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PCN 35-2012

(Copper-Wire Bonding for QFN packages for AS3606x-BQFT / AS3607x-BQFT)

Dear Customer,

We are happy to announce that ams AG is going to introduce Copper Wire Bonding.

The **AS3606x-BQFT** and **AS3607x-BQFT**, which are currently available in QFN package using Au wire bonding, are now qualified for Cu-wire bonding too.

Advantages

Copper wire bonding is rapidly gaining popularity in semiconductor packaging due to its economic advantage and superior electrical performance.

- 1) **Economic advantage:** ams AG is fully committed to continuous improvement as well as to the agreed cost reduction program to be able to support the customer's price reduction roadmap.
- 2) **Superior electrical conductivity:** The electrical resistivity of Cu is by about 25%-30% less than of Au, resulting in a better electrical performance especially for high-current or high-power applications.
- 3) **Superior thermal conductivity:** Copper wires dissipate heat within the package faster and more efficiently than gold wire, which minimizes the thermal stress to which they are exposed.



- 4) **Less intermetallic growths:** Another advantage of Cu-wire is the lower tendency to diffuse into the Al-pad and form intermetallic compounds with aluminium.
- 5) **Greater reliability of the bond at elevated temperatures:** Because of copper's lower tendency to form intermetallic compounds than gold, copper bonds are deemed to offer a higher reliability at elevated temperatures.
- 6) **Higher mechanical stability:** Standard bond strength tests such as the wire pull test and the ball shear test have demonstrated that copper ball bonds can achieve greater mechanical stability than gold wire. The results are up to 25%-30% higher than with comparable gold ball bonds.

Qualification

Qualification is finished with positive results. You will find the Qualification report attached to this PCN.

Set of qualification tests:

ams AG has qualified Cu-wire based on the following tests:

- Temperature Cycling Test
- Biased HAST
- High Temperature Storage

BOM:

BOM was carefully selected and is based on ASE standards. Only state of the art material sets are used.

The only change in the BOM is:

- WIRE TYPE changes from Au wire to Cu wire (Pd coated)

All other materials are the same as for the QFN package with Au wire.

Timing of change:

- C-samples are available on request.
- First production deliveries are anticipated for Q1/ 2013.



The following products will be affected:

AS3606x-BQFT- / QFN 5x5mm

AS3607x-BQFT- / QFN 5x5mm

Qualified sources:

For QFN

- ASE-Advanced Semiconductor Eng. Paju Korea

ASE is qualified manufacturing partner of ams AG for years and has already several years of production experience with Cu-wire bonding. ASE is certified in accordance with the ISO9001:2000 and the automotive quality system requirements, TS16949.

This change covers the assembly process of the product only. Final Electrical Testing and the rest of the backend processes are unchanged and will still be at ams AG.

Impact on Product:

No impact on product is anticipated, as complete reliability testing at ASE as well as ams AG have been performed. There are no changes in terms of form, fit, function and reliability of the device.

Please be advised that unless we receive your written refusal concerning this PCN within 30 days, the PCN shall be deemed accepted.

Kind regards,

A handwritten signature in blue ink, appearing to read 'Helmut Pessl'.

Helmut Pessl

ams AG

Director Operations

Business Unit Power and Wireless