



TV Test Receiver Option VSA-B10

for RF parameter measurement and monitoring with Video Measurement System VSA

The **TV Test Receiver Option VSA-B10** enhances the **Video Measurement System VSA** from Rohde & Schwarz for the reception and analysis of RF and IF TV signals. The system allows all important RF and VF quality parameters to be analyzed **in a single compact unit**. There is no need to buy a separate test receiver and demodulator.

VSA-B10 can easily be retrofitted – even on site – without calibration and level adjustment and with no problems regarding interfaces or cabling.

VSA with Option VSA-B10 provides the **following functions** (see also VSA data sheet, Order No. PD757.0464):

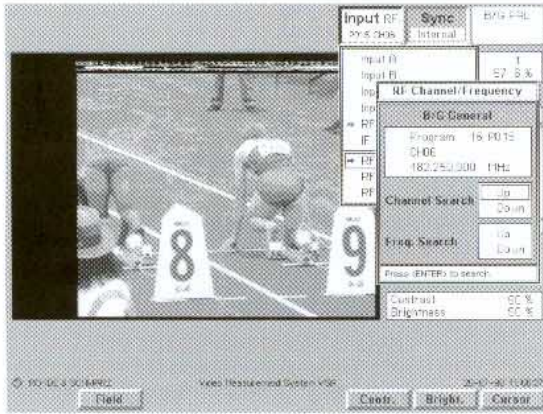
- TV test receiver (47 to 862 MHz) for standards B/G, I, D/K, K1
- Video and FFT analyzer
- 3-channel oscilloscope
- Vectorscope
- Monitor
- System controller

Features of VSA with Option VSA-B10

- RF/video analysis in a single unit
- Measurement of all relevant RF and VF quality parameters
- High-speed analysis
- No external cabling
- Easy to transport
- Little space required
- Uniform user interface for all measurement functions
- RF test parameters displayed in parameter list of VSA
- Display of test receiver configuration on VSA screen



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Screen of Video Measurement System VSA with channel setting of Test Receiver Option VSA-B10

RF and VF parameter measurement in a compact unit

Video Measurement System VSA in conjunction with TV Test Receiver VSA-B10 from Rohde&Schwarz is a compact unit ideal for quality assurance and reliable monitoring of cable TV networks and terrestrial transmission systems. This configuration not only saves space but also reduces the amount of cabling required. The VSA also contains a process controller for monitoring within automatic systems.

VSA-B10 allows measurement of the following additional parameters:

- Incidental carrier phase modulation (ICPM) of vision carrier
- Vision and sound carrier level and frequency
- Modulation depth of vision carrier (residual carrier) and sound carrier (FM deviation)

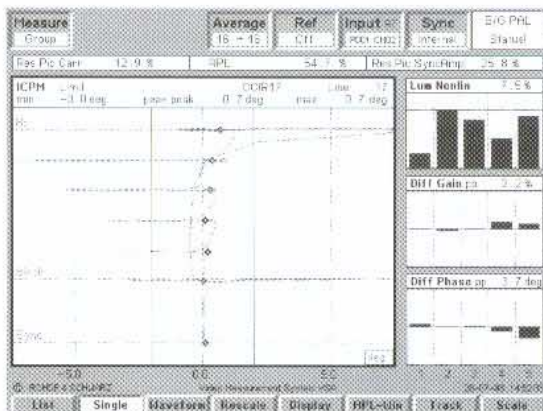
- Pilot-tone deviation and frequency
- Pilot-tone decoding

Due to the excellent performance data of the test receiver and the large variety of system interfaces, measurement and controller functions of the basic unit, all standard applications as well as customized solutions can be implemented. Unattended CATV system monitoring, remote polling of measurement results, automatic activation of standby equipment as well as applications in development labs, quality assurance and production monitoring are all possible with this powerful measurement system.

Main features of the TV test receiver

- 50-Ω or 75-Ω input (depending on model)
- IF input and IF output

- Video and audio outputs
- Large dynamic range (40 to 120 dBμV)
- Low-noise and low-distortion mode
- Low-noise preamplifier can be switched on to improve noise figure of receiver
- Video S/N ratio (weighted at 66 dBμV) >56 dB
- Inter-carrier S/N ratio (weighted) >46 dB
- Program, channel and frequency entry
- Channel and frequency search
- Synthesizer with low phase noise and high frequency resolution (1 Hz)
- Digital frequency control
- Manual and automatic gain control
- Integrated zero clamping for defining vision modulation depth
- Selectable synchronous detector mode with sampled or continuous phase control as well as selectable time constants
- Sound demodulation and decoding according to IRT dual-sound carrier method
- Linear distortion of video frequency response <0.5 dB (luminance/chrominance error <±20 ns)
- Video group-delay correction of receiver and sound deemphasis can be switched off
- Sound monitoring via loudspeaker of basic unit
- Very easy installation in VSA



Simultaneous display of incidental carrier phase modulation (ICPM) of vision carrier and of nonlinear distortion

All measurement parameters of the test receiver option are available in parallel and are displayed in the parameter list of VSA

Parameter	Value	Unit	Status	Ref.	Test Signal	Limit
Diff Gain neg	-11.3	%	L1	E	CCIR330	330
Diff Phase pos	0.0	deg		E	CCIR330	330
Diff Phase neg	-1.6	deg		E	CCIR330	330
Lum Noise LumA (bar)	47.8	μE-bar		E	Quiet	22
Vision Carrier Level	55.0	dBV				
Vision Carrier Level	-43.0	dBm				
Vision Carrier Level	46.3	dBμV				
Vision Carrier Frequency	175.2500	MHz				
Vision Carrier Offset	0.0	kHz				
Vision Carrier Ratio	12.2	dB				
Vision Carrier Ratio	18.9	dB				
Inter-carrier 1 Frequency	5500.0	kHz				
Inter-carrier 2 Frequency	5742.1	kHz				
FM Deviation Sound 1	24.1	kHz				
FM Deviation Sound 2	10.2	kHz				
FM Deviation Pilot	3.24	kHz				
Pilot Frequency	54655	Hz				
Pilot Code	2					

Specifications of VSA-B10

Specifications of Video Measurement System VSA see data sheet PD757.0464

TV standards	B/G, D/K, I (see ordering information); one standard per unit; other standards on request
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Inputs and outputs

RF input	rear panel, N connector
Frequency range	47 to 862 MHz
Level range	0.1 to 1000 mV (40 to 120 dB μ V) ¹⁾
Level range with 10-dB preamplifier	0.03 to 1 mV (30 to 60 dB μ V) ¹⁾
Impedance	50 Ω or 75 Ω (depending on model)
Return loss	>14 dB (VSWR <1.5)

IF input	rear panel, BNC connector
Frequency (vision carrier)	38.9 MHz (for all standards)
Level range	20 to 200 mV (86 to 106 dB μ V) ¹⁾
Impedance	50 Ω
Return loss	>20 dB (VSWR <1.2)

IF output	rear panel, BNC connector
Frequency (vision carrier)	38.9 MHz
Level	100 mV, controlled (100 dB μ V) ¹⁾
Impedance	50 Ω
Return loss	>20 dB (VSWR <1.2)

Video output	rear panel, BNC connector
Level	1 V _{pp} CVS with video modulation to standard
Impedance	75 Ω
Return loss	>26 dB (VSWR <1.1)

Audio outputs	2 x BNC connector on rear panel, unbalanced
Level for ± 30 kHz deviation and $f_{mod} = 500$ Hz	+6 dBm ± 0.2 dB into 600 Ω
Impedance	<25 Ω
Signals	mono, right and left (stereo), mono 1 and mono 2 (dual sound)

RF/IF characteristics

Frequency resolution	1 Hz
Frequency accuracy	< $\pm 2 \times 10^{-6}$ x receive frequency
Image-frequency rejection	
VHF	>70 dB
UHF	>50 dB
Adjacent-channel suppression	>48 dB

Video parameters

Synchronous demodulation	continuous or sampled (switch-selectable)
Phase control	
Time constants for	fast, normal, slow
continuous phase control	normal, slow
sampled phase control	<1°, typ. <0.5°
Switching carrier phase error	for measuring the incidental carrier phase modulation (ICPM)
Quadrature signal	

S/N ratio	
weighted to CCIR Rec. 567, $V_{REF} = 3$ mV (70 dB μ V) ¹⁾ ; attenuation 0 dB	>56 dB

Linear distortion	
Amplitude response	
Standard B/G, 0 to 4.5 MHz	± 0.5 dB
D/K, 0 to 5.5 MHz	± 0.5 dB
I, 0 to 5 MHz	± 0.5 dB
Group-delay response	group-delay correction
0 to 4.43 MHz	off on
via IF input	< ± 10 ns < ± 15 ns
via RF input	< ± 15 ns < ± 20 ns
Additional ripple due to SAW filter	< ± 20 ns
Group-delay correction	flat plus one standard-specific curve (see page 4)
2T k factor	<1%
1.5-kHz tilt	<1%

Nonlinear distortion	
Luminance nonlinearity	<3%
Differential gain	<3%
Differential phase	<2°
Intermodulation in low-distortion mode (vision carrier: -8/sound carrier: -10/SB: -16 dB)	<72 dB

Audio parameters

Stereo/dual-sound mode	A2 (IRT)
Frequency response, 40 Hz to 15 kHz	<0.5 dB
Deemphasis	50 μ s and off
Distortion for ± 50 kHz deviation	<0.5% ²⁾
Stereo crosstalk	>40 dB
Channel crosstalk with spurious FM	
± 30 kHz	>80 dB
± 55 kHz	>70 dB
Inter-carrier S/N ratio (weighted to CCIR 468-3)	
All-black picture	>55 dB
FuBK test pattern	>48 dB
Sinewave modulation (10 to 75%)	
0 to 5 MHz	>46 dB
242 ± 1.5 kHz	>42 dB
Split-carrier S/N ratio, measured at IF output (weighted to CCIR 468-3)	>56 dB

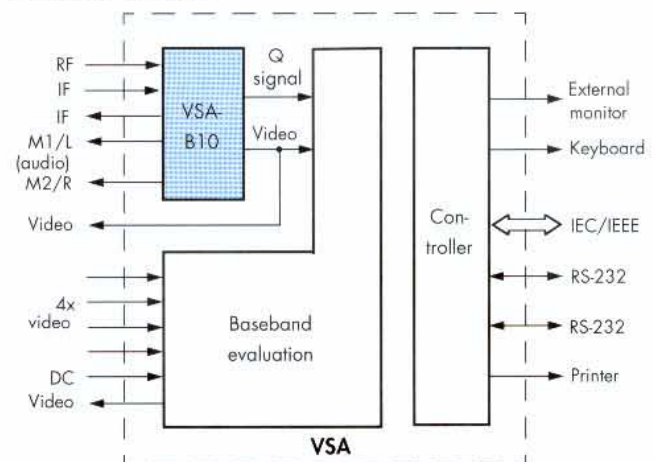
Test parameters

	Resolution	Deviation
Vision carrier power/level in dB μ V, dBm, dBpW	0.1 dB	± 3 dB
Vision carrier offset frequency	100 Hz	$\pm 2 \times 10^{-6}$ x receive frequency
Residual carrier	0.1%	$\pm 1\%$
Vision/sound carrier level ratio	0.1 dB	± 2 dB
Vision/sound carrier freq. spacing	0.1 kHz	± 0.2 kHz ³⁾
FM deviation of sound carrier	0.1 kHz	$\pm 5 \times 10^{-2}$ x $\Delta f_{carrier} \pm 500$ Hz
Pilot deviation	10 Hz	± 200 Hz
Pilot carrier frequency	1 Hz	± 10 Hz
Incidental carrier phase modulation	0.1°	$\pm 1^\circ$

General data

Rated temperature range	+5 to +45°C
Operating temperature range	0 to +50°C
Storage temperature range	-40 to +70°C
Power supply	100/120/220/230 V ± 10 /-15%, 47 to 63 Hz
Weight	3 kg

Interfaces of VSA system



¹⁾ RMS values, referred to sync peak level.

²⁾ At ambient temperatures >35°C: <1%.

³⁾ Without FM deviation.

Ordering information

TV Test Receiver Option

Standard B/G Europe, dual sound, IF 38.9 MHz + 33.4/33.158 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.02 2014.0000.03
Standard B/G Europe, mono sound, IF 38.9 MHz + 33.4 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.06 2014.0000.07
Standard B/G Australia, dual sound, IF 38.9 MHz + 33.4/33.158 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.10 2014.0000.11
Standard D/K CCIR, dual sound, IF 38.9 MHz + 32.4/32.642 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.40 2014.0000.41
Standard D/K CCIR, dual sound, IF 38.9 MHz + 32.4/32.158 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.42 2014.0000.43
Standard I UK, mono sound, IF 38.9 MHz + 32.9 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.70 2014.0000.71
Standard I SABC, mono sound, IF 38.9 MHz + 32.9 MHz	50 Ω 75 Ω	VSA-B10 VSA-B10	2014.0000.72 2014.0000.73

Other standards on request.

Group-delay characteristics defined by TV standards

Stand- ard	B/G CCIR	B/G Australia	B/G Sweden	D/K OIRT TKIII-830	D/K CCIR Rep. 308	I BBC	I SABC TVT12.2
Fre- quency [MHz]	Nominal value [ns]	Nominal value [ns]	Nominal value [ns]	Nominal value [ns]	Nominal value [ns]	Nominal value [ns]	Nominal value [ns]
0.1	0	0	0	0	0	0	0
0.25	-5		0		-5	0	0
1.0	-53	-30	0	-40	-53	0	0
2.0	-90	-60	0	-75	-87	0	0
3.0	-75	-40	0	-90	-85	0	0
3.5		0	0			0	0
3.6			0			0	0
3.75	0					0	0
4.0				-70	-50	0	0
4.43	170	170	175		0	0	40
4.8	400	260	400		90		100
5.0				0			
5.5				90			



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