

Phase Noise Measurement Technique Using Delta-Sigma TDC Without Reference Clock

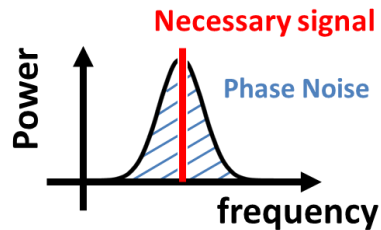


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Oscillator Phase Noise



Bad influence in electronic system

- Interference in RF system
- ADC performance degradation

Important

Phase Noise Test

Conventional Method



- **Expensive** spectrum analyzers
- **Long** measurement time (~10seconds)



Significant test cost



Proposed Method

Using simple circuit



**Delta-Sigma
Time-to-Digital Converter (TDC)**



**Low Cost , High Quality
Phase Noise Test**

