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(JBIA)

**Rolling bearings — Boundary dimensions
— Part 3: Tapered roller bearings**

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Bearing Industry Association (JBIA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied *mutatis mutandis* pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS B 1512-3** : 2011), which has been technically revised.

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JIS B 1512 series consists of the following 6 parts under the general title *Rolling bearings — Boundary dimensions*:

Part 1 : Radial bearings

Part 2 : Thrust bearings

Part 3 : Tapered roller bearings

Part 4 : Flange dimensions of radial ball bearings with flanged outer ring

Part 5 : Chamfer dimensions for loose rib and non-rib sides of single-row cylindrical roller bearings

Part 6 : Chamfer dimensions for outer ring non-thrust side of single-row angular contact ball bearings

Rolling bearings — Boundary dimensions — Part 3 : Tapered roller bearings

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 355** : 2019, Edition 3, with some modifications of the technical contents to reflect the local situation in Japan, including addition of contents not given in the said International Standard.

Annex JA is unique to **JIS** and not given in the corresponding International Standard. The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB.

1 Scope

This Standard specifies the bearing and subunit dimension series and boundary dimensions for complete single-row, double-row and matched pair of tapered roller bearings (hereafter referred to as bearings). It also specifies the flange dimensions of flanged outer rings for a selection of these bearings.

NOTE 1 Boundary dimensions of tapered roller bearings are also covered by **JIS B 1534** ^[2]. While this Standard specifies dimension series and boundary dimensions, **JIS B 1534** ^[2] provides a selection of generally used bearing boundary dimensions derived from this Standard and the corresponding designations.

NOTE 2 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 355 : 2019 *Rolling bearings — Tapered roller bearings — Boundary dimensions and series designations* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0104 *Rolling bearings — Vocabulary*

NOTE Normative reference in the corresponding International Standard : ISO 5593 *Rolling bearings — Vocabulary*

JIS B 0124 *Rolling bearings — Symbols for quantities*

NOTE Normative reference in the corresponding International Standard : ISO 15241 *Rolling bearings — Symbols for physical quantities*

JIS B 1514-1 *Rolling bearings — Geometrical product specifications (GPS) and tolerance values — Part 1 : Radial bearings*

NOTE Normative reference in the corresponding International Standard : ISO 492 *Rolling bearings — Radial bearings — Geometrical product specifications (GPS) and tolerance values*

JIS B 1514-3 *Rolling bearings — Tolerances of bearings — Part 3 : Chamfer dimensions — Maximum values*

NOTE Normative reference in the corresponding International Standard : ISO 582 *Rolling bearings — Chamfer dimensions — Maximum values*

JIS B 1515-1 *Rolling bearings — Tolerances — Part 1 : Terms and definitions*

NOTE Normative reference in the corresponding International Standard : ISO 1132-1 *Rolling bearings — Tolerances — Part 1 : Terms and definitions*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS B 0104** and **JIS B 1515-1** apply.

4 Symbols

For the purpose of this Standard, the symbols given in **JIS B 0124** and **JIS B 1514-1**, and the following apply. The symbols shown in Figures 1 to 4 and the values given in Tables 4 to 16 denote nominal dimensions unless specified otherwise.

- B : inner ring width of single-row bearing
- B_1 : overall width of inner rings of double-row tapered roller bearing or matched pair of tapered roller bearings with spacer
- C : outer ring width of single-row bearing
- C_1 : width of outer ring flange ¹⁾

Note ¹⁾ This dimension was given the symbol C_2 in **JIS B 1512-3 : 2011**.

- C_2 : width of double outer ring, or overall width of outer rings of matched pair of tapered roller bearings with spacers ²⁾

Note ²⁾ This dimension was given the symbol C_1 in **JIS B 1512-3 : 2011**.

- D : outside diameter of outer ring
- D_1 : outside diameter of outer ring flange
- d : bore diameter of inner ring
- E : inside diameter of outer ring back face
- h_1 : height of outer ring flange
- r : chamfer dimension of inner ring back face

$r_{s \min}$: smallest single chamfer dimension of inner ring back face

r_1 : chamfer dimension of outer ring back face

$r_{ls \min}$: smallest single chamfer dimension of outer ring back face

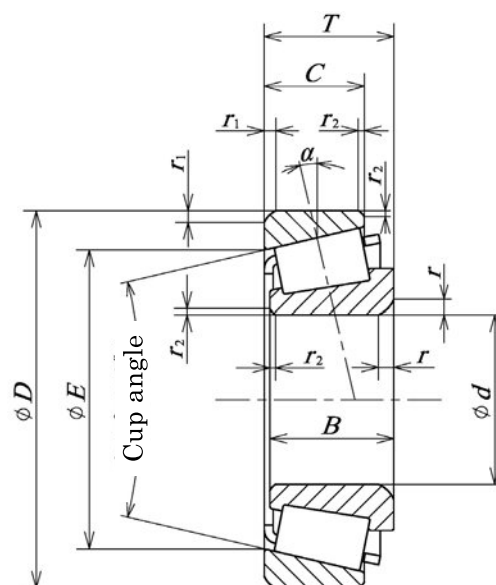
r_2 : chamfer dimension of inner ring and outer ring front face

T : bearing width of single-row bearing

T_F : bearing width of single-row tapered roller bearing with flanged outer ring

α : contact angle ³⁾

Note ³⁾ The position of this angle has been changed from **JIS B 1512-3 : 2011**.

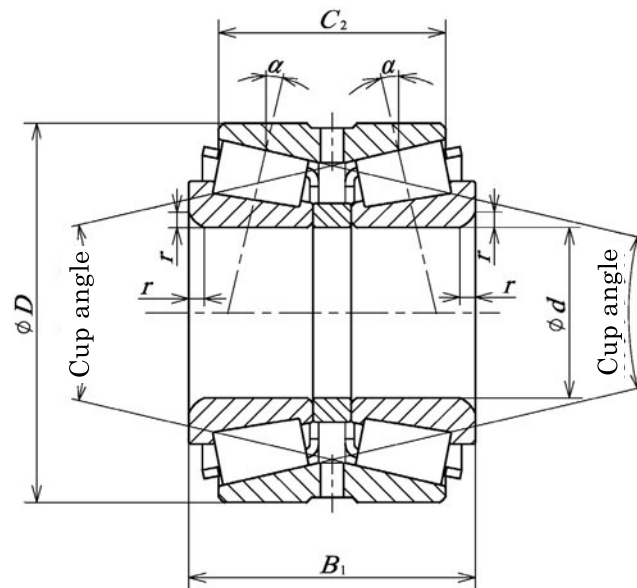


NOTE 1 The contact angle of a tapered roller bearing is equal to half the cup angle.

(Source : **JIS B 0104** : 1991, **04.04.04**, cup angle)

NOTE 2 The chamfer geometry defined by r and r_1 is in accordance with **JIS B 1514-3**.

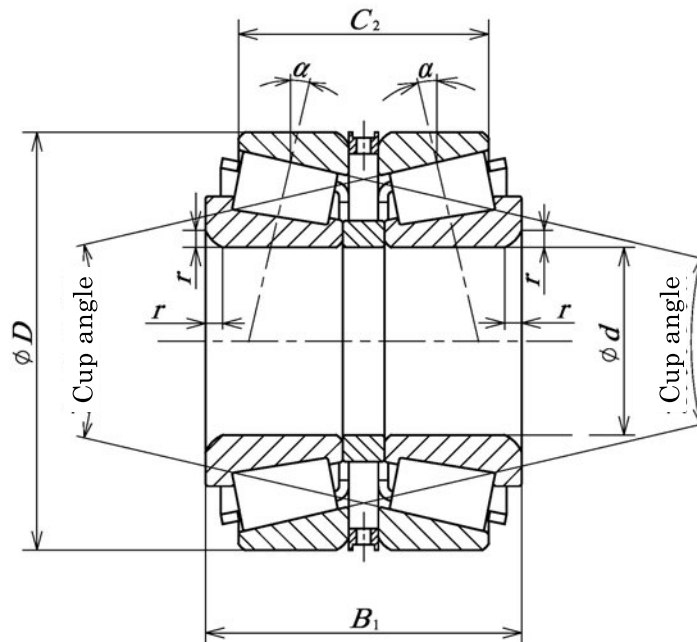
Figure 1 Single-row tapered roller bearing



NOTE 1 The double-row bearing outer ring may or may not have a lubrication groove and holes.

NOTE 2 The chamfer geometry defined by r is in accordance with **JIS B 1514-3**.

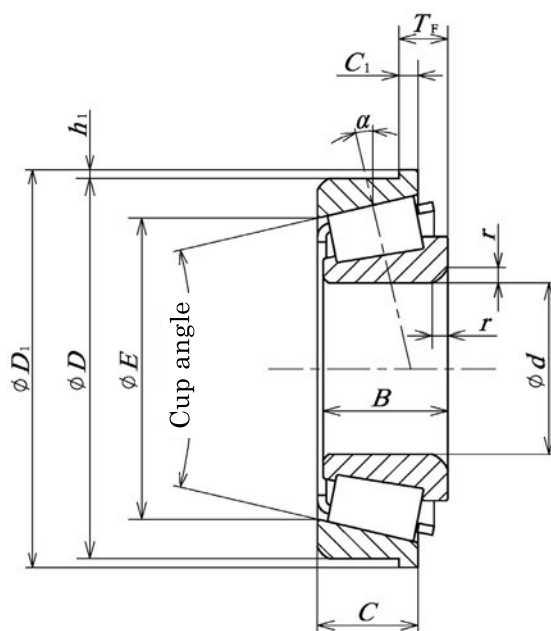
Figure 2 Double-row tapered roller bearing with double raceway outer ring



NOTE 1 The outer spacer may or may not have a lubrication groove and holes.

NOTE 2 The chamfer geometry defined by r is in accordance with **JIS B 1514-3**.

Figure 3 Matched pair of tapered roller bearings in back-to-back arrangement with spacers



NOTE The chamfer geometry defined by r is in accordance with JIS B 1514-3.

Figure 4 Single-row tapered roller bearing with flanged outer ring

5 Series designations

Each bearing whose dimensions are given in this Standard is referred to a dimension series. The dimension series is designated by a combination of three symbols, for example 2AC, denoting the contact angle series, diameter series and width series, respectively.

- Contact angle series** A numeric character which represents a range of contact angles, given first in the dimension series designation.
- Diameter series** An alphabetic character which represents a range of numeric values for the outside diameter to bore relationship, given second in the dimension series designation.
- Width series** An alphabetic character which represents a range of numeric values for the width to height relationship of a single-row bearing, given third in the dimension series designation.

NOTE 1 The dimension series designation can be used to build a taper roller bearing designation according to Annex JA.

NOTE 2 In Tables 4 to 16, the conventional series designations derived from Attached Table 1 of JIS B 1513 : 1995 ^[1] are given for reference in the column of "Conventional dimension series (informative)" next to the column of "Dimension series". For the details of dimension series and conventional dimension series, see Annex JA.

The designations for the standardized bearings generally conform with the angle

ranges and the numeric values for the relationships given in Tables 1 to 3.

In some cases, an exception has been made to avoid the condition that the same designation be used for two different bearings with the same bore diameter; in these cases, series designations other than given in this clause are shown in Tables 4 to 7, Table 9, Table 13 and Table 14.

The series designations shown in this clause shall not be applied to bearings other than those specified in Clause 6.

Table 1 Contact angle series

Designation of contact angle series	α	
	$>$	$\leq$
1	— a)	— a)
2	10°	13°52'
3	13°52'	15°59'
4	15°59'	18°55'
5	18°55'	23°
6	23°	27°
7	27°	30°
Note a) Reserved for future use.		

Table 2 Diameter series

Designation of diameter series	$\frac{D}{d^{0.77}}$	
	$>$	$\leq$
A	— a)	— a)
B	3.4	3.8
C	3.8	4.4
D	4.4	4.7
E	4.7	5
F	5	5.6
G	5.6	7
Note a) Reserved for future use.		

Table 3 Width series

Designation of width se- ries	$\frac{T}{(D-d)^{0.95}}$	
	$>$	$\leq$
A	— a)	— a)
B	0.5	0.68
C	0.68	0.8
D	0.8	0.88
E	0.88	1
Note a) Reserved for future use.		

6 Boundary dimensions

6.1 General

The bearing and subunit boundary dimensions given in Tables 4 to 16 are grouped by contact angle series and then listed in ascending order of bore, outside diameter and bearing width. Tolerances for the dimensions shall be as given in **JIS B 1514-1**. The chamfer dimensions r and r_1 only apply at the corners as indicated in Figures 1 to 4 and are specified by the smallest single chamfer dimensions $r_{\text{§ min}}$ and $r_{1\text{§ min}}$. Maximum chamfer dimensions shall be in accordance with **JIS B 1514-3**.

In this Standard, no values are given for the inner ring and outer ring front face chamfer dimension, r_2 . However, the front face corners shall not be sharp.

6.2 Single-row tapered roller bearings

Boundary dimensions for contact angle series 2, 3, 4, 5 and 7 are given in Tables 4, 5, 6, 7 and 8 respectively.

Table 4 . Contact angle series 2

Unit: mm

d	D	T	B	$r_s \min^{a)}$	C	$r_{1s} \min^{a)}$	α (° ' ")	E	Dimension series	Conventional dimension series (informative)
15	42	14.25	13	1	11	1	10° 45' 29"	33.272	2FB	03
17	40	13.25	12	1	11	1	12° 57' 10"	31.408	2DB	02
17	40	17.25	16	1	14	1	11° 45'	31.17	2DD	22
17	47	15.25	14	1	12	1	10° 45' 29"	37.42	2FB	03
17	47	20.25	19	1	16	1	10° 45' 29"	36.09	2FD	23
20	37	12	12	0.3	9	0.3	12°	29.621	2BD	29
20	45	17	17.5	1	13.5	1	12°	35.815	2DC	—
20	47	15.25	14	1	12	1	12° 57' 10"	37.304	2DB	02
20	47	19.25	18	1	15	1	12° 28'	35.81	2DD	22
20	50	22	22	2	18.5	1.5	12° 30'	38.063	2ED	—
20	52	16.25	15	1.5	13	1.5	11° 18' 36"	41.318	2FB	03
20	52	22.25	21	1.5	18	1.5	11° 18' 36"	39.518	2FD	23
22	40	12	12	0.3	9	0.3	12°	32.665	2BC	29
22	47	17	17.5	1	13.5	1	12° 35'	37.542	2CC	—
22	52	22	22	2	18.5	1.5	12° 14'	40.548	2ED	—
25	42	12	12	0.3	9	0.3	12°	34.608	2BD	29
25	47	17	17	0.6	14	0.6	10° 55'	38.278	2CE	30
25	50	17	17.5	1.5	13.5	1	13° 30'	40.205	2CC	—
25	52	19.25	18	1	16	1	13° 30'	41.331	2CD	22
25	52	22	22	1	18	1	13° 10'	40.441	2DE ^{b)}	32
25	58	26	26	2	21	1.5	12° 30'	44.805	2EE	—
25	62	18.25	17	1.5	15	1.5	11° 18' 36"	50.637	2FB	03
25	62	25.25	24	1.5	20	1.5	11° 18' 36"	48.637	2FD	23
28	45	12	12	0.3	9	0.3	12°	37.639	2BD	29
28	55	19	19.5	1.5	15.5	1.5	12° 10'	44.888	2CD	—
28	58	24	24	1	19	1	12° 45'	45.846	2DE	32
28	65	27	27	2	22	2	12° 45'	50.33	2ED	—
30	47	12	12	0.3	9	0.3	12°	39.617	2BD	29
30	55	20	20	1	16	1	11°	45.283	2CE	30
30	58	19	19.5	1.5	15.5	1.5	12° 50'	47.309	2CD	—
30	62	25	25	1	19.5	1	12° 50'	49.524	2DE	32
30	68	29	29	2	24	2	12° 28'	52.696	2EE	—
30	72	20.75	19	1.5	16	1.5	11° 51' 35"	58.287	2FB	03
30	72	28.75	27	1.5	23	1.5	11° 51' 35"	55.767	2FD	23

Table 4 (continued)

Unit: mm										
d	D	T	B	$r_s \min^a)$	C	$r_{ls} \min^a)$	α (° ' ")	E	Dimension series	Conventional dimensional series (informative)
32	52	14	15	0.6	10	0.6	12°	44.261	2BD	29
32	62	21	21	1.5	17	1.5	12° 30'	50.554	2CD	30
32	65	26	26	1	20.5	1	13°	51.791	2DE	32
32	72	29	29	2	24	2	12° 41' 30"	56.151	2ED	33
35	55	14	14	0.6	11.5	0.6	11°	47.22	2BD	29
35	62	21	21	1	17	1	11° 30'	51.32	2CE	30
35	68	23	23	2	18.5	2	12° 35'	55.4	2DD	31
35	72	28	28	1.5	22	1.5	13° 15'	57.186	2DE	32
35	78	33	32.5	2.5	27	2	12° 12'	61.925	2EE ^{b)}	33
35	80	22.75	21	2	18	1.5	11° 51' 35"	65.769	2FB	33
35	80	32.75	31	2	25	1.5	11° 51' 35"	62.829	2FE	33
40	62	15	15	0.6	12	0.6	10° 55'	53.388	2BC	29
40	68	22	22	1	18	1	10° 40'	57.29	2BE ^{b)}	30
40	75	24	24	2	19.5	2	12° 07'	62.155	2CD	31
40	75	26	26	1.5	20.5	1.5	13° 20'	61.169	2CE	31
40	80	32	32	1.5	25	1.5	13° 25'	63.405	2DE	32
40	85	33	32.5	2.5	28	2	12° 55'	66.612	2EE	33
40	90	25.25	23	2	20	1.5	12° 57' 10"	72.703	2FB	33
40	90	35.25	33	2	27	1.5	12° 57' 10"	69.253	2FD	33
45	68	15	15	0.6	12	0.6	12°	58.852	2BC	29
45	75	24	24	1	19	1	11° 05'	63.116	2CE	30
45	80	24	24	2	19.5	2	13°	66.615	2CD	31
45	95	36	35	2.5	30	2.5	12° 09'	75.712	2ED ^{b)}	33
45	100	27.25	25	2	22	1.5	12° 57' 10"	81.78	2FB	33
45	100	38.25	36	2	30	1.5	12° 57' 10"	78.33	2FD	33
50	72	15	15	0.6	12	0.6	12° 50'	62.748	2BC	29
50	80	24	24	1	19	1	11° 55'	67.775	2CE	30
50	82	21.5	21.5	3	17	0.5	11° 30'	70.594	2CC	31
50	85	24	24	2	19.5	2	13° 52'	70.969	2CD	31
50	90	28	28	3	23	2.5	12° 22'	74.538	2DD	32
50	100	36	35	2.5	30	2.5	12° 51'	79.996	2ED	33
50	110	29.25	27	2.5	23	2	12° 57' 10"	90.633	2FB	33
50	110	42.25	40	2.5	33	2	12° 57' 10"	86.263	2FD	33
55	80	17	17	1	14	1	11° 39'	69.503	2BC	29
55	85	18	18.5	2	14	2	12° 49'	73.586	2CC	31
55	90	27	27	1.5	21	1.5	11° 45'	76.656	2CE	30
55	95	27	27	2	21.5	2	12° 43' 30"	80.106	2CD	31
55	95	29	29	1.5	23.5	2.5	12° 35'	79.593	2DD ^{b)}	32
55	110	39	39	2.5	32	2.5	13°	88.446	2ED ^{b)}	33
55	120	31.5	29	2.5	25	2	12° 57' 10"	99.146	2FB	33
55	120	45.5	43	2.5	35	2	12° 57' 10"	94.316	2FD	33

Table 4 (continued)

Unit: mm

d	D	T	B	$r_s \min^a)$	C	$r_{1s} \min^a)$	α (° ' ")	E	Dimension series	Conventional dimension series (informative)
60	85	17	17	1	14	1	12° 27'	74.185	2BC	29
60	90	18	18.5	2	14	2	13° 38' 30"	78.249	2CC	—
60	95	27	27	1.5	21	1.5	12° 20'	80.422	2CE	30
60	100	27	27	2	21.5	2	13° 27'	84.587	2CD	—
60	115	40	39	2.5	33	2.5	12° 30'	93.46	2EE	—
60	130	33.5	31	3	26	2.5	12° 57' 10"	107.769	2FB	03
60	130	48.5	46	3	37	2.5	12° 57' 10"	102.939	2FD	23
65	90	17	17	1	14	1	13° 15'	78.849	2BC	29
65	100	22	22	2	17.5	2	12° 10' 30"	87.433	2CC	—
65	100	27	27	1.5	21	1.5	13° 05'	85.257	2CE	30
65	110	31	31	2	25	2	12° 27'	93.09	2DD	—
65	120	39	38.5	3	32	2.5	12° 40'	98.572	2ED	—
65	125	43	42	2.5	35	2.5	12°	102.378	2FD	—
65	140	36	33	3	28	2.5	12° 57' 10"	116.846	2GB	03
65	140	51	48	3	39	2.5	12° 57' 10"	111.786	2GD	23
70	100	20	20	1	16	1	11° 53'	88.59	2BC	29
70	105	22	22	2	17.5	2	12° 49' 30"	92.004	2CC	—
70	110	31	31	1.5	25.5	1.5	10° 45'	95.021	2CE	30
70	120	34	33	2	27	2	12° 22'	101.343	2DD	—
70	130	43	42	3	35	2.5	12° 31' 30"	106.766	2ED	—
70	150	38	35	3	30	2.5	12° 57' 10"	125.244	2GB	03
70	150	54	51	3	42	2.5	12° 57' 10"	119.724	2GD	23
75	105	20	20	1	16	1	12° 31'	93.223	2BC	29
75	115	25	25	2	20	2	12°	100.414	2CC	—
75	115	31	31	1.5	25.5	1.5	11° 15'	99.4	2CE	30
75	125	34	33	2.5	27	2	12° 55'	105.786	2DD	—
75	135	43	42	3	35	2.5	13° 03'	111.153	2ED	—
75	145	51	51	3	42	2.5	13° 34'	117.744	2FE	—
75	160	40	37	3	31	2.5	12° 57' 10"	134.097	2GB	03
75	160	58	55	3	45	2.5	12° 57' 10"	127.887	2GD	23
80	110	20	20	1	16	1	13° 10'	97.974	2BC	29
80	120	25	25	2	20	2	12° 33' 30"	105.003	2CC	—
80	125	36	36	1.5	29.5	1.5	10° 30'	107.75	2CE	30
80	130	34	33	2.5	27	2	13° 30'	110.475	2DD	—
80	145	46	45	3	38	2.5	12° 02'	120.366	2ED	—
80	170	42.5	39	3	33	2.5	12° 57' 10"	143.174	2GB	03
80	170	61.5	58	3	48	2.5	12° 57' 10"	136.504	2GD	23

Table 4 (continued)

Unit: mm										
d	D	T	B	$r_s \min^{a)}$	C	$r_{ls} \min^{a)}$	α (° ' ")	E	Dimension series	Conventional dimension series (informative)
85	120	23	23	1.5	18	1.5	12° 18'	106.599	2BC ^{b)}	29
85	125	25	25	2.5	20	2	13° 07' 30"	109.65	2CC	—
85	130	36	36	1.5	29.5	1.5	11°	112.838	2CE	30
85	135	34	33	2.5	28	2	13° 02'	115.904	2DD	—
85	150	46	46	3	38	3	12° 30'	124.965	2ED	—
85	180	44.5	41	4	34	3	12° 57' 10"	150.433	2GB	03
85	180	63.5	60	4	49	3	12° 57' 10"	144.223	2GD	23
90	125	23	23	1.5	18	1.5	12° 51'	111.282	2BC ^{b)}	29
90	135	28	27.5	2.5	23	2	12° 01' 30"	119.139	2CC	—
90	140	34	33	2.5	28	2.5	12° 02' 30"	121.86	2CD	—
90	140	39	39	2	32.5	1.5	10° 10'	122.363	2CE	30
90	155	44	44	3	35.5	2.5	12° 48' 40"	130.944	2EC ^{b)}	—
90	155	46	46	3	38	3	12° 17'	130.206	2ED	—
90	165	47	46	3	39	3	12°	140.251	2FC	—
90	190	46.5	43	4	36	3	12° 57' 10"	159.061	2GB	03
90	190	57.15	57.531	8	46.038	3.3	12° 35'	157.96	2GC	—
90	190	67.5	64	4	53	3	12° 57' 10"	151.701	2GD	23
95	130	23	23	1.5	18	1.5	13° 25'	116.082	2BC ^{b)}	29
95	140	28	27.5	2.5	23	2.5	12° 30'	123.797	2CC	—
95	145	34	33	2.5	28	2.5	12° 30'	126.419	2CD	—
95	145	39	39	2	32.5	1.5	10° 30'	126.346	2CE	30
95	160	46	46	3	38	3	12° 43'	134.711	2ED	—
95	200	49.5	45	4	38	3	12° 57' 10"	165.861	2GB	03
95	200	71.5	67	4	55	3	12° 57' 10"	160.318	2GD	23
100	140	25	25	1.5	20	1.5	12° 23'	125.717	2CC	29
100	145	28	27.5	2.5	23	2.5	12° 58' 30"	128.448	2DC ^{b)}	—
100	150	34	33	2.5	28	2.5	12° 57' 30"	130.992	2CD	—
100	150	39	39	2	32.5	1.5	10° 50'	130.323	2CE	30
100	165	47	46	3	39	3	12°	140.251	2EE	—
100	215	51.5	47	4	39	3	12° 57' 10"	178.578	2GB	03
100	215	66.675	66.675	7	53.975	3.3	12° 15'	177.891	2GC	—
100	215	77.5	73	4	60	3	12° 57' 10"	171.65	2GD	23
105	145	25	25	1.5	20	1.5	12° 51'	130.359	2CC	29
105	155	33	31.5	2.5	27	2.5	12° 17' 30"	137.045	2CD	—
105	160	38	37	3	31	2.5	12° 17' 30"	139.734	2DD	—
105	160	43	43	2.5	34	2	10° 40'	139.304	2DE	30
105	170	47	46	3	39	3	12° 18' 30"	145.104	2EE	—
105	225	53.5	49	4	41	3	12° 57' 10"	186.752	2GB	03
105	225	81.5	77	4	63	3	12° 57' 10"	179.359	2GD	23

Table 4 (continued)

Unit: mm

d	D	T	B	$r_s \min^a)$	C	$r_{ls} \min^a)$	α (° ' ")	E	Dimension series	Conventional dimension series (informative)
110	150	25	25	1.5	20	1.5	13° 20'	135.182	2CC	29
110	160	33	31.5	2.5	27	2.5	12° 42' 30"	141.607	2CD	—
110	165	38	37	3	31	2.5	12° 42' 30"	144.376	2DD	—
110	170	47	47	2.5	37	2	10° 50'	146.265	2DE	30
110	175	47	46	4	39	3	12° 41' 30"	149.543	2EE ^{b)}	—
110	240	54.5	50	4	42	3	12° 57' 10"	199.925	2GB	03
110	240	84.5	80	4	65	3	12° 57' 10"	192.071	2GD	23
120	165	29	29	1.5	23	1.5	13° 05'	148.464	2CC	29
120	175	36	35	2.5	29	2.5	12° 08'	155.479	2DC ^{b)}	—
120	180	41	40	3	33	2.5	12° 08' 30"	158.233	2DD	—
120	180	48	48	2.5	38	2	11° 30'	154.777	2DE	30
120	190	50	49	4	41	3	12° 09' 30"	163.635	2EE	—
120	260	59.5	55	4	46	3	12° 57' 10"	214.892	2GB	03
120	260	90.5	86	4	69	3	12° 57' 10"	207.039	2GD	23
130	180	32	32	2	25	1.5	12° 45'	161.652	2CC	29
130	185	36	35	3	29	2.5	12° 52'	164.714	2DC ^{b)}	—
130	190	41	40	3	33	2.5	12° 51' 30"	167.414	2DD	—
130	200	50	49	4	41	3	12° 50' 30"	172.653	2DE ^{b)}	—
130	200	55	55	2.5	43	2	12° 50'	172.017	2EE	30
130	280	63.75	58	5	49	4	12° 57' 10"	232.028	2GB	03
140	190	32	32	2	25	1.5	13° 30'	171.032	2CC	29
140	200	39	38	3	31	2.5	12°	179.234	2DC	—
140	205	44	43	3	36	2.5	12°	181.645	2DD	—
140	210	56	56	2.5	44	2	13° 30'	180.353	2DE	30
140	215	53	52	4	44	3	12°	187.051	2ED	—
140	300	67.75	62	5	53	4	12° 57' 10"	247.91	2GB	03
150	210	38	38	2.5	30	2	12° 20'	187.926	2DC	29
150	215	44	43	3	36	3	12° 37'	190.81	2DD	—
150	225	53	52	4	44	4	12° 35' 30"	196.097	2ED	—
150	225	59	59	3	46	2.5	13° 40'	194.26	2EE	30
150	320	72	65	5	55	4	12° 57' 10"	265.955	2GB	03
160	220	38	38	2.5	30	2	13°	197.962	2DC	29
160	225	44	43	3	36	3	13° 14' 30"	200.146	2DD	—
160	235	53	52	4	44	4	13° 11' 30"	205.257	2ED	—
160	340	75	68	5	58	4	12° 57' 10"	282.751	2GB	03