

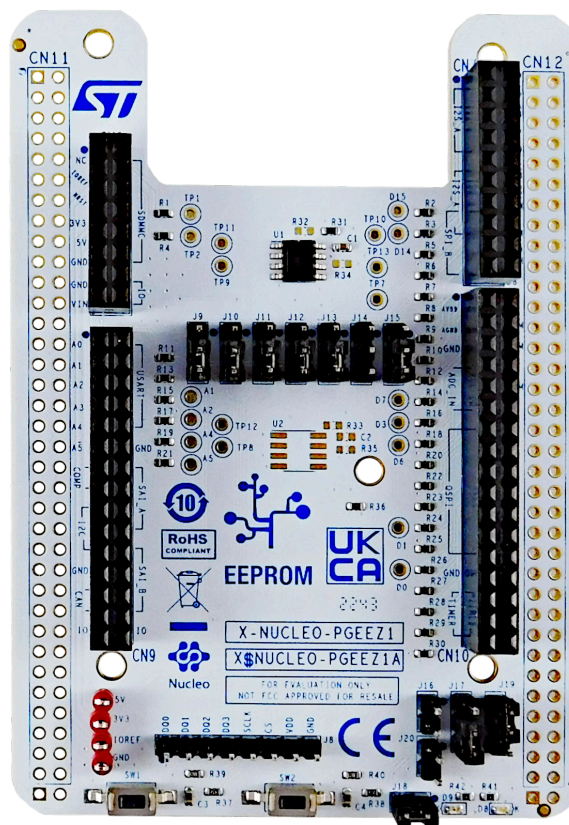
Getting started with the X-NUCLEO-PGEEZ1 standard SPI page EEPROM memory expansion board based on M95P32 series for STM32 Nucleo

Introduction

The X-NUCLEO-PGEEZ1 expansion board is designed for the M95P32 series SPI page EEPROM for data reading and writing. This expansion board allows developers to evaluate the new memory page EEPROM through a single/dual/quad SPI interface. It acts as an external storage device that can be used to store data, such as manufacturing traceability, calibration, user settings, error flags, data logs, and monitoring data to build more flexible and accurate applications.

The X-NUCLEO-PGEEZ1 expansion board can be plugged on top of an STM32 Nucleo-144 (via ZIO connectors) or STM32 Nucleo-64 (via Arduino® UNO R3 connectors).

Figure 1. X-NUCLEO-PGEEZ1 expansion board



1 Acronyms and abbreviations

Table 1. List of acronyms

Acronym	Description
EEPROM	Electrically erasable programmable read only memory
MHz	Mega Hertz
MCU	Microcontroller unit
SPI	Serial peripheral interface

2 Getting started

2.1 Overview

The X-NUCLEO-PGEEZ1 main features are:

- Up to 32-Mbits SPI bus embedded page EEPROM
- 50 MHz read single output
- 80 MHz fast read single/dual/quad output with one dummy byte
- Page program with buffer load
- Ultra-low power consumption
- Free comprehensive development firmware library and sample implementation available when the X-NUCLEO-PGEEZ1 expansion board is plugged on top of a NUCLEO-F401RE, NUCLEO-L053R8, NUCLEO-G474RE, or NUCLEO-H743ZI development board
- Developer can choose and solder an EEPROM to be tested using the evaluation software provided

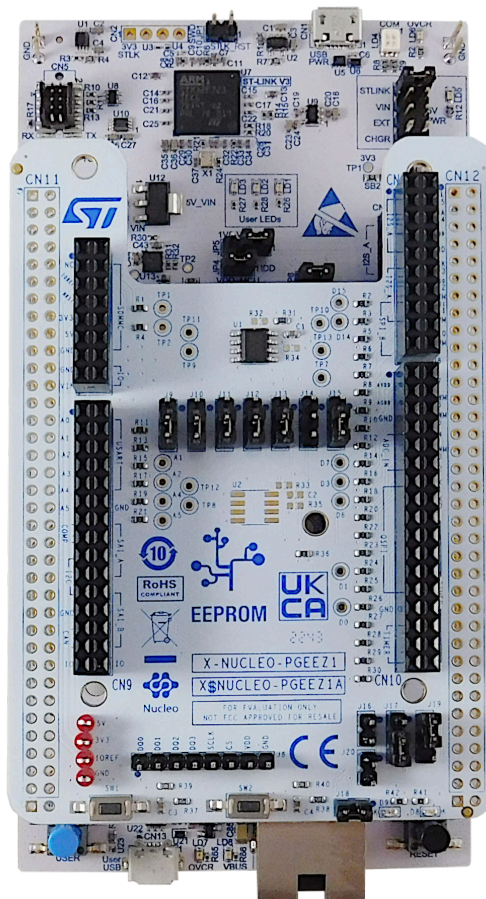
2.2 Typical applications

The X-NUCLEO-PGEEZ1 expansion board acts as an external storage device, which can be used to store data such as manufacturing traceability, calibration data, user setting, error flags, data log, and monitoring to make applications more flexible and accurate.

2.3 Hardware requirements

To use STM32 Nucleo development boards with the X-NUCLEO-PGEEZ1 expansion board, connect the boards as shown below.

Figure 2. X-NUCLEO-PGEEZ1 expansion board connected to an STM32 Nucleo development board



The EEPROM communicates with the [STM32 Nucleo](#) development board host microcontroller through the SPI signals available on the Arduino® UNO R3 connector.

The [X-NUCLEO-PGEEZ1](#) has been designed to be used on any [STM32 Nucleo](#) development board, although complete testing has been performed using the [NUCLEO-F401RE](#), [NUCLEO-L053R8](#), [NUCLEO-G474RE](#), and [NUCLEO-H743ZI](#) development boards.

2.4 System requirements

To use the [STM32 Nucleo](#) development boards with the [X-NUCLEO-PGEEZ1](#) expansion board, you need:

- a Windows PC/laptop (Windows 7 or above) to install the firmware package ([X-CUBE-EEPRMA1](#))
- a type A to Mini-B USB cable to connect the [STM32 Nucleo](#) development board to the PC
- an [STM32 Nucleo](#) development board ([NUCLEO-F401RE](#), [NUCLEO-L053R8](#), [NUCLEO-G474RE](#) or [NUCLEO-H743ZI](#))
- an [X-NUCLEO-PGEEZ1](#) expansion board

2.5 Board setup

Follow the table below for the correct jumper settings.

Table 2. X-NUCLEO-PGEEZ1 jumper settings

Jumper	Name	Configuration (for STM32 Nucleo-144 board)	Configuration (for STM32 Nucleo-64 board)
J09	M95_MOSI	2-3	1-2
J10	M95_MISO	2-3	1-2
J11	M95_WPn	2-3	1-2
J12	M95_Hn	2-3	1-2
J13	U1_CS	2-3	1-2
J15	M95_SCLK	2-3	1-2
J17	M95_VDD	2-3	2-3
J19	USR_VDD	1-2	1-2

3 Hardware description and configuration

3.1 Interconnection details

The X-NUCLEO-PGEEZ1 expansion board and the NUCLEO-F401RE, NUCLEO-L053R8, NUCLEO-G474RE or NUCLEO-H743ZI board connection details are listed below.

Table 3. X-NUCLEO-PGEEZ1 and NUCLEO-F401RE connection details (left connector)

Signal name													
NC	IORF	RES ET	3V3	5V	GND	GND	VIN	A0	A1	A2	A3	A4	A5
Connector name													
CN6 Power							CN8 Analog						
Pin number													
1	2	3	4	5	6	7	8	1	2	3	4	5	6
NUCLEO-F401RE MCU port													
								PA0	PA1	PA4	PB0	PC1	PC0
NUCLEO-F401RE MCU signals													
	3.3 V REF	RES ET	3.3 V input/ output	5 V output	GND	GND	POWER INPUT	ADC1 _0	ADC1 _1	ADC1 _4	ADC1_8	ADC1_11(P C1) or I2C1_SDA(PB9)	ADC1_10(P C0) or I2C1_SCL(P B8)
X-NUCLEO-PGEEZ1 expansion board signals													
NC			3V3		GND	GND						M95_Hn_ DQ3	

Table 4. X-NUCLEO-PGEEZ1 and NUCLEO-F401RE connection details (right connector)

Signal name																	
D15	D14	AREF	GND	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Connector name																	
CN5 Digital										CN9 Digital							
Pin number																	
10	9	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
NUCLEO-F401RE MCU port																	
PB8	PB9			PA5	PA6	PA7	PB6	PC7	PA9	PA8	PB10	PB4	PB5	PB3	PA10	PA2	PA3
NUCLEO-F401RE MCU signals																	
				SPI1_SCK	SPI1_MISO	TIM1_CH1N SPI1_MOSI	TIM4_CH4 SPI1_CS										
X-NUCLEO-PGEEZ1 expansion board signals																	
				M95_SCLK	M95_MISO_DQ1	M95_MOSI_DQ0	M95_WPn_DQ2		U1_CS								

Table 5. X-NUCLEO-PGEEZ1 and NUCLEO-L053R8 connection details (left connector)

Signal name													
NC	IOR EF	RES ET	3V3	5V	GND	GND	VIN	A0	A1	A2	A3	A4	A5
Connector name													
CN6 Power							CN8 Analog						
Pin number													
1	2	3	4	5	6	7	8	1	2	3	4	5	6
NUCLEO- L053R8 MCU port													
								PA0	PA1	PA4	PB0	PC1/PB9	PC0/PB8
NUCLEO-L053R8 MCU signals													
	3.3 V REF	RES ET	3.3 V input / output	5 V output	GND	GND	POW ER INPU T	ADC_I N0	ADC_I N1	ADC_I N4	ADC_IN8	ADC_IN11(P C1) or I2C1_SDA(P B9)	ADC_IN10(P C0) or I2C1_SCL(P B8)
X-NUCLEO-PGEEZ1 expansion board signals													
NC			3V3		GND	GND						M95_Hn_ DQ3	

Table 6. X-NUCLEO-PGEEZ1 and NUCLEO- L053R8 connection details (right connector)

Signal name																	
D1 5	D1 4	AR EF	GN D	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Connector name																	
CN5 Digital										CN9 Digital							
Pin number																	
10	9	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
NUCLEO- L053R8 MCU port																	
PB 8	PB 9			PA5	PA6	PA7	PB6	PC 7	PA9	PA8	PB 10	PB 4	PB 5	PB 3	PA1 0	PA2	PA3
NUCLEO- L053R8 MCU signals																	
				SPI1_ SCK	SPI1_MIS O	TIM12_C H2 SPI1_MO S	SPI1_CS										
X-NUCLEO-PGEEZ1 expansion board signals																	
				M95_ SCLK	M95_MIS O_DQ1	M95_MO SI_DQ0	M95_WP n_DQ2										U1 _C _S

Table 7. X-NUCLEO-PGEEZ1 and NUCLEO-G474RE connection details (left connector)

Signal name													
NC	IOR EF	RES ET	3V3	5V	GND	GND	VIN	A0	A1	A2	A3	A4	A5
Connector name													
CN6 Power							CN8 Analog						
Pin number													
1	2	3	4	5	6	7	8	1	2	3	4	5	6
NUCLEO-G474RE MCU port													
								PA0	PA1	PA4	PB0	PC1/PB9	PC0/PB8
NUCLEO-G474RE MCU signals													
	3.3 V REF	RES ET	3.3 V input / output	5 V output	GND	GND	POWER INPUT	ADC_I N0	ADC_I N1	ADC_I N4	ADC_IN8	ADC_IN11(P C1) or I2C1_SDA(P B9)	ADC_IN10(P C0) or I2C1_SCL(P B8)
X-NUCLEO-PGEEZ1 expansion board signals													
NC			3V3		GND	GND						M95_Hn_ DQ3	

Table 8. X-NUCLEO-PGEEZ1 and NUCLEO-G474RE connection details (right connector)

Signal name																	
D1 5	D1 4	AR EF	GN D	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Connector name																	
CN5 Digital										CN9 Digital							
Pin number																	
10	9	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
NUCLEO-G474RE MCU port																	
PB 8	PB 9			PA5	PA6	PA7	PB6	PC 7	PA9	PA8	PB 10	PB 4	PB 5	PB 3	PA1 0	PA2	PA3
NUCLEO-G474RE MCU signals																	
				SPI1_ SCK	SPI1_MIS O	TIM12_C H2 SPI1_MO S	SPI1_CS										
X-NUCLEO-PGEEZ1 expansion board signals																	
				M95_ SCLK	M95_MIS O_DQ1	M95_MO SI_DQ0	M95_WP n_DQ2		U1 _C S								

Table 9. X-NUCLEO-PGEEZ1 and NUCLEO- H743ZI connection details (left connector)

Signal name							
NC	IOREF	RESET	+3V3	+5V	GND	GND	VIN
Connector name							
CN8 Power							
Pin number							
1	3	5	7	9	11	13	15
NUCLEO- H743ZI MCU port							
NC	IOREF	NRST	3V3	5V	GND	GND	VIN
NUCLEO- H743ZI MCU signals							
NC	IOREF	NRST	3V3	5V	GND	GND	VIN
X-NUCLEO-PGEEZ1 expansion board signals							
NC			3V3		GND	GND	

Table 10. X-NUCLEO-PGEEZ1 and NUCLEO- H743ZI connection details (right connector)

Signal name																
AV DD	AG ND	GN D	A6	A7	A8	D26	D27	GN D	D28	D29	D30	D31	GN D	D3 2	D3 3	D3 4
Connector name																
CN10																
Pin number																
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33
NUCLEO- H743ZI MCU port																
VD DA	AG ND	GN D	PF 4	PF 5	PF 6	PG6	PB2	GN D	PD13	PD12	PD11	PE2	GN D	PA 0	PB 0	PE 0
NUCLEO- H743ZI MCU signals																
						QSPI1_NCS	QSPI1_CLK		QSPI1_IO	QSPI1_IO	QSPI1_IO	QSPI1_I O				
X-NUCLEO-PGEEZ1 expansion board signals																
						U1_C S	M95_SCLK		M95_H n_DQ3	M95_MIS O_DQ1	M95_MO SI_DQ0	M95_WP n_DQ2				

3.2 Current measurement

J17 can be used to monitor the SPI device power consumption. Connect an ammeter probe between the connector pin 1 and pin 2 for measurements.

3.3 X-NUCLEO-PGEEZ1 component placement details

Figure 3. X-NUCLEO-PGEEZ1 component placement details

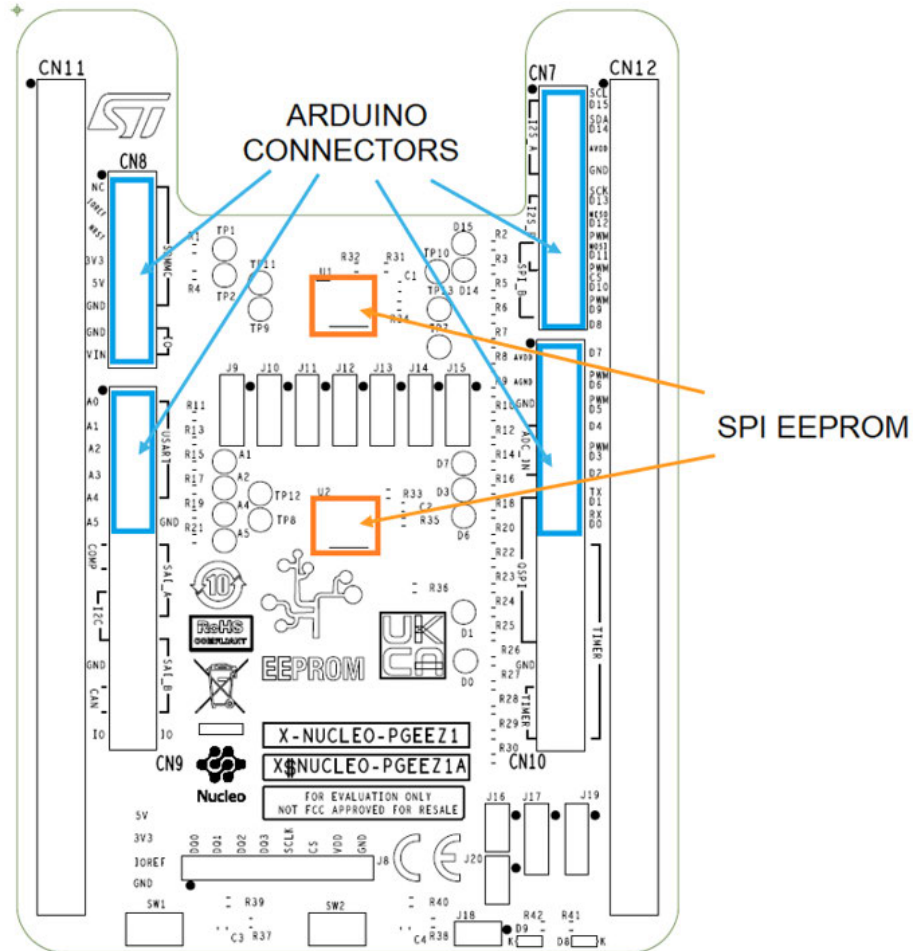


Figure 4. X-NUCLEO-PGEEZ1 top view layout

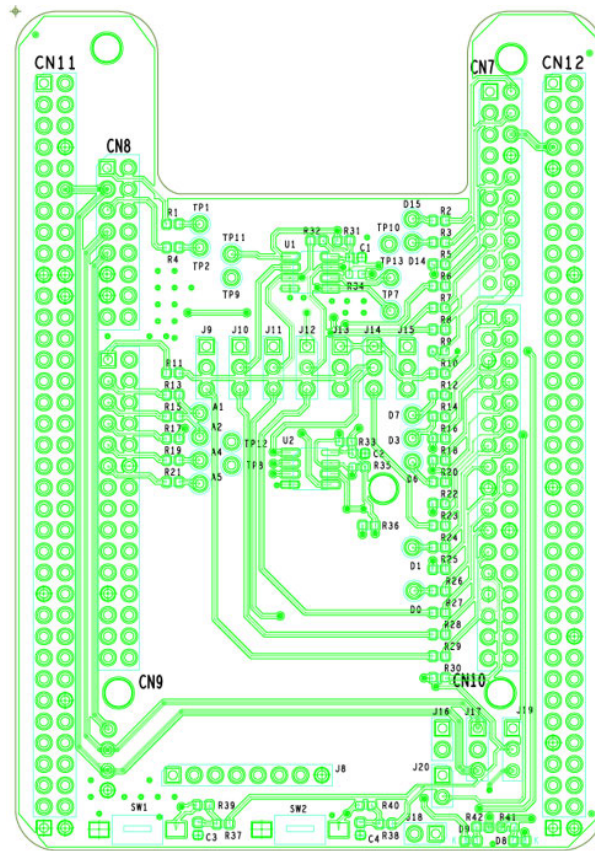
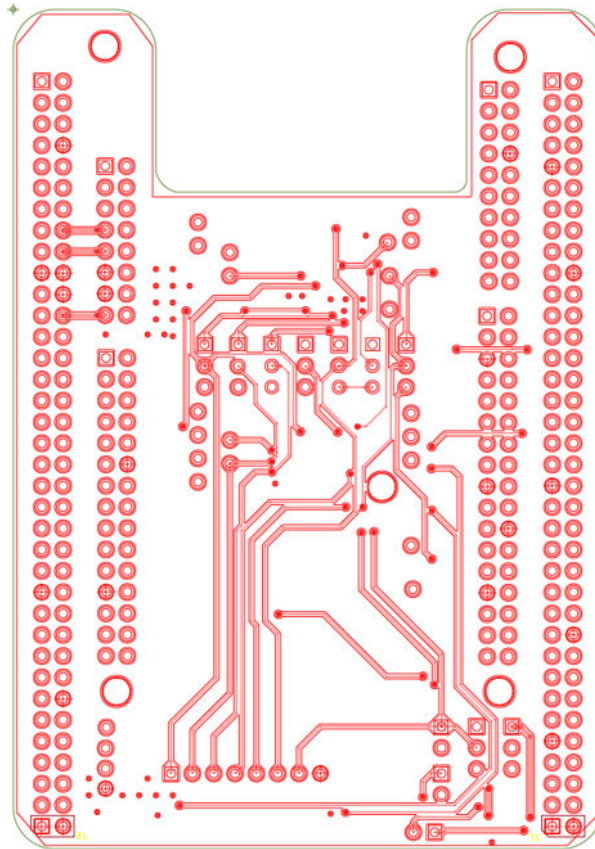


Figure 5. X-NUCLEO-PGEEZ1 bottom view layout



4 Component description

4.1 M95P32-I

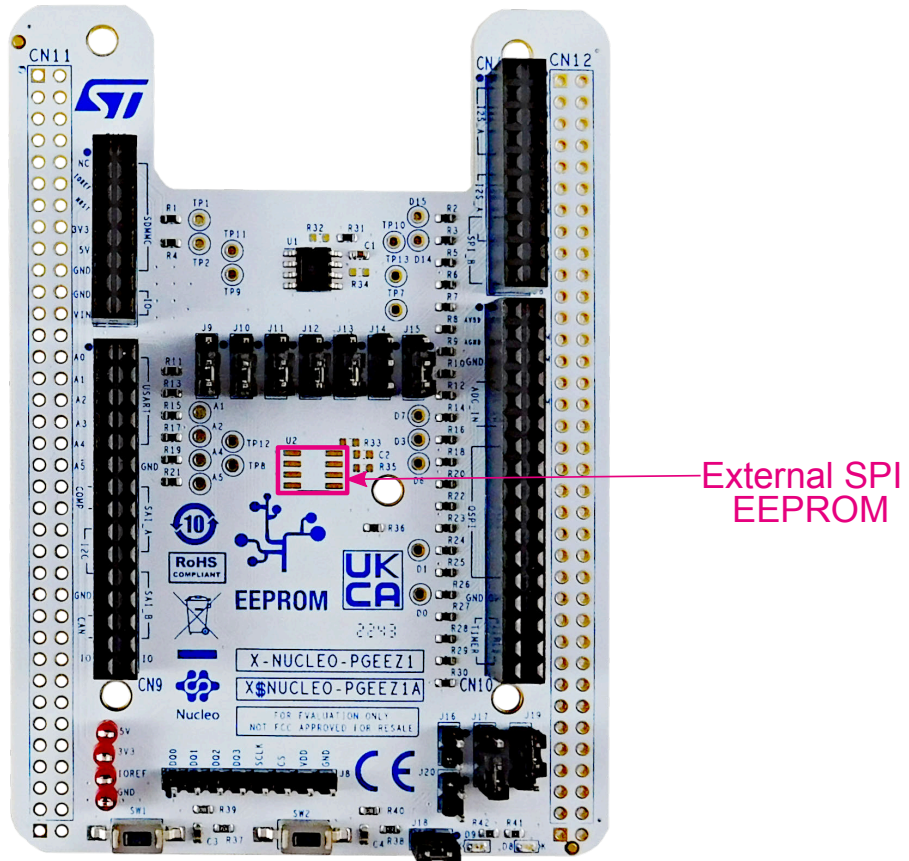
Table 11. M95P32-I details

Feature	Description
Sales type	M95P32
Package	UFDFPN8
Single supply voltage	1.6 to 3.6 V (ambient operating temperature)

5 External EEPROMs

You can easily solder a specific SPI EEPROM density to be used with the X-NUCLEO-PGEEZ1 expansion board.

Figure 6. External SPI EEPROM provision on the X-NUCLEO-PGEEZ1 expansion board



6 Board versions

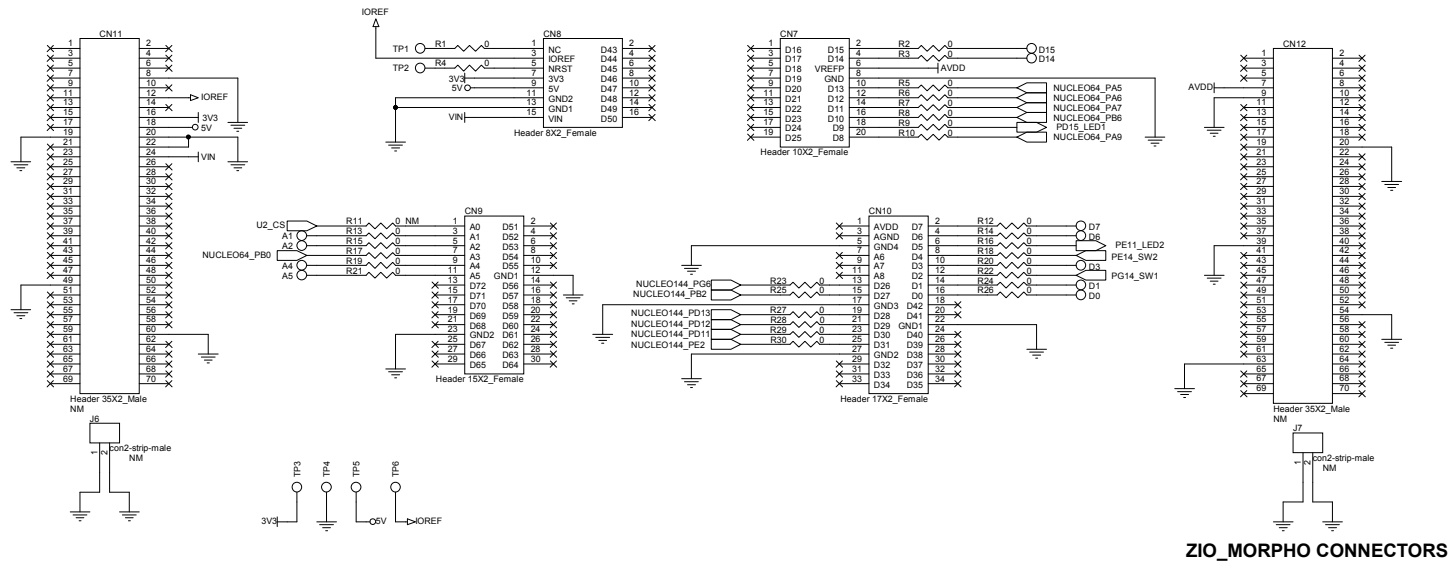
Table 12. X-NUCLEO-PGEEZ1 versions

PCB version	Schematic diagrams	Bill of materials
X\$NUCLEO-PGEEZ1A ⁽¹⁾	X\$NUCLEO-PGEEZ1A schematic diagrams	X\$NUCLEO-PGEEZ1A bill of materials

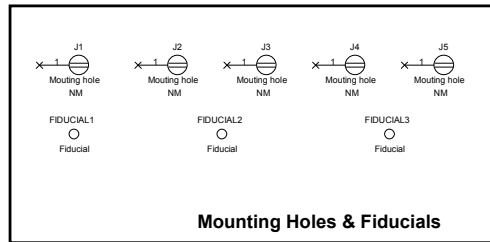
1. This code identifies the X-NUCLEO-PGEEZ1 expansion board first version. It is printed on the board PCB.

7 Schematic diagrams

Figure 7. X-NUCLEO-PGEEZ1 circuit schematic (1 of 4)



ZIO_MORPHO CONNECTORS



Mounting Holes & Fiducials



Figure 8. X-NUCLEO-PGEEZ1 circuit schematic (2 of 4)

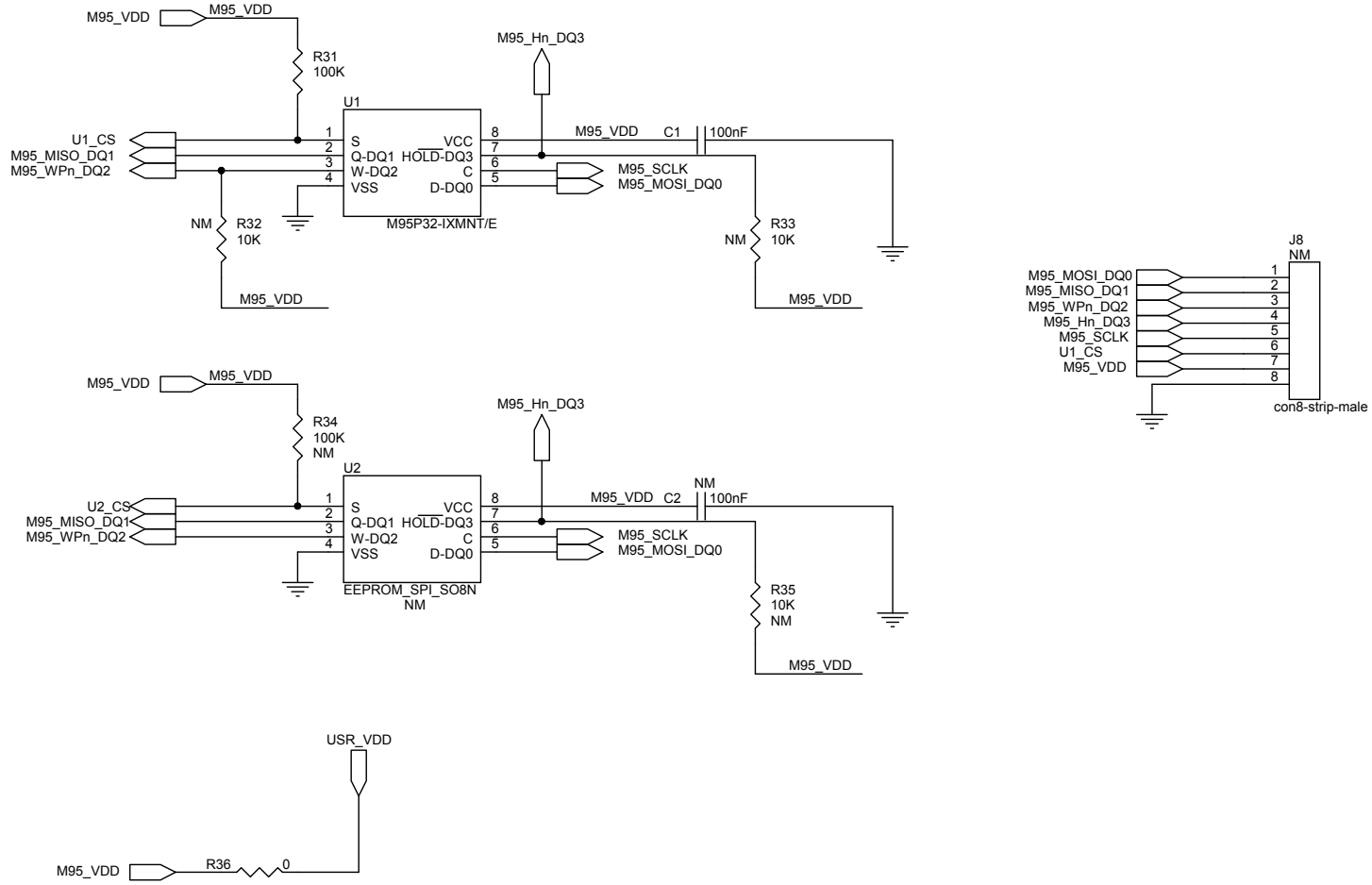
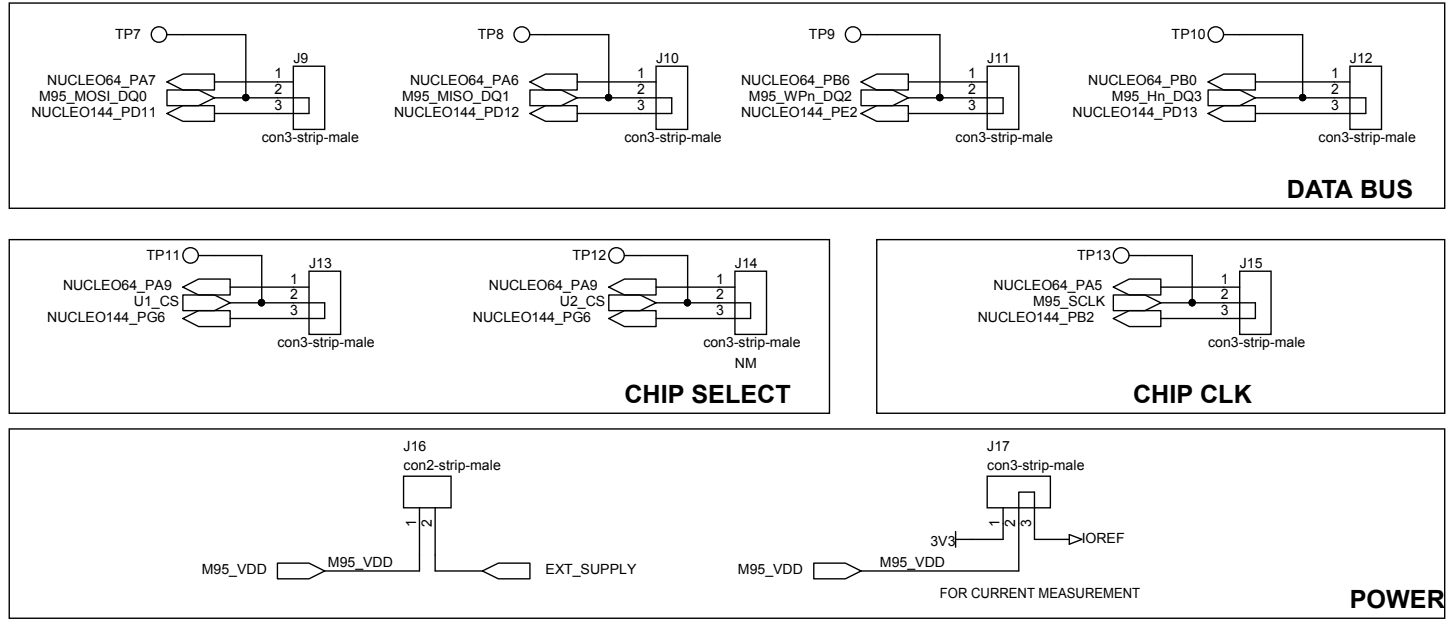


Figure 9. X-NUCLEO-PGEEZ1 circuit schematic (3 of 4)

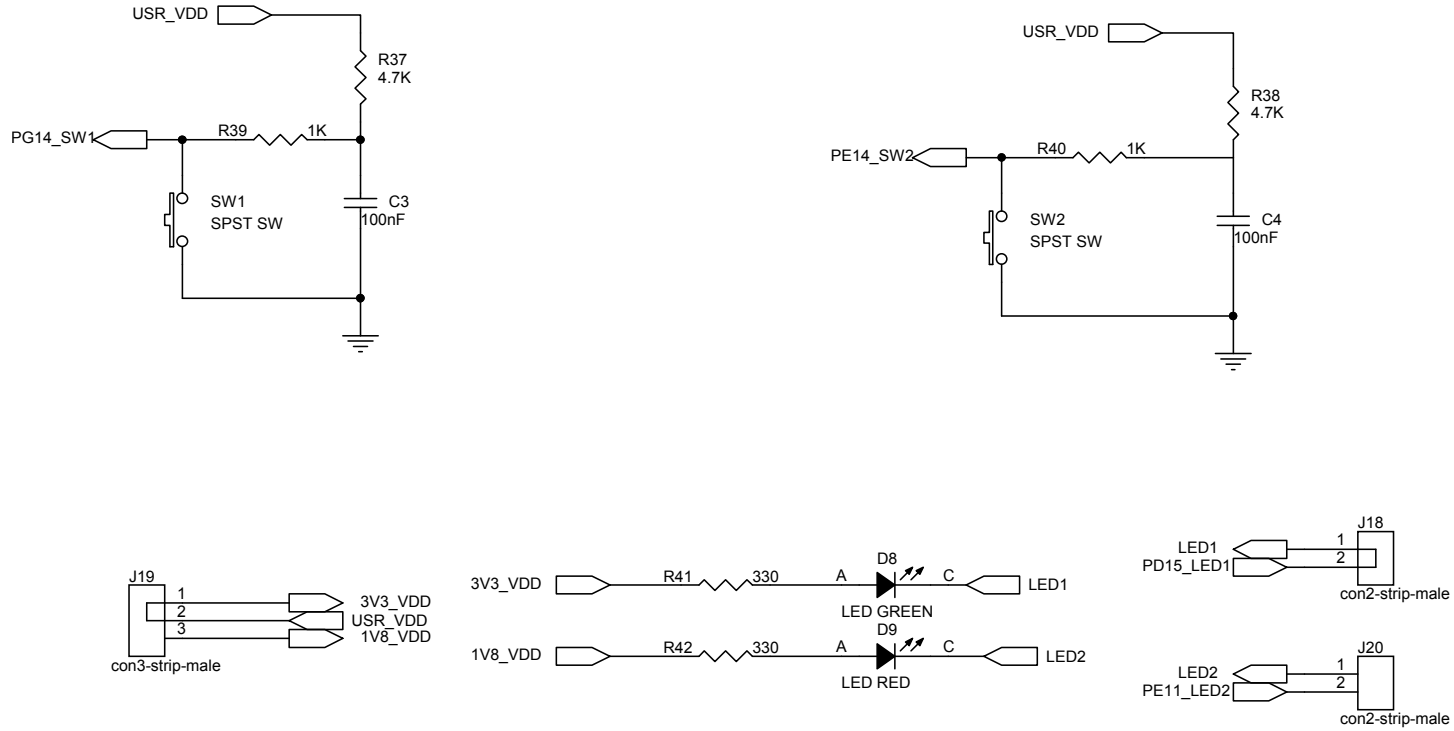


	J16	J17
1.External Supply	Short 1 and 2	Connectors to be left open
1.IOREF	Unshort 1 and 2	Short 2 and 3 (default)
3.3V3	Unshort 1 and 2	Short 1 and 2

	NUCLEO-144	NUCLEO-64
U1 (J13)	Short 2 and 3	Short 1 and 2
U2 (J14) No Jumper on J13	Short 2 and 3	Short 1 and 2



Figure 10. X-NUCLEO-PGEEZ1 circuit schematic (4 of 4)



IOREF as 3V3 (As per JP5 on NUCLEO H743ZI)	SHORT 1 & 2 of J19 Default	SHORT 1 & 2 of J18 (UNSHORT 1 & 2 of J20) Default
IOREF as 1V8 (As per JP5 on NUCLEO H743ZI)	SHORT 2 & 3 of J19	SHORT 1 & 2 of J20 (UNSHORT 1 & 2 of J18)



8 Bill of materials

Table 13. X-NUCLEO-PGEEZ1 bill of materials

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part Number
1	4	TP3 TP4 TP5 TP6	TP, 0.100" Dia x 0.180" L (2.54mm x 4.57mm)	TEST POINT PC MINI .040"D RED	Keystone Electronics	5000
2		C1 C3 C4	100nF, 0603 (1608 Metric), 16 V, ±10 %	CAP CER 0.1UF 16V X7R 0603	KEMET	C0603C104K4RACTU
3	1	C2 NM	100nF, 0603 (1608 Metric), 16 V, ±10 %	CAP CER 0.1UF 16V X7R 0603	KEMET	C0603C104K4RACTU
4	1	CN7	Header 10X2_Female, Header 10X2_female_2.54mm pitch	CONN HEADER FEMALE .100 DUAL STR 20POS	Samtec Inc.	SSW-110-23-H-D
5	1	CN8	Header 8X2_Female, Header 8X2_female_2.54mm pitch	CONN HEADER FEMALE .100 DUAL STR 16POS	Samtec Inc.	SSW-108-23-H-D
6	1	CN9	Header 15X2_Female, Header 15X2_female_2.54mm pitch	CONN HEADER FEMALE .100 DUAL STR 30POS	Samtec Inc.	SSW-115-23-H-D
7	1	CN10	Header 17X2_Female, Header 17X2_female_2.54mm pitch	CONN HEADER FEMALE .100 DUAL STR 34POS	Samtec Inc.	SSW-117-23-H-D
8	2	CN11, CN12	Header 35X2_Male_2.54mm pitch	CONN HEADER .100 DUAL STR 70POS (not mounted)	Samtec Inc.	HTSW-135-07-H-D
9	1	D8	LED GREEN, 0603 (1608 Metric), 20mA	LED GREEN CLEAR 0603 SMD	Würth Elektronik	150060GS75000
10	1	D9	LED RED, 0603 (1608 Metric), 20mA	LED RED CLEAR 0603 SMD	Würth Elektronik	150060RS75000
11	2	J18 J20	con2-strip-male, CON_2.54mm Pitch	CONN HEADER VERT 2POS	Amphenol	77311-118-02LF
12	1	J8	con8-strip-male, 8-pin Male Header_2.54m m pitch,	CONN HEADER .100 STR 8POS	Amphenol	77311-118-08LF
13	8	J9 J10 J11 J12 J13 J15 J17 J19	con3-strip-male, 3-pin Male Header_2.54m m pitch,	CONN HEADER .100 STR 3POS	Amphenol	77311-118-03LF

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part Number
14	1	J14	3-pin Male Header_2.54mm pitch	CONN HEADER .100 STR 3POS	Amphenol	77311-118-03LF
15	1	J16	3-pin Male Header_2.54mm pitch	CONN HEADER .100 STR 3POS	Amphenol	77311-118-02LF
16	30	R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R36	0, 0603 (1608 Metric), 0.1W, 1/10 W, 1 %	RES SMD 0 OHM JUMPER 1/10W 0603	TE Connectivity Passive Product	CRG0603ZR
17	1	R11	0, 0603 (1608 Metric), 0.1W, 1/10 W, 1 %	RES SMD 0 OHM JUMPER 1/10W 0603	TE Connectivity Passive Product	CRG0603ZR
19	3	R32 R33 R35 NM	10K, 0603 (1608 Metric), 0.1W, 1/10 W, 0.5 %	RES SMD 10K OHM 0.5% 1/10W 0603	Yageo	RT0603DRE0710KL
20	1	R34	100K, 0603 (1608 Metric), 0.1W, 1/10 W, 0.5 %	RES SMD 100K OHM 0.5% 1/10W 0603 (not mounted)	Yageo	RT0603DRE07100KL
21	2	R37 R38	4.7K, 0603 (1608 Metric), 0.1W, 1/10 W, 1 %	RES SMD 4.7K OHM 1% 1/10W 0603	Yageo	RC0603FR-074K7P
22	2	R39 R40	1K, 0603 (1608 Metric), 0.W, 1/10 W, 1 %	RES SMD 1K OHM 1% 1/10W 0603	Vishay Dale	CRCW06031K00FKEA
23	2	R41 R42	330, 0603 (1608 Metric), 0.25W, 1/4 W, 5 %	RES SMD 330 OHM 5% 1/4W 0603	Rohm Semiconductor	RHM330DTR-ND
24	2	SW1 SW2	SPST SW, 6.00mm x 3.50mm	SWITCH TACTILE SPST-NO 0.05A 24V	TE Connectivity ALCOSWITCH Switches	1437566-3
25	1	U1	M95P32, SO8	Ultra low-power 32 Mbit serial SPI page EEPROM with dual and quad output	STMicroelectronics	M95P32
26	1	U2 NM	M95P32-IXMNT/E, SO-8	Ultra low-power 32 Mbit serial SPI page EEPROM with dual and quad output	ST	M95P32-IXMNT/E
27	20	A1 A2 A4 A5 D0 D1 D3 D6 D7 D14 D15 TP1 TP2 TP7 TP8 TP9 TP10 TP11 TP12 TP13	0.100" Dia x 0.180" L (2.54mm x 4.57mm)	TEST POINT PC MINI .040"D RED (not mounted)	Keystone Electronics	5000

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part Number
28	2	J6 J7 NM	con2-strip-male, CON_2.54mm Pitch	CONN HEADER VERT 2POS	Amphenol	77311-118-02LF

9 Regulatory compliance information

Notice for US Federal Communication Commission (FCC)

For evaluation only; not FCC approved for resale

FCC NOTICE - This kit is designed to allow:

- (1) Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and
- (2) Software developers to write software applications for use with the end product.

This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter 3.1.2.

Notice for Innovation, Science and Economic Development Canada (ISED)

For evaluation purposes only. This kit generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to Industry Canada (IC) rules.

À des fins d'évaluation uniquement. Ce kit génère, utilise et peut émettre de l'énergie radiofréquence et n'a pas été testé pour sa conformité aux limites des appareils informatiques conformément aux règles d'Industrie Canada (IC).

Notice for European Union

This device is in conformity with the essential requirements of the Directive 2014/30/EU (EMC) and of the Directive 2015/863/EU (RoHS).

Notice for United Kingdom

This device is in compliance with the UK Electromagnetic Compatibility Regulations 2016 (UK S.I. 2016 No. 1091) and with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (UK S.I. 2012 No. 3032).

Revision history

Table 14. Document revision history

Date	Revision	Changes
16-Nov-2022	1	Initial release.

Contents

1	Acronyms and abbreviations	2
2	Getting started	3
2.1	Overview	3
2.2	Typical applications	3
2.3	Hardware requirements	3
2.4	System requirements	4
2.5	Board setup	4
3	Hardware description and configuration	5
3.1	Interconnection details	5
3.2	Current measurement	8
3.3	X-NUCLEO-PGEEZ1 component placement details	9
4	Component description	12
4.1	M95P32-I	12
5	External EEPROMs	13
6	Board versions	14
7	Schematic diagrams	15
8	Bill of materials	19
9	Regulatory compliance information	22
	Revision history	23
	List of tables	25
	List of figures	26

List of tables

Table 1.	List of acronyms	2
Table 2.	X-NUCLEO-PGEEZ1 jumper settings	4
Table 3.	X-NUCLEO-PGEEZ1 and NUCLEO-F401RE connection details (left connector)	5
Table 4.	X-NUCLEO-PGEEZ1 and NUCLEO-F401RE connection details (right connector)	5
Table 5.	X-NUCLEO-PGEEZ1 and NUCLEO-L053R8 connection details (left connector).	6
Table 6.	X-NUCLEO-PGEEZ1 and NUCLEO- L053R8 connection details (right connector)	6
Table 7.	X-NUCLEO-PGEEZ1 and NUCLEO-G474RE connection details (left connector)	7
Table 8.	X-NUCLEO-PGEEZ1 and NUCLEO- G474RE connection details (right connector).	7
Table 9.	X-NUCLEO-PGEEZ1 and NUCLEO- H743ZI connection details (left connector).	8
Table 10.	X-NUCLEO-PGEEZ1 and NUCLEO- H743ZI connection details (right connector).	8
Table 11.	M95P32-I details	12
Table 12.	X-NUCLEO-PGEEZ1 versions	14
Table 13.	X-NUCLEO-PGEEZ1 bill of materials	19
Table 14.	Document revision history	23

List of figures

Figure 1.	X-NUCLEO-PGEEZ1 expansion board	1
Figure 2.	X-NUCLEO-PGEEZ1 expansion board connected to an STM32 Nucleo development board	3
Figure 3.	X-NUCLEO-PGEEZ1 component placement details	9
Figure 4.	X-NUCLEO-PGEEZ1 top view layout	10
Figure 5.	X-NUCLEO-PGEEZ1 bottom view layout	11
Figure 6.	External SPI EEPROM provision on the X-NUCLEO-PGEEZ1 expansion board	13
Figure 7.	X-NUCLEO-PGEEZ1 circuit schematic (1 of 4)	15
Figure 8.	X-NUCLEO-PGEEZ1 circuit schematic (2 of 4)	16
Figure 9.	X-NUCLEO-PGEEZ1 circuit schematic (3 of 4)	17
Figure 10.	X-NUCLEO-PGEEZ1 circuit schematic (4 of 4)	18

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2022 STMicroelectronics – All rights reserved