

SEMI E138-0309

XML SEMICONDUCTOR COMMON COMPONENTS

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1 Purpose

1.1 This document is a central location for the definition of common XML elements that are not specific to a single standard, but common across multiple standards.

2 Scope

2.1 This document defines the representation of Error, Data Types, Data Value Types, and Unit which are considered common components. The common components are used in association with other XML documents or schemas generated as part of the XML based SEMI standard interface specifications.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 The purpose of this document is to define basic components and to allow for future additions as new common components are discovered and required in conjunction with an XML based interface. Four sets of components are defined at this time in this standard: Error, Data Types, Data Value Types, and Unit. Future additions to this standard may be possible when new common components are identified.

4 Referenced Standards and Documents

4.1 SEMI Standards

SEMI E5 — SEMI Equipment Communications Standard 2 Message Content (SECS-II)

SEMI E87 — Specification for Carrier Management (CMS)

SEMI E121 — Guide for Style & Usage of XML for Semiconductor Manufacturing Applications

SEMI E125 — Specification for Equipment Self Description (EqSD)

SEMI E132 — Specification for Equipment Client Authentication and Authorization

SEMI E134 — Specification for Data Collection Management

SEMI E145 — Classification for Measurement Unit Symbols in XML

4.2 Other References

Extensible Markup Language (XML) 1.0 (Second Edition) — W3C Recommendation, 6 October 2000; <http://www.w3.org/TR/2000/REC-xml-20001006>

XML Schema Part 1: Structures — W3C Recommendation, 2 May 2001; <http://www.w3.org/TR/xmlschema-1>

XML Schema Part 2: Datatypes — W3C Recommendation, 2 May 2001; <http://www.w3.org/TR/xmlschema-2>

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 Abbreviations and Acronyms

5.1.1 W3C — World Wide Web Consortium

5.1.2 WWW — World Wide Web

5.1.3 XML — Extensible Markup Language

6 Resources, Organizations, and Standards

6.1 Important resources and organizations used in the generation and definition of this document are found in:

6.1.1 *XML Schema Part 2: Datatypes* — W3C Recommendation

7 XML Type Definitions

7.1 *XML Schema* — This specification includes an XML schema file, “E138-1-V0309-Schema.xsd,” and should be provided with this document. That XML schema file provides the normative definitions of the types described here.

7.2 *Data Type for Error Handling* — Error handling in most cases even with standard interface specifications is implementation-specific. It is not practical for one specification to define all possible error conditions, error codes, descriptions and supplementary information that is needed to properly recover from the error. Regardless, a common approach to communicating error conditions can simplify error management for standards implementers and application developers.

7.3 *Error Data Structure* — The following data structure defines a common error structure that can be extended with additional implementation-specific information that can be used by other standards or suppliers.

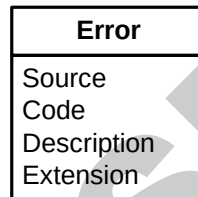


Figure 1
Error Structure

7.3.1 *Source* — The “Source” attribute represents the document from where the attribute code value is defined. For error codes defined by SEMI standards, the content of Source is the urn representation of the standard number. For error codes defined by a supplier, it is the urn representation of the supplier’s name (i.e., for SEMI E132 errors, the content of “Source” is: urn:semi-org:E132; for supplier ACME errors the content is: urn:ACME-com). Additional information may be included by the supplier by adding such information after the “:” colon symbol and separating the fields with a “.” period symbol.

Table 1 Example of Error Sources

#	Source	Comment
1	urn:semi-org:E005	Standard Error Codes for Equipment – SEMI E5.
2	urn:semi-org:E087	Standard Error Codes from Carrier Management.
3	urn:semi-org:E125	Standard Error Codes from Equipment Self Description.
4	urn:<Supplier>-com[:<SupplierFields>]	Identification of the source of error codes.

7.3.2 *Code* — Error code is an integer value that directly maps to a particular specification error code list. The following is an example of a list of code ranges. This specification does not require the allocation of any code range by other specification. The following is just an example of codes.

Table 2 Example of Error Code Range

#	Code Range	Comment
1	1–63, 32768–65535	Standard Error Codes for Equipment – SEMI E5.
2	10000–10500	Equipment Supplier Specific enumerated error codes (Example).
3	5000–5999	Common Standardized Core Components Errors.

7.3.3 Description — This is a human readable description of the error code being reported. It maps directly to the definition of the error code for each of the expected result of the services as defined by the specific standard. Additional information may be supplied after this string to provide more detail about the error. Use the “:” colon symbol as delimiter (i.e., Common Component, Code 5001, “Insufficient Arguments Provided:Argument “SessionID” missing).

Table 3 Example of Error Descriptions

#	Description	Comment
1	“Unknown Object in Object Specifier”	Error description for Code “1” as defined in SEMI E5.
2	“Loadport does not exist”	Error code “49” description from SEMI E87 and defined in SEMI E5.
3	“Operation Not Supported”	Error description for Error Code “5000.”

7.3.4 Extension — This attribute allows the supplier to include additional information regarding the error code encountered. This field is used when the description does not explicitly cover the problem and more specific information is required.

7.4 Common Standardized Errors — This section defines common errors to be reported by any application processing a service. Most of these errors are related to the validation of the service.

Table 4 Common Standardized Error Codes

Code	Description	Comment
5000	Operation Not Supported [:Operation specific detail]	Description of the actual error encountered. Additional information may be included.
5001	Insufficient Arguments Provided [:Operation specific detail]	One or more arguments are missing in the request.
5002	Invalid Arguments Provided [:Operation specific detail]	One or more arguments in the request are invalid or incompatible.

8 Data Types

8.1 The following sections define data types that can be used in conjunction with a parameter definition. A defined parameter in an equipment metadata has an associated data type that provides a defined format. Parameters have references to a defined data type via the data type name. Figure 2 shows a class that can be used to describe reusable data types. Type definitions can be re-used elsewhere in the metadata wherever a Parameter’s type can be declared.

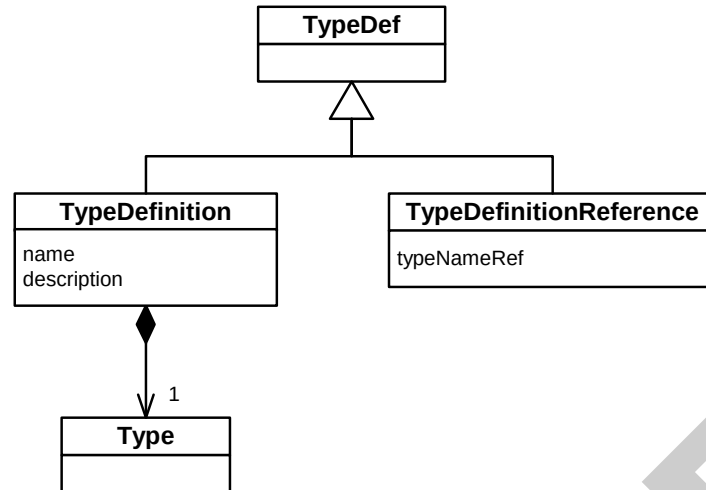


Figure 2
Describing Parameter Type Definitions

8.1.1 *TypeDef* — This is an abstract class from which *TypeDefinitions* and *TypeDefinitionReference* classes inherit when these two classes are compositions of *Array* or *Field* as shown in Figure 3.

8.1.2 *TypeDefinition* — This class from which all type description classes are derived. This class has two attributes: name and description. A parameter *TypeDefinition* can be a named *SimpleType*, *Array*, *Structure*, *Enumeration*, or *Variable*.

Table 5 TypeDefinition Attribute Definition

Attribute Name	Definition	Required	Form
name	The name for the type definition.	Y	Text, shall be unique across the equipment's own metadata <i>TypeDefinitions</i> . <i>SimpleTypes</i> shall use the names defined in Table 7, column 1. The remaining types (i.e., <i>Array</i> , <i>Structure</i> , and <i>Variable</i>) names are defined by the equipment or the standard from where the type originates.
description	A description of the meaning or purpose of the type definition.	Y	Text.

8.1.3 *TypeDefinitionReference* — Serves as a class for naming and providing a re-usable description of a primitive or composite type. For example, a parameter *TypeDefinition* could define a re-usable type named “Temperature” of type “F4”. A parameter *TypeDefinition* can be a named *SimpleType*, *Array*, *Structure*, *Enumeration*, or *Variable* as shown in Figure 3. *TypeDefinitionReference* can be re-used in the definition of other *TypeDefinitions*, recursively within the same *TypeDefinitionReference*, and in the definition of other composite types.

8.1.3.1 *TypeDefinitionReference* Association Definition Table

Table 6 TypeDefinitionReference Association Definition

Association Role Name	Definition	Comments
typeNameRef	The type name being referenced.	One and only one type definition name derived from an existing <i>TypeDefinition</i> .