

# Silicon Foundry Services

## From customer specification to ASIC product delivery

MHS offers dedicated assistance and services that cater to your needs at the different stages of your product development. In addition to MHS in-house capabilities, we have developed a network of preferred

qualified partners for ASIC conception and evaluation as well as test and assembly. MHS also offers to handle the complete project management as well as the complete supply chain management.

## Design and Prototyping

- Customer assistance for process technology choice with regards to the product specification and application
- Design kit shipment including all the necessary tools and documentation for a mixed-signal circuit design (PDK, libraries...)
- **ASIC design and layout (\*)**
- IP blocks customization. Customer design assistance
- Design and Layout reviews, including specific ESD rules check and FMEA
- GDSII data preparation, data completion and **mask fabrication (\*)**
- Multi Project Wafer Run or Multi Layer Mask set service (up to 4 layers per reticle)
- Prototype wafer lot manufacturing including corner lot experiments and rush flow upon request
- Prototype wafer test and **assembly (\*)**
- **Test development (\*)**
- Corner lot analysis and review
- **ASIC product validation and qualification (Failure analysis) (\*)**

## Volume Production

- Customer services: Forecast and Purchase Order processing, order and delivery acknowledgement
- WIP tracking through our FOCUS Extranet
- PCM Electrical test files delivery
- Wafer delivery, tested wafer delivery, or **finished goods delivery (\*)**
- Production Yield Ramp-Up management

## Low-cost prototyping solutions

### MULTI PROJECT WAFER (MPW) RUNS

MHS's Multi Project Wafer service is offered to our silicon foundry customers in order to minimize the prototyping costs (Mask-set and Wafer Processing).

This service consists in assembling different IC databases, delivered

by different customers, on a common mask-set. This mask-set is then used to process a Silicon lot using the chosen technology. After electrical test (Process Control Monitor), wafers are sawn and finally, bare dice (packed into waffle trays)

are delivered to the customer. Dice from this MPW service are not intended for production. Regular wafer runs per technology are quarterly scheduled. The calendar and detailed rules are available upon request.

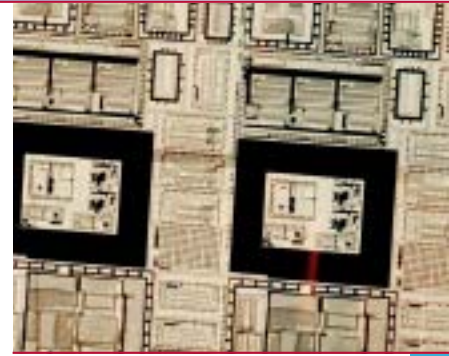
(\*) subcontracted to our preferred partners



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### MPW management and rules

- ❑ Customer interested in the MPW service should contact MHS at least one month prior to GDSII handoff as a preliminary communication for planning purposes
- ❑ MHS will perform the reticle assembly, the mask sizing and will process the wafers to deliver 30 dice in a chip-tray per submitted Customer die database
- ❑ Additional samples could be ordered with additional fees
- ❑ A summary of Process Control Monitor (PCM) data is delivered with the dice
- ❑ Assembly in various packages at added cost
- ❑ No Wafer may be stopped on a specific process flow step
- ❑ No process customization may be offered with respect to this service
- ❑ No complete Wafer may be provided to any customer



### MULTI LAYER MASK (MLM)

Based upon Customer GDSII files, during the reticle frame construction, the MHS CAD team organizes two to four different photo layer masks instead of one

within the frame. As a result, the number of reticles and the associated cost are lowered. The MLM service provides the customer more flexibility regarding

scheduling rather than fixed runs of MPW. This approach also allows the customer to create his own multi-project at an effective cost.

### MLM management and rules

- ❑ This service is exclusively dedicated to prototyping purpose
- ❑ No production wafers may be fabricated using an MLM Mask-set
- ❑ It is possible to stop wafers in the fab and mask/design revision is also possible
- ❑ Prototype samples may be delivered as wafers, bare dice, or assembled parts
- ❑ Maximum die size has to respect specific rules defining the capability of using two or four layers per reticle

## FOCUS Extranet Customer Account

MHS offers a reliable and secure extranet site to its Silicon Foundry Customers. The service is named FOCUS (FOundry CUStomer), providing updated data and documentation and is accessible 24 hours a day, 7 days a week. The customer may use it for such information as:

- Design Kits
- Documents (Process, Design, Quality, IPs)
- Work In Process (My WIP)
- Project Directory, including documents from and to the customer
- PCM Wafer test results (My Electrical Test Results)

To register for this service, customers may contact MHS and sign a mutual NDA document.

