ELECTRONIC COMPONENT TEST METHOD TAKING ACCOUNT OF THE DRIFT IN THE MEAN

An object of the present invention is a method for the testing of electronic components taking account of the drift in the mean. It can be used especially in the field of the testing of semiconductor electronic components, especially components such as integrated circuits. In the prior art, there is a known method for testing electronic components that reduces the unit testing time for each of the components. The value of the invention is that it proposes a test method that, firstly, reduces the unit testing time and, secondly, can be used to monitor drifts in responses of these tests, these drifts being caused, for example, by an as yet tolerable but possibly disturbing modification of the tested components.

A component to be tested is therefore subjected to a series of unit tests for the testing of each of its functions. A unit test of a function generally comprises the following elementary steps:

- at an initial date D_0, a terminal of the component, considered to be an input terminal with respect to the test, is subjected to an electrical potential V_e,
- there is a wait, during a time period, for the appearance and stabilization of a response at a second terminal of this component, this second terminal being considered to be an output terminal with respect to this test,
- at a nominal measurement date Dm_0 at the end of the time period (Dm_0 - D_0), this response is measured. In one example, this response is a value V_s of a potential of this output terminal.

Then, to ascertain that the component has given an acceptable or unacceptable response to this unit test,

- the measured response is compared with fixed acceptance criteria. Namely, in this example, the value of the potential Vs is compared with lower and upper acceptance limits. These limits are generally given in manufacturing specifications.

Since the electronic component has a known structure, the time period at the end of which it is possible to observe an expected response with respect to the test is determined theoretically. This theoretical time period

(Dm_{th} - D_0) is for example computed by the designer of the electronic component. Furthermore, in order to avoid having an excessively high failure rate for this test, a safety margin is taken into account by choosing the nominal measurement date Dm_0 used during tests. Indeed, the date Dm_0 is generally chosen to be greater than the theoretical measurement date Dm_{th} of this test.

Then, the nominal measurement date Dm_0 is used as a measurement date for all the components to be tested. This choice, which ensures a response in conformity with the test, has the consequence of considerably increasing the total execution time of a series of tests.

The document WO-A-97/45748 describes a known test method used to reduce the duration of each unit test of a series of tests. To this end, the test method comprises:

- a first "learning phase" carried out on a population of acceptable components. The nominal measurement date Dm_0 is used to perform tests on the first components of the batch. Only the components that have given an appropriate response are incorporated into the population of acceptable components of this batch, this population constituting the learning population. Then, as far as possible, a measurement date Dm_i earlier than the nominal measurement date Dm_0 is determined. The tests performed with this measurement date Dm_i must give a still acceptable response with respect to the acceptance limits,

- a second "application phase" during which all the other components of the batch are tested, by using the earliest measurement date Dm_i determined beforehand.

To determine the earliest measurement date Dm_i, the elementary steps of the test defined here above are reiterated on each of the components of the learning population, the measurement date applied being reduced at each iteration, either dichotomously or step by step. To choose the measurement date Dm_i among the intermediate measurement dates tested, $Dm_{i\text{-}TEST1}$, $Dm_{i\text{-}TEST2}$, the following are compared by means of a criterion:

- a statistical image of the responses obtained with at least one tested intermediate measurement date, for example $Dm_{i\text{-}TEST1}$, with

- a statistical image of the responses of this very same learning population, obtained at the nominal measurement date Dm_0.

A statistical image comprises all the responses, of the Vs type, obtained during the test and especially the computation, on the basis of these values, of the mean M and the standard deviation S, and of all the other statistical values as a function of this mean M and this standard deviation S.

For example, for each statistical image, a statistical value referenced CP is obtained. This value is equal to a ratio between a difference of acceptance limits and the standard deviation S of this statistical image. The difference between the acceptance limits is generally given by a manufacturer's tolerance.

Another statistical value can also be defined to characterise this statistical image. This other value referenced CPK is then equal to the ratio between an absolute value of a difference between the mean and an acceptance limit and the standard deviation S of this statistical image.

To compare the statistical images with one another, their respective statistical values CP or CPK are compared. The earliest possible measurement date Dm_i is chosen such that a statistical value CP_i obtained with the measurement date Dm_i remains within a certain proportion of the appreciation criterion CP_o, where CP_o is the statistical value characterising the statistical image obtained with the nominal measurement date Dm_0.

In a first example, if a wide range of responses is observed for a tested intermediate date $Dm_{i\text{-}TEST1}$ without any predominance of any value, it means that the behaviour of the electronic component under this test is not reliably reproducible on this date. According to the method of the invention, the standard deviation $S_{i\text{-}TEST1}$ of the statistical image is great and therefore the corresponding value $CP_{i\text{-}TEST1}$ will be low, and will certainly no longer be within the set criterion of proportion of CP_o. Then, this measurement date $Dm_{i\text{-}TEST1}$ will no longer be chosen as the earliest possible measurement date Dm_i and Dm_i will necessarily be greater than this tested date $Dm_{i\text{-}TEST}$.

The method of determining the earliest measurement date Dm_i may provide for another acceptance condition, for example a condition by which this date is necessarily greater than a theoretical minimum measurement date Dm_{min}.

The solution proposed in this document WO 97/45748 presents a problem because the learning phase preliminary to the execution of the application phase is excessively lengthy. Furthermore, the earliest possible measurement date determined during this learning phase may result in a greater discard rate for the electronic components tested because it may cause these components to be unjustifiably rejected from the good quality production. Indeed, since the learning phase is long, it cannot be carried out too frequently, and then an inappropriate measurement date may be used to test a part of the batch.

From the teaching of the document FR 99 09055, there is a known method also comprising a learning phase and an application phase.

However, this method provides that the learning phase used to define the earliest possible measurement date Dm_i is obtained by comparing:

- a statistical image between the responses of the learning population obtained with the nominal measurement Dm_0 and
- a cumulated statistical image, this image corresponding to the image of all the responses obtained on this same population with the tested intermediate measurement date, for example $Dm_{i\text{-}TEST1}$, and with the responses obtained on this population on the nominal measurement date Dm_0.

To compare the statistical images with each other, their respective statistical values CPK are compared in the same way. The earliest possible measurement date Dm_i is chosen such that the statistical value $CPK_{total:0+i\text{-}TEST1}$ remains within a certain proportion of the criterion of appreciation Cpk_0 where Cpk_0 is the statistical value characterising the statistical image obtained with the nominal measurement date Dm_0.

Furthermore, this method provides that the application phase will be independent of the learning phase which is performed on a learning population independent of the components of the batch to be tested during the application phase. Thus, the learning phase is achieved independently and only a short adjusting phase is carried out when starting a series of tests to be performed on a batch of components. During this adjusting phase, the earliest measurement date Dm_i is validated and possibly adjusted.

These adjusting phases are regular. For example they occur at a certain frequency depending on the given number of the tested parts of the

batch. They ensure that the measurement date is always optimised with respect to the duration of the test and optimised with respect to the profitability of this tested output in taking account of the natural variability of the characteristics of production.

During this adjusting phase, a population of good quality components is considered. And just as in the learning phase, the earliest measurement date Dm_i is verified and possibly modified by comparing:

- a statistical image of the responses of the population of good quality components obtained with the nominal measurement date Dm_0 with
- a cumulated statistical image, this image corresponding to the image of all the responses obtained on this same population with the measurement date Dm_i as well as the responses obtained on this population at the nominal measurement date Dm_0 , or with a modified measurement Dm_{modif} as well as the responses obtained on this population at the nominal measurement date Dm_0.

As the case may be, it is chosen to apply a modified measurement date Dm_{modif}, Dm_{modif} being greater than or equal to the measurement date Dm_i if the comparison between (a) the cumulated statistical image, comprising *inter alia* the responses obtained on the measurement date Dm_i and (b) the statistical image of this same population obtained with a nominal measurement date Dm_0 is not acceptable with respect to a criterion of appreciation.

This approach too raises a problem. Indeed, even if the method comprises an adjusting phase to take account of the intrinsic variability of the production of components, this method tolerates the presence of drift within this production and does not note this drift. According to this test method, the variability of the responses and their drift, if any, are not considered because the statistical images representing these data are compared by means of a statistical value: CPK. Now this statistical value CPK is computed by incorporating lower and upper acceptance limits, and these limits are determined as a function not of the method of manufacture of the components but of tolerable limits with respect to the quality of the manufactured components, namely the specifications of these components.

This method therefore results in the determining of statistical values CPK in the range of a thousand when they are values of response of a

statistical image obtained for a measurement date close to the nominal measurement date Dm_0. However, since the criterion of appreciation of this statistical value is a comparison with a criterion of acceptance in the range of 3, the mode of determining the earliest possible measurement date Dm_i leads to the choice of a measurement date Dm_i very close to the minimum measurement date Dm_{min}. Consequently, the test, with this method, will accept components that have given a response very close to one of the acceptance limits. This however, can be a sign of a drift in the manufacture of these components to be detected.

And even if the adjusting phase corrects the choice of an excessively early measurement date Dm_i, the adjusting phase then becomes almost as long as the learning phase, and this too is a drawback. Indeed, this test method makes it necessary to almost routinely increase this measurement date Dm_i during the adjusting phase because the date defined during the learning phase is unsuited to the output to be tested.

It is an object of the invention to overcome this problem by making a faster detection of the signs of drift in the manufacture of the components. The invention makes it possible especially to limit the search for the earliest measurement date Dm_i to the determining of a measurement date for which the drift of the mean is controlled. Hence, the earliest possible measurement date Dm_i determined according to the method of the invention ensures that reliable responses are obtained to the test. However, the earliest measurement date Dm_i determined according to this method may be later than the one which would have been obtained by using another test method also seeking to reduce the total duration of the testing time.

Indeed, an object of the invention is a method for the testing of electronic components that considers the statistical images of the population of components by representing them by statistical values which, first of all, do not take account of these acceptance limits. Furthermore, the method according to the invention compares the statistical images with one another, in considering statistical values that have at least one independent criterion of acceptance of the acceptance limits. The comparison thus made is far more strict and tolerates less variability of the responses to the test. The earliest measurement date defined according to this method guarantees

greater reliability and reduces the need for this date to be corrected far too frequently.

An object of the invention is a method for testing electronic components, wherein

- a terminal of a component is subjected to an electrical potential at an initial date,
- a response set up at a terminal of this component is measured on a measurement date,
- this response is compared with acceptance limits, for the acceptance or rejection of the component as a function of this comparison,
- the measurement date is defined by means of a criterion applied to compare an intermediate statistical image representing at least responses obtained at a tested intermediate measurement date with a nominal statistical image representing responses obtained at a nominal measurement date, the responses being obtained from a population of good quality components,
- the measurement date chosen is the earliest possible intermediate measurement date tested,

wherein:

- the criterion applied to compare the statistical images with one another comprises an assessment of an amplitude of the responses obtained for each of the statistical images.

The invention will be understood more clearly from the following description and the appended figures. These figures are given purely by way of an indication and in no way restrict the scope of the invention. Of these figures:

- Figure 1 shows a population of components to be tested according to the method of the invention;
- Figure 2 shows the distribution of the responses of the population of good quality components obtained with a test method according to the invention at different measurement dates;
- Figure 3 shows a table of parameters;
- Figure 4 is a timing diagram representing the temporal organisation of the learning phase, the adjusting phases and the application phases according to the invention.

Figure 1 shows a wafer 1 bearing electronic components 2. This wafer has a circular shape or else a parallelepiped or linear strip shape. The electronic components 2 of this wafer 1 are for example integrated circuit chips. An electronic component has at least one function 3 to be tested.

To test the function 3 of the electronic component 2, a test apparatus is used. This test apparatus has a first set of electrodes that apply the potential V_e to an input terminal 4 and a second set of electrodes that pick up an output potential V_s at the output terminal 5. An interface of the test apparatus manages the transmission of electrical signals and the measurement of picked-up signals. The interface is configured by testing means of the testing apparatus. The configuration of the interface processes the signals sent and received by these testing means.

The terminals 4 and 5 are conductive terminals of the component 2. The output terminal 5 may possibly be the same as the input terminal 4 on this component.

A response to this test generally consists of a measured electrical variable, for example the value of the output potential V_s. And the interface, in the light of this response, can be used to decide if a component is good or bad with respect to the test performed. The interface especially provides for the comparison of this response V_s with acceptance limits set by the manufacturer of these components.

To perform the test, the response V_s is measured at a measurement date Dm, this measurement date being necessarily later than an initial date D_0 at which the potential V_e has been sent to the input terminals 4.

To improve the period between Dm and D_0, namely generally by reducing it, the operation starts with the determining of the population of good-quality components P1 on the wafer 1. For this purpose, electronic components 2 are tested using a measurement date equal to a nominal measurement date Dm_0. This measurement date Dm_0 has preferably been determined theoretically in taking account of an additional safety margin. Generally, this measurement date corresponds to the measurement date used by a standard test method that is not optimised. Thus, acceptable components 6 and unacceptable components 7 are identified on the wafer 1. In a preferred example, the population of good-quality components P1

contains only one acceptable component 6. However, it may have several components such as 6.

Then, a statistical image IS of this population P1 is determined. The statistical image IS has a set of N responses obtained from the population P1 in reiterating the same test with the same measurement date. Then, a statistical image IS corresponding to a given measurement date is defined.

Figure 2 shows the nominal statistical image IS_0 comprising a set of responses V_{s0} of the population P1 obtained following N_0 test iterations performed with the nominal measurement date Dm_0. A distribution of these responses is generally a Gaussian distribution. The image IS_0 can be characterised by the value of a mean M_0 and and/or an amplitude R_0.

The mean M_0 corresponds to the mean of all the responses V_{s0} observed for the iterations performed with the same nominal measurement date Dm_0.

$$M_0 = \text{sum}\,(V_{s0})/N_0$$

And the amplitude R_0 corresponds to the difference between the greatest response value $V_{s0\text{-}max}$ observed and the smallest response value $V_{s0\text{-}min}$ observed during these same iterations.

$$R_0 = V_{s0\text{-}max} - V_{s0\text{-}min}$$

Then, to test earlier measurement dates, the same test is reiterated on the same population P1 with different measurement dates. For example, this test is reiterated a number $N_{i\text{-}TEST}$ times with a tested intermediate measurement date $Dm_{i\text{-}TEST}$. Then, a statistical image $IS_{i\text{-}TEST}$ is obtained, $IS_{i\text{-}TEST}$ being characterised possibly by a mean $M_{i\text{-}TEST}$ and an amplitude $R_{i\text{-}TEST}$.

In this case, the mean $M_{i\text{-}TEST}$ is defined as being the mean of all the responses V_{si} observed for the iterations made with the same measurement date $Dm_{i\text{-}TEST}$.

$$M_{i\text{-}TEST} = \text{sum}\,(V_{si})/N_{i\text{-}TEST}$$

And the amplitude $R_{i\text{-}TEST}$ corresponds to the difference between the greatest response value $V_{si\text{-}max}$ observed and the smallest response value $V_{si\text{-}min}$ observed during the same iterations

$$R_{i\text{-}TEST} = V_{si\text{-}max} - V_{si\text{-}min}$$

Then, to determine whether the intermediate measurement date tested $Dm_{i\text{-}TEST}$ can be accepted as the earliest measurement date to be used during an application phase of the method according to the invention, the

statistical images IS_0 and $IS_{i\text{-}TEST}$ are compared with one another by means of a criterion.

For example, this measurement date $Dm_{i\text{-}TEST}$ is accepted if the mean $M_{i\text{-}TEST}$ is also included in an acceptance interval. In a preferred example of the invention, if the mean $M_{i\text{-}TEST}$ meets the following condition:

$$| M_{i\text{-}TEST} - M_0 | < D - z * S_0 * \sqrt{(1/ N_{i\text{-}TEST} + 1/ N_0)}$$

where the mathematical term between vertical slashes corresponds to an absolute value.

S_0 is the standard deviation of the responses V_{s0} obtained after N_0 iterations and is preferably defined by the following formula:

$S_0^2 = 1/(N_0 - 1) * [\text{sum } (i= 1 \text{ to } N_0) \text{ of the } (M_0 - V^i_{s0})^2]$.

Furthermore, D corresponds to a tolerated deviation between the two means $M_{i\text{-}TEST}$ and M_0. D is generally set by an engineer in charge of adjusting the test instrument as a function of the specifications of the tested component.

The parameter z corresponds to a constant that is chosen from the statistical tables as a function of a level of risk chosen with respect to the tests performed. The risk level is defined with respect to a first risk α corresponding to what is called a "false alarm" risk and a second risk β corresponding to what is called a "missed signal" risk. The risk α corresponds to a probability of rejecting a component at the end of the test although the component is good. The risk β corresponds to a probability of accepting a component at the end of the test although it is a bad one. The parameter z is chosen so that the risk β is minimal, for example equal to 0,05. In this case, the parameter z is equal to 1.645.

In a first variant of the test of the mean, parameters of the table shown in Figure 3 are used to determine a lower acceptance boundary BM_{inf} and an upper acceptance boundary BM_{sup} of this interval of acceptance of the mean. For example, the parameters A2 proposed in the column 10 are used to compute these boundaries. This interval is defined as a function of the nominal mean M_0 and the nominal amplitude R_0.

$BM_{inf} = M_0 - A2^* R_0$,

$BM_{sup} = M_0 + A2^* R_0$,

In a second variant of the test of the mean, especially when the nominal amplitude is very low, this interval may be defined differently. In

particular, this interval may be determined as a function of the lower limit Linf and the upper limit Lsup determined to assess the responses V_s. Then, the lower and upper acceptance boundaries may be defined as follows:

$BM_{inf} = M_0 - A2 * f1 * (Lsup - Linf)$,

$BM_{sup} = M_0 + A2 * f1 * (Lsup - Linf)$,

where f1 corresponds to a real value for example between 0 and 1.

In a third variant of the test of the mean, especially when the responses V_s have to fulfill only one condition, with respect to a single limit L, the interval may be defined as follows:

$BM_{inf} = M_0 - A2 * f1 * | L - M_0 |$,

$BM_{sup} = M_0 + A2 * f1 * | L - M_0 |$,

The parameters A2 used in the above formulae are chosen as a function of the number of iterations N_{TEST} performed to determine $M_{i\text{-}TEST}$. Indeed the greater the value of N_{TEST}, the more reliable will be the mean determined and the more is it likely therefore to be located in a very narrow interval around the nominal mean M_0.

Furthermore, it may be decided to accept this measurement date $Dm_{i\text{-}TEST}$ if a second condition is fulfilled with respect to the amplitude $R_{i\text{-}TEST}$. In a preferred example, $Dm_{i\text{-}TEST}$ is chosen if, for one and the same intermediate date tested, accepted with respect to the test on the mean $M_{i\text{-}TEST}$, the corresponding amplitude $R_{i\text{-}TEST}$ meets the following condition:

the absolute value of the difference between $R_{i\text{-}TEST}$ and R_0 is lower than a threshold fixed by the engineer in charge of adjusting the instrument as a function of the specifications of the tested component.

In one variant of this test on amplitude, it is possible to use parameters of the table shown in Figure 3 to determine a lower acceptance boundary BR_{inf} and an upper acceptance boundary BR_{sup} of this acceptance interval. For example, the parameters proposed in the columns 8 and 9 are used to compute these boundaries. This interval is then defined as a function of the nominal amplitude R_0.

$BR_{inf} = D3 * R_0$ where D3 is a parameter of the column 8.

$BR_{sup} = D4 * R_0$ where D4 is a parameter of the column 9.

In a second variant of this test on amplitude, this interval is defined as a function of lower Linf and upper Lsup limits determined, generally by the designer of the test, to assess the responses V_s. This variant avoids the need

for determining an excessively narrow acceptance interval solely because the nominal amplitude R_0 is very small as may be the case when applying the method laid down by the first variable while the real acceptance interval is far wider. Then, the lower and upper acceptance boundaries may be defined as follows:

$$BR_{inf} = D3 * f1 * (Lsup - Linf),$$

$$BR_{sup} = D4 * f1 * (Lsup - Linf),$$

where f1 corresponds to a real value, for example between 0 and 1. In this second variant, the acceptance interval is a function of a percentage of the real acceptance interval.

In a third variant of the test on amplitude, the interval may be defined as a function of the limits Linf and Lsup and the mean M_0 especially when the responses V_s fulfill only one condition with respect only one limit L. Then, the lower and upper acceptance boundaries may be defined as follows:

$$BR_{inf} = D3 * f1 * | L - M_0 |,$$

$$BR_{sup} = D4 * f1 * | L - M_0 |,$$

where the elements defined between two vertical slashes correspond to an absolute value of these elements.

The parameters D3 and D4 used in each of the above formulae are chosen as a function of the number of iterations N_{TEST} performed to determine $R_{i\text{-}TEST}$. Indeed, the greater is N_{TEST}, the closer will the upper boundary BR_{sup} of the appreciation interval of the amplitude be to the nominal amplitude R_0. At the same time, the greater is N_{TEST}, the greater will be the possible distance of the lower boundary BR_{inf} from the nominal amplitude R_0. Indeed, it is probable that since the date tested is a measurement date prior to the nominal measurement date, the distribution of the responses V_s thus obtained will be less precise.

If an intermediate measurement date $Dm_{i\text{-}TEST}$ is chosen following this comparison, generally a second earlier intermediate measurement date is tested in the same way. And then, the earliest possible measurement date is chosen for application during the application phase. However, if this intermediate measurement date is not validated following this comparison, another intermediate measurement date is tested. This other intermediate measurement date must be as early as possible and even prior to the nominal measurement date. Generally, intermediate measurement dates are

tested according to a step-by-step method in order to choose a measurement date that is the last date to have been validated before the testing of a date that is validated.

According to a special mode of use of this test method, the earliest possible measurement date is determined during a first phase 11 (Figure 4) known as the learning phase. Then, this determined measurement date is applied continuously during the application phase 12.

In one variant, it is possible to regularly provide for adjusting phases 13 during the application phase 12 to validate the measurement date determined during the learning phase and possibly to determine an adjusted measurement date Dma.

To validate the intermediate measurement date during an adjusting phase, a population P2 of components is considered. These components are correct when they are tested with the nominal measurement date D_0. The components of the population P2 preferably come from a batch tested during the application phase. And then, statistical images obtained from iterations of the same test on this population P2 are compared.

Generally, the step of determining an adjusted measurement date Dma is performed only if the earliest intermediate measurement date has not been validated. This adjusted measurement date Dma is then later than the earliest measurement date determined during the learning phase.

To be chosen, an adjusted measurement date Dma must meet the same conditions of comparison as those set forth here above for determining the earliest intermediate measurement date. The consideration of the mean and the amplitude of the results of the population P2 used for the adjusting is assessed in the same way.

In a first preferred example, during the learning phase, the nominal statistical image IS_0 is determined in considering ten values obtained following iterations of the same test with the nominal measurement date D_0. Preferably, these ten values are obtained by ten iterations of the same test on the single component constituting the population P1. During this same phase, the earliest possible intermediate measurement date is determined in considering five values obtained by iterations of the test with this measurement date. Preferably, these five values are obtained by five iterations of the test on the single component of the population P1.

In a second preferred example, during the adjusting phases, the nominal statistical image of the population P2 is determined in considering three values obtained with this nominal measurement date D_0, these three values being preferably obtained following three iterations of the same test on one and the same component of P2. The earliest measurement date determined during the learning phase is validated, or a measurement date Dma is determined, in considering statistical images obtained for each of these dates from two values. The two values are preferably obtained from two iterations of the same test on the same component of the population P2.

The test method of the invention is applied especially to optimise the testing time of all tests for which a drift of the mean is not tolerable.

In another variant, it can be planned that the optimising of the testing time will be done in considering a statistical image comprising both the responses V_s and data determined as a function of these responses V_s. These data may take account of a tolerated drift of the values V_s.

CLAIMS

1. A method for testing electronic components, wherein

- a terminal (4) of a component (2) is subjected to an electrical potential (V_e) at an initial date,

- a response (V_S) set up at a terminal of this component is measured on a measurement date (Dm),

- this response is compared with acceptance limits (Linf, Lsup), for the acceptance or rejection of the component as a function of this comparison,

- the measurement date is defined by means of a criterion applied to compare an intermediate statistical image ($IS_{i\text{-}TEST}$) representing at least responses obtained at a tested intermediate measurement date ($Dm_{i\text{-}TEST}$) with a nominal statistical image (IS_0) representing responses obtained at a nominal measurement date (Dm_0), the responses being obtained from a population (P1) of good quality components,

- the measurement date chosen is the earliest possible intermediate measurement date tested,

wherein:

- the criterion applied to compare the statistical images with one another comprises an assessment of an amplitude (R_0 , $R_{i\text{-}TEST}$) of the responses obtained for each of the statistical images.

2. Method according to claim 1, wherein

- there is determined an interval of acceptance (BR_{inf}, BR_{sup}) of the amplitude ($R_{i\text{-}TEST}$) corresponding to a measurement date tested as a function of a nominal amplitude (R_0), and/or as a function of a tolerated amplitude.

3. Method according to one of the claims 1 to 2, wherein

- the criterion applied to compare the statistical images with one another comprises an assessment (M_0, $M_{i\text{-}TEST}$) of the responses obtained for each of the statistical images.

4. Method according to claim 3, wherein

- there is determined an interval of acceptance (BM_{inf}, BM_{sup}) of the mean ($M_{i\text{-}TEST}$) corresponding to the tested measurement date as a function of the nominal mean (M_0).

5. Method according to one of the claims 3 to 4, wherein:

- there is determined the interval of acceptance of the mean corresponding to the tested measurement date as a function of a nominal

standard deviation (S_0) of the responses obtained on the nominal measurement date and as a function of a statistical probability (α, β).

6. Method according to one of the claims 3 to 5, wherein

- the interval of acceptance of the mean corresponding to the tested measurement date is determined as a function of the nominal amplitude and/or as a function of the tolerated amplitude.

- the intervals of acceptance are determined as a function of parameters coming from a table these parameters taking account of the numbers of values of the statistical images.

7. Method according to one of the claims 1 to 6 wherein

- a population of good components comprising a single component is considered.

8. Method according to one of the claims 1 to 7 wherein

- the date of measurement is determined during a learning phase (11) before an application phase (12).

9. Method according to claim 1, 8 wherein

- iterations of the test are carried out on the population of good components with the nominal measurement date, for example to obtain ten values,

- iterations of the test are performed on this same population with an intermediate measurement date, for example to obtain five values.

10. Method according to one of the claims 1 to 9 wherein

- the measurement date is modified during an application phase, in the course of an adjusting phase.

- iterations of the test are performed on a population of good quality components coming from the application phase with the nominal measurement date, for example to obtain three values,

- iterations of the test are performed on the same population with an intermediate measurement date, for example to obtain two values.