

DATA SHEET

IIC10P-14/4

IIC10-14/4

Integrated inductive components

Product specification
File under Ferrite Ceramics, MA01

1999 Dec 23

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Effective core parameters

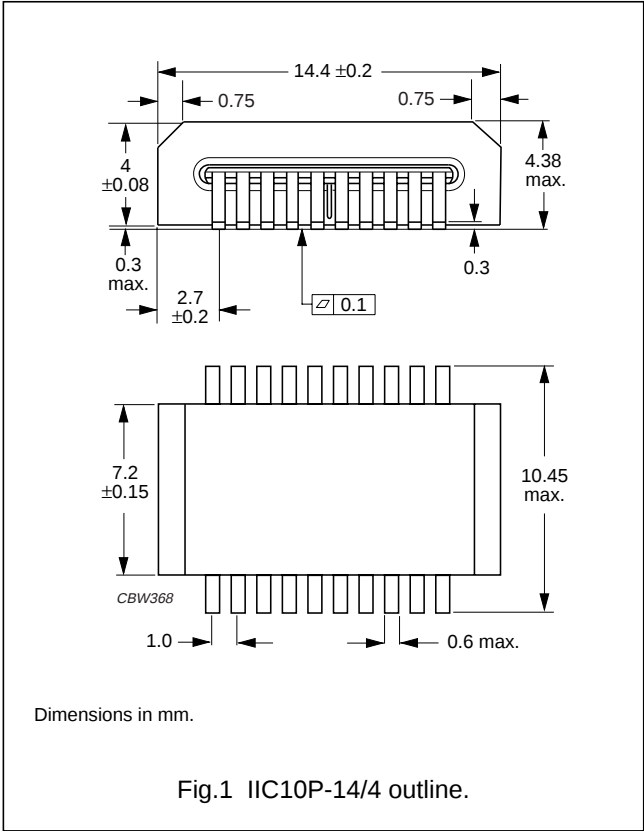
SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(I/A)$	core factor (C1)	2.47	mm^{-1}
V_e	effective volume	338	mm^3
l_e	effective length	28.9	mm
A_e	effective area	11.7	mm^2
m	mass of core half	≈ 1.85	g

FEATURES

- Inductive SMD component that looks like a standard IC.
- Windings are completed by PCB tracks.
- Suitable for reflow soldering.
- Partial air gap to resist saturation.
- Number of turns can be adapted by track layout.

APPLICATIONS

- Power inductor
- Output choke
- EMI choke with bias current.



IICs with partial air gap for use as power inductors

GRADE	L (μH) FOR 10 TURNS NO BIAS CURRENT			L (μH) FOR 10 TURNS WITH A BIAS CURRENT OF 1 A			TYPE NUMBER
	f = 100 kHz; T = 25 °C	f = 500 kHz; T = 25 °C	f = 1 MHz; T = 25 °C	f = 100 kHz; T = 25 °C	f = 500 kHz; T = 25 °C	f = 1 MHz; T = 25 °C	
3C30	92 $\pm 25\%$	—	—	≥ 5	—	—	IIC10P-14/4-3C30
3F4	—	—	45 $\pm 25\%$	—	—	≥ 5	IIC10P-14/4-3F4
3F35	—	70 $\pm 25\%$	—	—	≥ 5	—	IIC10P-14/4-3F35

IICs with partial air gap under power conditions

GRADE	CORE LOSS (mW)			TYPE NUMBER
	f = 100 kHz; $\hat{B} = 100 \text{ mT};$ T = 100 °C	f = 500 kHz; $\hat{B} = 50 \text{ mT};$ T = 100 °C	f = 1 MHz; $\hat{B} = 30 \text{ mT};$ T = 100 °C	
3C30	≤ 30	—	—	IIC10P-14/4-3C30
3F4	—	—	≤ 70	IIC10P-14/4-3F4
3F35	—	≤ 40	—	IIC10P-14/4-3F35

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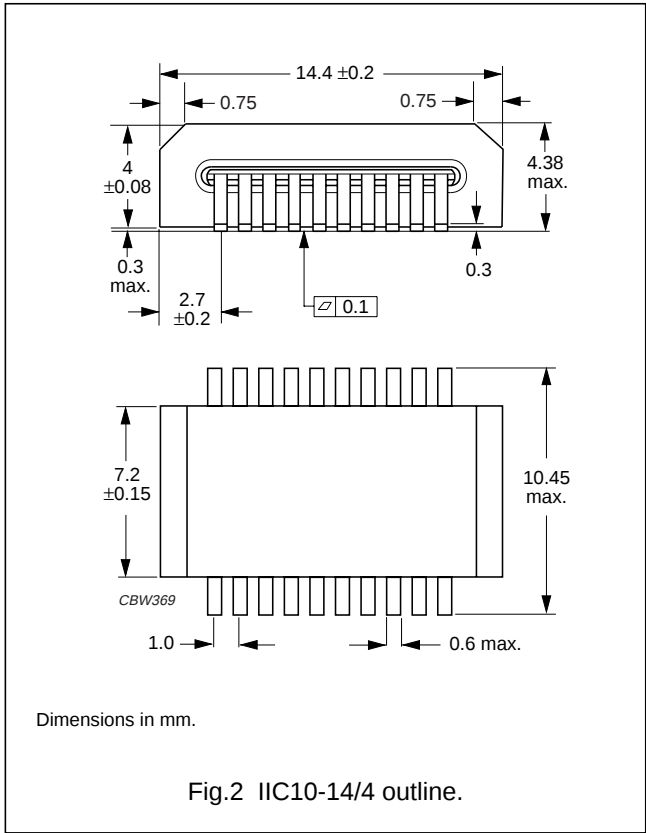
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FEATURES

- Inductive SMD component that looks like a standard IC.
- Windings are completed by PCB tracks.
- Suitable for reflow soldering.
- Several magnetic functions, depending on track layout.

APPLICATIONS

- Common-mode choke
- Mutli-line choke
- Power transformers
- Signal transformers
- Saturable inductor.



IICs for use as transformer or common-mode chokes

GRADE	A_L (nH) at			CORE LOSS (mW)		TYPE NUMBER
	$f = 10 \text{ kHz}; T = 25 \text{ }^\circ\text{C}$	$f = 500 \text{ kHz}; T = 25 \text{ }^\circ\text{C}$	$f = 1 \text{ MHz}; T = 25 \text{ }^\circ\text{C}$	$f = 500 \text{ kHz}; \hat{B} = 50 \text{ mT}; T = 100 \text{ }^\circ\text{C}$	$f = 1 \text{ MHz}; \hat{B} = 30 \text{ mT}; T = 100 \text{ }^\circ\text{C}$	
3F4	—	—	$450 \pm 25\%$	—	≤ 70	IIC10-14/4-3F4
3E6	$6000 \pm 30\%$	—	—	—	—	IIC10-14/4-3E6
3F35	—	$700 \pm 25\%$	—	≤ 40	—	IIC10-14/4-3F35

IIC for use as a common-mode choke or multi-line choke

GRADE	$ Z \text{ } \Omega$ for 1 turn at $f = 100 \text{ MHz}; T = 25 \text{ }^\circ\text{C}^{(1)}$	TYPE NUMBER
3S4	≈ 35	IIC10-14/4-3S4

Note

1. Minimum value, $|Z|_{\min}$ is -20% .

IIC with rectangular hysteresis loop for use in magnetic regulators

GRADE	E·t product (V·μs) at		TYPE NUMBER
	$f = 100 \text{ kHz}; H = 800 \text{ A/m}; T = 100 \text{ }^\circ\text{C}; I_{\text{reset}} = 70 \text{ mA}; 10 \text{ turns}$	$f = 100 \text{ kHz}; H = 800 \text{ A/m}; T = 100 \text{ }^\circ\text{C}; I_{\text{reset}} = 0 \text{ mA}; 10 \text{ turns}$	
3R1	≥ 33	≤ 12	IIC10-14/4-3R1

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GENERAL DATA **R_{dc}**

$\approx 65 \text{ m}\Omega$ (25 °C) and $\approx 85 \text{ m}\Omega$ (100 °C) for 10 turns including 20 solder joints (assuming 70 μm Cu PCB tracks).

Leadframe material

Copper, plated with tin-lead alloy SnPb (85/15).

Solderability

Compatible with reflow soldering, "IEC 60068-2-58, part 2, test Ta, method 1".

Moulding material

Liquid crystal polymer (LCP), flame retardant in accordance with "UL 94V-0".

Isolation voltage

>500 V (DC) between leads and between leads and ferrite core.

Isolation resistance

>100 M Ω between leads.

Inter winding capacitance

2 windings of 5 turns:

unifilar $\approx 5 \text{ pF}$

bifilar $\approx 10 \text{ pF}$.

(depending on track layout; see Figs 1 and 2)

Leakage inductance

2 windings of 5 turns:

unifilar $\approx 1.8 \mu\text{H}$

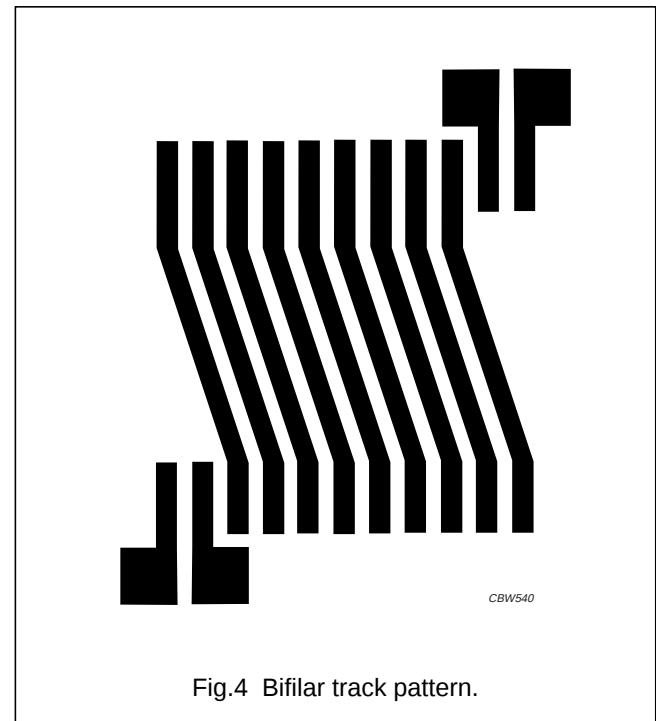
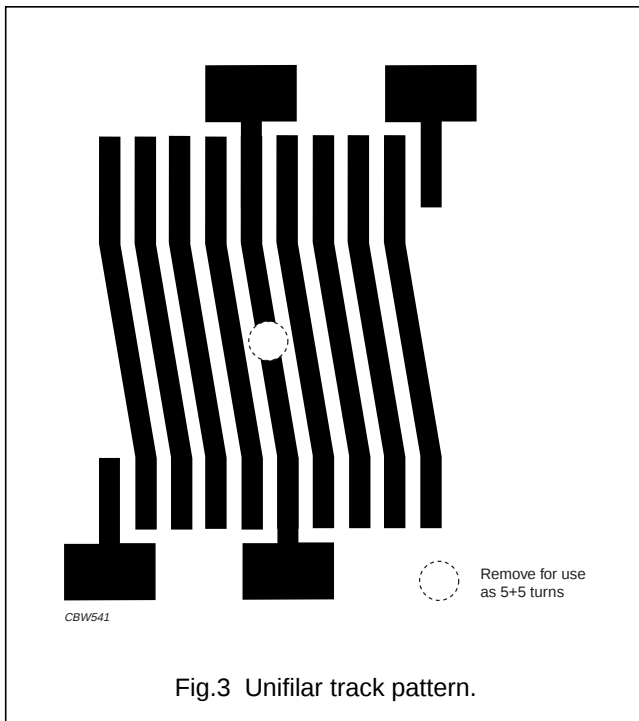
bifilar $\approx 0.2 \mu\text{H}$.

Maximum continuous current (DC)

4 A (depending on copper track thickness on PCB).

Maximum peak current

10 A.

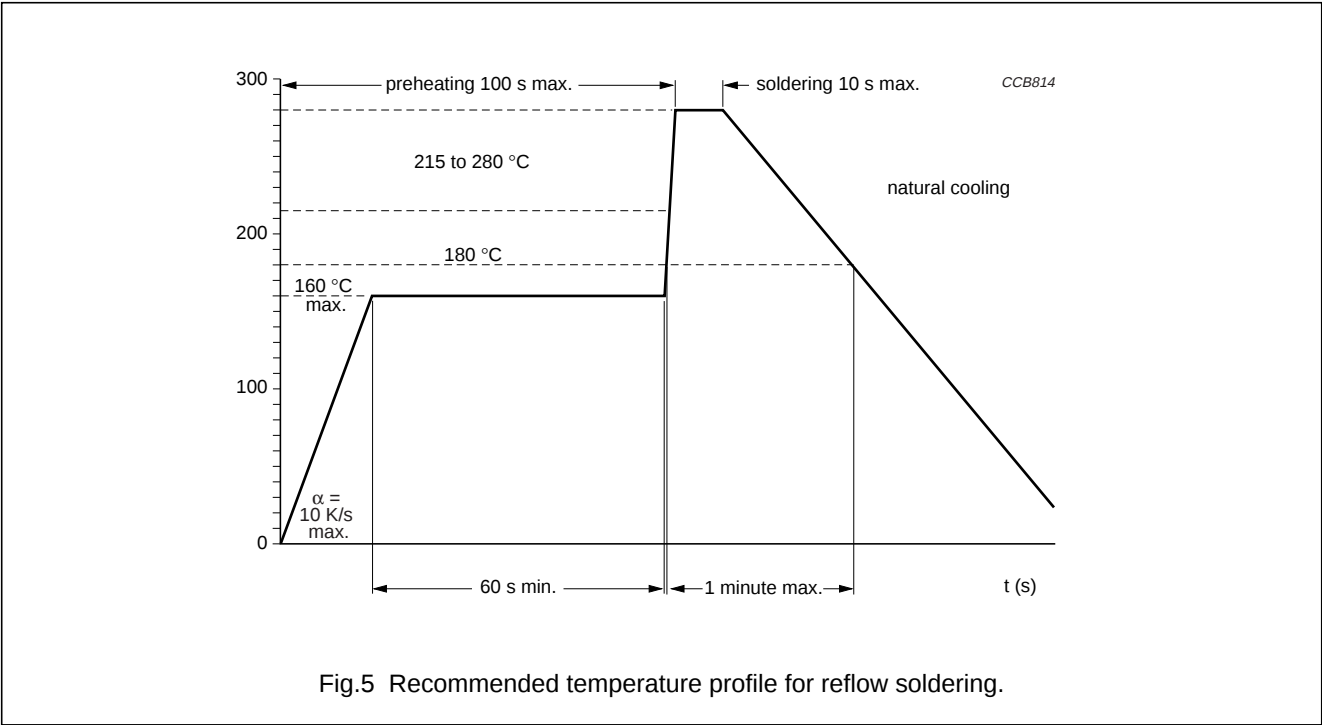


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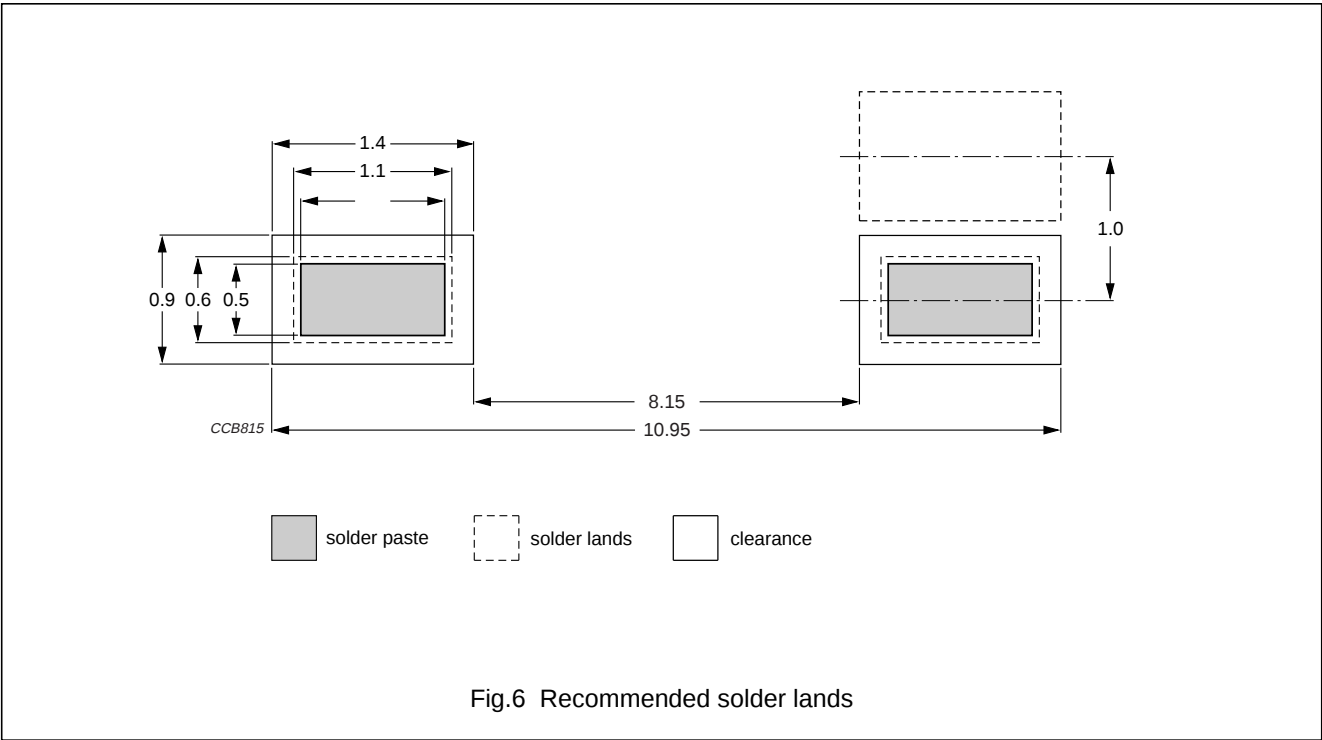
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MOUNTING

Soldering information



RECOMMENDED SOLDER LANDS



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PACKAGING

Tape and reel specifications

All tape and reel specifications are in accordance with the second edition of “IEC 60286-3”. Basic dimensions are given in Figs 7 and 8, and Table 1.

Blister tape

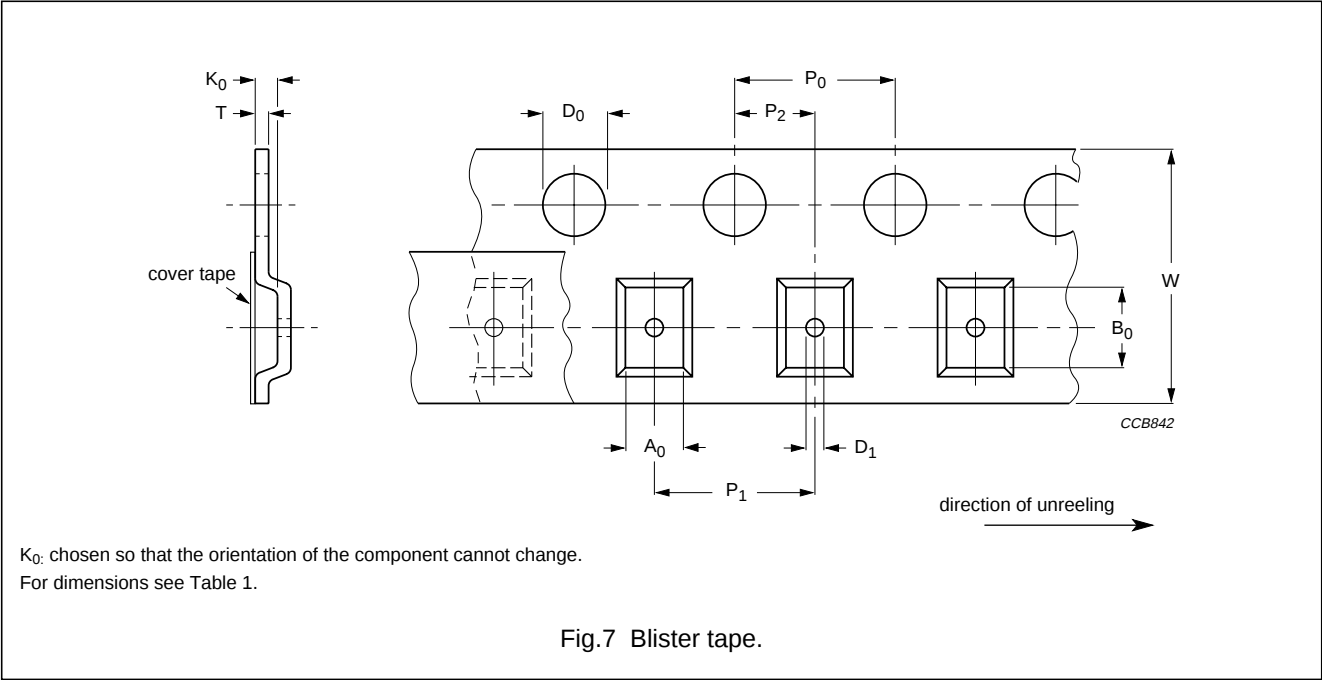


Table 1 Dimensions of blister tape; see Fig.7

SYMBOL	DIMENSIONS	TOL.	UNIT
A_0	10.6	± 0.1	mm
B_0	14.75	± 0.1	mm
K_0	4.75	± 0.1	mm
W	24	± 0.3	mm
D_0	1.5	± 0.1	mm
D_1	1.5	± 0.25	mm
P_0 ; note 1	4	± 0.1	mm
P_1	12	± 0.1	mm
P_2	6	± 0.1	mm
T	0.3	± 0.1	mm

Note

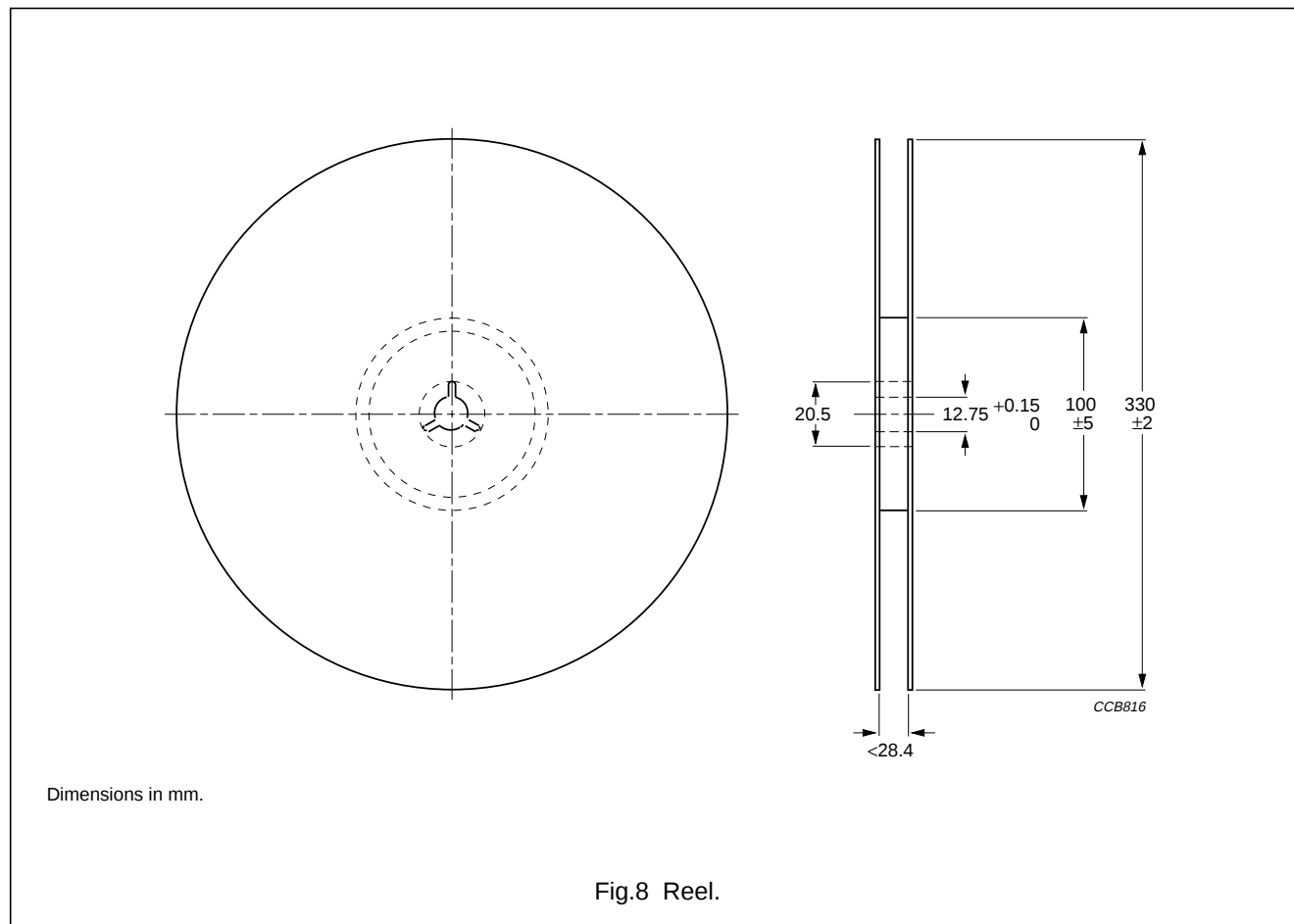
1. P_0 pitch tolerance over any 10 pitches is ± 0.2 mm.

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Reel specifications



Packaging quantities

IICs are delivered taped and reeled in quantities of 1000 units.

Storage requirements

These storage requirements should be observed in order to ensure the soldering of the exposed electrode:

- Maximum ambient temperature shall not exceed 40 °C. Storage temperature higher than 40 °C could result in the deformation of packaging materials.
- Maximum relative humidity recommended for storage is 70% RH. High humidity with high temperature can accelerate the oxidation of the tin-lead plating on the termination and reduce the solderability of the components.
- Products shall not be stored in environments with the presence of harmful gases containing sulfur or chlorine.