

COOLDIM_PRG_BOARD

User manual for CDM10V programming board

About this document

Scope and purpose

CDM10V programming user manual describes the “COOLDIM_PRG_BOARD” burner board usage, the UART protocol handling and the fusing details.

Intended audience

CDM10V programming board user.

Table of contents

About this document	1
Table of contents	1
1 CDM10V BURNER	2
1.1 Introduction.....	2
1.2 Chip orientation	2
1.3 Control buttons	3
1.4 Switches.....	3
1.5 Connectors / Jumper	4
2 Fusing details	5
2.1 UART configuration	5
2.2 Fusing conditions	5
2.3 Fusing procedure	6
Revision history	8

1 CDM10V BURNER

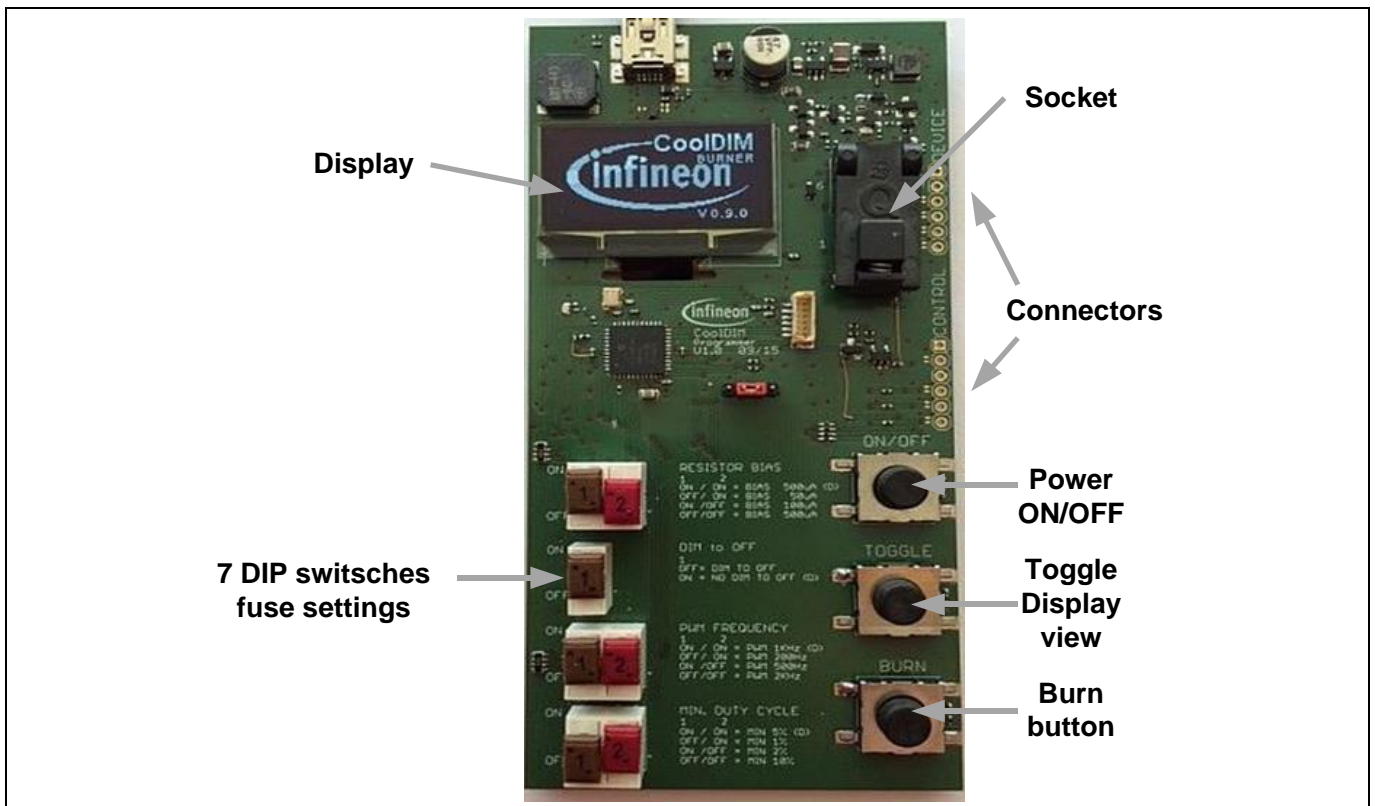


Figure 1 CDM10V BURNER

1.1 Introduction

The COOLDIM_PRG_BOARD is used to set fuses inside CDM10V chip. It is supplied from a USB power supply (5 V / 1 A) or could also be connected to a USB port of the PC. User will be guided through the burning process by the microcontroller firmware. If an error occur during handling user will be advised by firmware how to proceed. When no button is pressed during 5 minutes the display is switched off automatically and the LED below the display is flashing once per second, pressing any button will switch on the display again.

1.2 Chip orientation

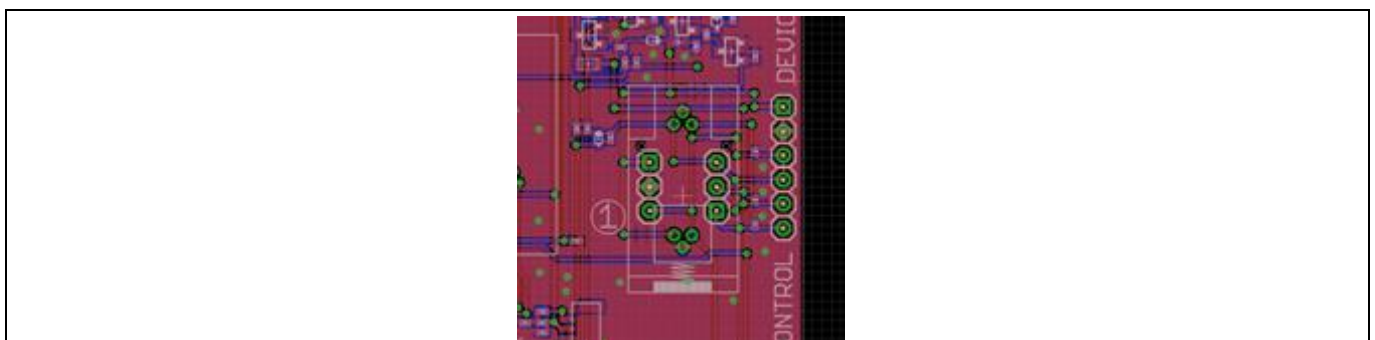


Figure 2 Chip orientation

Pin “1” of the chip shall be located in the lower left corner of the open socket. This is marked with a “1” on the PCB.

1.3 Control buttons

ON/OFF

Check if chip is applied in correct position and turn supply voltage on or off. When supply is turned on all 4 parameters are measured and shown in display. If one parameter could not be measured a contact fail is expected supply is turned off and the user is informed to check the socket. If none of the parameter could be measured user is informed that it is expected that socket is empty and supply is turned off. Only if all parameter could be measured correctly (+/- 10%) supply stays on and allows the use to proceed.

Toggle

Toggle screen to show either chip settings or board settings. To burn the board settings user has to switch to board settings view.

Burn

Start the fuse burning procedure. Fuse burning will only be started if:

1. The board settings differ from chip settings
2. Setting one (or several) bit to "1"

If these conditions are not fulfilled, burn procedure is aborted.

1.4 Switches

The switches are used to set the state of the fuses. Please note: user is only able to set a fuse bit from "0" to "1". If a bit is already set to "1" it could be not reversed and burn fuse will be aborted. The decoding of the switches is printed on the board and will be shown in board settings view on the display.

Table 1 CDM10V settings

Dimmer / resistor bias	00	200 μA	DEFAULT
	01	100 μ A	
	10	50 μ A	
	11	500 μ A	
Dim-to-off	0	NOT ENABLED	DEFAULT
	1	ENABLE DIM-TO-OFF	
PWM frequency	00	1000 Hz	DEFAULT
	01	500 Hz	
	10	200 Hz	
	11	2000 HZ	
Minimum duty cycle	00	5%	DEFAULT
	01	2%	
	10	1%	
	11	10%	

1.5 Connectors / Jumper

Optional connectors for external socket board.

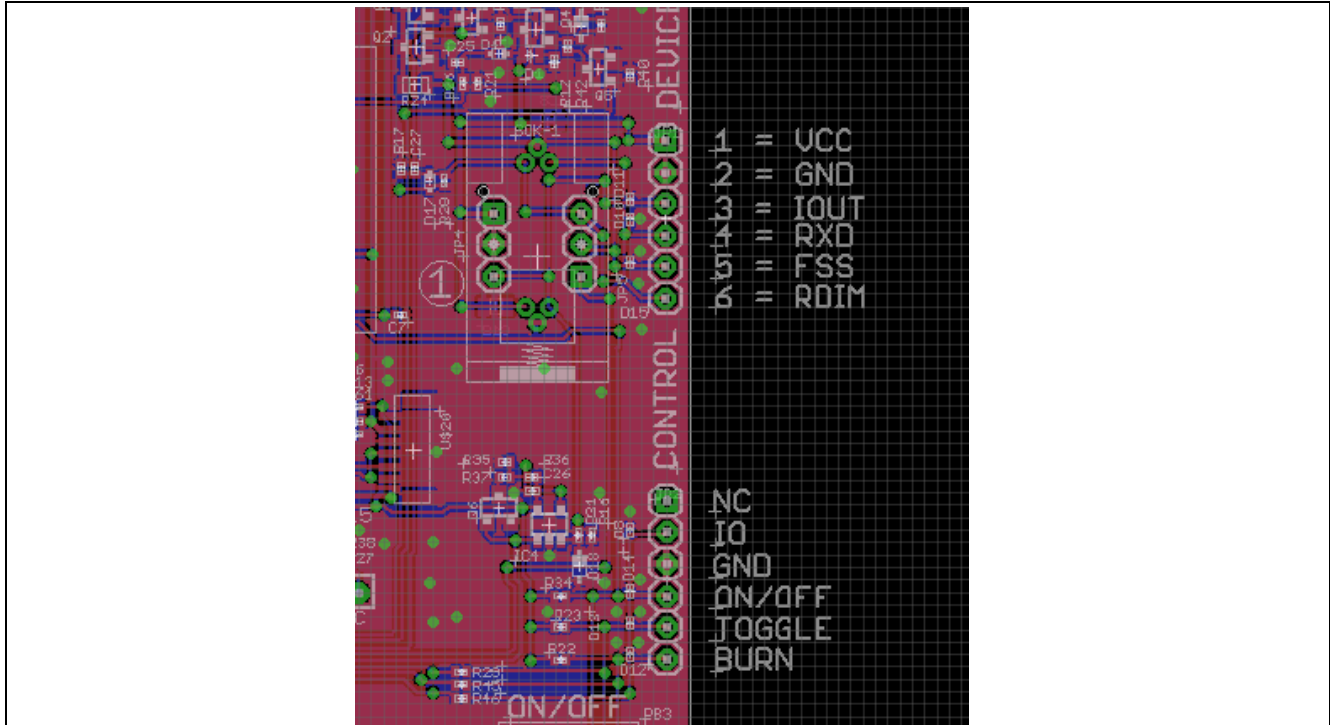


Figure 3 Connectors

Fusing details

2 Fusing details

2.1 UART configuration

The serial port (9600 Baud, 1 stop bit, no parity) enables a onetime reconfiguration of parameters for device function. The reserved CMD bit has to be set to HIGH. After this bit the 7 programming has to be sent in the order shown in the picture below.

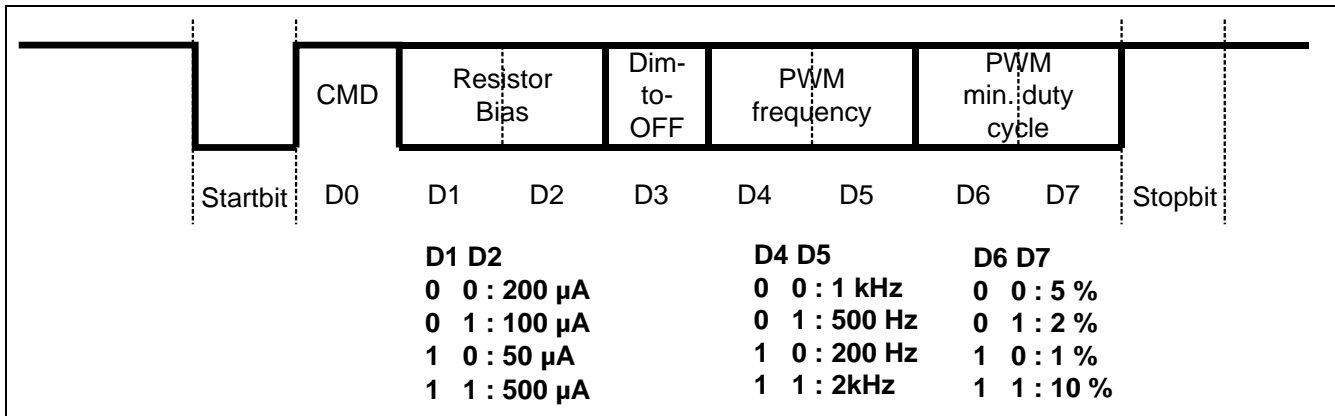


Figure 4 UART data frame format

The figure below shows the minimal fuse programming circuit diagram. The LED is optional and can be used to signalize the correct fusing procedure.

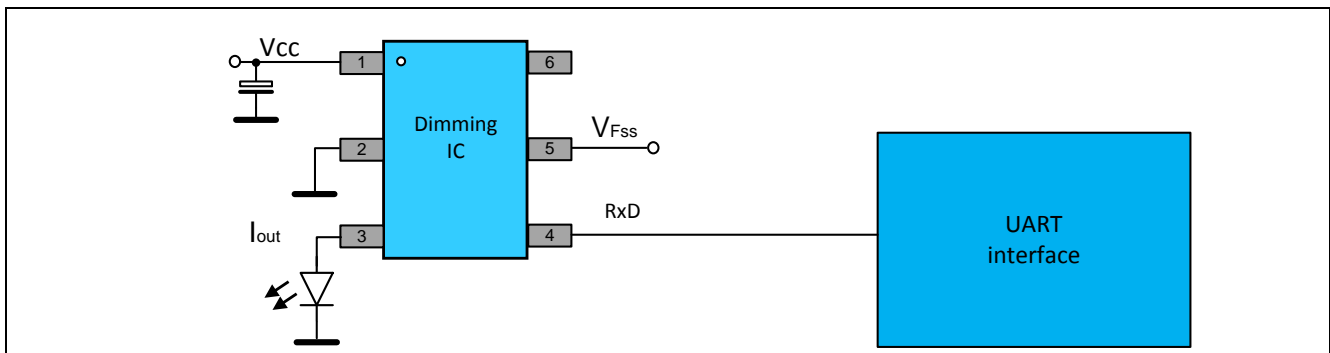


Figure 5 FUSE programming minimal circuit

2.2 Fusing conditions

Table 2 Fusing conditions

Condition	Nom. value	Limits
Vcc	11.0 V	
V _{Fss}	4.1 V	+0.1 V
I _{Fss}	20 mA	
Temperature	25°C	

Fusing details

2.3 Fusing procedure

To ensure the correct efuse burning automatic programming and checking procedure is implemented. Remark that fusing can be done one time only per device.

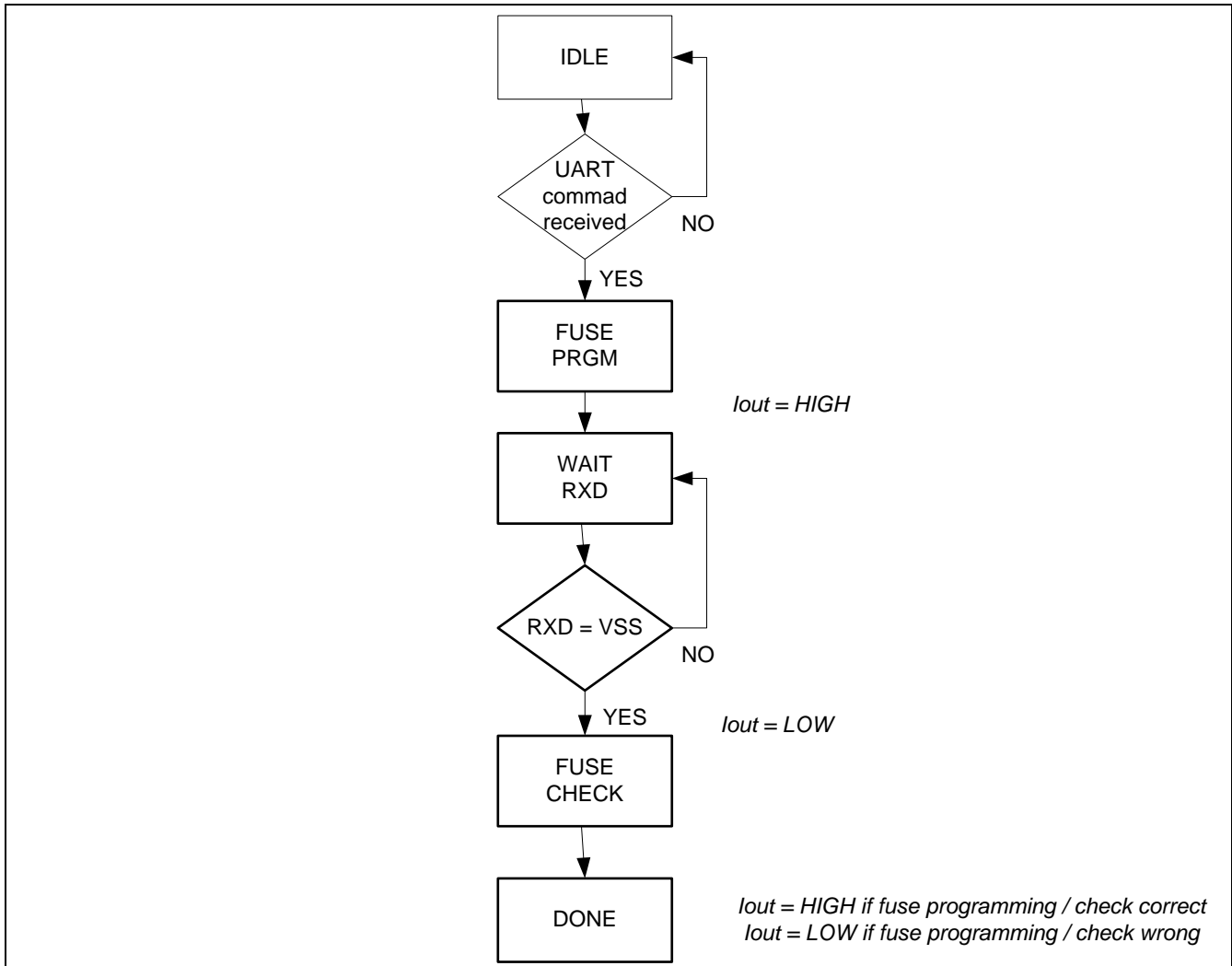


Figure 6 Fusing procedure

IDLE

The device is awaiting the correct UART frame. After correct frame is received (CMD bit is set to HIGH) the fuse programming procedure is started.

FUSE PRGM

Here the actual fuse procedure is performed. This takes at least ~10.5 ms. The end of the procedure signaled by setting the I_{out} pad to high state.

WAIT RXD

The FUSE programming is done, this is signaled by setting I_{out} to HIGH state. After detecting this state the RXD should be set to HIGH within 100 ms to proceed with the next state, the I_{out} is set to LOW.

FUSE CHECK

In this state the fuses will be read out and compared with the received UART byte. This step takes ~100 μ s.

Fusing details

DONE

If the compared data is correct the I_{out} is set to HIGH if not this will stay in LOW in this state. Remark that the power down/up step is required to return to the normal operation after the whole efuse burning procedure is performed.

The detailed fusing timing is shown in the figure below. Remark the 100ms timing after the FUSE PRGM state.

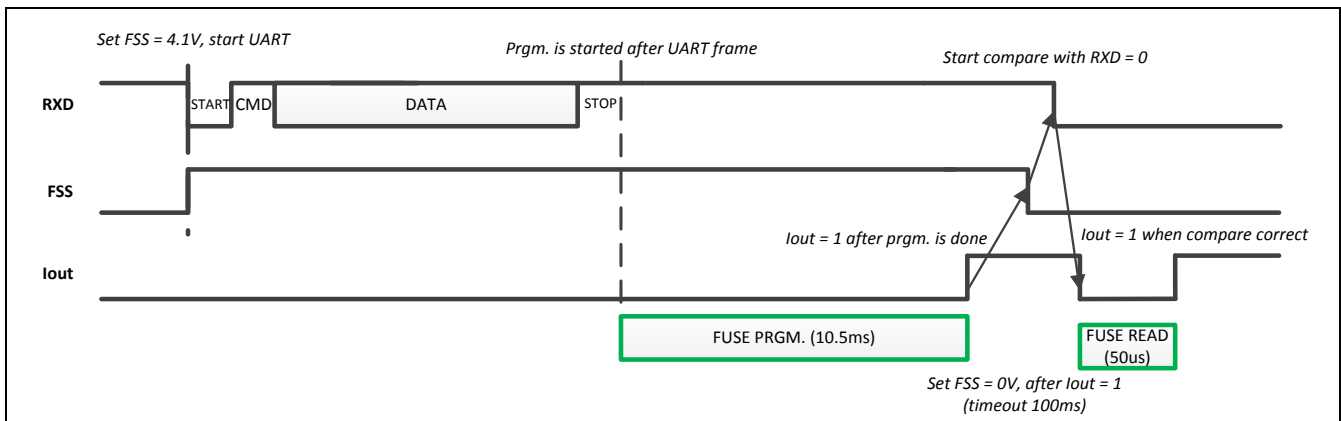


Figure 7 Fuse timing

Revision history

Document version	Date of release	Description of changes

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2017-09-19

Published by

Infineon Technologies AG

81726 Munich, Germany

© 2017 Infineon Technologies AG.

All Rights Reserved.

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

UM_201709_PL21_011

IMPORTANT NOTICE

The information contained in this application note is given as a hint for the implementation of the product only and shall in no event be regarded as a description or warranty of a certain functionality, condition or quality of the product. Before implementation of the product, the recipient of this application note must verify any function and other technical information given herein in the real application. Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind (including without limitation warranties of non-infringement of intellectual property rights of any third party) with respect to any and all information given in this application note.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.