

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 °C	-	60	mW
P _{tot}	total power dissipation	T _{amb} = 85 °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

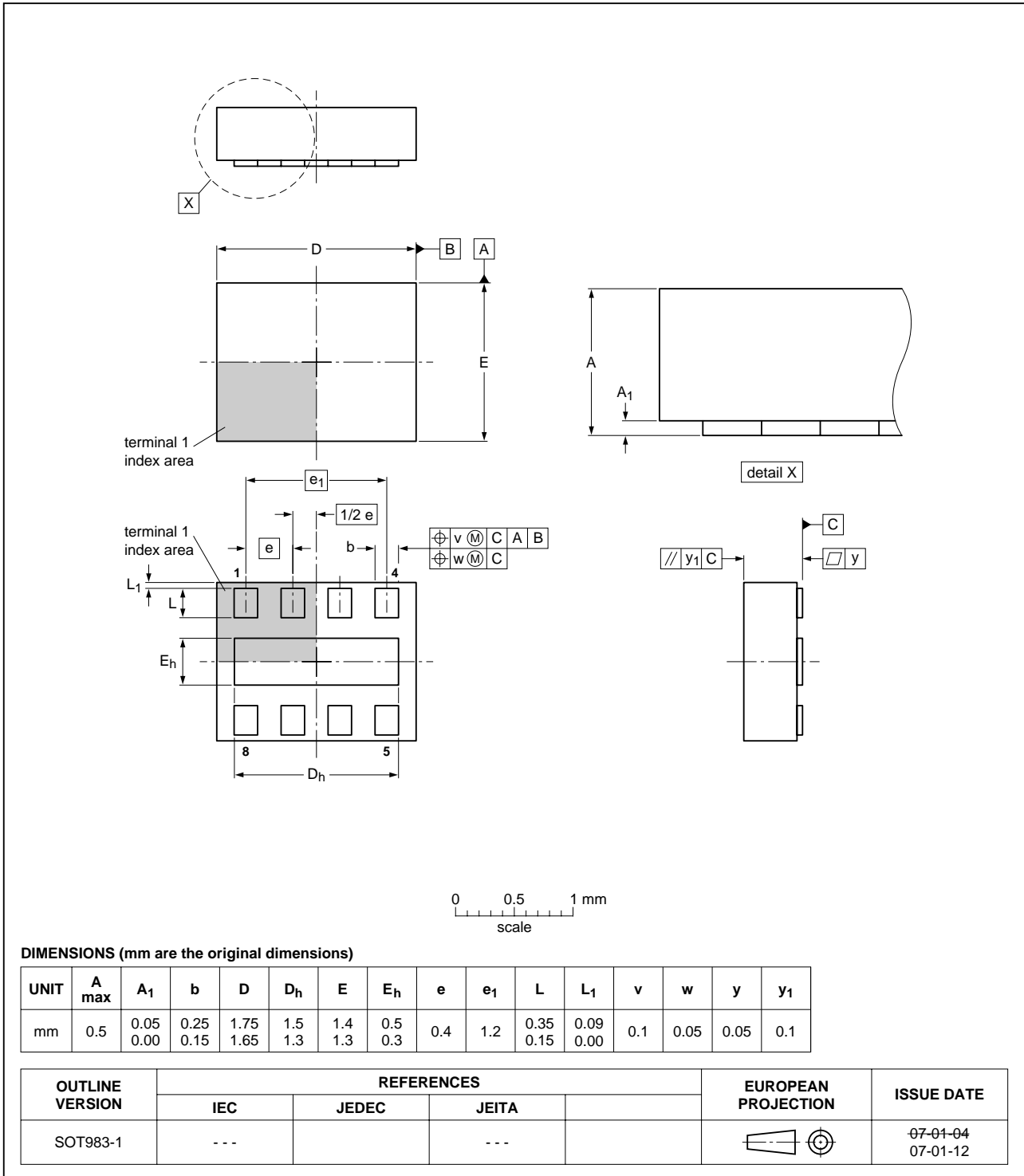


Fig 1. Package outline SOT983-1 (HXSON8)

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

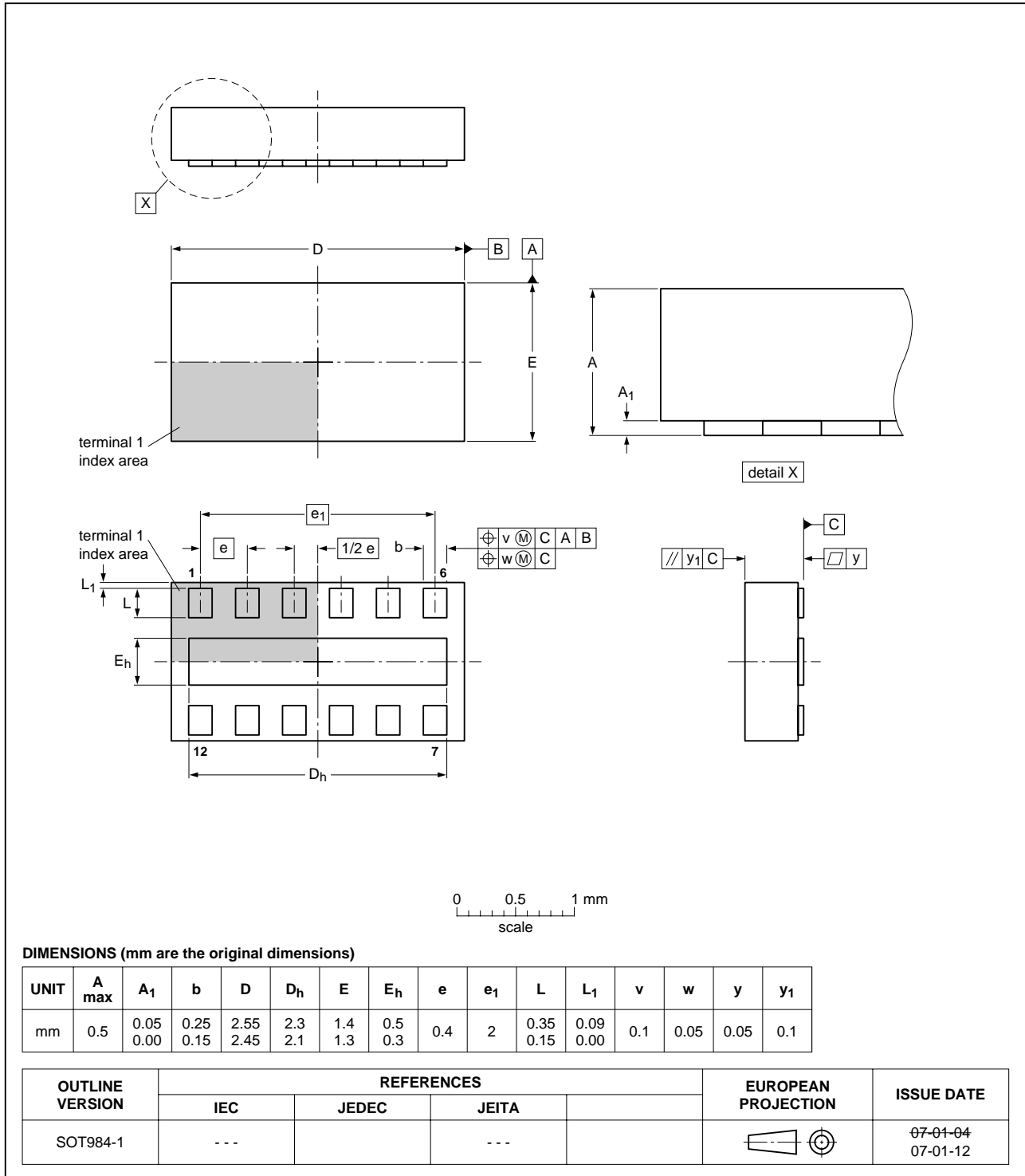


Fig 2. Package outline SOT984-1 (HXSON12)

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

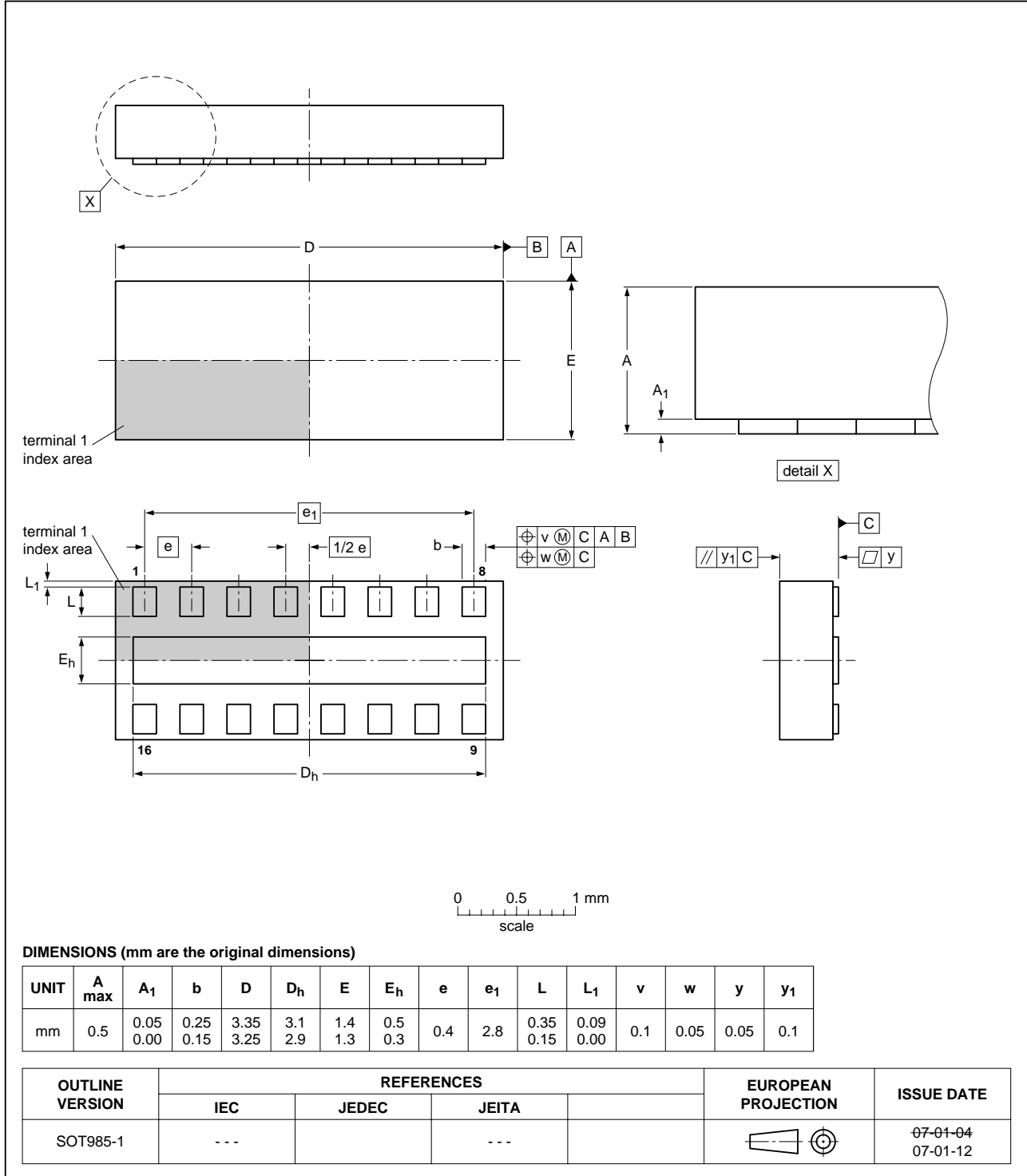


Fig 3. Package outline SOT985-1 (HXSON16)

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:		<ul style="list-style-type: none"> 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".

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