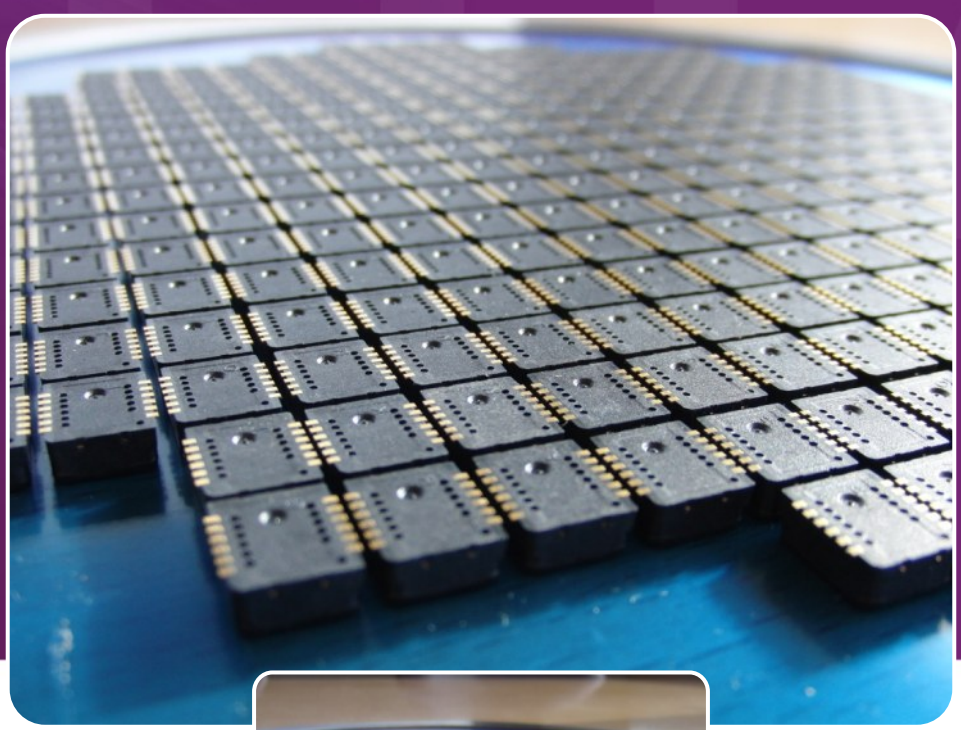
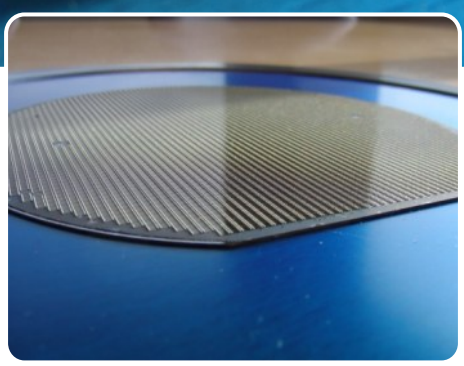
TOTA

TEST ON TAPE





AFORE

Meant for MEMS

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WHAT IS TOTA?

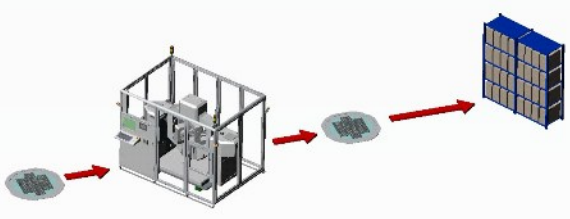
Afore has developed a new test method called TOTA (Test On Tape). TOTA makes it possible to use same test equipments for WLP (Wafer Level Package) and singulated components. TOTA method is the first and only method that has 0% jam rate.

In Afore's intelligent wafer level handlers the MEMS sensors on the tape are affected by real stimulus like pressure, yaw rate or acceleration. This enables calibration and final testing of the sensors without picking them from the tape.

TOTA with WLP?

WLP is a technique which will, in the near future, change the MEMS sensor market tremendously. Especially in the field of consumer electronics WLP –products will substitute a lot of the traditionally packaged sensors.

By using Wafer Level Test Handler (WLTH) the process flow is extremely short and therefore it has minimal handling risks and it is very cost effective. The tape frame used in dicing process can be transferred directly to WLTH for testing. After testing, the same frame can be delivered to end customer with wafer map. Alternatively the good components can be picked from tape and placed to a reel tape.

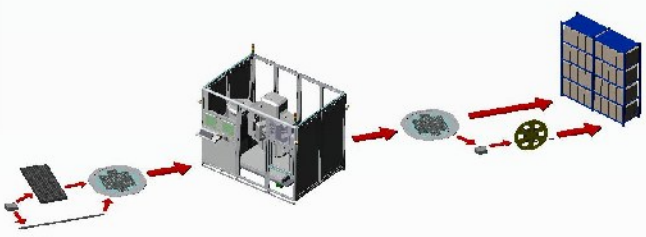


The risk to have yield loss due to handling is minimal. Since there are no extra pick and place processes or positioning to sockets we can promise a zero jam rate.

TOTA WITH CONVENTIONAL PACKAGES?

Meanwhile waiting for new package types from R&D, sensor manufacturers are able to use TOTA equipments for conventional singulated packages. As long as the component top is flat it can be easily placed on the tape to a desired pattern and tested with TOTA equipment.

The process flow has more steps but still less than any other testing method on the market. Also the flexibility of TOTA helps sensor manufacturers to adopt it without making big changes to their currents processes.



The chart above shows that the singulated components can come in trays or tubes. With a pick and place machine they are placed on a tape to desired testing pattern. After that, the flow is similar to WLP. Again the tape frame with wafer map can be the final delivery form or the sensors can be picked from the tape and placed on a reel tape.

Why TOTA?

The use of TOTA gives several benefits:

1) Zero jam rate!
2) TOTA enables high parallelism in testing without complex and expensive carriers or test socket boards.
3) The positioning differences between tests are eliminated which is leading to high repeatability and stimulus accuracy.
4) Product change for the TOTA handlers is easy and fast compared to conventional handlers. The tape frame type can remain the same when the product type or package changes. There are no product specific mechanical changes needed (example: track pars).
5) There is no need for handling a single component (for example pick and place) so yield loss is history no matter how many test cycles are needed.
6) All of above together extreme low cost per test! TOTA is the most economical way to test MEMS sensors with real stimulus.

TOTA with Afore!

Afore is a pioneer in wafer level testing. The first pressure sensor prober was delivered over a 10 years ago and now Afore is among the first who can deliver a wafer level testing handler for motion sensors with real stimulus.

Kronos (left) is our TOTA handler for accelerometer and yaw rate sensors with infinite turn range.

Aiolos (right) is for pressure sensors. Please find more information from our website www.afore.fi.

AFORE - Meant for MEMS

Our "Meant for MEMS" philosophy is to develop our handlers specifically suitable for MEMS testing. This concerns not only the required accuracy of the handler, but also the understanding of the behaviour of the sensor to be tested. This philosophy results certain principles we follow in every handler

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