Linewidth Analyzer 疏 LWA-1k 780



Wavelength Range ¹⁾	min.	typ.	max.			
760 – 1064 nm	760 nm	780 nm	1064 nm	_		
Input Power Range (@typical wa	velength)					
1 – 15 mW	1 mW	10 mW	15 mW			
Required Input Power Stability						
±5%						
Laser type						
Laser type CW, single mode						
Input fiber type						
PM-FC/APC						
Maximum frequency stroke (@ f > 10Hz)						
30 MHz						

1) Frequency noise and lineshape specifications are derived from measurements at 780 nm.









Frequency Noise Specification

Naise fleer N. Otun input		10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	> 1 Mhz	
power and wavelength $^{7)}$	Hz/√Hz	200	75	30	30	25	15	
Laser phase noise floor @typ3 input power and wavelength ^{5) 8)}	rad/√Hz	20	750 m	30 m	3 m	250 μ	15μ	
	dBrad/√Hz	26	-2.5	-30	-50	-72	-96	
Equivalent interferometer signal noise @ typ. input power and wavelength ^{3) 5)}	rad/√Hz/m	6.2µ	2.3μ	920 n	920 n	770 n	460 n	
	dBrad/√Hz/m	-104	-112	-120	-120	-122	-12	
Frequency noise bandwidth ⁴⁾		10 Hz – 10 MHz	:					
Minimum measurable intrinsic linewidth (lorentzian linewidth@1μs)		<3 kHz						
Effective linewidth range (optical linewidth @ 100 ms) [β-separation method]		<10 k - 20 M						
Relative intensity noise limit (lorentzian linewidth)		-						
Dynamic range		60 dB						

3) Not included in the software, can be calculated by the user from exported data.

4) According to a –3 dB criterion.

5) This is the calculated noise of the interferometer phase of a two path interferometer with length imbalance L (in meters). The alculation is performed for a given frequency noise density floor by $2\pi nL/c \times N_{\Delta v}$ with n being the refractive index of the reference fiber interferometer material and c being the speed of light in vacuum. Values in the table are given for an refractive index of n = 1.46 and a reference length of 1 meter.

7) $N_{\Delta v}$ is the noise floor of the instrument in terms of the square root of the power spectral density of the frequency noise.

8) The phase noise floor corresponds to the noise floor of the square root of the power spectral density of the phase. It is calculated from $N_{\Delta v}$ by the formula $1/f \times N_{\Delta v}$. Additionally, phase noise is often specified in terms of L(f) which can be calculated with the formula L(f) = $1/f^2 \times N^2_{\Delta v}/2$.









Lineshape Specifications

Effective linewidth range (FWHM)	< 10 kHz – 10 MHz			
Dynamic range	60 dB			
Miscellaneous				
Interface	USB 2.0 Type B			
Analog Output/error signal	BNC ± 7.5 (50 Ω) ± 15 (high impedance) V, single ended			
Cutoff (highpass filter)	10 Hz, 1 kHz, 10 kHz, 100 kHz			
Dimensions	220 mm × 334 mm × 96 mm			
Weight	8 kg			
Digitizer Module				
Sample rate	62.5 (max.) MSa/s			
Resolution	16 bits			
Acquisition time	1 – 100 ms			
Evaluation time ⁶⁾	10 m – 1 (typ.) s			
Communication	USB 3.0 Type B			
Dimensions	210 mm × 200 mm × 74 mm			

6) Windows 10 or newer, Intel i5 8600 / AMD Ryzen 5 2600 or better, 16GB RAM or more.

2 kg



Weight



Linewidth Analyzer



Further Information

For further technical information, application examples, diagrams and for customisation of linewidth analyzers please contact:

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