

PRTR5V0U4Y

Integrated quad ultra-low capacitance ESD protection

Rev. 01 — 8 May 2008

Product data sheet

1. Product profile

1.1 General description

The PRTR5V0U4Y is designed to protect Input/Output (I/O) ports that are sensitive to capacitive load, such as USB 2.0, Ethernet and DVI from destruction by ElectroStatic Discharge (ESD). It provides protection to downstream signal and supply components from ESD voltages as high as ± 8 kV (contact discharge).

The PRTR5V0U4Y incorporates four pairs of ultra-low capacitance rail-to-rail diodes plus a Zener diode. The rail-to-rail diodes are connected to the Zener diode which allows ESD protection to be independent of supply voltage. The PRTR5V0U4Y is fabricated using thin film-on-silicon technology integrating four ultra-low capacitance rail-to-rail ESD protection diodes in a miniature 6-lead SOT363 package.

1.2 Features

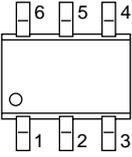
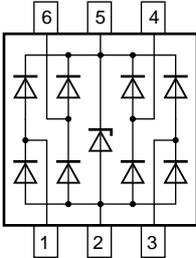
- Pb-free and RoHS compliant
- ESD protection compliant to IEC 61000-4-2 level 4, ± 8 kV contact discharge
- Four ultra-low input capacitance (1 pF typical) rail-to-rail ESD protection diodes
- Low-voltage clamping due to integrated Zener diode
- Small 6-lead SOT363 package

1.3 Applications

- General-purpose downstream ESD protection high frequency analog signals and high-speed serial data transmission for ports inside:
 - ◆ Cellular and PCS mobile handsets
 - ◆ PC-/notebook USB 2.0/IEEE 1394 ports
 - ◆ DVI/HDMI interfaces
 - ◆ Cordless telephones
 - ◆ Wireless data (WAN/LAN) systems
 - ◆ PDAs

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	ESD protection I/O 1		
2	ground (GND)		
3	ESD protection I/O 2		
4	ESD protection I/O 3		
5	supply voltage (V _{CC})		
6	ESD protection I/O 4		

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3. Ordering information

Table 2. Ordering information

Type number	Package		Version
	Name	Description	
PRTR5V0U4Y	SC-88	plastic surface-mounted package; 6 leads	SOT363

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	input voltage		-0.5	+5.5	V
V _{esd}	electrostatic discharge voltage	all pins; IEC 61000-4-2; level 4			
		contact discharge	-8	+8	kV
		air discharge	-15	+15	kV
T _{stg}	storage temperature		-55	+125	°C

5. Recommended operating conditions

Table 4. Operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
T _{amb}	ambient temperature		-40	+85	°C

6. Characteristics

Table 5. Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{(I/O-GND)}$	input/output to ground capacitance	pins 1, 3, 4 and 6; $V_I = 0\text{ V}$; $f = 1\text{ MHz}$; $V_{CC} = 3.0\text{ V}$	-	1.0	-	pF
I_{LR}	reverse leakage current	pins 1, 3, 4 and 6 to ground; $V_I = 3.0\text{ V}$	-	-	100	nA
V_{BR}	breakdown voltage	Zener diode; $I = 1\text{ mA}$	6	-	9	V
V_F	forward voltage		-	0.7	-	V

7. Application information

7.1 IEEE 1394a/b protection

The PRTR5V0U4Y is optimized to protect both the IEEE 1394 physical layer and the IEEE 1394 connector ports against ESD.

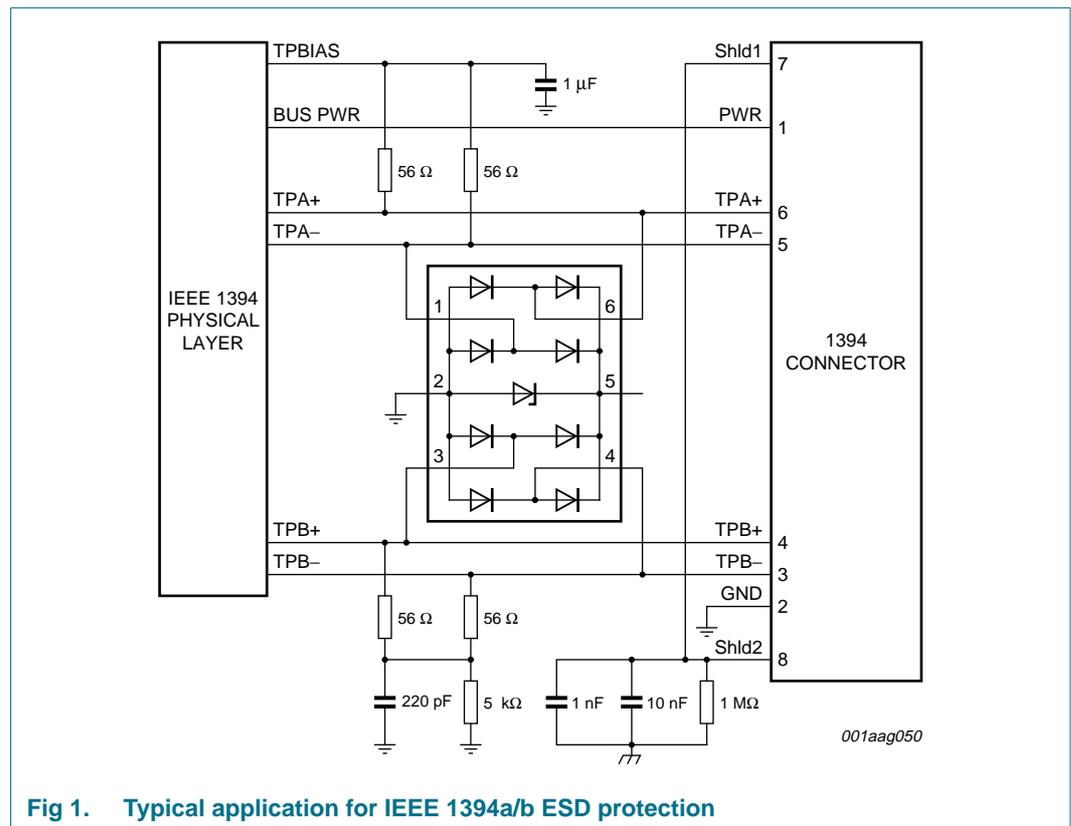
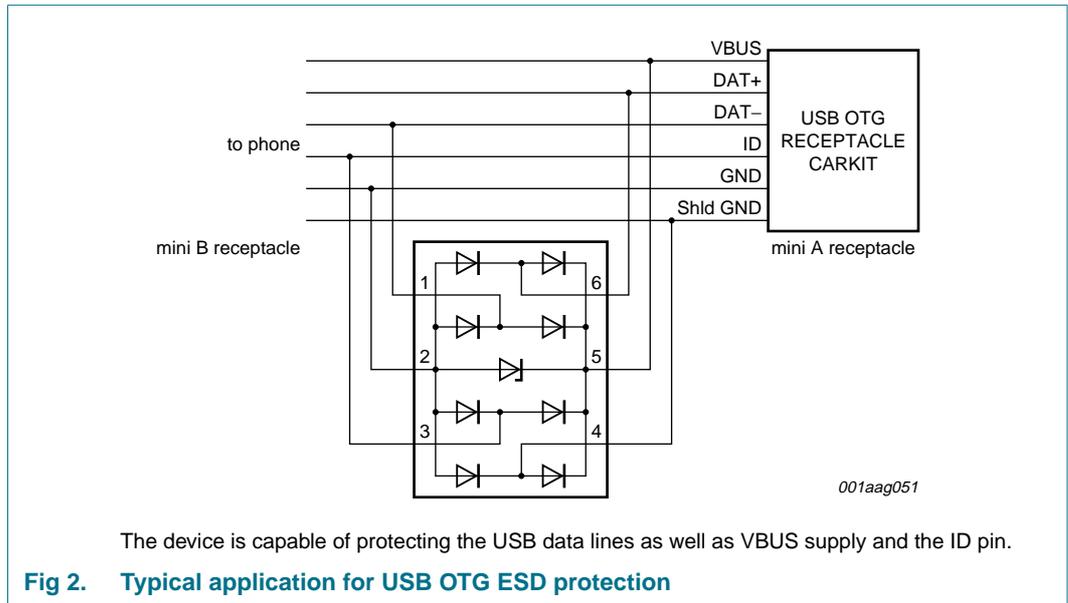


Fig 1. Typical application for IEEE 1394a/b ESD protection

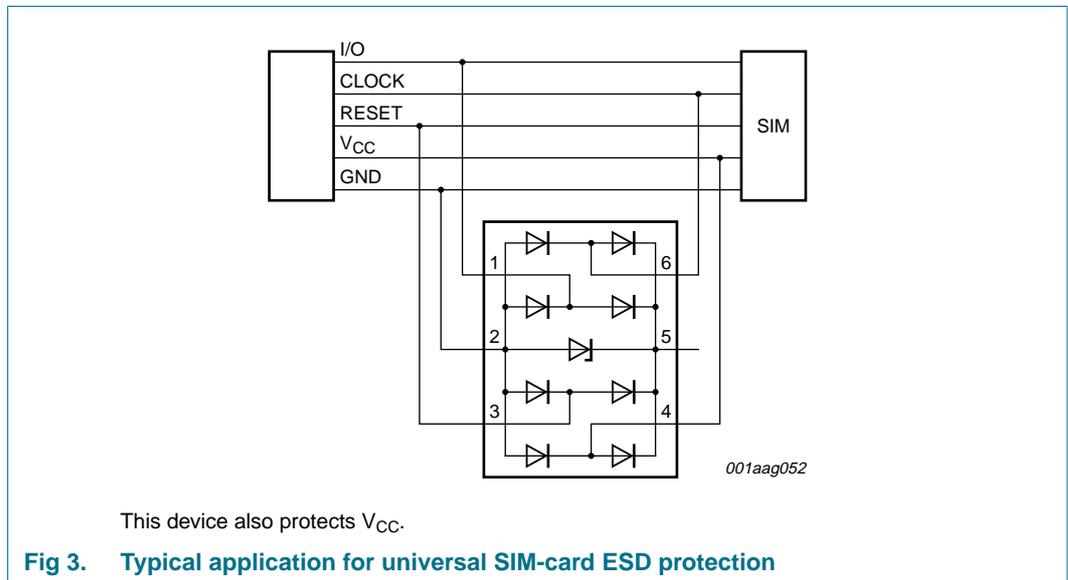
7.2 Universal serial bus 2.0 protection

The PRTR5V0U4Y is optimized to protect USB 2.0 ports with or without OTG functionality against ESD.



7.3 Universal SIM-card protection

The PRTR5V0U4Y protects the SIM-card interfaces against ESD.



7.4 Gigabit Ethernet transceiver protection

The PRTR5V0U4Y protects the gigabit Ethernet transceiver against ESD.

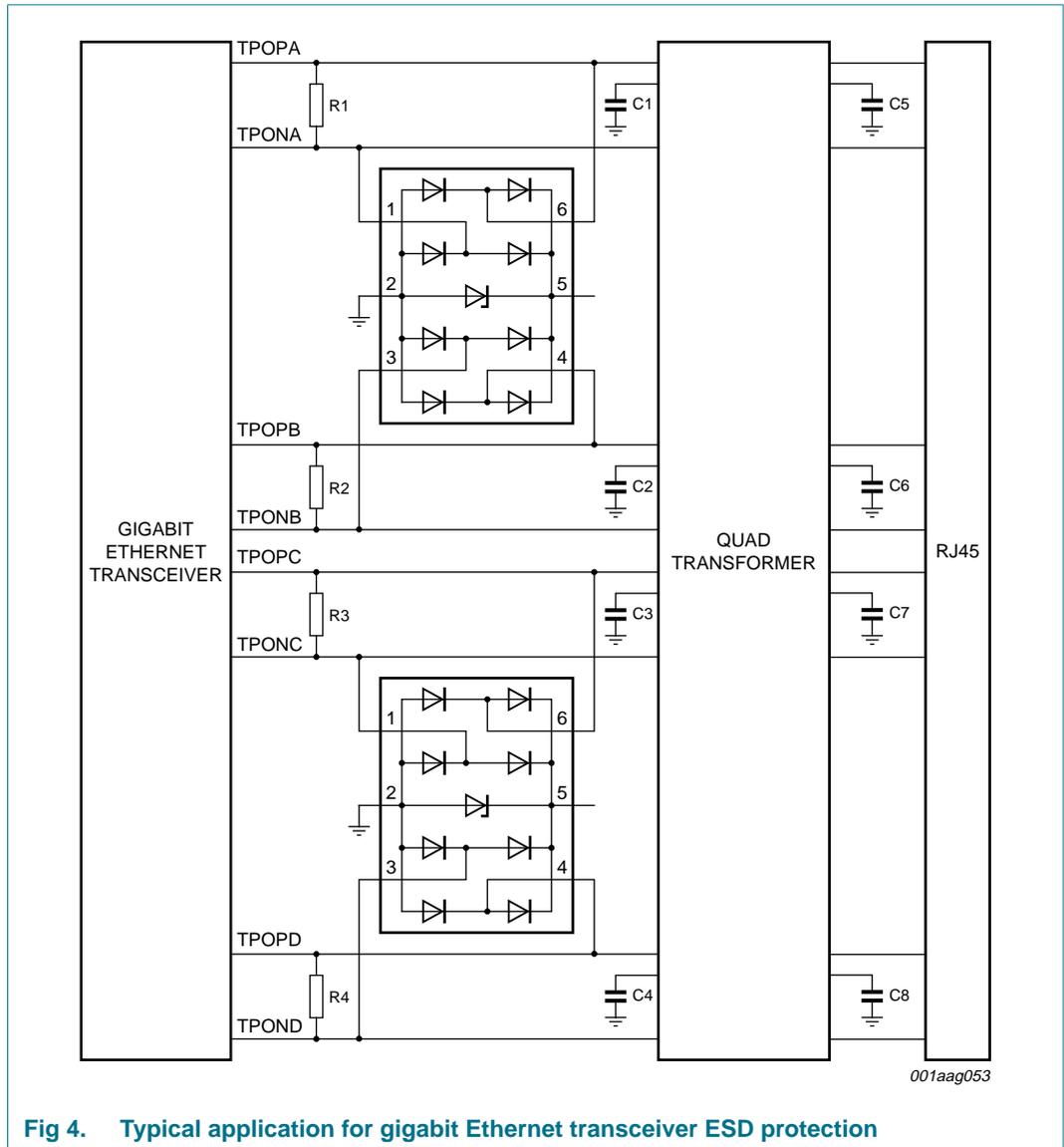


Fig 4. Typical application for gigabit Ethernet transceiver ESD protection

7.5 Universal microSD/TransFlash and SD-memory card protection

The PRTR5V0U4Y protects each data line of the microSD/TransFlash device against ESD.

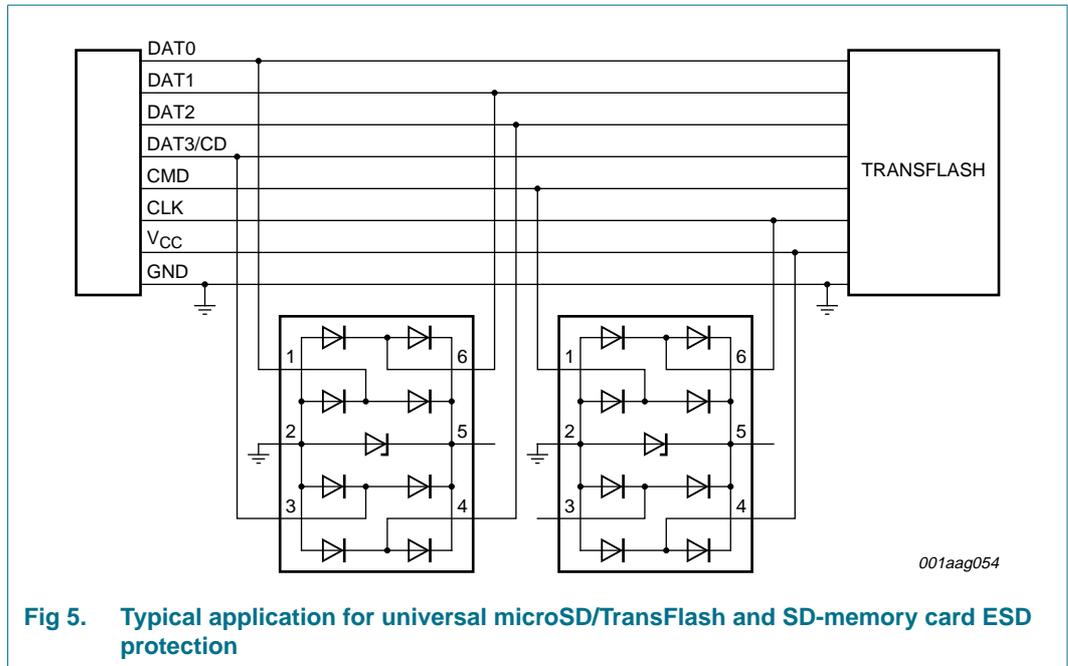


Fig 5. Typical application for universal microSD/TransFlash and SD-memory card ESD protection

8. Package outline

Plastic surface-mounted package; 6 leads

SOT363

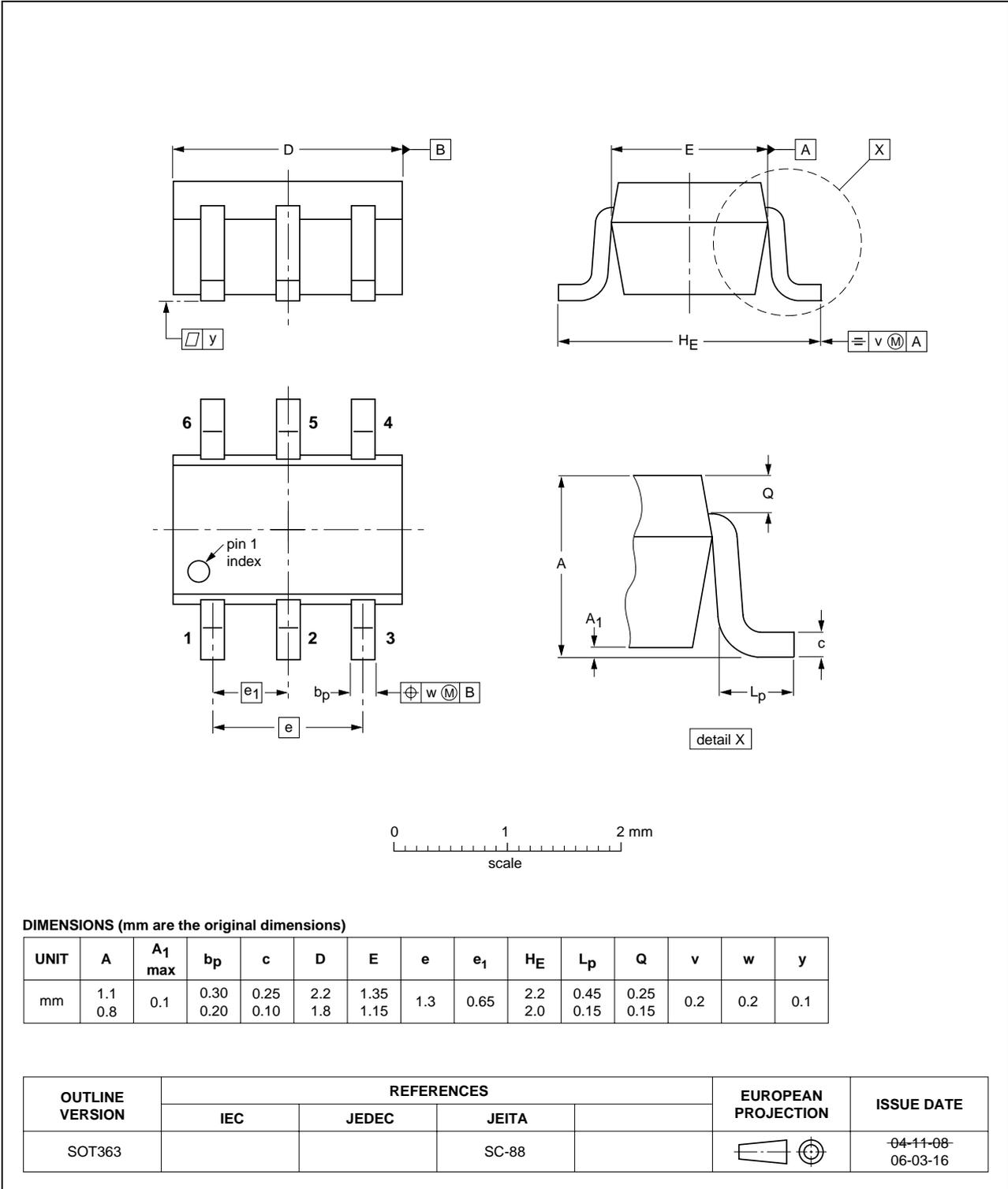


Fig 6. Package outline SOT363 (SC-88)

9. Abbreviations

Table 6. Abbreviations

Acronym	Description
DVI	Digital Video Interface
ESD	ElectroStatic Discharge
HDMI	High Definition Multimedia interface
LAN	Local Area Network
OTG	On-The-Go
PCS	Personal Computing System
PDA	Personal Digital Assistant
RoHS	Restriction of Hazardous Substances
SIM	Subscriber Identity Module
USB	Universal Serial Bus
WAN	Wide Area Network

10. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PRTR5V0U4Y_1	20080508	Product data sheet	-	-

11. Legal information

11.1 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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