

# Technical Note

## SEMI<sup>®</sup>-Defined Wafer Map Format

### Introduction

Micron has adopted the wafer map file format approved by Semiconductor Equipment and Materials International (SEMI<sup>®</sup>). Using a mapping format defined by a worldwide standards committee alleviates possible compatibility issues resulting from different semiconductor companies using internal, possibly proprietary, formats. With SEMI formatting, Micron's customers can be confident they will always receive consistent, compatible, reliable map files.

### Specifications

The following SEMI specifications outline the format and data items contained in the map file:

*G81-0703 Specification for Map Data Items*

*G85-0703 Specification for Map Data Format*

These documents may be requested from SEMI's Web site (<http://wps2a.semi.org/wps/portal>).

### Sending Wafer Maps

Micron uses three methods for sending wafer maps; they are listed here in order of preference:

1. Micron FTP site
2. E-mail distribution
3. CD with shipment

### Description

Table 1 lists and defines the attributes used in Micron's implementation of the SEMI specifications for wafer map format. Figure 1 on page 3 is an example of a one-wafer-lot map file (formatting has been added for easier reading).

**Table 1: Attributes and Definitions for SEMI-Defined Wafer Map Format**

| Attribute      | Definition                                       |
|----------------|--|
| xmlns          | Default value must be "http://www.semi.org"      |
| SubstrateId    | Identifying scribe on the physical wafer         |
| SubstrateType  | The type of substrate = "Wafer"                  |
| FormatRevision | SEMI specification version used for map creation |
| Rows           | The number of rows on the map                    |

**Table 1: Attributes and Definitions for SEMI-Defined Wafer Map Format (continued)**

| Attribute        | Definition   |
|------------------|--|
| LotId            | Production lot identifier for this map data  |
| BinType          | The format in which the bin code for each device will be represented in the map<br>Micron uses a single ASCII character  |
| Columns          | The number of columns in the map   |
| MapType          | Possible variations of data structure. Micron uses the array format (all bin data is expressed in a one-dimensional array)   |
| NullBin          | Code to indicate no device or an untested device   |
| ProductId        | Product identifier<br>Micron uses the Micron marketing part number ordered by the customer<br>Marketing part numbers comprise up to 34 alphanumeric characters                                       |
| WaferSize        | Diameter of wafer in millimeters   |
| CreateDate       | Date and time when the map data is acquired, formatted as YYYYMMDDhhmmssmmm<br>(year-month-date-hour-minute-second-millisecond)  |
| DeviceSizeX      | Device size on x-axis in microns   |
| DeviceSizeY      | Device size on y-axis in microns   |
| MicronLotId      | Internal Micron lot number   |
| Orientation      | Orientation of wafer flat or notch in relation to the map data<br>Micron uses "0" = the flat or notch is at the bottom of map data   |
| SupplierName     | Name of the wafer supplier = "Micron Technology, Inc."   |
| OriginLocation   | Location of the origin of the coordinates<br>Micron uses "2" = upper left - top side   |
| ReferenceDeviceX | X coordinate of the reference device to align device matrix on the wafer with the map data   |
| ReferenceDeviceY | Y coordinate of the reference device to align device matrix on the wafer with the map data   |
| BinCode          | BinCode Bin category in map<br>Micron uses BinCode "G" for each good probed die in map<br>Micron uses BinCode "X" for each failed die in map<br>Micron uses BinCode "0" for each Null Bin in the map |
| BinCount         | The number of devices on the wafer with the specified BinCode  |
| BinQuality       | Describes the quality (pass or fail) of the specified BinCode  |





8000 S. Federal Way, P.O. Box 6, Boise, ID 83707-0006, Tel: 208-368-3900  
[www.micron.com/productsupport](http://www.micron.com/productsupport) Customer Comment Line: 800-932-4992

Micron and the Micron logo are trademarks of Micron Technology, Inc. All other trademarks are the property of their respective owners.



## Revision History

|   |             |
|---|-------------|
| <b>Rev. E</b> .....   | <b>2/09</b> |
| <ul style="list-style-type: none"><li>• Updated SubstrateId in Figure 1.</li><li>• Updated template.</li></ul>                          |             |
| <b>Rev. D</b> .....   | <b>7/08</b> |
| <ul style="list-style-type: none"><li>• Added “Sending Wafer Maps” section.</li><li>• Updated BinCode information in Table 1.</li></ul> |             |
| <b>Rev. C</b> .....   | <b>9/07</b> |
| <ul style="list-style-type: none"><li>• Changed ProductID to Micron marketing part number ordered.</li></ul>                            |             |
| <b>Rev. B</b> .....   | <b>6/06</b> |
| <ul style="list-style-type: none"><li>• Added BinCode and BinCount for failed probe die.</li></ul>                                      |             |
| <b>Rev. A</b> .....   | <b>9/05</b> |
| <ul style="list-style-type: none"><li>• Initial release.</li></ul>  |             |