

PGA281EVM

This user's guide describes the characteristics, operation, and use of the evaluation module (EVM) for the [PGA281](#). This document also includes the schematic, printed circuit board (PCB) layout, and a bill of materials (BOM). Throughout this document the terms *evaluation board*, *evaluation module*, and *EVM* are synonymous with the PGA281EVM.

Contents

1	Introduction	2
2	PGA281EVM Hardware	3
3	Bill of Materials	12
4	Related Documentation from Texas Instruments	13

List of Figures

1	PGA281EVM	2
2	PGA281EVM Schematic	3
3	PGA281EVM Default Jumper Settings	4
4	Top Layer (Signal and Ground)	8
5	Layer 2 (Power)	9
6	Layer 3 (Power)	10
7	Bottom Layer (Power and Ground)	11

1 Introduction

1.1 PGA281

The [PGA281](#) is a high-precision instrumentation amplifier with pin-programmable gain, attenuation, and error detection. The PGA281 offers low offset voltage, near zero drift, and very low 1/f noise for high-resolution, precision measurement. The high supply voltage and excellent common-mode rejection comply with the requirements for universal industrial signal front-ends.

1.2 PGA281EVM

The PGA281EVM provides basic functional evaluation of the PGA281, along with the following features:

- Onboard power management circuitry generates all required power-supply rails from one split-supply input
- DIP switch allows easy setting of pin-programmable gain
- Error flag LED provides visual feedback of any detected error condition
- Easy access to pertinent nodes with test points, BNC connectors, and banana jacks
- Component footprints allow multiple filtering configurations

A picture of the PGA281EVM is shown in [Figure 1](#).

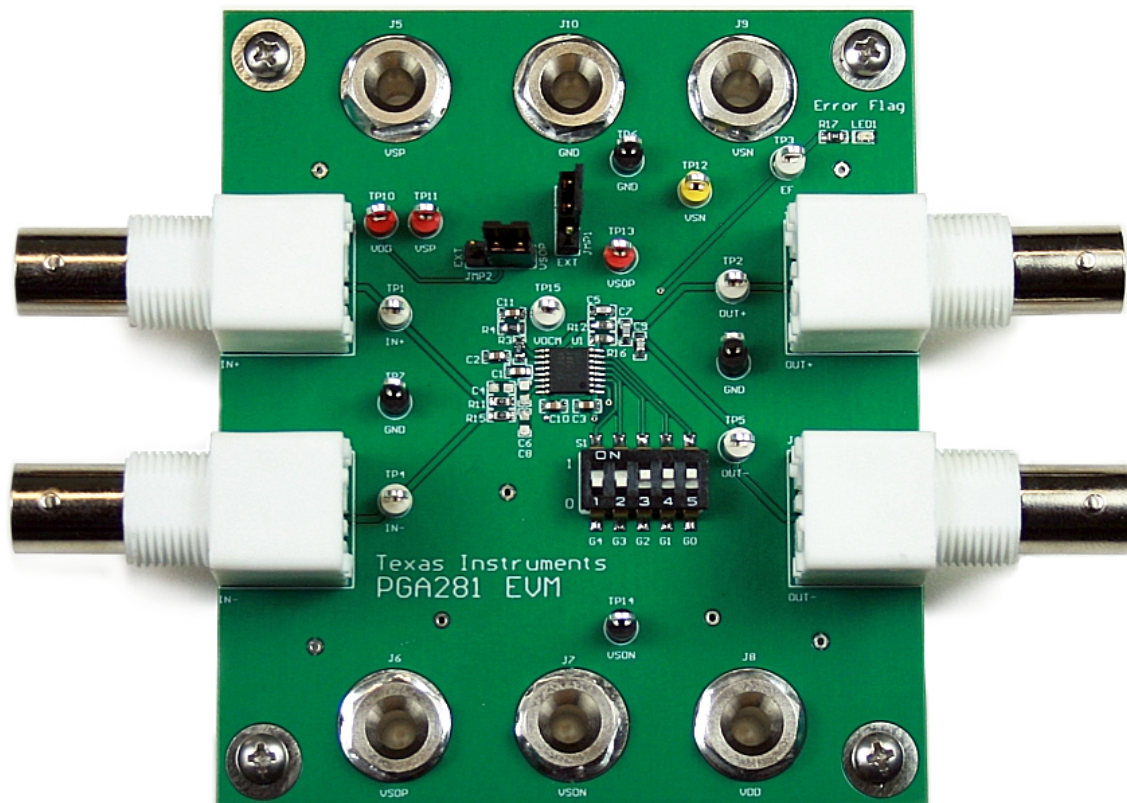


Figure 1. PGA281EVM

2 PGA281EVM Hardware

This section discusses the PGA281EVM hardware schematics and PCB layout.

2.1 Schematic

The schematic of the PGA281EVM is shown in Figure 2.

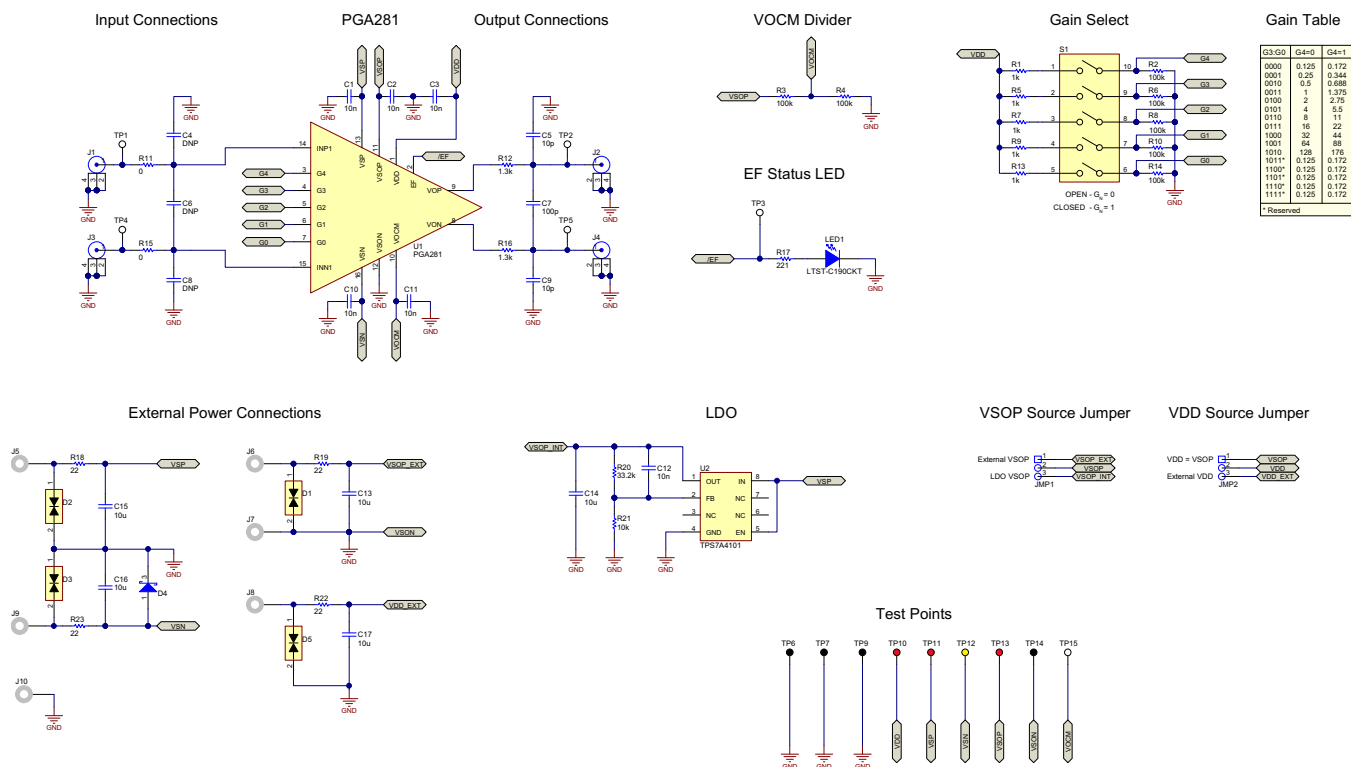


Figure 2. PGA281EVM Schematic

2.2 Jumper Settings

The PGA281EVM jumper settings are given in [Table 1](#). The default settings are shown in [Figure 3](#).

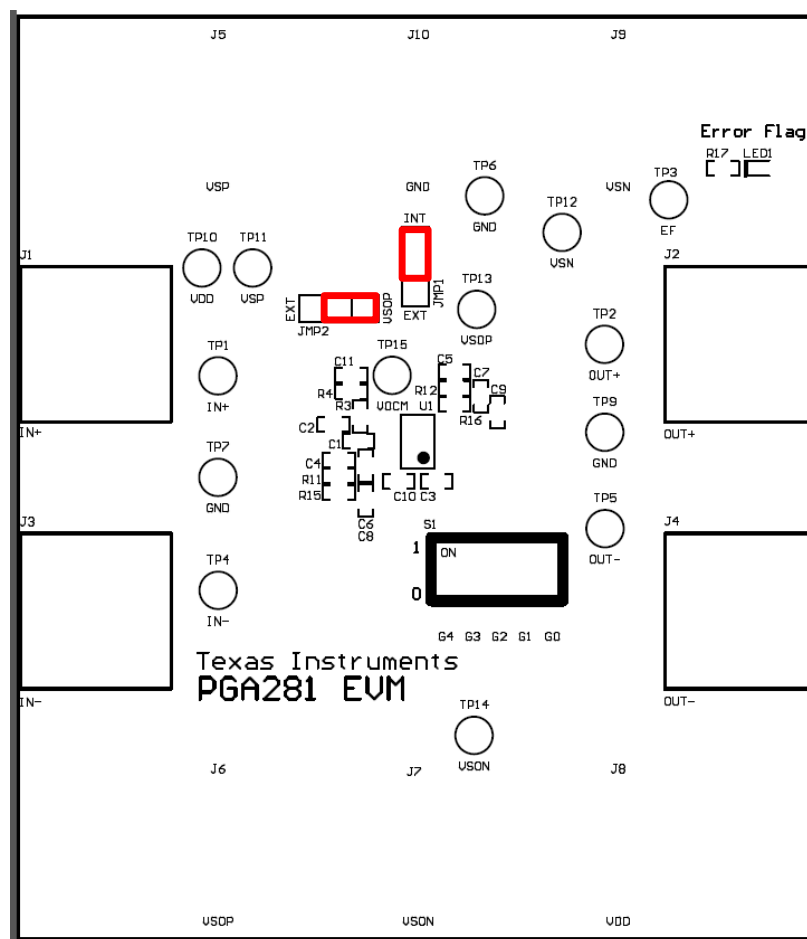


Figure 3. PGA281EVM Default Jumper Settings

Table 1. PGA281EVM Jumper Settings

Jumper	Position	Function
JMP1	INT (default)	VSOP provided by onboard low dropout (LDO) regulator
	EXT	VSOP provided externally at J6
JMP2	VSOP (default)	VDD connected to VSOP
	EXT	VDD provided externally at J8

2.3 Power Supply Connections

Power is applied through banana connectors J5, J6, J7, J8, J9, and J10. The PGA281 requires three supply voltages: the high-voltage analog input stage supply, the low-voltage analog output stage supply, and the digital supply.

2.3.1 Analog Input Stage Power (VSP, VSN)

Power for the analog input stage is applied at J5 (VSP), J10 (GND), and J9 (VSN). The specified range for these supplies is given in [Table 2](#).

Table 2. Analog Input Stage Power

Name	Minimum	Maximum	Description
VSP	+5 V	+18 V	Positive supply for analog input stage
GND	0 V	0 V	Ground reference voltage for analog input stage
VSN	–5 V	–18 V	Negative supply voltage for analog input stage

2.3.2 Analog Output Stage Power (VSOP, VSON)

Power for the analog output stage is applied at J6 (VSOP) and J7 (VSON). The specified range for these supplies is given in [Table 3](#). On the PGA281EVM, VSON is always connected to GND.

Table 3. Analog Output Stage Power

NAME	MINIMUM	Maximum	Description
VSOP	+2.7 V	+5.5 V	Positive supply for analog output stage
VSON	0 V	0 V	Negative voltage/ground reference for analog output stage

2.3.3 Digital Logic Power (VDD)

Power for the digital core is applied at J8 (VDD). The specified range for VDD is the same as VSOP (+2.7 V to +5.5 V). VSON is used as the digital core ground reference.

2.3.4 Onboard LDO Regulator

The PGA281EVM contains an onboard LDO regulator (U2) that is used to generate VSOP and VDD from VSP. This configuration greatly simplifies the power connections to the PGA281EVM, because then only VSP, VSN, and GND must be provided. The LDO regulator output voltage can be adjusted by replacing resistor R20. When using the LDO regulator in this manner, set jumpers JMP1 and JMP2 to INT and VSOP, respectively.

Table 4. LDO Adjustable Output Voltages

R20 Resistance	Output Voltage
33.2 k Ω	5 V
18.2 k Ω	3.3 V

2.4 Input/Output Connections

The PGA281 is a differential input, differential output amplifier. The input signal is applied at BNC connectors J1 (IN+) and J3 (IN–), while the output signal is measured at BNC connectors J2 (OUT+) and J4 (OUT–).

2.5 VOCM

VOCM controls the output stage common-mode voltage. On the PGA281EVM, a resistive voltage divider created by R3 and R4 sets VOCM equal to (VSOP/2).

2.6 Gain Select

Switch S1 controls the PGA281 gain. Each switch channel sets the logic level at the corresponding gain set pin. When the switch channel is on (up position), $G_N = 1$. When the switch channel is off (down position), $G_N = 0$. See [Table 5](#) for all possible gain settings.

Table 5. PGA281 Gain Settings

G3:G0	G4 = 0	G4 = 1
0000	0.125	0.172
0001	0.25	0.344
0010	0.5	0.688
0011	1	1.375
0100	2	2.75
0101	4	5.5
0110	8	11
0111	16	22
1000	32	44
1001	64	88
1010	128	176
1011*	0.125	0.172
1100*	0.125	0.172
1101*	0.125	0.172
1110*	0.125	0.172
1111*	0.125	0.172

2.7 Error Flag

The PGA281 contains circuitry that monitors the integrity of the analog signal at several of the internal nodes. When signal conditions are outside the linear range, the error flag pin goes active (sets to V_{DD}). In an error condition, LED1 on the PGA281EVM turns on.

Error conditions include:

- Input common-mode range exceeded
- Input clamp active
- Input stage at supply rail
- Input-stage current limit exceeded
- Output stage at supply rail
- Output-stage current limit exceeded

2.8 PGA281EVM PCB Layout

Figure 4, Figure 5, Figure 6, and Figure 7 depict the four layers of the PGA281EVM PCB layout.

NOTE: Board layouts are not to scale. These figures are intended to show how the board is laid out; they are not intended to be used for manufacturing PGA281EVM PCBs.

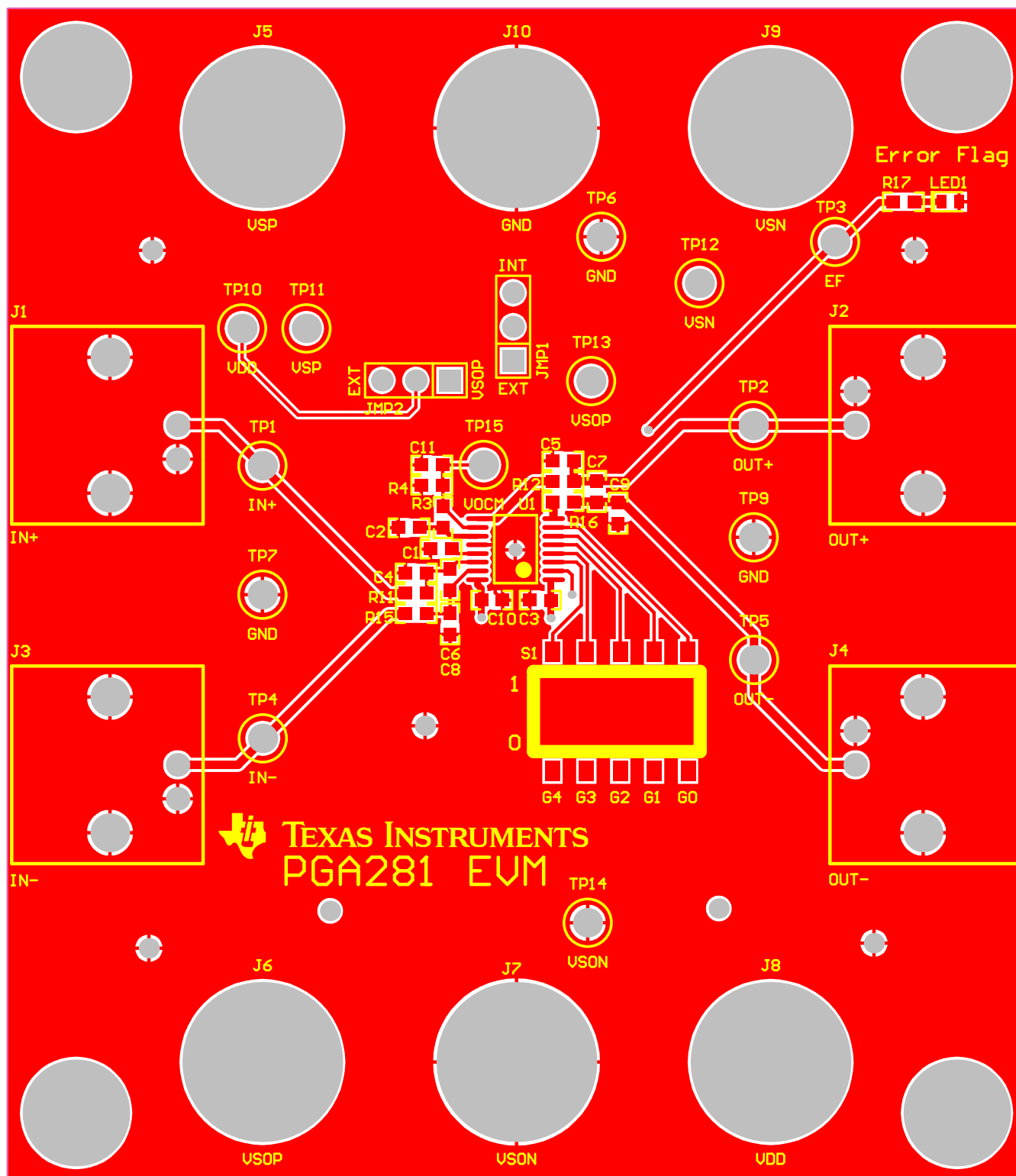


Figure 4. Top Layer (Signal and Ground)

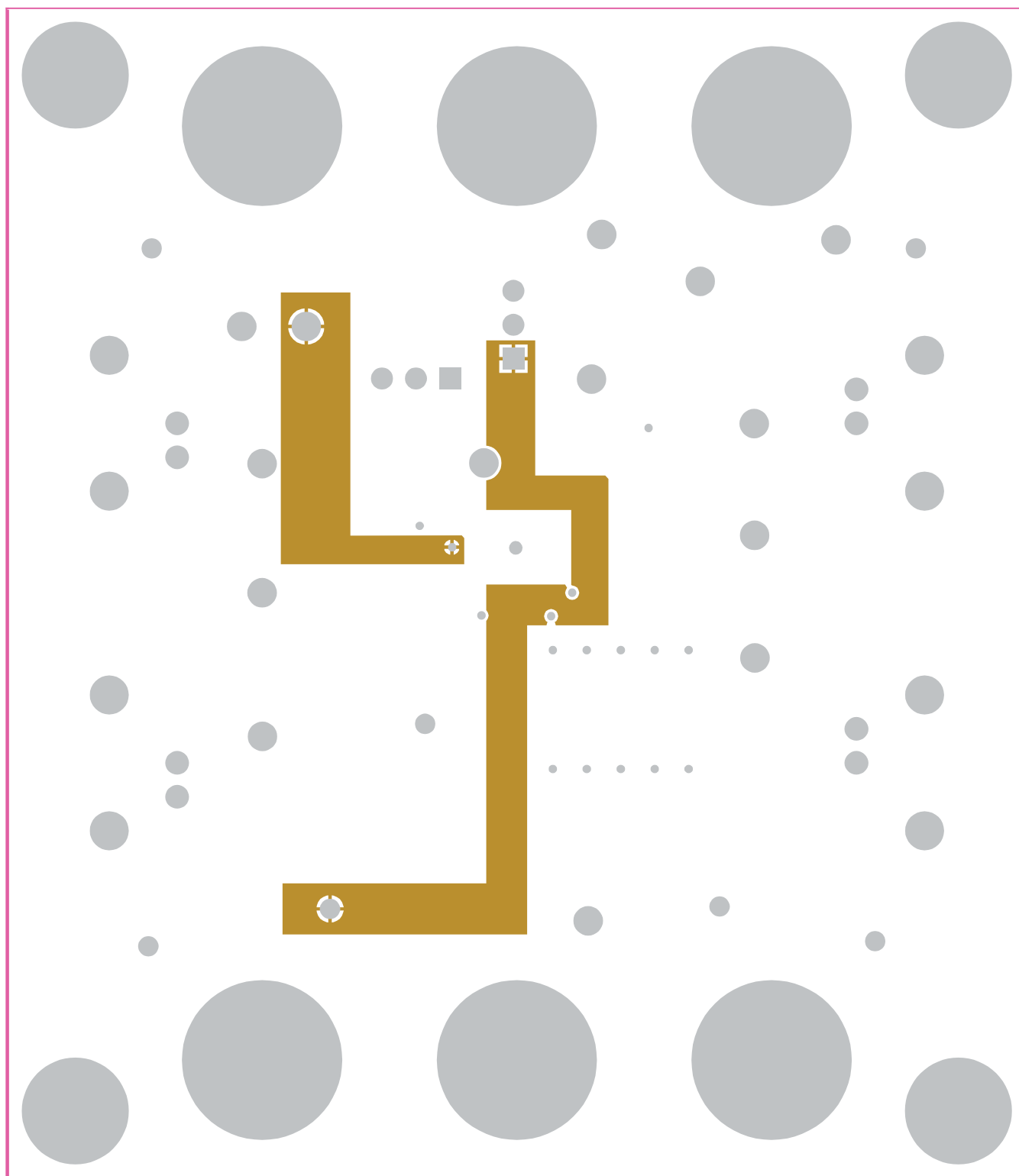


Figure 5. Layer 2 (Power)

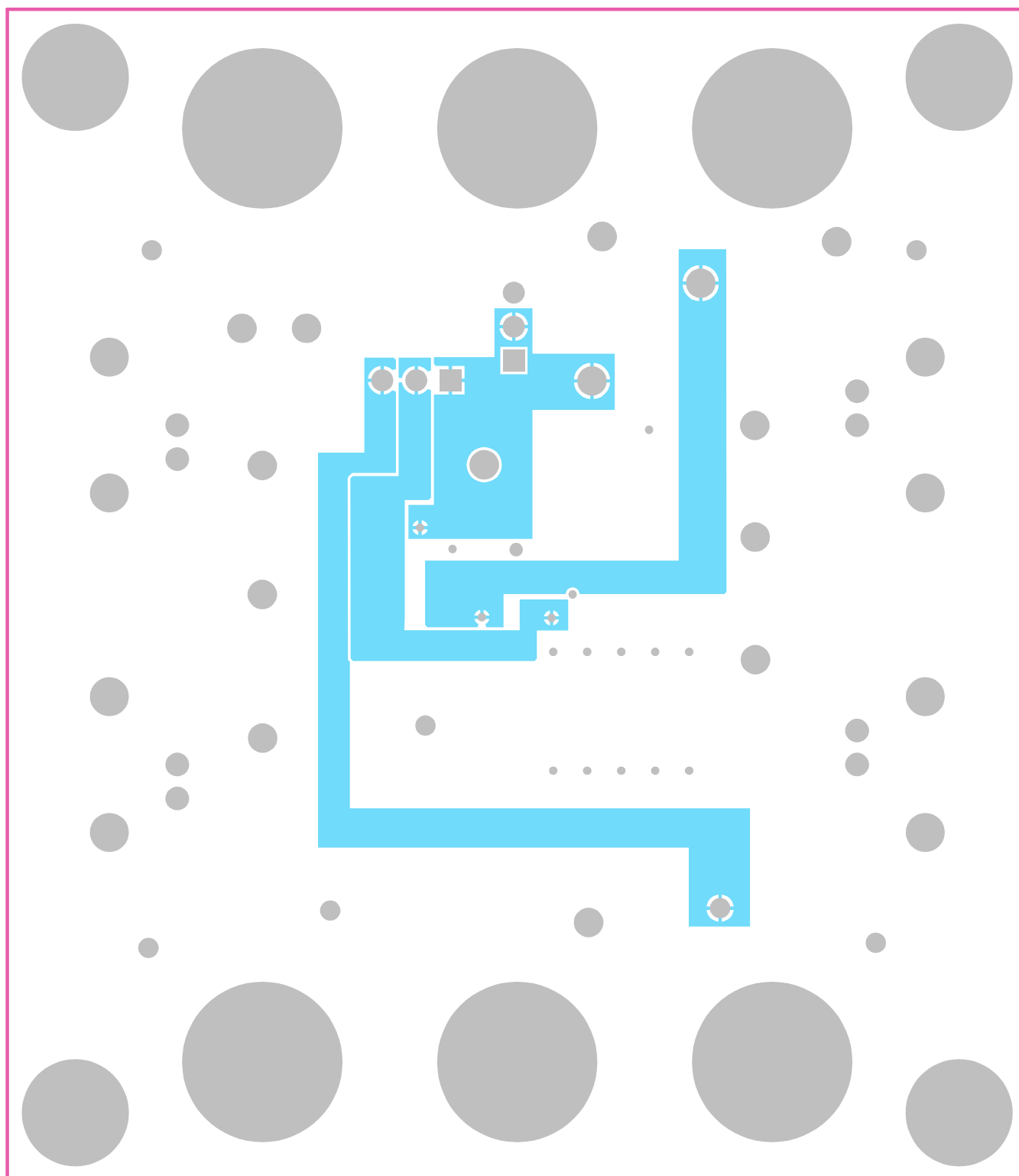


Figure 6. Layer 3 (Power)



3 Bill of Materials

Table 6 gives the bill of materials (BOM) used for the PGA281EVM. It also lists examples of optional components.

Table 6. PGA281EVM Bill of Materials

Count	RefDes	Value	Description	Part Number	Manufacturer
1	U1	N/A	PGA281, TSSOP-16	PGA281	Texas Instruments
1	U2	N/A	TPS7A4101, MSOP-8	TPS7A4101	Texas Instruments
5	C1-C3, C10, C11	10 nF	CAP CER 10000PF 25V 10% X7R 0603	C1608X7R1E103K080AA	TDK Corporation
2	C5, C9	10 pF	CAP CER 10PF 50V NP0 0603	C1608C0G1H100D080AA	TDK Corporation
1	C7	100 pF	CAP CER 100PF 50V 5% NP0 0603	C1608C0G1H101J080AA	TDK Corporation
1	C12	10 nF	CAP CER 10000PF 25V 5% NP0 0603	C1608C0G1E103J080AA	TDK Corporation
5	C13-C17	10 µF	CAP CER 10UF 25V 10% X7R 1206	C3216X7R1E106K160AB	TDK Corporation
2	D1, D5	N/A	TVS 6.0 VOLT 600 WATT BI-DIR SMB	SMBJ6.0CA	Littelfuse Inc
2	D2, D3	N/A	TVS 24 VOLT 600 WATT BI-DIR SMB	SMBJ24CA	Littelfuse Inc
1	D4	N/A	DIODE SCHOTTKY 30V 200MA SOT23	BAT54-V-GS08	Vishay Semiconductor
1	LED1	N/A	LED RED CLEAR 0603 SMD	LTST-C190CKT	Lite-On Inc
5	R1, R5, R7, R9, R13	1 kΩ	RES 1K OHM 1/10W 1% 0603 SMD	RMCF0603FT1K00	Stackpole Electronics Inc
7	R2-R4, R6, R8, R10, R14	100 kΩ	RES 100K OHM 1/10W 1% 0603 SMD	RMCF0603FT100K	Stackpole Electronics Inc
2	R11, R15	0 Ω	RES 0.0 OHM 1/10W JUMP 0603 SMD	ERJ-3GEY0R00V	Panasonic Electronic Components
2	R12, R16	1.3 kΩ	RES 1.3K OHM 1/16W .5% 0603 SMD	RR08P1.3KDCT-ND	Susumu
1	R17	221 Ω	RES 221 OHM 1/10W 1% 0603 SMD	RMCF0603FT221R	Stackpole Electronics Inc
4	R18-R19, R22-R23	22 Ω	RES 22 OHM 1/4W 5% 1206 SMD	RMCF1206JT22R0	Stackpole Electronics Inc
1	R20	33.2 kΩ	RES 33.2K OHM 1/10W .1% 0603 SMD	ERA-3AEB3322V	Panasonic Electronic Components
1	R21	10 kΩ	RES 10.0K OHM 1/10W .1% 0603 SMD	RG1608P-103-B-T5	Susumu
1	Q1	N/A	SWITCH DIP 5POS TOP ACT GULLEAD	A6S-5104-H	Omron Electronics Inc
6	TP1-TP5, TP15	N/A	TEST POINT WHITE	5012	Keystone Electronics
5	TP6-TP9, TP14	N/A	TEST POINT BLACK	5011	Keystone Electronics
3	TP10, TP11, TP13	N/A	TEST POINT RED	5010	Keystone Electronics
1	TP12	N/A	TEST POINT YELLOW	5014	Keystone Electronics
6	J5-J10	N/A	CONN JACK BANANA UNINS PANEL MOUNT	108-0740-001	Emerson Network Power
4	J1-J4	N/A	CONN SOCKET BNC R/A 75 OHM PCB	1-1478032-0	TE Connectivity
2	JMP1, JMP2	N/A	CONN HEADER .100 SNGL 3POS	TSW-103-07-G-S	Samtec
4	Screws	N/A	SCREW MACHINE PHILLIPS 4-40X3/8	PMS 440 0038 PH	B&F Fastener Supply
4	Standoffs	N/A	STANDOFF HEX 4-40THR ALUM .500"L	2203	Keystone Electronics
Not Installed	C4, C6, C8	N/A	Capacitor, 0603	N/A	N/A

4 Related Documentation from Texas Instruments

The following documents provide information regarding Texas Instruments' integrated circuits and support tools for the PGA281EVM. This user's guide is available from the TI web site under literature number **SBOU130**. Any letter appended to the literature number corresponds to the document revision that is current at the time of the writing of this document. Newer revisions may be available from the [TI web site](#), or call the Texas Instruments' Literature Response Center at (800) 477-8924 or the Product Information Center at (972) 644-5580. When ordering, identify the document by both title and literature number.

Related Documentation

Document	Literature Number
PGA281 Product Data Sheet	SBOS664

EVALUATION BOARD/KIT/MODULE (EVM) ADDITIONAL TERMS

Texas Instruments (TI) provides the enclosed Evaluation Board/Kit/Module (EVM) under the following conditions:

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user indemnifies TI from all claims arising from the handling or use of the goods.

Should this evaluation board/kit not meet the specifications indicated in the User's Guide, the board/kit may be returned within 30 days from the date of delivery for a full refund. THE FOREGOING LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THE INDEMNITY SET FORTH ABOVE, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Please read the User's Guide and, specifically, the Warnings and Restrictions notice in the User's Guide prior to handling the product. This notice contains important safety information about temperatures and voltages. For additional information on TI's environmental and/or safety programs, please visit www.ti.com/esh or contact TI.

No license is granted under any patent right or other intellectual property right of TI covering or relating to any machine, process, or combination in which such TI products or services might be or are used. TI currently deals with a variety of customers for products, and therefore our arrangement with the user is not exclusive. TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein.

REGULATORY COMPLIANCE INFORMATION

As noted in the EVM User's Guide and/or EVM itself, this EVM and/or accompanying hardware may or may not be subject to the Federal Communications Commission (FCC) and Industry Canada (IC) rules.

For EVMs **not** subject to the above rules, this evaluation board/kit/module is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION OR EVALUATION PURPOSES ONLY and is not considered by TI to be a finished end product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC or ICES-003 rules, which are designed to provide reasonable protection against radio frequency interference. Operation of the equipment may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

General Statement for EVMs including a radio

User Power/Frequency Use Obligations: This radio is intended for development/professional use only in legally allocated frequency and power limits. Any use of radio frequencies and/or power availability of this EVM and its development application(s) must comply with local laws governing radio spectrum allocation and power limits for this evaluation module. It is the user's sole responsibility to only operate this radio in legally acceptable frequency space and within legally mandated power limitations. Any exceptions to this are strictly prohibited and unauthorized by Texas Instruments unless user has obtained appropriate experimental/development licenses from local regulatory authorities, which is responsibility of user including its acceptable authorization.

For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant

Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For EVMs annotated as IC – INDUSTRY CANADA Compliant

This Class A or B digital apparatus complies with Canadian ICES-003.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Concerning EVMs including radio transmitters

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concerning EVMs including detachable antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet appareil numérique de la classe A ou B est conforme à la norme NMB-003 du Canada.

Les changements ou les modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner l'équipement.

Concernant les EVMs avec appareils radio

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

【Important Notice for Users of this Product in Japan】

This development kit is NOT certified as Confirming to Technical Regulations of Radio Law of Japan

If you use this product in Japan, you are required by Radio Law of Japan to follow the instructions below with respect to this product:

1. Use this product in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use this product only after you obtained the license of Test Radio Station as provided in Radio Law of Japan with respect to this product, or
3. Use of this product only after you obtained the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to this product. Also, please do not transfer this product, unless you give the same notice above to the transferee. Please note that if you could not follow the instructions above, you will be subject to penalties of Radio Law of Japan.

Texas Instruments Japan Limited
(address) 24-1, Nishi-Shinjuku 6 chome, Shinjuku-ku, Tokyo, Japan

<http://www.tij.co.jp>

【ご使用にあたっての注】

本開発キットは技術基準適合証明を受けておりません。

本製品のご使用に際しては、電波法遵守のため、以下のいずれかの措置を取っていただく必要がありますのでご注意ください。

1. 電波法施行規則第6条第1項第1号に基づく平成18年3月28日総務省告示第173号で定められた電波暗室等の試験設備でご使用いただく。
2. 実験局の免許を取得後ご使用いただく。
3. 技術基準適合証明を取得後ご使用いただく。

なお、本製品は、上記の「ご使用にあたっての注意」を譲渡先、移転先に通知しない限り、譲渡、移転できないものとします。

上記を遵守頂けない場合は、電波法の罰則が適用される可能性があることをご留意ください。

日本テキサス・インスツルメンツ株式会社

東京都新宿区西新宿 6 丁目 2 4 番 1 号

西新宿三井ビル

<http://www.tij.co.jp>

EVALUATION BOARD/KIT/MODULE (EVM) WARNINGS, RESTRICTIONS AND DISCLAIMERS

For Feasibility Evaluation Only, in Laboratory/Development Environments. Unless otherwise indicated, this EVM is not a finished electrical equipment and not intended for consumer use. It is intended solely for use for preliminary feasibility evaluation in laboratory/development environments by technically qualified electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems and subsystems. It should not be used as all or part of a finished end product.

Your Sole Responsibility and Risk. You acknowledge, represent and agree that:

1. You have unique knowledge concerning Federal, State and local regulatory requirements (including but not limited to Food and Drug Administration regulations, if applicable) which relate to your products and which relate to your use (and/or that of your employees, affiliates, contractors or designees) of the EVM for evaluation, testing and other purposes.
2. You have full and exclusive responsibility to assure the safety and compliance of your products with all such laws and other applicable regulatory requirements, and also to assure the safety of any activities to be conducted by you and/or your employees, affiliates, contractors or designees, using the EVM. Further, you are responsible to assure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard.
3. You will employ reasonable safeguards to ensure that your use of the EVM will not result in any property damage, injury or death, even if the EVM should fail to perform as described or expected.
4. You will take care of proper disposal and recycling of the EVM's electronic components and packing materials.

Certain Instructions. It is important to operate this EVM within TI's recommended specifications and environmental considerations per the user guidelines. Exceeding the specified EVM ratings (including but not limited to input and output voltage, current, power, and environmental ranges) may cause property damage, personal injury or death. If there are questions concerning these ratings please contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, some circuit components may have case temperatures greater than 60°C as long as the input and output are maintained at a normal ambient operating temperature. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors which can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during normal operation, please be aware that these devices may be very warm to the touch. As with all electronic evaluation tools, only qualified personnel knowledgeable in electronic measurement and diagnostics normally found in development environments should use these EVMs.

Agreement to Defend, Indemnify and Hold Harmless. You agree to defend, indemnify and hold TI, its licensors and their representatives harmless from and against any and all claims, damages, losses, expenses, costs and liabilities (collectively, "Claims") arising out of or in connection with any use of the EVM that is not in accordance with the terms of the agreement. This obligation shall apply whether Claims arise under law of tort or contract or any other legal theory, and even if the EVM fails to perform as described or expected.

Safety-Critical or Life-Critical Applications. If you intend to evaluate the components for possible use in safety critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, such as devices which are classified as FDA Class III or similar classification, then you must specifically notify TI of such intent and enter into a separate Assurance and Indemnity Agreement.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2013, Texas Instruments Incorporated

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.