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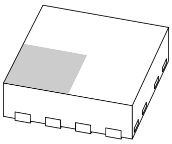


IP4264CZ8-10/20/40-TTL

Integrated (U)SIM card passive filter array with ESD protection

Rev. 2 — 12 October 2011 **Product data sheet**

1. Product profile

1.1 General description

The IP4264CZ8-10-TTL, IP4264CZ8-20-TTL and IP4264CZ8-40-TTL are 3-channel RC low-pass filter arrays. They are designed to provide filtering of undesired RF signals in the 800 MHz-to-3000 MHz frequency band. They incorporate diodes to provide protection to downstream components from ElectroStatic Discharge (ESD) voltages up to ±25 kV contact and higher than ±25 kV air discharge, far exceeding IEC 61000-4-2, level 4.

The devices support ESD protection of the USB data pins of a Universal Subscriber Identity Module (USIM) interface, as well as the digital standard SIM interface ESD protection and ElectroMagnetic Interface (EMI) filtering.

The devices are fabricated using monolithic silicon technology. They integrate three resistors and eight high-level ESD protection diodes in a 0.4 mm pitch Quad Flat-pack No-leads (QFN) plastic package with a height of only 0.5 mm. These features make all three devices ideal for use in applications requiring component miniaturization, such as mobile phone handsets, cordless telephones and personal digital devices.

Similar products are available in Wafer Level Chip-Size Package (WLCSP).
IP4365CX11/P (0.4 mm pitch, 11-ball WLCSP11) is designed for USIM interfaces.
IP4364CX8 (0.4 mm pitch, 8-ball WLCSP8) and
IP4064CX8 (0.5 mm pitch, 8-ball WLCSP8) are designed for SIM interfaces.

1.2 Features and benefits

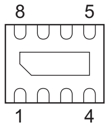
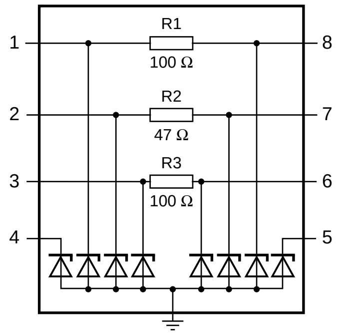
- Pb-free, Restriction of Hazardous Substances (RoHS) compliant and free of halogen and antimony (Dark Green compliant)
- 3-channel SIM card interface integrated RC-filter array and SIM voltage ESD protection
- 2 USIM (USB 1.1) compliant ESD protection diodes with 20 pF channel capacitance
- Integrated 100 Ω/100 Ω/47 Ω series channel resistors
- Total channel capacitance of 10 pF (IP4264CZ8-10-TTL), 20 pF (IP4264CZ8-20-TTL) or 40 pF (IP4264CZ8-40-TTL)
- Downstream ESD protection up to ±25 kV (contact) according to IEC 61000-4-2
- Micropak (QFN compatible) plastic package with 0.4 mm pitch

1.3 Applications

- SIM interfaces in for example, cellular phone and Personal Communication System (PCS) mobile handsets

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1 and 8	filter channel 1	 Transparent top view	 018aaa015
2 and 7	filter channel 2		
3 and 6	filter channel 3		
4 and 5	ESD protection		
GND	ground		

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
IP4264CZ8-10-TTL	HUSON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.7 × 0.55 mm	SOT1166-1
IP4264CZ8-20-TTL			
IP4264CZ8-40-TTL			

4. Marking

Table 3. Marking codes

Type number	Marking code
IP4264CZ8-10-TTL	N1
IP4264CZ8-20-TTL	N2
IP4264CZ8-40-TTL	N4

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5. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
IP4264CZ8-10-TTL					
V_{ESD}	electrostatic discharge voltage	pins 1, 2 and 3 to ground [1]			
		contact discharge	–10	+10	kV
		air discharge	–15	+15	kV
		pins 6, 7 and 8 to ground [1]			
		contact discharge	–8	+8	kV
		air discharge	–15	+15	kV
		pins 5 and 6 to ground [1]			
		contact discharge	–15	+15	kV
		air discharge	–15	+15	kV
IP4264CZ8-20-TTL					
V_{ESD}	electrostatic discharge voltage	all pins to ground [1]			
		contact discharge	–15	+15	kV
		air discharge	–15	+15	kV
IP4264CZ8-40-TTL					
V_{ESD}	electrostatic discharge voltage	all pins to ground [1]			
		contact discharge	–25	+25	kV
		air discharge	–25	+25	kV
IP4264CZ8-10-TTL, IP4264CZ8-20-TTL and IP4264CZ8-40-TTL					
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2, level 4; all pins to ground			
		contact discharge	–8	+8	kV
		air discharge	–15	+15	kV
V_I	input voltage	at I/O pins	–0.5	+5.5	V
P_{ch}	channel power dissipation	T_{amb} = 70 °C	-	60	mW
P_{tot}	total power dissipation	T_{amb} = 70 °C	-	180	mW
T_{stg}	storage temperature		–55	+150	°C
$T_{reflow(peak)}$	peak reflow temperature	$t_p \leq 10$ s	-	260	°C
T_{amb}	ambient temperature		–30	+85	°C

[1] All devices are qualified using 1000 contact discharges of ±8 kV (IP4264CZ8-10-TTL and IP4264CZ8-20-TTL) or ±25 kV (IP4264CZ8-40-TTL) using the IEC 61000-4-2 model, far exceeding the specified IEC 61000-4-2, level 4 (8 kV contact discharge).

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6. Characteristics

Table 5. Channel resistance

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{s(ch)}$	channel series resistance	R1, R3	85	100	115	Ω
		R2	40	47	54	Ω

Table 6. Channel characteristics

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{RM}	reverse leakage current	V_I = 3 V	-	-	50	nA
V_{BR}	breakdown voltage	I_{test} = 1 mA	6	-	10	V
IP4264CZ8-10-TTL						
C_{ch}	channel capacitance	f = 1 MHz [1][2]				
		$V_{bias(DC)}$ = 0 V	8	10	12	pF
		$V_{bias(DC)}$ = 2.5 V	4	6	8	pF
C_d	diode capacitance	f = 1 MHz [1][3]				
		$V_{bias(DC)}$ = 0 V	8	10	12	pF
		$V_{bias(DC)}$ = 2.5 V	4	6	8	pF
IP4264CZ8-20-TTL						
C_{ch}	channel capacitance	f = 1 MHz [1][2]				
		$V_{bias(DC)}$ = 0 V	-	17	20	pF
		$V_{bias(DC)}$ = 2.5 V	-	11	15	pF
IP4264CZ8-40-TTL						
C_{ch}	channel capacitance	f = 1 MHz [1][2]				
		$V_{bias(DC)}$ = 0 V	-	35	40	pF
		$V_{bias(DC)}$ = 2.5 V	-	23	28	pF
IP4264CZ8-20-TTL and IP4264CZ8-40-TTL						
C_d	diode capacitance	f = 1 MHz [3]				
		$V_{bias(DC)}$ = 0 V	12	16	20	pF
		$V_{bias(DC)}$ = 2.5 V	8	11	14	pF

[1] Guaranteed by design.

[2] Total line capacitance including diode capacitance, per channel.

[3] Pins 4 and 5 to ground.

7. Application information

7.1 Insertion loss

The devices are designed as EMI/Radio Frequency Interference (RFI) filters for SIM card interfaces. The setup for measuring return loss is shown in Figure 1.

The insertion loss in a 50 Ω system for all three channels of IP4264CZ8-10-TTL (C_{ch} = 10 pF) is shown in Figure 2. The same measurements for IP4264CZ8-20-TTL (C_{ch} = 20 pF) are shown in Figure 3. The insertion loss for IP4264CZ8-40-TTL (C_{ch} = 10 pF) is shown in Figure 4.

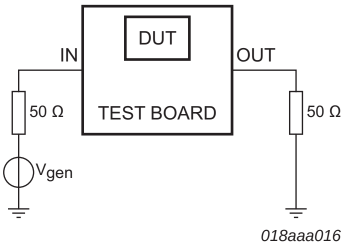
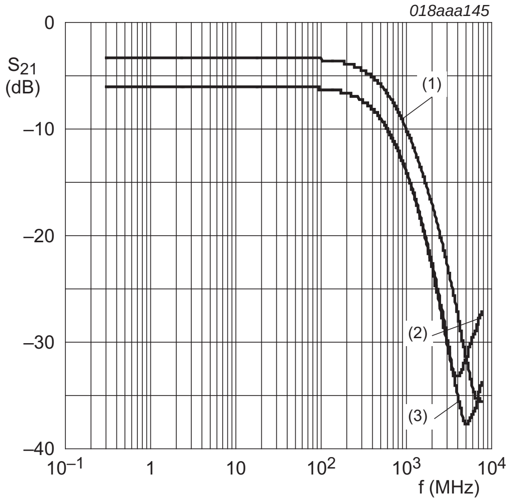


Fig 1. Frequency response setup



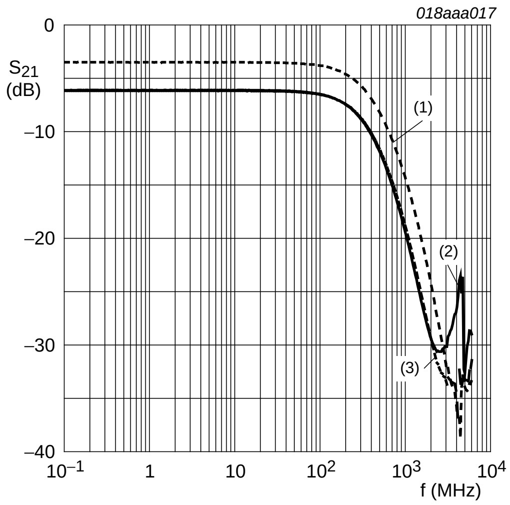
C_{ch} = 10 pF

(1) Pin 2 to 7

(2) Pin 1 to 8

(3) Pin 3 to 6

Fig 2. IP4264CZ8-10-TTL: Frequency response curves



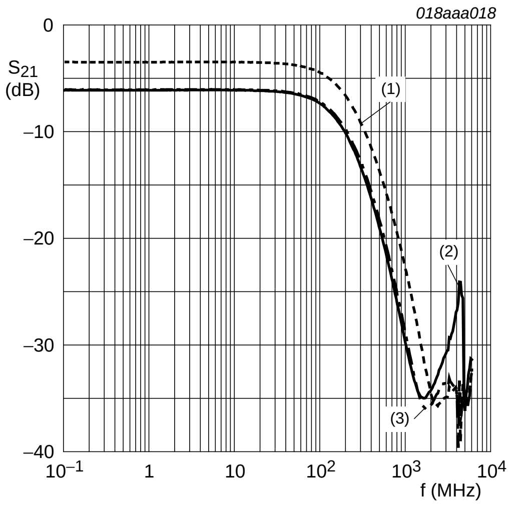
C_{ch} = 20 pF

(1) Pin 2 to 7

(2) Pin 1 to 8

(3) Pin 3 to 6

Fig 3. IP4264CZ8-20-TTL: Frequency response curves



C_{ch} = 40 pF

(1) Pin 2 to 7

(2) Pin 1 to 8

(3) Pin 3 to 6

Fig 4. IP4264CZ8-40-TTL: Frequency response curves

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7.2 Crosstalk

The setup for measuring crosstalk between channels in a 50 Ω system is shown in Figure 5. The crosstalk for IP4264CZ8-10-TTL is shown in Figure 6, for IP4264CZ8-20-TTL in Figure 7 and for IP4264CZ8-40-TTL in Figure 8. Unused channels are terminated with a 50 Ω resistor to ground.

The crosstalk between any pin and pin 4 and pin 5 is similar to the crosstalk between the channels.

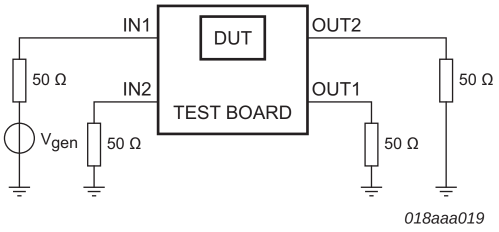
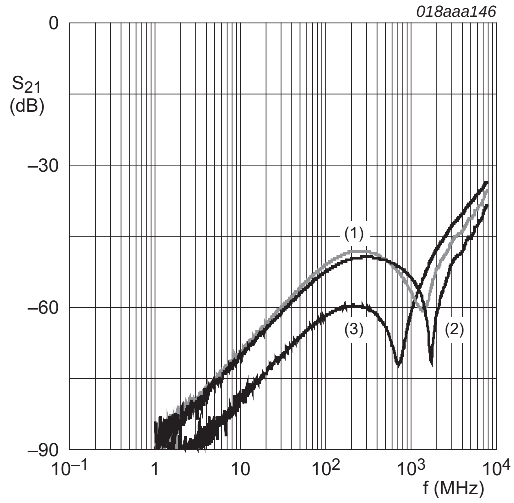


Fig 5. Crosstalk measurement setup



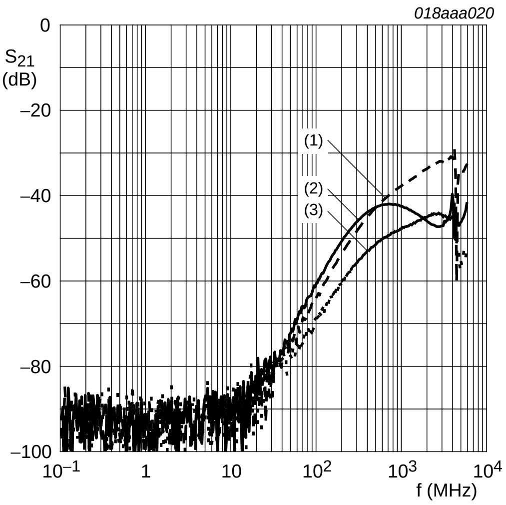
C_{ch} = 10 pF

(1) Pin 1 to 7

(2) Pin 2 to 6

(3) Pin 3 to 8

Fig 6. IP4264CZ8-10-TTL: Crosstalk behavior



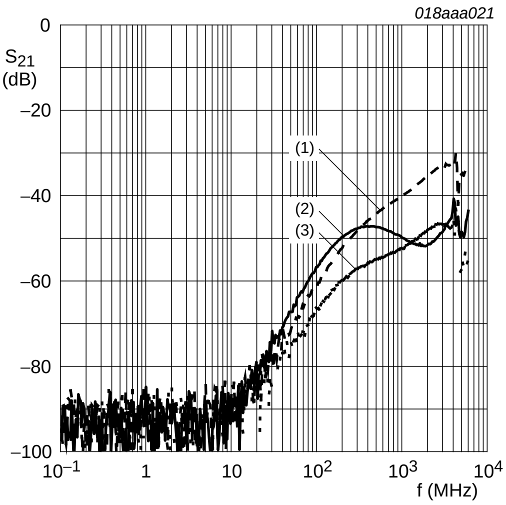
C_{ch} = 20 pF

(1) Pin 1 to 7

(2) Pin 2 to 6

(3) Pin 3 to 8

Fig 7. IP4264CZ8-20-TTL: Crosstalk behavior



C_{ch} = 40 pF

(1) Pin 1 to 7

(2) Pin 2 to 6

(3) Pin 3 to 8

Fig 8. IP4264CZ8-40-TTL: Crosstalk behavior

7.3 USIM and SIM interface application schematic

The application schematic diagram depicted in Figure 9 demonstrates how the three NXP SIM card EMI filter and ESD protection devices are used in a typical USIM interface application.

For example, in case a standard SIM interface without USB 1.1 is used, the two single diodes (pins 4 and 5) can protect the VSIM line.

It is only one example dependent on layout constraints. For example, channels 1 to 8 can be swapped with channels 3 to 6.

Also, the USB interface ESD protection pins 4 and 5 can be exchanged. Due to both sides of the devices containing identical protection diodes, baseband and SIM card side can be swapped, too (pin 1 with pin 8, pin 2 with pin 7 etc.).

A standard SIM interface application is depicted in Figure 10. In this case, both ESD protection diodes (pins 1 and 8) are used to protect VSIM.

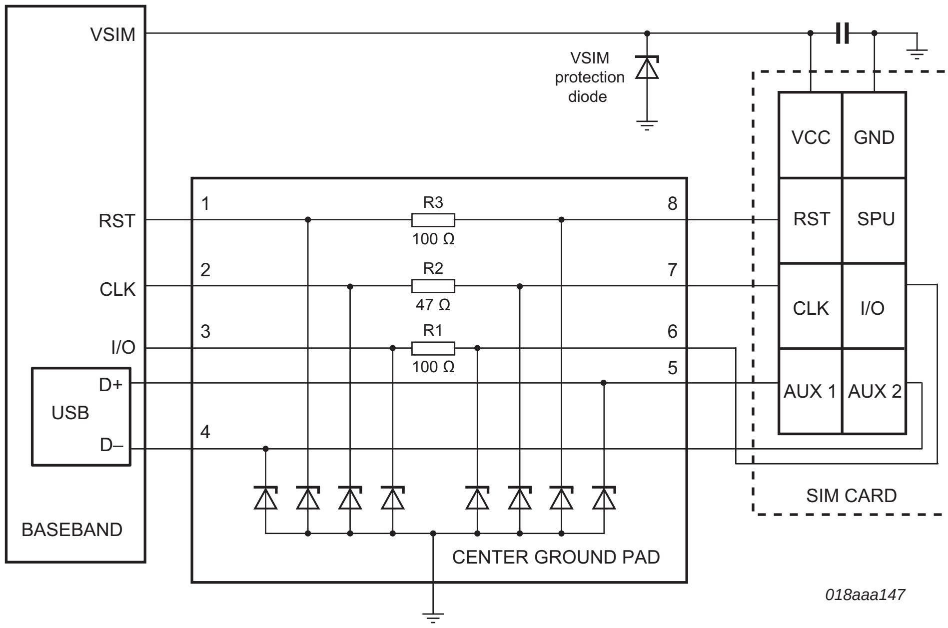


Fig 9. USIM application schematic

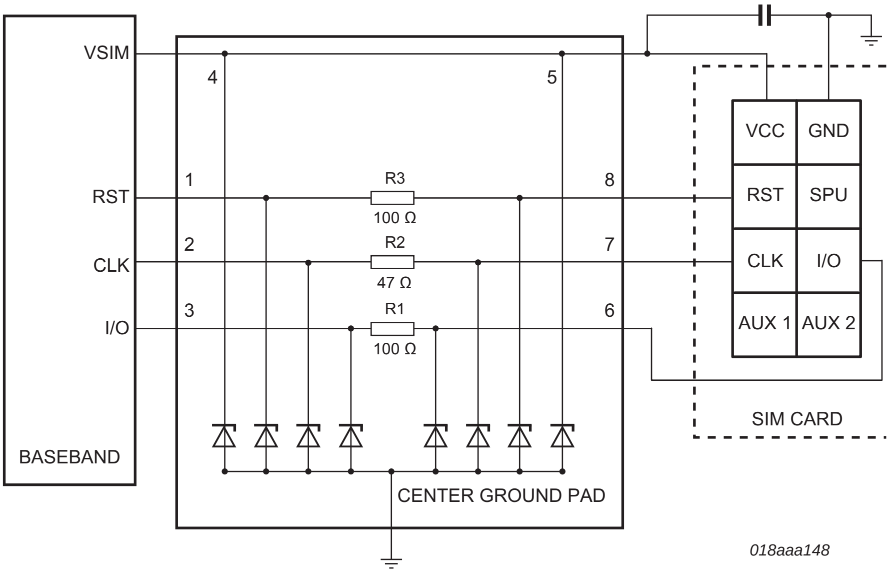


Fig 10. SIM application schematic

7.4 Compatible devices in WLCSP

The IP4264CZ8-10-TTL and IP4264CZ8-20-TTL are optimized for SIM and USIM interfaces. Comparable devices are also available in WLCSP:

- IP4064CX8, 0.5 mm pitch SIM interface device compatible with IP4264CZ8-20-TTL
- IP4364CX8, 0.4 mm pitch SIM interface device compatible with IP4264CZ8-20-TTL
- IP4366CX8/P, 0.4 mm pitch SIM interface device compatible with IP4264CZ8-10-TTL
- IP4365CX11/P, 0.4 mm pitch USIM interface device compatible with IP4264CZ8-10-TTL

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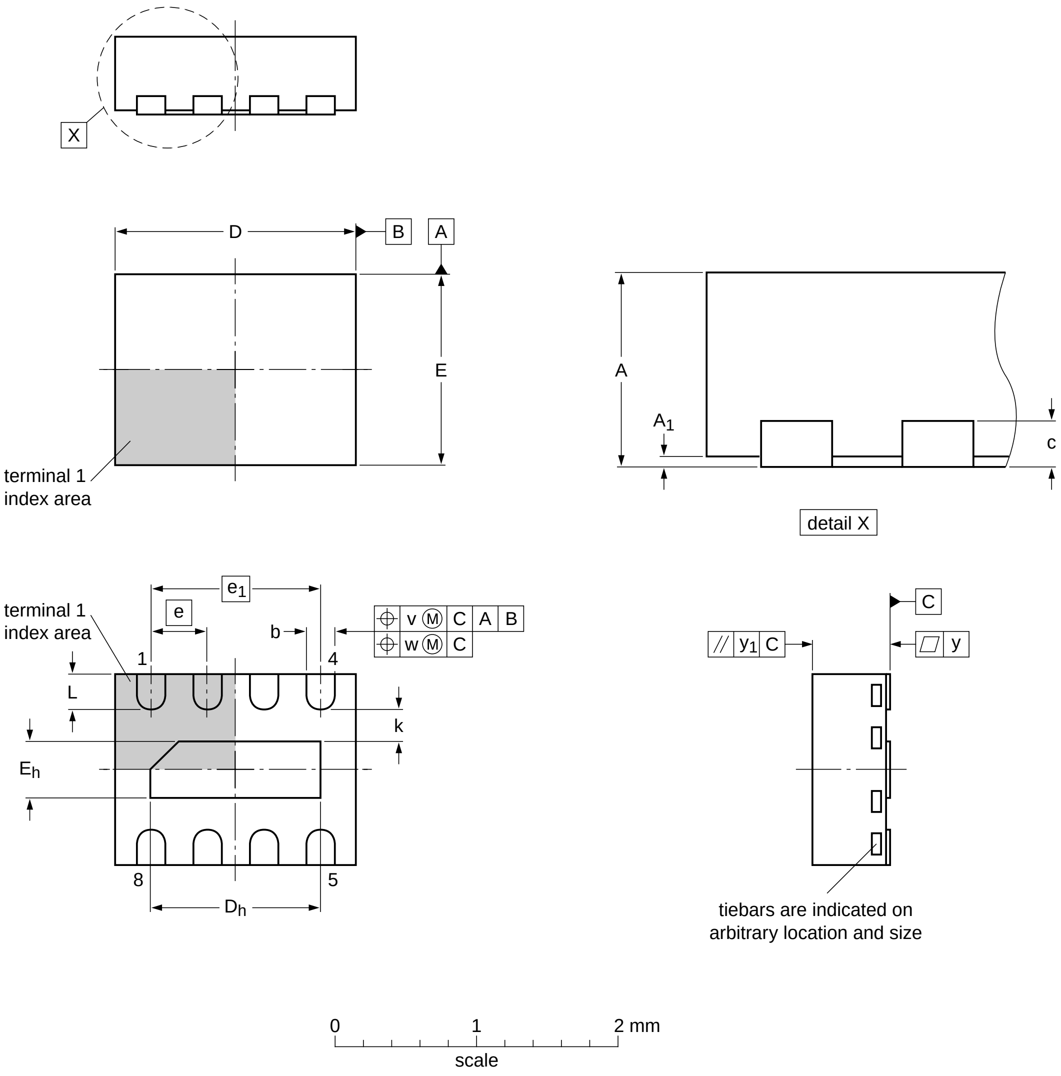
8. Package outline

**HUSON8: plastic, thermal enhanced ultra thin small outline package; no leads;
8 terminals; body 1.35 x 1.7 x 0.55 mm** **SOT1166-1**



Dimensions

Unit(1)		A	A1	b	c	D	Dh	E	Eh	e	e1	k	L	v	w	y	y1
mm	max	0.55	0.05	0.25		1.8	1.3	1.45	0.45				0.30				
	nom			0.20	0.127	1.7	1.2	1.35	0.40	0.4	1.2		0.25	0.1	0.05	0.05	0.05
	min		0.00	0.15		1.6	1.1	1.25	0.35			0.2	0.20				

Note
1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot1166-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1166-1	- - -	- - -	- - -			~~10-03-18~~ 10-03-22

Fig 11. Package outline SOT1166-1 (HUSON8)

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9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
IP4264CZ8-10_20_40-TTL v.2	20111012	Product data sheet	-	IP4264CZ8-10_20_40-TTL v.1
Modifications:	• Figure 2: corrected title • Section 10 “Legal information”: updated			
IP4264CZ8-10_20_40-TTL v.1	20110708	Product data sheet	-	-

10. Legal information

10.1 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.

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[2] The term ‘short data sheet’ is explained in section “Definitions”.

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Date of release: 12 October 2011
Document identifier: IP4264CZ8-10_20_40-TTL

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Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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