

IP4253CZ8/CZ12/CZ16; IP4254CZ8/CZ12/CZ16

Integrated 4-, 6- and 8-channel passive filter network with
ESD protection to IEC 61000-4-2, level 4

Rev. 02 — 8 November 2007

Product data sheet

1. Product profile

1.1 General description

The IP4253CZ8/CZ12/CZ16; IP4254CZ8/CZ12/CZ16 family consists of 4-, 6- and 8-channel RC low-pass filter arrays which are designed to provide filtering of undesired RF signals on the I/O ports of portable communication or computing devices. In addition, the IP4253CZ8/CZ12/CZ16; IP4254CZ8/CZ12/CZ16 family incorporates diodes to provide protection to downstream components from ElectroStatic Discharge (ESD) voltages as high as ± 30 kV.

The IP4253CZ8/CZ12/CZ16; IP4254CZ8/CZ12/CZ16 family is fabricated using monolithic silicon technology and integrates up to 8 resistors and 16 diodes in a 0.4 mm pitch 8-, 12- or 16-pin MicroPak (compatible with QFN) lead-free plastic package with a height of 0.5 mm only.

1.2 Features

- Pb-free and dark green compliant
- 4-, 6- and 8-channel integrated π -type RC filter network
- IP4253CZ8/CZ12/CZ16: 200 Ω channel series resistance, 30 pF (at 2.5 V DC) channel capacitance
- IP4254CZ8/CZ12/CZ16: 100 Ω channel series resistance, 30 pF (at 2.5 V DC) channel capacitance
- ESD protection to ± 30 kV contact discharge according to IEC 61000-4-2 standard far exceeding level 4
- MicroPak (QFN compatible) plastic package with 0.4 mm pitch

1.3 Applications

- General purpose ElectroMagnetic Interference (EMI) and Radio-Frequency Interference (RFI) filtering and downstream ESD protection for:
 - ◆ Cellular and Personal Communication System (PCS) mobile handsets
 - ◆ Cordless telephones
 - ◆ Wireless data (WAN/LAN) systems
 - ◆ PDAs

2. Pinning information

Table 1. Pinning IP4253CZx and IP4254CZx

Pin	Description	Simplified outline	Symbol
CZ8			
1 and 8	filter channel 1	<p>Transparent top view</p>	<p>001aaf978</p>
2 and 7	filter channel 2		
3 and 6	filter channel 3		
4 and 5	filter channel 4		
ground pad	ground		
CZ12			
1 and 12	filter channel 1	<p>Transparent top view</p>	<p>001aaf979</p>
2 and 11	filter channel 2		
3 and 10	filter channel 3		
4 and 9	filter channel 4		
5 and 8	filter channel 5		
6 and 7	filter channel 6		
ground pad	ground		
CZ16			
1 and 16	filter channel 1	<p>Transparent top view</p>	<p>001aaf980</p>
2 and 15	filter channel 2		
3 and 14	filter channel 3		
4 and 13	filter channel 4		
5 and 12	filter channel 5		
6 and 11	filter channel 6		
7 and 10	filter channel 7		
8 and 9	filter channel 8		
ground pad	ground		

3. Ordering information

Table 2. Ordering information

Type number	Package		Version
	Name	Description	
IP4253CZ8-4	HXSON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.7 × 0.5 mm	SOT983-1
IP4253CZ12-6	HXSON12	plastic thermal enhanced extremely thin small outline package; no leads; 12 terminals; body 1.35 × 2.5 × 0.5 mm	SOT984-1
IP4253CZ16-8	HXSON16	plastic thermal enhanced extremely thin small outline package; no leads; 16 terminals; body 1.35 × 3.3 × 0.5 mm	SOT985-1
IP4254CZ8-4	HXSON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.7 × 0.5 mm	SOT983-1
IP4254CZ12-6	HXSON12	plastic thermal enhanced extremely thin small outline package; no leads; 12 terminals; body 1.35 × 2.5 × 0.5 mm	SOT984-1
IP4254CZ16-8	HXSON16	plastic thermal enhanced extremely thin small outline package; no leads; 16 terminals; body 1.35 × 3.3 × 0.5 mm	SOT985-1

4. Limiting values

Table 3. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		-0.5	+5.6	V
V_{esd}	electrostatic discharge voltage	all pins to ground			
		contact discharge	[1] -30	+30	kV
		air discharge	[1] -30	+30	kV
		IEC 61000-4-2, Level 4; all pins to ground			
		contact discharge	-8	+8	kV
	air discharge	-15	+15	kV	
P_{ch}	channel power dissipation	$T_{amb} = 85\text{ °C}$	-	60	mW
P_{tot}	total power dissipation	$T_{amb} = 85\text{ °C}$	-	200	mW
T_{stg}	storage temperature		-55	+150	°C
T_{amb}	ambient temperature		-40	+85	°C

[1] Device withstands ≥ 1000 discharges with ±30 kV using the IEC 61000-4-2 model without degradation.

5. Thermal characteristics

Table 4. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-pcb)}$	thermal resistance from junction to printed-circuit board	2 layer printed-circuit board	120[1]	K/W

[1] Depends on layout details.

6. Characteristics

Table 5. Channel resistance

$T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{s(\text{ch})}$	channel series resistance	IP4253CZ8/CZ12/CZ16	160	-	240	Ω
		IP4254CZ8/CZ12/CZ16	80	-	120	Ω

Table 6. Channel characteristics

$T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
C_{ch}	channel capacitance	for the total channel; $f = 100\text{ kHz}$				
		$V_{\text{bias}(\text{DC})} = 2.5\text{ V}$	-	30	-	pF
		$V_{\text{bias}(\text{DC})} = 0\text{ V}$	[1]	-	45	-
I_{LR}	reverse leakage current	per channel; $V_I = 3.5\text{ V}$	-	-	0.1	μA
V_{BR}	breakdown voltage	positive clamp; $I_I = 1\text{ mA}$	5.8	-	9	V
V_F	forward voltage	negative clamp; $I_F = 1\text{ mA}$	0.4	-	1.5	V

[1] Guaranteed by design.

Table 7. Frequency characteristics

$T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
IP4253CZ8/CZ12/CZ16						
α_{il}	insertion loss	$R_{\text{source}} = 50\ \Omega$; $R_L = 50\ \Omega$				
		$800\text{ MHz} < f < 3\text{ GHz}$	-	25	-	dB
		$f = 1\text{ GHz}$	30	-	-	dB
α_{ct}	crosstalk attenuation	$R_{\text{source}} = 50\ \Omega$; $R_L = 50\ \Omega$; $800\text{ MHz} < f < 3\text{ GHz}$	-	25	-	dB
IP4254CZ8/CZ12/CZ16						
α_{il}	insertion loss	$R_{\text{source}} = 50\ \Omega$; $R_L = 50\ \Omega$				
		$800\text{ MHz} < f < 3\text{ GHz}$	-	20	-	dB
		$f = 1\text{ GHz}$	25	-	-	dB
α_{ct}	crosstalk attenuation	$R_{\text{source}} = 50\ \Omega$; $R_L = 50\ \Omega$; $800\text{ MHz} < f < 3\text{ GHz}$	-	21	-	dB

7. Package outline

HXSON8: plastic thermal enhanced extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1.7 x 0.5 mm

SOT983-1

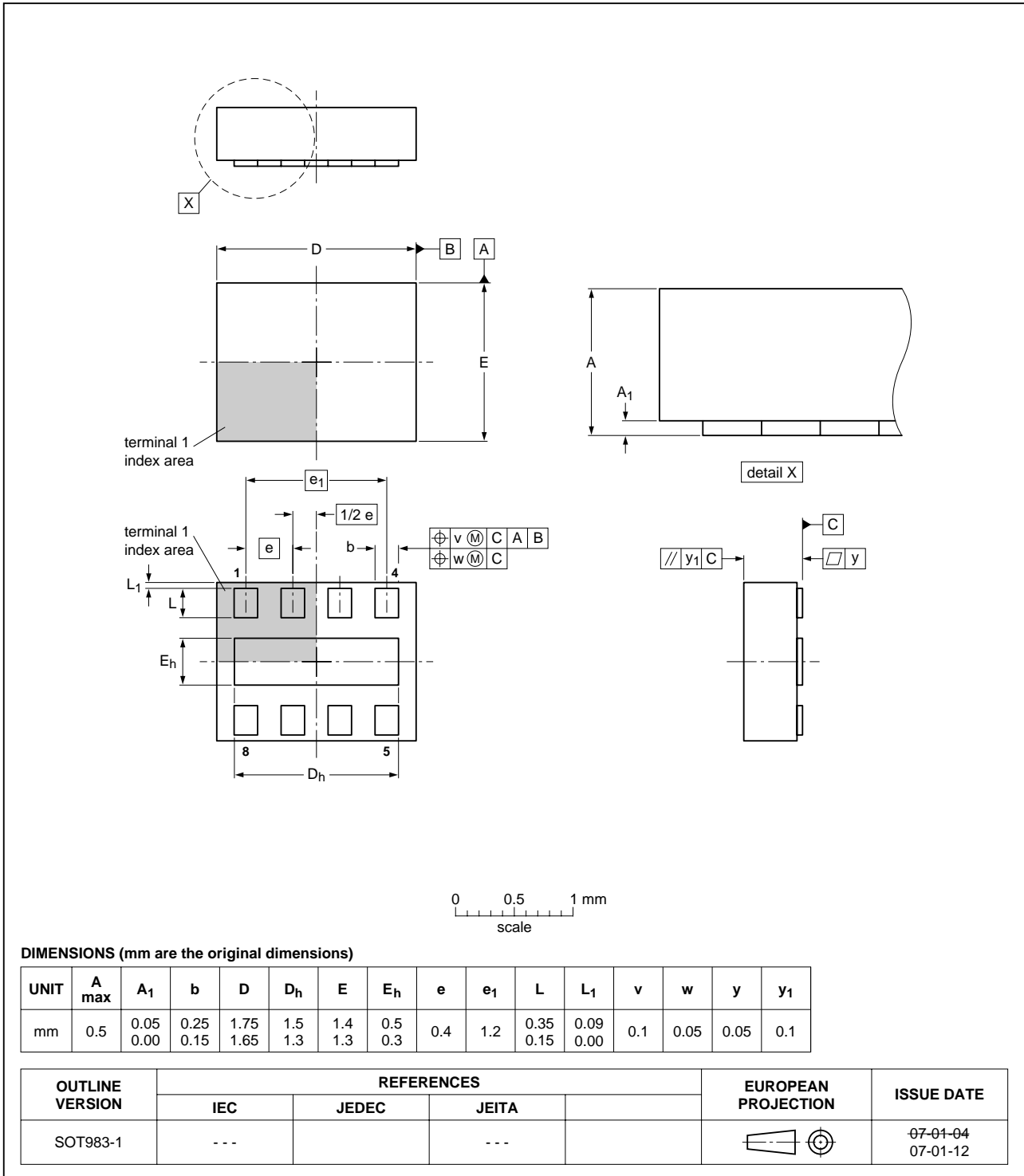


Fig 1. Package outline SOT983-1 (HXSON8)

HXSON12: plastic thermal enhanced extremely thin small outline package; no leads;
12 terminals; body 1.35 x 2.5 x 0.5 mm

SOT984-1

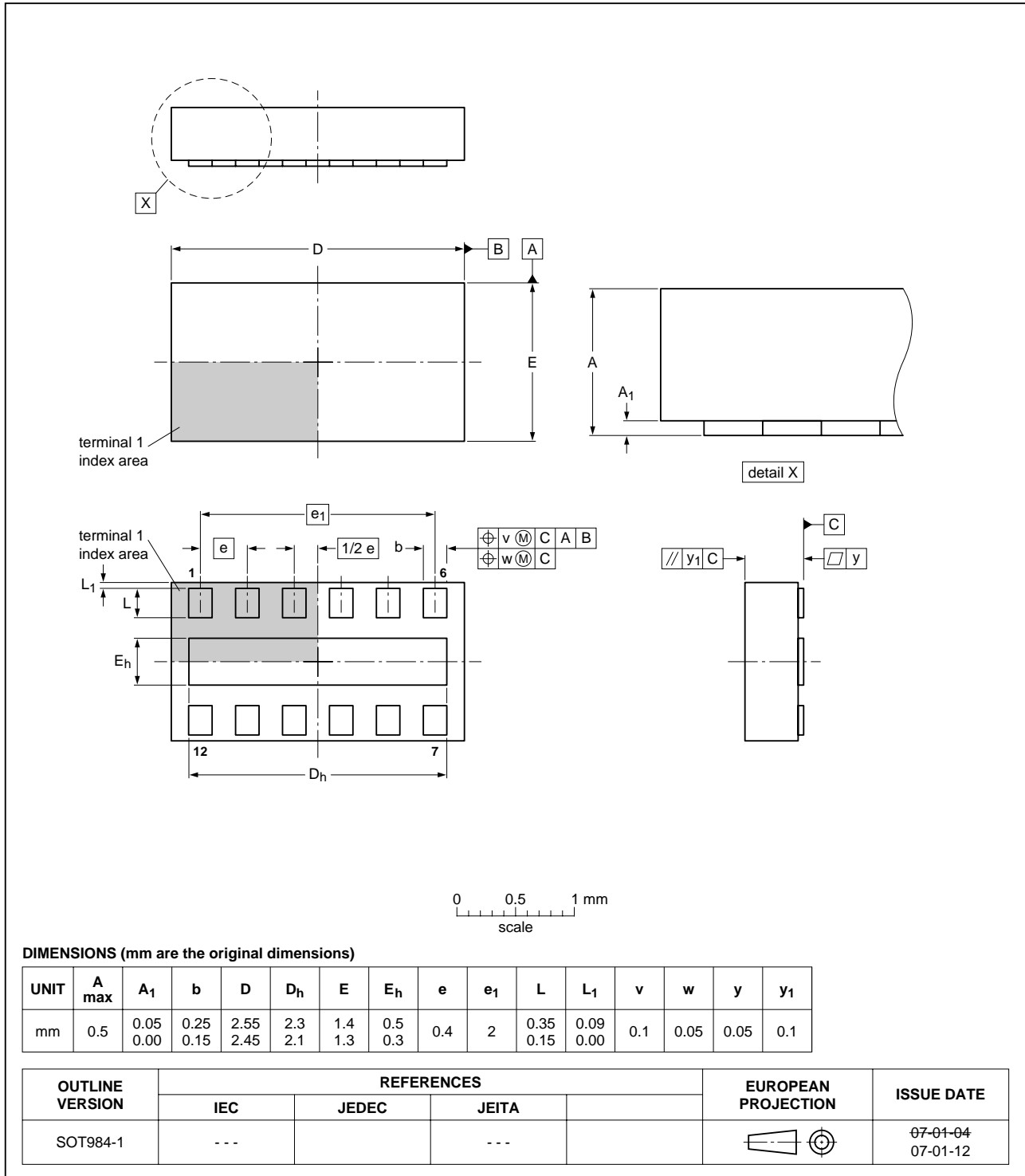


Fig 2. Package outline SOT984-1 (HXSON12)

HXSON16: plastic thermal enhanced extremely thin small outline package; no leads;
16 terminals; body 1.35 x 3.3 x 0.5 mm

SOT985-1

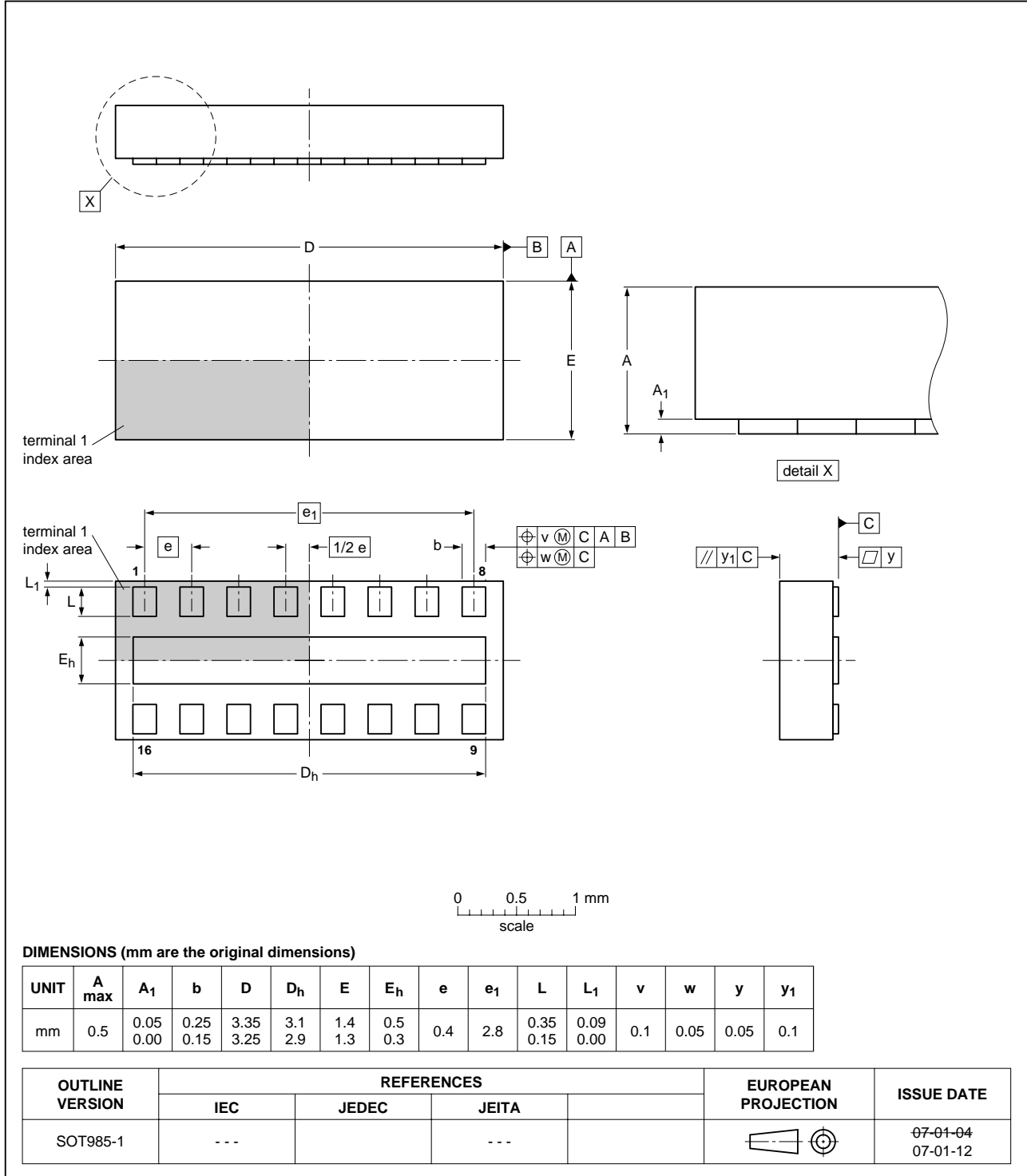


Fig 3. Package outline SOT985-1 (HXSON16)

8. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
IP4253_54_CZ8_CZ12_CZ16_2	20071108	Product data sheet	-	IP4253_54_CZ8_CZ12_CZ16_1
Modifications:	• All <td> values filled in.			
IP4253_54_CZ8_CZ12_CZ16_1	20070209	Objective data sheet	-	-

9. Legal information

9.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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