

Rev:A00

Microwave Direct Synthesis Module



The integrated multi-channel microwave direct synthesis module can directly generate high-resolution, wide-band, and arbitrarily programmable microwave pulse waveforms by moving the signal to the higher-order Nyquist domain and operating with appropriate filters. The module can provide up to 24 independent output channels within a 1U standard rack to meet the needs of scalable quantum computing. A built-in CPU is used for processing the waveform computation tasks of the channels within the module, avoiding the increased computational and communication load on the measurement and control host when scaling up the system. With up to 100+ qubits simultaneously controlled & measured, the performance is comparable to that of a few qubits.

Technical requirements

Item	Specifications
Model	MDSC2411A001A
output channels	19-inch standard 1U rack providing 24 independent output channels
Output interface	SMA 50 Ohm AC coupled
DAC vertical resolution	14 bit
DAC sampling rate	5 Gsps-9.8 Gsps, programmable adjustment
Output frequency range	3 GHz-14 GHz, instantaneous bandwidth ≥ 3.5 GHz
DAC channel output power	≥ -12 dBm @ 3.2 GHz-6.5 GHz; ≥ -15 dBm @ 6.0 GHz-7.8 GHz
Single-tone SFDR	≤ -55 dBc @ 4.0 GHz-8.0 GHz
Waveform length	≥ -12 dBm @ 3-6GHz
Channel isolation	≥ 52 dBc
Other	Built-in high-performance x86 processor, capable of local waveform computation and generation