

NEX30606 evaluation board: 1.8 V to 5.0 V, 600 mA, 220 nA ultra-low quiescent current, step-down converter

**Abstract:**

This user manual describes the NEX30606 evaluation board. The NEX30606 is designed for MCU, GPS and other chips to provide 0.7 V to 3.3 V adjustable output voltage power supply. This document contains the EVB schematics, EVB configuration, bill of materials (BOM), board layout drawing, and assembly drawings.

Keywords:

NEX30606, Step-down converter, Ultra-low operating quiescent current, Evaluation board

1. Introduction

This evaluation board (EVB) is designed for NEX30606. The output can provide 16-step adjustable voltage from 0.7 V to 3.3 V, which can be changed through the resistance on V_{SET} pin.

Features

The following features are available on this EVB:

- Input voltage range: 1.8 V to 5.0 V
- Output voltage range: 0.7 V to 3.3 V (16-step adjustable voltage)
- Output current: up to 600 mA
- Use jumper to enable or disable output

Applications

- Wearable electronics
- Smart meters
- Asset tracking device
- Medical sensor patches and monitors
- Industrial IoT/NB-IoT
- AA battery-powered applications

2. Schematic

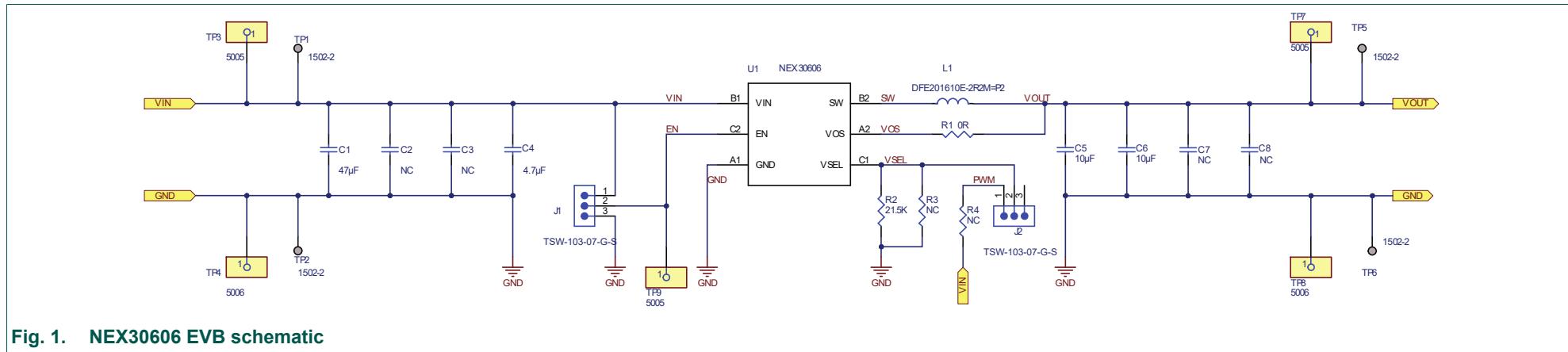


Fig. 1. NEX30606 EVB schematic

3. General configuration and description

This section describes the connectors, jumpers, and test points on the EVB, and how to properly connect, set up, and use the NEX30606 EVB.

Physical access

[Table 1](#) lists the NEX30606 EVB connector functionality.

Table 1. Bill of material (BOM)

Connector	Label	Description
TP1	V _{IN}	Power input for this board
TP2, TP6	GND	Power ground
J1	EN	Enable connector, including EN, GND and High (V _{IN}) Use jumpers to enable or disable ON and OFF.
J2	-	N/A
TP5	V _{OUT}	V _{OUT} output pin
TP3	+S_V _{IN}	TP1 V _{IN} sense pin and test point
TP4	-S_V _{IN}	TP1 V _{IN} _GND sense pin and test point
TP9	EN	TP3 EN sense pin and test point
TP7	+S_V _{OUT}	TP4 V _{OUT} sense pin and test point
TP8	-S_V _{OUT}	TP5 V _{OUT} _GND sense pin and test point

Test setup

[Fig. 2](#) shows the typical setting of NEX30606 EVB. Apply an input voltage of 1.8 V to 5.0 V to V_{IN}, and then enable the jumper on J1 EN connector ON, the output on V_{OUT} defaults to 1.8 V. Different output voltage can be set by changing the value of R2/R3 on V_{SEL}. Refer to [Table 2](#) for details.



Fig. 2. NEX30606 evaluation board

NEX30606 evaluation board: 1.8 V to 5.0 V, 600 mA, 220 nA ultra-low quiescent current, step-down converter**Table 2. NEX30606 output voltage setting**

V_{SET}	Output voltage setting V_{OUT} (V)	R_{SET} (kΩ) resistor value, E96 resistor, 1% accuracy
0	1.8 V	Connected to GND (no resistor needed)
1	0.7 V	3.32 kΩ
2	0.8 V	5.11 kΩ
3	0.9 V	7.50 kΩ
4	1.2 V	10.2 kΩ
5	1.3 V	13.3 kΩ
6	1.5 V	16.9 kΩ
7	1.8 V	21.5 kΩ
8	1.85 V	26.7 kΩ
9	1.9 V	52.3 kΩ
10	2.7 V	82.5 kΩ
11	2.8 V	118 kΩ
12	2.95 V	162 kΩ
13	3.0 V	210 kΩ
14	3.3 V	267 kΩ
15	0.7 V	340 kΩ or larger

4. PCB layout

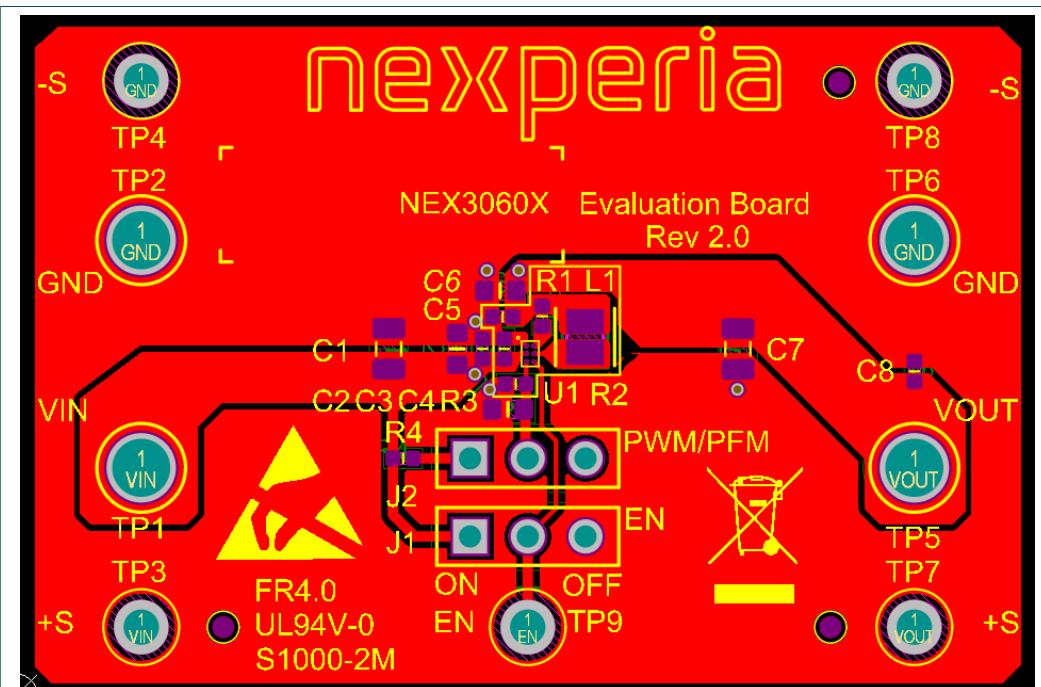


Fig. 3. Top silk screen layer

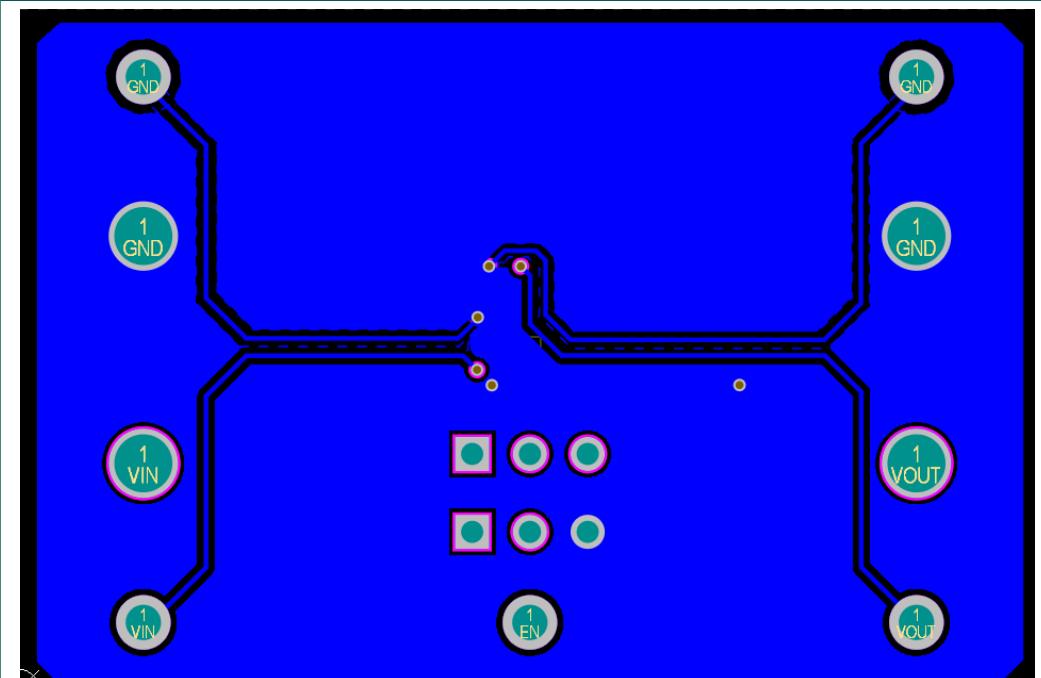


Fig. 4. Bottom silk screen layer

NEX30606 evaluation board: 1.8 V to 5.0 V, 600 mA, 220 nA ultra-low quiescent current, step-down converter

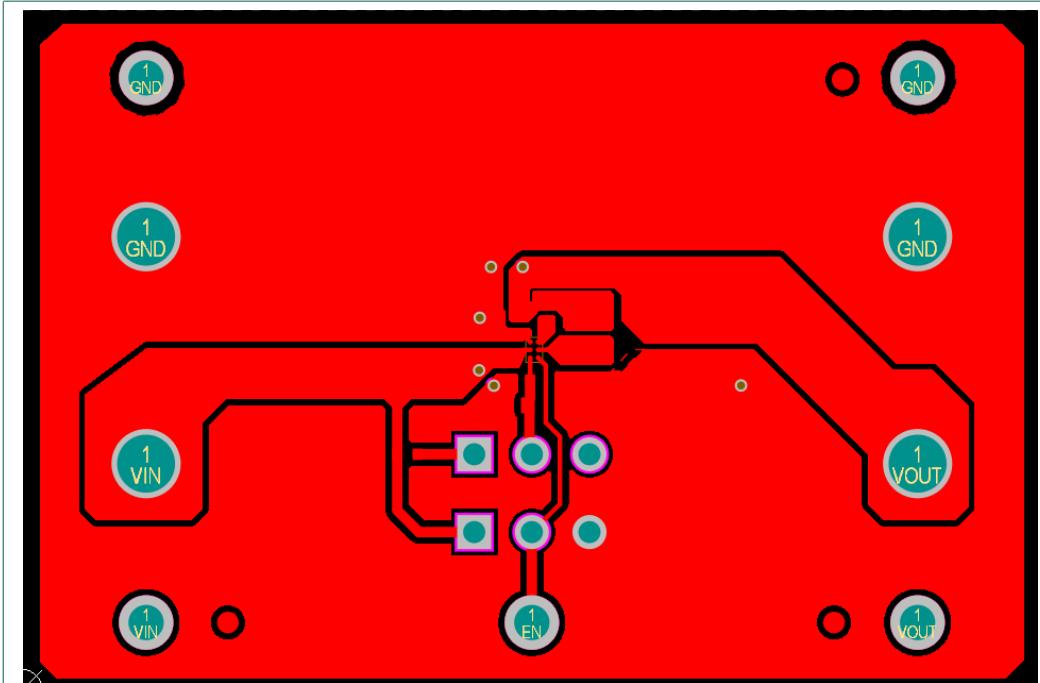


Fig. 5. Top layer

5. Bill of material

Table 3. Bill of material (BOM)

Reference	Quantity	Value	Description/Value/Package	Package	Part Number	Manufacturer
C1	1	47 μ F	CAP, 47 μ F, 6.3 V, $\pm 20\%$, X5R, 0805	0805	GRM21BR60J476ME01	muRata
C4	1	4.7 μ F	CAP, 4.7 μ F, 6.3 V, $\pm 20\%$, X5R, 0402	0402	GRM155R60J475ME87	muRata
C5, C6	2	10 μ F	CAP, 10 μ F, 6.3 V, $\pm 20\%$, X5R, 0402	0402	GRM155R60J106ME15	muRata
TP1, TP2, TP5, TP6	4	-	Terminal, Turret, TH, Double	Keystone 1502-2	1502-2	Keystone
J1, J2	2	-	Header, 100mil, 3x1, Gold, TH	3x1 Header	PBC03SAAN	Sullins Connector Solutions
L1	1	2.2 μ H	Inductor, 2.2 μ H, 2.1 A, 0.090 Ω , SMD	0806 (2016)	HTQH20120H-2R2MSR	Cyntec
R1	1	0 Ω	RES, 0 Ω , 1%, 0.05 W, 0201	0201	Std	Std
R2	1	21.5 k Ω	RES, 21.5K, 1%, 0.05 W, 0201	0201	Std	Std
TP3, TP7, TP9	3	-	Test Point, Compact, Red, TH	-	5005	Keystone
TP4, TP8	2	-	Test Point, Compact, Black, TH	-	5006	Keystone
U1	1	-	NEX30606UA	CSP-6	NEX30606	Nexperia
C2, C3, C7, C8, R3, R4	0	DNP	DNP	-	-	-

6. Revision history

Table 4. Revision history

Revision number	Date	Description
UM90042 v.1	20250212	Initial version

7. Legal information

Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of Nexperia.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — Nexperia products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Nexperia products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Nexperia does not accept any liability in this respect.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

Contents

1. Introduction.....	2
2. Schematic.....	3
3. General configuration and description.....	4
4. PCB layout.....	6
5. Bill of material.....	7
6. Revision history.....	8
7. Legal information.....	9

© Nexperia B.V. 2025. All rights reserved

For more information, please visit: <http://www.nexperia.com>

For sales office addresses, please send an email to: salesaddresses@nexperia.com

Date of release: 12 February 2025
