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Datasheet for the decision
of 22 July 2011

Case Number: T 2491/10 - 3.5.05

Application Number: 06251265.2

Publication Number: 1729448

IPC: H04L 12/26

Language of the proceedings: EN

Title of invention:
Method and apparatus for test pattern generation

Applicant:
Agere Systems, Inc.

Headword:
Test pattern with CID and PRBS portions/AGERE

Relevant legal provisions:
EPC Art. 84, 123(2)

Keyword:
"Clarity of claims - no (main request, first and second
auxiliary requests)
"Extension of subject-matter (second auxiliary request) - yes"

Catchword:
-

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Case Number: T 2491/10 **-** 3.5.05

D E C I S I O N
of the Technical Board of Appeal 3.5.05
of 22 July 2011

Appellant:	Agere Systems, Inc. 1110 American Parkway, NE Allentown PA 18109 (US)
Representative:	Williams, David John Page White & Farrer Bedford House John Street London WC1N 2BF (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 7 June 2010 refusing European application No. 06251265.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: A. Ritzka
Members: P. Cretaine
                D. Prietzel-Funk

Summary of Facts and Submissions

I.   This appeal is against the decision of the examining
        division announced in oral proceedings held on 4 May
        2010, with reasons dispatched 7 June 2010, refusing
        European patent application No. 06251265.2 on the
        grounds that independent claims 1 and 10 did not meet
        the requirement of Article 84 EPC with respect to
        clarity.

II.   The notice of appeal was submitted on 6 August 2010 and
        the appeal fee was paid on the same day. The statement
        setting out the grounds of appeal was submitted on
        18 October 2010. It was requested that the decision
        under appeal be set aside and that a patent be granted
        on the basis of one of the three sets of claims 1 to 10
        submitted, along with the statement setting out the
        grounds of appeal, as a main request and first and
        second auxiliary requests, the claims of the main
        request corresponding to the claims referred to in the
        decision under appeal. Oral proceedings were requested
        on an auxiliary basis.

III.   A summons to oral proceedings to be held on 15 July
        2011 was issued on 4 May 2011. In an annex accompanying
        the summons the board expressed the preliminary opinion
        that the independent claims 1 and 10 of the main and
        first auxiliary requests did not appear to meet the
        requirements of Article 84 EPC in respect of clarity
        and that the independent claims 1 and 10 of the first
        and second auxiliary requests did not appear to meet
        the requirements of Article 123(2) EPC. The board gave
        its reasons for the objections and expressed its view
        that the appellant's arguments were not convincing.

IV.   By letter submitted on 27 May 2011, the appellant
       requested a postponement of the date of the oral
       proceedings because the representative had been
       summoned to attend jury service in the UK. The
       appellant filed a copy of the Jury Summons in support
       of its request.

V.   By communication dated 7 June 2011, the board informed
       the appellant that the oral proceedings were postponed
       until 22 July 2011.

VI.   By letter submitted on 21 June 2011, the appellant
       filed claims 1 to 10 according to a modified first
       auxiliary request and claims 1 to 10 according to a
       modified second auxiliary request.

VII.   With a letter submitted on 21 July 2011 and received at
       the EPO on the same day, the appellant informed the
       board that it would not be attending the oral
       proceedings and requested the board to give a decision
       taking into account its submissions of 21 June 2011.

VIII. Accordingly, nobody appeared on behalf of the appellant
       at the oral proceedings on 22 July 2011, which were
       then held in the appellant's absence.

IX.   The appellant requested that the decision under appeal
       be set aside and that a patent be granted on the basis
       of claims 1 to 10 of the main request as filed with
       letter dated 18 October 2010, or on the basis of claims
       1 to 10 of the first auxiliary request or of claims 1
       to 6 of the second auxiliary request as filed with
       letter of 21 June 2011.

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After due deliberation on the basis of the written
submissions on file, the board announced its decision.

X.   Independent claim 1 of the main request reads as
         follows:

         "1. A method (100) of generating a modified test
         pattern (212) for testing communications equipment,
         said modified test pattern being a modified version of
         a baseline pattern (202) having a baseline consecutive
         identical digit (CID) portion with m consecutive
         identical digits and a baseline pseudo random bit
         sequence (PRBS) portion with p bits of a baseline PRBS,
         said method characterized by the steps of:
         generating a test CID portion comprising n consecutive
         identical digits; and
         generating a test PRBS portion comprising q bits of a
         test PRBS (106);
         wherein at least one of said test CID portion and said
         test PRBS portion is a modified version of said
         baseline CD portion (204) and said baseline PRBS
         portion (206), respectively, wherein said modified test
         pattern is characterized by a higher diagnostic value
         with respect to said baseline pattern."

         Independent claim 10 of the main request reads as
         follows:

         "10. An integrated circuit (500) for communications
         applications, with built-in test capability using a
         modified test pattern that is a modified version of a
         baseline pattern having a baseline consecutive
         identical digit (CID) portion with m consecutive

identical digits and a baseline pseudo random bit
sequence (PRBS) portion with p bits of a baseline PRBS,
said integrated circuit characterized by:
a communications portion; and
a built-in test portion (503), said built-in test
portion in turn comprising:

> a pattern generator that is configured to:

>> generate a test CID portion comprising n
>> consecutive identical digits;

> and

>> generate a test PRBS portion comprising q
>> bits of a test PRBS;

>> wherein at least one of said test CID

portion and said test PRBS portion is a modified
version of said baseline CID portion and said baseline
PRBS portion, respectively, wherein said modified test
pattern is characterized by a higher diagnostic value
with respect to said baseline pattern;

> a checker (510) that is configured to measure

performance of said communications portion when exposed
to said test pattern generated by said pattern
generator; and

> an interface portion that couples said

communications portion to said pattern generator and
said checker."

Independent claim 1 of the first auxiliary request
reads as follows:

"1. A method (100) of generating a modified test
pattern (212) for testing communications equipment,
said modified test pattern being a modified version of
a baseline pattern (202) having a baseline consecutive
identical digit (CID) portion with m consecutive

identical digits and a baseline pseudo random bit
sequence (PRBS) portion with p bits of a baseline PRBS,
said method characterized by the steps of:

generating a test CID portion comprising n
consecutive identical digits; and
generating a test PRBS portion comprising q bits
of a test PRBS (106);

wherein at least one of said test CID portion and
said test PRBS portion is a modified version of said
baseline CID portion (204) and said baseline PRBS
portion (206), respectively, wherein said modified test
pattern comprises one of the following with respect to
said baseline pattern: higher frequency data by having
at least one of said test CID portions be shorter than
the baseline CID portion, higher frequency toggle rate
by having said test PRBS be identical to said baseline
PRBS and said test PBS portion to a truncated version
of said baseline PRBS portion, higher frequency toggle
rate by having said test PRBS be a lower order
polynomial function than said baseline PRBS, and
stretched data by having said test PRBS be identical to
said baseline PRBS and said test PBS portion being
stretched with respect to said baseline PRBS portion."

Independent claim 10 of the first auxiliary request
reads as follows:

"10. An integrated circuit (500) for communications
applications, with built-in test capability using a
modified test pattern that is a modified version of a
baseline pattern having a baseline consecutive
identical digit (CID) portion with m consecutive
identical digits and a baseline pseudo random bit

sequence (PRBS) portion with p bits of a baseline PRBS, said integrated circuit characterized by:

a communications portion; and

a built-in test portion (503), said built-in test portion in turn comprising:

a pattern generator that is configured to:

generate a test CID portion comprising n consecutive identical digits; and

generate a test PRBS portion comprising q bits of a test PRBS;

wherein at least one of said test CID portion and said test PRBS portion is a modified version of said baseline CID portion and said baseline PRBS portion, respectively, wherein said modified test pattern comprises one of the following with respect to said baseline pattern: higher frequency data by having at least one of said test CID portions be shorter than the baseline CID portion, higher frequency toggle rate by having said test PRBS be identical to said baseline PRBS and said test PBS portion being a truncated version of said baseline PRBS portion, higher frequency toggle rate by having said test PRBS be a lower order polynomial function than said baseline PRBS, and stretched data by having said test PRBS be identical to said baseline PRBS and said test PBS portion being stretched with respect to said baseline PRBS portion;

a checker (510) that is configured to measure performance of said communications portion when exposed to said test pattern generated by said pattern generator; and

an interface portion that couples said communications portion to said pattern generator and said checker."

Independent claim 1 of the second auxiliary request
reads as follows:

"1. A method (100) of generating a modified test
pattern (212) for testing communications equipment,
said modified test pattern being a modified version of
a baseline pattern (202) having a baseline consecutive
identical digit (CID) portion with m consecutive
identical digits and a baseline pseudo random bit
sequence (PRBS) portion with p bits of a baseline PRBS,
said method characterized by the steps of:
    generating a test CID portion comprising n
    consecutive identical digits; and
    generating a test PRBS portion comprising q bits
    of a test PRBS (106);
    wherein at least one of said test CID portion and
said test PRBS portion is a modified version of said
baseline CID portion (204) and said baseline PRBS
portion (206), respectively, wherein said modified test
pattern comprises higher frequency data with respect to
said baseline pattern by having at least one of said
test CID portions be shorter than the baseline CID
portion."

Independent claim 6 of the second auxiliary request
reads as follows:

"6. An integrated circuit (500) for communications
applications, with built-in test capability using a
modified test pattern that is a modified version of a
baseline pattern having a baseline consecutive
identical digit (CID) portion with m consecutive
identical digits and a baseline pseudo random bit

sequence (PRBS) portion with p bits of a baseline PRBS,
said integrated circuit characterized by:

    a communications portion; and

    a built-in test portion (503), said built-in test
    portion in turn comprising:

        a pattern generator that is configured to:

            generate a test CID portion comprising n
            consecutive identical digits;

and

            generate a test PRBS portion comprising
            q bits of a test PRBS;
            wherein at least one of said test CID
            portion and said test PRBS portion is a
            modified version of said baseline CID
            portion and said baseline PRBS portion,
            respectively, wherein said modified test
            pattern comprises higher frequency data
            with respect to said baseline pattern by
            having at least one of said test CID
            portions be shorter than the baseline
            CID portion;

        a checker (510) that is configured to
measure performance of said communications portion when
exposed to said test pattern generated by said pattern
generator; and

        an interface portion that couples said
communications portion to said pattern generator and
said checker."

Reasons for the Decision

1. *Admissibility*

   The appeal complies with the provisions of Articles 106 to 108 EPC and is therefore admissible (see Facts and Submissions, point II).

2. *Non-attendance at oral proceedings*

   In its letter of 21 July 2011 the appellant announced that neither it nor its representative would be attending. The board considered it expedient to maintain the date set for oral proceedings. Nobody attended the proceedings on behalf of the appellant.

   Article 15(3) RPBA stipulates that the board is not obliged to delay any step in the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned, who may then be treated as relying only on its written case.

   Thus, the board was in a position to take a decision at the end of the oral proceedings.

   Main request

3. Article 84 EPC

   Independent claims 1 and 10 of the main request correspond to claims 1 and 10 referred to in the decision under appeal, which was based on the ground that claims 1 and 10 of the main request did not meet the requirements of Article 84 EPC.

3.1   The board agrees with the findings of the examining
        division in that respect, for the following reasons.

        Claim 1 is directed to a method of generating a test
        pattern by modifying a baseline pattern. The baseline
        pattern and the test pattern are both defined as having
        respective consecutive identical digit (CID) portions
        and pseudo random bit sequence (PRBS) portions. The
        test pattern is further defined as having at least one
        of its portions being a modified version of the
        portions of baseline pattern. Moreover the test pattern
        is defined as having a higher diagnostic value with
        respect to the baseline pattern.

        In the context of the application, a pattern is a
        series of digits (CID portion) or bits (PRBS portion).
        Thus, each pattern portion may be considered as the
        modified version of any other pattern portion of the
        same category (CID or PRBS portion), using an
        appropriate modification function, such as, e.g., a
        truncation function, a complementing function, etc...
        Since claim 1 does not define any such modification
        function, the wording "modified version of ...portion"
        used in claim 1 encompasses an undefined number of
        pattern portions and therefore renders the claimed
        subject-matter unclear.

        Furthermore the feature that the test pattern has a
        higher diagnostic value than the baseline pattern lacks
        clarity. The wording "diagnostic value" is not defined
        in the description and appears to be dependent on the
        communication equipment being tested and on the
        properties of that equipment that are the subject of

the test. Therefore the comparison of the respective diagnostic values of the baseline and test patterns appears even more unclear. Even if the wording "diagnostic value" had a clear meaning in the context of the application, this feature would represent an aim to be achieved since, as mentioned above, claim 1 does not define any technical features of the modifications which are applied to the baseline pattern portions in order to achieve this result.

3.2   The appellant has argued that the wording "characterized by a higher diagnostic value" does not solely define a purpose or result to be achieved, since a test pattern characterized by a higher diagnostic value has inherent technical features which would be recognized by the person skilled in the art, for instance a higher frequency. In the board's view however, technical features of a digits or bits pattern are features related to the digits or bits arrangement of the pattern, for instance the number of digits or bits, the values of particular digits or bits or groups of digits or bits in the pattern, etc.... Properties which can result from the arrangement of digits or bits within the pattern when the pattern is used as a test pattern in communication equipment, such as the effect of a simulated rapidly varying (or high frequency) entry data on the equipment, are not inherent technical features of the pattern but rather the (potential) technical effect of the technical features of the pattern. In the present case, the only technical features of the test pattern defined in claim 1 are the presence in the test pattern of a CID portion having n digits and of a PRBS portion having q bits. The mere presence of these features in claim 1 does not enable

the skilled person to make any assumption about the value of the diagnostic achieved by using the test pattern in a piece of communication equipment.

The appellant has further argued that a modification function that encompasses an <u>undefined number of pattern portions</u> does not render the claimed subject-matter unclear. The board is not convinced by this argument either since claim 1 does not define any modification function per se but only defines the result achieved by the employed modification function, which is a higher diagnostic value of the test pattern. Therefore the wording of claim 1 also encompasses an <u>undefined number of modification functions</u>, which, when applied to the baseline pattern, could achieve a higher diagnostic value.

The board therefore judges that claim 1 does not meet the requirements of Article 84 EPC.

3.3   Independent claim 10 is related to an integrated circuit for communications applications with built-in test capability. The circuit comprises, inter alia, a pattern generator configured to perform the method of claim 1. For this reason, the board judges that claim 10 also lacks clarity (Article 84 EPC).

First auxiliary request

4.1   Article 84 EPC

The description mentions (see paragraphs [0016] and [0017]) that a higher frequency toggle rate may be achieved by either truncating the baseline PRBS portion

or by using a lower order polynomial function for the
test PRBS. The toggle rate of a bit pattern sequence is
usually defined in the technical field as a value which
measures how often the bit value changes with respect
to the bit clock. For a PRBS sequence, the board
considers that lowering the order of the generating
polynomial function reduces the toggle rate of the
pattern since the values given by the polynomial
function then change more slowly as a function of time.
Since claims 1 and 10 actually define the opposite, i.e.
that a higher frequency toggle rate of the pattern is
achieved by using a lower order polynomial generating
function of its PRBS portion, the board judges that
claims 1 and 10 lack clarity in that respect.

The appellant did not provide any argument in response
to the above-mentioned objection, which was raised by
the board in the communication annexed to the summons
to oral proceedings.

Furthermore, claims 1 and 10 define that the modified
test pattern may comprise higher frequency data, with
respect to the baseline pattern, by having "at least
one of said CID portion**s** be shorter than the baseline
CID portion". Since however the modified test pattern
is previously defined in claims 1 and 10 as having "a
test CID portion" only, the board judges that claims 1
and 10 lack clarity in that respect.

Thus, claims 1 and 10 do not meet the requirements of
Article 84 EPC.

4.2   Article 123(2) EPC

        Moreover, the description only discloses that the test
        CID portion may be shorter than the baseline CID
        portion, see column 4, lines 10 to 16. The description
        does not provide a basis for the amendment "at least
        one of said CID portions be shorter than the baseline
        CID portion".

        Thus, claims 1 and 10 do not meet the requirements of
        Article 123(2) EPC.

        Second auxiliary request

5.1   Article 84 EPC

        Claims 1 and 6 define that the modified test pattern
        may comprise higher frequency data, with respect to the
        baseline pattern, by having "at least one of said CID
        portion**s** be shorter than the baseline CID portion".
        Since however the modified test pattern is previously
        defined in claims 1 and 6 as having "a test CID
        portion" only, the board judges that claims 1 and 6
        lack clarity in that respect.

        Thus, claims 1 and 6 do not meet the requirements of
        Article 84 EPC.

5.2   For the reasons set out in points 4.2, claims 1 and 6
        do not meet the requirements of Article 123(2) EPC.

6.   There being no further requests, the appeal has to be
        dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz   A. Ritzka