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# IPC-2615

## Printed Board Dimensions and Tolerances

**IPC-2615**

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A standard developed by IPC

# Table of Contents

<b>1</b>	<b>PURPOSE</b>	1	<b>3</b>	<b>GEOMETRIC CHARACTERS AND SYMBOLS</b>	3
1.1	Scope	1	3.1	General	3
1.2	General	1	3.2	Use of Notes to Supplement Symbols	3
1.2.1	Units	1	3.3	Symbol Construction	3
1.2.2	Reference to This Standard	1	3.3.1	Geometric Characteristic Symbols	3
1.2.3	Figures	1	3.3.2	Datum Feature Symbol	3
1.2.4	Notes	1	3.3.3	Basic Dimension Symbol	
1.2.5	Reference to Gauging	1	3.3.4	Material Condition Symbols	4
1.3	References	1	3.3.5	Diameter and Radius Symbols	4
1.3.1	IPC Specifications	1	3.3.6	Reference Symbol	4
1.3.2	ANSI Standards	1	3.4	Geometric Tolerance Symbols	4
<b>2</b>	<b>TERMS AND DEFINITIONS</b>	1	3.4.1	Feature Control Frame	4
2.1	Actual Size	1	3.4.2	Feature Control Frame Incorporating Datum References	4
2.2	Basic Dimension	1	3.4.3	Combined Feature Control Frame and Datum Feature Symbol	5
2.3	Bilateral Tolerance	1	3.5	Feature Control Frame Placement	6
2.4	Cumulative Tolerances	1	<b>4</b>	<b>GENERAL RULES</b>	7
2.5	Datum	2	4.1	Maximum Material Condition Principle (MMC) Effect of MMC	7
2.6	Datum Feature	2	4.2	Regardless of Feature Size	7
2.7	Datum Axis	2	4.3	Least Material Condition Principle	7
2.8	Datum Target	2	4.4	Limits of Size	7
2.9	Dependent of Size	2	4.4.1	Individual Feature of Size (Rule #1)	7
2.10	Dimension	2	4.4.2	Relationship Between Individual Features	9
2.11	End Product (End Item)	2	4.5	Applicability of MMC, RFS, and LMC	9
2.12	Fabrication Allowance	2	<b>5</b>	<b>DATUM REFERENCING</b>	9
2.13	Feature	2	5.1	General	9
2.14	Feature of Size	2	5.1.1	Application	9
2.15	Fiducial	2	5.1.2	Datum Reference Frame	10
2.16	Geometric Tolerance	2	5.2	Datum Features	10
2.17	Limits of Size	2	5.2.1	Datum Feature Symbols	10
2.18	Least Material Condition (LMC)	2	5.2.2	Datum Feature Control	10
2.19	Maximum Material Condition (MMC)	2	5.2.3	Specifying Datums in Order of Precedence	11
2.20	Positional Tolerance	2	5.3	Establishing Datums	12
2.21	Reference Dimension	2	5.3.1	Primary Datum Feature	12
2.22	Regardless of Feature Size (RFS)	2	5.3.2	Secondary and Tertiary Datum Features Not Subject to Size Variations	12
2.23	Simulated Datum	2	5.3.3	Secondary and Tertiary Datum Features Subject to Size Variations	12
2.24	Tolerance	2	5.3.4	Specifying Datum Features RFS	12
2.25	Tolerance, Statistical	2	5.3.5	Specifying Datum Features at MMC	13
2.26	Toleranced Dimension	3	5.3.6	Cylindrical Datum Features	13
2.27	True Position	3	5.3.7	Angular Orientation	16
2.28	Undimensioned Drawing	3			
2.29	Unilateral Tolerance	3			
2.30	Virtual Condition	3			

5.3.8 Pattern of Features to Establish a Secondary Datum ..... 16

5.3.9 Multiple Datum Reference Frames ..... 16

5.4 Datum Targets ..... 18

5.4.1 Datum Target Symbols ..... 18

5.4.2 Datum Target Dimensions ..... 19

5.4.3 Datum Planes ..... 19

**6 TOLERANCES OF LOCATION** ..... 21

6.1 General ..... 21

6.2 Positional Tolerancing ..... 21

6.2.1 Feature Locations Given by Basic Dimensions ..... 21

6.2.2 Feature Control Frame ..... 21

6.2.3 Establish Datums for Dimensions Locating True Positions ..... 21

6.2.4 Application to Base Line and Chain Dimensioning ..... 21

6.3 Fundamental Explanation of Positional Tolerancing ..... 21

6.3.1 Material Condition Basis ..... 21

6.3.2 MMC as Related to Positional Tolerancing ..... 21

6.3.3 LMC as Related to Positional Tolerancing ..... 24

6.3.4 Multiple Patterns of Features Located by Basic Dimensions Relative to Common Datums ..... 24

6.4 Feature Pattern Location ..... 26

6.4.1 Composite Positional Tolerancing ..... 26

6.5 Bi-directional Positional Tolerancing of Features .... 26

6.6 Position of Non-Circular Features ..... 26

6.6.1 Non-circular Features at MMC ..... 27

6.7 Undimensioned Drawings (Artwork) ..... 27

**7 TOLERANCES OF FORM, ORIENTATION, PROFILE** ..... 38

7.1 General ..... 38

7.2 Form and Orientation Control ..... 38

7.3 Specifying Form and Orientation Tolerances ... 38

7.3.1 Form and Orientation Tolerance Zones ..... 38

7.4 Profile Control ..... 38

7.4.1 Profile Tolerancing ..... 39

7.4.2 Controlled Radius Tolerance ..... 39

7.4.3 Angular Surfaces ..... 39

**Appendix A: FUNDAMENTAL DIMENSIONING AND TOLERANCING RULES** ..... 45

**Appendix B: GENERAL TOLERANCING AND RELATED PRINCIPLES** ..... 56

**Appendix C: DIMENSIONING FOR COMPUTER-AIDED DESIGN AND MANUFACTURING** ..... 58

**Figures**

Figure 3-1 Datum Feature Symbol ..... 4

Figure 3-2 Examples of Datum Identification ..... 5

Figure 3-3 Basic Dimension Symbol ..... 5

Figure 3-4 Feature Control Frame ..... 6

Figure 3-5 Feature Control Frame Incorporating Datum Report ..... 6

Figure 3-6 Order of Precedence of Datum Reference ..... 6

Figure 3-7 Multiple Feature Control Frames ..... 7

Figure 3-8 Symbol for All Around ..... 7

Figure 3-9 Combined Feature Control Frame and Datum Feature Symbol ..... 7

Figure 3-10 Feature Control Frame Placement ..... 7

Figure 4-1 Positional Tolerancing at MMC ..... 8

Figure 4-2 Variations of Form Allowed By Size Tolerance ..... 9

Figure 5-1 Datum Reference Frame ..... 10

Figure 5-2 Datum Reference Frame to Printed Board Relationships ..... 11

Figure 5-3 Datum Reference Using Printed Board Edges ..... 12

Figure 5-4 Hole and Slot Establishing Secondary and Tertiary Datums ..... 12

Figure 5-5 Additional Datum Example ..... 13

Figure 5-6 Datum Feature Identification and Reference . 14

Figure 5-7 Secondary Datum Established By Internal Feature ..... 14

Figure 5-8 Datum Feature and Simulated Datum ..... 15

Figure 5-9 Virtual Condition of Datum Feature ..... 15

Figure 5-10 Part With Cylindrical Datum Features (a) primary datum feature K, which establishes a datum plane; and (b) secondary datum feature M, which establishes a datum axis. .... 16

Figure 5-11 Cylindrical Internal Datum Features ..... 17

Figure 5-12 Development of a Datum Reference Frame .. 17

Figure 5-13 Pattern of Feature to Establish Secondary Datum ..... 18

Figure 5-14 Multiple Datum Reference Conditions (Rigid/Flex) Examples ..... 18

Figure 5-15 Referencing Datums in Feature Control Frames ..... 19

Figure 5-16 Datum Target Symbol ..... 19

Figure 5-17 Datum Target Point ..... 20

Figure 5-18 Dimensioning Datum Targets ..... 20

Figure 5-19 Primary Datum Plane Established ..... 21

Figure 6-1 Identifying Basic Dimensions ..... 22

Figure 6-2 Positional Tolerances With Datum Reference ..... 23

Figure 6-3 Positional Tolerancing ..... 23

Figure 6-4 Establishing Datums for True Position Location ..... 24

Figure 6-5 Basic Dimensioning Using Chain or Baseline Format ..... 25

Figure 6-6 Boundary for Surface of Hole at MMC ..... 26

Figure 6-7 Hole Axes in Relation to Positional Tolerance Zones ..... 27

Figure 6-8 Increase in Positional Tolerance Where Hole is Not at MMC ..... 28

Figure 6-9 Conventional Positional Tolerancing at MMC ..... 29

Figure 6-10 Regardless of Feature Size Applied to A Feature and A Datum ..... 29

Figure 6-11 Increase in Positional Tolerance Where Hole is not at LMC ..... 30

Figure 6-12 LMC Applied to A Pattern of Mounting Pins ... 31

Figure 6-13 Multiple Patterns of Features ..... 32

Figure 6-14 Tolerance Zones for Patterns Shown in Figure 6-13 ..... 33

Figure 6-15 Multiple Patterns of Features, Separate Requirement ..... 34

Figure 6-16 Hole Patterns Located By Composite Positional Tolerancing ..... 35

Figure 6-17 Tolerance Zone for Three-Hole Hole Patterns Shown in Figure 6-16. .... 36

Figure 6-18 Bi-Directional Positional Tolerancing, Rectangular Coordinate Method ..... 37

Figure 6-19 Keying Slot Detail ..... 37

Figure 6-20 "V" Groove ..... 37

Figure 6-21 Keying Slot Detail ..... 38

Figure 7-1 Application of A Profile of A Surface to A Contour ..... 40

Figure 7-2 Specifying Profile of A Surface All Around .... 41

Figure 7-3 Specifying Different Profile Tolerance ..... 42

Figure 7-4 Profile Implementation ..... 42

Figure 7-5 Specifying A Controlled Radius ..... 43

Figure 7-6 Tolerancing An Angular Surface Using A Combination of Linear and Angular Dimensions ..... 43

Figure 7-7 Interpreting Angularity Tolerances ..... 44

Figure 7-8 45 Degree Chamfer ..... 44

Figure A-1 Angular Units ..... 46

Figure A-2 Millimeter Dimensioning ..... 46

Figure A-3 Decimal Inch Dimensioning ..... 46

Figure A-4 Application of Dimensions ..... 47

Figure A-5 Grouping of Dimensions ..... 47

Figure A-6 Spacing of Dimensions ..... 47

Figure A-7 Staggered Dimensions ..... 47

Figure A-8 Dimension Line/Extension Line ..... 47

Figure A-9 Oblique Extension Lines ..... 48

Figure A-10 Breaks In Extension Lines ..... 48

Figure A-11 Point Location ..... 48

Figure A-12 Limited Length or Area Indication ..... 48

Figure A-13 Leader-Directed Dimension ..... 48

Figure A-14 Minimizing Leaders ..... 49

Figure A-15 Leader Directed to Circle ..... 49

Figure A-16 Reading Direction ..... 49

Figure A-17 Intermediate Reference Dimension ..... 49

Figure A-18 Radii ..... 50

Figure A-19 Radius With Locating Center ..... 50

Figure A-20 Radii With Unlocated Center ..... 50

Figure A-21 Dimensioning Chords, Arcs, and Angles ..... 50

Figure A-22 Fully Rounded Ends ..... 51

Figure A-23 Partially Rounded Ends ..... 51

Figure A-24 Rounded Corners ..... 51

Figure A-25 Circular Arc Outline ..... 51

Figure A-26 Coordinate or Offset Outline ..... 51

Figure A-27 Tabulated Outline ..... 51

Figure A-28 Round Holes ..... 52

Figure A-29 Slotted Holes ..... 52

Figure A-30 Equalized Chamfers ..... 52

Figure A-31 Chamfers at Other Than 90° ..... 53

Figure A-32 Edge Card Connector ..... 53

Figure A-33 Rectangular Coordinate Dimension ..... 54

Figure A-34 Rectangular Coordinate Dimensions Without Dimension Lines ..... 54

Figure A-35 Polar Coordinate Dimensions ..... 54

Figure A-36 Repetitive Features and Dimensions ..... 55

Figure A-37 Equal Spacing of Feature ..... 55

Figure B-1 Limit Dimensions ..... 56

Figure B-2 Plus or Minus Tolerances ..... 57

Figure C-1 Mathematical Quadrants ..... 58

Figure C-2 Locating A Circuit Pattern Using Fiducials Relative to Plated-Through Holes ..... 59

**Tables**

Table 3-1 General Geometric Characteristic Symbols ..... 3

Table 3-2 Special Application Symbols ..... 3

Table 3-3 Modifying Symbols ..... 6

Table 4-1 Maximum Material Condition Range ..... 8

Table 4-2 Regardless of Feature Size Range ..... 8

Table 4-3 Least Material Condition Range ..... 9

# Printed Board Dimensions and Tolerances

## 1 PURPOSE

The purpose of this Standard is to establish acceptable principals and practices for dimensioning and tolerancing used to define end-product requirements for printed boards and printed board assemblies.

**1.1 Scope** This Standard covers dimensioning and tolerancing of electronic packaging as it relates to printed boards and the assembly of printed boards. The concepts defined in this Standard are derived from ASME Y14.5M-1994. Printed boards have such wide applications that there may be times where this standard does not address a specific case. In those cases, the user is referred to ASME Y14.5M 1994 for use of additional dimensioning and tolerancing concepts.

**1.2 General** This Standard covers dimensioning, tolerancing, and related practices for use on printed board drawings and in related documents. Uniform practices for stating and interpreting these requirements are established herein.

**1.2.1 Units** The International System of Units (SI) is featured in this Standard.

**1.2.2 Reference to This Standard** Where drawings are based on this Standard, this fact shall be noted on the drawings or in a document referenced on the drawings. References to this Standard shall state "IPC-2615 or per IPC-2615."

**1.2.3 Figures** The figures in this Standard are intended only as illustrations to aid the user in understanding the principles and methods of dimensioning and tolerancing described in the text. The absence of a figure illustrating the desired application is neither reason to assume inapplicability nor basis for drawing rejection. In some instances figures show added detail for emphasis, in other instances figures are incomplete by intent. Numerical values of dimensions and tolerances are illustrative only.

**1.2.4 Notes** Notes herein in capital letters are intended to appear on finished drawings. Notes in lower case letters are explanatory only and are not intended to appear on drawings.

**1.2.5 Reference to Gauging** This document is not intended as a gauging standard. Any reference to gauging is included for explanatory purposes only.

## 1.3 References

### 1.3.1 IPC Specifications<sup>1</sup>

**IPC-T-50** Terms and Definitions

**IPC-D-310** Guidelines for Phototool and Artwork Generation

**IPC-D-325** Documentation for Printed Boards and Printed Board Assemblies

**IPC-D-330** Design Guide for Printed Boards and Printed Board Assemblies

**IPC-2220** Design Standard Series for Printed Boards

**IPC-6010** Performance Specification Series for Printed Boards

**1.3.2 ANSI Standards<sup>2</sup>** When the following American National Standards referred to in this Standard are superseded by a revision approved by the American National Standards Institute, Inc., the latest revision shall apply.

ANSI Y14.1-1980, Drawing Sheet Size and Format

ANSI Y14.2M-1979, Line Conventions and Lettering

ASME Y14.5M-1994, Geometric Dimensioning and Tolerancing

ANSI Z210.1-1976, Metric Practice

## 2 TERMS AND DEFINITIONS

The definition of terms shall be in accordance with IPC-T-50 and the following.

**2.1 Actual Size** The measured size.

**2.2 Basic Dimension** A numerical value used to describe the theoretically exact size, profile, orientation, or location of a feature or datum target. It is the basis from which permissible variations are established by tolerances on other dimensions, in notes, or in feature control frames (see 3.4.1).

**2.3 Bilateral Tolerance** A tolerance in which variation is permitted in both directions from the specified dimension.

**2.4 Cumulative Tolerances** The summation of all tolerances permitted between functionally related features:

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2. ANSI, 655 15th Street N.W., Suite 300, Washington, DC 20005-5794