Projet 4 - TENSION / Détecteur de tension TOR

Projet : LMP2b – TEST-TRIAC

Info : [DATA214]

Révision : avril 2002

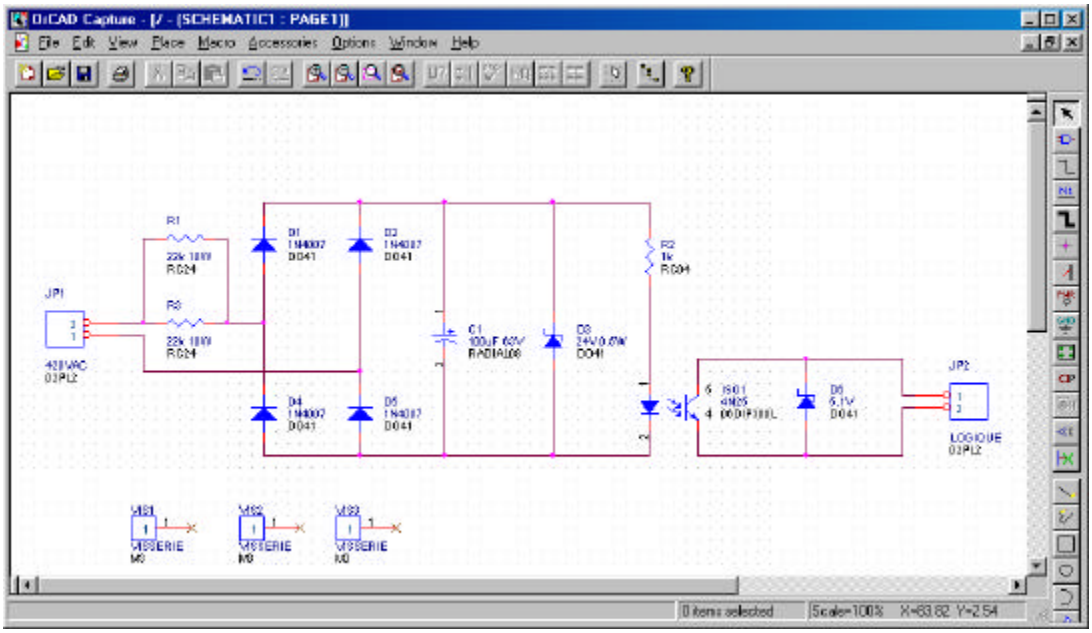


Figure 4.1. Vue d'ensemble du montage (images-maquettes\tension-11.jpg).

4.1 Liste des documents

- Prix du montage.
- Schéma ORCAD ver 9.x.
- Circuit imprimé LAYOUT.
- Documentation des fiches Embases.
- Documentation du connecteur Weidmuller 3 broches.

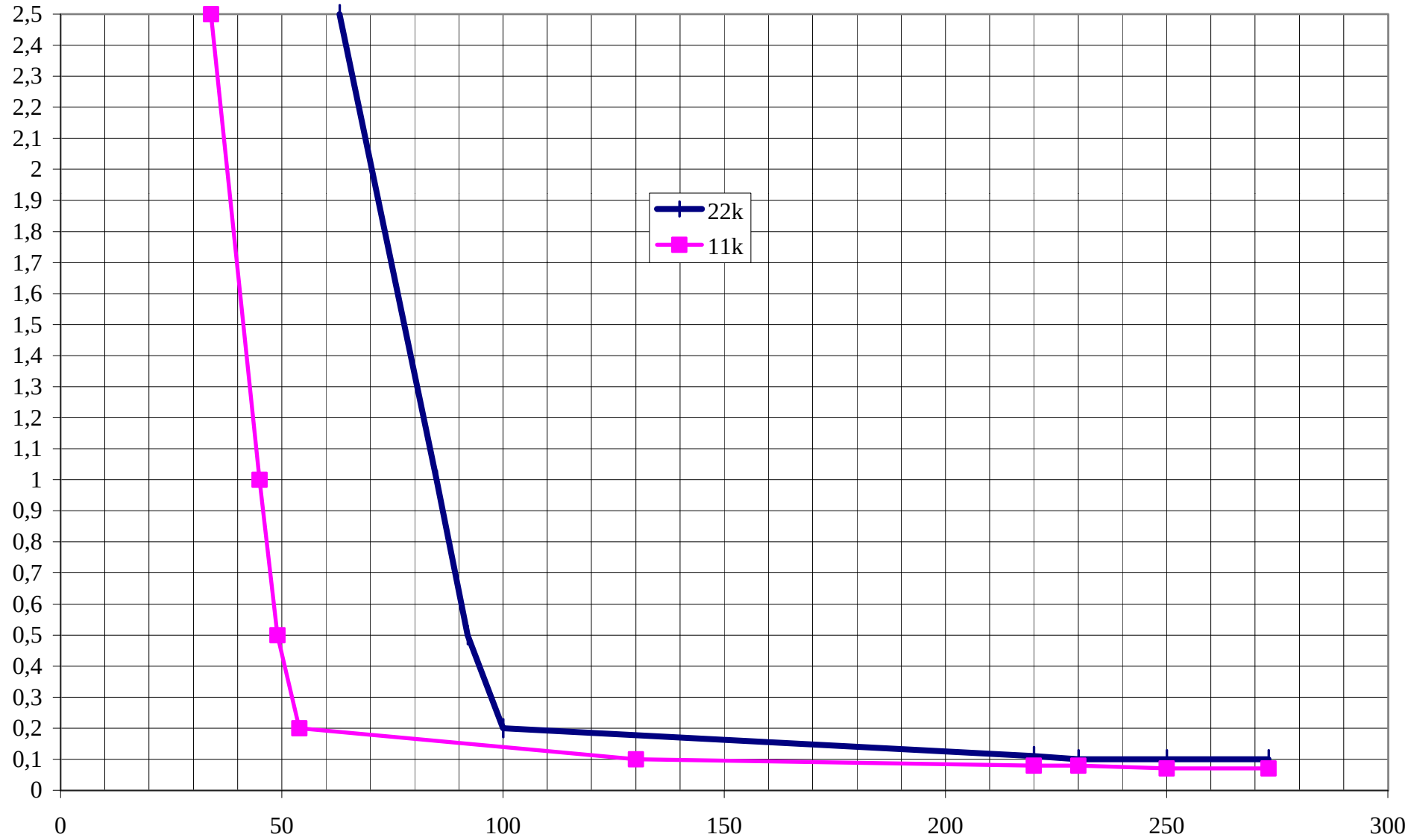
4.2 Liste des composants

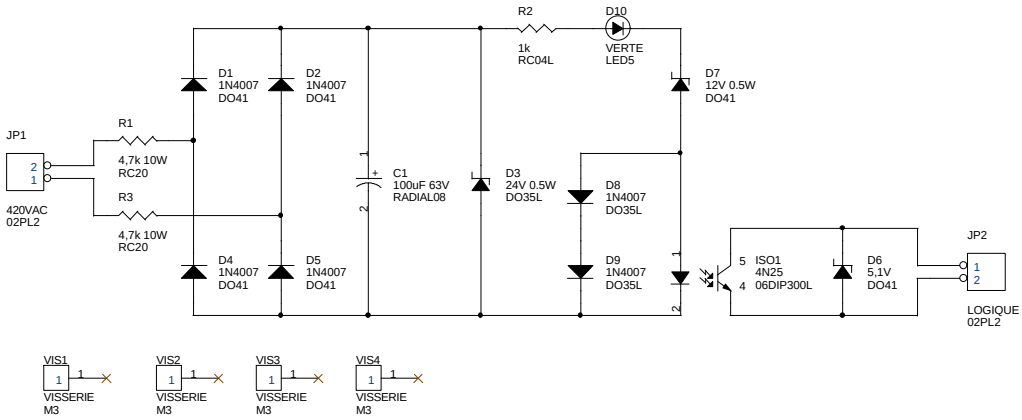
Tableau 4.2. Liste de composants (Projets-LMP2.xls / TENSION).

No	Quantité	Référence	Désignation	Empreinte
1	4	C1,C2,C3,C4	1000 uF 63V	RADIAL13
2	2	C5,C6	1uF 63V	RADIAL08
3	2	C8,C7	100nF	CK06
4	2	C9,C10	10uF	RADIAL08
5	1	D1	1A-100V	REDROND
6	1	JP1	SORTIE	WEID3
7	1	JP2	230V	2PL2
8	1	JP3	Radiateur	SK92
9	1	REG1	LM317	TO220
10	1	REG2	LM337	TO220
11	2	R2,R1	120	RC05
12	2	R4,R3	1.8K	RC05
13	2	R6,R5	2K AJ	RAJ10T
14	1	T1	2 x 22V	TR15VA
15	3	VIS1,VIS2,VIS3	VISSERIE	M3

4.3 Allure des principaux composants

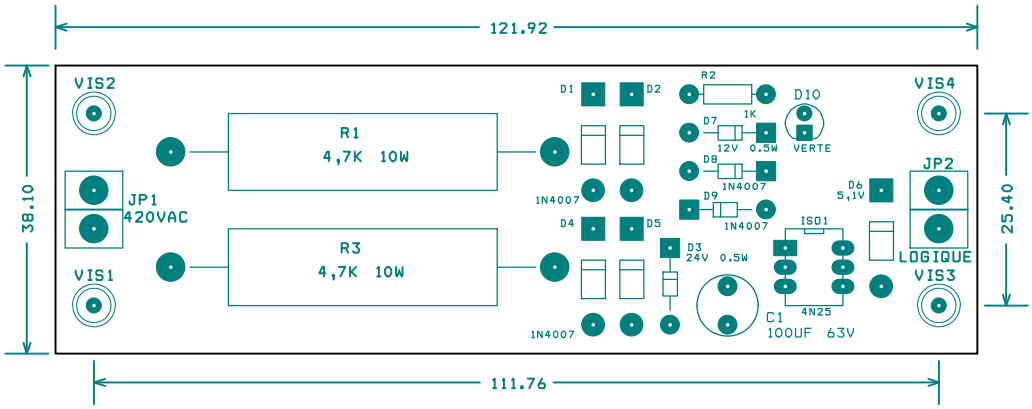
Fig. 4.2. Bornier CANDEM 3 points (images-composants\bornier1.jpg).

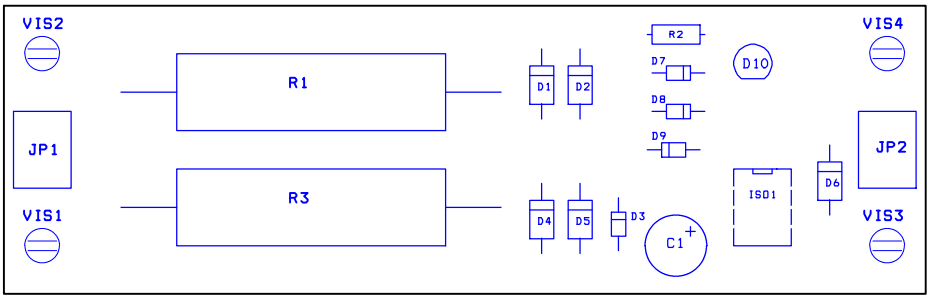

2,5
2,4
2,3
2,2
2,1
2
1,9
1,8
1,7
1,6
1,5
1,4
1,3
1,2
1,1
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
0
50
100
150
200
250
300
22k
11k

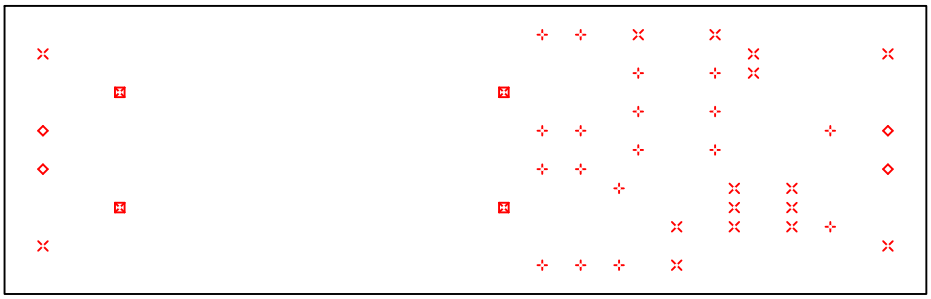


Auteur : Thierry LEQUEU		
Title: Detection de la présence de la tension		
Size: A4	Document Number: TEST_TRIAC / [DATA207] / TENSION	Rev: 2
Date: Monday, May 20, 2002	Sheet 1 of 1	

Thierry LEQUEU
le 20 mai 2002
LM72 \ TENSION


121.92
38.10
25.40
111.76
VIS2
VIS1
VIS4
VIS3
JP1
420VAC
JP2
LOGIQUE
R1
4,7K 10W
R3
4,7K 10W
D1
D2
D4
D5
1N4007
1N4007
1N4007
R2
1K
D7
12V 0.5W
D8
1N4007
D9
1N4007
D10
VERTE
D6
5,1V
D3
24V 0.5W
ISO1
4N25
C1
100UF 63V


VIS2
VIS4
R1
D1
D2
R2
D7
D10
D8
D9
JP1
JP2
R3
D4
D5
D3
C1
ISO1
D6
VIS1
VIS3



DRILL CHART				
SYM	DIAM	TOL	QTY	NOTE
×	0.787 mm		16	
+	0.991 mm		18	
◇	1.000 mm		4	
⊠	1.499 mm		4	
TOTAL			42	

FAIRCHILD
SEMICONDUCTOR®

GENERAL PURPOSE 6-PIN PHOTOTRANSISTOR OPTOCOUPLERS

4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

DESCRIPTION

The general purpose optocouplers consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 6-pin dual in-line package.

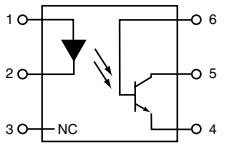
FEATURES

- UL recognized (File # E90700)
- VDE recognized (File # 94766)
  - -Add option V for white package (e.g., 4N25V-M)
  - -Add option 300 for black package (e.g., 4N25.300)
- Also available in white package by specifying -M suffix, eg. 4N25-M except H11A2, H11A4 and H11A5

APPLICATIONS

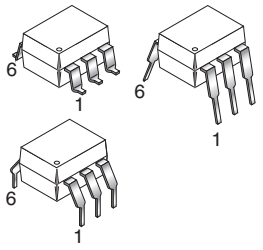
- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

SCHEMATIC

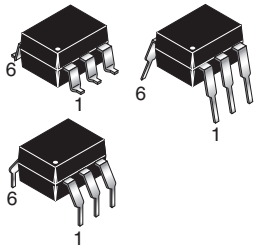


PIN 1. ANODE
2. CATHODE
3. NO CONNECTION
4. EMITTER
5. COLLECTOR
6. BASE

WHITE PACKAGE (-M SUFFIX)



BLACK PACKAGE (NO -M SUFFIX)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Temperature	T_{OPR}	-55 to +100	°C
Lead Solder Temperature	T_{SOL}	260 for 10 sec	°C
Total Device Power Dissipation @ T_A = 25°C	P_D	250	mW
Derate above 25°C		3.3 (non-M), 2.94 (-M)	
EMITTER			
DC/Average Forward Input Current	I_F	100 (non-M), 60 (-M)	mA
Reverse Input Voltage	V_R	6	V
Forward Current - Peak (300µs, 2% Duty Cycle)	I_F(pk)	3	A
LED Power Dissipation @ T_A = 25°C	P_D	150 (non-M), 120 (-M)	mW
Derate above 25°C		2.0 (non-M), 1.41 (-M)	mW/°C
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	30	V
Collector-Base Voltage	V_{CBO}	70	V
Emitter-Collector Voltage	V_{ECO}	7	V
Detector Power Dissipation @ T_A = 25°C	P_D	150	mW
Derate above 25°C		2.0 (non-M), 1.76 (-M)	mW/°C

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ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	(I_F = 10 mA)	V_F		1.18	1.50	V
Reverse Leakage Current	(V_R = 6.0 V)	I_R		0.001	10	µA
DETECTOR						
Collector-Emitter Breakdown Voltage	(I_C = 1.0 mA, I_F = 0)	BV_{CEO}	30	100		V
Collector-Base Breakdown Voltage	(I_C = 100 µA, I_F = 0)	BV_{CBO}	70	120		V
Emitter-Collector Breakdown Voltage	(I_E = 100 µA, I_F = 0)	BV_{ECO}	7	10		V
Collector-Emitter Dark Current	(V_{CE} = 10 V, I_F = 0)	I_{CEO}		1	50	nA
Collector-Base Dark Current	(V_{CB} = 10 V)	I_{CBO}			20	nA
Capacitance	(V_{CE} = 0 V, f = 1 MHz)	C_{CE}		8		pF

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	(Non-'M', Black Package) (f = 60 Hz, t = 1 min)	V_{ISO}	5300			Vac(rms)*
	('-M', White Package) (f = 60 Hz, t = 1 sec)		7500			Vac(pk)
Isolation Resistance	(V_{I-O} = 500 VDC)	R_{ISO}	10^{11}			Ω
Isolation Capacitance	(V_{I-O} = ∅, f = 1 MHz)	C_{ISO}		0.5		pF
	('-M' White Package)			0.2	2	pF

Note
* 5300 Vac(rms) for 1 minute equates to approximately 9000 Vac (pk) for 1 second
** Typical values at T_A = 25°C

TRANSFER CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

DC Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
Current Transfer Ratio, Collector to Emitter	(I_F = 10 mA, V_{CE} = 10 V)	CTR	4N35 4N36 4N37	100			%
			H11A1	50			
			H11A5	30			
			4N25 4N26 H11A2 H11A3	20			
			4N27 4N28 H11A4	10			
	(I_F = 10 mA, V_{CE} = 10 V, T_A = -55°C)		4N35 4N36 4N37	40			
	(I_F = 10 mA, V_{CE} = 10 V, T_A = +100°C)		4N35 4N36 4N37	40			
Collector-Emitter Saturation Voltage	(I_C = 2 mA, I_F = 50 mA)	$V_{CE\ (SAT)}$	4N25 4N26 4N27 4N28			0.5	V
	(I_C = 0.5 mA, I_F = 10 mA)		4N35 4N36 4N37			0.3	
			H11A1 H11A2 H11A3 H11A4 H11A5			0.4	
AC Characteristic Non-Saturated Turn-on Time	(I_F = 10 mA, V_{CC} = 10 V, R_L = 100Ω) (Fig.20)	T_{ON}	4N25 4N26 4N27 4N28 H11A1 H11A2 H11A3 H11A4 H11A5		2		µs

** Typical values at T_A = 25°C

TRANSFER CHARACTERISTICS (Cont.)

AC Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
Non Saturated Turn-on Time	(I_C = 2 mA, V_{CC} = 10 V, R_L = 100Ω) (Fig.20)	T_{ON}	4N35 4N36 4N37		2	10	µs
Turn-off Time	(I_F = 10 mA, V_{CC} = 10 V, R_L = 100Ω) (Fig.20)	T_{OFF}	4N25 4N26 4N27 4N28 H11A1 H11A2 H11A3 H11A4 H11A5		2		µs
	(I_C = 2 mA, V_{CC} = 10 V, R_L = 100Ω) (Fig.20)		4N35 4N36 4N37		2	10	

** Typical values at T_A = 25°C