

DATA SHEET

IP4250 series 18-channel AC termination array with 8 kV ESD protection

Objective specification
File under Advanced Ceramics and Modules, ACM4

1999 Jul 29

18-channel AC termination array with 8 kV ESD protection

IP4250 series

FEATURES

- 18-channel RC bused AC termination array in 20-pin QSOP or SOIC package
- ESD protection: >8 kV
- Undershoot protection
- High capacitance range.

APPLICATIONS

Ensure signal integrity and to reduce DC power dissipation for:

- Workstations
- Desktop and portable computers
- PDAs
- PCMICA cards.

DESCRIPTION

The Philips IP4250 series of Application Specific Integrated Products (ASIPs) is an 18-channel RC bused AC termination array incorporating ESD protection of >8 kV. IP4250 devices are fabricated using thin film-on-silicon technology and integrates 18 resistors, 18 capacitors and 18 diodes in a single 20-pin QSOP or SOIC package.

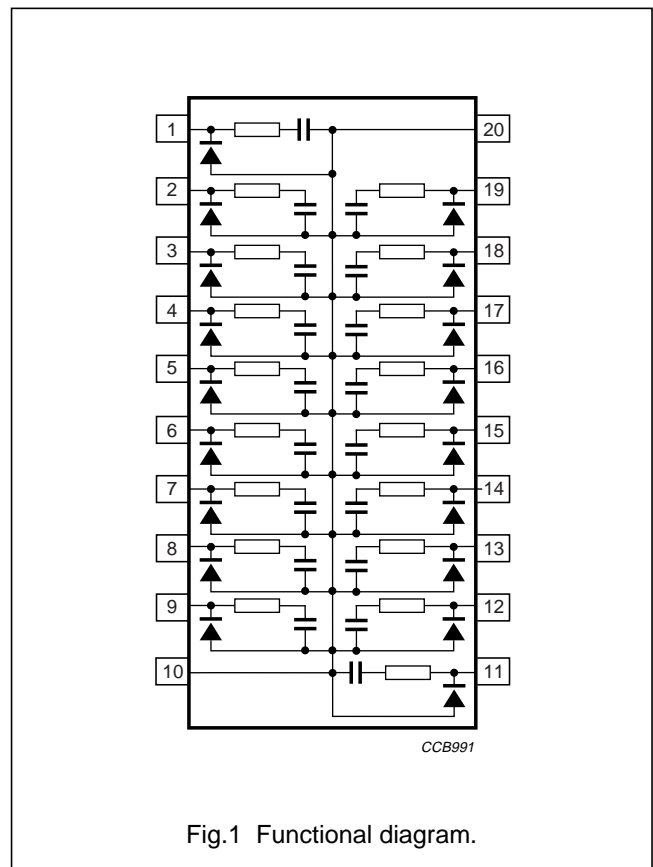
Resistance and capacitance variation, channel to channel, using thin film-on-silicon technology is far superior in comparison to RC filters which use thick film-on-ceramic technique.

The IP4250 should be used to terminate high speed digital lines without the penalty in DC dissipation incurred by resistors alone.

The IP4250 series of devices, together with their self-contained ESD protection, help maintain signal integrity on digital transmission lines by reducing digital undershoot conditions.

QUICK REFERENCE DATA

DESCRIPTION	VALUE
Electrical characteristics at 25 °C	
Resistance	±10%; see Table 1
Capacitance	±20%; see Table 1
Operating voltage, V _{CC}	0 to +5.5 V
ESD protection	IEC 61000-4-2, level 4 (8 kV contact)
Power rating per channel	100 mW, package limited
Package ratings	
Maximum dissipation at:	
T _{amb} = 70 °C	1 W
T _{amb} = 85 °C	0.83 W
Operating temperature	-25 to +85 °C
Storage temperature	-60 to +150 °C



18-channel AC termination array
with 8 kV ESD protection

IP4250 series

ORDERING INFORMATION

Ordering code

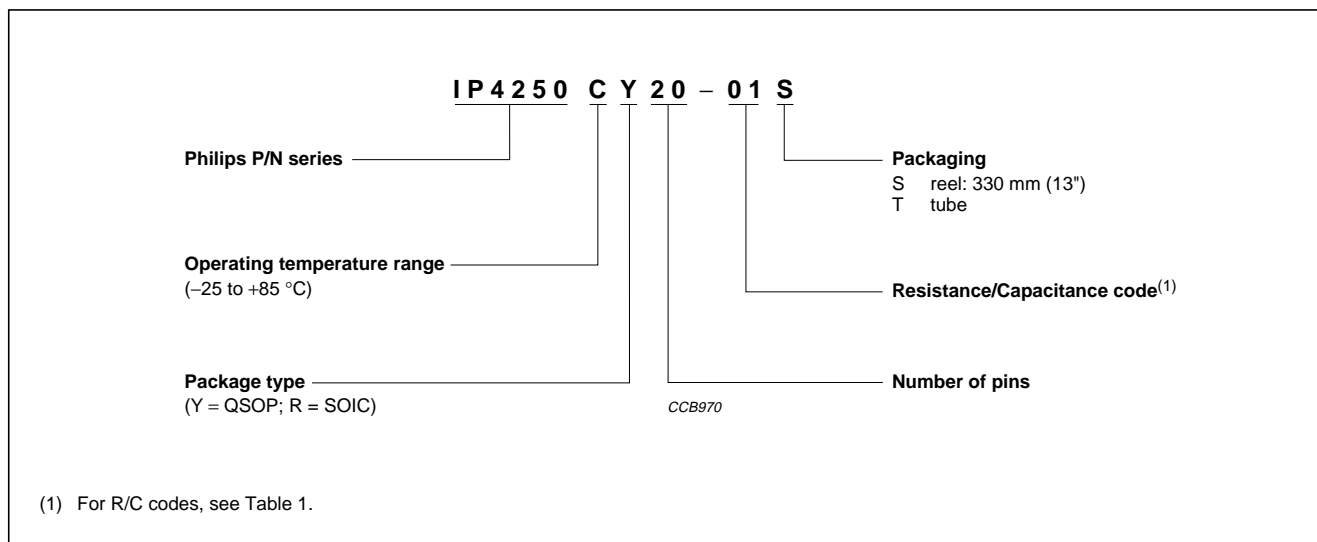


Table 1 Standard R/C values, ordering information and nominal packaging quantities

R/C CODES	RESISTANCE VALUE (Ω)	CAPACITANCE VALUE (pF)	CATALOGUE NUMBER IP4250CY(R)20-...	
			13" REEL	TUBE
SOIC20 package outline			1000 units	36 units
-01	33	47	01S	01T
-02	47	47	02S	02T
-03	47	33	03S	03T
-04	50	250	04S	04T
-05	75	22	05S	05T
-06	100	100	06S	06T
QSOP20 package outline			1000 units⁽¹⁾	56 units
-01	33	47	01S	01T
-02	47	47	02S	02T
-03	47	33	03S	03T
-04	50	250	04S	04T
-05	75	22	05S	05T
-06	100	100	06S	06T

Note

- Higher quantities per reel are available on request.

18-channel AC termination array
with 8 kV ESD protection

IP4250 series

PACKAGING

SOIC20 Package outline

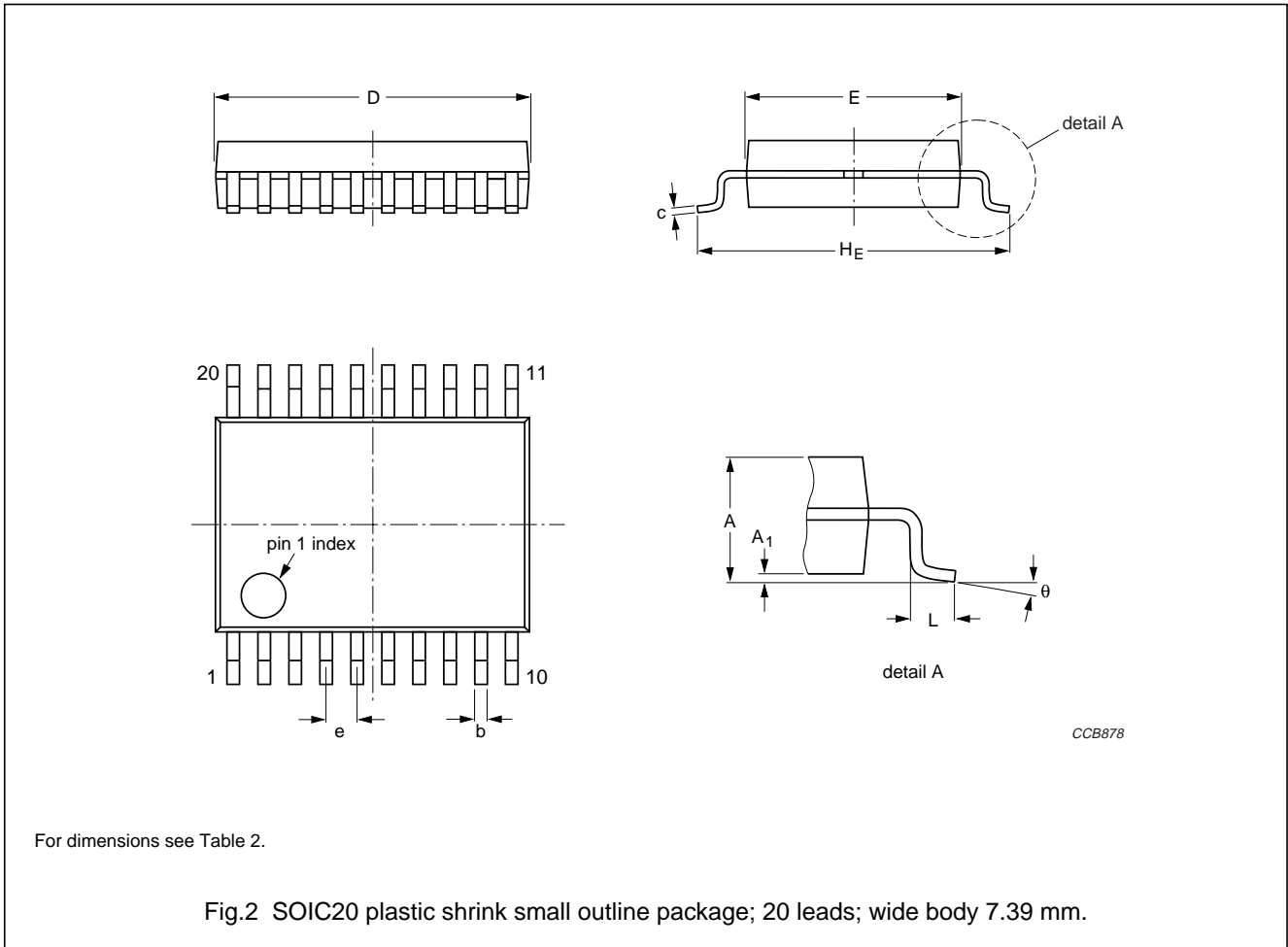


Table 2 Package dimensions; see Fig.2

DIMENSION	VALUE		UNIT
	MIN.	MAX.	
A	2.43	2.64	mm
A ₁	0.10	0.30	mm
b	0.36	0.46	mm
c	0.23	0.32	mm
D	12.65	12.85	mm
E	7.39	7.60	mm
H _E	10.06	10.52	mm
e	1.27 NOM.		mm
L	0.51	1.02	mm
θ	0	8	deg

18-channel AC termination array
with 8 kV ESD protection

IP4250 series

QSOP20 Package outline

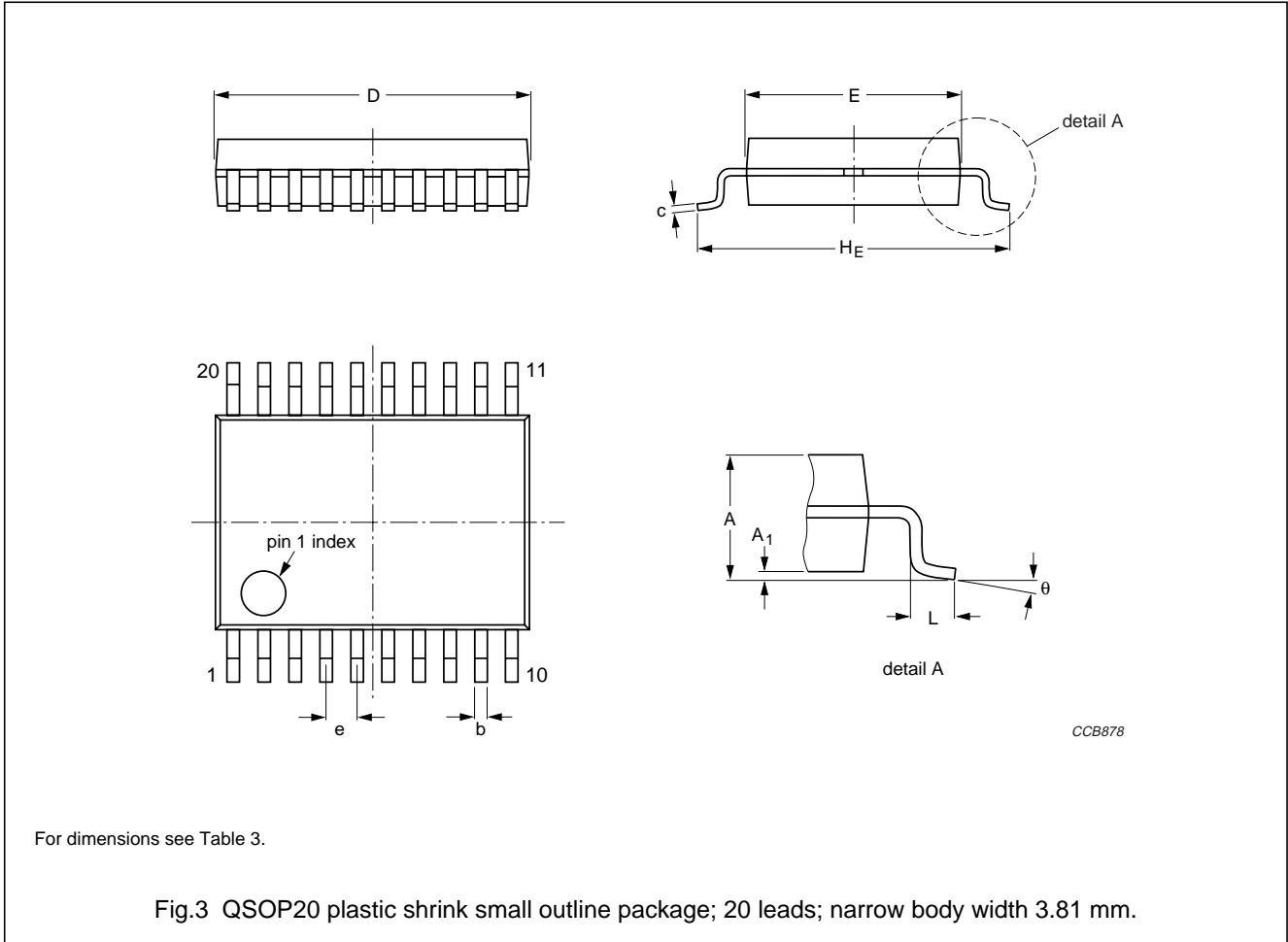


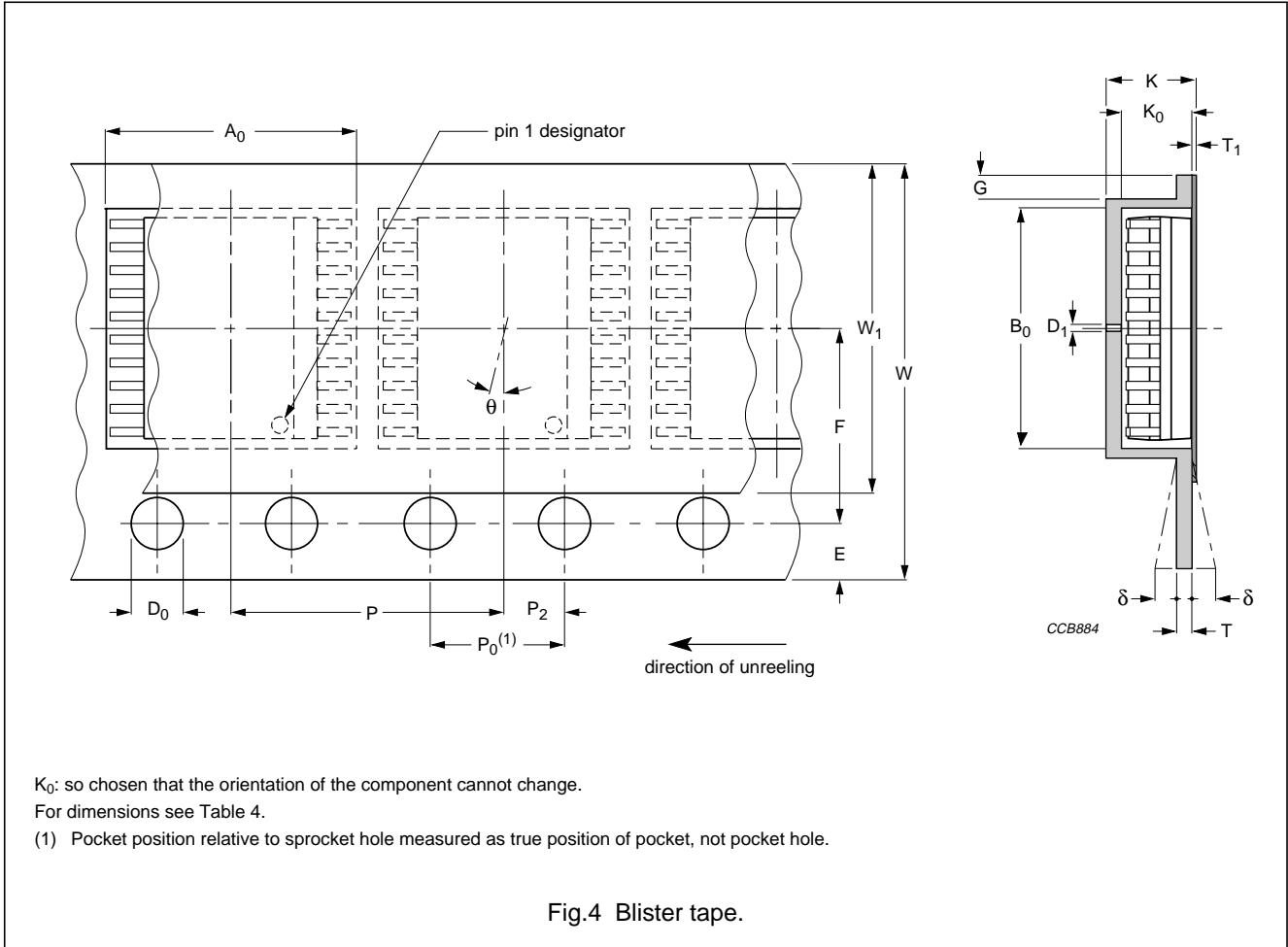
Table 3 Package dimensions; see Fig.3

DIMENSION	VALUE		UNIT
	MIN.	MAX.	
A	1.35	1.75	mm
A ₁	0.10	0.30	mm
b	0.20	0.30	mm
c	0.15	0.25	mm
D	8.55	8.74	mm
E	3.81	3.99	mm
H _E	5.79	6.20	mm
e	0.635 NOM.		mm
L	0.40	1.27	mm
θ	0	8	deg

18-channel AC termination array
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IP4250 series

Blister tape specifications



18-channel AC termination array with 8 kV ESD protection

IP4250 series

Table 4 Dimensions of blister tape; see Fig.4

PARAMETER	DIMENSION (mm)		TOLERANCE (mm)
	QSOP20 PACKAGE	SOIC20 PACKAGE	
A ₀ nominal clearance; note 1	6.5	10.9	±0.1
B ₀ nominal clearance; note 1	9.0	13.3	±0.1
K ₀ minimum clearance; note 1	2.3	3.0	±0.1
K	<2.4	<3.2	–
G	>0.75	>0.75	–
Θ	<15°	<15°	–
δ	<0.3	<0.3	–
W	16.0	24.0	±0.3
E	1.75	1.75	±0.1
F	7.5	7.5	±0.1
D ₀	1.5	1.5	+0.1/–0.0
D _{1 min}	1.5	1.5	–
P ₀ ; note 2	4.0	4.0	±0.1
P	8.0	12.0	±0.1
P ₂	2.0	2.0	±0.1
T	<0.35	<0.35	–
T ₁	<0.1	<0.1	–

Notes

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

18-channel AC termination array
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IP4250 series

Reel specifications

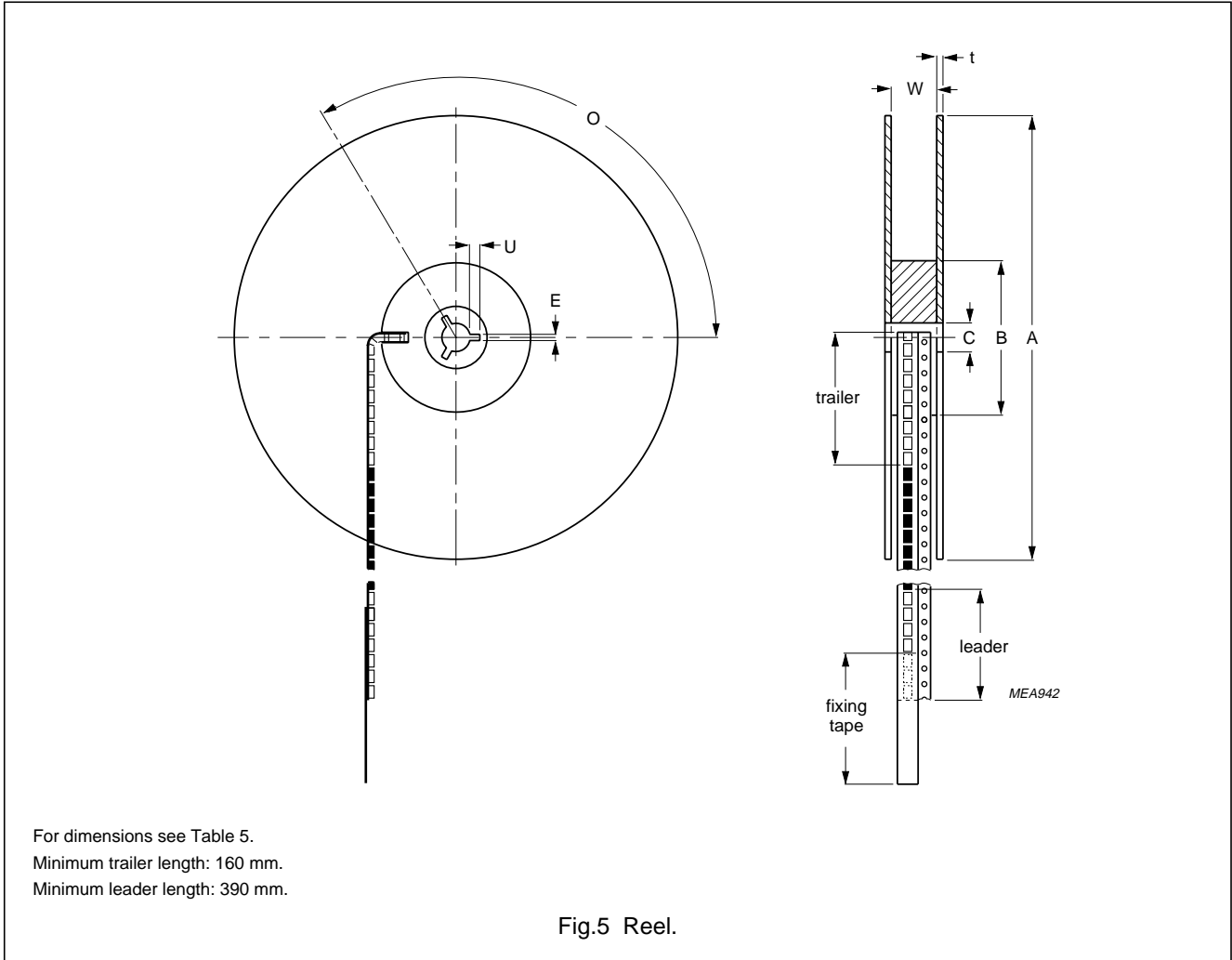


Table 5 Reel dimensions; see Fig.5

TAPE WIDTH (mm)	A NOM. (mm)	t (mm)	W (mm)	B (mm)	C (mm)	E MIN. (mm)	U MIN. (mm)	O
16	330	3 +0.0/-1.5	16.4 +2.0/-0.0	101 ±1.5	13 +0.5/-0.2	1.5	3.6	120°
24	330	3 +0.0/-1.5	24.4 +2.0/-0.0	101 ±1.5	13 +0.5/-0.2	1.5	3.6	120°

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IP4250 series

QUALITY AND RELIABILITY

Wafer fabrication and packaging technology

Philips ASIPs use well-proven semiconductor industry thin film-on-silicon fabrication and packaging technologies. Wafers are processed in a clean room wafer fabrication environment with circuit elements defined using a photolithography process. Metal disposition is performed by precision sputter process. Finished wafers are diced, assembled and tested in a state-of-the-art assembly and packaging facility fully compliant with ISO 9002.

Tests and requirements

The following tests have been conducted on representative samples of Philips ASIPs in QSOP (SSOP), SOIC and similar industry standard plastic packages in accordance with the appropriate IEC, EIA and EIAJ requirements.

Table 6 Test procedures and requirements

EIA/JESD22 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
B102-A	solderability (after ageing)	8 hours steam; immersed for 5 s in a solder bath at 215 °C	good tinning ($\geq 95\%$ covered); no visible damage
A113-A	SMD sequential stress	preconditioning; 5 cycles: -55 to $+125$ °C; 24 hours bake; temperature and humidity soak; 3 cycles of IR convection reflow at maximum 220 °C	device functional; no visible damage; SAT inspection
A104-A	temperature cycling	1000 cycles: 10 minutes minimum at -65 °C 10 minutes minimum at $+150$ °C	no visible damage; $\Delta R/R$ max.: $\pm 1\%$; $\Delta C/C$ max.: $\pm 1\%$
A102-B	autoclave (pressure pot)	336 hours: 121 °C, 100% RH	no visible damage; $\Delta R/R$ max.: $\pm 1\%$; $\Delta C/C$ max.: $\pm 1\%$
A101-B	temperature; humidity; bias	1000 hours: 85 °C; 85% RH; reverse voltage bias	no visible damage; $\Delta R/R$ max.: $\pm 1\%$; $\Delta C/C$ max.: $\pm 1\%$
A108-A	high temperature reverse bias	1000 hours: 125 °C; reverse voltage bias	no visible damage; $\Delta R/R$ max.: $\pm 1\%$; $\Delta C/C$ max.: $\pm 1\%$
A108-A	high temperature operating life	1000 hours: 125 °C; each channel with maximum power per spec.	no visible damage; $\Delta R/R$ max.: $\pm 1\%$; $\Delta C/C$ max.: $\pm 1\%$

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IP4250 series

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.