austria**micro**systems

Standard Family Cells

Seven Digit Document: ENG - 42

Revision #: 4.0

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austria**micro**systems

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Table of Contents

1   Introduction

1.1   Revision

Revision	Date	Changes	Affected pages
1.0	1996-12	First version of design rule specification	1 to 10
2.0	2003-02	add 0.35um processes	1 to 10
3.0	2007-01	change RVBLK placement	1 to 10
4.0	2007-08	add CUSTOM_LOGO, SFC010	1 to 10

1.2   Process Family

This document is valid for for all processes with minimum feature size $\leq$ 2.0um.

Note

All data represent drawn dimensions. Graphical illustrations are not to scale.
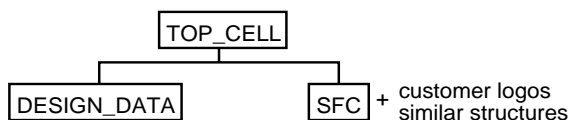
2   Definitions

BUTTRFLY: butterfly shaped mark for mask monitoring
DESIGN_DATA: all polygons on all process layers except SFCs
LOGO: austriamicrosystems logo
METx: metal-X layer
MTOP: top metal
TOPMET: top metal layer
PAD: pad window layer
RVBLK: revision block with device number, layer numbers, layer revisions
SCRIBE: scribe border
SCRIBECUT: scribe border cut
SFC: standard family cell
CUSTOM_LOGO: artistic expression of designer identity
XMIN: minimum feature size

3   General Rules

Note: For each process the SFCs are provided by austriamicrosystems on request in GDSII format.
There is no automatic update procedure.
Customers must check that they use the current version of SFCs for the considered process.

Rule	Description
SFC001	The structure of SFCs must not be modified. SFCs must not be mirrored
SFC002	SFCs include all process layers and must be excluded from layer generation procedures
SFC003	SFCs must not overlap DESIGN_DATA SFCs contain conducting layers and would introduce short circuits.
SFC004	SFC spacing to DESIGN_DATA = standard design rules SFCs themselves may violate design rules and must not be included in design rule checks.

Note: Preferred hierarchy of layout data base

```
          ┌───────────┐
          │ TOP_CELL  │
          └───────────┘
      ┌─────────┴─────────┐
┌──────────────┐      ┌─────┐    customer logos
│ DESIGN_DATA  │      │ SFC │ +  similar structures
└──────────────┘      └─────┘
```

4   Standard Family Cells

4.1   SCRIBE

SCRIBE provides a defined die edge and protects the chip from the environment.
SCRIBE encloses DESIGN_DATA and all other SFCs.

Rule	Description
SFC005	SCRIBE corner coordinates must be an integral multiple of 5um

Note: Refer to the Process Design Rules for additional SCRIBE rules.

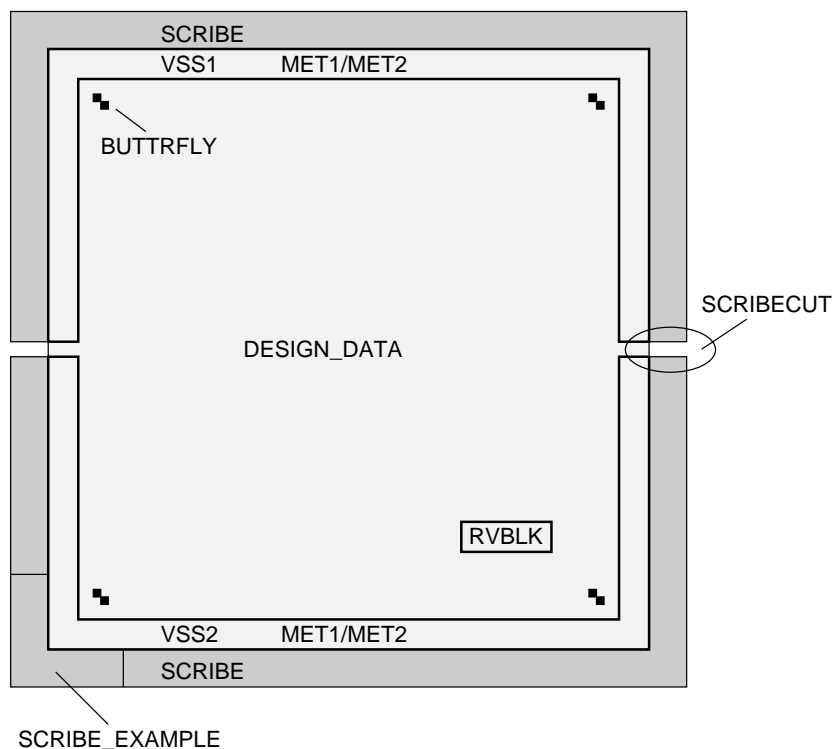### 4.1.1   Processes with XMIN > 0.35um

The outermost shapes (data extrema) of DESIGN_DATA must be METx.
The inner edge of SCRIBE is butted to DESIGN_DATA.
SCRIBE shorts METx to substrate.

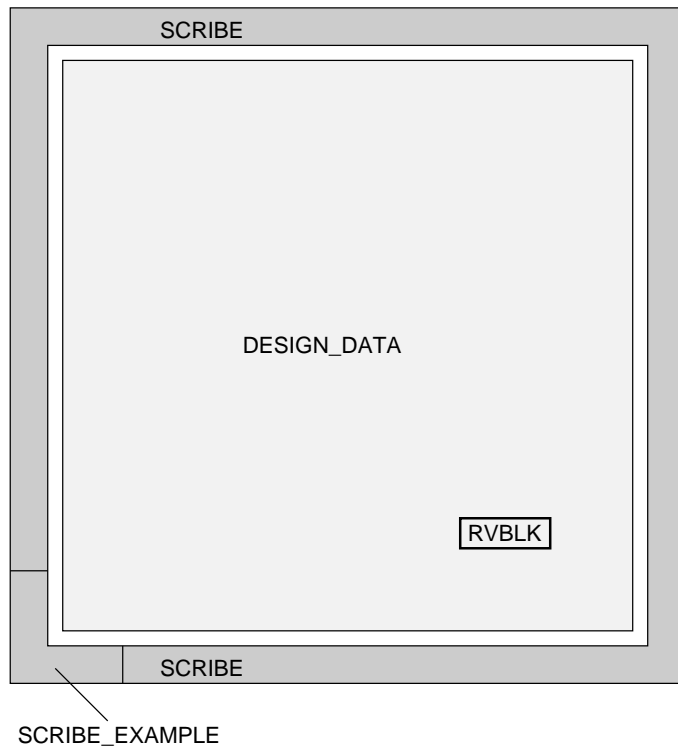SCRIBE can be split into separate parts with the predefined cell SCRIBECUT.
This is often necessary to avoid crosstalk between different supplies.

Note: The lower left corner of SCRIBE is provided in the cell "SCRIBE_EXAMPLE".

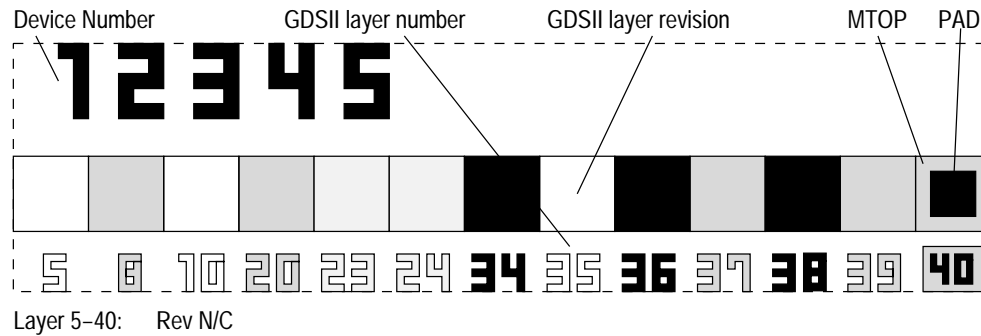### 4.1.2 Processes with XMIN ≤ 0.35um

The inner edge of SCRIBE is **not** butted DESIGN_DATA.
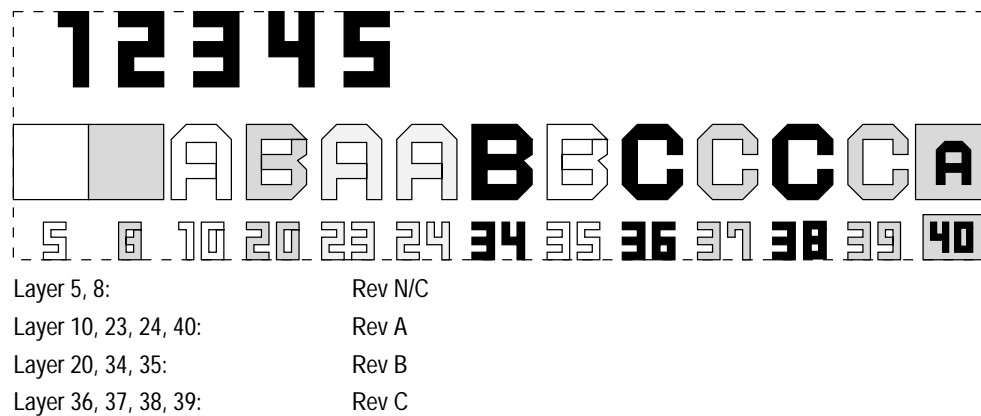SCRIBE is floating and is not connected to DESIGN_DATA.

Note: The lower left corner of SCRIBE is provided in the cell "SCRIBE_EXAMPLE".

4.2   RVBLK

Example for Revision "N/C"

Device Number   GDSII layer number   GDSII layer revision   MTOP   PAD

Layer 5–40:   Rev N/C

Example for Later Revisions

| Layer 5, 8:	Rev N/C
Layer 10, 23, 24, 40:	Rev A
Layer 20, 34, 35:	Rev B
Layer 36, 37, 38, 39:	Rev C

Note: These are examples for a fictive CMOS process.

Note: The cell "EXAMPLE" provides all shapes which are necessary to modify the template "RVBLK" for a specific design.
The actual 5-digit device number must be obtained from austriamicrosystems.
For circuits with different mask options a 3-digit overlay number is placed below the device number.

Rule	Description
SFC006	RVBLK must be configured for the current design and placed inside SCRIBE
SFC007	Layer specific information must appear on the corresponding layer.
	e.g. Information about layer "20" must appear on layer "20"
	Exception: PAD shapes must be created together with MTOP to avoid corrosion.
SFC008	Device numbers are created on all layers except PAD.
	Overlay numbers are created only on programmable layers.

4.3   BUTTRFLY

Note: BUTTRFLY is only needed for processes with XMIN > 0.35um.
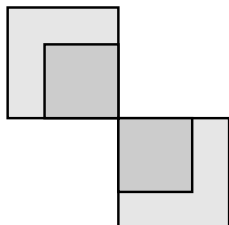
Rule	Description
SFC009	BUTTRFLYs must be placed in at least 3 corners of the chip inside SCRIBE (see figure in chapter 4.1.1)

4.4   LOGO, CUSTOM_LOGO

Guideline	Description
SFC010	LOGO and CUSTOM_LOGO should follow single layer width/spacing rules

Support

For questions on design rules please refer to:

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