

7.2 R3132N Specifications

(1) Frequency

Characteristics	Specification
Frequency range	9 kHz to 3.0 GHz
Frequency readout accuracy (Start, Stop, CF, Marker)	\pm (Frequency readout \times freq. reference accuracy + SPAN \times 1% + RBW \times 15% + 60 Hz)
Count frequency marker Resolution Count Accuracy	1 Hz to 1 kHz \pm (Marker frequency \times freq. reference accuracy + 1LSD) (S/N \geq 25dB, SPAN \leq 200MHz)
Frequency reference Aging Temperature stability	$\pm 2 \times 10^{-6}$ /year $\pm 1 \times 10^{-5}$ (from 0°C to 50°C)
Frequency span Range Accuracy	1 kHz to 3 GHz and 0 Hz (zero span) $\pm 1\%$ of Span
Residual FM Zero Span	≤ 60 Hz p-p/100ms
Noise Sidebands	freq. ≤ 2.6 GHz ≤ -100 dBc/Hz at 10 kHz offset (RBW 300 Hz OPT27) ≤ -105 dBc/Hz at 20 kHz offset freq. > 2.6 GHz ≤ -98 dBc/Hz at 10 kHz offset (RBW 300 Hz OPT27) ≤ -103 dBc/Hz at 20 kHz offset
Resolution Bandwidth At 3 dB: Range RBW Accuracy Selectivity (60 dB : 3 dB) QP (at 6 dB) Range:	1 kHz to 3 MHz 1-3-10 sequence $\pm 20\%$ from 1 kHz to 1 MHz $\pm 25\%$ for 3 MHz $< 15 : 1$ 1 MHz, 120 kHz, 9 kHz
Video Bandwidth	10 Hz to 3 MHz (1-3-10 sequence)

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(2) Amplitude Range

Characteristics	Specification
Measurement range	+134 dB μ V to displayed Average Noise Level
Maximum input level Preamplifier OFF	(Input attenuator \geq 10 dB) +134 dB μ V \pm 50 VDC max.
Preamplifier ON	+120 dB μ V \pm 50 VDC max.
Display range Log	10 \times 10 div 10, 5, 2, 1 dB/div
Linear	10% of reference level/div
Reference level range Preamplifier OFF	(Input attenuator 0 to 50 dB)
Log	+44.8 dB μ V to +148.8 dB μ V (0.1 dB step)
Linear	172.8 μ V to +27.39 V
Preamplifier ON	(Input attenuator 0 to 30 dB)
Log	+26.8 dB μ V to +118.8 dB μ V (0.1 dB step)
Linear	21.75 μ V to 866 mV
Input attenuator range	0 to 50 dB (5 dB step)

(3) Sweep

Characteristics	Specification
Sweep time	20ms to 1000s
Sweep time Accuracy	\pm 2%
Trigger mode	FREE RUN, LINE, VIDEO, EXT, TV
Sweep Mode	REPEAT, SINGLE

(4) Dynamic Range

Characteristics	Specification
Displayed Average Noise Level Preamplifier OFF Preamplifier ON	with RBW 1 kHz, VBW 10 Hz and input attenuator 0 dB, $f \geq 10$ MHz -6 dB μ V + 2f (GHz)dB *1 -21 dB μ V + 3f (GHz)dB
Gain compression (1 dB) Preamplifier OFF Preamplifier ON	frequency ≥ 200 MHz > +107 dB μ V (mixer input level) > +82 dB μ V (RF input level)
Spurious Response Second harmonic distortion Third order intermodulation distortion	Preamplifier OFF, Mixer level +77 dB μ V ≤ -70 dBc freq = 100 MHz to 800 MHz ≤ -80 dBc freq ≥ 800 MHz ≤ -80 dBc freq ≥ 200 MHz, 2-signal difference > 50 kHz
Residual responses Preamplifier OFF Preamplifier ON	(input terminated 75 Ω , input attenuator 0 dB) $\leq +11$ dB μ V $\leq +6$ dB μ V

*1 For a temperature range of 20°C to 30°C. Add 2 dB for a temperature range of 0°C to 50°C.

(5) Amplitude Accuracy

Characteristics	Specification
Frequency Response Preamplifier OFF Preamplifier ON	(after Calibration, Att = 10 dB) ± 0.5 dB (100 kHz to 2.2 GHz) *2 ± 2 dB (9 kHz to 2.2 GHz) ± 1 dB (100 kHz to 2.2 GHz) ± 2 dB (9 kHz to 2.2 GHz)
Calibration Signal Accuracy	-20 dBm ± 0.3 dB
IF Gain Error	(after automatic calibration) ± 0.5 dB
Scale Fidelity Log Linear	(after automatic calibration) ± 1 dB/10 dB ± 1.5 dB/90 dB ± 0.2 dB/1 dB $\pm 5\%$ of reference level
Input attenuator switching accuracy	± 0.3 dB (0 to 50dB settings) in reference to an attenuation of 10 dB at 30 MHz
Resolution bandwidth switching uncertainty	(after automatic calibration) ± 0.5 dB
Overall level accuracy	± 1.5 dB (REF = -50 to 0 dBm, ATT = 10 dB, 2 dB/div, RBW = 300 kHz, $f = 100$ kHz to 2.2 GHz, after automatic calibration)

*2 For a temperature range of 20°C to 30°C. Add 0.5 dB for a temperature range of 0°C to 50°C.

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(6) Input and Output

Characteristics	Specification
RF input Connector Impedance VSWR / Preamp OFF VSWR / Preamp ON	N type 75 Ω (nominal) < 1.5 : 1 (100 kHz to 2.2 GHz) (characteristic value) with input attenuator. 10 dB to 50 dB < 2 : 1 (9 kHz to 2.2 GHz) (characteristic value) with input attenuator. 5 dB to 50 dB < 2.5 : 1 (9 kHz to 2.2 GHz) (characteristic value)
Probe power	± 12 V (nominal), 4-pin connector
Calibration output signal	BNC female, 75 Ω (nominal) 30 MHz, -20 dBm
10MHz reference input	BNC female, 500 Ω (nominal) -10 dBm to +10 dBm
External trigger input	BNC female
Phone output	Small size monophonic female
GPIB interface	IEEE-488 bus connector
Serial interface	D-Sub 9pins
Printer interface	D-Sub 25pins, ESC/P, ESC/P-R, PCL
Video output	VGA (15 pins, female)
Floppy drive	3.5 inch, MS-DOS format

(7) General Specifications

Characteristics	Specification
Operating environment range	0°C to +50°C Relative humidity 85% or less (without condensation)
Storage environment range	-20°C to +60°C, Relative humidity 85% or less
AC input power source	Automatic switching to 100 VAC or 200 VAC For 100 VAC: 100 to 120 VAC, 50 to 60 Hz For 200 VAC: 220 to 240 VAC, 50 to 60 Hz
Power consumption	< 200 VA
Mass	< 14kg
Dimensions	Approximately 424(W) \times 177(H) \times 300(D) mm (not including projections such as rubber feet and connectors)

7.6 Options

(1) R3132/32N/62/72/82

- OPT20 Highly Stable Reference Frequency Crystal Oscillator

Characteristics	Specification
Reference frequency source accuracy	Aging $\pm 2 \times 10^{-8}/\text{day}$, $\pm 1 \times 10^{-7}/\text{year}$ Warm-up drift (nominal) $\pm 5 \times 10^{-8}$ (+25°C, 10 minutes after turning the power on) Temperature drift $\pm 5 \times 10^{-8}$ (0 to +40°C, with reference to +25°C)

- OPT27 Narrow-band Resolution Bandwidth

Characteristics	Specification
3-dB resolution bandwidth	300Hz, 100Hz, 30Hz
Bandwidth accuracy	$\pm 20\%$
6-dB resolution bandwidth	200Hz

- OPT29 High-Speed Time-Domain Sweep

Characteristics	Specification
Sweep time	50 μs to 10ms
Sweep time accuracy	$\pm 1\%$
Trace detector	Sample
Trace point	501

7.6 Options

(3) R3132N

- OPT74 Tracking Generator

Characteristics	Specification
Frequency range	100kHz to 3.0GHz
Output level range	105 to -45.1dB μ V
Output level accuracy	\pm 0.5dB (30MHz, 95dB μ V, 20°C to 30°C)
Output flatness	\pm 1.0dB (100kHz to 1GHz) \pm 1.5dB (100kHz to 2.2GHz) (The reference signal level and frequency are 95dB μ V and 30MHz, respectively.)
Output level switching uncertainty	\pm 1.0dB (100kHz to 1GHz) (Output level \geq -75dB μ V) \pm 2.0dB (100kHz to 2.2GHz) (The reference level is 95dB μ V.)
Spurious output Harmonics spurious signals Non-harmonics spurious signals	\leq -20dBc (Output level = 95dB μ V) \leq -30dBc (Output level = 95dB μ V)
TG leakage	\leq 7dB μ V (Input ATT = 0dB)
Output Impedance VSWR	75 Ω (nominal) (for the output level of 95dB μ V or less) \leq 2 (100kHz to 2.2GHz) (characteristic value)
Maximum allowable input level	123dB μ V \pm 10V
Mass	1 kg or less

(4) R3172

- OPT03 Ext. Mixer local Out

Characteristics	Specification
Frequency range	4.0 GHz to 7.6 GHz
Output level	> +8dBm
Output impedance	50 Ω (nominal)
Connector	SMA female