



MICROCHIP

MIC2128
Evaluation Board
User's Guide

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC[®] MCUs and dsPIC[®] DSCs, KEELOQ[®] code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

**QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
= ISO/TS 16949 =**

Trademarks

The Microchip name and logo, the Microchip logo, AnyRate, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KeeLoq, KeeLoq logo, Klear, LANCheck, LINK MD, MediaLB, MOST, MOST logo, MPLAB, OptoLyzer, PIC, PICSTART, PIC32 logo, RightTouch, SpyNIC, SST, SST Logo, SuperFlash and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

ClockWorks, The Embedded Control Solutions Company, ETHERSYNCH, Hyper Speed Control, HyperLight Load, IntelliMOS, mTouch, Precision Edge, and QUIET-WIRE are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KlearNet, KlearNet logo, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PureSilicon, RightTouch logo, REAL ICE, Ripple Blocker, Serial Quad I/O, SQL, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademarks of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2016, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

ISBN: 978-1-5224-0916-8

Object of Declaration: MIC2128 Evaluation Board

EU Declaration of Conformity

Manufacturer: Microchip Technology Inc.
2355 W. Chandler Blvd.
Chandler, Arizona, 85224-6199
USA

This declaration of conformity is issued by the manufacturer.

The development/evaluation tool is designed to be used for research and development in a laboratory environment. This development/evaluation tool is not a Finished Appliance, nor is it intended for incorporation into Finished Appliances that are made commercially available as single functional units to end users under EU EMC Directive 2004/108/EC and as supported by the European Commission's Guide for the EMC Directive 2004/108/EC (8th February 2010).

This development/evaluation tool complies with EU RoHS2 Directive 2011/65/EU.

This development/evaluation tool, when incorporating wireless and radio-telecom functionality, is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC and the FCC rules as stated in the declaration of conformity provided in the module datasheet and the module product page available at www.microchip.com.

For information regarding the exclusive, limited warranties applicable to Microchip products, please see Microchip's standard terms and conditions of sale, which are printed on our sales documentation and available at www.microchip.com.

Signed for and on behalf of Microchip Technology Inc. at Chandler, Arizona, USA


Derek Carlson
VP Development Tools

12-Sep-14
Date

NOTES:



MIC2128 EVALUATION BOARD USER'S GUIDE

Table of Contents

Preface	7
Introduction.....	7
Document Layout	7
Conventions Used in this Guide	8
Warranty Registration.....	8
Recommended Reading.....	9
The Microchip Website.....	9
Product Change Notification Service.....	9
Customer Support	9
Document Revision History	9
Chapter 1. Product Overview	
1.1 Introduction	11
1.2 MIC2128 Evaluation Board Overview	11
1.3 MIC2128 Evaluation Board Features	12
1.4 What the MIC2128 Evaluation Board Kit Contains	12
Chapter 2. Installation and Operation	
2.1 System and Configuration Requirements	13
2.2 Board Setup	13
2.3 Circuit Description	14
2.3.1 Feedback Resistors	14
2.3.2 SW Node	14
2.3.3 Current Limit	14
2.3.4 Loop Gain Measurement	16
2.3.5 Setting the Switching Frequency	16
2.3.6 Setting the Soft-Start Time	17
2.3.7 Auxiliary Bootstrap LDO (EXTVDD)	18
Appendix A. Schematic and Layouts	
A.1 Introduction	19
A.2 Board – Schematic	20
A.3 Board – Top Silk Layer	21
A.4 Board – Top Copper layer	22
A.5 Board – Mid Copper Layer 1	23
A.6 Board – Mid Copper Layer 2	24
A.7 Board – Bottom Copper layer	25
A.8 Board – Bottom Silk Layer	26
Appendix B. Bill of Materials (BOM)	27
Worldwide Sales and Service	30

MIC2128 Evaluation Board User's Guide

NOTES:

Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our website (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is “DSXXXXXXXXA”, where “XXXXXXXX” is the document number and “A” is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics, to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the MIC2128 Evaluation Board. Items discussed in this chapter include:

- [Document Layout](#)
- [Conventions Used in this Guide](#)
- [Recommended Reading](#)
- [The Microchip Website](#)
- [Customer Support](#)
- [Document Revision History](#)

DOCUMENT LAYOUT

This document describes how to use the MIC2128 Evaluation Board as a development tool to emulate and debug firmware on a target board. The manual layout is as follows:

- **Chapter 1. “Product Overview”** – Important information about the MIC2128 Evaluation Board.
- **Chapter 2. “Installation and Operation”** – Includes instructions on installing and starting the MIC2128 Evaluation Board.
- **Appendix A. “Schematic and Layouts”** – Shows the schematic and layout diagrams for the MIC2128 Evaluation Board.
- **Appendix B. “Bill of Materials (BOM)”** – Lists the parts used to build the MIC2128 Evaluation Board.

MIC2128 Evaluation Board User's Guide

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	<i>MPLAB® IDE User's Guide</i>
	Emphasized text	...is the <i>only</i> compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	<u><i>File</i></u> >Save
Bold characters	A dialog button	Click OK
	A tab	Click the Power tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
Courier New font:		
Plain Courier New	Sample source code	#define START
	Filenames	autoexec.bat
	File paths	c:\mcc18\h
	Keywords	_asm, _endasm, static
	Command-line options	-Opa+, -Opa-
	Bit values	0, 1
	Constants	0xFF, 'A'
Italic Courier New	A variable argument	<i>file.o</i> , where <i>file</i> can be any valid filename
Square brackets []	Optional arguments	mcc18 [options] <i>file</i> [options]
Curly brackets and pipe character: { }	Choice of mutually exclusive arguments; an OR selection	errorlevel {0 1}
Ellipses...	Replaces repeated text	var_name [, var_name...]
	Represents code supplied by user	void main (void) { ... }

RECOMMENDED READING

This user's guide describes how to use the MIC2128 Evaluation Board. Another useful document is listed below. The following Microchip document is available and recommended as a supplemental reference resource:

- **MIC2128YML Data Sheet – “75V, Synchronous Buck Controllers Featuring Adaptive On-Time Control” (DS20005620A)**

THE MICROCHIP WEBSITE

Microchip provides online support via our website at www.microchip.com. This website is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the website contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the website at:
<http://www.microchip.com/support>.

DOCUMENT REVISION HISTORY

Revision A (September 2016)

- Initial release of this document.

MIC2128 Evaluation Board User's Guide

NOTES:

Chapter 1. Product Overview

1.1 INTRODUCTION

This chapter provides an overview of the MIC2128 Evaluation Board and covers the following topics:

- MIC2128 Evaluation Board Overview
- MIC2128 Evaluation Board Features
- What the MIC2128 Evaluation Board Kit Contains

1.2 MIC2128 EVALUATION BOARD OVERVIEW

The MIC2128 Evaluation Board is a constant-frequency, synchronous buck controller featuring a unique adaptive on-time control architecture. The MIC2128 operates over an input supply range of 4.5V to 75V. The output voltage is adjustable down to 0.6V with a guaranteed accuracy of $\pm 1\%$. The device operates with programmable switching frequency from 270 kHz to 800 kHz.

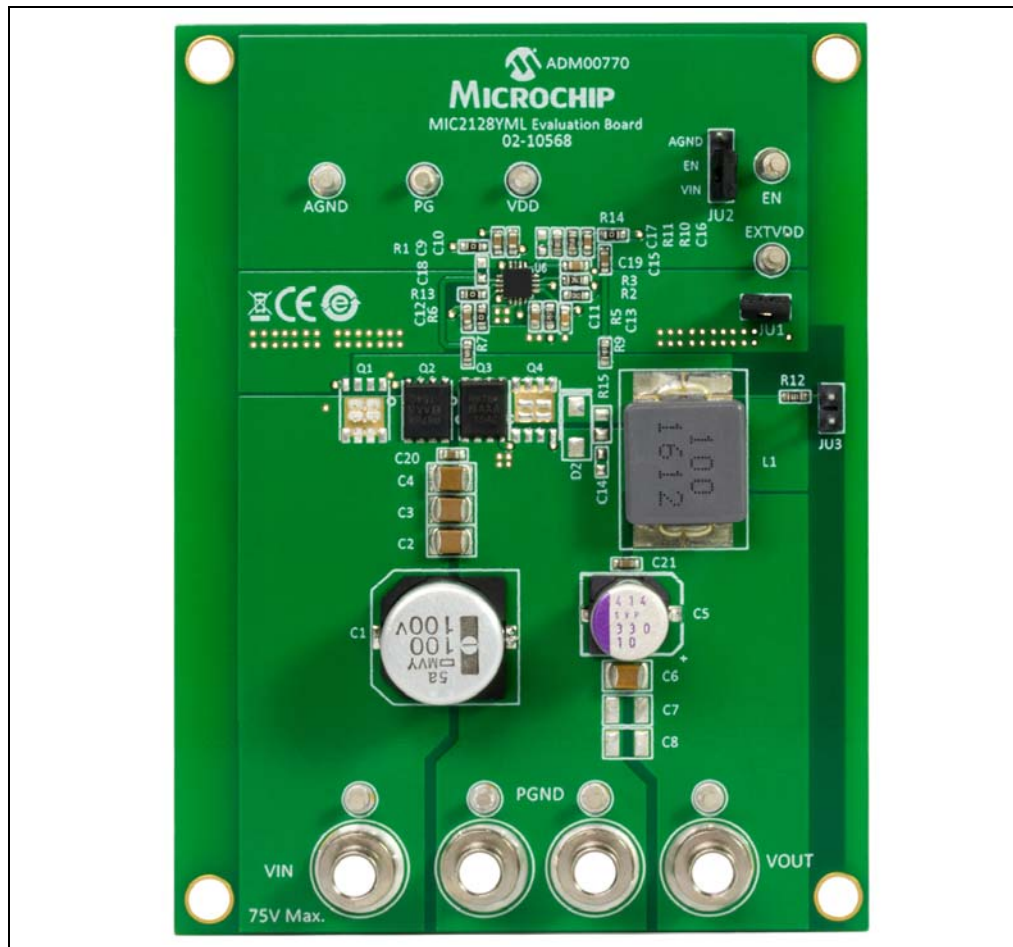


FIGURE 1-1: MIC2128 Evaluation Board Overview.

MIC2128 Evaluation Board User's Guide

1.3 MIC2128 EVALUATION BOARD FEATURES

The MIC2128 Evaluation Board:

- Features soft-start (SS) time selection pin which allows the user to adjust the output soft-start time to reduce inrush current from mains during startup
- Features an auxiliary bootstrap low-dropout (LDO) which improves the system efficiency by supplying the internal bias power from the output of the converter. A logic level enable (EN) signal can be used to enable or disable the controller.
- Can start up monotonically into a pre-biased output
- Features an open drain power good signal (PG) which signals when the output is in regulation
- Operates in discontinuous conduction mode during soft start at light loads

The basic parameters of the evaluation board are:

- Input: 7V to 75V (Optimized for 48V)
- Output: 5V at 5A
- 300 kHz Switching Frequency (adjustable 270 kHz to 800 kHz)

1.4 WHAT THE MIC2128 EVALUATION BOARD KIT CONTAINS

The MIC2128 Evaluation Board includes the following items:

- MIC2128 Evaluation Board (ADM00770)
- Important Information Sheet

Chapter 2. Installation and Operation

2.1 SYSTEM AND CONFIGURATION REQUIREMENTS

The MIC2128 Evaluation Board requires only a single power supply with at least 10A current capability. The MIC2128 has internal V_{DD} LDO so no external linear regulator is required to power the internal biasing of the IC. In the applications with $V_{IN} < +5.5V$, P_{VDD} should be tied to V_{IN} to by-pass the internal linear regulator. The output load can either be a passive or an active load.

Note: The MIC2128 Evaluation Board does not have reverse polarity protection. Applying a negative voltage to the V_{VIN} and GND terminals may damage the device. The maximum V_{VIN} of the board is rated at 75V. Exceeding 75V on the V_{VIN} could damage the device.

2.2 BOARD SETUP

Follow these steps prior to using the MIC2128 Evaluation Board:

1. Connect a supply to the V_{IN} and GND terminals, paying careful attention to the polarity and the supply range ($7V < V_{VIN} < 75V$). Monitor I_{IN} with a current meter and input voltage at V_{VIN} and GND terminals with voltmeter. Do not apply power until Step 4.
2. Connect a load to the V_{OUT} and GND terminals. The load can be either a passive (resistive) or an active (electronic) type. A current meter may be placed between the V_{OUT} terminal and load to monitor the output current. Ensure the output voltage is monitored at the V_{OUT} terminal.
3. Enable Input. An EN connector is provided on the evaluation board for users to easily access the enable feature. Applying an external logic signal on the EN pin to pull it low, or using a jumper to short the EN pin to GND, will shut off the output of the MIC2128 Evaluation Board.
4. Turn on the V_{VIN} supply and verify that the output voltage is regulated to 5V.

MIC2128 Evaluation Board User's Guide

2.3 CIRCUIT DESCRIPTION

This section describes the working principles and limitations that should be taken into account when using the MIC2128 Evaluation Board.

2.3.1 Feedback Resistors

The output voltage on the MIC2128 Evaluation Board, which is preset to 5V, is determined by the feedback divider:

EQUATION 2-1: EQUATION 1

$$V_{OUT} = V_{REF} \times \left(1 + \frac{R10}{R11}\right)$$

The MIC2128 output is optimized for 5V output. All other voltages other than 5V can be set by modifying R11 value according to:

EQUATION 2-2: EQUATION 2

$$R11 = \frac{R10 \times V_{REF}}{V_{OUT} - V_{REF}}$$

where:

$$V_{REF} = 0.6V$$

Note that the output voltage should not be set to exceed 5V due to the 6.3V voltage rating on the output capacitors.

For output voltage higher than 5V, output capacitors and EXTV_{DD} pin bypass capacitor (C13) of voltage rating higher than the set output voltage should be used.

2.3.2 SW Node

Test point JU3 (V_{SW}) is placed for monitoring the switching waveform, one of the most critical waveforms for the converter.

2.3.3 Current Limit

The MIC2128 Evaluation Board uses the low-side MOSFET R_{DS(ON)} to sense inductor current. In each switching cycle of the MIC2128 converter, the inductor current is sensed by monitoring the voltage across the low-side MOSFET during the OFF period of the switching cycle during which low-side MOSFET is ON. An internal current source of 96 μ A generates a voltage across the external current limit setting resistor RCL as show in [Figure 2-1](#).

The ILIM pin voltage (V_{ILIM}) is the difference of the voltage across the low-side MOSFET and the voltage across the resistor (V_{CL}). The sensed voltage VILIM is compared with the power ground (PGND) after a blanking time of 150 ns.

If the absolute value of the voltage drop across the low-side MOSFET is greater than the absolute value of the voltage across the current setting resistor (V_{CL}), the MIC2128 triggers the current limit event. Consecutive eight current limit events trigger the Hiccup mode. The hiccup sequence, including the soft start, reduces the stress on the switching field-effect transistors (FETs) and protects the load and supply from severe short conditions.

Installation and Operation

The short circuit current limit can be programmed by using the following formula:

EQUATION 2-3: EQUATION 3

$$R_7 = \frac{(I_{CLIM} + \Delta_{PP} \times 0.5) \times R_{DS(ON)} + V_{CL}}{I_{CL}}$$

where:

- I_{CLIM} = Desired current limit
- Δ_{PP} = Inductor current peak-to-peak
- $R_{DS(ON)}$ = On resistance of low-side power MOSFET
- V_{CL} = Current-limit threshold. The maximum value is +15 mV.
- I_{CL} = Current-limit source current. The typical value is 96 μ A.

The short circuit current limit is depicted in [Figure 2-1](#):

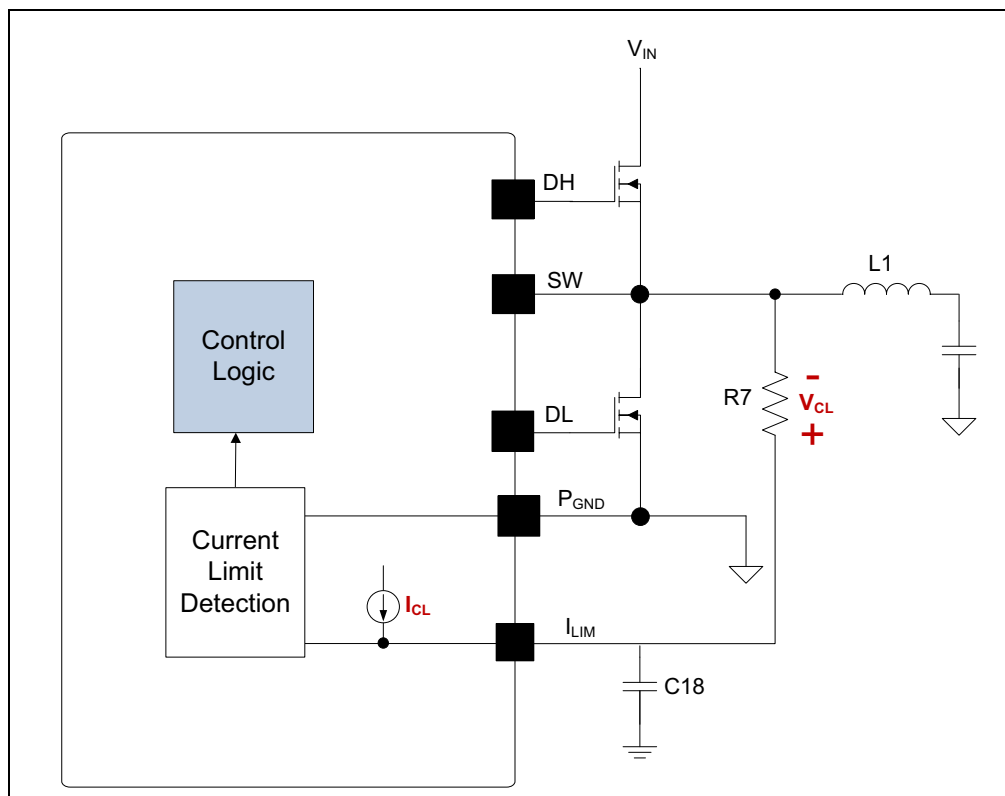


FIGURE 2-1: MIC2128 Current-Limiting Circuit.

It is mandatory to make sure that the inductor current used to charge the output capacitance during soft start is under the current limit, otherwise the supply will go in Hiccup mode and may not finish the soft start successfully.

The MOSFET $R_{DS(ON)}$ varies 30% to 40% with temperature. Therefore, it is recommended to add a 30% margin to I_{CL} in the above equation to avoid false current limiting due to increased MOSFET junction temperature rise. It is also recommended to connect the SW pin directly to the drain of the low-side MOSFET to accurately sense the MOSFET's $R_{DS(ON)}$.

MIC2128 Evaluation Board User's Guide

2.3.4 Loop Gain Measurement

Resistor R14 is placed in series with the regulator feedback path. The control loop gain can be measured by connecting an impedance analyzer across the resistor and selecting the resistor value between 20Ω to 50Ω.

2.3.5 Setting the Switching Frequency

The MIC2128 Evaluation Board is an adjustable-frequency, synchronous buck controller featuring a unique adaptive on-time control architecture. The switching frequency can be adjusted between 270 kHz and 800 kHz by changing the resistor divider network consisting of R2 and R3.

The following formula provides the estimated switching frequency:

EQUATION 2-4: EQUATION 4

$$f_{sw} = f_0 \times \frac{R3}{R2 + R3}$$

where:

f_0 = Switching Frequency when R2 is 100Ω and R3 is open, f_0 is typically 800 kHz. For a more precise setting, it is recommended to use the Switching Frequency graph from the data sheet.

The evaluation board design is optimized for a switching frequency of 300 kHz. If the switching frequency is programmed to either lower end or higher end, the design needs optimization. The switching frequency adjustment is depicted in [Figure 2-2](#):

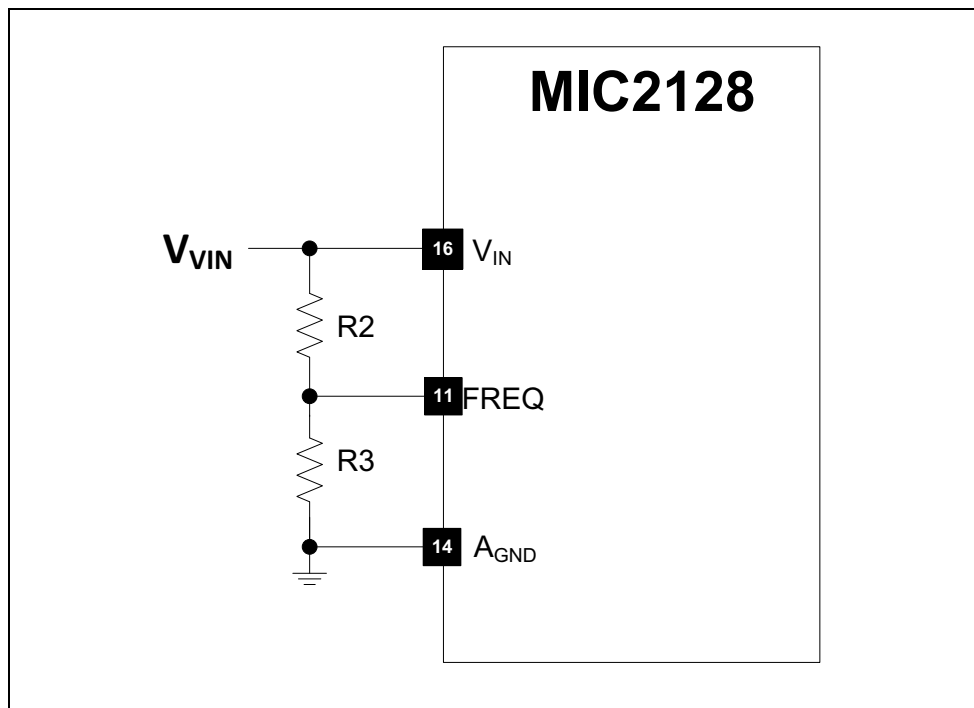


FIGURE 2-2: Switching Frequency Adjustment.

2.3.6 Setting the Soft-Start Time

The output soft-start time can be set by connecting a capacitor from SS to AGND as shown in Figure 2-3.

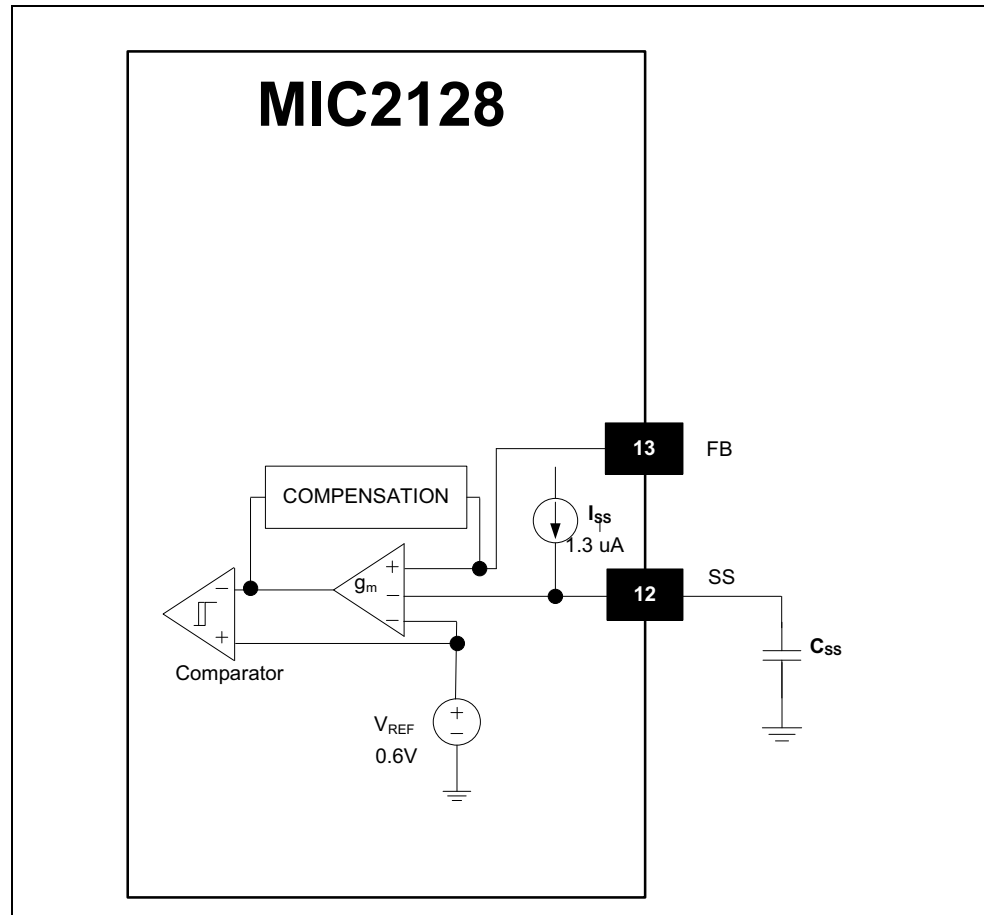


FIGURE 2-3: Setting the Soft-Start Time.

The value of the capacitor can be calculated using the following equation:

EQUATION 2-5: EQUATION 5

$$C_{19} = \frac{I_{SS} \times t_{SS}}{V_{REF}}$$

where:

C ₁₉	=	Capacitor from SS pin to AGND
I _{SS}	=	Internal soft-start current (1.3 uA typical)
t _{SS}	=	Output soft-start time
V _{REF}	=	Reference voltage (0.6V)

2.3.7 Auxiliary Bootstrap LDO (EXTVDD)

The MIC2128 Evaluation Board features an auxiliary bootstrap LDO which improves the system efficiency by supplying the MIC2128 internal circuit bias power from the converter output voltage. This LDO is enabled when the voltage on the EXTVDD pin is above 4.6V (typical) and at the same time, the main LDO which operates from V_{IN} , is disabled to reduce power consumption. If the regulator output voltage is $\geq 5V$ and $\leq 12V$, use output voltage to power the MIC2128, which will increase system efficiency. The JU1 jumper can be shorted to use output voltage as EXTVDD.



MIC2128 EVALUATION BOARD USER'S GUIDE

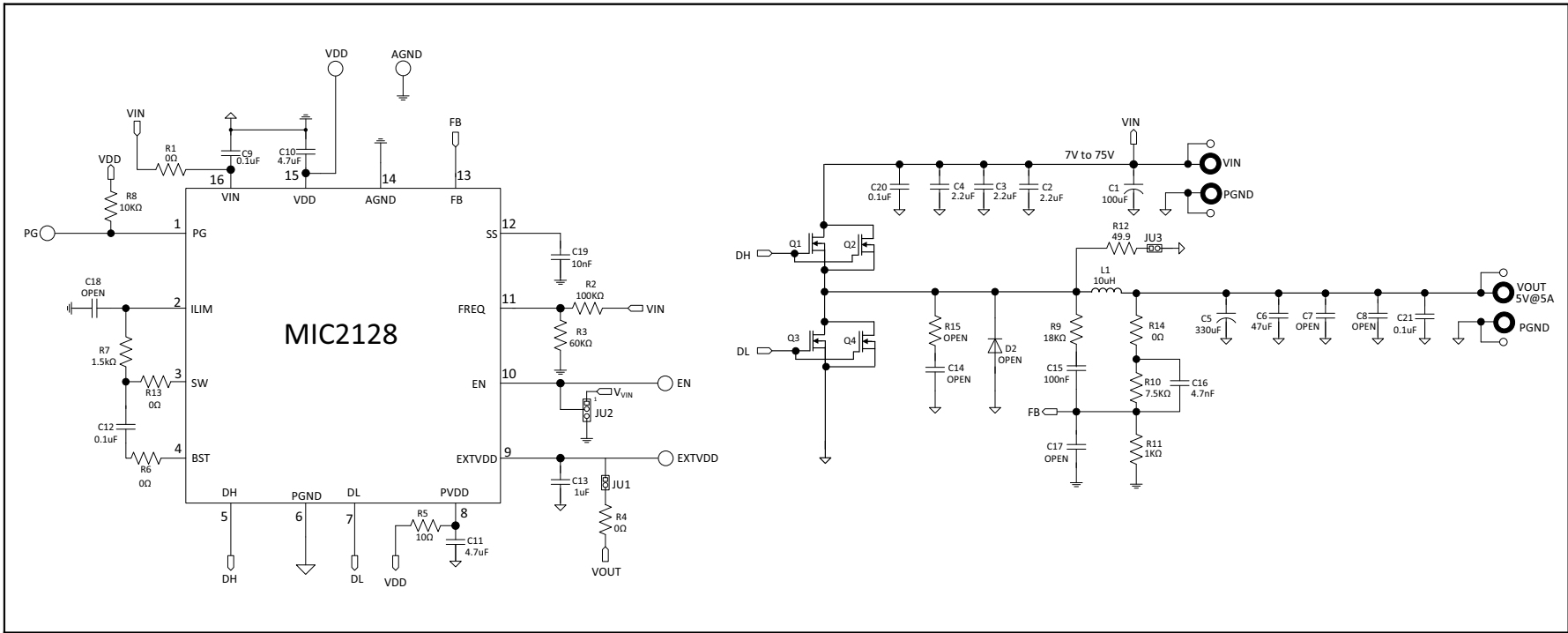
Appendix A. Schematic and Layouts

A.1 INTRODUCTION

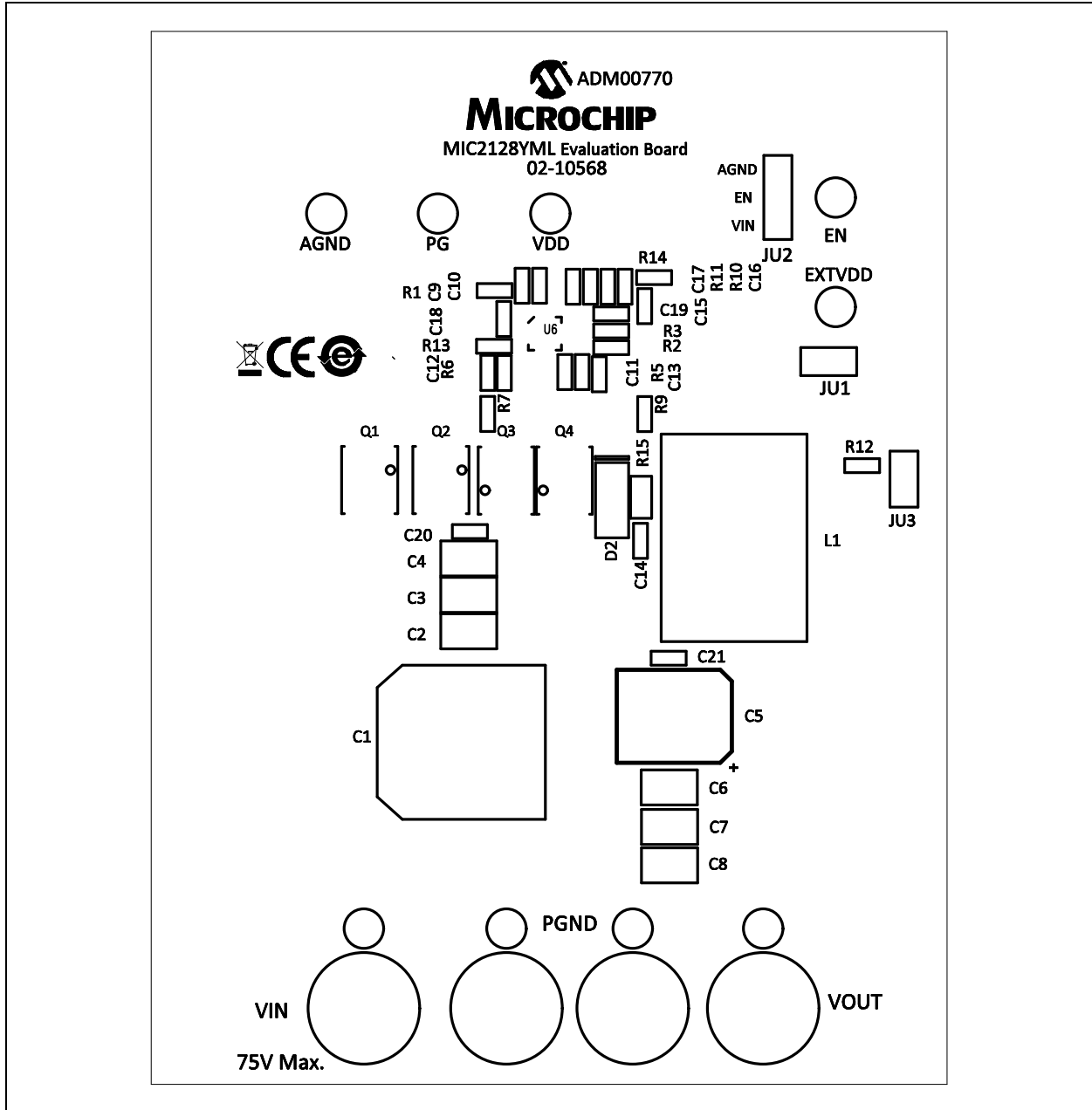
This appendix contains the following schematics and layouts for the MIC2128 Evaluation Board :

- Board – Schematic
- Board – Top Silk Layer
- Board – Top Copper layer
- Board – Mid Copper Layer 1
- Board – Mid Copper Layer 2
- Board – Bottom Copper layer
- Board – Bottom Silk Layer

A.2 BOARD – SCHEMATIC

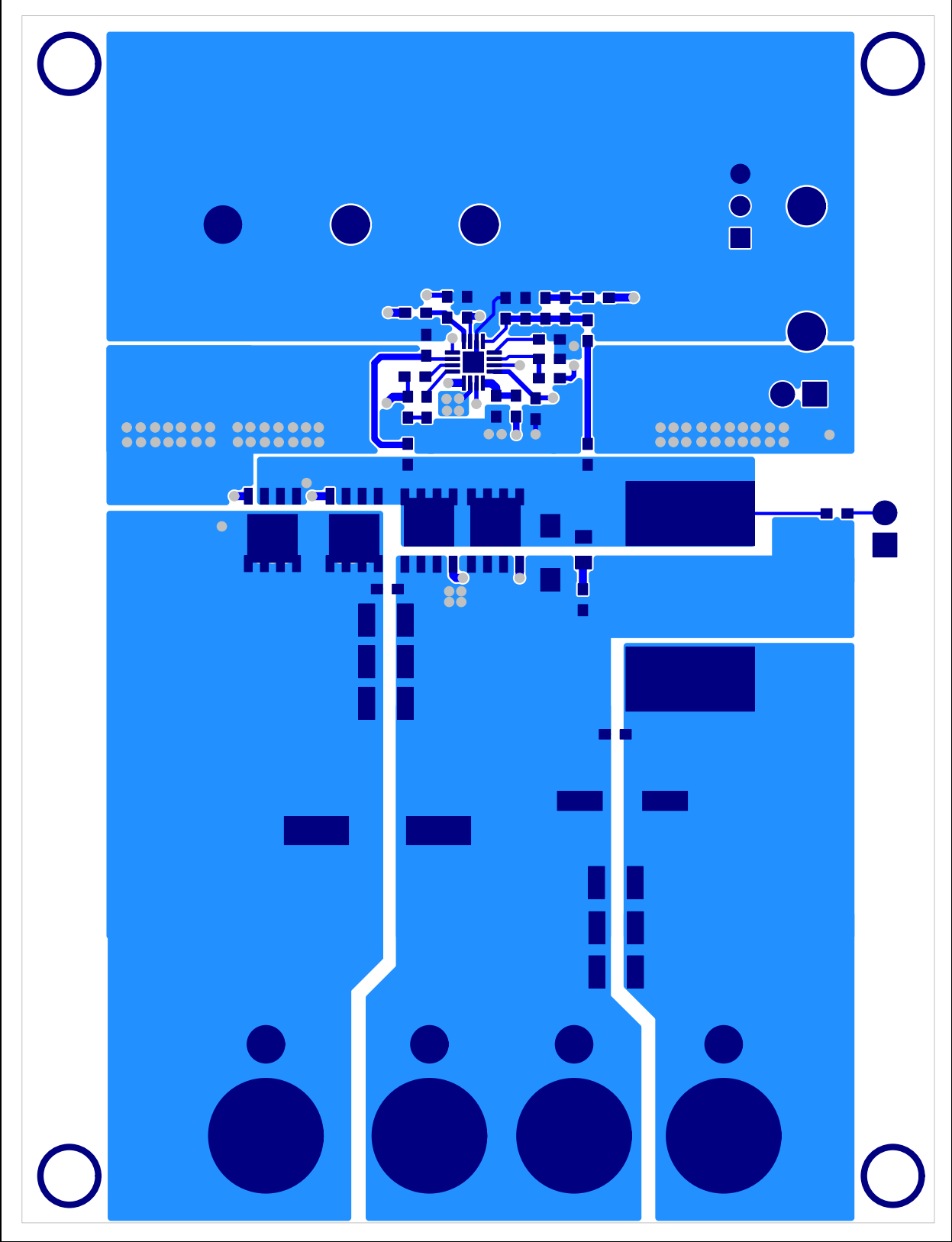


A.3 BOARD – TOP SILK LAYER

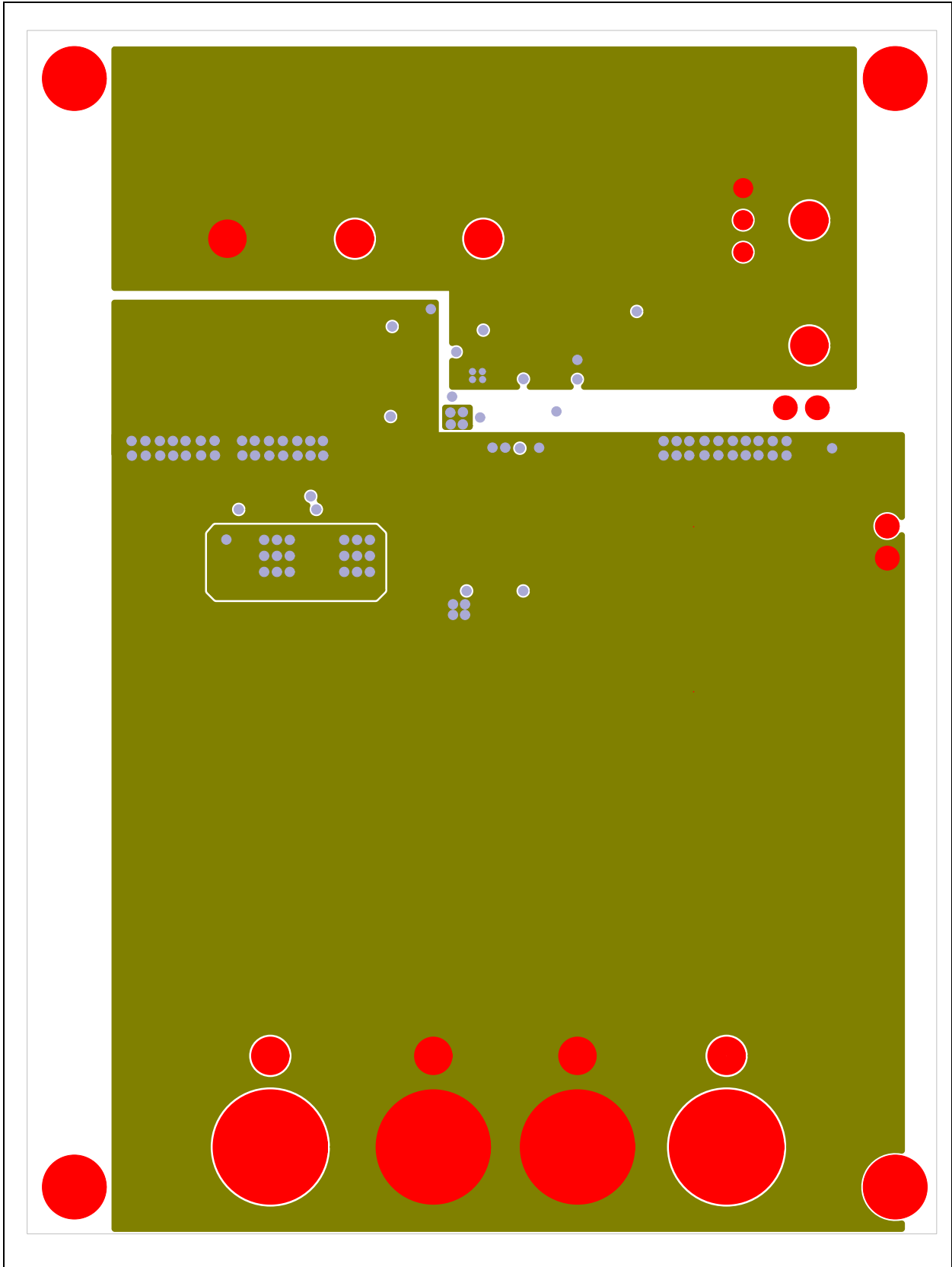


MIC2128 Evaluation Board User's Guide

A.4 BOARD – TOP COPPER LAYER

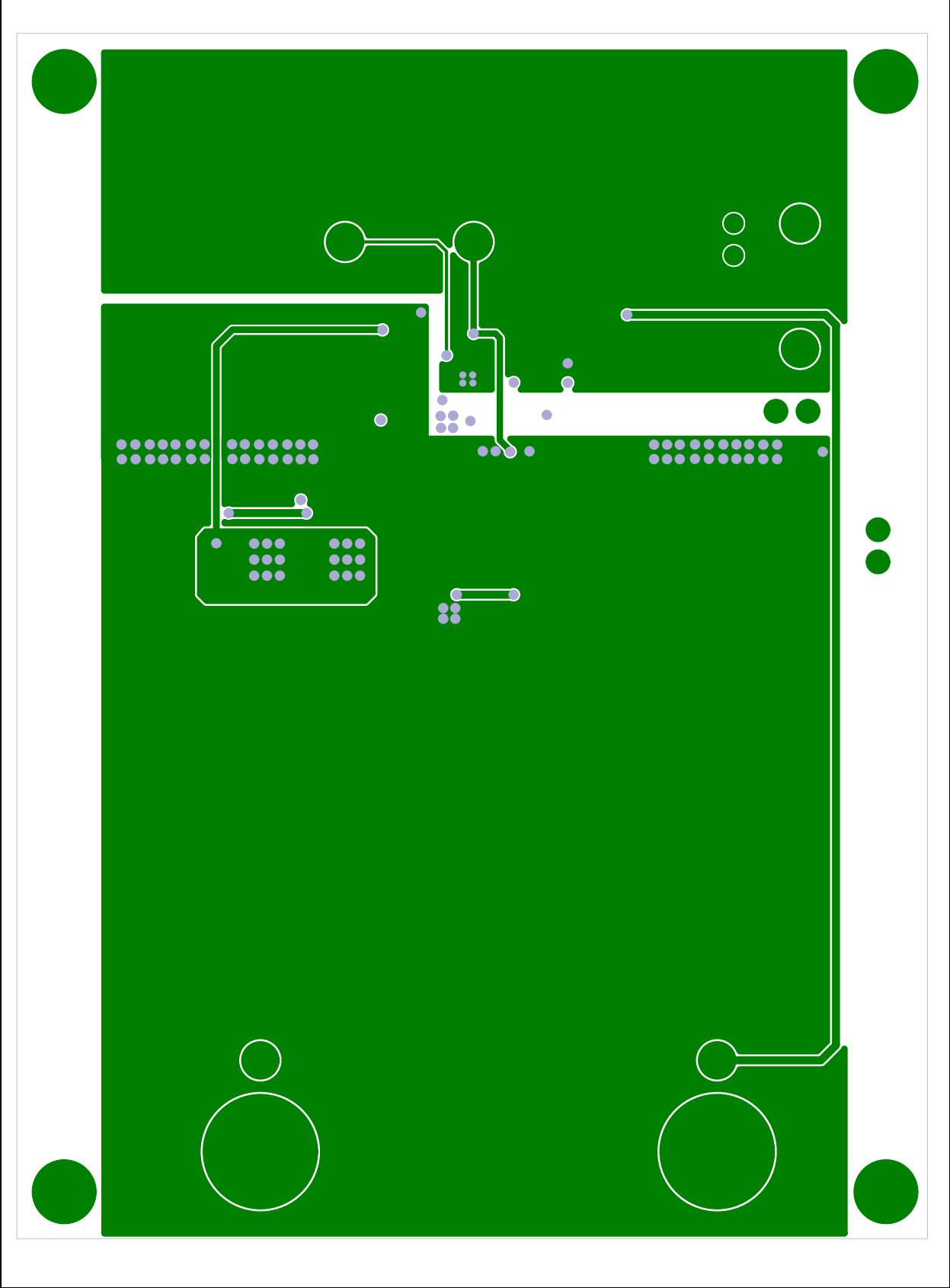


A.5 BOARD – MID COPPER LAYER 1

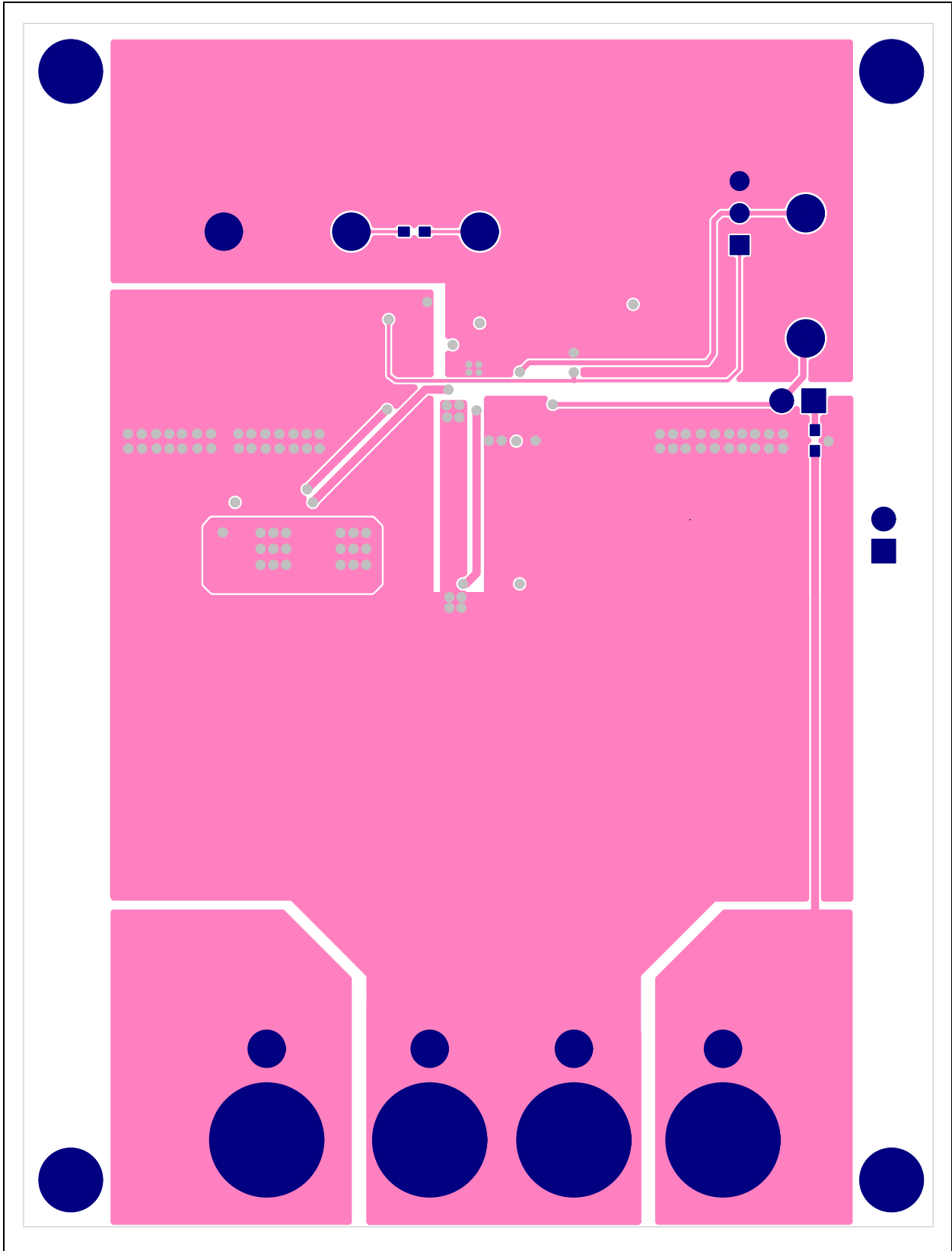


MIC2128 Evaluation Board User's Guide

A.6 BOARD – MID COPPER LAYER 2

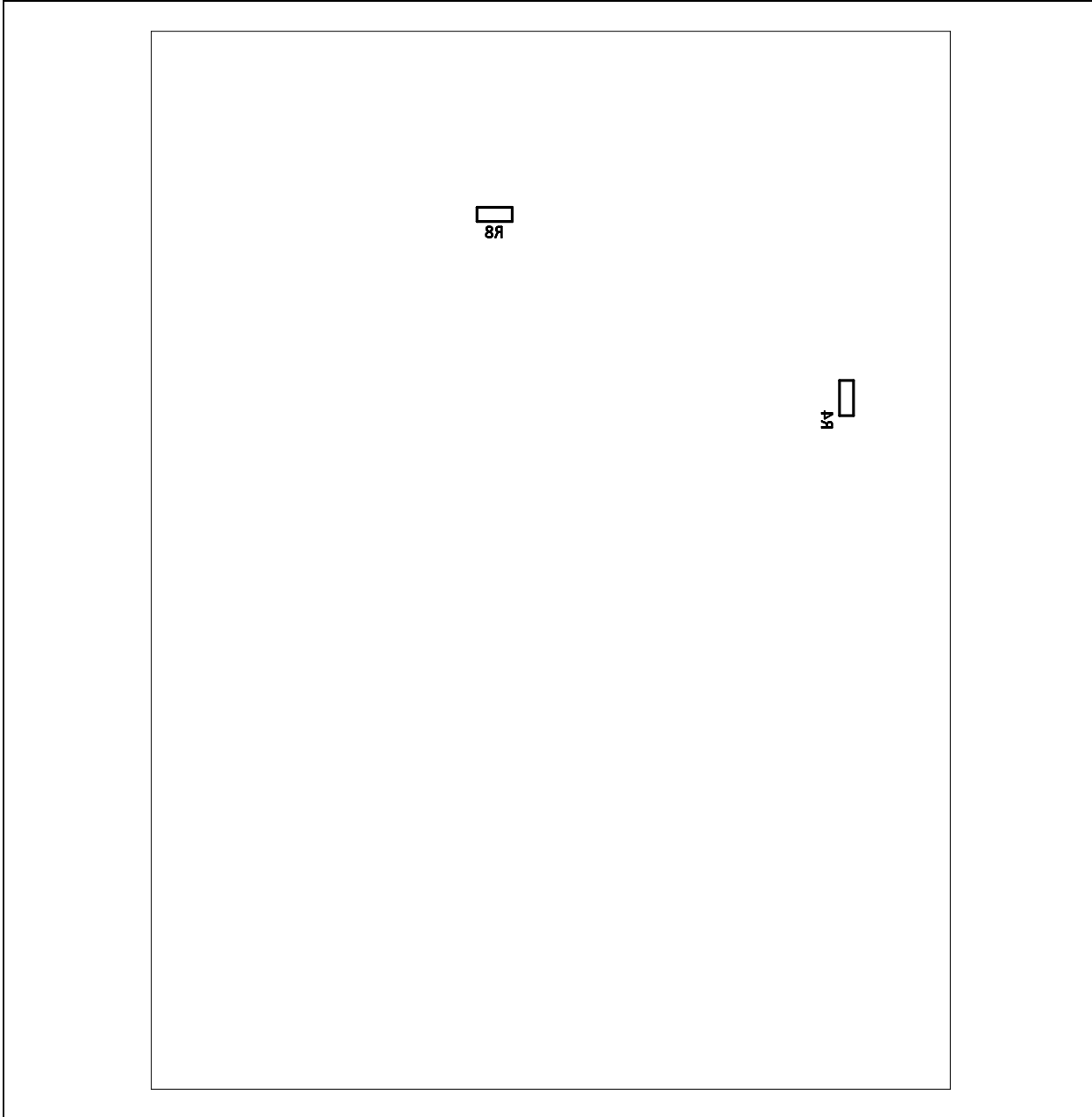


A.7 BOARD – BOTTOM COPPER LAYER



MIC2128 Evaluation Board User's Guide

A.8 BOARD – BOTTOM SILK LAYER





MIC2128 EVALUATION BOARD USER'S GUIDE

Appendix B. Bill of Materials (BOM)

TABLE B-1: BILL OF MATERIALS (BOM)

Qty.	Reference	Description	Manufacturer	Part Number
1	C1	100 μ F, 100V, 20%, 330 m Ω ,	United Chemi-Con	EMVY101ARA101MKE0S
3	C2, C3, C4	2.2 μ F, X7R, 100V, 10%	Murata Electronics®	GRM32ER72A225K
1	C5	330 μ F, 10V, 17 m Ω ,	Panasonic® - ECG	10SVP330M
1	C6	47 μ F, X7R, 10V, 10%	Murata Electronics	GRM32ER71A476K
0	C7, C8	1210 mm size MLCC capacitor DO NOT POPULATE		
3	C9, C20, C21	0.1 μ F, X7R, 100V, 10%	Murata Electronics	GRM188R72A104K
2	C10, C11	4.7 μ F, X7R, 10V, 10%	Samsung Electro-Mechanics America, Inc.	CL10B475KQ8NQNC
1	C12	0.1 μ F, X7R, 16V, 10%	Murata Electronics	GRM188R71C104K
1	C13	1 μ F, X7R, 10V, 10%	Murata Electronics	GRM188R71A105K
0	C14	0603 size capacitor DO NOT POPULATE		
1	C15	100 nF, 100V, 10%, X7R	Murata Electronics	GRM188R72A104K
1	C16	4.7 nF, X7R, 1 6V	Murata Electronics	GRM188R71C472KA
0	C17	0603 size MLCC capacitor DO NOT POPULATE		
0	C18	0603 size MLCC capacitor DO NOT POPULATE		
1	C19	10 nF, X7R, 6.3V, 1 0%	Murata Electronics	GRM188R70J103K
1	PCB	MIC2128 Evaluation Board	Microchip Technology Inc.	02-10568
5	R1,R4,R6,R13,R14	0 Ω , 0603 size resistor	Yageo Corporation	RC0603FR-070RL
1	R2	100K, 0603 size resistor	Yageo Corporation	RC0603FR-07100KL
1	R3	60K, 0603 size resistor	Yageo Corporation	RC0603FR-0760K4L
1	R5	10 Ω , 0603 size resistor	Yageo Corporation	RC0603FR-0710RL
1	R7	1.3K, 0603 size resistor	Yageo Corporation	RC0603FR-071K3L
1	R8	10K, 0603 size resistor	Yageo Corporation	RC0603FR-0710KL
1	R9	18K, 0603 size resistor	Yageo Corporation	RC0603FR-0718KL
1	R10	7.5K, 0603 size resistor	Yageo Corporation	RC0603FR-077K5L
1	R11	1K, 0603 size resistor	Yageo Corporation	RC0603FR-071KL
	R12	49.9K, 0603 size resistor	Yageo Corporation	RC0603FR-0749R9L
0	R15	0805 size resistor DO NOT POPULATE		

Note 1: The components listed in this Bill of Materials are representative of the PCB assembly. The released BOM used in manufacturing uses all RoHS-compliant components.

MIC2128 Evaluation Board User's Guide

TABLE B-2: BILL OF MATERIALS (BOM) - MECHANICAL PARTS

Qty.	Reference	Description	Manufacturer	Part Number
0	D2	100V Schottky diode, power PAK S08 (5.15 mm X 6.15 mm) DO NOT POPULATE		
2	JU1, JU3	2-pin Header (100 mil pitch)	TE Connectivity, Ltd.	5-146278-2
1	JU2	3-pin Header (100 mil pitch)	TE Connectivity, Ltd.	5-146282-3
9	PG, AGND, VDD, EN, EXTVDD, VIN, PGND, VOUT, PGND	Terminal double turret (through hole, noninsulated)	Keystone Electronics Corp.	1593-2
1	L1	10 μ H inductor, size 13.5 mm X 12.5 mm X 6.2 mm	Bourns [®] , Inc.	SRP1265A-100M
2	Q1, Q4	N-Channel MOSFET, power PAK S08 (5.15 mm X 6.15 mm) DO NOT POPULATE		
2	Q2, Q3	100V,40A N-Channel MOSFET, power PAK S08 (5.15 mm X 6.15 mm)	Vishay Intertechnology, Inc.	SIR878ADP
4	VIN, PGND, VOUT, PGND	Noninsulated banana jack	Keystone Electronics Corp.	575-4
2	Shunt	Shunts with closed top, (100 mil pitch)	Sullins Connector Solutions	SPC02SYAN

Note 1: The components listed in this Bill of Materials are representative of the PCB assembly. The released BOM used in manufacturing uses all RoHS-compliant components.

Bill of Materials (BOM)

NOTES:



MICROCHIP

Worldwide Sales and Service

AMERICAS

Corporate Office

2355 West Chandler Blvd.
Chandler, AZ 85224-6199

Tel: 480-792-7200

Fax: 480-792-7277

Technical Support:

[http://www.microchip.com/
support](http://www.microchip.com/support)

Web Address:

www.microchip.com

Atlanta

Duluth, GA

Tel: 678-957-9614

Fax: 678-957-1455

Austin, TX

Tel: 512-257-3370

Boston

Westborough, MA

Tel: 774-760-0087

Fax: 774-760-0088

Chicago

Itasca, IL

Tel: 630-285-0071

Fax: 630-285-0075

Cleveland

Independence, OH

Tel: 216-447-0464

Fax: 216-447-0643

Dallas

Addison, TX

Tel: 972-818-7423

Fax: 972-818-2924

Detroit

Novi, MI

Tel: 248-848-4000

Houston, TX

Tel: 281-894-5983

Indianapolis

Noblesville, IN

Tel: 317-773-8323

Fax: 317-773-5453

Los Angeles

Mission Viejo, CA

Tel: 949-462-9523

Fax: 949-462-9608

New York, NY

Tel: 631-435-6000

San Jose, CA

Tel: 408-735-9110

Canada - Toronto

Tel: 905-695-1980

Fax: 905-695-2078

ASIA/PACIFIC

Asia Pacific Office

Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon

Hong Kong

Tel: 852-2943-5100

Fax: 852-2401-3431

Australia - Sydney

Tel: 61-2-9868-6733

Fax: 61-2-9868-6755

China - Beijing

Tel: 86-10-8569-7000

Fax: 86-10-8528-2104

China - Chengdu

Tel: 86-28-8665-5511

Fax: 86-28-8665-7889

China - Chongqing

Tel: 86-23-8980-9588

Fax: 86-23-8980-9500

China - Dongguan

Tel: 86-769-8702-9880

China - Guangzhou

Tel: 86-20-8755-8029

China - Hangzhou

Tel: 86-571-8792-8115

Fax: 86-571-8792-8116

China - Hong Kong SAR

Tel: 852-2943-5100

Fax: 852-2401-3431

China - Nanjing

Tel: 86-25-8473-2460

Fax: 86-25-8473-2470

China - Qingdao

Tel: 86-532-8502-7355

Fax: 86-532-8502-7205

China - Shanghai

Tel: 86-21-5407-5533

Fax: 86-21-5407-5066

China - Shenyang

Tel: 86-24-2334-2829

Fax: 86-24-2334-2393

China - Shenzhen

Tel: 86-755-8864-2200

Fax: 86-755-8203-1760

China - Wuhan

Tel: 86-27-5980-5300

Fax: 86-27-5980-5118

China - Xian

Tel: 86-29-8833-7252

Fax: 86-29-8833-7256

ASIA/PACIFIC

China - Xiamen

Tel: 86-592-2388138

Fax: 86-592-2388130

China - Zhuhai

Tel: 86-756-3210040

Fax: 86-756-3210049

India - Bangalore

Tel: 91-80-3090-4444

Fax: 91-80-3090-4123

India - New Delhi

Tel: 91-11-4160-8631

Fax: 91-11-4160-8632

India - Pune

Tel: 91-20-3019-1500

Japan - Osaka

Tel: 81-6-6152-7160

Fax: 81-6-6152-9310

Japan - Tokyo

Tel: 81-3-6880-3770

Fax: 81-3-6880-3771

Korea - Daegu

Tel: 82-53-744-4301

Fax: 82-53-744-4302

Korea - Seoul

Tel: 82-2-554-7200

Fax: 82-2-558-5932 or

82-2-558-5934

Malaysia - Kuala Lumpur

Tel: 60-3-6201-9857

Fax: 60-3-6201-9859

Malaysia - Penang

Tel: 60-4-227-8870

Fax: 60-4-227-4068

Philippines - Manila

Tel: 63-2-634-9065

Fax: 63-2-634-9069

Singapore

Tel: 65-6334-8870

Fax: 65-6334-8850

Taiwan - Hsin Chu

Tel: 886-3-5778-366

Fax: 886-3-5770-955

Taiwan - Kaohsiung

Tel: 886-7-213-7828

Taiwan - Taipei

Tel: 886-2-2508-8600

Fax: 886-2-2508-0102

Thailand - Bangkok

Tel: 66-2-694-1351

Fax: 66-2-694-1350

EUROPE

Austria - Wels

Tel: 43-7242-2244-39

Fax: 43-7242-2244-393

Denmark - Copenhagen

Tel: 45-4450-2828

Fax: 45-4485-2829

France - Paris

Tel: 33-1-69-53-63-20

Fax: 33-1-69-30-90-79

Germany - Dusseldorf

Tel: 49-2129-3766400

Germany - Karlsruhe

Tel: 49-721-625370

Germany - Munich

Tel: 49-89-627-144-0

Fax: 49-89-627-144-44

Italy - Milan

Tel: 39-0331-742611

Fax: 39-0331-466781

Italy - Venice

Tel: 39-049-7625286

Netherlands - Drunen

Tel: 31-416-690399

Fax: 31-416-690340

Poland - Warsaw

Tel: 48-22-3325737

Spain - Madrid

Tel: 34-91-708-08-90

Fax: 34-91-708-08-91

Sweden - Stockholm

Tel: 46-8-5090-4654

UK - Wokingham

Tel: 44-118-921-5800

Fax: 44-118-921-5820

06/23/16

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Microchip:](#)

[ADM00770](#)