

IFX30081SJV

50mA, Adjustable Linear Voltage Regulator with Ultra Low Quiescent Current

Demoboard User's Guide

Rev. 1.0, 2015-02-05

1 Introduction

The IFX30081SJV demoboard can be used to easily evaluate the device in the PG-DSO-8 package. The IFX30081SJV is 50mA linear voltage regulator with ultra low quiescent current. The IFX30081SJV demoboard is fully equipped with external components as well as the device.

This demoboard user's guide contains all necessary information for using of the this board to evaluate the IFX30081SJV.

Table 1 Device Overview

Type	Output voltage	Output current	Enable	Reset	Package	Ordering Information
IFX30081SJV	Adjustable (Demoboard configured to 5V output voltage)	50 mA	Yes	No	PG-DSO-8	Device OPN : IFX30081SJVXUMA1 Demoboard Name : DEMOBD IFX30081SJV SP No. : SP00122728

The IFX30081SJV is not qualified and manufactured according to the requirements of Infineon Technologies with regards to automotive and/or transportation applications. For automotive applications and for linear voltage regulators with the Reset feature please refer to the Infineon TLx (TLE, TLF, TLS...) voltage regulator products.

1.1 General Description

The IFX30081SJV is a linear voltage regulator with wide input voltage range, low drop out voltage and ultra low quiescent current.

With an input voltage range of 2.75 V to 42 V and an ultra low quiescent of only 5 μ A, the regulator is perfectly suitable for applications that are battery driven.

The IFX30081SJV is an adjustable output voltage low dropout linear voltage regulator with an accuracy of 2 % and maximum output current up to 50mA.

The regulation concept implemented in IFX30081SJV combines fast regulation and very good stability while requiring only a small ceramic capacitor of 1 μ F at the output.

The tracking region starts already at input voltages of 2.75 V (extended operating range).

Internal protection features like output current limitation and overtemperature shutdown are implemented to protect the device against immediate damage due to failures like output short circuit to GND, over-current and over-temperature.

For more detailed information please refer to the datasheet of the device on the Infineon website.

1.2 IFX30081SJV Feature List

- Ultra Low Quiescent Current of 5 μ A
- Wide Input Voltage Range of 2.75 V to 42 V
- Output Current Capacity up to 50 mA
- Shutdown Current Less than 1 μ A
- Low Drop Out Voltage
- Output Current Limit Protection
- Overtemperature Shutdown
- Enable
- Wide Temperature Range
- Green Product (RoHS compliant)

1.3 Block Diagram

Figure 1 shows the blockdiagram of the IFX30081SJV.

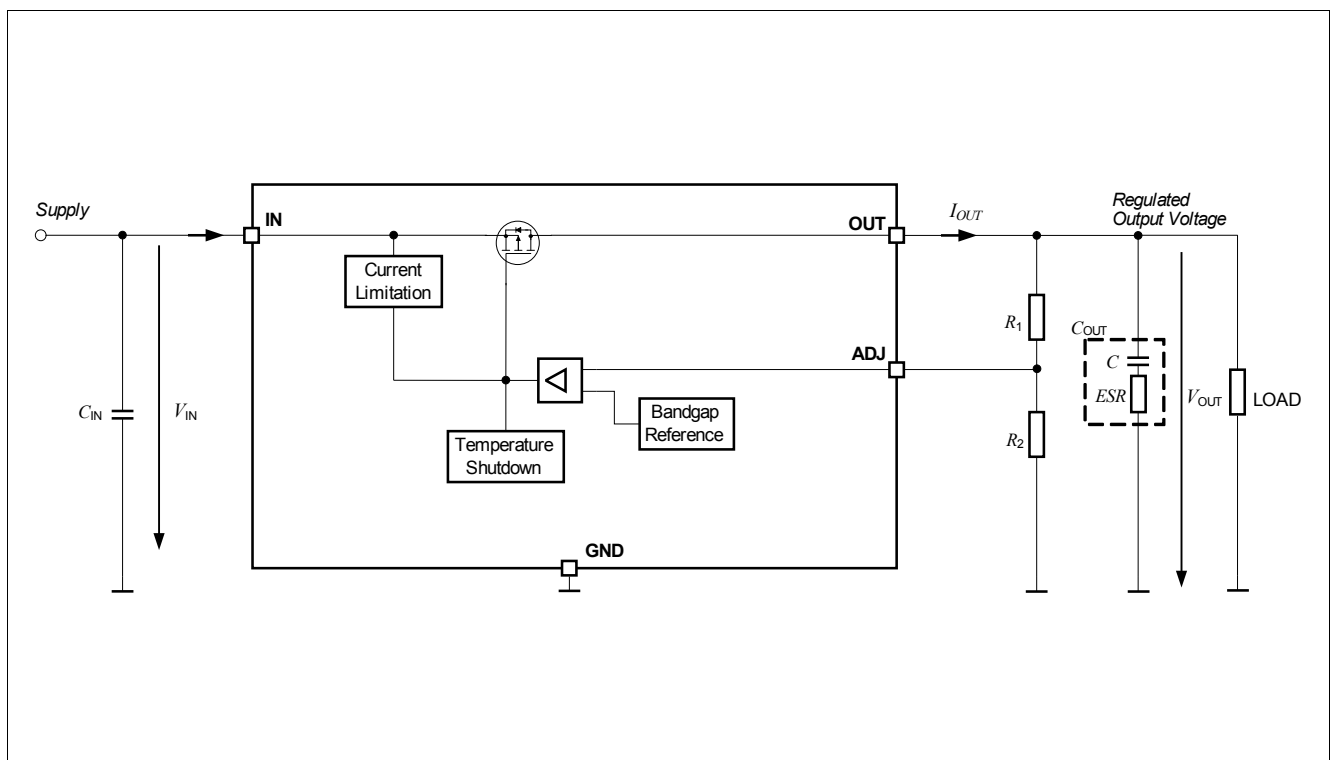


Figure 1 Block Diagram of IFX30081SJV

2 Demoboard

Figure 2 shows a IFX30081SVJ Demoboard (PG-DSO-8) equipped with the device.

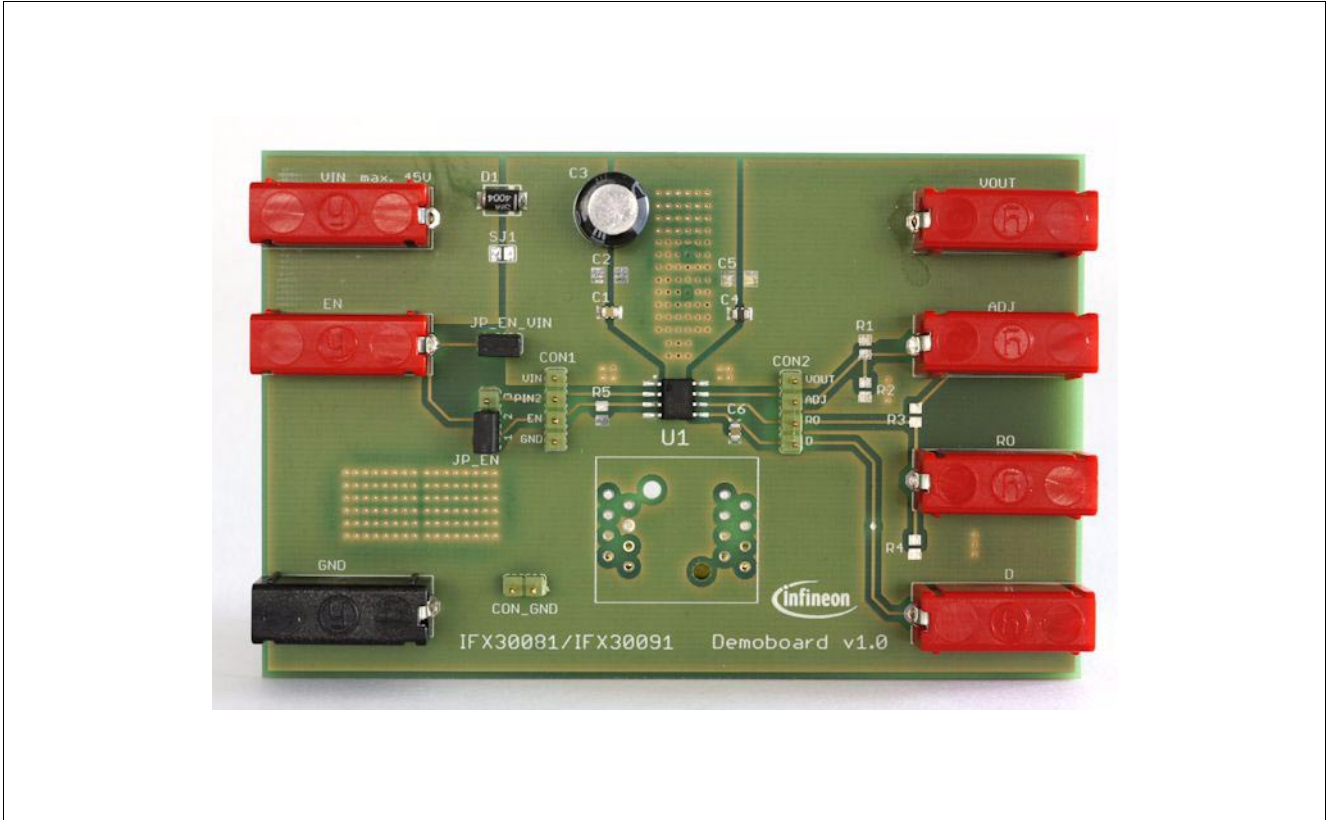


Figure 2 IFX30081SVJ Demo Board (PG-DSO-8)

2.1 Operating Conditions

To avoid any electrical damage of the Demoboard, the maximum operating range defined in [Table 2](#) must be followed.

Table 2 Operating Range¹⁾

Parameter	Symbol	Limit Values		Unit	Note
		Min.	Max.		
Board Supply ²⁾	V_{IN}	0	45	V	Power supply
Regulator Output	V_{OUT}	0	45	V	Regulated output voltage
Enable Signal	EN	0	45 ³⁾	V	Enable signal to switch on the regulator
Adjust Pin	ADJ	0	7	V	Connect the voltage divider for setting the output voltage
Ground	GND	0	0	V	System GND

1) The Demo Board operates at ambient temperature of 25°C

2) Functional input voltage range starts from 2.75 V to 42 V

3) Absolute maximum rating

2.2 Board Configuration

The IFX30081SJV Demoboard can be easily configured via jumpers on the board. The board provides the following configuration options:

- Bypassing the reverse protection diode D2 via solder option SJ1
- Connecting enable signal with the supply voltage V_{IN} (JP_EN_VIN)
- Selection of the enable pin (JP_EN)
- Placeholder for additional input capacitor (C2)
- Placeholder for additional output capacitor (C5)
- Placeholder for external voltage divider for the adjustable output voltage variants (R1, R2)
- Placeholder for DSO-8 socket (S1) and corresponding input and output capacitors (C7, C8)

2.2.1 Enable Function

The jumper JP_EN_VIN can be used to connect the EN signal to the supply voltage V_{IN} .

Table 3 Jumper JP_EN_VIN setting for enable function

JP_EN_VIN	Enable Function
set	EN is connected to the supply voltage V_{IN} ; the regulator is enabled while it is supplied
open	EN is supplied from external via connector EN (Banana jack) ¹⁾

1) Without supplying a signal to EN, the regulator is disabled because of an internal pull down resistor.

The jumper JP_EN can be used to configure the enable pin occupancy.

Table 4 Jumper JP_EN setting for enable function

JP_EN	Enable Function
set to 1 - 2	EN signal is routed to pin 3 (default setting for IFX30081SJV).
set to 2 - 3	EN signal is routed to pin 2 (for usage of compatible devices).

2.2.2 Signal Adaption

For easy signal adaption e.g. connecting probes for an oscilloscope, connectors CON1, CON2 and CON_GND can be used.

Table 5 Signals on connector

Connector	Accessible Signals
CON1	- VIN (input voltage) - EN (enable input signal) - GND (ground)
CON2	- VOUT (output voltage) - ADJ (adjust signal)
CON_GND	- GND

2.2.3 Output Voltage Adjust

The output voltage of the regulators with adjustable output voltage can be adjusted between 1.2 V and $V_{IN} - V_{dr}$ by an external resistor divider, connected to the adjust pin ADJ.

The output voltage can be easily calculated, neglecting the current flowing into the ADJ pin:

$$V_{OUT} = \frac{R_1 + R_2}{R_2} \times V_{ref} \quad (2.1)$$

with

- V_{ref} : internal reference voltage, typically 1.2V
- R_1 : resistor between regulator output OUT and adjust pin ADJ
- R_2 : resistor between adjust pin ADJ and GND

In order to neglect the current flowing into the ADJ pin, the values of R_1 and R_2 should be selected fulfilling the criteria $R_2 \leq 250 \text{ k}\Omega$.

To set the output voltage to 1.2 V, the adjust pin ADJ should be directly connected to the output pin Q.

The Demoboard is equipped with a resistor divider. R_1 and R_2 are mounted by default with the following values:

- $R_1 = 470 \text{ k}\Omega$
- $R_2 = 150 \text{ k}\Omega$

The nominal output voltage with the default resistor divider setting on the Demoboard is typ. 4.96 V.

3 Schematic and Layout

3.1 Schematic

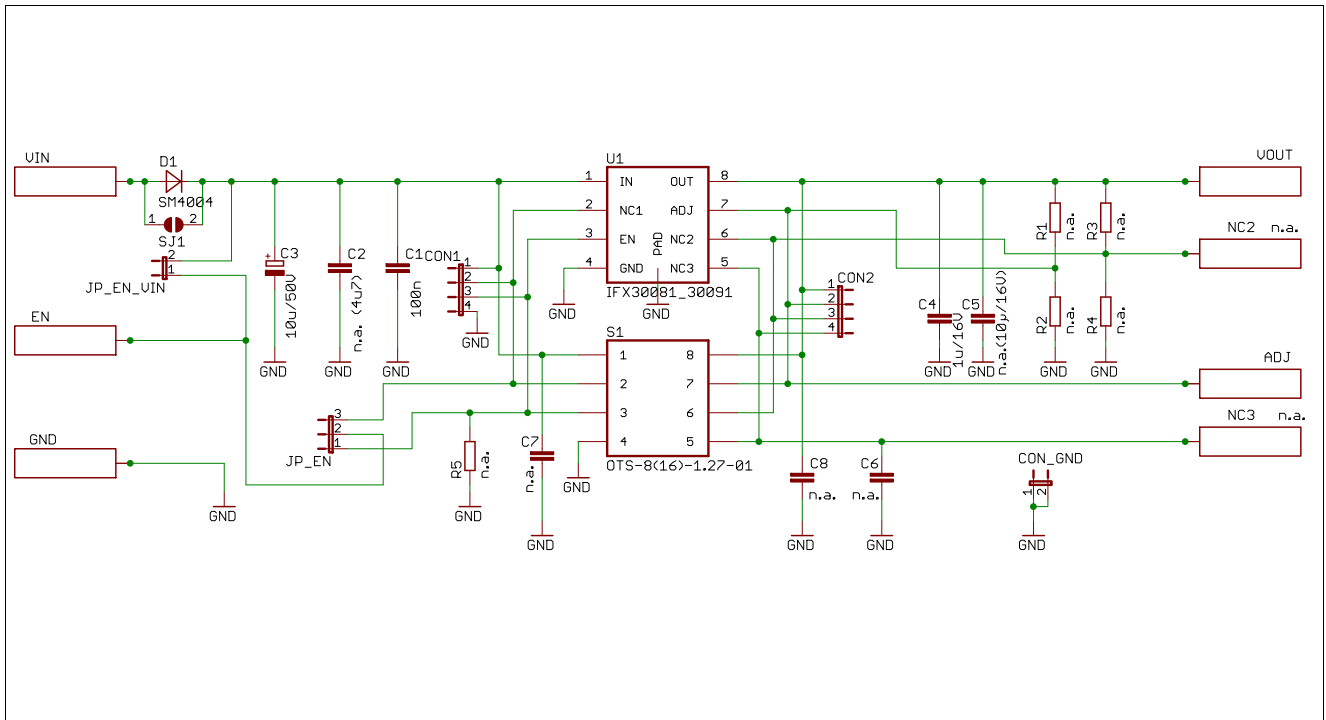


Figure 3 Schematic of IFX30081SJV Demoboard (PG-DSO-8)

3.2 Layout

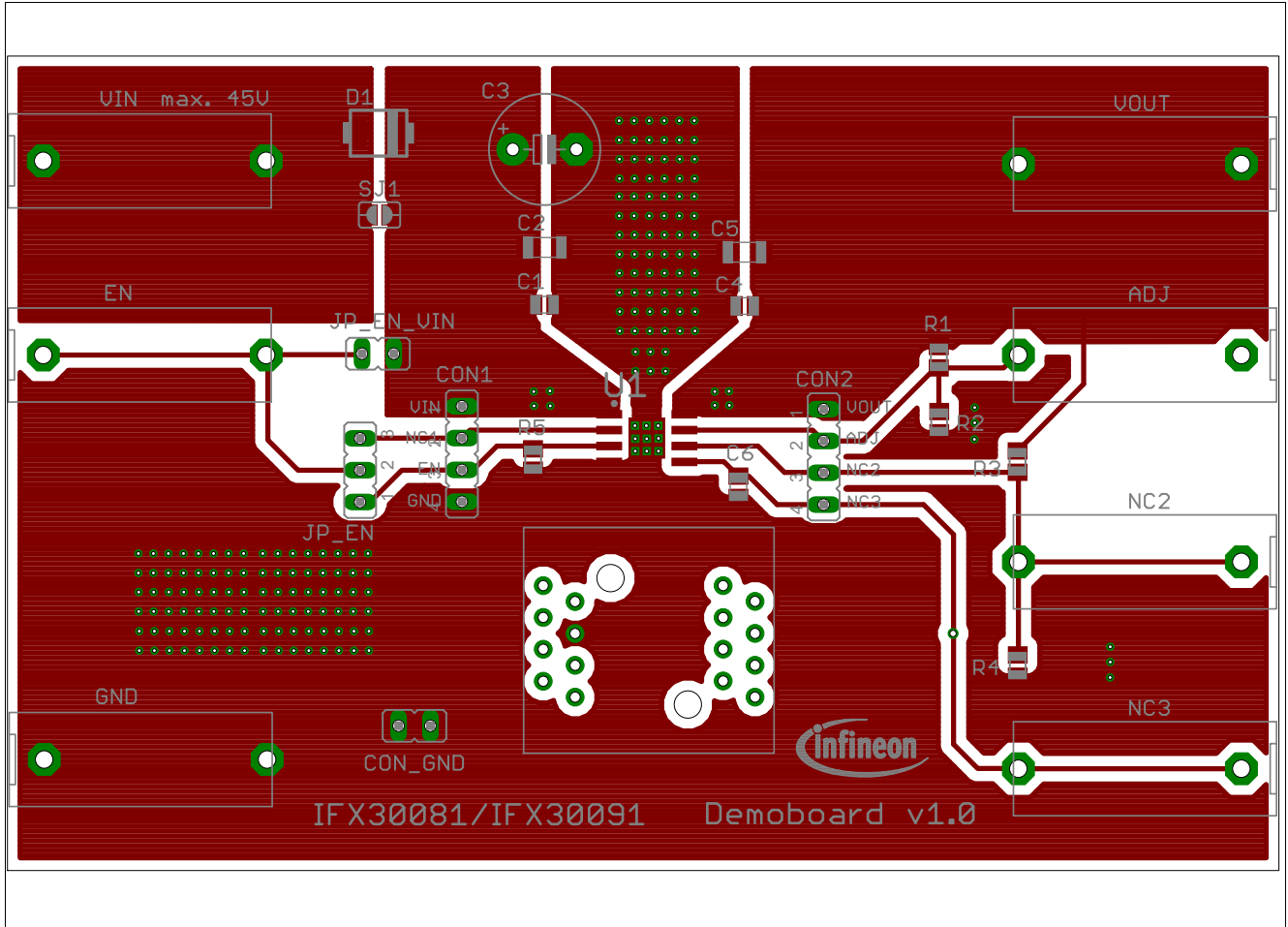


Figure 4 Top Layer of IFX30081SJV Demoboard (PG-DSO-8)

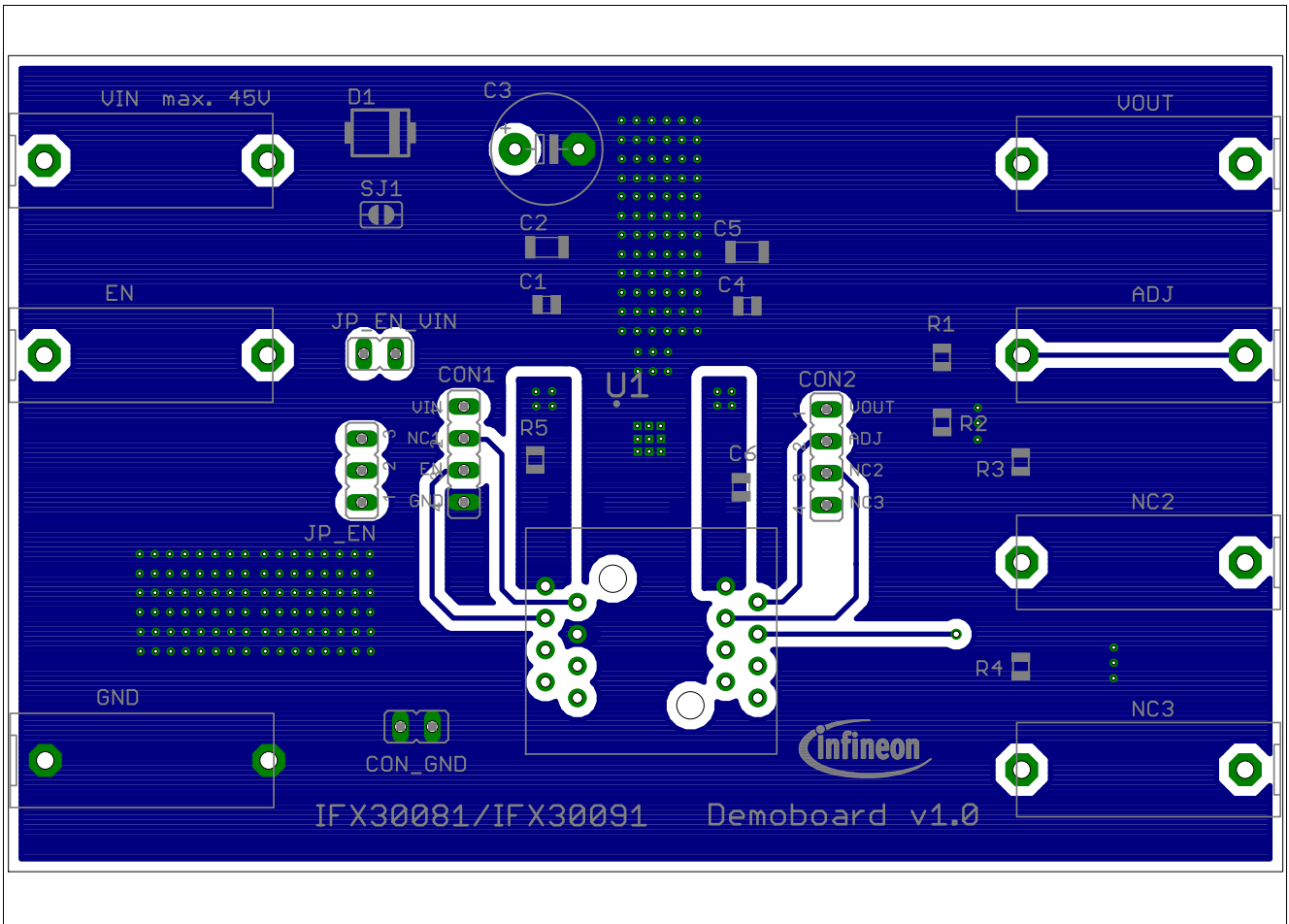


Figure 5 Bottom Layer of IFX30081SJV Demoboard (PG-DSO-8)

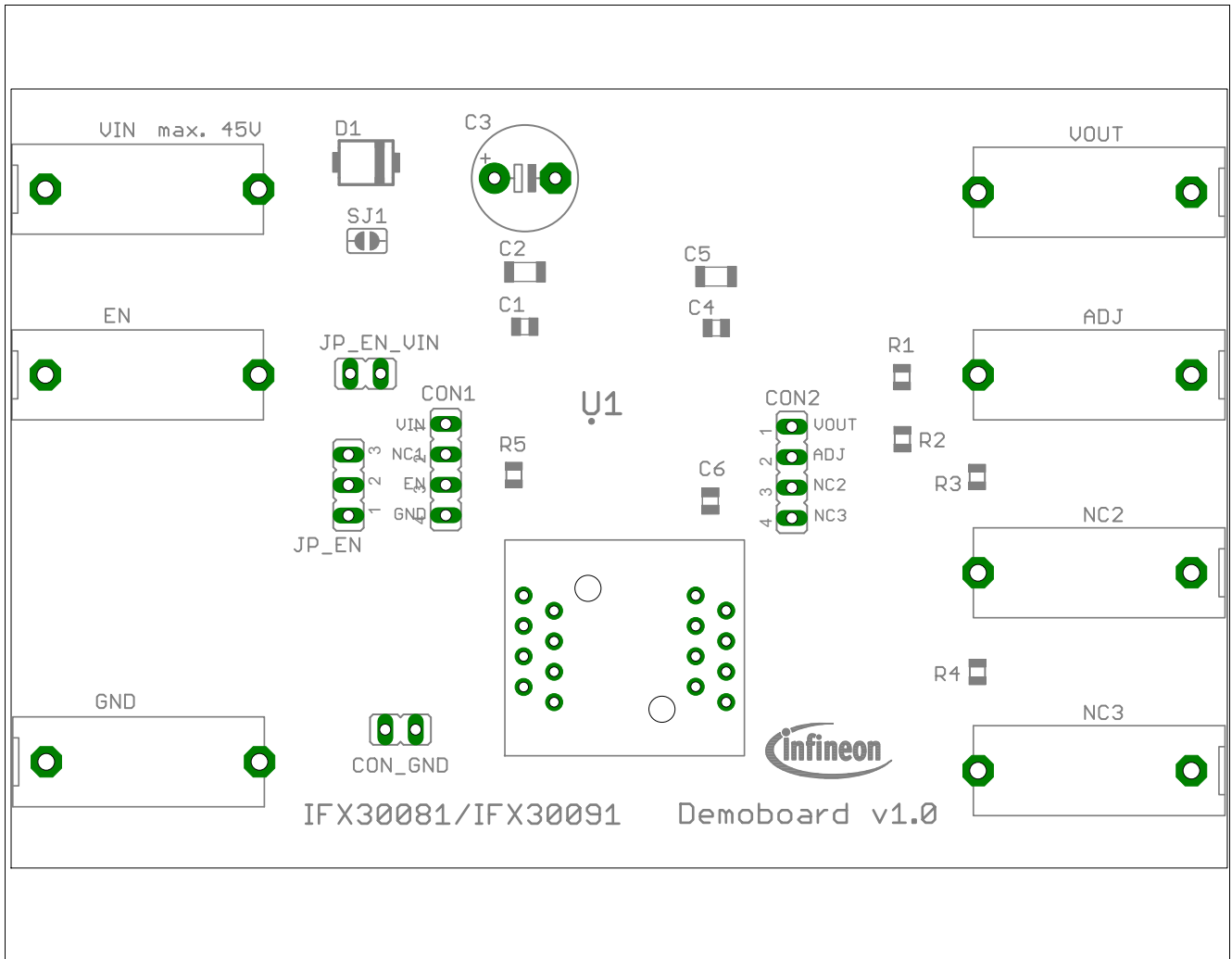


Figure 6 Top Layer components of IFX30081SJV Demoboard (PG-DSO-8)

4 Bill of Material

Table 6 Bill of Material

Part	Value	Package
VIN	Banana jack	BABU4MM
VOUT	Banana jack	BABU4MM
EN	Banana jack	BABU4MM
N.C.	Banana jack	BABU4MM
ADJ	Banana jack	BABU4MM
N.C.	Banana jack	BABU4MM
GND	Banana jack	BABU4MM
R1	n.a. / 470k	R0805
R2	n.a. / 150k	R0805
R3	n.a. (10k)	R0805
R4	n.a.	R0805
R5	n.a.	R0805
C1	100n/50V	C0805
C2	n.a. (4u7/50V)	C1206
C3	100u/50V	E5-8,5
C4	1u/16V	C0805
C5	n.a. (10u/16V)	C1206
C6	100n/16V	C0805
C7	n.a.	C0805
C8	n.a.	C0805
CON1	4 pin connector	
CON2	4 pin connector	
CON_GND	2 pin connector	
JP_EN_VIN		jumper
JP_EN		jumper
SJ1		solder jumper
D1	SM4004	diode
IC1	IFX30081SJV	PG-DSO-8
S1	OTS-8(16)-1.27-01	OTS-16-1.27-03

5 General Information

5.1 Restrictions

This Demoboard is offering limited features allowing you only to evaluate and test the Infineon products. The Demoboard is not an end product (or finished appliance), nor is it intended or authorized by Infineon to be integrated into end products. You are not authorized to use the Demoboard in any production system.

5.2 Additional Information

- For further information you may refer to <http://www.infineon.com/>

5.3 Revision History

Revision	Date	Changes
1.0	2015-02-05	Initial version

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