

Acronyms

ADC analog-to-digital converter

BEOL back-end-of-line

CDF cumulative distribution function

CMOS complementary metal-oxide-semiconductor

CPU central processing unit

CR charge-redistribution

CS charge-sharing

DAC digital-to-analog converter

DNL differential nonlinearity

ENOB effective number of bits

EOC end-of-conversion

FFT Fast Fourier Transform

FOM figure-of-merit

FPGA Field Programmable Gate Array

GA genetic algorithm

GPS global positioning system

GPU graphics processing unit

INL integral nonlinearity

IR input range

ISF input sensitivity function

ISSCC International Solid-State Circuits Conference

LSB least-significant bit
LTV linear time-varying
LVLPL low-voltage low-power

MCS merged capacitor switching
MDAC multiplying digital-to-analog converter
MIM metal-insulator-metal
MOM metal-oxide-metal
MOS metal-oxide-semiconductor
MOSCAP metal-oxide-semiconductor capacitor
MOSFET metal-oxide-semiconductor field-effect transistor
MSB most-significant bit

NQS non-quasi static
NSGA-II Non-dominated Sorting Genetic Algorithm-II

PAC periodic-ac
PMU power management unit
PNOISE periodic noise
PSD power spectral density
PSS periodic steady-state
PVT process, voltage, temperature

RAM random access memory
RF radio-frequency

SAR successive approximation register
SFDR spurious-free dynamic ratio
SNDR signal-to-noise-and-distortion ratio
SNR signal-to-noise ratio
SOI silicon-on-insulator

TH track-and-hold
THD total harmonic distortion
TSPC true-single-phase-clocked

VB voltage booster
VLSIC Symposium on VLSI Circuits

WSN wireless sensor network

Symbols

- Δ_{C_p} Parasitic capacitance mismatch
- Δ_C Capacitance mismatch
- Δ_G ADC gain error
- α Capacitance ratio
- $\hat{\alpha}$ Effective value of α
- B Number of bits
- C_0 Unitary capacitance
- C_{CAL} Calibration capacitor
- C_{DAC} Total DAC capacitance
- C_{GB} Capacitance between the gate and the bulk of a MOSFET
- C_{GD} Capacitance between the gate and the drain of a MOSFET
- C_{GG} Total gate capacitance of a MOSFET
- C_{GS} Capacitance between the gate and the source of a MOSFET
- C_p Parasitic capacitance
- C_{TH} Track-and-hold capacitor
- C_{THN} Track-and-hold capacitor (negative terminal)
- C_{THP} Track-and-hold capacitor (positive terminal)
- ENOB Effective number of bits
- E_{REF} Energy of the reference source
- G_{ADC} ADC gain, defined by the ratio between the input range V_{IR} and the reference voltage V_{REF} or the precharge voltage V_{PC}
- i Cycle in the conversion (0 corresponds to the MSB cycle)
- I_{CAP} Capacitor current
- I_{REF} Current of the reference source
- K Conversion result, $K = k_{B-1}, \dots, k_1, k_0$
- Q_N Charge on the node corresponding to the comparator negative input
- Q_P Charge on the node corresponding to the comparator positive input
- Q_{THN} Charge on the track-and-hold negative terminal
- Q_{THP} Charge on the track-and-hold positive terminal

Q_{TOP} Charge on the top plate of the capacitor
 SNDR Signal to noise-and-distortion ratio
 V_{BIAS} Bias voltage
 V_{CAL} Calibration voltage
 V_{CM} Common-mode voltage
 V_{DD} Positive supply voltage
 V_{DIF} Differential voltage
 V_{GS} Voltage between the gate and the source of a MOSFET
 $V_{\text{IN,CM}}$ Common-mode voltage of the input
 $V_{\text{IN,DIF}}$ Differential voltage at the ADC inputs
 V_{INN} Voltage at the negative ADC input
 V_{INP} Voltage at the positive ADC input
 V_{IR} Input-range voltage
 V_{LSB} Voltage of one LSB
 V_{N} Voltage at the negative comparator input
 V_{NOISE} Noise voltage
 V_{OS} Input-referred comparator offset voltage
 V_{P} Voltage at the positive comparator input
 V_{PC} Precharge voltage source, used to charge the DAC capacitors in the beginning of the conversion
 V_{PN} Differential voltage at the comparator inputs
 $V_{\text{P-P}}$ Volts peak-to-peak
 V_{REF} Reference voltage
 V_{SB} Voltage between the source and the bulk of a MOSFET
 V_{t} Threshold voltage of a MOSFET
 V_{TOP} Voltage on the top plate of the capacitor

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