

User's Guide

LM66200 Evaluation Module



ABSTRACT

This user's guide describes the characteristics, operation, and use of the LM66200 low I_Q ideal diode Evaluation Module (EVM). This document contains the complete EVM schematic diagram, printed-circuit board layouts, bill of materials, and necessary instructions on how to properly operate the EVM.

Table of Contents

1 Introduction	2
1.1 Description.....	2
1.2 Features.....	2
2 Electrical Performance	2
3 LM66200EVM Configurations	3
4 Schematic	4
5 PCB Layout	5
6 Test Setup	6
6.1 LM66200EVM Test Equipment.....	6
6.2 Setting up the LM66200EVM.....	6
7 Test Configuration	6
8 Bill of Materials (BOM)	7
Revision History	9

List of Figures

Figure 4-1. LM66200EVM Schematic.....	4
Figure 5-1. LM66200 Top Layer.....	5
Figure 5-2. LM66200 Bottom Layer.....	5
Figure 7-1. LM66200 Setup With Test Equipment.....	6

List of Tables

Table 1-1. LM66200 Modes of Operation.....	2
Table 3-1. LM66200EVM Input and Output Connector Functionality.....	3
Table 3-2. LM66200EVM Test Point Description.....	3
Table 3-3. LM66200EVM Jumper Description.....	3
Table 6-1. Default Jumper Settings.....	6
Table 8-1. LM66200EVM BOM.....	7

Trademarks

All trademarks are the property of their respective owners.

1 Introduction

The LM66200EVM is an evaluation module for the LM66200 low I_Q ideal diode. The LM66200 is a dual-input, single-output device that automatically passes the higher of its two input voltage to the output. The low quiescent current makes the LM66200 ideal for systems with a battery supply as an input to extend the life of the battery when in use.

1.1 Description

The LM66200EVM is a two layer PCB that enables the evaluation of the LM66200 low IQ ideal diode. This EVM contains multiple jumpers to configure the different modes of operation of the LM66200. [Table 1](#) lists the different modes of operation.

For additional details on ideal diodes, and the data sheet, see [Ideal diode & OR-ing Controllers](#) on TI.com.

Table 1-1. LM66200 Modes of Operation

EVM	Device	Modes of Operation	V_{OUT} Range	$I_{OUT MAX}$
LM66200EVM	LM66200	Diode (highest voltage operation)	1.6 V–5.5 V	2.5 A

1.2 Features

This EVM has the following features:

- 1.6-V–5.5-V voltage range for each input
- Various onboard loading conditions
- Test points on every pin of the LM66200 for easy evaluation

2 Electrical Performance

See the LM66200 data sheet for detailed characteristics.

3 LM66200EVM Configurations

This section provides an overview of the LM66200 evaluation board connector and jumpers. [Table 2](#) describes the input and output connectors and jumpers. [Table 3](#) describes the different test points and functionality. [Table 4](#) describes the jumper functionality and configurations.

Table 3-1. LM66200EVM Input and Output Connector Functionality

Input	Connector and Test Point	Label	Description
VIN1	J1	VIN1+	VIN1 Input connector
	TP1	VIN1	VIN1 Input test point
	TP2	VIN1 SENSE	VIN1 SENSE test point
VIN2	J3	VIN2+	VIN2 Input connector
	TP3	VIN2	VIN2 input test point
	TP4	VIN2 SENSE	VIN2 SENSE test point
VOUT	J4	VOUT+	VOUT output connector
	TP5	VOUT SENSE	VOUT SENSE test point
	TP6	VOUT	VOUT output test point
GND	J2	GND	GND connector for inputs
	J5	GND	GND connector for output
	TP9, TP10, TP11, TP12	GND	Test point for GND

Table 3-2. LM66200EVM Test Point Description

Input	Test point	Label	Description
VOUT	TP7	ST	Output status pin test point
VIN1	TP8	ON	Enable pin for LM66200

Table 3-3. LM66200EVM Jumper Description

Input	Jumper	Label	Description
VIN1, VIN2	JP1	JP1	Configures ON to reference VIN1 or VIN2
VOUT	JP2	JP2	1- μ F output capacitor
	JP3	JP3	10- μ F output capacitor
	JP4	JP4	100- μ F output capacitor
	JP5	JP5	10- Ω output resistor

4 Schematic

Figure 1 illustrates the LM66200EVM schematic.

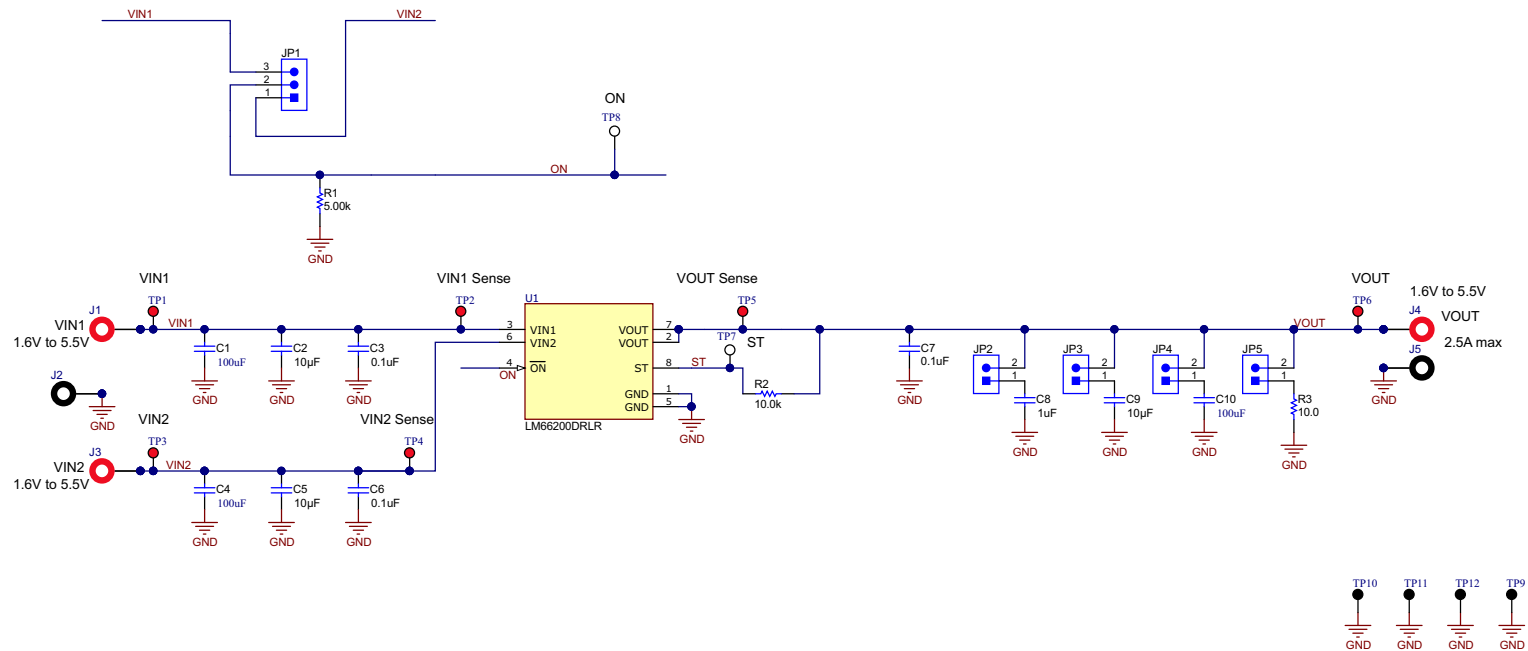


Figure 4-1. LM66200EVM Schematic

5 PCB Layout

Figure 2 and Figure 3 show the LM66200EVM PCB layout images.

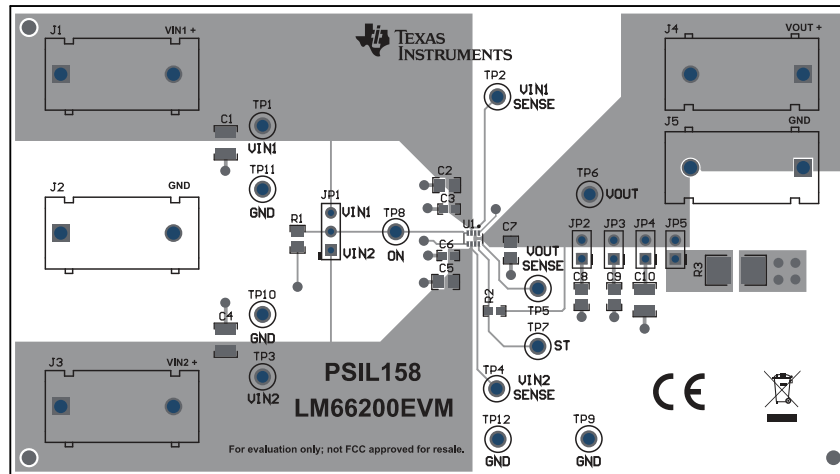


Figure 5-1. LM66200 Top Layer

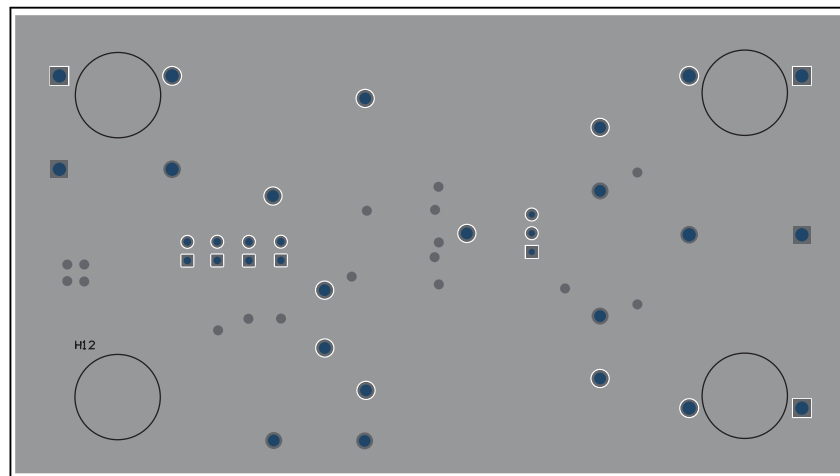


Figure 5-2. LM66200 Bottom Layer

6 Test Setup

This chapter describes the default jumper test setup for the evaluation of the LM66200 using the evaluation module.

6.1 LM66200EVM Test Equipment

Read the LM66200 data sheet before using the EVM.

The following test equipment is recommended:

- Two adjustable power supplies, 0 V–6 V at 2.5-A maximum
- Oscilloscope
- A passive or active load

6.2 Setting up the LM66200EVM

Make sure the LM66200EVM has the default jumper settings described in [Table 5](#).

Table 6-1. Default Jumper Settings

Jumper	Description	Position
JP1	Sets ON pin reference	Position 2 and 3 for VIN1 tied to ON Position 1 and 2 for VIN2 tied to ON
JP2	1 μ F	Install JP2 for 1 μ F of output capacitance
JP5	10 Ω	Install JP5 for 10 Ω of load resistance

7 Test Configuration

[Figure 4](#) shows the test equipment setup for the LM66200EVM.

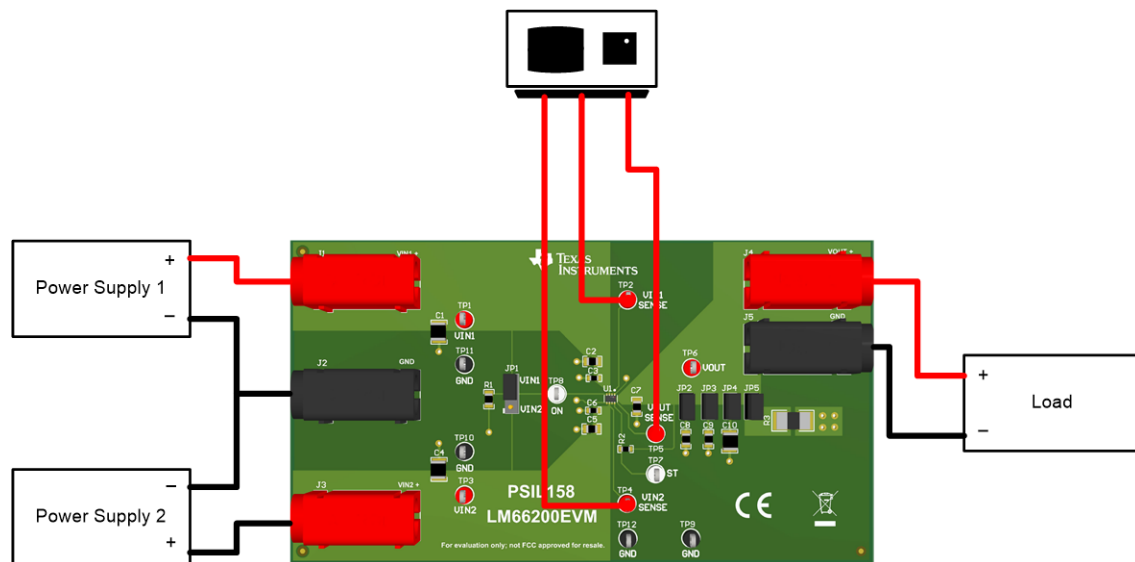


Figure 7-1. LM66200 Setup With Test Equipment

8 Bill of Materials (BOM)

Table 8-1 lists the LM66200EVM BOM.

Table 8-1. LM66200EVM BOM

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C1, C4, C10	3	100 uF	CAP, CERM, 100 uF, 16 V, +/- 20%, X5R, 1210	1210	C1210C107M4PAC7800	Kemet
C2, C5, C9	3	10 uF	CAP, CERM, 10 uF, 20 V, +/- 10%, X5R, 0805	0805	GRM21BR61D106KE15L	MuRata
C3, C6	2	0.1 uF	CAP, CERM, 0.1 uF, 25 V, +/- 10%, X7R, 0603	0603	06033C104KAT2A	AVX
C7	1	0.1 uF	CAP, CERM, 0.1 uF, 25 V, +/- 5%, X7R, 0805	0805	08053C104JAT2A	AVX
C8	1	1 uF	CAP, CERM, 1 uF, 50 V, +/- 10%, X7R, 0805	0805	C0805C105K5RACTU	Kemet
H9, H10, H11, H12	4		Bumpon, Hemisphere, 0.44 X 0.20, Clear	Transparent Bumpon	SJ-5303 (CLEAR)	3M
J1, J3, J4	3		Standard Banana Jack, insulated, 10A, red	571-0500	571-0500	DEM Manufacturing
J2, J5	2		Standard Banana Jack, insulated, 10A, black	571-0100	571-0100	DEM Manufacturing
JP1	1		Header, 100mil, 3x1, TH	Header, 3x1, 100mil, TH	800-10-003-10-001000	Mill-Max
JP2, JP3, JP4, JP5	4		Header, 100mil, 2x1, Tin, TH	Header, 2 PIN, 100mil, Tin	PEC02SAAN	Sullins Connector Solutions
R1	1	5.00 k	RES, 5.00 k, 0.1%, 0.2 W, 0805	0805	PNM0805E5001BST5	Vishay Thin Film
R2	1	10.0 k	RES, 10.0 k, 0.5%, 0.1 W, 0603	0603	RT0603DRE0710KL	Yageo America
R3	1	10.0	RES, 10.0, 1%, 16 W, 2512	2512	CPA2512Q10R0FS-T10	Susumu Co Ltd
SH-J1, SH-J2, SH-J3, SH-J4, SH-J5	5	1x2	Shunt, 100mil, Flash Gold, Black	Closed Top 100mil Shunt	SPC02SYAN	Sullins Connector Solutions
TP1, TP2, TP3, TP4, TP5, TP6	6		Test Point, Multipurpose, Red, TH	Red Multipurpose Testpoint	5010	Keystone

Table 8-1. LM66200EVM BOM (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
TP7, TP8	2		Test Point, Multipurpose, White, TH	White Multipurpose Testpoint	5012	Keystone
TP9, TP10, TP11, TP12	4		Test Point, Multipurpose, Black, TH	Black Multipurpose Testpoint	5011	Keystone
U1	1		1.6 V to 5 V, 2.5-A Dual Ideal Diode with Automatic Switchover	FCSOT8	LM66200DRLR	Texas Instruments
FID1, FID2, FID3	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
April 2021	*	Initial Release

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2022, Texas Instruments Incorporated