

Introduction

The MAXREFDES1284 Himalaya Power Evaluation Platform provides a proven design to evaluate 12 different high-efficiency, synchronous, step-down DC-DC converters. The reference design is preset for a 5V output for each converter. The board offers a quick evaluation platform for the parts listed in [Table 1](#). The platform also shows a typical solution size when using these DC-DC converter parts and compares an integrated circuit (IC) solution vs a module solution for each load current range. For more details on each part's benefits and features, refer to their separate data sheet. To evaluate all the features offered by the parts, refer to their dedicated evaluation kit (EV kit).

Other features include the following:

- Operates from a single 8V to 60V Input Supply
- 12 Programmed 5V Output Voltages
- Output Currents up to 100mA, 300mA, 2A, 3A, 3.5A, 4A
- Enable Jumpers
- RESET Outputs
- Proven PCB Layout
- Fully Assembled and Tested

Hardware Specification

The MAXREFDES1284 Himalaya Power Evaluation Platform provides a proven design to evaluate 12 different step-down DC-DC converters.

The output current for the solutions can range from up to 100mA for the first pair and up to 4A for the last pair. Each pair of solutions consists of an IC which requires an external inductor and a Himalaya Power Module which has an integrated inductor. See [Table 1](#) for the list of parts.

The reference design is preset for a 5V output from 8V to 60V input at the respective maximum load current of each converter.

The reference design includes an EN jumper next to each converter to independently enable it by removing the jumper.

[Table 2](#) provides an overview of the design specification.

Table 1. List of Converters on MAXREFDES1284

MAXIMUM OUTPUT CURRENT	SOLUTION TYPE	PART NUMBER
100mA	IC	MAX17552
	Module	MAXM17552
300mA	IC	MAX15062
	Module	MAXM15066
2A	IC	MAX17503
	Module	(Not populated - future product)
3A	IC	MAX17574
	Module	MAXM17574
3.5A	IC	MAX17504
	Module	MAXM17504
4A	IC	MAX17576
	Module	MAXM17536

Table 2. Design Specification

PARAMETER	SYMBOL	MIN	TYP	MAX
Input Voltage	V_{IN}	8V	24V	60V
Frequency	f_{SW}	450-660kHz		
Maximum Efficiency	η	>85%		
Output Voltage	V_{OUT}	5V		
Output Voltage Ripple	ΔV_{OUT}	<1% of V_{OUT}		

Designed–Built–Tested

This document describes the hardware shown in Figure 1.

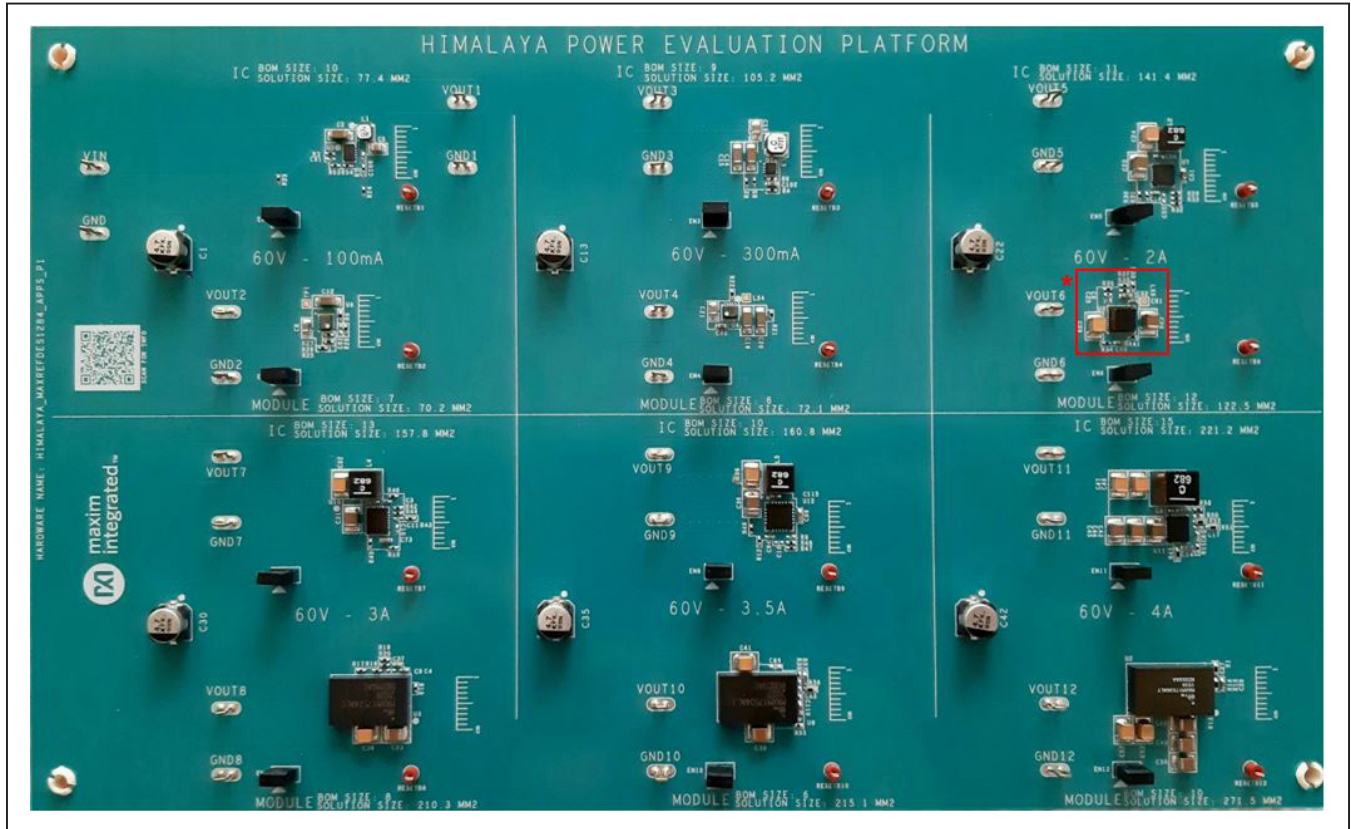


Figure 1. MAXREFDES1284 Himalaya Power Evaluation Platform (* not installed in current board).

Quick Start

Required Equipment

- MAXREFDES1284, Himalaya Power Evaluation Platform
- 8V to 60V, 5A DC input power supply
- Load capable of sinking up to 4A
- Digital voltmeter (DVM)

Procedure

The reference design is fully assembled and tested. The following steps are to verify the operation of the first converter on the board, MAX17552ATB+, a 100mA solution. The same steps can be adjusted and repeated for all 12 converters.

Caution: Do not turn on the power supply until all connections are completed.

Follow the steps below to verify board operation:

- 1) Set the power supply at 24V. Disable the power supply.
- 2) Connect the positive terminal of the power supply to the V_{IN} PCB pad and the negative terminal to the GND PCB pad below it.
- 3) Connect the positive terminal of the 100mA load to the V_{OUT1} PCB pad and the negative terminal to the GND1 PCB pad.
- 4) Connect the DVM across the V_{OUT1} PCB pad and the GND1 PCB pad.
- 5) Verify that shunts are installed across all enable jumpers except EN1 (See Table 3 for details).
- 6) Turn on the DC power supply.
- 7) Enable the load.
- 8) Verify that the DVM displays 5V.
- 9) Repeat steps 1 to 8 to analyze another solution on the board. Modify steps 3, 4 and 5 by using the Table 1 and Table 3 to modify the EN jumper settings and output connections.

Table 3. Converter EN Jumper Settings

HEADER	SHUNT POSITION	DESCRIPTION
EN1	Not installed	MAX17552 output enabled, 5V on V _{OUT1}
	1-2*	MAX17552 output disabled
EN2	Not installed	MAXM17552 output enabled, 5V on V _{OUT2}
	1-2*	MAXM17552 output disabled
EN3	Not installed	MAX15062 output enabled, 5V on V _{OUT3}
	1-2*	MAX15062 output disabled
EN4	Not installed	MAXM15066 output enabled, 5V on V _{OUT4}
	1-2*	MAXM15066 output disabled
EN5	Not installed	MAX17503 output enabled, 5V on V _{OUT5}
	1-2*	MAX17503 output disabled
EN6	Not installed	(Not populated- future product) output enabled, 5V on V _{OUT6}
	1-2*	(Not populated- future product) output disabled

HEADER	SHUNT POSITION	DESCRIPTION
EN7	Not installed	MAX17574 output enabled, 5V on V _{OUT7}
	1-2*	MAX17574 output disabled
EN8	Not installed	MAXM17574 output enabled, 5V on V _{OUT8}
	1-2*	MAXM17574 output disabled
EN9	Not installed	MAX17504 output enabled, 5V on V _{OUT9}
	1-2*	MAX17504 output disabled
EN10	Not installed	MAXM17504 output enabled, 5V on V _{OUT10}
	1-2*	MAXM17504 output disabled
EN11	Not installed	MAX17576 output enabled, 5V on V _{OUT11}
	1-2*	MAXM17576 output disabled
EN12	Not installed	MAX17536 output enabled, 5V on V _{OUT12}
	1-2*	MAXM17536 output disabled

* Default position.

Design Procedure

For more information on each of the 12 converters, refer to the IC and EV kit data sheet.

Design Resources

Download the complete set of [Design Resources](#) including schematic and bill of materials.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/21	Initial release	—



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