few μV up to about 100 V, and frequencies from as low as 10 Hz to around 100 kHz. This instrument has high sampling rates plus faster response of foreseeing auto range and parallel counter control for fast and stable notch filter operation supporting reduction of actual measurement speed.

AC Signal Measurement Time Cut to 80 ms (Typ.)

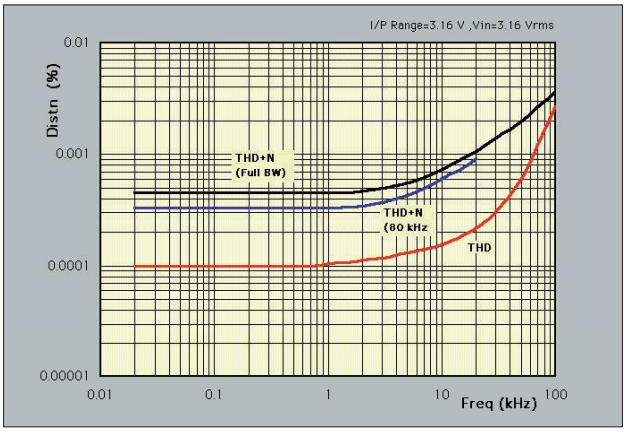
Its high speed response, with an 80 ms (Typical) AC signal measurement time, makes the VP-7782D an ideal component for high-speed measurements systems.

New High Speed Auto Ranging

Unlike normal auto range functions, which change measurement ranges step-by-step to match changes in signal input, the new auto ranging can foresee input range switch widely. This greatly increases the speed of measurements such as S/N and dynamic range.

High Speed and Stabilization for Distortion Measurement

Frequency counter has been parallel operation further improved to reducing the time required between counter measurement and notch frequency setting allows faster distortion measurements for varying frequencies and makes the counter less susceptible to input signal superimposed noise.



▲Overall distortion characteristics (Tyipical)

Innovative Functions Make Optimum Measurement Condition. Flexible and Simple Application for Digital Audio Signal Measure

Powerful Functions for Analyzer section

D-RANGE(Dynamic Range)

Dynamic range is the fundamental performance factor in digital audio. The VP-7782D makes dynamic range measurement a simple one-touch operation, and all required settings, including 20 kHz Pre-LPF and A-curve, are executed automatically.

Auto Range / Fixed Range Status Indication

A convenient new indication shows whether auto range or fixed range is selected when making analyzer input section, measurement section or notch filter settings.

DC Level Measurements

The VP-7782D can perform DC measurements, such as DUT supply voltage, from 0.316 V to 31.60 V full scale.

S / N Wait Time Setting

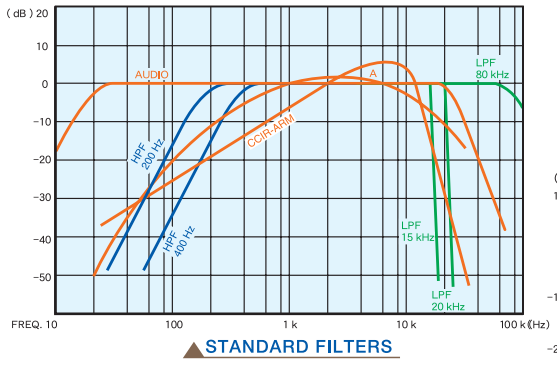
Switching time for S / N measurements, normally a fixed value, is variable. This allows settings to be optimized to match D.U.T. performance or measurement targets, for faster, more stable measurements.

Full Range of Standard Filters

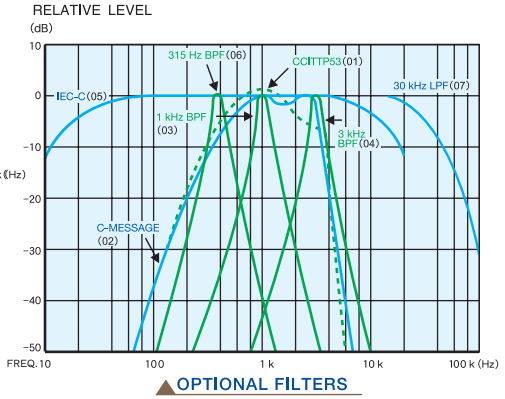
The instrument provides 9 standard filters, including LPF, HPF, PSOPHO and Pre-LPF (essential for digital audio measurements) plus further 3 optional filters. This layout is designed to allow easy setting of different filter combinations.

Channel Wait Time Settings

L / R switching time is now variable for 2-channel measurements. The ability to set wait time values to match L / R signal ratios also makes measurements faster and more stable.



▲STANDARD FILTERS



▲OPTIONAL FILTERS

(1) VQ-071H01
(2) VQ-071H02
(3) VQ-071H03
(4) VQ-071H04
(5) VQ-071H05
(6) VQ-071H06
(7) VQ-071H07

ment.

Improved Panel Operation Makes Settings Simpler

Versatile Measurement Unit Display Settings

Four combinations of display units can be set: V and dB for input signal, % and dB for distortion measurement.

Simplified Setting Operation

Conventionally, three steps have been required to make each signal source or output setting: press FREQ or AMPTD, enter numeric value and press ENTER. In the VP-7782A, the first of these steps has been eliminated: simply enter the value and press ENTER

Oscillator ON / OFF Switch

A switch to allow the oscillator to be switched on and off simplifies measurements such as D.U.T. residual noise.

SINGLE / DUAL and L / R Keys

Separate SINGLE / DUAL and L / R keys make switching faster when setting independent L / R or simultaneous L / R measurements.

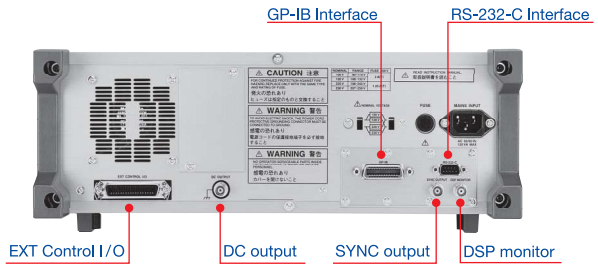
Variaty of Interfaces for Improved Measurement Efficiency

EXT I / O Interface

Following the audio / video common measurement concept, a built-in EXT I / O interface allows remote control of jigs and other measuring instruments.

- 100-point memory, dividable into 10 groups
- Memory address auto sequence allows linked operation with audio / video measuring instruments
- Limit function displays UNDER, PASS or OVER based on limit values and provides a decision output
- External control functions provide memory address remote and memory data modification control through two 8-bit I / O ports

Rear Panel



Audio Analyzer VP-7782D

SOURCE

Normal mode Sine wave mode	
Frequency	
Frequency range / Display	10 Hz to 110 kHz (4-range)
	4 digits display
Frequency accuracy	±3 % of setting (All ranges)
	±2 % of setting (0.160 kHz to 15.99 kHz)
Output	
Output range / Display	14.0 dB to −85.9 dB (0 dB =1 V [rms] 600 Ω loaded)
	16.2 dBm to −83.7 dBm (dBm : 1 mW 600 Ω loaded)
	3 digits display
Output accuracy (1 kHz)	±0.5 dB of setting : >−37.1 dB
	±0.8 dB of setting : ≤−37.2 dB
Flatness	±0.3 dB or less (All ranges)
	±0.05 dB or less (20 Hz to 20 kHz)
Output impedance	600 Ω ±2 % (Common for IMD signal output)
Distortion	0.000 2 % (−114 dB) or less (50 Hz to 10 kHz)
	(at 2 f_0 to 10 f_0 Harmonic distortion)
	0.003 % (−90 dB) or less (All range)

Inter modulation test signal SMPTE type IMD test signal	
Frequency / Display	4 digits display of HF signal
	LF : 50 Hz or 60 Hz, HF : 2.00 kHz to 10.00 kHz
Output	Output level shows two frequency of mixed RMS level
Output range / Display	4.0 dB to −85.9 dB / 6.2 dBm to −83.7 dBm
	(0 dB = 1 V [rms] 600 Ω loaded,
	dBm: 1 mW, 600 Ω loaded)
LF / HF Ratio range	1: 1 to 8: 1 / 1 step
Inter modulation distortion	0.002 % (−94 dB) or less (LF / HF 4: 1, HF 7 kHz)

MEASUREMENT

Measurement functions	
	1) Frequency
	2) DC level
	3) AC level (Relative level, S / N)
	4) Distortion
	THD + N (DISTN)
	THD (Detect 2 f_0 to 10 f_0 of harmonics)
	HD (2 f_0 to 5 f_0 of each harmonics level analysis)
	5) Dynamic range
	6) SINAD
	7) Inter modulation distortion (IMD by SMPTE method)
	8) Ratio (L / R, R / L level)
	9) Signal averaging (Relative level)

Frequency measurement Reciprocal counter	
Frequency range / Accuracy	10 Hz to 110 kHz / $\pm 5 \times 10^{-5} \pm 1$ digit
Input level	0.1 V [rms] to 100 V [rms]

DC level measurement	
Range	31.60 V / 3.160 V / 316 mV
Accuracy	±2 % of full scale

AC level measurement Input L and R common	
Full range display	0.316 0 mV to 100.0 V / 7 ranges
	Over range: Approx. 10 % (Except 100 V range)
Accuracy	± 2 % of fs. (Except 0.316 0 mV range)
Detection response	RMS or Avaraging response
Flatness	± 5 % (20 Hz or 20 kHz)
S / N measure range	0 dB to 130 dB
	(N components to be lower than S components in amplitude)
S / N accuracy	±1 dB or less
S / N measure delay time	S: Approx. 0.1 s to 9.9 s / N: Approx. 0.1 s to 9.9 s

Distortion (THD + N)	
Fundamental frequency range	10 Hz to 110 kHz
Distortion measure range	0.001 % (−100 dB) to 100 % (0 dB) full scale / 6 ranges
	100 % range: Manual setting range
Display unit	Input level: mV , V / dB · dBm, Distortion : % / dB
Detection response	Input level: RMS response, Distortion : RMS or Averaging response
Second harmonics accuracy	±1 dB (10 Hz to 15.99 kHz) / ±3 dB (16.0 kHz to 110 kHz)
Residual distortion	≤−95 dB (≥1 V input at 10 Hz to 20 kHz)
Input level measurement	40.0 dB to −17.5 dB / 2.5 dB step of 24 ranges and dynamic range measurement added 3.160 mV range of total 25 input ranges.
	Common for SINAD test or IMD input level, ratio measurement of numerator signal averaging of input condition.
Input level accuracy	±2 % of full scale (at 1 kHz except 3.160 mV range)
Input level frequency response	±5 % or less (10 Hz to 110 kHz) reference at 1 kHz

Harmonic Distortion-1 (THD1)	
Harmonic measure range	2 f_0 to 10 f_0 of harmonics
Distortion measure range	0.001 % (−100 dB) to 100 % (0 dB) full scale / 6 ranges
	100 % range: Manual setting range
Residual distortion	≤−110 dB (1 V: 20 Hz to 10 kHz)
DSP SYNC output	TTL level (at one channel measurement)
DSP monitor output	2 f_0 to 10 f_0 harmonic components
	Approx. 0.5 V [rms] (Full scale input condition)
	Fundamental frequency: 1 kHz, Output resistance: Approx. 1 kΩ

Harmonic Distortion-2 (THD2)	
Harmonic measure range	2 f_0 to 10 f_0 of harmonics
Distortion measure range	1 % (−40 dB) to 100 % (0 dB) full scale / 2 ranges
Residual distortion	≤−80 dB Input level ≥ 1 V

Harmonic analysis (2 f_0 to 5 f_0)	
Harmonic measure range	2 f_0 to 5 f_0 of specified harmonics
	Adjoining harmonic attenuation 25 dB or higher
DSP monitor output	Selected harmonic component

SINAD measurement	
SINAD measure range	Auto range: 0 dB / 20 dB / 40 dB
	Manual range: 0 dB / 20 dB / 40 dB / 60 dB
Display unit	Input level: mV/ V / dB / dBm
	SINAD: dB
Residual SINAD	> 80 dB Input level ≥ 1 V
	> 65 dB Input level ≥ 0.1 V

Inter modulation measurment (SMPTE method)	
Frequency range LF / HF	50 Hz or 60 Hz / 2 kHz to 20 kHz
Mix. level range	1: 1 to 8: 1
Inter modulation range	0.001 % (−100 dB) to 100 % (0 dB) full scale
Display unit	% or dB
Detection response	RMS or Averaging response
Residual IMD	< 0.003 % (−90 dB)
	(at LF / HF = 60 Hz / 7 kHz,
	Mix ratio 4:1 Input level ≥ 1 V)

Specifications

Ratio measurement	
Denominator range	0.05 V [rms] to 100 V [rms]
Numerator range	30 μV [rms] to 100 V [rms]
Ratio measure range	0 to −130 dB (100 % to 0.000 03 %)

Signal averaging measurement	
Full scale	Same as AC level measurement
Accuracy	±10 % of full scale at 1 kHz
Residual noise	10 μV [rms] or less at 16 times averaging
Flatness	±10 % (10 Hz to 110 kHz) at 1 kHz reference
Detection response	RMS or averaging response
Reference signal input level	0.1 V [rms] to 100 V [rms]
Averaging time	16 times, 32 times, 64 times, 128 times, 256 times

Dynamic range measurement	
Input level range	0.8 mV [rms] to 3.160 mV [rms] (at 3.160 mV range)
Accuracy	±5 % of full scale at 1 kHz
Input signal frequency response	±10 % (10 Hz to 10 kHz)
Residual distortion	D-RANGE ≥ 110 dB
	(at 1 kHz, LPF 20 kHz + A curve filter)

Common functions	
Input impedance	AC input: Approx. 100 kΩ, 200 pF or less
	DC input: Approx. 1 MΩ
Filters	
20kHz Pre-LPF	Approx. −60 dB at 24.1 kHz
	9th eliptic filter
200 Hz HPF	−3 dB / Cutoff frequency: 180 Hz ± 25 Hz
	Roll off characteristics : 60 dB / decade
400 Hz HPF	−3 dB / Cutoff frequency: 400 Hz ± 50 Hz
	Roll off characteristics : 60 dB / decade
80 kHz LPF	−3 dB / Cutoff frequency: 80 kHz ± 10 kHz
	Roll off characteristics: 60 dB / decade
15 kHz LPF	±1 dB or less: ≤ 15 kHz
	−30 dB or less: ≥ 19 kHz
20 kHz LPF	±1 dB or less: ≤ 20 kHz
	−30 dB or less: ≥ 24.1 kHz
PSOPHO A	IEC-A curve
PSOPHO AUDIO	DIN45 405 (1978) of AUDIO characteristics
PSOPHO CCIR-ARM	Dolby characteristics

Monitor output	
AC output	Approx. 1 V [rms] at full scale / 1 kΩ ± 5 %
DC output	Approx. −2.5 V

Preset memory
100 points
Panel condition, EXT control I / O
Limit data memory

Modify function
(1) Oscillator frequency, Output level, Mix. Ratio
(2) Manual operation condition
Distortion fundamental frequency
Measure range, S / N delay time
Averaging time

Limit function
Each measurement of Upper / Lower limit (Single or both) are available When input signal is over the limit, LED shows the information

GP-IB
SH1, AH1, T7, L3, SR0, RL1, PP0, DC1, DT1, C0
Preset data copy mode, Combination operation of recall mode (Talk only, Listen only mode)

EXT control I / O
・Memory remote sequential recall / Direct recall operation
・External control (8-bit × 2 ports)
・Data read (8-bit × 1 port)
・Rotary encoder remote control

RS-232-C
・Port number: 1
・Baud rate: 38 400 bps
・Character length: 8-bit
・Parity: NONE / Flow control: X-OFF / X-ON
Stop bit: 1 bit

Others	
Power requirement	100 V / 120 V / 220 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	120 VA or less
Dimension / Mass	Approx. 15 kg
	W 426 mm × H 150 mm × D 400 mm
Accessories	Operation manual × 1, Power cable × 1,
	Fuse × 1, GP-IB connector cap × 1

Optional Filters	
VQ-071H01	CCITT P53 (TEL) specification
	See filter curve →(1)
VQ-071H02	C-MESSAGE specification
	BELL specification BPF
	See filter curve →(2)
VQ-071H03	1 kHz BPF
	−1 dB < 1 kHz ± 40 Hz
	See filter curve →(3)
VQ-071H04	3 kHz BPF
	−1 dB < 3 kHz ± 40 Hz
	See filter curve →(4)
VQ-071H05	IEC-C specification
	IEC-651 C waiting filter (TYPE)
	See filter curve →(5)
VQ-071H06	315 Hz BPF
	−1 dB < 315 Hz ±12.6 Hz
	See filter curve →(6)
VQ-071H07	30 kHz LPF
	−3 dB / Cutoff frequency : 30 kHz ±5 kHz
	Rolloff characteristics : 60 dB / decade

Independent two-channel Audio Analyzer for digital audio equip especially for DVD and Super Audio CD.

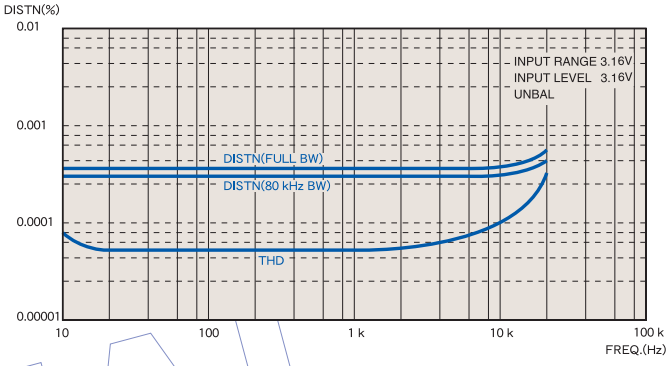
The VP-7725D combines a 2-channel signal source (audio oscillator) and a full range of measurement functions to provide the –120 dB distortion measurements needed for testing today's high precision digital audio equipment.
In addition to a low distortion 5 Hz to 110 kHz signal source, this new audio analyzer provides 7 major measurement functions: DC level, AC level, distortion, S/N, ratio, frequency and wow & flutter (option). The extensive range of filters includes 20 kHz Pre-LPF, essential for digital audio measurements, and the large LCD shows measurement results in combination of digital and analog format.
With pre-set memory, limit function, memory auto-sequence function, remote interface and GP-IB, the VP-7725D is an ideal solution for testing high performance audio equipment such as DVD audio and SACD*.(SACD*.=Super Audio CD)

Audio source

- **2-channel high-performance, high-output oscillator with low distortion (typically 0.000 05 % at 1 kHz)**

  Maximum output level is 14 dBV UNBAL/20 dBV BAL (600 Ω) for a frequency range of 5.0 Hz to 110.0 kHz.
  Low impedance mode provides high output: 20 dBV UNBAL/26 dBV BAL.

TOTAL HARMONIC DISTORTION



Independent two-channel Audio Analyzer

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nalyzer

Audio measurement

• **2 independent channels allow wide range of measurements**

DC measurement

31.6 V to 0.316 V full scale for D.U.T.supply voltage measurements,etc.

AC measurement

• **Extensive range of high performance measurements**

AC level measurement

2 channel voltmeter covers 0.316 mV to 100 V measurement range. Auto and Manual range results are displayed in V (mV), dBV or dBm.

Relative Level Measurement

For frequency response, S/N and crosstalk measurements.

Watt indication

Calculates power value using measured AC level and preset virtual load resistance (R_L).

Noise measurement

The analyzer can be used as a psophometer by selecting average, RMS or Q-peak detection with appropriate built-in filter.

Distortion measurement

Three kinds of distortion measurement with either average or RMS response are available for the 5 Hz to 110 kHz frequency range.

DISTN

Measures THD+N (total harmonic distortion plus noise component) at 0.001 % or less (–100 dB).

THD

Extracts up to the 10th harmonic component.
Measurement is possible to 0.000 1 % or less (–120 dB) for frequencies between 200 Hz to 2 kHz.

HD

Displays 2nd to 5th harmonic components. Can be displayed together with THD or as individual/additive components, as digital readout and analog bargraph.

Digital audio dynamic range measurement

3.16 mV (–60 dB input) / 31.62 mV ranges (essential for dynamic range measurements), with standard 20 kHz LPF/Pre-LPF.

THD Display screen

Frequency measurement

Built-in 5 Hz to 110 kHz reciprocal high-speed frequency counter is used for Frequency, AC Level, Distortion and Wow & Flutter modes.

S/N measurement

Automatic S/N measurement is ganged with oscillator operation.

Ratio measurement

AC levels are measured for A and B channels. A/B or B/A level ratio is calculated and displayed as dB or %. Used for measuring stereo signal channel separation, crosstalk, etc.

Wow & Flutter measurement (Factory Option)

Option 01: DIN and CCIR (Q-peak response), Option 02: JIS (RMS response)

VP-7725D

Measurement filters

- **9 standard/5 optional noise evaluation filters**

Standard filters

Pre-LPF

20 kHz: For digital audio. Ideal for low end audio CD/MD/DVD and semiconductor(ADC)testing. One extra filter option can be added.

LPF

15 kHz: For DAT and BS/FM tuners, 20 kHz: For digital audio, 80 kHz: Highfrequency elimination. One extra filter option can be added.

HPF

200 Hz: IHF-BPF low frequency elimination.
400 Hz:-18 dB/OCT butterworth characteristics.

PSOPHO

A: IEC-A filter, CCIR/ARM: Dolby,CCIR468 CCIR468-4, Audio: DIN 45405 filter. One extra filter option can be added. (Dolby is a registered trademark of Dolby Laboratory Inc.)

Optional filters (Factory Option)

- **LPF section and PSOPHO section each accept one filter option**

CCITTP53: Telephone/telecommunication equipment, circuit evaluation (mainly Europe).

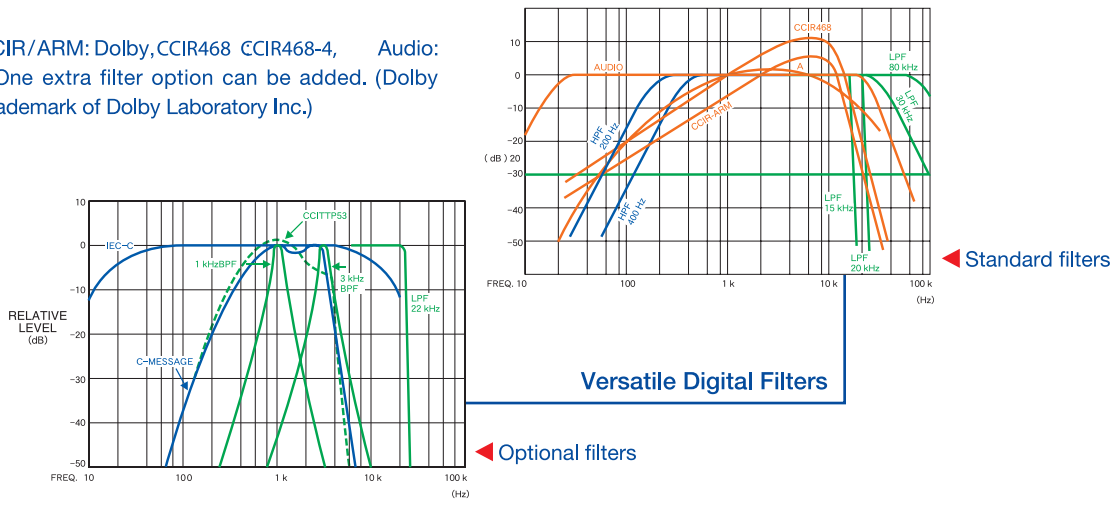
C-MESSAGE: Telephone/telecommunication equipment, Bell standard circuit evaluation (mainly U.S.).

1 kHz BPF: Crosstalk measurements, etc.

3 kHz BPF: Crosstalk, extinction ratio measurements, etc. (mainly for audio tape).

IEC-C: BPF characteristics for testing audio devices.

22 kHz LPF DAT,PCC.BS.



GP-IB and EXT I/O interfaces make it easy to construct automated test systems

1. 100-point memory:	Can be split into 10 groups.
2. Auto sequence:	Sequence time can be set for each memory address (can be synchronized to SG etc.).
3. Judgement function:	TTL ext. output function for limit values of Under/Over/Pass.
4. External control:	Allows remote control/modification of memory.
	8-bit, 2-port I/O for remote control of jigs and DUT.
5. GP-IB (standard):	Allows easy system expansion, with control of peripheral equipment, transfer of measurement data,
	synchronized operation (talk only/listen only modes) and memory dump function.

Audio Analyzer VP-7725D Specifications

Signal generator section

Output system	BAL/UNBAL, Dual, Floating
Output mode	A, B, A & B, A & –B, OFF
Frequency range	5.0 Hz to 110.0 kHz
Frequency accuracy	±2 % (0.101 to 10.09 kHz)
	±3 % (Overall range)
Output level	dBV, dBm and V/mV

Output	Impedance	Output level(600 Ω loaded)
BAL	2 Ω or less	26.04 to 20.03 dBV
	600 Ω ±2 %	20.02 to –79.97 dBV
UNBAL	1 Ω or less	20.02 to 14.01 dBV
	600 Ω ±2 %	14.00 to –85.99 dBV

Resolution	0.01 dB
Accuracy	± 0.5 dB or less
	output ≥ –45.99 dBV (UNBAL),
	≥ –39.97 dBV (BAL)
Flatness	±0.05 dB or less (20.0 Hz to 20.0 kHz)
	(1 kHz ref. 600 Ω)
Distortion	output 14.00 dBV (UNBAL)/20.02 dBV (BAL)
	output impedance = 600 Ω

Frequency	UNBAL	BAL	Remarks
All range	≤ 0.003 % (–90 dB)	≤ 0.01 % (–80 dB)	THD
20 Hz to 15 kHz	≤ 0.001 % (–100 dB)	≤ 0.001 % (–100 dB)	THD (Passive filter)
20 Hz to 10 kHz	≤ 0.000 1 % (–120 dB)	≤ 0.000 3 % (–110 dB)	THD (Passive filter)

	output: 20.02 dBV (UNBAL)/26.04 dBV (BAL)
	(Low impedance mode)

Frequency	UNBAL	BAL	Remarks
20 Hz to 20 kHz	≤ 0.003 % (–90 dB)	≤ 0.003 % (–90 dB)	THD

Output OFF noise	≤ 4 µV [rms]: A Filter
Crosstalk	≤ –120 dB: 20 kHz

Measurement section

Input system	BAL/UNBAL, Dual
Common	Floating/Grounded
Input mode	A, B, A & B, Generator monitor
Measurement function	(1) Frequency (1 ch)
	(2) DC level (1 ch)
	(3) AC level (2 ch)
	Relative level
	Watt indication
	(4) Distortion (2 ch)
	Total distortion
	THD (2nd to 10th HD)
	HD (2nd, 3rd, 4th, 5th HD)
	(5) S/N (2 ch)
	(6) Ratio (A/B, B/A) (2 ch)
	(7) Wow & Flutter (Option)

Frequency Measurement

	1 ch (Available in AC level, Distortion, S/N, Ratio and Wow & Flutter)
Measurement range	5 Hz to 330 kHz
Display unit	±(5 x 10^{-5}+1 digit)
	5 digits
Input level range	30 mV to 100 V [rms] (1 kHz)
Distortion input range	31.62 mV: 8 to 31.62 mV
	3.162 mV: 0.8 to 3.162 mV

DC level measurement

Measurement channel	1 ch DC level input terminal (BNC)
Full scale	31.62 V、3.162 V、316.2 mV
	3 ranges (Max. 60 V)
Accuracy	±(0.3 % of FS + 0.7 % of reading)

AC level measurement

Full scale	0.316 mV to 100 V (7 ranges)
	(–70.00 to 40.00 dBV, FS)
	(–67.78 to 42.22 dBm, FS)
Over range	Approx. 10 % (Except 100 V range)
Accuracy	±2 % of FS (Except 0.316 mV range and Q-PEAK)
Flatness	±3 % or less (20 Hz to 20 kHz)
1 kHz, Full scale input	±10 % or less (20 Hz to 20 kHz Q-PEAK)
Residual noise	4 µV (UNBAL 80 kHzBW RMS/AVG)
	8 µV (UNBAL 80 kHzBW Q-PEAK)
Relative level	Measurement range: ±130 dB
	Unit: dB
	Ref. setting range: 40.00 to –120.00 dBV
	42.22 to –117.78 dBm
	100.0 V to 0.001 0 mV
Watt indication	Calculated from an assumptive load
	(1.0 to 999.9 Ω).

Distortion measurement

Measurement mode	DISTN (THD + N), THD, HD
Fundamental frequency	10.0 Hz to 110.0 kHz (Range of HD is max. 330 kHz)
	10.0 Hz to 10.00 kHz for 31.62 mV and 3.162 mV range
Full scale	31.62 % to 0.003 162 % (5 ranges)
Response	RMS, AVG
2nd harmonics accuracy	±1 dB: 20 Hz to 20.09 kHz
	±3 dB: All range and THD mode
Residual noise and distortion	DISTN mode: show below

BAL & UNBAL							Detection BW
Input range	100 to 1 V range		750 to 316 mV range		237 to 133 mV range		
Input level	FS Input	FS –2.5 dB	FS Input	FS –2.5 dB	FS Input	FS –2.5 dB	
20 Hz to 10 kHz	≤ 0.001 %	≤ 0.001 4 %	≤ 0.002 %	≤ 0.003 2 %	≤ 0.006 3 %	≤ 0.006 3 %	80 kHz
	≤ –100 dB	≤ –97 dB	≤ –94 dB	≤ –90 dB	≤ –84 dB	≤ –84 dB	BW
10 Hz to 100 kHz	≤ 0.005 %	≤ 0.005 %	≤ 0.01 %	≤ 0.01 %	≤ 0.02 %	≤ 0.02 %	Full
	≤ –86 dB	≤ –86 dB	≤ –80 dB	≤ –80 dB	≤ –74 dB	≤ –74 dB	BW

	31.6 mV range: –66 dB or less for UNBAL,
	1 kHz, 31.6 mV input (20 kHz BW)
	3.16 mV range: –46 dB or less for UNBAL,
	1 kHz, 3.16 mV input (20 kHz BW)
	THD mode: show below

Input range		3.16 V range	1 V range	0.316 V range	0.133 V range
Input level		3.16 V	1 V	0.316 V	0.100 V
UNBAL	200 Hz to 2 kHz	≤ –120 dB	≤ –116 dB	≤ –106 dB	≤ –96 dB
	10 Hz to 20 kHz	≤ –110 dB	≤ –106 dB	≤ –96 dB	≤ –90 dB
	20 to 50 kHz	≤ –100 dB	≤ –96 dB	≤ –90 dB	≤ –86 dB
	50 to 100 kHz	≤ –86 dB	≤ –86 dB	≤ –80 dB	≤ –80 dB
BAL	200 Hz to 2 kHz	≤ –110 dB	≤ –110 dB	≤ –100 dB	≤ –90 dB
	10 Hz to 20 kHz	≤ –106 dB	≤ –106 dB	≤ –96 dB	≤ –90 dB
	20 to 50 kHz	≤ –96 dB	≤ –96 dB	≤ –90 dB	≤ –86 dB
	50 Hz to 100 kHz	≤ –86 dB	≤ –86 dB	≤ –80 dB	≤ –80 dB

Input level range	0.05 V to 100 V [rms]
	10 mV to 31.62 mV [rms]
	1 mV to 3.162 mV [rms] (For dynamic range meas.)
Accuracy	±2 % of FS: 1 kHz
	±5 % of FS: 1 kHz (31.6 mV, 3.16 mV range)
	(1 kHz Fullscale input)
Flatness	±5 % or less: 10.0 Hz to 110.0 kHz
	±10 % or less: 10.0 Hz to 10.00 kHz
	(For 31.6 mV and 3.16 mV ranges)

Audio Analyzer VP-7725D Specifications

S/N measurement

Measurement range	100.0 V to 0.316 2 mV fs
Measurement range	0 to 130 dB

Measurement range for each S level

S level (≤ 10 kHz)	Measurement range (RMS/AVG)		Measurement limit (Q-PEAK)	
	UNBAL	BAL	UNBAL	BAL
≥ 31.6 V (30 dBV)	> 130 dB	> 126 dB	> 124 dB	> 120 dB
≥ 3.16 V (10 dBV)	> 110 dB	> 106 dB	> 104 dB	> 100 dB
≥ 316 mV (−10 dBV)	> 90 dB	> 86 dB	> 84 dB	> 80 dB
≥ 31.6 mV (−30 dBV)	> 70 dB	> 66 dB	> 64 dB	> 60 dB
≥ 3.16 mV (−50 dBV)	> 50 dB	> 46 dB	> 44 dB	> 40 dB
≥ 0.316 mV (−70 dBV)	> 30 dB	> 26 dB	> 24 dB	> 20 dB

Accuracy	±1 dB
S level measurement time	1.0 to 30.0 s

Ratio measurement (A/B, B/A)

Input level	100 V to 30 µV [rms] (For numerator and denominator)
Measurement range	Max.–130 dB
Unit	Denominator: (m) V, dBV, dBm
	Ratio: dB, %
Accuracy	±1 dB

Wow & Flutter measurement (Option)

Measurement channel	1 ch (Only A ch)
Center frequency	3 kHz±200 Hz
	3.15 kHz±200 Hz
Full scale	3.162 %, 0.316 2 % (2 ranges)
Response	IEC (DIN), JIS, NAB
Frequency response	WTD: DIN 45 507
	UNWTD: 0.5 to 300 Hz
Accuracy	±5 % of full scale
Input level range	Same as distortion measurement
	(Except 31.62 mV and 3.162 mV ranges)

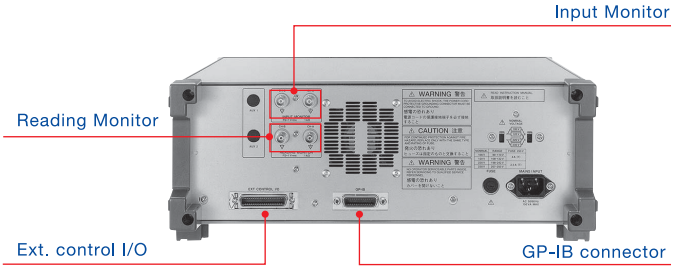
Common section

Input impedance	AC input: 100 kΩ, 270 pF or less	
	DC input: 1 MΩ	
Maximum input voltage	AC input: 150 V (DC + AC peak)	
	DC input: 150 V	
Filter	Pre-LPF: 20 kHz/OPT.	
	HPF: 200 Hz/400 Hz	
	LPF: 15 kHz/20 kHz/30 kHz/80 kHz/OPT. 01	
	PSOPHO: A/AUDIO/CCIR468/CCIR-ARM/OPT.02	
	(LPF & PSOPHO Filter are composed by digital circuit)	
Monitor output	Input monitor, reading monitor	
Preset memory	100 points/10 groups/Auto sequence	
Judgment	Under/Pass/Over	
	Result is output from Ext. I/O	
Interface	GP-IB:	SH1, AH1, T7, L3, SR1, RL1, PP0, DC1,
		DT0, C0
		Memory data copy
		Synchronized memory recall
	EXT I/O	Sequential memory recall
		Direct memory recall
		External control (8 bits x 2 ports)
		External data read (8 bits x 1 port)
		Remote control of rotary encoder
		Output of judgment result

Others

Accessories	Instruction manual, Power cable, Fuse,
	GP-IB connector cap
Power requirement	Voltage: 100, 120, 220, 230 V
	Consumption: 170 VA or less
Dimensions, Mass	W 426 mm × H 149 mm × D 400 mm
	Approx.18 kg

Rear Panel



Distributor

KIKUSUI AMERICA, INC.
1633 Bayshore Highway, Suite 331, Burlingame, CA 94010
Phone : 650-259-5900 or 1-800-KIKUSUI Facsimile : 650-259-5904
Website : www.kikusuiamerica.com E-mail : kikusui@kikusuiamerica.com

Tom Communication Industrial Co., Ltd.
1244, Nippa-cho, Kohoku-ku, Yokohama, Kanagawa, Japan 223-0057
Phone:+81-45-541-5078 Fax:+81-45-541-5089
URL http://www.tomcom.co.jp/

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