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EIA STANDARD

8 mm THROUGH 200 mm EMBOSSED CARRIER TAPING AND 8 mm & 12 mm PUNCHED CARRIER TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC HANDLING

自动装配表面贴装组件 8 毫米至 200 毫米压纹载体封装以及 8 毫米和 12 毫米穿孔载体封装

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(From Standards Proposal No.5147 formulated under the cognizance of the Automated Component Handling Committee).

(来自标准建议号 5148，在自动装配电子工业协会的认定下制订)。

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(From Standards Proposal 5173, formulated under the cognizance of the EIA Automated Component Handling Committee (ACH).)

(来自标准建议号5173, 在EIA自动装配电子工业协会的认定下制订)。

1 Scope 范围

This Standard covers requirements for taping surface mount components. Complementary standards for specialized taping requirements are included in the addendum.

本标准覆盖了表面贴装元件的包装标准。专业的卷装要求的补充标准包含在附录中。

2 Introduction 简介

This Standard was formulated to provide dimensions and tolerances necessary to tape surface mount components such that they may be automatically handled.

本标准的成立目的是为了提供载体的尺寸及公差标准, 使之可以自动装配。

3 Applicable Documents 适用文件

Unless otherwise specified the following documents form a part of this standard to the extent specified herein:

除非另作说明, 下列的文件构成了本标准的部分内容。

EIA-383 “Preparation for the Delivery of Electrical and Electronic Components”

EIA-383 “电子和电气元件的交付准备”

EIA-541 “Packaging Material Standards for ESD Sensitive Items”

EIA-541 “ESD敏感元件的包装材料标准”。

EIA-556 “Electronic Industries Association Outer Shipping Container Bar Code Label Standard”

EIA-556 “电子工业协会外部货运容器条形码标签标准。”

EIA-583 “Packaging Material Standards for Moisture Sensitive Items”

EIA-583 “湿气敏感元件的包装材料标准”。

EIA-624 “Product Package Bar Code Label Standard for Non-Retail Applications”

EIA-624 “非零售产品的包装条形码标签标准”

JED95 “JEDEC Registered and Standard Outlines for Solid State and Related Products”

JED95 “固态及其相关产品的JEDEC注册和标准纲要”。

IPC 7351 “Generic Requirements for Surface Mount Design and Land Pattern Standard”

IPC 7351 “表面安装器件和焊盘图形标准通用要求”。

4 Requirements 要求

4.1 Carrier tapes, cover tapes, reels, and taped components must meet the requirements defined in the Figures and Tables presented herein.

载体、覆盖带、卷轴和包包装的元件必须符合本文图表上规定的要求。

4.2 Procurement documents and quotation requests shall include the following information:

采购文件和报价请求应该包含下列的信息:

(a) Reference to this Standard by Title and Number.

按标题和编号参考本标准;

(b) Taping quality requirements including maximum number of missing components.

卷装质量要求，包括产品遗漏的最大数量；

(c) Container and reel marking requirements (including bar code labeling if required), and reel diameter (refer to 4.12 and Figure 10). 集装箱和卷轴标识要求(如需要的话，包括条形码贴标签)和卷轴直径(参考4.12和图10)。

(d) Shipping conditions, storage conditions and storage time. 运送条件，储存条件和储存时间。

(e) Weight of the reel containing components. NOTE: A heavy reel may not work on all feeders. Also, a reel containing components attached to a feeder may exceed regulatory or corporate weight limits for lifting by workers. 包含元件的卷轴的重量。注意：重的卷轴可能无法在所有的载体供料机上工作。此外，一卷包含元件的卷轴放在载体供料机上可能超出规章或公司规定的工人举起的重量限制。

4.3 Several conditions exist that may cause functional problems with carrier tapes and/or tape feeding systems even though the dimensions are within the parameters specified in the tables and figures of this document:

几种条件存在可能会引起覆盖带和/或载体的进料系统的功能性问题，即使尺寸是合乎本文档的表格和图形中指定的参数。

(a) Based on the carrier style, tape thickness T, tape cavity depth T2, outside pocket width B1, the cavity pitch P1, or the reel flange diameter A, the following conditions may cause problems with tape feeding systems and should be considered as part of the procurement documents and quotation requests as applicable: 根据载体的类型，带子的厚度T，载体格子深度T2，格子外侧宽度B1，格子间距P1，或者卷轴法兰直径A，下列条件可能造成载体的进料系统问题。如适用，应视为采购文件和报价请求的一部分：

Type (Punched / Embossed) 类型 (穿孔/压纹)	Tape width (mm) 载体宽度 (毫米)	Dimensions(mm) 尺寸 (毫米)	See Figure 见图
Punched / Embossed 穿孔/压纹	8,12	A>360	14
Embossed 压纹	8	B1>4.2	6
Punched 穿孔	8,12	T>1.1	4
Embossed 压纹	8,12	P1=2.0	5
Punched 穿孔	12	P1=2.0	5
Embossed 压纹	12	T2>4.5	6
Embossed 压纹	16,24	T2>6.5	6
Embossed 压纹	32 to 200	T2>10.1	7
Embossed 压纹	72 to 200	P1>56	7

(b) For 8, 12, 16 and 24 mm wide embossed tapes, if S1<1.0 mm (Table 2 and Figure 6), there may not be enough area to obtain a proper seal between the carrier and cover tapes according to paragraphs 4.5 and 4.11 and must be considered as part of the procurement documents and quotation requests as applicable. 对于8, 12, 16和24毫米宽的压纹载体，如果S1<1.0毫米(表2和图6)，根据4.5和4.11段，在载体和覆盖带之间可能会没有足够的区域获得适当的封合，如适用，应视为采购文件和报价请求的一部分。

(c) Users may experience problems feeding low mass components due to electrostatic effects (attraction and/or repulsion) associated with the separation of the cover tape and carrier tape during the feeding operation. The result of this phenomenon could cause devices to migrate, or be propelled away from the user pick up point, resulting in a mis-pick or non-pick situation during placement. To minimize this phenomenon, it is recommended that the packaging materials, component placement equipment, and controlled environmental conditions be optimized to effectively dissipate any charge buildup. This charge, commonly referred to as tribo-electric charge, should be controlled per the guidelines in EIA-541. 用户可能遇到一些重量小的元件由于静电效应(吸引力和/或排斥力)以及覆盖带和载体在在进料的操作过程中分离的问题。这一现象的结果可能会导致器件移动，或在放置的过程中远离用户的获取点，造成了误取或不取的情况。为了减少这种现象，因此建议包装材料、元件贴装设备和控制环境条件加以优化，从而有效地消除任何电荷的形成。这种电荷，通常被称为摩擦电荷，应根据EIA-541的指导方针予以控制。

(d) Carrier tapes may experience feeding problems when passed through tracks with lengths in excess of 250mm. Figure 12 outlines the suggested measurement of camber.

当通过的轨迹长度超过250毫米时，载体可能会遇到进料问题。图12描述了建议的弯曲度测量方法。

(e) Camber in excess of 1 mm over 250 mm may be generated when empty carrier tape is supplied on level-wound reels. 当空载体在水平绕卷轴上供应大于250毫米的时候，弯曲度可能超出1毫米。

4.4 Components are to be prevented from falling out of the cavity of the carrier tape, and shall remain in position for automatic handling after removal of the top cover tape (see Note 1, Tables 1, 2 & 3).

元件必须防止从载体的格子掉下来，并且在取出顶部的覆盖带后仍停留在位置上以供自动装配（见注意事项1，表格1，2 & 3）。

4.5 The cover tape(s) may not extend over the edge of the carrier tape or cover any part of the sprocket holes. 覆盖带不可以盖过载体的边缘，或是遮住齿孔的任何部分。

4.6 Tape in adjacent layers shall not stick together when wound on the carrier reel.

当载体绕在卷轴上的时候，相邻的两层不能粘在一起。

4.7 The packaging, materials and processes shall not adversely affect the mechanical and electrical characteristics or marking of the components. For intermediate and final packaging, refer to EIA-383 “Preparation for the Delivery of Electrical and Electronic Components,” EIA-541 “Packaging Material Standards for ESD Sensitive Items,” and EIA-583 “Packaging Material Standards for Moisture Sensitive Items,” and EIA-624 “Product Package Bar Code Label Standard for Non-Retail Applications.”

包装材料和包装的过程不可以损伤元件的机械，电气特性或标识。对于中间过程和最终的包装，请参照EIA-383 “电子和电气元件的交付准备”，EIA-541 “ESD敏感元件的包装材料标准”和EIA-583 “湿气敏感元件的包装材料标准”以及EIA-624 “非零售产品的包装条形码标签标准”。

4.8 The tapes shall be suitable to withstand storage of the taped components without danger of migration of contaminants onto the terminations, or the emission of vapors which would make soldering difficult or deteriorate the component properties or terminations by chemical action. In addition, the cover tape(s) shall not become detached, such that the components do not remain in position after storage. The punched carrier material shall not age and lose strength such that it breaks or delaminates on unreeling when the taped components are fed from the package by hand or into the assembly machines (refer to 4.2(d)).

载体必须适合存储在载体中的元件，载体不可对元件造成任何的伤害，包括了不清洁物的污染，转移到了接线端上，或因水蒸汽的挥发造成引脚焊接困难、元件性能损伤，甚至因为化学反应造成接线端恶化的情况。另外，覆盖带不可以脱落，否则将造成元件位置的偏移。穿孔载体材料不可以老化和失去强度，否则，当卷装的元件通过手工或装配机器从包装中进料的时候取件将会断裂或者分层（参考4.2(d)）。

4.9 Components may be removed from the cavity by incising the bottom cover tape (see Figure 10) for punched carrier tape, or in the case of embossed carrier, by incising at or below the cavity depth midpoint ($K_0/2$). In no case shall the incising affect the package functionality.

穿孔载体从覆盖带底部切割（见图10），或者压纹载体从载体底部或低于格子深度中心($K_0/2$)处切割时，元件可从中取出。切割决不能影响包装的功能性。

4.10 There shall not be consecutive components missing from any reel for any reason.

不得以任何理由连续遗漏元件。

4.11 The cover tape for each style and material of carrier tape shall have a total peel strength of from 0.1 N to 1.0 N (10 grams to 100 grams calibrated scale reading) for 8 mm carrier tapes and 0.1N to 1.3 N (10 grams to 130 grams calibrated scale reading) for 12 mm to 56 mm wide carrier tapes and from 0.1N to 1.5 N (10 grams to 150 grams calibrated scale reading) for 72 mm and wider carrier tapes. Peel is defined as the separation of the full width of the cover tape from the carrier tape or the removal of the center portion of the cover tape from the carrier tape to enable component removal from the cavity. The direction of pull shall be opposite the direction of carrier tape travel such that the cover tape makes an angle of between 165 and 180 degrees with the top of the carrier tape. The cover tape, shall be pulled with a velocity of 300 mm \pm 10 mm/minute, relative to the carrier tape, during peeling, which results in the cover/carrier tape seal being separated at a rate of 150 mm/minute.

任何类型和材质的载体所使用的覆盖带的总拔离撕力，如载体为8毫米，应为0.1 N 到 1.0 N (10到100克校准的刻度值)；对于12毫米到56毫米宽的载体，应为0.1 N ~1.3N (10到130克校准的刻度值)；对于72毫米及更宽的载体，应为0.1 N ~1.5N (10到150克校

准的刻度值)。拔离是指从载体分离全部宽度的覆盖带或从载体上剥离覆盖带的中心部分，使得元件可以从格子中取出。拉力的方向应与载体运行方向相反，并且拉伸的覆盖带与载体顶部呈165~180的夹角。在撕力测试中，覆盖带应以相对于载体300±10毫米/分钟的速度拉伸，这将使得覆盖带/载体的封合以150毫米/分钟的速率分离。

4.12 Bar code labeling (if required) shall be on the side of the reel opposite the round sprocket holes (refer to 4.2(c) and Figure 10). Refer to EIA-556 and EIA-624.

条形码（如需要）应贴在圆形齿孔对面的卷轴侧（参照4.2(c)和图10），参照EIA-556和EIA-624。

4.13 Reels as defined by Figure 14 shall be permanently marked with visible recycling symbology.

如图示14详细说明，卷轴应该有明显且永久的回收标志。

4.14 The following orientation rules shall be considered as standard for multi-connection components.

对于多引脚元件的摆放方向必须遵循下列的标准：

- (a) Traditionally packaged components with leaded, bottom-only terminations (e.g. PLCC, SOIC, SOJ, and BGA) shall be packaged with the terminations facing the bottom of the carrier cavity. The following rules apply whether the terminations are facing downward or upward in the cavity.
传统封装，只有底面上有上锡引脚接线端的元件（如：带引线的塑料芯片、小外形集成电路、J型脚小外形封装以及球栅阵列封装）包装时，接线端脚线应面对载体格子的底部。下列法则无论接线端在格子中是朝下或朝上，皆适用。
- (b) Termination is the electrical or mechanical connection from the component to the board and can be described as lead, pin, bump, ball, wirepad, connector, etc.
接线端定义为从元件到线路板的电气或机械连接，可能描述为引脚，脚线，肿块，球形脚，铜线焊盘，连接器等等。
- (c) Orienting feature is the attribute on the component that identifies a unique orientation. The most accurate description should be Termination 1 (refer to IPC 7351); however in absence of Termination 1 definition, the following features can be used: fiducial mark, chamfered edge, dimple, notch, wider termination, etc. If the orienting feature is located in the exact center of the component, or it lies on the shorter axis of the component, then an alternate orienting feature on the component should be chosen.
面向特征是元件上确定唯一方向的属性，最准确的描述应是接线端1脚（参照IPC7351）。然而，在没有定义脚1的情况下，可以使用下列的特征：坐标（基准）点，倒角，压痕，缺口，较宽的接线端等，如果面向特征位于元件的正中心处，或位于元件的短轴部分，那么需要在元件上选择一个代用的定向特征作为取向。
- (d) A component is considered as square if the bounding rectangle around the outer extents of the component (including body and terminations) contains edges with a difference no longer than 0.3mm between the nominal length and width.
如果元件外部（包括主体和接线端）的边界矩形边长度和宽度相差小于0.3毫米，则该元件视为方形元件。
- (e) The tape pocket quadrant designations that describe the taped orientation of components are shown in Figure 1.
如图1所示，载体格子象限指定规定了元件卷装方向。
- (f) For existing Component Packages use Figure 2 “Orientation Guide for Commonly Used Devices”.
现有的元件封装参照图2“常用器件定位指南”。
- (g) If a package type is not contained in Figure 2, use the rules in the sequence shown in the following flow chart (Figure 3) to determine the correct orientation of the component in the tape pocket.
如果封装类型没有包含在图2中，使用下列流程图（图3）中的顺序规则来确定的元件在载体格子中的正确方向。

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Figure 1 -- Component orientation and quadrant designations 图 1- 元件定向和象限指定

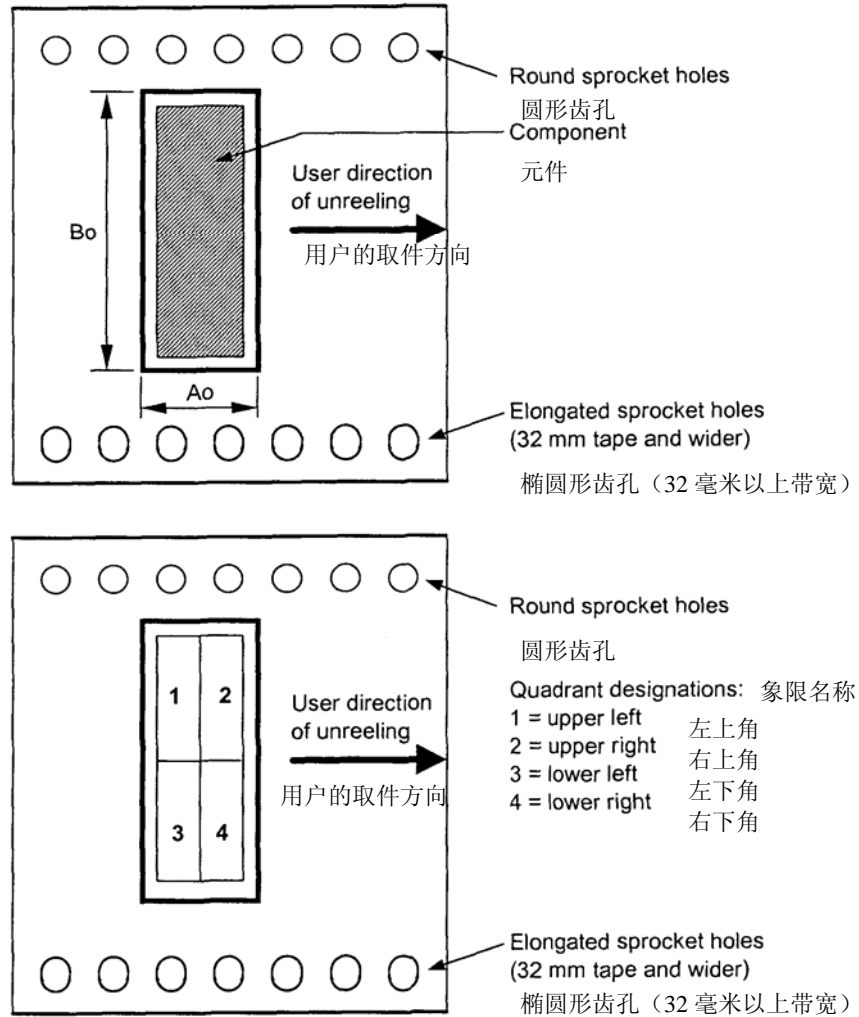


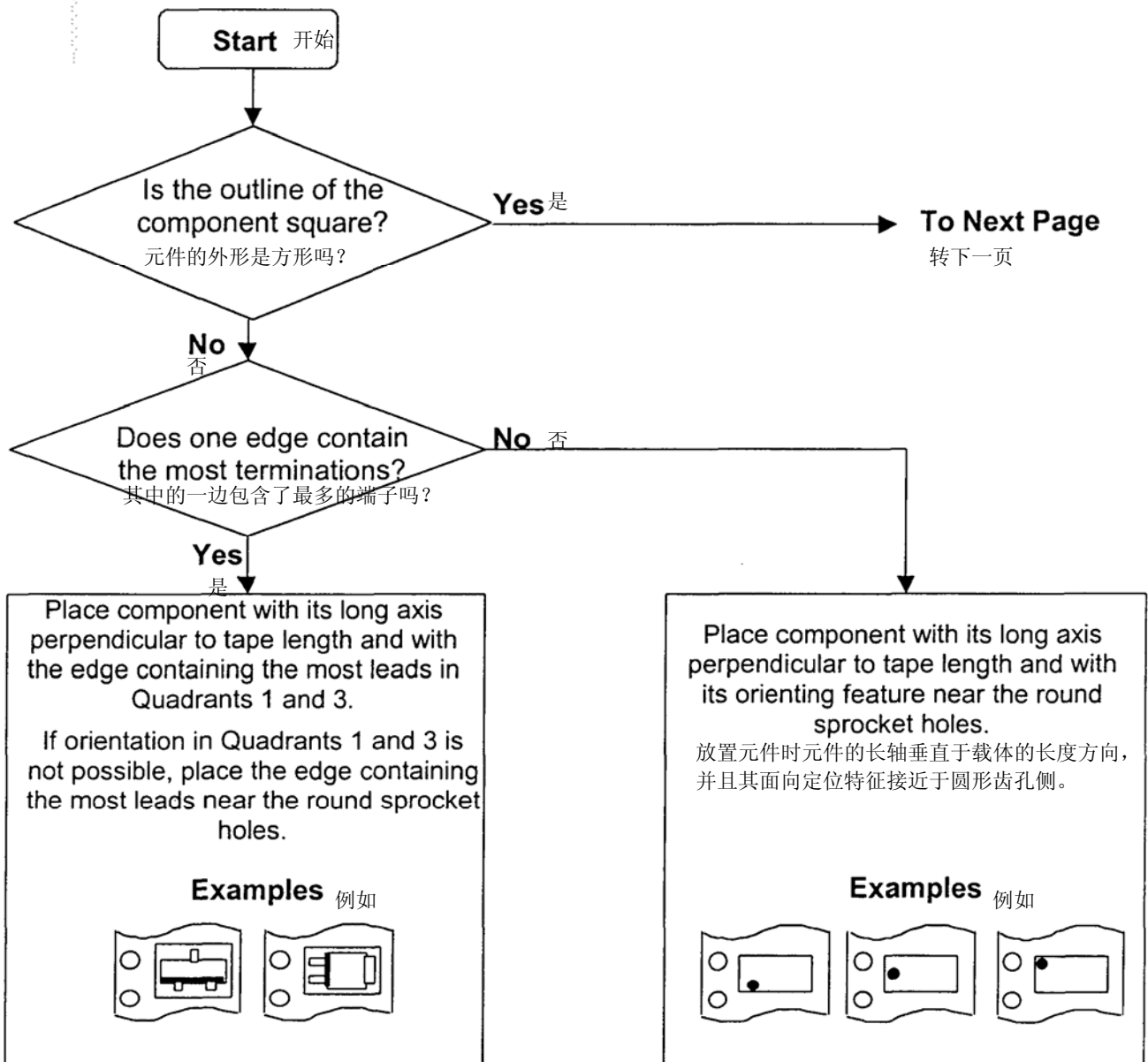
Figure 2--Orientation Guide for Commonly Used Devices 图2 常用器件定位指南



DIRECTION OF UNREELING 取件方向

Component Package	SOT23	SOT223	SOT143	SOT89	SOT343
元件封装 Orientation in carrier 在载体中的方向					
Termination 1 Orientation by Quadrant 脚1象限取向					
Component Package	SOT23-5 / SC70-5 / SSOP-5	SOT23-6 / SC70-6 / SSOT-6	TO-89	DPAK / D2PAK / TO-252 / TO-220	D2PAK-5P / TO-263-5
元件封装 Orientation in carrier 在载体中的方向					
Termination 1 Orientation by Quadrant 脚1象限取向					
Component Package 元件封装	QFP	TSOP	PLCC	SOIC	DIP
Orientation in carrier 在载体中的方向					
Termination 1 Orientation by Quadrant 脚1象限取向					
Component Package	QFN (Square geometry) 方形	QFN (Rectangular geometry) 矩形	BGA (Square geometry) 方形	BGA (Rectangular geometry) 矩形	LCC
元件封装 Orientation in carrier 在载体中的方向					
Termination 1 Orientation by Quadrant 脚1象限取向					
Component Package	SSOP / TSSOP / MSOP	Ultra Thin SO8 (US8)	Tantalum Capacitor	DIODE / LED 二极管/发光二极管	Connectors (square or rectangular) 连接器 (方形或矩形)
元件封装 Orientation in carrier 在载体中的方向					
Termination 1 Orientation by Quadrant 脚1象限取向					

Figure 3-- Rules for determining orientation of component in tape pocket(1 of 2)图 3-确定元件在载体格子中方向的规则(第 1 页, 共 2 页)



放置元件时元件的长轴垂直于载体的长度方向, 并且包含最多接线端的边在第 1 和第 3 象限。

如果不能在第 1 和第 3 象限定位的话, 包含最多接线端的边接近圆形齿孔侧。

Figure 3-- Rules for determining orientation of component in tape pocket (2 of 2) 图 3-确定元件在载体格子中方向的规则 (第 2 页, 共 2 页)

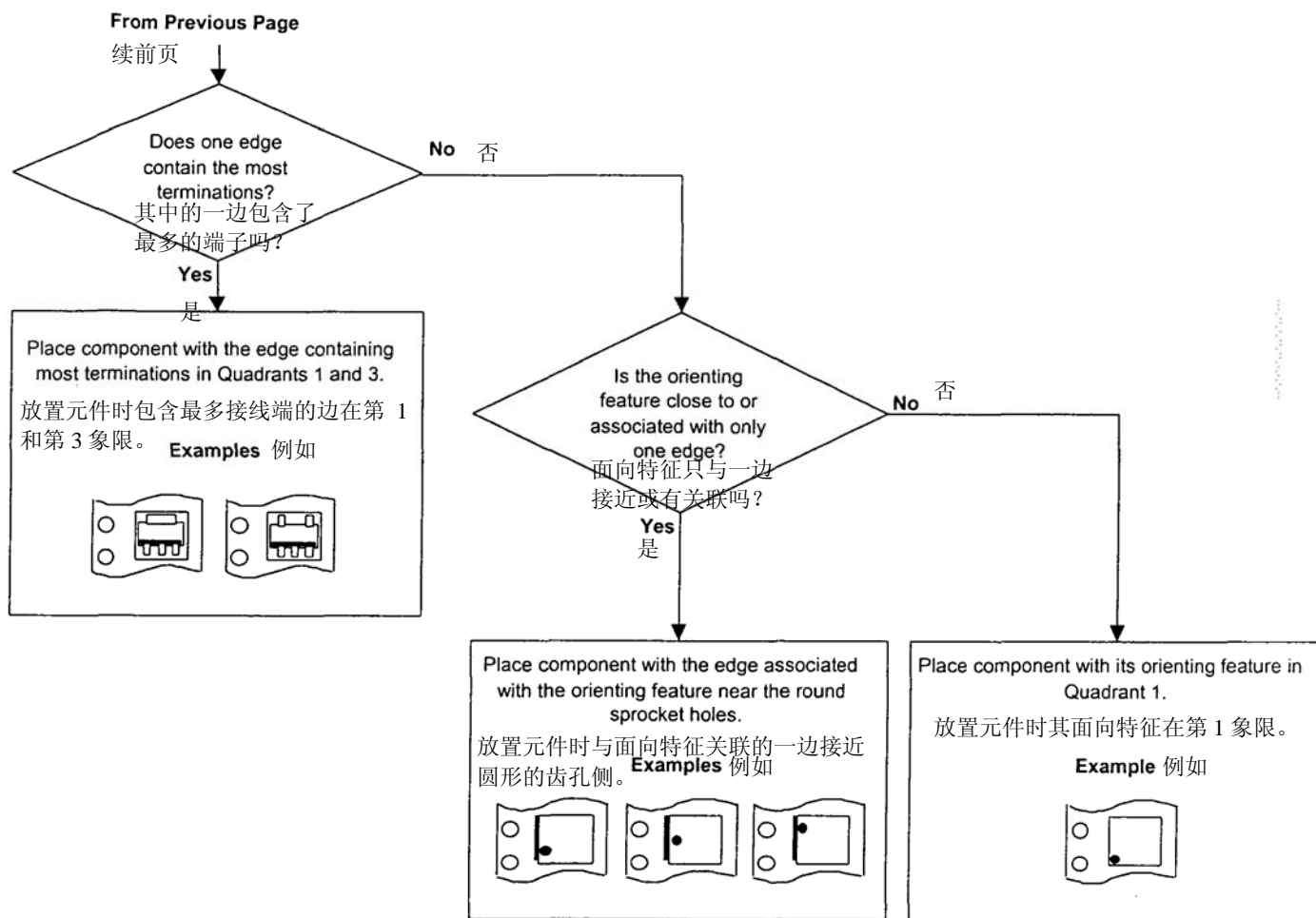


Figure 4-- 8 mm & 12 mm punched carrier tape dimensions 图 4--8 毫米&12 毫米穿孔载体尺寸
See Section 4.0 for requirements (all dimensions in millimeters)
详见段落 4.0 规范(所有的尺寸均以毫米为单位)

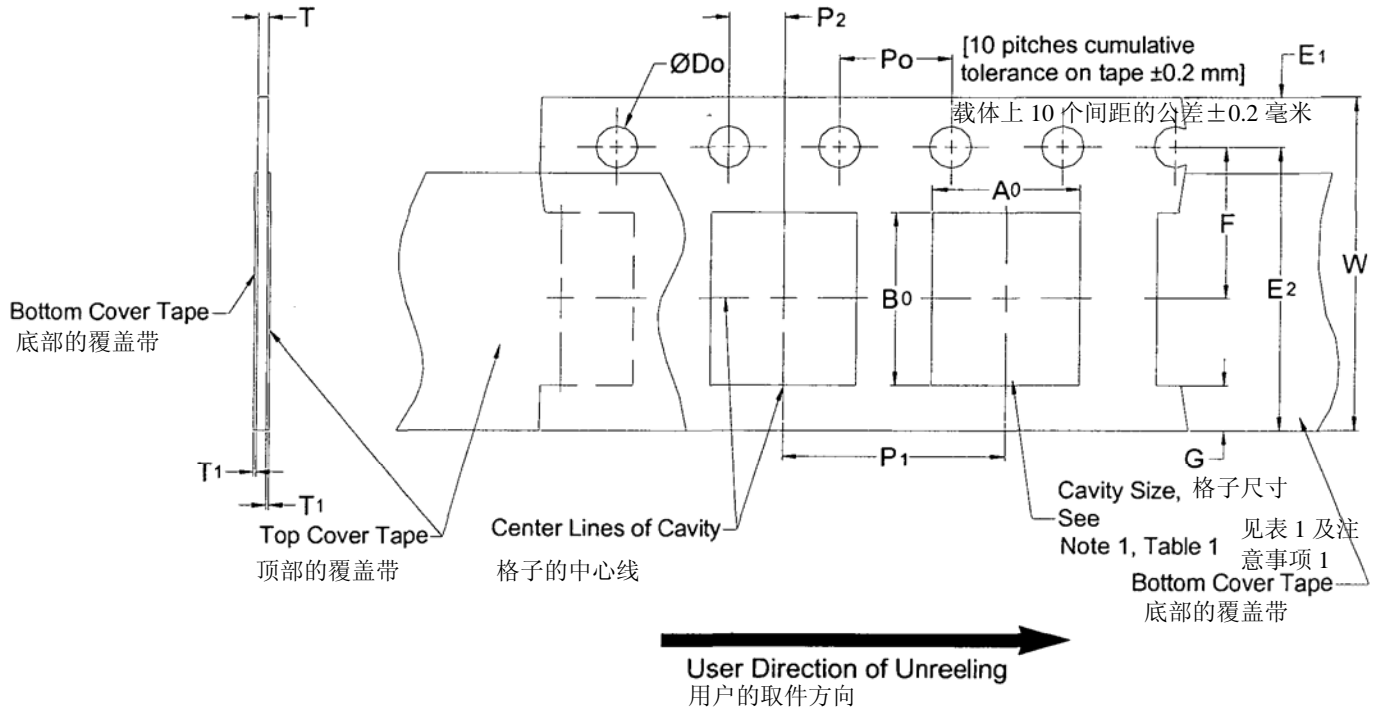


Figure 5 -- Illustration of 2 mm cavity pitch for 8 mm & 12 mm punched and embossed carrier,
P1. 图5--8毫米 & 12毫米穿孔载体和压纹载体2毫米格子间距图解, P1
See Tables 1 & 2 and requirement 4.3
详见表1 & 2和段落4.3规范

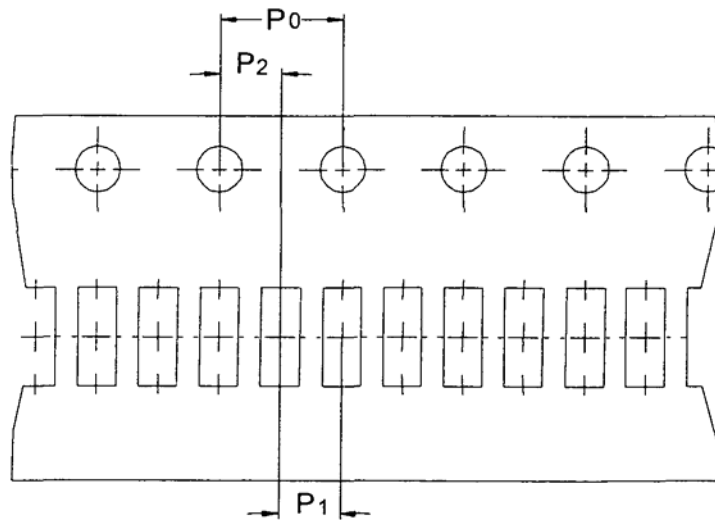


Table 1 -- 8 & 12 mm punched carrier dimensions 表1--8 & 12 毫米穿孔载体尺寸
(all dimensions in millimeters)

(所有的尺寸均以毫米为单位)

Constant Dimensions 固定尺寸部分

Tape Size 带宽	D ₀	E ₁	P ₀	P ₂	T ₁ Max.	G Min.	R Ref. See Note 2 见注意事项 2
8 mm & 12 mm	1.5+0.1 -0.0	1.75 ± 0.1	4.0 ±0.1	2.0 ±0.05	0.1	0.75	25

Variable Dimensions 变动尺寸部分

Tape Size 带宽	E ₂ Min	F	P ₁	W Max	A ₀ B ₀	T
8 mm	6.25	3.5 ± 0.05	2.0 ±0.05 or 4.0 ±0.1	8.3	See Note 1 见注意 事项 1	1.1 mm Maximum for Paper Base Tape and 1.6 mm maximum for Non-Paper Base Compositions. 纸基载体为最大 1.1 毫米，非纸基组合为最大 1.6 毫米。 See Note 2 and Requirement 4.3 详见注意事项 2 和段落 4.3 规范
12 mm	10.25	5.5 ± 0.05	2.0 ± 0.05, 4.0 ±0.1 or 8.0 ±0.1	12.3		

Notes 注意事项

1. The cavity defined by A₀, B₀ and T shall surround the component with sufficient clearance that:

格子的尺寸由 A₀, B₀ 和 T 定义，它包围着元件并留有充分的间隙：

a) the component does not protrude beyond either surface of the carrier tape.
元件不超出载体的任何一面。

b) the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.
在去除顶部的覆盖带后，元件可以在垂直的方向上无任何机械障碍地从格子中取出。

c) rotation of the component is limited to 20° maximum (See Figure 8).
元件的转动范围限制在 20° 以内(见图 8)。

d) lateral movement of the component is restricted to 0.5 mm maximum (See Figure 9).
元件水平方向上的移动量限制在 0.5 毫米以内(见图 9)。

e) see Addendum for standards relating to more precise taping requirements.
参照附录查找相关更多精确的卷装要求的标准。

d) lateral movement of the component is restricted to 0.5 mm maximum (See Figure 9).
元件水平方向上的移动量限制在 0.5 毫米以内(见图 9)。

e) see Addendum for standards relating to more precise taping requirements.
参照附录查找相关更多精确的卷装要求的标准。

e) see Addendum for standards relating to more precise taping requirements.
参照附录查找相关更多精确的卷装要求的标准。

2. The tape with or without components shall pass around R without damage (see Figure 11).
有无元件的载体应可无损地通过圆形 R(见图 11)。

有无元件的载体应可无损地通过圆形 R(见图 11)。

Figure 6 -- 8 mm, 12 mm, 16 mm & 24 mm embossed carrier tape dimensions 图 6--8 毫米, 12 毫米, 16 毫米 & 24 毫米压纹载体尺寸

See Section 4.0 for requirements (all dimensions in millimeters)

详见段落 4.0 规范(所有的尺寸均以毫米为单位)

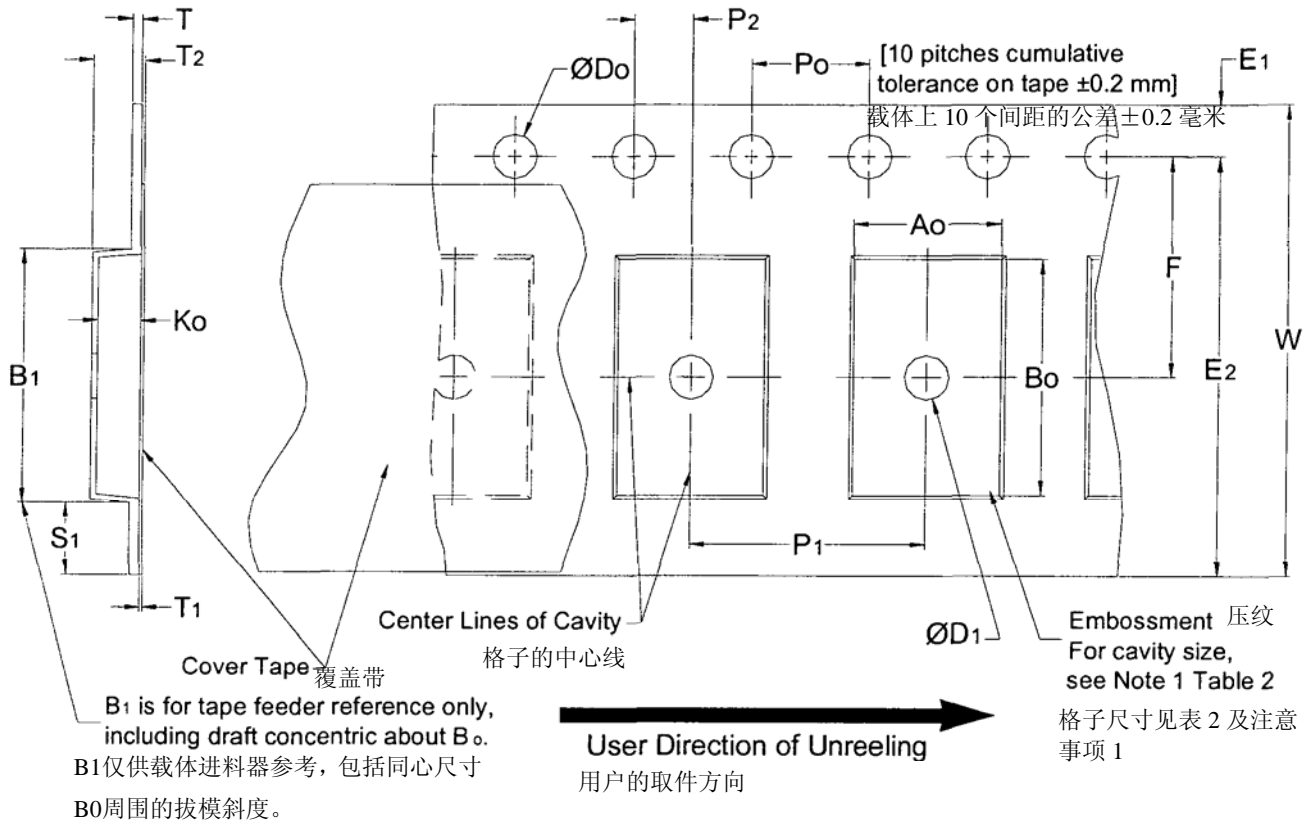


Table 2—8, 12, 16 & 24 mm embossed carrier dimensions 表2--8, 12, 16 & 24毫米压纹载体尺寸
Constant (for 2 or more widths) Dimensions

固定尺寸部分（用于2个以上的带度）

Tape size 载体尺寸	D ₀	D ₁ Min	E ₁	P ₀	P ₂	R Ref. See Note 2 见注意事项 2	S ₁ Min. See Note 3. 见注意事项 3	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±	30			
16 mm					2.0±				
24 mm					0.1				

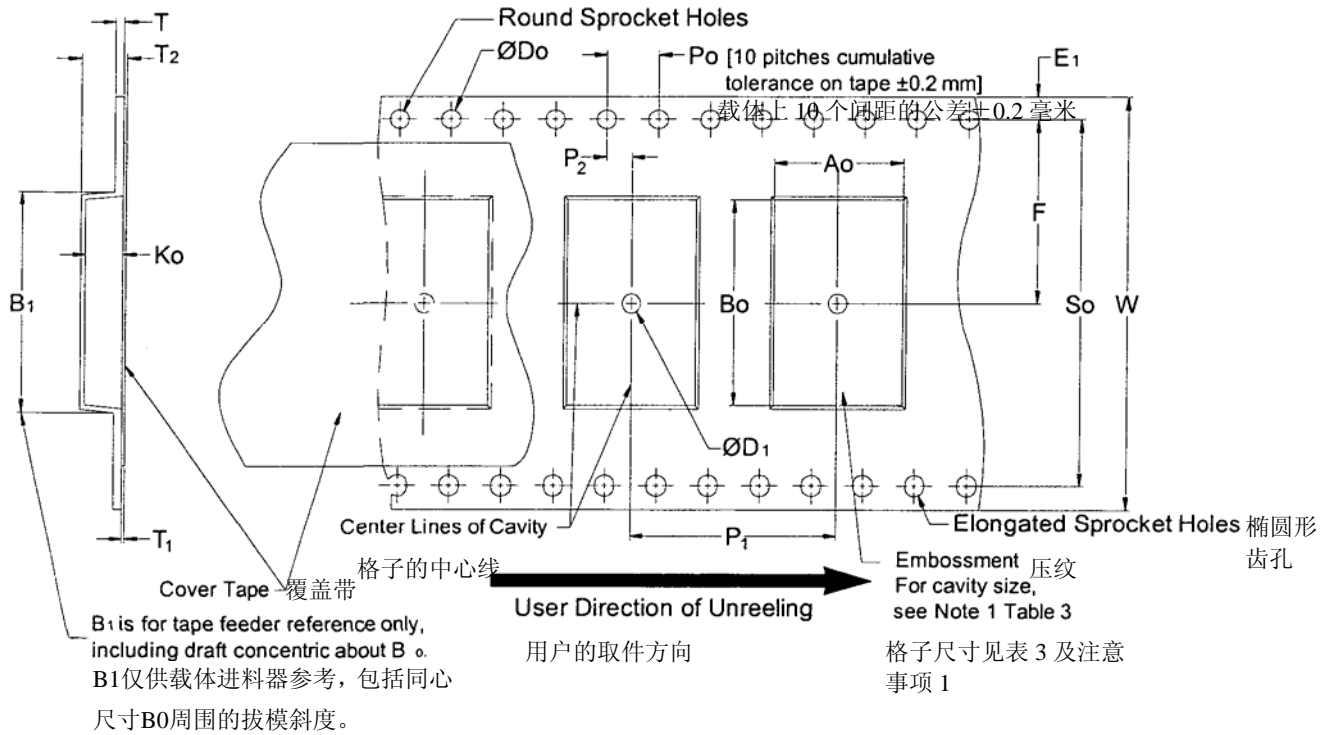
Variable Dimensions 变动尺寸部分

Tape Size 带宽	B ₁ Max.	E ₂ Min.	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±0.05 or 4.0±0.10	2.5	8.3	See Note 1 见注意事项 1
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±0.1 to 12.0±0.1 in 4.0 increments 以 4.0 为增量	8.0	16.3	
24 mm	20.1	22.25	11.5 ±0.1	4.0±0.1 to 20.0±0.1 in 4.0 increments 以 4.0 为增量	12.0	24.3	

Note 注意事项

- The cavity defined by A₀, B₀ and K₀ shall surround the component with sufficient clearance that:
格子的尺寸由 A₀, B₀ 和 K₀ 定义，它包围着元件并留有充分的间隙：
 - the component does not protrude above the top surface of the carrier tape.
元件不超出载体的顶面。
 - the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.
在去除顶部的覆盖带后，元件可以在垂直的方向上无任何机械障碍地从格子中取出。
 - rotation of the component is limited to 20° maximum for 8 and 12 mm tapes and 10° maximum for 16 mm and 24 mm tapes (see Figure 8).
8 和 12 毫米的载体，元件的转动范围限制在 20° 以内；16 和 24 毫米的载体限制在 10° 以内(见图 8)。
 - lateral movement of the component is restricted to 0.5 mm maximum for 8 mm and 12 mm wide tape and to 1.0 mm maximum for 16 mm, 24 mm wide tape (see Figure 9).
8 和 12 毫米的载体，元件水平方向上的移动量限制在 0.5 毫米以内；16 和 24 毫米的载体限制在 1.0 毫米以内(见图 9)。
 - see Addendum for standards relating to more precise taping requirements.
参照附录查找相关更多精确的卷装要求的标准。
- The tape with or without components shall pass around R without damage (see Figure 11).
有无元件的载体应可无损地通过圆形 R(见图 11)。
- If S₁<1.0mm, there may not be enough area for cover tape to be properly applied (see paragraph 4.3(b)).
如果 S₁<1.0 毫米，可能会没有足够的区域使覆盖带获得适当的封合（见段落 4.3(b)）。

Figure 7 - 32,44,56,72,88,104,120,136,152,168,184 and 200 mm embossed carrier tape dimensions 图7--32, 44, 56, 72, 88, 104, 120, 136, 152, 168, 184 和200毫米压纹载体尺寸



Detail, Elongation and Skew of Sprocket Holes

局部视图, 齿孔的椭圆形及偏离

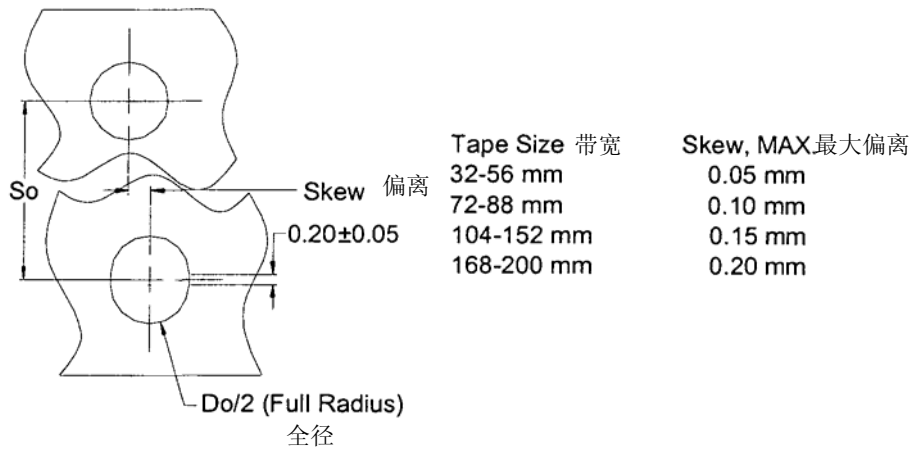


Table 3--32, 44, 56, 72, 88, 104, 120, 136, 152, 168, 184 & 200 mm embossed carrier dimensions 表 3--32, 44, 56, 72, 88, 104, 120, 136, 152, 168, 184 & 200 毫米压纹载体尺寸
Constant Dimensions (for 2 or more widths)

固定尺寸部分 (用于 2 个以上的带度)

Tape size 带宽	D ₀	D ₁ Min	E ₁	P ₀	P ₂	R Ref. See Note 2 见注意事项 2	T Max.	T ₁ Max.
32 mm	1.5 +0.1 -0.0	2.0	1.75 ± 0.10	4.0 ± 0.1	2.0 ± 0.1	50	0.6	0.1
44 mm					2.0 ±			
56 mm					0.15			
72 mm through 200 mm 72 到 200 毫 米					2.0 ± 0.2	75		

Variable Dimensions 变动尺寸部分

Tape size 带宽	B ₁ Max.	F	P ₁ (in 4.0 increments 以 4.0 为增量)	S ₀	T ₂ Max.	W	A ₀ , B ₀ & K ₀
32 mm	23.0	14.2 ± 0.10	4.0 ± 0.1 to 32.0 ± 0.1	28.4 ± 0.1	12.0	32.0 ± 0.3	See Note 1 见注意事项 1
44 mm	35.0	20.2 ± 0.15	4.0 ± 0.1 to 44.0 ± 0.1	40.4 ± 0.1	16.0	44.0 ± 0.3	
56 mm	46.0	26.2 ± 0.15	4.0 ± 0.1 to 56.0 ± 0.1	52.4 ± 0.1	20.0	56.0 ± 0.3	
72 mm	60.0	34.2 ± 0.30	4.0 ± 0.1 to 72.0 ± 0.1	68.4 ± 0.1	30.0	72.0 ± 0.3	
88 mm	76.0	42.2 ± 0.30		84.4 ± 0.1	35.0	88.0 ± 0.3	
104 mm	91.0	50.2 ± 0.35		100.4 ± 0.1		40.0	
120 mm	107.0	58.2 ± 0.35		116.4 ± 0.1	120.0 ± 0.3		
136 mm	123.0	66.2 ± 0.40		132.4 ± 0.1	136.0 ± 0.3		
152 mm	139.0	74.2 ± 0.40		148.4 ± 0.1	152.0 ± 0.3		
168 mm	153.0	82.2 ± 0.45		164.4 ± 0.1	168.0 ± 0.3		
184 mm	169.0	90.2 ± 0.45		180.4 ± 0.1	184.0 ± 0.3		
200 mm	185.0	98.2 ± 0.50		196.4 ± 0.1	200.0 ± 0.3		

Note 注意事项

1. The cavity defined by A₀, B₀ and K₀ shall surround the component with sufficient clearance that:

格子的尺寸由 A₀, B₀ 和 K₀ 定义, 它包围着元件并留有充分的间隙:

(a) the component does not protrude above the top surface of the carrier tape.
元件不超出载体的顶面。

元件不超出载体的顶面。

(b) the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.

在去除顶部的覆盖带后, 元件可以在垂直的方向上无任何机械障碍地从格子中取出。

(c) rotational limits of the component in the pocket are illustrated in Figure 8.

元件在格子中的转动范围限制在图 8 中有说明。

(d) lateral movement of the component is restricted to 1.0 mm maximum (See Figure 9).

元件水平方向上的移动量限制在 1.0 毫米以内(见图 9)

2. The tape with or without components shall pass around R without damage (see Figure 11).

有无元件的载体应可无损地通过圆形 R(见图 10)。

Figure 8 -- Maximum component rotation for punched and embossed carrier 图 8—穿孔和压纹载体中元件的最大旋转

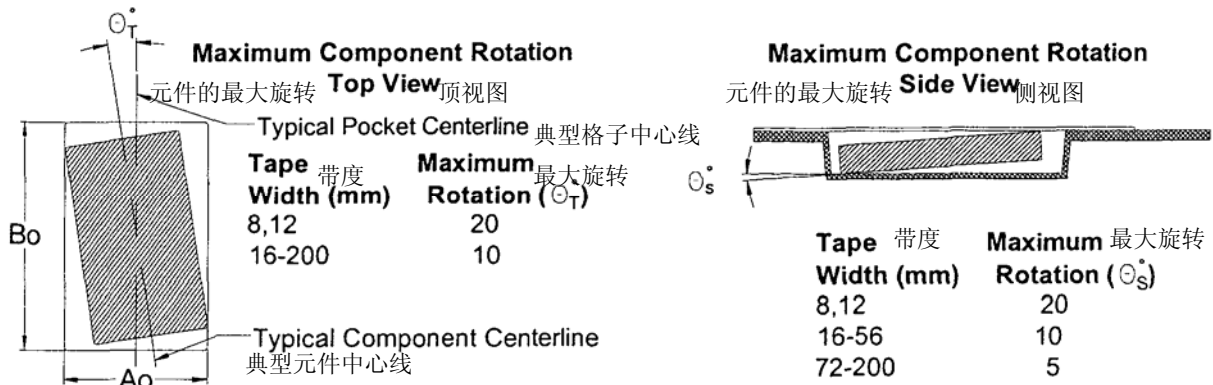


Figure 9 -- Maximum lateral movement for punched and embossed carrier 图 9—穿孔和压纹载体中的元件最大移动

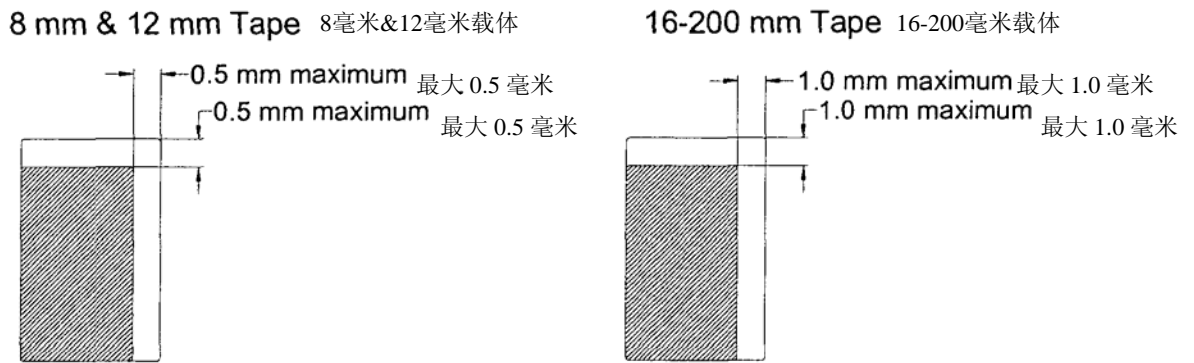


Figure 10 -- Bar code label area for punched and embossed carrier 图 10—穿孔和压纹载体条形码区域

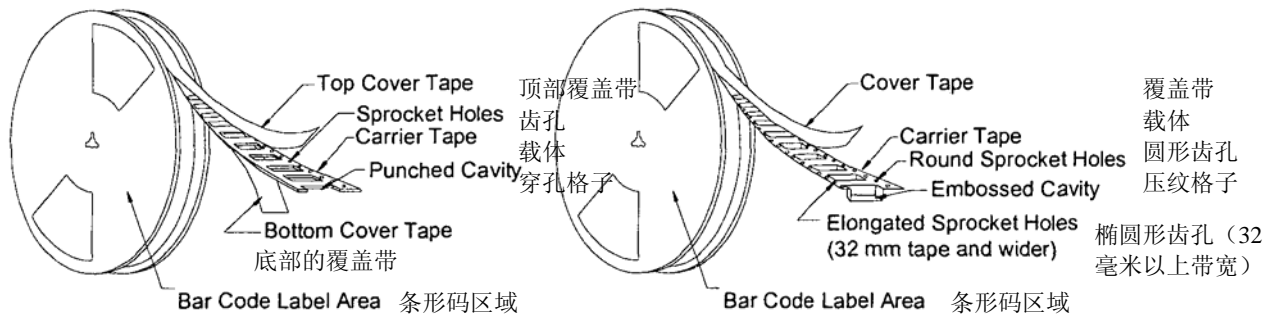


Figure 11-- Bending radius for punched and embossed carrier 图 11—穿孔和压纹载体的弯曲半径

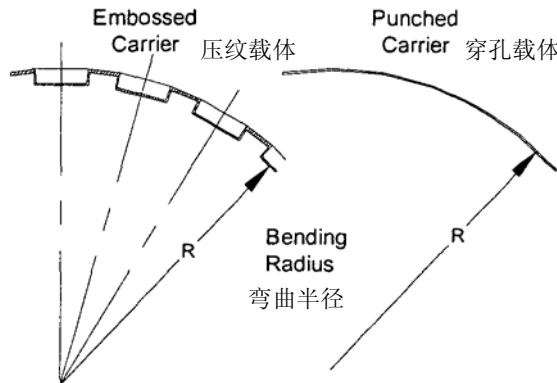
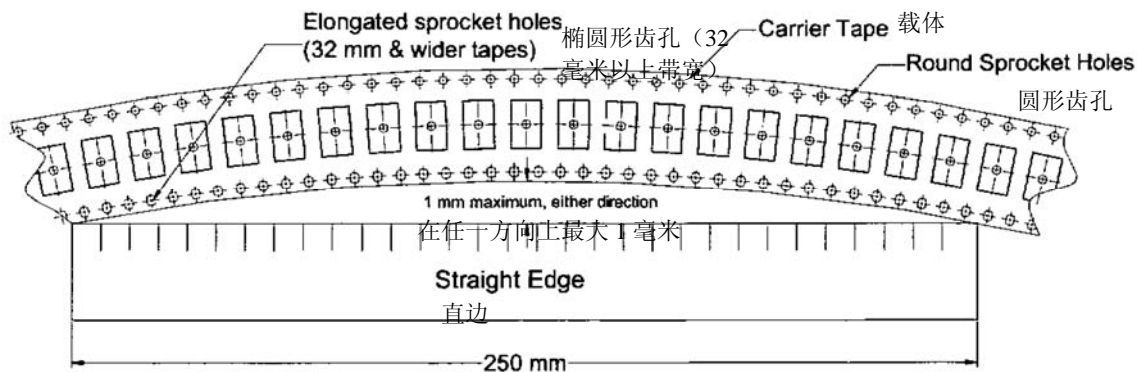


Figure12 -- Maximum camber for punched and embossed carrier 图 12 - 穿孔和压纹载体的最大弯曲度



To accurately measure camber, 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.

要精确测量弯曲度，将载体样品的开始端放置在测量制具或直边的左侧。移动到右侧，在载体与测试制具或直边接触的左、右侧之间的最高点测量允许的弯曲度。

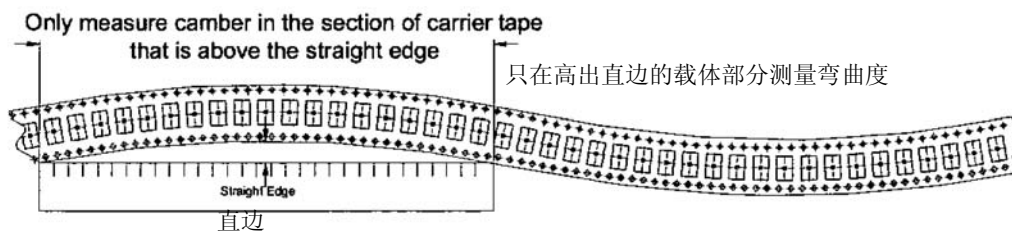
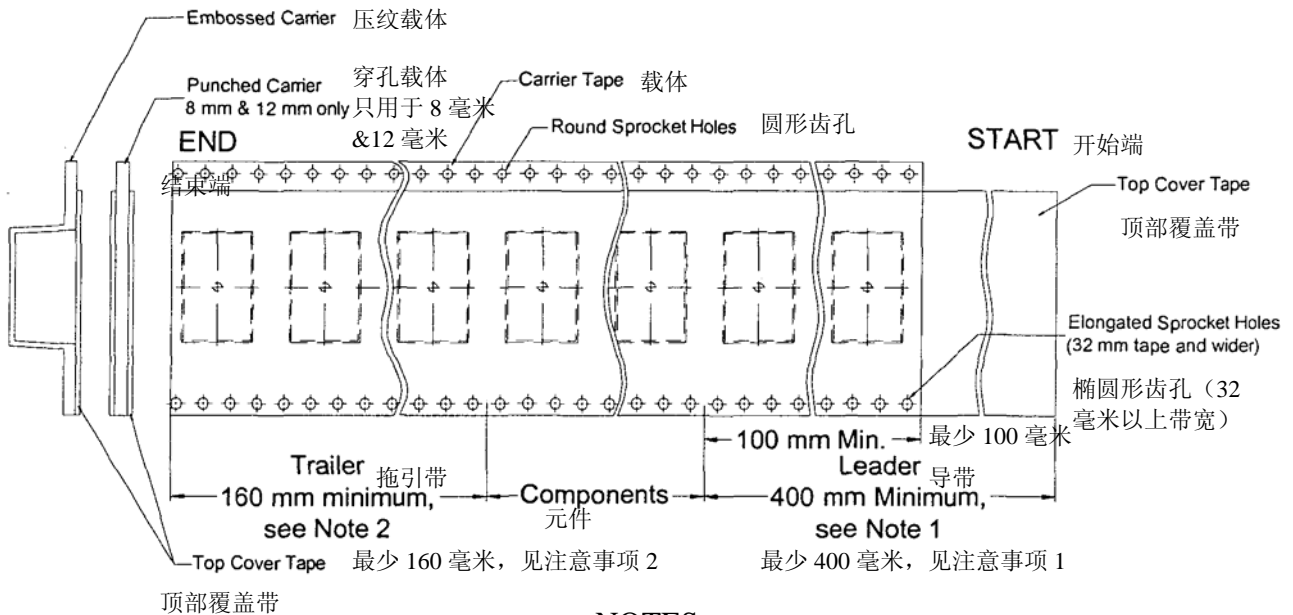


Figure 13 -- Tape leader & trailer dimensions for punched and embossed carrier 图 13 – 穿孔和压纹载体的导带&拖引带尺寸

See Section 4.0 for requirements (all dimensions in millimeters)

详见段落 4.0 规范(所有的尺寸均以毫米为单位)



NOTES

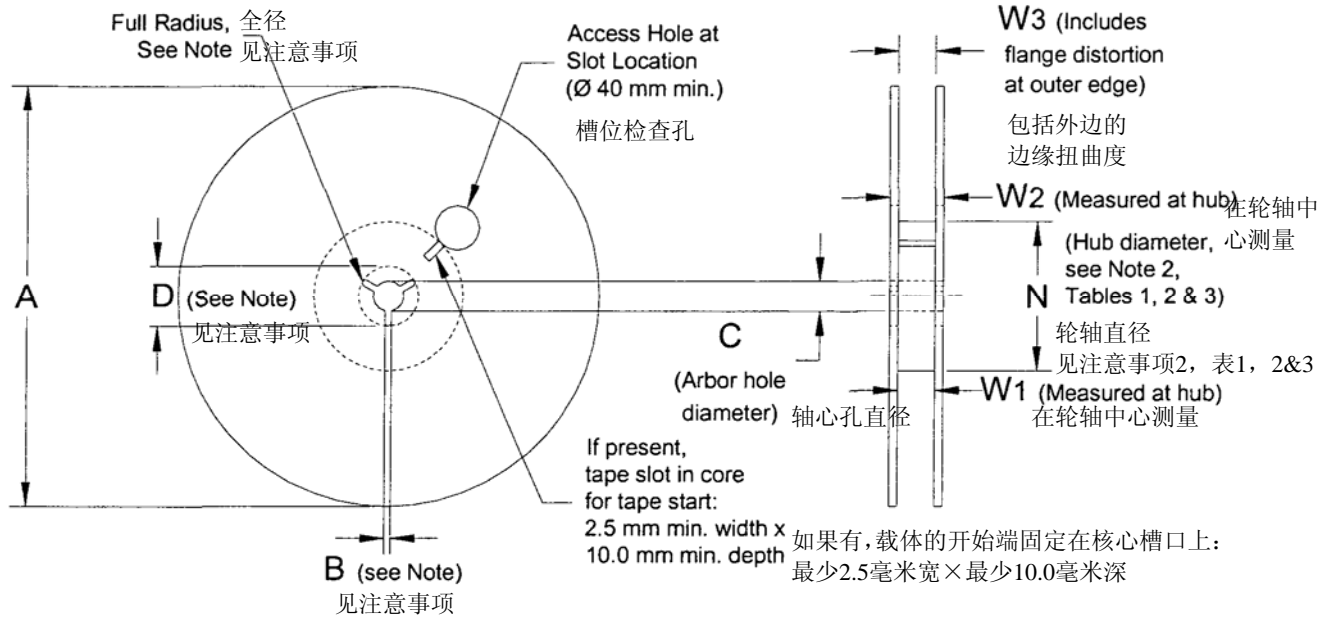
1. There shall be a leader of 400 mm minimum of cover tape, which includes at least 100 mm of carrier tape with empty compartments and sealed by the cover tape. All of the leader may consist of the carrier tape with empty compartments sealed by cover tape.
导带最少有 400 毫米的覆盖带，包括最少 100 毫米封有覆盖带的空载体。所有的导带可以由封有覆盖带的空载体组成。
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.
拖引带最少有 160 毫米长封有覆盖带的空载体。当取件到最后部分时，整个载体必须可从卷轴的轮轴中心松脱而不损害载体和仍留在格子中的产品。

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Figure 14 -- Reel dimensions 图 14 – 卷轴尺寸
See Section 4.0 for requirements (all dimensions in millimeters)
详见段落 4.0 规范(所有的尺寸均以毫米为单位)

Reel Without Drive Hole

没有驱动孔的卷轴



Note: Drive spokes optional; if used, dimensions B and D shall apply.

注意事项: 驱动轮辐为选用设计, 如果采用的话, 必须将 B 和 D 尺寸考虑在内。

Reel With Drive Hole

有驱动孔的卷轴

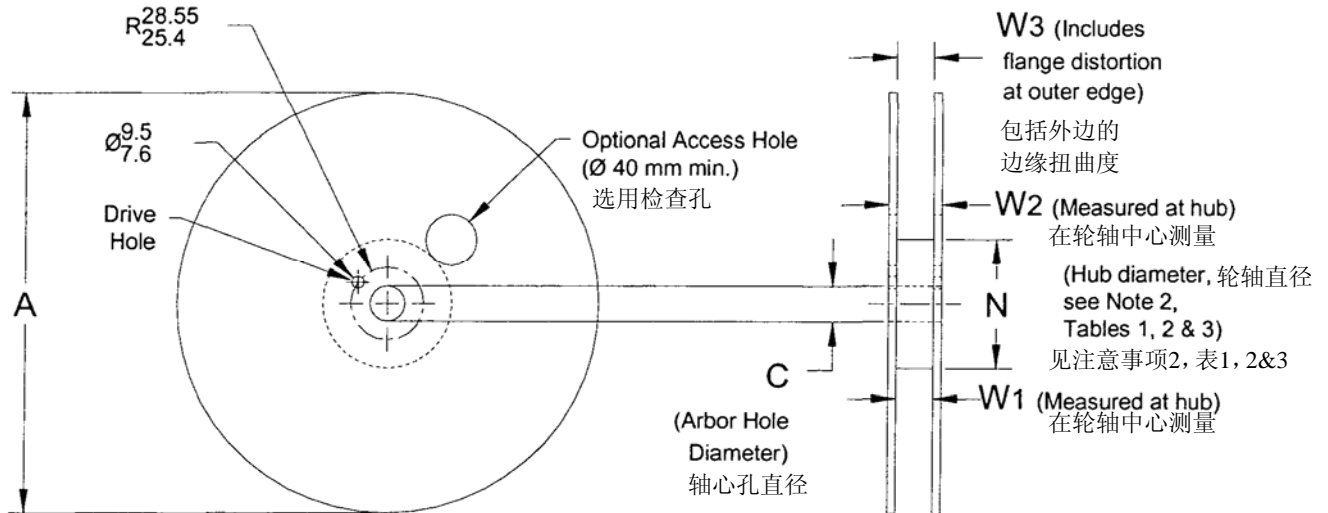


Table 4 – Reel dimensions 表 4–卷轴尺寸
See Section 4.0 for requirements (all dimensions in millimeters)
详见段落 4.0 规范(所有的尺寸均以毫米为单位)

Constant Dimensions 固定尺寸部分

Tape Size 带宽	Reels without drive hole 没有驱动孔的卷轴				Reels with drive hole 有驱动孔的卷轴		
	A Max.	B Min.	C	D Min.	B	C Max.	D
8mm to 200 mm	609	1.5	13.0+0.5 -0.2	20.2	Not Applicable 不适用	29.2	Not Applicable 不适用

Variable Dimensions 变动尺寸部分

Tape Size (mm) 带宽 (毫米)	N Min. See Note 2, Tables 1-3 见注意事项 2,表 1-3	W ₁	W ₂ Max for A<360 mm See Note 1 A<360 毫米时的 W ₂ 最大值见注意事项 1	W ₂ Max for A ≥360 and ≤ 609 mm See Note 2 360≤A≤690 毫米 时的 W ₂ 最大值见注 事项 2	W ₃
8	50	8.4+1.5/-0.0	14.4	14.4	Shall Accommodate tape width without interference 应毫无阻碍地容纳 载体的宽度
12		12.4+2.0/-0.0	18.4	18.4	
16		16.4+2.0/-0.0	22.4	29.0	
24	60	24.4+2.0/-0.0	30.4	37.0	
32	See Note 3 注意事项 3	32.4+2.0/-0.0	38.4	45.0	
44		44.4+2.0/-0.0	50.4	57.0	
56		56.4+2.0/-0.0	62.4	69.0	
72		72.4 Min	89.0		
88		88.4 Min	105.0		
104		104.4 Min	121.0		
120		120.4 Min	137.0		
136		136.4 Min	153.0		
152		152.4 Min	169.0		
168		168.4 Min	185.0		
184	184.4 Min	201.0			
200	200.4 Min	217.0			

Notes 注意事项

- For reels less than 360 mm diameters (A), the most widely used reel diameters are 178 mm ± 2 mm and 330 mm ± 2 mm. Reel diameters ranging from 254 mm to 292 mm also exist. Commonly used hub diameters are 80, 100, 150 and 178 mm.
在小于直径(A)360 毫米的卷轴中，最通用的卷轴为直径 178±2 毫米和 330±2 毫米。直径 254 毫米到 292 毫米的卷轴也有在使用，通用的轴心直径为 80, 100, 150 和 178 毫米。
- For reels greater than or equal to 360 mm diameters (A), various sizes exist with the most widely used being 381 mm ± 2 mm, 482mm ± 2 mm and 558mm ± 2 mm. Hub diameters vary widely, up to 254 mm.
在大于直径(A)360 毫米的卷轴中，最通的卷轴为直径 381±2 毫米, 482±2 毫米和 558±2 毫米。轴心直径规格扩大到 254 毫米都有。
- Tape with components must wrap around hub without damage.
装有元件的载体必须无受损地绕在轮轴中心周围。

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Addendum 附录

Complementary Taping Standards: 补充的卷装标准

EIA-726 8mm punched & Embossed carrier taping of surface mount components for automatic handling of devices smaller than 2.0 mm *1.2 mm

自动装配小于 2.0 毫米 *1.2 毫米表面贴装元件的 8 毫米穿孔载体&压纹载体

EIA-747 Adhesive backed punched plastic carrier taping of singulated bare die and other surface mount components for automatic handling of devices generally less than 1.0 mm thick.

用于厚度小于 1.0 毫米的常用自动装配设备的无屏蔽单模及其他表面贴装元件的粘性塑料传送带

EIA-763 Bare die and chip scale packages taped in 8 mm & 12 mm carrier tape for automatic handling

自动装配空模和芯片的 8 毫米 & 12 毫米载体卷装

Other Reference Documents: 其它参考文献

ESD TR20.20 ESD Association Standard -- ESD Handbook

ESD 协会标准-ESD 手册

ESD ADV1.0 ESD Association Glossary - Glossary of Terms

ESD 协会术语表-ESD 手册-词汇表

SEMI E78 Semiconductor Equipment and Materials International Standard - Electrostatic Compatibility - Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment

半导体设备与材料国际标准-静电兼容性-设备静电放电与静电吸附评估和控制指南

Recommendation: 建议

For waste minimization purposes it is recommended that the industry modify its methods and equipment so that the minimum leader dimension can be eventually reduced from 400 mm to 320 mm and that the minimum trailer dimension be reduced from 160 mm to 80 mm.

为了达到减少浪费的目的，建议工厂修改方法和设备以便最小的导带尺寸可最终从 400 毫米降低到 320 毫米，最小拖引带尺寸从 160 毫米降低到 80 毫米。

EIA Document Improvement Proposal EIA 文件的改进建议

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Immediate 立即: <input type="checkbox"/>	At next revision 下一版本: <input type="checkbox"/>
Problem Area 有问题的地方:	
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b. Recommended Changes 建议的更改:	
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