Abstracts

Development of 4-Gsps 2-bit ADC with GaAs ICs for radio astronomy

M. Okiura, S. Iguchi, S.K. Okumura, M. Momose, K. Matsumoto and N. Kawaguchi. "Development of 4-Gsps 2-bit ADC with GaAs ICs for radio astronomy." 2002 MTT-S International Microwave Symposium Digest 02.1 (2002 Vol. I [MWSYM]): 485-488 vol.1.

We developed two sets of prototype 4-Gsps 2-bit analog to digital converters (ADCs) with GaAs ICs for the realization of 4 GHz sampling in an ADC system for the Atacama Large Millimeter / submillimeter Array (ALMA). This consists of three sets of 12-Gbps decision circuits and 12-Gbps demultiplexers, and has the capability of sampling in a bandwidth of 6 GHz. Toward implementation of GaAs ICs in the ADC system, we measured the sampling jitter of the ADC using the ultra-wide band correlator (UWBC) developed for the Nobeyama Millimeter Array (NMA). The measured Allan standard deviation of phase, corresponding to the stability of sampling timing is 2.3/spl times/10/sup -15/ at 10 seconds, and the Allan standard deviation due to the flicker-frequency noise is 0.8/spl times/10/sup -15/. It is shown that the coherence loss becomes 0.95 at a coherence time of 86400 seconds (24 hours). The Allan standard deviation of sampling timing and its long-time stability are acceptable for application to radio astronomical ADC systems.

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