



**TDA8170**

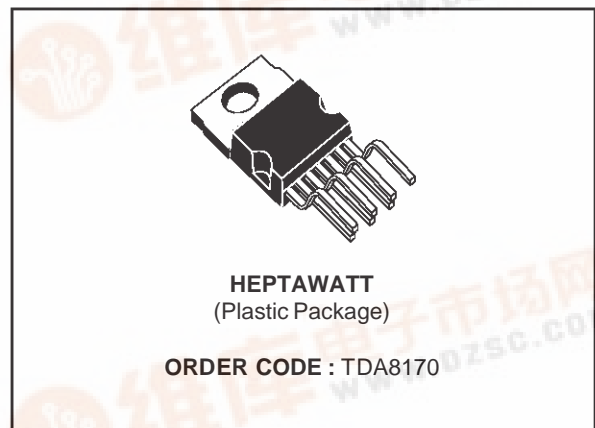
## TV VERTICAL DEFLECTION OUTPUT CIRCUIT

The functions incorporated are :

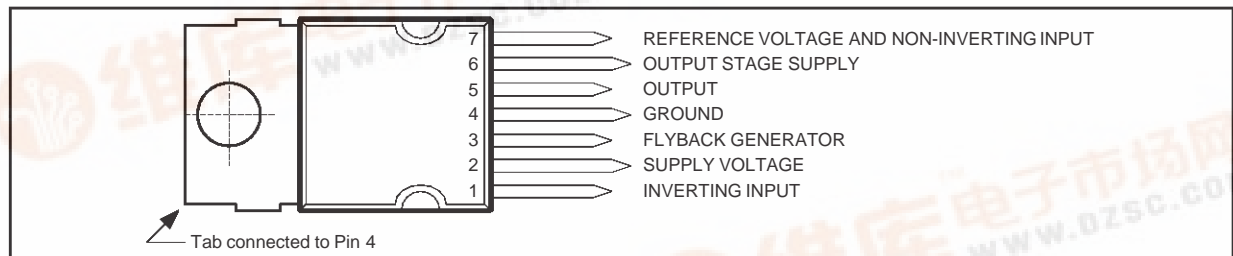
- POWER AMPLIFIER
- FLYBACK GENERATOR
- REFERENCE VOLTAGE
- THERMAL PROTECTION

### DESCRIPTION

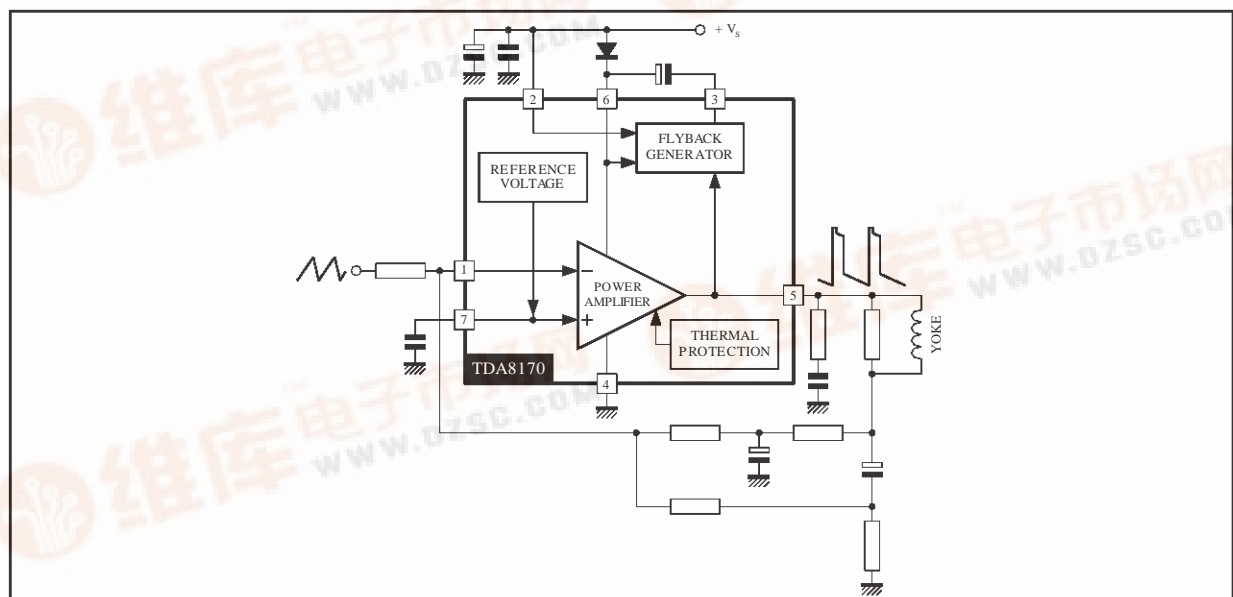
The TDA8170 is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Colour and B & W television receivers as well as in monitors and displays.



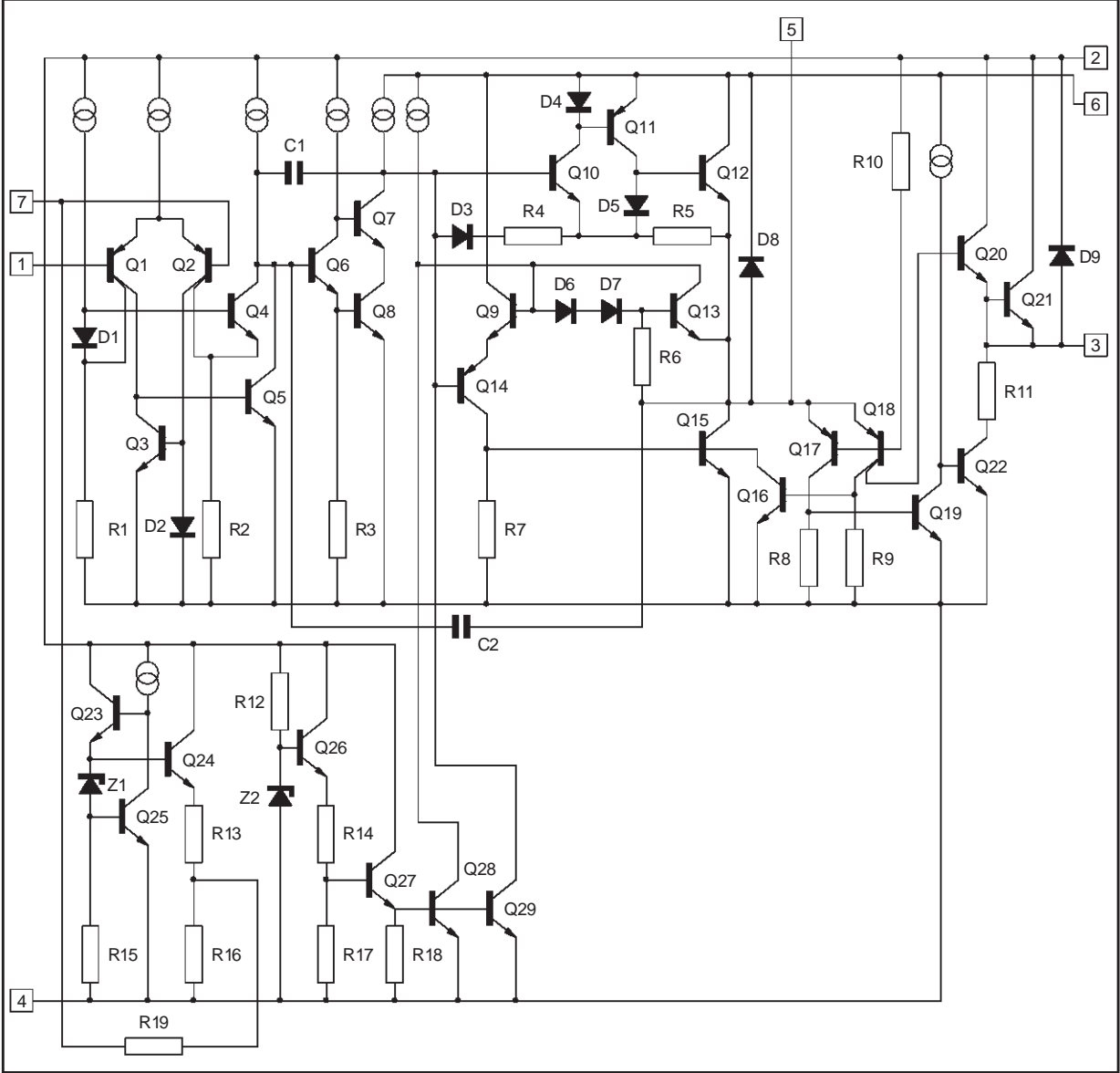
### PIN CONNECTIONS



### BLOCK DIAGRAM



SCHEMATIC DIAGRAM



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## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage (pin 2)	35	V
$V_5, V_6$	Flyback Peak Voltage	60	V
$V_3$	Voltage at Pin 3	+ $V_S$	
$V_1, V_7$	Amplifier Input Voltage	+ $V_S, -0.5$	V
$I_o$	Output Peak Current (non repetitive, $t = 2$ msec)	2.5	A
$I_o$	Output Peak Current at $f = 50$ or $60$ Hz, $t \leq 10$ $\mu$ sec	3	A
$I_o$	Output Peak Current at $f = 50$ or $60$ Hz, $t > 10$ $\mu$ sec	2	A
$I_3$	Pin 3 DC Current at $V_5 < V_2$	100	mA
$I_3$	Pin 3 Peak to Peak Flyback Current at $f = 50$ or $60$ Hz, $t_{fly} \leq 1.5$ msec	3	A
$P_{tot}$	Total Power Dissipation at $T_{case} = 90$ °C	20	W
$T_{stg}, T_j$	Storage and Junction Temperature	- 40, +150	°C

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## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max. 3	°C/W

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## ELECTRICAL CHARACTERISTICS

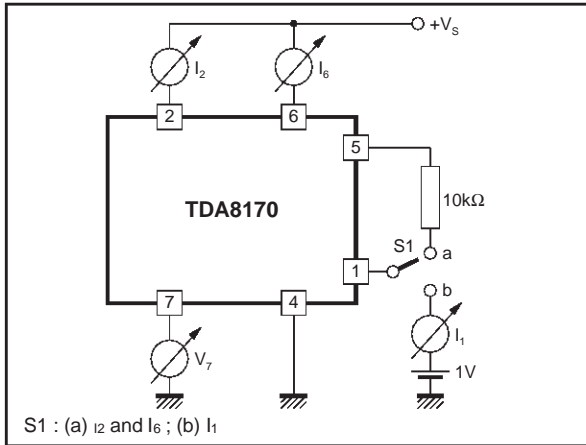
(refer to the test circuits,  $V_S = 35V$ ,  $T_{amb} = 25^\circ C$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
$I_2$	Pin 2 Quiescent Current	$I_3 = 0, I_5 = 0$		8	16	mA	1a
$I_6$	Pin 6 Quiescent Current	$I_3 = 0, I_5 = 0$		16	36	mA	1a
$I_1$	Amplifier Input Bias Current	$V_1 = 1$ V		- 0.1	- 1	$\mu$ A	1a
$V_7$	Reference Voltage			2.2		V	1a
$\frac{\Delta V_7}{\Delta V_S}$	Reference Voltage Drift versus Supply Voltage	$V_S = 15$ to $30$ V		1	2	mV/V	1a
$V_{3L}$	Pin 3 Saturation Voltage to GND	$I_3 = 20$ mA		1		V	1c
$V_5$	Quiescent Output Voltage	$V_S = 35$ V, $R_a = 39$ k $\Omega$		18		V	1d
		$V_S = 15$ V, $R_a = 13$ k $\Omega$		7.5		V	1d
$V_{5L}$	Output Saturation Voltage to GND	$I_5 = 1.2$ A		1	1.4	V	1c
		$I_5 = 0.7$ A		0.7	1	V	1c
$V_{5H}$	Output Saturation Voltage to Supply	- $I_5 = 1.2$ A		1.6	2.2	V	1b
		- $I_5 = 0.7$ A		1.3	1.8	V	1b
$T_j$	Junction Temperature for Thermal Shut Down			140		°C	

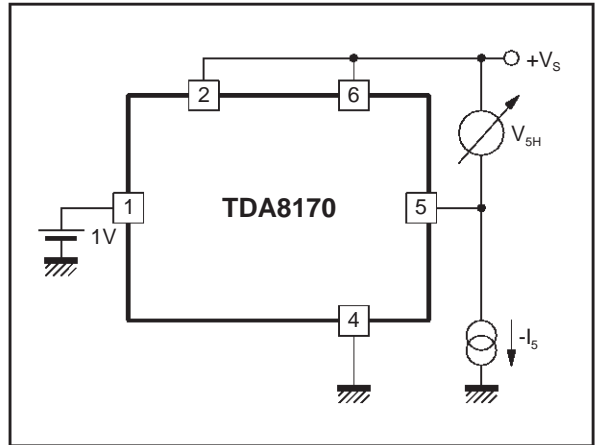
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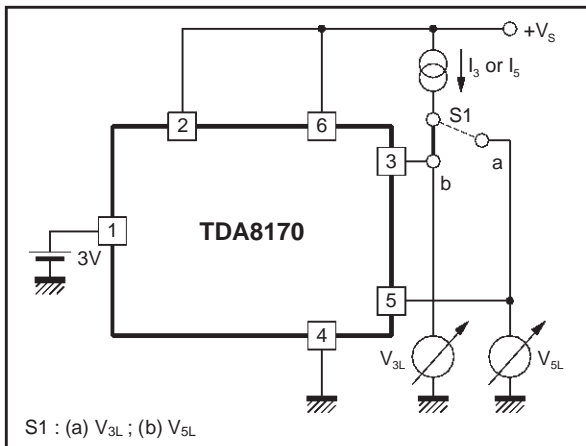
**Figure 1a :** Measurement of  $I_1, I_2, I_6, V_7, \Delta V_7/\Delta V_S$



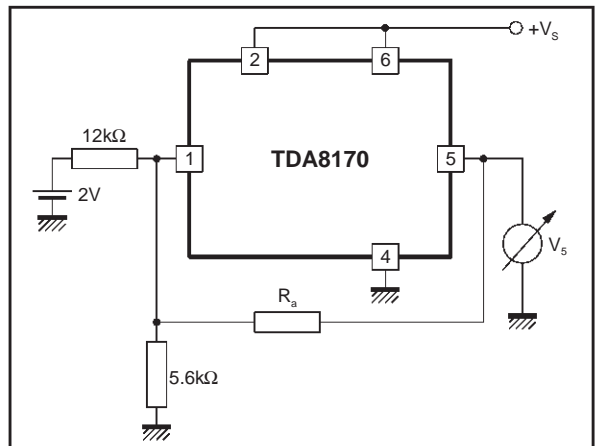
**Figure 1b :** Measurement of  $V_{5H}$



**Figure 1c :** Measurement of  $V_{3L}, V_{5L}$



**Figure 1d :** Measurement of  $V_5$



**Figure 2 :** Application Schematic

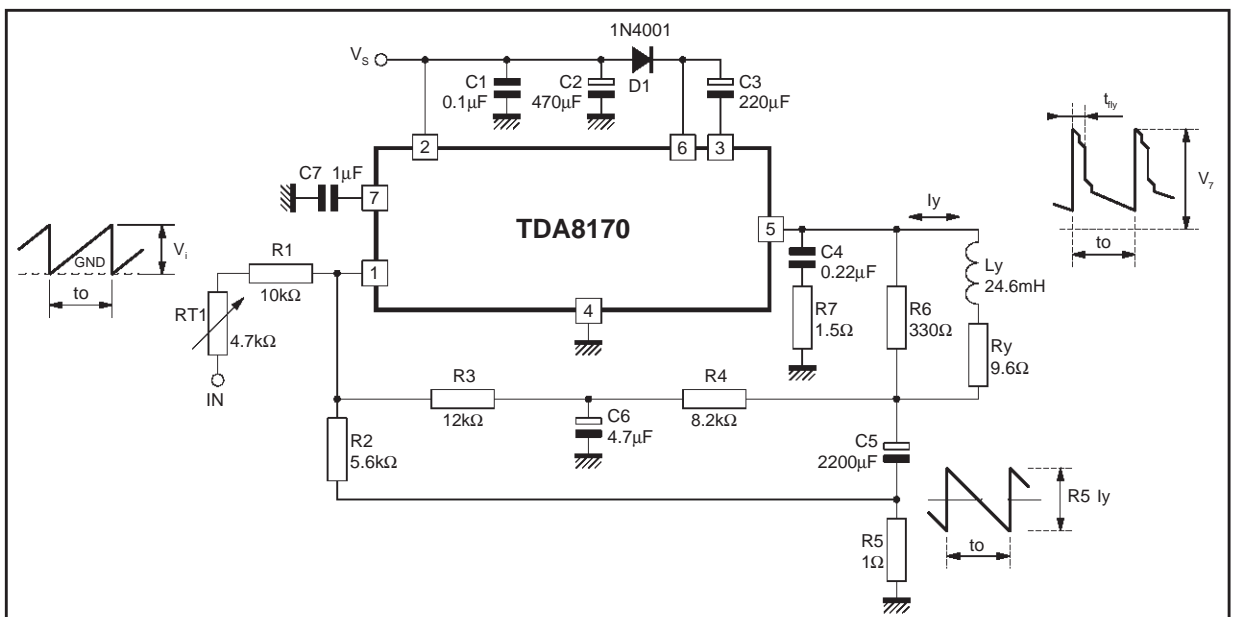
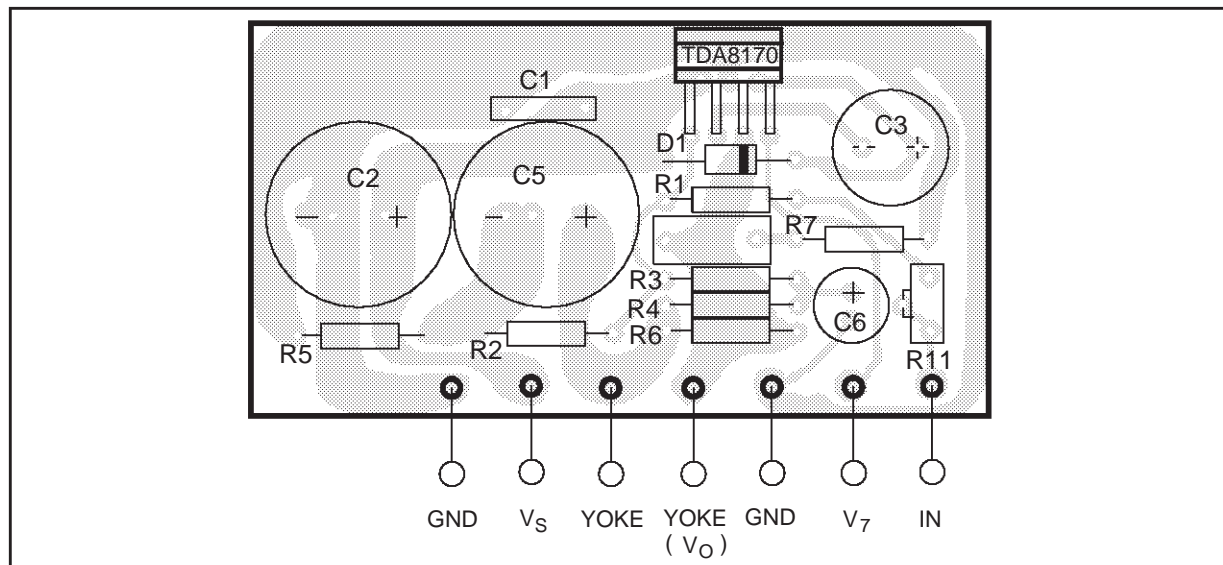


Figure 3 : PC Board and Component layout of the Circuit of fig. 2(1 : 1 scale)



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## COMPONENTS LIST FOR TYPICAL APPLICATIONS

Component	110 ° TVC 5.9 Ω/10 mH 1.95 App	110 ° TVC 9.6 Ω/24.6 mH 1.2 App	90 ° TVC 15 Ω/30 mH 0.82 App	Unit
RT1	10	4.7	10	kΩ
R1	12	10	12	kΩ
R2	10	5.6	5.6	kΩ
R3	27	12	18	kΩ
R4	12	8.2	5.6	kΩ
R5	0.82	1	1	Ω
R6	270	330	330	Ω
R7	1.5	1.5	1.5	Ω
D1	1N 4001	1N 4001	1N 4001	–
C1	0.1	0.1	0.1	μF
C2 el.	1000/25 V	470/25 V	470/25 V	μF
C3 el.	220/25 V	220/25 V	220/25 V	μF
C4	0.22	0.22	0.22	μF
C5 el.	200/25 V	2200/25 V	1000/16 V	μF
C6 el.	4.7/16 V	4.7/16 V	10/16 V	μF
C7	1.0/16V	1.0/16V	1.0/16V	μF

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TYPICAL PERFORMANCES

Parameter	110 ° TVC 5.9 Ω/10 mH	110 ° TVC 9.6 Ω/27 mH	90 ° TVC 15 Ω/30 mH	Unit
V <sub>s</sub> - Supply Voltage	24	22.5	25	V
I <sub>s</sub> - Current	280	175	125	mA
t <sub>fly</sub> - Flyback Time	0.6	1	0.7	ms
P <sub>tot</sub> - Power Dissip.	4.2	2.5	2.05	W
R <sub>th o-a</sub> - Heatsink	7	13	16	°C/W
T <sub>amb</sub>	60	60	60	°C
T <sub>j max</sub>	110	110	110	°C
T <sub>o</sub>	20	20	20	ms
V <sub>l</sub>	2.5	2.5	2.5	V <sub>pp</sub>
V <sub>7</sub>	2.5	2.5	2.5	V <sub>p</sub>

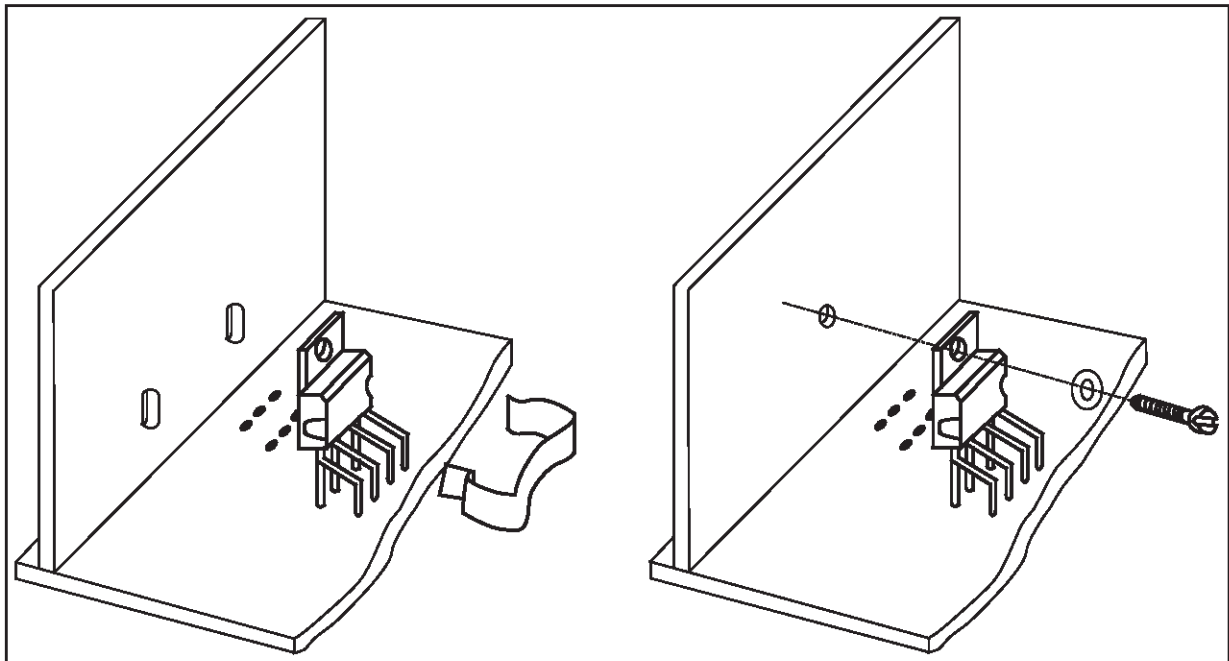
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MOUNTING INSTRUCTIONS

The power dissipated in the circuit must be removed by adding an external heatsink. Thanks to the HEPTAWATT™ package attaching the heatsink is very simple, a screw a compression

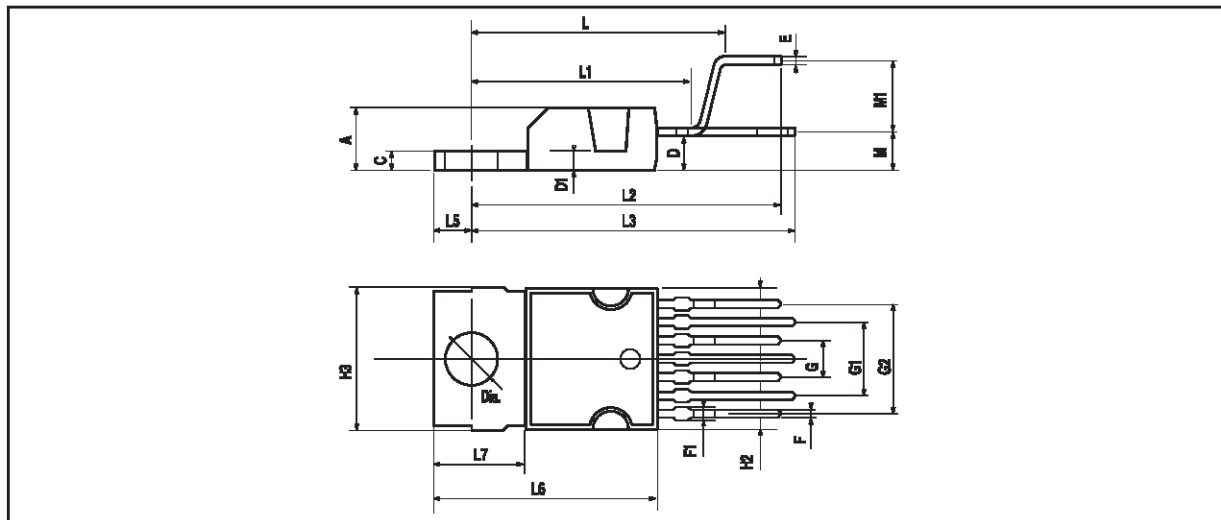
spring (clip) being sufficient. Between the heatsink and the package it is better to insert a layer of silicon grease, to optimize the thermal contact ; no electrical isolation is needed between the two surfaces.

Figure 4 : Mounting Examples



8170-10.EPS

## PACKAGE MECHANICAL DATA : 7 PINS - PLASTIC HEPTAWATT



PM-HEPTVEPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		16.97			0.668	
L1		14.92			0.587	
L2		21.54			0.848	
L3		22.62			0.891	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		2.8			0.110	
M1		5.08			0.200	
Dia.	3.65		3.85	0.144		0.152

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