

Projet 12 - ALIM2595 / Alimentation à découpage +3.,6V avec le LM2595Txx

Projet : IUT5
Info : [DIV495]
Révision : 1 du 30 mai 2006.

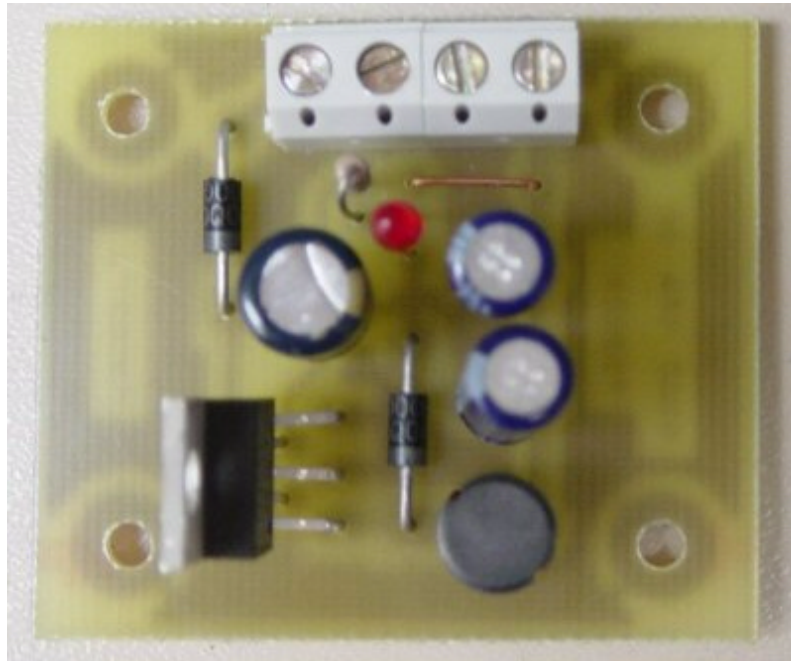


Figure 12.1. Vue de carte électronique (images-maquettes\lm2595-12.jpg).

12.1 Liste des documents

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

12.2 Désignation des composants

Tableau 12.1. Liste de composants (projets-iut2.xls /).

N°	Quantité	Référence	Désignation	Empreinte
1	1	C1	100 uF 63V	RADIAL06
2	2	C3,C2	1 mF 10V	RADIAL13
3	1	D1	11DQ06	DO41
4	1	JP1	SORTIE	02PL2
5	1	JP2	ENTREE	02PL2
6	1	L1	300 uH 2A	WE300
7	1	U1	LM2575	TO220-5b
8	4	VIS1,VIS2,VIS3,VIS4	VISSERIE	M3

12.3 Allure des principaux composants

Figure 12.2. Inductance série WE-FI Würth Elektronik (images-composants\WE300FI.jpg).

12.4 Relevés oscillographiques

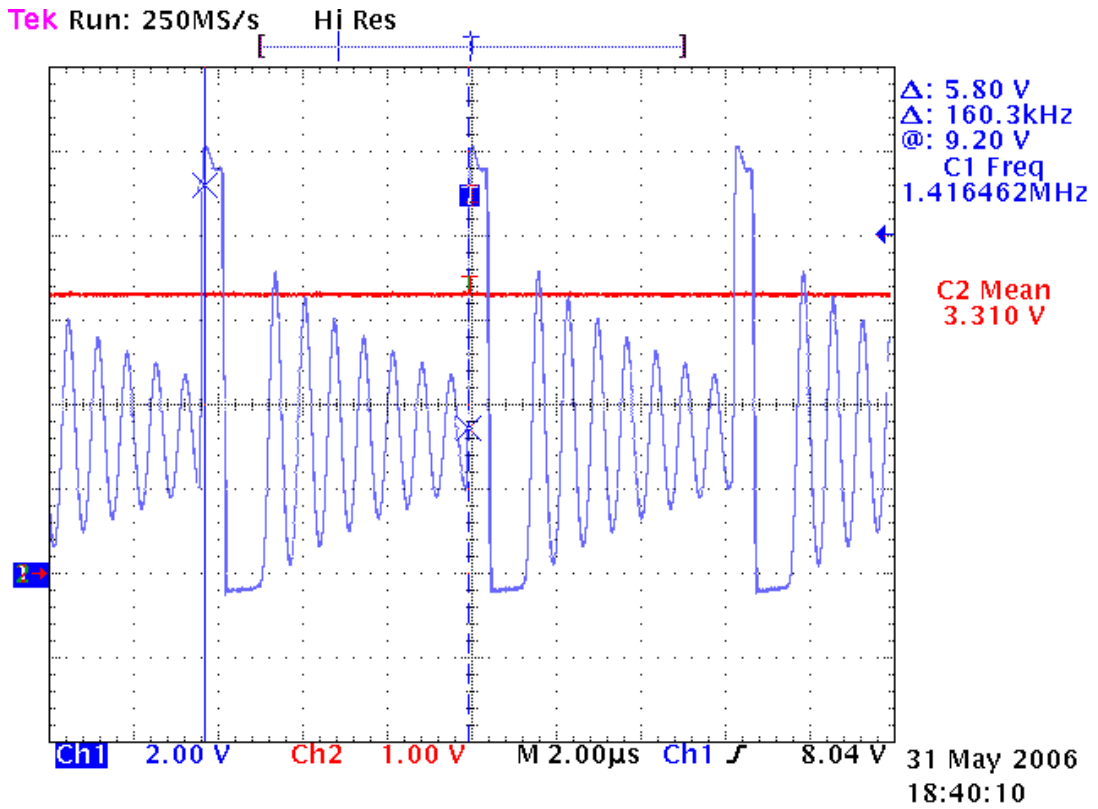


Figure 12.3. Tension diode et tension de sortie pour $V_e = +10V$ et $I_s = 0 A$ (Tek00000.pcx).

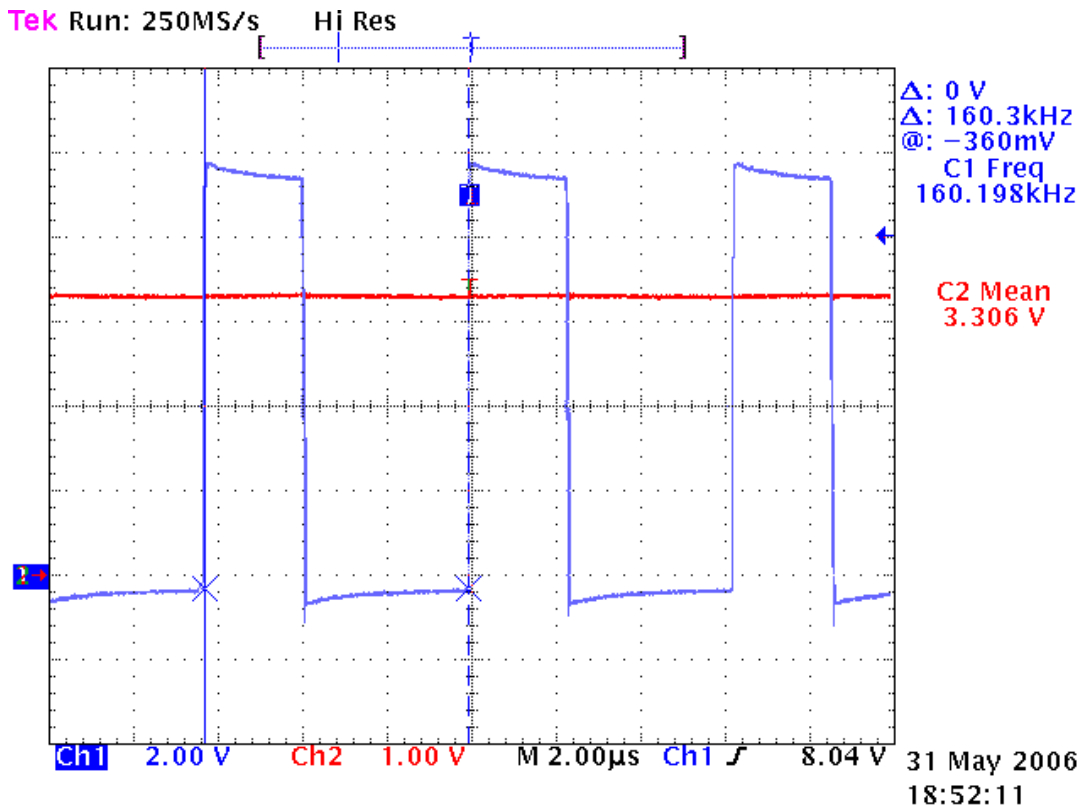


Figure 12.4. Tension diode et tension de sortie pour $V_e = +10 V$ et $I_s = 101 mA$ (Tek00001.pcx).

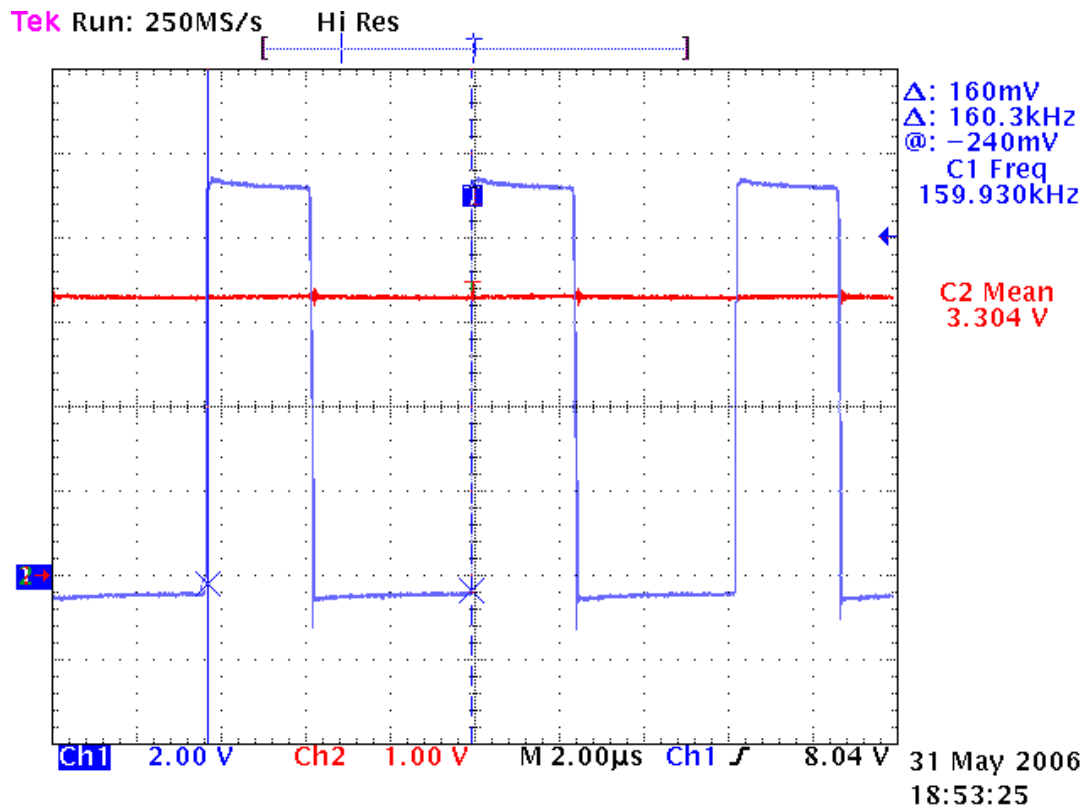


Figure 12.5. Tension diode et tension de sortie pour $V_e = +10\text{ V}$ et $I_s = 460\text{ mA}$ (Tek00002.pcx).

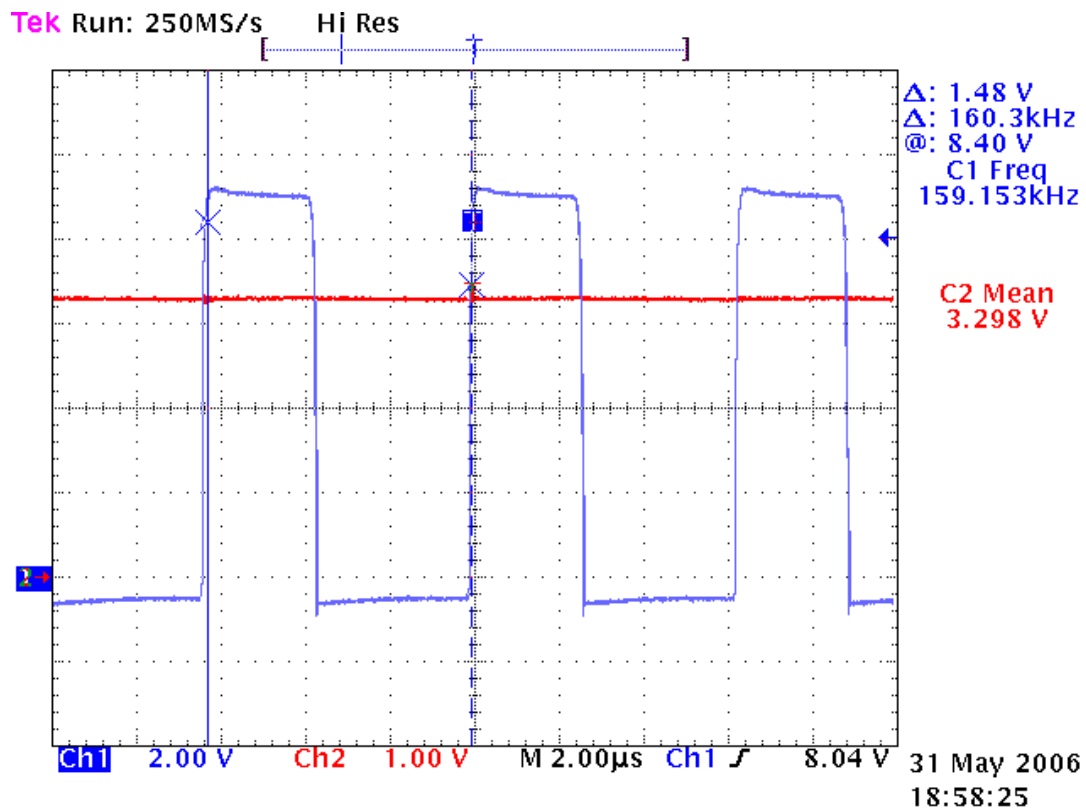
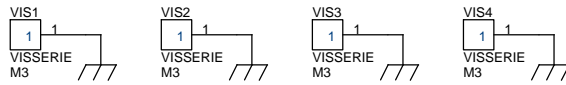
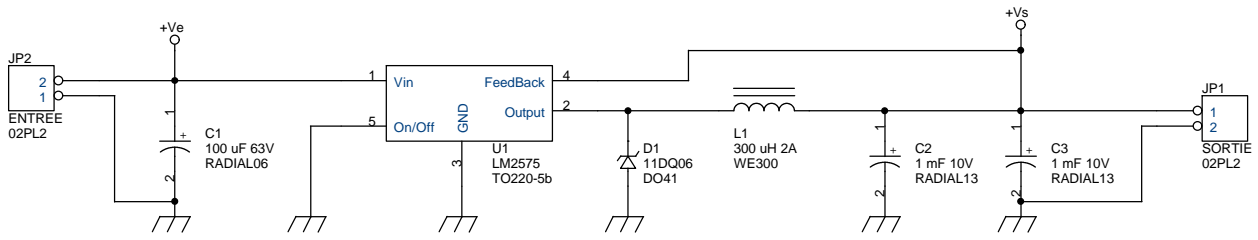
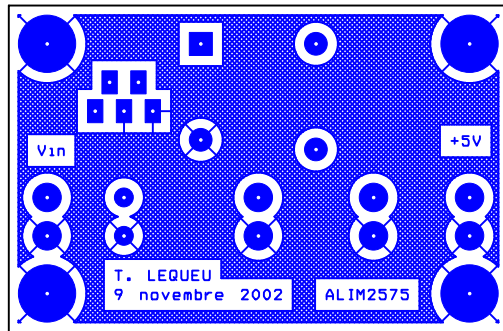


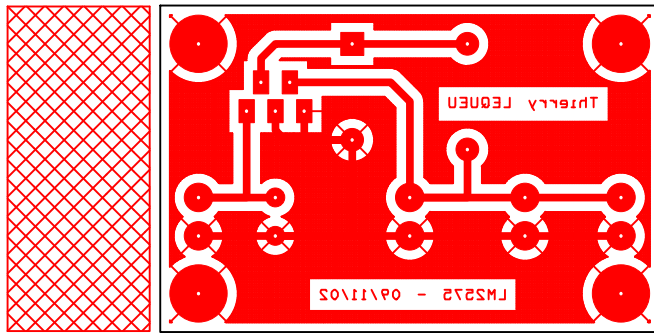
Figure 12.6. Tension diode et tension de sortie pour $V_e = +10\text{ V}$ et $I_s = 1,00\text{ A}$ (Tek00003.pcx).

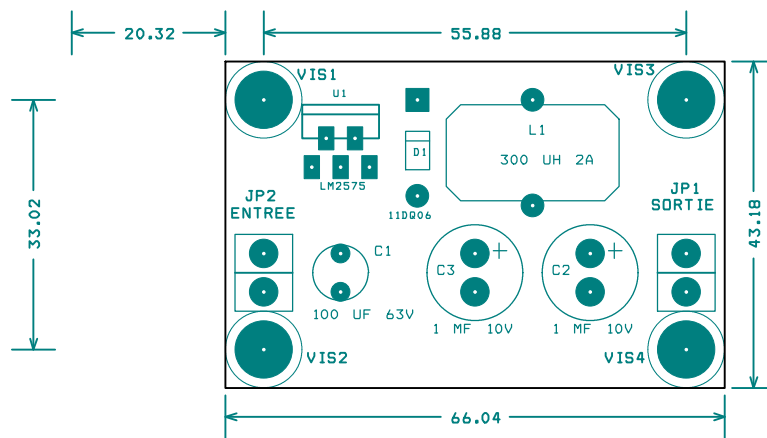
"Remplacez vos régulateurs 3 pattes"
 Pages 34, revue N° 269, Electronique Pratique, octobre 2002.
http://www.iut.univ-tours.fr/geii/lequeu/doc_tl/REVUE358.htm

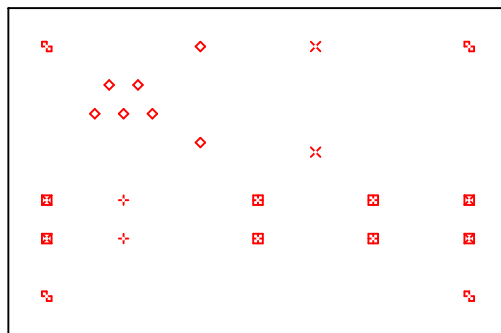


Auteur : Thierry LEQUEU		
Title Alimentation à découpage +5V		
Size A	Document Number IUT2 \ [DIV\372] \ALIM2575	Rev 1
Date:	Saturday, November 09, 2002	Sheet 1 of 1









DRILL CHART				
SYM	DIAM	TOL	QTY	NOTE
+	0.787 mm		2	
◇	0.991 mm		7	
⊠	1.000 mm		4	
⊞	1.194 mm		4	
×	1.499 mm		2	
⊞	3.200 mm		4	
TOTAL			23	

LM2595

SIMPLE SWITCHER® Power Converter 150 kHz 1A Step-Down Voltage Regulator

General Description

The LM2595 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 1A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, 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 LM2595 series operates at a switching frequency of 150 kHz thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators. Available in a standard 5-lead TO-220 package with several different lead bend options, and a 5-lead TO-263 surface mount package. Typically, for output voltages less than 12V, and ambient temperatures less than 50°C, no heat sink is required.

A standard series of inductors are available from several different manufacturers optimized for use with the LM2595 series. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed $\pm 4\%$ tolerance on output voltage under specified input voltage and output load conditions, and $\pm 15\%$ on the oscillator frequency. External shutdown is included, featuring typically 85 μA stand-by current. Self protection features include a two stage frequency reducing current limit for the output switch and an over temperature shutdown for complete protection under fault conditions.

Features

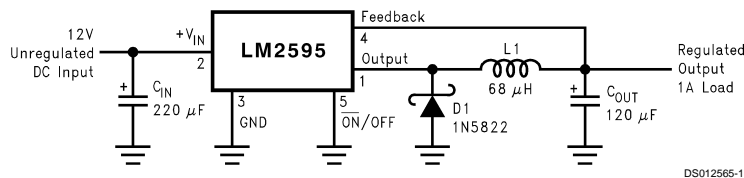
- 3.3V, 5V, 12V, and adjustable output versions
- Adjustable version output voltage range, 1.2V to 37V $\pm 4\%$ max over line and load conditions
- Available in TO-220 and TO-263 (surface mount) packages
- Guaranteed 1A output load current
- Input voltage range up to 40V
- Requires only 4 external components
- Excellent line and load regulation specifications
- 150 kHz fixed frequency internal oscillator
- TTL shutdown capability
- Low power standby mode, I_Q typically 85 μA
- 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

Note: † Patent Number 5,382,918.

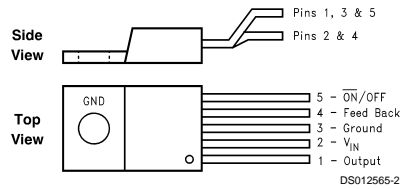
Typical Application (Fixed Output Voltage Versions)



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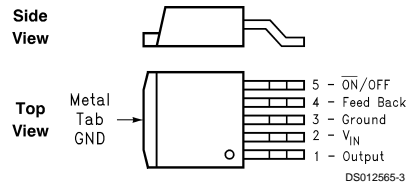
Connection Diagrams and Ordering Information

Bent and Staggered Leads, Through Hole Package 5-Lead TO-220 (T)



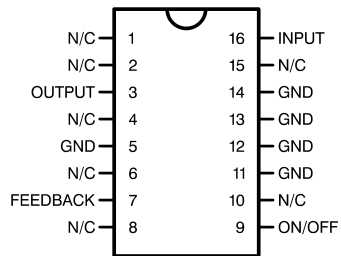
Order Number LM2595T-3.3, LM2595T-5.0,
LM2595T-12 or LM2595T-ADJ
See NS Package Number T05D

Surface Mount Package 5-Lead TO-263 (S)



Order Number LM2595S-3.3, LM2595S-5.0,
LM2595S-12 or LM2595S-ADJ
See NS Package Number TS5B

16-Lead Ceramic Dual-in-Line Package (J)



DS012565-57

Order Number LM2595J-3.3-QML (5962-9687901QEA),
LM2595J-5.0-QML (5962-9650301QEA),
LM2595J-12-QML (5962-9650201QEA),
or LM2595J-ADJ-QML (5962-9650401QEA)
See NS Package Number J16A

For specifications and information about Military-Aerospace products, please see the Mil-Aero web page at
<http://www.national.com/appinfo/milaero/index.html>.