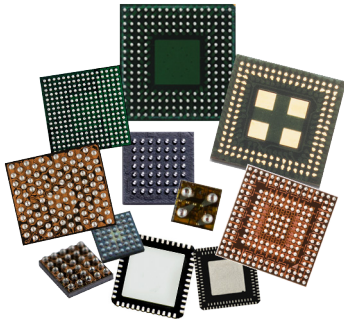


MEMS and Sensors

Micro-Electro-Mechanical Systems and Sensors



Wide range of MEMS and sensors packaging solutions

FEATURES

- Very small size
- Very low power consumption
- Low cost
- Easy to integrate into systems

APPLICATIONS

- Voice / sound (Silicon microphones)
- Motion / positioning sensors (Accelerometers, Gyroscopes, Magnetometers and Inertial Combos)
- Pressure monitoring (Pressure sensors)
- Optical / image (Proximity sensors, HRMs, light sensors, etc.)
- Fingerprint sensors
- Bio sensors (Wearables)
- RF-related functions (Oscillators, Resonators, Switches and Tuners)
- Automotive (ADAS: Advanced Driver Assistance Systems, LiDAR: Light Detection and Ranging)



DESCRIPTION

Sensor

A sensor is a device or system that detects/measures a physical property and then records, reports and/or responds to the stimulation. Sensors are typically assembled in a module that responds based on the stimulation or feed to the sensor. There are many different types of sensors and applications such as:

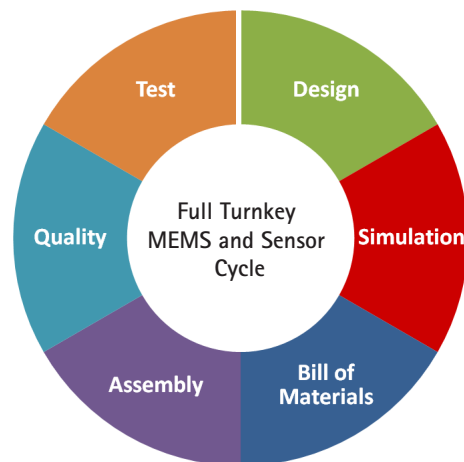
- Pressure sensor
- Inertial sensor
- Microphone
- Proximity sensor
- Fingerprint sensor
- Environmental sensor

MEMS

Micro-Electro-Mechanical-Systems (MEMS) are specialized sensors that combine mechanical and electrical components in a discrete format or a module. MEMS are typically multi-die solutions such as a sensing die paired with an application-specific integrated circuit (ASIC). A MEMS can consist of mechanical elements, sensors, actuators, and electrical and electronics devices on a common silicon substrate. Some of the advantages of using a MEMS based sensor in consumer, automotive and mobile applications are smaller size, low power consumption, lower cost, etc.

TURNKEY MEMS AND SENSOR CYCLE

Our dedicated MEMS team can provide a comprehensive turnkey solution to support your production ramp, including package co-design, simulation, Bill of Material (BOM) qualification, assembly, quality assurance and in-house test solutions.



ASSEMBLY PROCESS HIGHLIGHTS

- Class 1k or better assembly line
- Back-end and front-end process on the same manufacturing floor
- 2D barcode
- AOI thru assembly process
- Die traceability through assembly process
- Strip detect map for final test

Die Handling	Package Singulation	Molding Methods	Die Singulation
Small die (<1mm ²) Sensitive features Thin <100um MEMS with released membrane	Tape Saw (UV Tape) Jig Saw Glass Wafer Saw	Transfer Mold Compression Mold Film Assisted Mold Et Cavity Mold	Stealth Dicing Blade Saw


TECHNOLOGY BLOCKS

Wirebond



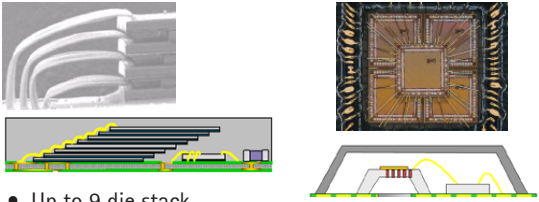
- Au, Ag, and Cu wire
- 0.5mil (Au), 0.6mil (Cu), and 0.7mil (Ag)

Substrate



- Up to 6L strip and 14L singulated
- 1L/2L/3L/4L for wirebond LGA & BGA package
- High density strip
- Embedded passive in high volume manufacturing (Eaps and Embedded Capacitive Material)

Die Stacking / Bonding



- Up to 9 die stack
- Die to die bonding

Various BOMs

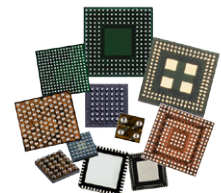
- Stainless steel, brass with Ni plating metal lids
- Pre-molded lids (usually Liquid Crystal Polymere)
- Plastic and clear mold
- Curing gel fill
- Die attach films (DAFs)
- Variety of conductive/nonconductive epoxy attach (including silicon based)
- Lid solder attach

TEST SERVICES

- Turnkey test solution: test, System Level Test, laser marking, LIS, packing, and drop shipment
- Engineering support and services to improve test performance during high volume production
- Test production capabilities with multiple sites (4x, 8x, 12x, and 16x)
- Experienced in thin core substrates (300 um), higher ball counts
- Supports sound test production with higher quality by experienced test engineering, stable manufacturing resources, automation and advanced tools
- Supports various inspection (LIS) requirements with advanced equipment

PACKAGE TYPES

- eWLB – Single die, multi die, stacked PoP configurations
- WLCSP – Very small single die
- fcFBGA – Single or multi die flip chip configurations
- FBGA – Single die, multi die configurations
- LGA – Single die or multi die configurations
- QFN – Single die or multi die configurations



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