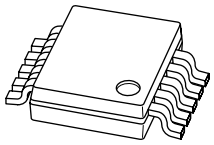


PRTR5V0U8S

Integrated octal low-capacity ESD protection to IEC 61000-4-2 level 4

Rev. 01 — 14 January 2008 Preliminary data sheet

1. Product profile

1.1 General description

The PRTR5V0U8S is designed to protect Input/Output (I/O) ports that are sensitive concerning capacitive load, such as USB 2.0, Ethernet, Digital Video Interface (DVI), etc. from destruction by ElectroStatic Discharges (ESD).

Therefore, the PRTR5V0U8S incorporates eight pairs of ultra-low capacity rail-to-rail diodes plus an additional Zener diode to provide protection to downstream signal and supply components from ESD voltages as high as ±8 kV contact discharge.

Due to the rail-to-rail diodes being connected to the Zener diode, the protection is working independent from the availability of a supply voltage.

The PRTR5V0U8S is fabricated using thin film-on-silicon technology and integrates eight pairs of ultra-low capacity rail-to-rail ESD protection diodes in a miniature 10-lead TSSOP10 package.

1.2 Features

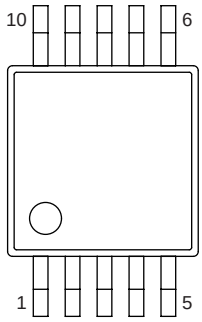
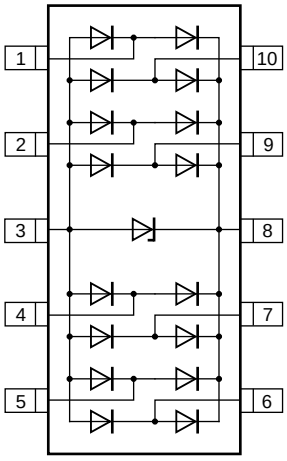
- Pb-free and RoHS (Restriction of Hazardous Substances) compliant, dark green
- ESD protection of up to eight Hi-Speed data lines or high-frequency signal lines
- Eight pairs of ESD rail-to-rail protection diodes
- Ultra-low input capacitance: $C_{(I/O-GND)}$ = 1 pF
- ESD protection up to 8 kV (contact discharge compliant)
- IEC 61000-4-2, level 4 (ESD)
- Low voltage clamping due to an integrated protection Zener diode
- Small TSSOP10 (SOT552-1) package

1.3 Applications

- General-purpose downstream ESD protection high-frequency analog signals and high-speed serial data transmission for ports inside:
  - Cellular and Personal Communication System (PCS) mobile handsets
  - USB 2.0 ports in PC or Notebook
  - IEEE 1394 ports
  - Digital Video Interface (DVI) and High Definition Multimedia Interface (HDMI)
  - Cordless telephones
  - Wireless data: Wide Area Network (WAN) and Local Area Network (LAN) systems
  - Personal Digital Assistants (PDAs)

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	ESD protection I/O 1		
2	ESD protection I/O 2		
3	ground (GND)		
4	ESD protection I/O 3		
5	ESD protection I/O 4		
6	ESD protection I/O 5		
7	ESD protection I/O 6		
8	supply voltage (V_{CC})		
9	ESD protection I/O 7		
10	ESD protection I/O 8		

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3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
PRTR5V0U8S	TSSOP10	plastic thin shrink small outline package; 10 leads; body width 3 mm	SOT552-1

4. Limiting values

Table 3. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{(I/O-GND)}$	input/output to ground voltage		0	5.5	V
T_{stg}	storage temperature		–55	+125	°C

Table 4. ESD standards compliance

Standard	Conditions
Per diode	
IEC 61000-4-2; level 4 (ESD)	≤ 8 kV (contact)

5. Recommended operating conditions

Table 5. Operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb}	ambient temperature		–40	-	+85	°C

6. Characteristics

Table 6. Characteristics

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

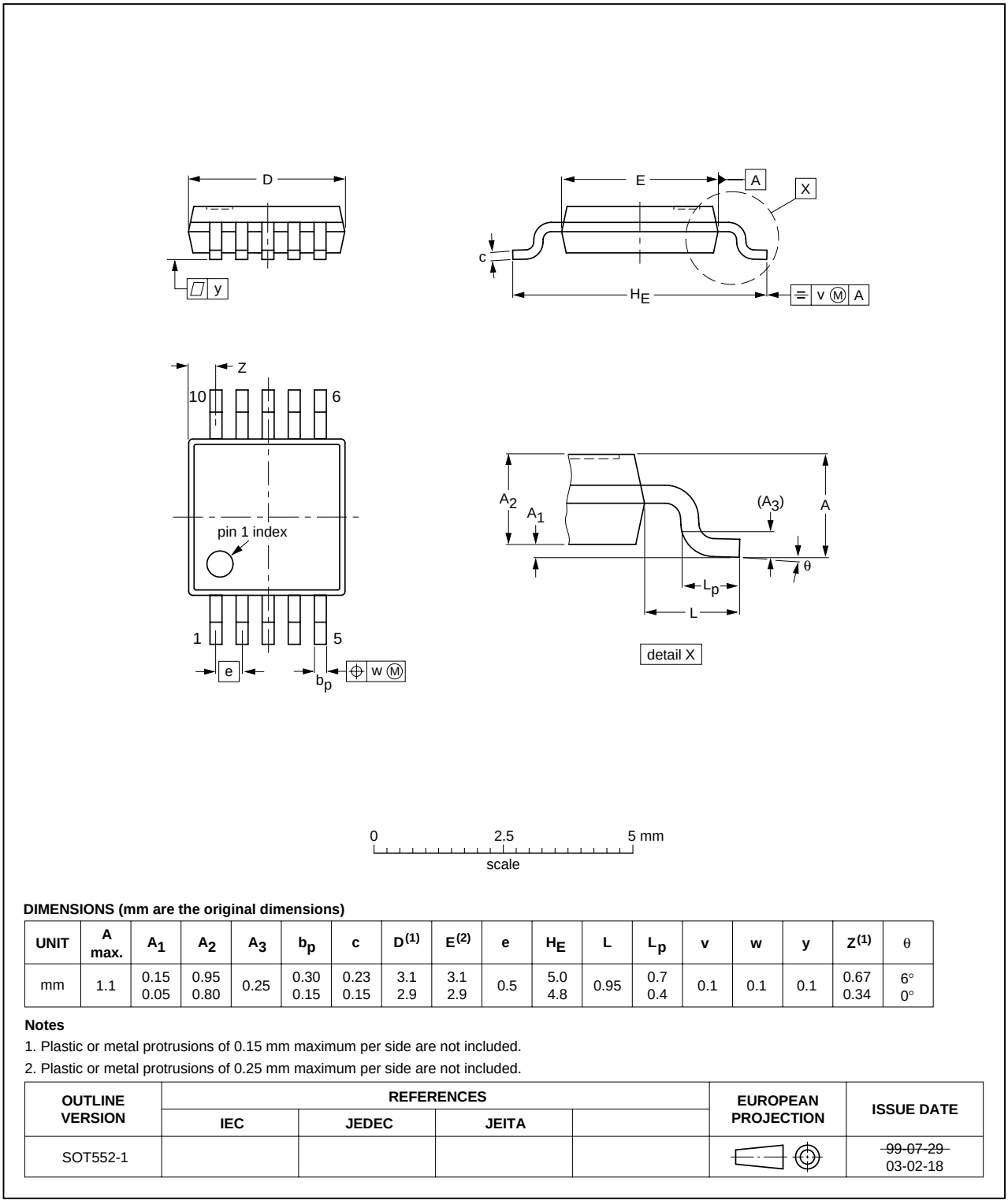
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Protection diodes							
$C_{(I/O-GND)}$	input/output to ground capacitance	V_I = 0 V; f = 1 MHz; V_{CC} = 3 V	[1]	-	1.0	-	pF
I_{LR}	reverse leakage current	V_I = 3 V	[1]	-	-	100	nA
Zener diode							
V_{BR}	breakdown voltage	I_I = 1 mA	[2]	6	-	9	V
C_{sup}	supply pin to ground capacitance	V_I = 0 V; f = 1 MHz; V_{CC} = 3 V	[2]	-	30	-	pF
V_F	forward voltage			-	0.7	-	V

[1] Measured from pin 1, 2, 4, 5, 6, 7, 9 and 10 to ground

[2] Measured from pin 8 to ground

7. Package outline

TSSOP10: plastic thin shrink small outline package; 10 leads; body width 3 mm **SOT552-1**



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	v	w	y	$Z^{(1)}$	θ
mm	1.1	0.15 0.05	0.95 0.80	0.25	0.30 0.15	0.23 0.15	3.1 2.9	3.1 2.9	0.5	5.0 4.8	0.95	0.7 0.4	0.1	0.1	0.1	0.67 0.34	6° 0°

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT552-1						~~99-07-29~~ 03-02-18

Fig 1. Package outline SOT552-1 (TSSOP10)

8. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PRTR5V0U8S_1	20080114	Preliminary 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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11. Contents

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