Digital oscilloscope **MOSC6**

- 2 channels
- Sample rate 5 GS/s per channel
- Bandwidth 900 MHz
- Resolution ADC 8 bit
- RAM 1024 MSamples per channel

MOSC6 module is designed to work as part of information measuring systems based on the VXI bus as a digital oscilloscope. The module is made in the form of a triple-width mezzanine, is mounted on a mezzanine carrier and connected to it via a local information highway. MOSC6 is designed to convert instantaneous voltage values of an electrical signal into a digital code, measure instantaneous voltage values, measure time intervals between two instantaneous voltage values via two independent channels.

MOSC6 provides:
- digital-to-analog conversion of the instantaneous voltage values of the input signals through two channels with a given sampling rate and recording the received measurement information in the memory installed on the mezzanine;
- setting the signal bias voltage for each channel, which is performed within the selected measurement range;

- software setting of channel operation modes for direct current: "Open" (absence of separation capacitance at the input); "Closed" (presence at the input of the separation capacitance);
- the ability to select a trigger on the rising or falling edge of the signal in the modes of internal and external launches;
- the ability to select launch modes: program, internal, external;

Specifications

Measurement ranges of instantaneous voltage values at the inputs of each channel									
Range designation	«± 50 мВ»	«± 100 мВ»	«± 250 мВ»	«± 500 мВ»	«± 1 В»	«± 2,5 В»	«± 5 В»	«± 10 В»	«± 20 В»	«± 50 В»
Input voltage swing, V	от - 0,05 до + 0,05 В	от - 0,10 до +0,10 В	от - 0,25 до + 0,25 В	от - 0,50 до + 0,50 В	от - 1,00 до + 1,00 В	от -2,50 до + 2,50 В	от -5,00 до +5,00 В	от - 10,00 до +10,00 В	от - 20,00 до +20,00 В	от -50,00 до +50,00 В

The maximum absolute value of voltage measurement in each range is at least 1.02 × D, where D is the value of the measurement range

The bandwidth of each channel at the level of -3 dB:
- not less than 900 MHz with an input impedance of 50 Ohm;
- not less than 250 MHz with an input impedance of 1 MOhm

Bandwidth limitation for each channel using software-connected low-pass filters with upper frequency limits of 20 MHz or 500 MHz	The limits reduced to the value of the upper limit of the range, the permissible error of measurements of instantaneous voltage values for each channel are: • ± 3.0% in the range of "± 50 mV"; • ± 2.0% in the range of "± 100 mV"; • ± 1.5% in other ranges
The limits of the permissible error in setting the bias voltage reduced to the value of the upper limit of the measurement range are ± 1.5%. Resolution resolution of bias voltage: • 100 µV for the range of "± 50 mV"; • 200 µV for the range of "± 100 mV"; • 500 µV for the range of "± 250 mV"; • 1 mV for the range of "± 500 mV"; • 2 mV for the range of "± 1 V"; • 5 mV for the range of "± 2.5 V"; • 10 mV for the range of "± 5 V"; • 20 mV for the range of "± 10 V"; • 50 mV for the range of "± 20 V"; • 100 mV for the range of "± 50 V"	The choice of sampling rate from the following series of values: • 5 GS samples / s (sampling period 0.2 ns); • 2.5 GS / s (sampling period 0.4 ns); • 1.25 GS / s (0.8 ns sampling period); • 1 GS / s (sampling period 1 ns); • 500 Samples / s (sampling period 2 ns); • 200 Samples / s (sampling period 5 ns); • 100 Samples / s (sampling period 10 ns); • 50 Samples / s (sampling period 20 ns); • 20 Samples / s (sampling period 50 ns); • 10 Samples / s (sampling period 100 ns); • 5 Samples / s (sampling period 200 ns); • 2 Samples / s (sampling period 500 ns); • 1 Sample / s (1 µs sampling period)
Maximum non-destructive voltage supplied to the channel inputs at a time of continuous exposure not exceeding 1 min, no more than: • ± 7.5 V at an input impedance of 50 Ohm; • ± 100 V at an input impedance of 1 MOhm	The maximum sampling frequency when measuring a signal in real time is 5 GS samples / s (sampling period 0.2 ns) in two-channel operation mode
Software setting of input resistance values for each channel: • 1 MOhm ± 1% - for all ranges; • 50 Ohm ± 2% - for the ranges: "± 50 mV", "± 100 mV", "± 250 mV", "± 500 mV", "± 1 V", "± 2.5 V" and "± 5 V"	Limits of permissible absolute error of measurement of time intervals in the measurement time range from 204.8 ns to 1073.742 s: ± [2,5×10⁻⁶ × Tx + Тд], where Tx is the measured time interval; Тд - sampling period

Limits of permissible absolute error of measurement of time intervals in the measurement time range from 204.8 ns to 1073.742 s:
$$\pm [2{,}5 \times 10^{-6} \times T_x + T_{д}],$$
where Tx is the measured time interval; Тд - sampling period

RAM to store conversion results for each channel. The amount of each RAM is 1024 MB (1073741824 samples)	In two-channel operation mode, the rise time is not more than: • 500 ps with a set input impedance of 50 Ohm; • 1.4 ns with 1 MOhm input impedance set
Number of bits of the ADC: 8	

The trigger threshold setting range for the internal trigger mode corresponds to the selected measurement range. The resolution increment of the trigger threshold is Umax / 128, where Umax is the value of the upper limit of the measurement range

Startup login options: • input resistance to a direct current of 50 Ohm or 1 MOhm (it is set programmatically); • voltage swing from -5.0 to 5.0 V; • setting range of the switching threshold from -2.0 to 2.0 V in 0.1 V increments; • bandwidth - 250 MHz	The formation of the output trigger signal with the parameters: • shape - rectangular impulses; • high voltage output voltage - at least 2.3 V at a load current of up to -8 mA; • low voltage output voltage - not more than 0.6 V at a load current of up to 8 mA
Software selection of reference frequency sources: • internal frequency generator 10 MHz. The relative error and instability of the reference frequency is not more than $2{,}5 \times 10^{-6}$; • an external generator, from which a 10 MHz signal should be supplied to the mezzanine connector "INPUT FREQUENCY"	External reference frequency input parameters: • DC operation mode - "closed" (presence of separation capacitance); • input impedance at a frequency of 10 MHz - 50 ± 1 Ohm; • the range of non-destructive voltage is not more than 6 V
Requirements for an external reference frequency signal: • signal type: sinusoid or rectangular pulses; • signal frequency - 10 MHz; • signal amplitude - from 0.5 to 2.5 V	The formation of the output signal of the reference frequency with the parameters: • shape - rectangular pulses with duty cycle 2; • frequency - 10 MHz; • high voltage output voltage - at least 2.3 V at a load current of up to minus 8 mA; • low voltage output voltage - not more than 0.6 V at a load current of up to 8 mA