

CCII Key Concepts, Reliable CCII Test Testking

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Research Article Oscillation-Based Test Applied to a Wideband CCII

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Oscillation-based testing (OBT) has been proven to be a simple, yet effective VLSI test for numerous circuit types. This paper investigates, for the first time, the application of OBT verification for second generation current conveyors (CCIIs). The OBT is formed by connecting the CCII into a simple Wien bridge oscillator and monitoring both the amplitude and frequency of oscillation. The fault detection rate, taking into account both the open and short circuit fault simulation analyses, indicates 96.34% fault coverage using a combination of amplitude and frequency output sensing in all technology corners. The only nondetected faults are short circuits between V_{CO} and V_{AO} , which can be detected using other techniques such as IDPDQ testing. This method is found to be sensitive to resistor and capacitor process variation in the Wien bridge oscillator, but mitigating test steps are proposed.

1. Introduction

Despite the digital implementation of modern communication subsystems, analog front-ends and active filters are still used extensively in mixed-signal ICs. The second generation current conveyor (CCII) is an adaptable multifunction component that can be applied in a large number of analog circuits (such as active continuous time filters and all pass networks) and has been the subject of intensive study for the last decade [1–4]. Most CCII-based circuits use only all-transistor CCII, resistors, and capacitors, making their use attractive compared to large on-chip inductors. Additionally, the component count of these structures is usually very low, further decreasing the area cost [1].

Given the prominent role CCIIs play in integrated systems, it would be prudent to define explicit test procedures for individual CCII elements as part of larger VLSI production testing. Due to large CMOS process tolerances as well as potential failure points, a nonintrusive testing procedure using a minimal number of input and output test vectors is necessary, especially in mass produced telecommunication systems on chip (SOC). Excellent reviews of analog IC testing can be found in [5, 6], highlighting various simulation-before-test and simulation-after-test techniques. It is, however, evident that most of these tests require multiple complex test vectors and swept DC or AC inputs. Some attempt at a

formalized test of a CCII was made in [7], but the procedure is not exhaustive and the conclusions are not generally applicable. It depends significantly on the configuration used and on a very singular fault-set selection. The method requires sweeping an input voltage between a given range, making the procedure difficult to implement. As the method is analog, it is further complicated by the read-out (faulty/nonfaulty) of the produced test result.

In contrast, the oscillation-based test (OBT) technique introduced in the early 1990s [8], is a vectorless technique that can be used either in offline testing or as the core of the so-called OBIST (Oscillation-Based Built-In-Self-Test). The principle of OBT is to convert the circuit under test (CUT) into an oscillator during the test phase by adding a feedback loop (either globally to the total CUT or locally to specific parts of it) to produce self-sustained oscillation monitored at an output. Faulty behavior is then indicated by deviation from the fault-free operation in either the frequency or the amplitude of the oscillations [9]. This method has been used extensively for operational amplifiers, filters, and data converters [8–10]. The benefit of this approach is that a single test (with a single output and no input vector) can detect multiple problems, thus reducing the number of test points and probe pads. OBT, therefore, avoids the problem of test vector generation, requires relatively simple and few measurement vectors, and generally does not require

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McAfee Certified Cyber Intelligence Investigator (CCII) Sample Questions

(Q96-Q101):

NEW QUESTION # 96

How is a privacy policy used in social networks?

- A. To set guidelines on how information will be shared
- **B. All of the above**
- C. To protect members' information

Answer: B

Explanation:

Social media platforms are legally required to publish privacy policies that explain how they protect user information from breaches and unauthorized access.

The guidelines for data sharing with third parties, advertisers, and governments.

What security measures are in place (e.g., encryption, multi-factor authentication).

Despite privacy policies, many platforms have been criticized for violating privacy rights through unlawful data collection and sale (e.g., Facebook-Cambridge Analytica scandal).

Failing to notify users about security breaches.

Tracking user activity even after logging out.

Thus, while privacy policies exist to protect users, they often favor corporate interests over privacy rights.

References: Privacy in Practice, OSINT Techniques by Michael Bazzell.

NEW QUESTION # 97

What benefit do fraudsters obtain by manipulating feedback systems?

- A. The ability to sell multiple quantities of like items
- **B. All of the above**
- C. Established trust
- D. The ability to sell in shorter durations of time
- E. The ability to use multiple accounts to carry out fraud schemes

Answer: B

Explanation:

Fraudsters manipulate feedback systems to create a false sense of trust, enabling them to sell more products quickly and deceive buyers. They use multiple fake accounts, positive feedback loops, and low-value transactions to inflate their credibility before executing larger fraud schemes. This method is commonly used in e-commerce fraud, dark web marketplaces, and social media scams.

References: McAfee Institute CCII Cyber Fraud Guide, Cyber Crime Investigator's Field Guide.

NEW QUESTION # 98

A virus is a program that attaches itself to a program or file. This allows it to spread across networks and cause damage to software and hardware.

- A. False
- **B. True**

Answer: B

Explanation:

A computer virus is malicious software (malware) that replicates itself by attaching to legitimate programs or files. Once activated, viruses can:

Corrupt or delete files.

Spread across networks, infecting multiple systems.

Cause performance issues or even render a system inoperable.

Unlike worms, which can spread independently, viruses require human action (e.g., opening an infected file or running an executable).

References: McAfee Institute CCII Cyber Threat Guide, Cybercrime Encyclopedia.

NEW QUESTION # 99

A public IP address is assigned to every computer that connects to the Internet where each IP is unique.

- A. False
- B. True

Answer: B

Explanation:

A public IP address is globally unique and assigned to devices connected directly to the Internet. It enables direct communication between devices and services across the web. Unlike private IPs, public IPs are exposed and can be tracked in cyber investigations.
References: McAfee Institute CCII Cyber Investigations Guide, OSINT Handbook.

NEW QUESTION # 100

Auction fraud patterns typically involve trends and medians in the cost structure.

- A. False
- B. True

Answer: B

Explanation:

Investigators analyze price fluctuations, listing patterns, and bidding history to detect auction fraud. Unusual trends, such as repeated low-price listings or last-minute bidding wars, indicate fraudulent activities.

References: McAfee Institute CCII Auction Fraud Analysis, Cyber Crime Investigator's Field Guide.

NEW QUESTION # 101

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