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**ASE news**

## **ASE Embarks on Volume Production of Image Sensor Packages**

*Improved packaging technology enhances image quality, package reliability and form factor*

**Santa Clara, California, December 11, 2002** - Advanced Semiconductor Engineering Incorporated (ASE) (TAIEX: 2311, NYSE: ASX), one of the world's largest semiconductor packaging and testing companies, announced today that it is ready for volume production of its image sensor packages; the Ceramic Leadless Chip Carrier (CLCC) and Organic Leadless Chip Carrier (OLCC). Image sensors are semiconductor devices that allow the storage, processing and display of images. Image sensors are popularly found in most types of imaging products - digital cameras, computer cameras, videoconferencing equipment, mobile phones, closed circuit TVs, biometric sensors, scanners and many others.

ASE's CLCC and OLCC offer customers different benefits in terms of applications and cost. The CLCC package technology, which consists of 3 layers of ceramic substrate with a glass lid, is suitably applied in high-end image sensors that require large IC package size and for applications of 1.3M pixels or above. OLCC, on the other hand, utilizes organic BT substrate. OLCC is a lower cost alternative to CLCC owing to the higher flexibility in substrate design and the availability of a wider selection of substrate types. Its smaller pin design also enables more compact packaged end-products. OLCC packaging is fast becoming a mainstream image sensor package application and is an ideal package for the lower end consumer products such as mobile phones, toy cameras, video phones, scanners etc. where cost and functionality are major concerns. Both the CLCC and OLCC packaging technologies feature flat substrate design and horizontal pins to increase the accuracy of each chip's thickness and make optical adjustment easier. The better thermal functionality ensures attaining a higher level of stability within vast temperature ranges.

Image sensor ICs are high-end optic-electronics products, which are much more demanding in terms of the packaging and assembly environment control. To meet these challenges, ASE offers a world class team of experienced engineers and the latest image sensor process equipment and toolings. In addition, ASE adds more value to its customers with its capability to offer complete turnkey solutions including front-end testing, wafer probing, substrate design and supply, packaging and final test.

"According to InStat/MDR forecasts, the worldwide image sensor market is growing nearly 25 percent annually from 2001 to 2005. ASE recognizes this growth and is experiencing demands from customers to provide them with complete packaging and testing solutions," said J.J. Lee,

Vice President of Research and Development, ASE Group. "In image sensor packaging technology, substrate is a key component and ASE customers can be assured of ample supply as we have our in-house substrate design and manufacturing capability through ASE Material Inc. We also align with several top-tier substrate vendors to ensure immediate access to their supply," added J.J.

ASE's CLCC and OLCC package reliability data is now available. Customers can contact their local ASE sales office for more information.

**About Advanced Semiconductor Engineering Group (ASE Group)**

The ASE Group is one of the world's largest providers of semiconductor manufacturing services. As a global leader geared towards meeting the industry's ever growing needs for faster, smaller and higher performing chips, the Group develops and offers a wide portfolio of technology and solutions including IC test program design, front-end engineering test, wafer probe, wafer bump, substrate design and supply, wafer level package, flip chip, system-in-package, final test and electronic manufacturing services through Universal Scientific Industrial Co Ltd, a member of the ASE Group. The Group generated revenues of \$2.17 billion in 2001 and employs 23,000 people worldwide. For more information about the ASE Group, visit <http://www.aseglobal.com>

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