NX30P6093A

High-voltage I²C controlled OVP load switch with OTG

Rev. 1 — 14 August 2018 Product short data sheet

1. General description

The NX30P6093A is a 5.6A I²C controlled overvoltage protection load switch for USB Type-C and PD applications. It includes undervoltage lockout, overvoltage lockout and overtemperature protection circuits, designed to automatically isolate the power switch terminals when a fault condition occurs. It features input pin impedance detection function, providing USB power supply pin status to system to avoid short circuit damage for the Type-C port power supply pin.

NX30P6093A has a default overvoltage protection threshold, and the OVLO threshold can be adjusted by both external resistor divider on ADJ pin and internal I²C register. A 13ms debounce time is deployed every time before the device is switched ON, followed by a soft start to limit the inrush current.

USB OTG is supported when the plugged accessory is recognized as an OTG device by system and a 5V source is applied on VOUT pin of NX30P6093A. The current capability in USB OTG mode is limited to max 1.5A.

Designed for operation from 2.8V to 20.0V, it can be used in USB Type-C and PD power control applications to offer essential protection and enhance system reliability.

NX30P6093A is offered in a small 20-bump 1.7 x 2.16 mm, 0.4mm pitch WLCSP package.

2. Features and benefits

- Wide supply voltage range for VIN from 2.8V to 20.0V
- System Power supply VDD from 3.0V to 4.5V
- I_{SW} maximum 5.6A continuous current for OVP mode
- Support 1.5A USB OTG
- 29V tolerance on VIN pin
- 16mΩ (typical) ultra-low ON resistance
- Adjustable VIN overvoltage protection by both external resistor and I²C
- Built-in slew rate control for inrush current limit
- Integrated current source for VIN pin impedance detection
- Protection circuitry
  - Overtemperature protection
  - Overvoltage protection
  - Undervoltage lockout

- Surge protection:
  - IEC61000-4-5 exceeds ±100V on VIN
- ESD protection
  - IEC61000-4-2 contact discharge exceeds 8kV on VIN
  - IEC61000-4-2 air discharge exceeds 15kV on VIN
  - HBM ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 3kV on all pins
  - MM Class B exceeds 100 V on all the pins
- Specified from -40 °C to +85 °C

3. Applications

- Smart and feature phones
- Tablets, eBooks
- Notebook

4. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
NX30P6093AUK	–40 °C to +85 °C	WLCSP20	wafer level chip-scale package; 20 bumps; 1.70 mm x 2.16 mm x 0.525 mm body (backside coating included)	SOT1397-6

4.1 Ordering options

Table 2. Ordering options

Type number	Orderable part number	Package	Packing method	Minimum order quantity	Temperature
NX30P6093AUK	NX30P6093AUKZ	WLCSP20	REEL 7" Q1/T1 *SPECIAL MARK CHIPS DP	4000	T_{amb} = –40 °C to +85 °C

5. Functional diagram

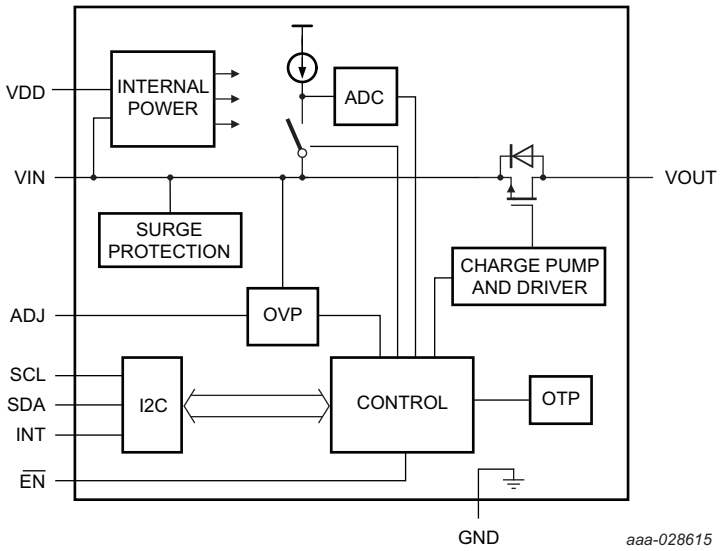


Fig 1. Block diagram

6. Pinning information

6.1 Pinning

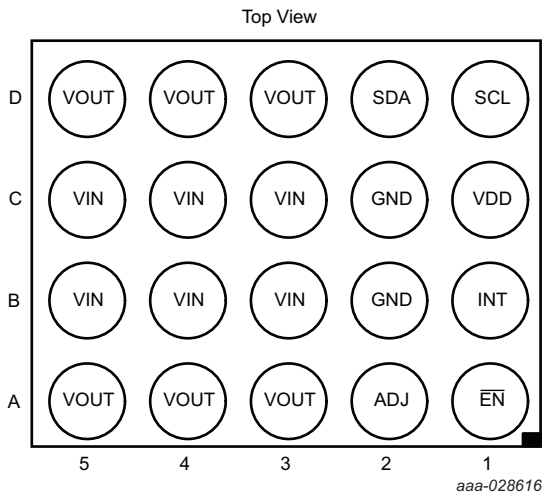


Fig 2. Top view pin map WLCSP20

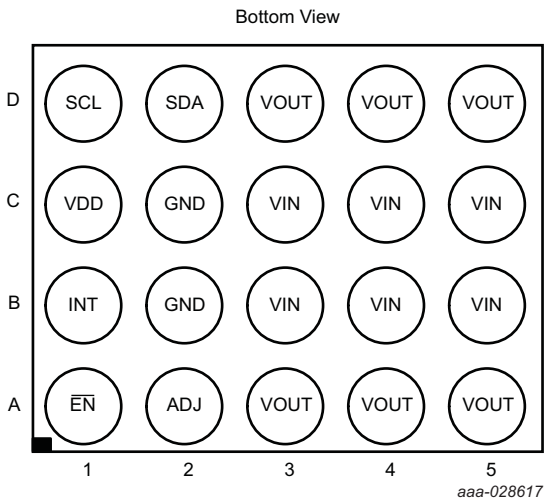
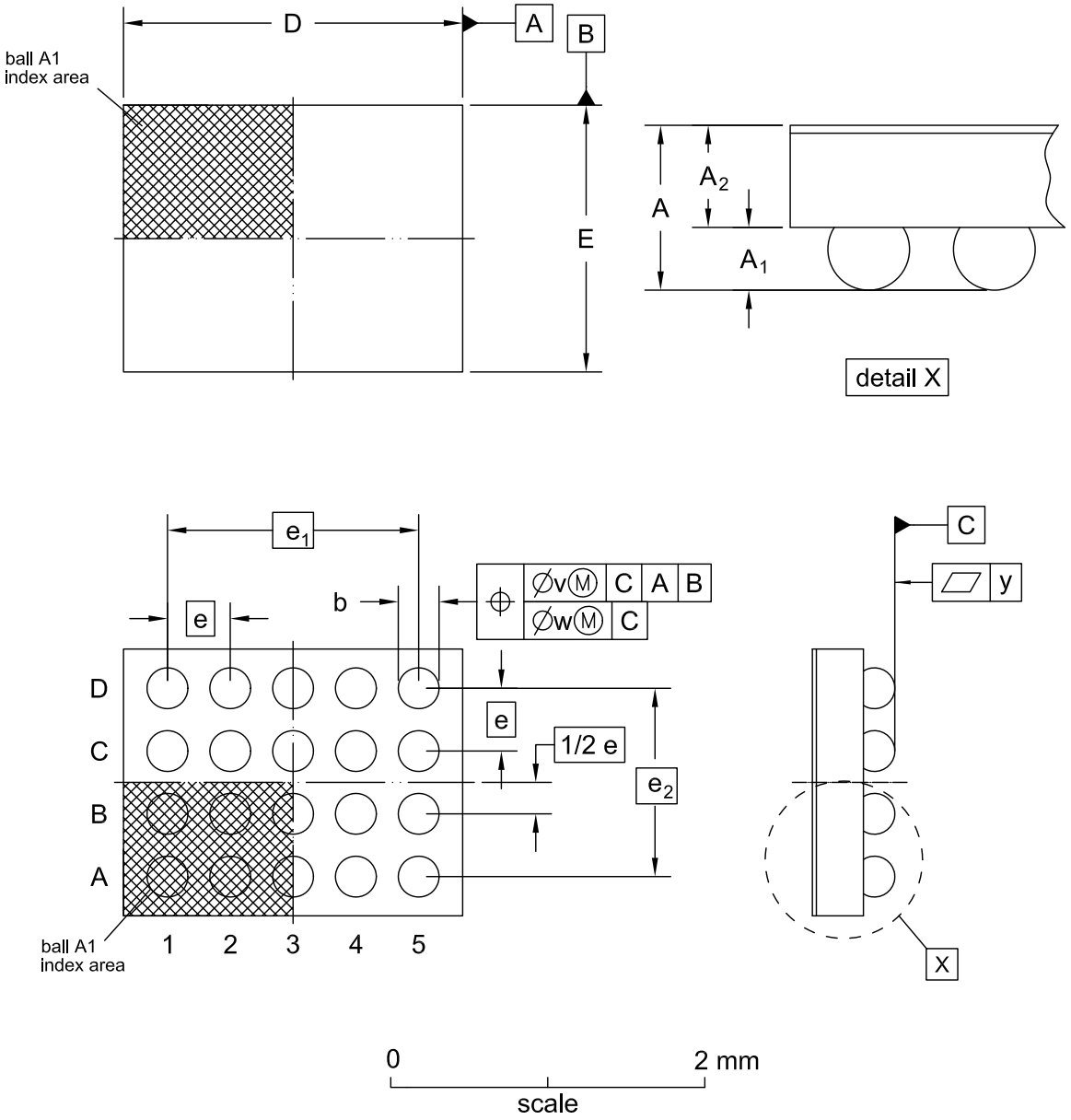


Fig 3. Bottom view pin map WLCSP20

7. Package outline



DIMENSIONS (mm are the original dimensions)

UNIT		A	A_1	A_2	b	D	E	e	e_1	e_2	v	w	y
mm	MAX.	0.565	0.230	0.350	0.290	2.19	1.73	0.4	1.6	1.2	0.15	0.05	0.03
	NOM.	0.525	0.200	0.325	0.260	2.16	1.70						
	MIN.	0.485	0.170	0.300	0.230	2.13	1.67						

NOTE: Backside coating 25 um

Fig 4. Package outline SOT1397-6 (WLCSP20)

8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NX30P6093A_SDS v.1	20180814	Product short 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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