PB_PF0300

Power management integrated circuit (PMIC) for high-performance applications

Rev. 1.3 — 21 November 2023 **Product brief**

Document information

Information	Content
Keywords	PF0300, power management, integrated circuit (PMIC), high performance
Abstract	The PF0300 integrates multiple high-performance buck regulators and one LDO regulator. It can operate as a standalone point-of-load regulator IC, or as a companion chip to a larger PMIC.

1 Introduction

This product brief is intended to provide overview/summary information for evaluating a product for design suitability. It is intended for quick reference only and should not be relied upon to contain detailed and full information.

Some of the content in this product brief is extracted from the product's full data sheet. In case of any inconsistency or conflict, the full data sheet prevails.

For detailed and full information, refer to the PF0300 full data sheet, available via the NXP website at https://www.nxp.com.

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2 General description

The PF0300 integrates multiple high-performance buck regulators and an LDO regulator. It can operate as a standalone point-of-load regulator Integrated Circuit (IC) or as a companion chip to a larger power management integrated circuit (PMIC).

Built-in One-Time-Programmable (OTP) memory stores key startup configurations, drastically reducing external components typically used to set the output voltage and the sequence of regulators. Regulator parameters are adjustable through high-speed I^2C after startup, offering flexibility for different system states.

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3 Feature and benefits

The PF0300 is a PMIC designed to be the primary core power supply for NXP high-end ADAS application processors.

- Buck regulators
  - SW1, SW2, and SW3: 0.5 V to 3.3 V; 3500 mA; 1.5 % accuracy
  - Dynamic voltage scaling
  - Configurable as dual- and triple-phase regulator
  - Programmable current limit
  - Spread-spectrum and manual tuning of switching frequency
- LDO regulator
  - LDO1: 0.75 V to 3.3 V; 500 mA; 1.5 % accuracy
- PGOOD output and monitor
- Clock synchronization through configurable input sync pin
- System features
  - Advanced state machine for seamless processor interface
  - High speed I^2C interface support (up to 3.4 MHz)
  - Programmable soft-start sequence and power-down sequence
  - Programmable regulator configuration
- OTP (One-time programmable) memory for device configuration
- Monitoring circuits
  - Independent voltage monitoring with programmable fault protection
  - Advance thermal monitoring and protection
  - Watchdog monitoring and programmable internal watchdog counter
  - I^2C Cyclic Redundancy Check CRC and write protection mechanism

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4 Applications

- Automotive – radio, infotainment, domain controllers
- High-end consumer and industrial

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5 Ordering information

Table 1. Samples are not yet available

Type number[1]	Package		
	Name	Description	Version
PPF0300AMMA0ES[2]	HWQFN28	HWQFN28, plastic thermal-enhanced, very thin quad flat pack; no leads, wettable flank, 28 terminals, 0.5 mm pitch, 4.5 mm x 4.5 mm x 0.53 mm body	SOT2089-1(SC)

[1] To order parts in tape and reel, add the R2 suffix to the part number.
[2] Safety grade: QM

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6 Block diagram

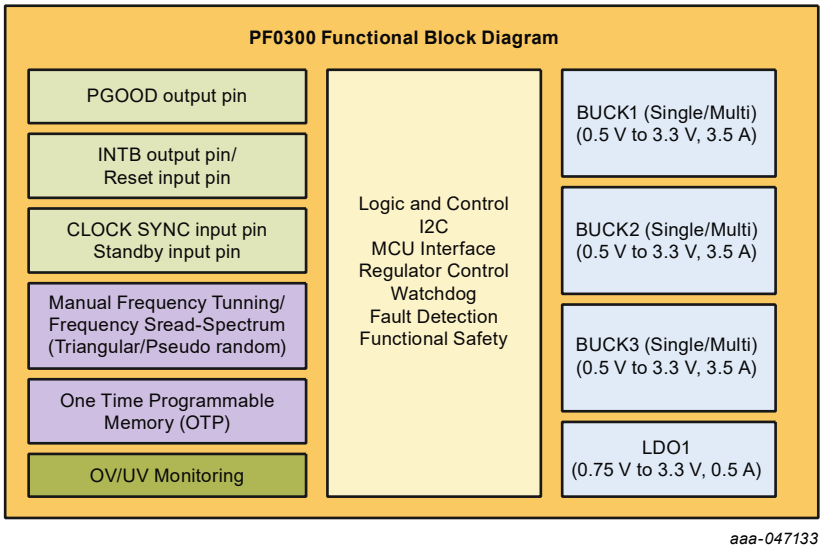

Figure 1. PF0300 Block diagram

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7 Application information

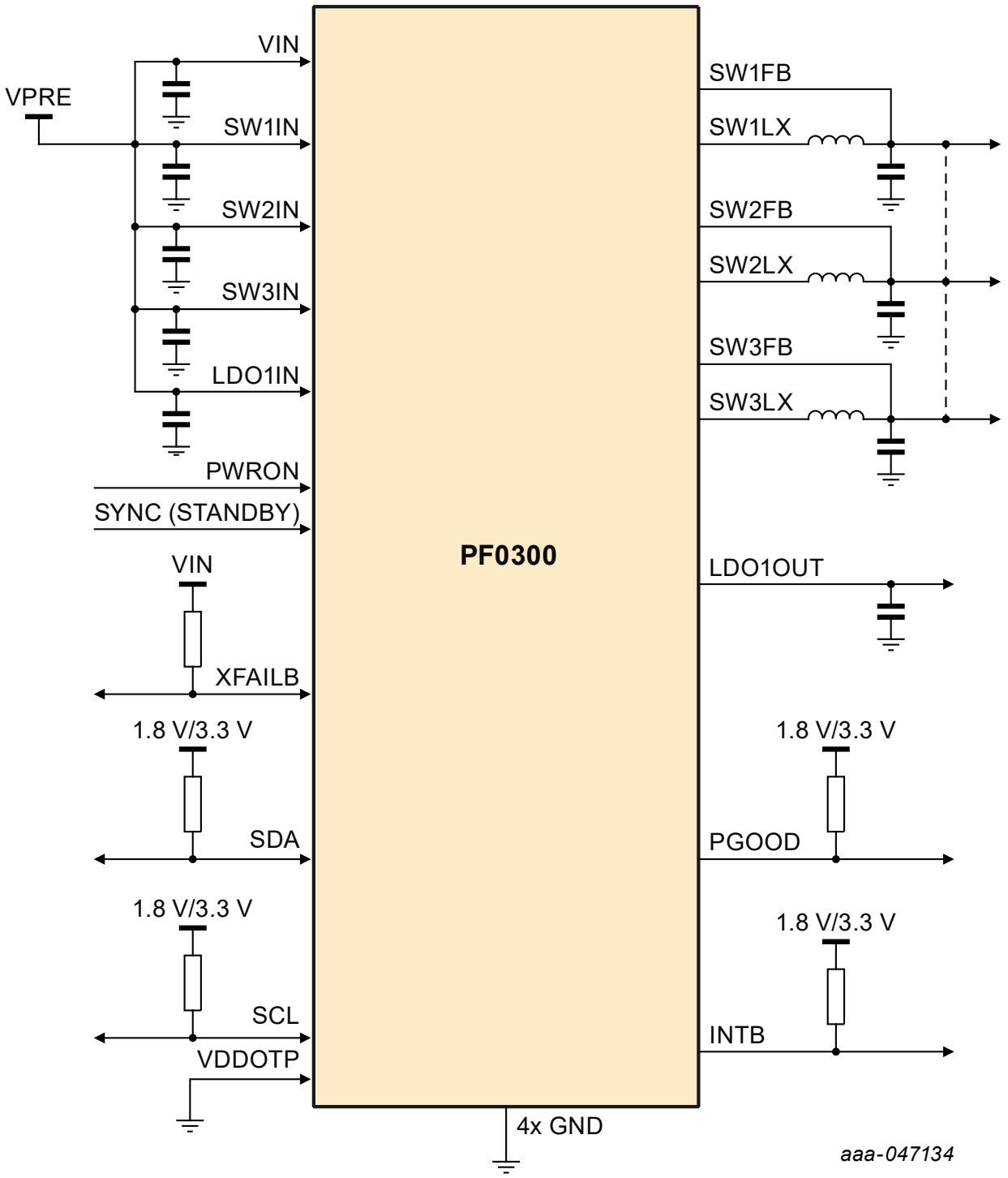

Figure 2. Simplified application diagram

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8 Pinning information

8.1 Pinning

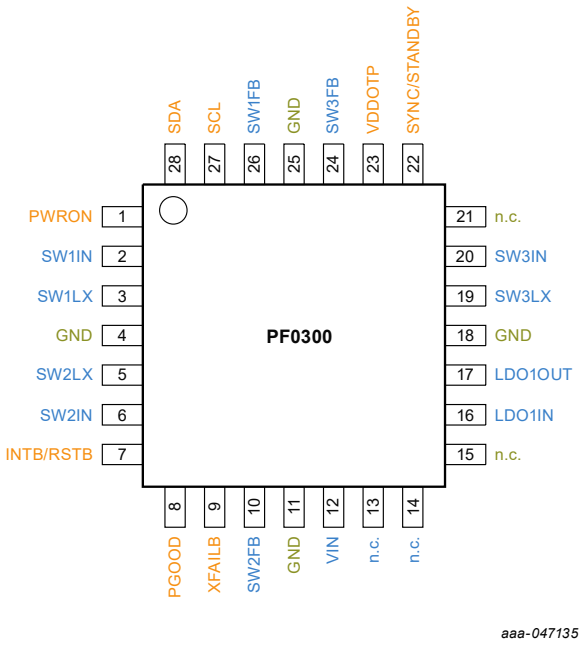

Figure 3. PF0300 pinout top view

8.2 Pin description

Table 2. Figure 3. PF0300 Pinout (Top-View)

QFN pin number	Pin name	Pin description	Min	Max	Units
1	PWRON	PWRON input	-0.3	5.5	V
2	SW1IN	SW1 input supply	-0.3	5.5	V
3	SW1LX	SW1 switching node	-0.3	5.5	V
4	PGND	Ground	-0.3	0.3	V
5	SW2LX	SW2 switching node	-0.7	5.5	V
6	SW2IN	SW2 input supply	-0.3	5.5	V
7	INTB/RSTB	Interrupt output/External reset input	-0.3	5.5	V
8	PGOOD	PGOOD output	-0.3	5.5	V
9	XFAILB	XFAILB bidirectional signal	-0.3	5.5	V
10	SW2FB	SW2 feedback input	-0.3	5.5	V
11	GND	Ground	-0.3	0.3	V
12	VIN	Input supply	-0.3	5.5	V
13	NC	No connect	-0.3	5.5	V
14	NC	No connect	-0.3	5.5	V

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Table 2. Figure 3. PF0300 Pinout (Top-View)*...continued*

QFN pin number	Pin name	Pin description	Min	Max	Units
15	NC	No connect	-0.3	0.3	V
16	LDO1IN	LDO1 input	-0.3	5.5	V
17	LDO1OUT	LDO1 output	-0.3	5.5	V
18	GND	Ground	-0.3	0.3	V
19	SW3LX	SW3 switching node	-0.7	5.5	V
20	SW3IN	SW3 input supply	-0.3	5.5	V
21	NC	No connect	-0.3	0.3	V
22	SYNC_STANDBY	Clock synchronization input or standby input	-0.3	5.5	V
23	VDDOTP	Debug mode\/OTP programming input supply	-0.3	10	V
24	SW3FB	SW3 feedback input	-0.3	5.5	V
25	GND	Ground	-0.3	0.3	V
26	SW1FB	SW1 feedback input	-0.3	5.5	V
27	SCL	I^2C SCL signal	-0.3	5.5	V
28	SDA	I^2C SDA signal	-0.3	5.5	V

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9 Package outline

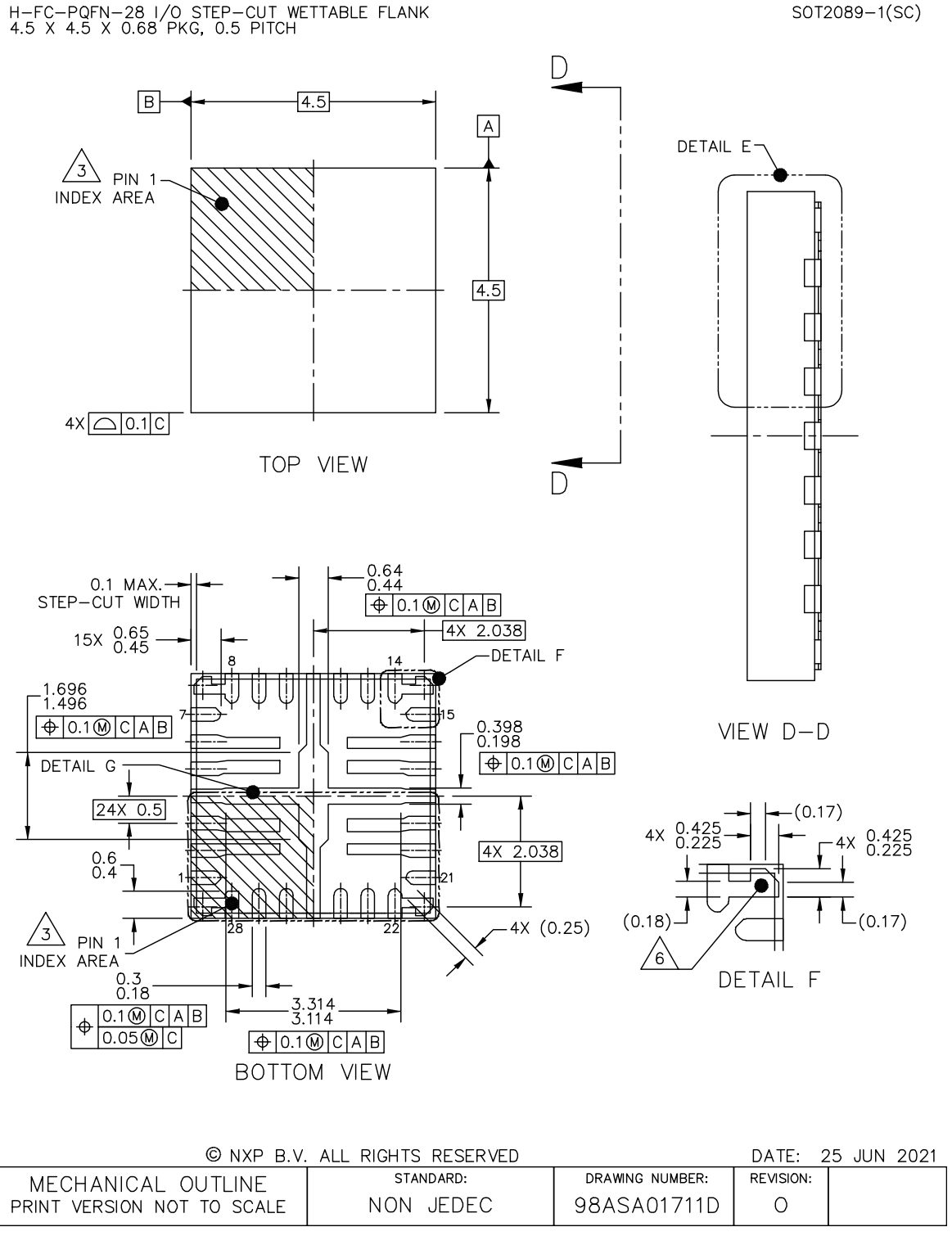

Figure 4. Package outline for PQFN28

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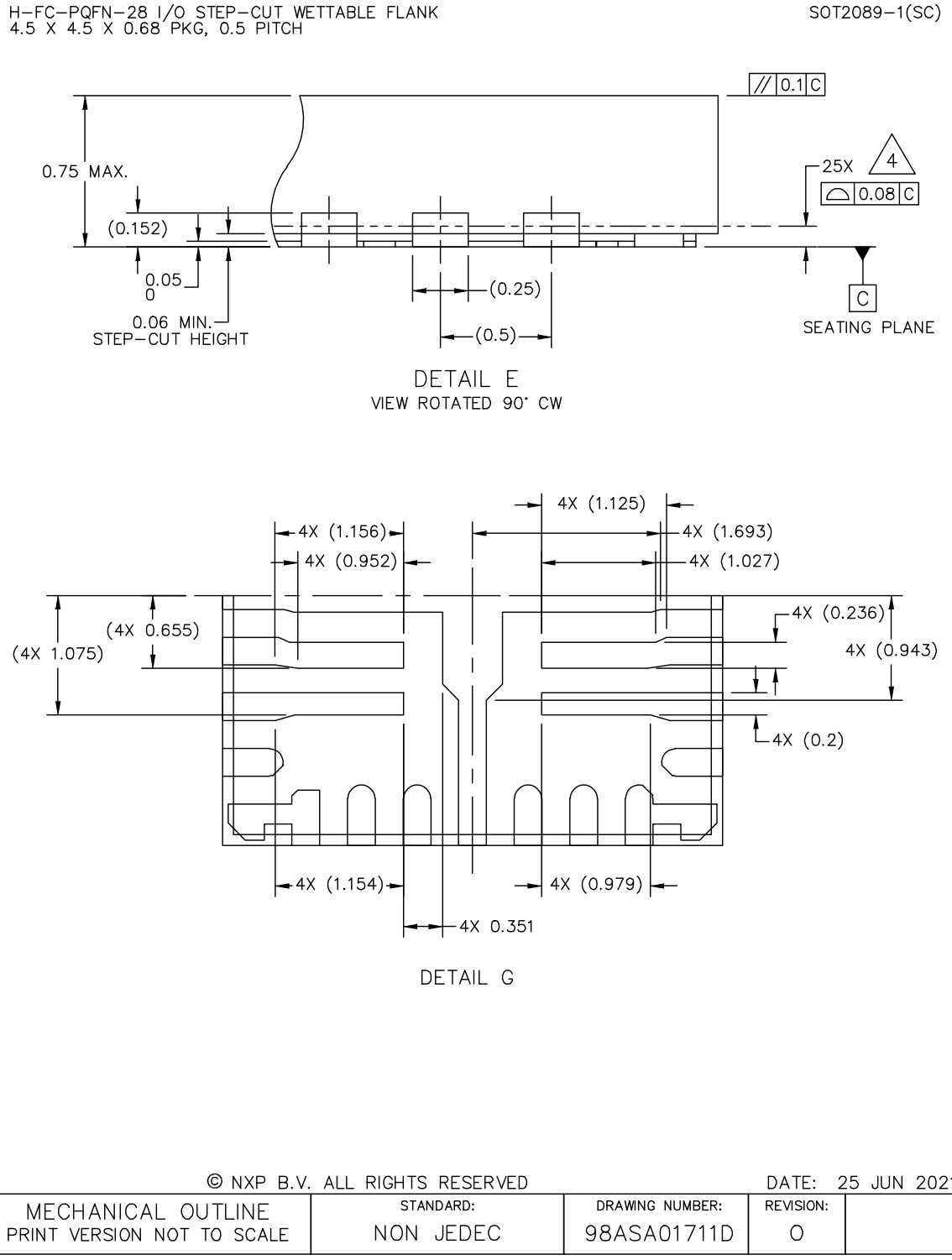

Figure 5. Package outline detail for PQFN28

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H–FC–PQFN–28 I/O STEP–CUT WETTABLE FLANK
4.5 X 4.5 X 0.68 PKG, 0.5 PITCH

SOT2089–1(SC)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M–1994.
3. PIN 1 FEATURE, SHAPE, SIZE AND LOCATION MAY VARY.
4. COPLANARITY APPLIES TO LEADS AND DIE ATTACH PAD.
5. MIN. METAL GAP FOR LEAD TO EXPOSED PAD SHALL BE 0.2 MM.
6. ANCHORING PADS.

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Figure 6. Package outline notes for PQFN28

10 Revision history

Document ID	Release date	Description
PB_PF0300 v. 1.3	20231121	• Corrected Figure 1: used the figure version where LDO1 current is 0,5 A
PB_PF0300 v. 1.2	20231120	• Updated Section 3: removed mentions of ASIL D and ABIST • Table 1: removed footnotes abour ASIL B and ASIL D • Updated Figure 2: changed two instances of *0.3 V* at the lower right to *3.3 V* • Updated Figure 3: changed *FCCU / XFAILB* to *XFAILB* • Updated Section 9 • Updated legal information
PB_PF0300 v. 1.1	20231005	• Section 4: updated first bullet item from *Automotive – RADAR, infotainment, domain controllers* to *Automotive – radio, infotainment, domain controllers* • Updated Figure 1 • Updated legal information
PB_PF0300 v. 1.0	20220822	Initial release

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Tables

Tab. 1. Samples are not yet available 6

Tab. 2. Figure 3. PF0300 Pinout (Top-View) 9

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Figures

Fig. 1. PF0300 Block diagram 7
Fig. 2. Simplified application diagram 8
Fig. 3. PF0300 pinout top view 9
Fig. 4. Package outline for PQFN28 11
Fig. 5. Package outline detail for PQFN28 12
Fig. 6. Package outline notes for PQFN28 13

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Contents

1 Introduction 2
2 General description 3
3 Feature and benefits 4
4 Applications 5
5 Ordering information 6
6 Block diagram 7
7 Application information 8
8 Pinning information 9
8.1 Pinning 9
8.2 Pin description 9
9 Package outline 11
10 Revision history 14
Legal information 15

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