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PartModel Assembly Process Classification Guidelines for Electronic-Device Packages – XML Requirements

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PartModel Assembly Process Classification Guideline for Electronic-Device Packages – XML Requirements

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PartModel Assembly Process Classification Guideline for Electronic-Device Packages – XML Requirements

From JEDEC Board Ballot JCB-24-53, JCB-24-29, JCB-17-48, JCB-25-59 formulated under the cognizance of the JC-11 Committee on Mechanical Standardization.)

1 Scope

The JEP30 document establishes the requirements for exchanging part data between part manufacturers and their customers for electrical and electronic products. The JEP30 documents are part of a series to describe XML data exchange structure and hierarchy. The JEP30 document series will detail data exchange between companies for design at the next level, analysis, and interconnection. The parent JEP30 document specifically focuses on the parental structure, under which several sub-sections are listed, such as electrical, physical, thermal, supply chain, assembly process classification, design kit, generated ECAD models, product substrate and assemblies, and environment including material declaration. This document specifically focuses on the “Assembly Process Classification” sub-section of the PartModel.

All releases of the [AssemblyProcessClassificationSection](#) sub-schema must be under the umbrella of the PartModel Schema to ensure that the PartModel schema is referencing the correct version of the [AssemblyProcessClassificationSection](#) sub-schema. In addition, this will enable the [AssemblyProcessClassificationSection](#) sub-schema to connect to the Manufacturer Part Number and the Manufacturer of the Part.

1.1 Purpose

This standard is intended to benefit part manufacturers and their customers by providing consistency and efficiency to the transfer of part data from part manufacturer to customers. This standard specifically covers data applicable to the assembly process classification and requirements of the part during the assembly process.

2 Applicable Documents

The following documents form a part of this standard to the extent specified herein. The revision of the document in effect at the time of solicitation shall take precedence.

2.1 JEDEC

JESD30J, *Descriptive Designation System for Electronic-device Packages*

JEP30, *PartModel Guidelines for Electronic-Device Packages – XML Requirements*

JEP30-10, *PartModel Schema*

JEP30-A101, *PartModel Assembly Process Classification Schema*

JEP30-D10, *PartModel Schema Types Dictionary* (Required to support the PartModel Schema and each of its sectional sub-schemas.)

JESD22-A111, *Evaluation Procedure for Determining Capability to Bottom Side Board Attach by Full Body Solder Immersion of Small Surface Mount Solid State Devices*

2.2 IPC

IPC-T-50, *Terms and Definitions for Interconnecting and Packaging Electronic Circuits*

IPC-CH-65, *Guidelines for Cleaning Printed Circuit Boards and Assemblies*

2.3 ECA/IPC/JEDEC

J-STD-075, *Classification of Passive and Solid State Devices for Assembly Processes*

2.4 IPC/JEDEC

J-STD-020, *Moisture/Reflow Sensitivity Classification for Nonhermetic Surface mount Devices*

2.5 ECIA

EIA 364-56, *Resistance to Soldering Heat Test Procedure for Electrical Connectors and Sockets*

EIA 364-61, *Resistance to Soldering Heat From Rework Test Procedure for Electrical Connectors and Sockets*

3 Requirements

The following terms and definitions are applicable to this XML Schema.

3.1 Terms and Definitions

All definitions and terms associated with the Process Sensitivity Levels aspect of the part or process are in accordance with J-STD-075A and / or IPC-T-50 Terms and Definitions or later versions.

All definitions and terms associated with the Moisture Sensitivity Levels aspect of the part are in accordance with J-STD-020 and / or IPC-T-50 Terms and Definitions or later versions.

The Assembly Process Classification details of the part are defined in the [AssemblyProcessClassificationSection](#) of the PartModel XML Schema.

All common Terms and Definitions that are used by more than one sectional sub-schema, such as any of the Electrical, Package, Environmental, Assembly Process Classification, are defined in the "PartModel Schema Types Library"

All other definitions and terms necessary to define the schema, are defined by this document.

3.1 Terms and Definitions (cont'd)

PartModel: A PartModel is a data representation described in an XML file that conforms to the rules and structure of the PartModel XML Schema.

NOTE 1 Companies who use the PartModel XML Files and claim compliance to JEDEC, must ensure that their PartModel XML file conforms to the specific released version of the PartModel XML Schema released by JEDEC.

NOTE 2 Section 4 defines the outline of the structure of the Assembly Process Classification XML Schema. Specific components of the XML Schema and their hierarchy are specifically controlled by the JC-14 Committee who retains the expertise for these structures.

NOTE 3 The [AssemblyProcessClassificationSection](#) of the schema forms part of the PartModel XML Schema and is not intended to act as a standalone schema. In addition, there is a "PartModel Schema Types Library" XML Schema, which is a common set of xml structures shared across the PartModel XML Schema and all its sub-section schemas.

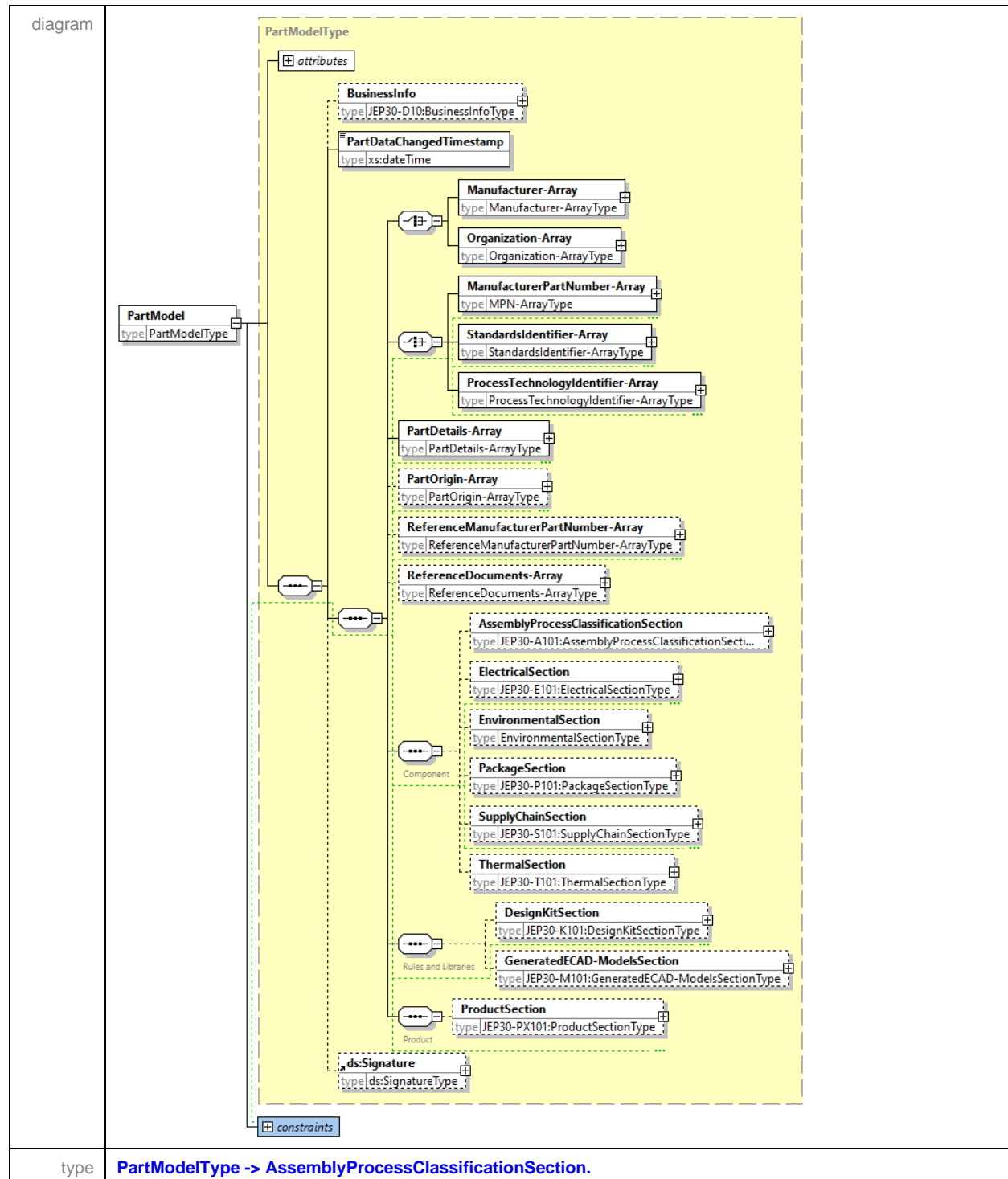
3.2 XML Schema Key Terms and Definitions

Reference the JEP30, 3.2, XML Schema Key Terms and Definitions.

4 PartModel Schema Definition

The following section describes the XML Schema structure.

4.1 PartModel Parent - Assembly Process Classification Section



4.1 PartModel Parent - Assembly Process Classification Section (cont'd)

The [PartModelType](#) belongs to the “PartModel XML Schema”. The “[AssemblyProcessClassificationSection](#)” belongs to the “PartModel Assembly Process Classification XML Schema”. The primary purpose of the PartModel Schema is to provide the structure for identifying unique parts (Manufacturer and MPN), and the structure to include the sub-schemas which define the part details, as outline in the JEP30 - PartModel Guidelines for Electronic-Device Packages – XML Requirements.

This document covers the [AssemblyProcessClassificationSection](#), which is referenced from its parent’s structure, the [PartModel](#). The contents under the [AssemblyProcessClassificationSection](#) is tied to the Manufacturer’s name and Manufacturer’s part number

The [ComplianceToPartModelSchemaVersion](#) indicates the version of the Schema to which the XML file is to be validated against. All new releases to this document or XML Schema is governed by the rules outlined in JEP30, and must be released in sync with the PartModel.

“Each time that a Sub-schema gets updated, then the PartModel version also gets updated in order to release that Sub-schema under the umbrella of the PartModel. This is because the PartModel must now reference the new version of Sub-schema, since all subschemas have their own version number. The parent schema includes them by referring to a precise version, so a version bump in the subschema requires a version bump in the parent only at the time of release of the Parent.”

The [PartModelContentRevision](#) indicates the revision of the data for the Part that is submitted in the XML file. This enables the Component Manufacturer to provide a new XML file for a Part each time they wish to upgrade a new set of data for a part, in any of the sub-sections such as this [AssemblyProcessClassificationSection](#).

4.2 Manufacturer Part Number-Array

path	PartModel/ManufacturerPartNumber-Array.
diagram	<p>The diagram illustrates the XSD structure for the ManufacturerPartNumber-Array. It is an array of ManufacturerPartNumbers (type MPN-ArrayType). Each ManufacturerPartNumbers element contains the following attributes and elements:</p> <ul style="list-style-type: none"> ID (type xs:string) PartNumberSeries (type JEP30-D10:PartNumberSeriesType) OrderablePartNumber (type JEP30-D10:OrderablePartNumberType) FuturePart (type FuturePartType) ManufacturerID (type xs:string) ManufacturerSignatureDigest (type JEP30-D10:SignatureDigestLinkType) ds:Signature (type ds:SignatureType) <p>The diagram also shows a constraints section.</p>
type	MPN-ArrayType, ManufacturerPartNumbersType, JEP30-D10:PartNumberSeriesType, JEP30-D10:OrderablePartNumberType, FuturePartType, JEP30-D10:SignatureDigestLinkType, ds:SignatureType.

The *ManufacturerPartNumber-Array/ManufacturerPartNumber* provides the definition of the part number, so that it can be connected to the technical specification details in the *AssemblyProcessClassificationSection* via the *PartDetails-Array* section.

4.3 Standards Identifier - Array

path	PartModel/StandardsIdentifier-Array.
diagram	<p>The diagram illustrates the XML Schema Definition (XSD) for the <code>StandardsIdentifier-Array</code>. It is composed of the following elements:</p> <ul style="list-style-type: none">StandardsIdentifier-ArrayType: The root element, which is an array of <code>StandardsIdentifier</code> elements. It has a cardinality of <code>0..∞</code>.StandardsIdentifier: A complex type element that contains the following attributes:<ul style="list-style-type: none">ID: A string attribute, required (indicated by a green checkmark), with a cardinality of <code>1..1</code>.Name: A string attribute, required, with a cardinality of <code>1..1</code>.StandardsNumber: A string attribute, required, with a cardinality of <code>0..∞</code>.Version: A string attribute, required, with a cardinality of <code>1..1</code>.BaseIdentifier: A string attribute, required, with a cardinality of <code>0..∞</code>.ModelVariationIdentifier: A string attribute, required, with a cardinality of <code>0..∞</code>.Description: A string attribute, optional (indicated by a green checkmark), with a cardinality of <code>1..1</code>.StandardsOrganizationIdentityID: A string attribute, required, with a cardinality of <code>1..1</code>.StandardsOrganizationIdentitySignatureDigest: A string attribute, required, with a cardinality of <code>1..1</code>, of type <code>JEP30-D10:SignatureDigestLinkType</code>.ds:Signature: A signature attribute, optional, with a cardinality of <code>1..1</code>, of type <code>ds:SignatureType</code>. <p>The diagram also shows the <code>constraints</code> section for the <code>StandardsIdentifier-ArrayType</code> and the <code>StandardsIdentifier</code> element.</p>
type	StandardsIdentifier-ArrayType, StandardsIdentifierType, JEP30-D10:SignatureDigestLinkType, ds:SignatureType.

The [StandardsIdentifier-Array/StandardsIdentifier](#) provides the definition of a specific Standard, so that it can be connected to the technical specification details in the [AssemblyProcessClassificationSection](#) via the [PartDetails-Array](#) section.

4.4 Process Technology Identifier - Array

path	PartModel/ProcessTechnologyIdentifier-Array.
diagram 1 of 2	
diagram 2 of 2	
type	ProcessTechnologyIdentifier-ArrayType , ProcessTechnologyIdentifier , JEDEC-Stage-in-DevelopmentType , JEP30-D10:SignatureDigestLinkType , ds:SignatureType .

The [ProcessTechnologyIdentifier-Array/ProcessTechnologyIdentifier](#) provides the definition of the process technology identifier, so that it can be connected to the technical specification details in the [AssemblyProcessClassificationSection](#) via the [PartDetails-Array](#) section.

4.5 Linking the Manufacturing Part Number to a specific Assembly Process Classification Data set

The linking of the Parts to its technical data is done via the [PartDetails-Array](#) section as outline in the JEP30 - PartModel Guidelines for Electronic-Device Packages – XML Requirements. This consists of two sections called [PartsSelection-Array](#) and [Association-Array](#) which defines the relationship between identifying the specific set of parts and how they are associated with the assembly process classification content. Reference the JEP30 parent document for more details on this association.

path	PartModel/PartDetails-Array/PartDetails/Association-Array/Association/AssemblyProcessClassification-Array
diagram at the Association level	
type	AssemblyProcessClassificationAssociation-ArrayType , AssemblyProcessClassificationAssociationType , ProcessSensitivityLevelAssociation-ArrayType , MoistureSensitivityLevelAssociation-ArrayType , JEP30-D10:SignatureDigestLinkType .
path	PartModel/AssemblyProcessClassificationSection
diagram at the Assembly Process Classification Section level	
type	AssemblyProcessClassificationSectionType , AssemblyProcessClassification-ArrayType , AssemblyProcessClassificationType , ProcessSensitivityLevel-ArrayType , MoistureSensitivityLevel-ArrayType , StorageTemperature-ArrayType , ds:SignatureType .

When all the parts that are identified in the parts identity section would point to a single instance of [ProcessSensitivityLevels](#), [MoistureSensitivityLevelsClassification](#) and [StorageTemperature](#), then a single mapping via the [PartsSelectionID](#) is used to make the association.

Typically, when providing assembly process classification data for a set of parts as defined by the [ManufacturerPartNumbers](#), then the entirety of the process sensitivity level profiles, moisture sensitivity levels classifications and storage temperature information is provided in one instance, then this collection can be digitally signed.

4.3 Linking the Manufacturing Part Number to a specific Assembly Process Classification Data set (cont'd)

The [AssemblyProcessClassificationID](#) references the [AssemblyProcessClassification/ID](#) under the [AssemblyProcessClassificationSection/AssemblyProcessClassification-Array/AssemblyProcessClassification](#). This is enforced by the key named as [AssemblyProcessClassificationKey](#) that is assigned to the [AssemblyProcessClassification/ID](#) element, which is referenced by the [AssemblyProcessClassificationID](#) which has a KeyRef that refers to the [JEP30-A101:AssemblyProcessClassificationKey](#).

4.5.1 Linking the Manufacturing Part Number to Process Sensitivity Level

path	PartModel/PartDetails-Array/PartDetails/Association-Array/Association/AssemblyProcessClassification-Array/AssemblyProcessClassification/ProcessSensitivityLevel-Array
diagram at the Process Sensitivity Association level	
type	ProcessSensitivityLevelAssociation-ArrayType
path	PartModel/AssemblyProcessClassificationSection/AssemblyProcessClassification-Array/AssemblyProcessClassification/ProcessSensitivityLevel-Array
diagram at the Process Sensitivity Level-Array level	
type	ProcessSensitivityLevel-ArrayType , ProcessSensitivityLevelsType ,

However, when there are multiple process sensitivity level profiles or multiple moisture sensitivity levels classifications for the same set of parts as represented by the same [ManufacturerPartNumbers](#), then a subset of parts as defined by the [PartsSelectionID](#) is configured and mapped to its specific instance of the process sensitivity level profiles via the [ProcessSensitivityLevels/ID](#). This process is repeated for each process sensitivity level profile that is mapped to its respective subset of parts as defined by each [PartsSelectionID](#).

The [ProcessSensitivityLevelID](#) references the [ProcessSensitivityLevels/ID](#) under the [AssemblyProcessClassificationSectionType/AssemblyProcessClassification-Array/AssemblyProcessClassification/ProcessSensitivityLevel-Array](#). This is enforced by the key named as [PSL-Key](#) that is assigned to the [ProcessSensitivityLevels/ID](#) element, which is referenced by the [ProcessSensitivityLevelID](#) which has a KeyRef that refers to the [JEP30-A101:PSL-Key](#).

4.5.2 Linking the Manufacturing Part Number to Moisture Sensitivity Level

path	PartModel/PartDetails-Array/PartDetails/Association-Array/Association/AssemblyProcessClassification-Array/AssemblyProcessClassification/MoistureSensitivityLevel-Array/MoistureSensitivityLevelsID
diagram at the Moisture Sensitivity Association level	<p>The diagram shows a dashed box labeled 'MoistureSensitivityLevel-Array' with a 'type' of 'MoistureSensitivityLevel-ArrayType'. This is connected to a solid box labeled 'MoistureSensitivityLevelAssociation-ArrayType' which contains a 'MoistureSensitivityLevelsID' element with a 'type' of 'xs:string'. A red arrow points from a circle labeled 'C' to the 'MoistureSensitivityLevelsID' element. The cardinality '0..∞' is shown at the bottom right.</p>
type	MoistureSensitivityLevelAssociation-ArrayType
path	PartModel/AssemblyProcessClassificationSection/AssemblyProcessClassification-Array/AssemblyProcessClassification/MoistureSensitivityLevel-Array
diagram at the Moisture Sensitivity Level Array level	<p>The diagram shows a dashed box labeled 'MoistureSensitivityLevel-Array' with a 'type' of 'MoistureSensitivityLevel-ArrayType'. This is connected to a solid box labeled 'MoistureSensitivityLevel-ArrayType' which contains a 'MoistureSensitivityLevel' element with a 'type' of 'MoistureSensitivityLevelType'. This element is further connected to a solid box labeled 'MoistureSensitivityLevelType' which contains an 'ID' element with a 'type' of 'xs:string'. A red arrow points from a circle labeled 'C' to the 'ID' element. Other elements in the 'MoistureSensitivityLevelType' include 'MSL-Code' (type: MSL-ClassificationType), 'FloorLife' (type: FloorLifeType), and 'Bake' (type: BakeType). The cardinality '1..∞' is shown for the 'MoistureSensitivityLevel' element, and '0..∞' for the others. A 'constraints' box is at the bottom left.</p>
type	MoistureSensitivityLevel-ArrayType , MoistureSensitivityLevelType , ...

If the selection of parts as defined by any of the previous [PartsSelectionID](#) that was defined for mapping to the process sensitivity level profiles, has the same moisture sensitivity levels classification, then that same [PartsSelectionID](#) can be used to make an association to the [MoistureSensitivityLevel/ID](#). If the sub-selection of parts is different, then a dedicated [PartsSelectionID](#) is configured to this new sub-selection of parts to the moisture sensitivity levels classifications information via the [MoistureSensitivityLevel/ID](#).

The [MoistureSensitivityLevelID](#) references the [MoistureSensitivityLevels/ID](#) under the [AssemblyProcessClassificationSectionType/AssemblyProcessClassification-Array/AssemblyProcessClassification/MoistureSensitivityLevel-Array](#). This is enforced by the key named as [MSL-Key](#) that is assigned to the [MoistureSensitivityLevels/ID](#) element, which is referenced by the [MoistureSensitivityLevelID](#) which has a [KeyRef](#) that refers to the [JEP30-A101:MSL-Key](#).

4.5.3 Linking the Manufacturing Part Number to Storage Temperature

path	PartModel/PartDetails-Array/PartDetails/Association-Array/Association/AssemblyProcessClassification-Array/AssemblyProcessClassification
diagram at the Assembly Process Classification Association level	
type	AssemblyProcessClassificationAssociationType ,
path	PartModel/AssemblyProcessClassificationSection/AssemblyProcessClassification-Array/AssemblyProcessClassification/StorageTemperature-Array
diagram at the Storage Temperature-Array level	
type	StorageTemperature-ArrayType , StorageTemperatureType , ...

The [StorageTemperatureIID](#) references the [StorageTemperature/ID](#) under the [AssemblyProcessClassificationSectionType/AssemblyProcessClassification-Array/Assembly ProcessClassification/StorageTemperature-Array](#). This is enforced by the key named as [StorageTemperatureKey](#) that is assigned to the [StorageTemperature/ID](#) element, which is referenced by the [StorageTemperatureIID](#) which has a KeyRef that refers to the [JEP30-A101:StorageTemperatureKey](#).

4.6 Assembly Process Classification

path	PartModel/AssemblyProcessClassificationSection
diagram	
type	AssemblyProcessClassificationType, ProcessSensitivityLevel-ArrayType, ProcessSensitivityLevelsType, MoistureSensitivityLevel-ArrayType, MoistureSensitivityLevelType, Storage Temperature-ArrayType, StorageTemperatureType, JEP30-D10:Footnote-ArrayType, ds:SignatureType.

The [AssemblyProcessClassificationSection](#) is broken into 3 sub-sections that are relevant to the Manufacturing Process for assembling the Part to the Printed Board, namely:

1. [ProcessSensitivityLevel-Array](#),
2. [MoistureSensitivityLevel-Array](#),
3. [StorageTemperature-Array](#).

These sections are described in detail in the following sections.

4.6.1 Process Sensitivity Levels Family

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels
diagram	
type	ProcessSensitivityLevelsType, ReflowProcessSensitivityLevelsType, WaveProcessSensitivityLevelsType, OtherProcessSensitivityLevelsType, PostAssemblyClassificationProfileType.

ProcessSensitivityLevels has 4 sections, two sections for the soldering process - one for *Reflow* and one for *Wave*, a third section for *OtherProcessLimitations*, and the last section is for *PostAssembly* classification profile. Some parts are only suitable for reflow soldering process in which case the *Reflow* branch is captured (the *Wave* branch is not captured) in the XML file. Other parts are only suitable for the wave process and unsuitable for the reflow process, in which case the PartModel data is captured for the *Wave* branch (and not the *Reflow* branch) in the XML file. However there are also parts that are compatible for both the *Reflow* and the *Wave* process, such as

1. Coarse pitch Flatpacks/Small Outline Package Bodies with Gull-wing terminals,
2. Ceramic Discrete parts that are within a certain Package Body size,
3. Through Hole Parts that are also suitable for Paste-in-Hole technology, Etc., etc.

4.4.1 Process Sensitivity Levels Family (cont'd)

SMD Parts which are assembled to their Products and soldered via a wave soldering process will have their package body immersed in the liquidus solder, whereas in the reflow process, the package body does not receive the same thermal shock. While many of the terminologies under the [ClassificationProfile](#) and [Limitations](#) sections are similar, their values for each respective process may not be the same. These parts must have both the [Reflow](#) and the [Wave](#) sections captured in the XML file.

The 3rd section [OtherProcessLimitations](#) addresses device limitations to other process steps in the card assembly process other than the reflow and wave soldering processes. If none of these limitations apply then no information needs to be reported for this section.

The [PostAssembly](#) classification section covers four post assembly process steps to which the device specified in this xml file, could be exposed after it has been attached to a printed board assembly. If the device cannot withstand the stated conditions below, then details of what conditions the device can withstand must be captured under that respective branch. If the device can withstand the stated conditions then no information needs to be reported for this section.

1. [AssemblyLevelCureBakeCondition](#),

- a. This section applies to the heating up of whole printed board assembly to cure the adhesive used to attach a heatsink onto one or more other devices on the printed board. A common cure condition is 125 °C for 90 minutes.

2. [AssemblyLevelMoistureBake](#),

- a. Baking the whole printed board assembly so that nearest neighbors devices that are moisture sensitive are not damaged when a failing device is removed and replaced using hot air tools. Printed board assembly bake conditions could be 125°C for 48 hours.

3. [ThermalCycling](#), and

- a. On rare occasions to remove marginal devices or assemblies, a printed board assembly level thermal cycle screen may be performed. The target "capability" conditions are 100 cycles of 0 °C to 100 °C, at one cycle per hour.

4. [ThermalExposure-to-NeighbouringRework](#).

- a. During Rework, the heat from hot air rework tools on sensitive devices when a device next to it needs to be removed and replaced, can cause damage to those sensitive devices. The target "capability" conditions are 180 °C for 5 minutes.

4.6.1.1 Reflow Process Sensitivity Levels Type

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow
diagram	
type	ReflowProcessSensitivityLevelsType , ReflowClassificationProfileType , CelsiusTemp-in-SecondsLimitType , TemperatureRampRateType , TimeAboveLiquidousTemperatureType , CelsiusTemperatureValueType , Time-in-SecondsValueType , Time-in-MinutesValueType , ReflowFluxLimitationType , ReflowLimitationsType , ReflowType , PSL-AdditionalInfoType , ReflowPSL-AdditionalLimitationsType

This section applies to SMD parts and selective through-hole parts (where the supplier has specifically documented support for reflow soldering, via “Paste-in-Hole” technology).

If a part is reflow compatible, then the [ReflowCode](#) under [Limitations](#) is a mandatory requirement to be specified, even in the event that the part is compliant with the standard process profile as defined in the J-STD-075 standard. The supplier shall evaluate and classify their part’s PSL to the worse-case process limits as outlined in this standard. The [ReflowCode](#) consists of 2 characters, as defined in the table titled “Reflow Solder PSL Classification” of that standard, where the first character denotes Reflow and the 2nd character represents a temperature classification (T_C). The [ReflowPSL-AdditionalInfoCode](#) is an optional 3rd character that identifies other process limitations, as defined in the “PSL 3rd Character” table in the J-STD-075 standard.

4.4.1.1 Reflow Process Sensitivity Levels Type (cont'd)

If a supplier is following the J-STD-075 classification process, then it is only necessary to capture the [Limitations](#) section. However in the event of the following two criteria, the part manufacturer is encouraged to provide a target classification profile for their part.

1. If better yield and reliability can be achieved for the part, or
2. The Part Manufacturer does not comply with the standard classifications specified in the J-STD-075 document.

4.6.1.1.1 Reflow Classification Profile Type

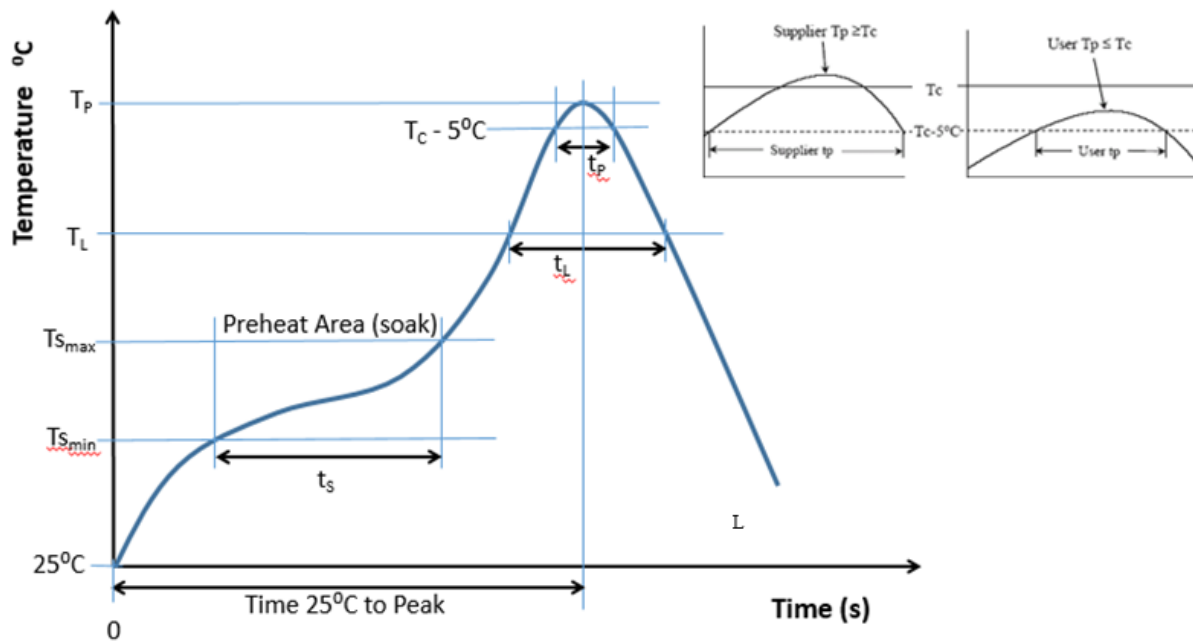


Figure 1 — Reflow Classification Profile (Not to scale)

The Base Solder Process conditions as specified under the [ClassificationProfile](#) and shown in Figure 1 from J-STD-075, Base Reflow Solder Process Conditions section.

As new soldering technologies emerge, driving new requirement for new classification profiles, it is desirable for component manufacturers to provide this [ClassificationProfile](#) for the part, so as to enable better efficiencies in the creation of a classification profile for the board assembly, without risking damage to the part.

In addition, as new soldering alloys are introduced, which require new classification profiles to be introduced which are not yet standardized, the provision of the [ClassificationProfile](#) details in this section, greatly enhances the ability of a board assembler to develop a board assembly profile that will match the requirements of the part.

4.6.1.1.1 Preheat

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/Preheat
diagram	
type	MinMaxTemperature-in-Celsius-in-MinMaxTime-in-SecondsType , MinMaxTemperature-in-CelsiusType , MinMaxLimitsType , Temperature-in-CelsiusUOMType , MinMaxTime-in-SecondsType , Time-in-SecondsUOMType .

4.6.1.1.2 Temperature Ramp up Rate

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/TemperatureRampupRate
diagram	
type	TemperatureRampRateType , TemperatureRampRateUOMType .

4.6.1.1.1.3 Time above Liquidus Temperature

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/TimeAboveLiquidusTemperature
diagram	
type	TimeAboveLiquidusTemperatureType , Temperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType , MinMaxTime-in-SecondsType , MinMaxLimitsType , Time-in-SecondsUOMType .

4.6.1.1.1.4 Peak Package Body Temperature

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/PeakPackageBodyTemperature
diagram	
type	Temperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType .

4.6.1.1.1.5 Time within 5 °C of Classification Temperature

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/TimeWithin5DegreeCelsiusOfClassificationTemperature
diagram	
type	Time-in-SecondsValueType , Time-in-SecondsUOMType .

4.6.1.1.1.6 Temperature Ramp down Rate

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/TemperatureRampdownRate
diagram	
type	TemperatureRampRateType , TemperatureRampRateUOMType .

4.6.1.1.1.7 Time from 25 °C -to-Peak Temperature

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/TimeFrom25DegreeCelsius-to-PeakTemperature
diagram	
type	Time-in-MinutesValueType , Time-in-MinutesUOMType ,.

4.6.1.1.1.8 Flux Limitation

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/ClassificationProfile/FluxLimitation
diagram	<pre>classDiagram class FluxLimitation { type ReflowFluxLimitationType } class ReflowFluxLimitationType { Mildly-to-HighlyActivatedWaterS... type xs:string No-cleanFluxes type xs:string Other type xs:string } FluxLimitation -- > ReflowFluxLimitationType</pre>
type	ReflowFluxLimitationType.

If the supplier is following the J-STD-075 classification process, then the part can be classified in the following [Reflow](#) Limitations Type section. However, if the supplier is either not following the J-STD-075 classification process or is unable to classify the part as per this standard, then the supplier shall provide the above [ClassificationProfiles](#) for the part.

The provision of this reflow classification profile for the part are for classification / preconditioning and are not meant to specify board assembly profiles. Actual board assembly profiles should be developed based on specific process needs and board designs and should exceed the parameters defined for this part. For example, if T_C is 260°C and the time T_P is 30 seconds, this means the following is claimed by the supplier and becomes a restriction on the user:

1. For a supplier, the peak temperature must be at least 260 °C, and the time above 255 °C must be at least 30 seconds.
2. For the user, the peak temperature must not exceed 260 °C, and the time above 255 °C must not exceed 30 seconds

4.6.1.1.2 Reflow Limitations Type

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Reflow/Limitations
diagram	<pre> classDiagram class ReflowLimitationsType { ReflowCode ReflowType ReflowPSL-AdditionalInfoCode PSL-AdditionalInfoType ReflowPSL-AdditionalLimitations ReflowPSL-AdditionalLimitationsType } class ReflowPSL-AdditionalLimitationsType { C-Preheat MinMaxTemperature-in-Celsius-in-MaxTime-in-SecondsType F-TimeAbove217DegC-LiquidousT... Time-in-SecondsValueType G-TimeWithin5DegC-of-Classificat... Time-in-SecondsValueType H-TemperatureRamp-downRate TemperatureRampRateType J-NumberOfReflowCycles xs:integer K-FluxLimitation ReflowFluxLimitationType Z-Other xs:string } ReflowLimitationsType --> ReflowPSL-AdditionalLimitationsType </pre>
type	ReflowLimitationsType , ReflowType , PSL-AdditionalInfoType , ReflowPSL-AdditionalLimitationsType , MinMaxTemperature-in-Celsius-in-MaxTime-in-SecondsType , Time-in-SecondsValueType , TemperatureRampRateType , ReflowFluxLimitationType .

If a part does not comply with the industry standard J-STD-075 classification process, as denoted by the [ReflowCode](#) R0, then one or more limitations exists. This section enables the supplier to provide details on the limitations and to quantify the limitation that apply to the part during the reflow process.

4.6.1.2 Wave Process Sensitivity Levels Type

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave
diagram	
type	WaveProcessSensitivityLevelsType , WaveClassificationProfileType , MaxTemperature-in-Celsius-in-MaxTime-in-SecondsType , Temperature-in-CelsiusValueType , MaxTemperature-in-CelsiusValueType , MaxTime-in-SecondsType , TemperatureRampRateType , WaveFluxLimitationType , WaveLimitationsType , WaveSolderType , PSL-AdditionalInfoType , WavePSL-AdditionalLimitationsType .

This section applies to through-hole parts where the package body is not immersed in the solder wave (only the terminals), and to all SMD parts where the supplier has identified full-wave submersion as an acceptable process for their part family.

If a part is wave solder compatible, then the [WaveCode](#) under [Limitations](#) is a mandatory requirement to be specified, even in the event that the part is compliant with the standard process profile as defined in the J-STD-075 standard. The supplier shall evaluate and classify their part's PSL to the worse-case process limits as outlined in this standard. The [WaveCode](#) consists of 2 characters, as defined in the table titled "Wave Solder PSL Classification" in this standard, where the first character denotes Wave and the 2nd character represents a temperature classification (T_C). The [WavePSL-AdditionalInfo](#) is an optional 3rd character that identifies other process limitations, as defined in the "PSL 3rd Character" table in the J-STD-075 standard.

4.4.1.2 Wave Process Sensitivity Levels Type (cont'd)

JESD22-A111 covers MSL testing for the backside wave attach of SMT packages (full solder immersion).

If a supplier is following the J-STD-075 classification process, then it is only necessary to capture the [Limitations](#) section. However in the event of the following two criteria, the part manufacturer is encouraged to provide a target classification profile for their part.

1. If better yield and reliability can be achieved for the part, or
2. The Part Manufacturer does not comply with the standard classifications specified in the J-STD-075 document.

4.6.1.2.1 Wave Classification Profile Type

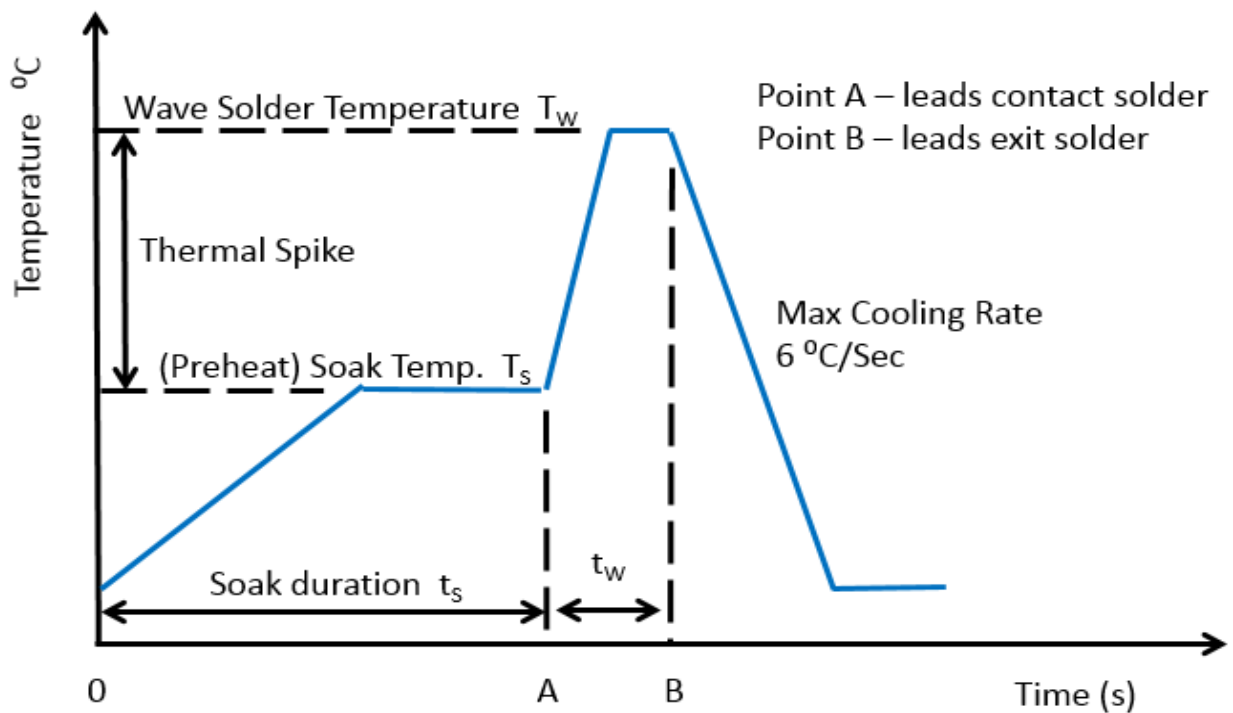


Figure 2 — Classification Profile for Wave Solder Process (Not to scale)

The Base Solder Process conditions as specified under the [Classification Profile](#) and shown above in the chart is in the “Base Wave Solder Process Conditions” section of the J-STD-075 document.

As new soldering technologies emerge, driving new requirement for new classification profiles, it is desirable for component manufacturers to provide this [Classification Profile](#) for the part, so as to enable better efficiencies in the creation of a classification profile for the board assembly, without risking damage to the part.

4.4.1.2.1 Wave Classification Profile Type (cont'd)

In addition, as new soldering alloys are introduced, which require new classification profiles to be introduced which are not yet standardized, then the provision of the classification profiles details in this section, greatly enhances the ability of a board assembler to develop a board assembly profile, that will match the requirements of the part.

If the supplier classifies the part as being compliant with the industry standard, then the Wave Code in the following Limitation section can be specified as W0. However, for new technology components or for parts that do not conform to the normal industry standards, the supplier can provide a "Classification Profile".

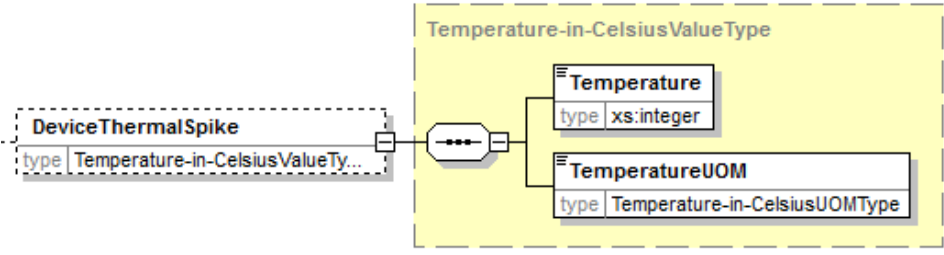
The provision of this wave classification profile for the part are for classification / preconditioning and are not meant to specify board assembly profiles. Actual board assembly profiles should be developed based on specific process needs and board designs and should exceed the parameters defined for this part. For example, if T_s is 160°C and the time T_s is 250 seconds, this means the following is claimed by the supplier and becomes a restriction on the user:

1. For a supplier, the maximum soak temperature T_s must be at least 160°C, and the time from room temperature to Max T_s must be at least 250 seconds.
2. For the user, the maximum soak temperature T_s must not exceed 160°C, and the time from room temperature to Max T_s must not exceed 250 seconds

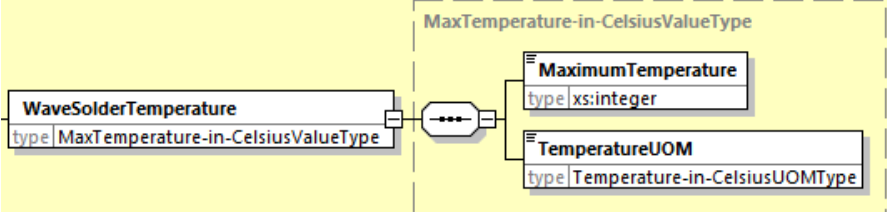
4.6.1.2.1.1 Preheat Soak

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/PreheatSoak
diagram	<pre> classDiagram class PreheatSoak { type MaxTemperature-in-Celsius-in-MaxTime-in-SecondsType } class SoakTemperature { type MaxTemperature-in-CelsiusValueType } class TimeFrom25DegCelsius-to-MaximumSoakTemperature { type MaxTime-in-SecondsType } class MaximumTemperature { type xs:integer } class TemperatureUOM { type Temperature-in-CelsiusUOMType } class MaximumTime { type xs:double } class TimeUOM { type Time-in-SecondsUOMType } PreheatSoak --> SoakTemperature PreheatSoak --> TimeFrom25DegCelsius-to-MaximumSoakTemperature SoakTemperature --> MaximumTemperature SoakTemperature --> TemperatureUOM TimeFrom25DegCelsius-to-MaximumSoakTemperature --> MaximumTime TimeFrom25DegCelsius-to-MaximumSoakTemperature --> TimeUOM </pre>
type	MaxTemperature-in-Celsius-in-MaxTime-in-SecondsType , MaxTemperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType , MaxTime-in-SecondsType , Time-in-SecondsUOMType .

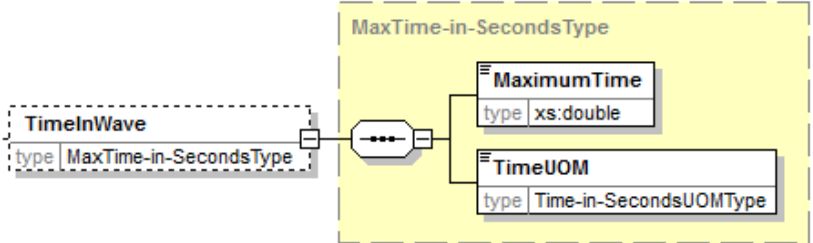
4.6.1.2.1.2 Device Thermal Spike

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/DeviceThermalSpike
diagram	 <p>The diagram shows a dashed box labeled DeviceThermalSpike with a type attribute <code>Temperature-in-CelsiusValueType</code>. This box is connected via a connector to a larger dashed box labeled Temperature-in-CelsiusValueType. Inside this larger box, there are two sub-elements: Temperature with type <code>xs:integer</code> and TemperatureUOM with type <code>Temperature-in-CelsiusUOMType</code>.</p>
type	Temperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType .

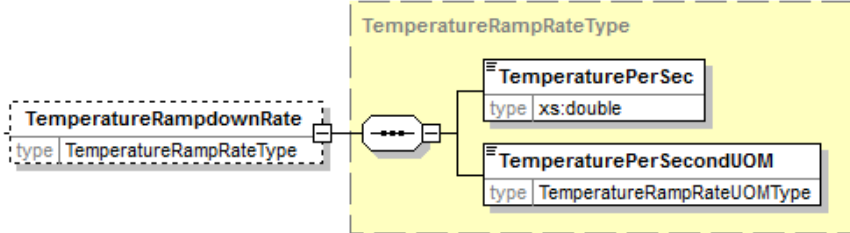
4.6.1.2.1.3 Wave Solder Temperature

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/WaveSolderTemperature
diagram	 <p>The diagram shows a box labeled WaveSolderTemperature with a type attribute <code>MaxTemperature-in-CelsiusValueType</code>. This box is connected via a connector to a larger dashed box labeled MaxTemperature-in-CelsiusValueType. Inside this larger box, there are two sub-elements: MaximumTemperature with type <code>xs:integer</code> and TemperatureUOM with type <code>Temperature-in-CelsiusUOMType</code>.</p>
type	MaxTemperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType .

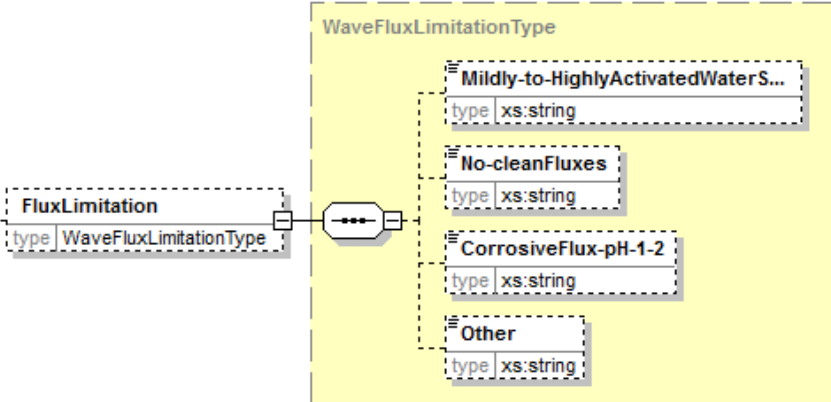
4.6.1.2.1.4 Time in Wave

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/TimeInWave
diagram	 <p>The diagram shows a dashed box labeled TimeInWave with a type attribute <code>MaxTime-in-SecondsType</code>. This box is connected via a connector to a larger dashed box labeled MaxTime-in-SecondsType. Inside this larger box, there are two sub-elements: MaximumTime with type <code>xs:double</code> and TimeUOM with type <code>Time-in-SecondsUOMType</code>.</p>
type	MaxTime-in-SecondsType , Time-in-SecondsUOMType .

4.6.1.2.1.5 Temperature Ramp down Rate

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/TemperatureRampdownRate
diagram	 <p>The diagram shows a dashed box labeled TemperatureRampdownRate with a note indicating its type is <code>TemperatureRampRateType</code>. This box is connected via a connector to a larger yellow box labeled TemperatureRampRateType. Inside the yellow box, there are two sub-elements: TemperaturePerSec (type <code>xs:double</code>) and TemperaturePerSecondUOM (type <code>TemperatureRampRateUOMType</code>).</p>
type	TemperatureRampRateType , TemperatureRampRateUOMType .

4.6.1.2.1.6 Flux Limitation

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/ClassificationProfile/FluxLimitation
diagram	 <p>The diagram shows a dashed box labeled FluxLimitation with a note indicating its type is <code>WaveFluxLimitationType</code>. This box is connected via a connector to a larger yellow box labeled WaveFluxLimitationType. Inside the yellow box, there are four sub-elements, each with a note indicating its type is <code>xs:string</code>: Mildly-to-HighlyActivatedWaterS..., No-cleanFluxes, CorrosiveFlux-pH-1-2, and Other.</p>
type	WaveFluxLimitationType .

4.6.1.2.2 Wave Limitations Type

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/Wave/Limitations
diagram	<pre> classDiagram class WaveLimitationsType { type WaveLimitationsType } class WavePSL-AdditionalInfoCode { type PSL-AdditionalInfoType } class WavePSL-AdditionalLimitations { type WavePSL-AdditionalLimitationsType } class A-ThermalSpike { type Temperature-in-CelsiusValueType } class C-Preheat { type MinMaxTemperature-in-Celsius-in-MaxTime-in-SecondsType } class E-TimeInWave { type MaxTime-in-SecondsType } class H-TemperatureRamp-downRate { type TemperatureRampRateType } class J-NumberOfPasses { type xs:integer } class K-FluxLimitation { type WaveFluxLimitationType } class Z-Other { type xs:string } WaveLimitationsType "1" *-- "1" WavePSL-AdditionalInfoCode WaveLimitationsType "1" *-- "1" WavePSL-AdditionalLimitations WavePSL-AdditionalLimitations "1" *-- "1" A-ThermalSpike WavePSL-AdditionalLimitations "1" *-- "1" C-Preheat WavePSL-AdditionalLimitations "1" *-- "1" E-TimeInWave WavePSL-AdditionalLimitations "1" *-- "1" H-TemperatureRamp-downRate WavePSL-AdditionalLimitations "1" *-- "1" J-NumberOfPasses WavePSL-AdditionalLimitations "1" *-- "1" K-FluxLimitation WavePSL-AdditionalLimitations "1" *-- "1" Z-Other </pre>
type	WaveLimitationsType , WaveSolderType , PSL-AdditionalInfoType , WavePSL-AdditionalLimitationsType , Temperature-in-CelsiusValueType , MinMaxTemperature-in-Celsius-in-MaxTime-in-SecondsType , MaxTime-in-SecondsType , TemperatureRampRateType , WaveFluxLimitationType .

If a part does not comply with the industry standard J-STD-075 classification process, as denoted by the [WaveCode](#) W0, then one or more limitations exists. This section enables the supplier to provide details on the limitations and to quantify the limitation that apply to the part during the wave process.

4.6.1.3 Other Process Limitations

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/OtherProcessLimitations
diagram	<p>The diagram illustrates the structure of the OtherProcessSensitivityLevelsType. It is a dashed box containing several elements:</p> <ul style="list-style-type: none"> OtherProcessLimitations: A dashed box containing the text <code>type OtherProcessSensitivityLevelsType</code>. It is connected to the main container by a line with a small square at the end. M-Cleaning: A dashed box containing the text <code>type CleaningProcessSensitivityLevelsType</code>. It is connected to the main container by a line with a small square at the end. V-VacuumPick-up: A dashed box containing the text <code>type JEP30-D10:EmptyType</code>. X-XRayRadiationLimitation: A dashed box containing the text <code>type JEP30-D10:EmptyType</code>. CleaningProcessSensitivityLevelsType: A dashed box containing four sub-elements: <ul style="list-style-type: none"> FullImmersion: <code>type xs:string</code> HighPressureJetWash: <code>type xs:string</code> ChemicalWashingAgent: <code>type xs:string</code> Other: <code>type xs:string</code> <p>Connections: A line with a small square at the end connects the OtherProcessLimitations box to the main container. Another line with a small square at the end connects the M-Cleaning box to the CleaningProcessSensitivityLevelsType box.</p>
type	OtherProcessSensitivityLevelsType , CleaningProcessSensitivityLevelsType .

This section [OtherProcessLimitations](#) indicates a component's susceptibility to the non-soldering stages in the assembly process of mounting the part to the printed board and in subsequent product validation.

4.6.1.4 Post Assembly

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/PostAssembly
diagram	<p>The diagram illustrates the structure of the PostAssemblyClassificationProfileType. It is a dashed box containing several elements:</p> <ul style="list-style-type: none"> PostAssembly: A dashed box containing the text <code>type PostAssemblyClassificationPro...</code>. It is connected to the main container by a line with a small square at the end. AssemblyLevelCureBakeCondi...: A dashed box containing the text <code>type AssemblyLevelCureBakeCondit...</code>. It is connected to the main container by a line with a small square at the end. AssemblyLevelMoistureBake: A dashed box containing the text <code>type AssemblyLevelMoistureBakeTy...</code>. It is connected to the main container by a line with a small square at the end. ThermalCycling: A dashed box containing the text <code>type ThermalCyclingType</code>. ThermalExposure-to-Neighbori...: A dashed box containing the text <code>type ThermalExposure-to-Neighbori...</code>. <p>Connections: A line with a small square at the end connects the PostAssembly box to the main container. Another line with a small square at the end connects the AssemblyLevelCureBakeCondi... box to the AssemblyLevelMoistureBake box.</p>
type	PostAssemblyClassificationProfileType , AssemblyLevelCureBakeConditionType , AssemblyLevelMoistureBakeType , ThermalCyclingType , ThermalExposure-to-NeighboringReworkType .

4.6.1.5 Assembly Level Cure Bake Condition

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/PostAssembly/AssemblyLevelCureBakeCondition
diagram	<p>The diagram illustrates the structure of the AssemblyLevelCureBakeConditionType. It is a complex type containing two main elements: Time and Temperature. The Time element is of type Time-in-MinutesValueType and is connected to a Time-in-MinutesValueType container. This container includes MaximumTime (type xs:double) and TimeUOM (type Time-in-MinutesUOMType). The Temperature element is of type MaxTemperature-in-CelsiusValueType and is connected to a MaxTemperature-in-CelsiusValueType container. This container includes MaximumTemperature (type xs:integer) and CelsiusTempUOM (type Temperature-in-CelsiusUOMType). The entire structure is enclosed in a dashed box labeled AssemblyLevelCureBakeConditionType.</p>
type	AssemblyLevelCureBakeConditionType , Time-in-MinutesValueType , MaxTemperature-in-CelsiusValueType , Time-in-MinutesUOMType , Temperature-in-CelsiusUOMType

4.6.1.6 Assembly Level Moisture Bake

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/PostAssembly/AssemblyLevelMoistureBake
diagram	<p>The diagram illustrates the structure of the AssemblyLevelMoistureBakeType. It is a complex type containing two main elements: Time and Temperature. The Time element is of type Time-in-HoursValueType and is connected to a Time-in-HoursValueType container. This container includes MaximumTime (type xs:double) and TimeUOM (type Time-in-HoursUOMType). The Temperature element is of type MaxTemperature-in-CelsiusValueType and is connected to a MaxTemperature-in-CelsiusValueType container. This container includes MaximumTemperature (type xs:integer) and CelsiusTempUOM (type Temperature-in-CelsiusUOMType). The entire structure is enclosed in a dashed box labeled AssemblyLevelMoistureBakeType.</p>
type	AssemblyLevelMoistureBakeType , Time-in-HoursValueType , MaxTemperature-in-CelsiusValueType , Time-in-HoursUOMType , Temperature-in-CelsiusUOMType .

4.6.1.7 Thermal Cycling

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/PostAssembly/ThermalCycling
diagram	
type	ThermalCyclingType , MinMaxTemperature-in-CelsiusType , MinMaxLimitsType , Temperature-in-CelsiusUOMType , Time-in-HoursValueType , Time-in-HoursUOMType .

4.6.1.8 Thermal Exposure-to-Neighboring Rework

path	PartModel/AssemblyProcessClassificationSection/ProcessSensitivityLevel-Array/ProcessSensitivityLevels/PostAssembly/ThermalExposure-to-NeighbouringRework
diagram	
type	ThermalExposure-to-NeighboringReworkType , Time-in-MinutesValueType , Time-in-MinutesUOMType , MaxTemperature-in-CelsiusValueType , Temperature-in-CelsiusUOMType .

4.6.2 Moisture Reflow Sensitivity

path	PartModel/AssemblyProcessClassificationSection/MoistureSensitivityLevelClassification-Array/MoistureSensitivityLevelClassification
diagram	<pre> classDiagram class MoistureSensitivityLevel_ArrayType { type MoistureSensitivityLevel_ArrayType } class MoistureSensitivityLevelType { type MoistureSensitivityLevelType ID xs:string PartSelectionSignature xs:string MSL-Code MSL-ClassificationType FloorLife FloorLifeType Bake BakeType } class MSL_ClassificationType { type MSL-ClassificationType } class FloorLifeType { type FloorLifeType } class BakeType { type BakeType } MoistureSensitivityLevel_ArrayType "1" -- "1..∞" MoistureSensitivityLevelType MoistureSensitivityLevelType "1" -- "1" ID MoistureSensitivityLevelType "1" -- "1" PartSelectionSignature MoistureSensitivityLevelType "1" -- "1" MSL_ClassificationType MoistureSensitivityLevelType "1" -- "0..∞" FloorLifeType MoistureSensitivityLevelType "1" -- "0..∞" BakeType </pre>
type	MoistureSensitivityLevel-ArrayType , MoistureSensitivityLevelType , MSL-ClassificationType , FloorLifeType , BakeType .

This section [MoistureSensitivityLevel](#) indicates a component's susceptibility to damage due to absorbed moisture when subjected to reflow soldering, as defined by the J-STD-020 standard "Moisture/Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices". It is intended to be used by component manufacturers to inform users (board assembly operations) of the level of moisture sensitivity of their product devices, and by board assembly operations to ensure that proper handling precautions are applied to moisture/reflow sensitive devices.

The vapor pressure of moisture inside a nonhermetic package increases greatly when the package is exposed to the high temperature of solder reflow. Under certain conditions, this pressure can cause internal delamination of the packaging materials from the die and/or terminal-frame/substrate, internal cracks that do not extend to the outside of the package, bond damage, wire necking, bond lifting, die lifting, thin film cracking, or cratering beneath the bonds. In the most severe case, the stress can result in external package cracks. This is commonly referred to as the "popcorn" phenomenon because the internal stress causes the package to bulge and then crack with an audible "pop."

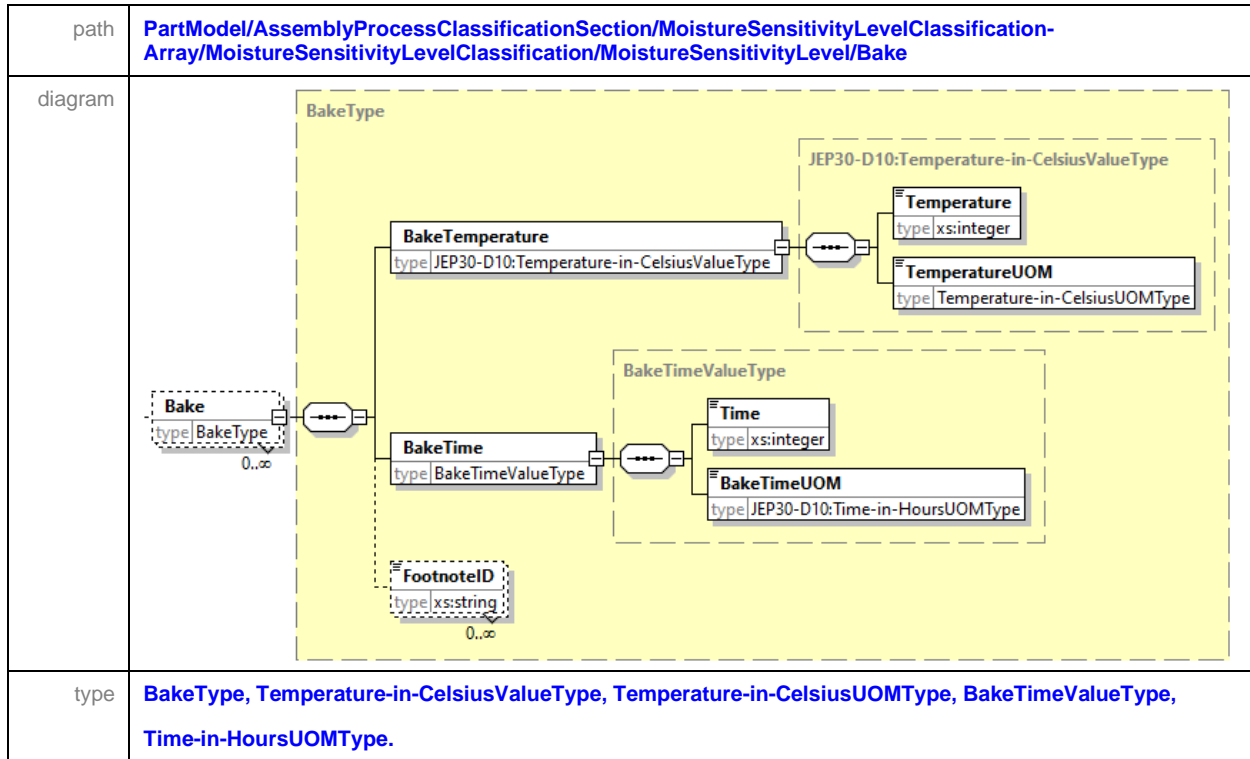
The [MSLCode](#) are defined in the "Moisture Sensitivity Levels" table in the J-STD-020 standard.

4.6.2.1 Floor Life type

path	PartModel/AssemblyProcessClassificationSection/MoistureSensitivityLevelClassification-Array/MoistureSensitivityLevelClassification/MoistureSensitivityLevel/FloorLife
diagram	
type	FloorLifeType, FloorLifeTimeValueType, LifeTimeUOMType, MSL-EnvironmentConditionType, Temperature-in-CelsiusValueType, Temperature-in-CelsiusUOMType.

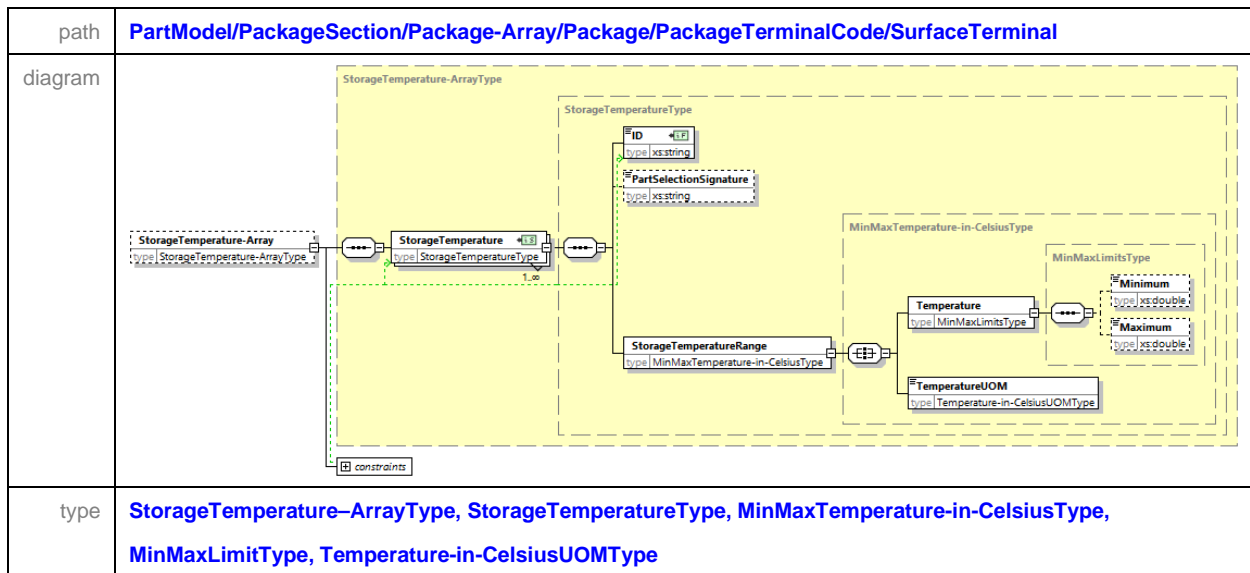
This section *FloorLife* enables the supplier to provide details on the allowable *FloorLifeTime* period after removal from a moisture barrier bag, dry storage, or dry bake and before the soldering process, under a set of temperature and humidity conditions.

4.6.2.2 Bake Type



This section *Bake* enables the supplier to provide details on the *BakeTemperature* in degree Celsius and the *BakeTime* duration in hours, in order to remove the moisture from the part prior to the soldering process.

4.6.3 Storage Temperature - Array Type



This section *StorageTemperature* enables the supplier to provide details on the storage temperature for the part.

Annex A (informative) Differences between JEP30-A100 and its predecessors

This table briefly describes most of the changes made to entries that appear in this standard, JEP30-A100, compared to its predecessor; Punctuation changes may or may not be included.

Change Record History		
Initial Issue: 1	Date: February 2018	Item Number: 11.2-938
Issue: A	Date: March 2023	Item Number:
Section 4.4.1.2.1.1 Preheat Soak: Renamed element name from “CelcuisTempUOM” to “TemperatureUOM”.		
Section 4.4.1.2.1.3 Wave Solder Temperature: Renamed element name from “CelcuisTempUOM” to “TemperatureUOM”.		
Sections 4.4.2, 4.4.2.1 and 4.4.2.2: Changed “FloorLife” and “Bake” from bounded to unbounded elements.		
Issue: B	Date: August 2024	Item Number: 11.2-1059
Description of Change		
Section 4.1, and section 4.2: Update sections to align with modifications performed at the JEP30 parent structure.		
Issue: B.01	Date: February 2025	Item Number: 11.2-1073
Description of Change		
Sections 1, 4.1, and 4.2: Update sections to align with modifications performed at the JEP30 parent structure.		
Issue: B.02	Date: September 2025	Item Number: 11.2-1083
Description of Change		
Section 4.1 PartModel - SupplyChain Section: Update sections to align with modifications performed at the JEP30 parent structure.		
Section 4.2 Manufacturer Part Number-Array: Updated images to match changes in the JEP30 parent schema		
Section 4.3 Standards Identifier Array: Added new section to connect Standards Identifiers to the Assembly Process Classification content.		
Section 4.4 Process Technology Identifier Array: Added new section to connect Process Technology Identifiers to the Assembly Process Classification content.		

Annex B (cont'd)

Multiple Sections within the Schema: The unit "DegC" is replaced by the proper SI character as in °C
Changed signature element names to ds:Signature in all sections

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Standard Improvement Form**JEDEC Standard No. JEP30-A100B.02**

The purpose of this form is to provide the Technical Committees of JEDEC with input from the industry regarding usage of the subject standard. Individuals or companies are invited to submit comments to JEDEC. All comments will be collected and dispersed to the appropriate committee(s).

If you can provide input, please complete this form and return to:

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Email: angies@jedec.org

1. I recommend changes to the following:

☐ Requirement, clause number _____

☐ Test method number _____ Clause number _____

The referenced clause number has proven to be:

☐ Unclear ☐ Too Rigid ☐ In Error

☐ Other _____

2. Recommendations for correction:

3. Other suggestions for document improvement:

Submitted by

Name: _____

Company: _____

Address: _____

City/State/Zip: _____

Phone: _____

E-mail: _____

Date _____

