Product Tape and Reel Specification

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ISBN: 978-1-5224-1944-0

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GENERAL INFORMATION

Many Microchip products are available packed into embossed tape that is wound onto a reel. This document provides the general specifications for such packing.

This specification follows the Electronic Components Industry Association standard EIA-481.

Material from EIA-481-E is used with permission of the Electronic Components Industry Association. This standard is available for purchase from IHS (www.global.ihs.com).

EMBOSSED TAPE DIMENSIONS

Embossed tape 8 mm through 24 mm wide has a single row of sprocket holes along one edge of the tape, as shown in Figure 1.

- Constant dimensions are listed in Table 1.
- Variable dimensions, except for the individual cavity dimensions, are listed in Table 2.
- Cavity dimensions are listed in Table 5 through Table 13.

Embossed tape 32 mm through 200 mm wide has a single row of sprocket holes along both edges of the tape, as shown in Figure 2.

- Constant dimensions are listed in Table 3.
- Variable dimensions, except for the individual cavity dimensions, are listed in Table 4.
- Cavity dimensions are listed in Table 5 through Table 13.

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FIGURE 1: 8, 12, 16 and 24 mm EMBOSSED CARRIER TAPE DIMENSIONS

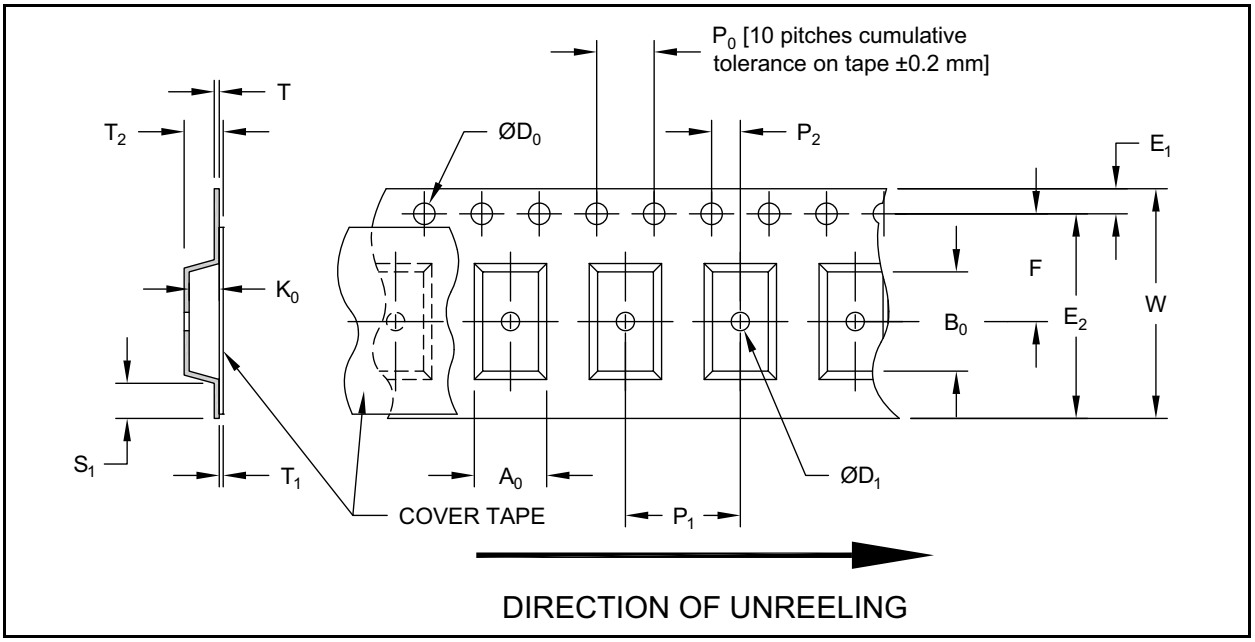


Table 1: Constant Dimensions for Embossed 8 mm~24 mm Carrier Tape

Tape Size	D_0	D_1 Min.	E_1	P_0	P_2	R (Ref.)	S_1 Min.	T Max.	T_1 Max
8 mm	$1.5^{+0.1}_{-0.0}$	1.0	1.75±0.1	4.0±0.1	2.0±0.05	25	0.6	0.6	0.1
12 mm		1.5			2.0±0.05	30			
16 mm		1.5			2.0±0.1	30			
24 mm		1.5			2.0±0.1	30			

Table 2: Variable Dimensions for Embossed 8 mm~24 mm Carrier Tape

Tape Size	B_1 Max.	E_2 Max.	F	P_1	T_2 Max.	W Max.	A_0, B_0, & K_0
8 mm	4.35	6.25	3.5±0.05	2.0±0.5 or 4.0±0.1	2.5	8.3	See Table 5 through Table 13
12 mm	8.2	10.25	5.5±0.05	2.0±0.05 or 4.0±0.1 or 8.0±0.1	6.5	12.3	
16 mm	12.1	14.25	7.5±0.1	4.0±0.05 to 12.0±0.1 in 4.0 increments	8.0	16.3	
24 mm	20.1	22.25	11.5±0.1	4.0±0.05 to 20.0±0.1 in 4.0 increments	12.0	24.3	

Source: EIA-481

FIGURE 2: 32, 44, 56, 72, 88, 104, 120, 136, 152, 168, 184 and 200 mm EMBOSSED CARRIER DIMENSIONS

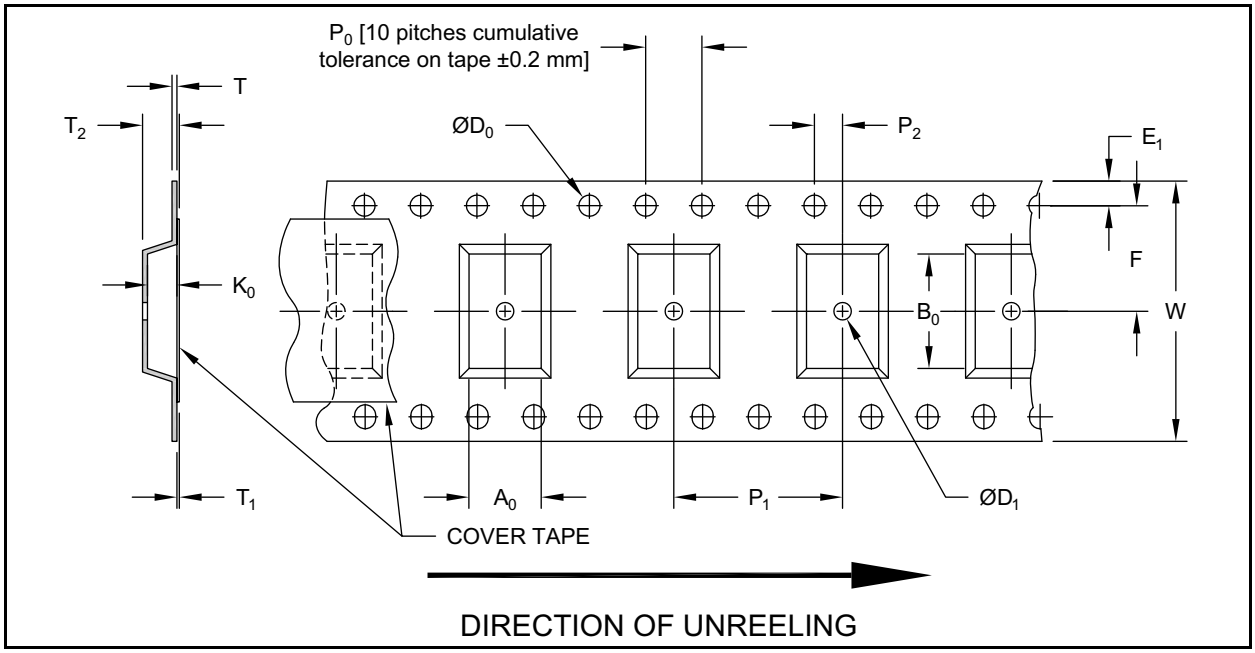


Table 3: Constant Dimensions for Embossed 32 mm to 200 mm Carrier Tape

Tape Size	D_0	D_1 Min.	E_1	P_0	P_2	R (Ref.)	T Max.	T_1 Max
32 mm	$1.5^{+0.1}_{-0.0}$	2.0	1.75±0.1	4.0±0.1	2.0±0.1	50	0.6	0.1
44 mm					2.0±0.15			
56 mm					2.0±0.2	75		
72 through 200 mm								

Source: EIA-481

Product Tape and Reel Specification

Table 4: Variable Dimensions for Embossed 32 mm to 200 mm Carrier Tape

Tape Size	B_1 Max.	F	P_1 ±0.1	S_0 ±0.1	T_2 Max.	W Max. ±0.3	A_0, B_0, & K_0
32	23.0	14.2±0.10	4.0 to 32.0	28.4	12.0	32.0	See Table 5 through Table 13
44	35.0	20.2±0.15	4.0 to 44.0	40.4	16.0	44.0	
56	46.0	26.2±0.15	4.0 to 56.0	52.4	20.0	56.0	
72	60.0	34.2±0.30	4.0 to 72.0	68.4	30.0	72.0	
188	76.0	42.2±0.30		84.4	30.0	88.0	
104	91.0	50.2±0.35		100.4	35.0	104.0	
120	107.0	58.2±0.35		116.4	40.0	120.0	
136	123.0	66.2±0.40		132.4	40.0	136.0	
152	139.0	74.2±0.40		148.4	40.0	152.0	
168	153.0	82.2±0.45		164.4	40.0	168.0	
184	169.0	90.2±0.45		180.4	40.0	184.0	
200	185.0	98.2±0.50		196.4	40.0	200.0	

Source: EIA-481

INDEX MARKING QUADRANTS

Most devices have an index marking on the top surface, indicating the location of terminal 1 or A1, as appropriate. The location of the index within the cavity is indicated by dividing the cavity into numbered quadrants, and listing the quadrant in which the index mark appears.

FIGURE 3: Index Marking Quadrants

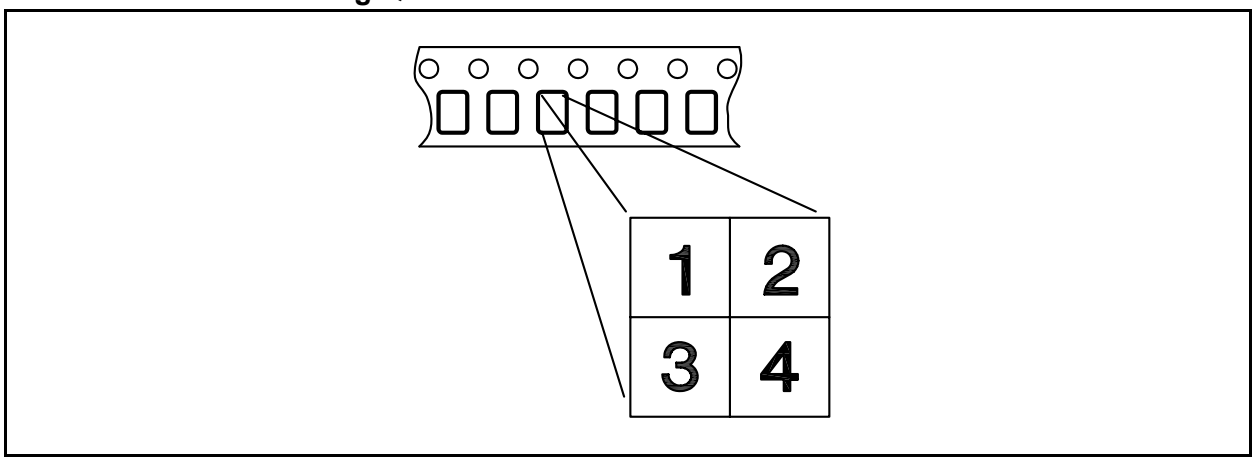
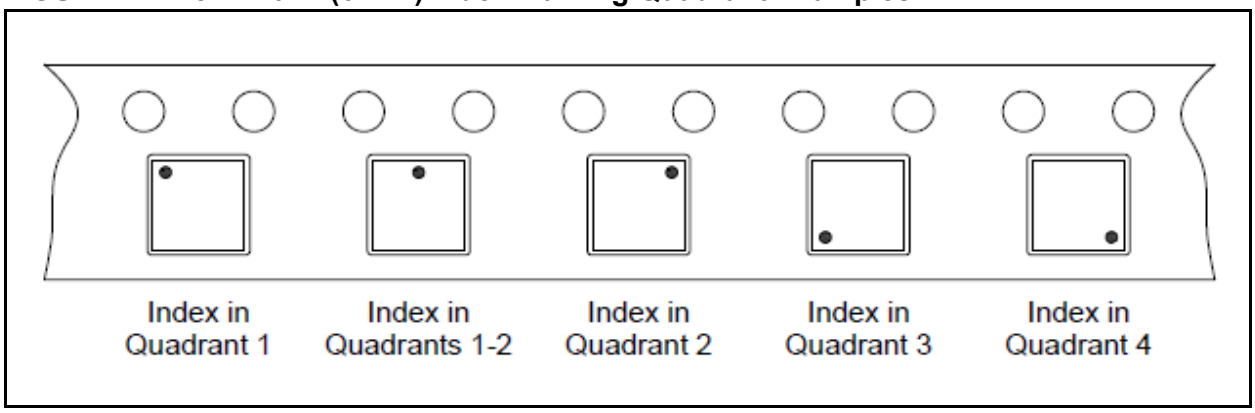


FIGURE 4: Terminal 1 (or A1) Index Marking Quadrant Examples



Source: EIA-481

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EMBOSSED TAPE DIMENSION TABLES

The following tables list carrier tape and cavity dimensions by package type. The tables are organized according to the following criteria:

- Table 5 Plastic Products with Leads
- Table 6 No-Lead Plastic Products (DFN, QFN, SON, etc.)
- Table 7 Grid Array Products (LGA, BGA, etc.)
- Table 8 Modules
- Table 9 SMSC Automotive (AIS) Products
- Table 10 SMSC Commercial Products
- Table 11 Supertex Products
- Table 12 ISSC Products
- Table 13 Micrel Products

Product Tape and Reel Specification

Table 5: Microchip Technology Plastic Products, with Leads, Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
DDPAK		3	24	16	10.6	15.8	4.9	2
DDPAK		5	24	16	10.6	15.8	4.9	2
DDPAK		7	24	16	10.6	15.8	4.9	2
DPAK		3	16	8	N/A	N/A	N/A	2
LQFP	20x20x1.4 mm	144	44	32	23.5	23.5	2	2
LQFP	20x20x1.4 mm	144	44	32	22.63	22.63	2.2	2
MQFP	10x10x2 mm	44	24	24	14.2	14.2	2.8	2
MQFP	14x14x2.7 mm	64	32	24	18	18	3.6	2
MSOP	3x3x1.0 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	10	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	10	12	8	5.3	3.4	1.4	1
PLCC	11.5x11.5x4.4 mm	28	24	16	13	13	4.9	1-2
PLCC	11.5x11.5x4.4 mm	28	24	16	13	13	4.9	1-2
PLCC	11.5x14x3.37 mm	32	24	16	13.1	15.5	3.9	1-2
PLCC	16.6x16.6x4.4 mm	44	32	24	18	18	4.9	1-2
PLCC	16.6x16.6x4.4 mm	44	32	24	18	18	4.9	1-2
PLCC	24.2x24.2x44 mm	68	44	32	25.6	25.6	5.7	1-2
PLCC	24.2x24.2x44 mm	68	44	32	25.6	25.6	5.8	1-2
PLCC	24.2x24.2x44 mm	68	44	32	25.6	25.6	5.3	1-2
PLCC	29.3x29.3x4.4 mm	84	44	36	30.7	30.7	5.8	1-2
QSOP	3.90 mm (.150 inches)	16	12	8	6.4	5.2	2.1	2
QSOP	3.90 mm (.150 inches)	16	12	8	6.4	5.2	2.1	2
QSOP	3.90 mm (.150 inches)	16	12	8	6.23	5.4	2.12	2
QSOP	3.90 mm (.150 inches)	16	12	8	6.5	5.2	2.1	2
SC70		3	8	4	2.40	2.60	1.20	3
SC70		5	8	4	2.25	2.40	1.22	2
SC70		6	8	4	2.25	2.40	1.22	2

Table 5: Microchip Technology Plastic Products, with Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
SOIC	150 mils	8	12	8	6.4	5.2	2.1	1
SOIC	150 mils	8	12	8	6.5	5.2	2.1	1
SOIC	150 mils	8	12	8	6.4	5.2	2.1	1
SOIC	150 mils	8	12	8	6.4	5.2	2.1	1
SOIC	150 mils	8	12	8	6.4	5.2	2.1	1
SOIC	150 mils	14	16	8	6.5	9.5	2.1	1
SOIC	150 mils	14	16	8	6.4	9.05	2.1	1
SOIC	150 mils	14	16	8	6.55	9.5	2.1	1
SOIC	150 mils	16	16	8	6.5	10.3	2.1	1
SOIC	150 mils	16	16	8	6.5	10.3	2	1
SOIC	207 mils	8	16	12	8.3	5.7	2.3	1
SOIC	207 mils	8	16	12	8.4	7.7	2.5	1
SOIC	300 mils	16	16	12	10.9	10.7	3	1
SOIC	300 mils	18	24	16	11.1	12	2.8	1
SOIC	300 mils	18	24	16	11.05	12.04	2.84	1
SOIC	300 mils	18	24	16	11.1	12	2.8	1
SOIC	300 mils	18	24	12	10.9	13.3	3	1
SOIC	300 mils	20	24	12	10.9	13.3	3	1
SOIC	300 mils	24	24	12	10.9	16	3	1
SOIC	300 mils	28	24	12	10.9	18.5	3	1
SOIC	300 mils	28	24	12	10.9	18.5	3	1
SOIC	300 mils	28	24	12	10.9	18.5	3	1
SOP		8	12	8	N/A	N/A	N/A	1
SOT-143		4	8	4	3.19	2.8	1.31	3
SOT-223		3	12	8	6.83	7.42	1.88	3
SOT-223			12	8	6.83	7.42	1.88	3
SOT-23		3	8	4	3.15	2.77	1.22	3
SOT-23		3	8	4	3.15	2.77	1.22	3

Table 5: Microchip Technology Plastic Products, with Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
SOT-23		5	8	4	3.23	3.17	1.37	3
SOT-23		6	8	4	3.23	3.17	1.37	3
SOT-23A		3	8	4	3.25	3.15	1.55	3
SOT-89		3	12	8	4.7	4.5	1.7	3
SOT-89		3	12	8	4.8	4.4	1.8	3
SOT-89		5	12	8	N/A	N/A	N/A	3
SSOP	3.90 mm (.150 inches)	20	16	12	8.5	7.6	2.2	1
SSOP	3.90 mm (.150 inches)	20	16	12	8.4	7.6	2.5	1
SSOP	3.90 mm (.150 inches)	24	16	12	8.4	8.7	2.5	1
SSOP	3.90 mm (.150 inches)	28	24	12	8.3	10.7	2.2	1
SSOP	3.90 mm (.150 inches)	28	24	12	8.5	10.8	2.2	1
TO92		2	See Figure 13, Figure 14, and Table 16					
TO92		3	See Figure 13, Figure 14, and Table 16					
TQFP	10x10x1.0 mm	44	24	16	12.45	12.45	1.6	2
TQFP	10x10x1.0 mm	44	24	16	12.4	12.4	1.6	2
TQFP	10x10x1.0 mm	64	24	16	12.45	12.45	1.6	2
TQFP	10x10x1.0 mm	64	24	16	12.4	12.4	1.6	2
TQFP	12x12x1.0 mm	80	24	24	14.5	14.5	1.5	2
TQFP	12x12x1.0 mm	100	24	24	14.5	14.5	1.5	2
TQFP	14x14x1.0 mm	64	24	20	16.5	16.5	1.9	2
TQFP	14x14x1.0 mm	80	24	20	16.5	16.5	1.9	2
TQFP	14x14x1.0 mm	100	24	20	16.5	16.5	1.9	2
TQFP	16x16x1.0 mm	144	32	24	19	19	1.7	2
TQFP	7x7x1.0 mm	32	16	12	9.6	9.6	1.85	2
TQFP	7x7x1.0 mm	48	16	12	9.6	9.6	1.85	2
TSOP	12x20 mm	48	32	16	12.5	20.6	2.1	2
TSOP	8x14 mm	32	24	12	8.6	14.5	1.8	2
TSOP	8x20 mm	28	32	16	8.6	20.6	2.1	2

Table 5: Microchip Technology Plastic Products, with Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
TSOP	8x20 mm	28	32	16	8.6	20.6	2.1	2
TSOP	8x20 mm	32	32	16	8.6	20.6	2.1	2
TSOP	8x20 mm	32	32	16	8.6	20.6	2.1	2
TSSOP	4.4 mm	8	12	8	6.75	3.4	1.3	2
TSSOP	4.4 mm	14	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	14	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	14	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	16	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	16	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	16	16	8	6.8	5.4	1.6	1
TSSOP	4.4 mm	20	16	8	6.8	6.9	1.6	1
TSSOP	4.4 mm	20	16	8	6.8	6.9	1.6	1
VSOP		28	24	12	8.7	13.9	2.1	1-2

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Table 6: Microchip Technology Plastic Products, With No Leads, Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
DFN	2.5x2 mm	10	8	4	2.19	2.77	1.05	2
DFN	2x2x0.9 mm	6	8	4	2.3	2.3	1.00	2
DFN	2x2x0.9 mm	8	8	4	2.25	2.25	1.00	2
DFN	2x3x0.9 mm	6	8	4	2.3	3.2	1.00	2
DFN	2x3x0.9 mm	6	8	4	2.25	3.35	1.05	2
DFN	2x3x0.9 mm	6	12	8	2.2	3.2	1.1	2
DFN	2x3x0.9 mm	8	8	4	2.3	3.2	1.00	2
DFN	2x3x0.9 mm	8	8	4	2.25	3.35	1.05	2
DFN	2x3x0.9 mm	8	12	8	2.2	3.2	1.1	2
DFN	2x3x0.9 mm	8	12	4	2.3	3.3	1.1	2
DFN	3x3x0.9 mm	6	12	8	3.3	3.3	1.1	2
DFN	3x3x0.9 mm	6	12	8	3.3	3.3	1	2
DFN	3x3x0.9 mm	8	12	8	3.3	3.3	1.1	2
DFN	3x3x0.9 mm	8	12	8	3.3	3.3	1	2
DFN	3x3x0.9 mm	10	12	8	3.3	3.3	1.1	2
DFN	3x3x0.9 mm	10	12	8	3.3	3.3	1	2
DFN	4x4x09 mm	8	12	8	4.35	4.35	1.1	2
DFN	4x4x09 mm	16	12	8	4.35	4.35	1.1	2
DFN	4x4x09 mm	20	12	8	4.35	4.35	1.1	2
DFN	4x4x09 mm	24	12	8	4.35	4.35	1.1	2
DFN	4x4x09 mm	28	12	8	4.35	4.35	1.1	2
DFN-S	4x4x0.9 mm	8	12	8	4.35	4.35	1.1	2
DFN-S	5x6x0.9 mm	8	12	8	5.3	6.3	1.2	2
DFN-S	5x6x0.9 mm	8	16	12	5.3	6.3	1.3	2
DQFN	11x11 mm	132	24	16	11.4	11.4	1.2	2
QFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	2
QFN	3x3x0.9 mm	16	12	8	3.3	3.3	1	2
QFN	4x4x0.9 mm	8	12	8	4.35	4.35	1.1	2

Table 6: Microchip Technology Plastic Products, With No Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
QFN	4x4x0.9 mm	8	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	12	12	8	4.35	4.35	1.1	1
QFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	20	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	20	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	28	12	8	4.35	4.35	1.1	2
QFN	4x4x0.9 mm	28	12	8	4.35	4.35	1.1	2
QFN	5x5x0.9 mm	20	12	8	5.25	5.25	1.1	2
QFN	5x5x0.9 mm	28	12	8	5.25	5.25	1.1	2
QFN	5x5x0.9 mm	40	12	8	5.25	5.25	1.1	2
QFN	6x6x0.9 mm	28	16	12	6.3	6.3	1.1	2
QFN	6x6x0.9 mm	28	16	12	6.3	6.3	1.1	2
QFN	6x6x0.9 mm	28	16	12	6.3	6.3	1.1	2
QFN	6x6x0.9 mm	40	16	12	6.3	6.3	1.1	2
QFN	7x7x0.9 mm	44	16	12	7.25	7.25	1.1	2
QFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	2
QFN	7x7x0.9 mm	56	16	12	7.25	7.25	1.1	2
QFN	8x8x0.9 mm	40	16	12	8.3	8.3	1.1	2
QFN	8x8x0.9 mm	40	16	12	8.3	8.3	1.1	2
QFN	8x8x0.9 mm	44	16	12	8.3	8.3	1.1	2
QFN	8x8x0.9 mm	44	16	12	8.3	8.3	1.1	2
QFN	9x9x0.9 mm	64	16	12	9.3	9.3	1.1	2
TDFN	2x3x0.8 mm	6	8	4	2.30	3.2	1.0	2
TDFN	2x3x0.8 mm	6	8	4	2.25	3.35	1.05	2
TDFN	2x3x0.8 mm	6	12	8	2.2	3.2	1.1	2

Table 6: Microchip Technology Plastic Products, With No Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
TDFN	2x3x0.8 mm	8	8	4	2.30	3.2	1.0	2
TDFN	2x3x0.8 mm	8	8	4	2.25	3.35	1.05	2
TDFN	2x3x0.8 mm	8	12	8	2.2	3.2	1.1	2
TDFN	3x3x0.8 mm	10	12	8	3.3	3.3	1.1	2
TDFN	3x3x0.8 mm	10	12	8	3.3	3.3	1	2
TDFN-S	5x6x0.8 mm	8	12	8	5.3	6.3	1.2	2
TDFN-S	5x6x0.8 mm	8	16	12	5.3	6.3	1.3	2
UDFN	2x3x0.5 mm	8	12	4	2.3	3.3	0.8	2
UDFN	2x3x0.5 mm	8	8	4	2.3	3.2	1.0	2
UDFN	3x3x0.5 mm	10	12	8	3.4	3.4	0.55	2
UDFN	3x3x0.5 mm	10	12	8	3.3	3.3	0.8	2
UQFN	3x1.6x0.55 mm	6	12	8	1.95	3.5	0.75	2
UQFN	3x3x0.5 mm	10	12	8	3.4	3.4	0.55	2
UQFN	3x3x0.5 mm	16	12	8	3.4	3.4	0.55	2
UQFN	3x3x0.5 mm	20	12	8	3.4	3.4	0.55	2
UQFN	4x4x0.5 mm	16	12	8	4.25	4.25	0.9	2
UQFN	4x4x0.5 mm	20	12	8	4.25	4.25	0.9	2
UQFN	4x4x0.5 mm	28	12	8	4.25	4.25	0.9	2
UQFN	5x5x0.5 mm	40	12	8	5.3	5.3	0.75	2
UQFN	6x6x0.5 mm	48	16	12	6.3	6.3	0.9	2
UQFN	6x6x0.5 mm	48	16	12	6.3	6.3	0.8	2
VDFN	2.5x2 mm	10	8	4	2.19	2.77	1.05	2
VDFN	3x4.5 mm	14	12	8	3.35	4.85	1.2	1
VQFN	6x6x0.9 mm	32	16	12	6.3	6.3	1.1	2
VQFN	10x10x1.0 mm	72	24	12	10.4	10.4	1.4	1
WSON	5x6x0.8 mm	8	16	8	5.6	6.6	1.5	2
X2QFN	2.5x2.5x0.4 mm	16	8	4	2.74	2.74	0.69	2
X2SON	2X2X0.4 mm	8	8	4	2.24	2.24	0.75	2

Table 6: Microchip Technology Plastic Products, With No Leads, Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
XSON	1.5x1.5x0.45 mm	6	8	4	1.65	1.65	0.71	2
XSON	2X2X0.45 mm	8	8	4	2.24	2.24	0.75	2

Table 7: Microchip Technology Grid Array Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
TBGA	10x13 mm	80	24	16	10.6	13.6	1.90	1
TFBGA	10x10x1.0 mm	121	24	12	10.30	10.30	1.50	1
TFBGA	10x10 mm	169	24	12	10.4	10.4	1.4	1
TFBGA	10x10 mm	169	24	12	10.4	10.4	1.34	1
TFBGA	10x10 mm	169	24	12	10.3	10.3	2.2	1
TFBGA	12x12x1.2 mm	176	24	16	12.60	12.60	1.90	1
TFBGA	6x6 mm	84	12	8	6.3	6.3	1.3	1
TFBGA	6x8x1.0 mm	48	16	12	6.5	8.5	2.1	1
TFBGA	8x10x1.0 mm	48						1
TFBGA	8x10x1.2 mm	48	24	12	8.2	10.4	1.7	1
TFBGA	9x9x1.2 mm	84	16	12	9.25	9.25	2.1	1
VFBGA	6x8x0.8 mm	44	16	12	6.5	8.5	2.1	1
VFBGA	6x8x0.8 mm	56	16	12	6.5	8.5	2.1	1
WFBGA	4x4x0.8 mm	44	12	8	4.35	4.35	1.1	1
WFBGA	4x4x0.8 mm	34	12	8	4.4	6.4	1.4	1
WFBGA	4x6x0.8 mm	48	12	8	4.4	6.4	1.4	1
WFBGA	5x6x0.8 mm	48	12	8	5.3	6.3	1.2	1
WFBGA	6x6x0.8 mm	64	16	12	6.3	6.3	0.9	1
WFBGA	8x8x08 mm	100	16	12	8.3	8.3	0.9	1
WFBGA	9x9x0.65 mm	144	16	12	9.6	9.9	0.9	1
WFBGA	10x10x0.8 mm	144	24	12	10.4	10.4	1.4	1
WLCSP	2.225x2.170x0.64	16	8	4	2.36	2.31	0.75	1
XFBGA	7x7x0.5 mm	144	16	12	7.25	7.25	0.75	1
XFLGA	4x6x0.6 mm	48	12	8	4.4	6.4	1.4	1
XFLGA	5x6x0.6 mm	48	12	8	5.3	6.3	1.2	1

Table 8: Microchip Technology Module Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
RF Module	(MA)	12	44	24	18.2	28.35	2.5	1
RF Module	(MB/MC)	12	44	28	23.3	33.4	4.1	1
RN4020			32	16	11.9	19.9	2.7	1
RN171	26.67x17.78x3.18	49	44	24	18.20	27.10	3.6	1

Table 9: SMSC Automotive (AIS) Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
CABGA	12x12 mm	196	24	24	12.5	12.5	1.8	1
LQFP	10x10x1.4 mm	44	24	16	12.35	12.35	2.2	1
LQFP	14x14x1.4 mm	100	32	24	16.8	16.8	2.1	1
MQFP	14x20x2.7 mm	128	44	24	18.9	24.9	3.9	1
SiP	12.42x8.92x1.98 mm	45	24	12	9.3	12.75	2.3	2
SOIC	150 mils	8	12	8	6.4	5.2	2.1	1
SOIC	600 mils	28	32	16	10.9	18.5	3.2	1
TQFP	10x10x1.0 mm	44	24	16	12.45	12.45	1.6	1
TQFP	10x10x1.0 mm	64	24	16	12.45	12.45	1.6	1
TQFP	14x14x1.0 mm	128	24	20	16.5	16.5	1.55	1
VQFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	20	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	28	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	32	12	8	4.35	4.35	1.1	1
VQFN	5x5x0.9 mm	28	12	8	5.25	5.25	1.1	1
VQFN	5x5x0.9 mm	32	12	8	5.25	5.25	1.1	1
VQFN	6x6x0.9 mm	36	16	12	6.3	6.3	1.1	1
VQFN	6x6x0.9 mm	40	16	12	6.3	6.3	1.1	1

Product Tape and Reel Specification

Table 9: SMSC Automotive (AIS) Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VQFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	1
VQFN	7x7x0.9 mm	56	16	12	7.25	7.25	1.1	1
VQFN	8x8x0.9 mm	56	16	12	8.30	8.30	1.4	1
VQFN	9x9x0.9 mm	64	16	12	9.3	9.3	1.1	1
VQFN	10x10x0.9 mm	72	24	12	10.4	10.4	1.4	1

Product Tape and Reel Specification

Table 10: SMSC Commercial Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
DFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
LFBGA	11x11x1.4 mm	169	24	16	11.3	11.3	1.7	1
LFBGA	11x11x1.4 mm	169	24	16	11.4	11.4	2	1
LFBGA	11x11x1.4 mm	169	24	16	11.35	11.35	2.1	1
LFBGA	13x13x1.3 mm	225	24	16	13.3	13.3	2.25	1
LFBGA	27x27x1.6 mm	324	44	32	27.5	27.5	3.6	1
MSOP	3x3x1.0 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	10	12	8	5.3	3.4	1.4	1
PLCC	11.5x11.5x4.3 mm	28	24	16	13	13	4.9	1-2
QFN	1.8x1.3x0.55 mm	10	8	4	1.49	1.99	0.75	1
QFN	5x5x0.9 mm	16	12	8	5.25	5.25	1.1	1
QFN	5x5x0.9 mm	24	12	8	5.25	5.25	1.1	1
QFN	6x6x0.9 mm	36	16	12	6.3	6.3	1.1	1
QFN	6x6x0.9 mm	40	16	12	6.3	6.3	1.1	1
QFN	6x6x0.9 mm	40	16	12	6.3	6.3	1.1	1
QFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	1
QFN	7x7x0.9 mm	56	16	12	7.25	7.25	1.1	1
QFN	8x8x0.9 mm	56	16	12	8.3	8.3	1.4	1
QFN	9x9x0.9 mm	64	16	12	9.3	9.3	1.1	1
QFP	14x20 mm	100	44	32	19	25	3.9	1
QSOP	.150 In	24	16	8	6.5	9.5	2.3	1
QSOP	.150 In	28	16	8	6.5	10.3	2.3	1
SOIC	.150 In	8	12	8	6.4	5.2	2.1	1
SOIC	.150 In	14	16	8	6.5	9.5	2.1	1
SOIC	.150 In	16	12	8	6.4	5.2	2.1	1
SQFN	12x12x0.9 mm	100	24	16	12.4	12.4	1.1	1
TDFN	2x3x0.75 mm	8	12	8	2.2	3.2	1.1	2
TFBGA	7x7x1.0 mm	144	16	12	7.3	7.3	2.1	1
TQFP	14x14x1.0 mm	128	24	20	16.5	16.5	1.55	2

Table 10: SMSC Commercial Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
TSOT	2.9x1.6 mm	5	8	4	3.23	3.17	1.37	2
TSOT	2.9x1.6 mm	6	8	4	3.23	3.17	1.37	2
UFBGA	3x3x0.6 mm	25	12	8	3.3	3.3	1.1	1
VFBGA	3x3x0.6 mm	25	12	8	3.3	3.3	1.1	1
VFBGA	4x4x0.8 mm	40	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	28	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	32	12	8	4.35	4.35	1.1	1
VQFN	6x6x0.9 mm	36	16	12	6.3	6.3	1.1	1
VQFN	6x6x0.9 mm	40	16	12	6.3	6.3	1.1	1
VQFN	7x7x0.9 mm	56	16	12	7.25	7.25	1.1	1
VQFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	1
VQFN	8x8x0.9 mm	56	16	12	8.3	8.3	1.4	1
VQFN	8x8x0.9 mm	64	16	12	8.3	8.3	1.4	1
VQFN	9x9x0.9 mm	64	16	12	9.3	9.3	1.1	1
VQFN	10x10x0.9 mm	72	24	12	10.4	10.4	1.4	1
VQFN	12x12x0.9 mm	100	24	16	12.4	12.4	1.1	1
WFBGA	11x11x0.8 mm	169	24	16	11.4	11.4	1.2	1
WLCSP	2x2x0.62 mm	25	8	4	2.18	2.18	0.81	1
XFBGA	8x8x0.5 mm	169	16	12	8.3	8.3	0.9	1

Product Tape and Reel Specification

Table 11: Supertex Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
CERQUAD	.650x.650 inches	44	32	24	18	18	4.9	1-2
DPAK (TO-252)		3	16	12	10.3	6.9	2.6	4
DPAK (TO-252)		5	16	12	10.3	6.9	2.6	4
FPBGA	5.7x5 mm	25	12	8	6.25	5.25	1.4	1
FPBGA	6x5.35 mm	26	16	8	5.5	6.5	1.2	2
LQFP	7x7x1.4 mm	32	16	12	9.8	9.8	2.0	1
LQFP	7x7x1.4 mm	48	16	12	9.8	9.8	2.0	1
MSOP	3x3 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3 mm	10	12	8	5.3	3.4	1.4	1
MSOP	3x3 mm	10	12	8	5.3	3.4	1.4	1
PLCC		44	32	24	18	18	4.9	1-2
PLCC		44	32	24	18	18	4.1	1-2
PLCC	11.5x11.5x4.3 mm	28	24	16	13	13	4.9	1-2
PLCC	11.5x11.5x4.3 mm	28	24	16	13	13	4.9	1-2
PQFP (FP=3.9 mm)	10x10x2 mm	44	24	24	15.35	15.35	2.7	1
QFN	4x4x0.9 mm	16	12	8	4.3	4.3	1.25	1
QFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	1
QFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	1
QFN	4x4x0.9 mm	16	12	8	4.25	4.25	1.13	1
QSOP	7.5mm (.300 inches)	44	32	12	10.9	18.3	3	1
SOIC	.150 inches	8	12	8	6.4	5.2	2.1	1
SOIC	.150 inches	8	12	8	6.4	5.2	2.1	1
SOIC	.150 inches	8	12	8	6.5	5.2	2.1	1
SOIC	.150 inches	8	12	8	6.5	5.4	2	1
SOIC	.150 inches	8	12	8	6.5	5.3	2.1	1
SOIC	.150 inches	14	16	8	6.55	9.5	2.1	1
SOIC	.150 inches	14	16	8	6.5	9.5	2.1	1
SOIC	.150 inches	14	16	8	6.5	9.5	2.3	1

Table 11: Supertex Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
SOIC	.150 inches	16	16	8	6.5	10.3	2.1	1
SOIC	.300 inches	16	8	8	6.55	10.38	2.1	1
SOIC	.300 inches	20	24	12	10.9	13.3	3	1
SOIC	.300 inches	20	24	12	10.9	13.3	3	1
SOIC	.300 inches	24	24	12	10.9	16	3	1
SOIC	.300 inches	24	24	12	10.8	15.9	3.2	1
SOIC	.300 inches	28	32	12	10.9	18.3	3	1
SOIC	.300 inches	16	16	12	10.9	10.7	3	1
SOIC	.300 inches	16	16	12	10.9	10.7	3.2	1
SOT-223		3	12	8	6.83	7.42	1.88	3
SOT-23		3	8	4	3.15	2.77	1.22	3
SOT-23		3	8	4	3.15	2.77	1.22	3
SOT-23		5	8	4	3.23	3.17	1.37	3
SOT-89		3	12	8	4.6	4.78	1.91	3
SOT-89		3	12	8	4.52	4.84	1.84	3
TO-92		3	See Figure 13, Figure 14 and Figure 16					
TSSOP	4.4 mm	24	16	8	6.9	8.4	1.7	1
VDFN	3x4x1.0 mm	10	12	8	3.3	4.3	1.2	1
VDFN	3x4x1.0 mm	10	12	8	3.3	4.3	1.2	1
VDFN	4x4x1.0 mm	8	12	8	4.35	4.35	1.1	1
VDFN	4x4x1.0 mm	8	12	8	4.35	4.35	1.1	1
VDFN	4x4x1.0 mm	8	12	8	4.3	4.3	1.1	1
VDFN	4x4x1.0 mm	12	12	8	4.3	4.3	1.25	1
VDFN	4x4x1.0 mm	12	12	8	4.35	4.35	1.1	1
VDFN	4x4x1.0 mm	12	12	8	4.35	4.35	1.1	1
VDFN	4x4x1.0 mm	12	12	8	4.25	4.25	1.13	1
VDFN	5x5x1.0 mm	8	12	8	5.25	5.25	1.1	1
VDFN	5x5x1.0 mm	8	12	8	5.25	5.25	1.1	1
VDFN	5x5x1.0 mm	8	12	8	5.3	5.3	1.25	1

Table 11: Supertex Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VDFN	5x5x1.0 mm	18	12	8	5.25	5.25	1.1	1
VDFN	5x5x1.0 mm	18	12	8	5.25	5.25	1.1	1
VDFN	5x5x1.0 mm	18	12	8	5.3	5.3	1.25	1
VQFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
VQFN	3x3x0.9 mm	16	12	8	3.3	3.3	1	1
VQFN	3x3x0.9 mm	16	12	8	3.25	3.25	1.15	1
VQFN	3x3x0.9 mm	16	12	8	3.25	3.25	1.25	1
VQFN	4x4x0.9 mm	12	12	8	4.3	4.3	1.25	1
VQFN	4x4x0.9 mm	12	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	12	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	12	12	8	4.25	4.25	1.13	1
VQFN	4x4x0.9 mm	24	12	8	4.3	4.3	1.25	1
VQFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.25	4.25	1.13	1
VQFN	4x4x1.0 mm	16	12	8	4.3	4.3	1.25	1
VQFN	4x4x1.0 mm	16	12	8	4.35	4.35	1.1	1
VQFN	4x4x1.0 mm	16	12	8	4.35	4.35	1.1	1
VQFN	4x4x1.0 mm	16	12	8	4.25	4.25	1.13	1
VQFN	5x5x1.0 mm	32	12	8	5.25	5.25	1.1	1
VQFN	5x5x1.0 mm	32	12	8	5.25	5.25	1.1	1
VQFN	5x5x1.0 mm	32	12	8	5.3	5.3	1.25	1
VQFN	6x6x1.0 mm	33	16	12	6.3	6.3	1.1	1
VQFN	6x6x1.0 mm	33	16	12	6.3	6.3	1.1	1
VQFN	6x6x1.0 mm	33	16	12	6.3	6.3	1	1
VQFN	6x6x1.0 mm	40	16	12	6.3	6.3	1.1	1
VQFN	6x6x1.0 mm	40	16	12	6.3	6.3	1.1	1
VQFN	6x6x1.0 mm	40	16	12	6.3	6.3	1	1
VQFN	7x7x1.0 mm	48	16	12	7.35	7.35	1.25	1

Table 11: Supertex Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VQFN	7x7x1.0 mm	48	16	12	7.25	7.25	1.1	1
VQFN	8x8x1.0 mm	56	16	12	8.3	8.3	1.1	1
VQFN	8x8x1.0 mm	56	16	12	8.3	8.3	1.1	1
VQFN	8x8x1.0 mm	56	16	12	8.4	8.4	1.25	1
WDFN	3x3x0.8 mm	8	12	8	3.3	3.3	1.1	1
WDFN	3x3x0.8 mm	8	12	8	3.3	3.3	1	1
WDFN	3x3x0.8 mm	8	12	8	3.25	3.25	1.15	1
WDFN	3x3x0.8 mm	8	12	8	3.25	3.25	1.25	1
WDFN	3x3x0.8 mm	10	12	8	3.3	3.3	1.1	1
WDFN	3x3x0.8 mm	10	12	8	3.3	3.3	1	1
WDFN	4x4x0.8 mm	10	12	8	4.3	4.3	1.25	1
WDFN	4x4x0.8 mm	10	12	8	4.35	4.35	1.1	1
WDFN	4x4x0.8 mm	10	12	8	4.35	4.35	1.1	1
WDFN	4x4x0.8 mm	10	12	8	4.25	4.25	1.13	1
WFGA	3x3x0.85 mm	6	12	8	3.3	3.3	1.1	1
WFGA	3x3x0.85 mm	6	12	8	3.3	3.3	1	1
WQFN	3x3x0.8 mm	12	12	8	3.3	3.3	1.1	1
WQFN	3x3x0.8 mm	12	12	8	3.3	3.3	1	1
WQFN	3x3x0.8 mm	12	12	8	3.25	3.25	1.15	1
WQFN	3x3x0.8 mm	12	12	8	3.25	3.25	1.25	1
WQFN	3x3x0.8 mm	16	12	8	3.3	3.3	1.1	1
WQFN	3x3x0.8 mm	16	12	8	3.3	3.3	1	1
WQFN	3x3x0.8 mm	16	12	8	3.25	3.25	1.15	1
WQFN	3x3x0.8 mm	16	12	8	3.25	3.25	1.25	1
WQFN	4x5x0.9 mm	24	12	8	4.3	5.3	1.2	1
WQFN	5x5x0.8 mm	32	12	8	5.25	5.25	1.1	1
WQFN	5x5x0.8 mm	32	12	8	5.25	5.25	1.1	1
WQFN	5x5x0.8 mm	32	12	8	5.3	5.3	1.25	1
WQFN	5x5x0.8 mm	40	12	8	5.25	5.25	1.1	1

Table 11: Supertex Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
WQFN	5x5x0.8 mm	40	12	8	5.25	5.25	1.1	1
WQFN	5x5x0.8 mm	40	12	8	5.3	5.3	1.25	1
WQFN	6x6x0.8 mm	32	16	12	6.3	6.3	1.1	1
WQFN	6x6x0.8 mm	32	16	12	6.3	6.3	1.1	1
WQFN	6x6x0.8 mm	32	16	12	6.3	6.3	1	1
WQFN	7x7x0.8 mm	44	16	12	7.35	7.35	1.25	1
WQFN	7x7x0.8 mm	44	16	12	7.25	7.25	1.1	1

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Table 12: ISSC Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VQFN	5x6.5x0.9 mm	48	16	8	5.3	6.8	1.2	1
VQFN	6x5x0.9 mm	42	12	8	5.3	6.3	1	2
VQFN	6x6x0.9 mm	40	16	8	6.3	6.3	1.1	1
VQFN	6x6x0.9 mm	48	16	8	6.3	6.3	1.1	1
VQFN	7x7x0.9 mm	48	16	12	7.3	7.3	1.2	1
VQFN	7x7x0.9 mm	56	16	12	7.3	7.3	1.2	1
VQFN	8x8x0.9 mm	56	16	12	8.3	8.3	1.2	2
VQFN	8x8x1.0 mm	56	16	12	8.3	8.3	1.2	2
VQFN	8x8x0.9 mm	68	16	12	8.3	8.3	1.2	2

Table 13: Micrel Products Carrier Tape and Cavity Dimensions

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
B1QFN	12x12x3 mm	64	24	16	12.30	12.30	4.15	1
B1QFN	8x8x3 mm	52	16	12	8.3	8.3	3.4	1
B2QFN	10x10x4 mm	52	24	16	10.35	10.35	4.6	1
B2QFN	12x12x4 mm	64	24	16	13.30	12.30	4.15	1
DDPAK (TO-263)		3	24	16	10.60	16.50	4.90	2
DDPAK (TO-263)		3	24	16	10.6	16.5	4.9	2
DDPAK (TO-263)		3	24	16	10.6	16.50	4.90	2
DDPAK (TO-263)		5	24	16	10.6	16.5	4.9	2
DDPAK (TO-263)		5	24	16	10.60	16.50	4.9	2
DPAK (TO-252)		5	16	8	6.9	10.5	2.8	2
DPAK (TO-252)		2	N/A	N/A	N/A	N/A	N/A	2
DPAK (TO-252)		5	16	8	6.9	10.5	2.8	2
LFBGA	10x10x1.42 mm	100	24	12	10.4	10.4	1.6	1
LFBGA	9x9x1.38 mm	100	16	12	9.4	9.4	1.7	1
LLGA	5x7x1.45 mm	38	16	8	5.5	7.5	1.5	1
LQFP	14x14x1.4 mm	128	24	20	16.5	16.5	1.9	1
LQFP	14x14x1.4 mm	128	24	20	16.5	16.5	1.9	1
LQFP	10x10 mm	80	24	16	12.35	12.35	1.55	1
LQFP	10x10x1.4 mm	44	24	16	12.35	12.35	2.2	1
LQFP	10x10x1.4 mm	52	24	16	12.35	12.35	2.2	1
LQFP	10x10x1.4 mm	64	24	16	12.35	12.35	2.2	1
LQFP	10x10 mm	64	24	16	12.35	12.35	1.55	1
LQFP	7x7x1.4 mm	48	16	12	9.5	9.5	2	1
LQFP	07x07x1.6 mm	48	N/A	N/A	N/A	N/A	N/A	1
LQFP	07x07x1.6 mm	48	N/A	N/A	N/A	N/A	N/A	1
MSOP	3x3x1.0 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	8	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	8	12	8	5.2	3.3	1.6	1
MSOP	3x3x1.0 mm	10	12	8	5.3	3.4	1.4	1
MSOP	3x3x1.0 mm	10	12	8	5.2	3.3	1.6	1
PLCC		44	N/A	N/A	N/A	N/A	N/A	1-2

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
PLCC		32	24	16	N/A	N/A	N/A	1-2
PLCC		20	16	12	10.3	10.3	4.9	1-2
PLCC		28	24	16	13	13	4.9	1-2
PLCC		28	N/A	N/A	N/A	N/A	N/A	1-2
PLCC		28	N/A	N/A	N/A	N/A	N/A	1-2
PLCC		44	32	24	18	18	4.9	1-2
PQFP	14x20 mm	128	44	24	N/A	N/A	N/A	1
QFN	1x1x0.5 mm	4	8	2.0	1.16	1.16	0.63	1
QFN	4x4x0.8 mm	24	12	8	4.35	4.35	1.1	1
QSOP	.150 inches	16	12	8	6.5	5.2	2.1	1
QSOP	.150 inches	16	12	8	6.5	5.2	2.1	1
QSOP	.150 inches	20	12	8	N/A	N/A	N/A	1
SC70		3	8	4	2.4	2.4	1.2	3
SC70		4	8	4	N/A	N/A	N/A	N/A
SC70		5	8	4	2.25	2.4	1.22	2
SC70		6	8	4	2.25	2.4	1.22	2
SOIC	.150 inches	8	12	8	6.4	5.2	2.1	1
SOIC	.300 inches	28	32	16	10.75	18.6	3	1
SOIC	.150 inches	14	16	8	6.5	9.5	2.1	1
SOIC	.150 inches	16	16	8	6.5	10.3	2.1	1
SOIC	.300 inches	14	16	12	10.9	9.5	3	1
SOIC	.300 inches	16	16	12	10.9	10.7	3	1
SOIC	.300 inches	18	24	16	10.9	12.0	3.2	1
SOIC	.300 inches	20	24	12	10.9	13.3	3	1
SOIC	.300 inches	24	24	12	10.9	16	3	1
SOT-143		4	8	4	3.15	2.6	1.2	3
SOT-143		4	8	4	3.15	2.6	1.2	3
SOT-143		3	16	12	N/A	N/A	N/A	N/A
SOT-223		3	16	12	7.1	7.5	2.2	3
SOT-223		3	16	12	7.1	7.5	2.2	3
SOT-23		3	8	4	3.02	2.18	1.27	2

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
SOT-23		3	8	4	3.15	2.77	1.22	2
SOT-23		5	8	4	3.2	3.1	1.4	2
SOT-23		5	8	4	3.23	3.17	1.37	2
SOT-23		5	8	4	3.23	3.17	1.37	2
SOT-23		6	8	4	3.2	3.1	1.4	2
SOT-23		6	8	4	3.23	3.17	1.37	2
SOT-23		6	8	4	3.23	3.17	1.37	2
SOT-23		8	8	4	3.2	3.1	1.4	2
SOT-23		8	8	4	3.23	3.17	1.37	2
SOT-23		8	8	4	3.23	3.17	1.37	2
SPAK		3	24	12	9.8	12	2.7	2
SPAK		5	24	12	9.8	12	2.7	2
SPAK		7	24	12	9.8	12	2.7	2
SSOP	5.3 mm	14	16	12	8.2	6.6	2.5	1
SSOP	5.3 mm	16	16	12	8.2	6.6	2.5	1
SSOP	5.3 mm	20	16	12	8.2	7.6	3.0	1
SSOP	5.3 mm	20	16	12	8.2	7.6	3.0	1
SSOP	5.3 mm	24	16	12	N/A	N/A	N/A	1
SSOP	5.3 mm	28	16	12	8.2	10.6	2.5	1
SSOP	5.3 mm	48	32	16	N/A	N/A	N/A	1
TDFN	2.5x2.0x1.15 mm	10	8	4	2.4	2.9	1.25	2
TDFN	3.5x3.0x1.15 mm	14	12	8	3.3	3.8	1.2	1
TDFN	1.2x1.2x0.4 mm	6	8	4	1.37	1.37	0.55	1
TDFN	1.2x1.6x0.4 mm	6	8	4	1.37	1.77	0.55	1
TQFN	4x4 mm	24	12	8	4.4	4.4	1	1
TQFN	5x5x0.85 mm	32	12	8	5.25	5.25	1.1	1
TQFN	7x7 mm	48	16	12	7.3	7.3	1.2	1
TQFN	8x8 mm	64	16	12	8.3	8.3	2.4	1
TQFP	07x07x1.2 mm	32	N/A	N/A	N/A	N/A	N/A	1
TQFP	07x07x1.2 mm	38	N/A	N/A	N/A	N/A	N/A	1
TQFP	10x10x.12 mm	64	N/A	N/A	N/A	N/A	N/A	1

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
TQFP	7x7 mm	48	16	12	9.35	9.35	1.2	1
TQFP	7x7x1.0 mm	32	16	12	N/A	N/A	N/A	1
TQFP	7x7x1.0 mm	48	16	12	9.35	9.35	12	1
TQFP	10x10x1.0 mm	64	24	16	N/A	N/A	N/A	1
TSOT		5	8	4	3.2	3.1	1.4	3
TSOT		5	8	4	3.23	3.17	1.37	3
TSOT		5	8	4	3.23	3.17	1.37	2
TSOT		6	8	4	3.2	3.1	1.4	2
TSOT		6	8	4	3.23	3.17	1.37	2
TSOT		6	8	4	3.23	3.17	1.37	2
TSSOP	4.4 mm	16	12	8	6.95	5.6	1.6	1
TSSOP	4.4 mm	20	16	8	6.8	6.9	1.6	1
TSSOP	4.4 mm	24	16	8	6.95	8.3	1.6	1
TSSOP	4.4 mm	8	12	8	N/A	N/A	N/A	1
TSSOP	4.4 mm	14	12	8	6.95	5.6	1.6	1
TSSOP	4.4 mm	28	16	8	6.8	10.2	1.6	1
UDFN	1.2x1.2x0.6 mm	4	8	4	1.35	1.35	0.76	2
UDFN	1.2x1.2x0.6 mm	6	8	4	1.35	1.35	0.76	2
UDFN	0.85x0.85x0.6 mm	4	N/A	N/A	N/A	N/A	N/A	1
UDFN	0.85x0.85 mm		8	2	0.97	0.87	0.73	1
UDFN	1.0x1.0 mm	4	8	2	1.16	1.16	0.63	1
UDFN	1.0x1.0 mm	4	8	4	1.15	1.15	0.65	1
UDFN	1x1x0.55 mm	4	8	4	1.16	1.16	0.63	1
UDFN	1.0x1.0 mm	6	8	2	1.16	1.16	0.63	1
UDFN	1.25x1.25 mm	4	8	4	N/A	N/A	N/A	1
UDFN	1.2x1.6x0.55 mm	8	8	4	1.38	1.78	0.78	1
UDFN	1.2x1.6x0.6 mm	8	8	4	1.38	1.78	0.78	1
UDFN	2x2x0.55 mm	6	8	4	2.30	2.30	1.0	1
UDFN	2x2x0.55 mm	8	8	4	2.30	2.30	1.0	1
UDFN	2x2x0.55 mm	10	8	4	2.30	2.30	0.75	1
UDFN	1.2x1.6x0.6 mm	8	8	4	1.38	1.78	0.78	1

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
UDFN	1.2x1.6x0.6 mm	8	8	4	1.38	1.78	0.78	1
UDFN	1.6x1.6x0.6 mm	6	8	4	1.78	1.78	0.69	1
UDFN	1.6x2.0x0.6 mm		8	4	1.79	2.12	0.75	1
UDFN	2x2x0.6 mm	6	8	4	2.30	2.30	0.75	1
UDFN	2x2x0.6 mm	8	8	4	2.30	2.30	0.75	1
UDFN	2x2x0.6 mm	10	8	4	2.30	2.30	0.75	1
UDFN	2x2x0.6 mm	22	8	4	N/A	N/A	N/A	1
UDFN	2.5x2.5x0.6 mm	10	8	4	2.77	2.77	0.8	1
UDFN	2.5x2.5x0.6 mm	12	8	4	2.77	2.77	0.8	1
UDFN	3x3x0.6 mm		12	8	N/A	N/A	N/A	1
UDFN	1.2x1.2x0.55 mm	4	8	4	1.35	1.35	0.76	1
UDFN	1.2x1.2x0.55 mm	6	8	4	1.35	1.35	0.76	1
UDFN	3x3x0.6 mm		12	8	3.3	3.3	1.1	1
UQFN	2x2x0.6 mm	8	8	4	2.30	2.3	0.75	1
UQFN	1x1x0.6 mm	10	N/A	N/A	N/A	N/A	N/A	1
UQFN	2x2x0.6 mm	12	8	4	2.30	2.3	0.75	1
UQFN	2.5x2.5x0.6 mm	14	8	4	2.77	2.77	0.80	1
UQFN	2.0x2.5x0.6 mm	16	8	4	2.77	2.77	0.80	1
VDFN	2.0x2.5 mm	4	N/A	N/A	N/A	N/A	N/A	1
VDFN	2.0x2.5 mm	6	N/A	N/A	N/A	N/A	N/A	1
VDFN	2x2x0.6 mm	8	8	4	2.30	2.30	0.75	1
VDFN	3x4x0.9 mm	10	12	8	3.40	4.40	1.1	1
VDFN	2x2x0.9 mm	6	8	4	2.30	2.30	1.0	1
VDFN	2x2x0.9 mm	8	8	4	2.30	2.30	1.0	1
VDFN	2.5x2.5x0.9 mm	10	12	4	2.8	2.8	1.1	1
VDFN	2.5x2.5x0.9 mm	14	12	4	2.8	2.8	1.1	1
VDFN	3x3x0.9 mm	8	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	8	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	10	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	10	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	12	12	8	3.3	3.3	1.1	1

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VDFN	3x3x0.9 mm	12	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
VDFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
VDFN	4x4x0.9 mm	8	12	8	4.35	4.35	1.1	1
VDFN	4x4x0.9 mm	8	12	8	N/A	N/A	N/A	1
VDFN	4x4x0.9 mm	12	12	8	4.35	4.35	1.1	1
VDFN	4x4x0.9 mm	12	12	8	4.35	4.35	1.1	1
VDFN	4x5x0.9 mm	20	12	8	4.30	5.30	1.1	1
VDFN	4x5x0.9 mm	20	12	8	4.37	5.64	1.88	1
VLGA	5.5x5.5x0.8 mm	76	12	8	N/A	N/A	N/A	1
VQFN	2x2x0.9 mm	10	N/A	N/A	N/A	N/A	N/A	1
VQFN	3.5x3.0x1 mm	14	N/A	N/A	N/A	N/A	N/A	1
VQFN	3.0x3.5x0.9 mm	16	N/A	N/A	N/A	N/A	N/A	1
VQFN	3x4x0.9 mm	24	12	8	3.40	4.40	1.1	1
VQFN	4x6x0.9 mm	28	12	8	4.40	6.40	1.4	1
VQFN	5x4x0.9 mm	28	N/A	N/A	N/A	N/A	N/A	1
VQFN	5x4x0.9 mm	28	N/A	N/A	N/A	N/A	N/A	1
VQFN	2x2x0.85 mm	6	8	4	2.30	2.30	1	1
VQFN	3x3x0.85 mm	16	12	8	3.3	3.3	1.1	1
VQFN	3x3x0.9 mm	12	12	8	3.3	3.3	1.1	1
VQFN	3x3x0.9 mm	12	12	8	3.3	3.3	1.1	1
VQFN	2.5x2.0 mm	10	8	4	2.40	2.90	1.25	1
VQFN	3.0x3.5 mm	14	12	8	3.25	3.95	1	1
VQFN	4x6 mm	28	12	8	4.4	6.4	1.4	1
VQFN	4x6 mm	28	12	8	4.4	6.40	1.4	1
VQFN	2.5x2.8x0.9 mm	17	8	4	2.8	3.25	1.1	1
VQFN	2.5x2.8x0.9 mm	17	8	4	N/A	N/A	N/A	1
VQFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
VQFN	3x3x0.9 mm	16	12	8	3.3	3.3	1.1	1
VQFN	3x4x0.9 mm	20	12	8	3.4	4.4	1.1	1
VQFN	3x4x0.9 mm	20	12	8	3.4	4.4	1.1	1

Table 13: Micrel Products Carrier Tape and Cavity Dimensions (Continued)

Package Type	Body Size	Terminal Count	Carrier Dimensions (mm)		Cavity Dimensions (mm)			Index Quadrant
			W	P_1	A_0	B_0	K_0	
VQFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	16	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	24	12	8	4.25	4.25	1.1	1
VQFN	4x4x0.9 mm	28	12	8	4.35	4.35	1.1	1
VQFN	4x4x0.9 mm	28	12	8	N/A	N/A	N/A	1
VQFN	5x5x0.9 mm	32	12	8	5.25	5.25	1.1	1
VQFN	5x5x0.9 mm	32	12	8	5.25	5.25	1.1	1
VQFN	5x6x0.9 mm	28	12	8	5.3	6.3	1.2	1
VQFN	7x7x0.9 mm	44	16	12	7.25	7.25	1.1	1
VQFN	7x7x0.9 mm	44	16	12	7.25	7.25	1.1	1
VQFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	1
VQFN	7x7x0.9 mm	48	16	12	7.25	7.25	1.1	1
VQFN	8x8x0.9 mm	64	16	12	N/A	N/A	N/A	1
WLCSP	1.2x0.8x0.63 mm	6	8	4	0.88	1.28	0.68	1
WLCSP	1.3x1.3x0.715 mm	9	8	4	1.38	1.38	0.7	1
WLCSP	1.74x1.64x0.59 mm	9	8	4	1.71	2.08	0.71	1
WLCSP	1.8x1.7x0.67 mm	16	8	4	1.8	1.95	0.75	2
WLCSP	1.85x1.85x0.61 mm	16	8	4	2.07	2.07	0.89	2
WLCSP	2.1x1.1 mm	8	N/A	N/A	N/A	N/A	N/A	1
WLCSP		6	N/A	N/A	N/A	N/A	N/A	1
WDFN	3x2x0.8 mm	14	8	4	3.29	2.31	1.1	2
WDFN	1.2x1.6x0.8 mm	4	8	4	1.42	1.8	0.91	1
WDFN	1.2x1.6x0.8 mm	4	8	4	1.47	1.73	0.65	1
WDFN	1.2x1.6x0.8 mm	4	8	4	N/A	N/A	N/A	1
WDFN	1.6x1.6x0.8 mm	6	8	4	1.9	1.9	1	1
WDFN	1.6x1.6x0.8 mm	6	8	4	1.91	1.98	0.91	1

WAFER LEVEL CHIPSCALE PACKAGES (WLCSP, CSP)

Please contact your Microchip sales representative or supplier for specific carrier tape information that is not listed in this document.

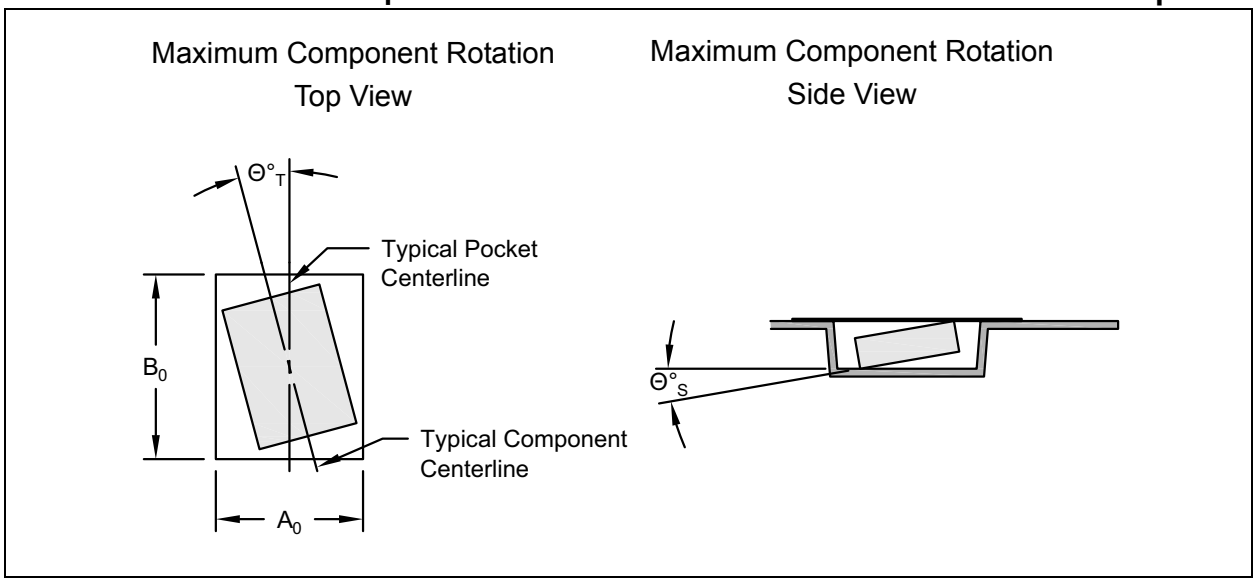
Table 14: Cover Tape Dimensions

Carrier Width	Width (mm)	Thickness (mm)
8 mm	5.3	0.062
12 mm	9.3	0.062
12 mm	9.2	0.05
12 mm	9.05	0.05
16 mm	13.05	0.05
16 mm	13.3	0.05
24 mm	21	0.05
32 mm	25.5	0.05
44 mm	37.5	0.05

Source: EIA-481

Product Tape and Reel Specification

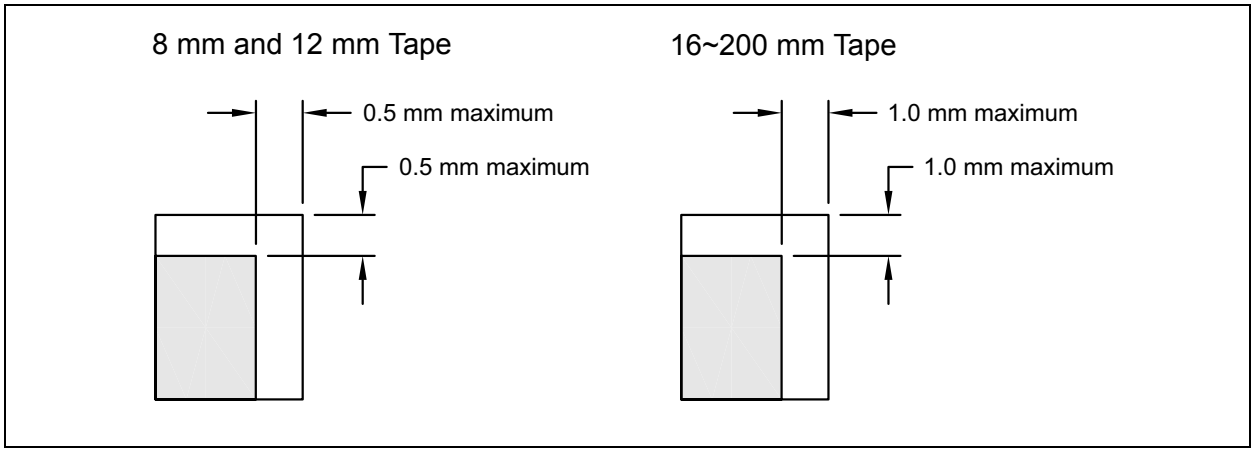
FIGURE 5: Maximum Component Rotation for Punched and Embossed Carrier Tape



Tape Width (mm)	Maximum Rotation Θ°T
8, 12	20
16~200	10

Tape Width (mm)	Maximum Rotation Θ°S
8, 12	20
16~56	10
72~200	5

FIGURE 6: Maximum Lateral Movement for Punched and Embossed Carrier



Source: EIA-481

FIGURE 7: Bar Code Label Area for Punched and Embossed Carrier

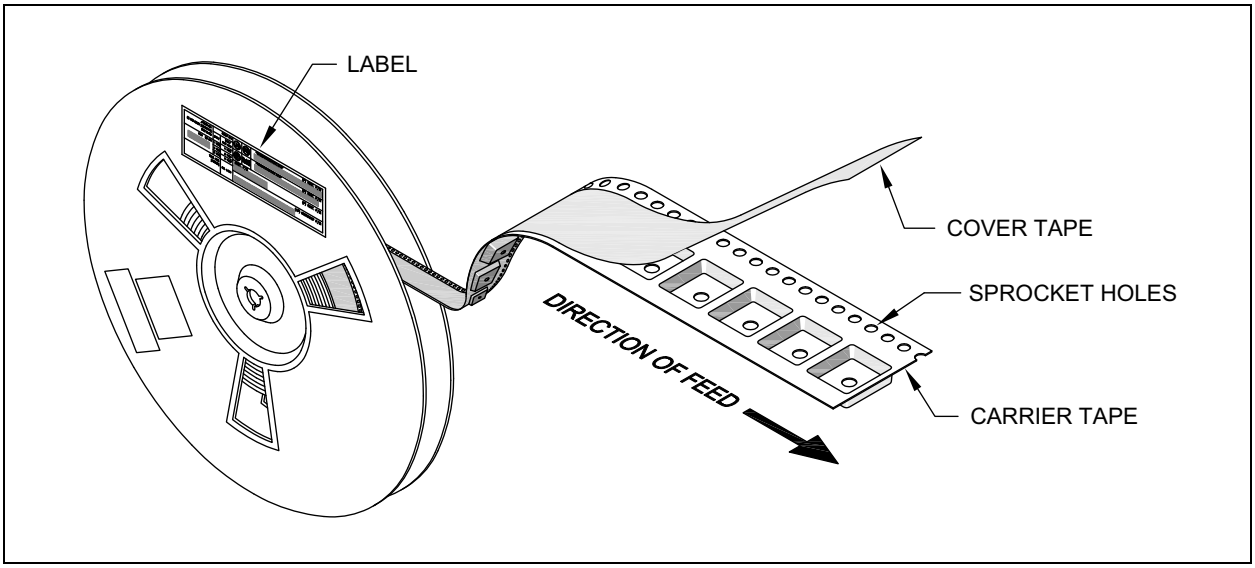
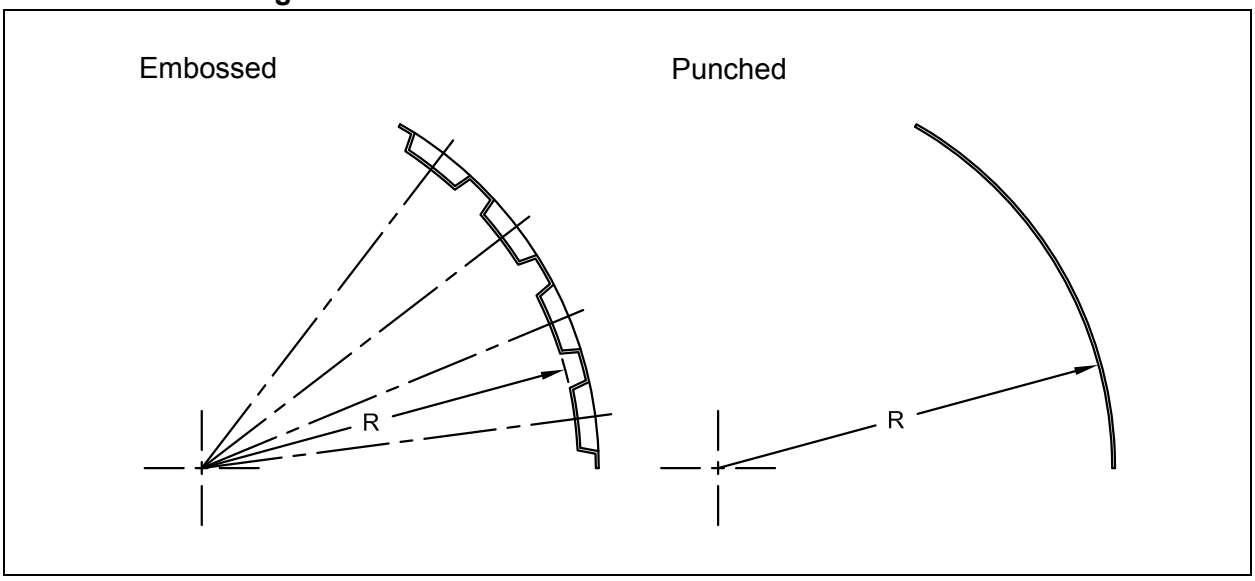
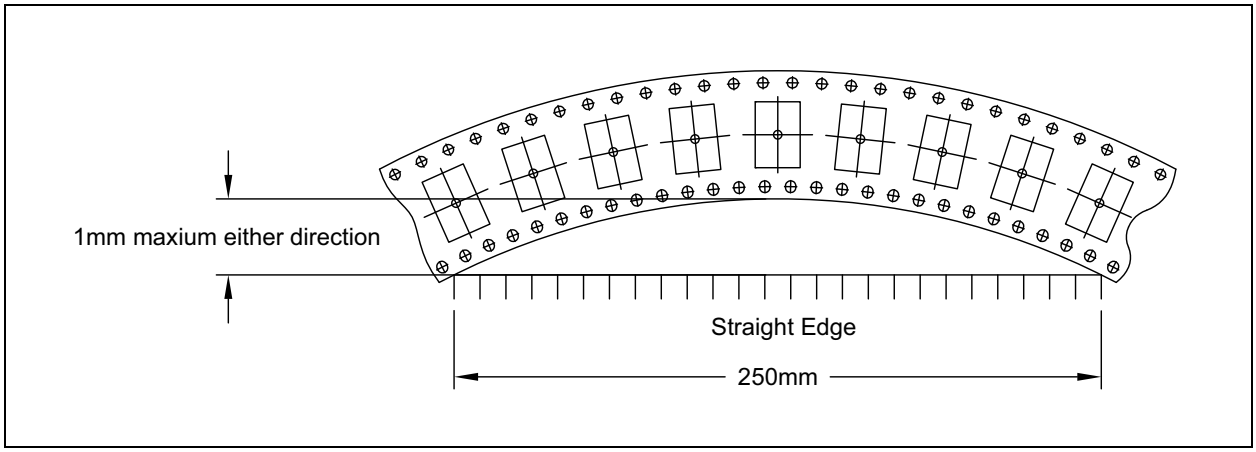


FIGURE 8: Bending Radius for Punched and Embossed Carrier



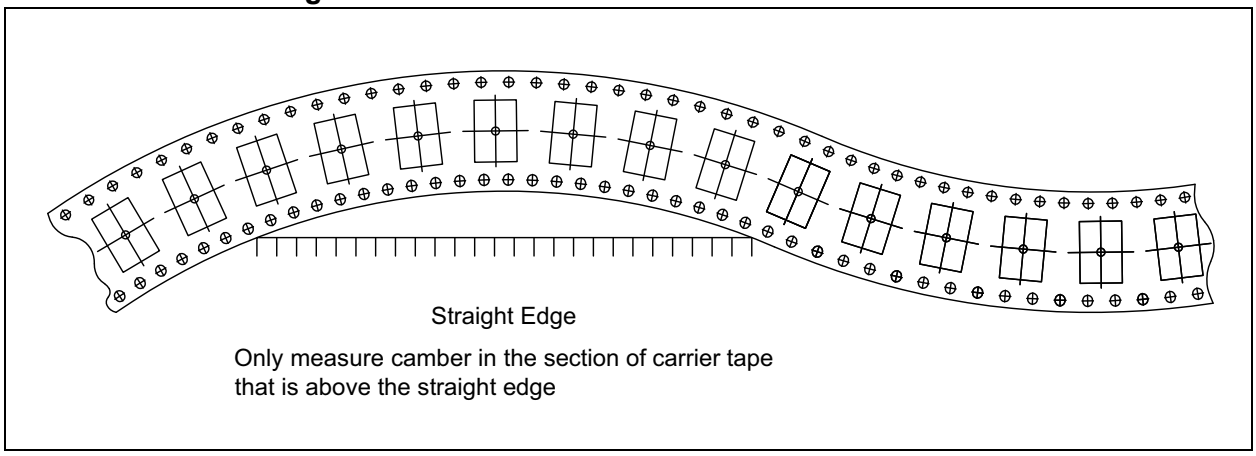
Source: EIA-481

FIGURE 9: Maximum Camber for Punched and Embossed Carrier



To measure camber accurately, place the starting end of the carrier tape sample on the left end of the measurement fixture or straight edge. Moving to the right, measure the allowable camber at the highest point between where the left edge and the right edge of the carrier tape make contact with the measurement fixture or straight edge.

FIGURE 10: Measuring Camber for Punched and Embossed Carrier



Source: EIA-481

FIGURE 11: Ten Pitches Cumulative Sprocket Holes Measurement

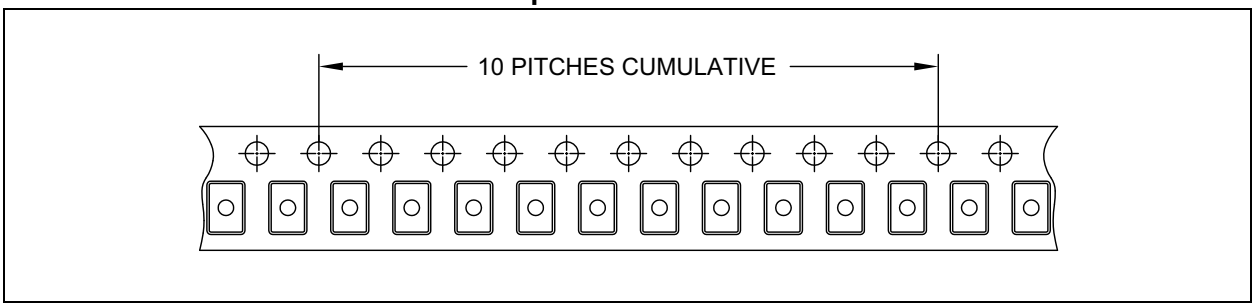
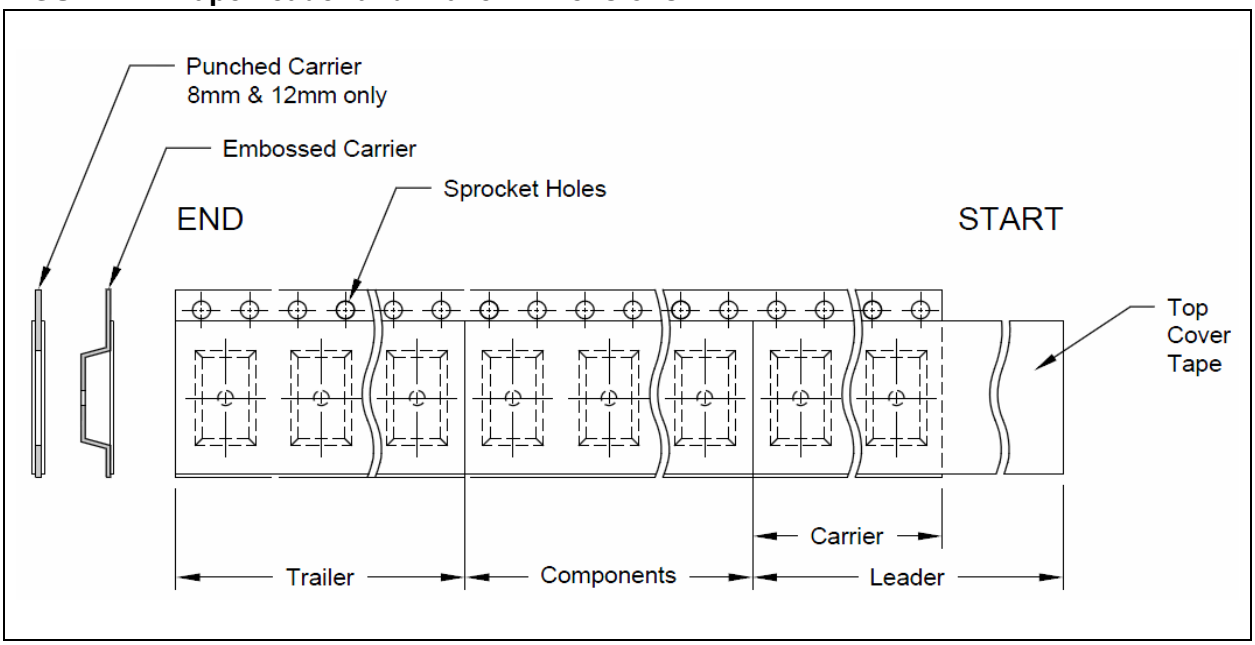


FIGURE 12: Tape Leader and Trailer Dimensions



1. There shall be a leader of 400 mm minimum of cover tape, which includes at least 100 mm of carrier tape with empty compartments and sealed by the cover tape. All of the leader may consist of the carrier tape with empty compartments sealed by cover tape.
2. There shall be a trailer of 160 mm minimum of empty carrier tape sealed with cover tape. The entire carrier tape must release from the reel hub as the last portion of the tape unwinds from the reel without damage to the carrier tape and the remaining components in the cavities.

Source: EIA-481

FIGURE 13: Reel With a Drive Hole

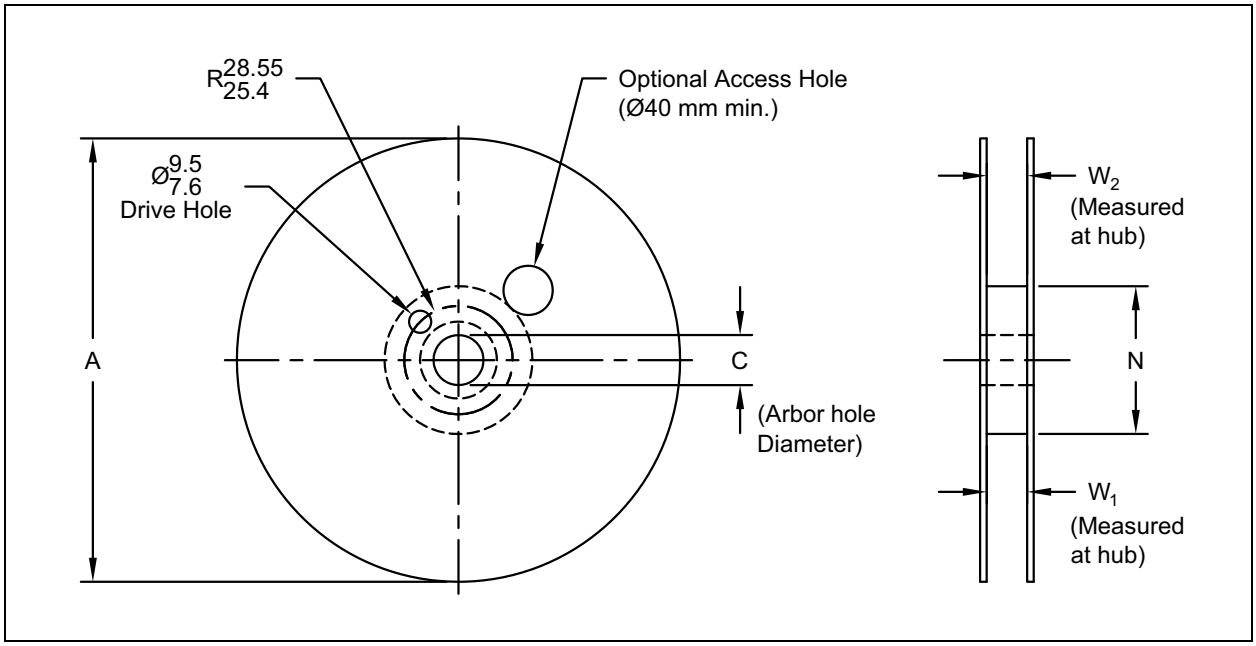
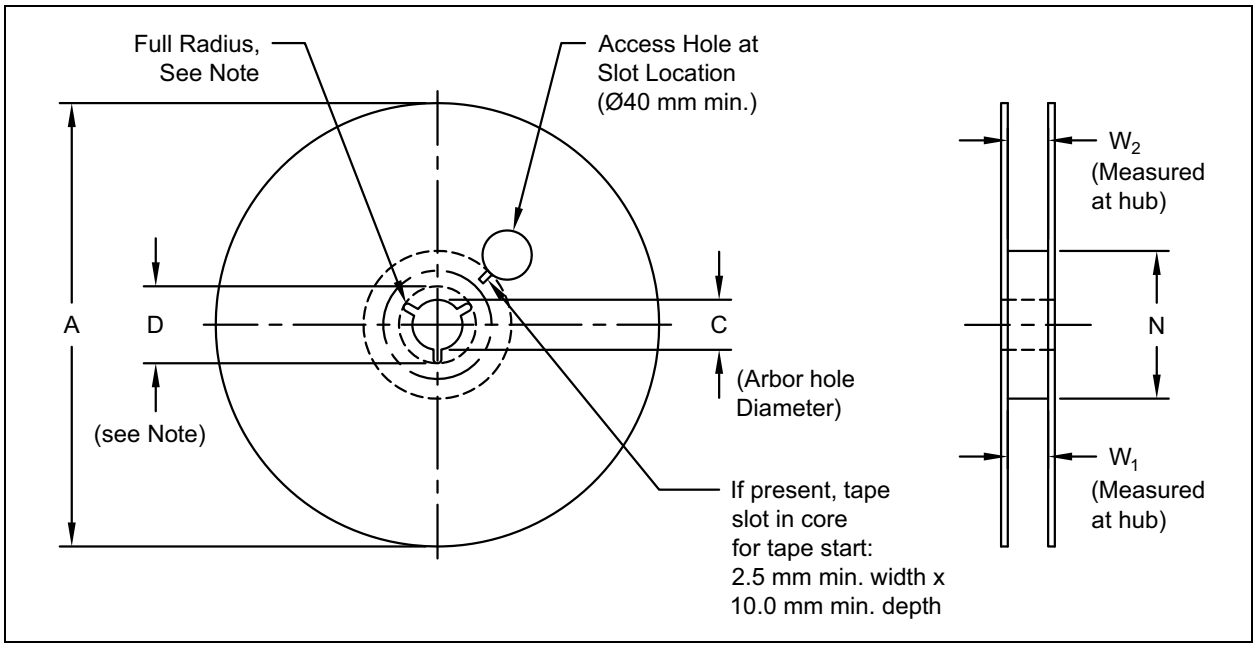


FIGURE 14: Reel Without a Drive Hole



Source: EIA-481

Product Tape and Reel Specification

Table 15: Plastic Reel Dimensions:

Carrier Width	(A) Reel Diameter (mm) ±3.0 or as specified	(N) Hub Diameter (mm) ±1.5 or as specified	(W_1) Reel Thickness (mm) $^{+2.0}_{-0.0}$ or as specified	(W_2) Total Thickness (mm) Max	(C) Center Hole Diameter (mm) ±0.2 or as specified
8 mm	330	60	8.4	14.4	13
8 mm	178±2.0	60.5±0.5	$8.4^{+1.5}_{-0}$	14.4	$13^{+0.5}_{-0.2}$
8 mm	$180^{+0}_{-1.5}$	60^{+1}_{-0}	9^{+1}_{-0}	11.4±1.0	13
8 mm	177-179	59-61	8.5-9.5	--	12.8-13.5
12 mm	328-332	100-101	13.0-14.0	18.4	12.8-13.5
12 mm	328-332	100-102	12.4-14.4	18.4	12.8-13.5
12 mm	328-332	179.5 -183.5	12.4-13.4	18.2	12.8-13.5
12 mm	330+2.0	100±2.0	12.4^{+2}_{-0}	18.4	$13^{+0.5}_{-0.2}$
16 mm	328-332	100-101	17.0-18.0	22.5	12.5-13.5
16 mm	328-332	100-102	16.4-18.4	22.4	12.8-13.5
16 mm	330±2.0	100±2.0	16.4^{+2}_{-0}	22.4	$13^{+0.5}_{-0.2}$
24 mm	328-332	100-102	24.4-26.4	38.4	12.8-13.5
24 mm	330±2.0	100±2.0	24.4±2.0	30.4	$13^{+0.5}_{-0.2}$
32 mm	328-332	100-102	32.4-34.4	38.4	12.8-13.5
32 mm	330±2.0	100±2.0	32.4±2.0	38.4	13
44 mm	328-332	100-102	44.4-46.4	50.4	12.8-13.5
44 mm	330±2.0	100±2.0	44.4±2.0	50.4	$13^{+0.5}_{-0.2}$

Source: EIA-481

FIGURE 15: TO-92 Carrier Tape Dimensions

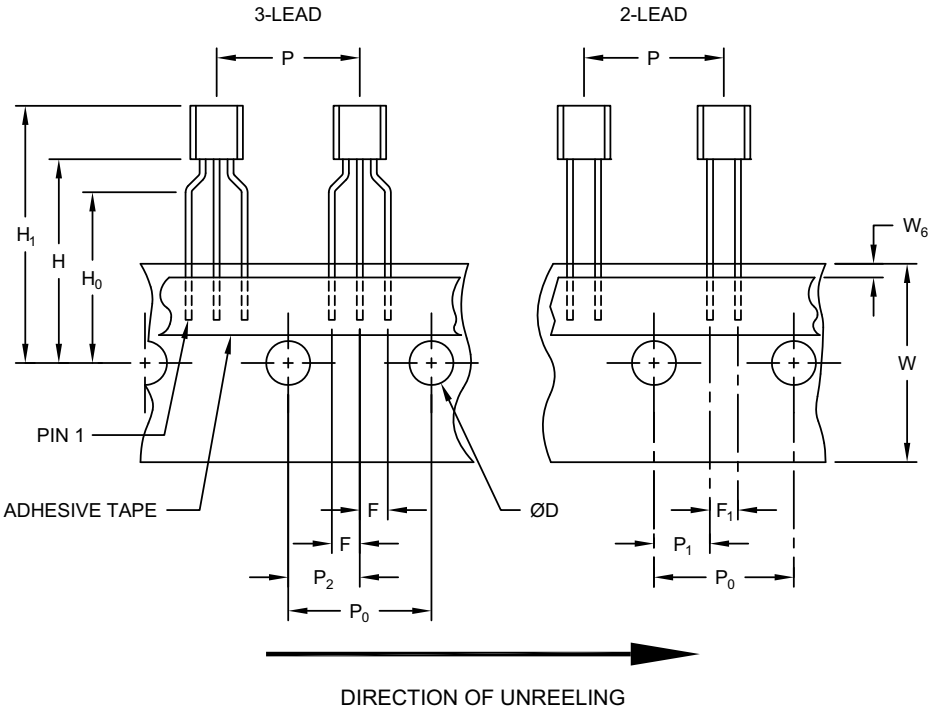
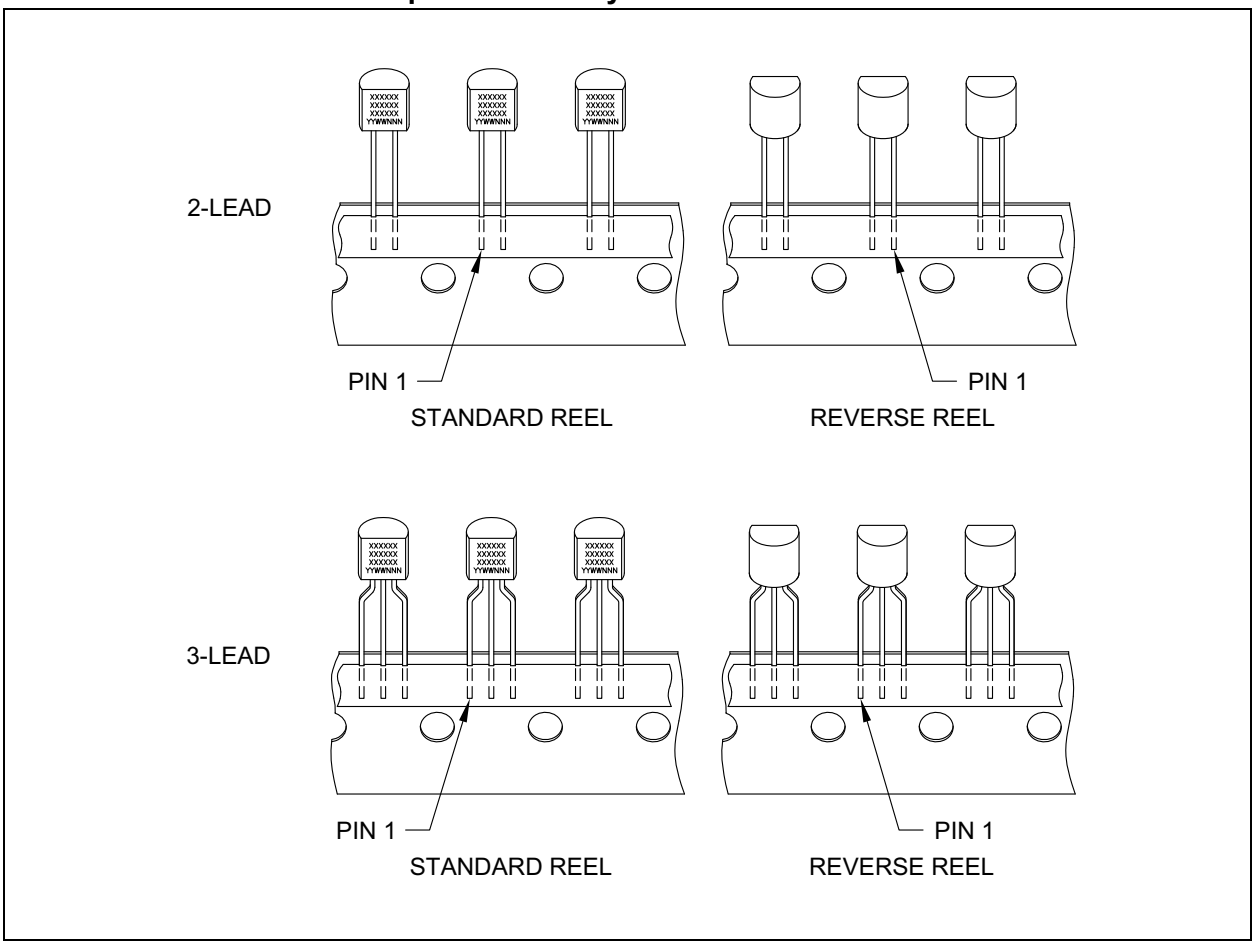


Table 16: TO-92 Carrier Tape Dimensions

Symbol	Description	Dimension (mm)
D	Sprocket Hole Diameter	4.0 ±0.2
P	Device Pitch	12.7 ±0.1
P_0	Feed Hole Pitch	12.7 ±0.1
P_1	Ordinate to Adjacent lead (2-Lead TO-92)	5.07 ±0.7
P_2	Ordinate to Center Lead (3-Lead TO-92)	6.35 ±0.7
F_1	2 Lead TO-92 Spacing	$2.54^{+0.6}_{-0.2}$
F	3 Lead TO-92 Spacing	$2.54^{+0.4}_{-0.1}$
H_0	Height to Seating Plane (Formed Leads)	15.5 MIN.
H_1	Overall Height Above Abscissa	32.2 MAX.
H	Height to Seating Plane (Straight Leads)	16-21
W	Carrier Tape Width	18
W_6	Adhesive Tape Position	3 MAX.
-	Output Quantity Units	1000
-	Reel Diameter	355

Source: EIA-481

FIGURE 16: BGA and LGA Square Geometry



Source: EIA-481

EIA STANDARD PACKAGE ORIENTATION

FIGURE 17: BGA and LGA Rectangular Geometry

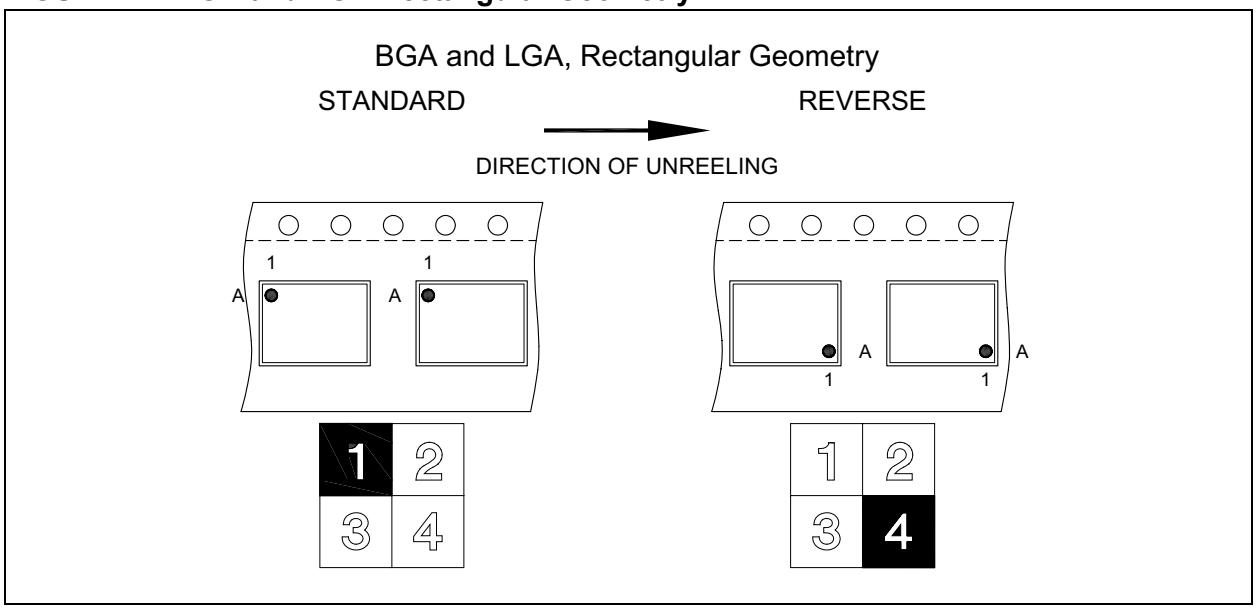
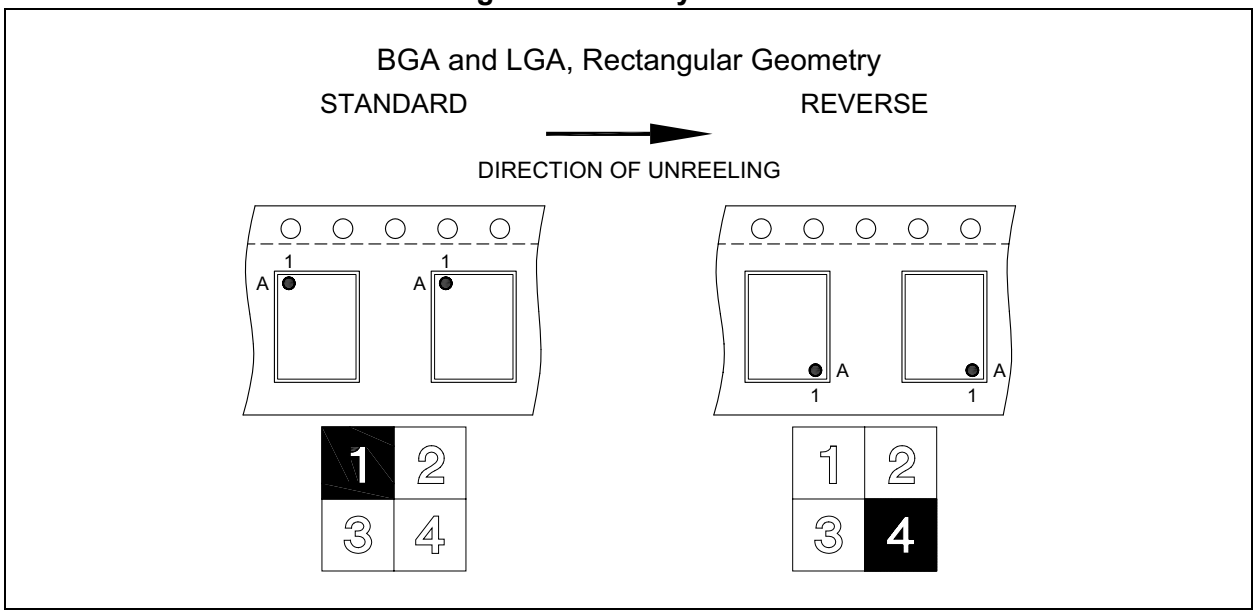


FIGURE 18: BGA and LGA Rectangular Geometry



Source: EIA-481

FIGURE 19: BGA and LGA Rectangular Geometry, Rotated

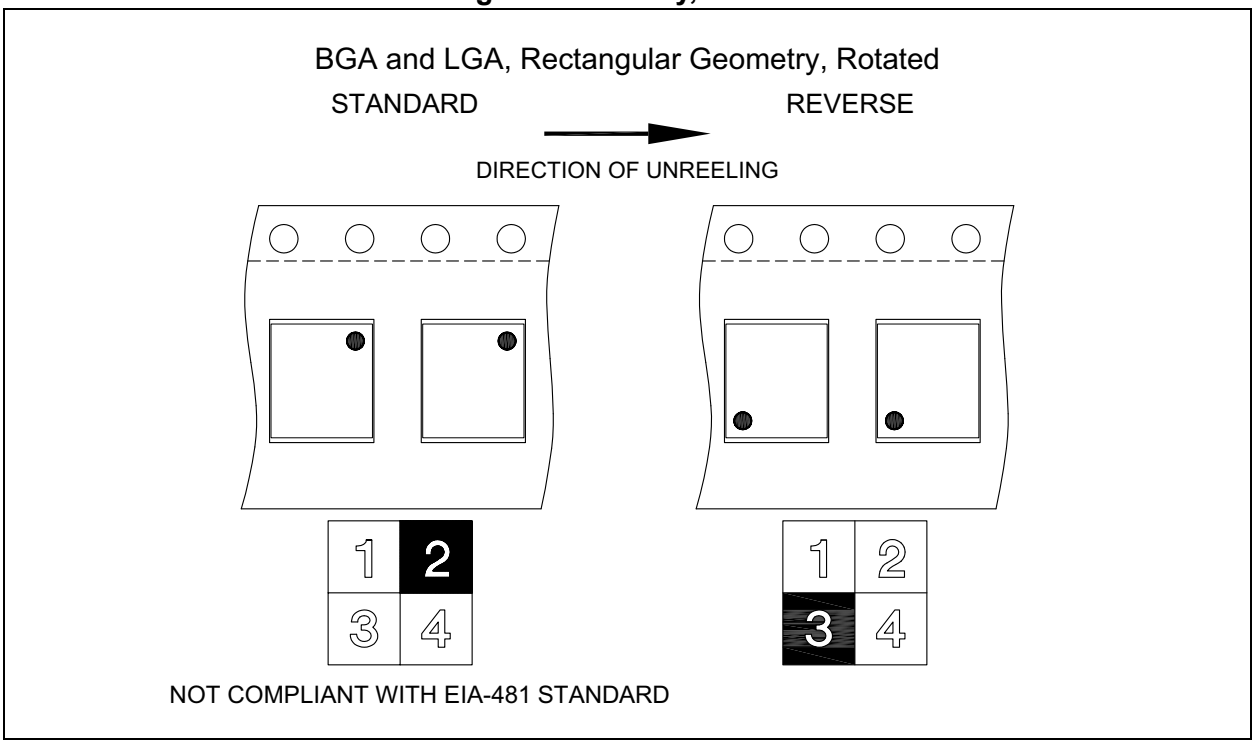
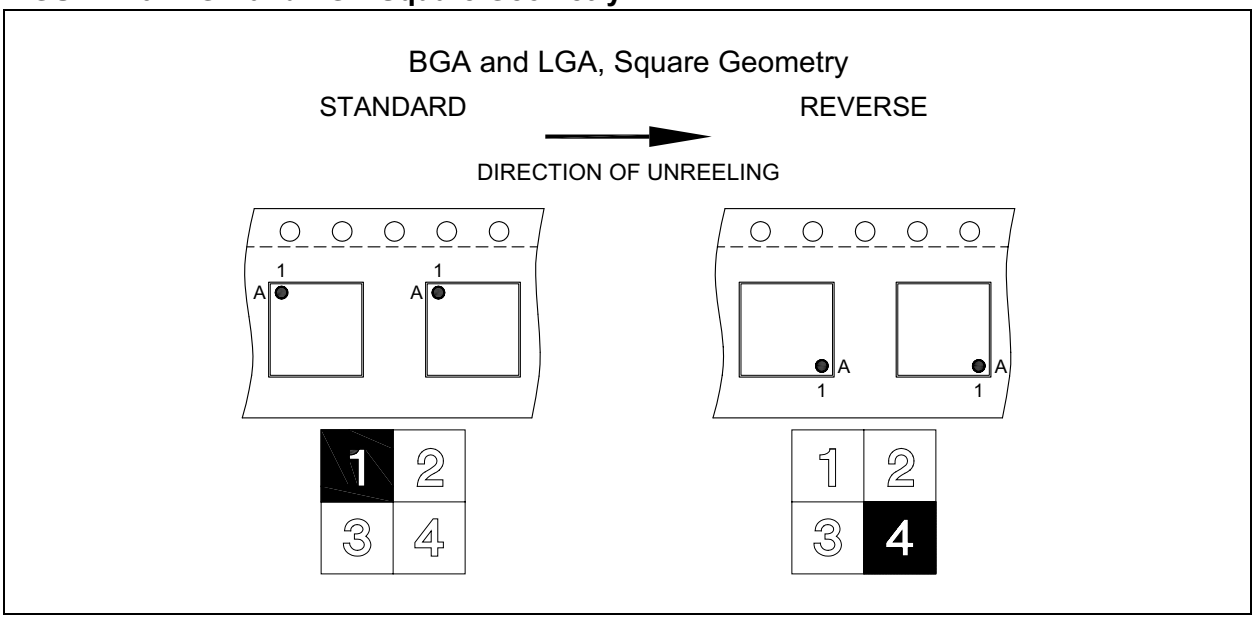


FIGURE 20: BGA and LGA Square Geometry



Source: EIA-481

FIGURE 21: DFN, Rectangular Geometry

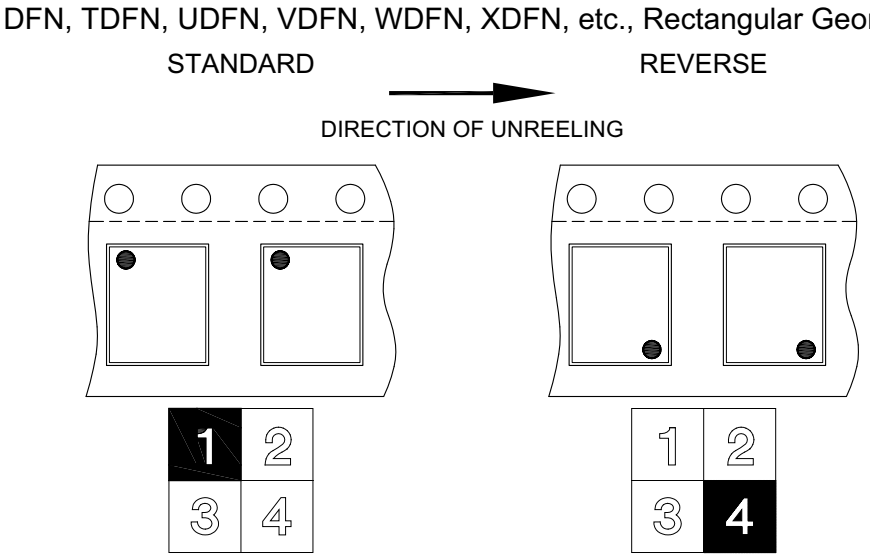
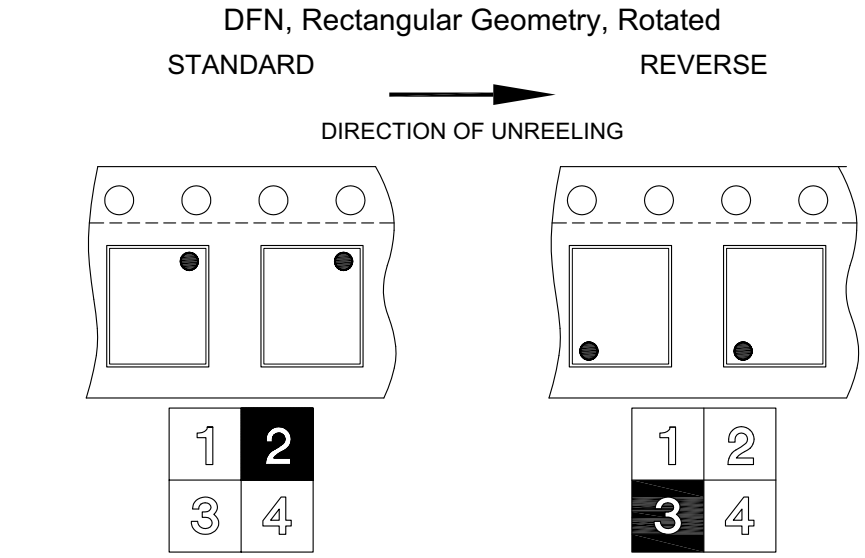


FIGURE 22: DFN, Rectangular Geometry, Rotated



Source: EIA-481

FIGURE 23: DFN, Rectangular Geometry

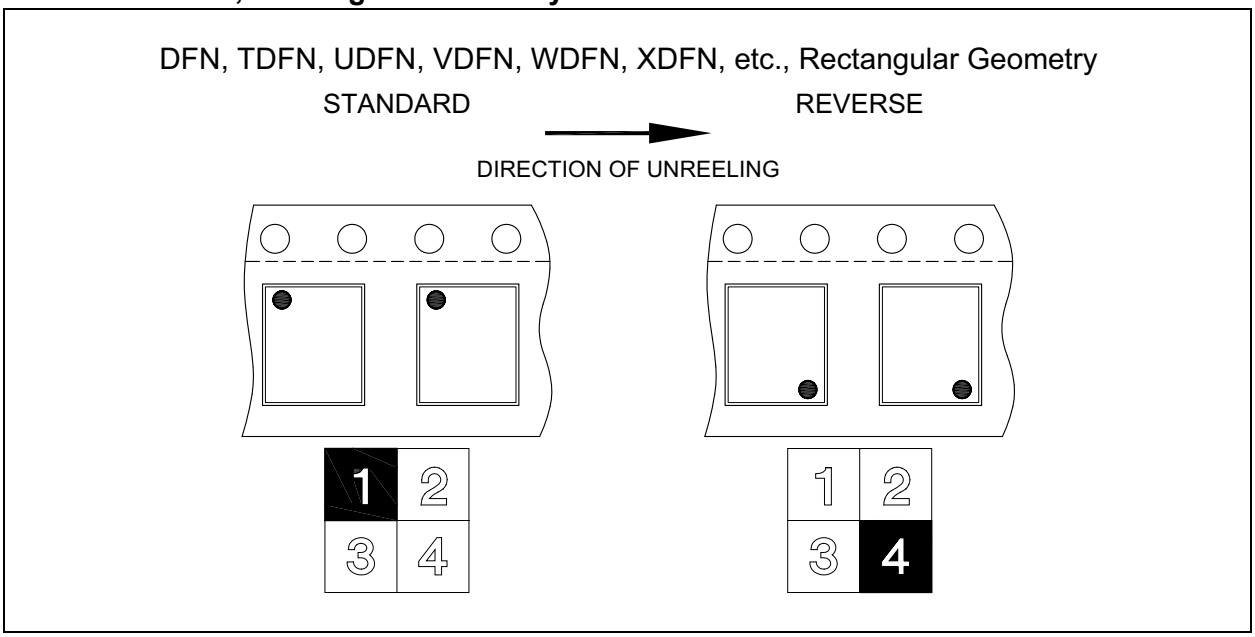
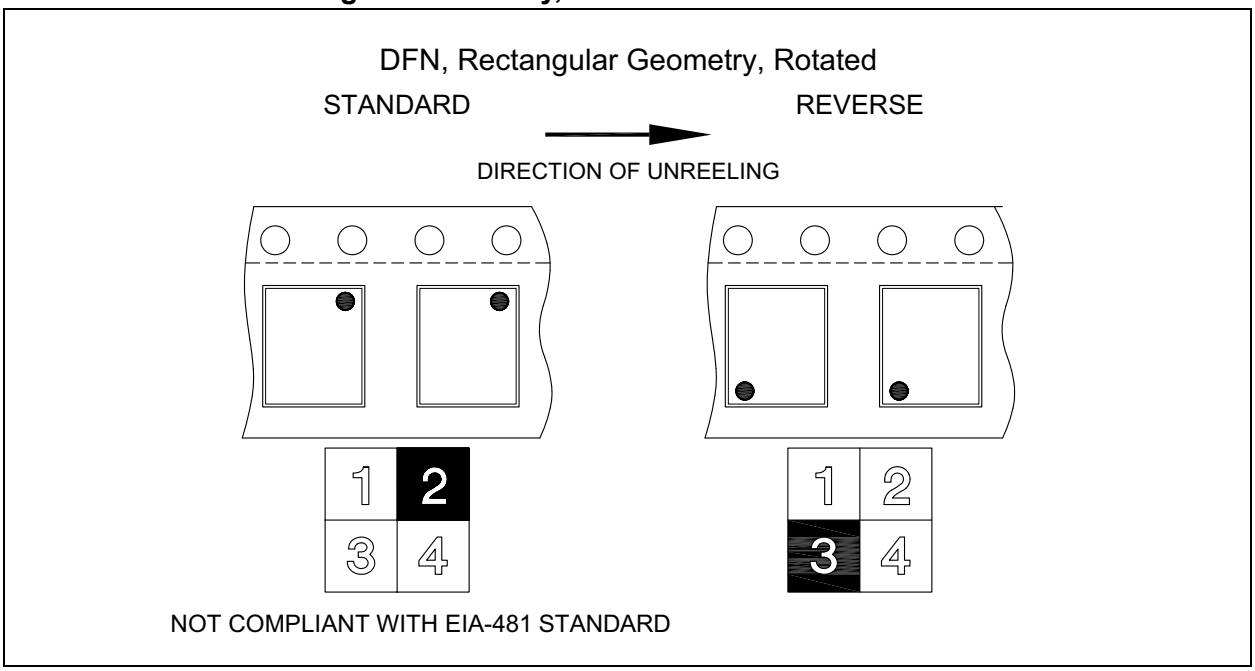


FIGURE 24: DFN Rectangular Geometry, Rotated



Source: EIA-481

FIGURE 25: DFN Square Geometry

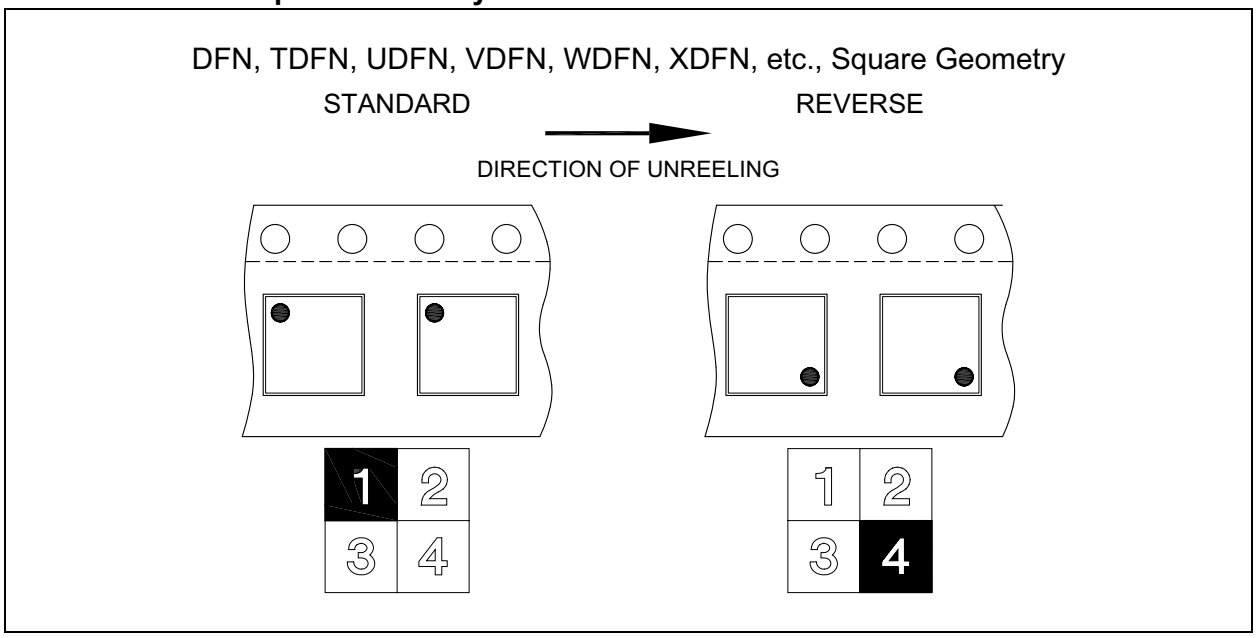
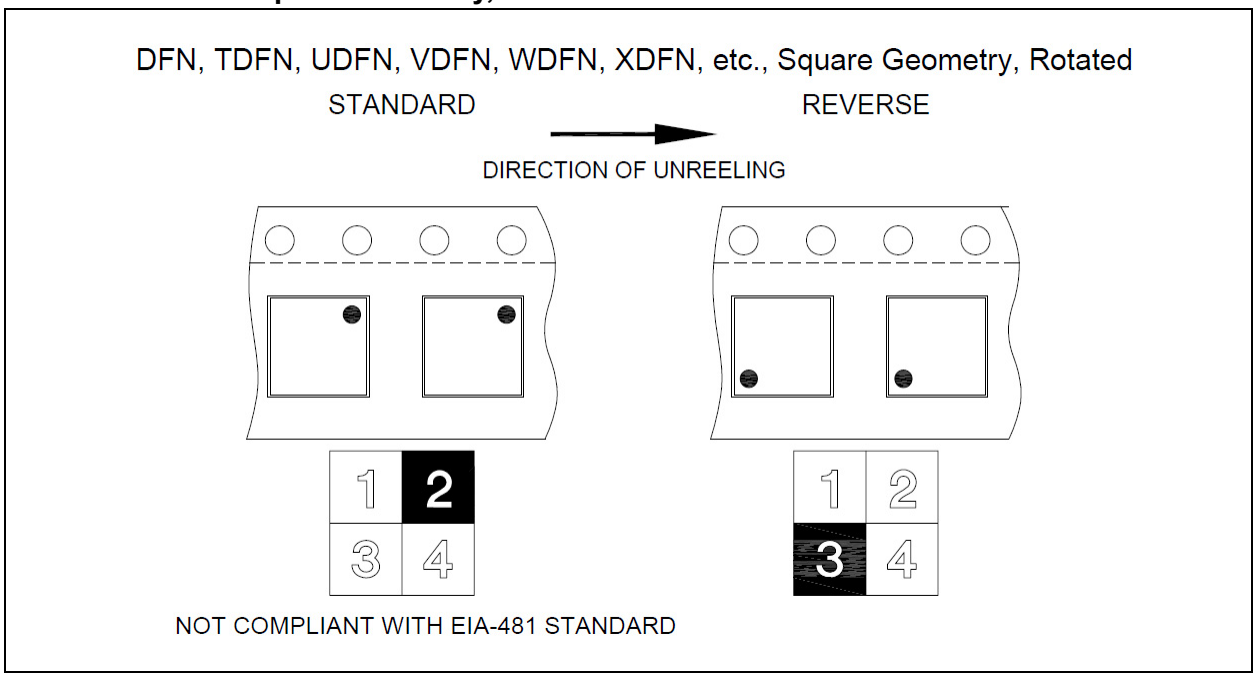


FIGURE 26: DFN Square Geometry, Rotated



Source: EIA-481

FIGURE 27: DDPAK or D²PAK (TO-263)

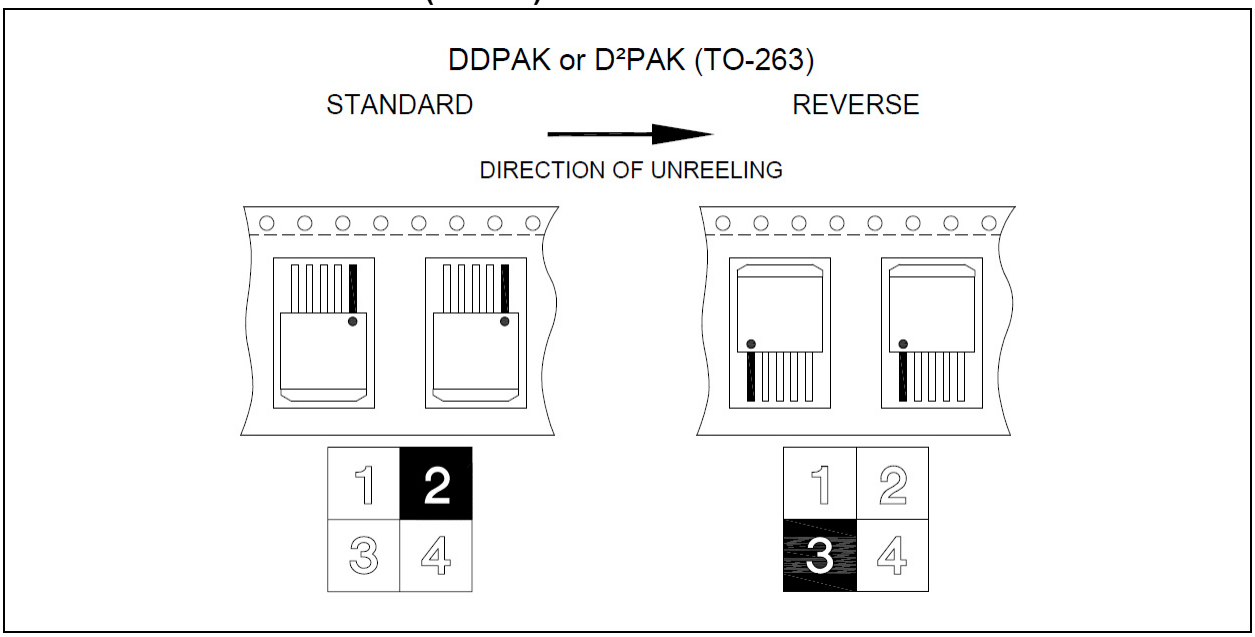
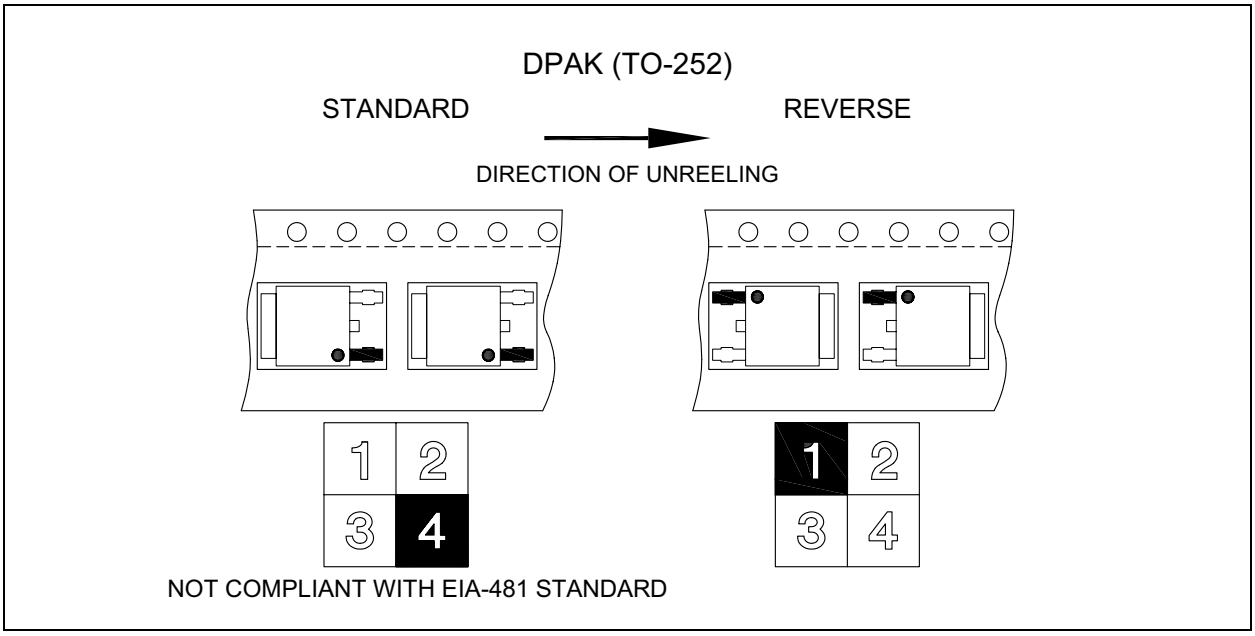


FIGURE 28: DPAK (TO-252), Supertex



Source: EIA-481

FIGURE 29: MSOP

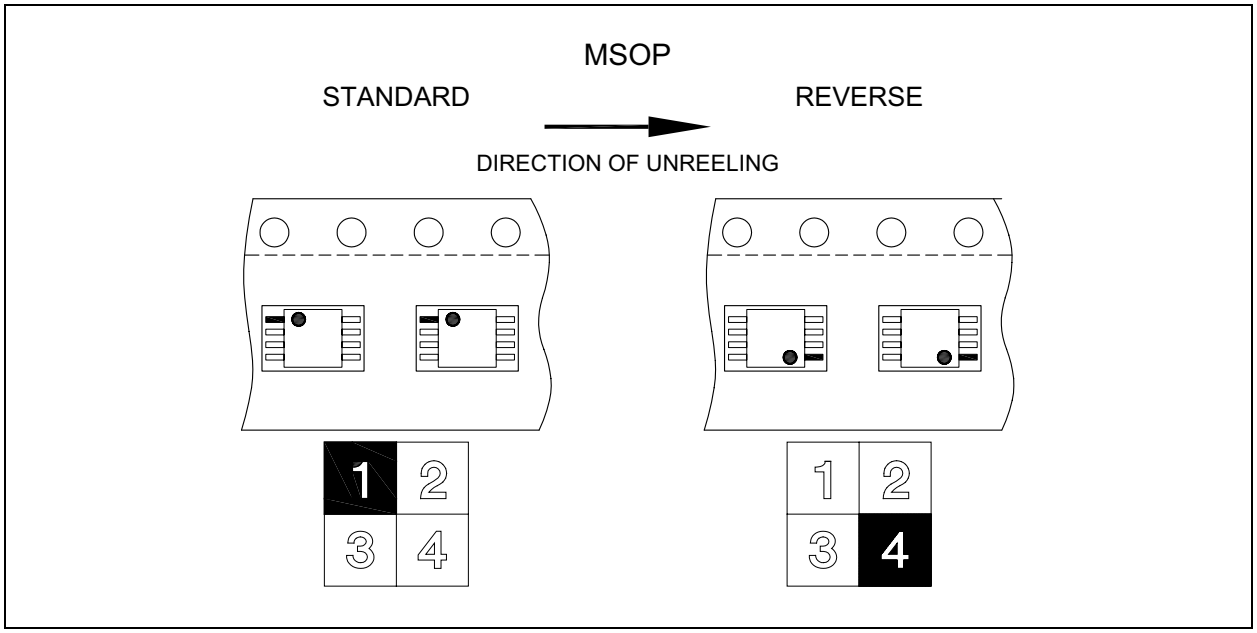
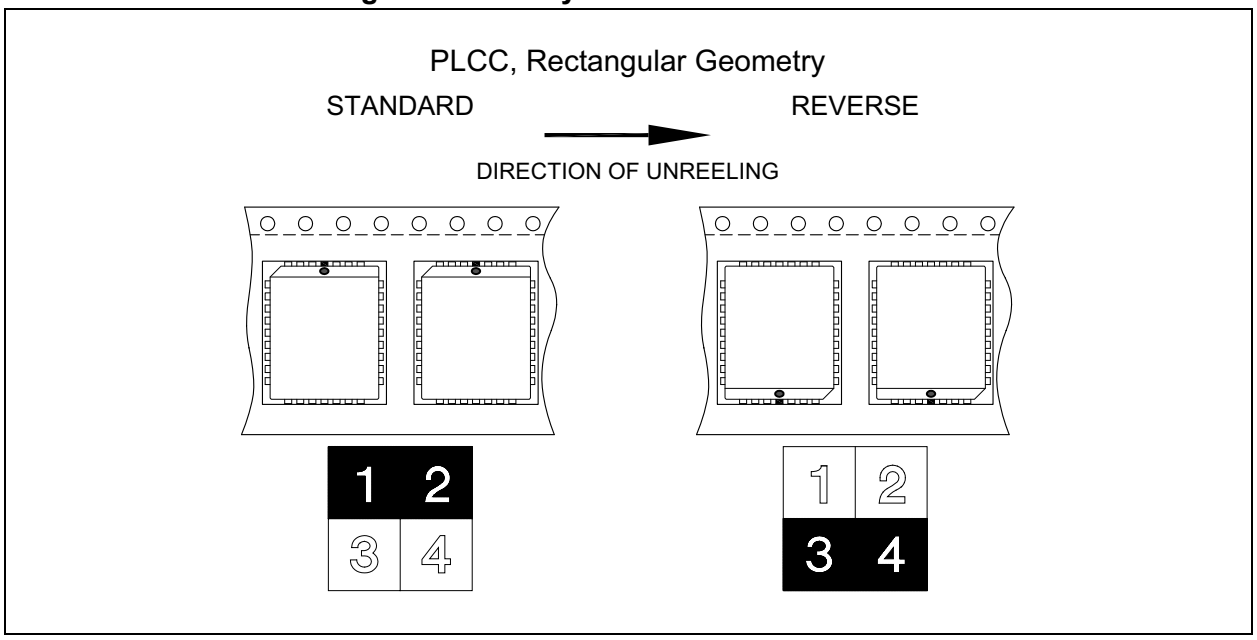


FIGURE 30: PLCC Rectangular Geometry



Source: EIA-481

FIGURE 31: PLCC Square Geometry

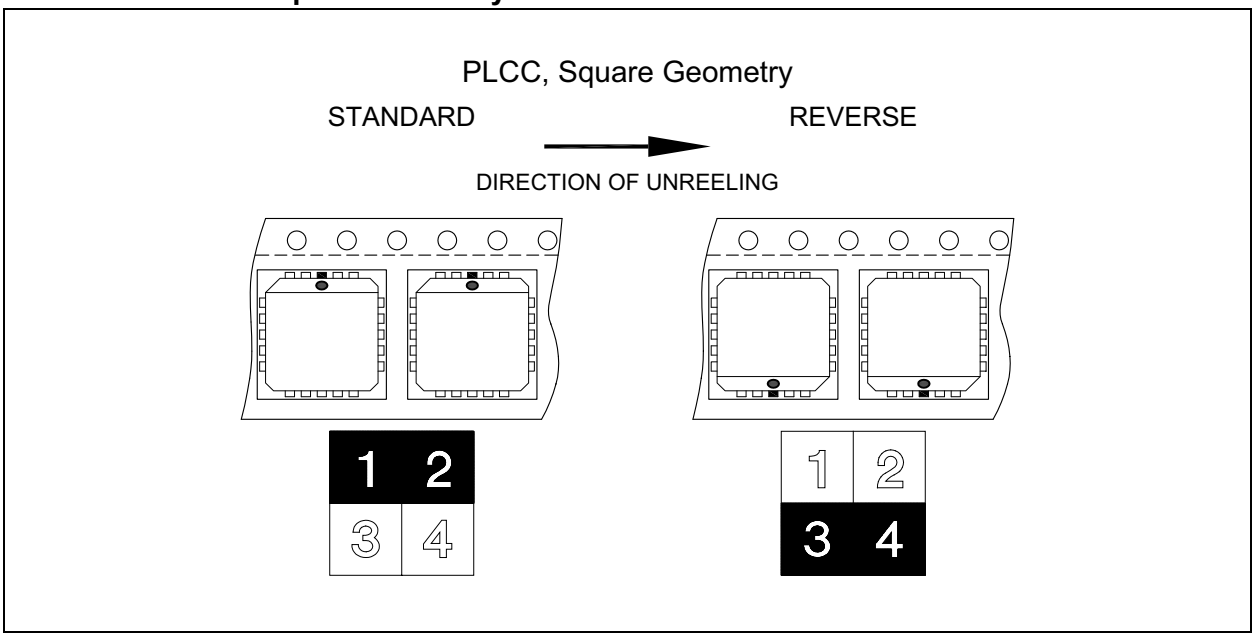
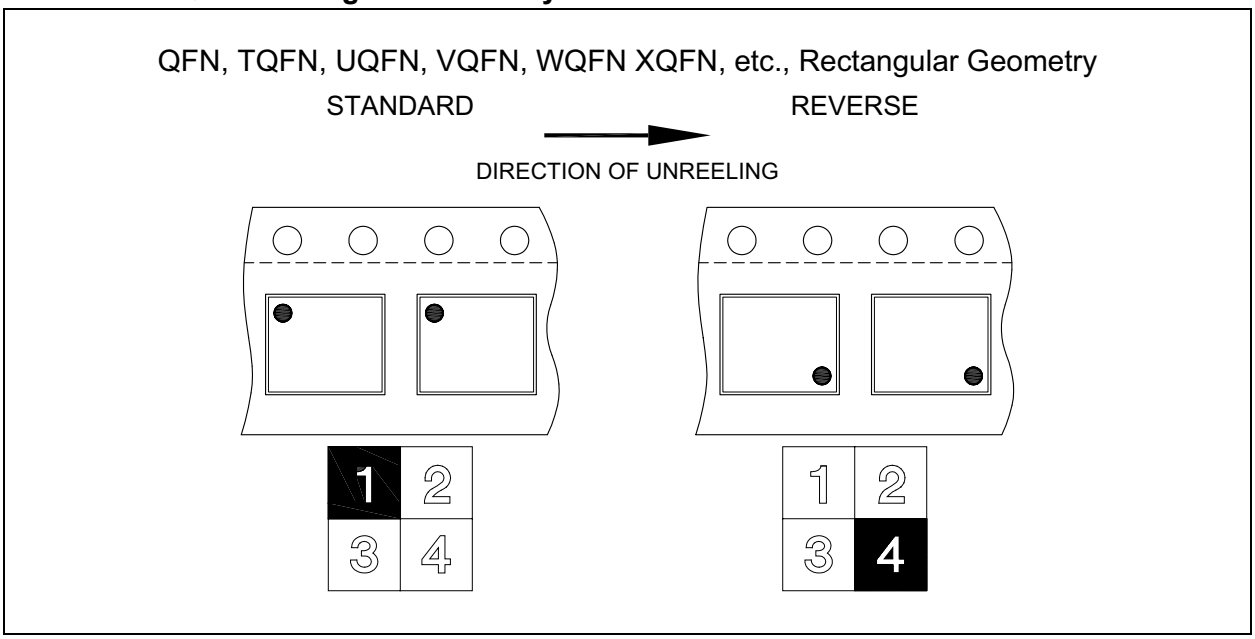


FIGURE 32: QFN Rectangular Geometry



Source: EIA-481

FIGURE 33: QFN Rectangular Geometry, Rotated

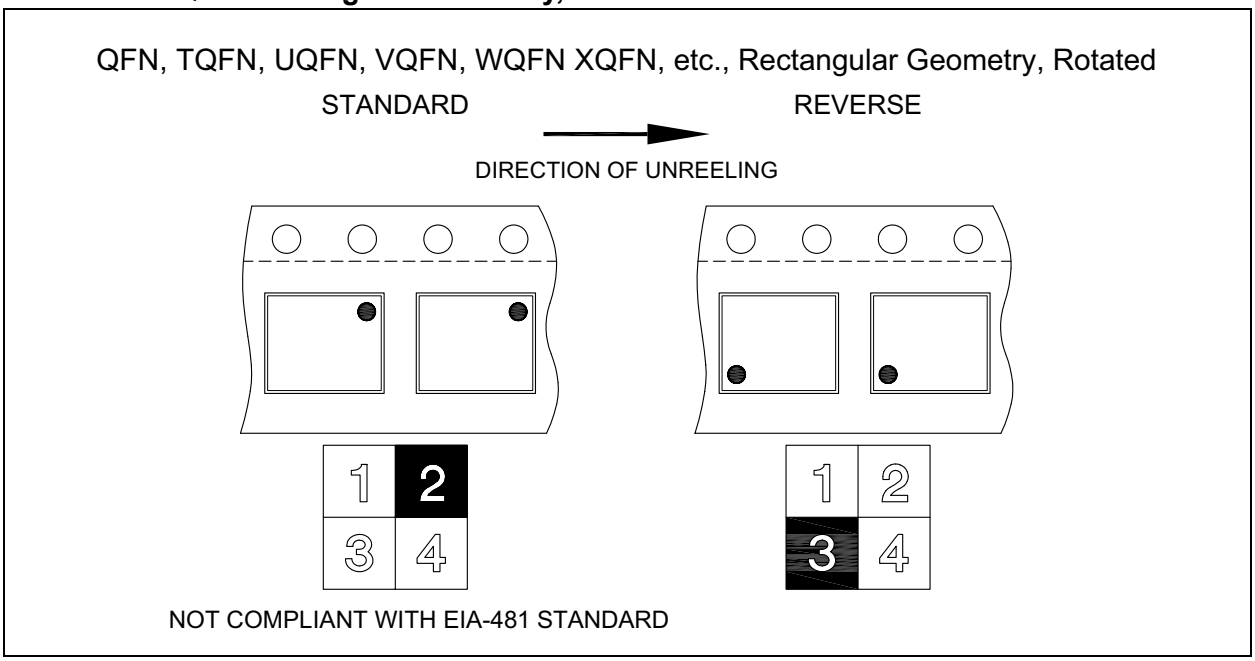
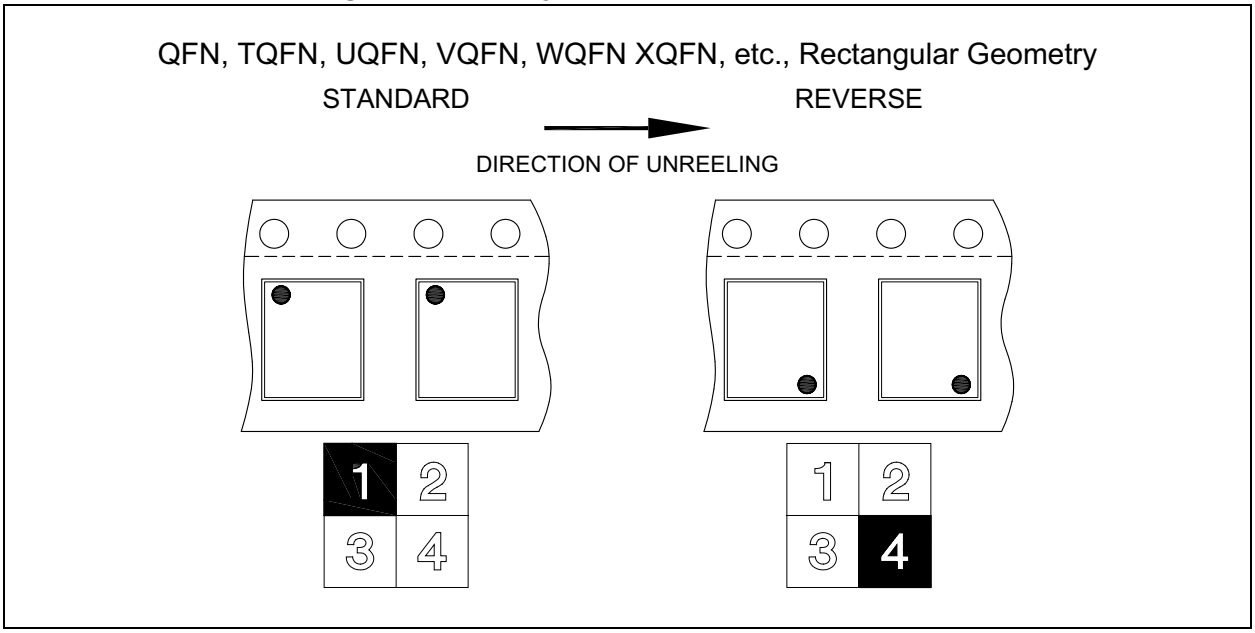


FIGURE 34: QFN Rectangular Geometry



Source: EIA-481

FIGURE 35: QFN Rectangular Geometry, Rotated

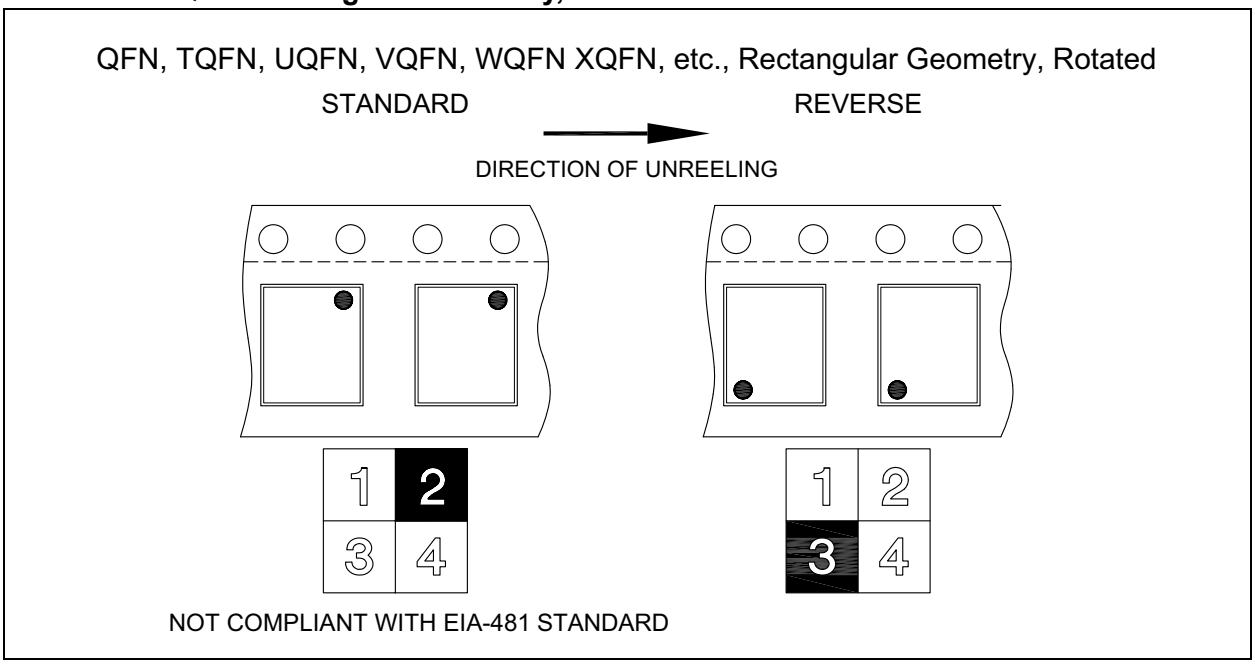
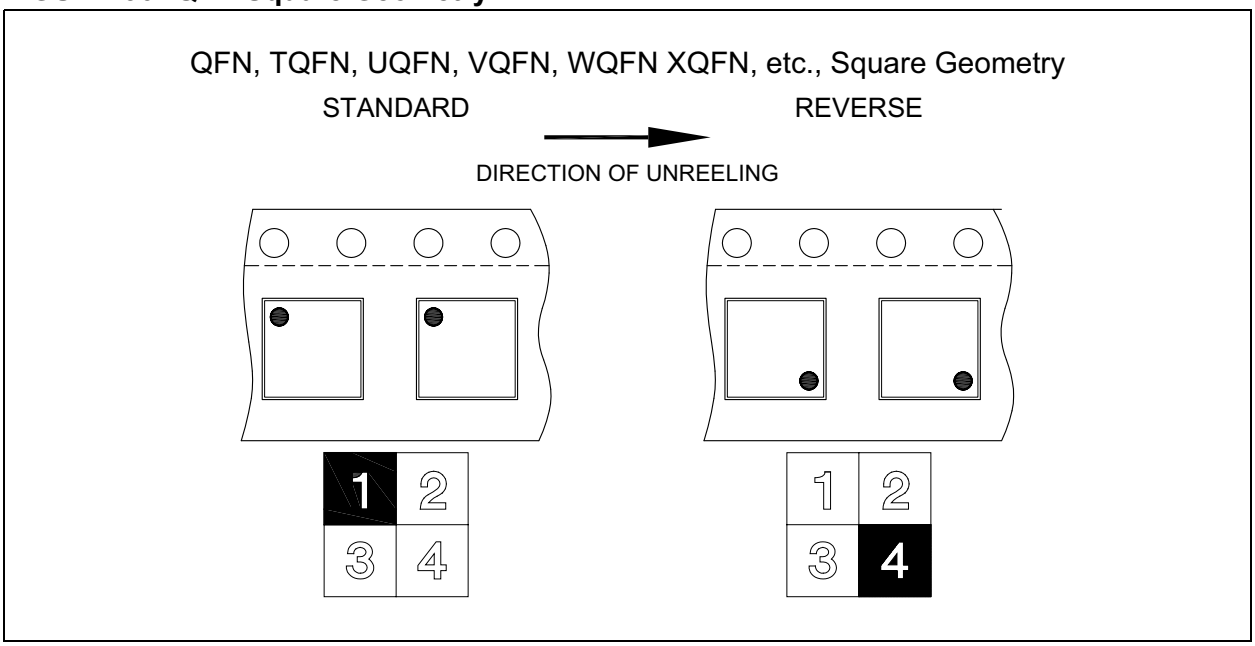


FIGURE 36: QFN Square Geometry



Source: EIA-481

FIGURE 37: QFN Square Geometry, Rotated

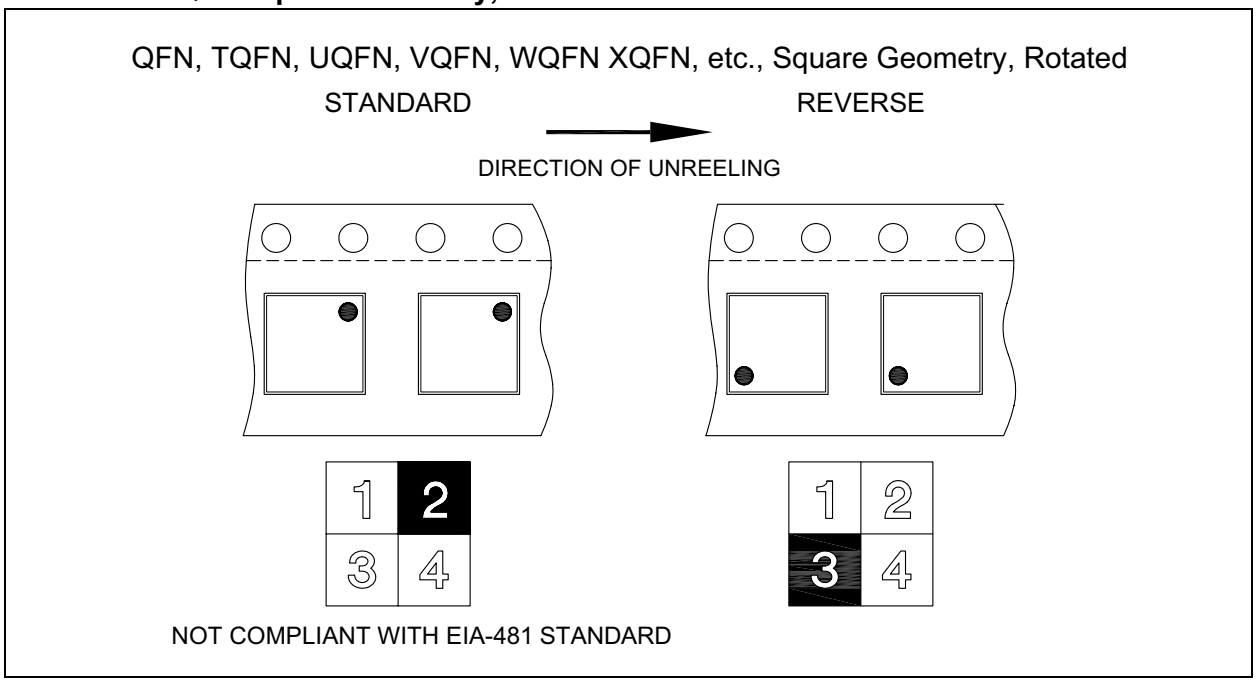
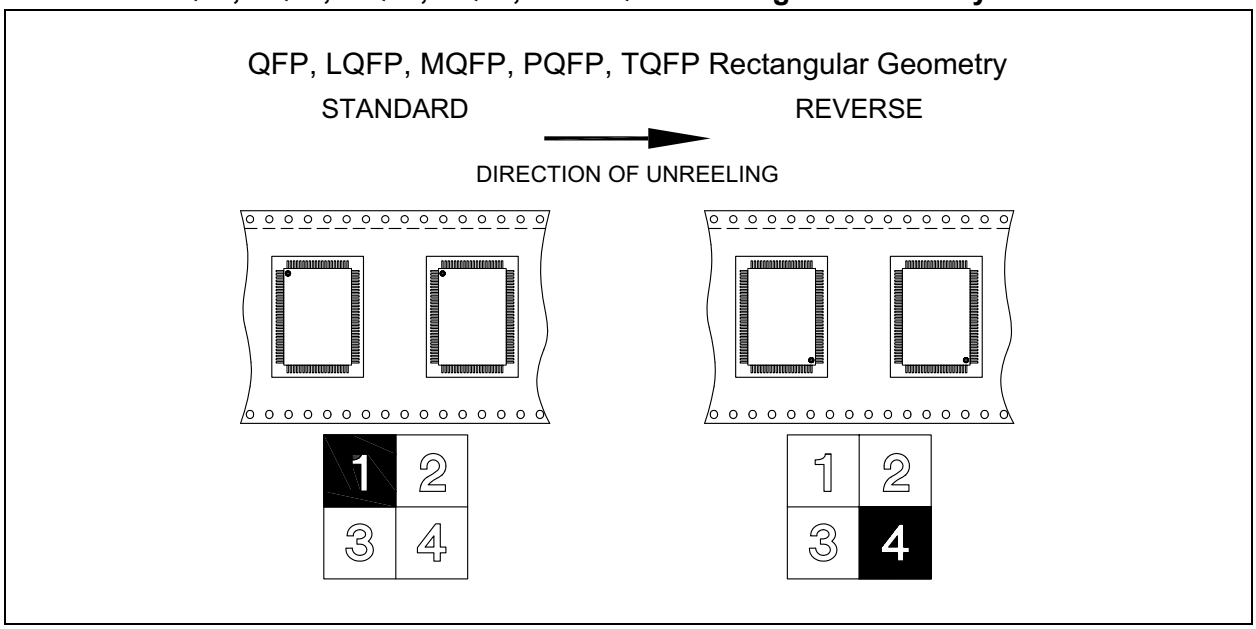


FIGURE 38: QFP, LQFP, MQFP, PQFP, and TQFP Rectangular Geometry



Source: EIA-481

FIGURE 39: QFP, LQFP, MQFP, PQFP and TQFP Square Geometry

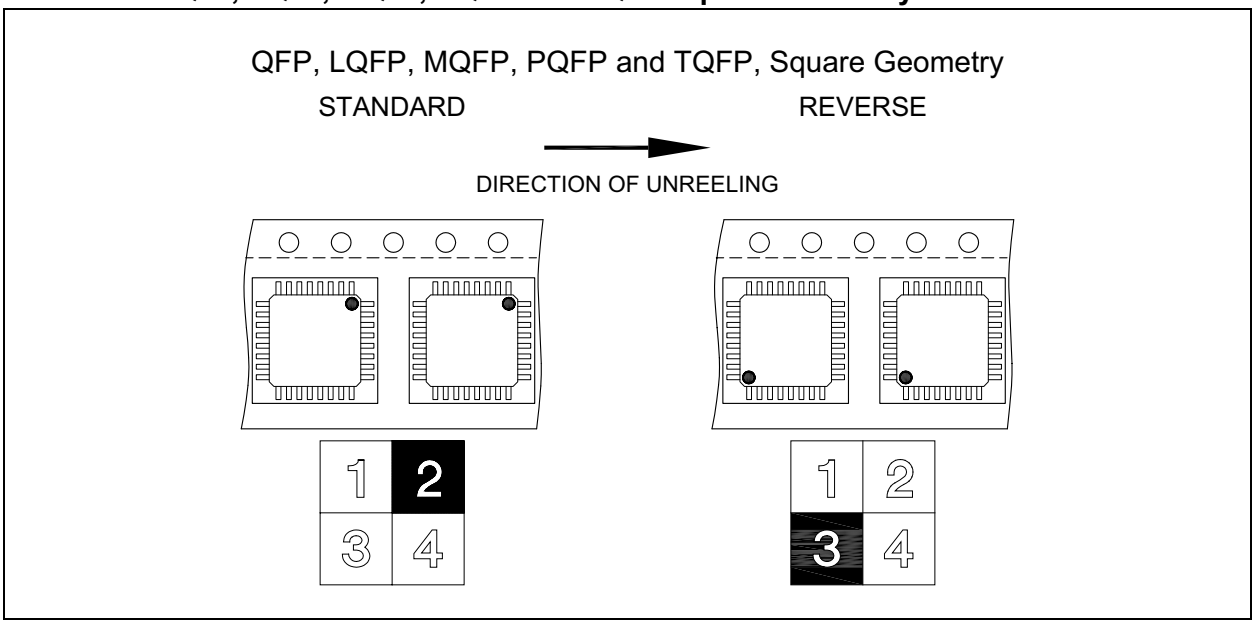
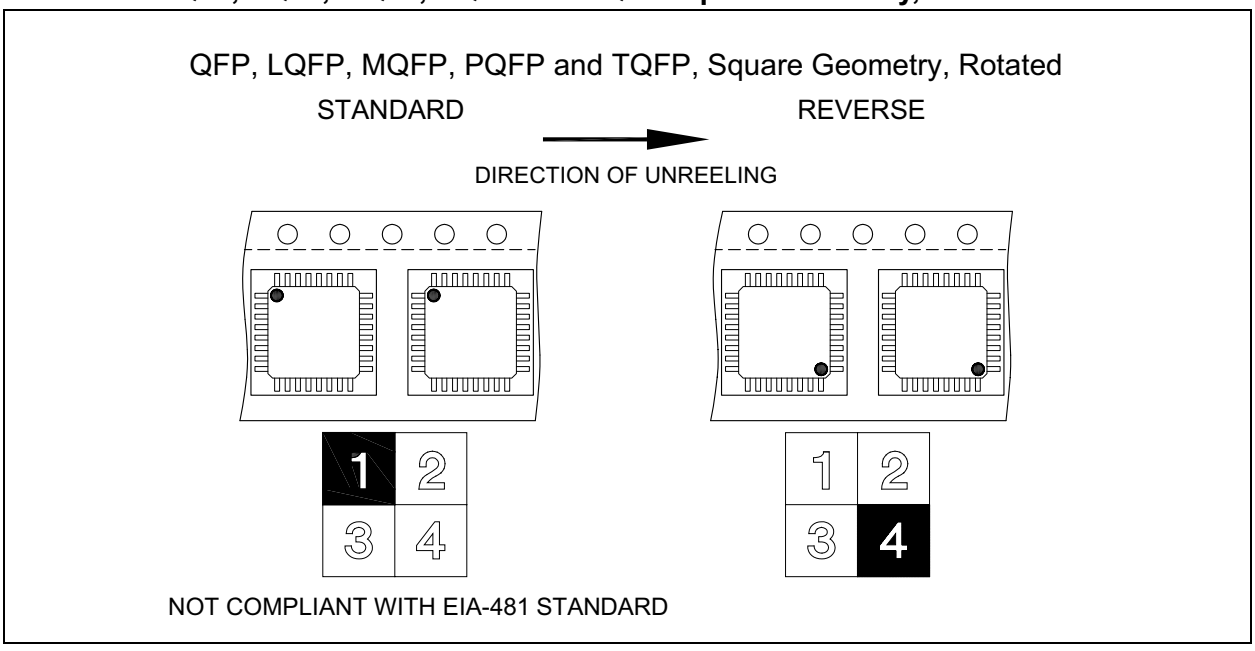


FIGURE 40: QFP, LQFP, MQFP, PQFP and TQFP Square Geometry, Rotated



Source: EIA-481

FIGURE 41: QSOP, SSOP and TSSOP

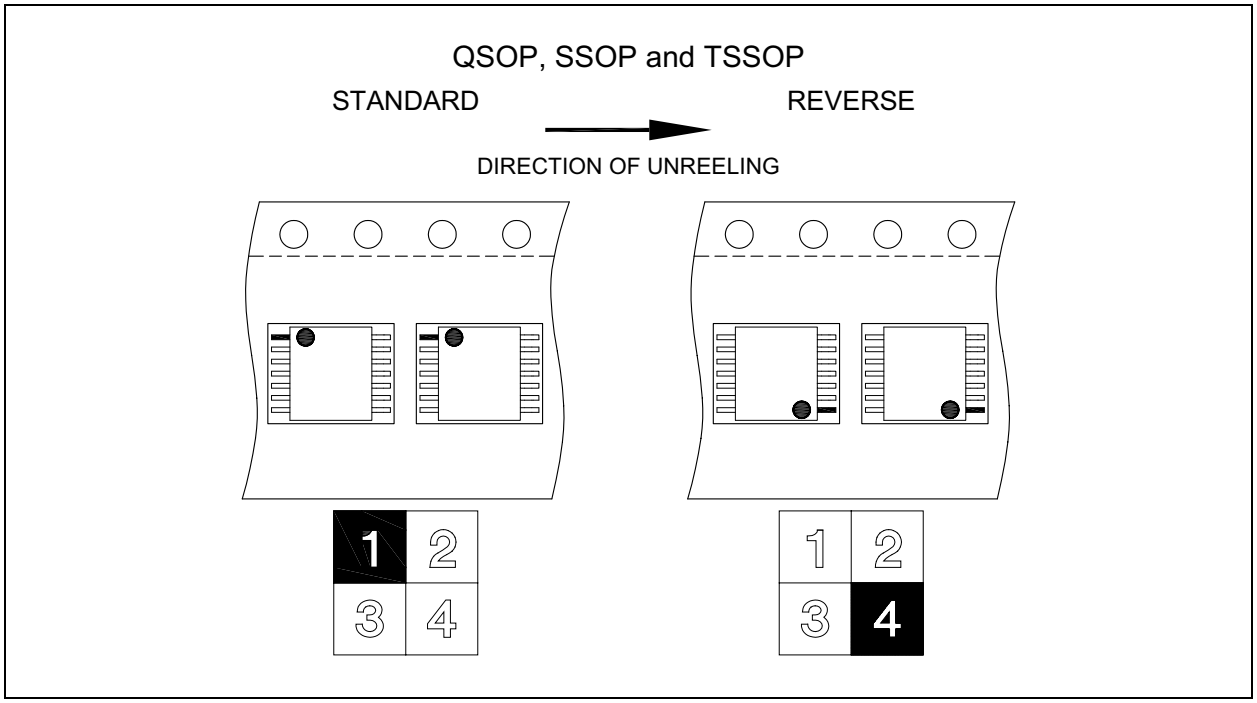
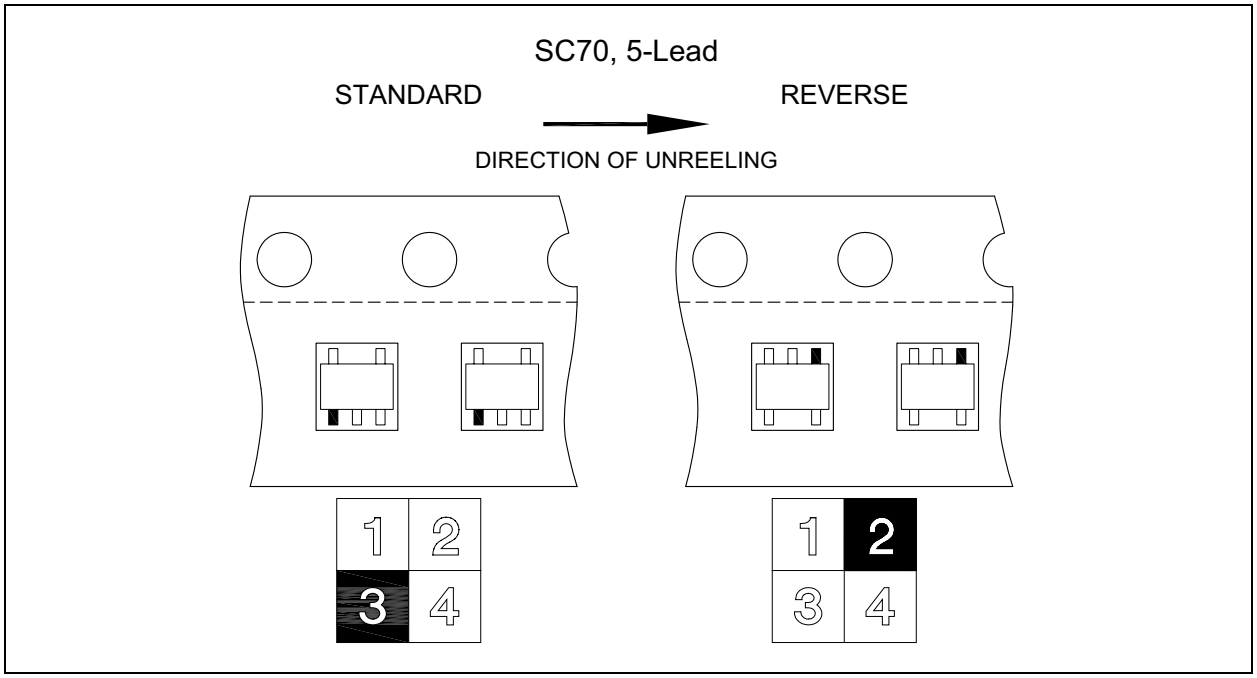


FIGURE 42: SC70 5-Lead



Source: EIA-481

FIGURE 43: SC70 6 Lead

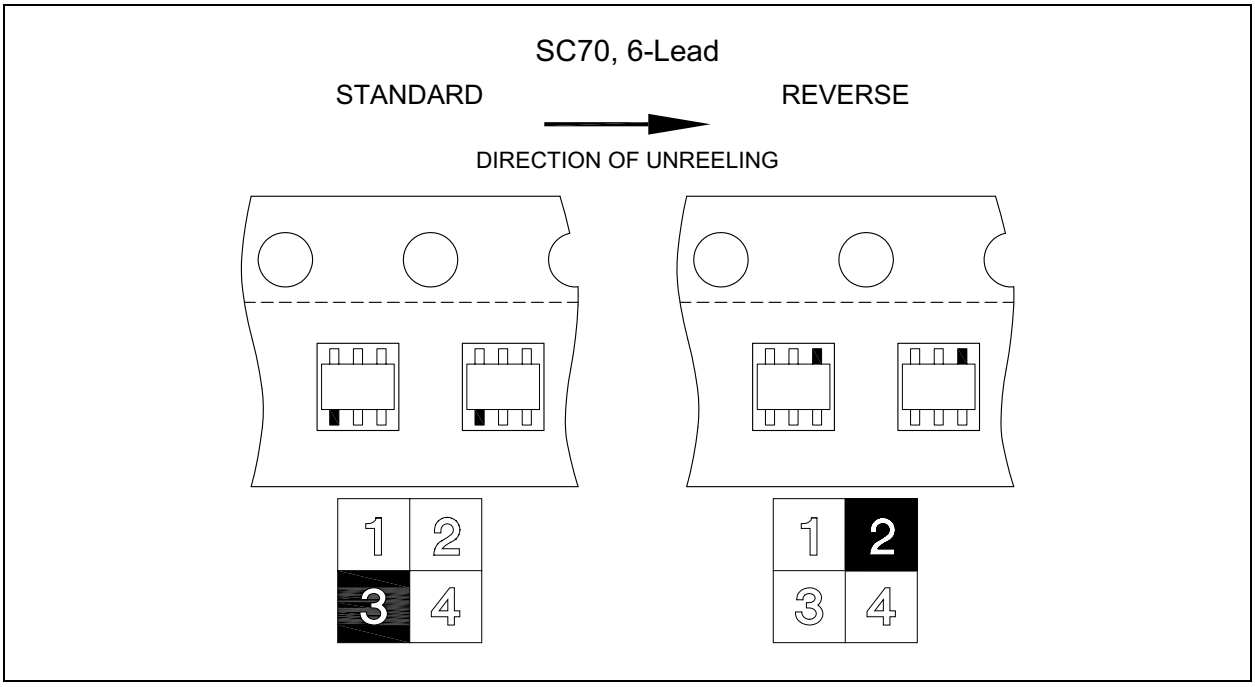
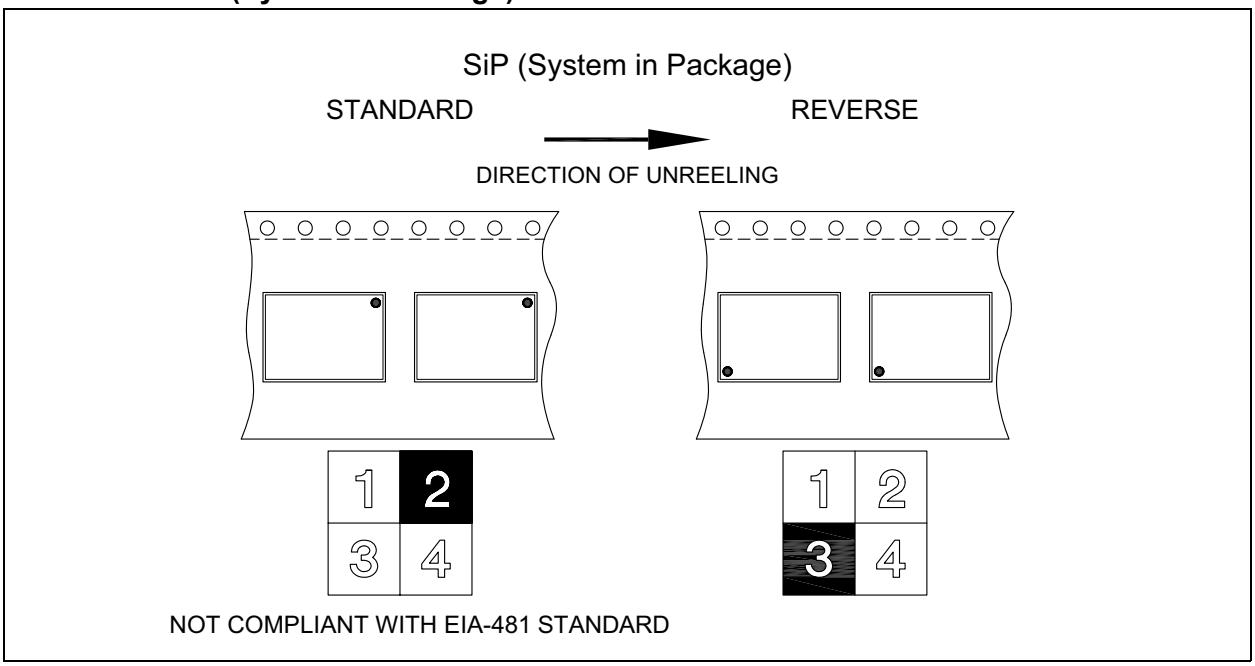


FIGURE 44: SiP (System in Package)



Source: EIA-481

FIGURE 45: SOIC

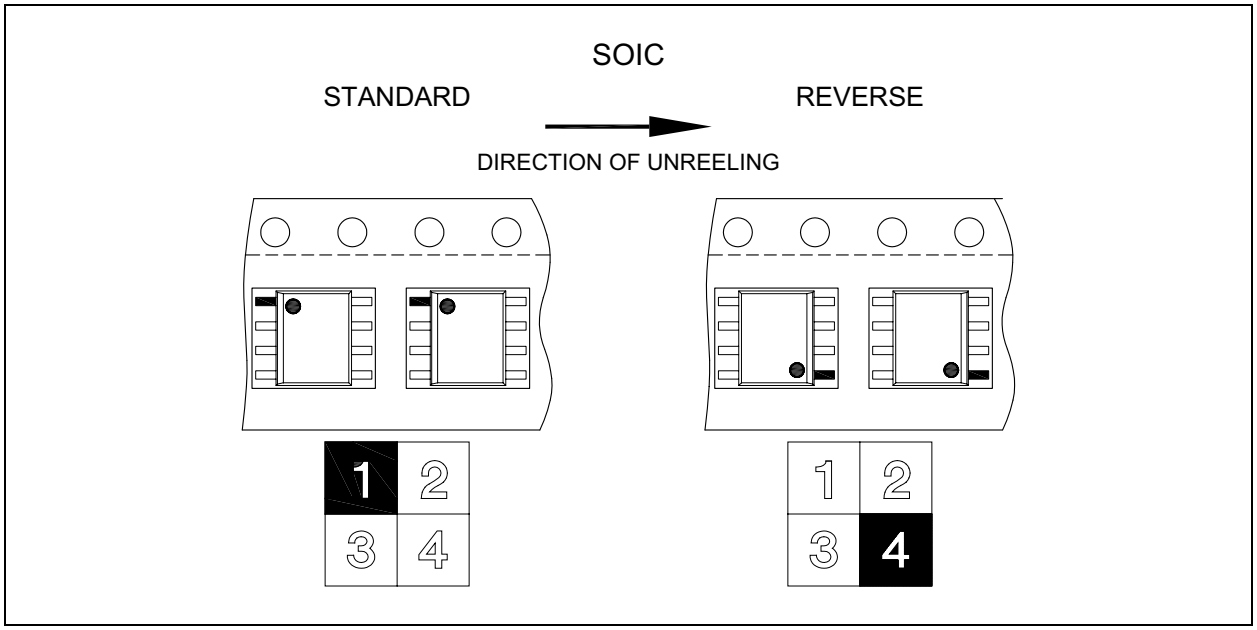
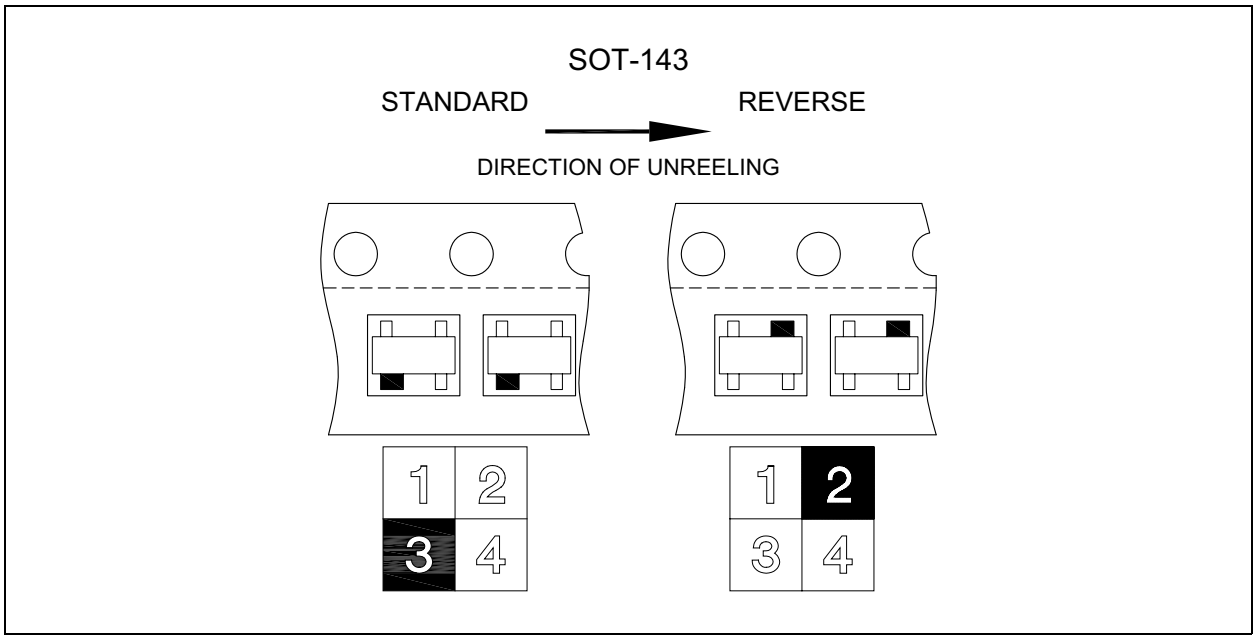


FIGURE 46: SOT-143



Source: EIA-481

FIGURE 47: SOT-233

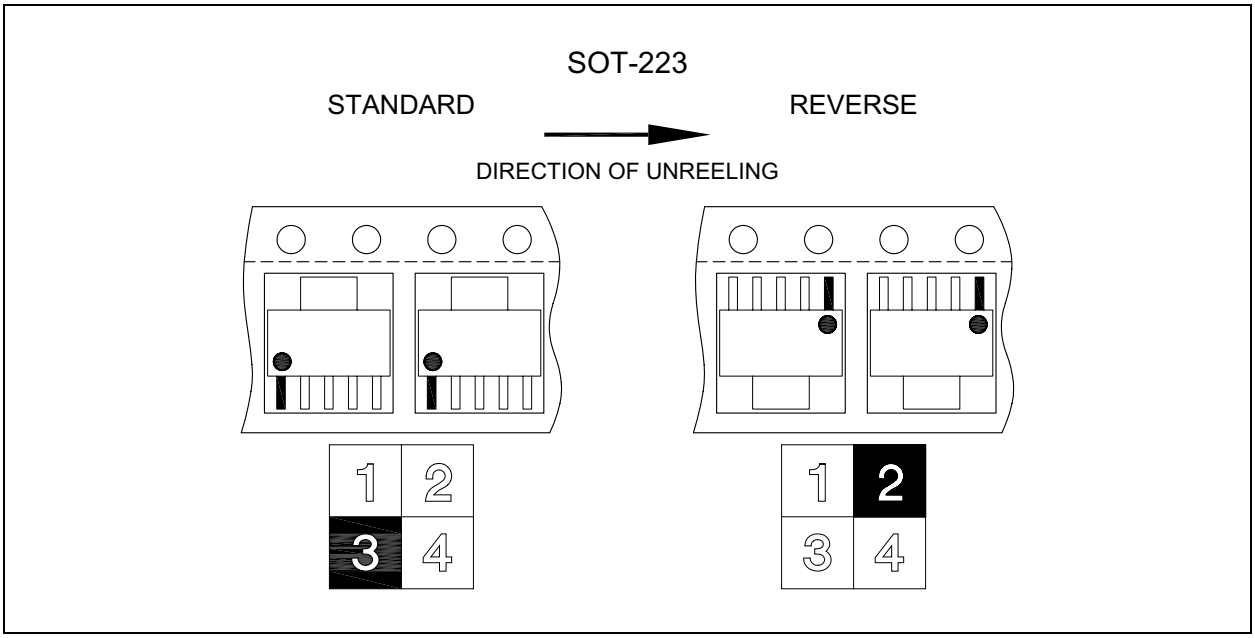
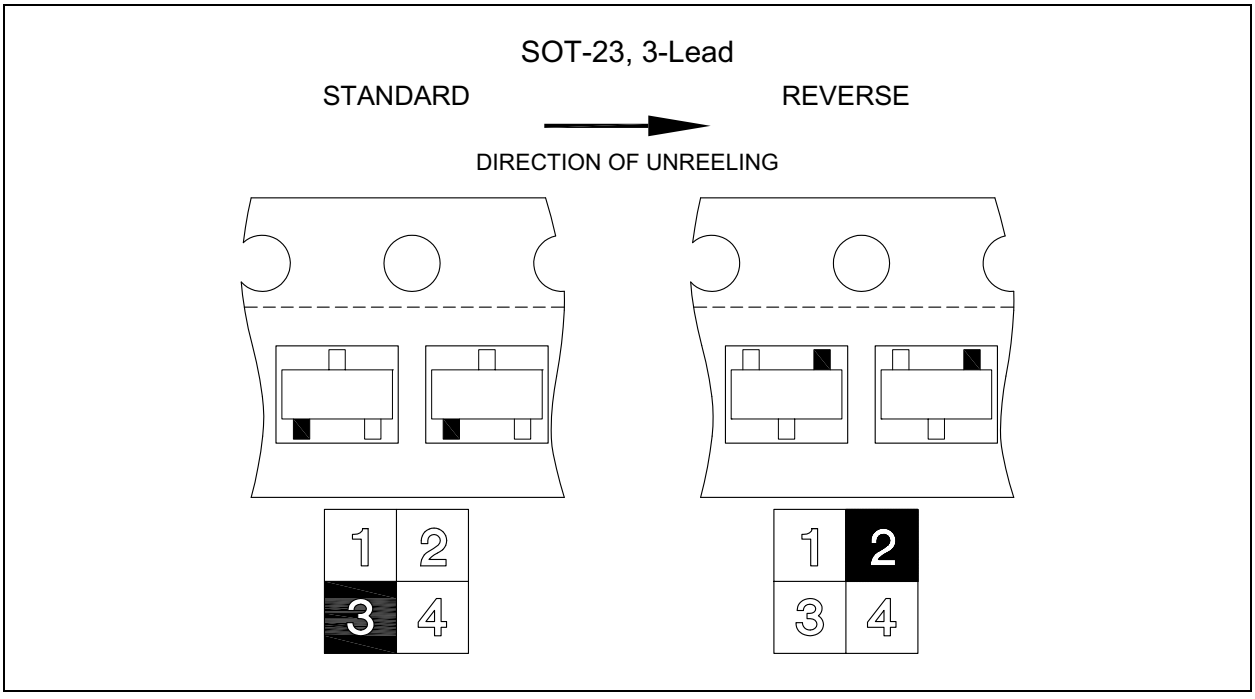


FIGURE 48: SOT-23 and TSOT, 3 Lead



Source: EIA-481

FIGURE 49: SOT-23 and TSOT, 5 Lead

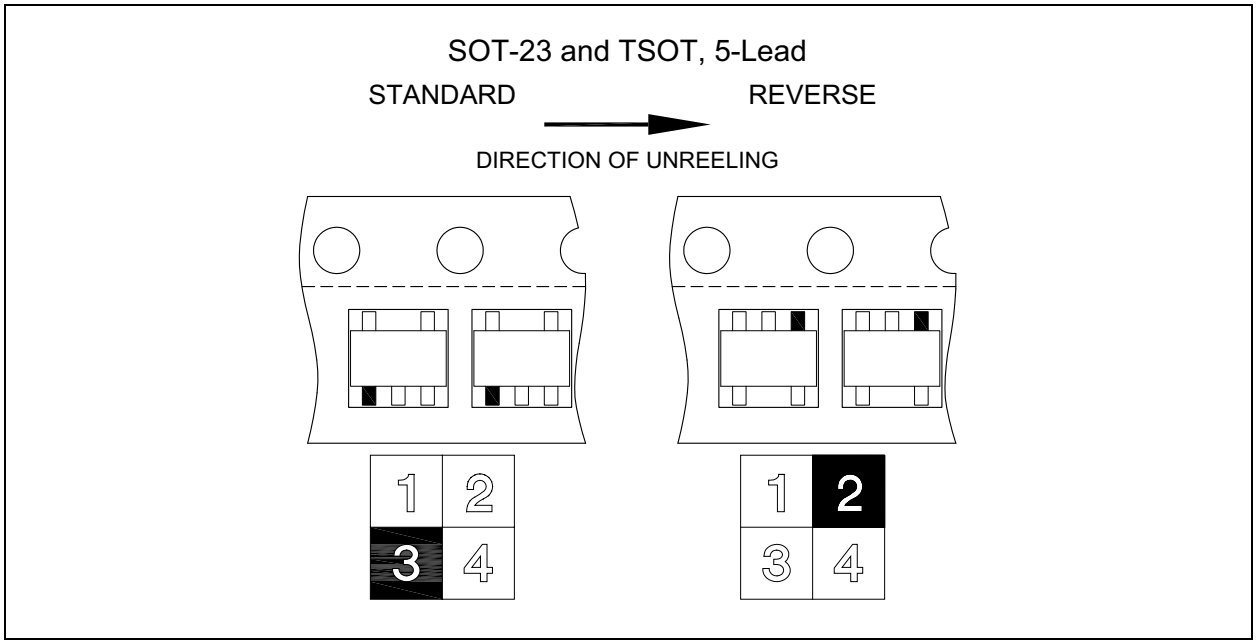
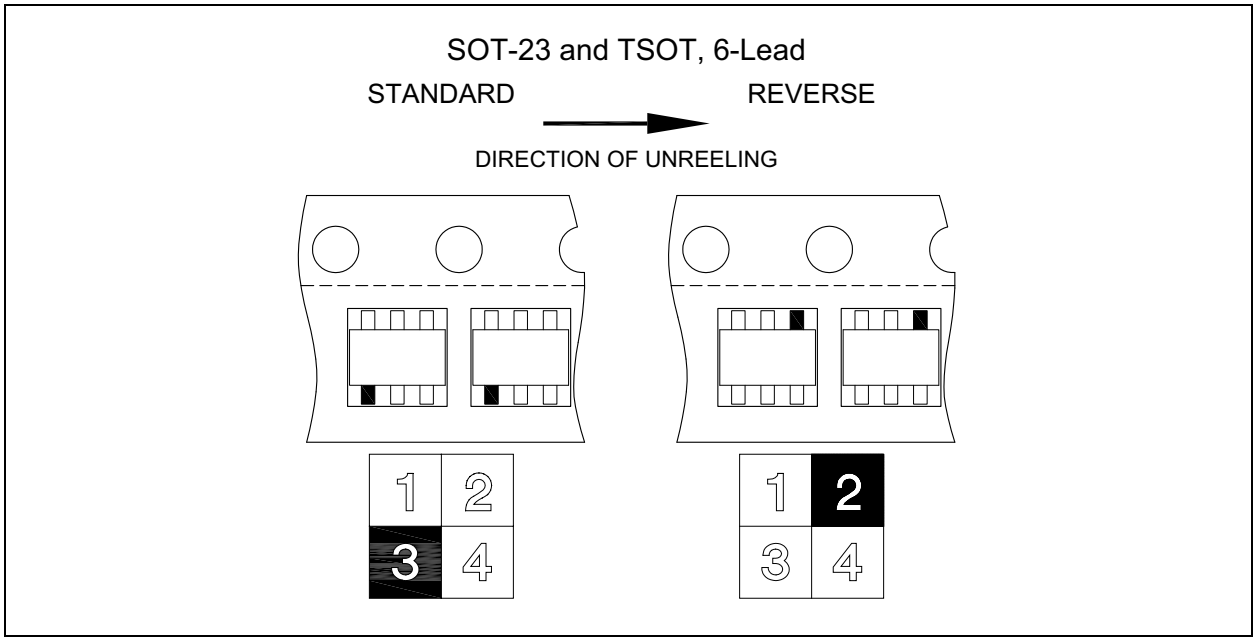


FIGURE 50: SOT-23 and TSOT, 6 Lead



Source: EIA-481

FIGURE 51: SOT-23 and TSOT, 8 Lead

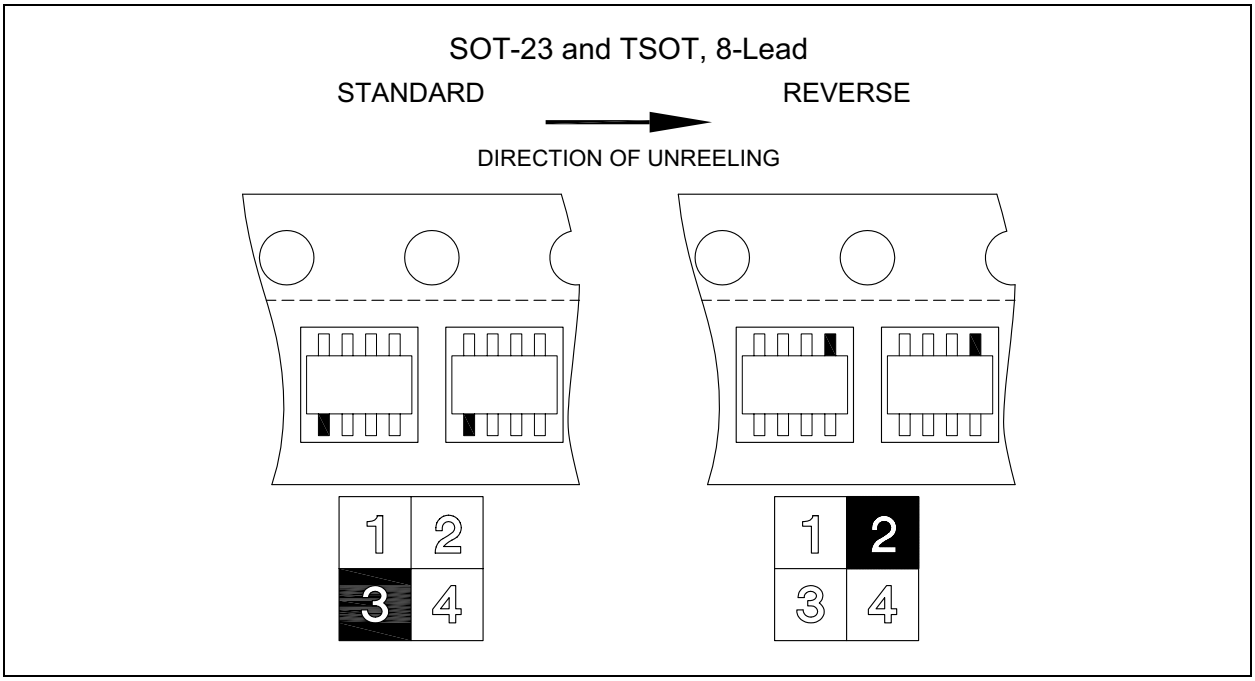
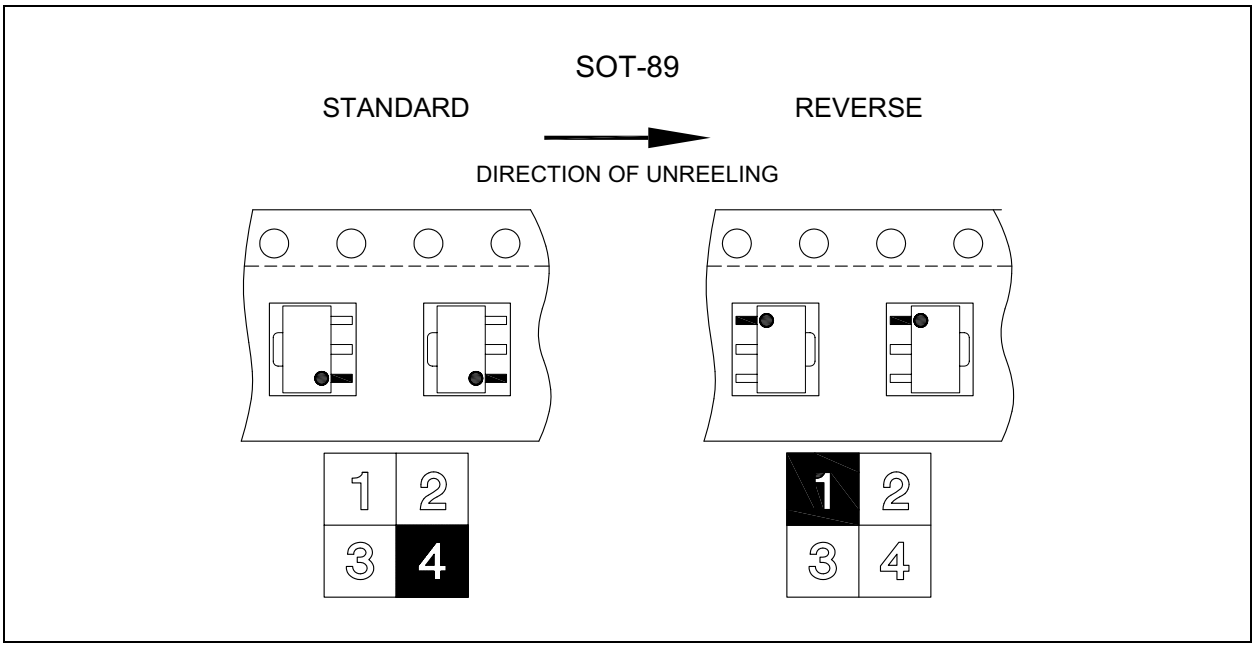


FIGURE 52: SOT-89



Source: EIA-481

FIGURE 53: SOT-89, Rotated

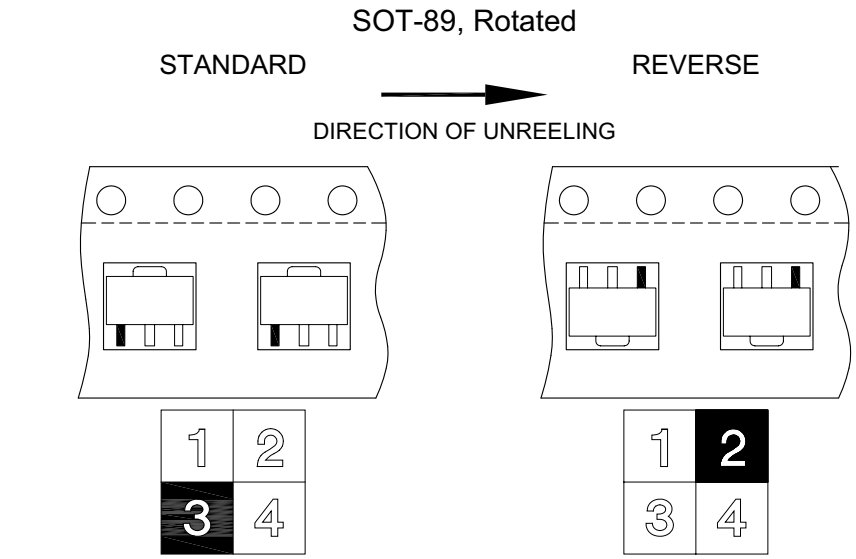
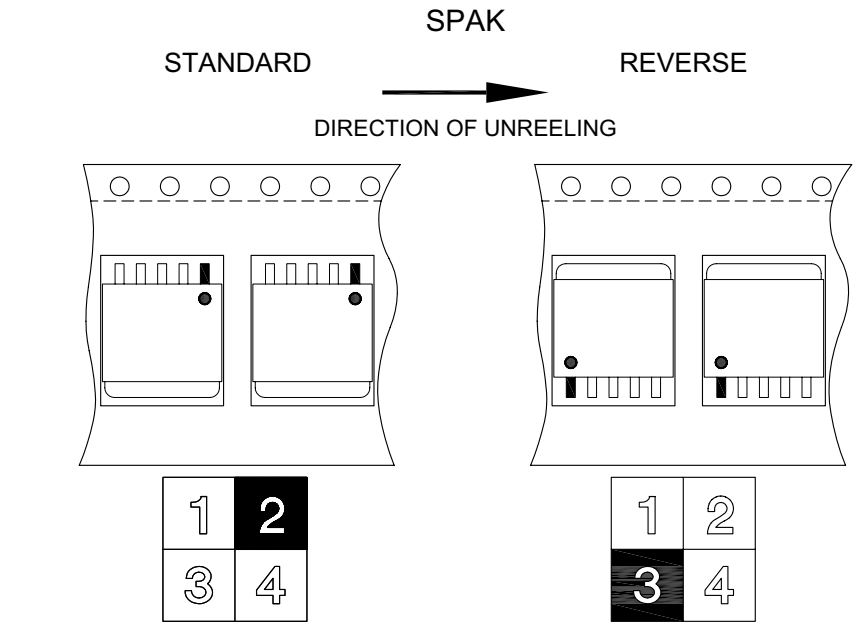
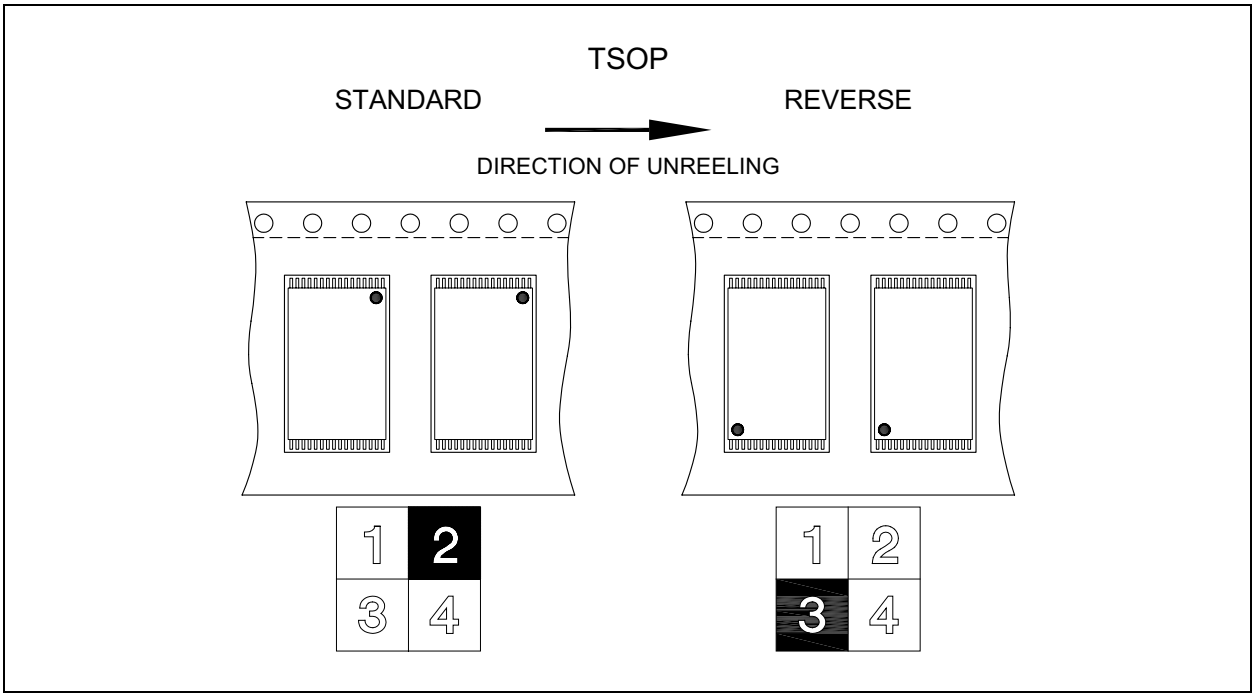


FIGURE 54: SPAK



Source: EIA-481

FIGURE 55: TSOP



Source: EIA-481

Product Tape and Reel Specification

NOTES:

APPENDIX A: REVISION HISTORY

Revision Q Document (August 2017)

Changes were made to the following tables:
Table 6: Microchip Technology Plastic Products, With No Leads, Carrier Tape and Cavity Dimensions
Table 9: SMSC Automotive (AIS) Products Carrier Tape and Cavity Dimensions
Table 11: Supertex Products Carrier Tape and Cavity Dimensions

Revision P Document (March 2017)

Changes were made to the following tables:
Table 9: SMSC Automotive (AIS) Products Carrier Tape and Cavity Dimensions
Table 11: Supertex Products Carrier Tape and Cavity Dimensions

Revision N Document (January 2017)

Changes were made to the following table:
Table 11: Supertex Products Carrier Tape and Cavity Dimensions

Revision M Document (December 2016)

Changes and additions were made to the following tables:
Table 7: Microchip Technology Grid Array Products Carrier Tape and Cavity Dimensions
Table 8: Microchip Technology Module Carrier Tape and Cavity Dimensions
Table 11: Supertex Products Carrier Tape and Cavity Dimensions

Revision L Document (October 2016)

TABLE 13: ISSC Products Carrier Tape and Cavity Dimensions was corrected to TABLE 13: Micrel Products Carrier Tape and Cavity Dimensions.

Revision K Document (September 2016)

Specification rewrite.

Revision J Document (March 2016)

Specification rewrite.

Revision H Document (November 2011)

Removed the section “Dimensions and Tolerances” that was Appendix A in the previous version.

Revision G Document (September 2010)

Included additional package style codes, so packages that are identical except for the associated package designators are listed separately; once by the Microchip designator, and again by the TelCom designator. For example, a 5-Lead SOT-23 package is listed twice in the Carrier Tape and Cavity Dimensions table – once as an OT package style code, and again as a CT package style code.

Revision F Document (February 2008)

The content and drawings in this document have been revised for this new version.

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