

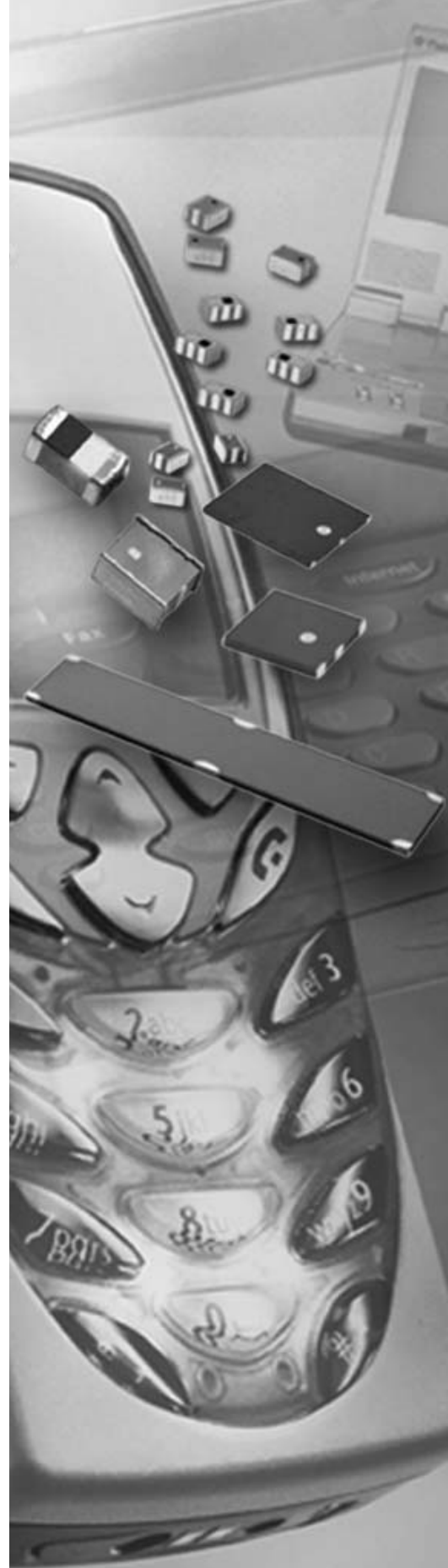
DATA SHEET

HIGH FREQUENCY

SMD type antennas
for BT/802.11b/g application

2.45 GHz

size 5.3 × 2.0



High Frequency SMD type antennas for BT/802.11b/g application 2.45 GHz size 5.3 × 2.0

FEATURES

- Designed for 2.45 GHz ISM-band
- Simplifies antenna circuitry
- NiSn lead-free terminations
- Suitable for wave and reflow soldering
- Supplied in tape on reel.

APPLICATIONS

- Telecommunications
- Computing (PCs, printers, PDAs)
- Wireless office data communications including WLAN
- Consumer electronics (wireless headphones).

DESCRIPTION

This 2.45 GHz ceramic multilayer antenna has been designed to meet the requirements of the BluetoothTM(1) and IEEE 802.11b/g wireless communications protocol. It consists of a rectangular block of low-dielectric ceramic material and is fabricated in a water-based non-toxic process. The antenna is capable of providing good connectivity using near 50 Ω microstrip directly onto the PC board.

Notes

1. Bluetooth is a trademark owned by Telefonieaktiebolaget L M Ericsson, Sweden.

QUICK REFERENCE DATA

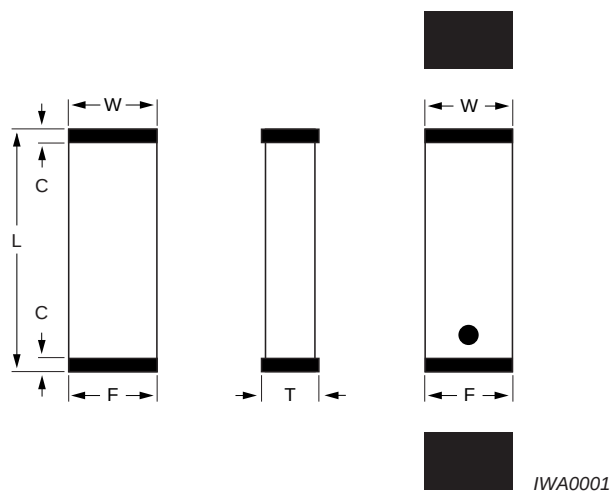
DESCRIPTION	VALUE
Centre frequency	2.45 GHz 0 type/01type/02 type/03 type/Default/04 type/05 type
Bandwidth	> 100 MHz
Gain	4 dBi max. (depends on the special environment)
VSWR	2.5 max. (depends on the special environment)
Polarization	Linear
Azimuth beam width	Omni-directional
Impedance	50 Ω
Power dissipation	1 W
Operating temperature	–55 to +85 °C
Terminations	NiSn
Resistance to soldering heat	260 °C for 10 seconds

High Frequency

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MECHANICAL DATA



For dimensions see Table 1.

Fig.1. Component outline.

Physical dimensions

Table 1 Antenna dimensions

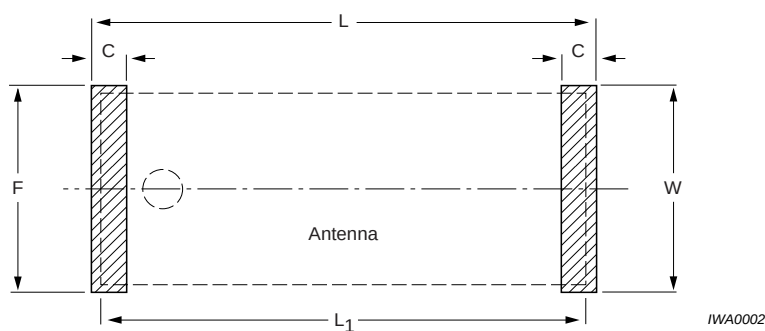
SYMBOL	DETAILS	DIMENSIONS (mm)
L	—	5.3 ±0.20
W	—	2.0 ±0.20
T	—	1.3 ±0.20
F	feed termination	2.0 ±0.20
C	—	0.4 ±0.25

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ELECTRICAL CHARACTERISTICS

DESCRIPTION	VALUE
Centre frequency	2.45 GHz 0 type/01type/02 type/03 type/Default/04 type/05 type
Bandwidth	> 100 MHz
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VSWR	2.5 max. (depends on the special environment)
Polarization	Linear
Azimuth beam width	Omni-directional
Impedance	50 Ω
Power dissipation	1 W
Operating temperature	–55 to +85 °C
Terminations	NiSn
Resistance to soldering heat	260 °C for 10 s
Weight	0.05 g/piece

FOOTPRINT DIMENSIONS



For dimensions see Table 2.

Fig.2. Recommend dimensions of solder

Physical dimensions

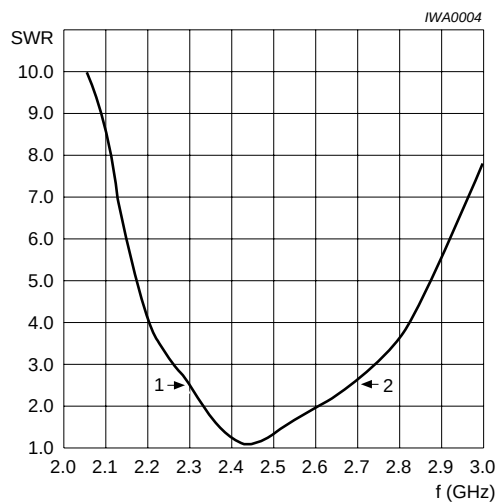
Table 2 The dimensions of antenna appearance

SYMBOL	DETAILS	DIMENSIONS (mm)
L	–	5.5 ±0.2
W	–	2.2 ±0.2
F	feed pad	2.2 ±0.2
C	–	0.5 ±0.25
L1	–	5.3 ±0.5

High Frequency

SMD type antennas

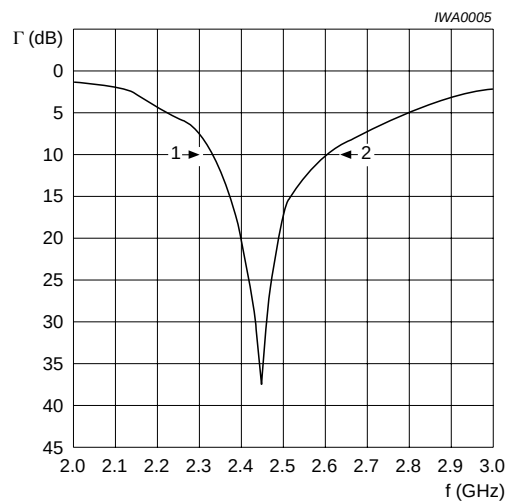
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Marker data:

1: $SWR = 2.5$; $f = 2.30$ GHz

2: $SWR = 2.5$; $f = 2.70$ GHz



Marker data:

1: $\Gamma = -10$ dB; $f = 2.33$ GHz

2: $\Gamma = -10$ dB; $f = 2.60$ GHz

Pre-tuning reference only, after-tuning performance is depending on customer installation.

Fig.3 The measurements of typical SWR and return loss on the special environment .

High Frequency

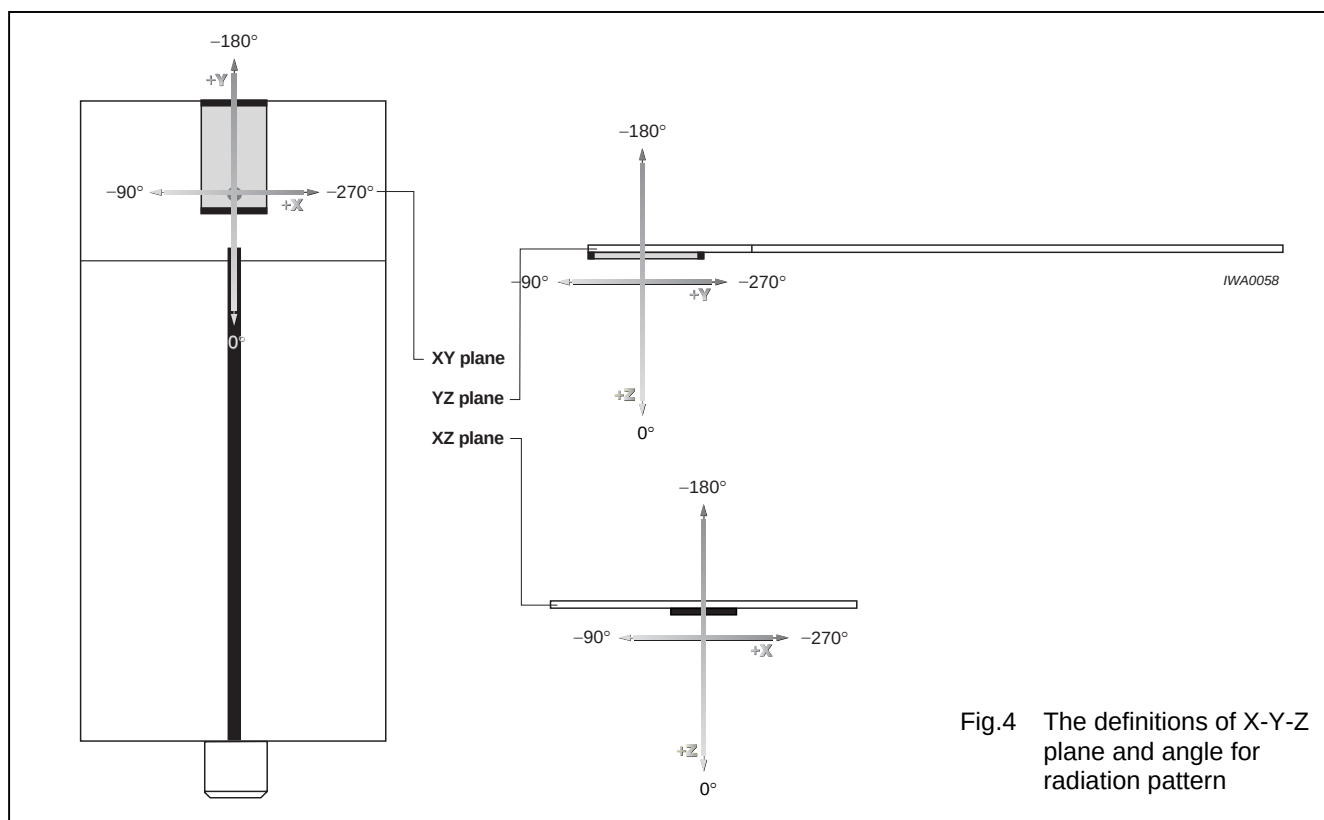
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Fig.4 The definitions of X-Y-Z plane and angle for radiation pattern

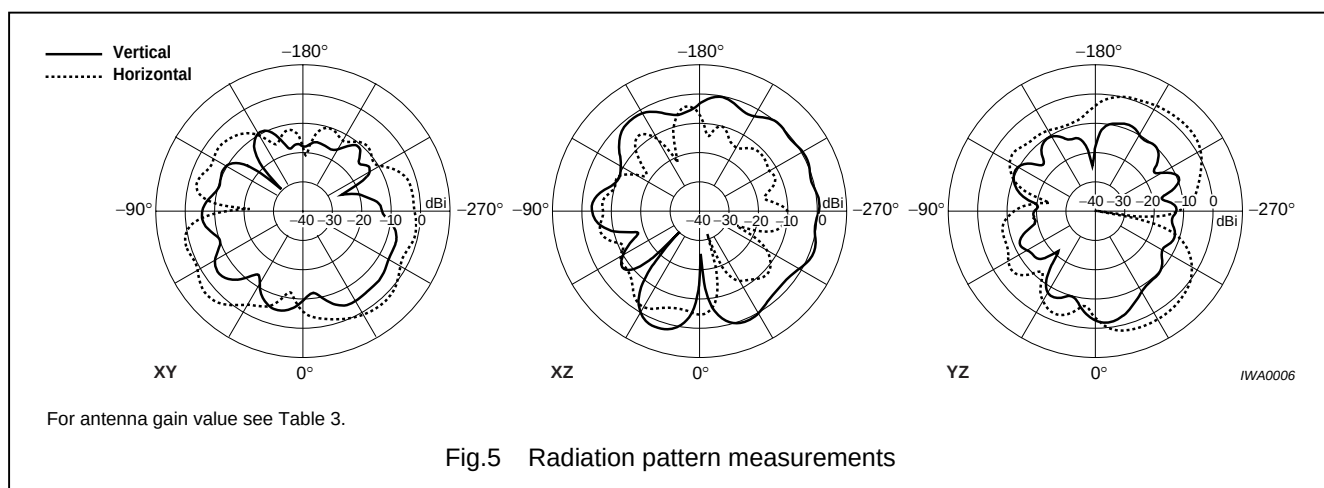


Fig.5 Radiation pattern measurements

Table 3 Max. and avg. antenna gain value of radiation pattern

Plane	XY (dBi)	XZ(dBi)	YZ (dBi)
Vertical Pol. (max.)	-3.8	2.6	-1.8
Vertical Pol. (avg.)	-8.4	-1.6	-9.7
Horizontal Pol. (max.)	4.0	-1.9	2.7
Horizontal Pol. (avg.)	-2.2	-8.4	-2.1
Total gain (max.)	4.0	2.7	2.7
Total gain (avg.)	-1.9	-1.3	-1.9

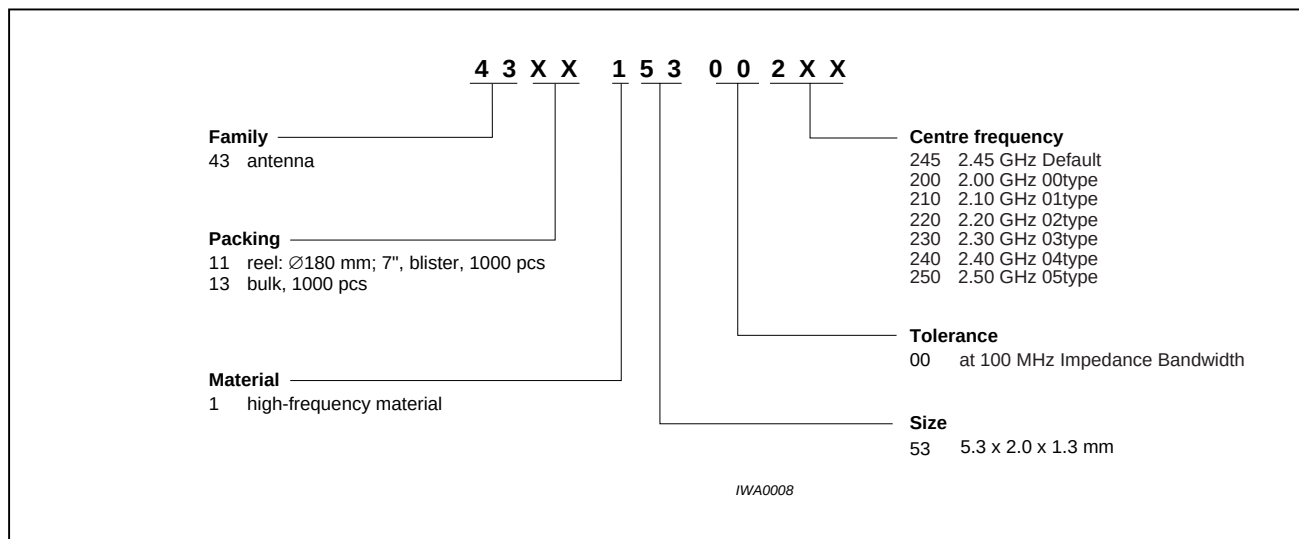
High Frequency SMD type antennas for BT/802.11b/g application 2.45 GHz size 5.3 × 2.0

ORDERING INFORMATION

Components may be ordered by using either a Phycomp's unique 12NC or the simple 17-digit clear text code (Yageo part number)

12NC ORDERING CODE

EXAMPLE: 4311 153 002 XX



Yageo part number

EXAMPLE: CAN4311153002451K

DESCRIPTION	CODE
Family	CAN43 = antenna products
Packing	11 = 180 mm/7" blister
Materials	1 = high frequency materials
Size	53 = 5.3 × 2.0 × 1.3 mm
Tolerance	00 = large than 100 MHz
Working Frequency ⁽¹⁾	245 = 2.45 GHz (Default) 200 = 2.0 GHz (00 type) 210 = 2.1 GHz (01 type) 220 = 2.2 GHz (02 type) 230 = 2.3 GHz (03 type) 240 = 2.4 GHz (04 type) 250 = 2.5 GHz (05 type)
Packing type	1K = 1,000 pcs per reel

Notes

- Depends on the special environment.

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TESTS AND REQUIREMENTS

Table 4 Test procedures and requirements

IEC 384-10/ CECC32 100 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.4		mounting	the antenna may be mounted on printed-circuit boards or ceramic substrates by applying wave soldering, reflow soldering (including vapour phase soldering) or conductive adhesive	no visible damage
4.5		visual inspection and dimension check	any applicable method using × 10 magnification	in accordance with specification (chip off 4 mm)
4.8		adhesion	a force of 3 N applied for 10 s to the line joining the terminations and in a plane parallel to the substrate	
4.9		bond strength of plating on end face	mounted in accordance with CECC 32 100, paragraph 4.4	no visible damage
			conditions: bending 0.5 mm at a rate of 1 mm/s; radius jig: 340 mm; 2 mm warp on FR4 board of 90 mm length	no visible damage
4.10	20 (Tb)	resistance to soldering heat	260 ±5 °C for 10 ±5 s in a static solder bath	the terminations should be well tinned after recovery; central frequency changed to ±6%
		resistance to leaching	at 260 ±5 °C for 30 ±1 s in a static solder bath	using visual enlargement of × 10, dissolution of the terminations should not exceed 10%
4.11	20 (Ta)	solderability	zero hour test, and test after storage (20 to 24 months) in original atmosphere; unmounted chips completely immersed for 2 ±0.5 s at 235 ±5 °C	good tinning (≥ 75% covered) at terminations

High Frequency
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IEC 60384-10/ CECC32 100 CLAUSE	IEC 60384-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.12	4 (Na)	rapid change of temperature	–55 °C (30 minutes) to +85 °C (30 minutes); 100 cycles	no visual damage; central frequency changed to ±6%
4.14	3 (Ca)	damp heat	500 ±12 hours at 60 °C; 90 to 95% RH	no visual damage; 2 hours recovery; central frequency changed to ±6%
4.15		endurance	500 ±12 hours at 85 °C	no visual damage; 2 hours recovery; central frequency changed to ±6%

High Frequency

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PACKING

Tape and reel specifications

Tape and reel specifications are in accordance with "IEC 60286-3". Basic dimensions are given in Fig. 6 and 7, and Table 5 and 6.

Peel-off force

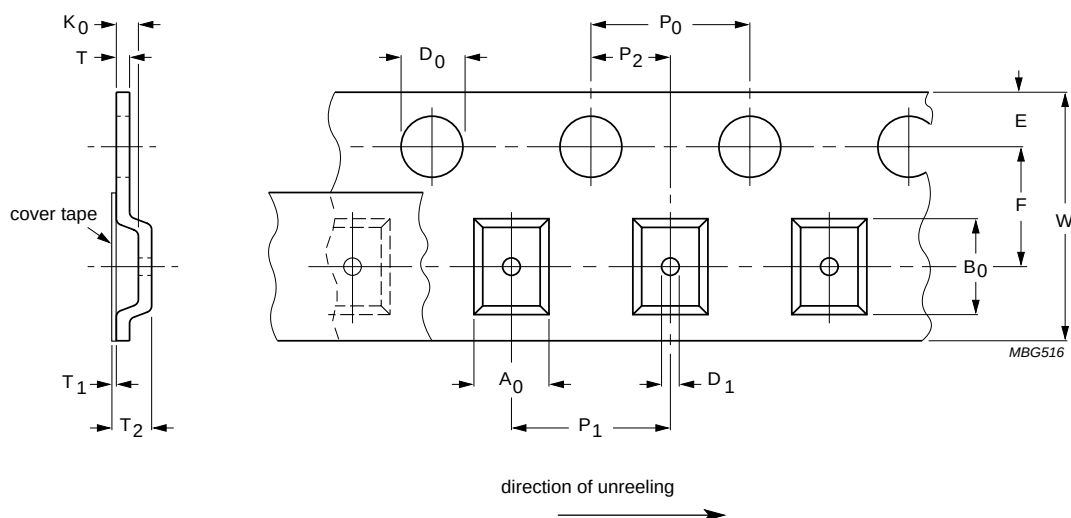
Peel-off force of the blister tape is in accordance with "IEC 60286-3"; that is, at a peel-off speed of 300 ± 10 mm/minute, 0.1 N to 1.3 N for 16 mm tape. The peel-off angle should be between 165° and 180°

Blister tape

ENVIRONMENTAL CONSIDERATIONS

- Cover tape, carrier tape and reel do not contain environmentally harmful PVC materials.
- Because the carrier tape is made of polycarbonate, a homogeneous material (mono-plastic), it is ideally suited for recycling.
- Compared to other PVC-free materials polycarbonate shows excellent stiffness and very little deformation with temperature.

Blister tape specifications



Cumulative pitch error: 0.2 mm over 10 pitches.
Cumulative tolerance over 10 holes: ± 0.2 mm.
K₀: chosen so that the orientation of the component cannot change.
For dimensions see Table 5.

Fig.6 Blister tape

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Table 5 Dimensions of blister tape; see Fig. 6

SYMBOL	DIMENSION	TOLERANCE	UNIT
A ₀ nominal clearance; note 1	2.28	±0.10	mm
B ₀ nominal clearance; note 1	5.70	±0.10	mm
K ₀ nominal clearance; note 1	1.58	±0.10	mm
W	12.0	±0.30	mm
E	1.75	±0.10	mm
F	5.50	±0.05	mm
D ₀	1.50	±0.10	mm
D ₁	1.50	±0.25	mm
P ₀	4.0	±0.10	mm
P ₁	4.0	±0.10	mm
P ₂	2.0	±0.05	mm
T	0.229	±0.02	mm

Note

1. Possible product displacement in pocket.
2. P₀ pitch tolerance over any 10 pitches is ±0.2 mm.

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Reel specifications

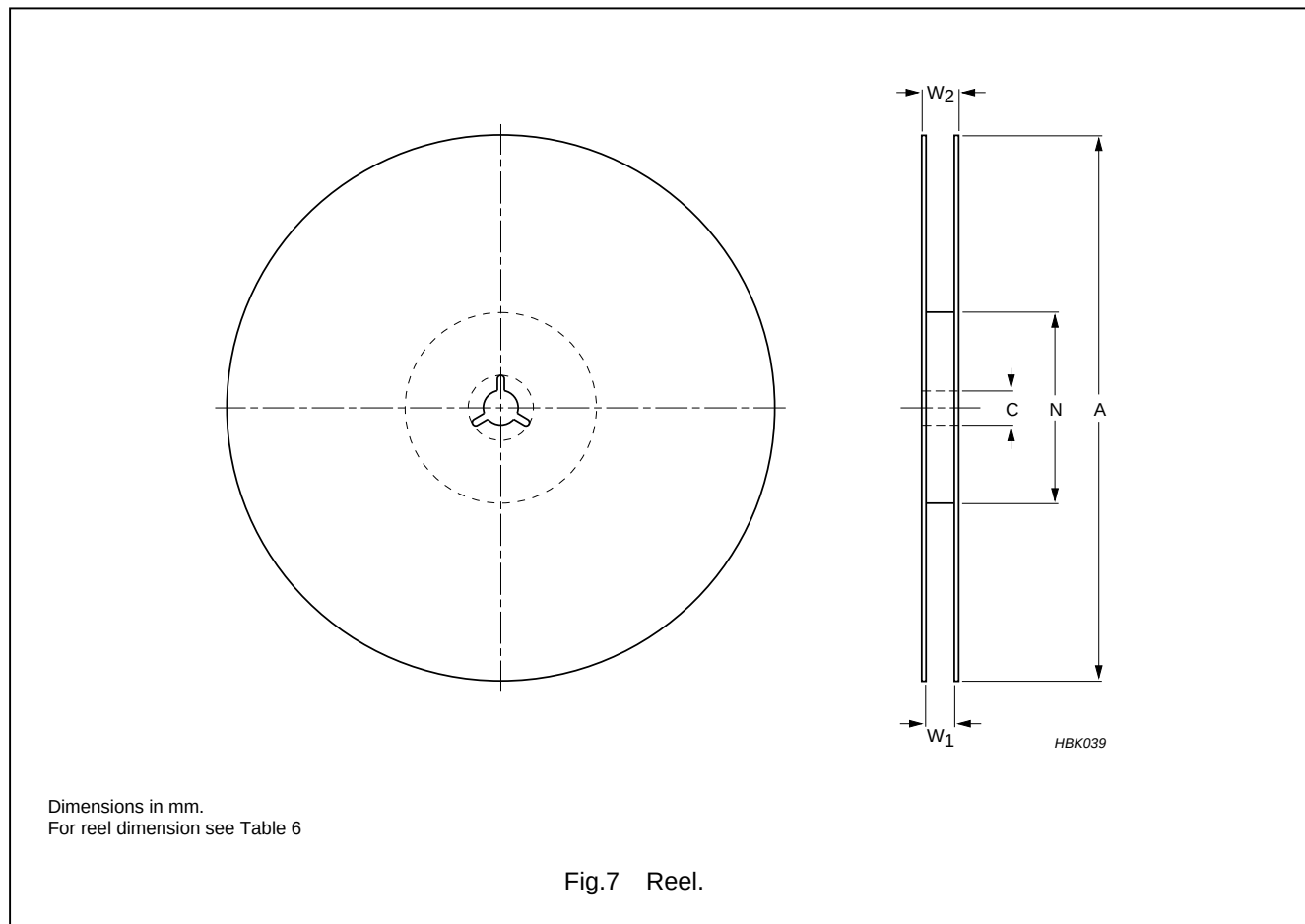


Table 6 Reel dimensions; see Fig.7

TAPE WIDTH (mm)	A (mm)	C (mm)	N (mm)	W ₁ (mm)	W ₂ (mm)	QUANTITY PER REEL (pcs)
12 ±0.3	180 ±1.0	19 ±2.0	58 ±2.0	12.4 ±2.0	18.4 ±2.0	1,000

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REVISION HISTORY

Revision	Date	Change Notification	Description
Rev.3	2004 July 15	-	- Updated company logo
Rev.4	2004 Oct 12	-	- Add more types of central frequency products for customized layout. Eliminate standard demo board.
Rev.5	2005 Mar 08	-	- Revised L1 value in table 2.