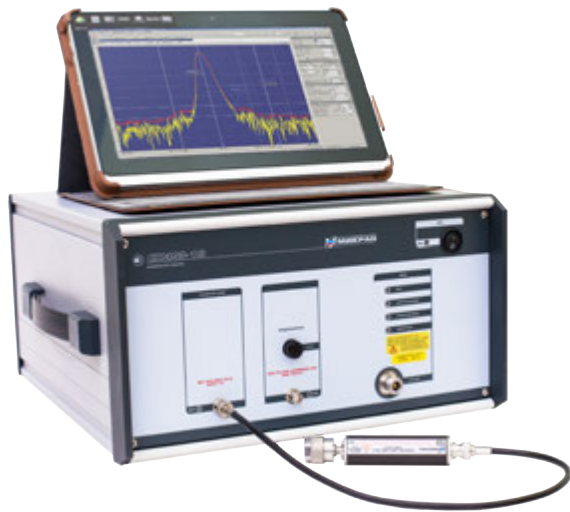


스펙트럼 분석기 -SK4M



DESCRIPTION

Spectrum analyzer is used to measure level and frequency of harmonic components of periodic signal spectrum, and also the spectral power density of stationary random process.

Super-heterodyne design of wide dynamic range line path with synthesizer heterodynes, and intermediate frequency digital processing unit allow for a wide application in modern electronics research and development, manufacturing and operating.

MAIN CAPABILITIES

Versatile configurable architecture design of noise meter allows to enhance its functionality by adding different options.

BUILT-IN INTERRUPTIBLE LOW-NOISE AMPLIFIER (MUA OPTION)

The amplifier increases sensibility of analyzer to -166 dBm/Hz. Also it allows for wider noise measurements application.

BUILT-IN INTERRUPTIBLE POWER ADAPTER (APA OPTION)

Power supply adapter allows to measure amplifiers and converters with power supply feeded through the coaxial central conductor. Max voltage is ± 20 V, max current 500 mA.

Activated adapter raises minimal operating frequency of analyzer to 20 MHz.

BUILT-IN INTERRUPTIBLE BLOCKING CAPACITOR (RKA OPTION)

This option provides analyzer's input circuits with protection from DC up to 20 V in voltage, making easier to operate when measuring active microwave devices. Activated blocking capacitor raises minimal operating frequency of analyzer to 20 MHz.

FEATURES

- 100 Hz to 50 GHz operating frequencies range;
- third-order intercept (TOI) level $> +20$ dBm;
- low inherent noise < -165 dBm/Hz;
- low phase noise -125 dBc/Hz at 1 GHz and 100kHz offset;
- built-in clock oscillator with high frequency settability $\pm 1 \times 10^{-7}$;
- selective and FFT filters 1 Hz - 10 MHz;
- built-in input attenuator and ovenized preselector;
- built-in interruptible low-noise amplifier from 100 Hz up to 3.2 GHz.

TYPE N INPUT CONNECTOR (11R OPTION)

Installed type N input coaxial connector (female), defining the connectivity of measured DUT.

NMD 3.5 MM INPUT CONNECTOR (13N OPTION)

Installed type NMD 3.5 mm input coaxial connector (male), defining the connectivity of measured DUT.

NMD 2.4 MM INPUT CONNECTOR (05N OPTION)

Installed type NMD 2.4 mm input coaxial connector (male), defining the connectivity of measured DUT. Available only for SK4M-50 model.

SOFTWARE

Graphit SK4M software allows to control the analyzer via the Ethernet interface.

Software features:

- user-friendly interface;
- versatile report generating system;
- custom profiles save/load for different measurement setups;
- formulae editor for complex mathematical calculations;
- unlimited memory traces.

Multichannel synchronization system provides precision connection with other instruments. SCPI control commands allow to integrate SK4M into automated test and measurement complexes.

SPECIFICATIONS

Operating frequencies range		
SK4M-18 with 11R option	100 Hz...18 GHz	
SK4M-18 with 13N option	100 Hz...20 GHz	
SK4M-50 with 05N option	100 Hz...50 GHz	
Clock oscillator thermal instability ¹	$\pm 5 \times 10^{-8}$	
Frequency simulation relative error, when operating with built-in clock oscillator over 1 year period	$\pm 5 \times 10^{-8}$	
Phase noise, at 1 GHz with offset of:	Guaranteed	Typical
10 Hz	- 60 dBc/Hz	- 60 dBc/Hz
100 Hz	- 95 dBc/Hz	- 95 dBc/Hz
1 kHz	- 115 dBc/Hz	- 115 dBc/Hz
10 kHz	- 110 dBc/Hz	- 120 dBc/Hz
100 kHz	- 120 dBc/Hz	- 125 dBc/Hz
1 MHz	- 135 dBc/Hz	- 150 dBc/Hz
10 MHz	- 145 dBc/Hz	- 160 dBc/Hz
Residual frequency modulation at 1 GHz	< 1 Hz/s	
Selective filters		
-3 dB bandwidth	1 to 103 with step of 1 Hz/2 Hz/3 Hz/5 Hz/7 Hz 103 to 107 with step of 1 Hz/3 Hz special filters 140 and 6366	
IF filter switching relative to 10 kHz reference band absolute error 1 Hz to 10 MHz	Guaranteed	Typical
	± 0.1	± 0.05
IF filter -3 dB bandwidth setup relative error:		
1 Hz to 1 kHz	$\pm 5 \%$	$\pm 1 \%$
3 kHz to 300 kHz	$\pm 10 \%$	$\pm 6 \%$
1 MHz to 3 MHz	$\pm 15 \%$	$\pm 12 \%$
10 MHz	$\pm 20 \%$	$\pm 15 \%$
Amplitude characteristics		
Power level measurement range	Displayed average noise level (DANL) to +30 dBm	
Input signal max power level DC voltage sine wave (input att. = 0 dB) sine wave (input att. > 10 dB)	0 V (± 20 V for closed input) +20 dBm +30 dBm	
Power level measurement at 100 MHz -30 dBm ² level absolute error	Guaranteed	Typical
	± 0.2 dB	± 0.1 dB
Power level measurement error due to scale nonlinearity at fixed frequency of 100 MHz ³	± 0.1 dB	± 0.02 dB
Reference level setup absolute error at fixed frequency of 100 MHz	± 0.2 dB	± 0.1 dB

Notes:

¹ In +5 to +50 °C environment temperature range.

² For input attenuator 10 dB and IF filter 10 kHz.

³ For input attenuator 10 dB, and input power level 10 dBm to -90 dBm.



Frequency response flatness relative to reference frequency 100 MHz for input attenuator 10 dB:		
100 Hz to 19 MHz	±1 dB	±0.5 dB
20 MHz to 3.2 GHz	±0.75 dB	±0.5 dB
3.3 GHz to 9 GHz	±1.5 dB	±1.0 dB
10 GHz to 20 GHz	±2.0 dB	±1.5 dB
20 GHz to 50 GHz	±2.5 dB	±2.5 dB
Power level measurement error due to input attenuation switching, at fixed frequency 100 MHz	Guaranteed	Typical
0 dB	±0.3 dB	±0.1 dB
20 dB	±0.3 dB	±0.1 dB
30 dB	±0.3 dB	±0.1 dB
40 dB	±0.3 dB	±0.1 dB
50 dB	±0.3 dB	±0.1 dB
Dynamic characteristics		
Displayed average noise level (DANL), 1 Hz RBW		
Without MUA option	Guaranteed	Typical
10 kHz to 20 MHz	- 148 dBm	- 155 dBm
20 MHz to 3.2 GHz	- 148 dBm	- 153 dBm
3.2 to 9 GHz	- 138 dBm	- 142 dBm
9 to 20 GHz	- 133 dBm	- 138 dBm
20 to 26.5 GHz	- 120 dBm	- 130 dBm
26.5 to 40 GHz	- 120 dBm	- 125 dBm
40 to 44 GHz	- 120 dBm	- 125 dBm
44 to 50 GHz	- 120 dBm	- 125 dBm
With MUA option		
10 kHz to 20 MHz	- 160 dBm	- 166 dBm
20 MHz to 3.2 GHz	- 164 dBm	- 167 dBm
3.2 to 9 GHz	- 162 dBm	- 166 dBm
9 to 20 GHz	- 160 dBm	- 164 dBm
20 to 26.5 GHz	- 145 dBm	- 155 dBm
26.5 to 40 GHz	- 140 dBm	- 150 dBm
40 to 44 GHz	- 140 dBm	- 150 dBm
44 to 50 GHz	- 140 dBm	- 150 dBm
Third-order intermodulation distortion		
Without MUA option ⁴		
20 MHz to 3.2 GHz	15 dBm	20 dBm
3.2 GHz to 20 GHz	15 dBm	20 dBm
20 GHz to 50 GHz	13 dBm	20 dBm
With MUA option ⁵		
20 MHz to 3.2 GHz	-20 dBm	-10 dBm
3.2 GHz to 20 GHz	-20 dBm	-10 dBm
20 GHz to 50 GHz	-20 dBm	-10 dBm

Notes:

⁴ For two signals of -10 dBm level and frequency spacing more than 5 times IF filter bandwidth, and input attenuator 0 dB.

⁵ For two signals of -30 dBm level and frequency spacing more than 5 times IF filter bandwidth, and input attenuator 0 dB.

Second harmonic interference level		
Without MUA option ⁶		
10 MHz to 1.6 GHz	45 dBm	50 dBm
1.6 MHz to 10 GHz	93 dBm	100 dBm
10 GHz to 25 GHz	80 dBm	100 dBm
With MUA option ⁷		
10 MHz to 1.6 GHz	- 5 dBm	5 dBm
1.6 MHz to 10 GHz	- 5 dBm	5 dBm
10 GHz to 25 GHz	-5 dBm	5 dBm
Spurious signals		
Other spurious responses	< -100 dBm	
RF input		
Input impedance	50 Ohm	
Input VSWR (input att. = 10 dB)	< 2:1	

Notes:

⁶ Expressed as a second harmonic interference point for input attenuator of 0 dB and input signal level of -10 dBm.

⁷ Expressed as a second harmonic interference point for input attenuator of 0 dB and input signal level of -50 dBm.

ORDERING INFORMATION

MODIFICATIONS	
SK4M-18/1	Spectrum analyzer, 100 Hz...18 GHz with 11R option
SK4M-18/2	Spectrum analyzer, 100 Hz...18 GHz with 11R, APA options
SK4M-18/3	Spectrum analyzer, 100 Hz...18 GHz with 11R, MUA options
SK4M-18/4	Spectrum analyzer, 100 Hz...18 GHz with 11R, RKA options
SK4M-18/5	Spectrum analyzer, 100 Hz...18 GHz with 11R, APA, MUA options
SK4M-18/6	Spectrum analyzer, 100 Hz...18 GHz with 11R, MUA, RKA options
SK4M-18/7	Spectrum analyzer, 100 Hz...20 GHz with 13N option
SK4M-18/8	Spectrum analyzer, 100 Hz...20 GHz with 13N, APA options
SK4M-18/9	Spectrum analyzer, 100 Hz...20 GHz with 13N, MUA options
SK4M-18/10	Spectrum analyzer, 100 Hz...20 GHz with 13N, RKA options
SK4M-18/11	Spectrum analyzer, 100 Hz...20 GHz with 13N, APA, MUA options
SK4M-18/12	Spectrum analyzer, 100 Hz...20 GHz with 13N, MUA, RKA options
SK4M-50/1	Spectrum analyzer, 100 Hz...50 GHz with 05N option
SK4M-52/2	Spectrum analyzer, 100 Hz...50 GHz with 05N, MUA options
ADDITIONAL ACCESSORIES	
— adapter kits	— RF cable assemblies
— torque wrenches	— connector gage kits
— attenuators	

ORDER EXAMPLE

- SK4M-18/5 Spectrum analyzer — 1 pce.

L.TECH

엘텍

T: 1599-6628

e-mail: lee@ltech.co.kr

http://www.ltech.co.kr