

Projet 1 - ALIM2574 / Alimentation à découpage +5V avec le LM2574

Projet : IUT3
Info : [DIV440]
Révision : 1 du 7 juillet 2004

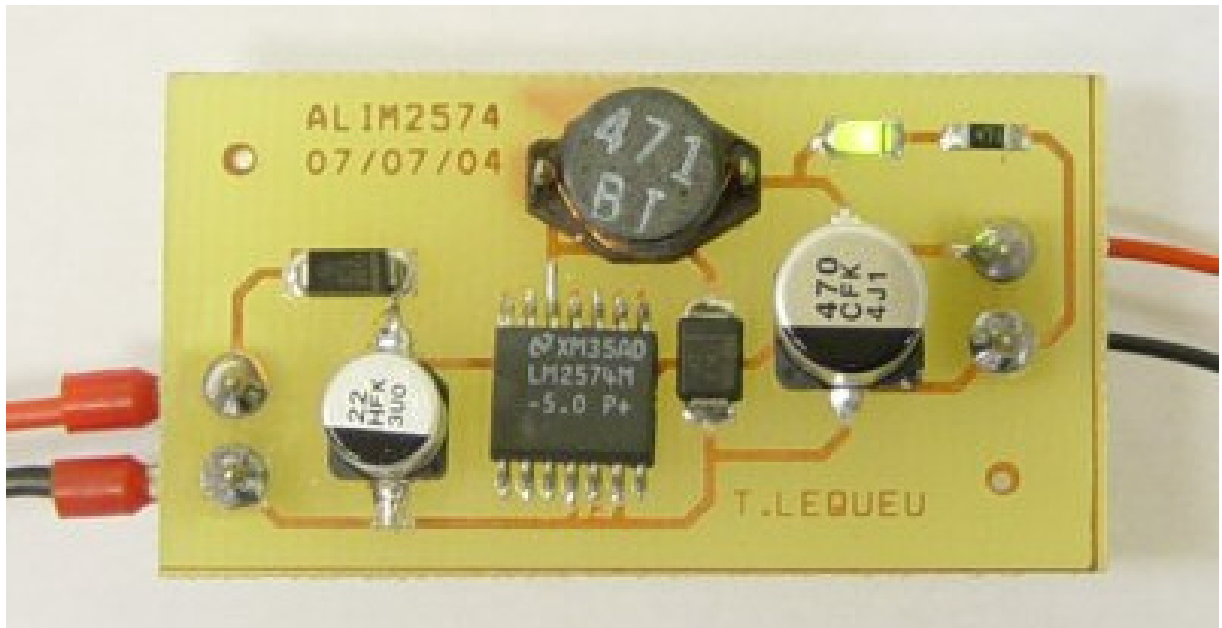


Fig. 1.1. Maquette (images-maquettes\alim2574-2.jpg).

1.1 Liste des documents

- Prix du montage.
- Schéma électronique.
- Circuit imprimé coté cuivre.
- Circuit imprimé coté composants.
- Implantation des composants.
- Documentations.

1.2 Désignation des composants

Tableau 1.1. Liste de composants (projets-iut3.xls / ALIM2574).

N°	Quantité	Référence	Désignation	Empreinte
1	1	C1	10 uF 63V	CFK-F
2	1	C3	470 uF 16V	CFK-F
3	1	D1	MBRS130T3	DO213AB
4	1	D2	1N4007	DO214AA
5	1	D3	Verte 10mA	D1206
6	1	JP1	SORTIE	02PL2
7	1	JP2	ENTREE	02PL2
8	1	L1	470 uH 0.5A	LJ-10
9	1	R1	470 0.25W	R1206
10	1	U1	LM2574	14SO420
11	4	VIS1,VIS2,VIS3,VIS4	VISSERIE	M3

1.3 Caractéristique du montage

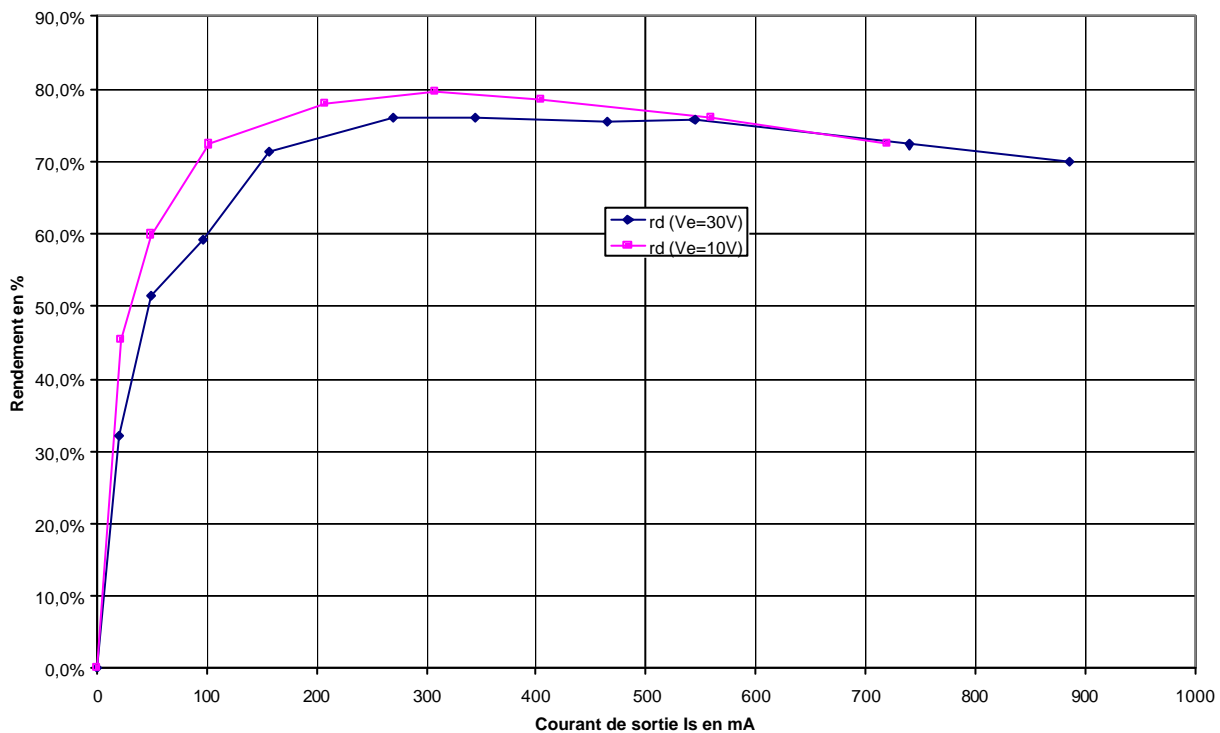


Fig. 1.2. Rendement en fonction du courant de sortie I_s pour $V_e = 10V$ et $V_e = +30V$ (alim2574.xls).

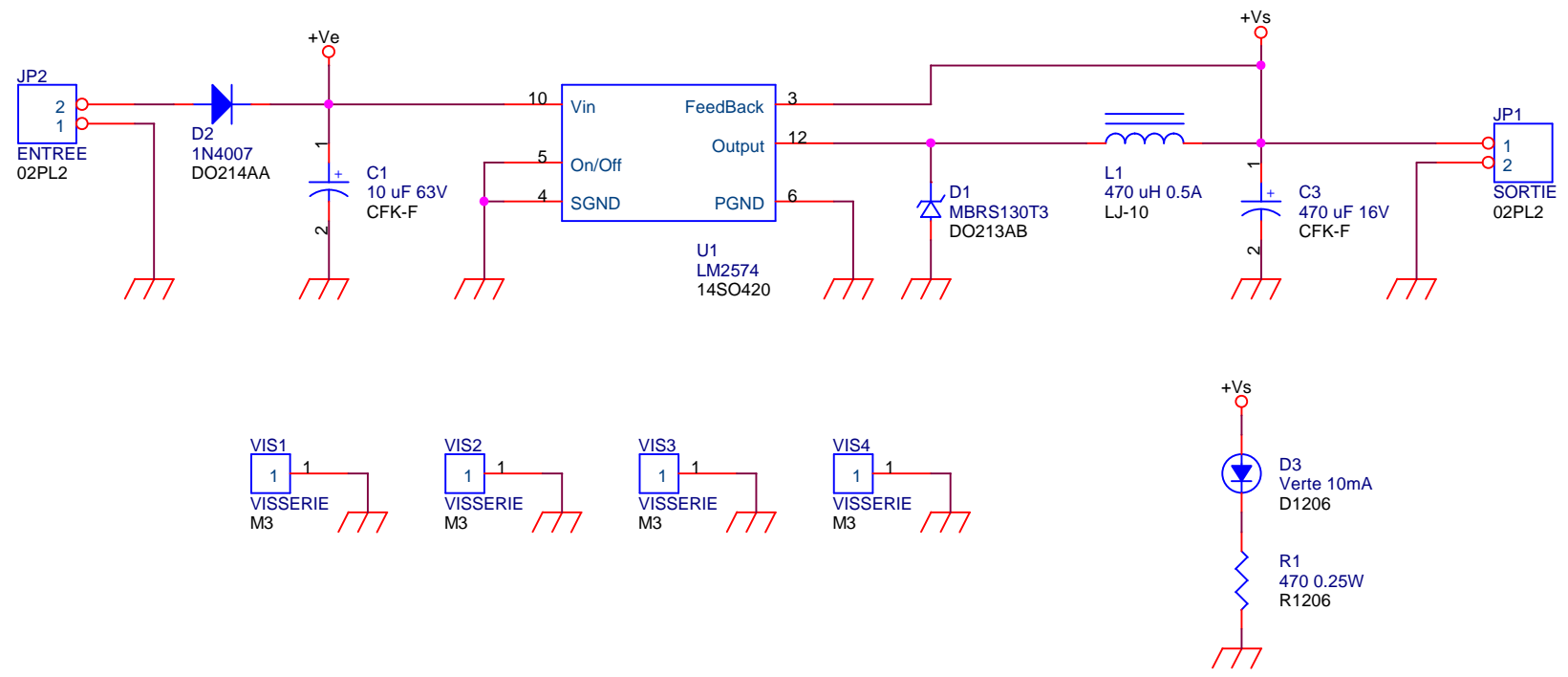
Alimentation à découpage +5V avec un LM2574**Revised: Wednesday, July 07, 2004****IUT3 \ [DIV440] \ ALIM2574 Revision: 1**

1 euro 6,55957 F

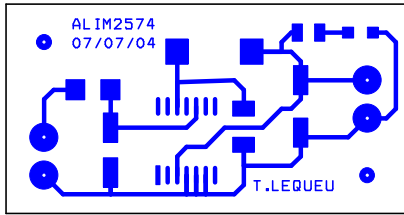
Référence	Qu.	Désignation	Fournisseur	Date	Code Cde.	U.d.V.	Prix U.	Prix T.		
C1	1	Condensateur 1H101P, 100 uF 50V	Radiospares	novembre-04	434-0071	5	3,700	0,740	4,85 F	
C3	1	Condensateur EEVFK1C471P, 470 uF 16V	Radiospares	novembre-04	433-9914	5	4,550	0,910	5,97 F	
D1	1	Schottky, 30V, 1A, CMS, Motorola, MBR5130LT3.	Radiospares	novembre-04	348-6283	1	0,700	0,700	4,59 F	
D2	1	Diode redresseur, MRA4007T3.	Radiospares	novembre-04	419-1419	50	8,150	0,163	1,07 F	
D3	1	LED - 20mA - 2.2V - CMS 1206 - verte 9mcd, HewlettPackard, HSMGC650.	Radiospares	novembre-04	171-3454	50	9,470	0,189	1,24 F	
JP1	1	Bornier 2 plots à visser	Radiospares	novembre-04	446-7328	5	1,530	0,306	2,01 F	
JP2	1	Bornier 2 plots à visser	Radiospares	novembre-04	446-7328	5	1,530	0,306	2,01 F	
L1	1	Inductance CMS, BI Technologique, HMS76, 470µH, 500mA, HM76-30471J.	Radiospares	novembre-04	382-6805	10	16,090	1,609	10,55 F	
R1	1	Résistance CMS, minibobine, 1206, 1 %, VishayDraloric, miniReel, 470 Ohms, D25P/CRCW1206P.	Radiospares	novembre-04	345-2735	1000	17,210	0,017	0,11 F	
U1	1	Semiconducteur LM2574M-5.0.	Radiospares	novembre-04	435-7293	1	2,820	2,820	18,50 F	
Divers	2	Entretoise mâle/femelle M3 - 10 mm	Radiospares	novembre-04	125-6002	50	14,730	0,589	3,86 F	
Divers	17	Circuit imprimé 30 x 55 mm	IUT GEII	avril-04	CI	600	14,270	0,404	2,65 F	
								TOTAL H.T. :	8,75	57,42 F
								19,60%	1,72	11,25 F
								TOTAL T.T.C. :	10,47	68,68 F

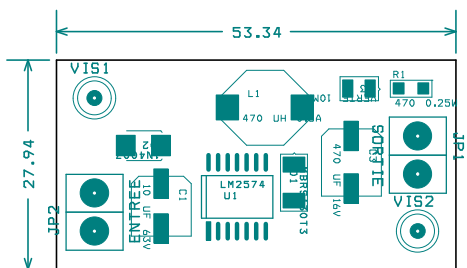
LM2574
 Vin = 7-40 V
 Iout = 0.5 A

MBRS130T3
 VRRM = 30 V
 IF(AV) = 1 A



Auteur : Thierry LEQUEU		
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DRILL CHART				
SYM	DIAM	TOL	QTY	NOTE
x	0.787 mm		2	
+	1.000 mm		4	
TOTAL			6	

LM2574/LM2574HV SIMPLE SWITCHER™ 0.5A Step-Down Voltage Regulator

General Description

The LM2574 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 0.5A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, 15V, and an adjustable output version.

Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The LM2574 series offers a high-efficiency replacement for popular three-terminal linear regulators. Because of its high efficiency, the copper traces on the printed circuit board are normally the only heat sinking needed.

A standard series of inductors optimized for use with the LM2574 are available from several different manufacturers. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed $\pm 4\%$ tolerance on output voltage within specified input voltages and output load conditions, and $\pm 10\%$ on the oscillator frequency. External shutdown is included, featuring 50 μA (typical) standby current. The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

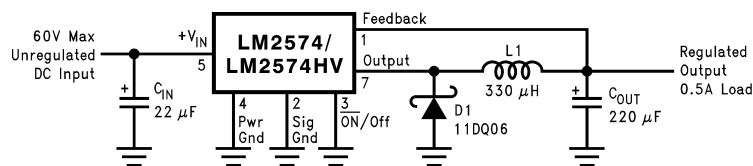
Features

- 3.3V, 5V, 12V, 15V, and adjustable output versions
- Adjustable version output voltage range, 1.23V to 37V (57V for HV version) $\pm 4\%$ max over line and load conditions
- Guaranteed 0.5A output current
- Wide input voltage range, 40V, up to 60V for HV version
- Requires only 4 external components
- 52 kHz fixed frequency internal oscillator
- TTL shutdown capability, low power standby mode
- High efficiency
- Uses readily available standard inductors
- Thermal shutdown and current limit protection

Applications

- Simple high-efficiency step-down (buck) regulator
- Efficient pre-regulator for linear regulators
- On-card switching regulators
- Positive to negative converter (Buck-Boost)

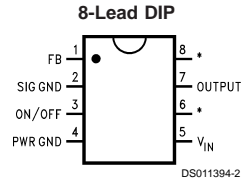
Typical Application (Fixed Output Voltage Versions)



DS011394-1

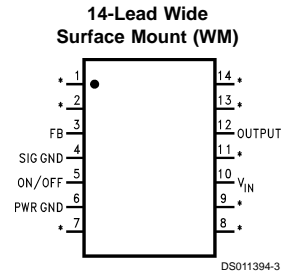
Note: Pin numbers are for 8-pin DIP package.

Connection Diagrams



* No internal connection, but should be soldered to PC board for best heat transfer.

Top View
Order Number LM2574-3.3HVN, LM2574HVN-5.0,
LM2574HVN-12, LM2574HVN-15, LM2574HVN-ADJ,
LM2574N-3.3, LM2574N-5.0, LM2574N-12,
LM2574N-15 or LM2574N-ADJ
See NS Package Number N08A



Top View
Order Number LM2574HVM-3.3, LM2574HVM-5.0,
LM2574HVM-12, LM2574HVM-15, LM2574HVM-ADJ,
LM2574M-3.3 LM2574M-5.0, LM2574M-12,
LM2574M-15 or LM2574M-ADJ
See NS Package Number M14B