

Application Note

AP7354D Application Information and Demo Board User Guide

Description

The AP7354 is a low dropout regulator with high output voltage accuracy. The AP7354 includes a voltage reference, error amplifier, current limit circuit, and an enable input to turn it on/off. With the integrated resistor network, fixed output voltage versions can be delivered.

With its ultra-low quiescent current, the AP7354 is well-suited for lowpower handheld, wearable devices, and other battery-operated devices requiring an extended time period until new battery replacement.

Features

- Wide V_{IN} Range: 2.0V to 5.5V
- Guarantee Output Current: 150mA
- Output Voltage Range: 1.1V to 4.5V
- V_{OUT} Accuracy: $\pm 1\%$
- Quiescent Current as Low as 0.25 μ A
- Output Discharge Available for Devices in SOT25 or X2- DFN1010-4 (Type B)
- Typical Standby Current: 0.02 μ A
- ESD Protection Exceeds JESD 22
 - Exceeds 4000V Human Body Model (A114)
 - Exceeds 400V Machine Model (A115)
- Latch-Up Exceeds 400mA per JESD 78, Class I

- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities) ,please contact us or your local Diodes representative.
<https://www.diodes.com/quality/product-definitions/>

Applications

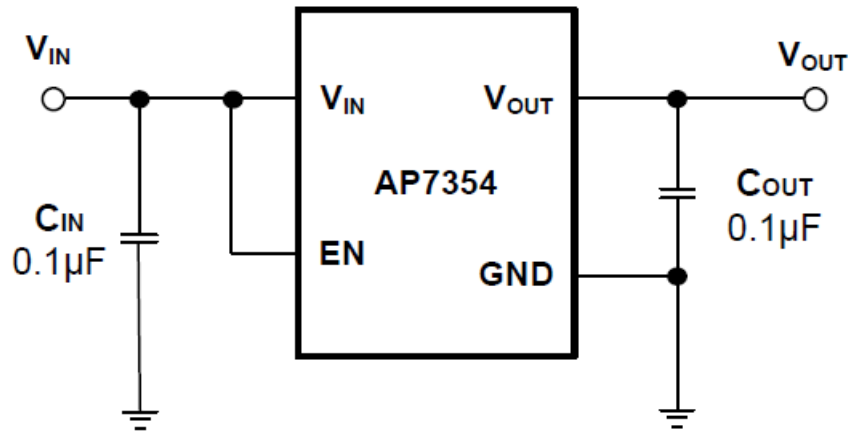
- Wearable Electronics
- Sensor Module for Internet-of-Things (IoT)
- Wireless Communication Module
- Battery-Operated Device Printers
- Camera

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

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Typical Applications Circuit



X5R- and X7R-type capacitors are suggested due to their minimal variation in value and ESR over temperature.

Absolute Maximum Ratings

Symbol	Parameter	Ratings	Unit
ESD HBM	Human Body Model ESD Protection	4	kV
ESD MM	Machine Model ESD Protection	400	V
VIN	Input Voltage	6.0	V
VEN	Input Voltage at EN Pin	6.0	V
VOUT	Output Voltage to GND	-0.3 to VIN +0.3	V
TA	Operating Ambient Temperature	-40 to +85	°C
TJ	Maximum Junction Temperature	+125	°C
TSTG	Storage Temperature	-55 to +125	°C
PD	Power Dissipation	315	mW

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Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	2.0	5.5	V
I_{OUT}	Output Current	0	150	mA
T_A	Operating Ambient Temperature	-40	+85	°C

Evaluation Board



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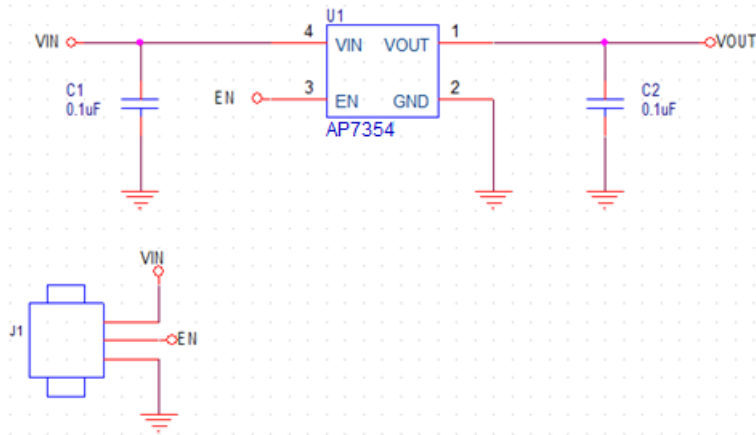
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Quick Start Guide

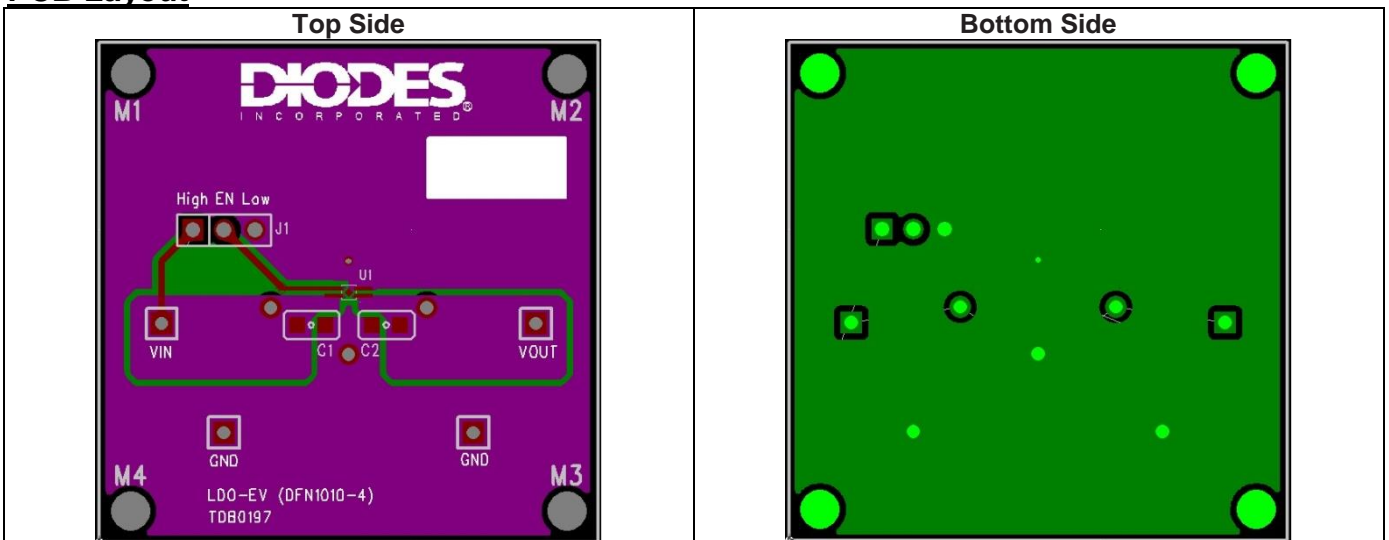
The AP7354D-EVM has a simple layout and allows access to the appropriate signals through test points. To evaluate the performance of the AP7354D, follow the procedure below:

1. Connect a power supply to the input terminals VIN and GND. Set VIN to VOUT+1V.
2. Connect the positive terminal of the electronic load to VOUT and negative terminal to GND.
3. For Enable, place a jumper at J1 to "High" position to connect EN pin to enable IC. Jump to "Low" position to disable IC.
4. The evaluation board should now power up with a 3.3V output voltage.
5. Check for the proper output voltage at the output terminals VOUT and GND. Measurement can also be done with a multimeter with the positive and negative leads between VOUT and GND.

Evaluation Board Schematic



PCB Layout



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Bill of Materials

Component Location	Qty	Specification	Mark	Maker Part No.	Size
C1	1	Cap MLCC 0.1uF/50V/X7R	YAGEO	CC0805KRX7R9BB104	0805
C2	1	Cap MLCC 0.1uF/50V/X7R	YAGEO	CC0805KRX7R9BB104	0805
J1	1	0.1"*3 Header 1 and Jumper			5mm X 2.5mm
VIN VOUT GND	4	Test pin			2.2mm X 1.35mm
U1	1	LDO	Diodes Inc	AP7354D-33FS4-7	DFN1010
PCB	1	LDO-EV (DFN1010-4)	Diodes Inc.	TDB0197	40mmX40mm

Vendors of peripheral components

Suggested Capacitors :

Vendor	Capacitance	Type	Series
YAGEO	Cap MLCC 0.1uF/50V/X7R	SMD	CC0805KRX7R9BB104

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