Projet 4 - BUCK55B / Hacheur abaisseur réversible en courant 60V / 55A

Projet : IUT3

Info : [DIV427]

Révision : 3 du 30 mars 2004

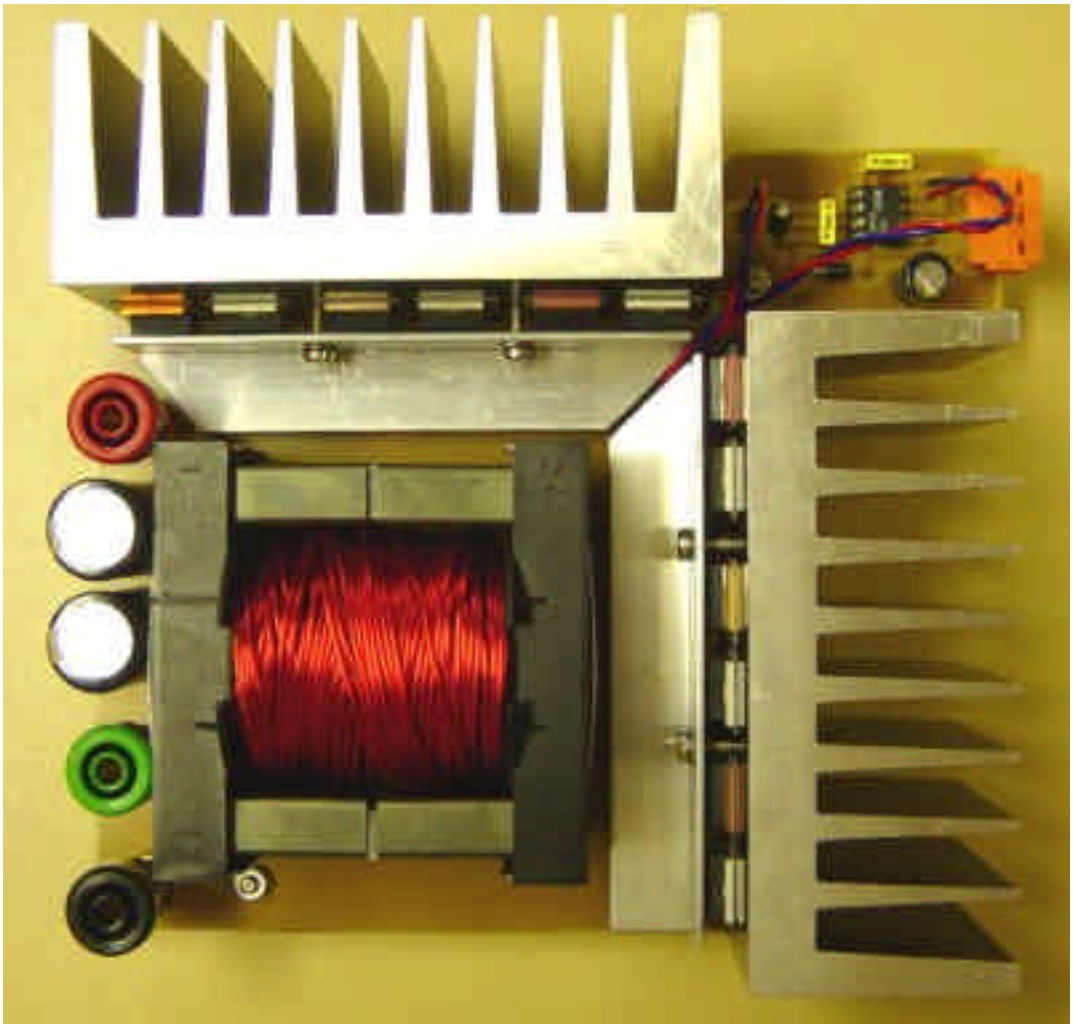


Fig. 4.1. Maquette (images-maquettes\buck55b-32.jpg).

4.1 Liste des documents

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

4.2 Désignation des composants

Tableau 4.1. Liste de composants (projets-iut3.xls / BUCK55B).

No	Quantité	Référence	Désignation	Empreinte
1	2	C1,C2	330uF	RADIAL16
2	1	C3	120uF	RADIAL06
3	1	C4	10uF	RADIAL06
4	2	C6,C5	100nF	CK06
5	6	D1,D2,D3,D4,D5,D6	43CTQ100	TO220
6	1	D7	11DQ06	DO41
7	1	JH1	+60V	EMBASE
8	1	JH2	#NOM?	EMBASE
9	1	JH3	MASSE	EMBASE
10	2	JP2,JP1	Radiateur	SK92
11	1	JP3	MLI	03PL2
12	2	JP4,JP5	GK1	02PL1
13	2	JP7,JP6	GK2	02PL1
14	1	L1	400uH 55A	ETD59
15	6	R1,R2,R3,R7,R8,R9	10	RC04
16	6	R4,R5,R6,R10,R11,R12	1k	RC04
17	1	R13	4.7k	RC02
18	6	T1,T2,T3,T4,T5,T6	HUF75639P3	TO220
19	1	U1	IR2183	08DIP300L
20	3	VIS1,VIS2,VIS3	VISSERIE	M3L

4.3 Allure des principaux composants

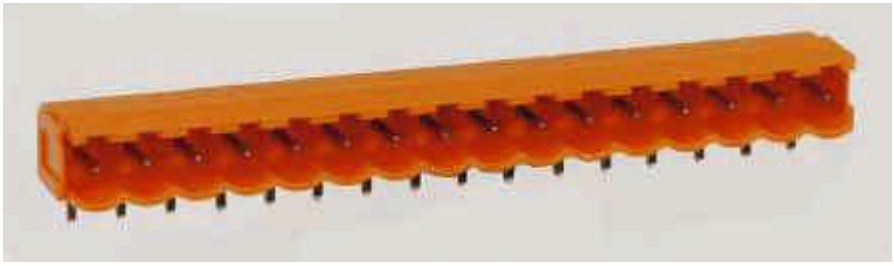


Fig. 4.2. Connecteur Weidmuller 3 points (images-composants\Weidmuller-2.jpg).

4.4 Chronogrammes du hacheur

4.4.1 Etude de l'inductance ETD59–3C90 – e = 1mm

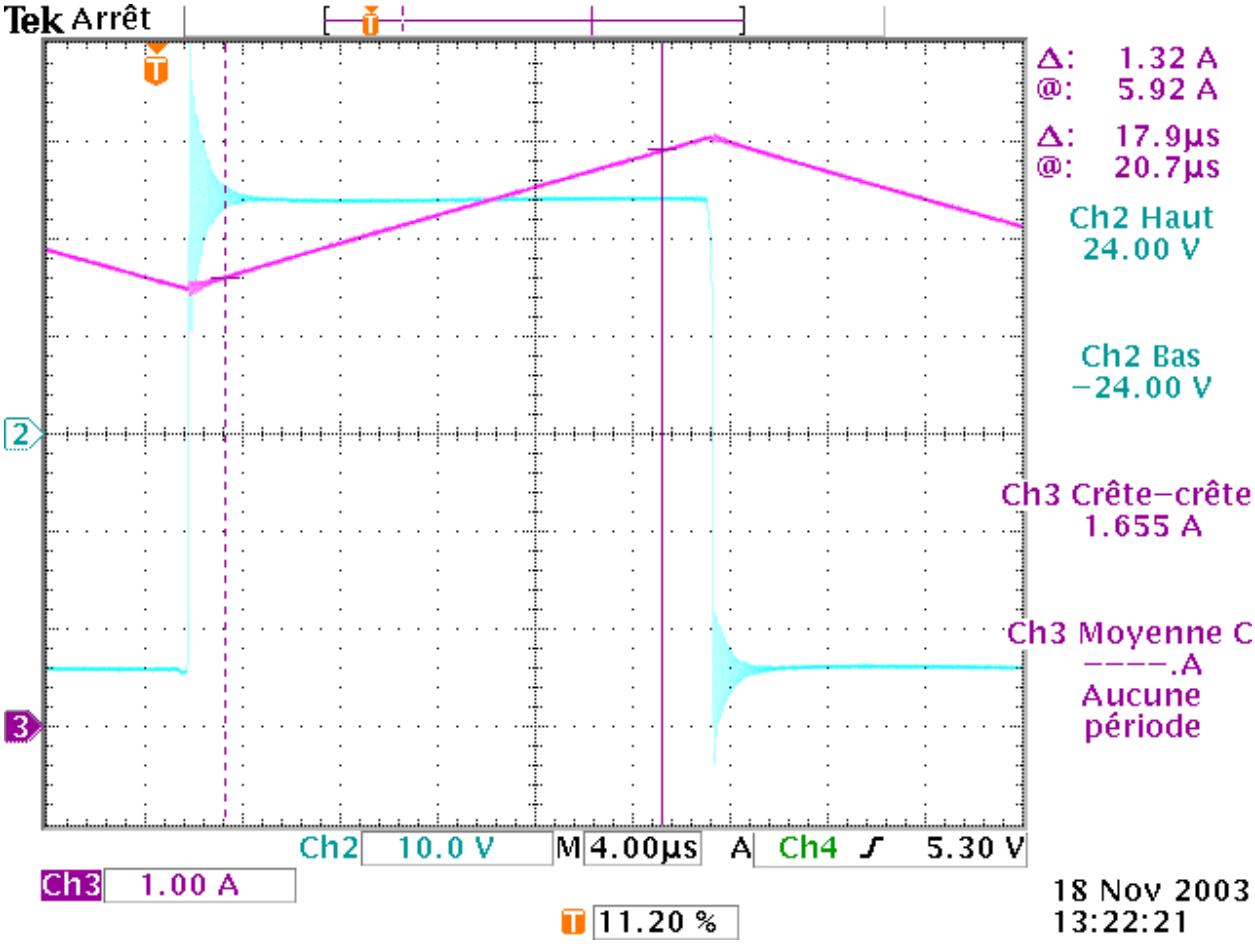


Fig. 4.3. Courant et tension de l'inductance (tektronix\h2qa\0VL-IL-ETD39-1mm.pcx).

Essais **: hacheur de type BUCK**

Tension d'entrée : E = 50 V

Rapport cyclique : $\alpha = 50\ \%$

Courant d'entrée : Ie = 2,5 A

Courant de sortie : Is = 5 A

Tension inductance : V_{Lmax} = +24 V pendant ΔT = 17,9 µs

Variation du courant : ΔI_L = 1,32 A

Inductance : $v = L\frac{di}{dt}$ soit $L = \frac{V_L \times \Delta T}{\Delta I_L}$ = 325 µH.

Circuit ETD39 – Matériaux 3C90 – Entrefer e = 1 m (FR4) – N = 57 spires – Fils 2 x AWG19 (ϕ 1 mm)

μ_e = 1900 – Ae = 125 mm² – Le = 92,2 mm – $\mu_0 = 4 \cdot \pi \cdot 10^{-7}$

$$L = N^2 \cdot \frac{\mu_0 \cdot \mu_e \cdot Ae}{Le} \cdot \frac{1}{1 + \frac{2 \cdot e \cdot \mu_e}{Le}} = 249\ \mu H$$

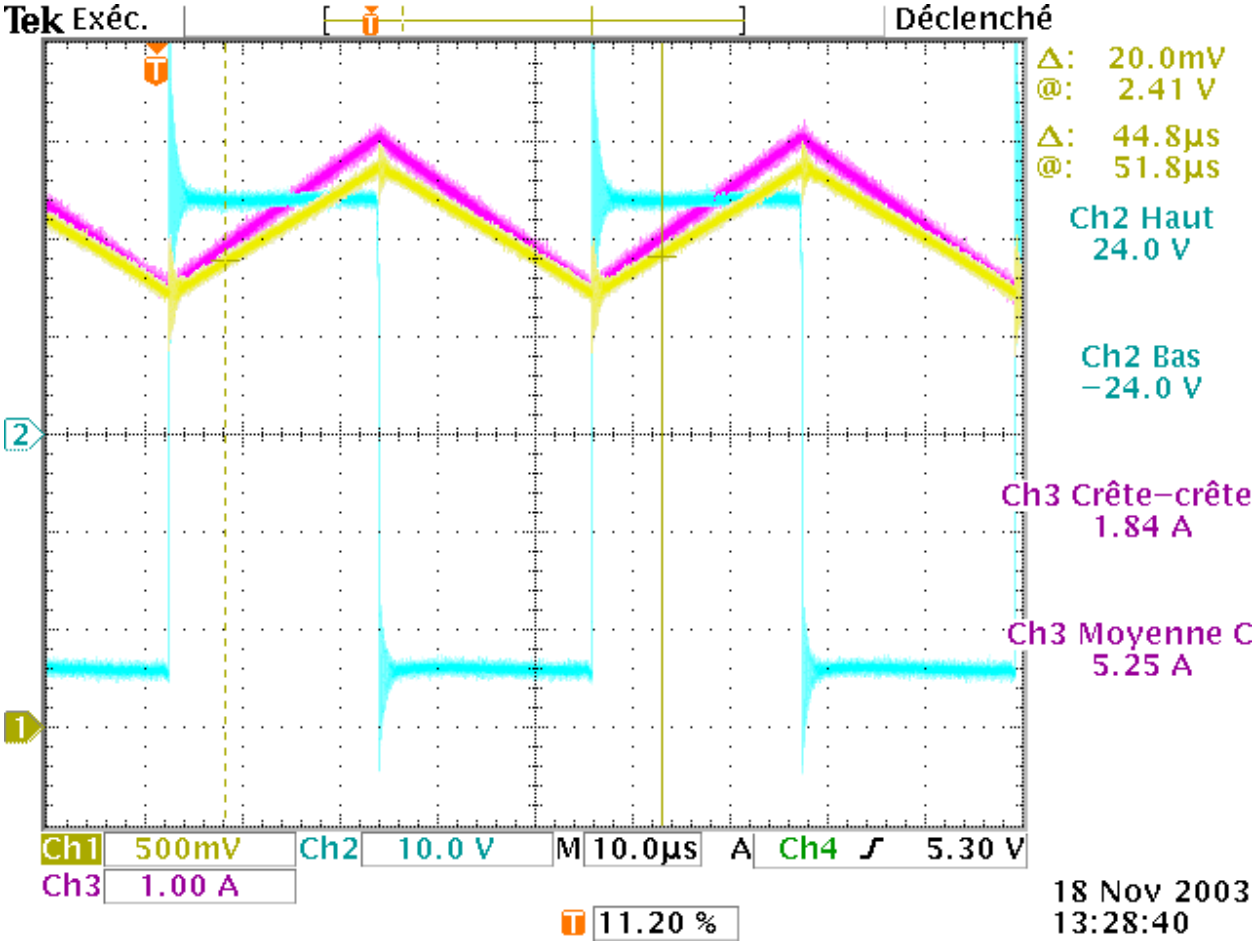


Fig. 4.4. Tension de sortie du capteur de courant (tektronix\h2qa\VL-IL-LA55-100.pcx).

Capteur LEM LA55-P – 5 tours – R_{mesure} = 100 Ω.

$$\Delta I_L = 1{,}4\ A - \Delta V_{Imes} = 700\ mV - \frac{\Delta V}{\Delta I} = \frac{700\ mV}{1{,}4A} = 0{,}5$$

$$V_{OUT} = \frac{Ns \cdot i_P}{1000} \times R_{mes} = \frac{i_P}{200} \times 100\Omega - \frac{\Delta V}{\Delta I} = \frac{100\Omega}{200} = 0{,}5$$

$$V_{OUT} = \frac{Ns \cdot i_P}{1000} \times R_{mes} = i_p \frac{5}{1000} \times 100\Omega \Rightarrow 0{,}5\ {}^{V}\!/_{A}$$

Hacheur de puissance de type BUCK pour le karting

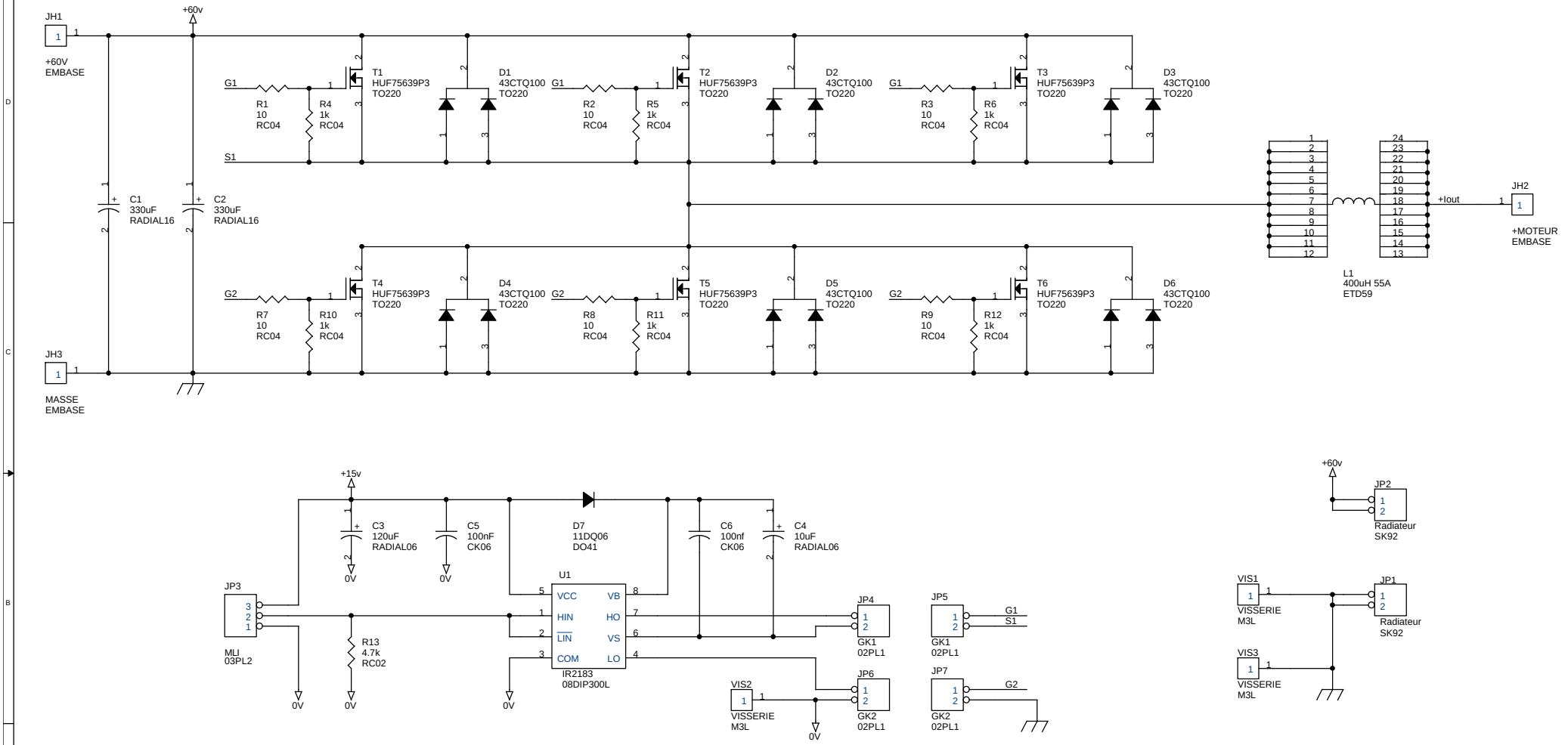
Revised: Friday, March 26, 2005

Thierry LEQUEU / LAPLAINE Francois / FONTAINE Benjamin Revision: 3

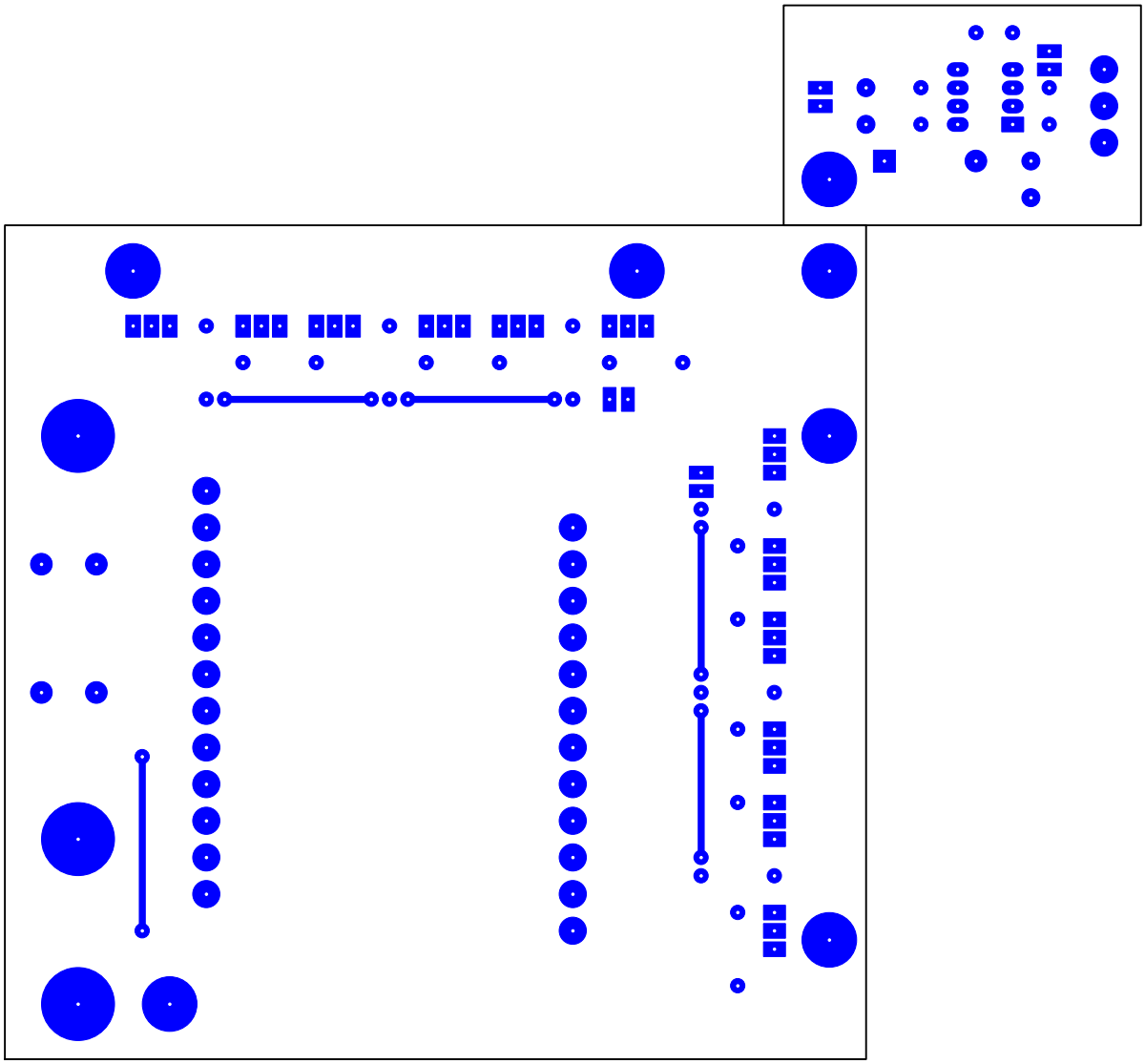
1 euro 6,55957 F

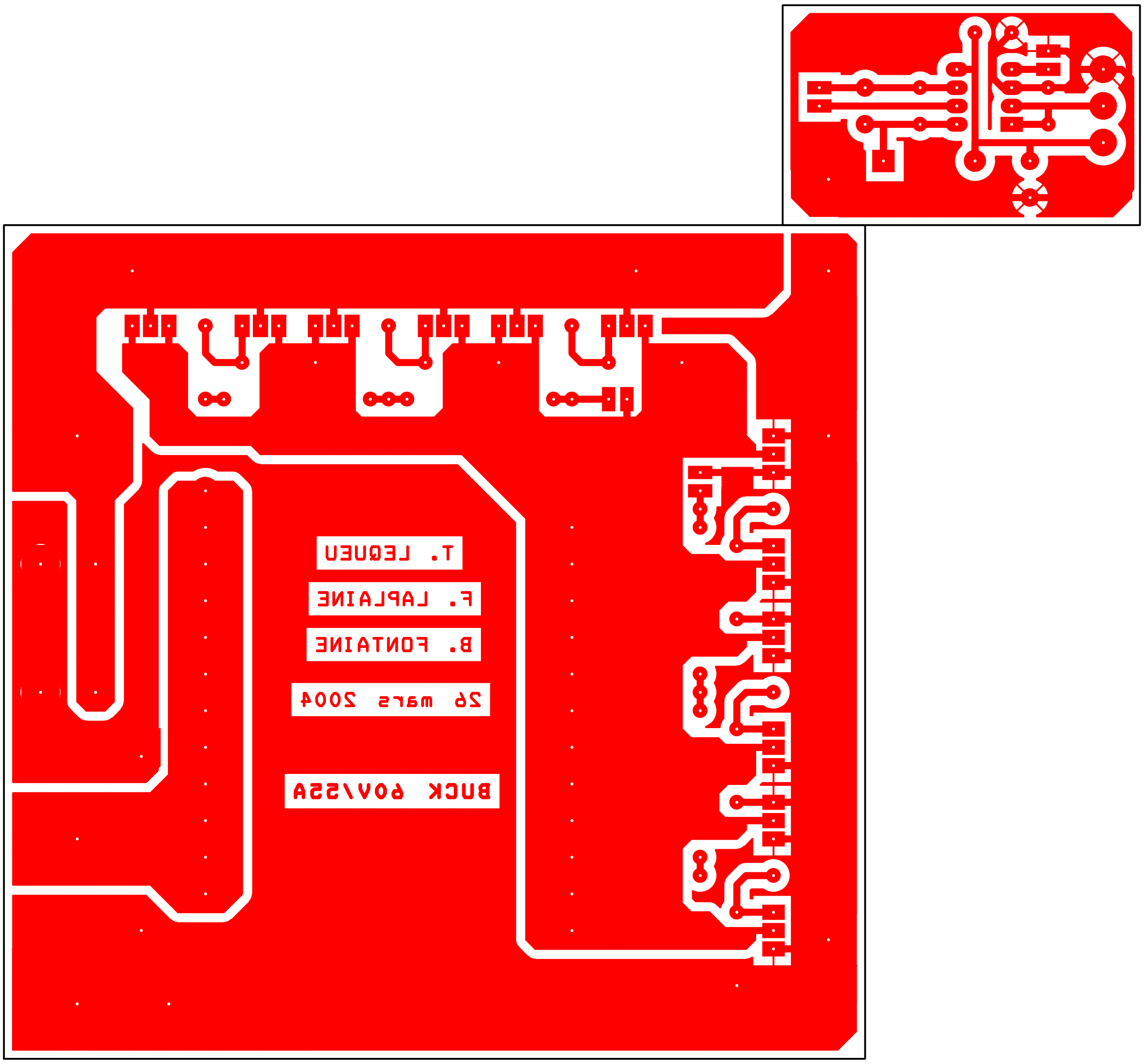
Référence	Qu.	Désignation	Fournisseur	Date	Code Cde.	U.d.V.	Prix U.	Prix T.	
C1,C2	2	Condensateur,aluminium,radial, µF, V, °C,faib le impédance,Panasonic,EEUF,C A .	Radiospares	avril-04	315-1094	5	11,14	4,46	29,23 F
C3	1	Condensateur,aluminium,radial, µF, V, °C,faible impédance,Panasonic,EEUF,C E .	Radiospares	avril-04	315-0546	5	1,21	0,24	1,59 F
C4	1	Condensateur,aluminium,radial, µF, V, °C,faible impédance,Panasonic,EEUF,C H .	Radiospares	avril-04	315-0805	5	0,95	0,19	1,25 F
C6,C5	2	Condensateur,film,polyester métallisé,pas de 5mm,100V,100nF,AVX, BF014E0104K--.	Radiospares	avril-04	405-8334	10	1,19	0,24	1,56 F
D1,D2,D3,D4,D5,D6	6	Semiconducteur,discret,diode,petits signaux,schottky,I.R.,43CTQ100.	Radiospares	avril-04	357-4122	1	4,09	24,54	160,97 F
D7	1	Semiconducteur,discret,diode,petits signaux,Schottky,11DQ06.	Radiospares	avril-04	395-6350	10	4,06	0,41	2,66 F
JH1	1	Embase mm à visser ROUGE	Radiospares	avril-04	230-6344	1	3,35	3,35	21,97 F
JH2	1	Embase mm à visser NOIRE	Radiospares	avril-04	230-6350	1	3,35	3,35	21,97 F
JH3	1	Embase mm à visser VERTE	Radiospares	avril-04	230-6388	1	1,57	1,57	10,30 F
JP2,JP1	2	Dissipateur SK92 150 SA	Radiospares	août-	169-4252	3	23,63	15,75	103,33 F
L1	50	Fil,cuivre isolé,monobrin, SWG, m.	Radiospares	avril-04	357-788	80	10,59	6,62	43,42 F
L1	2	Ferrite ETD59	Farnell	avril-04	305-6430	1	5,13	10,26	67,30 F
L1	1	Bobine ETD59	Farnell	avril-04	137-054	1	7,81	7,81	51,23 F
L1	2	Clips ETD59	Farnell	avril-04	137-066	1	1,47	2,94	19,29 F
R1,R2,R3,R7,R8,R9	6	Résistance,carbone,circuit imprimé,axial, . W, ohms, %,Neohm,CFR .	Radiospares	avril-04	132-012	10	0,38	0,23	1,50 F
R4,R5,R6,R10,R11,R12	6	Résistance,carbone,circuit imprimé,axial, . W, kohms, %,Neohm,CFR .	Radiospares	avril-04	132-494	10	0,40	0,24	1,57 F
R13	1	Résistance,carbone,circuit imprimé,axial, . W, . kohms, %,Neohm,CFR .	Radiospares	avril-04	132-652	10	0,38	0,04	0,25 F
T1,T2,T3,T4,T5,T6	6	Semiconducteur,Transistor,MOSFET,N Channel,HUF75639P3,.	Radiospares	avril-04	329-1013	1	5,25	31,50	206,63 F
U1	1	Semiconducteur,IR2183.	Radiospares	avril-04	415-4280	1	6,21	6,21	40,73 F
	4	Rondelle anti desserrage,acier zingué,pour pas métrique,M .	Radiospares	avril-04	526-574	250	2,08	0,03	0,22 F
	4	Écrou,hexagonal,acier doux zingué,pas métrique,M .	Radiospares	avril-04	560-293	250	4,54	0,07	0,48 F
	4	Vis,acier zingué,pas métrique,tête cylindrique bombée,fendue,M x mm.	Radiospares	avril-04	560-798	100	2,88	0,12	0,76 F
	4	Entretoise M3 x 20 mm	Radiospares	avril-04	125-6018	50	17,62	1,41	9,25 F
	4	Isolateur,TO220,non conducteur,Warth Int.,K177353BQ2840.	Radiospares	avril-04	112-8109	10	2,54	1,02	6,66 F
Divers	3	Connecteur,support tulipe,de production,8 points,DIP8,PreciDip,1109130841001.	Radiospares	avril-04	100-9935	10	4,31	1,29	8,48 F
Divers	57	Circuit imprimé x mm	IUT GEII	avril-04	CI	600	14,27	1,36	8,89 F

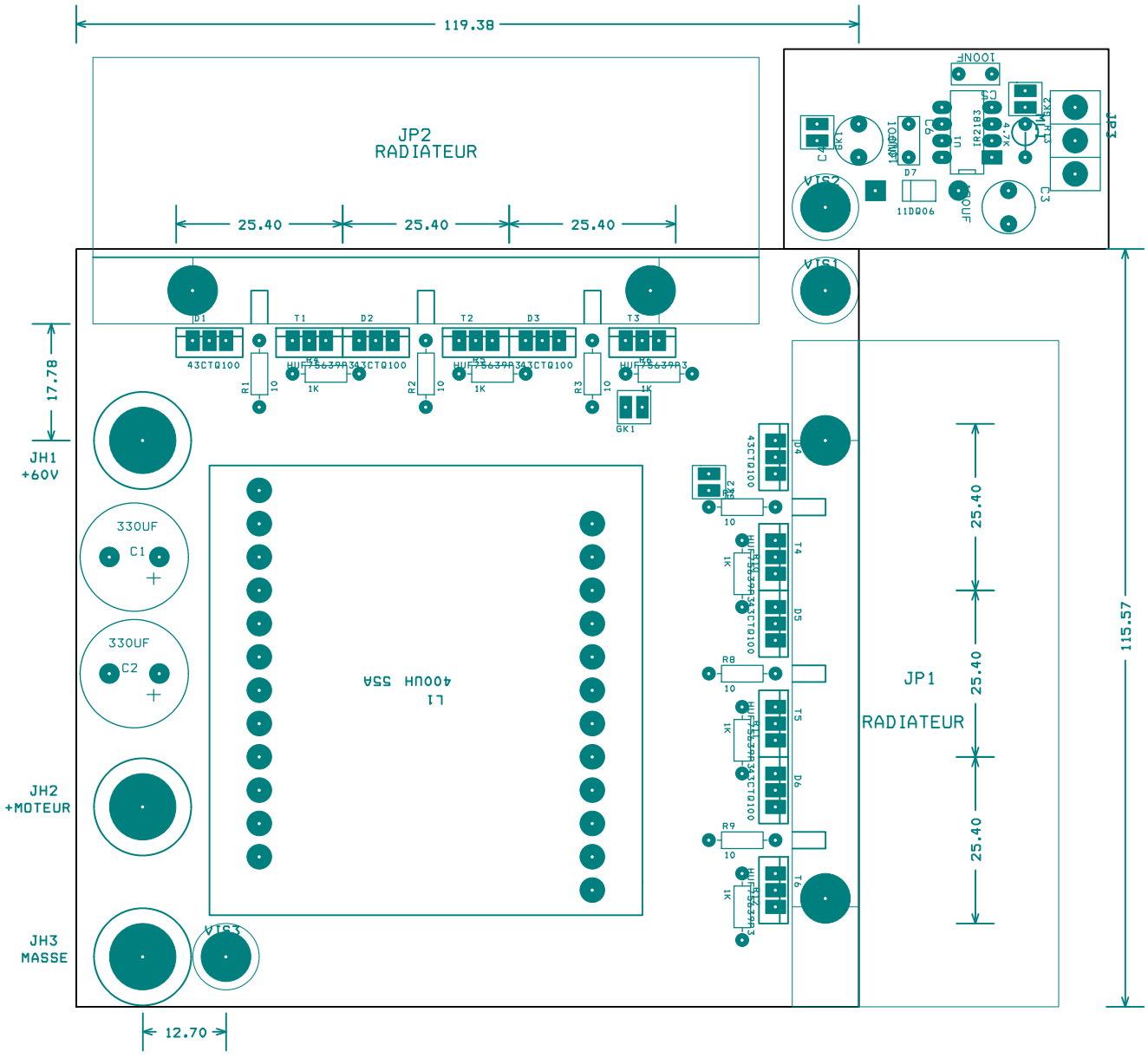
TOTAL H.T. :	125,24	821,49 F
19,60%	24,55	161,01 F
TOTAL T.T.C. :	**149,78**	982,50 F

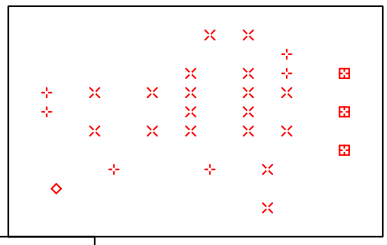


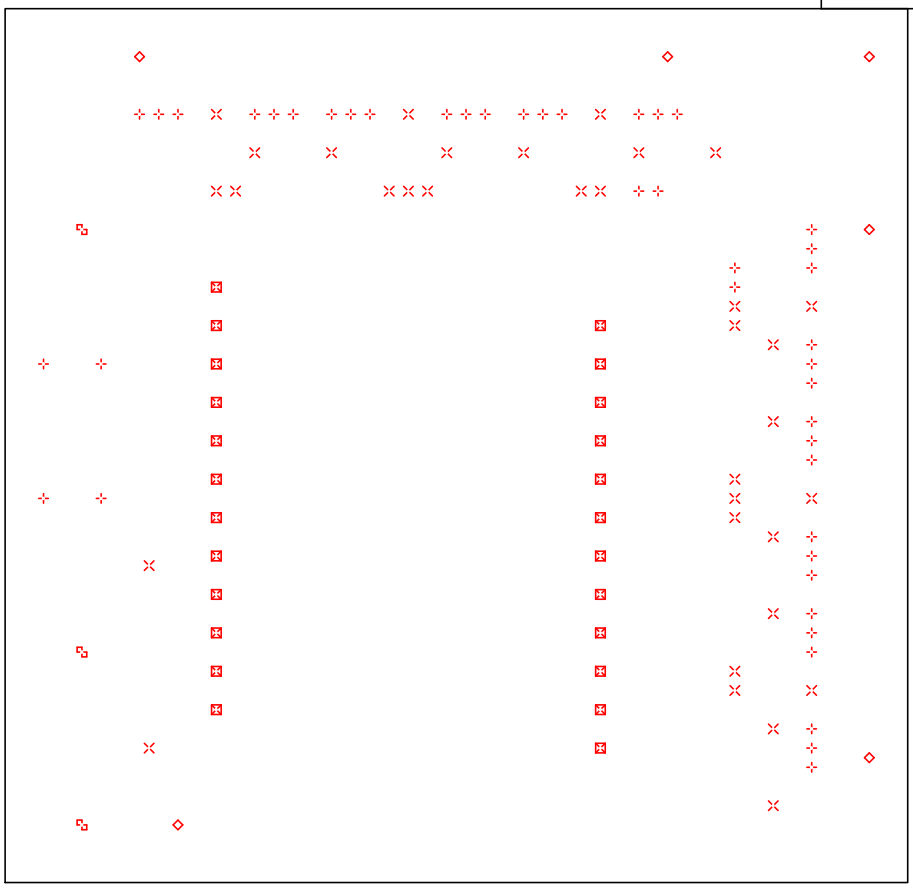
Title	Hacheur de puissance de type BUCK pour le karting	
Size B	Document Number Thierry LEQUEU / LAPLAINE Francois / FONTAINE Benjamin	Rev 3
Date: Friday, March 26, 2004	Sheet 1 of 1	




T. LEQUEU
F. LAPLAINE
B. FONTAINE
26 mars 2004
BUCK 60V/25A


119.38
JP2
RADIATEUR
25.40
25.40
25.40
17.78
JH1
+60V
330UF
C1
330UF
C2
JH2
+MOTEUR
JH3
MASSE
12.70
L1
400UH 55A
JP1
RADIATEUR
25.40
25.40
25.40
115.57
JP3
100NF
IR2183
11DQ06
43CTQ100
1K
10





DRILL CHART				
SYM	DIAM	TOL	QTY	NOTE
×	0.787 mm		52	
+	0.991 mm		50	
⊞	1.000 mm		3	
⊠	1.194 mm		24	
◇	3.200 mm		7	
⧉	4.191 mm		3	
TOTAL			139	

FAIRCHILD SEMICONDUCTOR®

HUF75639G3, HUF75639P3, HUF75639S3S, HUF75639S3

Data Sheet **December 2001**

56A, 100V, 0.025 Ohm, N-Channel UltraFET Power MOSFETs

These N-Channel power MOSFETs are manufactured using the innovative UltraFET® process. This advanced process technology achieves the lowest possible on-resistance per silicon area, resulting in outstanding performance. This device is capable of withstanding high energy in the avalanche mode and the diode exhibits very low reverse recovery time and stored charge. It was designed for use in applications where power efficiency is important, such as switching regulators, switching converters, motor drivers, relay drivers, low-voltage bus switches, and power management in portable and battery-operated products.

Formerly developmental type TA75639.

Ordering Information

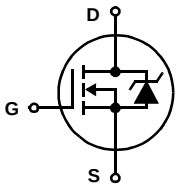
PART NUMBER	PACKAGE	BRAND
HUF75639G3	TO-247	75639G
HUF75639P3	TO-220AB	75639P
HUF75639S3S	TO-263AB	75639S
HUF75639S3	TO-262AA	75639S

NOTE: When ordering, use the entire part number. Add the suffix T to obtain the TO-263AB variant in tape and reel, e.g., HUF75639S3ST.

Features

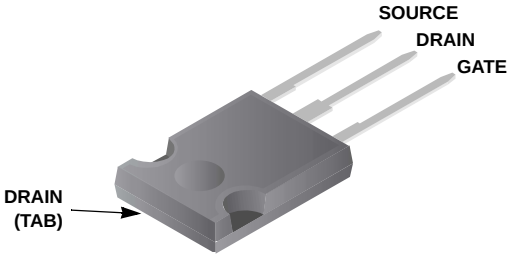
- 56A, 100V
- Simulation Models
  - Temperature Compensated PSPICE® and SABER™ Electrical Models
  - Spice and Saber Thermal Impedance Models
  - www.fairchildsemi.com
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- Related Literature
  - TB334, “Guidelines for Soldering Surface Mount Components to PC Boards”

Symbol

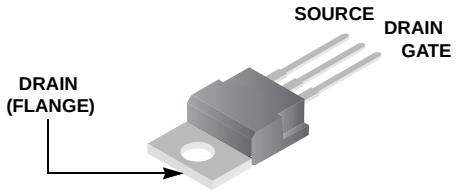


Packaging

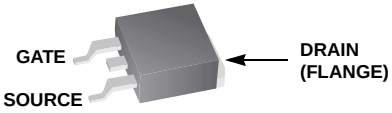
JEDEC STYLE TO-247



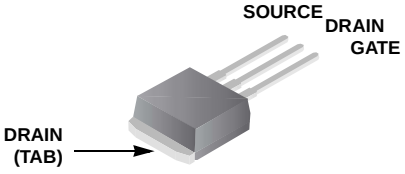
JEDEC TO-220AB



JEDEC TO-263AB



TO-262AA



Product reliability information can be found at http://www.fairchildsemi.com/products/discrete/reliability/index.html
For severe environments, see our Automotive HUFA series.
All Fairchild semiconductor products are manufactured, assembled and tested under ISO9000 and QS9000 quality systems certification.

Absolute Maximum Ratings $T_C = 25^oC$, Unless Otherwise Specified

			UNITS
Drain to Source Voltage (Note 1)	V_{DSS}	100	V
Drain to Gate Voltage (R_{GS} = 20kΩ) (Note 1)	V_{DGR}	100	V
Gate to Source Voltage	V_{GS}	±20	V
Drain Current			
Continuous (Figure 2)	I_D	56	A
Pulsed Drain Current	I_{DM}	Figure 4	
Pulsed Avalanche Rating	E_{AS}	Figures 6, 14, 15	
Power Dissipation	P_D	200	W
Derate Above 25^oC		1.35	$W/^oC$
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	^oC
Maximum Temperature for Soldering			
Leads at 0.063in (1.6mm) from Case for 10s	T_L	300	^oC
Package Body for 10s, See Techbrief 334	T_{pkg}	260	^oC

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

1. $T_J = 25^oC$ to 150^oC.

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNITS
OFF STATE SPECIFICATIONS							
Drain to Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V (Figure 11)		100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 95V, V_{GS} = 0V		-	-	1	μA
		V_{DS} = 90V, V_{GS} = 0V, $T_C = 150^oC$		-	-	250	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V		-	-	±100	nA
ON STATE SPECIFICATIONS							
Gate to Source Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250μA (Figure 10)		2	-	4	V
Drain to Source On Resistance	$r_{DS(ON)}$	I_D = 56A, V_{GS} = 10V (Figure 9)		-	0.021	0.025	Ω
THERMAL SPECIFICATIONS							
Thermal Resistance Junction to Case	$R_{\theta JC}$	(Figure 3)		-	-	0.74	$^oC/W$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	TO-247		-	-	30	$^oC/W$
		TO-220, TO-263		-	-	62	$^oC/W$
SWITCHING SPECIFICATIONS (V_{GS} = 10V)							
Turn-On Time	t_{ON}	V_{DD} = 50V, $I_D \cong$ 56A, R_L = 0.89Ω, V_{GS} = 10V, R_{GS} = 5.1Ω		-	-	110	ns
Turn-On Delay Time	$t_{d(ON)}$			-	15	-	ns
Rise Time	t_r			-	60	-	ns
Turn-Off Delay Time	$t_{d(OFF)}$			-	20	-	ns
Fall Time	t_f			-	25	-	ns
Turn-Off Time	t_{OFF}			-	-	70	ns
GATE CHARGE SPECIFICATIONS							
Total Gate Charge	$Q_{g(TOT)}$	V_{GS} = 0V to 20V	V_{DD} = 50V, $I_D \cong$ 56A, R_L = 0.89Ω, $I_{g(REF)}$ = 1.0mA (Figure 13)	-	110	130	nC
Gate Charge at 10V	$Q_{g(10)}$	V_{GS} = 0V to 10V		-	57	75	nC
Threshold Gate Charge	$Q_{g(TH)}$	V_{GS} = 0V to 2V		-	3.7	4.5	nC
Gate to Source Gate Charge	Q_{gs}			-	9.8	-	nC
Gate to Drain "Miller" Charge	Q_{gd}			-	24	-	nC

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
CAPACITANCE SPECIFICATIONS						
Input Capacitance	C_{ISS}	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz (Figure 12)	-	2000	-	pF
Output Capacitance	C_{OSS}		-	500	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	65	-	pF

Source to Drain Diode Specifications

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Source to Drain Diode Voltage	V_{SD}	I_{SD} = 56A	-	-	1.25	V
Reverse Recovery Time	t_{rr}	I_{SD} = 56A, dI_{SD}/dt = 100A/µs	-	-	110	ns
Reverse Recovered Charge	Q_{RR}	I_{SD} = 56A, dI_{SD}/dt = 100A/µs	-	-	320	nC

Typical Performance Curves

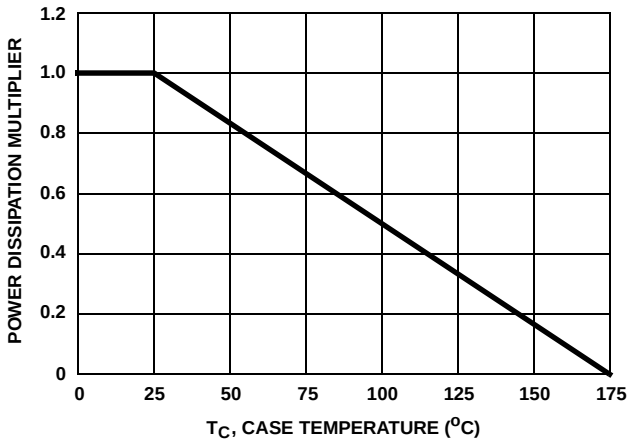


FIGURE 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

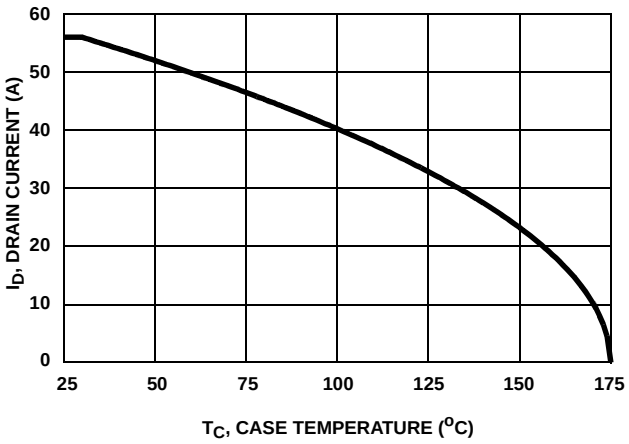


FIGURE 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

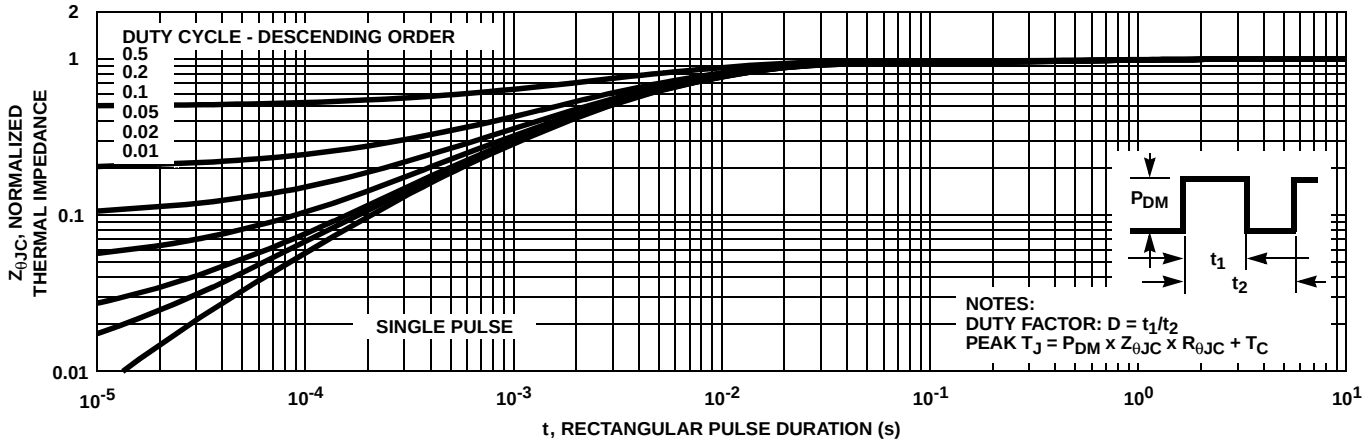


FIGURE 3. NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

PD-20542 rev. B 11/99

International
IOR Rectifier

43CTQ...
43CTQ...S
43CTQ...-1

SCHOTTKY RECTIFIER

40 Amp

Major Ratings and Characteristics

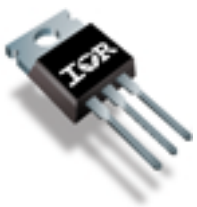
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	80/100	V
I_{FSM} @ tp = 5 µs sine	850	A
V_F @ 20 Apk, T_J = 125°C (per leg)	0.67	V
T_J range	-55 to 175	°C

Description/Features

This center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Center tap configuration
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

43CTQ...	43CTQ...S	43CTQ...-1
		
TO-220	D^2PAK	TO-262

Voltage Ratings

	Parameters	43CTQ080 43CTQ080S 43CTQ080-1	43CTQ100 43CTQ100S 43CTQ100-1
V_R	Max. DC Reverse Voltage (V)	80	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	20	A	50% duty cycle @ T_C = 135°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	40			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	850	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	275		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	7.50	mJ	T_J = 25 °C, I_{AS} = 0.50 Amps, L = 60 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	0.50	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.81	V	@ 20A	T_J = 25 °C
		0.98	V	@ 40A	
		0.67	V	@ 20A	T_J = 125 °C
		0.81	V	@ 40A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1	mA	T_J = 25 °C	V_R = rated V_R
		11	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.71	V	T_J = T_J max.	
r_t	Forward Slope Resistance	0.43	mΩ		
C_T	Max. Junction Capacitance (Per Leg)	1480	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance (Per Leg)	8.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10,000	V/ µs		

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		2.0	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		1.0	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased (only for TO-220)
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		

Data Sheet No. PD60173-E

International
IOR Rectifier

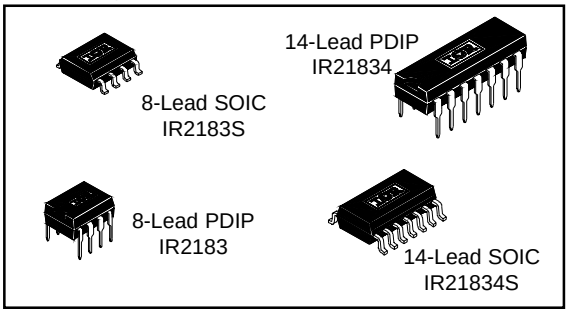
IR2183(4) (S)

HALF-BRIDGE DRIVER

Features

- Floating channel designed for bootstrap operation
  - Fully operational to +600V
  - Tolerant to negative transient voltage
  - dV/dt immune
- Gate drive supply range from 10 to 20V
- Undervoltage lockout for both channels
- 3.3V and 5V input logic compatible
- Matched propagation delay for both channels
- Logic and power ground +/- 5V offset.
- Lower di/dt gate driver for better noise immunity
- Output source/sink current capability 1.4A/1.8A

Packages



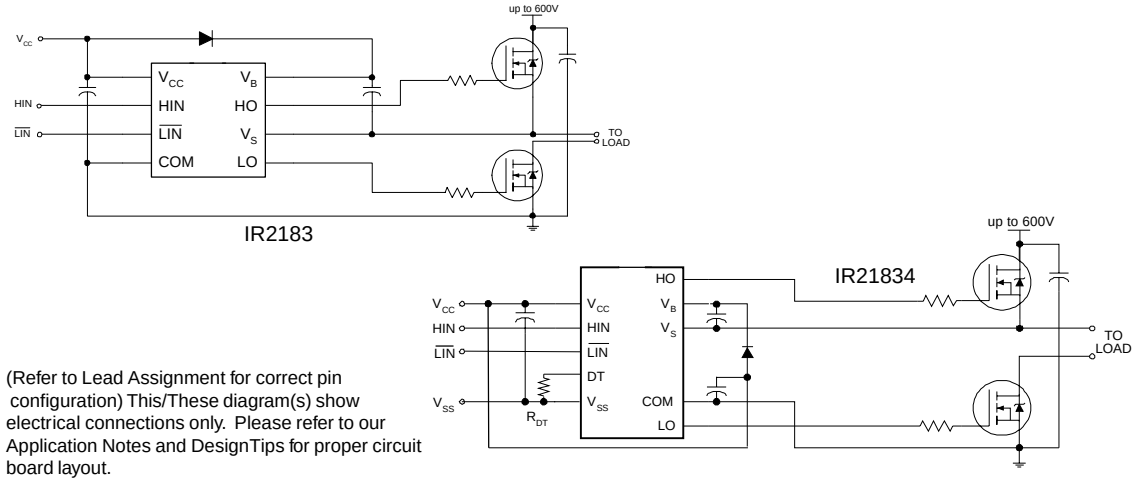
Description

The IR2183(4)(S) are high voltage, high speed power MOSFET and IGBT drivers with dependent high and low side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output, down to 3.3V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high side configuration which operates up to 600 volts.

IR2181/IR2183/IR2184 Feature Comparison

Part	Input logic	Cross-conduction prevention logic	Dead-Time	Ground Pins	Ton/Toff
2181	HIN/LIN	no	none	COM	180/220 ns
21814				VSS/COM	
2183	HIN/$\overline{\text{LIN}}$	yes	Internal 500ns	COM	180/220 ns
21834			Program 0.4 ~ 5 us	VSS/COM	
2184	IN/$\overline{\text{SD}}$	yes	Internal 500ns	COM	680/270 ns
21844			Program 0.4 ~ 5 us	VSS/COM	

Typical Connection

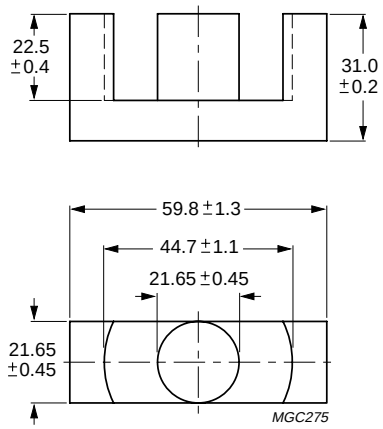


(Refer to Lead Assignment for correct pin configuration) This/These diagram(s) show electrical connections only. Please refer to our Application Notes and DesignTips for proper circuit board layout.

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.378	mm^{-1}
V_e	effective volume	51500	mm^3
l_e	effective length	139	mm
A_e	effective area	368	mm^2
A_{min}	minimum area	360	mm^2
m	mass of core half	≈130	g



Dimensions in mm.

Fig.1 ETD59 core half.

Core halves

Clamping force for A_L measurements, 70 ±20 N. Gapped cores are available on request.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	6000 ±25%	≈1950	≈0	ETD59-3C90
3F3	5600 ±25%	≈1800	≈0	ETD59-3F3

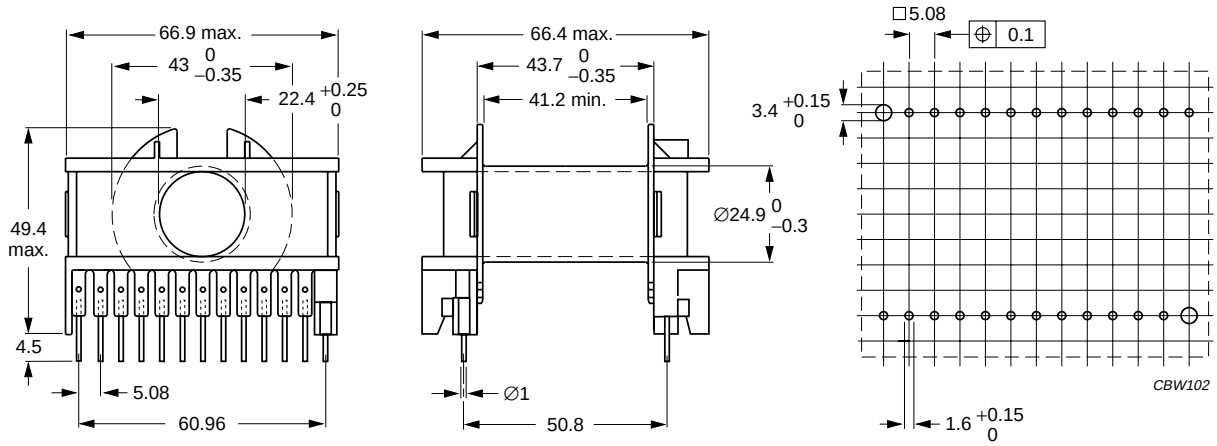
Properties of core sets under power conditions

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C	f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C	f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C
3C90	≥330	≤6.2	≤7.3	–
3F3	≥320	–	≤6.7	≤12.8

COIL FORMER

General data 24-pins ETD59 coil former

PARAMETER	SPECIFICATION
Coil former material	polybutyleneterephtalate (PBT), glass-reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E41613(M)
Pin material	copper-tin alloy (CuSn), tin-lead alloy (SnPb) plated
Maximum operating temperature	155 °C, *"IEC 60085"*, class F
Resistance to soldering heat	*"IEC 60068-2-20"*, Part 2, Test Tb, method 1B, 350 °C, 3.5 s
Solderability	*"IEC 60068-2-20"*, Part 2, Test Ta, method 1



Dimensions in mm.

Fig.2 ETD59 coil former; 24-pins.

Winding data for 24-pins ETD59 coil former

NUMBER OF SECTIONS	WINDING AREA (mm^2)	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	TYPE NUMBER
1	366	41.2	106	CPH-ETD59-1S-24P

Auteur : Thierry LEQUEU Date : 9 décembre 2000
Fichier : DISSIP-1.DRW