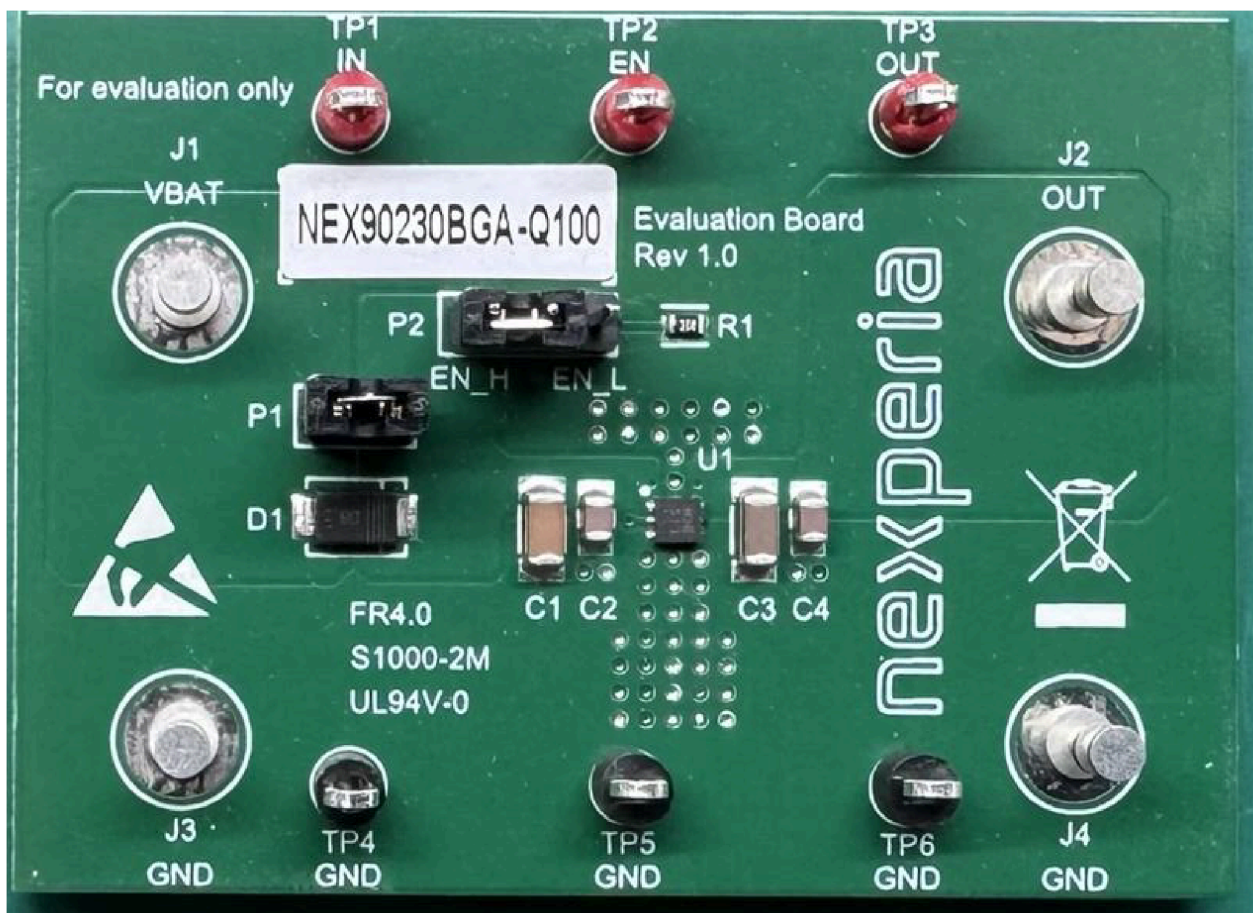




NEX90230BGA-Q100 300 mA, 40 V low I_q (5.3 μA) LDO evaluation board



Abstract: This user manual describes the NEX90230BGA-Q100 evaluation board (EVB). The NEX90230BGA-Q100 is a 40 V, 300 mA low-dropout (LDO) linear regulator with only 5.3 μA typical quiescent current at light load for automotive always on/stand by applications. This document contains the EVB schematic and configuration, bill of materials (BOM) and board layouts.

Keywords: NEX90230BGA-Q100, LDO linear regulator, ultra-low operating quiescent current, evaluation board

1. Introduction

This evaluation board is designed for NEX90230BGA-Q100. The NEX90230BGA-Q100 device is an LDO designed for up to 40 V input voltage with maximum 300 mA output current. The EVB helps engineers to evaluate the operation and performance of NEX90230BGA-Q100.

1.1. Features

The following features are available on this EVB:

- Input voltage range: 3 V to 40 V
- Output voltage and current:
 - 3.3 V/300 mA
 - 5 V/300 mA
- Use jumpers to enable or disable device output

1.2. Applications

NEX90230BGA-Q100 is used in the following applications:

- Body control modules (BCMs)
- Automotive lighting
- Automotive head units & clusters
- Telematics control units
- Powertrain of electric vehicles (EV) and hybrid electric vehicles (HEV)

1.3. Target EVBs for this document

This user manual is applicable to the EVBs listed in [Table 1](#).

Table 1. Target EVBs and type numbers

Target EVBs	Type number
NEVB-NEX90230BGA	NEX90230BGA-Q100
NEVB-NEX90230AGA	NEX90230AGA-Q100
NEVB-NEX90215BGA	NEX90215BGA-Q100
NEVB-NEX90215AGA	NEX90215AGA-Q100

2. Schematic

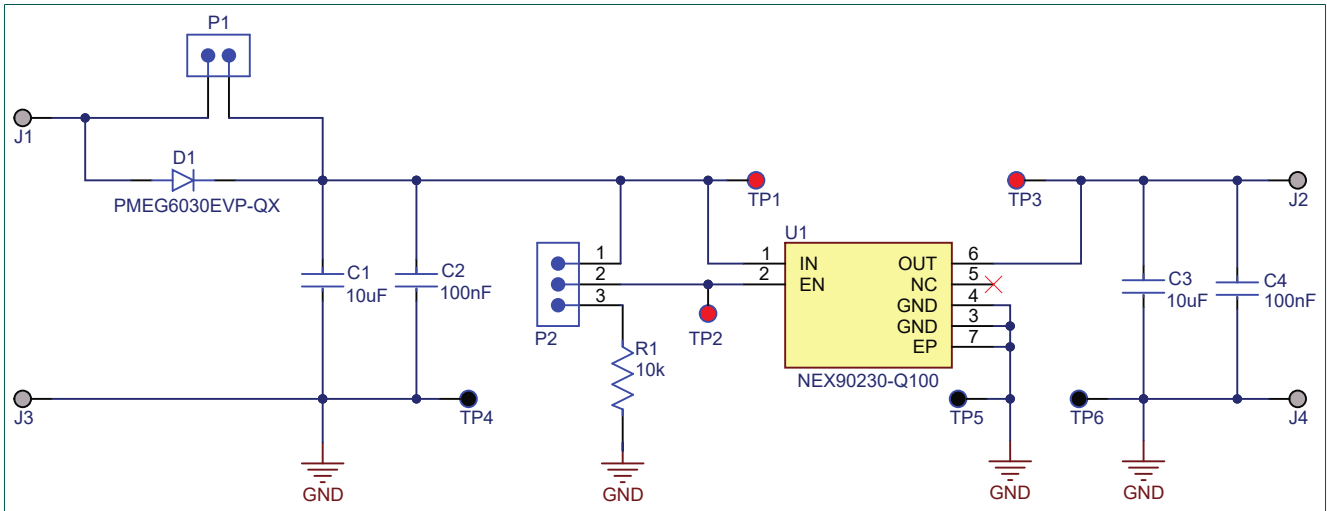


Fig. 1. NEVB-NEX90230BGA schematic diagram

3. General configuration and description

This section describes the connectors and test points on the EVB and how to properly connect, set up and use the NEVB-NEX90230BGA.

3.1. Physical access

[Table 2](#) lists the NEVB-NEX90230BGA connectors and test point functionality.

Table 2. Connectors and test points

Connector	Label	Descriptions
J1	VBAT	This connector is the input of the EVB
J2	OUT	This connector is the output of the EVB
J3, J4	GND	These connectors are the ground connector of the EVB
P1	N/A	This jumper is for bypass of reverse diode D1
P2	N/A	This connector is used to enable or disable configuration
TP1	IN	Device input test point
TP2	EN	Enable test point
TP3	OUT	Output test point
TP4, TP5, TP6	GND	Ground test points

3.2. Test setup

The following steps show how to set up this EVB.

1. EN ties to IN (pin 2 of P2 connected to pin 1) with enable status or ties to GND (pin 2 of P2 connected to pin 3) with disabled status.
2. P1 is floating to connect reverse diode or short together to bypass reverse diode.
3. Connect a power supply with positive voltage between J1 (VBAT) and J3 (GND) connectors, and ensure that the input range is 3 V to 40 V.
4. Connect a load from 0 mA to 300 mA between the J2 (OUT) and J4 (GND) connectors.
5. Turn on the input power supply.
6. Measure the respective parameters by using test points (TP1 to TP6).

4. PCB layout

Figure 2 and Figure 3 show the PCB layouts for the NEVB-NEX90230BGA.

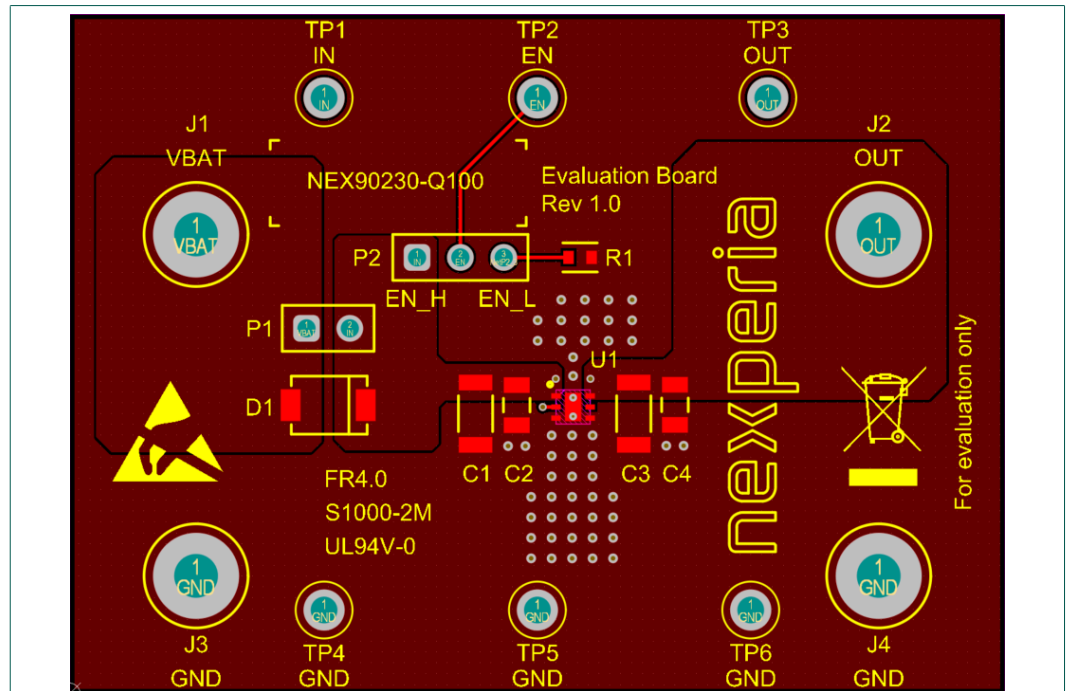


Fig. 2. NEVB-NEX90230BGA top layer routing

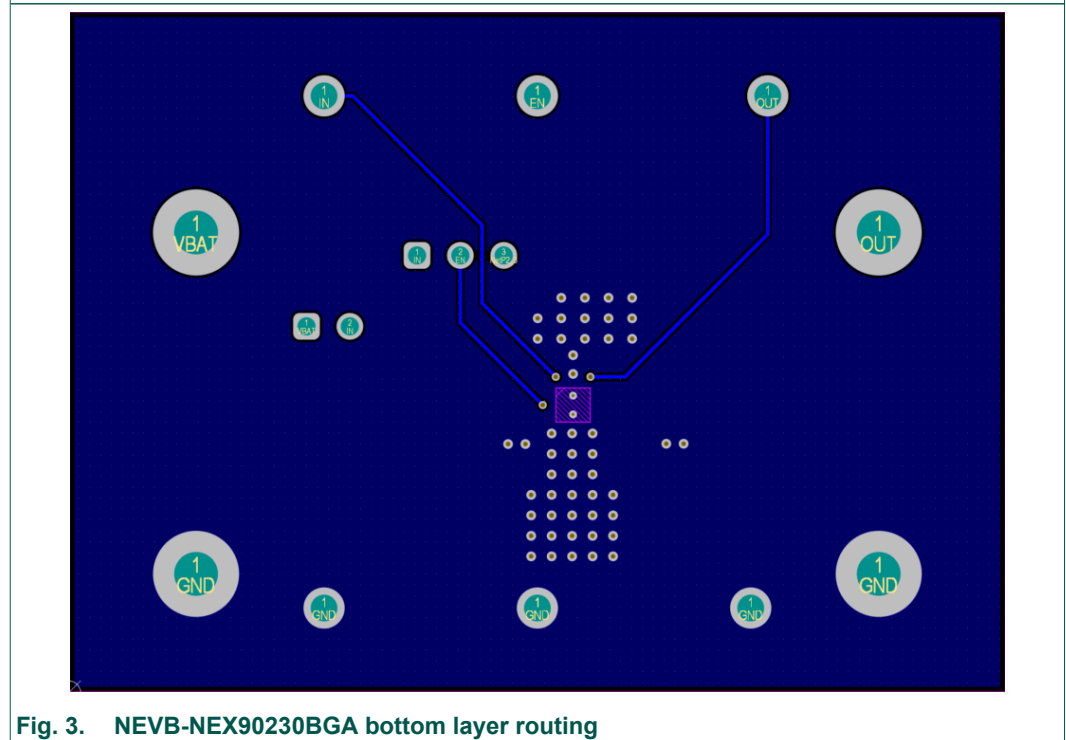


Fig. 3. NEVB-NEX90230BGA bottom layer routing

5. Bill of materials

[Table 2](#) details the bill of materials of NEVB-NEX90230BGA.

Table 3. Bill of materials (BOM)

Designator	Value	Description	Quantity	Part number	Manufacturer
C1	10 μ F	Cap Ceramic 1 μ F 50 V X7R 10% Pad SMD 1206 125 °C Automotive T/R	1	CGA5L1X7R1H106KT0Y0N	TDK
C2, C4	100 nF	Cap Ceramic 100 nF 100 V X7R 10% Pad SMD 0805 125 °C Automotive T/R	2	CGA4J2X7R2A104K125AA	TDK
C3	10 μ F	Cap Ceramic 10 μ F 16 V X7R 10% Pad SMD 1206 125 °C Automotive T/R	1	CGA5L1X7R1C106K160AC	TDK
D1	SMA	PMEG6030EVP-Q - High-temperature 60 V, 3 A Schottky barrier rectifier	1	PMEG6030EVP-QX	Nexperia
J1, J2, J3, J4	TH	Terminal DBL Turret, Through Hole, RoHS	4	1502-2	Keystone Electronics
P1	TH	CONN HEADER VERT 2POS 2.54 MM	1	61300211121	We-online
P2	TH	CONN HEADER VERT 3POS 2.54 MM	1	61300311121	We-online
R1	10 k Ω	RES Thick Film, 10 k Ω , 5%, 0.1 W, 200 ppm/°C, 0603	1	RC0603FR-0710KL	YAGEO
TP1, TP2, TP3	TH	PC TEST POINT COMPACT BLACK	4	5005	Keystone Electronics
TP4, TP5, TP6	TH	PC TEST POINT COMPACT BLACK	4	5006	Keystone Electronics
U1	-	300 mA High Voltage Ultra-Low Iq Low Dropout Regulator	1	NEX90230-Q100	Nexperia

6. Revision history

Table 4. Revision history

Revision number	Release date	Description
UM90089 v. 1	20260128	Initial version

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