NX20P3483UK

USB PD and Type-C high voltage sink/source combo switch with protection

Rev. 2 — 4 March 2019 Product short data sheet

1. General description

The NX20P3483UK is a product with combined multiple power switches and an LDO for USB PD application. The device includes a bidirectional high voltage power switch which supports both 20V sink and 6V source; a 5V power switch for source and a 100mA LDO provides power supply for dead battery operation.

The high voltage power switch has 29V DC tolerance, and is able to sink up to 5A at maximum of 20V and source up to 3.4A at maximum of 6V. When it is configured as a high voltage sink switch, the path has overvoltage protection and reverse current protection features. While it is configured as high voltage source switch, the adjustable overcurrent limit circuit is integrated.

The 5V power switch has an adjustable overcurrent limit, “ideal diode” feature and short circuit protection. The maximum current capability is 3.4A. It supports fast role swap for USB PD3.0 application.

A VBUS discharge circuit is integrated according to USB PD VBUS discharging requirement. To minimize inrush current during normal startup, turn on slew rate control has been built in for all power switches. Over temperature protection is also equipped to automatically isolate the switch terminals when the device is overheated.

The device is controlled through an I^2C-bus interface, allowing the host to configure switches and program different specified parameters according to an I^2C register map.

The NX20P3483UK is offered with WLCSP42 package: 0.4mm pitch, 2.51 x 2.91 x 0.525mm, 0.4mm pitch.

2. Features and benefits

- Wide supply voltage range for VBUS from 2.8V to 20V
- System power supply V5V from 4.0V to 5.5V
- Chip power supply VDD from 2.7V to 5.5V
- VBUS to VCHG Switch
  - 28mΩ (typical) ultra low ON resistance
  - I_{SW} maximum 5A continuous current
  - Bidirectional operation: 20V sink switch from VBUS to VCHG with RCP and 6V source switch from VCHG to VBUS with overcurrent limit
  - Adjustable overcurrent limit for source configuration from 400mA to 3.4A by I^2C-bus interface
- V5V to VBUS switch
  - 38mΩ (typical) ultra low ON resistance

- I_{SW} maximum 3.4A continuous current
- Adjustable overcurrent limit from 400mA to 3.4A by I^2C-bus interface

- Integrated high voltage LDO with reverse voltage protection
- Built in slew rate control for all power switches for inrush current limit
- Supports 1MHz Fast Mode Plus I^2C-bus interface and four different I^2C slave addresses by ADDR pin
- Safety approvals
  - UL 62368-1, file no. 20181009- E470128
  - IEC 62368-1, file no. DK-77044-UL
- Protection circuitry
  - Over-Temperature Protection
  - Over-Voltage Protection
  - Under-Voltage Lockout
  - Reverse current protection
- Surge protection:
  - IEC61000-4-5 exceeds ±95 V on VBUS
  - IEC61000-4-5 exceeds ±100 V on VBUS with 4.7uF capacitor
- ESD protection
  - IEC61000-4-2 contact discharge exceeds 8 kV on VBUS
  - IEC61000-4-2 air discharge exceeds 15kV on VBUS
  - HBM ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 2 kV on all pins
  - CDM ANSI/ESDA/JEDEC JS-002 exceeds 500V
- Operating ambient temperature −40°C to +85°C

3. Applications

- Notebook, Ultrabook and Desktop
- USB PD DFP, UFP and DRP
- Tablet and Smart phone

4. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
NX20P3483UK	–40 °C to +85 °C	WLCSP42	wafer level chip-scale package; 42 bumps; 2.91 mm x 2.51 mm x 0.525 mm body (backside coating included)	SOT1459-6

4.1 Ordering options

Table 2. Ordering options

Type number	Orderable part number	Package	Packing method	Minimum order quantity	Temperature
NX20P3483UK	NX20P3483UKAZ	WLCSP42	reel dry pack, SMD, 7" Q1 standard product orientation	2000	T_{amb} = –40 °C to +85 °C

5. Marking

Table 3. Marking

Line	Content	Description
1	Pin 1 dot	Pin 1 dot
	3483UK	Product identification
2	XXXX	4 digit lot number before dot
	??	wafer ID
3	Z	wafer fab code (SSMC)
	t	Identification of assembly site (ASE-K)
	D	RoHS indicator (Dark green)
	YWW	Y: Last digits of year code of assembly, WW: week code of assembly
4	CCC-RRR	Die x-y coordinate

6. Functional diagram

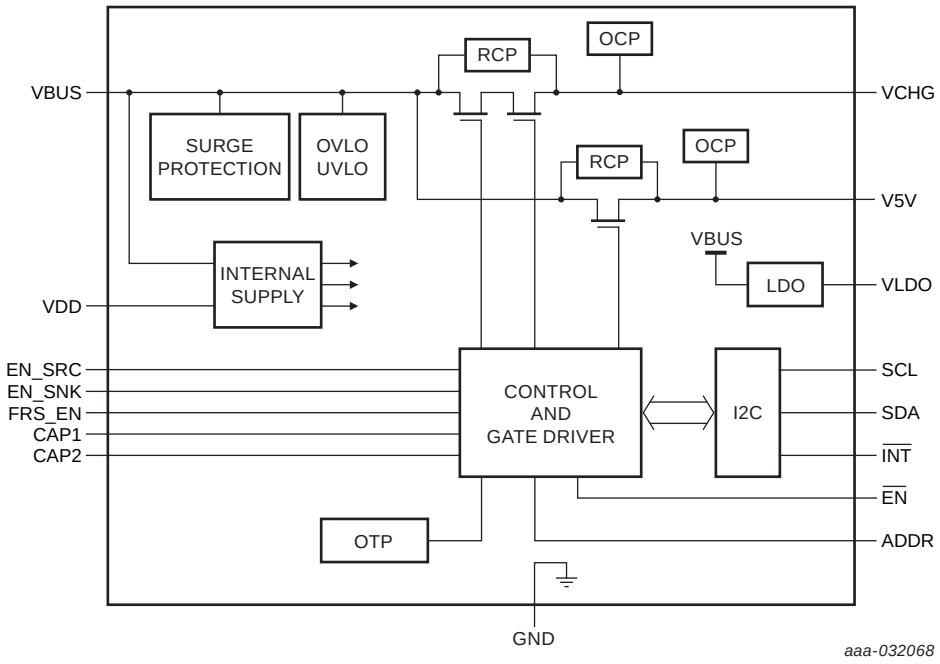
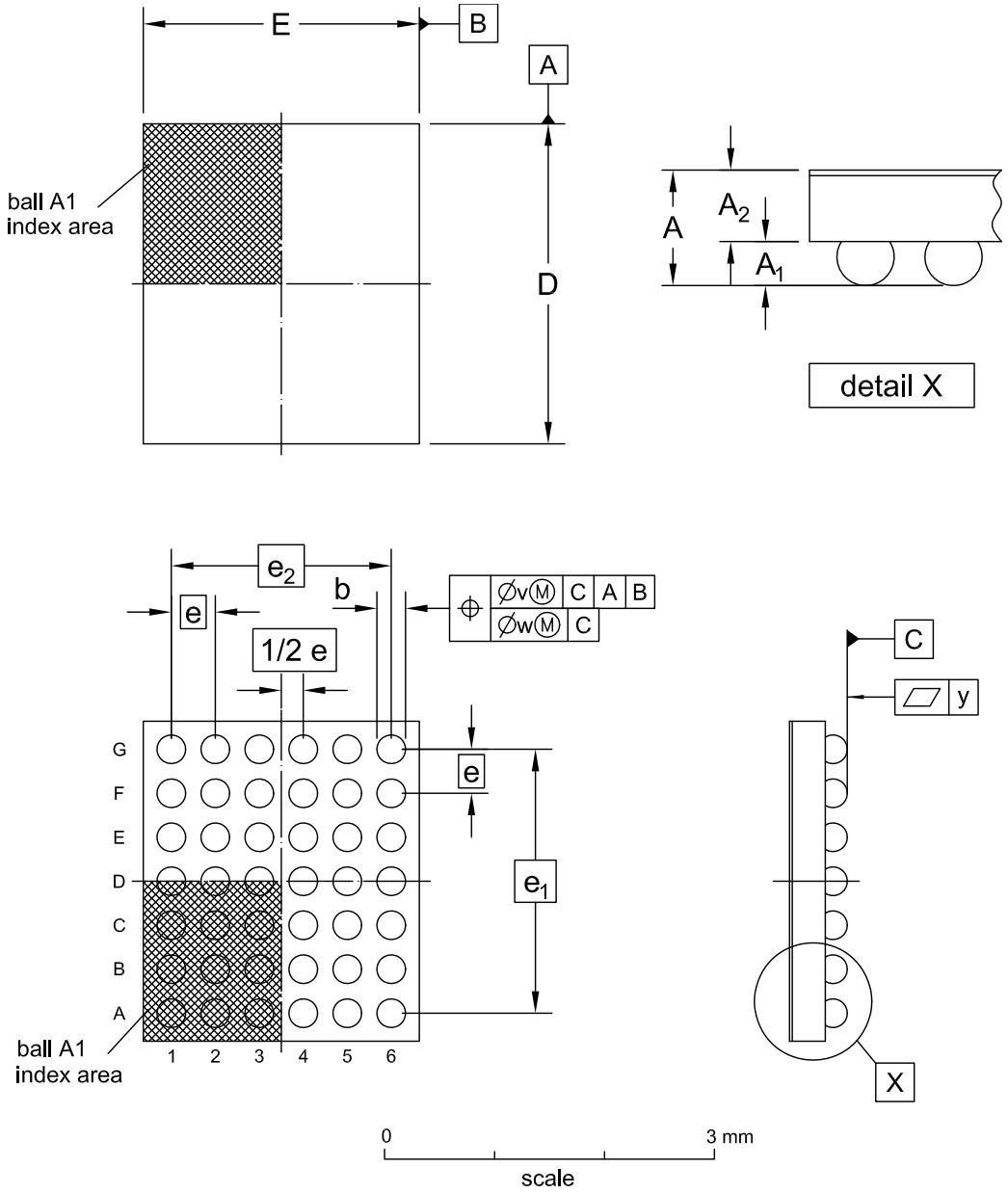


Fig 1. Block diagram

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	0.23	0.350	0.29	2.94	2.54	0.4	2.4	2.0	0.05	0.02	0.03
	NOM.	0.525	0.20	0.325	0.26	2.91	2.51						
	MIN.	0.485	0.17	0.300	0.23	2.88	2.48						

NOTE: Backside coating 25 um

Fig 2. Package outline SOT1459-6 (WLCSP42)

8. Revision history

Table 4. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NX20P3483UK_SDS v2.0	20190304	Product data sheet	-	NX20P3483UK_SDS v1.0
Modifications:	• Updated Section 2 “Features and benefits”			
NX20P3483UK_SDS v1.0	20181029	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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