AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

Electronics and Communications Engineering Department

High Performance Data Converter for Video Application

A Thesis

Submitted in partial fulfillment of the requirements of the degree of

Master of Science in Electrical Engineering

Submitted by

Mohamed Saeed Abdel-Aziz

B.Sc. of Electrical Engineering

(Electronics and Communications Engineering)

Ain Shams University, 2004

Supervised By

Prof. Hisham S. Haddara

Dr. Mohamed Ameen Dessouky

Cairo, 2011

Examiners' Committee

Name: **Mohamed Saeed Abdel-Aziz**

Thesis: High Performance Data Converter for Video Application

Degree: Master of Science in Electrical Engineering

Title, Name and Affiliation	**Signature**
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Date:

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master of Science in Electrical Engineering (Electronics and Communications Engineering).

The work included in this thesis was carried out by the author at the Electronics and Communications Engineering Department, Faculty of Engineering, Ain Shams University, Cairo, Egypt.

No part of this thesis was submitted for a degree or a qualification at any other university or institution.

Name: Mohamed Saeed Abdel-Aziz

Signature:

Date:

Curriculum Vitae

Name of Researcher	Mohamed Saeed Abdel-Aziz
Date of Birth	7/9/1981
Place of Birth	Egypt
First University Degree	B.Sc. in Electrical Engineering
Name of University	Ain Shams University
Date of Degree	June 2004

ABSTRACT

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This dissertation demonstrates the design of a standard CMOS high performance Analog–to–Digital Converter (ADC). It begins with an introduction to Analog to Digital Conversion. Basic definitions for performance metrics, different types of ADC's is discussed briefly & choosing the proper topology which is Pipelined ADC.

Next, it presents in more details the operation of Pipelined ADC, building blocks & main sources of errors. An automated system level design procedure is explained, and the circuit design of a prototype ADC with commercial specs in standard CMOS technology is presented. All blocks of the system are analyzed, designed, and simulated, then post layout simulated.

Finally, experimental results for a commercial ADC previously designed using the same method is presented.

Key words: CMOS, Pipelined, FOM, Quantization, Video.

To the memory of my father

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إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ لَءَايَٰتٍ لِّأُو۟لِى ٱلْأَلْبَٰبِ ﴿١٩٠﴾ ٱلَّذِينَ يَذْكُرُونَ ٱللَّهَ قِيَٰمًا وَقُعُودًا وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِى خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَٰذَا بَٰطِلًا سُبْحَٰنَكَ فَقِنَا عَذَابَ ٱلنَّارِ ﴿١٩١﴾

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